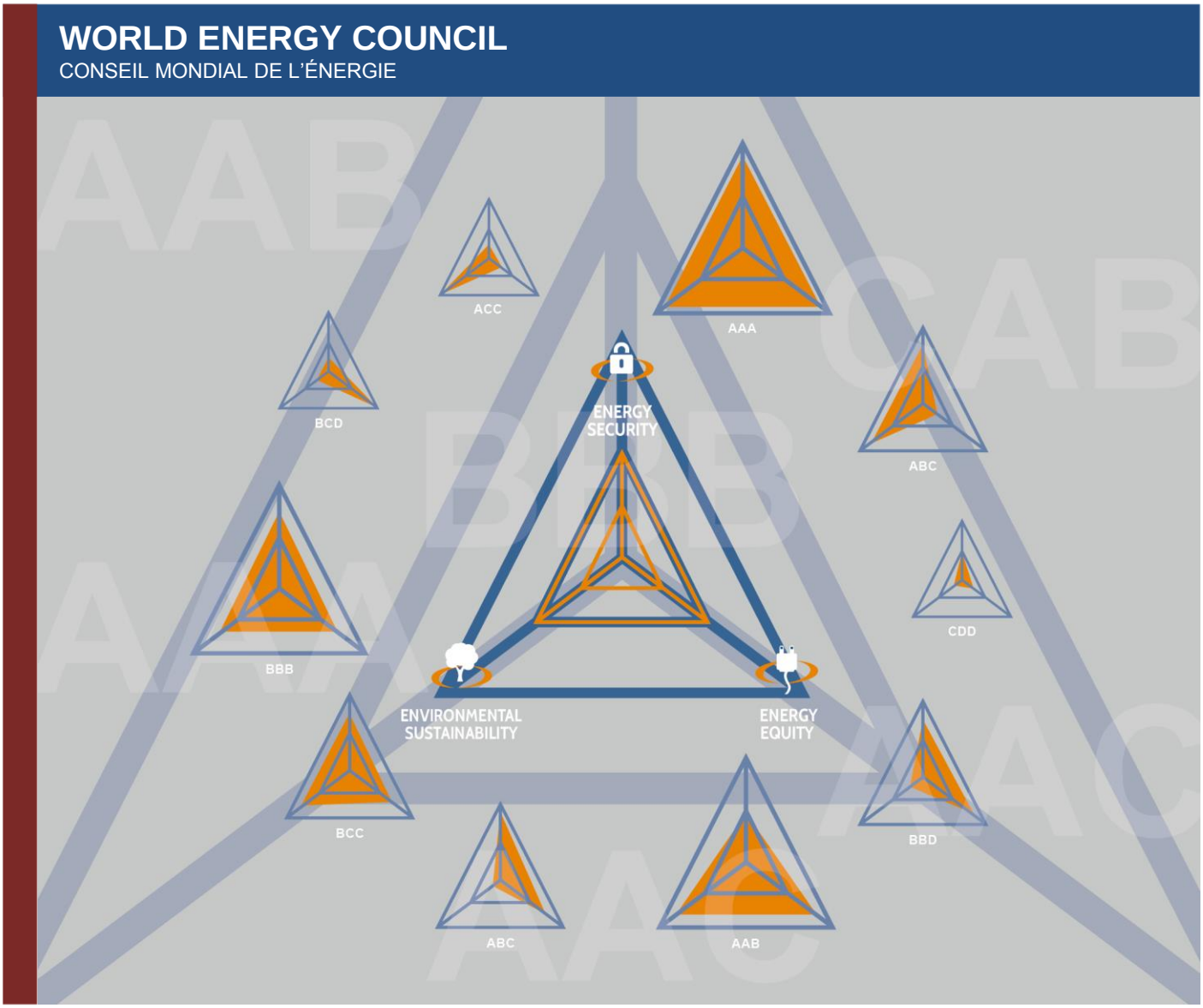
WORLD ENERGY COUNCIL
CONSEIL MONDIAL DE L'ÉNERGIE
For sustainable energy.

2015 Energy Trilemma Index

Benchmarking the sustainability of national energy systems

Project Partner OLIVER WYMAN



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Executive Summary

Now in its fifth edition, the 2015 World Energy Trilemma Index registers overall improvements across the three trilemma goals, although results show it is still a struggle for countries to develop a balanced approach, with only two countries out of 130 achieving a 'AAA' balance score.

This year Switzerland, Sweden and Norway take top rankings in the Index. Within the security dimension, Canada is once again the highest ranking country, with the United States (US) maintaining the position for most equitable (affordable and accessible) and Switzerland leading the way on the environmental sustainability dimension. In the Latin American region Uruguay ranks the highest with Colombia following closely behind, while Qatar outperforms its regional peers in the Middle East. In Sub-Saharan Africa, Gabon continues to climb the upper half of the Index. New Zealand remains the only top 10 country in Asia.

Managing trade-offs between the three dimensions continues to be a challenge for many countries, as only Switzerland and Sweden obtain a 'AAA' balance score. The United Kingdom's score (UK) is amended to 'AAB', as its energy equity dimension suffers compared to other leading countries. The report's 'watch list' highlights those countries that are expected to display trend changes in the next few years. These changes can be driven by deep transitions in their energy systems, be they of a regulatory nature, concerning the energy supply mix or related to infrastructure changes to improve the resilience of their energy systems. In 2015 South Africa and the US join Germany, Italy, Japan, and the UK on negative watch, whilst the Philippines and Serbia are expected to experience overall positive trends in upcoming years, alongside Mexico and the United Arab Emirates.

Despite the evident challenges faced by each country, Index results for the past five years show signs of progress for all dimensions of the energy trilemma, proving that the transition towards sustainable, balanced energy systems is slowly occurring. Global energy intensity, as recorded over the past five years, has decreased by 4.2%, and CO_2 emission intensity has diminished by 4.5%.[1] The global electrification rate has risen to 85%, with an additional 222 million people gaining access to electricity over the period 2010-2012.[2] And while gasoline has become more affordable in many countries across the globe, electricity bills are weighing more on household budgets in OECD countries.

In the run-up to the 21st Conference of the Parties (COP21) Paris meeting to define an agreement to tackle climate change and reduce greenhouse gas (GHG) emissions, the Index's regional analysis highlights the challenges and opportunities faced by energy systems in the various regions in relation to emissions production.

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[1] Enerdata/World Energy Council, 2013: Energy efficiency indicator database
[2] Sustainable Energy for All, 2015: Global tracking framework

- Fast-growing economies in **Asia** are responsible for almost 50% of global emissions, but the use of renewable energy sources for electricity generation is increasing, with almost half of global investment in renewable energy made in Asia in 2014.[3] Nationally determined actions pledged by countries such as China, with the goal to achieve the peaking of GHG emissions latest by 2030, will hopefully incentivise other Asian countries to follow.
- **Europe** is once again leading in the Index on the environmental dimension, with ambitious GHG reduction targets set out. A combination of continued deindustrialisation, greater energy efficiency and the use of more renewable energy has allowed countries of the European Union to decouple economic growth and GHG emissions. However, competitiveness and changing consumer preferences is a growing concern in the region.
- Responsible for about 9% of global GHG emissions,[4] countries in **Latin America** face increasing challenges driven by changing weather patterns and concerns related to the energy-water-food nexus, which require the implementation of soft and hard resilience measures to adapt to a potential 'new normal'.[5] Alongside adapting to these risks, countries face the challenge of maintaining their high environmental performance as they address societal and economic inequalities.
- In the **Middle East and North Africa**, policies related to energy efficiency and diversification of the energy mix are given a growing focus. If the right targets are set and policy frameworks are developed, there is the potential for CO_2 emissions to peak in 2030. If not, they could continue to increase until 2050.[6]
- Emissions in **North America** − accounting for roughly 14% of the global total[7] − are expected to peak by 2030 and then decrease back to 2010 levels or even lower.[8] As all three economies rely heavily on energy production for energy exports and heavy industries, efforts to reduce GHG emissions from the energy sector will likely focus on energy-efficiency improvements and the development of lower carbon energy solutions, such as carbon capture and storage technologies.
- **Sub-Saharan African** countries, mostly located in the lower Index half, register low emissions from the energy sector. Countries are expected to experience significant economic growth with emissions increasing between 30% and 140% by 2050.[9] Increased attention on soft and hard adaptation measures to counteract increasing average global temperatures and their impact on the energy system will be essential for the region's economic and social development.

While access to energy, the share of renewables in the electricity generation mix, and the rate of energy-efficiency improvements all see positive developments, it is clear that progress is still slow, and can only be sped up by creating robust and stable policy frameworks that give certainty to investors. The inclusion of energy in the United Nation's Sustainable Development Goals will hopefully catalyse the achievement of trilemma goals. Likewise, a meaningful agreement at COP21 with a clear measurable target for GHG emissions, supported by practical and strong implementing measures as recommended in the 2015 World Energy Trilemma: Priority actions on climate change and how to balance the trilemma report earlier this year, will help accelerate the transition towards low-carbon energy systems.

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[3] United Nations Environmental Programme/Bloomberg New Energy Finance, 2015: Global trends in renewable energy investment
[4] World Resource Institute (WRI), 2014: CAIT 2.0 - WRI's climate data explorer
[5] World Energy Council, 2015: The road to resilience - managing and financing extreme weather risks
[6] World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050
[7] WRI, 2014: CAIT 2.0 - WRI's climate data explorer
[8] World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050
[9] World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050

Introduction

This report provides country-level details on the results of the 2015 Energy Trilemma Index prepared by the World Energy Council in partnership with global consultancy Oliver Wyman, along with the Global Risk Centre of its parent Marsh & McLennan Companies.

The Index provides a comparative ranking of a total of 130 countries and awards countries with a balance score. The balance score highlights how well countries manage the trade-offs between the three energy trilemma dimensions and identifies top performing countries with a AAA score.

For each World Energy Council member country, a country profile has been prepared to highlight its relative energy performances and contextual attributes. These profiles and the Index provide a comparative assessment tool to evaluate countries' ability to balance the energy trilemma by providing secure, affordable, and environmentally-sensitive energy system and highlight current challenges.

Included in this Index report are:

- Overview: A time for action and an ambitious climate framework
- Infographic: Priority actions on climate change and how to balance the trilemma
- 2015 Energy Trilemma Index rankings and balance scores
- Regional profiles
- Cross-regional energy trilemma profiles
- Country profiles for each World Energy Council member country
- Index rationale, structure and methodology.

Although the overall Index rankings are important, trends and the balance within the three dimensions provide the most valuable information in helping countries address their energy trilemma. Every country has a chance to improve its energy performance, regardless of whether they are ranked first or last. Decision makers in both the public and private sectors are encouraged to look at trends in performance over the years, particularly in each dimension and to compare their countries against peer groups – including regional or GDP group peers.

The Index discussion highlights countries with common energy trilemma profiles that offer additional benchmarking groups for decision makers to learn from. The cross-regional, illustrative profile groups include the challenges that oil-exporting countries face, the experiences of countries that have developed a high share of renewables or hydropower, or the energy trade-offs that fast-growing economies have to manage.

Readers are also directed to the companion document World Energy Trilemma: Priority actions on climate change and how to balance the trilemma, which was published earlier this year. The report aims to support policymakers as they set climate and development goals and design policies in international and domestic forums. While it acknowledges that regional and national differences and priorities call

for different solutions, it emphasises that the level of uncertainty created by the continued lack of an international climate framework is not acceptable for the energy sector. The recommendations, which build on and reinforce the global dialogue between the energy sector, policymakers and the financial sector presented in previous World Energy Trilemma reports, point to five priority action areas identified by energy leaders across the globe to support the implementation of an effective framework and ensure climate and development goals can be achieved.

Since 2012, the reports' methodology is based on the guiding premise that energy sustainability involves both the efforts of public and private stakeholders. Together the publications support an evolving dialogue aimed at furthering knowledge of effective strategies and policies to deliver the necessary transformation of the energy system to support sustainable economic and social development.

Iconography

Graphics displaying results of the Trilemma Index analysis make use of the following iconography.

Energy performance dimensions:

 Energy security

 Energy equity

 Environmental sustainability

Trilemma Index results and country profiles can be found on the World Energy Council website at www.worldenergy.org/data/sustainability-index

1. Time for action and an ambitious climate framework

The US$48-53 trillion of investment needed for global energy infrastructure is increasingly contingent on a clear climate framework and a global target for emissions

The energy sector could not be clearer: the time is ripe for action on climate. It has the right capabilities, expertise and commitment, but for negotiation to give way to implementation, clear policy direction and consistent targets are essential.

Extensive research into the views of leaders across the globe and across all energy sectors reveals a renewed sense of urgency to move forward. A prolonged period of uncertainty is weighing on the industry at this point in the commodities cycle at which it can ill afford to be buffered by strong and volatile policy crosswinds. It is one of the issues cited by industry leaders as the most critical of those affecting them.

The IEA estimates that up to $53 trillion of investment in energy infrastructure is required by 2035 to meet the '2 degree goal' increase in global warming set by governments in 2009. Continued indecision is having a demonstrable impact on the prospects for securing this investment. The longer it persists, the more difficult it will become to ensure that the right energy infrastructure and technology is in place to sustain a successful energy transition and address the global energy trilemma.

The urgency is underlined not only by the hardening science in climate change, but also by predictions of dramatic changes in global energy demand.

Asia is set to produce almost 50% of global economic growth by 2050, with its share of primary energy consumption rising to between 45 and 48% of the global total. The Middle East and North Africa will continue to be heavy users of energy - their economies are set to triple by 2050, stimulating a doubling in energy demand during the same time. Despite European GDP doubling over that period, energy demand there will remain largely unchanged owing to improved energy efficiency. The picture is similar in North America.

As the world begins to focus on the implications of a potential climate agreement at COP21 in Paris in December – and as the pessimists brace themselves for the consequences of another failed negotiation – the energy industry is keen to position itself as an enabler of the transition towards a lower carbon energy mix.

The 2,500 energy leaders who guided our work on the 2015 World Energy Trilemma report − which assesses countries' energy policies against the goals of energy security, energy equity (affordability and access) and environmental sustainability - backed five major measures to make real progress: setting a carbon price to level the playing field; removing barriers to trade and enhancing the transfer of technology; a step change in research, development and demonstration; providing the right policy signals and a pipeline of bankable projects for investment to flow; and a greater focus on energy demand.

Those mechanisms, though, stand a limited chance of success without a transparent and consistent target for emissions. That target should be easily monitored, but also be flexible enough to meet the specific circumstances of countries as they evolve. Its success, however, hinges on policymakers fostering a culture of greater collaboration with industry and the investment community to ensure that targets are achievable and that implemented measures contribute to meeting them. This is why the Energy Trilemma report does not just call for action but also sets out clear action areas to enable the energy sector to play its full part in the energy transition.

The sector must also engage proactively in the debate. With communities apprehensive about the impact of new technologies on affordability, the onus is on our industry, supported by the right policy platforms, to help develop better public understanding of the challenges of climate change and the implications of various approaches to meeting them for public understanding.

The way energy is delivered and used has to change, but until environment, energy and commerce ministers get in one room, there won't be readily implementable climate decisions. Negotiation must now turn to vigorous implementation. It's a message that can be heard loud and clear: it is time to get something done.

The infographic on the following page illustrates the key findings of the 2015 World Energy Trilemma report Priority actions on climate change and how to balance the trilemma.[10]

[10] 'Jazz' and 'Symphony' are the two World Energy Council scenarios introduced in the 2013 World Energy Scenarios: Composing energy futures to 2050 report. The lower number in the infographic on the following page refers to the Council's 'Symphony' scenario, which focuses on achieving environmental sustainability through internationally coordinated policies and practices, while the higher number reflects the Council's 'Jazz' scenario, which focuses on energy equity with priority given to achieving individual access and affordability of energy through economic growth.

Tackling policy uncertainty

The energy sector is ready for policymakers to agree on a clear target to reduce greenhouse gas (GHG) emissions. Policy stability will enable the energy sector to deliver the transition to a sustainable energy future. Individual countries will contribute to the target through a variety of measures, in line with their energy profiles and priorities.

Regional differences and priorities

Solutions to accommodate the energy transition need to be devised according to regional and country level differences.

North America

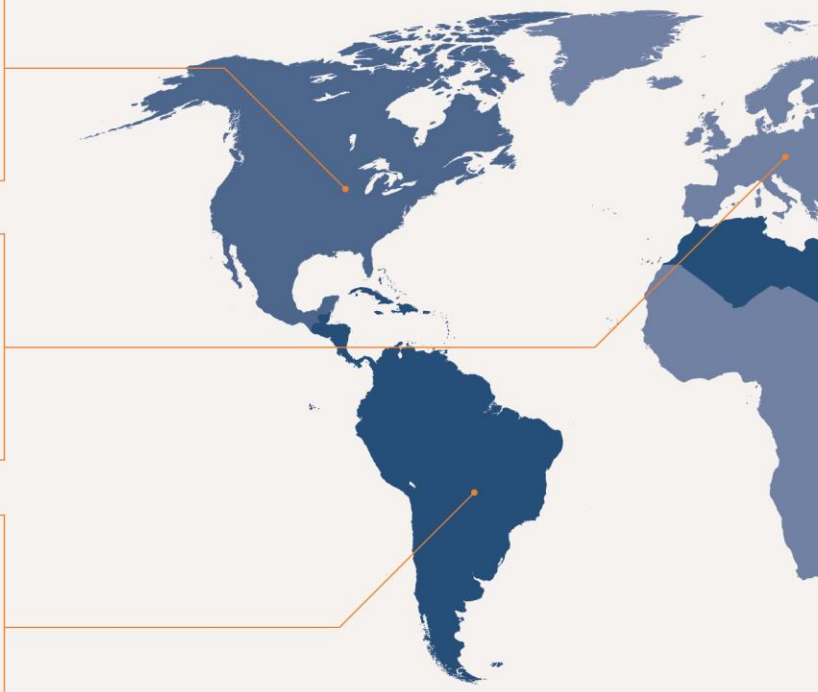
- Research,development and demonstration
- Lower carbon fossil fuel use through gas and technology deployment

Europe

- More efficient energy use
- Greater share of low-carbon energy sources in energy supply

Latin America & Caribbean

- Regional integration and interconnection
- Education and information to drive behavioural changes in consumers and increase energy efficiency



Priority actions from the energy sector

To meet climate and development goals, and balance the trilemma, a focus on some key mechanisms is needed.

AT THE INTERNATIONAL LEVEL

Trade and transfer of technology

Eliminating tariffs on environmental goods and services, carefully designing local content requirements and protecting intellectual property rights are key to reducing costs, stimulating business and incentivising the use of low-carbon technologies, especially in developing countries.

Carbon pricing

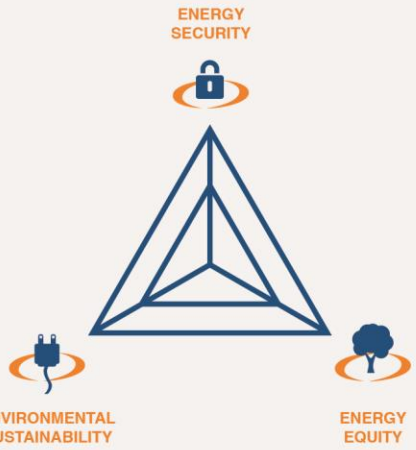
An effective price on carbon will redirect investments towards low-carbon solutions and 'level the playing field' among different technologies. Many business leaders already use a 'shadow carbon price' for their operations, corporate planning or when analysing investment options.

Financing mechanisms

The right policy signals need to be provided and a portfolio of bankable projects needs to be in place to attract more private capital. Financial markets will develop innovative financing mechanisms if the regulatory rules indicate a clear and stable direction towards sustainable energy systems.

World Energy Trilemma

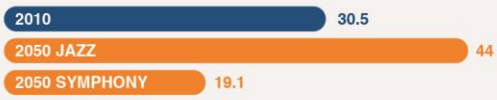
Balancing the three core dimensions of the energy trilemma is the basis for prosperity and competitiveness of individual countries. If the energy sector is to deliver on climate goals and support the achievement of development goals, it needs to do so in balance with the other two dimensions, to ensure sustainability of energy systems.

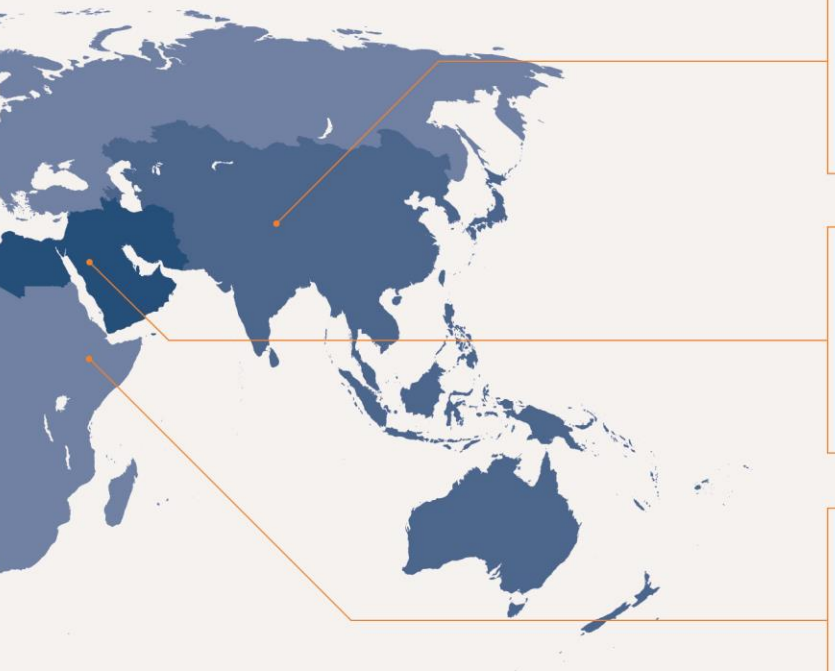


Whose views?

This report presents findings from workshops convened across all the Council's regions and from interviews with leading figures from the energy sector to highlight bottlenecks, opportunities and solutions.

Total global CO_2 levels ($GtCO_2$/year)





Asia

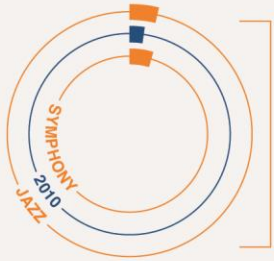
- Technology transfers to manage demand growth
- Greater social acceptance of changing energy supply

Middle East and North Africa

- Transparent energy pricing to incentivise efficient energy use
- Increase share of solar and wind energy in energy supply

Sub-Saharan Africa

- Tap potential for renewables and gas for energy supply
- Access to energy and clean cooking fuels



AT THE NATIONAL LEVEL

Demand management and energy efficiency

Energy leaders emphasise that a sustainable energy future will require improved energy efficiency on the supply side and an equally strong focus on managing energy demand and increasing energy efficiency across all sectors including residential, commercial, industrial, and transport.

Prioritise innovation and RD&D

Investments in research, development and demonstration, including new technologies, materials, and fuels are essential to achieve climate targets and development goals. National and international public–private collaborations have to be encouraged.

Greater dialogue among government, business and finance is essential for a successful energy transition. More interaction would ensure a focus on practical, economically-sound solutions.

2. 2015 World Energy Trilemma Index

Trends and the balance between the three dimensions provide the most valuable information in helping countries address their energy trilemma.

Sustainable energy is not only an opportunity to transform societies and grow economies, but also a necessity - a prerequisite to meet growing energy demand and reduce the carbon footprint. That is why it is so important to balance what the World Energy Council defines as the energy trilemma. Balancing the three core dimensions of the energy trilemma is a strong basis for prosperity and competitiveness of individual countries. Secure energy is critical to fuelling economic growth and social development. Energy must be accessible and affordable at all levels of society, and the impact of energy production and energy use on the environment needs to be minimised in order to combat climate change and maintain good air and water quality.

The 2015 Trilemma Index quantifies the energy trilemma and comparatively ranks countries in terms of their ability to provide a secure, affordable, and environmentally-sustainable energy system. The rankings are based on a range of databases that capture both energy performance and the context of that energy performance. Energy performance indicators consider supply and demand, the affordability of and access to energy, and the environmental impact of a country's energy use. The contextual indicators consider the broader circumstances of energy performance including a country's political, societal and economic strength and stability. Indicators were selected on their high degree of relevance to the research goals.

Each country is also given a balance score that highlights how well a country manages the trade-offs between the three competing dimensions. Figure 1 shows the overall Index performance and balance score of the 130 countries assessed in 2015. This is a unique and unparalleled resource and guide for policymakers seeking to develop solutions for sustainable energy systems.

The Index illustrates the trade-offs that exist with the energy trilemma and points to key areas that countries must give extra attention to in order to develop a balanced energy profile. Trends and the balance between the three dimensions provide the most valuable information in helping countries address their energy trilemma. Rankings from three consecutive years broken down by dimension are covered in the Index. This means that a country can track the results of energy policies not only on a

macro level, but also by dimension. The Index also makes it possible to generate regional, economic or structure of the energy sector peer group comparisons. As countries have unique resource endowments, policy goals and challenges, the absolute rank of a country may be less meaningful than its relative performance versus its peers.

For the deeper Index analysis, countries were organised in four economic groups:

- Group I: GDP per capita greater than US$33,500
- Group II: GDP per capita between US$14,300 and US$33,500
- Group III: GDP per capita between US$6,000 and US$14,300
- Group IV: GDP per capita lower than US$6,000.

Finally, it is important to note that the Index methodology continues to be improved. Further information on Index methodology, 2013 and 2014 rankings, and the balance score can be found in Appendix A.

Benchmarking the sustainability of national energy systems

The 2015 Trilemma Index confirms that trade-offs in the energy trilemma persist for countries at all stages of development. It shows that countries face specific challenges as they pass through the stages of economic and social development. Developed countries currently rank higher in the Index but they must address ageing and carbon-intensive energy systems by increasing low- and zero-carbon emission forms of energy such as renewables, including hydro and nuclear into their energy mix. The Index also shows the opportunity for developing countries. As renewable energy sources become more widely available and cost-effective, countries may be able to leverage environmentally-sensitive and affordable energy sources to support their industrialisation and improve their populations' access to energy. These countries have the highest potential of developing renewable energy sources, but mobilising the necessary investment will be crucial to the success of these future projects.

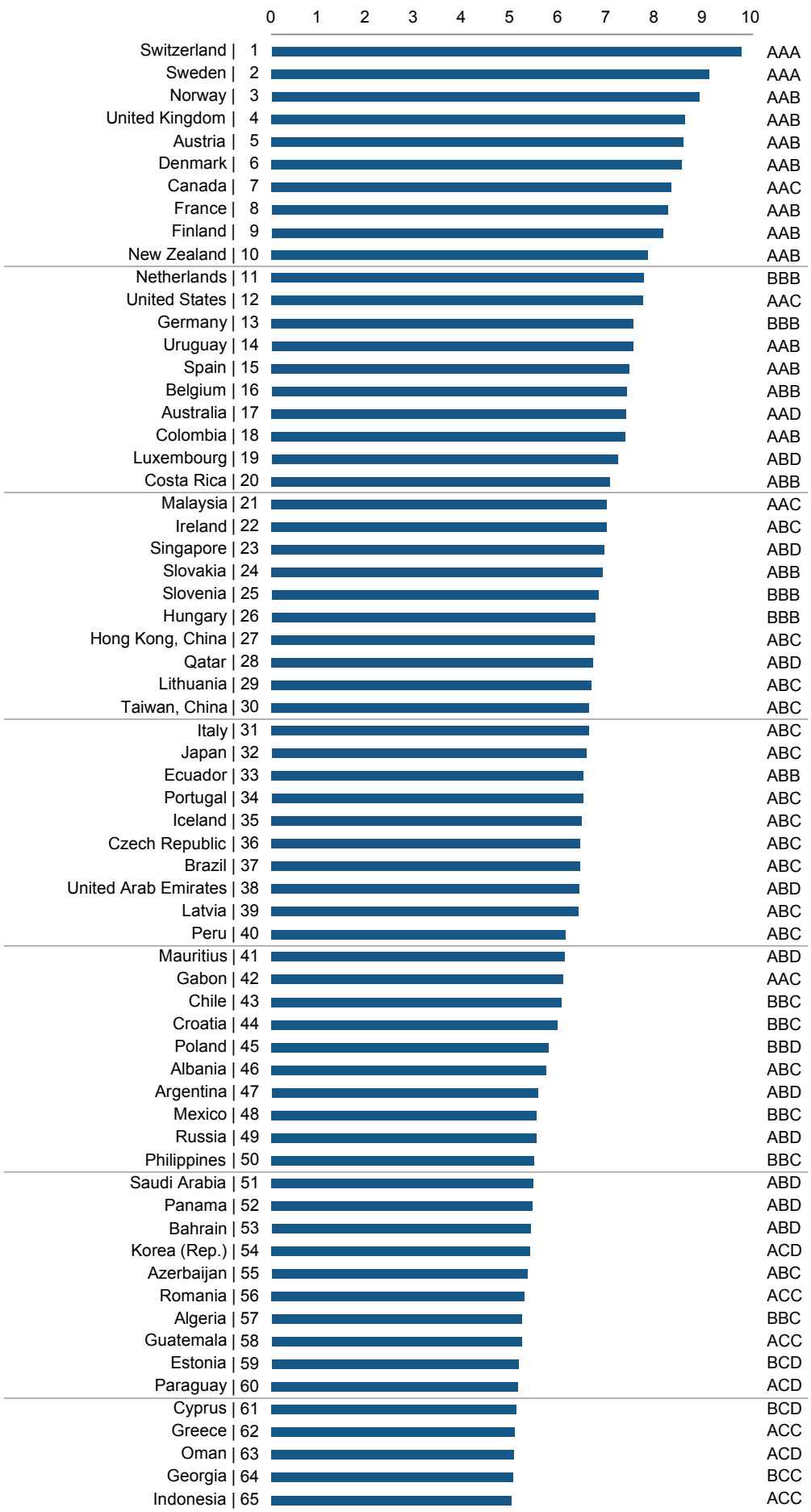
The results of the 2015 Energy Trilemma Index show that the top 10 countries are developed countries with higher shares of energy coming from low- or zero-carbon energy sources, supported by well-established energy-efficiency programmes (see Figure 2). Beyond these commonalities, there are differences in energy resources and supply, such as large discrepancies in the use of nuclear energy. The differences reinforce the conclusion that there is no single solution, but that countries need to take full advantage of available indigenous resources where appropriate and develop policy frameworks that support energy sustainability through the value chain to the end user.

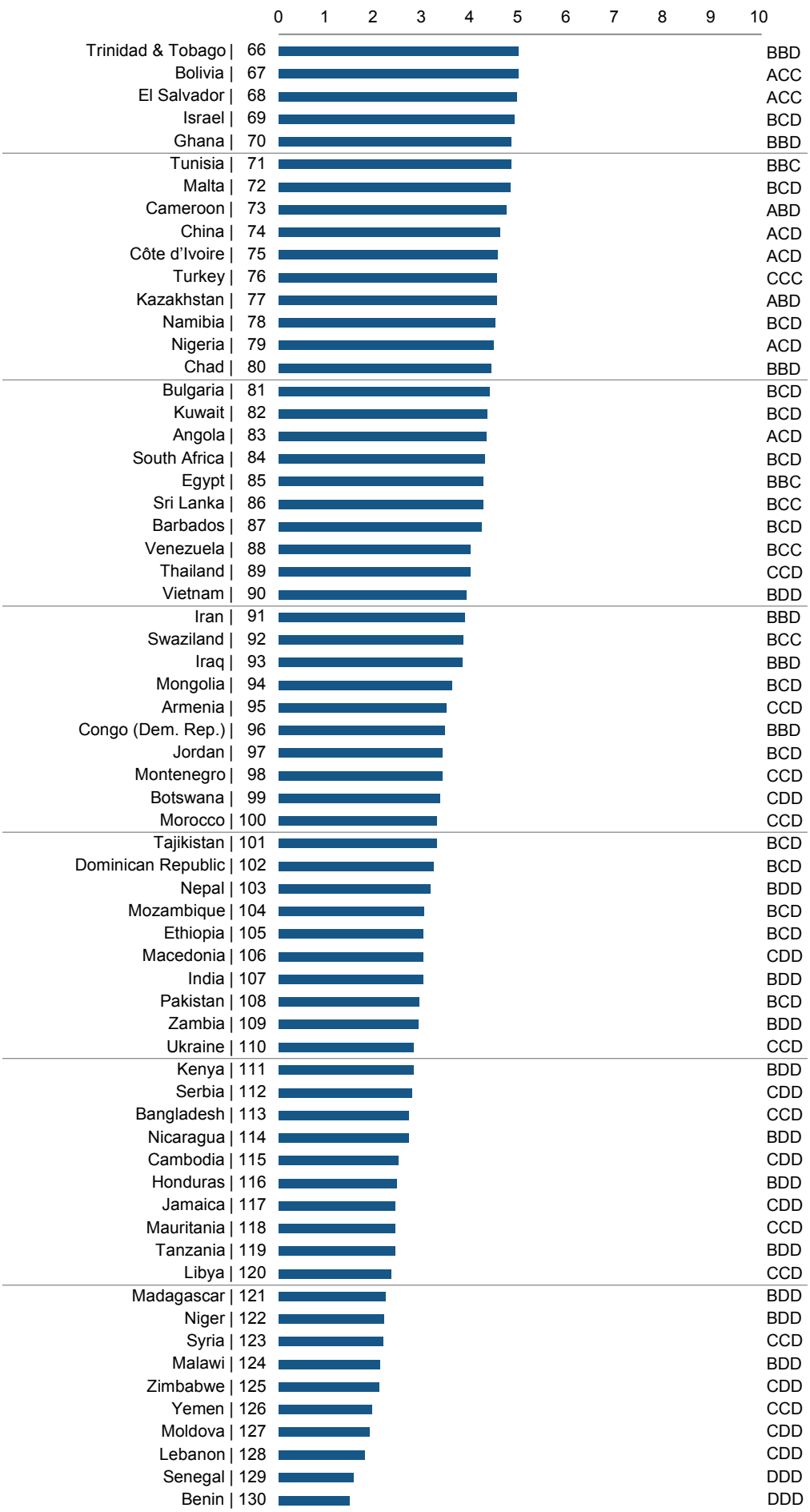
Looking at the Index results of the past five years, it becomes clear that the transition towards sustainable, balanced energy systems is slowly occurring. Progress is visible for all dimensions of the energy trilemma. The average global energy and emission intensity as measured by CO_2 emissions per kilowatt hour went down marginally. The average access to electricity increased for the countries assessed. At the same time, quality of electricity supply is perceived to be marginally better. And while gasoline has become more affordable in many countries across the globe, average electricity prices have gone up in OECD countries.

Figure 1

2015 Energy Trilemma Index rankings and balance scores

Source: World Energy Council/Oliver Wyman, 2015




0 1 2 3 4 5 6 7 8 9 10
Trinidad & Tobago | 66 BBD
Bolivia | 67 ACC
El Salvador | 68 ACC
Israel | 69 BCD
Ghana | 70 BBD
Tunisia | 71 BBC
Malta | 72 BCD
Cameroon | 73 ABD
China | 74 ACD
Côte d'Ivoire | 75 ACD
Turkey | 76 CCC
Kazakhstan | 77 ABD
Namibia | 78 BCD
Nigeria | 79 ACD
Chad | 80 BBD
Bulgaria | 81 BCD
Kuwait | 82 BCD
Angola | 83 ACD
South Africa | 84 BCD
Egypt | 85 BBC
Sri Lanka | 86 BCC
Barbados | 87 BCD
Venezuela | 88 BCC
Thailand | 89 CCD
Vietnam | 90 BDD
Iran | 91 BBD
Swaziland | 92 BCC
Iraq | 93 BBD
Mongolia | 94 BCD
Armenia | 95 CCD
Congo (Dem. Rep.) | 96 BBD
Jordan | 97 BCD
Montenegro | 98 CCD
Botswana | 99 CDD
Morocco | 100 CCD
Tajikistan | 101 BCD
Dominican Republic | 102 BCD
Nepal | 103 BDD
Mozambique | 104 BCD
Ethiopia | 105 BCD
Macedonia | 106 CDD
India | 107 BDD
Pakistan | 108 BCD
Zambia | 109 BDD
Ukraine | 110 CCD
Kenya | 111 BDD
Serbia | 112 CDD
Bangladesh | 113 CCD
Nicaragua | 114 BDD
Cambodia | 115 CDD
Honduras | 116 BDD
Jamaica | 117 CDD
Mauritania | 118 CCD
Tanzania | 119 BDD
Libya | 120 CCD
Madagascar | 121 BDD
Niger | 122 BDD
Syria | 123 CCD
Malawi | 124 BDD
Zimbabwe | 125 CDD
Yemen | 126 CCD
Moldova | 127 CDD
Lebanon | 128 CDD
Senegal | 129 DDD
Benin | 130 DDD

The efforts of many countries to become less dependent on energy imports as well as energy exports show in the data for the countries assessed. Similarly, many countries are making progress in diversifying their electricity generation away from relying on one energy resource for power generation towards a mix of fossil fuels, nuclear, hydropower, and renewable energy sources. But does this mean the energy system is becoming more sustainable? While access to energy, the share of renewables, and the rate of energy efficiency-improvements all see positive developments, progress is still slow, and could only be sped up by creating robust and stable policy frameworks on the national level that give certainty to investors.

Figure 2

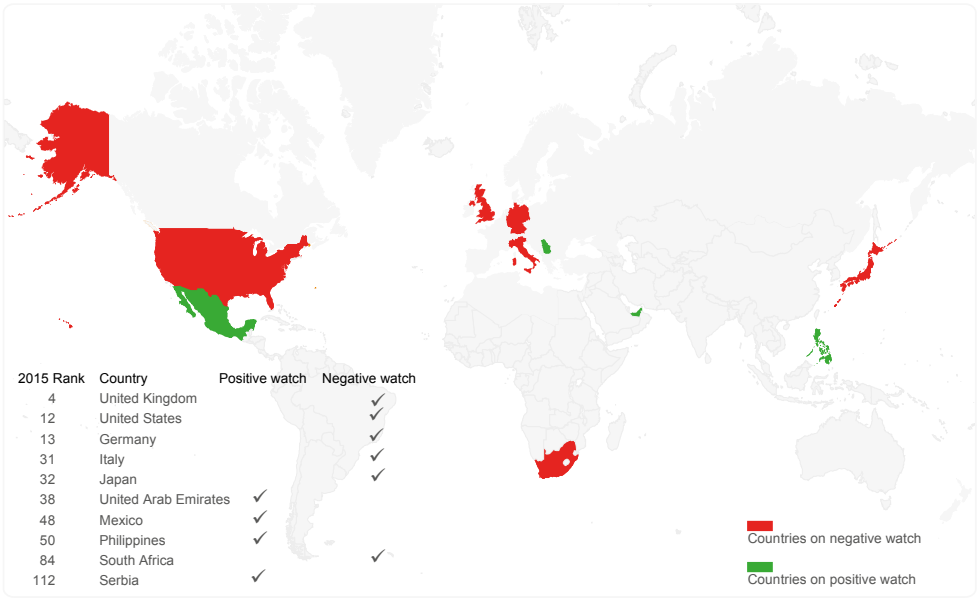
Top 10 Energy Trilemma Index performers overall and per dimension

Source: World Energy Council/Oliver Wyman, 2015

Placing countries on the Index watch list

The watch list, first introduced in 2014, seeks to identify countries that are likely to experience significant changes − positive or negative − in their trilemma Index performance in the near future. Due to constraints on the collection, processing, and dissemination of data, the goal of the watch list is to reflect developments in a country's energy sector that are currently ongoing but are not yet captured in the Index. In order to establish a forward-looking view on a country's performance in light of recent policy changes, unscheduled incidents or undealt with structural issues, the watch list builds on selected Index indicators as well as ad hoc indicators and related country-specific data.

Figure 3
2015 World Energy Council watch list
Source: World Energy Council/Oliver Wyman, 2015



The 2015 watch list includes the following countries which were first put on watch in 2014 and remain on the World Energy Council's watch list:

- ***Germany*** ranking continues to be affected by the impacts of the plan to transition Germany's energy system, which includes goals of increasing power generation from renewable sources, a reduction of primary energy usage and CO_2 emissions, as well as the phase-out of nuclear power by 2022 (16% of the electricity generation mix in 2012)[11]. Investment needs on the incumbent energy system are estimated at US$470bn by 2033.[12] Germany's energy equity performance already saw a decline over the past five years as energy services became more expensive. Further changes in energy security and environmental sustainability are expected in future evaluations.
- As ***Italy*** increasingly shifts its energy supply towards natural gas, given its rejection of nuclear power, reduced use of coal, and limited development of renewables, the country will further increase its dependence on imports. It is estimated that Italy will be importing the majority of its energy resources required to satisfy energy needs by 2025.[13] Italy's energy security and energy equity performance are expected to see more strain in future evaluations.
- In ***Japan***, uncertainty around energy supply and nuclear power after the Fukushima accident remains despite the Nuclear Regulation Authority's (NRA) plans to start reopening plants that pass safety examinations. Whether agreements on the restart of nuclear power plants can be obtained easily from neighbouring municipalities and prefectural governors continue to be an unresolved question. The Fukushima accident had a notable impact on the country's electricity fuel mix, thus also affecting its impact on the environment as

[11] U.S. Energy Information Administration (EIA), 2012: International energy statistics (www.eia.gov)
[12] Oliver Wyman, 2014: Financing Germany's Energy Transition (Oliver Wyman journal)
[13] Italian Ministry of Foreign Affairs and International Cooperation: Energy, the Italian outlook (www.est.it/mae/it/politica_estera/temi_globali/energia/situazi_italiana.html)

more fossil fuels are burned for power generation. Japan's overall performance has deteriorated from rank 13 in 2011 to rank 32 in 2015. The downward trend is expected to continue for a few more years until there is more certainty around future energy supply.

- In 2014, in ***Mexico*** the government approved constitutional changes and respective legislation allowing full participation of the private sector in Mexico's competitive energy markets. Thus, the Mexican energy sector faces the challenge of managing two transitions simultaneously: the transition from a monopolistic structure to a competitive market scheme and from a high-carbon to a low-carbon economy. While managing these changes will be a difficult endeavour, the country's overall energy trilemma performance is expected to improve as the reforms are implemented.
- Even though the ***United Arab Emirates (UAE)*** is well endowed with oil and natural gas reserves, the country is making major investments in low-carbon energy solutions. Some of the latest projects include the construction of a 5.4 GW of nuclear power; the establishment of renewable energy targets, the establishment of demand reduction and energy-efficiency targets and the development of the region's first green growth plan. The recently announced elimination of subsidies on petrol and diesel from August 2015 is expected to rationalise fuel consumption and protect natural resources and the environment, and support state finances.[14] Moreover, the UAE is working to develop a coherent energy policy across all emirates that will be built upon the framework the energy trilemma provides. The UAE's performance across all energy dimensions is expected to change, with significant improvements on the energy security and environmental sustainability dimensions.
- The ***United Kingdom (UK)*** faces significant challenges in securing energy supply. Domestic production of fossil fuels has steadily declined, nuclear power plants are being run down, and many coal plants will be forced to close due to changes in European legislation. Furthermore, ageing infrastructure and the tightening of reserve capacity margins, called for extraordinary measures by the national grid operator, including tenders, to ensure supply during the winter 2014/2015. The UK's energy security performance does not yet reflect these constraints and is expected to decrease in future rankings. Moreover, the unexpected removal of feed-in tariffs for wind and solar may hinder investments in these sectors, impacting the country's goal to further diversity of its energy supply and improve its environmental sustainability.

With the support of its member countries the World Energy Council has collected information on a select number of qualitative indicators that helped identify the following countries to be added to the watch list in 2015: the Philippines, South Africa Serbia and the United States. For further information on the qualitative indicators see Appendix A.

- Following the deregulation reform in the late 1990s, the ***Philippines*** has seen a positive trend over the last five years. Through an improving diversity of electricity generation portfolio including more than 15% of new renewable energy sources,[15] a decreasing dependence on fuel imports, increasing shares of electricity access, improving quality of electricity supply, and a continued reduction of both energy

[14] Carpenter C and Khan S, 2015: U.A.E. Removes Fuel Subsidy as Oil Drop Hurts Arab Economies (Bloomberg, 22 July 2015)
[15] EIA, 2012: International energy statistics

and emission intensity, the country has made great progress. However, reoccurring extreme weather events such as typhoon Yolanda (2013) and typhoon Glenda (2015) − not yet reflected in the data − could affect energy security and reliability, and may impact the positive trend of the country's performance over the next few years.

- ***Serbia***'s new Energy Law 2014 (Official Gazette 145/2014), adopted in December 2014, includes abolition of monopolies and introduction of market competition in all energy activities including transposition and is expected to improve the country's overall trilemma performance over the next decades if implemented consequently.
- ***South Africa***'s energy system suffers from undercapacity and an unreliable supply of electricity, coal and liquid fuels. The electricity supply crisis is the most obvious, with tight reserve margins, poor maintenance practices, fuel constraints and slow addition of new capacity, against a continuously growing electricity demand. The country's major power utility has been implementing rotational load shedding to avoid national blackouts which have led to the shutting of shops and factories and delayed flights in the continent's biggest economy.
- The ***United States (US)*** Department of Energy's Quadrennial Energy Review highlights concerns around ageing energy transmission, storage, and distribution systems, which are further affected by the country's changing energy landscape, as it moves from importer to exporter. Increasingly exposed to extreme weather events such as hurricanes, droughts, blizzards, and flooding, damages to equipment, failures and power interruptions could increase over the coming years without the necessary investments to counteract these issues. Increasing average temperatures may also stress the country's water system, a threat to conventional power generation, which requires large volumes of water to operate.[16] Moreover, the majority of coal-fired and nuclear power plants are at least 30 years old, and, with an average lifespan of just 40 years, will need to be replaced over the coming years.[17] This poses threats to the country's energy security which may slip over the coming years despite the fact that the country is expected to become an energy exporter in the near future.

[16] Fahey J, 2013: U.S. Electrical Grid Report Calls For More Spending; Cites Climate Change And Aging Infrastructure, Huffington Post, 8 December 2013
[17] EIA, 2011: Age of electric power generators varies widely, 16 June 2011

3. Regional profiles

The variability in performance seen across the three dimensions of the Trilemma Index shows the degree to which the energy challenges faced by each country are unique. However, the transnational nature of both energy markets and environmental sustainability issues necessitates a view that extends past the country level as highlighted in previous reports. Energy leaders emphasised the need to examine opportunities to adopt regionally coordinated approaches to energy resources, infrastructure and regulation.

This section shows the average results for countries in each geographic region represented in the 2015 Index, as well as an overview of regional challenges.

Table 1

Comparison of key metrics among geographical regions

Source: World Energy Council/Oliver Wyman

Geographical region		GDP per capita (PPP, US$)	Industrial sector (% of total GDP)	TPEP/TPEC[1]	Population with access to electricity (%)	Energy affordability (US$ per kWh)[2]	Energy intensity (koe per US$, PPP)	Emission intensity (kCO_2 per US$, PPP)	CO_2 emissions per capita
Asia	Asia	21,851	29.8	0.82	90.1	0.19	0.14	0.29	5.12
	High-GDP countries	43,737	27.1	0.56	99.9	0.19	0.14	0.32	9.84
	Low-GDP countries	7,261	31.7	0.99	83.5	–	0.14	0.28	1.97
Europe	Europe	29,486	26.7	0.69	100.0	0.23	0.15	0.29	5.85
	Western Europe	42,313	23.5	0.58	100.0	0.25	0.14	0.22	6.88
	Eastern Europe	17,774	29.6	0.79	100.0	0.19	0.17	0.36	4.90
Lat. Am. & Caribbean		13,670	26.5	0.90	94.0	–	0.14	0.26	3.66
Middle East & North Africa	Middle East & N. Africa	34,347	42.0	1.88	96.2	0.15	0.14	0.35	10.70
	GCC countries	58,708	48.1	2.01	98.7	0.15	0.17	0.38	18.45
	Non-GCC countries	21,059	39.0	1.82	95.0	–	0.13	0.34	6.83
North America		37,993	28.4	1.12	99.7	0.11	0.15	0.34	11.75
Sub-Saharan Africa		5,454	27.8	4.53	40.3	–	0.21	0.18	0.92
Global average		**22,031**	**29.5**	**1.65**	**85.5**	**0.21**	**0.16**	**0.27**	**5.26**

Table 2

Comparison of key metrics among GDP groups

Source: World Energy Council/Oliver Wyman

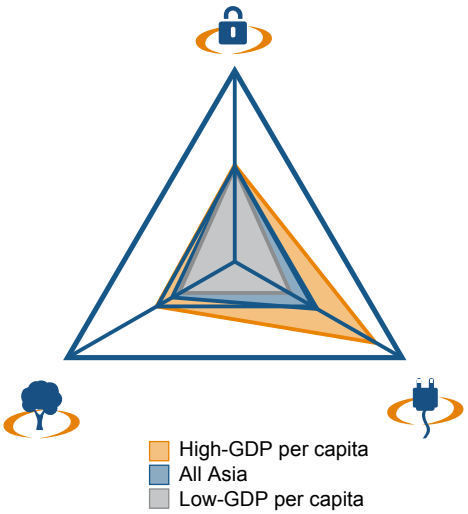
GDP group	**GDP per capita** (PPP, US$)	**Industrial sector** (% of total GDP)	**TPEP/TPEC**[1]	**Population with access to electricity** (%)	**Energy affordability** (US$ per kWh)[2]	**Energy intensity** (koe per US$, PPP)	**Emission intensity** (kCO_2 per US$, PPP)	**CO_2 emissions per capita**
Group I	52,304	31.3	1.16	99.5	0.23	0.16	0.29	11.78
Group II	22,102	29.6	1.06	98.1	0.18	0.14	0.31	5.68
Group III	10,172	33.0	1.36	90.4	–	0.13	0.29	2.57
Group IV	3,127	24.3	3.24	49.8	–	0.21	0.19	0.56
Global average[3]	**22,031**	**29.5**	**1.65**	**85.5**	**0.21**	**0.16**	**0.27**	**5.26**

[1] Ratio of total primary energy production to total primary energy consumption, showing the extent to which a country imports or exports energy

[2] '–' indicates lack of available data for this indicator for too many countries in this region

[3] Average of all 130 countries included in the Index

Figure 3
Trilemma profile: Asia
Source: World Energy Council/Oliver Wyman



Low-GDP countries	High-GDP countries
Armenia	Australia
Azerbaijan	Hong Kong, China
Bangladesh	Japan
Cambodia	Korea (Rep.)
China	Malaysia
Georgia	New Zealand
India	Singapore
Indonesia	Taiwan, China
Kazakhstan	
Mongolia	
Nepal	
Pakistan	
Philippines	
Sri Lanka	
Tajikistan	
Thailand	
Vietnam	

Asia

Asia is the world's largest and most populated continent. The region contains a diverse array of economies and includes less-developed countries, rapidly-developing economies, and highly-developed nations.

Asia has a mix of net energy importers and exporters and the demand for and consumption of energy is set to increase in almost all countries, reaching a share of 45-48% of the global total by 2050.[18] Primary energy supply is set to increase, potentially by as much as 90%, through to 2050 with South, Central and East Asia at the centre of future growth, in particular China and India.[19] Coal will likely remain the dominant fuel, with reserves and infrastructure in place in many countries. Large amounts of oil and natural gas will need to be imported as societies become more motorised. In 2012 close to 50% of total global greenhouse gas (GHG) emissions were produced by Asian countries, with China as the single largest emitter.[20]

The continued use of fossil fuels to fuel economic growth and meet the energy needs of the growing population will lead to an increase in emissions in the medium-term. However, the use of renewable energy sources for electricity generation continues to grow and is higher in low-GDP countries. In 2014, almost half of global investment in renewable energy was made in Asia, with investment in China amounting to more than US$83bn, an increase of US$28bn compared to 2013, and an additional US$56bn spend in other Asian countries including India.[21]

[18] World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050
[19] World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050
[20] World Resource Institute (WRI), 2014: CAIT 2.0 - WRI's climate data explorer
[21] United Nations Environmental Programme/Bloomberg New Energy Finance, 2015: Global trends in renewable energy investment

There is a wide gap in energy equity between high- and low-GDP Asian countries, as many of the low-GDP economies still struggle to provide access to modern energy services to their populations. Of the 1.1 billion people without access to electricity globally, more than 240 million of them live in India.[22]

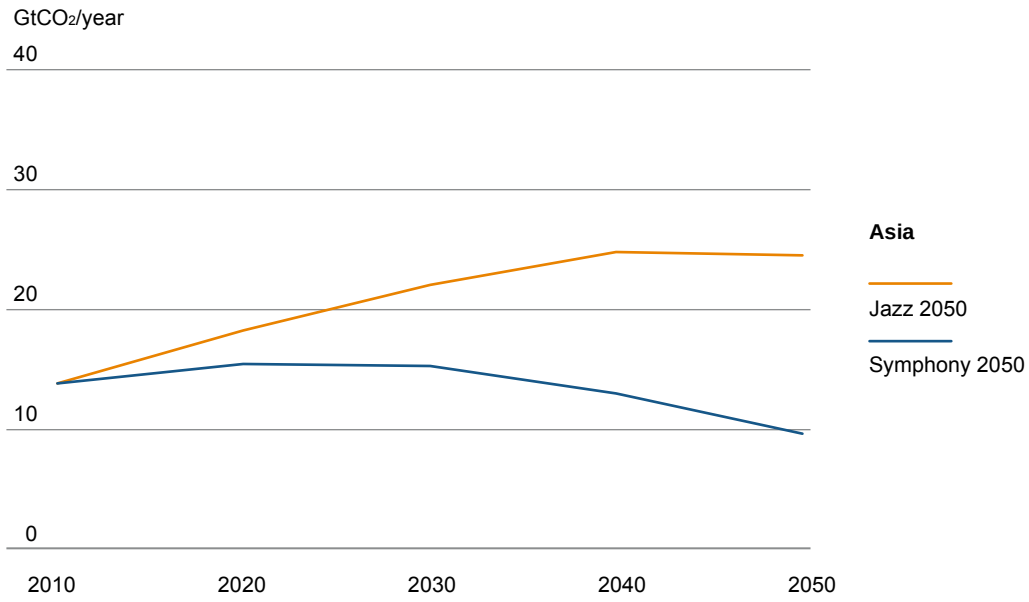
Environmental sustainability performance remains a persistent challenge in low-GDP countries, especially in more industrialised ones such as China, Indonesia, Thailand, India, and Vietnam. It will become increasingly important for these countries to meet rising energy demands through low-carbon methods of electricity generation and a continued focus on improving energy efficiency. Nationally determined actions pledged by countries such as China including the goal to achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early,[23] may incentivize other Asian countries to follow the example and submit their Intended Nationally Determined Contributions (INDCs) in preparation of COP21 in Paris at the end of 2015.

Depending on actions taken by governments in the next years, emissions could gradually decrease by more than 30%, or increase by more than 75% by 2050 (see Figure 4). Priority actions for the Asian energy sector stretch from increased access to a stronger emphasis on energy efficiency in energy supply and on the demand side as well as active demand management, depending on the energy and economic profile of the country. Social acceptance to changing energy supply, for example towards increasing nuclear power generation or the share of renewables in the energy mix, is a barrier in many countries. Increasing resilience of the energy systems through adaptation as well as mitigation measures, especially towards extreme weather events, is viewed as very important.[24]

Figure 4

Asia's projected CO_2 emissions by 2050

Source: World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050



[22] Sustainable Energy for All, 2015: Global tracking framework
[23] WRI, 2014: CAIT 2.0 - WRI's climate data explorer
[24] World Energy Council, 2015: World Energy Trilemma - Priority actions on climate change and how to balance the trilemma

Figure 5
Trilemma profile: Europe
Source: World Energy Council/Oliver Wyman

Western Europe		Eastern Europe	
Austria	Luxembourg	Albania	Moldova
Belgium	Malta	Bulgaria	Montenegro
Cyprus	Netherlands	Croatia	Poland
Denmark	Norway	Czech Rep.	Romania
Finland	Portugal	Estonia	Russia
France	Spain	Hungary	Serbia
Germany	Sweden	Latvia	Slovakia
Greece	Switzerland	Lithuania	Slovenia
Iceland	Turkey	Macedonia	Ukraine
Ireland	United Kingdom		

Europe

Following the recent global recession, GDP in the eurozone was growing again at 0.8% in 2014 and growth is expected to continue throughout 2015 and 2016 at 1.5% and 1.7% respectively.[25] In Central and Eastern Europe and Turkey GDP growth is expected to remain solid, ranging from 3.1-3.6% throughout 2015 and 2016 supported by higher private consumption driven by cheaper oil.[26] While GDP in Europe is expected to increase between 75% and 100 over the next 35 years, the region's energy demand is expected to remain mostly unchanged, mostly due to improved energy efficiency.[27]

The majority of European countries are net energy importers and lack large natural deposits of fossil fuels. Yet, Europe overall manages to still be relatively energy-secure due to contained energy consumption growth and a conscious effort to diversify the electricity generation portfolio. Renewable energy sources including hydro account for an average of 23% of the region's electricity generation already.[28] Following a 36% drop in investment in renewable energy in 2013, on the back of policy uncertainty and retroactive subsidy changes, investment in renewable energy remains fairly stable at US$57.5bn in 2014.[29]

Although access to electricity is virtually 100% across the entire region and the quality of the service is perceived as reliable in most countries, rising prices for electricity and gasoline are of concern for many European countries as an increasing number of households face fuel poverty. Many European countries also worry about the impact

[25] IMF, 2015: World Economic Outlook (July 2015 Update)
[26] IMF, 2015: Regional Economic Issues - Central, Eastern, and Southeastern Europe
[27] World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050
[28] EIA, 2012: International energy statistics (www.eia.gov)
[29] United Nations Environmental Programme/Bloomberg New Energy Finance, 2015: Global trends in renewable energy investment

rising energy prices will have on their economy's competitiveness and changing consumer preferences.

Supported by a combination of continued deindustrialisation, greater energy efficiency and the use of more renewable energy have allowed countries of the European Union to decouple economic growth and GHG emissions.[30]

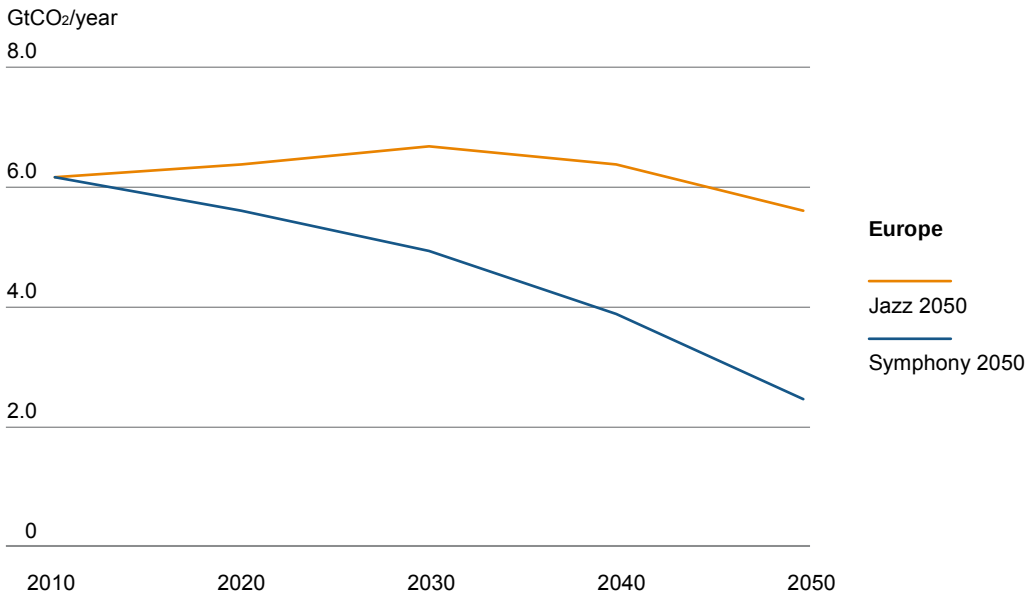
Ambitious GHG emissions reduction targets, diversification of the energy mix by growing share of renewables and increasing energy efficiency goals are three key instruments to deliver a more secure and clean energy system. In 2012 14% of total global GHG emissions were produced by European countries.[31] In its submission to the (UNFCCC) the EU and its Member States committed to a binding target of at least 40% domestic reduction in GHG emissions by 2030 compared to 1990.[32]

The World Energy Council's Scenarios to 2050 predict decreasing emissions in Europe between 10% and 60% over the next 35 years (see Figure 6). Priority actions for the European energy sector stretch from reducing GHG emissions to increasing energy efficiency and diversification of the energy mix by growing share of renewable energy. Competitiveness and changing purchasing power of consumers is a growing concern to many European countries.[33]

Figure 6

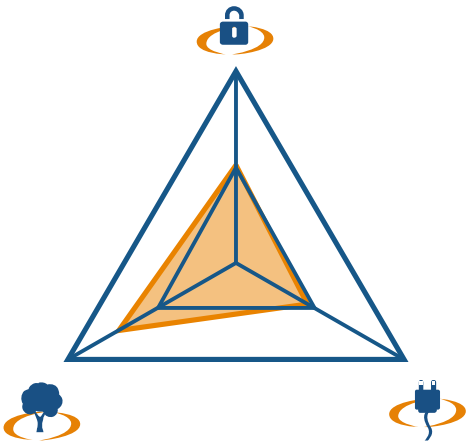
Europe's projected CO_2 emissions by 2050

Source: World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050



[30] World Energy Council, 2015: World Energy Trilemma - Priority actions on climate change and how to balance the trilemma
[31] WRI, 2014: CAIT 2.0 - WRI's climate data explorer
[32] UNFCCC, 2015: INDCs as communicated by Parties (www4.unfccc.int/submissions/INDC/Submission%20Pages/submissions.aspx)
[33] World Energy Council, 2015: World Energy Trilemma - Priority actions on climate change and how to balance the trilemma

Figure 7
Trilemma profile: Latin America and Caribbean
Source: World Energy Council/Oliver Wyman



LAC countries	
Argentina	Guatemala
Barbados	Honduras
Bolivia	Jamaica
Brazil	Nicaragua
Chile	Panama
Colombia	Paraguay
Costa Rica	Peru
Dominican Republic	Uruguay
Ecuador	Venezuela
El Salvador	

Latin America and Caribbean

The Latin America and Caribbean (LAC) region includes mostly middle and lower-income countries, with some of the world's fastest growing economies. LAC is expected to see a lower economic growth rate of 0.5% in 2015, picking up again in 2016 at 1.7%.[34] While sound economic policies and a relatively favourable international context in the preceding decade have lifted tens of millions of people out of poverty, the region still suffers from the highest levels of income disparity in the world.

The LAC region includes a mix of both net energy importers and exporters, including OPEC members Ecuador and Venezuela. Overall, LAC is an energy-rich region with large oil and gas deposits and great natural endowments of exploitable renewable energy. With economies expanding, energy consumption continues to rise across the region, with energy demand expected to increase and almost double by 2050.[35] Managing energy demand growth in coming years will be crucial.

Energy equity as a whole is fairly low in the region. Access to electricity varies, with nearly a quarter of the population in Nicaragua lacking modern electricity services, while some of the more developed countries have electrification rates of nearly 100%.[36] Subsidies play an important role in many countries such as Argentina, Venezuela, Bolivia, Ecuador, and Chile, and government attempts to reduce fuel subsidies have for the most part failed due to large protests.

In 2012, only about 9% of total global GHG emissions were produced by countries in the region.[37] CO_2 emissions could gradually decrease by more than 30%, or increase by more than 75% by 2050 (see Figure 8). Some of the biggest challenges for the LAC energy sector are driven by changing weather patterns and the escalating

[34] IMF, 2015: World Economic Outlook (July 2015 Update)
[35] World Energy Council, 2013: World Energy Scenarios
[36] Sustainable Energy for All, 2015: Global tracking framework
[37] WRI, 2014: CAIT 2.0 - WRI's climate data explorer

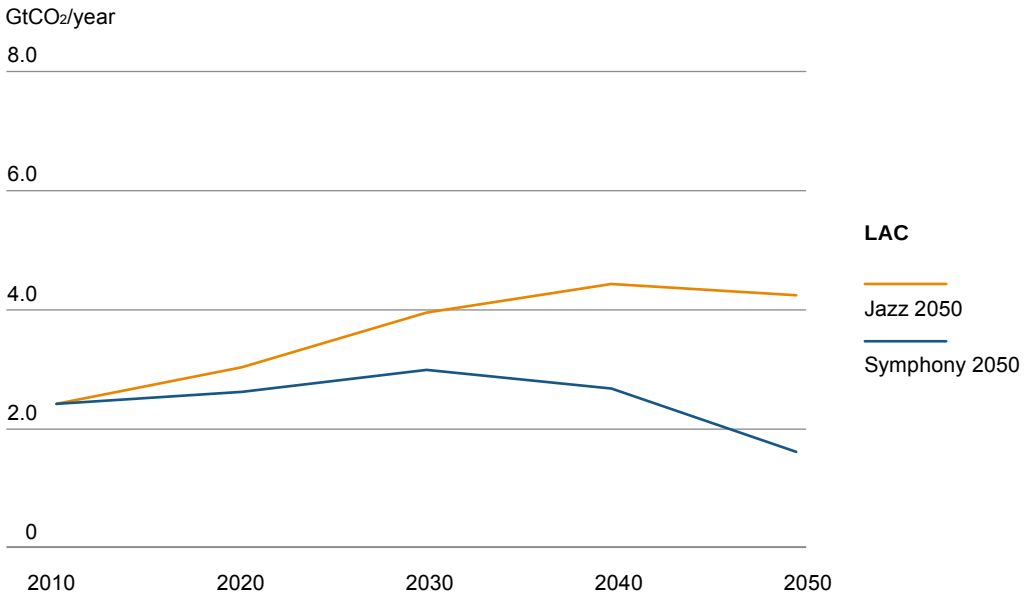
energy-water-food nexus. Droughts, for example, in Brazil, Venezuela, and Colombia, torrential storms and rains, such as seen in Chile and Bolivia, threaten the energy infrastructure of countries in the region more frequently. These changes require the implementation of soft and hard resilience measures to adapt to the new normal.[38] To adapt to changes in hydrological patterns and cycles, the countries in the region may need to increase fossil-fuel power generation as well as focusing on solar and wind energy. Regional integration to optimise the use of energy resources is an opportunity to ensure sustainable development.[39]

It remains to be seen if this region can maintain its superior environmental performance as its countries address societal and economic inequality and try to extend the benefits of development to the rest of their populations.

Figure 8

Latin America and the Caribbean's projected CO_2 emissions by 2050

Source: World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050



[38] World Energy Council, 2015: The road to resilience - managing and financing extreme weather risks
[39] World Energy Council, 2015: World Energy Trilemma - Priority actions on climate change and how to balance the trilemma

Figure 9
Trilemma profile: Middle East and North Africa
Source: World Energy Council/Oliver Wyman

GCC countries	Non-GCC countries	
Bahrain	Algeria	Lebanon
Kuwait	Egypt	Libya
Oman	Iran	Morocco
Qatar	Iraq	Syria
Saudi Arabia	Israel	Tunisia
United Arab Emirates	Jordan	Yemen

Middle East and North Africa

The Middle East and North Africa (MENA) play a vital role in the global energy industry. These countries have an estimated 66% of the world's oil and 45% of the world's natural gas reserves, most of which is concentrated in the Gulf Cooperation Council (GCC) member countries.[40] While many of these countries have economies tied heavily to oil and gas exports, several have taken steps in recent years to diversify their economies and energy mix.

Despite their vast strategic oil and natural gas reserves, energy security in the region, which includes eight of the 12 OPEC countries, remains average. This can be explained in part by high five-year energy consumption growth rates, a high economic dependence on energy exports especially among the GCC countries, and currently very low amounts of diversity in the sources of electricity production, which is almost exclusively fossil-fuelled. However, some of the traditionally oil-reliant Gulf countries, such as Saudi Arabia, the United Arab Emirates, and Bahrain, are addressing the lack of diversity in their electricity fuel mixes by leveraging their fossil fuel wealth to develop the use of renewables and nuclear. This concern is becoming increasingly relevant given the decline in oil prices over the past year.

Volatile crude oil prices, shifting global energy demands and supply, massive infrastructure programmes, and rising domestic demand are impacting the competitive landscape of National Oil Companies (NOCs) in the Middle East. With strong links between the NOCs and their countries' economies, there are high stakes for these companies to effectively navigate strategic risks. To continue funding their

[40] World Energy Council, 2013: World Energy Resources

governments' visionary strategies NOCs must develop sound risk governance practices.[41]

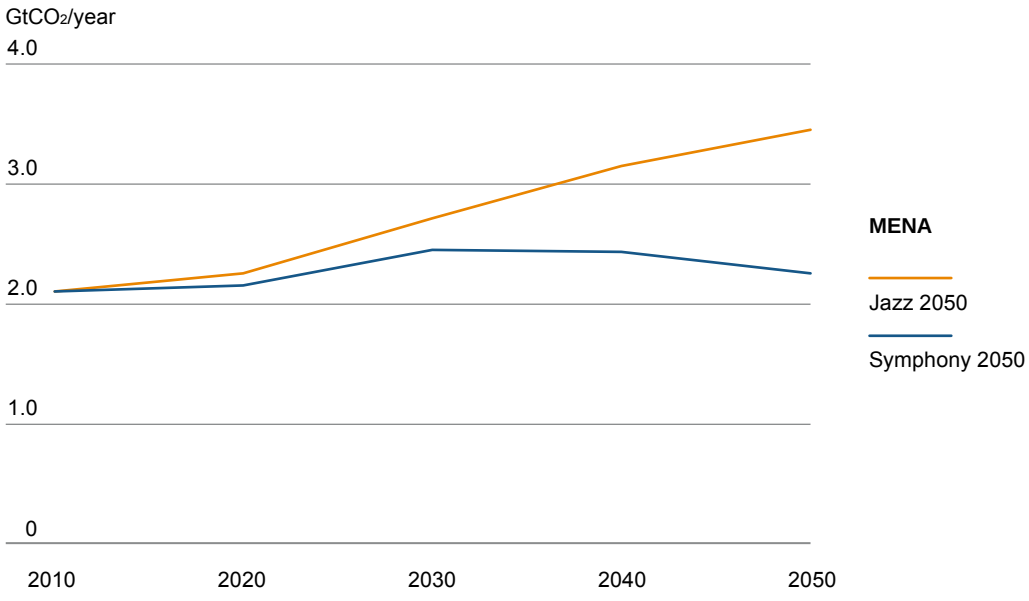
Energy equity remains the strongest of the three energy dimensions in this region as electricity and gasoline are very affordable, and often subsidised or fixed at artificially low prices by the government. However, low cost energy does little to incentivise energy efficiency or the reduction of energy consumption – and the region's environmental sustainability performance reflects this. Emission and energy intensity remain the worst in the world. Meanwhile, CO_2 emissions from electricity generation also remain extraordinarily high, with virtually no use of either nuclear power or renewables at the moment.

In 2012, the MENA region produced about 7% of total global GHG emissions.[42] However, energy emissions are expected to rise over the next decades. If the right targets are set and policy frameworks are developed, there is the potential for CO_2 emissions to peak in 2030, or else, they could continue to increase until 2050 (see Figure 10)[43]. Energy efficiency and diversification of the energy mix areas must be given a growing focus to sustain energy security levels and reduce the impact on the environment. Increasing transparency in market value of energy would support improved demand management and related issues. Moreover, transparent pricing of energy and water could also help address the energy-water-nexus − a crucial issue in the water-scarce region.[44]

Figure 10

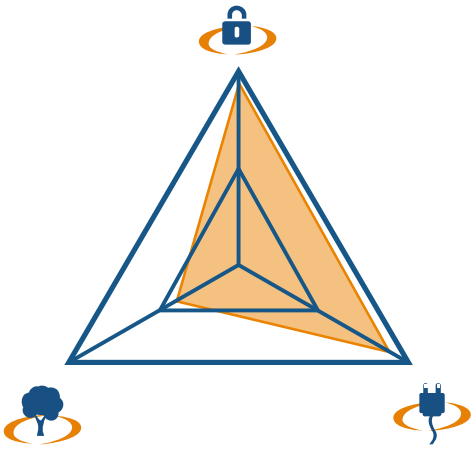
Projected CO_2 emissions by 2050 for the Middle East and North Africa

Source: World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050



[41] Oliver Wyman, 2012: Creating value under pressure: why national oil companies need risk management in a shifting environment
[42] WRI, 2014: CAIT 2.0 - WRI's climate data explorer
[43] World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050.
[44] World Energy Council, 2015: World Energy Trilemma - Priority actions on climate change and how to balance the trilemma

Figure 11
Trilemma profile: North America
Source: World Energy Council/Oliver Wyman



North American countries
Canada
Mexico
United States

North America

The North America region includes Canada, the United States (US), and Mexico. Canada and the United States both have mature, post-industrial economies, while Mexico is a modern, fast-growing industrial economy. In 2015, GDP in the region is expected to grow between 1.5% and 2.5%, going up to between 2.1% and 3.0% in 2016.[45] All three countries benefit heavily from the 1994 North American Free Trade Agreement, which eliminated trade tariffs between the three countries. For example, 90% of Mexico's exports now go to either Canada or the US. The entire region was hit particularly hard by the recent global recession, but economic growth has recovered, although not quite to pre-recession levels.

Although the region's energy use is high, North American countries are relatively self-sufficient as all three have large natural endowments of oil, natural gas, coal and hydropower potential. Both Canada and Mexico are net energy exporters and the US is on course to becoming a net energy exporter, sometime between 2020 and 2030.[46] The diversity of the electricity generation portfolio improved overall this year, but the use of low-carbon and renewable energy sources for electricity generation remained mixed. Mexico still obtains four-fifths of its electricity from burning fossil fuels, while Canada uses nuclear, hydropower and other renewables to meet 78% of its needs.[47]

While scoring very high on energy security and energy equity, the region lags behind on environmental sustainability. Mexico and the US continue to rely on conventional thermal power generation using the indigenous energy resources. Improved standards for light and heavy duty vehicles in the US, as well as changing regulation for coal-fired power plants in combination with an increased use of natural gas in power

[45] IMF, 2015: World Economic Outlook (July 2015 Update)
[46] EIA, 2015: U.S. energy imports and exports to come into balance for first time since 1950s (15 April 2015)
[47] EIA, 2012: International energy statistics (www.eia.gov)

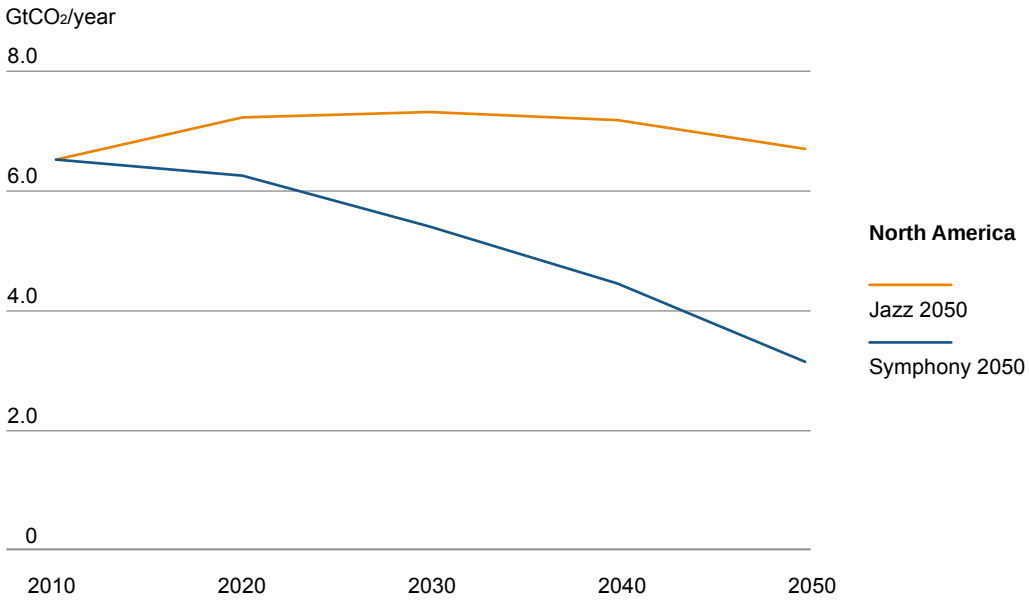
generation could continue to support the already decreasing GHG emissions. Canada, with a high share of hydropower, nuclear and other renewables in its electricity generation mix, struggles with high energy and emissions intensity due to long distances and a high reliance on energy-intensive industries.

In 2012, North America was responsible for producing roughly 14% of total global GHG emissions.[48] Emissions in the region are expected to peak between 2010 and 2030 and then decrease back to 2010 levels or even lower (see Figure 12). As all three economies rely heavily on energy production for energy exports and heavy industries, efforts to reduce CO_2 emissions from the energy sector are likely to focus on energy-efficiency improvements, both on the supply and demand side, and the development of lower carbon energy solutions, such as carbon capture and storage technologies.[49] All three countries submitted their Intended Nationally Determined Contributions (INDCs) in preparation of COP21 in Paris at the end of 2015. Pledges made include economy-wide targets to lower GHG emissions with a focus on mitigation measures, but also actions towards adaptation, capacity building, as well as development and transfer of technology were included.[50]

Figure 12

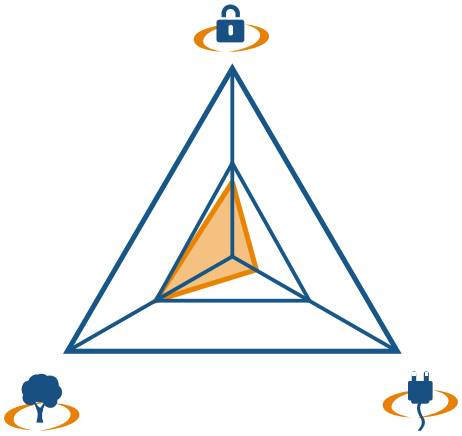
Projected CO_2 emissions by 2050 for North America

Source: World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050



[48] WRI, 2014: CAIT 2.0 - WRI's climate data explorer
[49] World Energy Council, 2015: World Energy Trilemma - Priority actions on climate change and how to balance the trilemma
[50] UNFCCC, 2015: INDCs as communicated by Parties

Figure 13
Trilemma profile: Sub-Saharan Africa
Source: World Energy Council/Oliver Wyman



Sub-Saharan African countries	
Angola	Ghana
Benin	Kenya
Botswana	Madagascar
Cameroon	Malawi
Chad	Mauritania
Congo (Dem. Rep.)	Mauritius
Côte d'Ivoire	Mozambique
Ethiopia	Namibia
Gabon	Niger

Sub-Saharan Africa

Economic growth is expected to remain strong throughout the region, with GDP growing between 4.4% in 2015 and 5.1% in 2016.[51] However, sub-Saharan Africa also includes some of the world's least developed countries with per capita GDP ranging from the Democratic Republic of Congo's US$650 to Gabon's US$22,000.[52] The region's economies rely predominantly on commodities and resource extraction such as oil, gas, coal, uranium, minerals and gemstones, and agriculture. Many sub-Saharan African countries are also working on industrialising and building up a manufacturing base.

While energy security rankings are low (with a few notable exceptions), sub-Saharan African countries fare even worse on energy equity, as 55% of the total population lacks access to electricity.[53] Environmental sustainability appears to be the strongest trilemma dimension for the region. However this is primarily a reflection of low energy consumption levels, as many of these countries have yet to face the sharp increase in energy demand that accompanies rapid social and economic development. Energy demand in the region is predicted to increase and more than double by 2050.[54]

Sub-Saharan Africa is well endowed with both fossil fuels and sources of renewable energy, especially hydro and solar power. The region includes a few large oil producers such as OPEC members Angola and Nigeria, as well as several countries that generate all or nearly all of their electricity using renewables, mainly from hydropower. Many of these potential energy resources remain untapped, as countries face institutional and infrastructural barriers to making efficient use of them, and investors stay away due to the perceived political risks and ethical weaknesses.

[51] IMF, 2015: World Economic Outlook (July 2015 Update)
[52] IMF, 2015: World Economic Outlook database (data reflect GDP PPP per capita in 2013)
[53] SE4All, 2015: Global tracking framework
[54] World Energy Council, 2013: World Energy Scenarios

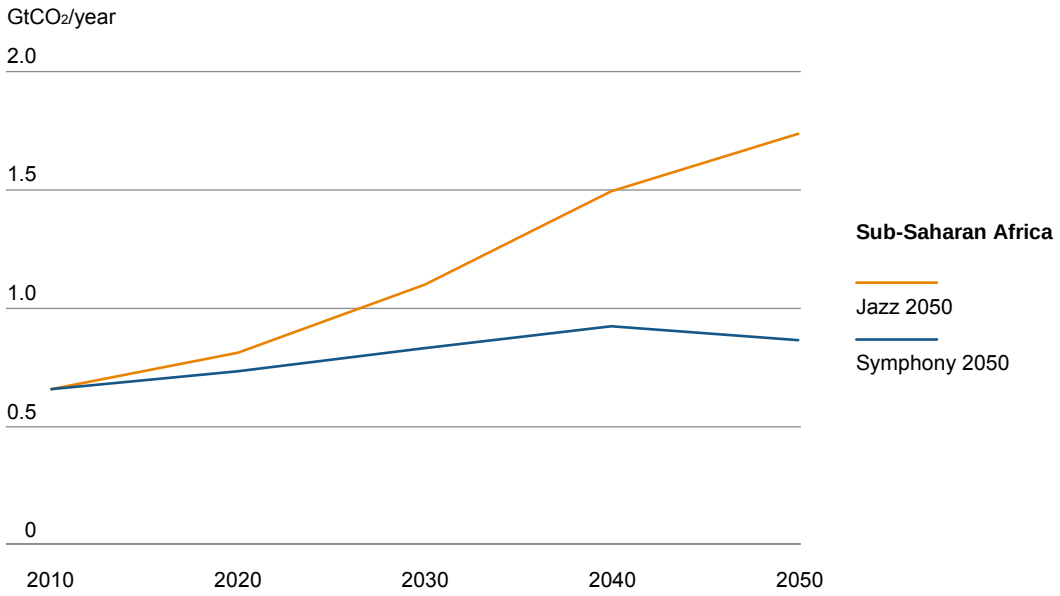
Efforts and investments in sub-Saharan energy systems need to focus on increasing energy access and affordability as a means to grow economies, improve quality of life and life expectancy. While CO_2 emissions in the region are low, less than 7% of total global GHG emissions were produced by African countries in 2012,[55] it would be beneficial for policymakers to consider adopting an alternative path to development and realise renewable energy potentials and build more sustainable and resilient energy systems. Currently, less than 12% of global new investment in renewable energy is made in sub-Saharan African countries. South Africa stands out among the countries in the region. With US$5.5bn invested, it was listed among the top 10 countries globally investing in renewable energy in 2014. Kenya, with a current share of 24% of renewables in its electricity generation profile, attracted US$1.3bn of investment in 2014.[56]

While emissions in many countries in the region are low, scenarios show gradually increasing emissions to 2050 by between 30% and 140%. With less focus on mitigation many countries call for increased attention to adaptation measures as the impacts of increasing average global temperatures are expected to affect the region's economic and social development over the coming decades. Only a few African countries have been able to contribute to the UNFCCC's INDC process to date, including Benin, Congo (Dem. Rep.), Ethiopia, Gabon, Kenya, and Morocco.[57]

Figure 14

Projected CO_2 emissions by 2050 for sub-Saharan Africa

Source: World Energy Council, 2013: World Energy Scenarios: Composing energy futures to 2050



[55] WRI, 2014: CAIT 2.0 - WRI's climate data explorer
[56] United Nations Environmental Programme/Bloomberg New Energy Finance, 2015: Global trends in renewable energy investment
[57] UNFCCC ad source

4. Cross-regional profiles

Each country will adopt its own path to achieving balance on the energy trilemma considering its developmental stage, resource endowment, policies and regulations, as well as the country's own economic and societal goals and needs. Along with this, each country will have specific investment requirements to meet the goals it has set for its energy sector. However, patterns exist and grouping countries with similar energy trilemma profiles can help policymakers identify existing or emerging successful approaches to common problems.

The challenges facing the energy sector overall can be better understood by examining five distinct profile groups that can be identified from the Index analysis – with countries in each group sharing energy trilemma characteristics and challenges. The illustrative profiles, initially presented in the 2013 Trilemma Index, serve as benchmark guides to other countries with similar preconditions (see Table 3). With the exception of the 'Pack Leaders', the illustrative groupings are not based on a country's absolute performance, but rather on its relative and comparable performance on the three dimensions of energy security, energy equity, and environmental sustainability. Furthermore, each group contains some countries that are further along the path of economic and social development than others, but still face (or once faced) comparable energy challenges.

In addition, a profile has been created for countries that are part of the Clean Energy Ministerial (CEM), a high-level global forum to promote policies and measures focused on three global climate and energy policy goals: improve energy efficiency worldwide, enhance clean energy supply and expand clean energy access. Participating governments account for 75% of global greenhouse gas emissions and 90% of global clean energy investment.[58] They also fund the vast majority of public research and development in clean energy technologies. The trilemma profile of CEM countries varies, and so do their challenges and opportunities. Many of the participating countries are also included in the five trilemma profiles.

[58] Clean Energy Ministerial, 2015 (www.cleanenergyministerial.com)

Table 3

Five profiles of energy investment challenges

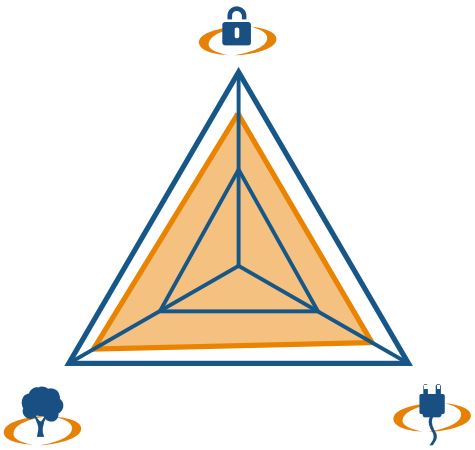
Source: World Energy Council/Oliver Wyman, 2014

	Illustrative members	Key energy trilemma strengths	Core energy investment needs and challenges
Pack Leaders	Switzerland, Sweden, United Kingdom	Overall high performance and balance due to legacy of incumbent system and economic strength: benefit from investment decisions taken decades ago	Transforming incumbent systems and maintenance of high-performing utility sector; managing energy demand and continuing to drive energy efficiency
Fossil-fuelled	United Arab Emirates, Malaysia, Saudi Arabia	Affordability and security of energy due to the availability of exploitable fossil fuels	Stimulating a sustained transition to less intense energy use; managing rising exploration costs and risks for oil and gas; and responding to changing energy markets
Highly-Industrialised	China, Mexico, Russia	Energy security and strong GDP growth	Development of financial markets and a secure investment profile; managing energy demand and increasing energy efficiency; increase investment in energy system to support economic growth
Hydro-powered	Brazil, Colombia, Ethiopia	Strong use of renewables leads to low emissions and higher electrification rates	Development of financial markets and a secure investment profile; developing bankable projects and increasing investors' comfort with new renewables to strengthen the resilience of energy systems
Back of the Pack	Senegal, Nicaragua	Countries are not locked into fossil fuel heavy development path	Country risk ratings may hinder potential investments; developing bankable projects, local financial market capacity and human capacity

Figure 15

Trilemma profile and illustrative countries: Pack leaders

Source: World Energy Council/Oliver Wyman



Countries	Index rank	Balance score
Switzerland	1	AAA
Sweden	2	AAA
United Kingdom	4	AAB
Austria	5	AAB
Denmark	6	AAB
France	8	AAB
New Zealand	10	AAB
Netherlands	11	BBB
Germany	13	BBB
Spain	15	AAB

Pack leaders

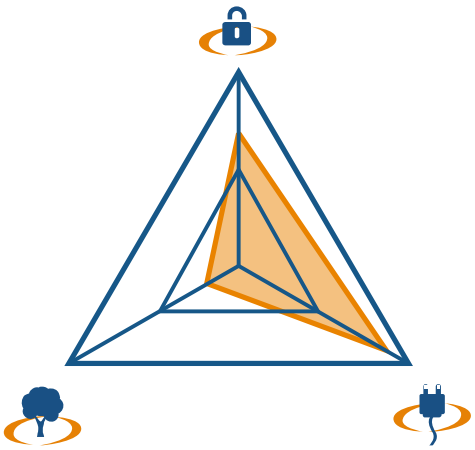
The 'Pack leaders' are top performers in terms of both dimensional balance and overall ranking on the Trilemma Index. The majority of the countries rank in the top one-third of all countries on each of the three dimensions.

Pack leaders are all high-GDP per capita, OECD member countries with mature and strong political, societal and economic conditions that support energy infrastructure investments. They generally have set specific targets for reducing GHG emissions, increasing the percentage of renewables in their electricity fuel mixes and improving energy efficiency in efforts to reduce their environmental impact and increase their energy security. However, even these leading countries face significant energy issues and there is no guarantee that they will remain part of this elite group in the future. Policymakers have to craft the right market structures, and support and successfully implement prudent, forward-looking energy policies based on strategies that reflect local resources and capabilities in order to meet decarbonisation goals while at the same time preserving affordability of energy services and competitiveness of economies.

One of the greatest challenges facing the pack leaders is the need to drive and finance changes in the transition to low-carbon economies. Incumbent energy systems need to be replaced and often restructured to adapt to new risks. For example, the integration of decentralised and intermittent renewable energy sources such as wind and solar energy poses challenges on the grid as those renewables are characterised by strong daily and seasonal variations, and require accurate forecasting. Increasing the energy system’s flexibility while maintaining the reliability and quality of the electricity supply are new requirements for the entire electricity system; making them will require a timely development of the grid infrastructure.

Furthermore, for some of the pack leaders nuclear power production has become of increasing concern to the public. Policymakers are faced with the challenge of replacing nuclear power and further developing new ways of generating low- or zero-carbon energy.

Figure 16
Trilemma profile and illustrative countries: Fossil-fuelled
Source: World Energy Council/Oliver Wyman



Countries	Index rank	Balance score
United States	12	AAC
Australia	17	AAD
Malaysia	21	AAC
Qatar	28	ABD
United Arab Emirates	38	ABD
Saudi Arabia	51	ABD
Oman	63	ACD
Kazakhstan	77	ABD
Kuwait	82	BCD
Egypt	85	BBC

Fossil-fuelled

'Fossil-fuelled' countries are well endowed with fossil fuel resources and tend to rely heavily on fossil fuels for electricity generation with associated comparatively high CO_2 emissions per kWh generated. While this group's economies benefit from affordable and secure access to energy, high per-capita energy consumption leads to high levels of GHG emissions and a greater environmental impact. Countries that illustrate the fossil-fuelled profile typically show an energy trilemma imbalance that tilts towards energy security and energy equity, while they struggle to minimise their environmental impact.

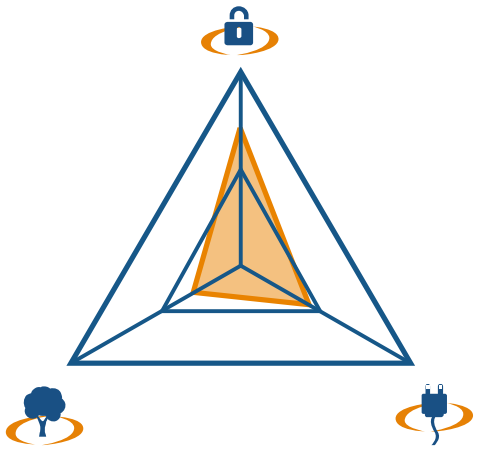
The group is generally made up of energy exporters, notably Saudi Arabia, the United Arab Emirates (UAE) as well as the United States (US), which is on course to becoming an energy exporter. Although fossil fuels are predicted to remain globally dominant in the primary energy mix up to 2050, there are challenges on the horizon for these economies. These include the potential impact of a meaningful post-2015 climate change agreement; the need to diversify energy sources to increase energy security; the urgency of managing demand and increasing energy efficiency. However, there are also opportunities. A concerted effort on the development of carbon capture, utilisation and storage (CCUS) technologies would allow the mitigation of GHG emissions from large-scale fossil-fuel usage in power generation, fuel transformation, but also industry. A breakthrough would have a 'game-changing' impact on these countries' trilemma performance and would enable the long-term, sustainable utilisation of fossil fuels under a post-2015 climate change agreement.

Reducing the carbon footprint is especially important for these countries as they face emerging risks such as more extreme weather events in North America or the increasingly complex relationship between energy and water in water-scarce countries in the Middle East. Diversification of energy sources and decarbonising electricity generation is a key next step on the path to balancing the trilemma profile for the countries in this group. For example, the US has set 2020 emission targets that are as aggressive as those of several of the Pack Leaders and as a result of shale gas and the reduction in coal-fired power generation, it is making progress towards meeting those targets.

Figure 17

Trilemma profile and illustrative countries: Highly-industrialised

Source: World Energy Council/Oliver Wyman



Countries	Index rank	Balance score
Mexico	48	BBC
Russia	49	ABD
Philippines	50	BBC
Indonesia	65	ACC
Bolivia	67	ACC
Tunisia	71	BBC
China	74	ACD
Turkey	76	CCC
South Africa	84	BCD
Thailand	89	CCD
Vietnam	90	BDD
India	107	BDD

Highly-industrialised

'Highly-industrialised' countries are emerging economies with large manufacturing sectors. Countries that illustrate the Highly-industrialised profile have an energy trilemma balance that is tilted heavily towards energy security, with progress needed to ensure energy equity and environmental sustainability.

Economies are based on energy- and emission-intensive activities, which raise their average emissions intensity 37% above the Index countries' average of 0.27 kg CO_2 per US dollar. Similarly, the average energy intensity of this profile group is 33% higher than that of the pack leaders.[59] The impact the rapid rate of economic growth and associated energy demand in these countries has had on their citizens' economic status has been significant, yet per capita energy consumption is still low.

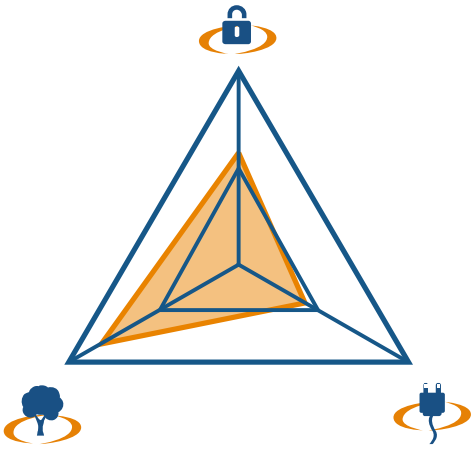
Though focused on rapid economic development improving environmental sustainability performance is becoming increasingly important. To meet increasing energy demand, some members of the group are making significant investments in renewable energy sources, such as China or India. Increasing the share of renewable energy sources in the energy mix will not only help reduce countries' environmental footprint, but also help enhance energy security and lower dependency on energy imports.

Another key challenge for these emerging economies is to expand energy access, meet the rising energy needs of a growing middle class population and ensure energy remains affordable for all. Increasing generation capacity, securing energy resources, and upgrading existing transmission and distribution lines in order to provide more reliable energy services remains a struggle for all of them.

There is an opportunity for these countries to include environmental considerations as they develop or upgrade their generation as well as transmission and distribution systems, which will support the sustainability of their energy systems in the long term.

[59] Enerdata/World Energy Council, 2013: Energy efficiency indicator database

Figure 18
Trilemma profile and illustrative countries: Hydro-powered
Source: World Energy Council/Oliver Wyman



Countries	Index rank	Balance score
Uruguay	14	AAB
Colombia	18	AAB
Costa Rica	20	ABB
Ecuador	33	ABB
Brazil	37	ABC
Peru	40	ABC
Panama	52	ABD
Paraguay	60	ACD
Cameroon	73	ABD
Sri Lanka	86	BCC
Ethiopia	105	BCD

Hydro-powered

These emerging economies have an average of 79% of electricity generation from hydropower, the highest share of any profile group.[60] The energy trilemma profile of the 'Hydro-powered' countries is tilted towards the environmental sustainability dimension, although these countries also perform reasonably well on energy security.

The hydro-powered countries are predominantly in Latin America, due to the region's endowments with numerous powerful rivers. Some countries have been impacted by droughts and resulting energy shortfalls highlight concerns about energy security. To mitigate the risks associated with hydroelectric power generation, many countries are looking to increase the share of non-hydropower renewable, but also complementary thermal power generation to maintain energy security and affordable energy.

To adapt to changing hydrological patterns and cycles hydro-powered countries are adopting a number of strategies to increase the resilience of their energy system, for example, through increased fossil-fuel power generation, a focus on developing more solar and wind energy as well as regional integration.

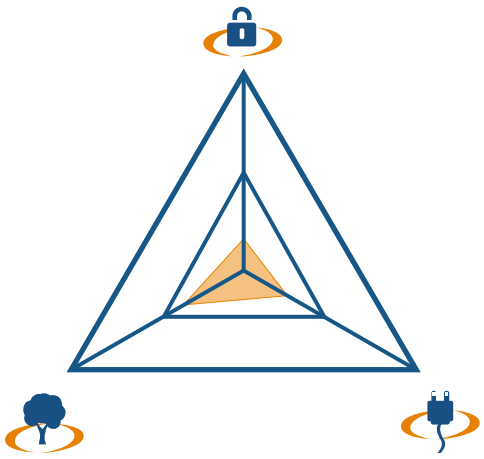
While most of these economies are still developing, their challenge will be to meet a growing demand for electricity while maintaining a low environmental footprint. Historically, industrialising countries have substantially increased their impact on the environment as they strive to boost economic growth and access to energy. However, hydro-powered countries like Brazil, Panama, and Uruguay are proving that industrialisation and environmental sustainability are not mutually exclusive.

[60] EIA, 2012: International energy statistics

Figure 19

Trilemma profile and illustrative countries: Back of the pack

Source: World Energy Council/Oliver Wyman



Countries	Index rank	Balance score
Jordan	97	BCD
Morocco	100	CCD
Dominican Republic	102	BCD
Nepal	103	BDD
Nicaragua	111	BDD
Honduras	116	BDD
Jamaica	117	CDD
Libya	120	CCD
Yemen	126	CCD
Moldova	127	CDD
Lebanon	128	CDD
Senegal	129	DDD
Benin	130	DDD

Back of the pack

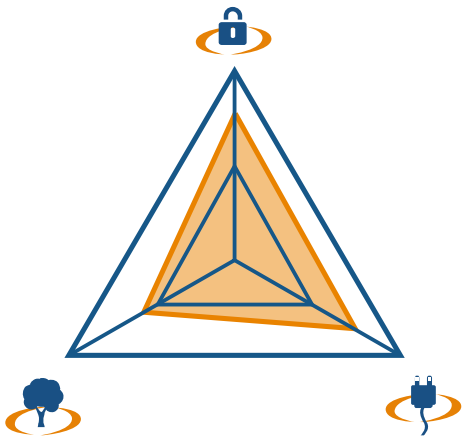
The energy trilemma profile of the 'Back of the pack' is tightly clustered and countries struggle to make progress on all three dimensions. The profile is represented by less developed and developing countries from all over the world.

Due to a lower use of energy and related activities, environmental sustainability is comparatively stronger than performance in the other dimensions. In the absence of a sufficient energy infrastructure, oil and oil product stocks, and investments, countries are typically not yet locked into high-carbon or fossil fuel energy infrastructures and have the potential to take a more sustainable approach to energy and economic development. Key obstacles to such a development include lack of financial and human capital, political instability and high levels of corruption.

To attract capital and exploit resources, the countries must develop the institutional frameworks to support investment. Moreover, financial investments and energy projects must be managed by people and human capital constraints are key barriers to increasing the velocity and volume of bankable projects in many countries. The lack of managerial, scientific and engineering capital in these countries is a key focus for many development efforts. In this regard, the role of multinational development banks is crucial in working with governments to develop institutional strength and domestic financial markets, provide financial guarantees and support, and help build local human capacity. If the right investment conditions can be created, the development opportunities are significant.

The challenge facing the back of the pack countries is monumental, but the development of domestic energy sectors could help these countries begin the journey to economic growth, social development, and sustainability.

Figure 20
Trilemma profile: Clean Energy Ministerial (CEM) countries
Source: World Energy Council/Oliver Wyman



Countries particpating in CEM	
Sweden	Japan
United Kingdom	Italy
Norway	Brazil
Denmark	United Arab Emirates
Canada	Mexico
Finland	Russia
France	Korea (Rep.)
Germany	Indonesia
United States	China
Australia	South Africa
Spain	India

CEM participants

The Clean Energy Ministerial (CEM) is a high-level forum that brings together countries to increase international collaboration on promoting policies and best practices to enhance energy efficiency worldwide, expand clean energy supply and increase clean energy access. Participating governments account for 75% of global greenhouse gas emissions and 90% of global clean energy investment.[61] They also fund the vast majority of public research and development in clean energy technologies. The trilemma profile of CEM countries varies, and so do their challenges and opportunities. Many of the participating countries are also included in the five trilemma profiles.

Through annual ministerial meetings, public-private engagements and year-round initiatives, CEM countries cooperate to improve the sustainability of their energy systems. The commitment to advance clean energy technologies through this mechanism shows a level of leadership in addressing the triple challenge of the energy trilemma. The CEM works through 13 main initiatives that are divided into four categories: integration, human capacity, clean energy supply, and energy efficiency. Progress in these areas can help nations overcome the energy trilemma challenge and it will be important to watch the trends for these countries in future years.

While the US is in the lead for more than half of the CEM initiatives, Western European countries, as well as emerging economies such as China and India, perform leadership roles in accelerating the transition to clean energy technologies.

To further strengthen momentum around the globe to combat climate change and accelerate clean energy technology and policies ahead of the December 2015 climate talks in Paris, energy leaders launched several new initiatives at the Energy and Climate Partnership of the Americas and the sixth Clean Energy Ministerial in May 2015 to grow low-carbon economies while helping to implement national commitments to reduce climate pollution.

[61] Clean Energy Ministerial, 2015 (www.cleanenergyministerial.com)

5. Country profiles

This section shows the Index rankings overall and per dimension for each of the World Energy Council's member country represented in the 2015 Trilemma Index as well as their balance score. The trilemma graph on each country profile (upper left corner) illustrates the balance score, which highlights the trade-offs between the three competing dimensions: energy security, energy equity, and environmental sustainability. The table on the right hand side shows the Index rankings from three consecutive years broken down by dimension and trends in performance over the years. Furthermore, the country profile provides a commentary on performance, an indication of trends and future developments, an overview of the country's energy endowment, and contributions of energy sources to total electricity generation as well as relevant key metrics to provide more context**.**

BBB SCORE

COUNTRY PROFILE GUIDE

RANK 33

Balance Score

Overall rank

TRILEMMA BALANC

Index scores for energy security, energy equity, and environmental sustainability highlight the degree of balance among the three dimensions

INDEX RANKINGS AND BAL

	2013	2014	2015	Trend	Score
Energy performance	23	31	26	→	
Energy security	39	46	43	↓	B
Energ		42	54	↓	B
Envir		44	35	↑	B
ual perf		41	57	↓	
Political strength	33	32	38	↓	
Societal strength	43	43	42	→	
Economic strength					
rank and balance score					BBB

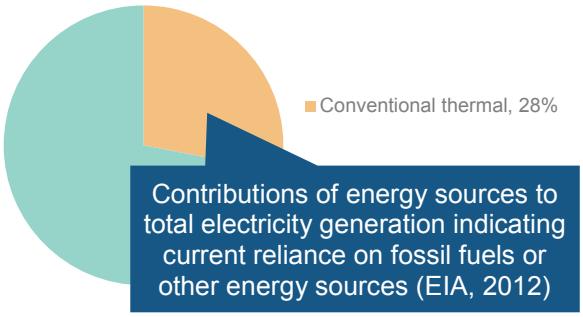
2013-2015 rank for each Index component as well as overall rank

2013-2015 trend for each Index component

INDEX COMMENTARY

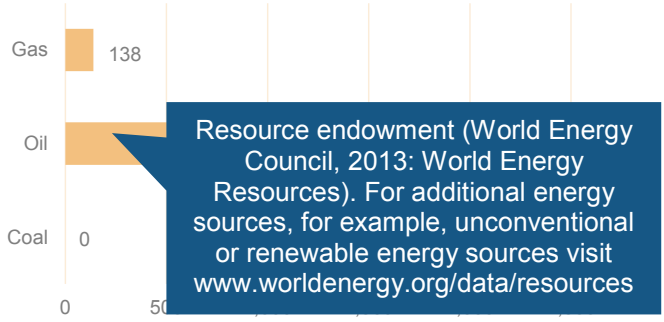
Overview of current Index ranking and country's energy trilemma, highlighting indicator changes from 2014 to 2015

DIVERSITY OF ELECTRICITY GENERATION



Contributions of energy sources to total electricity generation indicating current reliance on fossil fuels or other energy sources (EIA, 2012)

FOSSIL FUEL RESERVES (IN MTOE)



Resource endowment (World Energy Council, 2013: World Energy Resources). For additional energy sources, for example, unconventional or renewable energy sources visit www.worldenergy.org/data/resources

KEY METRICS

Industrial sector (% of GDP) 29.6

Percent of total GDP that is in the industrial sector (CIA World Factbook, 2014)

TPEP/TPEC (net energy importer) 0.39

Ratio of total primary energy production to total primary energy consumption, showing the extent to which a country imports or exports energy (EIA, 2012)

Emission intensity (kCO_2 per USD) 0.25

Measures CO_2 emissions from fuel combustion created by one dollar of GDP at purchasing power parity (Enerdata and World Energy Council, 2013)

Energy affordability (USD per kWh, 2014) 0.18

Average cost of electricity (IEA, 2012-2014)

GDP per capita (PPP, USD); GDP Group 19,445 (II)

GDP (IMF, 2013) and GDP group assignment as defined in this report

Energy intensity (koe per USD) 0.14

Measure of how much energy is required to produce one dollar GDP at purchasing power parity (Enerdata and World Energy Council, 2013)

CO_2 emissions (tCO_2) per capita 4.29

CO_2 emissions from fuel combustion per person (Enerdata and World Energy Council, 2013)

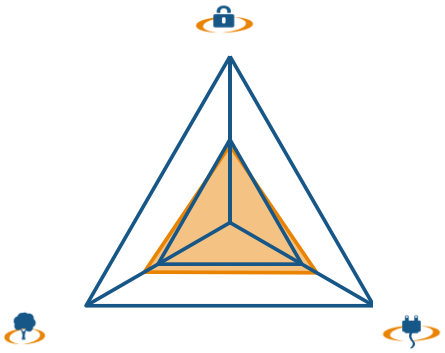
Population with access to electricity (%) 100.0

Access to electricity (SE4All, 2012)

TRENDS AND OUTLOOK

Commentary explaining recent energy policy developments, future trends for country's sustainability balance and issues of importance for future policymaking as provided by the country's WEC member committee

TRILEMMA BALANCE



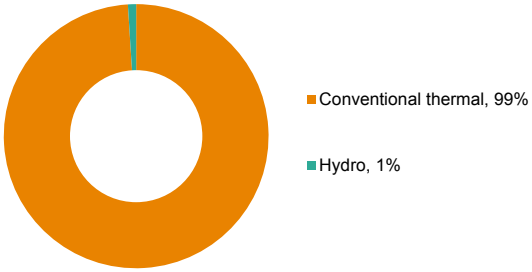
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	81	69	52	↑	
Energy security	86	80	70	→	C
Energy equity	68	49	52	↑	B
Environmental sustainability	74	78	53	↑	B
Contextual performance	99	77	75	↑	
Political strength	120	116	114	↑	
Societal strength	97	94	95	→	
Economic strength	75	36	22	↑	
Overall rank and balance score	**88**	**79**	**57**	↑	**BBC**

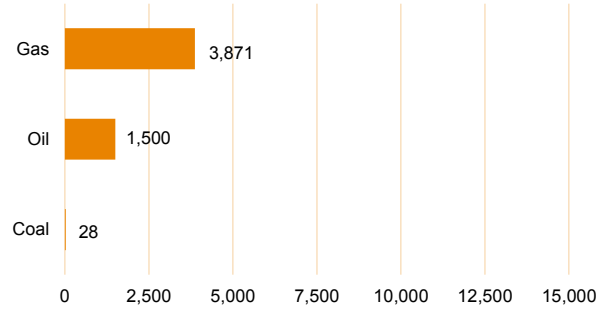
INDEX COMMENTARY

Algeria improves by 22 places in this year's Index. The energy trilemma appears more balanced in 2015 as the country's performance on the environmental sustainability and energy security dimensions improves. Performance on energy security improves, mostly because of a significantly decreased economic dependence on fuel exports. The energy equity dimension remains relatively stable. Algeria's contextual performance for political and societal strength stays weak, while the country's economic strength remains comparatively strong due to low cost of living expenditure.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



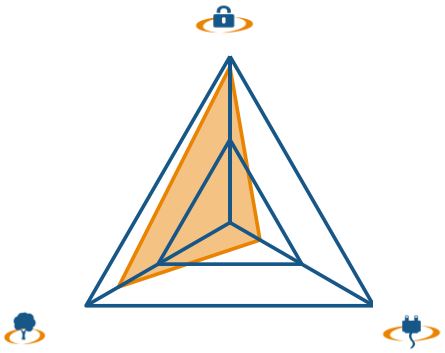
KEY METRICS

Industrial sector (% of GDP)	48.3	GDP per capita (PPP, USD); GDP Group	13,781 (III)
TPEP/TPEC (net energy exporter)	3.14	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.26	CO_2 emissions (tCO_2) per capita	2.98
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In recent years, Algeria has continuously developed its economy and improved its energy system. Energy policies have been implemented to intensify oil and gas exploration efforts to increase reserves, to promote renewable energy and energy efficiency and increase the share of renewables in electricity generation to 40% by 2030.
- Policymakers should continue to focus on: 1) increasing the proportion of renewable energy in electricity generation; 2) the development of energy efficiency because there is great potential for improvement; 3) the development of a renewable energy industry that is economically sustainable; and 4) the development and support of research and development (R&D) and training to increase the transfer of knowledge and technology.

TRILEMMA BALANCE



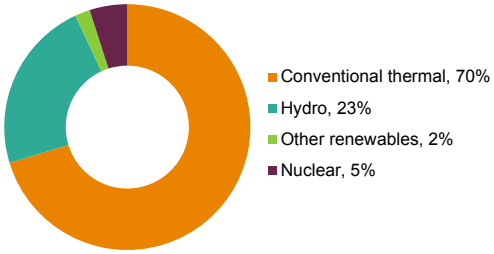
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	12	45	32	↓	
Energy security	14	14	9	→	**A**
Energy equity	33	96	103	↓	**D**
Environmental sustainability	38	44	30	↑	**B**
Contextual performance	83	98	100	↓	
Political strength	80	89	89	↓	
Societal strength	67	64	65	→	
Economic strength	100	122	124	↓	
Overall rank and balance score	**26**	**60**	**47**	↓	**ABD**

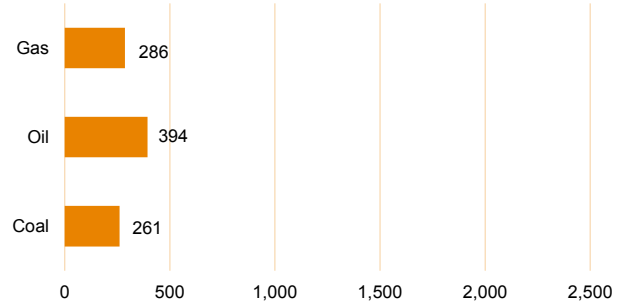
INDEX COMMENTARY

Argentina improves its position by 13 places in the 2015 Index. While energy security improves, Argentina's social equity dimension deteriorates slightly. The shift from energy exporter to energy importer has a positive impact on the country's energy security performance as dependence on imports is comparatively low. Contextually, Argentina continues to struggle with indicators of political, social and economic strength, and displays no significant changes.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



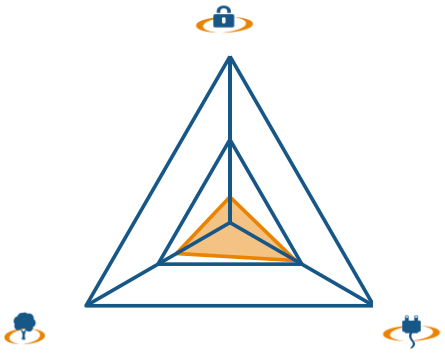
KEY METRICS

Industrial sector (% of GDP)	29.5	GDP per capita (PPP, USD); GDP Group	22,404 (II)
TPEP/TPEC (net energy importer)	0.89	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.24	CO_2 emissions (tCO_2) per capita	4.70
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	88

TRENDS AND OUTLOOK

- Argentina, although positioned relatively high in the Index, still faces major challenges and is expected to drop further in the rankings.
- With the current energy policy of low prices for producers and high subsidies to consumers continues, there is little chance to reverse the decline production. Oil production declined by 30% since 1998, while natural gas production declined by 8% since 2006. As a consequence, Argentina, previously a net energy exporter in 2006 with a surplus of US$6 billion, became a net energy importer in 2011 with a deficit of US$3 billion.
- The lack of investment in all energy sectors has become a major challenge, further intensified by the nationalisation of the oil company YPF (by expropriation of Repsol shares in Argentina's biggest oil company). The new management is struggling to attract new investors, which are necessary to exploit the large reserves of unconventional oil and natural gas in Argentina.
- Policymakers urgently need to focus on restoring the energy markets and attracting a great deal of investment by implementing clear and stable rules and regulations.

TRILEMMA BALANCE



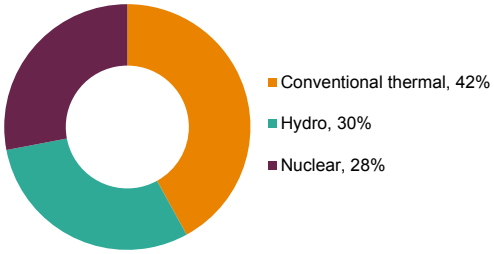
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	86	85	97	↓	
Energy security	95	92	110	↓	**D**
Energy equity	69	66	71	→	**C**
Environmental sustainability	73	75	82	→	**C**
Contextual performance	81	73	76	→	
Political strength	64	57	58	↑	
Societal strength	77	73	68	↑	
Economic strength	104	103	109	→	
Overall rank and balance score	**85**	**84**	**95**	→	**CCD**

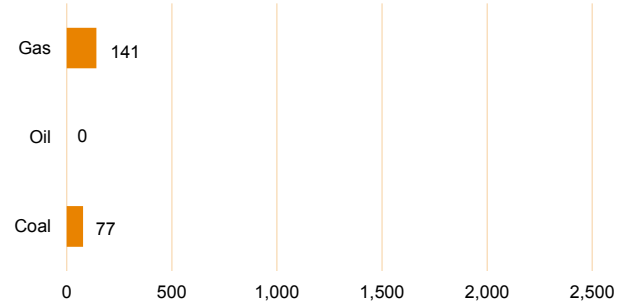
INDEX COMMENTARY

Armenia drops 11 places in the 2015 Index. The country continues to struggle most with its energy security performance, with energy equity as the strongest energy dimension. Energy security drops mainly due to a high energy consumption growth relative to GDP growth and an increasing dependence on energy imports. Energy equity and environmental sustainability performance remain comparatively stable. Contextually, Armenia continues to underperform economically, whilst societal strength further improves due to improvements of indicators across the board.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



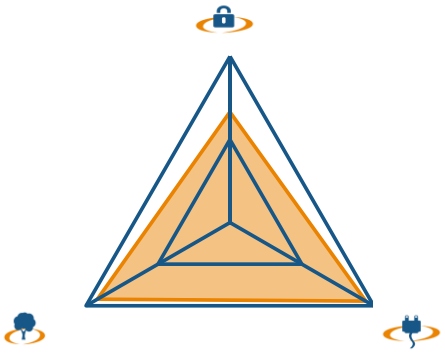
KEY METRICS

Industrial sector (% of GDP)	31.5	GDP per capita (PPP, USD); GDP Group	7,039 (III)
TPEP/TPEC (net energy importer)	0.23	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.27	CO_2 emissions (tCO_2) per capita	1.79
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Recent policy changes in Armenia include the decision of the Public Services Regulatory Commission to increase the tariff for electricity, starting on 1 August 2015. This caused a large discontent and unrest among the population, following which the government decided to subsidise the tariff increase in the short term.
- There are plans for new infrastructure to be developed, such as small hydropower plants with a total installed capacity of approximately 140 MW, a photovoltaic power station with installed capacity of 40 MW, and a geothermal power plant with installed capacity of 25-30 MW.
- Investments are being sought for the construction of a new nuclear power unit; in the meantime the operation period of the second power unit of the Armenian nuclear power plant has been extended by 10 years.

TRILEMMA BALANCE



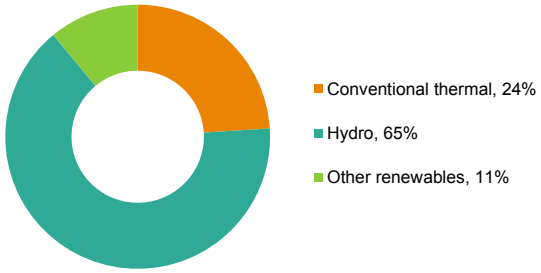
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		5	5	5	→	
	Energy security	33	44	44	→	**B**
	Energy equity	7	10	8	→	**A**
	Environmental sustainability	7	8	11	→	**A**
Contextual performance		12	13	12	→	
	Political strength	12	12	12	→	
	Societal strength	16	13	13	→	
	Economic strength	27	19	18	→	
Overall rank and balance score		**4**	**7**	**5**	→	**AAB**

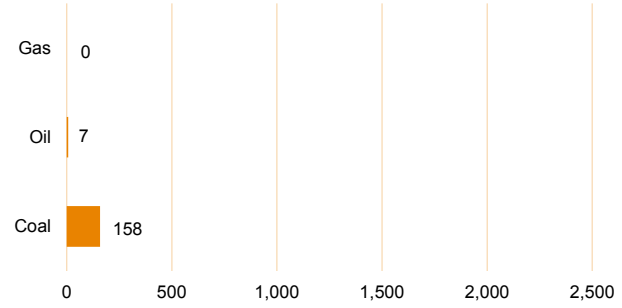
INDEX COMMENTARY

Austria continues to balance the three dimensions of the trilemma fairly well, gaining two places in this year's Index. Even though the country has a well-diversified generation portfolio, energy security is the country's weakest dimension, with comparatively low oil and oil product stocks, and a high reliance on fuel imports. For the most part, energy equity and environmental sustainability indicators remain stable. Performance on contextual indicators stays very good.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



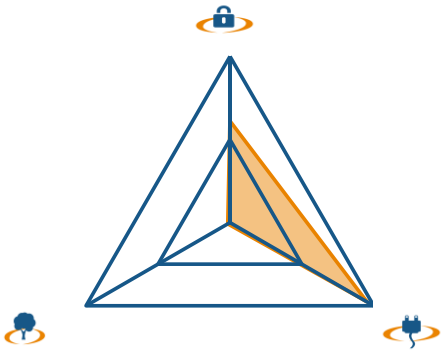
KEY METRICS

Industrial sector (% of GDP)	28.6	GDP per capita (PPP, USD); GDP Group	45,789 (I)
TPEP/TPEC (net energy importer)	0.35	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.20	CO_2 emissions (tCO_2) per capita	7.29
Energy affordability (USD per kWh, 2014)	0.27	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The Energy Trilemma Index reflects Austria's situation very well. Energy security, however, does not yet reflect the accomplishments achieved by the country. For example: Austria's increasing energy self-sufficiency, which is also one of the country's main long goals; or the progress since 1980 in the renewable energy sector, where Austria has more than doubled the production of renewable energy.
- Policy developments in Austria and targets for 2020 are compatible and in line with EU policy, including: an increase of the share of energy consumption produced from renewable resources to 34% by 2020; reducing greenhouse gas emissions by 16% from 2005 levels for sectors not included in the EU Emissions Trading Scheme (EU ETS) and 21% from 2005 levels for sectors included in EU-ETS; and a 20% improvement in energy efficiency. In addition, Austria set the goal of achieving 100% energy self-sufficiency with renewables by 2050. Lastly, Austria's Sustainability Strategy lists 20 goals to: increase quality of life overall; strengthen economic growth; support sustainable goods and services; and optimise the transport system.
- Key issues policymakers need to focus on are: 1) reduce dependence on energy imports; 2) increase efforts around energy efficiency and energy savings; 3) decrease energy intensity; and 4) increase the use of renewable energy.

TRILEMMA BALANCE



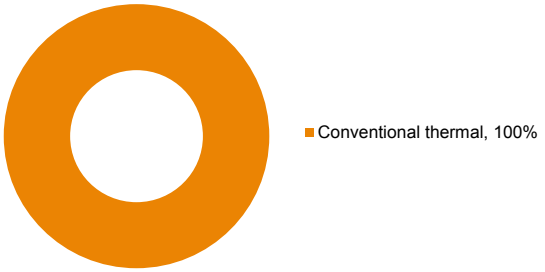
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	52	58	67	→	
Energy security	23	40	51	↓	**B**
Energy equity	19	13	11	→	**A**
Environmental sustainability	125	126	128	→	**D**
Contextual performance	31	43	46	↓	
Political strength	54	60	64	↓	
Societal strength	41	45	45	→	
Economic strength	8	31	48	↓	
Overall rank and balance score	**38**	**47**	**53**	↓	**ABD**

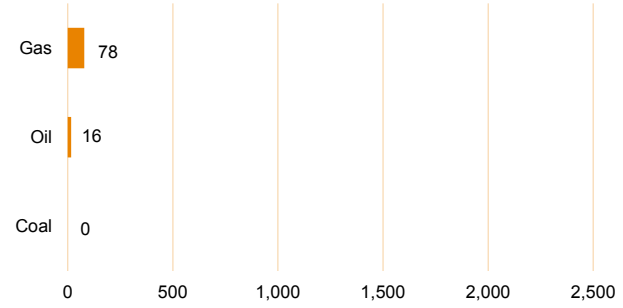
INDEX COMMENTARY

Bahrain drops six places in the Index. The small island country continues to struggle with balancing the energy trilemma, as its good levels of energy security and equity are offset by its underperformance in mitigating its environmental impact. Bahrain performs relatively well on the energy security dimension, although higher distribution losses cause the country's ranking to drop by 11 places. Bahrain's high ranking on the energy equity dimension is driven by increasing electrification rates, low gasoline prices and the availability of affordable and reliable electricity. However, the country's impact on the environment remains large, with comparatively poor air and water quality, and worsening energy and emission intensity levels. Contextually, Bahrain's indicators of political and societal strength are average and stable, while, economically, there is a slight deterioration due to lower macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



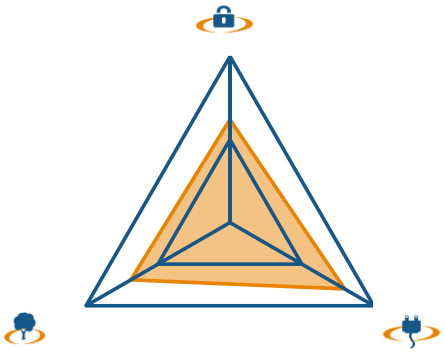
KEY METRICS

Industrial sector (% of GDP)	47.1	GDP per capita (PPP, USD); GDP Group	49,633 (I)
TPEP/TPEC (net energy importer)	0.93	Energy intensity (koe per USD)	0.31
Emission intensity (kCO_2 per USD)	0.69	CO_2 emissions (tCO_2) per capita	26.10
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	98

TRENDS AND OUTLOOK

- Bahrain holds comparatively small reserves, and, at its current production rate, its recoverable natural gas reserves will be depleted in less than 8 years. At the same time Bahrain experiences a continuously increasing demand for energy due to growth in population and of the economy. Energy infrastructure to import gas as well as augment oil production and refinery capacity is under development.
- Bahrain's latest National Economic Strategy (2009-2014) identifies energy efficiency and renewable energy technologies as key instruments to sustain energy security for economic growth and improve environmental sustainability. Both areas are also identified as important in the strategy document Economic Vision 2030. Bahrain has ratified the Kyoto protocol and CO_2 emissions have been decreasing since 2000.
- Even though a comprehensive energy and climate policy framework is not yet in place, Bahrain has initiated a number of initiatives focusing on energy security, energy efficiency and the development of renewable energy sources. Initiatives include: an Energy Efficiency Implementation Programme in collaboration with the World Bank to tackle energy inefficiencies in buildings; solar and wind 'pilot' projects initiated by the Electricity and Water Authority to assess the potential of alternative energy sources; efforts by the National Oil and Gas Authority aiming to double oil production by 2018 and increase the country's refinery capacity by 50%, a strong asset for the country due to the abundance of oil in neighbouring countries.

TRILEMMA BALANCE



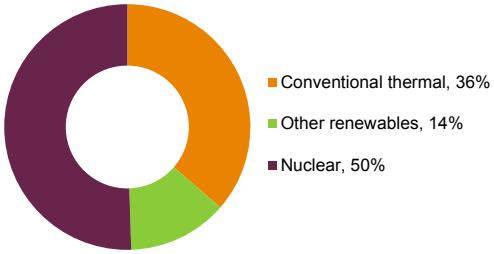
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		20	23	20	→	
	Energy security	63	65	50	→	**B**
	Energy equity	13	29	26	↓	**A**
	Environmental sustainability	34	32	41	→	**B**
Contextual performance		17	18	17	→	
	Political strength	16	17	17	→	
	Societal strength	14	17	17	→	
	Economic strength	45	34	34	→	
Overall rank and balance score		**17**	**21**	**16**	→	**ABB**

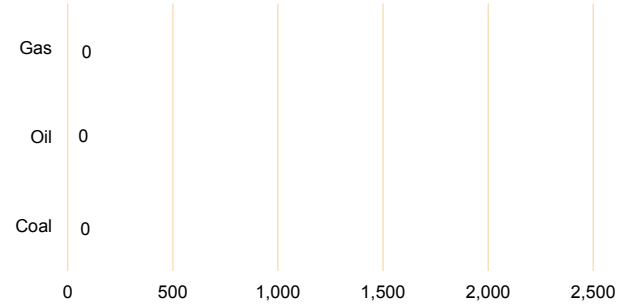
INDEX COMMENTARY

Belgium moves up by five places in this year's Index with few overall changes in energy performance. Energy security continues to be the weakest of the three dimensions but improves due to a slightly more diversified energy mix and slower energy consumption growth. Energy equity improves by a few positions given the decrease in electricity and gasoline prices. Environmental sustainability remains above average. Belgium's contextual performance stays strong overall.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



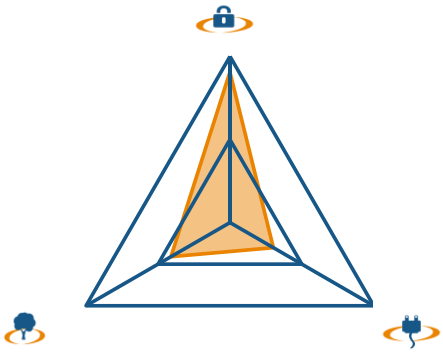
KEY METRICS

Industrial sector (% of GDP)	21.1	GDP per capita (PPP, USD); GDP Group	42,078 (I)
TPEP/TPEC (net energy importer)	0.22	Energy intensity (koe per USD)	0.16
Emission intensity (kCO_2 per USD)	0.25	CO_2 emissions (tCO_2) per capita	8.25
Energy affordability (USD per kWh, 2014)	0.25	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- With regards to primary provision, Belgium's supply is secure as its reliance on oil and gas imports is facilitated by a liquid oil market and a well-diversified contractual gas portfolio. Belgium has 18 entrance points for natural gas (pipelines and LNG combined). However, the Belgian electricity market suffers from a lack of economic profitability due to the current low average wholesale prices in north-west Europe, a push back of thermal generation driven by injection of low marginal cost renewables, a continuing low level of demand stemming from only moderate economic activity, low global coal prices and low prices for CO_2 certificates in the EU-ETS. Given European prices in 2014/2015, operating gas-fired units is not profitable, leading to the intention to mothball these units. Technical issues on two major nuclear power plants and changes to the phase-out process for older units add to the strain of the electricity market. Also, constantly changing energy policies, depending on the composition of the government, lead to a lack of new investments.
- The government is aware of the market issues and is working on solutions via allocation of strategic reserves and possibly capacity remuneration mechanisms. The price level for the end consumer, however, will continue to rise since the VAT on electricity will return to the 'usual' 21% after having been lowered by previous governments to 14%, partly to keep inflation low and to mask the high levies for renewable support. The very fast growth of solar PV and wind in the Belgian system will have to be paid for by high-end consumer electricity prices. These choices will continue to weigh on Belgian electricity prices.

TRILEMMA BALANCE



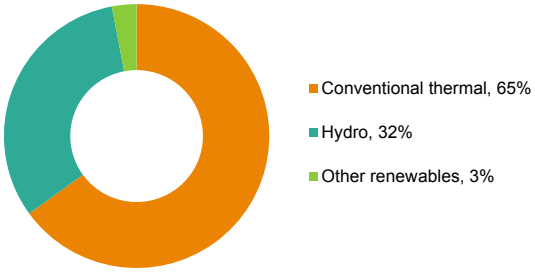
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		44	50	59	→	
	Energy security	4	7	14	→	**A**
	Energy equity	84	88	91	→	**C**
	Environmental sustainability	71	70	77	→	**C**
Contextual performance		86	86	81	→	
	Political strength	100	101	98	→	
	Societal strength	99	107	104	→	
	Economic strength	53	46	44	→	
Overall rank and balance score		**55**	**62**	**67**	→	**ACC**

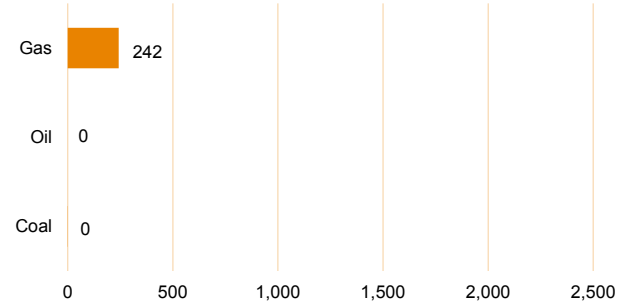
INDEX COMMENTARY

Bolivia drops five places in the Index maintaining strong energy security indicators and comparatively weaker energy equity and environmental sustainability dimensions. Reliance on energy exports is moderate and availability of oil and oil product stocks improves, however, because of the up-to-date data point underlying the indicator for energy consumption growth in relation to GDP growth the ranking drops slightly. Attention still needs to be paid to the reliability of the electricity transmission and distribution network. Nine per cent of the Bolivian population is without access to electricity, and for those with access, electricity remains relatively expensive. The country's environmental sustainability is mostly stable. Bolivia's political and societal indicators performance continues to be weak overall, while indicators of economic strength are comparatively stronger. Overall the contextual performance improves.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



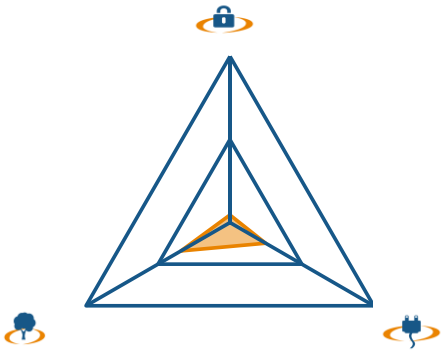
KEY METRICS

Industrial sector (% of GDP)	38.9	GDP per capita (PPP, USD); GDP Group	5,928 (IV)
TPEP/TPEC (net energy exporter)	2.38	Energy intensity (koe per USD)	0.16
Emission intensity (kCO_2 per USD)	0.30	CO_2 emissions (tCO_2) per capita	1.60
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	91

TRENDS AND OUTLOOK

- The energy sector is of political and economic significance to Bolivia, which is a meaningful contributor to regional natural gas supplies. Bolivia exports natural gas to Brazil and Argentina, and its proven natural gas reserves rank as the fifth largest reserves in South America. Bolivia has a fairly small amount of proven oil reserves, and in recent years has been a net oil importer because production has failed to keep pace with consumption. There is good potential for renewable energy derived from by-products of sugar cane and wood industries, and the vast hydroelectric potential has not been fully exploited.
- Recent developments include: an intensive campaign in oil exploration to replenish reserves and maintain the domestic market and export contracts of natural gas to Brazil and Argentina; and a recently approved Investment Act, which will be complemented by a Law of Incentives for the oil sector, a new hydrocarbons law and a law on prior consultation.
- Key issues for policymakers to focus on: 1) creation of an attractive, enabling environment for investment to flow into transport of hydrocarbons in both the internal network and future export markets; 2) continuous assessment of exploration and production potential of domestic natural gas resources; 3) engagement with the general public in order to increase public acceptance, shorten the time of pre-consultation with indigenous peoples and allow for a speedier approval of contracts; and 4) further development of renewables including hydropower.

TRILEMMA BALANCE



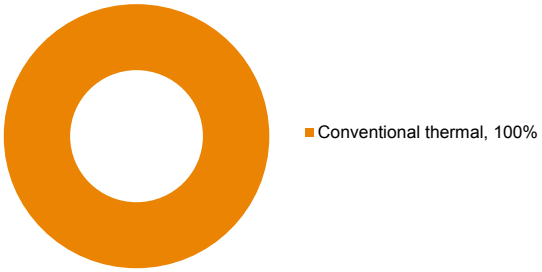
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	109	121	123	→	
Energy security	126	126	124	→	**D**
Energy equity	97	98	98	→	**D**
Environmental sustainability	62	71	86	↓	**C**
Contextual performance	63	33	35	↑	
Political strength	38	35	38	→	
Societal strength	56	66	67	↓	
Economic strength	82	15	15	↑	
Overall rank and balance score	**99**	**91**	**99**	→	**CDD**

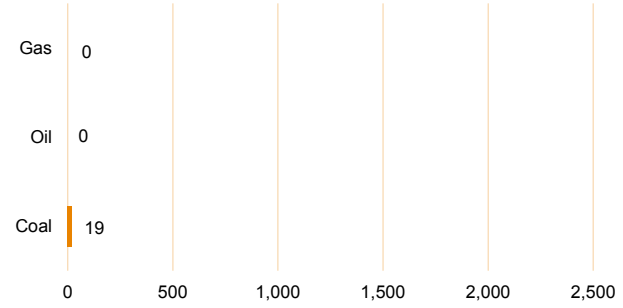
INDEX COMMENTARY

Botswana drops by eight places in this year's Index. The country continues to struggle with balancing the three facets of the energy trilemma. Energy security is very weak as the country relies exclusively on conventional thermal power for electricity generation, electricity transmission and distribution losses remain very high and the reliance on energy imports further increases. Energy equity performance is low even though the share of the population with access to modern electricity services increases from 43% to 53%. A further increase in emission intensity causes the country to slip on environmental sustainability performance. Performance on indicators of political and societal strength remains mostly stable, while indicators of economic strength are stable and strong driven by relatively low cost of living and high macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

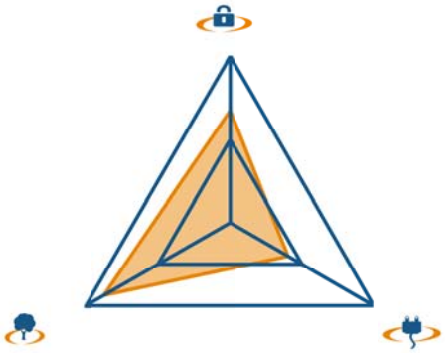


KEY METRICS

Industrial sector (% of GDP)	28.7	GDP per capita (PPP, USD); GDP Group	15,240 (II)
TPEP/TPEC (net energy importer)	0.32	Energy intensity (koe per USD)	0.09
Emission intensity (kCO_2 per USD)	0.23	CO_2 emissions (tCO_2) per capita	3.06
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	53

TRENDS AND OUTLOOK

TRILEMMA BALANCE



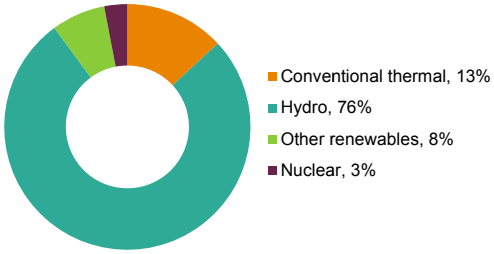
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	30	29	29	→	
Energy security	27	29	43	→	**B**
Energy equity	86	86	78	→	**C**
Environmental sustainability	17	19	17	→	**A**
Contextual performance	58	45	44	→	
Political strength	63	65	69	↓	
Societal strength	66	59	54	↑	
Economic strength	37	25	31	→	
Overall rank and balance score	**34**	**30**	**37**	→	**ABC**

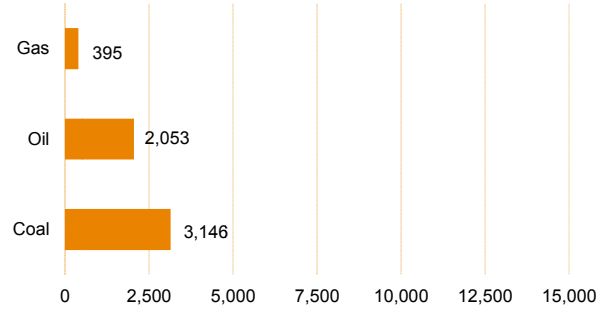
INDEX COMMENTARY

Brazil drops by seven places in this year's Index. Brazil's balancing of the energy trilemma is lopsided, with high rankings in energy security and environmental sustainability, but low levels of energy equity. Despite efforts to further diversify the electricity generation energy security deteriorates mostly due to an increase in distribution and transmission losses, energy consumption growing faster than GDP as well as comparatively lower oil and oil product stocks. Brazil's energy equity ranking still lags behind the country's performance on the other energy dimensions despite some improvements. The perceived quality of the electricity supply continues to worsen. With electricity being generated mostly with hydropower, Brazil's environmental impact is relatively low and earns a very good ranking. Contextual indicators remain mostly stable.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



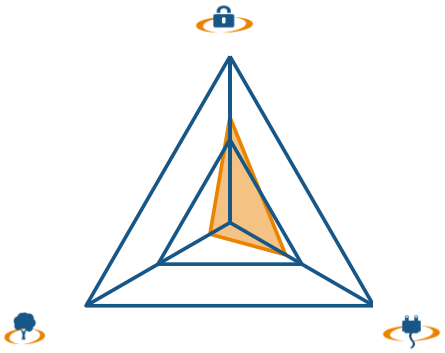
KEY METRICS

Industrial sector (% of GDP)	23.8	GDP per capita (PPP, USD); GDP Group	15,979 (II)
TPEP/TPEC (net energy importer)	0.82	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.18	CO_2 emissions (tCO_2) per capita	2.30
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The most significant policy developments in Brazil's energy sector in 2015 include: 1) a 50% rise in electricity prices due to losses incurred by the government following a plan to reduce power bills by 20% in 2012. An additional increase of 8-10% in electric power tariffs is expected for 2016. A system of tariff flags, applying different tax rates depending on flag colour printed on the bill, was initiated to provide relief for poorer consumers. 2) A halt in the operation of 21 thermal power plants, which should generate monthly savings of R$5.5 billion, driven by greater volumes of rainfall and lower demand for energy. 3) A 14% increase of the supply generated by sugarcane bagasse. The sector has great potential for growth, especially as sugarcane's harvest period coincides with Brazil's driest months and electricity tariffs make investments attractive.
- In August 2015 the federal government issued the Programa de Investimentos em energia elétrica worth R$186 billion with the objective of increasing the total energy supply, with a preference towards low-carbon generation, and strengthening the transmission and distribution system.
- Current forecasts predict total consumption increasing at an average rate of 3.5% (per annum) to 2019. Installed capacity for wind energy is predicted to increase by 60% in 2015, accounting for a larger share of the electricity generation mix (now 4.5%), and reach 15.2 GW by 2019 from 6GW in 2014. With regards to the oil and gas sectors, Petrobras recently approved its 2015−2019 business plan, reducing its outlook for petroleum production by 2020 from 4.2 million bbd/day to 2.8 million.

TRILEMMA BALANCE



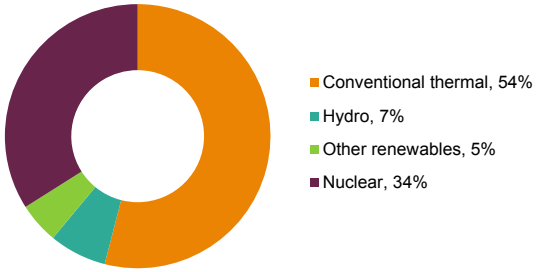
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	71	78	88	↓	
Energy security	26	24	48	↓	**B**
Energy equity	77	80	80	→	**C**
Environmental sustainability	108	109	112	→	**D**
Contextual performance	54	48	49	→	
Political strength	49	50	50	→	
Societal strength	52	58	58	→	
Economic strength	61	50	55	→	
Overall rank and balance score	**70**	**67**	**81**	↓	**BCD**

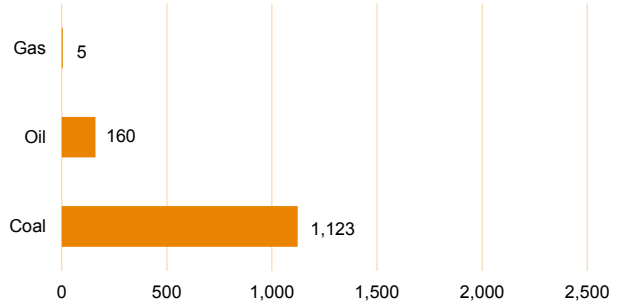
INDEX COMMENTARY

Bulgaria's overall ranking drops by 14 places in this year's Index driven by a lower energy security performance. The competing dimensions of the energy trilemma continue to be unbalanced, as Bulgaria still has an above average level of energy security, performs mediocre on energy equity, and does a poor job in mitigating its impact on the environment. Energy security, the strongest of all dimensions deteriorates despite a more diversified electricity generation portfolio and lower transmission and distribution losses. However, because of the up-to-date data point underlying the indicator for energy consumption growth in relation to GDP growth the ranking drops. Energy equity performance remains lackluster, with comparatively high levels of household spending on electricity services. Environmental sustainability is Bulgaria's weakest dimension, with energy and emission intensity being high and above European average, comparatively poor air and water quality, and high CO_2 emissions from electricity generation. Overall contextual performance is stable.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



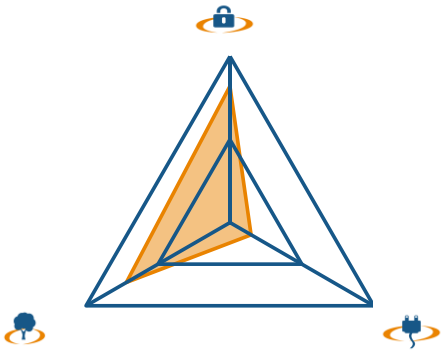
KEY METRICS

Industrial sector (% of GDP)	31.2	GDP per capita (PPP, USD); GDP Group	17,222 (II)
TPEP/TPEC (net energy importer)	0.63	Energy intensity (koe per USD)	0.19
Emission intensity (kCO_2 per USD)	0.45	CO_2 emissions (tCO_2) per capita	5.52
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In the spring of 2015 the Bulgarian Parliament amended the existing Energy Act to: increase the political independence of the national regulatory commission, financially stabilise the electricity sector, improve market transparency, promote trans-border trade, and enhance end-user rights. The new legal framework was expected to improve the sustainable use of renewable energy sources, market liberalisation and social equity during the period prior to full liberalisation of the market. The amendments have not yet resulted in the expected improvements.
- Key issues policymakers need to focus on are: 1) improved energy security through stimulation of investments in reliable energy infrastructure, further diversifying sources and routes of energy supply, and optimizing the use of indigenous energy resources; 2) increased energy efficiency; 3) prompt actions focused on financial stabilisation of the energy sector; 4) increased social protection; 5) pursuing the ambitious targets of giving 30% of households access to natural gas by 2020 as set out in the national energy strategy; and 6) respect for the rule of law.

TRILEMMA BALANCE



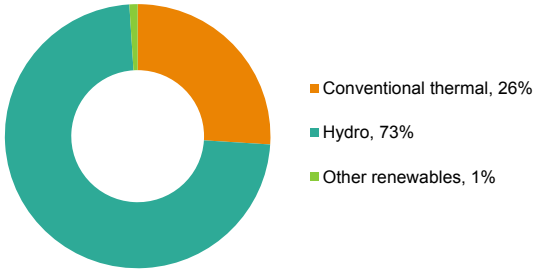
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	70	59	50	↑	
Energy security	62	38	24	↑	**A**
Energy equity	107	111	111	→	**D**
Environmental sustainability	39	30	37	→	**B**
Contextual performance	104	109	114	→	
Political strength	111	111	108	→	
Societal strength	115	121	122	→	
Economic strength	74	56	84	↓	
Overall rank and balance score	**82**	**70**	**73**	↑	**ABD**

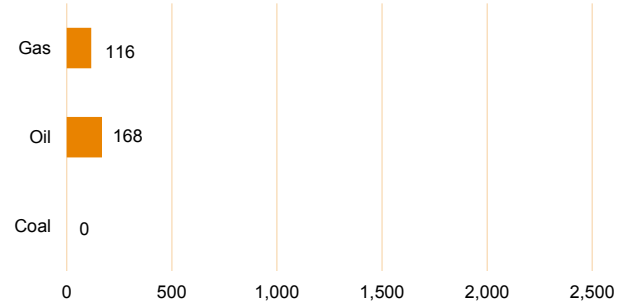
INDEX COMMENTARY

Cameroon drops by three places in this year's Index. Energy security remains relatively stable. Meeting the growth in energy consumption needs to be at the centre of attention as well as the reliability of the electricity transmission and distribution network. Energy equity, Cameroon's weakest energy performance dimension, does not improve even though access to electricity improves to 54% of the population. Both gasoline and electricity are to a large extent unaffordable. Cameroon's high share of hydropower in its electricity fuel mix enables the country to maintain a comparatively small environmental footprint, although emission intensity slightly worsens. Contextually, societal and political stability is stable, but low. Economic strength remains Cameroon's strongest contextual dimension, albeit a worsening of macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

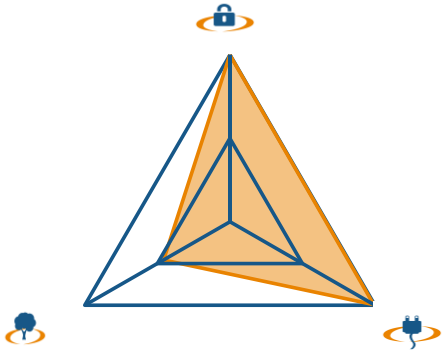


KEY METRICS

Industrial sector (% of GDP)	27.6	GDP per capita (PPP, USD); GDP Group	2,864 (IV)
TPEP/TPEC (net energy exporter)	1.66	Energy intensity (koe per USD)	0.14
Emission intensity (kCO_2 per USD)	0.12	CO_2 emissions (tCO_2) per capita	0.29
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	54

TRENDS AND OUTLOOK

TRILEMMA BALANCE



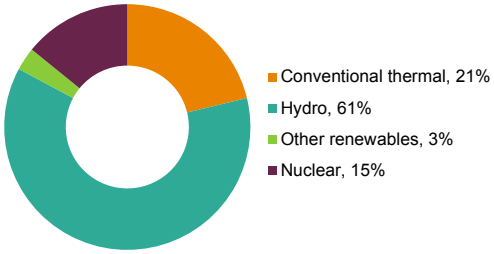
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	8	4	9	→	
Energy security	1	1	1	→	**A**
Energy equity	2	2	2	→	**A**
Environmental sustainability	60	56	71	↓	**C**
Contextual performance	14	14	15	→	
Political strength	10	10	10	→	
Societal strength	10	14	14	→	
Economic strength	46	27	29	→	
Overall rank and balance score	**6**	**6**	**7**	→	**AAC**

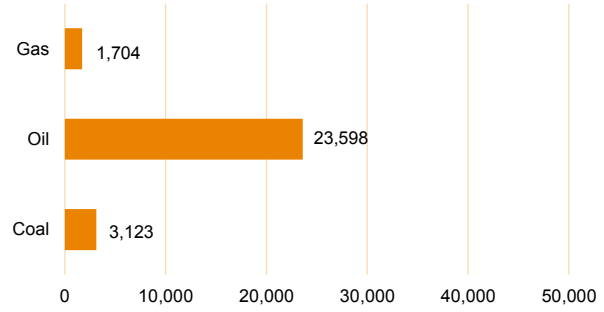
INDEX COMMENTARY

Canada ranks 7 in the overall Index ranking. Although one of the top Index performers overall, Canada's weaker environmental sustainability ranking continues to undermine its otherwise excellent performance. Canada, one of the largest energy exporters in the world, ranks exceptionally well on the energy security dimension with a favorable energy export to import ratio, a significantly diversified electricity generation portfolio away from fossil fuels and a low economic dependency on fuel exports. Energy equity is also high with plentiful, relatively affordable energy. Environmental sustainability remains Canada's weakest energy dimension with comparatively high, although decreasing levels of energy and emission intensity, and a higher reliance on energy-intensive resource development industries than most industrialised countries. Contextual performance is stable and strong.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



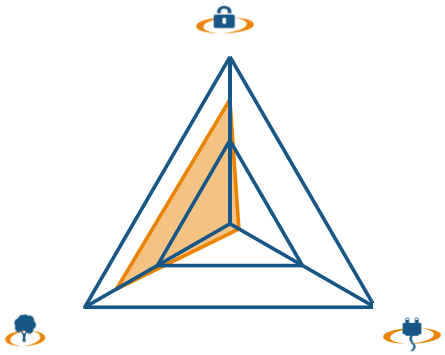
KEY METRICS

Industrial sector (% of GDP)	28.2	GDP per capita (PPP, USD); GDP Group	43,590 (I)
TPEP/TPEC (net energy exporter)	1.41	Energy intensity (koe per USD)	0.19
Emission intensity (kCO_2 per USD)	0.41	CO_2 emissions (tCO_2) per capita	15.33
Energy affordability (USD per kWh, 2014)	0.10	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Canada's high and improving position in the Index reflects the country's extensive and diverse energy resource base and public and private commitment to develop those resources. The two main challenges Canada faces are: balancing resource development with environmental protection; and developing diverse markets for Canada's energy resources.
- The most recent energy policy developments include: strong focus on developing markets for oil and gas beyond North America; a faster energy infrastructure approvals process; more stringent environmental standards for fossil-fuelled power generation, both federally and provincially. These three developments should support continuing improvement in Canada's energy balance.
- The three key issues policymakers need to focus on are: 1) managing the environmental/climate impacts of energy resource development; 2) market diversification; and 3) ensuring an appropriate sharing of the benefits from resource development, most notably with Canada's aboriginal population in whose traditional territory most resource development and delivery projects are being developed.

TRILEMMA BALANCE



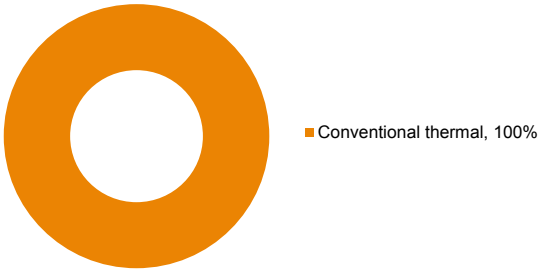
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	96	94	61	↑	
Energy security	83	85	34	↑	**B**
Energy equity	123	121	122	→	**D**
Environmental sustainability	50	48	29	↑	**B**
Contextual performance	113	115	116	→	
Political strength	124	125	124	→	
Societal strength	128	127	127	→	
Economic strength	58	56	73	→	
Overall rank and balance score	**104**	**101**	**80**	↑	**BBD**

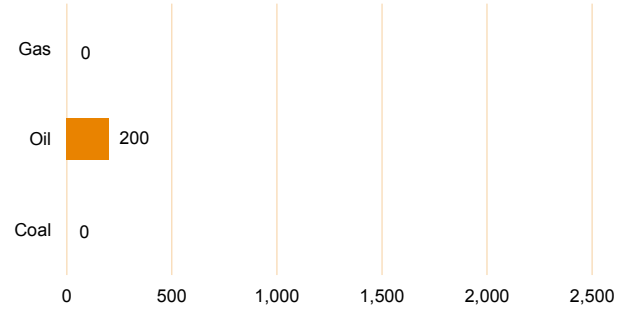
INDEX COMMENTARY

Chad improves its overall ranking by 21 positions, mainly driven by an upsurge in energy security, which is solely caused by the up-to-date data point underlying the indicator for energy consumption in relation to GDP growth. The country's energy trilemma changes, with above average results for energy security and environmental sustainability being balanced by very low levels of energy equity. Because of the very low energy consumption related to the low energy access rates, Chad has a very strong ratio of total energy production to total energy consumption. However, performance on other indicators of energy security, for example, diversity of electricity generation or transmission and distribution losses continues to be very low. Energy equity continues to be the country's weakest dimension, with 94% of the population without access to electricity. The country's environmental impact is moderate. Contextually, political and societal strength remain very poor, while economic strength is comparatively stronger, albeit a worsening of macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

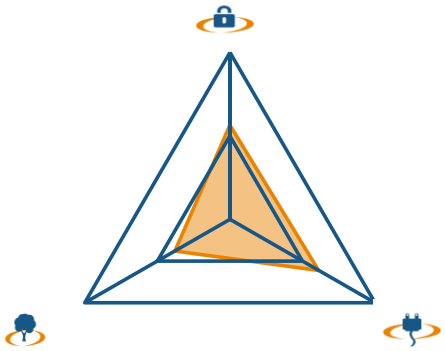


KEY METRICS

Industrial sector (% of GDP)	13.2	GDP per capita (PPP, USD); GDP Group	2,474 (IV)
TPEP/TPEC (net energy exporter)	69.09	Energy intensity (koe per USD)	0.09
Emission intensity (kCO_2 per USD)	0.02	CO_2 emissions (tCO_2) per capita	0.03
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	6

TRENDS AND OUTLOOK

TRILEMMA BALANCE



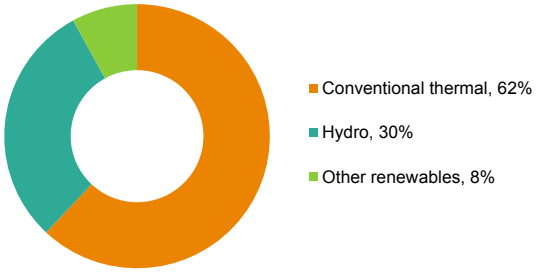
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		78	77	64	↑	
	Energy security	90	89	57	↑	**B**
	Energy equity	56	55	51	→	**B**
	Environmental sustainability	72	67	81	↓	**C**
Contextual performance		20	17	16	→	
	Political strength	25	28	28	→	
	Societal strength	36	27	24	↑	
	Economic strength	19	9	9	→	
Overall rank and balance score		**57**	**53**	**43**	↑	**BBC**

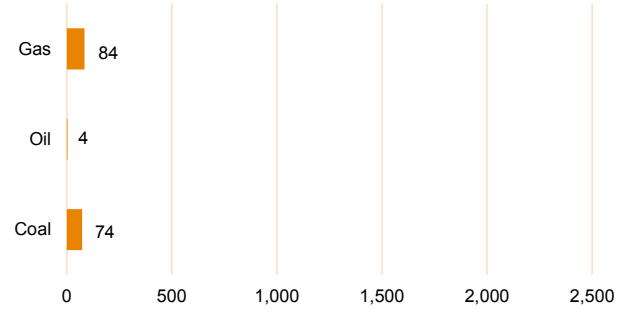
INDEX COMMENTARY

Chile improves by ten positions in this year's Index. Energy security improves substantially because of the up-to-date data point underlying the indicator for energy consumption growth in relation to GDP growth and a reduction of losses in transmission and distribution. Energy equity continues to gradually improve. Environmental sustainability is Chile's weakest dimension, and although emission and energy intensity remain stable, Chile loses a few ranks as peer countries improve their positions in the Index. Contextually, Chile performs strongly in all dimensions, especially on indicators of economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



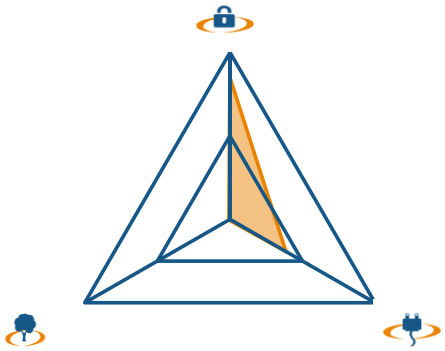
KEY METRICS

Industrial sector (% of GDP)	35.5	GDP per capita (PPP, USD); GDP Group	22,470 (II)
TPEP/TPEC (net energy importer)	0.24	Energy intensity (koe per USD)	0.13
Emission intensity (kCO_2 per USD)	0.28	CO_2 emissions (tCO_2) per capita	4.51
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Chile currently imports 60% of its total primary energy, exposing it to international commodity price volatility as well political and market related risks. The greatest challenges are perceived to be: securing fuel supply; developing local resources, in particular renewables; developing a regulatory framework for the gas sector; promoting energy efficiency; reducing biomass cooking and heating; promoting regional integration through gas and electricity interconnectors; advancing e-mobility and smart cities; and accounting for additional capacity delivered by upcoming tenders for electricity production.
- The 2014 Agenda de Energía sets the following targets: 1) 30% reduction of marginal costs of electricity in 4 years; 2) 25% price cuts of tenders for households as well as small and medium enterprises that produce electricity; 3) renewables to constitute 45% of capacity installed by 2025; 4) energy efficiency improvements to achieve a 20% savings target by 2025; 5) development of a framework to hedge exposure to fuel price volatility; 6) reform of state-owned ENAP to have a greater participation in new electricity generation; and 7) development of a comprehensive and inclusive energy policy.
- Policymakers should continue to focus on: 1) completing the interconnection of the northern SING and central SIC grids; 2) advancing the interconnection Chile-Peru; 3) achieving 30% CO_2 emissions reduction compared to 2007 levels by 2030 and the recovery of 100,000 hectares of forest; 4) improving regulatory stability and administrative licensing; 5) building greater dialogue with local communities; and 6) attracting investments in low-carbon transport and electricity generation.

TRILEMMA BALANCE



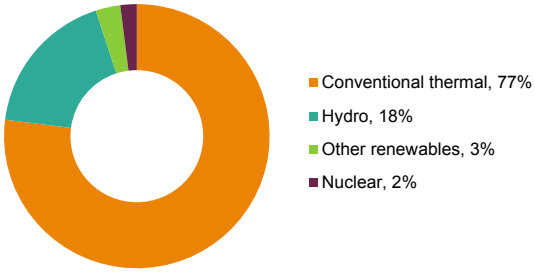
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	90	82	86	→	
Energy security	18	19	21	→	**A**
Energy equity	101	82	79	↑	**C**
Environmental sustainability	126	127	129	→	**D**
Contextual performance	44	47	47	→	
Political strength	76	79	84	↓	
Societal strength	61	69	66	→	
Economic strength	7	8	11	→	
Overall rank and balance score	**78**	**74**	**74**	→	**ACD**

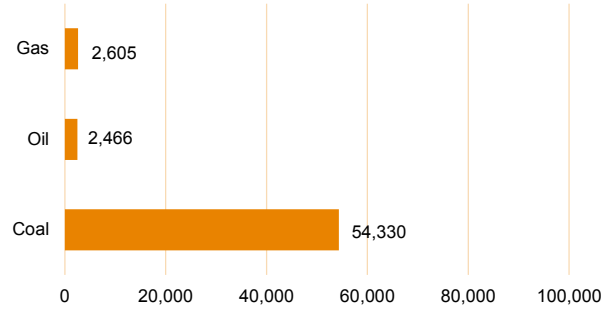
INDEX COMMENTARY

China maintains its position in the Index with a rather unbalanced energy trilemma. Energy security is by far the strongest of this 'Highly-industrialised' country's three dimensions as it struggles to replicate its success in this dimension with equally strong performances in the other two dimensions of the energy trilemma. The energy equity dimension remains stable. China fails to improve its ranking on the environmental sustainability dimension, as energy and emissions intensity continue to be high compared to peer countries. Contextual performance is mostly stable, with mediocre scores for indicators of political and societal strength, and a strong economic performance.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



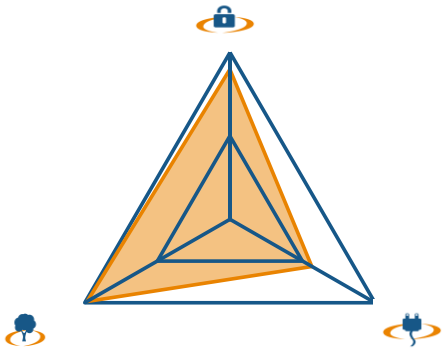
KEY METRICS

Industrial sector (% of GDP)	43.9	GDP per capita (PPP, USD); GDP Group	11,886 (III)
TPEP/TPEC (net energy importer)	0.86	Energy intensity (koe per USD)	0.22
Emission intensity (kCO_2 per USD)	0.59	CO_2 emissions (tCO_2) per capita	6.09
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- China is the largest global energy consumer, and emitter of CO_2 emissions. Given its fast growing economy, energy security is crucial to the country's development. To limit its dependence on oil and gas imports, China is set to develop the oil and gas shale industry, and a great number of nuclear power plants are either under construction or in planning, most of them located in coastal areas where the economy is expanding rapidly.
- The 12th Five year plan (2011-2015) prioritises sustainable growth, industrial upgrading, energy efficiency, an increase of the share of renewables and reduction of GHG emissions. The 12th Energy Development plan addresses additional issues such as: improvement of safety in coal mines; further exploration of petroleum and natural gas resources; development of unconventional oil and gas resources; and halting foreign oil dependence at 61%.
- To enable continued economic growth, meet the growing demand and manage the environmental impact China needs to continue investing in the diversification of its energy mix, the deployment of clean energy technologies, and energy efficiency and conservation. Strategies such as the 'Top 10,000 programme', which targets 15,000 industrial enterprises, around 160 large transportation enterprises and public buildings (consuming about two-thirds of China's energy) for energy efficiency improvements; the development of a pricing mechanism for natural resources that reflects market forces; resource scarcity and the cost of environmental damage; or the implementation of plans to expand the transmission and distribution are crucial.

TRILEMMA BALANCE



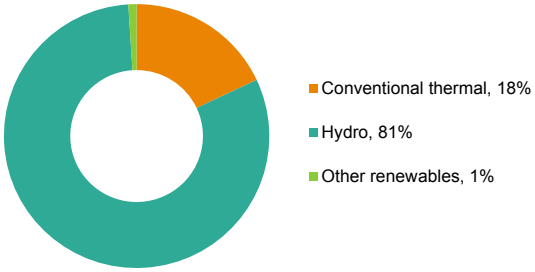
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	13	9	10	→	
Energy security	5	5	13	→	**A**
Energy equity	85	63	58	↑	**B**
Environmental sustainability	4	4	3	→	**A**
Contextual performance	67	68	68	→	
Political strength	72	81	77	→	
Societal strength	73	67	70	→	
Economic strength	56	63	56	→	
Overall rank and balance score	**24**	**16**	**18**	→	**AAB**

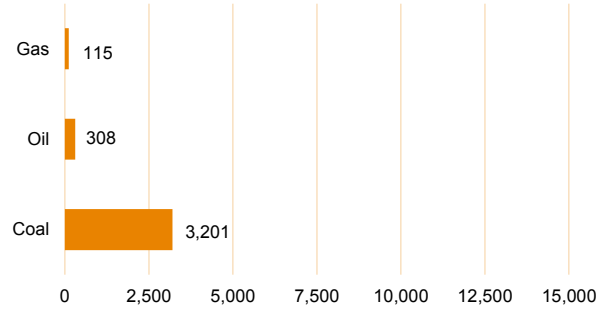
INDEX COMMENTARY

Colombia drops two places in this year's index. A member of the 'Hydro-powered' grouping of countries, Colombia exhibits strong performance on the energy security and environmental sustainability dimensions of the energy trilemma, but, like many of its peers, struggles with a lagging energy equity ranking. The rank change in energy security is largely driven by the up-to-date data point underlying the indicator for energy consumption growth in relation to GDP growth. The energy exporter's favourable total energy production to consumption ratio, economically low dependence on energy exports and its large strategic oil reserves continue to be an advantage. Energy equity, Colombia's weakest dimension, remains mostly stable. Environmental sustainability performance is among the best in the world. Contextually, indicators of political and economic strength see some improvements, while societal strength slightly declines.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



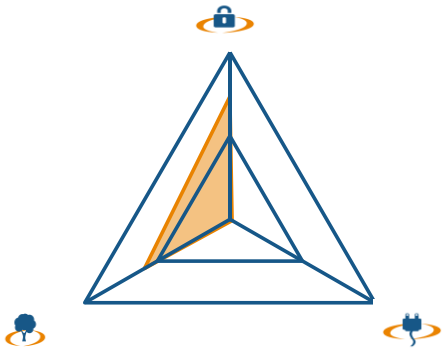
KEY METRICS

Industrial sector (% of GDP)	37.3	GDP per capita (PPP, USD); GDP Group	12,806 (III)
TPEP/TPEC (net energy exporter)	3.35	Energy intensity (koe per USD)	0.06
Emission intensity (kCO_2 per USD)	0.14	CO_2 emissions (tCO_2) per capita	1.48
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	97

TRENDS AND OUTLOOK

- Colombia, although in a relatively high position in the Index, still faces major challenges such as: expanding coverage of energy services, and finding solutions based on non-conventional energies; improving quality and reliability of energy services; diversification of the energy mix; and sustaining the positive economic development without increasing CO_2 emissions.
- Main areas policymakers are focusing on are: 1) ensuring the continued development of the mining and energy sector as one of the main drivers of economic growth and social development; 2) promoting of energy efficiency on energy demand and supply side, and consolidating a culture for sustainable use of natural resources; 3) strengthening the participation of different stakeholders in the development phases of the industry; 4) increasing exploration of natural gas; 5) developing and implementing efficient mass transportation systems; 6) ensuring the expansion of electricity generation capacity; and 7) strengthening guarantees and investment opportunities in the country, and boosting investment in science and technology in the energy sector.
- Furthermore, Colombia was an active participant at the Rio+20 summit, and is committed to continue this effort in: setting the objectives of sustainable development; seeking food security; protecting water sources; promoting the use of renewable energy; sustainable city development; protecting the oceans; and increasing employment to reduce poverty.

TRILEMMA BALANCE



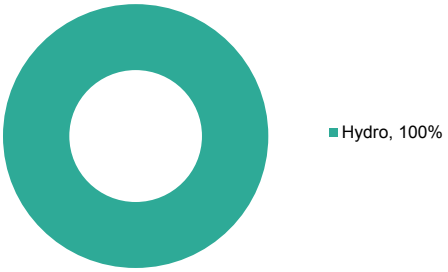
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	56	83	81	↓	
Energy security	30	46	35	→	**B**
Energy equity	121	126	128	→	**D**
Environmental sustainability	27	58	54	↓	**B**
Contextual performance	129	129	127	→	
Political strength	129	128	128	→	
Societal strength	129	129	129	→	
Economic strength	115	120	120	→	
Overall rank and balance score	**80**	**100**	**96**	↓	**BBD**

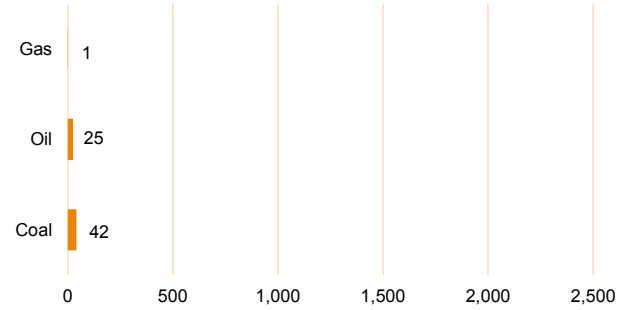
INDEX COMMENTARY

Congo (DR) improves its overall rank by four places in this year's Index. Energy security and environmental sustainable performance continue to be quite good, but the country still struggles with providing affordable, high-quality energy to all its citizens. Lower transmission and distribution losses have a positive impact on the country's energy security performance, while environmental sustainability improves due to gradually decreasing emissions and energy intensity. Energy equity performance is very poor as only 16% of the population has access to electricity. Once the country develops economically and is able to provide a larger share of its population with access to modern energy services, it will face the challenge of meeting the growing demand while sustaining the current levels of energy security and environmental sustainability. Contextual performance remains very poor across all indicators. No improvements were made on these contextual indicators during the past year.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



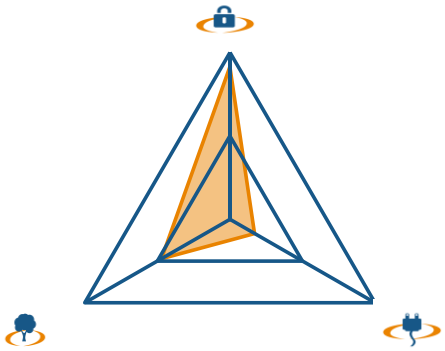
KEY METRICS

Industrial sector (% of GDP)	23.0	GDP per capita (PPP, USD); GDP Group	655 (IV)
TPEP/TPEC (net energy exporter)	1.17	Energy intensity (koe per USD)	0.48
Emission intensity (kCO_2 per USD)	0.05	CO_2 emissions (tCO_2) per capita	0.04
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	16

TRENDS AND OUTLOOK

ACD SCORE **CÔTE D'IVOIRE** RANK 75

TRILEMMA BALANCE



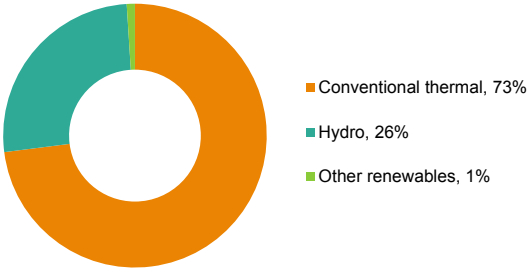
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	72	76	64	→	
Energy security	36	35	12	↑	**A**
Energy equity	108	110	108	→	**D**
Environmental sustainability	68	66	69	→	**C**
Contextual performance	128	121	105	↑	
Political strength	124	119	113	↑	
Societal strength	126	120	117	↑	
Economic strength	116	89	60	↑	
Overall rank and balance score	**93**	**86**	**75**	↑	**ACD**

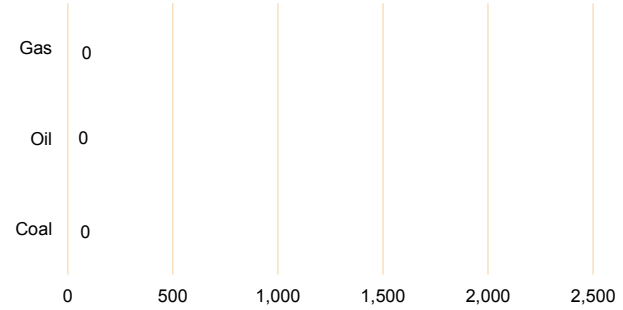
INDEX COMMENTARY

Côte d'Ivoire improves by eleven places in the 2015 Index. The country struggles to balance the energy trilemma, with a good performance on the energy security dimension offset by a mediocre environmental sustainability ranking and low levels of energy equity. At the current level of economic and social development the country's energy security is strong enough, but further improvements to the electricity infrastructure will soon be needed. The change in ranks in this dimension is mainly driven by an update of the data points underlying the indicator for energy consumption in relation to GDP growth. Energy equity remains poor as over 40% of the population still does not have access to electricity, and energy services are not affordable. Once the country further develops economically and is able to provide an even larger share of its population with access to modern energy services it will be challenging to meet the growing demand, sustain the current level of energy security and maintain the relatively low environmental impact. Contextual performance overall remains poor. Visible improvements in economic performance are driven by improved macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

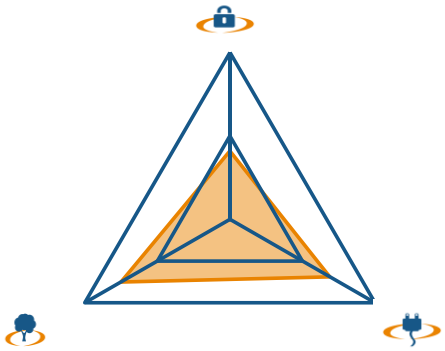


KEY METRICS

Industrial sector (% of GDP)	21.9	GDP per capita (PPP, USD); GDP Group	2,946 (IV)
TPEP/TPEC (net energy exporter)	1.29	Energy intensity (koe per USD)	0.25
Emission intensity (kCO_2 per USD)	0.16	CO_2 emissions (tCO_2) per capita	0.41
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	56

TRENDS AND OUTLOOK

TRILEMMA BALANCE



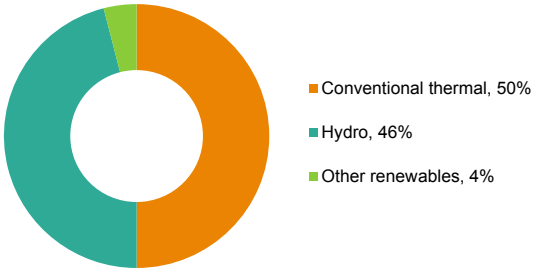
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	24	24	39	↓	
Energy security	66	74	77	→	**C**
Energy equity	31	31	41	→	**B**
Environmental sustainability	21	26	33	→	**B**
Contextual performance	61	56	60	→	
Political strength	45	43	45	→	
Societal strength	48	47	46	→	
Economic strength	81	85	96	→	
Overall rank and balance score	**30**	**32**	**44**	↓	**BBC**

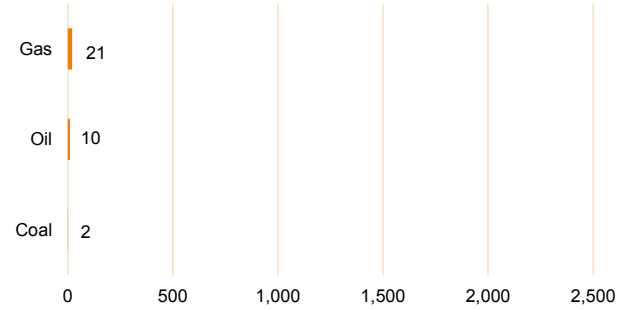
INDEX COMMENTARY

Croatia loses 12 positions in overall Index ranking but it continues to balance the three sides of the energy trilemma relatively well, although energy security lags slightly behind. The country's energy security ranking declines further, despite small improvements in further diversifying its electricity fuel mix. Performance in the energy equity dimension deteriorates slightly. As peer countries improve faster, environmental sustainability worsens despite decreasing emission and energy intensity. Contextual performance remains largely unchanged. Economic strength continues to be Croatia's weakest contextual dimension.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

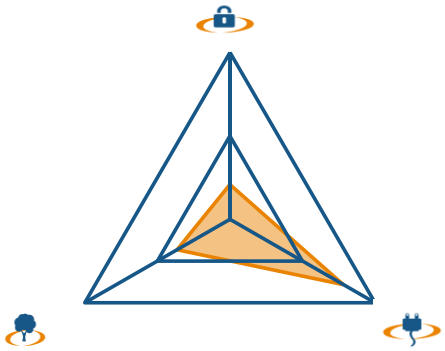


KEY METRICS

Industrial sector (% of GDP)	26.6	GDP per capita (PPP, USD); GDP Group	20,574 (II)
TPEP/TPEC (net energy importer)	0.33	Energy intensity (koe per USD)	0.12
Emission intensity (kCO_2 per USD)	0.25	CO_2 emissions (tCO_2) per capita	4.02
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



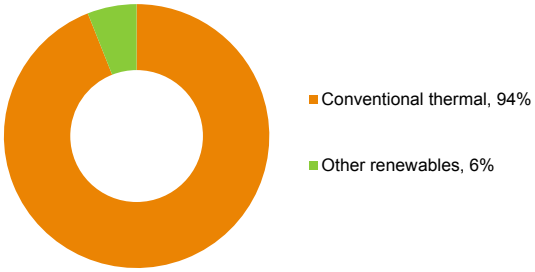
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	79	79	78	→	
Energy security	104	106	103	→	**D**
Energy equity	36	32	29	→	**B**
Environmental sustainability	80	77	83	→	**C**
Contextual performance	34	31	40	→	
Political strength	27	23	34	↓	
Societal strength	20	25	30	↓	
Economic strength	60	64	68	→	
Overall rank and balance score	**63**	**63**	**61**	→	**BCD**

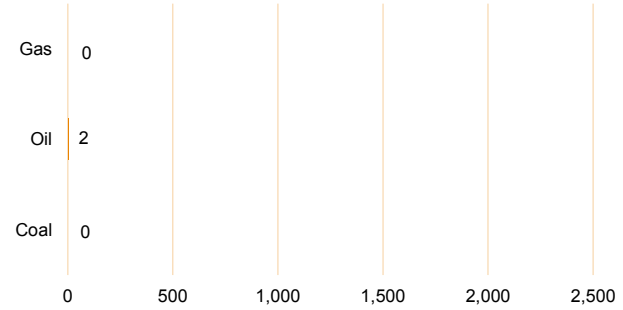
INDEX COMMENTARY

Cyprus' overall Index ranking remains mostly unchanged as it continues to struggle with balancing the energy trilemma. Cyprus' continually-strong energy equity ranking is offset by weaker performances on the energy security and environmental sustainability dimensions. Energy security is the weakest of the three energy dimensions as the country is highly reliant on fuel imports and struggles to diversify its electricity generation portfolio away from fossil fuels. Energy equity is Cyprus's strongest energy dimension, and slightly improves due to comparatively lower household expenditures on electricity and decreasing gasoline prices. Environmental sustainability performance remains relatively stable. Indicators of contextual societal and political strength continue to be good.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

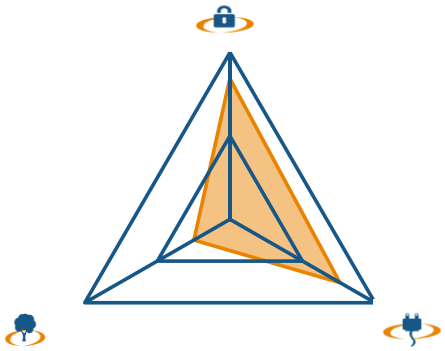


KEY METRICS

Industrial sector (% of GDP)	12.8	GDP per capita (PPP, USD); GDP Group	31,362 (II)
TPEP/TPEC (net energy importer)	0.01	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.29	CO_2 emissions (tCO_2) per capita	6.25
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



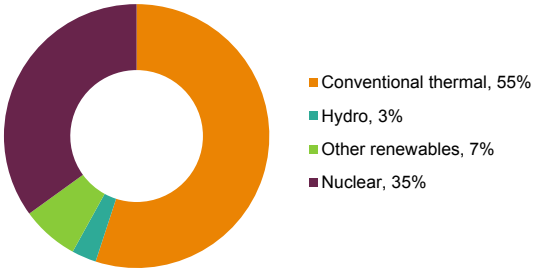
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	32	31	37	→	
Energy security	16	12	22	→	**A**
Energy equity	32	38	31	→	**B**
Environmental sustainability	90	87	98	→	**C**
Contextual performance	38	38	31	→	
Political strength	18	25	22	→	
Societal strength	40	35	34	→	
Economic strength	72	68	57	→	
Overall rank and balance score	**32**	**28**	**36**	→	**ABC**

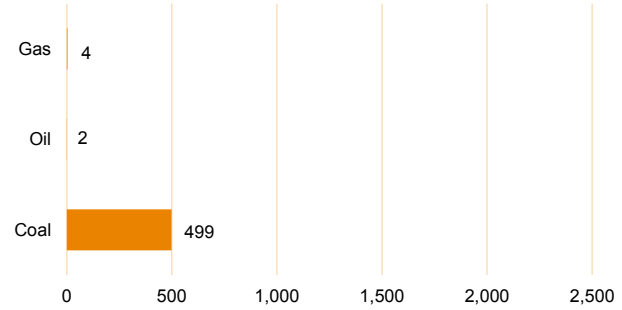
INDEX COMMENTARY

The Czech Republic continues to address the energy security and equity dimensions of the energy trilemma very well, while its environmental sustainability dimension lags behind. Performance on the energy security dimension sees continued diversification of the electricity generation portfolio, lower transmission and distribution losses and a higher number of oil and oil product stocks. However, dependency on fuel imports increases slightly. Performance in energy equity improves as household expenditures on electricity become less expensive. Performance on the environmental sustainability dimension remains relatively low with comparatively high energy and emission intensity. Contextual performance is stable with economic strength continuing to improve.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



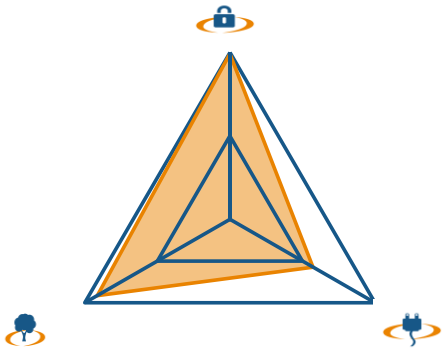
KEY METRICS

Industrial sector (% of GDP)	37.4	GDP per capita (PPP, USD); GDP Group	28,900 (II)
TPEP/TPEC (net energy importer)	0.67	Energy intensity (koe per USD)	0.17
Emission intensity (kCO_2 per USD)	0.41	CO_2 emissions (tCO_2) per capita	9.73
Energy affordability (USD per kWh, 2014)	0.17	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In 2015 the Czech government issued a number of energy policy documents: 1) the update of the State Energy Concept of the Czech Republic (SEK); 2) the National Action Plan for Smart Grids; 3) the National Action Plan for Energy Efficiency; and 4) the National Plan on Nuclear Energy Development. . The national energy policy is based on the following: construction of new nuclear power generation units in the existing sites of nuclear power plants; gradual transition from largely extracted lignite deposits towards natural gas and renewable energy sources for electricity and heat production, with domestic coal remaining a stable segment of the country´s energy mix (decreasing from 45% today to less than 20% in the coming decades); medium-term stabilising of combined heat and power (CHP), provision of coal / fuels for central heating; efficiency increase in energy production and reaching considerable economies in use of all kinds of energy; and reconstruction and development of network infrastructure (electricity, gas) to ensure system integration of decentralised production, operational reliability, as well as ancillary and transit services.
- Key issues to be considered by policymakers are: 1) diversification of imported fuels (oil, gas) and enlargement of transport routes and capacities; 2) acceleration and simplification of project administration approval and permitting procedures for modernising and new constructions of energy infrastructure; and 3) strengthening international cooperation in the process of implementing EU Internal Energy Markets and, creating regional markets, especially for electricity and gas.

TRILEMMA BALANCE



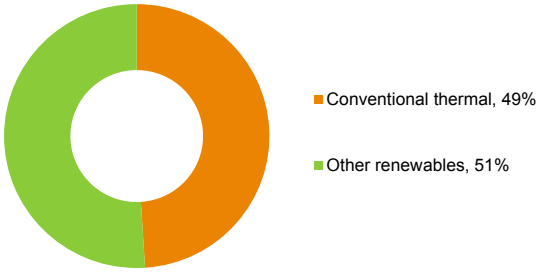
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	2	7	8	↓	
Energy security	3	6	2	→	**A**
Energy equity	25	47	57	↓	**B**
Environmental sustainability	10	9	12	→	**A**
Contextual performance	9	11	10	→	
Political strength	3	11	9	↓	
Societal strength	15	10	9	→	
Economic strength	21	18	13	→	
Overall rank and balance score	**2**	**5**	**6**	→	**AAB**

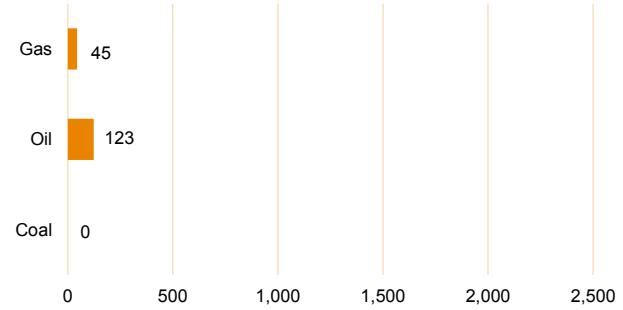
INDEX COMMENTARY

Denmark's overall Index ranking is mostly unchanged, and the country remains to be a top performer and a 'Pack leader' in 2015. Denmark continues to balance all three sides of the energy trilemma fairly well, providing its population with secure, affordable and environmentally-sensitive energy. Energy security continues to be the country's strongest energy dimension with a well-diversified electricity generation portfolio, low dependency on fuel exports, and a high quality distribution and transmission network. Energy equity, which is the least-strong of the three Danish energy dimensions, declines in relation to other countries. Impact on the environment remains low although energy and emission intensity slightly increase compared to last year. Contextual performance is strong overall and mostly stable, with minor improvements across the board.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



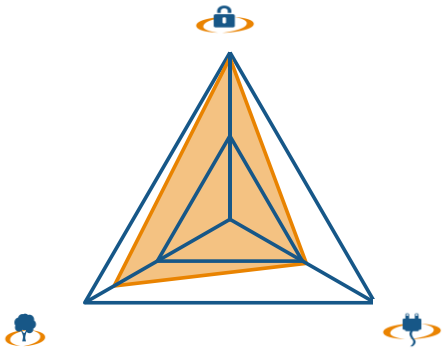
KEY METRICS

Industrial sector (% of GDP)	21.2	GDP per capita (PPP, USD); GDP Group	43,467 (I)
TPEP/TPEC (net energy exporter)	1.19	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.20	CO_2 emissions (tCO_2) per capita	6.56
Energy affordability (USD per kWh, 2014)	0.40	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In March 2012 a new Energy Agreement was reached in Denmark. The Agreement contains a wide range of ambitious initiatives. This should bring Denmark closer to reaching the target of 100% renewable energy in the energy and transport sectors by 2050 by committing to large investments up to 2020 in energy efficiency, renewable energy and the overall energy system. Targets to reach by 2020 include approximately 50% of electricity consumption supplied by wind power, and more than 35% of final energy consumption supplied from renewable energy sources.
- To overcome the challenges and reach its ambitious targets of becoming independent of fossil fuels and reducing CO_2 emissions, Danish policymakers are focusing on the implications of: being fossil fuel free for the transport sector; the future role of the Danish natural gas grid; and the introduction of huge amounts of fluctuating renewable energy in the electricity grid.

TRILEMMA BALANCE



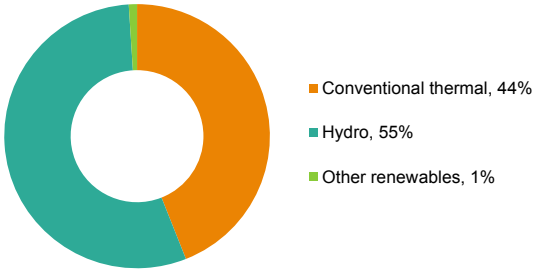
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	23	15	12	→	
Energy security	25	23	5	↑	**A**
Energy equity	62	52	62	→	**B**
Environmental sustainability	28	28	27	→	**B**
Contextual performance	78	101	98	↓	
Political strength	109	107	101	↑	
Societal strength	89	93	89	→	
Economic strength	30	81	85	↓	
Overall rank and balance score	**35**	**36**	**33**	→	**ABB**

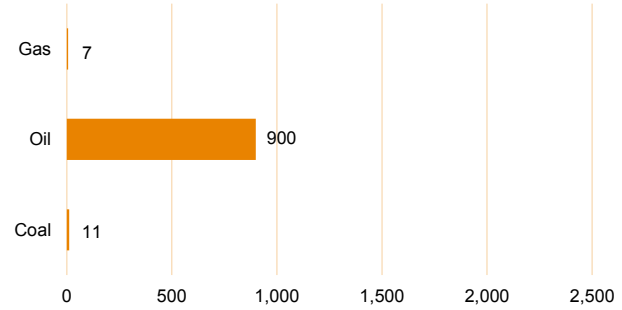
INDEX COMMENTARY

Ecuador improves its overall Index ranking by three positions in 2015, with strong environmental sustainability performance and an improvement in energy security partially offset by a decline in energy equity. Considering the highly diversified electricity generation portfolio and a low dependence on fuel exports, energy security is the country's strongest dimension. This year's improvement is mainly driven by an update in the data point underlying the indicator for energy consumption in relation to GDP growth. However, the quality of the transmission and distribution network sees continued high losses. Similar to its 'Hydro-powered' peer countries, Ecuador lags behind on energy equity, but performs strong on environmental sustainability. The energy equity dimension sees a slight decline in 2015 as prices for gasoline slightly increase. Contextual performance is weak, especially political indicators. Societal performance improves, whilst economic performance remains low.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



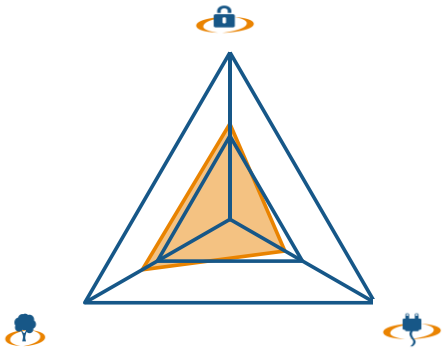
KEY METRICS

Industrial sector (% of GDP)	34.4	GDP per capita (PPP, USD); GDP Group	10,864 (III)
TPEP/TPEC (net energy exporter)	1.90	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.24	CO_2 emissions (tCO_2) per capita	2.15
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	97

TRENDS AND OUTLOOK

- The Ecuadorian government has been pushing several initiatives to create a more sustainable energy sector. The Ecuadorian National Strategic Planning (National Plan for Good Living), sets the following goals: increase of the share of renewable energy in the electricity generation mix; reduce oil-derived imports; change the current profile of oil exports to higher value-added products; increase of effectiveness and efficiency of the transportation sector; reduce losses of generation and distribution; and an overall increase in energy efficiency.
- For this purpose, the government is currently developing several projects, which include: 1) the construction of eight high-capacity hydroelectric power plants; 2) the promotion of installing non-conventional renewable power plants; 3) the change from gas-based cooking to efficient induction-based cooker appliances; and 4) the construction of a big oil refinery.
- The ambitious policies developed by the government will ensure the sustainability of the Ecuadorian energy sector by promoting improvement on each of the three energy trilemma dimensions.

TRILEMMA BALANCE



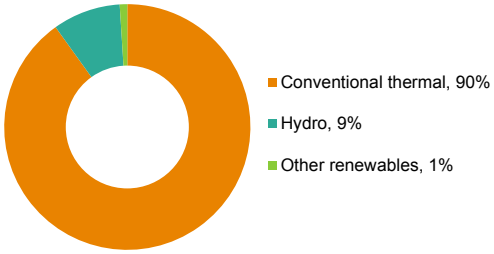
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	63	68	64	→	
Energy security	47	58	56	→	**B**
Energy equity	59	54	81	↓	**C**
Environmental sustainability	84	89	52	↑	**B**
Contextual performance	102	122	123	↓	
Political strength	107	112	115	↓	
Societal strength	90	92	96	→	
Economic strength	98	125	126	↓	
Overall rank and balance score	**76**	**85**	**85**	→	**BBC**

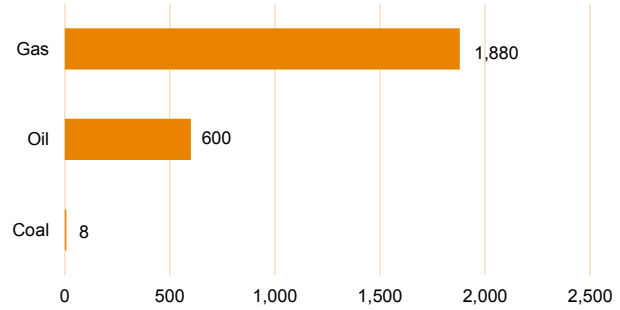
INDEX COMMENTARY

Egypt maintains rank 85 in this year's Index. Energy security is stable, while energy equity drops due to a decrease in the perceived quality of electricity supply and less affordable gasoline. Environmental sustainability performance improves due to up-to-date data points underlying the indicators for emission and energy intensity. Contextual indicators remain weak and slip even further, reflecting the country's more recent political events.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



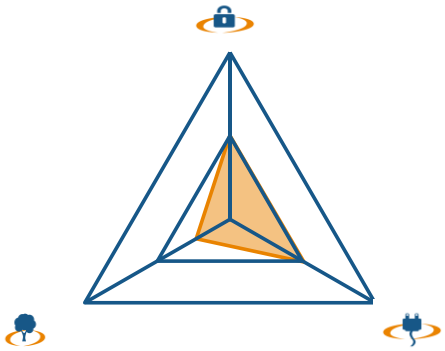
KEY METRICS

Industrial sector (% of GDP)	38.9	GDP per capita (PPP, USD); GDP Group	10,742 (III)
TPEP/TPEC (net energy exporter)	1.09	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.25	CO_2 emissions (tCO_2) per capita	2.36
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- As the most populous country in North Africa, Egypt is keen to improve its energy sustainability. Therefore, energy has become one of the most important topics in recent years. Due to the political transition the country is going through, challenges related to energy security need to be overcome. These challenges include an insufficient electricity capacity to meet the demand and no reserve capacities, low energy efficiency especially in the industrial sector, or the slow progress new and renewable energy projects make due to the incremental cost gap between fossil fuel and renewable technologies.
- Policymakers are addressing the following energy developments: 1) expansion of new power capacities at the least cost location; 2) diversification of power generation by expanding wind farms, and introducing solar PV and solar thermal generation to benefit from one of the best solar belt locations in the world; 3) improvement of the energy tariff structure to encourage energy saving measures; 4) encouragement of the private sector to invest in the development of energy infrastructure including renewable energy projects using build, own, operate (BOO) schemes; and 5) extension of the regional interconnection power grid capacity between Egypt and Arab, African and European countries.

TRILEMMA BALANCE



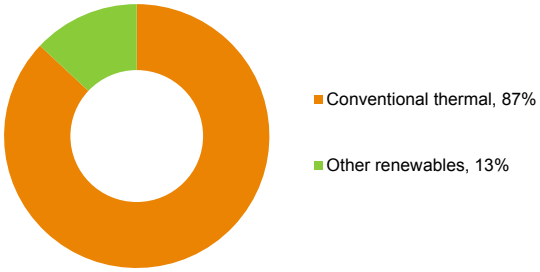
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	82	93	85	→	
Energy security	65	71	66	→	**C**
Energy equity	51	68	64	↓	**B**
Environmental sustainability	117	115	100	↑	**D**
Contextual performance	25	21	21	→	
Political strength	26	30	27	→	
Societal strength	30	30	27	→	
Economic strength	35	22	25	→	
Overall rank and balance score	**68**	**75**	**59**	→	**BCD**

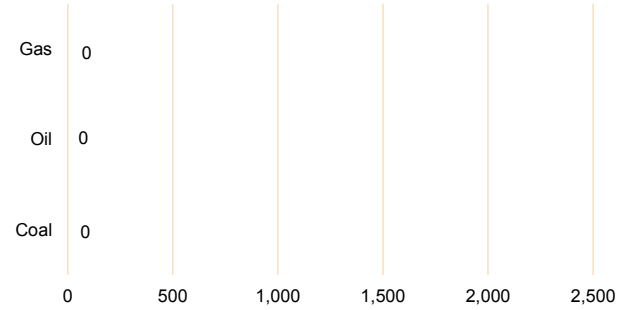
INDEX COMMENTARY

Estonia moves up by 16 places in this year's Index, driven by improvements across all three energy dimensions. Overall, Estonia continues to struggle with balancing the energy trilemma, as the country's poor performance on environmental sustainability lags far behind its energy security and energy equity rankings. Efforts to diversify the electricity generation portfolio further pay off as the energy security performance improves. The country's energy equity indicators do not display significant changes, while environmental sustainability performance slowly improves due to decreasing emission intensity. Estonia's contextual performance remains solid.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



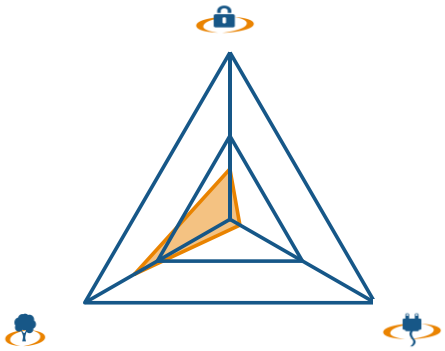
KEY METRICS

Industrial sector (% of GDP)	29.2	GDP per capita (PPP, USD); GDP Group	26,052 (II)
TPEP/TPEC (net energy importer)	0.12	Energy intensity (koe per USD)	0.23
Emission intensity (kCO_2 per USD)	0.19	CO_2 emissions (tCO_2) per capita	3.63
Energy affordability (USD per kWh, 2014)	0.17	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Estonia has over the last couple of years successfully worked on improving its security of energy supply by diversifying its energy imports, increasing the domestic electricity production capacity to exceed domestic demand and the share of domestically-produced liquid fuels, and thereby increasing its export capability. Estonia still struggles with environmental sustainability, mainly due to CO_2 emissions from electricity production. However, the future looks promising, as there is a strong drive to switch from using oil shale in electricity generation to instead use the oil shale to produce oil and a by-product gas. This gas, similar to natural gas, will then be used to generate electricity. This will significantly reduce CO_2 emission from power generation.
- Recently, Estonia has had several excellent developments: the share of renewable electricity in total electricity consumption in 2013 increased to 12.6%; new shale oil production units are being built, leading to less dependence on imports of petroleum products; and liberalised electricity markets delivered lower prices for all market participants.
- The key trends, which are expected to support Estonia's moving up in the Index rankings, are: 1) the continued increase of the share of renewable energy in the electricity generation mix; 2) the building of new interconnection power grid capacity with neighbouring countries; and 3) the ability to satisfy most of its need for diesel fuel from refining shale oil. However, Estonian policymakers also need to continue their focus on the other two aspects of the energy trilemma, environmental sustainability and energy equity, while keeping energy security levels high.

TRILEMMA BALANCE



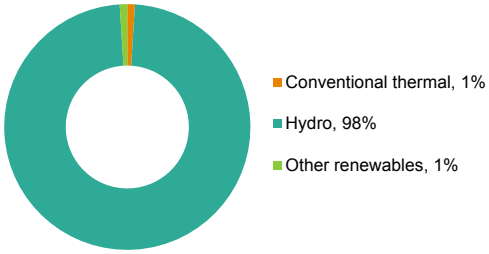
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		99	104	96	→	
	Energy security	97	99	91	→	**C**
	Energy equity	119	119	121	→	**D**
	Environmental sustainability	47	47	45	→	**B**
Contextual performance		122	123	117	→	
	Political strength	113	114	116	→	
	Societal strength	116	108	106	↑	
	Economic strength	124	112	103	→	
Overall rank and balance score		**112**	**115**	**105**	→	**BCD**

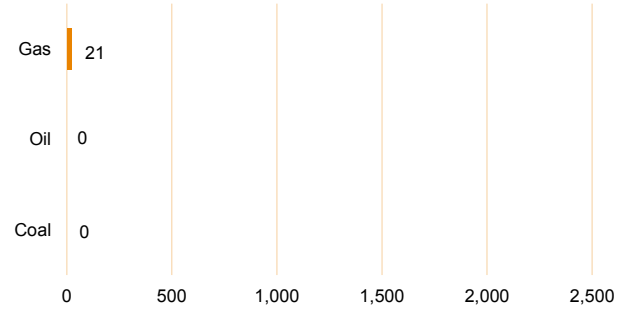
INDEX COMMENTARY

Ethiopia moves up ten places in this year's Index. As one of the 'Hydro-powered' countries, Ethiopia exhibits many of the same challenges in balancing the energy trilemma that are faced by the countries in that group. A strong environmental sustainability performance is unfortunately overshadowed by poorer performances on the energy security and equity dimensions. Ethiopia's energy security improves due to a reduced dependency on fuel imports. However, the country continues to struggle with increasing transmission and distribution losses and a homogenous electricity mix because that is almost solely reliant on hydropower. Energy equity performance is poor as only 27% of the population has access to electricity and the perceived quality of electricity supply remains very low. Environmental sustainability, Ethiopia's strongest dimension, sees further reductions in energy intensity. Contextual performance across the board is weak, with further marginal improvements in social and economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



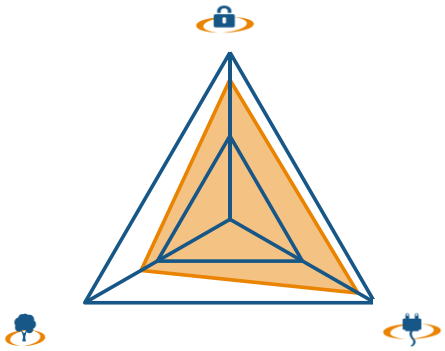
KEY METRICS

Industrial sector (% of GDP)	10.4	GDP per capita (PPP, USD); GDP Group	1,453 (IV)
TPEP/TPEC (net energy importer)	0.35	Energy intensity (koe per USD)	0.45
Emission intensity (kCO_2 per USD)	0.08	CO_2 emissions (tCO_2) per capita	0.09
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	27

TRENDS AND OUTLOOK

- Ethiopia has undergone substantial changes over the last 18 years. GDP has been growing by about 11% for the last eight consecutive years and population growth continued at an average rate of 2.5% annually, both contributing to the substantial level of energy demand created over the corresponding period. The Government Growth and Transformation Plan aims at becoming a middle income country by 2025. The Climate-Resilient Green Economy (CRGE) strategy focuses on enhancing development with minimum carbon emission. The vision for the Ethiopian energy sector is to ensure access to affordable, clean and modern energy for all citizens by 2025 and to become a renewable energy hub in the Eastern Africa Region.
- With regard to energy supply, electricity generation capacity has more than doubled while far more generation capacity is within reach. To meet the demand, petroleum fuel imports have increased over the past decade. Also, the demand for biomass energy has increased exerting pressure on existing forest and woodlands. Projections indicate that unless action is taken to change the traditional development path annual petroleum and fuel wood consumption will rise significantly.
- Policymakers need to address: 1) high levels of energy poverty; 2) low private sector participation and competition; 3) the lack of human and institutional capacity; 4) high dependence on and unsustainable use of biomass; 5) high dependence on imported petroleum fuels; 6) wasteful and inefficient energy production, transportation, and use; and 7) development of renewable energy technologies, energy conservation and sustainable forest and woodland management practices.

TRILEMMA BALANCE



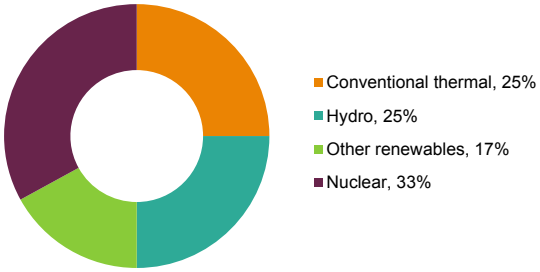
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	17	10	11	→	
Energy security	37	26	23	→	**A**
Energy equity	21	16	16	→	**A**
Environmental sustainability	45	37	51	↓	**B**
Contextual performance	6	7	11	→	
Political strength	2	2	2	→	
Societal strength	1	3	3	→	
Economic strength	34	20	27	→	
Overall rank and balance score	**13**	**8**	**9**	→	**AAB**

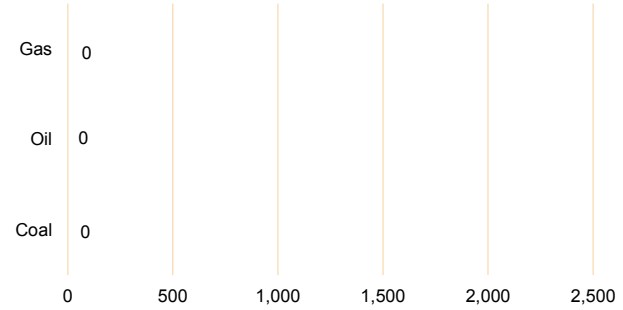
INDEX COMMENTARY

Finland's overall Index ranking remains mostly unchanged. Finland continues to balance the three sides of the energy trilemma well with a slight deterioration in environmental sustainability performance. The rise in energy security is mostly driven by an increase in oil and oil product stocks. Energy equity performance continues to be strong as gasoline and electricity prices are stable and the perceived quality of the electricity supply improves. Environmental sustainability continues to be Finland's weakest energy dimension. Performance on contextual indicators remains excellent, although economic strength stays lower than societal and political strength due to the relatively high cost of living.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



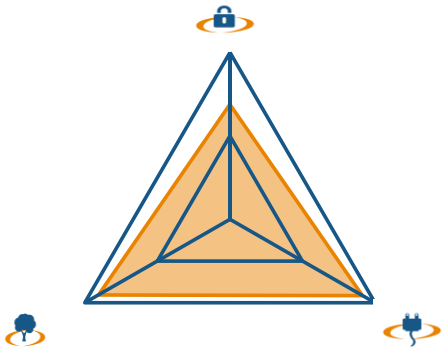
KEY METRICS

Industrial sector (% of GDP)	27.0	GDP per capita (PPP, USD); GDP Group	40,011 (I)
TPEP/TPEC (net energy importer)	0.37	Energy intensity (koe per USD)	0.19
Emission intensity (kCO_2 per USD)	0.29	CO_2 emissions (tCO_2) per capita	9.03
Energy affordability (USD per kWh, 2014)	0.20	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Even though Finland's electricity fuel mix still shows a large share of conventional thermal power generation, it has to be noted that three-quarters of that figure is combined heat and power production. This should not be viewed as conventional because it reaches efficiency ratios up to two times compared to conventional thermal generation.
- Recent energy policy developments in Finland include: 1) streamlining the approval of wind farms; 2) tax hikes on fossil fuels in heat generation that will mainly affect light fuel oil in domestic heating and other fossil fuels in district heating and industrial cogeneration, and which will increase costs but also 'clean' the fuel mix; and 3) nuclear, biomass and waste (CHP), and wind power are high on the agenda, and their share in the electricity generation mix is expected to grow significantly.

TRILEMMA BALANCE



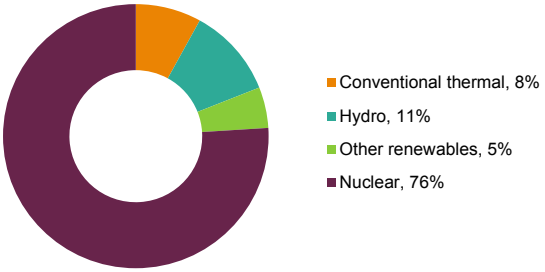
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	6	6	7	→	
Energy security	44	41	41	→	**B**
Energy equity	5	11	13	→	**A**
Environmental sustainability	9	10	13	→	**A**
Contextual performance	28	23	23	→	
Political strength	27	30	30	→	
Societal strength	19	20	20	→	
Economic strength	52	38	40	→	
Overall rank and balance score	**10**	**9**	**8**	→	**AAB**

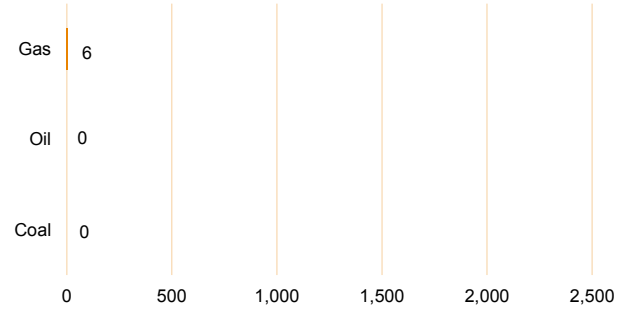
INDEX COMMENTARY

France's overall Index ranking remains mostly unchanged. The three sides of the energy trilemma are relatively well-balanced, although energy security lags slightly behind. Overall energy security performance continues to be stable. Energy equity as well as environmental sustainability performance is unchanged and excellent – not unexpected as France uses fossil fuels to generate less than 10% of its electricity. Contextual performance is good and stable.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



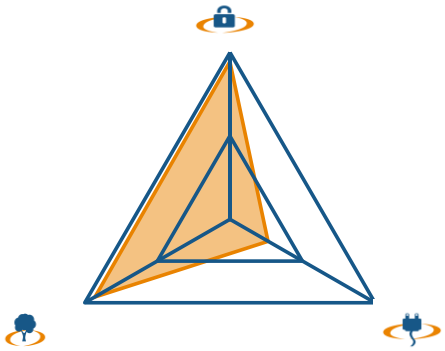
KEY METRICS

Industrial sector (% of GDP)	19.4	GDP per capita (PPP, USD); GDP Group	39,818 (I)
TPEP/TPEC (net energy importer)	0.48	Energy intensity (koe per USD)	0.13
Emission intensity (kCO_2 per USD)	0.17	CO_2 emissions (tCO_2) per capita	5.02
Energy affordability (USD per kWh, 2014)	0.21	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- France has very little domestic oil and natural gas production and relies heavily on imports. To reduce import dependency, France has pursued a vigorous policy of nuclear power development since the mid-1970s and now has by far the largest nuclear generating capacity of any country in Europe, and is second only to the United States in the world. Nuclear power constitutes about 79% of total electricity generation.
- Recent energy policies include measures and targets to improve energy efficiency, boost renewable power and tackle climate change. The government recently passed a new energy transition law with the aim to cut France's reliance on nuclear energy in favour of renewables. The legislation includes the commitment to increase the target price of carbon to €56 per ton in 2020 and €100 per ton in 2030.The government has also revised social tariffs for electricity and gas to counteract the increase in energy prices.
- Key challenges for France come with the implementation phase of its policies and efforts must go towards meeting the targets set. The coexistence of regulated tariffs and market prices for electricity could also cause friction for producers.

TRILEMMA BALANCE



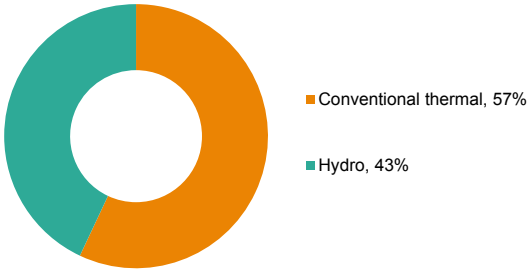
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	33	28	18	→	
Energy security	35	33	8	↑	**A**
Energy equity	92	89	96	→	**C**
Environmental sustainability	12	12	10	→	**A**
Contextual performance	116	96	101	↑	
Political strength	92	90	88	→	
Societal strength	95	79	86	↑	
Economic strength	127	105	107	↑	
Overall rank and balance score	**56**	**49**	**42**	↑	**AAC**

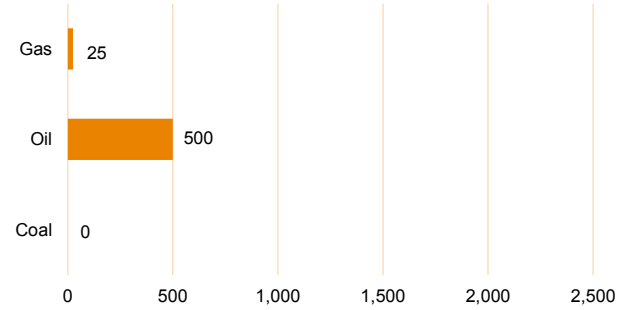
INDEX COMMENTARY

Gabon continues to improve and moves up seven places in this year's Index. The country struggles to balance the energy trilemma, as strong performances in energy security and environmental sustainability are outweighed by a poor energy equity ranking. Gabon's improvement in energy security is mainly driven by the use of up-to-date data points underlying the indicator for energy consumption in relation to GDP growth. Transmission and distribution losses are by far the weakest of all indicators used. Whilst environmental sustainability performance remains largely stable, energy equity sees a slight deterioration. Only 11% of the population is without access to electricity. As the country further develops economically and is able to provide all of its population with access to modern energy services it will be challenging for the country to meet the growing demand, sustain the current level of energy security and maintain the relatively low environmental impact. Contextual performance is still poor, with indicators of economic strength being weaker than those of political and societal strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

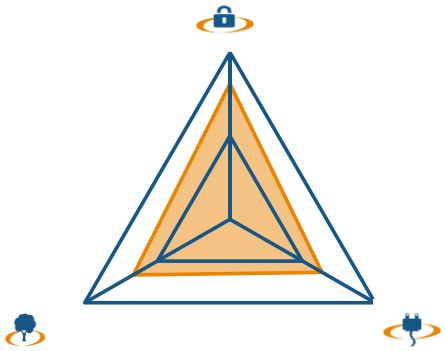


KEY METRICS

Industrial sector (% of GDP)	61.7	GDP per capita (PPP, USD); GDP Group	21,813 (II)
TPEP/TPEC (net energy exporter)	10.32	Energy intensity (koe per USD)	0.08
Emission intensity (kCO_2 per USD)	0.09	CO_2 emissions (tCO_2) per capita	1.52
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	89

TRENDS AND OUTLOOK

TRILEMMA BALANCE



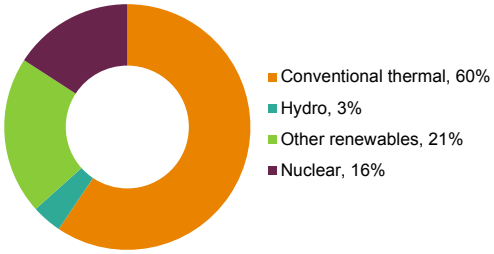
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	10	14	19	↓	
Energy security	31	27	25	→	**B**
Energy equity	11	42	46	↓	**B**
Environmental sustainability	30	27	44	↓	**B**
Contextual performance	13	12	13	→	
Political strength	16	16	15	→	
Societal strength	18	11	14	→	
Economic strength	24	14	16	→	
Overall rank and balance score	**11**	**11**	**13**	→	**BBB**

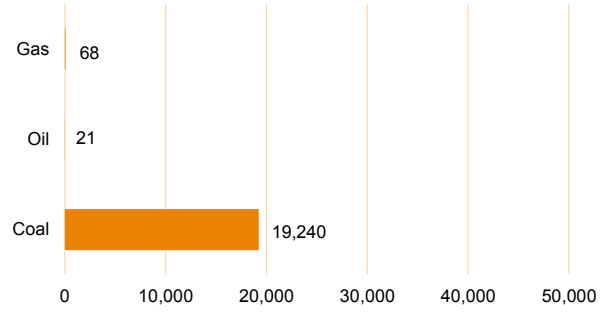
INDEX COMMENTARY

Germany drops two places in this year's Index but continues to balance the three facets of the energy trilemma very well. Given the sharp policy shift determined by the 'Energiewende', the country has been put on watch as a deterioration of energy security and energy equity is to be expected in the following years. Performance on energy security and energy equity remain stable. Environmental sustainability dropped from 2011 to 2013 as emissions and energy intensity increased in light of the shutdown of several nuclear power plants and the increased usage of lignite. However, for a country with a large industrial sector environmental sustainability performance is still very good. Germany's performance on contextual indicators continues to be very strong.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



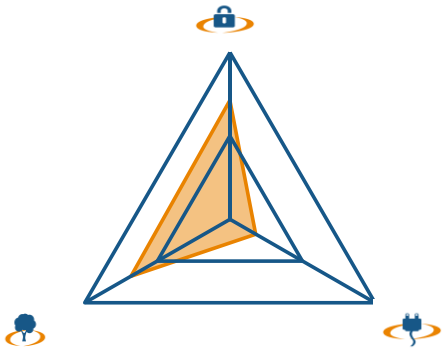
KEY METRICS

Industrial sector (% of GDP)	30.8	GDP per capita (PPP, USD); GDP Group	44,697 (I)
TPEP/TPEC (net energy importer)	0.35	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.27	CO_2 emissions (tCO_2) per capita	9.43
Energy affordability (USD per kWh, 2014)	0.39	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The most recent policy development in Germany, initiated before 2010, is the German Energy Transition. The goal of the policy is sustainability, focusing on a strong increase in power generation from renewable sources, a reduction of primary energy usage and CO_2 emissions. The 2011 decision to phase out nuclear by 2022 constitutes a challenge to Germany's energy mix. Eight out of 17 facilities were closed immediately, one was closed in 2015, and the remaining eight nuclear power plants will be phased out gradually over the next seven years. Due to low wholesale prices and regulatory uncertainty, investors are reluctant to invest in new conventional power plants, which will still be needed to secure energy demand.
- To achieve the increase in power generation from renewable sources, the Renewable Energy Law (EEG) guarantees a fixed price independent of demand and supply for renewable power plants. The law first came into effect in 2000 with revisions in 2006, 2008, 2012 and 2014. Even though there are visible successes as shown by the significantly increased share of renewable energy, the law is disabling market mechanisms allowing the sector to rely on subsidies rather than encouraging competition for innovative, efficient and inexpensive technologies.
- Subsidies for renewable energy and investments in grid infrastructure to integrate the increasing amounts of volatile renewable energy into the system have led and will continue to lead to higher electricity prices. Policymakers must set the right framework towards a free and efficient European electricity market to limit the burden.

TRILEMMA BALANCE



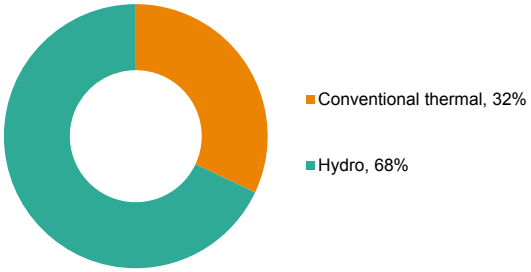
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		103	98	62	↑	
	Energy security	85	78	38	↑	**B**
	Energy equity	105	106	107	→	**D**
	Environmental sustainability	77	76	42	↑	**B**
Contextual performance		87	84	86	→	
	Political strength	62	62	63	→	
	Societal strength	75	78	80	→	
	Economic strength	120	114	111	→	
Overall rank and balance score		**102**	**96**	**70**	↑	**BBD**

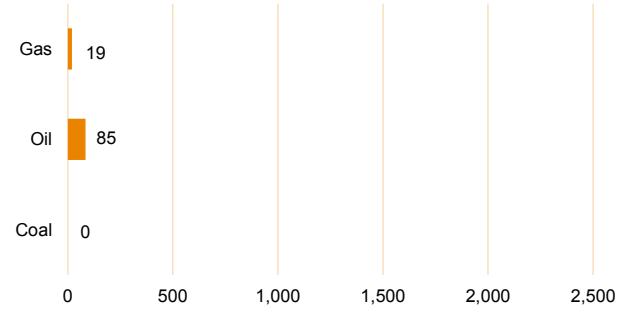
INDEX COMMENTARY

Ghana improves its overall Index ranking by 26 places. The three energy dimensions remain unbalanced, as energy equity ranking continues to fall behind performance on the other two dimensions. Energy security performance further improves this year, with increased strategic oil and oil product reserves and a more favourable production to consumption ratio. Transmission and distribution losses of electricity worsen. Further improvements in the energy security dimension are caused by the use of up-to-date data points underlying the indicator for energy consumption in relation to GDP growth. Providing its people with access to modern energy services continues to be a challenge for Ghana, which has a 64% electrification rate, an obstacle that must be overcome if the country seeks to further develop economically. Performance improvements for environmental sustainability dimension are driven by the use of up-to-date data points underlying the indicators for emissions and energy intensity. Contextual performance stays weak, with political and societal strength being more robust than economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



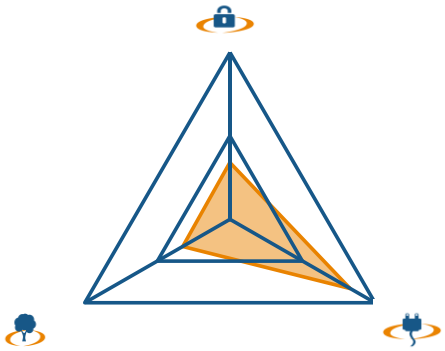
KEY METRICS

Industrial sector (% of GDP)	29.2	GDP per capita (PPP, USD); GDP Group	4,007 (IV)
TPEP/TPEC (net energy exporter)	1.16	Energy intensity (koe per USD)	0.12
Emission intensity (kCO_2 per USD)	0.16	CO_2 emissions (tCO_2) per capita	0.53
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	64

TRENDS AND OUTLOOK

- In order to improve energy security, energy equity and environmental sustainability Ghana needs to address a number of related challenges, such as: 1) the lack of credible, sustained and focused energy policy; 2) the inability to execute policies; 3) governmental interference; and 4) ineffective regulatory authorities.
- Recent policy developments include: the enactment of Electricity Regulations, 2008 (L.I 1937), which is intended to provide for the planning, expansion, safety criteria, reliability and cost-effectiveness of the Interconnected Transmission System, and to regulate the wholesale electricity market; the enactment of the Renewable Energy Act, 2011 (Act 832) to improve the development, management and utilisation of renewable energy sources for production of heat and power in an efficient and environmentally-sustainable manner; and the incorporation of Ghana Gas Company in July 2011 with the responsibility to build, own, and operate infrastructure required for gathering, processing, transporting and marketing of natural gas in Ghana.

TRILEMMA BALANCE



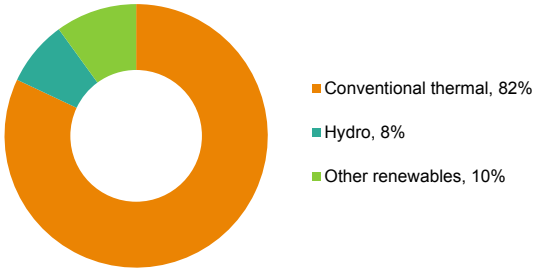
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		42	49	72	↓	
	Energy security	54	59	86	↓	C
	Energy equity	18	23	21	→	A
	Environmental sustainability	81	82	88	→	C
Contextual performance		48	62	63	↓	
	Political strength	51	55	51	→	
	Societal strength	37	41	41	→	
	Economic strength	64	100	99	↓	
Overall rank and balance score		**39**	**51**	**62**	↓	**ACC**

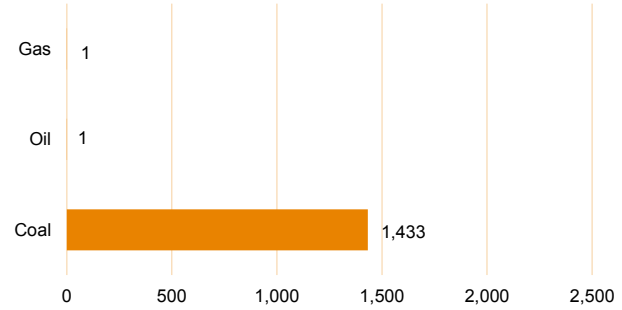
INDEX COMMENTARY

Greece drops 11 places in this year's Index, driven by a sharp decline in energy security. Greece continues to struggle balancing the three sides of the energy trilemma, with a very good energy equity ranking, and weaker energy security and environmental sustainability performances. Despite improving the diversity of its electricity generation mix, Greece's energy security drops due to a decrease in oil stocks and increased dependence on energy imports. Further deterioration in the energy security dimension is caused by the use of up-to-date data points underlying the indicator for energy consumption in relation to GDP growth. Energy equity is very high, with Greece continuing to offer its citizens affordable energy and electricity. High level of emissions intensity and CO_2 emissions from electricity generation keep Greece struggling with its environmental sustainability. Contextual performance remains stable, with very poor economic indicators. Greece's position may further worsen as the effects of the most recent political events reflect in the underlying data.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

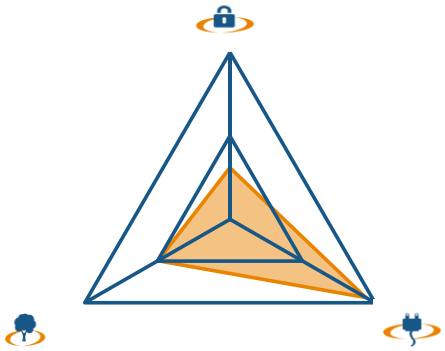


KEY METRICS

Industrial sector (% of GDP)	15.9	GDP per capita (PPP, USD); GDP Group	25,132 (II)
TPEP/TPEC (net energy importer)	0.31	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.30	CO_2 emissions (tCO_2) per capita	6.21
Energy affordability (USD per kWh, 2014)	0.18	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



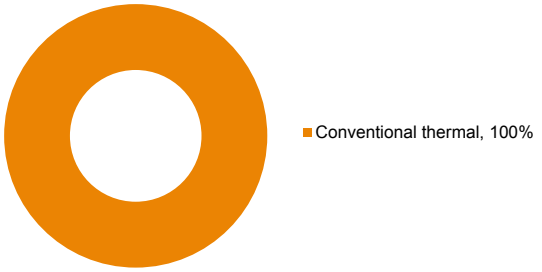
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	58	52	47	→	
Energy security	99	101	90	→	C
Energy equity	24	9	8	↑	A
Environmental sustainability	58	60	66	→	B
Contextual performance	18	6	6	↑	
Political strength	11	9	13	→	
Societal strength	50	12	12	↑	
Economic strength	15	2	2	→	
Overall rank and balance score	**40**	**27**	**27**	↑	**ABC**

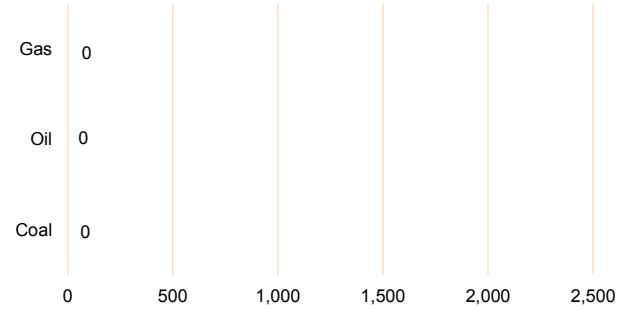
INDEX COMMENTARY

Hong Kong holds its position in the 2015 Index. While Hong Kong ranks very well on the energy equity dimension, it struggles to replicate this performance on the energy security and environmental sustainability dimensions. Hong Kong's low energy security ranking is driven primarily by a lack of domestic energy production and its essentially sole reliance on fossil fuels in power generation. Current improvements are caused by the use of up-to-date data point underlying the indicator for energy consumption growth in relation to GDP growth. Energy equity is high and stable. Environmentally, Hong Kong, like China, suffers from very high levels of air and water pollution. Contextual performance remains very strong.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



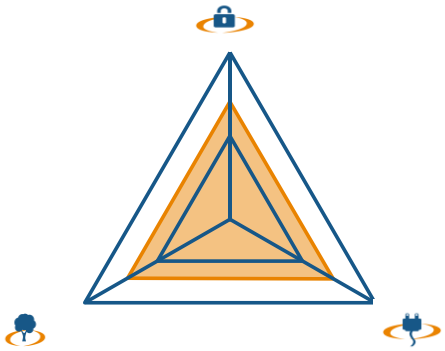
KEY METRICS

Industrial sector (% of GDP)	6.6	GDP per capita (PPP, USD); GDP Group	53,023 (I)
TPEP/TPEC (net energy importer)	0.00	Energy intensity (koe per USD)	0.05
Emission intensity (kCO_2 per USD)	0.14	CO_2 emissions (tCO_2) per capita	6.47
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- As Hong Kong, China, does not have much indigenous energy resources and 23% of the economy's electricity is imported, active steps have been taken to ensure a safe and stable energy supply at reasonable prices, while minimising the environmental impact. To secure clean and reliable electricity supply, Hong Kong signed a Memorandum of Understanding (MOU) on energy cooperation with mainland China in August 2008, which provided assurance to the continual supply of nuclear energy and enhanced supply of natural gas from mainland China to Hong Kong. The recent completion and commissioning of the Hong Kong Branch Line of the Second West-East Natural Gas Pipeline has helped ensure a stable and secure supply of natural gas from the mainland for power generation. The government has put in place a contingency plan for oil supply, that coordinates the allocation and consumption of essential oil products in the event of an oil supply disruption. A code of practice has also been put in place that requires major oil companies to maintain a minimum of 30 days' supply of gas oil and naphtha.
- To increase energy diversity natural gas has been introduced as feedstock for electricity generation since the 1990s. Moreover, with the introduction of LPG vehicles around 2000, LPG has been used as a fuel for more than 20,000 taxis and light buses. The increased use of natural gas and LPG reduce Hong Kong's dependence on conventional oil products.
- A wide range of measures to protect the environment and improve air quality have been implemented with positive results. The Clean Air Plan for Hong Kong, released in March 2013, outlines relevant policies, measures and plans to tackle the issue.

TRILEMMA BALANCE



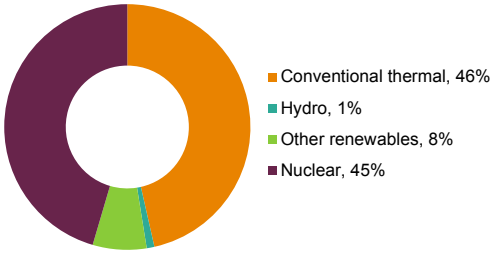
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	31	25	21	→	
Energy security	46	43	40	→	**B**
Energy equity	42	53	38	→	**B**
Environmental sustainability	44	35	39	→	**B**
Contextual performance	41	57	52	↓	
Political strength	32	38	39	↓	
Societal strength	43	42	43	→	
Economic strength	68	96	88	↓	
Overall rank and balance score	**31**	**33**	**26**	→	**BBB**

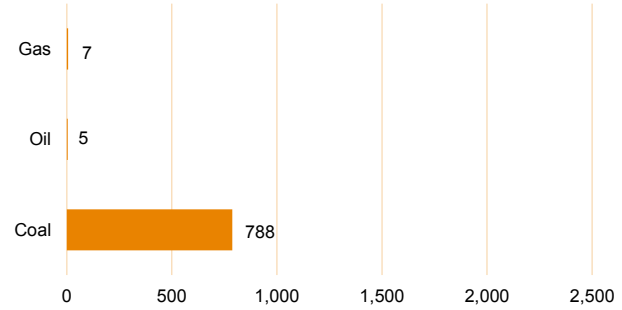
INDEX COMMENTARY

Hungary gains seven places this year to finish 26 in the 2015 Index. The three competing sides of the energy trilemma remain well-balanced, with mostly good scores on all dimensions. Energy security and environmental sustainability performance see little change this year. With regard to energy equity, the cost of energy for Hungarian citizens decreases slightly while the perceived quality of the electricity also improves, causing a rise in the ranks. Contextual performance remains mostly unchanged, except for an improvement of macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



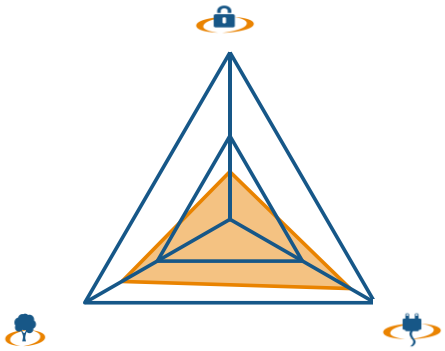
KEY METRICS

Industrial sector (% of GDP)	31.1	GDP per capita (PPP, USD); GDP Group	23,645 (II)
TPEP/TPEC (net energy importer)	0.41	Energy intensity (koe per USD)	0.13
Emission intensity (kCO_2 per USD)	0.23	CO_2 emissions (tCO_2) per capita	3.98
Energy affordability (USD per kWh, 2014)	0.16	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The Hungarian government has developed a National Energy Strategy to 2030 focusing on reducing the country's energy dependency by 1) improving energy-efficiency measures throughout the supply and consumption chain; 2), increasing the share of low-carbon electricity generation; and 3) increasing the share of low-carbon modes of transport.
- The 2006 gas crisis, the cancellation of the Nabucco and South Stream pipeline development and projections of increasing demand to 2020 have shifted the policy focus towards developing alternative resources to gas in the form of renewables, as well as further increasing nuclear capacity (a new nuclear reactor is being built in cooperation with Russia on the Paks Nuclear Power Plant's site).
- The government is keen to strengthen its involvement in the electricity, heat and gas supply markets via the establishment of state-owned companies. A recent manifestation of this intention is the new state-owned utility holding ENKSZ that will provide natural gas to the whole country.
- Key areas policymakers need to continue to focus on are: 1) energy efficiency, through renovation of existing building stock to reduce energy consumption for heating and cooling; 2) electricity market regulation, through inclusion of capacity payment mechanisms, to cover long-term marginal costs of power plants as [wholesale] electricity prices decrease.

TRILEMMA BALANCE



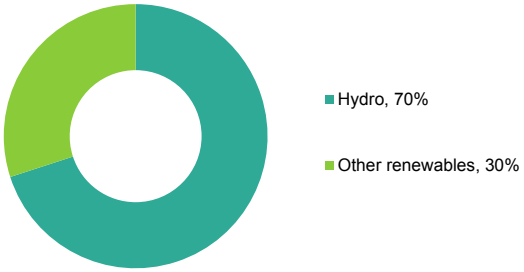
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	40	39	35	→	
Energy security	96	94	93	→	**C**
Energy equity	15	18	22	→	**A**
Environmental sustainability	41	36	34	→	**B**
Contextual performance	26	35	30	→	
Political strength	15	15	14	→	
Societal strength	7	8	8	→	
Economic strength	70	99	91	↓	
Overall rank and balance score	**33**	**31**	**35**	→	**ABC**

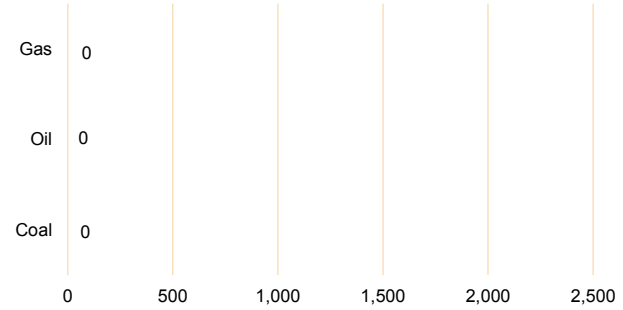
INDEX COMMENTARY

Overall, Iceland has maintained a stable position in the Index through the years. Iceland, which performs well on the energy equity and environmental sustainability dimensions, struggles with providing energy security. The country's energy consumption growth rate, in particular, has historically been quite high, although the country has made some successful efforts to slow this growth recently. Furthermore, Iceland is heavily reliant on hydropower and has no strategic oil stocks, two things that also contribute to its low energy security rank. Iceland's energy equity is among the best in the world, as it provides its citizens with affordable, high-quality access to energy. Environmental sustainability performance is also fairly good, especially as Iceland's electricity fuel mix is virtually emission-free. The big flaw here is the country's high level of energy intensity. Contextual performance remains mostly stable across the board, although macroeconomic stability continues to be very low (but further improving) in the wake of the recent collapse of the country's banks.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

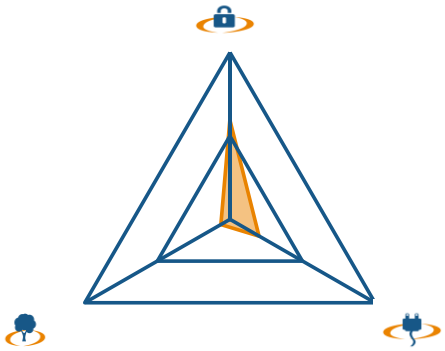


KEY METRICS

Industrial sector (% of GDP)	22.4	GDP per capita (PPP, USD); GDP Group	42,767 (I)
TPEP/TPEC (net energy importer)	0.80	Energy intensity (koe per USD)	0.60
Emission intensity (kCO_2 per USD)	0.16	CO_2 emissions (tCO_2) per capita	5.55
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



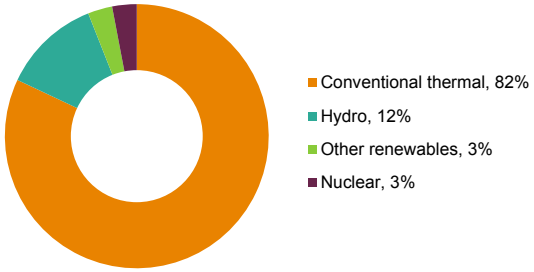
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	124	122	109	↑	
Energy security	76	76	53	↑	**B**
Energy equity	110	105	104	→	**D**
Environmental sustainability	121	123	122	→	**D**
Contextual performance	76	90	90	↓	
Political strength	93	103	104	↓	
Societal strength	80	84	87	→	
Economic strength	54	77	69	→	
Overall rank and balance score	**115**	**122**	**107**	→	**BDD**

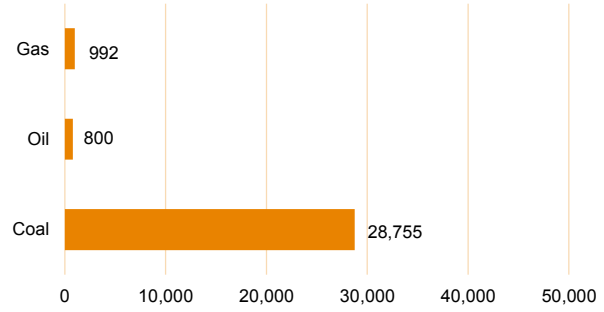
INDEX COMMENTARY

India gains 15 places in the overall Index rankings. India has a stronger energy security performance, followed by a weaker energy equity result and a very poor performance on the environmental sustainability dimension. Energy security improves, driven by updated data points, underlying the indicator for energy consumption in relation to GDP growth. Energy infrastructure becomes more stable as transmission and distribution losses are reduced. Energy equity performance is still low with only 79% of the population having access to electricity. The emerging economy faces environmental challenges such as high CO_2 emissions from electricity generation. Contextual performance is fairly stable, with economic strength India's best contextual dimension, slowly improving.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



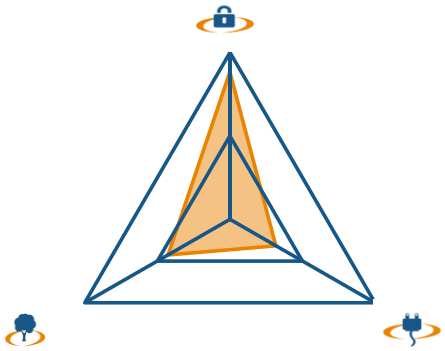
KEY METRICS

Industrial sector (% of GDP)	24.2	GDP per capita (PPP, USD); GDP Group	5,456 (IV)
TPEP/TPEC (net energy importer)	0.67	Energy intensity (koe per USD)	0.14
Emission intensity (kCO_2 per USD)	0.34	CO_2 emissions (tCO_2) per capita	1.62
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	79

TRENDS AND OUTLOOK

- India faces challenges on all three dimensions of the energy trilemma. The National Action Plan for Climate Change (NAPCC) provides a road map for sustainable development). The National Institution for Transforming India, which has taken over from the Planning Commission, has the mandate to design strategic and long-term policy frameworks and is working on a new Integrated Energy Policy (IEP) to develop a new road map for developing energy security to support equitable growth.
- Recent policy developments include: 1) a target 175 GW of renewable power generation by 2022, of which 100 GW is through solar; 2) carbon taxation through coal cess; 3) the Deendayal Upadhyaya Gram Jyoti Yojana (DDGJY) scheme overseeing rural electrification (village electrification has reached 97%); 4) the deregulation of petroleum products, and introduction of targeted subsidies through Direct Benefit Transfer (DBT) for LPG; 5) the allocation of coal block through auctions; and 6) the completion of the first cycle of a Perform, Achieve and Trade (PAT) scheme to facilitate industrial investment in energy efficiency through trading of energy savings certificates, covering 90% of total industrial sector energy consumption.
- The challenges policymakers need to focus on are: 1) reviving the distribution sector financially and operationally; 2) developing an easier exploration policy for the allocation of hydrocarbon blocks; 3) expanding modern energy access; and 4) integrating large renewable capacity, both planned and under development.

TRILEMMA BALANCE



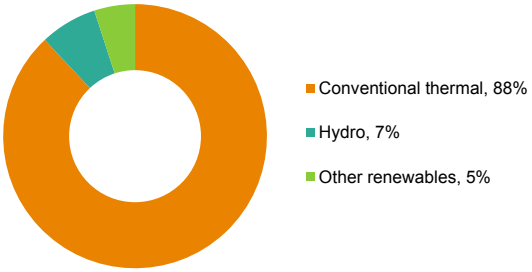
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	68	61	58	→	
Energy security	17	17	17	→	**A**
Energy equity	83	64	89	↓	**C**
Environmental sustainability	104	106	75	↑	**C**
Contextual performance	72	81	82	↓	
Political strength	95	88	86	↑	
Societal strength	82	87	84	→	
Economic strength	42	76	77	↓	
Overall rank and balance score	**73**	**69**	**65**	→	**ACC**

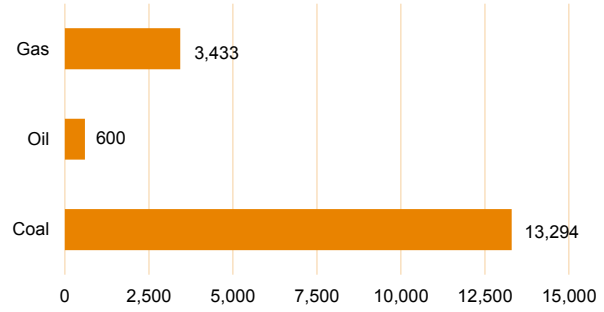
INDEX COMMENTARY

Indonesia moves up four places in this year's Index. However, Indonesia faces the same challenges in balancing the competing sides of the energy trilemma as its peers in the 'Highly-industrialised' group of countries do, with the very strong energy security ranking offset by weaker energy equity and environmental sustainability performance. Energy security is robust, with a very favourable total energy production to consumption ratio, and a slowing energy consumption growth rate. Energy equity faces a drop this year as prices for gasoline increase. Performance on the environmental sustainability dimension also lags quite a bit, with slowly improving energy intensity offset by high CO_2 emissions from electricity generation. Contextually, indicators remain mostly stable, with slight improvements across the board for political strength and societal strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



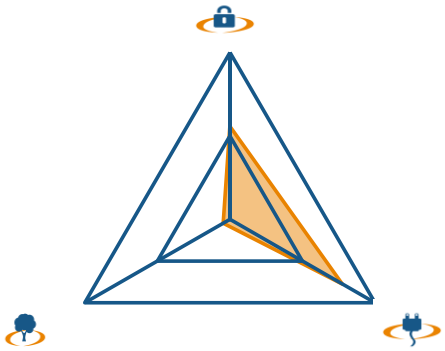
KEY METRICS

Industrial sector (% of GDP)	45.5	GDP per capita (PPP, USD); GDP Group	10,129 (III)
TPEP/TPEC (net energy exporter)	2.24	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.23	CO_2 emissions (tCO_2) per capita	1.89
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	96

TRENDS AND OUTLOOK

- Fossil fuels remain the main energy source. Levels of development and deployment of efficient and low-carbon and carbon-free energy technologies are slower than expected to fulfil sustained energy demand growth, which remains positive under significant energy subsidies to support social and economic development.
- Recent energy policy developments include the energy policy targets of the Presidential Decree No. 5, 2006 on National Energy Policy and its Blueprint of National Energy Management 2005-2025. The policy targets are: reducing energy elasticity to less than one, aligned with the target of economic growth; enhancing the national energy mix with oil below 20%, natural gas more than 30%, coal to more than 33%, and the remaining 17% from new and renewable energy. The Ministerial Decree on feed-in tariffs for renewable energy gives more opportunity for development of small renewable energy with private participations. This will give remote islands the opportunity to accelerate access to electricity. The government is also preparing to issue a new national energy policy as the implementation of Energy Law No. 30, 2007.
- Key issues policymakers need to continue to focus on include: 1) removing energy subsidies; 2) intensifying the efforts to increase the use of new and renewable energy through research and development, pilot projects, providing incentives, capacity building; 3) embed low-carbon and carbon-free technologies in the long-term energy plan; 4) increase energy efficiency on supply and demand sides; and 5) attract more investments to the energy sector.

TRILEMMA BALANCE



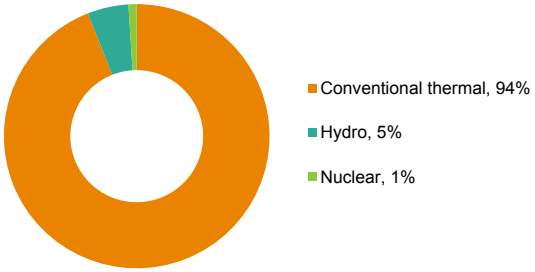
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		87	75	76	↑	
	Energy security	75	66	58	→	**B**
	Energy equity	44	24	28	↑	**B**
	Environmental sustainability	119	120	124	→	**D**
Contextual performance		95	124	122	↓	
	Political strength	115	115	118	→	
	Societal strength	81	96	93	↓	
	Economic strength	89	126	123	↓	
Overall rank and balance score		**91**	**89**	**91**	→	**BBD**

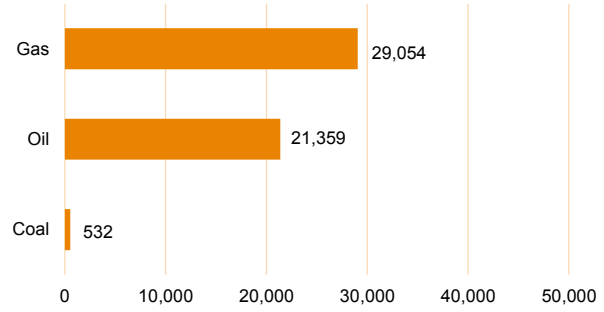
INDEX COMMENTARY

Iran's overall Index ranking remains mostly unchanged. Iran's balancing of the various dimensions of the energy trilemma is rather lopsided, with a respectable energy equity ranking and slightly lagging performance in energy security being counterbalanced by the country's lack of mitigation of its environmental impact. High distribution losses of electricity (an amount equal to 15% of total electricity generated), and low, but improving diversity of the electricity generation portfolio result in a lower energy security rank than might be expected from an OPEC country. Energy equity is Iran's strongest energy dimension, slightly deteriorating as gasoline becomes less affordable and the perceived quality of electricity supply worsens. Performance on the environmental sustainability dimension is a serious challenge for Iran, with high energy and emission intensity, levels of pollution, and amounts of CO_2 emitted from electricity generation. Contextually, indicators of political and societal strength are stable but low.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



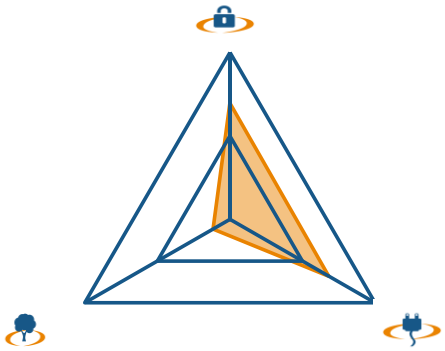
KEY METRICS

Industrial sector (% of GDP)	40.7	GDP per capita (PPP, USD); GDP Group	16,591 (II)
TPEP/TPEC (net energy exporter)	1.53	Energy intensity (koe per USD)	0.22
Emission intensity (kCO_2 per USD)	0.52	CO_2 emissions (tCO_2) per capita	6.95
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Home of the world's fourth largest proved crude oil reserves and second largest natural gas reserves, Iran's energy sector has been crippled by international sanctions since 2011, resulting in limited foreign investment, a near 1.0 million b/d drop in crude oil, a decreasing rate of gas production growth and a 47% drop in oil and natural gas export revenue in the first year after the sanctions were enforced. Structural issues such as subsidies on both natural gas and refined petroleum products have led to the inefficient and wasteful use of energy. Finally, Iran's rapidly growing own energy consumption (about 6 percent per year for the past 30 years) has raised concerns about the country's ability to continue to export oil in the next decade.
- After 20 months of negotiations, Iran has agreed a long-term nuclear deal to limit its sensitive nuclear activities in return for the lifting of sanctions. Once the agreement is finalised, Iran will be able to revive its oil and gas sectors. A new oil contract model to attract foreign investors by allowing international oil companies to participate in all phases of an upstream project, including production, is being drafted. Lifting of sanctions should also allow for technology (such as enhanced oil recovery techniques) and expertise to flow in order to expand capacity at oil and natural gas fields and reverse declines in mature ones.
- In light of declining oil prices, policymakers also have the opportunity to revisit subsidy schemes which weigh heavily on government budgets.

TRILEMMA BALANCE



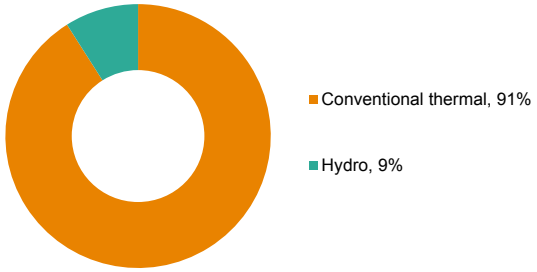
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		-	-	70	-	
	Energy security	-	-	39	-	**B**
	Energy equity	-	-	42	-	**B**
	Environmental sustainability	-	-	115	-	**D**
Contextual performance		-	-	129	-	
	Political strength	-	-	127	-	
	Societal strength	-	-	126	-	
	Economic strength	-	-	130	-	
Overall rank and balance score		**-**	**-**	**93**	-	**BBD**

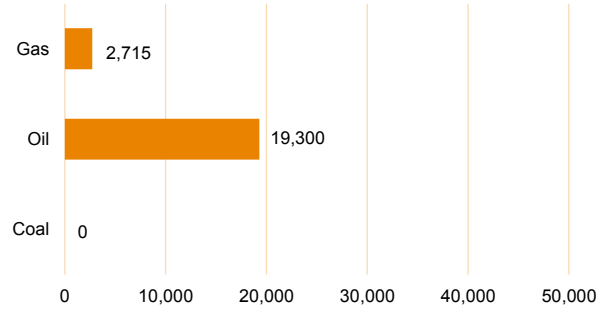
INDEX COMMENTARY

As sufficient data points become available to measure Iraq's energy and contextual performance, Iraq for the first time enters the Energy Trilemma Index. Ranked 93, Iraq, a typical 'Fossil-fuelled' country, performs well on energy security and energy equity, but struggles to mitigate its environmental impact. Energy security is driven by a favourable consumption to production ratio, a relatively low consumption growth rate in relation to GDP growth, and adequate oil and oil product stocks. Both electricity and gasoline are accessible and affordable to Iraq's population. Iraq's environmental footprint is very high with over 90% of electricity being generated from fossil fuels, resulting in high levels of CO_2 emissions. Air and water pollution levels are also particularly high. Contextually all indicators are very weak as the country is still struggling to recover from the recent war.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



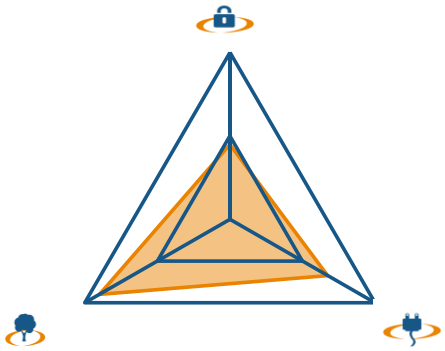
KEY METRICS

Industrial sector (% of GDP)	64.5	GDP per capita (PPP, USD); GDP Group	15,178 (II)
TPEP/TPEC (net energy exporter)	3.50	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.29	CO_2 emissions (tCO_2) per capita	3.85
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The Iraqi energy sector is wholly owned and operated by the national government. The sector is entirely dependent on oil and gas for electricity generation, transportation and distribution, and faces the dual challenge of having to meet rising internal energy demand while reducing carbon emissions. In addition, the sector is put under strain by the threat of a destructive and highly expensive war against terrorists, a low oil selling price, and hence limited government revenues, and serious disputes with the Kurdistan Regional Government (KRG) that leaves total oil production and export not clearly defined.
- Iraq is tackling the above challenges through diversification of the economy and better exploitation of gas and gas-linked industry. In addition, a portion of oil revenues is planned to be invested in the non-energy sectors such as agriculture, trade and transport.
- The improvement of energy efficiency is also indicated as a priority in the recently adopted energy and renewable energy strategy. The national target is for renewable energy to reach a 5% share of total electricity production by 2030.
- In order to achieve the targets set, policymakers should focus on creating an enabling legislative environment, with governance reforms in the energy sector, as well as encouraging private sector participation (both local and foreign) in all energy subsectors by giving adequate incentives for investments.

TRILEMMA BALANCE



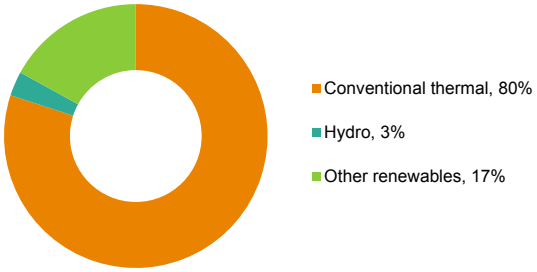
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	25	21	25	→	
Energy security	82	69	72	→	**C**
Energy equity	30	39	43	↓	**B**
Environmental sustainability	15	13	14	→	**A**
Contextual performance	18	25	26	→	
Political strength	14	14	19	→	
Societal strength	11	18	19	↓	
Economic strength	51	61	58	→	
Overall rank and balance score	**20**	**22**	**22**	→	**ABC**

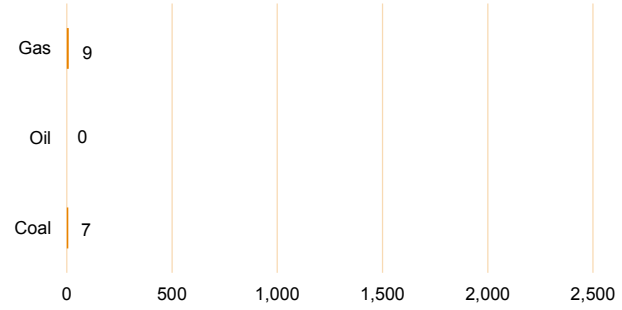
INDEX COMMENTARY

Overall, Ireland maintains a stable position in the Trilemma Index through the years. While Ireland performs quite well on indicators of environmental sustainability and energy equity, it struggles to replicate this success on the energy security dimension. Energy security slightly deteriorates due to an increased dependence on fuel imports. Ireland continues to struggle with low rates of energy production. Household expenditure on electricity gradually increases, but energy equity performance remains good. Despite its heavy reliance on burning fossil fuels to generate electricity (and the attendant CO_2 emissions), Ireland does very well on the environmental sustainability dimension, due to an extremely high air and water quality and a low energy intensity. Contextually, Ireland continues to do well on almost all indicators, with the notable exception of macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

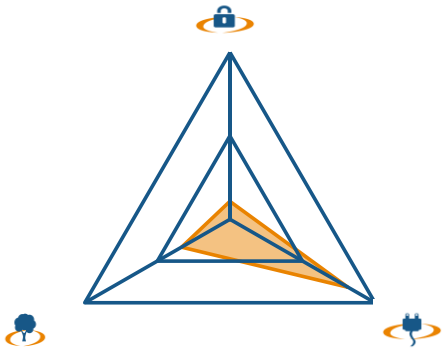


KEY METRICS

Industrial sector (% of GDP)	27.0	GDP per capita (PPP, USD); GDP Group	46,441 (I)
TPEP/TPEC (net energy importer)	0.12	Energy intensity (koe per USD)	0.08
Emission intensity (kCO_2 per USD)	0.21	CO_2 emissions (tCO_2) per capita	7.55
Energy affordability (USD per kWh, 2014)	0.31	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



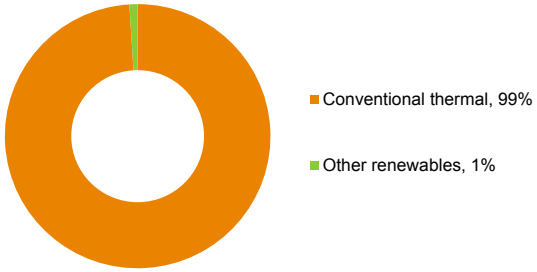
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	73	80	84	→	
Energy security	102	104	116	→	**D**
Energy equity	29	27	25	→	**B**
Environmental sustainability	83	88	87	→	**C**
Contextual performance	45	41	34	↑	
Political strength	50	49	49	→	
Societal strength	31	26	29	→	
Economic strength	66	60	41	↑	
Overall rank and balance score	**67**	**66**	**69**	→	**BCD**

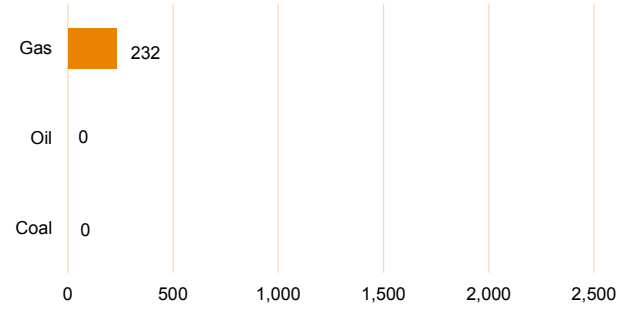
INDEX COMMENTARY

Israel slips three places in the overall Index ranking. The three sides of Israel's energy trilemma are unbalanced, with weaker energy security and environmental sustainability performance, and a high degree of energy equity. Energy security continues to be Israel's weakest dimension due to the small country's heavy reliance on energy imports, low oil and oil product stocks, and a homogenous electricity fuel mix that uses mostly conventional thermal energy. Environmental sustainability performance remains fairly stable, with decreasing energy and emission intensity. Contextually, Israel has a high degree of societal strength, decent political and economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



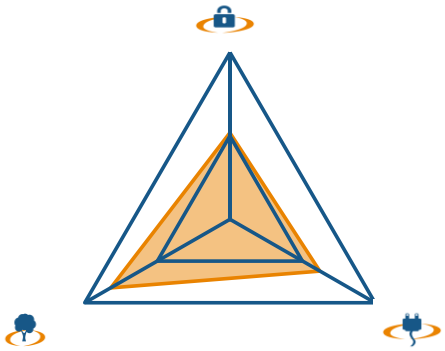
KEY METRICS

Industrial sector (% of GDP)	25.7	GDP per capita (PPP, USD); GDP Group	31,965 (II)
TPEP/TPEC (net energy importer)	0.15	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.29	CO_2 emissions (tCO_2) per capita	8.13
Energy affordability (USD per kWh, 2014)	0.15	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The discovery of offshore natural gas reserves and underground oil shale and the subsequent beginning of exploration will change the country's energy landscape, as Israel relies heavily on fossil fuel imports to meet its growing energy needs. As a country that has been largely dependent on imports to meet its needs, these reserves are critical to the country's energy security.
- Recent policy developments include: the National Energy Efficiency Programme; and a target for renewable electricity generations set at 10% by 2020 to help counteract increasing energy demand and reduce GHG emissions.
- The greatest challenges for policymakers are to: 1) ensure that production of new resources is carried out efficiently; 2) set a binding target for reducing GHG emissions; and 3) closely monitor the implementation of the energy efficiency programme.

TRILEMMA BALANCE



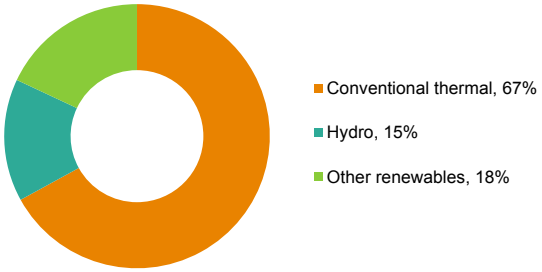
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	25	34	27	→	
Energy security	69	70	63	→	**C**
Energy equity	34	48	50	↓	**B**
Environmental sustainability	24	21	23	→	**A**
Contextual performance	39	36	38	→	
Political strength	43	42	41	→	
Societal strength	32	38	38	→	
Economic strength	59	44	51	→	
Overall rank and balance score	**28**	**29**	**31**	→	**ABC**

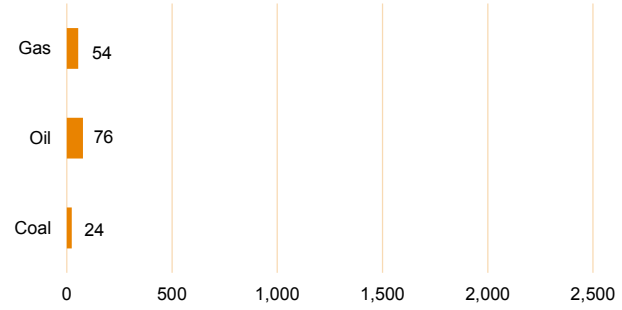
INDEX COMMENTARY

Overall, Italy maintains a stable position in the Trilemma Index through the years, but the three sides of the energy trilemma are not balanced. Hampered by an unfavourable total energy production to consumption ratio, Italy is increasing both its energy production and the diversity of its electricity fuel mix to improve its long-term energy security. Energy equity remains mostly stable as Italy continues to provide its citizens with relatively affordable, high-quality energy. Environmental sustainability performance remains relatively stable, with slight declines in CO_2 emissions from electricity generation and improved emissions intensity. Contextual performance is also largely unchanged, with macroeconomic stability being by far the worst indicator.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



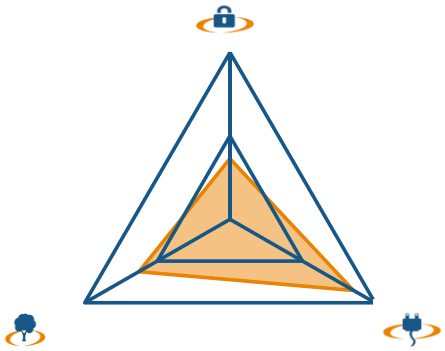
KEY METRICS

Industrial sector (% of GDP)	23.9	GDP per capita (PPP, USD); GDP Group	35,284 (I)
TPEP/TPEC (net energy importer)	0.19	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.22	CO_2 emissions (tCO_2) per capita	5.75
Energy affordability (USD per kWh, 2014)	0.31	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Italy has reached important mitigation policy objectives by transforming its thermoelectric fleet into one of the most efficient in Europe and by changing the energy mix for power generation from oil to cleaner natural gas and renewable energy. Furthermore, several measures were adopted for improving energy efficiency in the residential, commercial and transport sectors. These policies have led to impressive achievements in the reduction of GHG emissions and water pollution between 2005 and 2013.
- Recent policy developments include: a review of the incentive scheme for PV installations, extending the timeframe during which the incentive will be provided; asking producers of renewable energy (RE) to contribute to balancing and transmission/distribution costs (RE associated with on-site consumption is partially exempted); the introduction of the Conto Energia, a mechanism supporting cooling/thermal efficiency and the production of thermal energy from RE in buildings and businesses; and the development of the PAEE National Action Plan on Energy Efficiency that sets efficiency goals to 2020 and policies for achieving them. These measures are expected to have a positive impact on both energy affordability and environmental sustainability by lowering the burden of incentives on energy bills, increasing the share of RE in thermal uses and improving efficiency.
- Finally, the increasing interconnection of the Italian natural gas market with EU markets is expected to lower natural gas prices in the wholesale market, and hence for households and industry. The new government is also working on the legal framework for offshore upstream activities to encourage the domestic production of oil and natural gas.

TRILEMMA BALANCE



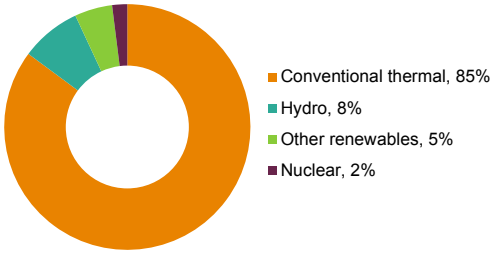
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		14	22	38	↓	
	Energy security	48	62	83	↓	**C**
	Energy equity	17	20	19	→	**A**
	Environmental sustainability	33	41	49	↓	**B**
Contextual performance		32	28	24	→	
	Political strength	22	19	16	↑	
	Societal strength	12	15	11	→	
	Economic strength	71	71	64	→	
Overall rank and balance score		**16**	**23**	**32**	↓	**ABC**

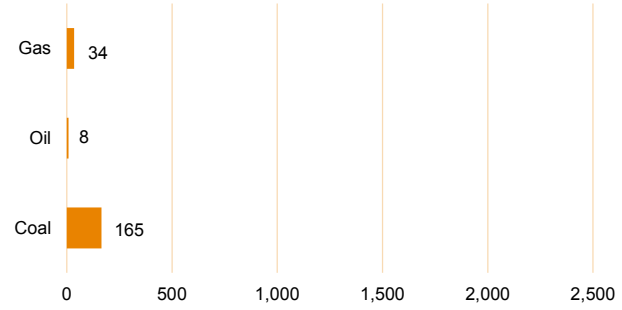
INDEX COMMENTARY

Japan's overall Index ranking slips a further nine places this year, a reflection of weaker energy performance. Japan, a resource-poor country, continues to struggle with unfavourable total energy production to consumption and therefore import to export ratios. The electricity fuel mix becomes notably less diverse, as many of the country's nuclear reactors remain closed after the 2011 Fukushima accident and the future of nuclear power in Japan continues to be uncertain. Japan's rank on the energy equity dimension is stable. An again improving quality of the electricity supply and lower gasoline prices are offset by increasing electricity prices. Environmental sustainability performance continuous to drop given the increased amount of fossil fuels burned for power generation. Contextually, indicators of political and societal strength repeat their outstanding performance for yet another year, with economic indicators improving across the board.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



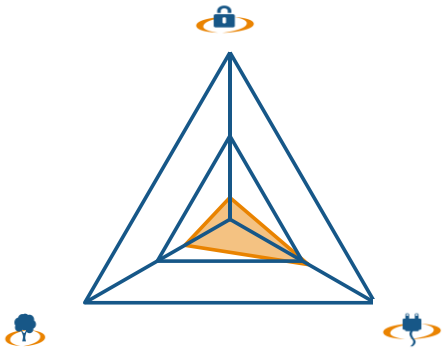
KEY METRICS

Industrial sector (% of GDP)	25.7	GDP per capita (PPP, USD); GDP Group	36,793 (I)
TPEP/TPEC (net energy importer)	0.15	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.29	CO_2 emissions (tCO_2) per capita	9.16
Energy affordability (USD per kWh, 2014)	0.25	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Most recent energy policy developments include the implementation of a feed-in tariff (FIT) system in July 2012, which led to the rapid penetration of renewables, in particular of mega-solar PV. As a result, in some areas the total capacity of renewables connected to the grid has become larger than the minimum demand during daytime, making it difficult to balance supply and demand for electricity. In addition, the FIT system is viewed with some criticism as purchasing prices are set high based on the estimated cost of individual renewable energies to guarantee investors' profit. In this context, the government has started to examine the amendment of the FIT system, such as imposing a ceiling on the total annual purchasing cost for solar PV.
- In July 2015 the government finalised the 2030 energy mix (renewables: 22-24%; nuclear: 22-20%; LNG: 27%; coal: 26%, oil: 3%) and submitted its 2030 GHG reduction target of 26% compared to 2013 levels to the UNFCCC. The 2014 Basic Energy Plan repositioned nuclear as an important base-load and in July 2013 the newly established independent Nuclear Regulation Authority (NRA) started to accept applications from nuclear power operators to undergo safety examinations based on new standards, which added severe accident management and measures against risks such as terrorism attacks or volcano eruption. In September 2014, the NRA announced that the first two PWR nuclear units passed the safety examinations. One of these two plants restarted its operation in mid-August 2015. However, it remains uncertain when and how many units will follow, and whether to extend the lifetime of aged plants from 40 years to 60 years.

TRILEMMA BALANCE



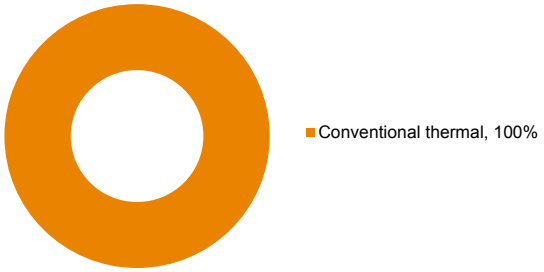
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	113	114	99	↑	
Energy security	119	112	113	→	**D**
Energy equity	63	61	60	→	**B**
Environmental sustainability	107	114	90	↑	**C**
Contextual performance	49	75	79	↓	
Political strength	67	69	76	↓	
Societal strength	49	53	51	→	
Economic strength	38	118	119	↓	
Overall rank and balance score	**96**	**108**	**97**	→	**BCD**

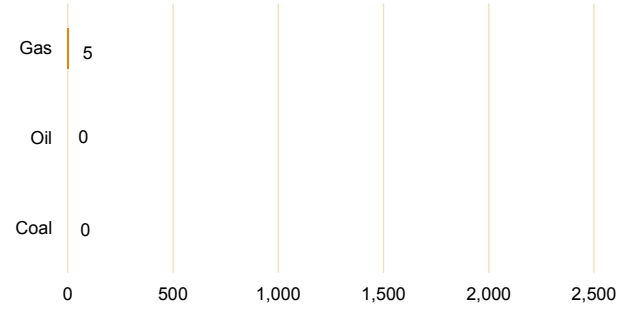
INDEX COMMENTARY

Jordan gains 11 places in this year's Index. One of the 'Back of the pack' countries, Jordan has its weaker performances on the energy security and environmental sustainability dimensions balanced out by a decent energy equity ranking. The country's low energy security, the weakest of the three dimensions, is driven by a combination of its unfavourable total energy production to consumption and import to export ratios, its homogenous fossil-fuelled electricity fuel mix, and the high proportion of electricity lost in transmission and distribution. Energy equity is Jordan's strongest energy dimension, with relatively affordable, mostly high-quality energy supply. Environmental sustainability performance improves as energy and emission intensity gradually decreases. Contextually, indicators of political strength are worsening across the board as societal ones improve or remain flat. Economic strength stays low driven by comparatively high living costs and low macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

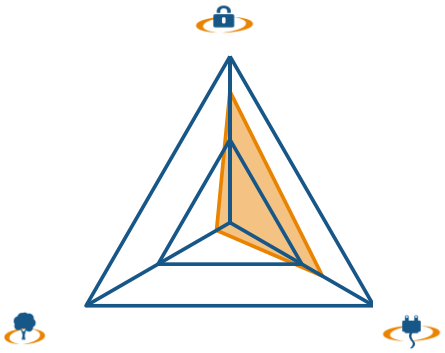


KEY METRICS

Industrial sector (% of GDP)	29.3	GDP per capita (PPP, USD); GDP Group	11,656 (III)
TPEP/TPEC (net energy importer)	0.04	Energy intensity (koe per USD)	0.12
Emission intensity (kCO_2 per USD)	0.34	CO_2 emissions (tCO_2) per capita	3.41
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



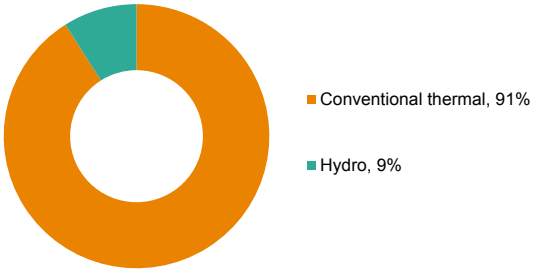
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	43	38	69	↓	
Energy security	6	13	28	↓	**A**
Energy equity	35	17	48	↓	**B**
Environmental sustainability	116	118	118	→	**D**
Contextual performance	90	93	102	→	
Political strength	83	91	94	↓	
Societal strength	102	89	91	↑	
Economic strength	79	88	97	→	
Overall rank and balance score	**58**	**56**	**77**	↓	**ABD**

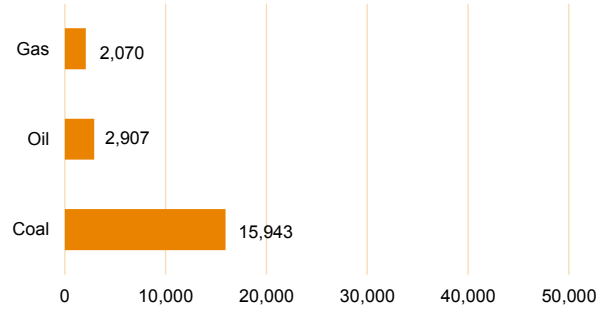
INDEX COMMENTARY

Overall, Kazakhstan loses 21 positions in this year's Index. Kazakhstan, a 'Fossil-fuelled' country, has relatively strong energy security and energy equity rankings, and performs rather poorly on environmental sustainability. The country's robust energy security performance drops slightly with the key driver being an update of the data points underlying the indicator for energy consumption in relation to GDP growth. Attention must still be paid to further diversifying the electricity generation portfolio away from fossil fuels to include renewable energy sources and potentially more hydropower, and decreasing transmission and distribution losses. Energy equity also drops due to changes in the availability of the underlying data. Environmental sustainability still lags behind with emissions and energy intensity levels decreasing very slowly only. Contextual indicators of political, societal, and economic strength weaken across the board and remain on the lower end of the spectrum – with the notable exception of the country's robust macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



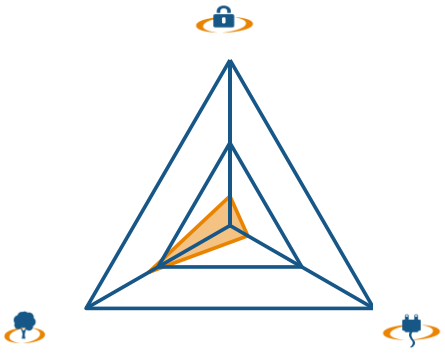
KEY METRICS

Industrial sector (% of GDP)	29.5	GDP per capita (PPP, USD); GDP Group	23,038 (II)
TPEP/TPEC (net energy exporter)	2.20	Energy intensity (koe per USD)	0.23
Emission intensity (kCO_2 per USD)	0.68	CO_2 emissions (tCO_2) per capita	13.52
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The government together with business, the energy industry and industrial associations, has developed and implemented a clear energy strategy and well-defined energy policy to support the development of a sustainable energy system.
- Recent policy developments in Kazakhstan include: strengthening state institutions responsible for energy efficiency in production, extraction and consumption of energy; clear and comprehensive energy saving programmes to reduce energy intensity of industry (reduce 10% by 2015 and 25% by 2020 compared to 2008); the adoption of policies to support the development and inclusion of available renewable energy sources (RES) into the energy mix (electricity generated from RES should reach 1 billion kWh per year by 2014, almost three times the 2009 level); and plans and programmes to facilitate the modernisation of existing power generation, power grids and oil refining installations. Together, these changes are expected to improve the country's environmental sustainability noticeably. Moreover, the diversification of the generation portfolio is envisaged by the concept of Kazakhstan's Transition to a Green Economy approved by the Order of the President of Kazakhstan in 2013.
- Policymakers will continue existing successful practices to maintain a favourable investment climate, which allows improvements to the country's trilemma balance, and attracts investment into the exploration and production of energy resources for export to world markets. There is a need to further develop power generating facilities by introducing cutting-edge technologies that will not only ensure domestic supply, but also enable the country to offer significant amounts of electricity to markets in neighbouring countries.

TRILEMMA BALANCE



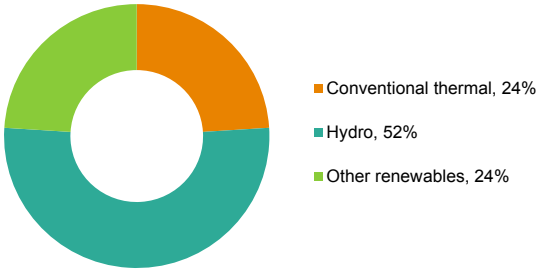
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	100	101	107	→	
Energy security	88	84	107	↓	D
Energy equity	114	114	114	→	D
Environmental sustainability	63	63	57	→	B
Contextual performance	118	112	109	↑	
Political strength	102	104	106	→	
Societal strength	122	114	111	↑	
Economic strength	99	82	81	→	
Overall rank and balance score	**108**	**104**	**111**	→	**BDD**

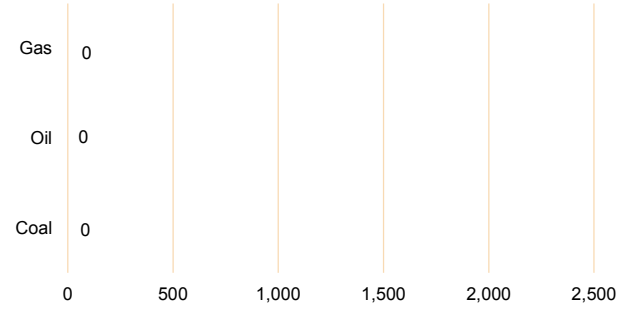
INDEX COMMENTARY

Kenya decreases seven places in the 2015 Index. Kenya struggles with balancing the energy trilemma, as energy security and energy equity lag behind its performance on the environmental sustainability dimensions. With Kenya producing less than a quarter of the total energy it consumes, overall energy security remains low. This year's deterioration is mainly driven by an update in the data points underlying the indicator for energy consumption in relation to GDP growth. Energy equity is Kenya's weakest energy dimension, with high gasoline prices and only 23% of its citizens having access to rather expensive electricity services. Environmental sustainability is Kenya's strongest dimension with emissions and energy intensity further decreasing. However, the country will face the challenge of keeping these emissions low (fossil fuels currently make up less than a third of Kenya's electricity fuel mix) as it works to strengthen its economy and increase energy equity. Contextual performance continues to be low with no noticeable changes.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



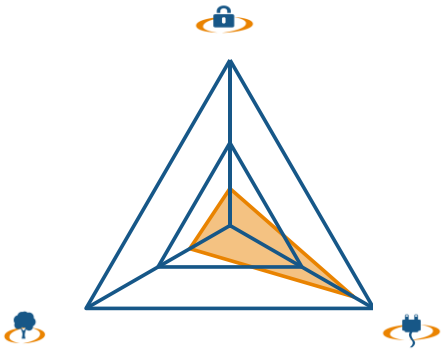
KEY METRICS

Industrial sector (% of GDP)	17.7	GDP per capita (PPP, USD); GDP Group	2,966 (IV)
TPEP/TPEC (net energy importer)	0.21	Energy intensity (koe per USD)	0.25
Emission intensity (kCO_2 per USD)	0.12	CO_2 emissions (tCO_2) per capita	0.24
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	23

TRENDS AND OUTLOOK

- Kenya's energy sector faces a number of challenges: meet growing demand, inadequate power supply capacity, a low connectivity rate, a weak transmission and distribution network, and lack of investments from the private sector. The country's high dependence on hydropower also exposes the energy sector to emerging risks, such as extreme weather events.
- Recent developments to boost electricity generation include the commissioning of: 1) the Olkaria IV power plant, the world's largest single turbine geothermal power plant, which will add 140 MW to the grid, 2) the largest wind energy project in the region to deliver 15% of supply, 3) 1 GW of world-class solar projects to be built by SkyPower over the next five years.
- In its long-term development strategy 'Vision 2030' energy was identified as one of the critical foundations and enablers of the socio-economic transformation envisioned for the country. A 2015 Energy Bill has been drafted to consolidate all laws relating to energy. A new Petroleum Bill 2015 has also been published including mid-stream and downstream operations, whereas upstream petroleum has been removed, in line with the devolution embodied in the new constitution (different bills to deal with different sectors). The National Energy and Petroleum Policy 2015 is set to support the administration of all the proposed laws. Finally, the Petroleum Exploration, Development and Production Local Content Regulations 2014 Act has been implemented, ensuring any contractor or other entity carrying out upstream petroleum operations embeds local content.

TRILEMMA BALANCE



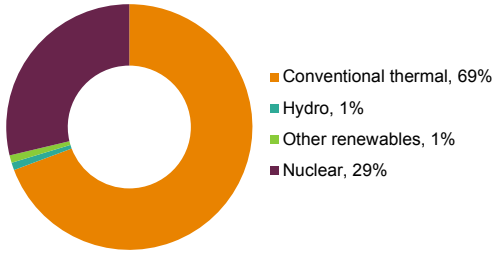
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		85	70	78	↑	
	Energy security	103	98	101	→	**D**
	Energy equity	49	25	20	↑	**A**
	Environmental sustainability	85	85	94	→	**C**
Contextual performance		16	22	22	→	
	Political strength	37	40	40	→	
	Societal strength	26	31	32	→	
	Economic strength	9	13	14	→	
Overall rank and balance score		**64**	**55**	**54**	→	**ACD**

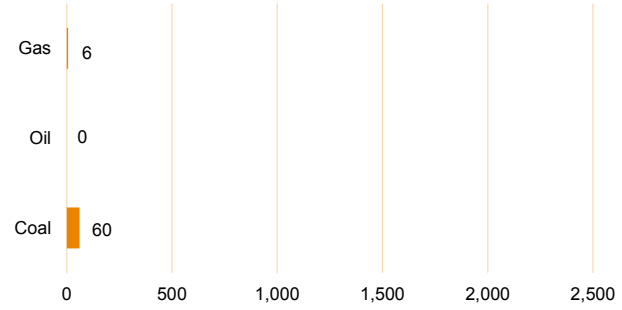
INDEX COMMENTARY

Korea moves up one place in the 2015 Trilemma Index, mostly due to improvements in energy equity. Korea has a low level of energy security and struggles with mitigating its environmental impact, but performs rather well on the energy equity dimension. Korea continues to be heavily reliant on fuel imports with an unfavourable energy import to export ratio. Indicators for energy equity display no notable changes. While there is no improvement or worsening for indicators underlying environmental sustainability, the movement in ranking is caused by peer countries improving faster. Contextual performance is good and stable across the board, with a particularly strong performance in economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



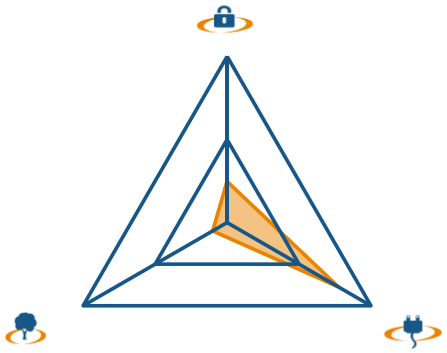
KEY METRICS

Industrial sector (% of GDP)	38.7	GDP per capita (PPP, USD); GDP Group	33,791 (I)
TPEP/TPEC (net energy importer)	0.14	Energy intensity (koe per USD)	0.18
Emission intensity (kCO_2 per USD)	0.39	CO_2 emissions (tCO_2) per capita	12.23
Energy affordability (USD per kWh, 2014)	0.11	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Energy security remains a major challenge with a very low stability of resource supplies and an energy import dependency of around 97%. As a counter measure Korea (Republic) has invested in overseas resource development, but this brings new challenges such as low production capacity, lack of human resources, technical skills and so on. There are environmental sustainability calls for action given high energy intensity levels, growing energy consumption and increasing GHG emissions.
- Recent policy measures to enhance energy security include: expanding cooperation with resource-rich countries; strengthening the competitiveness of energy developing companies; and establishing the Overseas Resource Development Fund to fund energy development projects in addition to giving government loans and guarantees. Environmental sustainability policy measures include: the expansion of renewable energy with targets until 2030; the shift from government-financed feed-in tariffs to a renewable portfolio standard in 2012 to create new demand for renewable energy; and the strong support of RD&D. Nuclear energy plays an essential role in the country's energy system in terms of energy security, economics, climate change and load demand.
- Policymakers need to continue focusing on: 1) the enhancement of overseas energy development; 2) the development of renewable energy; and 3) the expansion of the nuclear power sector considering safety issues, waste disposal, and increasing public acceptance by providing objective information and being transparent.

TRILEMMA BALANCE



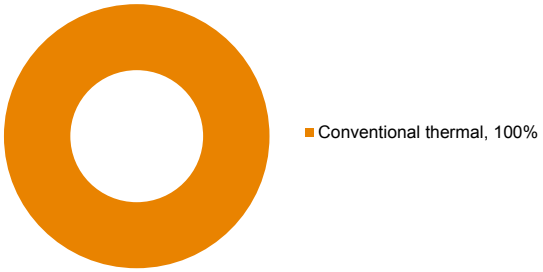
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	80	81	90	→	
Energy security	73	79	98	↓	C
Energy equity	28	26	27	→	B
Environmental sustainability	122	121	117	→	D
Contextual performance	36	51	50	↓	
Political strength	60	64	61	→	
Societal strength	53	54	57	→	
Economic strength	4	54	46	↓	
Overall rank and balance score	**66**	**76**	**82**	↓	**BCD**

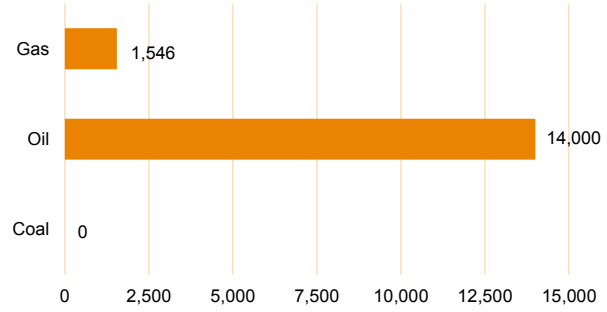
INDEX COMMENTARY

Kuwait drops six places in the overall Index ranking. A member of the 'Fossil-fuelled' grouping, Kuwait has a very low score on the environmental sustainability dimension. Kuwait's energy security ranking is lower than expected for an OPEC country, as the energy consumption growth rate outpaces economic growth and its electricity fuel mix remains homogenous and entirely reliant on burning fossil fuels. Losses in transmission and distribution also slightly worsen this year, while the perceived quality of electricity supply improves. Both gasoline and electricity are affordable to Kuwaitis, making energy equity Kuwait's strongest energy dimension by far. The country's environmental sustainability ranking is still among the worst in the world, with high levels of energy and emission intensity and large amounts of CO_2 emissions resulting from electricity generation, although all indicators see some improvements this year. Contextually, political and societal strength remain mostly stable, with an improvement in economic performance as more domestic credit becomes available to the private sector.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

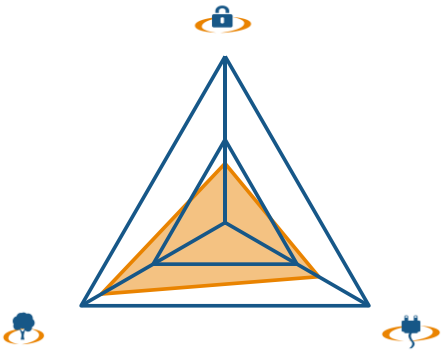


KEY METRICS

Industrial sector (% of GDP)	49.4	GDP per capita (PPP, USD); GDP Group	71,029 (I)
TPEP/TPEC (net energy exporter)	3.92	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.38	CO_2 emissions (tCO_2) per capita	27.49
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	98

TRENDS AND OUTLOOK

TRILEMMA BALANCE



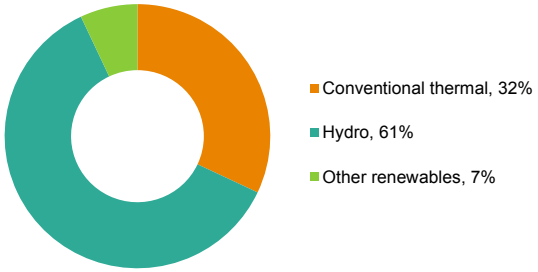
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		51	51	34	→	
	Energy security	98	96	84	→	**C**
	Energy equity	54	59	45	↑	**B**
	Environmental sustainability	14	14	19	→	**A**
Contextual performance		43	40	39	→	
	Political strength	41	39	36	→	
	Societal strength	42	43	42	→	
	Economic strength	62	52	53	→	
Overall rank and balance score		**43**	**43**	**39**	→	**ABC**

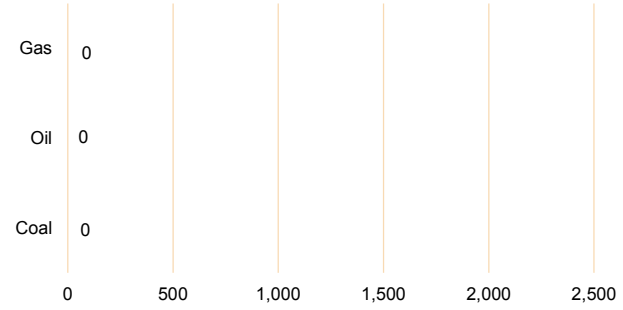
INDEX COMMENTARY

Latvia improves its position by four places in this year's Index. The country faces challenges similar to those that are faced by the 'Hydro-powered' grouping of countries, with lower levels of energy security and energy equity being counterpoints to a strong environmental sustainability performance. Latvia, which imports over three-quarters of the energy it consumes, struggles with its energy security ranking the most. However, performance on this dimension improves this year as the share of renewable energy sources increases in the electricity generation profile and the country increases its oil and oil product stocks. Latvia also improves on the energy equity dimension, with higher quality and affordable (although not quite cheap) prices of gasoline and electricity. Latvia's environmental sustainability performance is its best, and among the top worldwide. Contextually, indicators of societal, political and economic strength remain stable and good.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



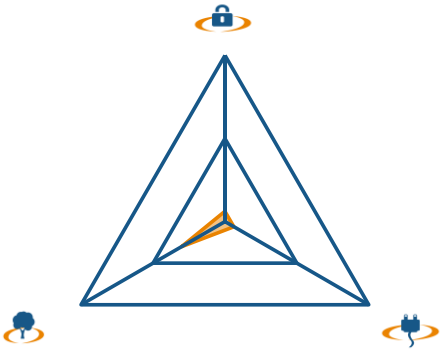
KEY METRICS

Industrial sector (% of GDP)	24.8	GDP per capita (PPP, USD); GDP Group	22,758 (II)
TPEP/TPEC (net energy importer)	0.18	Energy intensity (koe per USD)	0.13
Emission intensity (kCO_2 per USD)	0.20	CO_2 emissions (tCO_2) per capita	3.34
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Latvia's current power generation capacity, which consists of hydropower plants (HPP) and combined heat-electric generation plants (CHP), is insufficient to meet the electricity demand. To address this issue and other challenges the Cabinet of Ministers in Latvia issued the Guidelines for Energy Sector Development for 2007-2016 and defined main principles, goals and directions for the next 10 years including the goal to achieve energy self-sufficiency by 2016.
- Furthermore, in 2012 the Latvian government agreed on the Latvian Energy Long Term Strategy 2030 – Competitive Energy for Society. The main goals include: reduce electricity and natural gas imports from third countries by 50%; increase energy production from renewable resources up to 50% of gross energy consumption; provide alternatives for natural gas deliveries; open electricity market in Latvia and integrate it into the Baltic electricity markets; and increase interconnection power grid capacity to increase the effectiveness of the electricity market and to reduce electricity prices.
- The main challenges in Latvia will be to incentivise investments to develop new power plants and to balance the goals of increasing renewable energy generation (mainly wind) and keeping energy prices at an acceptable level to avoid negative impacts on the economy.

TRILEMMA BALANCE



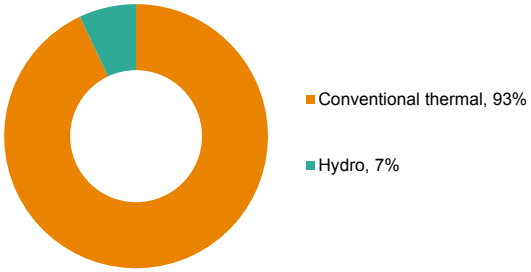
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	121	125	128	↓	
Energy security	127	127	122	→	**D**
Energy equity	87	123	123	↓	**D**
Environmental sustainability	89	68	91	→	**C**
Contextual performance	70	102	99	↓	
Political strength	96	102	102	↓	
Societal strength	69	75	74	→	
Economic strength	48	104	100	↓	
Overall rank and balance score	**109**	**123**	**128**	↓	**CDD**

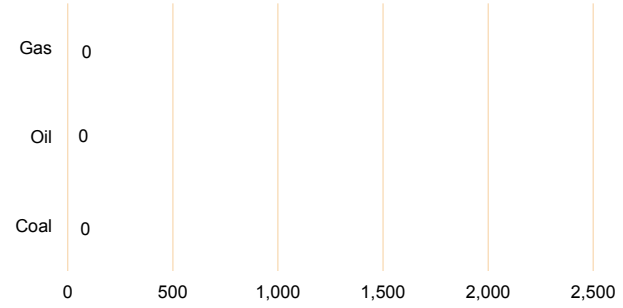
INDEX COMMENTARY

Lebanon falls five places in the Index. The country's rankings on the three energy dimensions are all low. Producing a mere 4% of the energy it consumes and having no oil stocks of its own, Lebanon is heavily reliant on fuel imports and is ill-equipped to handle any potential disruptions to its energy supply. The lack of diversity of its electricity fuel mix does not help either, as the country relies on burning fossil fuels to generate 93% of its electricity. Lebanon's environmental sustainability worsens this year as a decrease in energy intensity is offset by an increase in emissions intensity. Lebanon's energy equity dimension remains stable, however the country's performance is hard to assess (a necessary data point is not available). Similarly for economic strength for which the low rank is caused by the absence of data points underlying the indicator for cost of living expenditure. Moreover, Lebanon continues to be plagued by low levels of political stability, control of corruption, and rule of law, causing it to score relatively low on political and societal indicators.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



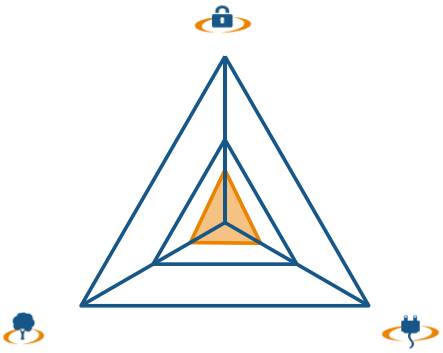
KEY METRICS

Industrial sector (% of GDP)	21.1	GDP per capita (PPP, USD); GDP Group	17,547 (II)
TPEP/TPEC (net energy importer)	0.03	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.34	CO_2 emissions (tCO_2) per capita	5.08
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Lebanon has a chronic electricity supply problem. However, in 2010, the government approved a promising strategy for the rehabilitation of the power sector, including the development of energy efficiency and renewable energy. The national target is to reach 12% of renewable energy out of the total electricity production in 2020. The energy efficiency target is to minimise demand by 5% in 2015. Challenges include mainly updating the legislative framework of the power sector.
- In addition to the policy paper, Lebanon is the first country in the Arab world to develop its National Energy Efficiency Action Plan (NEEAP) in 2011. Currently, the Renewable Energy Strategy is under preparation. Furthermore, Lebanon is embarking on a promising oil and gas exploration programme.
- Policymakers should focus on creating an enabling legislative framework for the development of renewable energy and energy efficiency, in addition to setting clear environmental regulations for the upcoming oil and gas industry.

TRILEMMA BALANCE



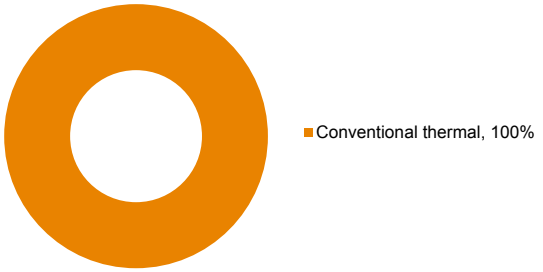
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	101	106	113	→	
Energy security	70	73	89	↓	C
Energy equity	72	91	99	↓	C
Environmental sustainability	123	108	99	↑	D
Contextual performance	124	116	124	→	
Political strength	126	127	129	→	
Societal strength	117	106	109	↑	
Economic strength	117	78	101	↑	
Overall rank and balance score	**117**	**114**	**120**	→	**CCD**

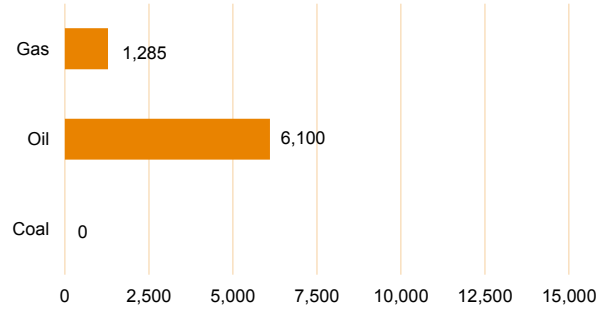
INDEX COMMENTARY

Libya drops six places in the overall Index ranking. The energy trilemma is fairly balanced, with equally low performances across all three energy dimensions. Energy security drops as the data points underlying the indicator for energy consumption in relation to GDP growth are updated, while energy equity drops given a comparative worsening of the quality of electricity services. Performance on the environmental sustainability dimension is low, albeit gradually improving. Performance on contextual indicators remains fairly stable, with the exception of worsening lower macroeconomic stability which causes economic indicators to drop.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

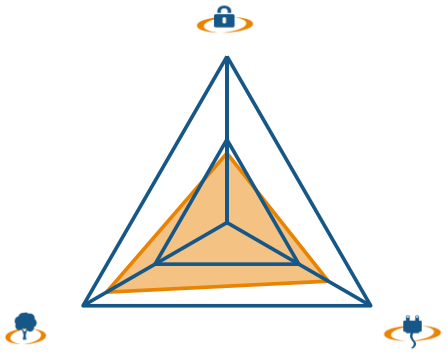


KEY METRICS

Industrial sector (% of GDP)	45.8	GDP per capita (PPP, USD); GDP Group	20,681 (II)
TPEP/TPEC (net energy exporter)	1.90	Energy intensity (koe per USD)	0.14
Emission intensity (kCO_2 per USD)	0.38	CO_2 emissions (tCO_2) per capita	6.96
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



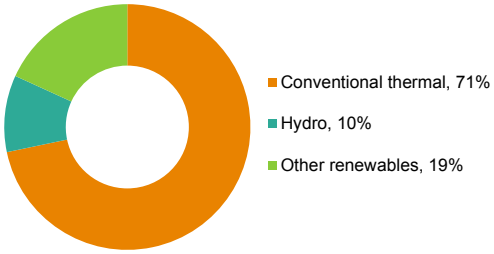
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	48	46	27	↑	
Energy security	93	90	76	↑	**C**
Energy equity	46	45	39	→	**B**
Environmental sustainability	26	20	22	→	**A**
Contextual performance	42	39	32	↑	
Political strength	36	33	28	↑	
Societal strength	39	39	40	→	
Economic strength	69	62	47	→	
Overall rank and balance score	**42**	**37**	**29**	↑	**ABC**

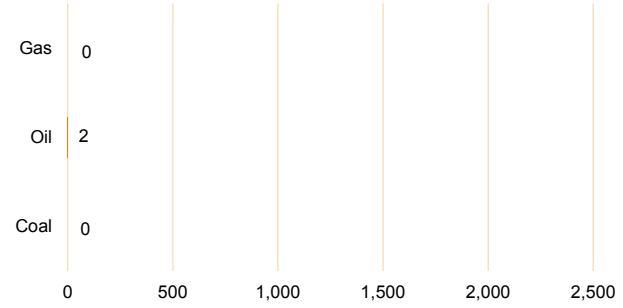
INDEX COMMENTARY

Lithuania moves up eight places in the overall rankings as performance improves across the majority of the Index dimensions. The three sides of the energy trilemma are not very well-balanced. Energy security continues to be the most challenging dimension for Lithuania, which produces a mere 4% of the total energy it consumes. However, improvements can be seen across almost all indicators in this dimension; transmission and distribution losses decrease, an increase in the share of hydropower has a positive impact on the diversity of electricity generation and also a lower dependence on fossil fuel imports cause the ranking in this dimension to improve. As prices for gasoline decrease and the quality of electricity supply better, energy equity also improves. Even though emissions and energy intensity decrease, performance on the environmental sustainability dimension does not change significantly. Indicators measuring societal and political strength remain mostly stable. Economic strength improves due to an increase in macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

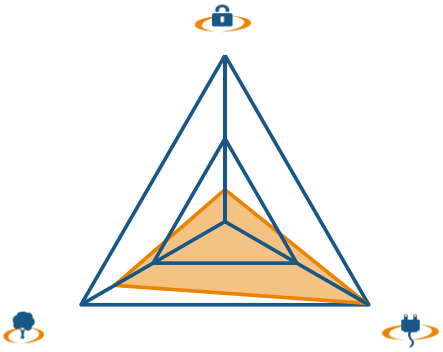


KEY METRICS

Industrial sector (% of GDP)	28.2	GDP per capita (PPP, USD); GDP Group	25,779 (II)
TPEP/TPEC (net energy importer)	0.04	Energy intensity (koe per USD)	0.12
Emission intensity (kCO_2 per USD)	0.21	CO_2 emissions (tCO_2) per capita	4.07
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



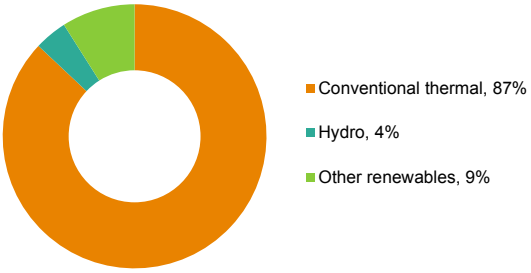
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	34	30	30	→	
Energy security	107	109	105	→	**D**
Energy equity	4	4	3	→	**A**
Environmental sustainability	29	23	31	→	**B**
Contextual performance	2	9	9	→	
Political strength	5	6	8	→	
Societal strength	13	16	18	→	
Economic strength	1	5	5	→	
Overall rank and balance score	**19**	**18**	**19**	→	**ABD**

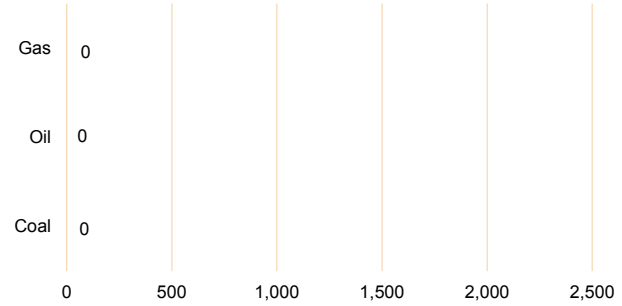
INDEX COMMENTARY

Overall, Luxembourg maintains a stable position in the Index through the years. Its balance of the energy trilemma remains lopsided, with excellent performances on the energy equity and environmental sustainability dimensions, but a low degree of energy security. This poor performance on the energy security dimension is driven by a heavy reliance on fuel imports (totalling 98% of energy consumed), minimal oil and oil product stocks, and the low, although improving, diversity of the electricity fuel mix. These are all persisting challenges for Luxembourg, given the country's small geographical size and resource-poor natural endowments, but high level of economic development. Energy equity remains among the highest in the world, as the country continues to provide its citizens with (relatively) affordable gasoline and electricity. Despite improving levels of energy and emission intensity Luxembourg drops a few rankings in the environmental sustainability dimensions. However, the movement in ranking is caused by peer countries improving faster. Contextually, Luxembourg ranks ninth in the world overall and continues to receive top marks on all indicators of political, societal, and economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

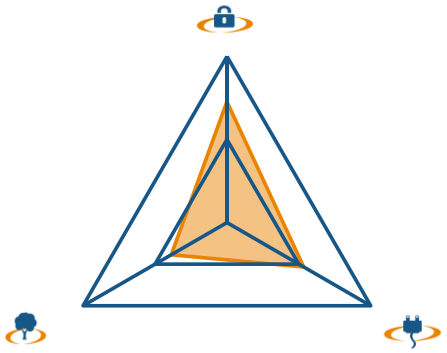


KEY METRICS

Industrial sector (% of GDP)	12.0	GDP per capita (PPP, USD); GDP Group	90,298 (I)
TPEP/TPEC (net energy importer)	0.02	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.27	CO_2 emissions (tCO_2) per capita	17.63
Energy affordability (USD per kWh, 2014)	0.21	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



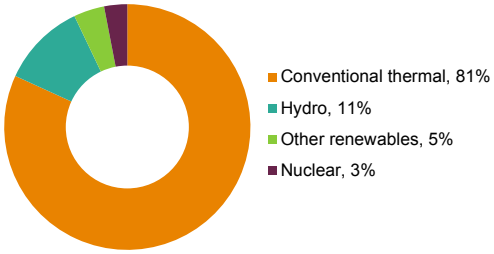
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		38	37	55	↓	
	Energy security	29	30	37	→	**B**
	Energy equity	47	43	61	↓	**B**
	Environmental sustainability	75	74	80	→	**C**
Contextual performance		61	52	55	→	
	Political strength	65	63	60	→	
	Societal strength	68	68	73	→	
	Economic strength	40	42	42	→	
Overall rank and balance score		**41**	**38**	**48**	↓	**BBC**

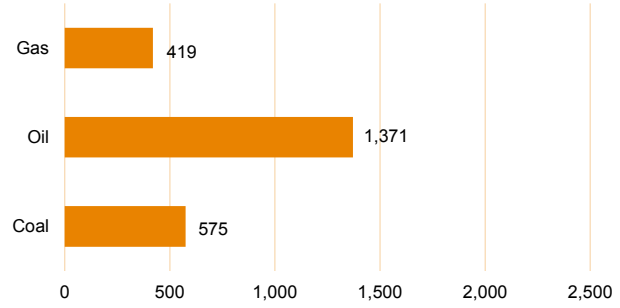
INDEX COMMENTARY

Mexico drops 10 places, with slight deterioration across all three core energy dimensions. Like the other 'Highly-industrialised' countries, Mexico shows a strong performance in energy security, decent levels of energy equity, and an environmental sustainability ranking that lags behind. The net energy exporter's energy security performance slightly worsens as its production to consumption ratio changes. Energy equity also slips as gasoline becomes more expensive even though the quality of electricity supply remains stable. Mexico, which has a highly-industrialised economy and still generates 81% of its electricity by burning fossil fuels, struggles the most with mitigating its impact on the environment. Although most underlying indicators show an improvement, this dimension drops a few ranks as peer countries perform better. Mexico's biggest challenges in this dimension remain air and water pollution. Contextually, Mexico's performance is overall stable, with mediocre levels of political and societal strength and a comparatively stronger economy.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



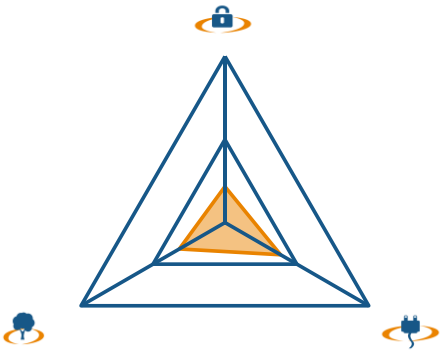
KEY METRICS

Industrial sector (% of GDP)	36.4	GDP per capita (PPP, USD); GDP Group	17,449 (II)
TPEP/TPEC (net energy exporter)	1.14	Energy intensity (koe per USD)	0.12
Emission intensity (kCO_2 per USD)	0.27	CO_2 emissions (tCO_2) per capita	3.47
Energy affordability (USD per kWh, 2014)	0.09	Population with access to electricity (%)	99

TRENDS AND OUTLOOK

- In 2013 the Mexican Congress approved the constitutional changes and respective legislation allowing the participation of the private sector through competitive markets in most of the activities involved. Thus, the Mexican energy sector will have the challenge to manage two transitions simultaneously: the transition from a monopolistic structure to a competitive market scheme and from a high-carbon to a low-carbon economy.
- One of the new laws establishes a clean energy certificate scheme for the energy sector bringing it in line with the 2012 General Law on Climate Change. Mexico is the second country, after the UK, which has enacted a law that frames the actions to be taken as far as climate change is concerned, both from an emission mitigation point of view as well as measures of adaptation. Mexico's Intended Nationally Determined Contributions for COP21 include a 25% reduction in GHG emissions with respect to a business as usual (BAU) projection by 2030, with 35% of electricity generation to come from clean energies and an aspirational goal of a 50% reduction in GHG emissions by 2050, as described in the LGCC.
- The greatest challenges policymakers need to focus on to meet the targets are: 1) the continuation of a renewable energy programme and the re-initiation of a nuclear programme; 2) continued increase of production of both oil and natural gas on and offshore as well as the development of shale gas resources; and 3) improved energy efficiency and energy conservation including cogeneration in order to reduce Mexico's energy intensity.

TRILEMMA BALANCE



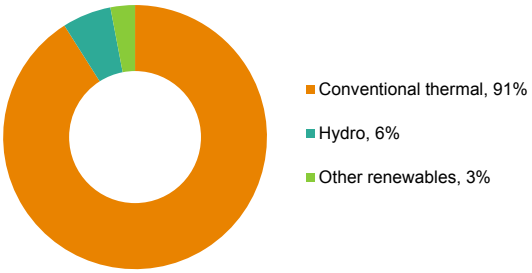
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	111	113	102	→	
Energy security	110	118	102	→	**D**
Energy equity	79	72	77	→	**C**
Environmental sustainability	96	96	89	→	**C**
Contextual performance	79	85	84	→	
Political strength	80	75	81	→	
Societal strength	71	81	82	↓	
Economic strength	78	98	86	→	
Overall rank and balance score	**105**	**111**	**100**	→	**CCD**

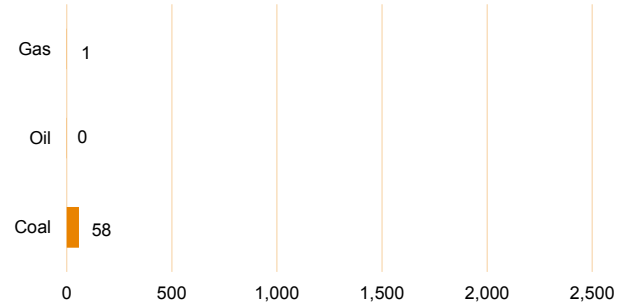
INDEX COMMENTARY

Morocco, a member of the 'Back of the pack' country grouping, gains 11 places in the overall Index to rank 100. The rise is caused largely by a surge in energy security, which stays Morocco's weakest dimension. The country struggles with an unfavourable total energy consumption to production ratio, which sees a further decline this year (the country only produces 5% of the energy it consumes), a high reliance on fossil fuels in its electricity generation mix, further increasing transmission and distribution losses, as well as comparatively low oil and oil product stocks. Improvements in this dimension are mainly driven by an update of the data points underlying the indicator for energy consumption in relation to GDP growth. Performance on the energy equity dimension is mostly stable. Mitigating its impact on the environment also continues to be a challenge for Morocco, as it faces high levels of pollution and rising emissions and energy intensity levels. Contextually, indicators of political and societal strength remain constant and on the lower side. Economic strength regains pace as macroeconomic stability improves.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

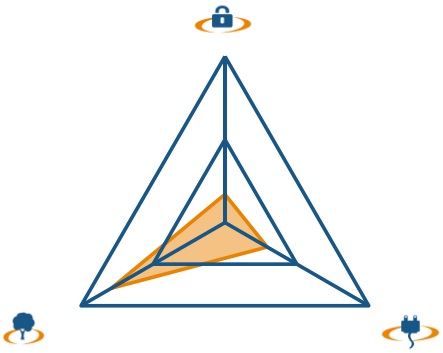


KEY METRICS

Industrial sector (% of GDP)	24.9	GDP per capita (PPP, USD); GDP Group	7,356 (III)
TPEP/TPEC (net energy importer)	0.05	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.26	CO_2 emissions (tCO_2) per capita	1.65
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



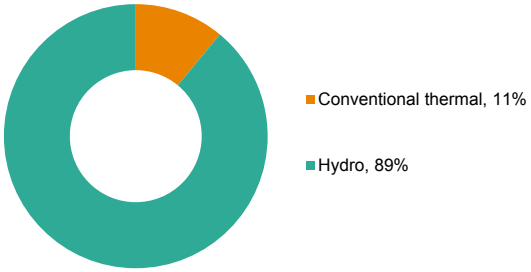
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	102	101	83	↑	
Energy security	123	123	108	↑	**D**
Energy equity	94	92	92	→	**C**
Environmental sustainability	49	46	28	↑	**B**
Contextual performance	65	58	59	→	
Political strength	48	48	47	→	
Societal strength	76	74	75	→	
Economic strength	67	59	61	→	
Overall rank and balance score	**90**	**88**	**78**	↑	**BCD**

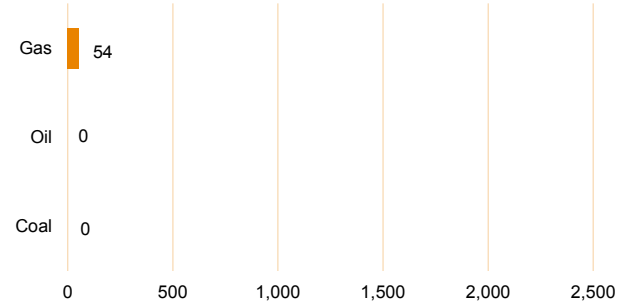
INDEX COMMENTARY

Namibia continues the positive trend of previous years and moves up 10 more places in this year's Index to rank 78. Although not in the 'Hydro-powered' grouping of countries, Namibia does rely heavily on hydropower for electricity generation and exhibits an energy trilemma balance that is similar to some of those countries. Energy security is a big challenge for Namibia. Transmission and distribution losses are slowly improving. A better production to consumption ratio helps the country to decrease its reliance on energy imports. However, diversity in the electricity fuel mix keeps declining. Performance on the energy equity dimension remains stable. The country does well at mitigating its environmental impact with comparatively lower energy and emission intensity and low CO_2 emissions from electricity generation. Contextual indicators are average and stable.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



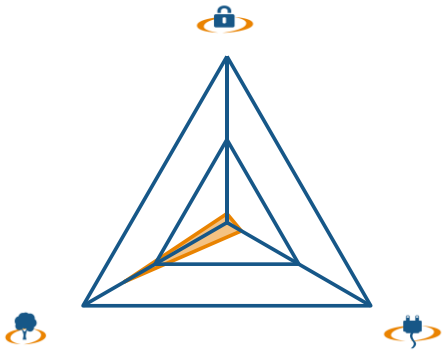
KEY METRICS

Industrial sector (% of GDP)	30.0	GDP per capita (PPP, USD); GDP Group	10,160 (III)
TPEP/TPEC (net energy importer)	0.18	Energy intensity (koe per USD)	0.09
Emission intensity (kCO_2 per USD)	0.18	CO_2 emissions (tCO_2) per capita	1.48
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	47

TRENDS AND OUTLOOK

- Namibia struggles to meet local demand. In addition to its own installed capacity the country relies on imports from neighbouring countries such as Zimbabwe, Zambia, Mozambique, and South Africa. The current energy policy is outdated and needs to be reviewed. Policies to develop renewable energy resources and support Independent Power Producers are not yet in place.
- In 2012 the country developed the Integrated Resources Plan. Renewable energy policies as well as an energy policy white paper are currently being drafted. The aim is to set targets for the electricity generation mix and international and local goals for sustainable development.
- Policymakers should focus on developing an integrated National Development Plan.

TRILEMMA BALANCE



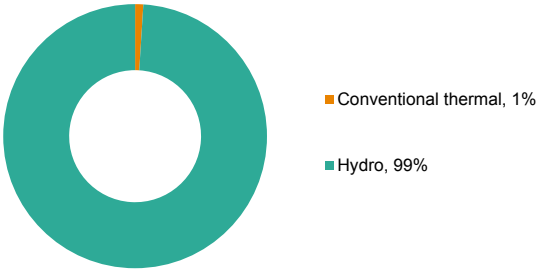
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		116	112	106	→	
	Energy security	125	125	123	→	**D**
	Energy equity	122	117	117	→	**D**
	Environmental sustainability	46	43	38	→	**B**
Contextual performance		88	79	77	→	
	Political strength	117	121	117	→	
	Societal strength	121	110	107	↑	
	Economic strength	22	17	17	→	
Overall rank and balance score		**111**	**109**	**103**	→	**BDD**

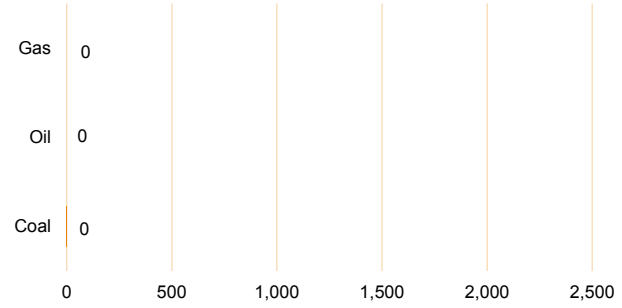
INDEX COMMENTARY

Nepal, a 'Back of the pack' country, improves by six places in the 2015 Trilemma Index. The country's energy security ranking marginally improves as some conventional thermal power generation is added to the recently hydropower dominated electricity generation, and transmission and distribution losses slowly decrease albeit are still high at 30%. The recent earthquakes that have hit Nepal are not captured in the Index but may pose additional challenges to an already weak energy system. Energy equity is also extremely low in Nepal with high gasoline prices and expensive electricity that is both inaccessible (Nepal has a 76% electrification rate) and perceived to be of low quality. Despite poor performances on the energy security and energy equity dimensions, Nepal does comparatively well at mitigating its impact on the environment. Energy intensity remains high, but the country's reliance on hydropower for electricity results in almost no carbon emissions from electricity generation. Contextual performance sees minor shifts, with political strength and societal strength continuing to be among the lowest globally, and economic strength high.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

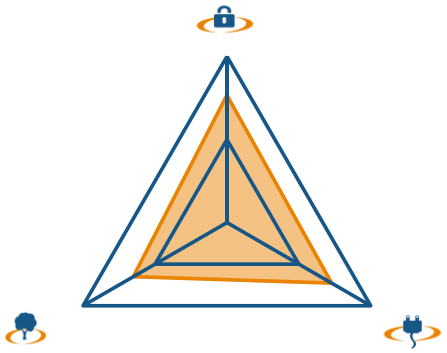


KEY METRICS

Industrial sector (% of GDP)	13.6	GDP per capita (PPP, USD); GDP Group	2,245 (IV)
TPEP/TPEC (net energy importer)	0.39	Energy intensity (koe per USD)	0.19
Emission intensity (kCO_2 per USD)	0.10	CO_2 emissions (tCO_2) per capita	0.19
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	76

TRENDS AND OUTLOOK

TRILEMMA BALANCE



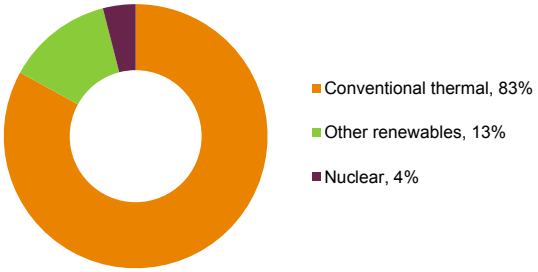
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		16	20	17	→	
	Energy security	42	55	31	↑	**B**
	Energy equity	23	33	36	↓	**B**
	Environmental sustainability	35	31	46	↓	**B**
Contextual performance		4	7	5	→	
	Political strength	8	7	7	→	
	Societal strength	4	7	6	→	
	Economic strength	16	11	12	→	
Overall rank and balance score		**12**	**14**	**11**	→	**BBB**

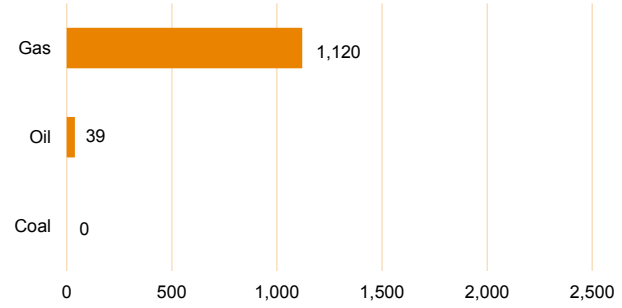
INDEX COMMENTARY

The Netherlands' overall Index ranking remains mostly unchanged throughout the years. As a 'Pack leader', the country balances the energy trilemma well. Indicators for energy security are mostly stable, apart from a much lower dependence on fuel imports which has a positive impact on the performance. Energy equity is stable, while environmental sustainability performance slightly drops as emissions intensity levels increase. Though showing signs of improvement, the Netherlands still relies on burning fossil fuels to generate a much higher proportion of its electricity (83%) than the other 'Pack leaders', indicating that low- and no-carbon sources of electricity need to be further developed if it wishes to stay in this premier country grouping position. Contextually, the Netherlands is one of the world's top performers.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



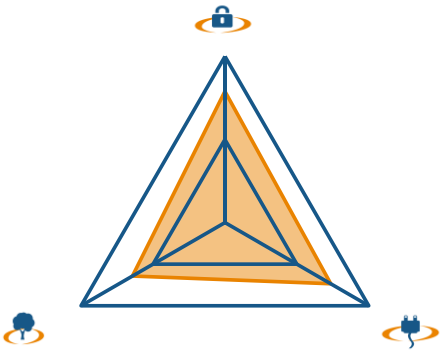
KEY METRICS

Industrial sector (% of GDP)	22.3	GDP per capita (PPP, USD); GDP Group	46,435 (I)
TPEP/TPEC (net energy importer)	0.69	Energy intensity (koe per USD)	0.13
Emission intensity (kCO_2 per USD)	0.29	CO_2 emissions (tCO_2) per capita	10.32
Energy affordability (USD per kWh, 2014)	0.25	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The Netherlands is well-positioned in the Index but still faces a number of challenges. These include: the public debate around installation of additional onshore wind capacity; high expectations of biomass and green gas in the face of challenging markets; ensuring solar surges and geothermal meet promises given the low starting base; and a feed-in tariff scheme that is not sufficient to reach targets. Furthermore, energy efficiency progress is fairly slow.
- Key energy policy developments are: the green deals – specific arrangements between the national government and individual sustainability initiatives such as energy, water, resources, waste to remove red tape, adjust policies where appropriate, make knowledge available and so on; energy innovation top sector approach designed to strengthen market steering, market involvement and market resources for energy innovation in seven key areas that include gas, solar, offshore wind, industrial efficiency and biomass/bio-based economy; and the SDE+ (stimulation of sustainable/renewable energy) feed-in scheme that is fully operational, has significant funding (>1,5 bill. Euro/annum) and strong competition among options.
- Key trends include a strong decentralisation of power generation such as solar, wind, small CHP, and to some degree also of gas production (green gas). Policymakers have to create the framework to stimulate or facilitate this development including the upgrade of the existing network such as smart grids. Finally, the Netherlands is expected to strengthen its position as a gas country, with an increased focus on the role of gas as a balancing fuel in a system that moves towards sustainability.

TRILEMMA BALANCE



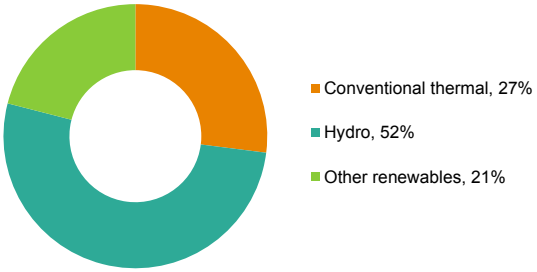
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	11	11	16	→	
Energy security	15	16	29	→	**A**
Energy equity	26	28	35	→	**A**
Environmental sustainability	37	42	47	→	**B**
Contextual performance	6	4	4	→	
Political strength	1	3	3	→	
Societal strength	3	6	7	→	
Economic strength	33	12	8	↑	
Overall rank and balance score	**8**	**10**	**10**	→	**AAB**

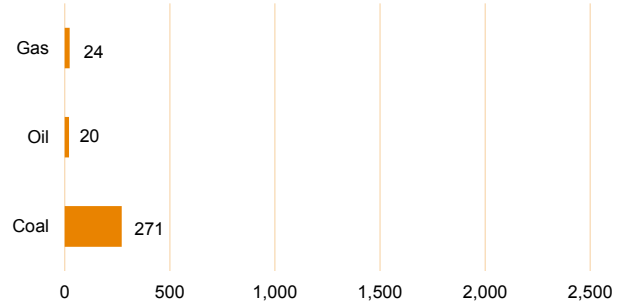
INDEX COMMENTARY

Overall, New Zealand maintains its position among the top 10 countries worldwide in the 2015 Index. One of the 'Pack leaders', New Zealand exhibits strong, well-balanced performance on all three facets of the energy trilemma. Energy security is the country's strongest energy dimension. Although a net energy importer, the country produces most (84%) of its own energy and continues its focus on diversifying the electricity fuel mix, which consists of a healthy and robust combination of fossil fuels, hydropower, and other renewables. Lower transmission and distribution losses are offset by small deterioration across the other energy security indicators. Indicators for energy equity and environmental sustainability remain mostly stable with rank changes driven by peer country performance improvements. Contextual performance stays extremely strong, with a high degree of political and societal strength. Economic strength further improves this year.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



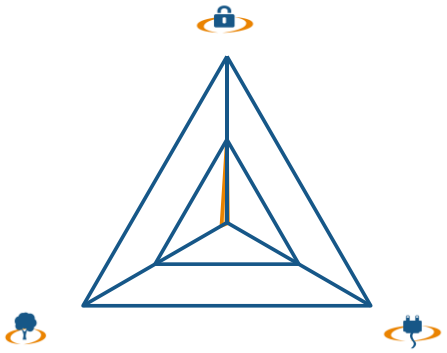
KEY METRICS

Industrial sector (% of GDP)	26.6	GDP per capita (PPP, USD); GDP Group	34,061 (I)
TPEP/TPEC (net energy importer)	0.84	Energy intensity (koe per USD)	0.17
Emission intensity (kCO_2 per USD)	0.27	CO_2 emissions (tCO_2) per capita	7.13
Energy affordability (USD per kWh, 2014)	0.22	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- New Zealand is well-positioned in the Index. It could yet see further improvements due to its progressively improving macroeconomic position. With its strong market-based framework and independent regulation, it has further potential to increase renewable energy sources in electricity and heat generation, thereby lowering CO_2 emissions and improving environmental sustainability performance without the need for subsidies.
- The New Zealand Energy Strategy (NZES) and Energy Efficiency and Conservation Strategy set the government's overarching energy policy framework. Its four priorities (diverse resource development, environmental responsibility, efficient use of energy, and secure and affordable energy) contribute to improvements in New Zealand's performance across all three energy dimensions. The NZES contains the aspirational goals to increase the amount of renewable electricity to 90% by 2025, facilitated by the only country-wide emissions trading scheme outside of the EU, competitive market signals and grid investment, while not compromising security of supply or competitiveness.
- Trends to watch are: 1) further transitioning from thermal to renewable sources of generation with the closure of coal and gas-fired power plants which may have potential impacts on dry-year security; 2) growing competing interests in the use and allocation of water, and concerns around water quality; 3) growing demand-side involvement in the electricity market, and the implications of the more rapid adoption of new technologies on demand, future competition, investment, network regulation, prices and energy intensity.

TRILEMMA BALANCE



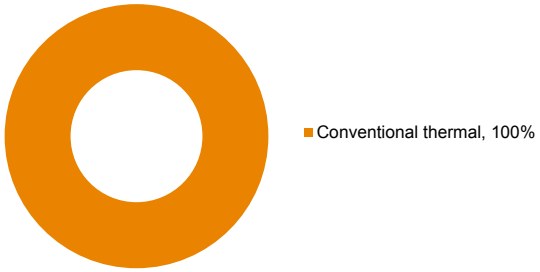
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	118	108	125	↓	
Energy security	80	57	65	↑	**B**
Energy equity	127	127	126	→	**D**
Environmental sustainability	91	92	125	↓	**D**
Contextual performance	105	99	95	↑	
Political strength	108	110	109	→	
Societal strength	91	101	98	↓	
Economic strength	103	66	63	↑	
Overall rank and balance score	**122**	**110**	**122**	→	**BDD**

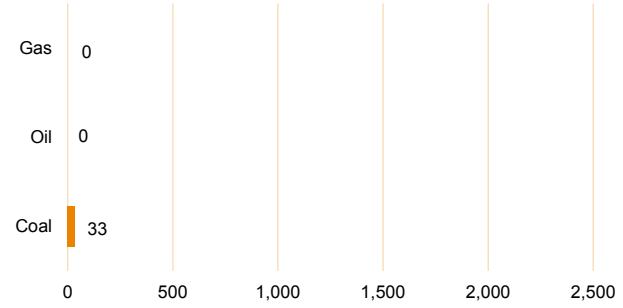
INDEX COMMENTARY

Niger drops 12 places in the Index rankings. While energy security is average, energy equity and environmental sustainability performance are at the bottom of the Index. Providing energy equity is Niger's biggest challenge, as over 85% of the population continues to live without access to modern electricity services and for those with access, energy services are expensive. Energy security changes mainly due to an update of the data points underlying the indicator for energy consumption in relation to GDP growth. Performance on the environmental sustainability dimension drops as emissions and energy intensity increase and air and water quality remain very low. Performance in the contextual dimensions is low for indicators of political and societal strength, and average for economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

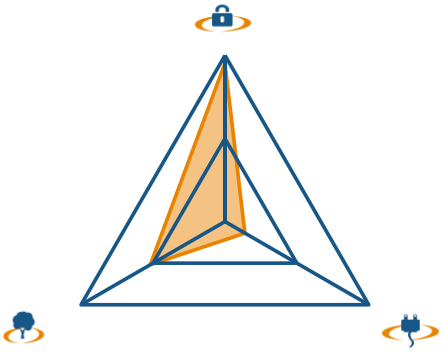


KEY METRICS

Industrial sector (% of GDP)	18.6	GDP per capita (PPP, USD); GDP Group	996 (IV)
TPEP/TPEC (net energy importer)	1.04	Energy intensity (koe per USD)	0.28
Emission intensity (kCO_2 per USD)	0.31	CO_2 emissions (tCO_2) per capita	0.24
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	9.3

TRENDS AND OUTLOOK

TRILEMMA BALANCE



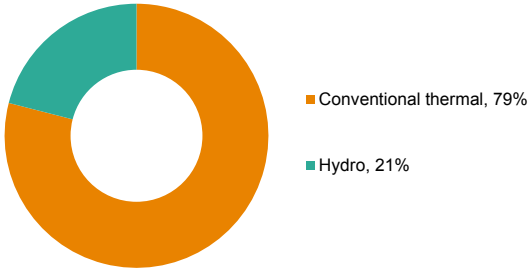
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	67	65	59	→	
Energy security	13	11	7	→	**A**
Energy equity	111	108	112	→	**D**
Environmental sustainability	79	81	63	↑	**C**
Contextual performance	121	108	118	→	
Political strength	122	124	123	→	
Societal strength	127	124	124	→	
Economic strength	97	41	79	↑	
Overall rank and balance score	**84**	**81**	**79**	→	**ACD**

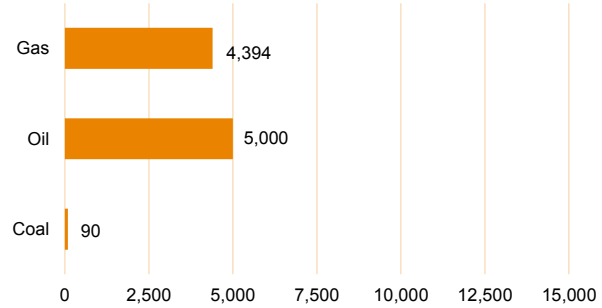
INDEX COMMENTARY

Nigeria ascends two places to rank 79 in the overall Index. The country has difficulty balancing the three sides of the energy trilemma, with very high levels of energy security, an average environmental sustainability performance and low levels of energy equity. This year sees further improvement in energy security as electricity transmission and distribution losses further decline and dependence on energy exports decreases. Energy equity is by far Nigeria's weakest energy dimension. Although prices for gasoline slowly decrease, electricity remains expensive and the overall perception of the quality of the electricity supply worsens. Close to half of Nigerians do not have access to modern electricity services. To sustain and continue economic growth and become on a par with South Africa Nigeria needs to urgently solve its issues with power generation. Environmental sustainability performance moves to the middle of the Index as emissions and energy intensity gradually decrease. Contextual performance overall is very weak for indicators of political and societal strength, and sees a drop in economic strength as macroeconomic stability decreases.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

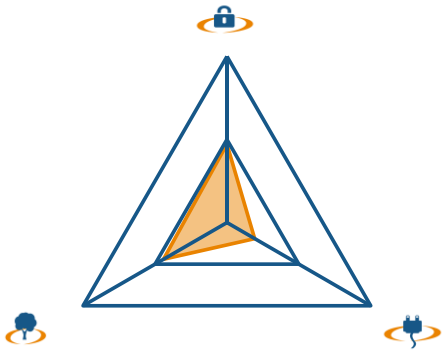


KEY METRICS

Industrial sector (% of GDP)	25.6	GDP per capita (PPP, USD); GDP Group	5,746 (IV)
TPEP/TPEC (net energy exporter)	7.37	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.07	CO_2 emissions (tCO_2) per capita	0.33
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	48.0

TRENDS AND OUTLOOK

TRILEMMA BALANCE



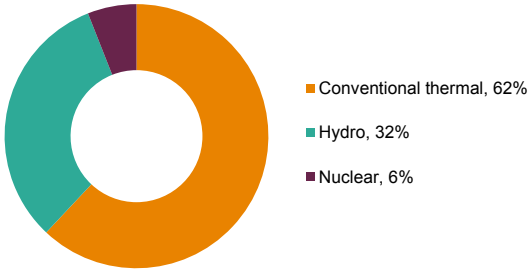
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		98	100	94	→	
	Energy security	56	60	69	→	**B**
	Energy equity	103	104	105	→	**D**
	Environmental sustainability	100	97	73	↑	**C**
Contextual performance		126	125	126	→	
	Political strength	119	120	121	→	
	Societal strength	124	119	119	→	
	Economic strength	123	128	127	→	
Overall rank and balance score		**114**	**118**	**108**	→	**BCD**

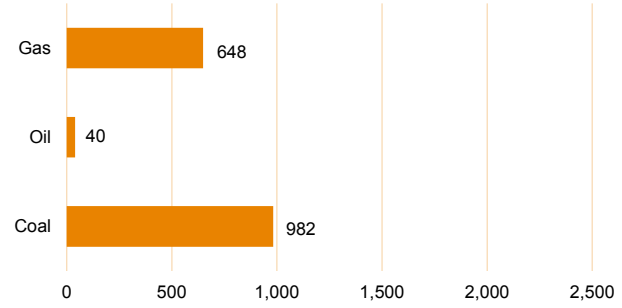
INDEX COMMENTARY

Pakistan gains 10 places in the overall Index rankings, mainly driven by an improvement in environmental sustainability performance. One of the 'Highly-industrialised' countries, Pakistan faces many of the same challenges as the other members of that group when it comes to balancing the energy trilemma, resulting in a stronger energy security ranking being offset by weaker performances on the energy equity and environmental sustainability dimensions. The well-diversified electricity generation portfolio, a mix of conventional thermal power, hydropower, and a small amount of nuclear power, helps boost the energy importer's energy security ranking, while transmission and distribution losses remain a big challenge. Meanwhile, energy equity continues to be low, as energy services are relatively expensive and of lower quality. A decrease in the levels of energy and emissions intensity is the driver behind the improvement in environmental sustainability ranking. Performances on all indicators of political, societal, and economic strength are stable, but very poor.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



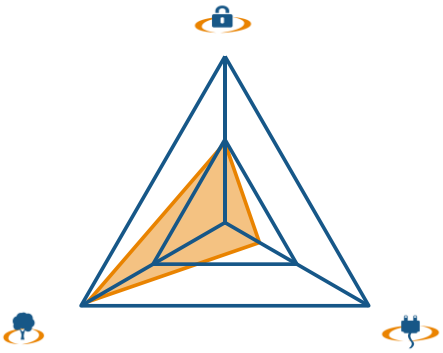
KEY METRICS

Industrial sector (% of GDP)	21.3	GDP per capita (PPP, USD); GDP Group	4,574 (IV)
TPEP/TPEC (net energy importer)	0.65	Energy intensity (koe per USD)	0.12
Emission intensity (kCO_2 per USD)	0.19	CO_2 emissions (tCO_2) per capita	0.76
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	94

TRENDS AND OUTLOOK

- Key trends, which are expected to support Pakistan's moving up in the Index rankings are: 1) the continued increase of the share of renewable energy in the electricity production mix; 2) stringent energy conservation rules and regulations; and 3) synergy in all energy-related departments/ministries through development of a single ministry of energy.

TRILEMMA BALANCE



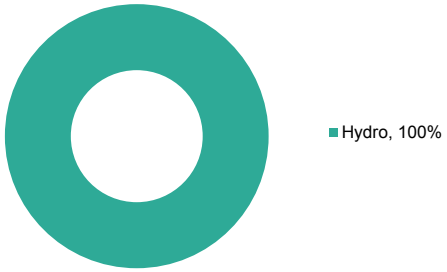
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	66	65	53	→	
Energy security	84	81	68	→	**C**
Energy equity	99	103	100	→	**D**
Environmental sustainability	13	16	7	→	**A**
Contextual performance	89	83	83	→	
Political strength	106	106	105	→	
Societal strength	108	104	108	→	
Economic strength	50	43	35	→	
Overall rank and balance score	**74**	**77**	**60**	↑	**ACD**

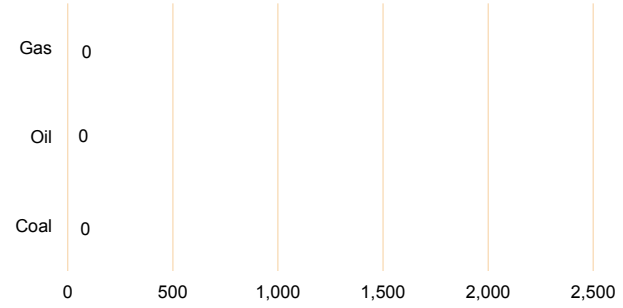
INDEX COMMENTARY

Paraguay moves up 17 places in the Index, with improvements across the board in energy performance. Paraguay, a 'Hydro-powered' country, has an energy trilemma balance that is typical of that country grouping, with average energy security and low energy equity scores balanced out by excellent marks on the environmental sustainability dimension. Paraguay's total energy consumption growth rate is comparatively slower considering its strong economic growth, allowing it to strengthen its favourable energy consumption to production ratio and free up more energy (most of it excess electricity generated through hydropower) for export. This has a positive effect on the energy security performance. Energy equity is the most challenging of the three dimensions, as gasoline and electricity prices continue to be comparatively expensive. Environmental sustainability performance remains exceptional, with the country's CO_2 emissions-free electricity generation being of note. Indicators of contextual political and societal strength are on the lower side, while economic strength improves driven by an improvement in macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

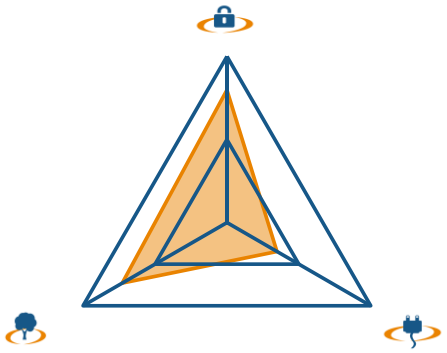


KEY METRICS

Industrial sector (% of GDP)	17.6	GDP per capita (PPP, USD); GDP Group	8,112 (III)
TPEP/TPEC (net energy exporter)	1.20	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.11	CO_2 emissions (tCO_2) per capita	0.76
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	98

TRENDS AND OUTLOOK

TRILEMMA BALANCE



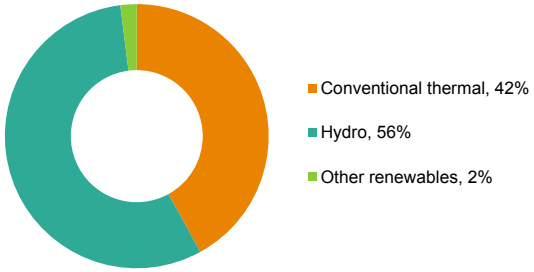
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	45	43	33	→	
Energy security	21	18	27	→	**A**
Energy equity	96	97	84	↑	**C**
Environmental sustainability	43	38	36	→	**B**
Contextual performance	60	53	54	→	
Political strength	69	74	74	→	
Societal strength	79	77	79	→	
Economic strength	23	23	21	→	
Overall rank and balance score	**45**	**40**	**40**	→	**ABC**

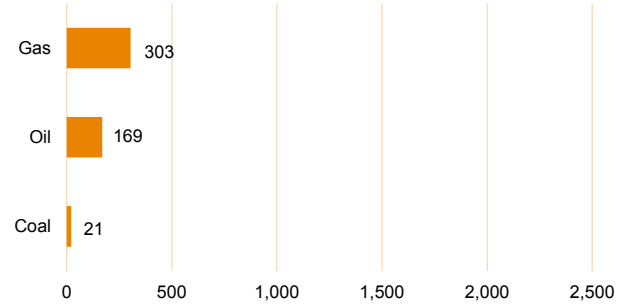
INDEX COMMENTARY

Peru maintains a stable position in the Index over the years. Although Peru is a member of the 'Hydro-powered' grouping of countries, unlike in most of those countries, energy security outperforms the environmental sustainability dimension. Energy equity still lags quite a bit behind. Peru is able to meet 90% of its energy needs through domestic production. The drop in the 2015 energy security it caused by higher transmission and distribution losses, and a less favourable energy consumption to production ratio. As the price of gasoline decreases accessibility to modern energy services increases and the overall quality and affordability of electricity remain stable, Peru's energy equity performance increases. With hydropower making up 60% of Peru's electricity fuel mix, the country continues to perform well on the environmental sustainability dimension although air and water register high levels of pollution. Contextually, Peru sees a solid economic performance driven by low cost of living and high macroeconomic stability. Political indicators and societal indicators are mostly stable.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



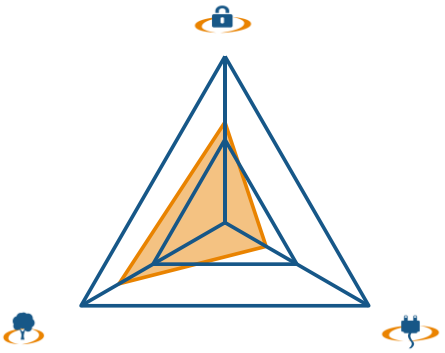
KEY METRICS

Industrial sector (% of GDP)	36.7	GDP per capita (PPP, USD); GDP Group	11,556 (III)
TPEP/TPEC (net energy importer)	0.90	Energy intensity (koe per USD)	0.07
Emission intensity (kCO_2 per USD)	0.15	CO_2 emissions (tCO_2) per capita	1.52
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	91

TRENDS AND OUTLOOK

- Peru's National Energy Policy 2010-2040 was approved at the end of 2010 with the goal to encourage and protect private investment in the sector; and to minimise the social and environmental impacts by promoting the development of energy markets, encouraging efficiency and the development of renewable energies at the local, regional, and national level.
- Schemes to support these goals are already in place and include: a law, passed in April 2012, to promote energy security in hydrocarbons; a scheme to promote the modernisation of oil refineries; a universal energy access plan for the 2013-2022 period, implemented in May 2013, with clearly defined targets for different subcomponents; and auctions and call for tenders to secure the implementation of hydro projects. Additional fiscal incentives are in place for small scale hydro, solar, wind, biomass, and geothermal.

TRILEMMA BALANCE



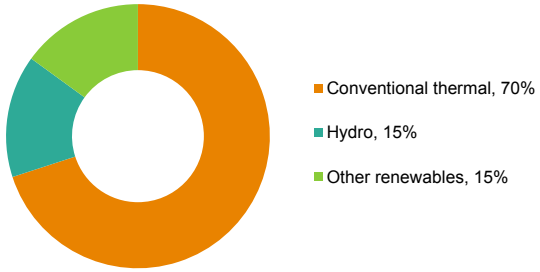
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	61	57	57	→	
Energy security	39	34	52	↓	B
Energy equity	93	93	93	→	C
Environmental sustainability	54	51	35	↑	B
Contextual performance	75	60	58	↑	
Political strength	94	84	82	↑	
Societal strength	100	82	77	↑	
Economic strength	32	26	20	→	
Overall rank and balance score	**65**	**58**	**50**	→	**BBC**

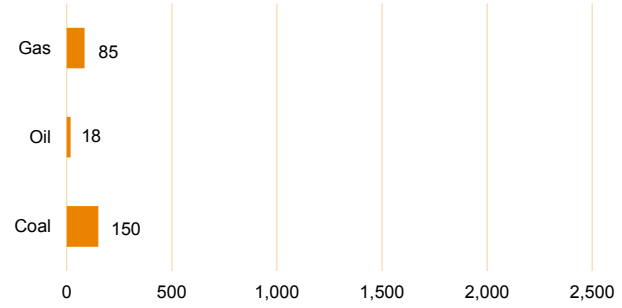
INDEX COMMENTARY

The Philippines moves its Index ranking up by eight places, again riding on the strength of small across-the-board improvements on almost all energy and contextual dimensions. The Philippines' decent performances on the energy security and environmental sustainability dimensions are offset by its comparatively worse performance in energy equity. Energy security is the only dimension that sees a drop this year due to lower oil and oil product stocks and the use of up-to-date data points underlying the indicator for energy consumption in relation to GDP growth. Energy equity stays low, as energy prices remain expensive and 12% of Filipinos continue to live without access to modern electricity services. Environmental sustainability performance becomes the Philippines' strongest energy dimension helped by an electricity fuel mix that is almost one-third hydropower and other renewables and decreasing levels of energy intensity. Contextually, the country makes marginal improvements across the board, further improving its already very respectable economic ranking. The effects of typhoon Yolanda are yet to be fully reflected in the data.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



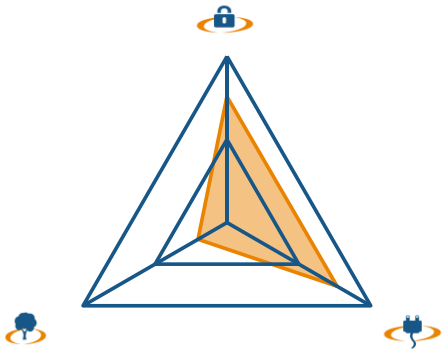
KEY METRICS

Industrial sector (% of GDP)	31.5	GDP per capita (PPP, USD); GDP Group	6,597 (III)
TPEP/TPEC (net energy importer)	0.38	Energy intensity (koe per USD)	0.08
Emission intensity (kCO_2 per USD)	0.16	CO_2 emissions (tCO_2) per capita	0.88
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	88

TRENDS AND OUTLOOK

- With a coal-dominant energy mix, the Philippines suffers from a shortage of power supply, often resulting in rotating brownouts lasting an average of 2-3 hours daily. Though the power shortage is a systemic problem to be resolved through the collaboration of all stakeholders, the Department of Energy (DOE) has outlined some short-term solutions to address the brownouts: 1) the "Interruptible Load Programme", where consumers will be compensated for using their generator sets when there is shortfall in supply in the grid; 2) a boost in supply through the commissioning and rehabilitation of plants; 3) an increase in capacity for renewables, primarily solar, wind and biomass.
- There is a clear need for investments in power generations. Currently, most pipeline projects are coal fired as coal project developers are currently favoured by a premium given to the peso-per-kilowatt hour cost of electricity. High level discussions have also been initiated to promote additional natural gas projects via LNG regasification opportunities. This entails implementing a 'standard' LNG chain between the Middle East/Europe/Australia with an anticipated capacity of 2-4 million tons of gas per year.
- The DOE has also recently implemented an increased feed-in tariff allocation for solar power projects in the country by as much as 450 MW. This initiative should see the growth of solar energy project investments with the DOE offering long-term contracts and guaranteed pricing to renewable energy firms.

TRILEMMA BALANCE



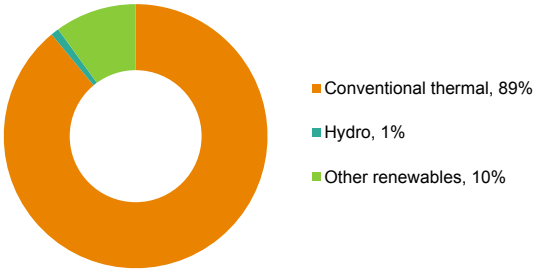
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	54	48	49	→	
Energy security	38	32	32	→	**B**
Energy equity	39	36	32	→	**B**
Environmental sustainability	94	91	104	↓	**D**
Contextual performance	52	49	48	→	
Political strength	30	32	31	→	
Societal strength	34	37	36	→	
Economic strength	96	94	94	→	
Overall rank and balance score	**48**	**42**	**45**	→	**BBD**

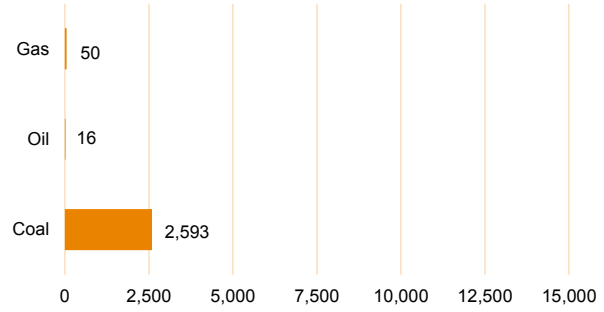
INDEX COMMENTARY

Poland maintains a stable position in the Index over the years but struggles with balancing the three sides of the energy trilemma, with good performances on the energy security and energy equity dimensions, and a poor environmental sustainability ranking. The country's performance on energy security and energy equity remain stable. With a large percentage of coal-fired power generation in the electricity generation mix, the environmental sustainability dimension continues to be the most challenging for Poland, with the problematic indicators being the high level of emission intensity and CO_2 emissions from electricity generation. Contextual performance is mostly constant, with decent levels of political and societal strength, but a comparatively weaker economy.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



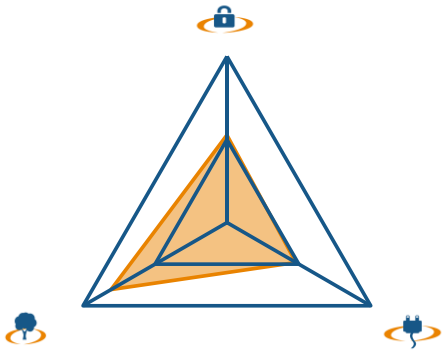
KEY METRICS

Industrial sector (% of GDP)	32.0	GDP per capita (PPP, USD); GDP Group	23,926 (II)
TPEP/TPEC (net energy importer)	0.66	Energy intensity (koe per USD)	0.14
Emission intensity (kCO_2 per USD)	0.42	CO_2 emissions (tCO_2) per capita	7.81
Energy affordability (USD per kWh, 2014)	0.19	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Recent energy policy developments are expected to affect energy efficiency, energy security and environmental sustainability positively: diversification of electricity generation portfolio by the decision to build nuclear plants; reducing energy consumption per GDP, increasing energy efficiency and reducing energy losses in manufacturing and distribution; incentives that foster the development of renewable energy; diversification of gas supplies; increase of the competitiveness of fuels and energy by liberalisation of the markets; improving the legal framework for exploration works for domestic primary energy fuels; and limiting the energy sector impact on environment by the development of clean coal technologies.
- Expected future trends affecting Poland's sustainability balance and issues for policymakers to focus on are: 1) development of the country's energy network infrastructure; 2) further diversification of energy sources; 3) modernisation of the electricity generation sector; 4) increase security of primary fuel supply through investments in more efficient coal mining exploitation and exploration for conventional and unconventional gas; 5) increase transport biofuels production and use; 6) continued efforts to improve energy efficiency and energy savings (end-user energy-efficiency measures); 7) further development and deployment of clean coal technologies; and 8) transition to a low-carbon economy, while enabling an improvement of lifestyles over the next 20 years, by deploying low-emission technologies to achieve lower emissions growth.

TRILEMMA BALANCE



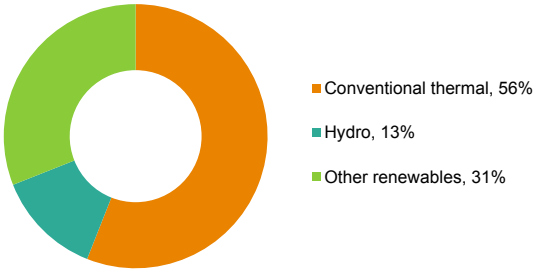
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	27	35	41	→	
Energy security	55	53	62	→	**B**
Energy equity	53	65	68	↓	**C**
Environmental sustainability	20	22	26	→	**A**
Contextual performance	28	24	25	→	
Political strength	35	34	35	→	
Societal strength	28	28	25	→	
Economic strength	36	30	32	→	
Overall rank and balance score	**23**	**25**	**34**	→	**ABC**

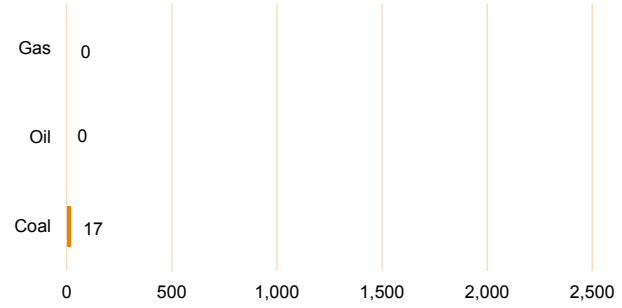
INDEX COMMENTARY

Portugal drops nine places in the Index. Nevertheless, Portugal's energy trilemma balance consists of two fair performances on the energy security and equity dimensions, and a very good performance in mitigating its impact on the environment, mainly due to renewable electricity generation capacity (hydropower and wind power) representing almost 50% of the installed portfolio. The energy production to consumption ratio worsens, transmission and distribution losses increase, and total oil stocks decrease, causing the country's energy security performance to slip. Energy equity sees a slight dip as electricity prices creep up (mainly due to a VAT increase). Environmental sustainability drops as energy intensity increases a little and dry weather conditions cause an increase in fossil-fuelled electricity generation. Contextually, Portugal once again exhibits solid, well-rounded scores, although still recovering its macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



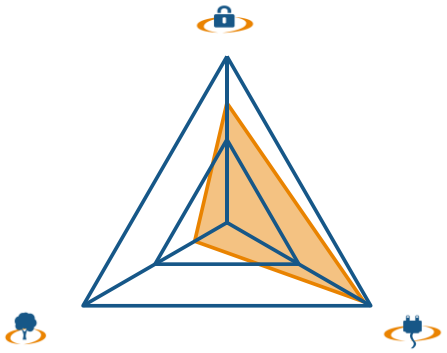
KEY METRICS

Industrial sector (% of GDP)	22.4	GDP per capita (PPP, USD); GDP Group	26,188 (II)
TPEP/TPEC (net energy importer)	0.24	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.20	CO_2 emissions (tCO_2) per capita	4.20
Energy affordability (USD per kWh, 2014)	0.29	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Portuguese energy policy is based on economic rationality and sustainability, seeking the promotion of energy efficiency, use of renewable indigenous sources and the reduction of energy costs.
- Portugal's aim to reinforce the electricity interconnection capacity between the Iberian Peninsula and Central Europe gained momentum with the Madrid Declaration (4 March, 2015) of the President of France and the Prime Ministers of Spain and Portugal asking for EU financial support for select projects, namely through the Connecting Europe Facility. The initiative seeks to promote market integration and the supply to Europe of excess renewable electricity generated in this southwestern region. Gas interconnections were also considered in the Declaration by the three leaders (project MIDCAT), to integrate the Iberian gas market with France and Central Europe, fostering competition and potentiating European supply security by taking advantage of the high capacity of LNG terminals in the Iberian Peninsula. Security of energy supply is also sought by the Portuguese government, not only by promoting renewable resources but also by oil and gas exploration.
- Greater access to energy services for low-income households was facilitated by the Portuguese government in 2015 by increasing tariff reductions and broadening the eligibility criteria.
- The government also implemented a Green Taxation Reform and called for civil society participation and support to a Green Growth Commitment, which aims at reducing emissions and promoting the efficient use of resources.

TRILEMMA BALANCE



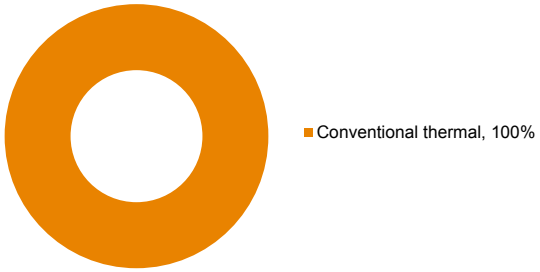
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		22	19	31	↓	
	Energy security	8	3	36	↓	**B**
	Energy equity	9	6	4	→	**A**
	Environmental sustainability	95	103	101	→	**D**
Contextual performance		15	29	29	↓	
	Political strength	31	23	24	↑	
	Societal strength	29	32	33	→	
	Economic strength	10	53	44	↓	
Overall rank and balance score		**18**	**20**	**28**	↓	**ABD**

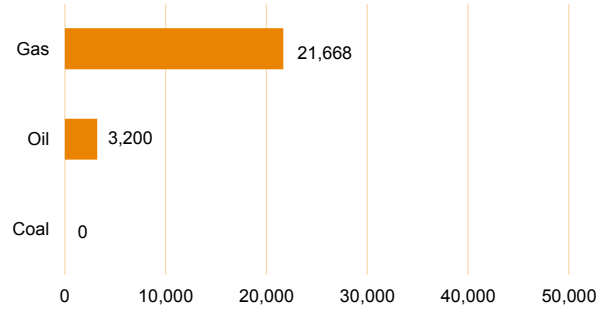
INDEX COMMENTARY

Qatar drops eight places in this year's Index. A member of the 'Fossil-fuelled' country grouping, Qatar displays strong energy security and equity rankings and a severely lagging performance on the environmental sustainability dimension. Regarding energy security, Qatar performs very well on all available underlying indicators with the exception of its diversity of the electricity generation portfolio. This year's drop is driven by higher transmission and distribution losses and the use of up-to-date data points for the indicator measuring energy consumption in relation to GDP growth. Qatar's energy equity and environmental sustainability ranking are stable. Contextually, performance on all indicators of political and societal strength remains mostly stable. Economic strength moves up in the ranking driven by an improvement in macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



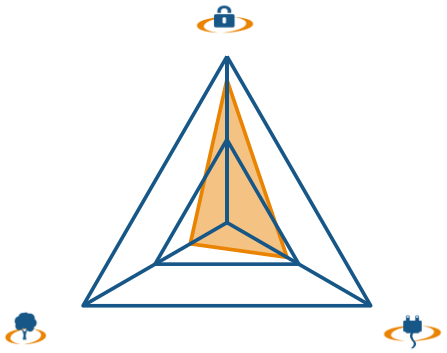
KEY METRICS

Industrial sector (% of GDP)	68.0	GDP per capita (PPP, USD); GDP Group	145,539 (I)
TPEP/TPEC (net energy exporter)	5.33	Energy intensity (koe per USD)	0.19
Emission intensity (kCO_2 per USD)	0.34	CO_2 emissions (tCO_2) per capita	38.85
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	98

TRENDS AND OUTLOOK

- Qatar controls 14% of the total world natural gas reserves, which makes it the third country in the world in terms of the proved gas reserves, and is the world's largest supplier of LNG.
- The Qatar National Vision 2030 defines the long-term outcomes for the country and provides a framework within which national strategies and implementation plans can be developed. Expanding competitive industries derived from hydrocarbon industries, building a knowledge-based economy characterised by relying on research, development and innovation, and excellence in entrepreneurship are three key elements identified to achieve the set goals.
- Recent energy policy developments include the objectives to: reduce electricity usage by 20% and water consumption by 35% within five years; and enhance the management of economic, environmental and social impacts within the energy and industry sector. Multinational companies in Qatar are encouraged to put forward their five-year sustainable development strategies with well-defined performance targets with higher levels of innovation.
- Policymakers need to continue developing an integrated set of measures to attract domestic, regional and foreign investment to establish and support the government's goal to open the economy, focusing on industries with new technologies and high added value.

TRILEMMA BALANCE



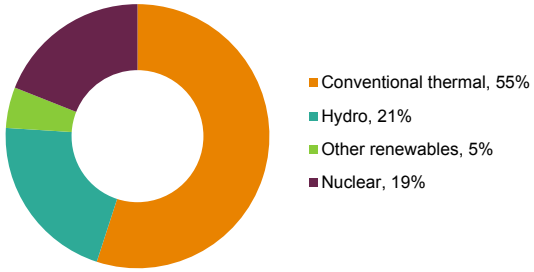
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	53	55	68	→	
Energy security	9	4	20	→	**A**
Energy equity	70	78	75	→	**C**
Environmental sustainability	88	95	97	→	**C**
Contextual performance	69	55	53	↑	
Political strength	56	61	54	→	
Societal strength	65	56	56	↑	
Economic strength	90	58	61	↑	
Overall rank and balance score	**52**	**54**	**56**	→	**ACC**

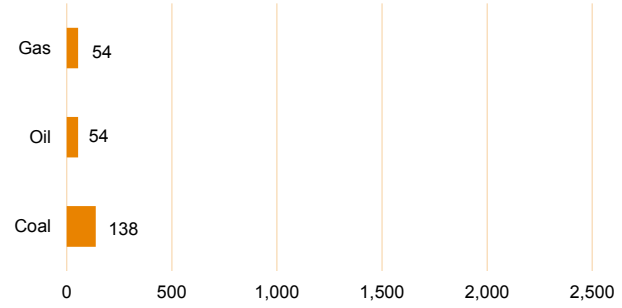
INDEX COMMENTARY

Romania maintains a stable position in the Index over the years. Romania's balance of the energy trilemma is lopsided, with a very strong energy security ranking and much weaker performances on the energy equity and environmental sustainability dimensions. The drop in energy security this year is caused by the use of up-to-date data points for the indicator measuring energy consumption in relation to GDP growth. Other indicators remain stable and strong, except for a slight worsening of the energy production to consumption ratio. Romania's energy equity ranking improves marginally as the quality of electricity supply improves. Still the worst of Romania's three energy dimensions, the country's environmental sustainability performance does not improve despite slightly lower levels of emissions and energy intensity. Contextual indicators remain stable, with the most notable changes being an improvement in political stability and a decrease of credit availability to the private sector.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



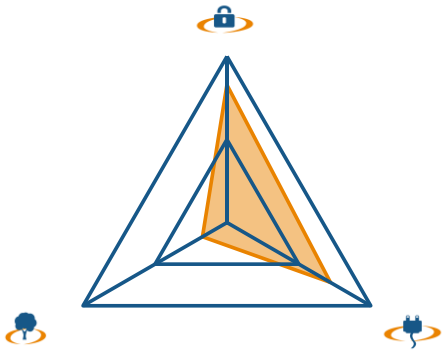
KEY METRICS

Industrial sector (% of GDP)	35.6	GDP per capita (PPP, USD); GDP Group	17,674 (II)
TPEP/TPEC (net energy importer)	0.77	Energy intensity (koe per USD)	0.13
Emission intensity (kCO_2 per USD)	0.27	CO_2 emissions (tCO_2) per capita	3.36
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The most recent energy policy development that is expected to have a positive influence on the country's energy sustainability balance is the revision of Romania's renewable energy law, which will offer differentiated, and potentially lucrative, green certificate packages across all renewable technologies. However, the implementation of the law has been postponed since 2008 and the delay has resulted in uncertainty of returns for investors. Despite the uncertainty, the installed renewable energy capacity continues to increase slowly.
- Progress has also been made with: building insulation to improve energy efficiency; the share of coal in the energy mix, which continues to decline; and the integration of the power markets of Czech Republic, Slovakia, Hungary and Romania as of November 2014. In February 2015 Transeletrica also signed a Memorandum of Understanding with the Prysmian Group to study a submarine connection between Romania and Turkey, with the aim of further promoting integration in the region.
- Key issues for policymakers to focus on include: 1) integration of renewable energy sources; 2) energy infrastructure development, especially in the electricity transmission and distribution grid; 3) market integration at regional and European level; 4) increasing environmental impact mitigation efforts; and 5) increasing awareness for energy efficiency measures.

TRILEMMA BALANCE



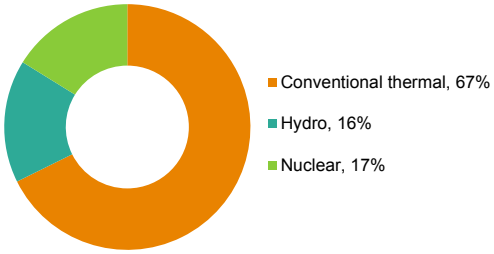
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		46	40	43	→	
	Energy security	2	2	15	→	**A**
	Energy equity	61	44	37	↑	**B**
	Environmental sustainability	99	104	108	→	**D**
Contextual performance		80	74	74	→	
	Political strength	97	97	96	→	
	Societal strength	92	90	83	↑	
	Economic strength	47	51	50	→	
Overall rank and balance score		**54**	**50**	**49**	→	**ABD**

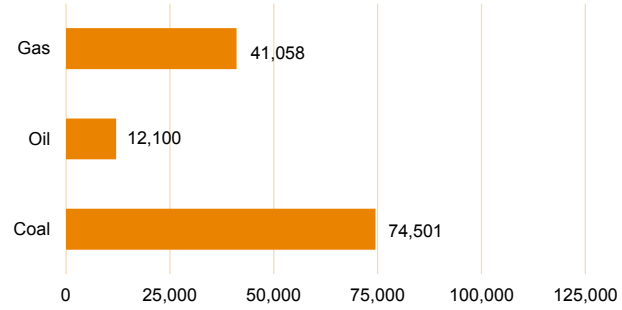
INDEX COMMENTARY

Russia maintains a stable position in the Index over the years. One of the 'Highly-industrialised' countries, Russia's balance of the energy trilemma consists of a very good level of energy security, an average performance on energy equity, and a poor environmental sustainability ranking. Russia's energy security drop is driven by the use of up-to-date data points for the indicator capturing energy consumption in relation to GDP growth. As gasoline is very affordable and the perceived quality of electricity services improves Russia moves up the energy equity ranking. The environmental sustainability dimension, by far the country's weakest, remains stable with low levels of emissions and energy intensity. Contextual performance stays mostly unchanged compared to last year.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



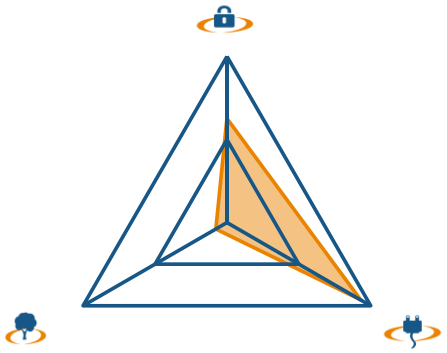
KEY METRICS

Industrial sector (% of GDP)	36.3	GDP per capita (PPP, USD); GDP Group	24,298 (II)
TPEP/TPEC (net energy exporter)	1.73	Energy intensity (koe per USD)	0.34
Emission intensity (kCO_2 per USD)	0.73	CO_2 emissions (tCO_2) per capita	11.24
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Russia is endowed with natural resources, and exports natural gas and oil to countries in Eastern and Western Europe, Turkey, Japan as well as other Asian countries. The high dependence of the economy on energy exports and the vulnerability to the fluctuations in the energy prices, the development of shale gas in other regions of the world, but also Europe's efforts to decrease dependence on Russian gas imports following disputes with key transit countries such as Ukraine, led to the development of diversification strategies for the economy, transportation routes, but also the country's own energy and electricity generation mix.
- The Energy Strategy to 2030 emphasises action on improving energy efficiency, increasing the use of clean energy technologies such as renewable energy, hydro and nuclear, and reducing GHG emissions. With the accession of Russia to the World Trade Organisation in August 2012, the country agreed to increase its domestic natural gas prices, with the target of setting domestic prices in Russia equal to European 'net of transport prices' by 2014.
- Some targets as well as policies and measures are in place already. For example, in May 2013 Russia issued Resolution No. 449 on a Mechanism for the Support of Renewable Energy Sources on the Wholesale Electric Power and Capacity Market, which incentivises the use of renewables in power generation, legislations does not yet match the ambitious target to reduce GHG emissions by 2030 of up to 100 to 105% compared to 1990 levels.

TRILEMMA BALANCE



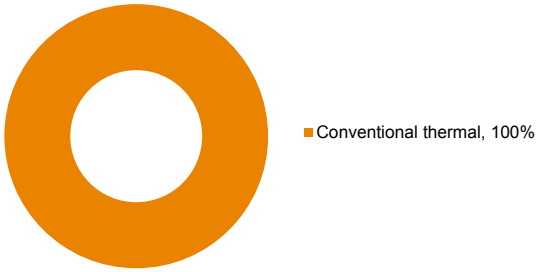
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	57	67	54	→	
Energy security	45	68	49	→	**B**
Energy equity	12	7	7	→	**A**
Environmental sustainability	124	125	120	→	**D**
Contextual performance	47	64	64	↓	
Political strength	79	67	67	↑	
Societal strength	55	51	49	→	
Economic strength	14	84	76	↓	
Overall rank and balance score	**51**	**68**	**51**	→	**ABD**

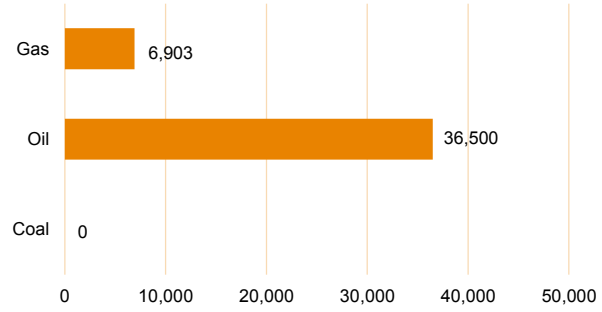
INDEX COMMENTARY

Saudi Arabia's ranking gains 17 places in this year's Index. As one of the 'Fossil-fuelled' countries, Saudi Arabia's energy trilemma is balanced in a fashion that is typical of that country grouping, with good performance on energy security and high levels of energy equity, and a poor environmental sustainability performance. Energy security goes up by several ranks this year, mainly due to a lower dependence on fuel exports, which make up a large part of Saudi Arabia's GDP, supported by a decrease in transmission and distribution losses and a better consumption to GDP growth ratio. Performance on energy equity remains high helped largely by cheap gasoline and plentiful, high-quality electricity. Environmental sustainability still lags severely since Saudi Arabia's energy mix relies entirely on fossil fuels. Contextually performance is stable, with improvements in political stability, control of corruption, rule of law, and accessibility of domestic credit to the private sector.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



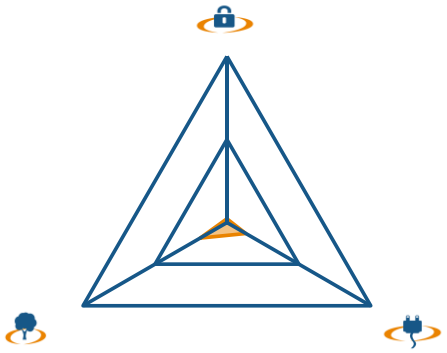
KEY METRICS

Industrial sector (% of GDP)	59.7	GDP per capita (PPP, USD); GDP Group	50,934 (I)
TPEP/TPEC (net energy exporter)	2.83	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.36	CO_2 emissions (tCO_2) per capita	16.46
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	98

TRENDS AND OUTLOOK

- The Saudi energy sector, totally dependent on oil and gas for electricity generation and transportation, faces the dual challenge of coping with rising internal energy demand and reducing carbon emissions.
- In order to tackle the challenge Saudi Arabia is looking to diversify its national energy mix to include renewable energy and nuclear and recently announced plans to invest US$109 billion over the next 20 years in solar energy. Energy efficiency has been identified as a key national priority. Saudi Arabia is also investing in the exploration of shale gas to meet its domestic energy demand. Carbon capture, utilisation and storage (CCUS) gained a strategic priority on the Saudi energy policy agenda to promote clean use of fossil fuels.
- To achieve the above mentioned goals, policymakers should focus on: 1) maintaining Saudi Arabia's spare capacity and global position as a secure supplier of energy; 2) diversifying the economy which currently depends mainly on hydrocarbons; 3) educating the public about the importance of energy, managing national demand, and increasing efficiency.

TRILEMMA BALANCE



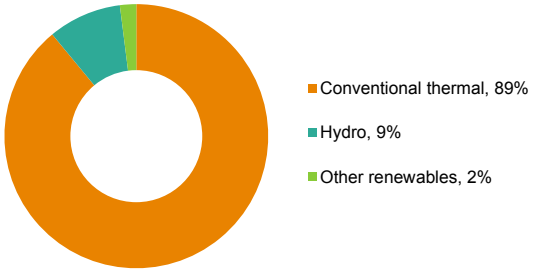
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	127	127	129	→	
Energy security	120	122	127	→	**D**
Energy equity	118	116	113	→	**D**
Environmental sustainability	93	100	106	↓	**D**
Contextual performance	96	103	102	→	
Political strength	88	79	75	↑	
Societal strength	105	91	94	↑	
Economic strength	94	110	113	→	
Overall rank and balance score	**126**	**127**	**129**	→	**DDD**

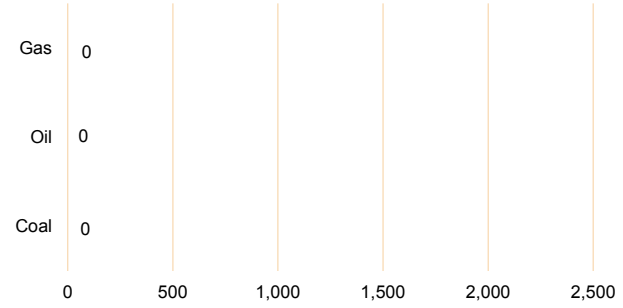
INDEX COMMENTARY

Senegal's overall Index ranking remains mostly unchanged. One of the 'Back of the pack' countries, Senegal's rankings on all three dimensions of the energy trilemma are low. Energy security lags behind the most, with low marks being driven by an extremely low ratio of total energy production to consumption, a high percentage of electricity being lost in transmission and distribution and non-existent oil stocks. Energy equity sees a marginal improvement as the perceived quality of electricity services improves for the 57% of the population that has access to electricity services. Senegal's environmental sustainability ranking, while its strongest, is still rather poor. Burning fossil fuels to generate electricity results in high CO_2 emissions, and high energy and emissions intensity continue to be a serious problem. The country's energy mix does contain a small amount (11%) of hydropower and renewables, which represents a potentially promising start for the contribution of renewables. Contextual performance is low, but mostly stable.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



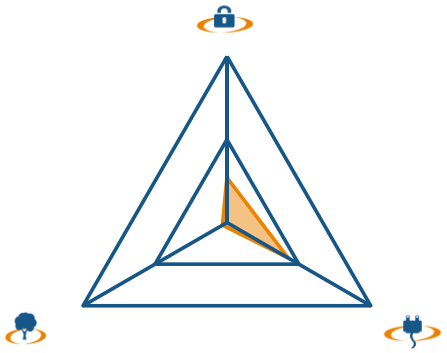
KEY METRICS

Industrial sector (% of GDP)	23.8	GDP per capita (PPP, USD); GDP Group	2,243 (IV)
TPEP/TPEC (net energy importer)	0.04	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.21	CO_2 emissions (tCO_2) per capita	0.41
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	57

TRENDS AND OUTLOOK

- Senegal's energy sector is currently faced with a number of challenges, including ageing infrastructure that is not being properly maintained nor planned to be replaced. Water issues are also at the top of the agenda, as droughts have a strong impact on households, especially those located in rural areas.
- The 2012 Energy Strategy for Senegal sets out a sustainable development plan for the country's energy sector, to include all resources, both renewable and conventional, to provide secure, affordable and environmentally low-impact energy. Targets include achieving a 50% rural electrification rate by 2017 and a 20% renewables share of the electricity generation mix by 2017. There are planned investments to develop both renewable energy sources and carbon power plants. The electricity mix set out in the policy will lead to an increased dependence of Senegal on imported fossil fuels.
- Policymakers need to continue developing the energy strategy to deliver a sustainable energy system. In particular, electrification of rural areas and the risks associated with the water-energy nexus in water stress situations need to be addressed.

TRILEMMA BALANCE



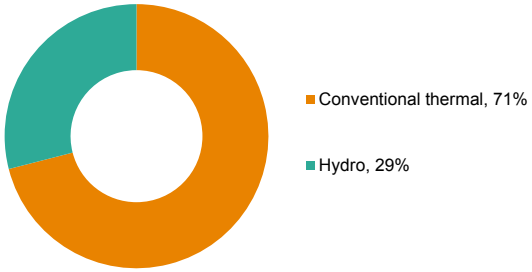
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		110	120	116	→	
	Energy security	101	105	95	→	**D**
	Energy equity	65	70	74	→	**C**
	Environmental sustainability	118	119	126	→	**D**
Contextual performance		85	81	84	→	
	Political strength	74	71	68	↑	
	Societal strength	59	61	59	→	
	Economic strength	118	119	122	→	
Overall rank and balance score		**106**	**116**	**112**	→	**CDD**

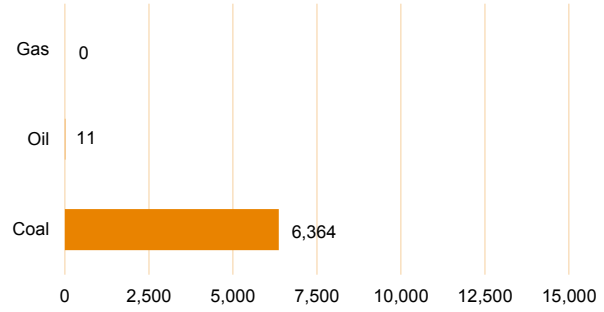
INDEX COMMENTARY

In 2015, Serbia gains four places in the Index, up to rank 112. As Serbia has developed economically, its efforts to maximize energy equity and provide its people with affordable, good quality energy has come at the cost of environmental sustainability, resulting in an imbalance between the various sides of the energy trilemma. With a slightly more diversified electricity generation mix and comparatively slower energy consumption growth rate, Serbia's performance on energy security improves. Performance on the energy equity dimension decreases, but continues to be the country's strongest. Serbia's large environmental footprint is a serious challenge. Emissions intensity and levels of CO_2 from electricity generation remain particularly high. Regarding its contextual performance, Serbia's political and societal indicators continue their upward trend, while economic strength slightly drops.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



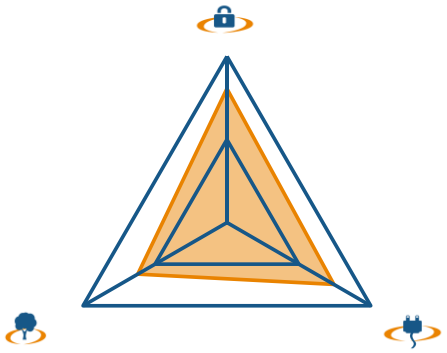
KEY METRICS

Industrial sector (% of GDP)	36.9	GDP per capita (PPP, USD); GDP Group	13,380 (III)
TPEP/TPEC (net energy importer)	0.70	Energy intensity (koe per USD)	0.22
Emission intensity (kCO_2 per USD)	0.64	CO_2 emissions (tCO_2) per capita	6.35
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In the last few years considerable investments have been made in the energy sector, transportation system, and waste management. For example, in electrostatic precipitators, and new slug and ash removal systems. Two large Flue Gas Desulphurisation projects are in progress, meeting the demands of the Energy Community Treaty.
- The recent energy policy developments include: implementation of new energy policy, which opens the energy market further and meets the requirements of the South Eastern Europe Energy Treaty; new standards for energy efficiency, including the building sector, are in force meeting EU regulations; and implementation of a feed-in tariff scheme two years ago. These developments are expected to have a positive impact especially on the energy security and environmental sustainability dimension.
- Key issues policymakers need to focus on are: 1) adopt the new energy sector development strategy until 2030 with a clear vision for how the sector and the energy mix should develop until 2050; 2) meet the obligation from the South Eastern Europe Energy Treaty to open the energy market fully by 2015; 3) implement flue gas desulphurisation in all power plants by 2017; 4) meet EU biofuel targets for the transportation sector; and 5) establish a fund under the new law on rational use of energy, which will support energy efficiency and renewable energy projects, complementing the existing fund under the environmental policy.

TRILEMMA BALANCE



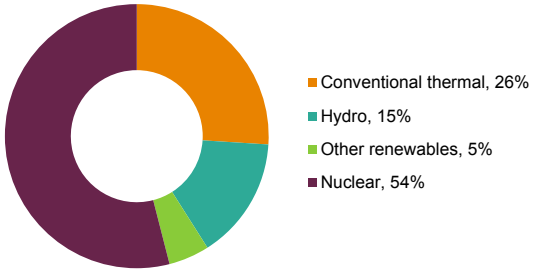
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		19	11	15	→	
	Energy security	20	15	26	→	**A**
	Energy equity	38	37	34	→	**B**
	Environmental sustainability	48	34	50	→	**B**
Contextual performance		55	54	51	→	
	Political strength	29	27	25	→	
	Societal strength	38	46	47	↓	
	Economic strength	95	101	94	→	
Overall rank and balance score		**22**	**17**	**24**	→	**ABB**

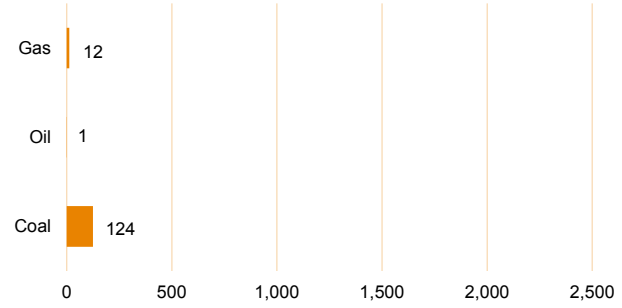
INDEX COMMENTARY

Slovakia moves down seven places in the Index ranking this year, with declines in both energy security and environmental sustainability. Slovakia does a good job at balancing the various competing demands of the energy trilemma, with good rankings on all three energy dimensions. Although Slovakia imports the majority of its energy, it still performs well on energy security due to the diversity of energy sources of the electricity it does produce, and low rates of electricity distribution losses. However, increased dependence on imports drives the country a few places down on energy security. As gasoline and electricity prices decrease, Slovakia continues to perform well on the energy equity dimension. The country's environmental sustainability ranking diminishes as the country is outperformed by its peers. Contextually, Slovakia performs well on political and societal indicators, but economic strength still lags behind, albeit slowly improving.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



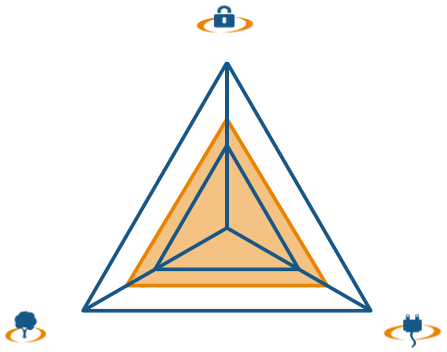
KEY METRICS

Industrial sector (% of GDP)	35.7	GDP per capita (PPP, USD); GDP Group	27,150 (II)
TPEP/TPEC (net energy importer)	0.36	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.28	CO_2 emissions (tCO_2) per capita	5.96
Energy affordability (USD per kWh, 2014)	0.21	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Improvements made to the Slovak energy sector over the past years are driven by energy saving efforts in all sectors of the economy, by using more efficient and clear heat and power technologies. The dependence on energy imports remains high and not diversified, however, the use of domestic renewable energy sources and processing of waste is increasing.
- Recent policy developments are mainly driven by EU energy and climate targets and implementation of EU policy and regulation continues including market liberalisation and promotion of environmentally-friendly energy technologies. The removal of cross subsidies is challenging as it conflicts with the support of the availability of cheap energy for low-income households and for the manufacturing sector.
- Policymakers need to focus on dealing with the challenge for the distribution system as a result of decentralised production and electric mobility. Increasing energy efficiency in all sectors of the economy remains a challenge and requires structural changes in the economy to diverge from heavy industry to a sophisticated production, but also measures to reduce energy consumption of buildings. The role of nuclear energy needs to be discussed because the technology allows an increase of electricity generation without increasing carbon emissions. Furthermore, policymakers need to focus on decreasing the dependence on natural gas and oil imports.

TRILEMMA BALANCE



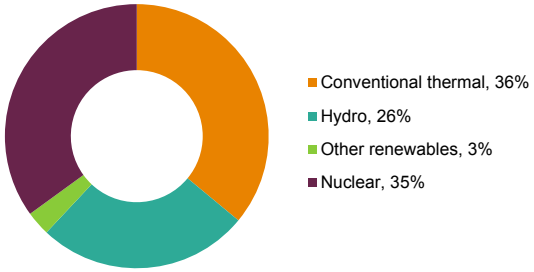
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	28	32	24	→	
Energy security	60	52	45	→	**B**
Energy equity	27	40	40	↓	**B**
Environmental sustainability	42	45	40	→	**B**
Contextual performance	35	26	41	↓	
Political strength	34	37	37	→	
Societal strength	25	29	28	→	
Economic strength	48	32	70	↓	
Overall rank and balance score	**25**	**24**	**25**	→	**BBB**

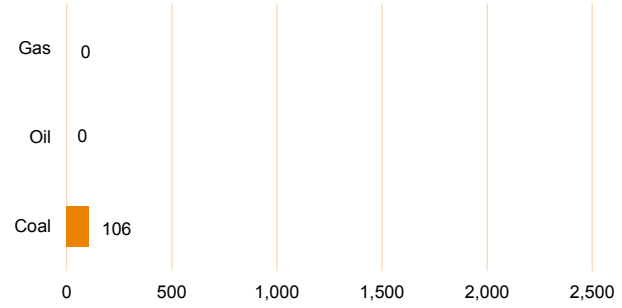
INDEX COMMENTARY

Overall, Slovenia maintains a stable position in the Index throughout the years and exhibits a good, well-rounded performance on all three dimensions. Energy security improves slightly with the key driver being an update of the data points underlying the indicator for energy consumption in relation to GDP growth. Other indicators are mostly stable. Energy equity remains unchanged. Performance on the environmental sustainability dimension also improves as energy and emissions intensity levels decline. Contextually, political and societal indicators are stable and very good while economic strength drops driven by deterioration in macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



KEY METRICS

Industrial sector (% of GDP)	28.4	GDP per capita (PPP, USD); GDP Group	28,512 (II)
TPEP/TPEC (net energy importer)	0.50	Energy intensity (koe per USD)	0.13
Emission intensity (kCO_2 per USD)	0.26	CO_2 emissions (tCO_2) per capita	6.36
Energy affordability (USD per kWh, 2014)	0.21	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The New Energy Act, which was adopted in parliament at the beginning of 2014, implemented the provisions of the EU's Third Energy Package. Changes made in legislation are expected to increase competition in the electricity and especially in the gas market, investments in the use of renewable energy sources in final energy consumption as well as investments in energy efficiency. Furthermore, intense preparations are going on for the construction of a series of hydroelectric power plants on the Sava River, which will increase share of renewables in energy mix.
- Due to increased competition in the market, electricity prices for both industry and households dropped significantly at the beginning of the year 2012, and similarly, in the second half of the year 2012; natural gas prices dropped by approximately 20%. This trend continued through 2013 and 2014, and is expected to have a positive impact on Slovenia's energy equity performance.
- The construction of South Stream, a gas pipeline that will pass through Slovenian territory on the way to Italy and supply the southern and eastern countries of the European Union with natural gas from Russia, depends on the fulfilment of the respective European legislation on the complete corridor.
- To improve Slovenia's environmental performance additional financial investments are needed for energy-efficiency measures, particularly in the energy consumption of buildings (thermal insulation, window replacement and replacement of obsolete heating systems) and into supporting schemes for the use of renewable energy sources for energy supply of buildings.

TRILEMMA BALANCE

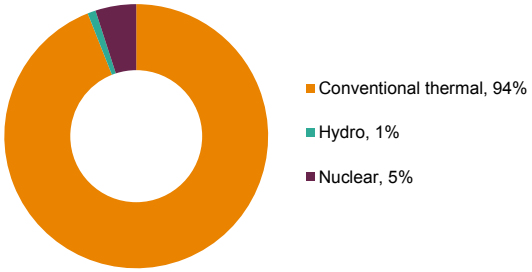
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	93	96	93	→	
Energy security	43	42	30	→	**B**
Energy equity	78	85	87	→	**C**
Environmental sustainability	128	129	130	→	**D**
Contextual performance	51	46	45	→	
Political strength	52	53	55	→	
Societal strength	84	76	76	↑	
Economic strength	20	24	26	→	
Overall rank and balance score	**79**	**83**	**84**	→	**BCD**

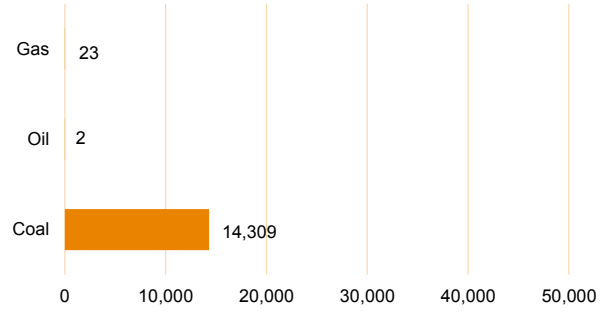
INDEX COMMENTARY

South Africa maintains a stable position in the Index throughout the years. Typical of the 'Highly-industrialised' group, South Africa's better energy security and energy equity rankings are offset by a poor performance on the environmental sustainability dimension. Energy security performance improves as a result of greater availability of oil and oil product stocks and comparatively lower energy consumption in relation to GDP growth. However, the data does not yet reflect the recent blackouts and load shedding due to the inability of the electricity generation infrastructure to support demand, which places South Africa on the Index's watch list. Energy equity is low as gasoline and electricity prices are relatively expensive and 15% of the population still lacks access to modern energy services. South Africa ranks last globally on environmental sustainability. This is due to the almost sole reliance on coal for electricity generation, extremely high emissions rates, and the yet limited impact of the renewable energy IPP programme. Overall contextual performance for South Africa remains relatively constant. Performance on economic strength is above average globally.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



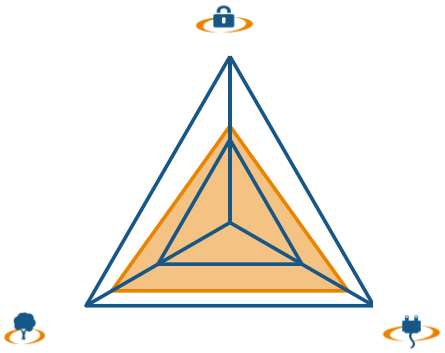
KEY METRICS

Industrial sector (% of GDP)	28.5	GDP per capita (PPP, USD); GDP Group	12,867 (III)
TPEP/TPEC (net energy exporter)	1.08	Energy intensity (koe per USD)	0.25
Emission intensity (kCO_2 per USD)	0.66	CO_2 emissions (tCO_2) per capita	7.12
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	85

TRENDS AND OUTLOOK

- Most recently, independent power producers (IPPs) are being allowed into the electricity sector using renewable technologies. Already 1,800 MW is operational, with the balance of 3,400 MW due to be online by mid-2016. As a result, the energy security and environmental performance dimensions will show an improvement.
- Issues policymakers should focus on are: 1) there is still much to be done on the social equity dimension, especially in terms of providing energy to rural communities; and 2) South Africa has abundant coal reserves but no natural gas or oil as yet. The choice of technology for replacement and new electricity generation plant will be a very difficult one, especially since the issues of access and affordability are so critical to the social and economic development of the country.

TRILEMMA BALANCE



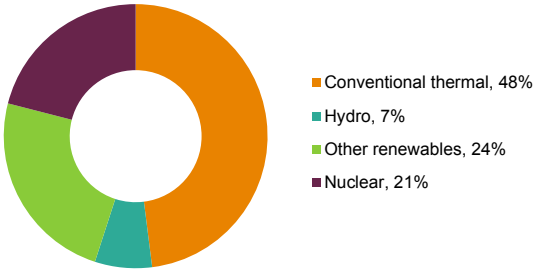
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	7	16	14	↓	
Energy security	22	37	55	↓	**B**
Energy equity	16	46	23	↓	**A**
Environmental sustainability	23	24	24	→	**A**
Contextual performance	24	27	27	→	
Political strength	40	44	42	→	
Societal strength	24	22	22	→	
Economic strength	25	37	37	→	
Overall rank and balance score	**9**	**15**	**15**	↓	**AAB**

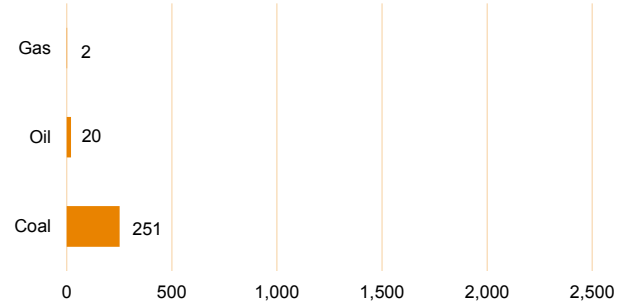
INDEX COMMENTARY

This year, Spain maintains a stable position in the overall Index rankings as improvements in energy equity are offset by a drop in energy security. Spain still balances the competing dimensions of the energy trilemma well. One of the world's larger energy importers, Spain maintains a diversified electricity mix and reduces distribution losses of electricity, although worse energy consumption to GDP growth ratio (data point update) cause its performance in energy security to deteriorate. Spain's energy equity ranking surges as gasoline prices decrease (and the data point for electricity prices becomes unavailable and an average gets used). Like many of its fellow EU members, Spain performs well on the environmental sustainability dimension, with 21% of its energy coming from nuclear power, 7% from hydro, and 24% from other renewables (mostly wind). Spain's contextual indicators are stable and good.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



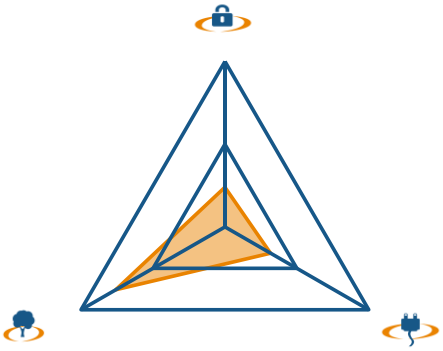
KEY METRICS

Industrial sector (% of GDP)	25.4	GDP per capita (PPP, USD); GDP Group	32,681 (II)
TPEP/TPEC (net energy importer)	0.26	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.20	CO_2 emissions (tCO_2) per capita	5.12
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In 2014, energy demand in Spain continued its decreasing tendency. However, there is evidence of a changing stable trend, as a result of economic recovery and a return to positive growth rates of energy consumption.
- The electricity market reform introduced by the Spanish Administration in 2013 with the main objective to eliminate the tariff deficit is on track to reaching its aim: the sector's costs and revenues are back in balance, and the accumulated deficit, which peaked at the end of 2013, should gradually disappear over the next 15 years.
- Spain has significantly increased its share of renewable sources in the primary energy mix in 2014, especially in power generation (40% to date), contributing to lowering the country's energy dependence. However, the lack of interconnections with Europe is viewed as an obstacle to further growth of the renewable energy sector in Spain, and enhanced security of supply. The EU agreed on a target of 10% share of interconnection capacity of total installed generation capacity for every member country by 2020; Spain's electricity interconnection capacity remains low, at around 6% of installed capacity.
- A new hydrocarbons law has recently been approved, creating a new single organised gas market operator, which will be responsible for managing a Spanish gas 'hub', i.e. a trading platform aimed at improving trade and prices of gas. This is an important step towards creating a European gas market and enhancing interconnections with Europe, especially taking into account that Spain has the largest LNG regasification capacity in the EU (one-third of total EU capacity).

TRILEMMA BALANCE



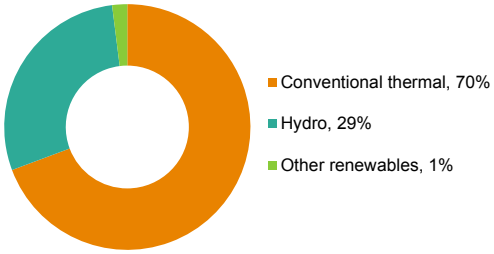
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	64	73	80	→	
Energy security	72	77	99	↓	C
Energy equity	80	83	85	→	C
Environmental sustainability	40	49	32	↑	B
Contextual performance	71	80	89	↓	
Political strength	76	87	85	↓	
Societal strength	54	55	61	→	
Economic strength	85	107	112	↓	
Overall rank and balance score	**69**	**80**	**86**	↓	**BCC**

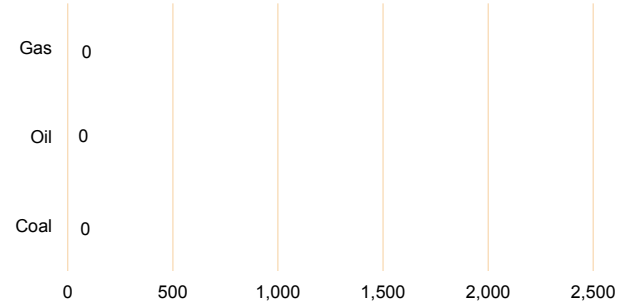
INDEX COMMENTARY

Sri Lanka's overall Index ranking drops by six places this year. A member of the 'Hydro-powered' grouping of countries, Sri Lanka has a high degree of environmental sustainability that is offset by lower performances on the energy security and equity dimensions. Its rank on the energy security dimension drops as lower distribution losses and a decreased dependence from fuel imports are offset by a comparatively accelerated energy consumption in relation to GDP growth rate (data point update). Energy equity performance is mostly stable with electricity supply perceived to be of slightly lower quality. Sri Lanka's low and decreasing levels of energy and emissions intensity cause its environmental footprint to further decrease. Contextually, all of Sri Lanka's indicators for political strength remain relatively flat, while indicators of societal and economic strength see slight deterioration.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

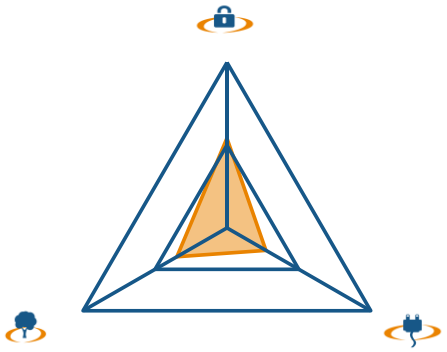


KEY METRICS

Industrial sector (% of GDP)	33.1	GDP per capita (PPP, USD); GDP Group	9,584 (III)
TPEP/TPEC (net energy importer)	0.17	Energy intensity (koe per USD)	0.06
Emission intensity (kCO_2 per USD)	0.08	CO_2 emissions (tCO_2) per capita	0.70
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	89

TRENDS AND OUTLOOK

TRILEMMA BALANCE



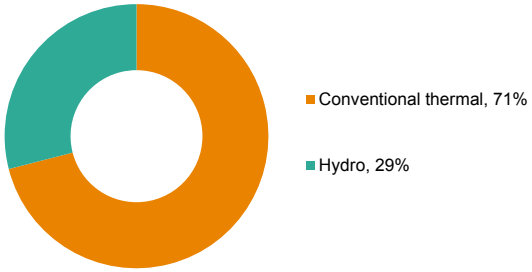
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	83	90	88	→	
Energy security	61	72	60	→	**B**
Energy equity	98	94	95	→	**C**
Environmental sustainability	76	79	85	→	**C**
Contextual performance	101	96	78	↑	
Political strength	105	100	91	↑	
Societal strength	98	99	100	→	
Economic strength	92	75	54	↑	
Overall rank and balance score	**92**	**92**	**92**	→	**BCC**

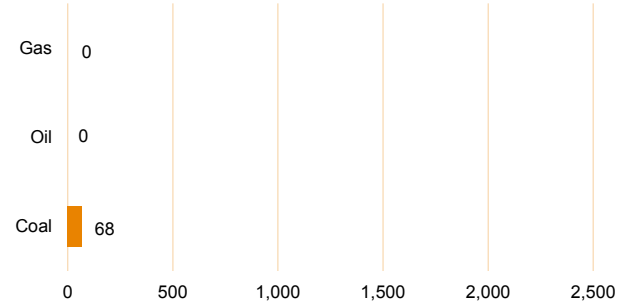
INDEX COMMENTARY

Swaziland maintains a stable position in the Index throughout the years. Energy security improves, largely driven by the use of up-to-date data points underlying the indicator for energy consumption in relation to GDP growth. On the energy equity dimension, Swaziland continues to lag, largely because only 42% of the country's population has access to electricity and electricity and gasoline are relatively expensive. Although it does not have high emissions intensity, the country struggles with mitigating its impact on the environment, reflected in poor air and water quality. Political and societal indicators are low but economic strength rises above average driven by a stronger macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



KEY METRICS

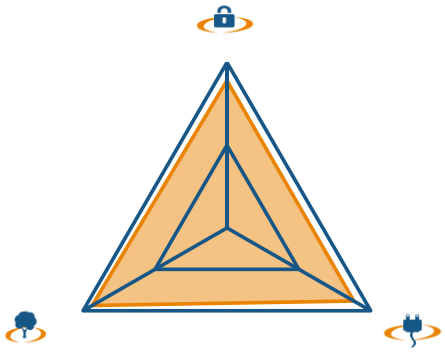
Industrial sector (% of GDP)	47.4	GDP per capita (PPP, USD); GDP Group	7,647 (III)
TPEP/TPEC (net energy importer)	0.90	Energy intensity (koe per USD)	0.14
Emission intensity (kCO_2 per USD)	0.18	CO_2 emissions (tCO_2) per capita	1.04
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	42

TRENDS AND OUTLOOK

- A trend towards an increased share of renewable energy in both power (off and on-grid) and fuel (biofuels) sector is apparent and the development of a renewable energy strategy, independent power producer policy, and feed-in tariffs are underway.
- Coal will continue to play an important role in the energy mix of Swaziland. The country has vast reserves and is considering building a 300 MW coal fired thermal power station using clean coal technologies, which is expected to supply the country and allow export to the Southern African Power Pool. However, companies are investing in cogeneration to replace coal. These efforts are expected to improve the country's energy independence by reducing the heavy reliance on imported energy.
- In addition, the country is looking to increase its strategic fuel reserves, enhance bulk purchasing (better prices), explore the possibility of setting up a petroleum products refinery, and tap into the natural gas market in Mozambique.
- The recently conducted GHG inventory, submitted to the UNFCCC in March 2012, shows that Swaziland is a net source for GHGs. The energy-related activities account for only 6.7% of total GHG emissions. There is, however, room for pollution reduction. That is why Swaziland has approved waste and air pollution regulations to enforce pollution control.
- Policymakers need to: 1) support the adoption of renewable energy technologies and the development of incentives to enable market penetration; and 2) increase the budget for the energy sector to enable economic development and poverty reduction, through increased rural electrification, energy access, research and development, development of skills, and capacity building.

AAA SCORE **SWEDEN** RANK 2

TRILEMMA BALANCE



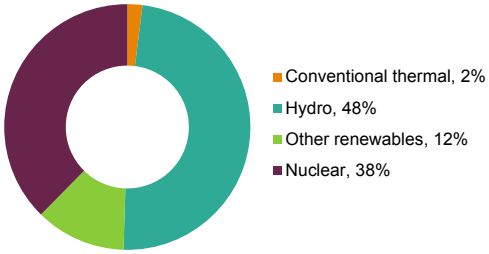
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		4	2	2	→	
	Energy security	24	20	16	→	**A**
	Energy equity	14	19	17	→	**A**
	Environmental sustainability	6	6	9	→	**A**
Contextual performance		5	5	7	→	
	Political strength	4	5	4	→	
	Societal strength	2	1	4	→	
	Economic strength	26	16	19	→	
Overall rank and balance score		**3**	**2**	**2**	→	**AAA**

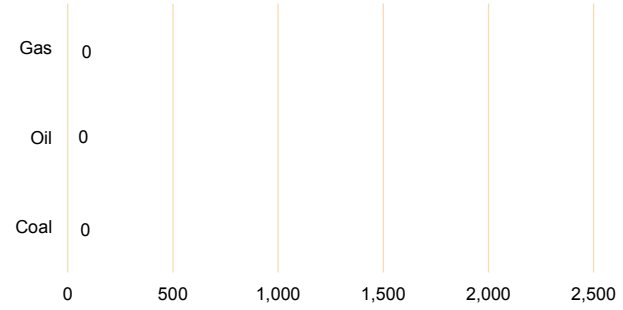
INDEX COMMENTARY

Sweden continues its exceptional performance in the Index and maintains its position overall. As a 'Pack leader', Sweden exhibits strong, well-balanced performance on all three energy dimensions. Energy security improves slightly as the country's energy production to consumption ratio betters. Performance on the energy equity dimension also improves as electricity and gasoline prices decline. The country's mitigation of its impact on the environment continues to rank among the best in the world, with comparatively low emissions intensity and air and water pollution levels. Part of Sweden's success on this dimension is undoubtedly due to its diverse electricity mix, with 98% of its electricity generation coming from low- or zero-carbon sources. Only 2% of electricity is generated using fossil fuels, and almost all oil plants have been either shut down or relegated to reserve use. Sweden performs extremely well on indicators of political and societal strength, with economic strength trailing slightly behind due solely to the country's high cost of living.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



KEY METRICS

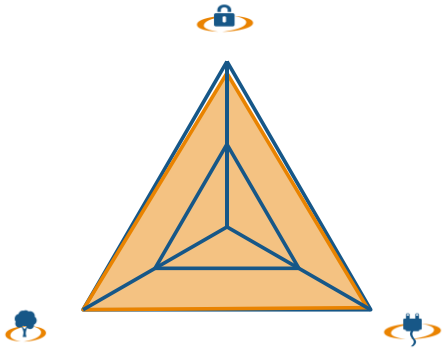
Industrial sector (% of GDP)	33.4	GDP per capita (PPP, USD); GDP Group	44,849 (I)
TPEP/TPEC (net energy importer)	0.64	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.11	CO_2 emissions (tCO_2) per capita	3.83
Energy affordability (USD per kWh, 2014)	0.21	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In order to maintain a high Index ranking, a key issue for Sweden is to make the transportation sector sustainable. Currently, the transportation sector (except trains, metro and trams) relies on fossil fuels. Special policies and financial support to incentivise the purchase of electric cars are in place, but results are not yet fulfilling expectations. The EU target to increase the share of biofuels used in transport to 10% by 2020 will be exceeded as the share has reached 18% already. This is mostly due to a rapid increase of blending of HVO-biodiesel and other biofuels in gasoline and diesel, and an increased number of cars running on biogas.
- Sweden has had a successful market-based green certificate system for promoting renewable energy sources (RES) in place from 2003, and since 2012 this is a joint system with Norway.
- Policymakers need to focus on finding a solution to replace the existing 10 nuclear reactors that will be taken out of operation gradually, to meet the future electricity demand. The first reactors are expected to close between 2018 and 2020. Vattenfall has taken a policy decision to close the two smallest reactors in Ringhals and E.ON is expected to close the smallest reactor in Oskarshamn within the same timeframe. Although the application to build new reactors has not been formally withdrawn, Vattenfall has currently stopped any further work on the application. In addition to finding measures to meet the EU CO_2 reduction and RES targets, energy efficiency needs to be a top priority.

1 RANK **SWITZERLAND** SCORE **AAA**

TRILEMMA BALANCE



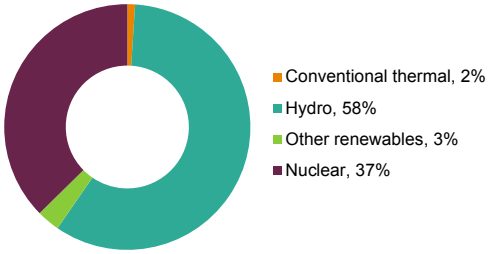
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	1	1	1	→	
Energy security	19	22	10	→	**A**
Energy equity	6	5	5	→	**A**
Environmental sustainability	1	1	1	→	**A**
Contextual performance	3	1	1	→	
Political strength	7	4	5	→	
Societal strength	6	2	1	→	
Economic strength	6	1	1	→	
Overall rank and balance score	**1**	**1**	**1**	→	**AAA**

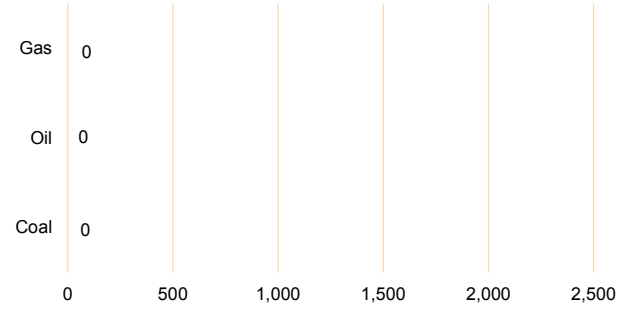
INDEX COMMENTARY

Switzerland maintains the top spot in the Index for yet another year and exhibits strong, balanced performances across the board, achieving top 10 rankings on all three dimensions. Energy security is Switzerland's least strong dimension, as the country imports around half of the energy it uses. Energy equity is high and Switzerland continues to be the best in the world at limiting its impact on the environment, with low levels of pollution and an ultra-low emission energy infrastructure, which utilizes fossil-fuelled power plants for only 1% of electricity generation. Contextual performance remains among the best in the world.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



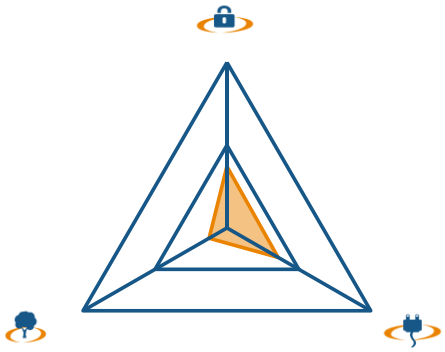
KEY METRICS

Industrial sector (% of GDP)	26.7	GDP per capita (PPP, USD); GDP Group	56,839 (I)
TPEP/TPEC (net energy importer)	0.47	Energy intensity (koe per USD)	0.08
Emission intensity (kCO_2 per USD)	0.12	CO_2 emissions (tCO_2) per capita	4.93
Energy affordability (USD per kWh, 2014)	0.21	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Switzerland's leading position in the Index reflects the country's past energy and energy-related policy decisions. However, the recent developments and expected changes are likely to have a strong impact on the country's energy sustainability balance.
- Most recent energy policy developments include the decision to refrain from building new nuclear power plants, which will be included in the new energy strategy that is under development and expected to be implemented fully by 2050. The necessary measures and next steps to phase out nuclear are not yet known and will be a matter of political discussions in the next few months (a public referendum is probable). To achieve the transition to a low-carbon energy system in the long term, in the mid-term Switzerland is likely to become more dependent on gas-fired electricity generation.
- Policymakers need to focus on: 1) construction of new electricity grids; 2) completing the liberalisation of the electricity market; and 3) come to a bilateral agreement with the European Union in order to participate in the European internal energy market and the EU-ETS. Furthermore, there is the need to be ambitious and increase the renovation rate of buildings as part of the transition to a low-carbon energy system.

TRILEMMA BALANCE



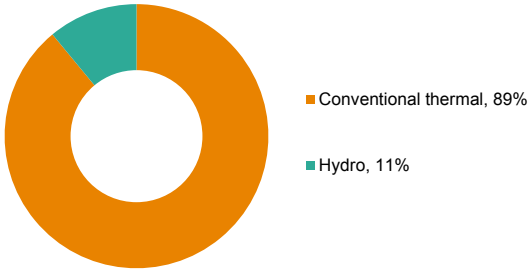
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	75	103	108	↓	
Energy security	52	64	82	↓	**C**
Energy equity	52	81	83	↓	**C**
Environmental sustainability	113	117	114	→	**D**
Contextual performance	117	127	130	↓	
Political strength	114	129	130	↓	
Societal strength	113	122	129	↓	
Economic strength	93	123	128	↓	
Overall rank and balance score	**87**	**119**	**123**	↓	**CCD**

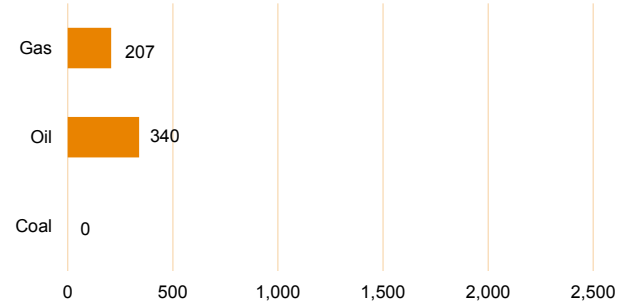
INDEX COMMENTARY

Overall, Syria drops four places in this year's Index. Syria's energy trilemma balance is weighted with low performances on the energy security and energy equity dimensions and a poor environmental sustainability ranking. Syria is an oil exporter, but its performance on the energy security dimension suffers as electricity distribution losses increase, the production to consumption ratio worsens and the availability of oil and oil product stocks decreases even further. Energy equity ranking remains stable. Meanwhile, the country's performance on its environmental sustainability lags far behind, with an emissions and energy-intensive economy, high levels of pollution, and an electricity generation mix that is 89% conventional thermal. Indicators of political, societal, and economic strength are all in the lowest percentile, reflecting some of the effects of Syria's civil war.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

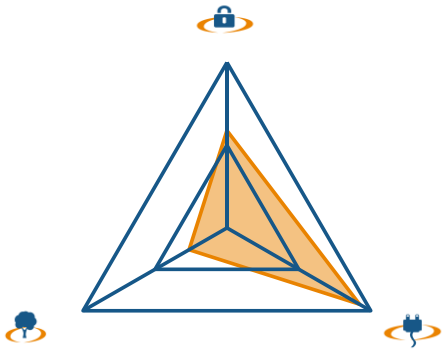


KEY METRICS

Industrial sector (% of GDP)	22.7	GDP per capita (PPP, USD); GDP Group	n/a (I)
TPEP/TPEC (net energy exporter)	1.23	Energy intensity (koe per USD)	-
Emission intensity (kCO_2 per USD)	-	CO_2 emissions (tCO_2) per capita	1.56
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	96

TRENDS AND OUTLOOK

TRILEMMA BALANCE



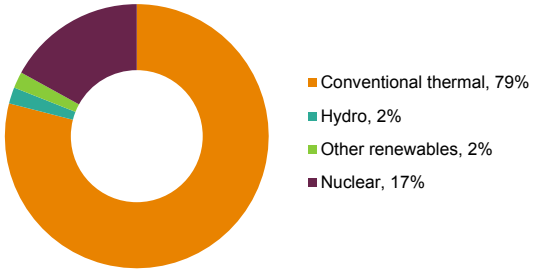
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	41	54	45	→	
Energy security	71	75	54	↑	**B**
Energy equity	22	14	12	→	**A**
Environmental sustainability	59	86	96	↓	**C**
Contextual performance	11	15	14	→	
Political strength	23	22	23	→	
Societal strength	22	24	23	→	
Economic strength	5	9	6	→	
Overall rank and balance score	**27**	**34**	**30**	→	**ABC**

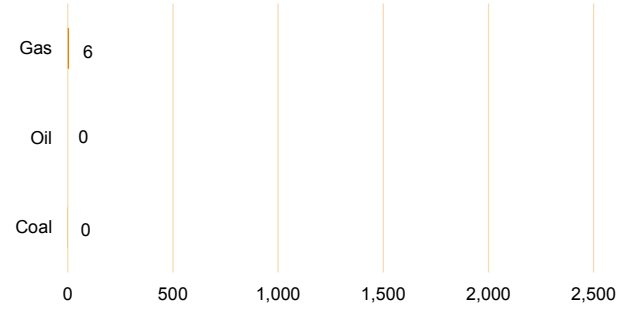
INDEX COMMENTARY

Taiwan maintains a stable position in the Index throughout the years. Average to low performances on the energy security and environmental sustainability dimensions are balanced out by a high degree of energy equity. Taiwan's energy security ranking is lower mostly due to its heavy reliance on energy imports. The island's small size and lack of natural energy resources means that it only produces 10% of the energy it consumes, although Taiwan is trying to change this by increasing the amount of nuclear and wind power in its electricity generation portfolio. The recent improvements are driven by the use of up-to-date data points underlying the indicator for energy consumption in relation to GDP growth. Energy equity, Taiwan's best performing dimension, is high. Taiwan sees a drop in environmental sustainability performance as the country is outperformed by its peers. Contextually, Taiwan continues to perform well with no noteworthy changes.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

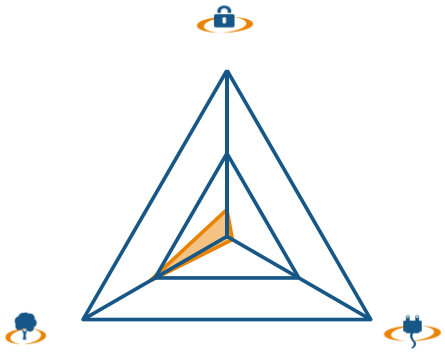


KEY METRICS

Industrial sector (% of GDP)	30.5	GDP per capita (PPP, USD); GDP Group	43,678 (I)
TPEP/TPEC (net energy importer)	0.10	Energy intensity (koe per USD)	0.23
Emission intensity (kCO_2 per USD)	0.54	CO_2 emissions (tCO_2) per capita	10.86
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	99

TRENDS AND OUTLOOK

TRILEMMA BALANCE



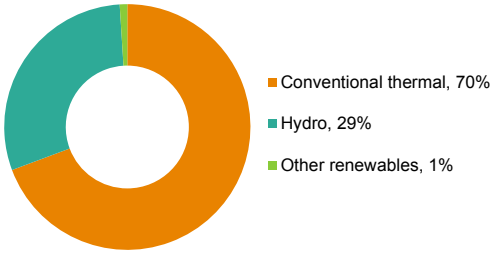
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	117	118	118	→	
Energy security	117	110	109	→	**D**
Energy equity	125	128	127	→	**D**
Environmental sustainability	53	52	61	→	**B**
Contextual performance	91	113	107	↓	
Political strength	89	92	90	→	
Societal strength	93	113	112	↓	
Economic strength	83	97	93	→	
Overall rank and balance score	**116**	**121**	**119**	→	**BDD**

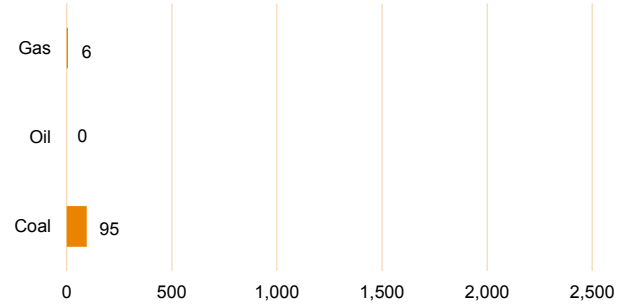
INDEX COMMENTARY

Tanzania maintains a fairly stable position in the Index throughout the years. The country performs poorly on the energy security dimension, challenged by a high reliance on energy imports, a domestic electricity generation portfolio that is largely hydropowered and vulnerable to droughts, and a high percentage of transmission and distribution losses. Tanzania ranks very low on the energy equity dimension with gasoline and electricity that are not affordable and only 15% of its population having access to electricity. Once the country develops economically and is able to provide modern energy services to a larger share of its population, it will face the challenge of continuing to meet growing demand while sustaining its currently small environmental footprint. Contextually, performance across most indicators remains low.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



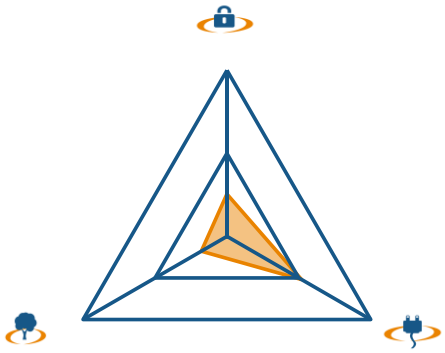
KEY METRICS

Industrial sector (% of GDP)	25.2	GDP per capita (PPP, USD); GDP Group	2,525 (IV)
TPEP/TPEC (net energy importer)	0.33	Energy intensity (koe per USD)	0.31
Emission intensity (kCO_2 per USD)	0.13	CO_2 emissions (tCO_2) per capita	0.20
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	15

TRENDS AND OUTLOOK

- Tanzania faces a shortage of energy services. Power generation capacities are still insufficient, transmission and distribution networks are inadequate, as well as a huge lack of investment, human capital and technology.
- The government is implementing a number of projects under Big Results Now (BRN) to increase power generation, access to electricity and bring reliable power to citizens for economic growth and social development. Generation and transmission projects are underway, which will bring close to 800 million standard square foot per day online and will be used for power generation (up to 3,000 MW), both for the industrial sector and households.
- Targets set by the government include: 1) increasing electricity access to 50% by 2025 and reaching 75% in 2033; 2) increasing electricity generation up to 3,000 MW in 2018 and 10,000 MW by 2025; and 3) reducing transmission and distribution losses to 12% by 2018. The government has also developed a number of initiatives, such as the Petroleum Policy, the PPP Act and participation in the Southern African Power Pool, to create an attractive environment for private investors as well as increase competitiveness and transparency in the energy sector.
- Policymakers need to continue to focus on 1) resource diversification (prioritising the development of hydro, other renewables and natural gas); 2) improving efficiency in the energy sector; 3) encouraging private sector participation; 4) mobilising financing for investments; and 5) developing human capital for the oil and gas industries.

TRILEMMA BALANCE



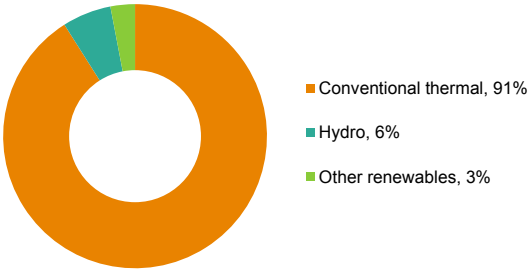
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		107	110	101	→	
	Energy security	91	95	97	→	**C**
	Energy equity	88	77	63	↑	**C**
	Environmental sustainability	101	107	107	→	**D**
Contextual performance		46	44	43	→	
	Political strength	75	77	79	→	
	Societal strength	70	62	63	↑	
	Economic strength	2	4	3	→	
Overall rank and balance score		**89**	**90**	**89**	→	**CCD**

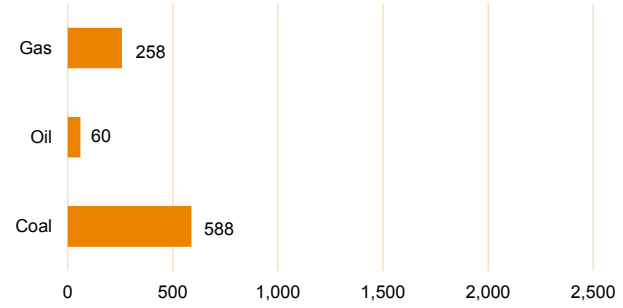
INDEX COMMENTARY

Overall, Thailand maintains a stable position in the Index throughout the years. Performance on all three dimensions is fairly low. Thailand's energy security ranking remains stable despite marginal improvements in the diversification of the electricity mix which is still almost entirely based on fossil fuels. Energy equity performance improves as electricity and gasoline become comparatively more affordable. Thailand struggles with its performance on the environmental sustainability dimension, as both energy and emissions intensities as well as air and water quality are high. Contextually, indicators are relatively stable across the board. Economic strength continues to be by far the strongest dimension, the result of a stable, growing economy, with very low cost of living, and a wide domestic availability of credit.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



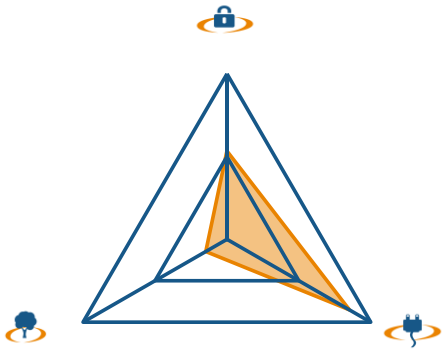
KEY METRICS

Industrial sector (% of GDP)	43.3	GDP per capita (PPP, USD); GDP Group	14,122 (III)
TPEP/TPEC (net energy importer)	0.48	Energy intensity (koe per USD)	0.16
Emission intensity (kCO_2 per USD)	0.30	CO_2 emissions (tCO_2) per capita	3.78
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- In order to enhance energy security and become more self-sufficient, the Thai government is committed to increase energy production. To achieve its goals, it will advance the exploration and production of energy resources at domestic and international levels; explore the joint development of energy resources with neighbouring economies; develop a more diversified energy mix; and encourage electricity production from renewable and other alternative energy sources.
- Alternative energy is very promising in Thailand. The government has developed a set of aggressive policies to encourage the production and use of alternative energy, in particular biofuels, biomass, solid waste and animal manure. These measures are expected to enhance energy security, reduce pollution and support farmers by encouraging the production and use of renewable energy at the community level.
- The Thai government is keen to encourage competition and investment in the energy industry by creating a business-friendly, transparent environment. To achieve its goals, a designated agency, the Investor Relation Office, will be responsible for investment procedures and processes in the energy industry. Furthermore, a mechanism for a company to be a 'service company' in the operations and maintenance of the electricity industry, refineries, gas separation plants and both domestic and overseas oil and gas rigs will be created.

TRILEMMA BALANCE



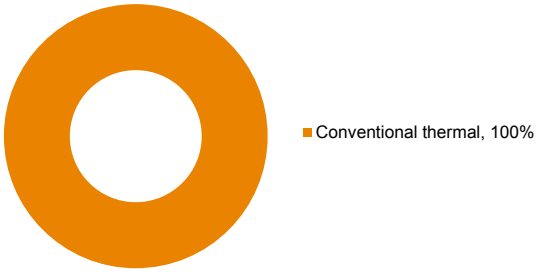
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	113	64	75	↑	
Energy security	79	50	61	↑	**B**
Energy equity	95	30	33	↑	**B**
Environmental sustainability	115	112	111	→	**D**
Contextual performance	53	59	56	→	
Political strength	53	52	53	→	
Societal strength	64	70	72	↓	
Economic strength	43	65	52	→	
Overall rank and balance score	**98**	**64**	**66**	↑	**BBD**

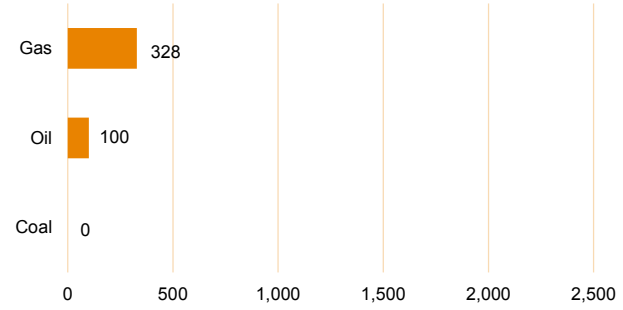
INDEX COMMENTARY

Trinidad and Tobago drops two places in this year's Index. Energy security for the oil and petroleum products exporter slightly deteriorates as oil stocks decrease and the consumption to production ratio worsens. The country's energy equity performance remains high as gasoline prices further decrease. Regarding the island nation's environmental footprint, greenhouse gas emissions, as well as energy and emissions intensity continue to be among the worst in the world. Contextually, political and societal indicators are stable this past year, whereas economic strength improves as macroeconomic stability increases.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)

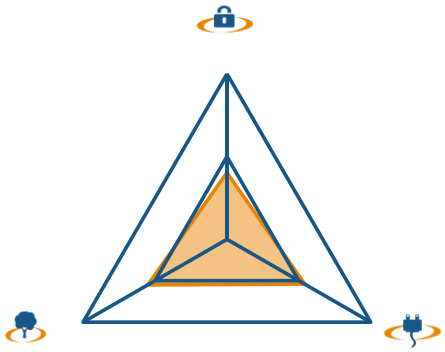


KEY METRICS

Industrial sector (% of GDP)	15.2	GDP per capita (PPP, USD); GDP Group	31,493 (II)
TPEP/TPEC (net energy exporter)	1.94	Energy intensity (koe per USD)	0.56
Emission intensity (kCO_2 per USD)	1.08	CO_2 emissions (tCO_2) per capita	28.31
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

TRILEMMA BALANCE



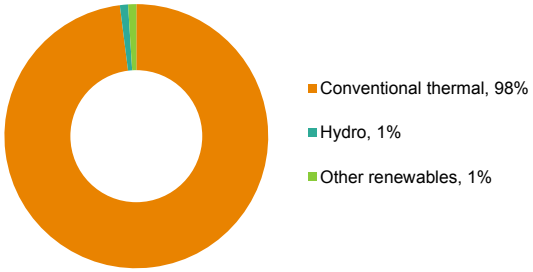
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	35	42	70	↓	
Energy security	28	36	78	↓	C
Energy equity	57	58	59	→	B
Environmental sustainability	56	57	59	→	B
Contextual performance	59	70	72	↓	
Political strength	70	85	87	↓	
Societal strength	60	60	60	→	
Economic strength	39	70	80	↓	
Overall rank and balance score	**36**	**45**	**71**	↓	**BBC**

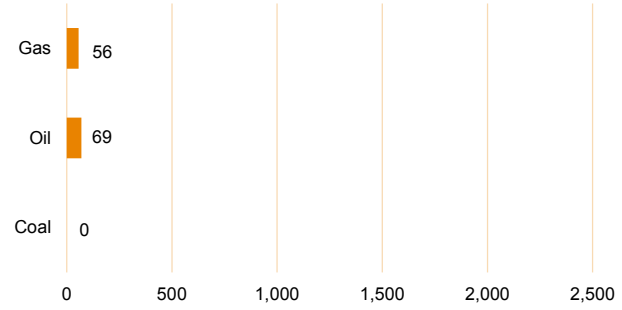
INDEX COMMENTARY

Tunisia drops 26 places in 2015, mostly due to a decrease in performance on the energy security dimension. Higher distribution and transmission losses, a worsening production to consumption ratio cause the energy security ranking to slip. However, the major drivers are up-to-date data points underlying the indicator for energy consumption in relation to GDP growth. Performance on energy equity and environmental sustainability see no major changes. Contextually, political and societal indicators remain stable. Despite high availability of credit to the private sector, Tunisia's economic stability performance slightly worsens due to weaker macroeconomic stability.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



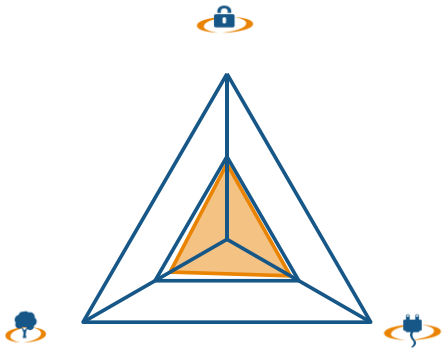
KEY METRICS

Industrial sector (% of GDP)	29.0	GDP per capita (PPP, USD); GDP Group	10,998 (III)
TPEP/TPEC (net energy importer)	0.66	Energy intensity (koe per USD)	0.10
Emission intensity (kCO_2 per USD)	0.22	CO_2 emissions (tCO_2) per capita	2.11
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Over the past few years, Tunisia has made continued efforts to sustain its economic development and improve the energy sustainability balance. To achieve the latter, policies have been implemented to manage the exploration and production of hydrocarbons that will allow Tunisia to accelerate its economic development and to establish its position on the world market. Furthermore, programmes for the promotion of energy efficiency, renewable energy and energy substitution have been instigated.
- Key issues policymakers need to focus on are: 1) increasing the share of renewable energy in electricity generation (including wind, solar and a new CSP scheme) and households (solar water heat, micro generation); and 2) extending the natural gas network in the south and central part of the country.

TRILEMMA BALANCE



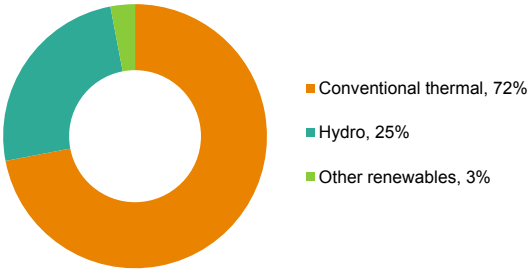
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		74	71	82	→	
	Energy security	64	63	71	→	C
	Energy equity	82	76	73	→	C
	Environmental sustainability	70	69	79	→	C
Contextual performance		68	69	62	→	
	Political strength	65	68	70	→	
	Societal strength	51	52	50	→	
	Economic strength	91	95	71	↑	
Overall rank and balance score		**75**	**73**	**76**	→	**CCC**

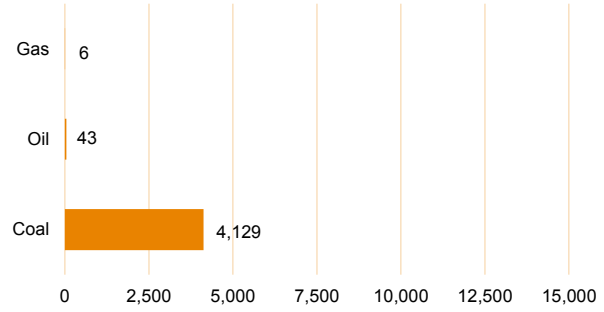
INDEX COMMENTARY

Turkey maintains a stable position in the Index throughout the years. The country balances the three competing sides of the energy trilemma well, despite below average rankings on all three dimensions. With regards to energy security, the country's performance deteriorates slightly as oil and oil product stocks decrease. Performance on the energy equity dimension does not display great changes as gasoline and electricity prices are stable. Turkey continues to struggle with mitigating its impact on the environment, although some progress is reflected in slightly lower energy and emissions intensity, progress in peer countries is faster. Contextually, Turkey's performance remains largely unchanged on the political and societal strength dimensions, but with a notable improvement in economic strength driven by greater access to credit to the private sector.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



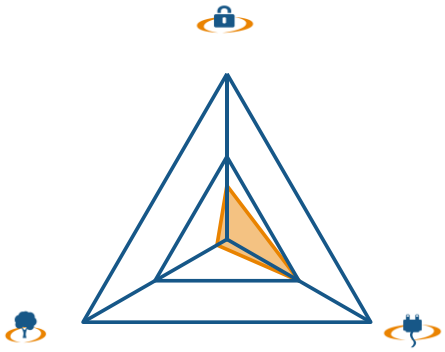
KEY METRICS

Industrial sector (% of GDP)	26.9	GDP per capita (PPP, USD); GDP Group	18,994 (II)
TPEP/TPEC (net energy importer)	0.28	Energy intensity (koe per USD)	0.11
Emission intensity (kCO_2 per USD)	0.28	CO_2 emissions (tCO_2) per capita	3.95
Energy affordability (USD per kWh, 2014)	0.17	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Turkey has to accommodate a fast-growing demand for energy and enormous investment volumes are required to meet this growth. Furthermore, only 23% of energy consumption is met by domestic resources, thus energy dependence is of great concern.
- Policymakers should consider increased support for the development of domestic resources, such as hydropower and lignite to meet the increasing energy demand.

TRILEMMA BALANCE



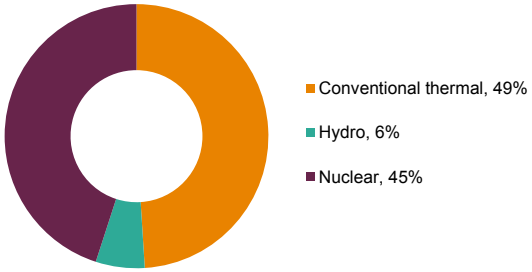
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	92	89	105	↓	
Energy security	59	54	88	↓	C
Energy equity	73	74	65	→	C
Environmental sustainability	114	116	121	→	D
Contextual performance	97	110	112	→	
Political strength	99	96	107	↓	
Societal strength	88	83	88	→	
Economic strength	101	113	110	→	
Overall rank and balance score	**97**	**94**	**110**	↓	**CCD**

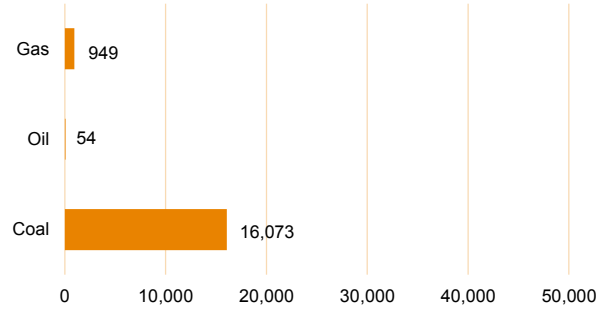
INDEX COMMENTARY

Ukraine drops 16 positions in this year's Index. Energy security deteriorates, mainly driven by an update in data points underlying the indicator for energy consumption in relation to GDP growth. The lower gasoline prices and an improved perceived quality of electricity services, help to enhance the energy equity ranking. From an environmental sustainability point of view, energy and emissions intensity decrease, but stay among the highest in the world. The deterioration is driven by peer countries outperforming Ukraine's strides towards a lower environmental impact. Contextual performance remains low with deterioration in the political and societal strength dimensions, and a slight improvement on the economic strength dimension. The effects of the 2014 Euromaidan Revolution and continued conflict does not yet reflect in the data assessed.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



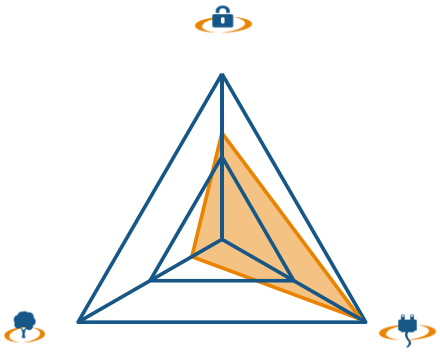
KEY METRICS

Industrial sector (% of GDP)	29.0	GDP per capita (PPP, USD); GDP Group	9,143 (III)
TPEP/TPEC (net energy importer)	0.64	Energy intensity (koe per USD)	0.34
Emission intensity (kCO_2 per USD)	0.78	CO_2 emissions (tCO_2) per capita	5.91
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Ukraine's energy sector faces great challenges, from a high dependence on expensive fossil fuel imports such as oil and gas, to inefficient infrastructure and markets. Recent energy policy developments to address those challenges include the decision to replace Russian gas by Ukrainian coal, increase oil and gas production, for example, from the Black Sea shelf, and develop the nuclear power capacity.
- Furthermore, there is a need to strengthen energy-efficiency policies, make full use of the country's renewable energy potential such as biogas and municipal waste for heat and power generation, and lower gas consumption in the district heating sector to ensure heat supply and lower energy bills.

TRILEMMA BALANCE



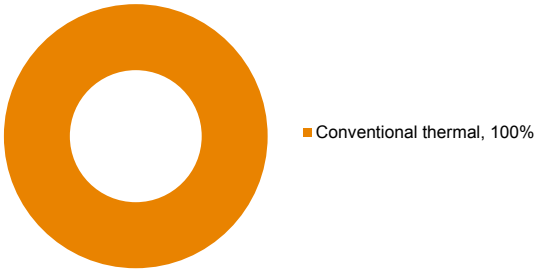
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	62	47	42	↑	
Energy security	49	47	47	→	**B**
Energy equity	37	8	6	↑	**A**
Environmental sustainability	102	102	103	→	**D**
Contextual performance	22	32	28	↓	
Political strength	39	35	33	↑	
Societal strength	33	34	26	↑	
Economic strength	11	45	43	↓	
Overall rank and balance score	**44**	**35**	**38**	→	**ABD**

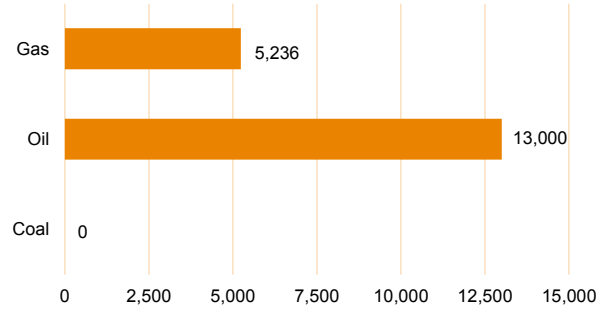
INDEX COMMENTARY

The United Arab Emirates maintains its overall stable Index position of rank 38 with minor changes across the board. Well endowed with deposits of oil and natural gas, the UAE maintains an above average energy security ranking. The country's energy equity performance continues to be among the best in the world, supported by very affordable gasoline. Similarly, electricity remains affordable and of high quality. Environmentally, emissions intensity and emissions from electricity generation are high given that the UAE's electricity mix is still 100% fossil-fuel based. Both the Emirates' first nuclear power plant that becomes operational in 2017, solar power projects and increased efforts to raise awareness around energy efficiency are likely to improve the UAE's energy security and environmental sustainability performances in the coming years. Contextually, the UAE performs well with strong and improving indicators across the board.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



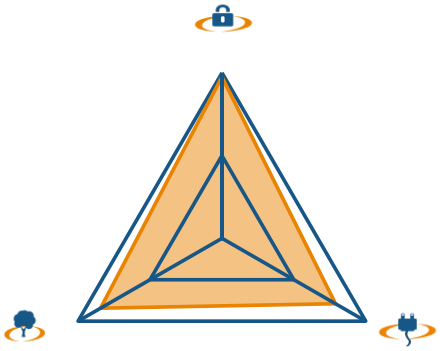
KEY METRICS

Industrial sector (% of GDP)	58.9	GDP per capita (PPP, USD); GDP Group	63,181 (I)
TPEP/TPEC (net energy exporter)	2.16	Energy intensity (koe per USD)	0.14
Emission intensity (kCO_2 per USD)	0.36	CO_2 emissions (tCO_2) per capita	19.06
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	98

TRENDS AND OUTLOOK

- The UAE has witnessed a high energy intensity trend over the last decade, and it could continue growing given the increasing opportunities of investment in the country. The UAE relies majorly on conventional hydrocarbon resources for electricity and transport, with electricity tariffs not reflecting the internal market cost of energy generation, which distorts the opportunity cost (for investments in other resources). There are opportunities for renewable energy and energy-efficiency solutions, and the UAE has already undertaken a number of investments to make improvements.
- The UAE has launched initiatives that are both economy and energy-related, such as Vision 2021, Dubai Plan 2021, or Abu Dhabi Vision 2030, which include the establishment of renewable energy (7% generation capacity in Abu Dhabi by 2020 and 5% consumption in Dubai by 2030) and energy efficiency targets (30% demand reduction target by 2030 in Dubai). The UAE is also working on a comprehensive energy policy plan to coordinate all federal initiatives.
- Diversification of the energy mix, energy efficiency and conservation as well as a deep understanding of the water-energy nexus in a water-scarce environment, are all issues policymakers need to focus on in the next years.
- Moreover, most recently it was announced that the leading oil producer in the UAE would scrap subsidies on petrol and diesel from August 2015 to support state finances, rationalise fuel consumption and protect natural resources and the environment.

TRILEMMA BALANCE



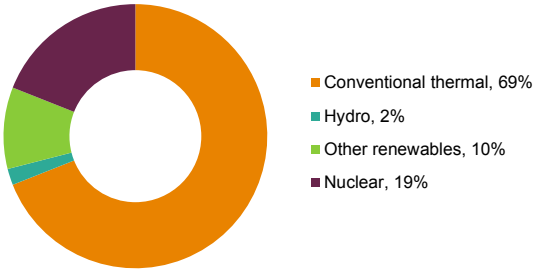
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	2	3	3	→	
Energy security	11	9	4	→	**A**
Energy equity	8	22	30	↓	**B**
Environmental sustainability	19	18	21	→	**A**
Contextual performance	27	20	18	→	
Political strength	21	21	20	→	
Societal strength	17	19	16	→	
Economic strength	55	35	33	↑	
Overall rank and balance score	**5**	**4**	**4**	→	**AAB**

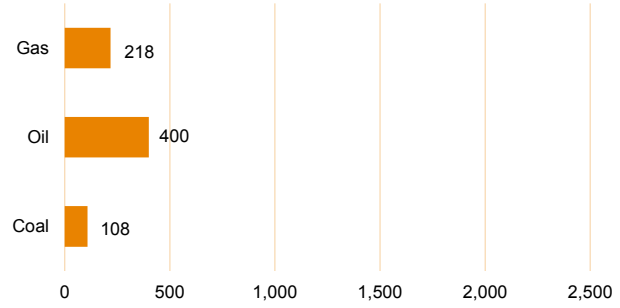
INDEX COMMENTARY

Overall, the United Kingdom maintains a stable position in the Index throughout the years. The UK remains a 'Pack leader' and continues to balance the energy trilemma very well, with good performance on all three energy dimensions. A more diversified electricity generation portfolio and lower import dependence result in a slightly higher energy security ranking. However, tightening capacity margins place the UK on the Index's watch list as the effects of ageing power plant infrastructure are not yet reflected in the data. Performance in energy equity suffers this year, as electricity becomes comparatively more expensive. The environmental sustainability performance is stable. Unlike most other 'Pack leaders', the UK still relies on fossil fuels for 69% of its electricity fuel mix. Contextually, indicators of political, societal and economic strength are robust.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



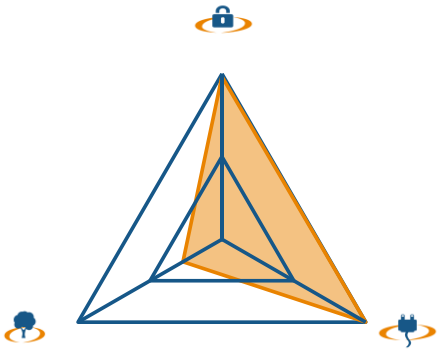
KEY METRICS

Industrial sector (% of GDP)	20.6	GDP per capita (PPP, USD); GDP Group	38,225 (I)
TPEP/TPEC (net energy importer)	0.62	Energy intensity (koe per USD)	0.09
Emission intensity (kCO_2 per USD)	0.21	CO_2 emissions (tCO_2) per capita	7.03
Energy affordability (USD per kWh, 2014)	0.26	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- The UK faces significant challenges in securing its energy supply. Domestic production of fossil fuels has steadily declined. Aspirations to produce unconventional oil and gas have to surmount technical barriers and secure public acceptance. In the power sector, the nuclear fleet is being run down, and many coal plants will be forced to close by European legislation. Constraints in domestic supply have been further aggravated by a number of unscheduled incidents in 2014, which have caused the closure of three power supply plants and four nuclear reactors.
- The UK is implementing policies that aim at decarbonising the power sector while securing supply through comprehensive reforms in the Energy Act 2013, notably contracts for difference to support low-carbon generation and the creation of a capacity market. A renewables energy target is already in place (15% of energy demand is to come from renewables by 2020). The fourth carbon budget has been confirmed, requiring a cut of 40% in CO_2 emissions compared with 1990, setting the UK on a path to meet its long-term objective of reducing GHG emissions by 80% by 2050 compared to 1990 levels.
- The greatest challenges for policymakers will be executing the reforms, monitoring their impact and if necessary adjusting the new policies to ensure they are effective while staying within the overall prescribed cost framework. Difficulties with implementation are vividly illustrated by the unsatisfactory start to the Green Deal, designed to drive more demand-side efficiency. Consistency of policy is also crucial to secure and maintain investments while reforms are being implemented.

TRILEMMA BALANCE



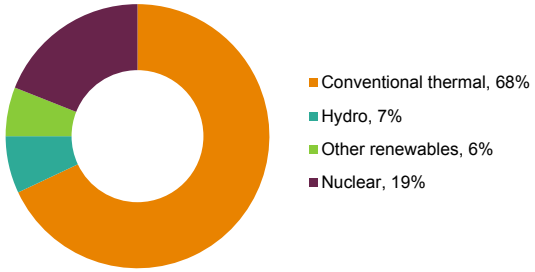
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	15	13	13	→	
Energy security	12	8	3	→	**A**
Energy equity	1	1	1	→	**A**
Environmental sustainability	86	83	95	→	**C**
Contextual performance	20	19	19	→	
Political strength	24	20	21	→	
Societal strength	27	21	21	→	
Economic strength	29	28	28	→	
Overall rank and balance score	**15**	**12**	**12**	→	**AAC**

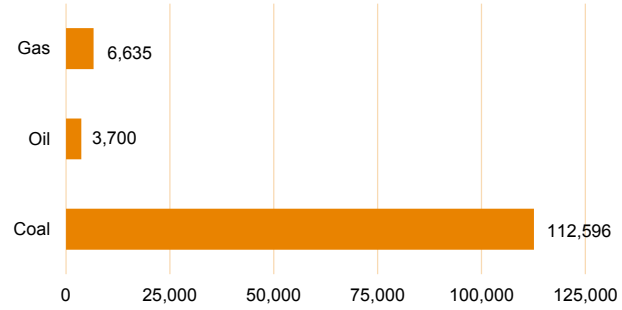
INDEX COMMENTARY

The United States maintains its position in this year's Index. The US balances the three dimensions of the energy trilemma in a fashion that is typical for a 'Fossil-fuelled' country. Strong performances on energy security and energy equity are partially offset by the country's large environmental footprint. An improved consumption to production ratio leads to improved better energy security ranking. The country maintains its global first place ranking on the energy equity dimension, as it continues to offer some of the most (relatively) affordable energy in the world. Performance on the environmental sustainability dimension lags behind, with high levels of energy and emission intensities. Contextually, the country's performance is constant and well above average.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



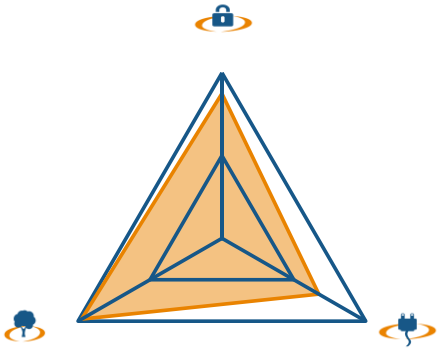
KEY METRICS

Industrial sector (% of GDP)	20.7	GDP per capita (PPP, USD); GDP Group	52,939 (I)
TPEP/TPEC (net energy importer)	0.82	Energy intensity (koe per USD)	0.15
Emission intensity (kCO_2 per USD)	0.36	CO_2 emissions (tCO_2) per capita	16.46
Energy affordability (USD per kWh, 2014)	0.13	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Due to advances in horizontal drilling and hydraulic fracturing, shale gas production has become economically viable in recent years. The Energy Information Administration (EIA) estimates that the country has more than 1,744 trn cubic feet of technically recoverable natural gas, including 211 tcf of proved reserves (the discovered, economically recoverable fraction of the original gas-in-place). Production of shale gas is expected to increase from a 2007 US total of 1.4 tcf to 4.8 tcf in 2020. The significant increases in domestic oil and gas production will greatly reduce oil imports over the next 10 years, and lead to increased exports of refined products and possibly natural gas.
- Important energy policy developments in the United States that will impact on the country's balance in the three dimensions of energy sustainability include: 1) the Environmental Protection Agency (EPA) regulations on coal leading to the projected closure of more than 200 coal plants in the next few years accounting for more than 10% of the USA's current energy production; 2) possible regulations on unconventional gas production; and 3) the extension (or not) of the wind production tax credit, which can cut the cost of developing a wind project by nearly a third.

TRILEMMA BALANCE



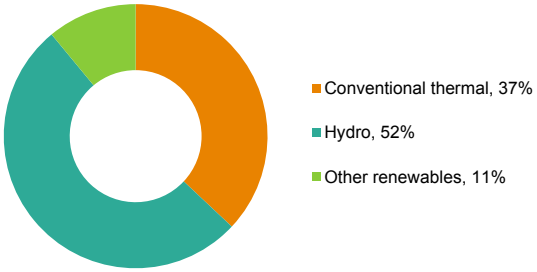
INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	47	33	6	↑	
Energy security	92	91	18	↑	**A**
Energy equity	67	41	44	↑	**B**
Environmental sustainability	5	7	4	→	**A**
Contextual performance	56	64	65	↓	
Political strength	42	45	44	→	
Societal strength	35	40	39	→	
Economic strength	86	117	118	↓	
Overall rank and balance score	**46**	**39**	**14**	↑	**AAB**

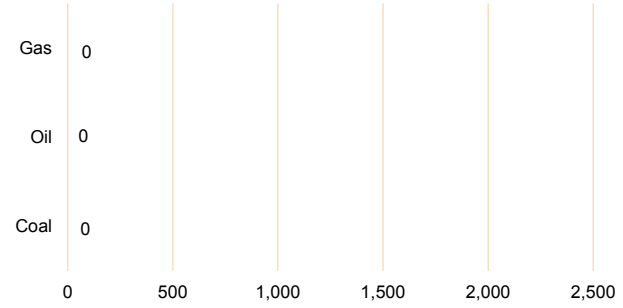
INDEX COMMENTARY

A member of the 'Hydro-powered' country grouping, Uruguay moves up 25 places in this year's Index rankings. This is largely due to a higher energy security ranking. The diversity of electricity generation improves, transmission and distribution losses decrease a little, and the dependence on fuel imports reduces. Moreover, the availability of up-to-date data points for indicators measuring oil and oil product stocks as well as energy consumption in relation to GDP growth allow for a better evaluation and lead to the uplift in the ranking. Performance on the energy equity dimension remains stable. Due to its low-carbon electricity generation profile, Uruguay continues to rank among the best in the world at mitigating its impact on the environment, with low energy and emissions intensities. Contextually, Uruguay performs similarly to last year in political and societal strength, but very poorly in economic strength.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



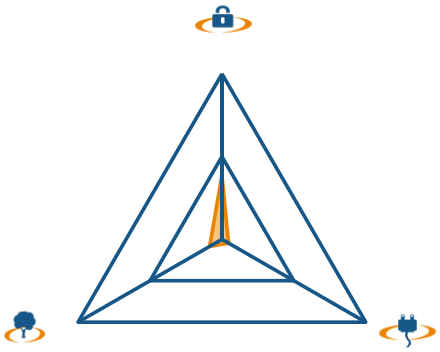
KEY METRICS

Industrial sector (% of GDP)	20.4	GDP per capita (PPP, USD); GDP Group	19,679 (II)
TPEP/TPEC (net energy importer)	0.43	Energy intensity (koe per USD)	0.09
Emission intensity (kCO_2 per USD)	0.12	CO_2 emissions (tCO_2) per capita	2.10
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	100

TRENDS AND OUTLOOK

- Uruguay has defined a long term (2030) National Energy Policy, approved by all political parties. The country has no proven oil, natural gas or coal reservoirs but a high availability of renewable energy sources. By carefully choosing renewable energy sources and technologies such as hydropower, wind energy, biomass cogeneration, and biofuels it was possible, without subsidies, to reach a 49.2% share of renewable energy in the 2013 energy mix (up from 30% in 2005). This has enhanced the country's energy sovereignty, sustainability, security, and contributed to the reduction of energy costs.
- Currently, the installed wind power capacity is 581 MW. Under the National Energy Policy, an additional 800 MW of wind energy are to be installed by 2015/2016 as part of the energy transformation. The average national power demand is currently 1,100 MW. Furthermore, a regasification LNG plant is under construction and 70% of the Uruguayan offshore area is being explored for natural gas and oil. Between 2010 and 2015 US$7 billion is being invested in the energy sector (15% of the annual GDP). As a result of this process, during the last two years Uruguay has moved from being an energy importer to become an energy exporter. For the first time in 20 years, during the last 33 months Uruguay did not have to import electricity. This is not yet reflected in this year's Index due to the fact that data reflects the years 2010 to 2012. Future Index editions will capture the improved Uruguayan situation.

TRILEMMA BALANCE



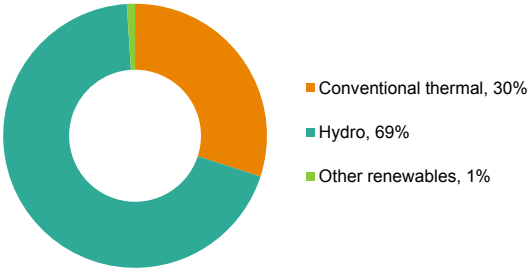
INDEX RANKINGS AND BALANCE SCORE

		2013	2014	2015	Trend	Score
Energy performance		129	129	126	→	
	Energy security	112	120	80	↑	**C**
	Energy equity	128	122	124	→	**D**
	Environmental sustainability	127	122	119	→	**D**
Contextual performance		124	107	93	↑	
	Political strength	127	122	120	↑	
	Societal strength	123	126	125	→	
	Economic strength	110	39	24	↑	
Overall rank and balance score		**129**	**129**	**125**	→	**CDD**

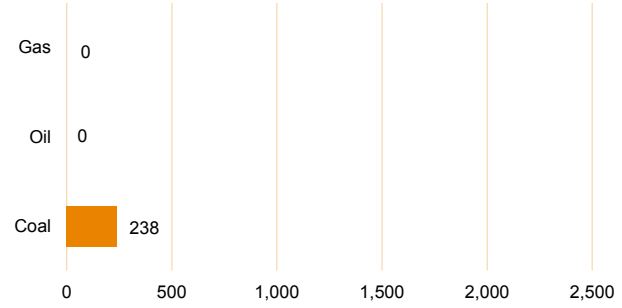
INDEX COMMENTARY

Zimbabwe gains four spots in the overall Index rankings. With virtually no fossil fuel resources of its own, Zimbabwe faces problems with meeting the growing energy demand from economic and social development. Energy security jumps up in the rankings mainly due to an update of the data points underlying the indicator for energy consumption in relation to GDP growth. In addition, progress can be seen in the diversification of the generation portfolio, the energy production to consumption ratio as well as a lower dependence on energy imports. Transmission and distribution losses increase substantially, offsetting some of the other improvements. Energy equity is very low, as only 40% of Zimbabweans have access to electricity, and gasoline and electricity prices continue to be unaffordable to the majority of the population. Due to the heavy use of coal and firewood, Zimbabwe is one of the most emissions-heavy, least efficient countries in the world. Zimbabwe still performs poorly on contextual indicators of political and societal strength. Economic strength stays above average and improves as cost of living remains comparatively low and macroeconomic stability increases.

DIVERSITY OF ELECTRICITY GENERATION



FOSSIL FUEL RESERVES (IN MTOE)



KEY METRICS

Industrial sector (% of GDP)	25.7	GDP per capita (PPP, USD); GDP Group	1,976 (IV)
TPEP/TPEC (net energy importer)	0.78	Energy intensity (koe per USD)	0.46
Emission intensity (kCO_2 per USD)	0.49	CO_2 emissions (tCO_2) per capita	0.71
Energy affordability (USD per kWh, 2014)	-	Population with access to electricity (%)	40

TRENDS AND OUTLOOK

- Over the past few years Zimbabwe has made continued efforts to improve its energy security, energy access and environmental footprint. Policy developments include: establishment of an independent energy regulator to regulate and supervise the entire energy sector; amendment of the Electricity Act to promote energy efficiency in the public utility; adoption of biofuels and incentives to promote uptake with a minimum target of 20% by 2015; promotion of public-private partnerships to spur development in the petroleum and power sector; adoption of a long-term, government-driven renewable energy technologies programme, which encourages independent power producers and public-private partnerships to develop renewable energy technologies in Zimbabwe; establishment of a comprehensive household energy plan addressing issues related to shortages, inefficient use of biomass and affordability of modern energy services; and establishment and adoption of energy-efficiency programmes.
- Key issues policymakers need to focus on are: 1) increase the use of renewable energy, including biofuels and the use of solar power, by developing appropriate incentives; 2) improve energy efficiency and decrease the high electricity losses (which are currently more than 30% because of inefficiency and obsolete equipment); and 3) develop mechanisms to increase power generation capacity.

Appendix A: Index methodology and balance score

The Energy Trilemma Index ranks countries in terms of their likely ability to provide a stable, affordable, and environmentally-sensitive energy system. The rankings are based on a range of country-level data and databases that capture energy performance and the contextual framework. Energy performance considers supply and demand, the affordability and access of energy, and the environmental impact of the country's energy use. The contextual indicators consider the broader circumstances of energy performance including societal, political and economic strength and stability.

Each country is also given a balance score identifying those that address the three dimensions of energy sustainability – energy security, energy equity, and environmental sustainability – equally well by giving them a score for high performance (AAA). Other letter scores (for example, BBC, CCD) show where countries need to improve to balance the energy trilemma. The goal of the score system is to help energy leaders identify areas to focus on to develop a balanced energy profile, necessary for minimising uncertainties and risks.

The findings of the Index analysis are complemented with the individual country profiles – of World Energy Council member countries only – captured in this report.

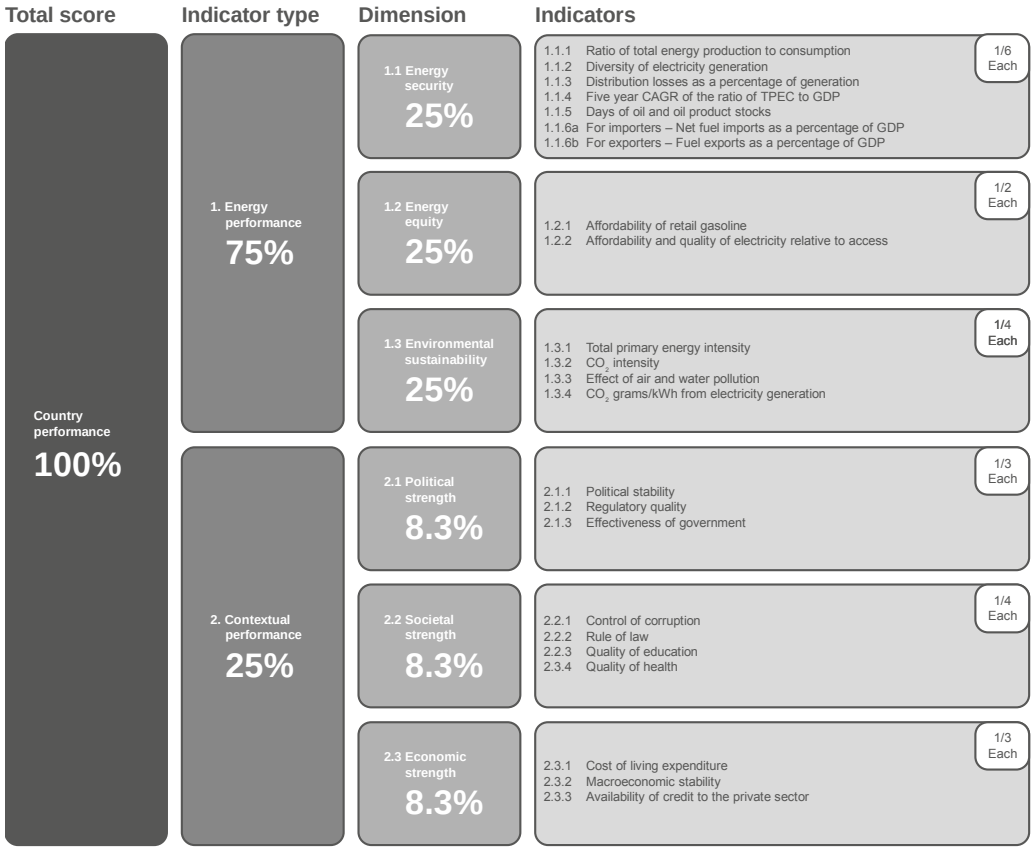
Indicators were selected based on the high degree of relevance to the research goals, exhibited low correlation, and could be derived from reputable sources to cover a high proportion of countries. The Index also includes 35 non-member countries and measures the performance of 130 countries. Data sources used include the International Energy Agency, the US Energy Information Administration, the World Bank, the International Monetary Fund, the World Economic Forum, Enerdata, the World Energy Council and others.

The structure of the Index and the coverage of its 23 indicators are set out in Figure A-1. More than 60 data sets are used to develop 23 indicators. The Index is weighted in favour of the energy performance axis by a ratio of 3:1, with the scores for each dimension carrying equal weight within their axis.

Overall, the Index displays the aggregate effect of energy policies applied over time in the context of each country and provides a snapshot of current energy sustainability performance. It is very difficult to compare the effectiveness of particular policies across countries, since each one interacts with a unique set of policies specific to that country. But it is possible to broadly measure the aggregate outcome of policies – for example, how countries with similar levels of energy intensity per capita perform in mitigating their environmental impact or the overall use of electricity per capita.

Full details of country scores in the three dimensions, further key metrics and analytical commentaries for each country can be found in the country profiles online at www.worldenergy.org. The full methodology can be obtained on request.

Figure A-1
Index structure
Source: World Energy Council/Oliver Wyman, 2014



Structure of the Index and selection of indicators

The structure of the Index and the selection of indicators have been governed by a suite of intellectual and pragmatic principles:

1. Relevance: Indicators are chosen or developed to provide insight into country situations in the context of the project goals.
2. Distinctiveness: Each indicator focuses on a different aspect of the issue being explored, unless reinforcement is required.
3. Balance: Indicators within each dimension (and dimensions across the Index) exhibit coverage of different issues.
4. Contextual sensitivity: Indicators capture different country situations (for example, wealth, size) and, where appropriate, indicators are normalised by gross domestic product (GDP) at purchasing power parity (PPP) and per capita.
5. Coverage: Individual indicators are required to provide data for 85% of World Energy Council member countries. Only countries with data available for at least 75% of all indicators were included in the Index calculation.
6. Robustness: Indicators to be taken from reputable sources with the most current information.
7. Comparability: Data to calculate an indicator is derived from a single source to ensure comparability between countries.

Data updates

The Index is based on 60 data sets which are used to develop 23 indicators. While some of the indicators are derived from a single data set, others are a combination of two, three or more subsets.

Where possible, data has been updated. However, due to constraints on the collection, processing, and dissemination of data, the current Index generally reflects data from 2011 to 2014. Recent world events that could affect the Index's outcomes are not completely captured. Policies generally take two to three years to become fully implemented and it may take longer for their effects to become evident.

While the majority of the indicators are updated annually or biannually, some are reviewed irregularly or at longer time intervals. These irregular updates sometimes lead to more significant changes of the individual indicator results, and hence the dimensional rankings.

For example, the World Bank's International Comparison Program (ICP) was published only twice so far: the first time with results for 2005 and the second time with results for 2011. The ICP produces internationally comparable price and volume measures for GDP with component expenditure based on purchasing power parities. The recently published ICP includes additional countries that were not covered before; others, such as Argentina and Lebanon, are not included anymore. As can be observed in the 2014 Index results, the data update and change of data availability for certain countries caused significant changes for indicators underlying the Index's energy equity and economic stability dimensions.

Following the release of the 2011 ICP survey for new purchasing power parity benchmarks, the International Monetary Fund in its World Economic Outlook's estimates of purchasing power parity weights and GDP valued at purchasing power parity have been updated. The changes made led to sometimes significant shifts for the indicators total primary energy intensity (1.3.1), emission intensity 1.3.2), as well as the five year CAGR of the ratio of TPEC to GDP (1.1.4).

Index results by GDP group

To understand how each dimension of the Index is affected by wealth, countries were also organised into four economic groups:

- Group I: GDP (PPP) per capita greater than US$33,500
- Group II: GDP (PPP) per capita between US$14,300 and US$33,500
- Group III: GDP (PPP) per capita between US$6,000 and US$14,300
- Group IV: GDP (PPP) per capita lower than US$6,000.

Figures A-2 to A-5 present the rankings of each country in these GDP groups.

Figure A-2

Country ranking for GDP Group I

Source: World Energy Council/Oliver Wyman, 2015

GDP group rank	Country	Importer/ Exporter	Energy security	Energy equity	Environmental sustainability	2015 index
1	Switzerland	I	10	5	1	1
2	Sweden	I	16	17	9	2
3	Norway	E	33	18	6	3
4	United Kingdom	I	4	30	21	4
5	Austria	I	44	9	11	5
6	Denmark	E	2	57	12	6
7	Canada	E	1	2	71	7
8	France	I	41	13	13	8
9	Finland	I	23	16	51	9
10	New Zealand	I	29	35	47	10
11	Netherlands	I	31	36	46	11
12	Unites States	I	10	1	95	12
13	Germany	I	25	46	44	13
14	Belgium	I	50	26	41	16
15	Australia	E	6	14	110	17
16	Luxembourg	I	105	3	31	19
17	Ireland	I	72	43	14	22
18	Singapore	I	120	15	25	23
19	Hong Kong, China	I	90	8	66	27
20	Qatar	E	36	4	101	29
21	Taiwan, China	I	54	12	96	30
22	Italy	I	63	50	23	31
23	Japan	I	83	19	49	32
24	Iceland	I	93	23	34	35
25	United Arab Emirates	E	47	6	103	38
26	Saudi Arabia	E	49	7	120	51
27	Bahrain	E	51	11	128	53
28	Korea (Rep.)	I	101	20	94	54
29	Oman	E	81	10	123	63
30	Kuwait	E	98	27	116	82

Figure A-3

Country ranking for GDP Group II

Source: World Energy Council/Oliver Wyman, 2015

GDP group rank	Country	Importer/ Exporter	Energy security	Energy equity	Environmental sustainability	2015 index
1	Uruguay	I	18	44	4	14
2	Spain	I	55	23	24	15
3	Costa Rica	I	64	53	2	20
4	Malaysia	E	19	24	76	21
5	Slovakia	I	26	34	50	24
6	Slovenia	I	45	40	40	25
7	Hungary	I	40	38	39	26
8	Lithuania	I	76	39	22	29
9	Portugal	I	62	68	26	34
10	Czech Republic	I	22	31	98	36
11	Brazil	I	43	78	17	37
12	Latvia	I	84	45	19	39
13	Mauritius	I	106	49	8	41
14	Gabon	E	8	96	10	42
15	Chile	I	57	51	81	43

GDP group rank	Country	Importer/ Exporter	Energy security	Energy equity	Environmental sustainability	2015 index
16	Croatia	I	77	41	33	44
17	Poland	I	32	32	104	45
18	Argentina	I	9	103	30	47
19	Mexico	E	37	61	80	48
20	Russia	E	15	37	108	49
21	Panama	I	104	54	15	52
22	Azerbaijan	E	11	67	74	55
23	Romania	I	20	75	97	56
24	Estonia	I	66	64	100	59
25	Cyprus	I	103	29	83	61
26	Greece	I	86	21	88	62
27	Trinidad & Tobago	E	61	33	111	66
28	Israel	I	116	25	87	69
29	Malta	I	129	55	64	72
30	Turkey	I	71	73	79	76
31	Kazakhstan	E	28	48	118	77
32	Bulgaria	I	48	80	112	81
33	Barbados	I	114	47	84	87
34	Venezuela	E	74	56	72	88
35	Iran	E	58	28	124	91
36	Iraq	E	39	42	115	93
37	Montenegro	I	118	72	93	98
38	Botswana	I	124	98	86	99
39	Libya	E	89	99	99	120
40	Lebanon	I	122	123	91	128

Figure A-4
Country ranking for GDP Group III
Source: World Energy Council/Oliver Wyman, 2015

GDP group rank	Country	Importer/ Exporter	Energy security	Energy equity	Environmental sustainability	2015 index
1	Colombia	E	13	58	3	18
2	Ecuador	E	5	62	27	33
3	Peru	I	27	84	36	40
4	Albania	I	59	86	5	46
5	Philippines	I	52	93	35	50
6	Algeria	E	70	52	53	57
7	Guatemala	I	73	76	16	58
8	Paraguay	E	68	100	7	60
9	Georgia	I	75	70	43	64
10	Indonesia	E	17	89	75	65
11	El Salvador	I	96	66	18	68
12	Tunisia	I	78	59	59	71
13	China	I	21	79	129	74
14	Namibia	I	108	92	28	78
15	Angola	E	67	109	20	83
16	South Africa	E	30	87	130	84
17	Egypt	E	56	81	52	85
18	Sri Lanka	I	99	85	32	86
19	Thailand	I	97	63	107	89
20	Swaziland	I	60	95	85	92

GDP group rank	Country	Importer/ Exporter	Energy security	Energy equity	Environmental sustainability	2015 index
21	Mongolia	E	42	94	127	94
22	Armenia	I	110	71	82	95
23	Jordan	I	113	60	90	97
24	Morocco	I	102	77	89	100
25	Dominican Republic	I	119	88	56	102
26	Macedonia	I	112	69	116	106
27	Ukraine	I	88	65	121	110
28	Serbia	I	95	74	126	112
29	Jamaica	I	126	82	105	117

Figure A-5

Country ranking for GDP Group IV

Source: World Energy Council/Oliver Wyman, 2015

GDP group rank	Country	Importer/ Exporter	Energy security	Energy equity	Environmental sustainability	2015 index
1	Bolivia	E	14	91	77	67
2	Ghana	E	38	107	42	70
3	Cameroon	E	24	111	37	73
4	Côte d'Ivoire	E	12	108	69	75
5	Nigeria	E	7	112	63	79
6	Chad	E	34	122	29	80
7	Vietnam	E	46	97	102	90
8	Congo (Dem. Rep.)	E	35	128	54	96
9	Tajikistan	I	79	106	48	101
10	Nepal	I	123	117	38	103
11	Mozambique	E	85	125	58	104
12	Ethiopia	I	91	121	45	105
13	India	I	69	105	122	108
14	Pakistan	I	6	14	73	16
15	Zambia	I	100	120	60	109
16	Kenya	I	107	114	57	111
17	Bangladesh	I	94	110	65	113
18	Nicaragua	I	111	101	67	114
19	Cambodia	I	121	116	70	115
20	Honduras	I	125	102	68	116
21	Mauritania	I	92	119	78	118
22	Tanzania	I	109	127	61	119
23	Madagascar	I	115	129	62	121
24	Niger	E	65	126	125	122
25	Syria	I	82	83	114	123
26	Malawi	I	117	130	55	124
27	Zimbabwe	I	80	124	119	125
28	Yemen	E	87	115	92	126
29	Moldova	I	130	90	113	127
30	Senegal	I	127	113	106	129
31	Benin	I	128	118	109	130

2015 Index profile groups

To support decision makers, the 2015 Index analysis highlights five distinct profiles. Countries in each group share common energy trilemma characteristics and challenges. While simplified and not comprehensive, these profiles serve as benchmark guides to other countries with similar preconditions.

- Pack leaders: top performers in terms of both dimensional balance and overall ranking on the Index.
- Fossil-fuelled: well endowed with fossil fuel resources, tend to rely heavily on fossil fuels for electricity generation with associated comparatively high CO_2 emissions per kWh generated, trilemma profile is imbalanced and is tilted towards energy security and energy equity, while they struggle to minimise their environmental impact.
- Highly-industrialised: emerging economies with large manufacturing sectors (30% or higher), trilemma profile is imbalanced and is tilted heavily towards energy security, with progress needed to ensure energy equity and environmental sustainability.
- Hydro-powered: have a high share of electricity generation from hydropower (40% or higher), trilemma profile is imbalanced and is tilted towards the environmental sustainability dimension, although these countries also perform reasonably well on the energy security dimension.
- Back of the pack: tightly clustered, less-developed and developing countries that struggle to make progress on all three dimensions.

Only 42 of the 95 World Energy Council member countries are included in the five illustrative groups. While some countries may be closely associated with one group from the point of view of region, economy, or structure of the energy sector, others cannot be readily classified into a single profile as they may align to two profiles.

Readers are encouraged to review the detailed country profiles presented in this report to consider which energy profile serves as a guide for a particular country.

Score system methodology

The Index ranking measures both energy and contextual performance of a country. Although the weighting of the dimensions is tilted towards the energy dimensions, the contextual dimensions often give an advantage to developed countries while penalising developing countries. Furthermore, the Index ranking does not indicate how well a country is meeting the energy trilemma challenge (balancing the three dimensions).

To overcome this challenge, a balance score system that highlights how well a country manages the trade-offs between the three competing dimensions was introduced. The score looks at the energy performance only – energy security, energy equity and environmental sustainability. This leaves aside the performance in the three contextual dimensions – political, societal and economic strength.

The score enables the World Energy Council to identify and show countries that perform very well in the energy dimensions and balance the energy trilemma, by giving them an easy to understand score for high performance. High performers

receive a score of AAA, while countries that do not yet perform well receive a DDD score.

The scores are calculated by splitting the normalised 0–10 results on the energy performance dimensions into four groups. Countries were then provided with a three-letter score. Note, the sequence of the letters in the score does not correspond to a specific energy dimension, but presents the letter scores in descending alphabetical order.

The best score A was given for results higher than 8. Countries with normalised results higher than 5 were given score B. Average results of between 2.51 and 5 were given a C. Lastly, the score D was given for underperformance.

To ensure that countries' scores are upgraded or downgraded only in the case of a systemic trend (as opposed to a short-term fluctuation), a 10% 'margin of appreciation' is used (see Figure A-6). For a country to be awarded a new score for any of the dimensions it has to exceed the set margin in case of an improvement, or fall below in case of deterioration. Otherwise, the 2013 balance score remains in place.

The following countries' scores fall within the margin of appreciation and were hence not up or downgraded in 2014: Angola, Belgium, Cambodia, Colombia, Estonia, Finland, Indonesia, Iran, Korea (Rep.), Kuwait, Latvia, Mauritania, Mongolia, New Zealand, Oman, Peru, Portugal, Saudi Arabia, Senegal, and Swaziland.

Figure A-6

Balance score system

Source: World Energy Council/Oliver Wyman, 2014

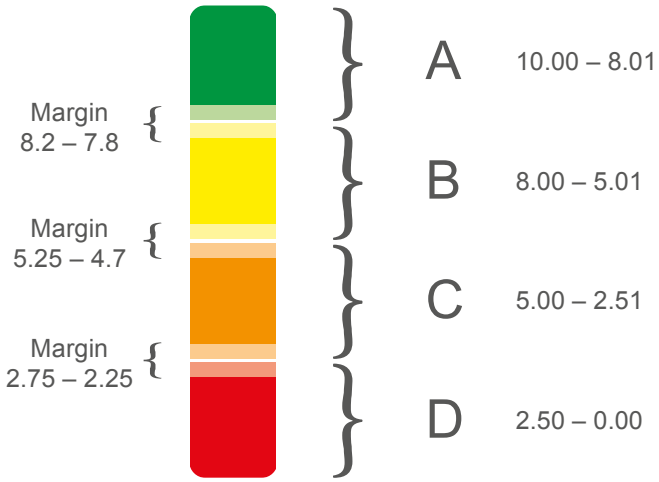


Figure A-7

2015 Energy Trilemma Index ranking and balance score

Source: World Energy Council/Oliver Wyman, 2015

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
1	Switzerland	AAA	10	4	1
2	Sweden	AAA	16	17	9
3	Norway	AAB	33	18	6
4	United Kingdom	AAB	4	30	21
5	Austria	AAB	44	9	11
6	Denmark	AAB	2	57	12
7	Canada	AAC	1	2	71
8	France	AAB	41	13	13
9	Finland	AAB	23	16	51
10	New Zealand	ABB	29	35	47
11	Netherlands	BBB	31	36	46
12	United States	AAC	3	1	95
13	Germany	BBB	25	46	44
14	Uruguay	AAB	18	44	4
15	Spain	AAB	55	23	24
16	Belgium	ABB	50	26	41
17	Australia	AAD	6	14	110
18	Colombia	AAB	13	58	3
19	Luxembourg	ABD	105	3	31
20	Costa Rica	ABB	64	53	2
21	Malaysia	AAC	19	24	76
22	Ireland	ABC	72	43	14
23	Singapore	ABD	120	15	25
24	Slovekia	ABB	26	34	50
25	Slovenia	BBB	45	40	40
26	Hungary	BBB	40	38	39
27	Hong Kong, China	ABC	90	8	66
28	Qatar	ABD	36	4	101
29	Lithuania	ABC	76	39	22
30	Taiwan, China	ABC	54	12	96
31	Italy	ABC	63	50	23
32	Japan	ABC	83	19	49
33	Ecuador	ABB	5	62	27
34	Portugal	ABC	62	68	26
35	Iceland	ABC	93	22	34
36	Czech Republic	ABC	43	31	98
37	Brazil	ABC	47	78	17
38	United Arab Emirates	ABD	22	6	103
39	Latvia	ABC	84	45	19
40	Peru	ABC	27	84	36
41	Mauritius	ABD	106	49	8
42	Gabon	AAC	8	96	10
43	Chile	BBC	57	51	81
44	Croatia	BBC	77	41	33
45	Poland	BBD	32	32	104
46	Albania	ABC	59	86	5
47	Argentina	ABD	9	103	30
48	Mexico	BBC	37	61	80
49	Russia	ABD	15	37	108
50	Phillipines	BBC	52	93	35
51	Saudi Arabia	ABD	49	7	120
52	Panama	ABD	104	54	15
53	Bahrain	ABD	51	11	128
54	Korea (Rep.)	ACD	101	20	94
55	Azerbaijan	ABC	11	67	74
56	Romania	ACC	20	75	97
57	Algeria	BBC	70	52	53
58	Guatemala	ACC	73	76	16
59	Estonia	BCD	66	64	100
60	Paraguay	ACD	68	100	7
61	Cyprus	BCD	103	29	83
62	Greece	ACC	86	21	88
63	Oman	ACD	81	10	123
64	Georgia	BCC	75	70	43
65	Indonesia	ACC	17	89	75

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
66	Trinidad & Tobago	BBD	61	33	111
67	Bolivia	ACC	14	91	77
68	El Salvador	ACC	96	66	18
69	Israel	BCD	116	25	87
70	Ghana	BBD	38	107	42
71	Tunisia	BBC	78	59	59
72	Malta	BCD	129	55	64
73	Cameroon	ABD	24	110	37
74	China	ACD	21	79	129
75	Côte d'Ivoire	ACD	12	108	69
76	Turkey	CCC	71	73	79
77	Kazakhstan	ABD	28	48	118
78	Namibia	BCD	108	92	28
79	Nigeria	ACD	7	112	63
80	Chad	BBD	34	122	29
81	Bulgaria	BCD	48	79	112
82	Kuwait	BCD	98	27	116
83	Angola	ACD	67	109	20
84	South Africa	BCD	30	87	130
85	Egypt	BBC	56	81	52
86	Sri Lanka	BCC	99	85	32
87	Barbados	BCD	114	47	84
88	Venezuela	BCC	74	56	72
89	Thailand	CCD	97	63	107
90	Vietnam	BDD	46	97	102
91	Iran	BBD	58	28	124
92	Swaziland	BCC	60	95	85
93	Iraq	BBD	39	42	115
94	Mongolia	BCD	42	94	127
95	Armenia	CCD	110	71	82
96	Congo (Dem. Rep.)	BBD	35	128	54
97	Jordan	BCD	113	60	90
98	Montenegro	CCD	118	72	93
99	Botswana	CDD	124	98	86
100	Morocco	CCD	102	77	89
101	Tajikistan	BCD	79	106	48
102	Dominican Republic	BCD	119	88	56
103	Nepal	BDD	123	117	38
104	Mozambique	BCD	85	125	58
105	Ethiopia	BCD	91	121	45
106	Macedonia	CDD	112	69	116
107	India	BDD	53	104	122
108	Pakistan	BCD	69	105	73
109	Zambia	BDD	100	120	60
110	Ukraine	CCD	88	65	121
111	Kenya	BDD	107	114	57
112	Serbia	CDD	95	74	126
113	Bangladesh	CCD	94	110	65
114	Nicaragua	BDD	111	101	67
115	Cambodia	CDD	121	116	70
116	Honduras	BDD	125	102	68
117	Jamaica	CDD	126	82	105
118	Mauritania	CCD	92	119	78
119	Tanzania	BDD	109	126	61
120	Libya	CCD	89	99	99
121	Madagascar	BDD	115	129	62
122	Niger	BDD	65	126	125
123	Syria	CCD	82	83	114
124	Malawi	BDD	117	130	55
125	Zimbabwe	CDD	80	124	119
126	Yemen	CCD	87	115	92
127	Moldova	CDD	130	90	113
128	Lebanon	CDD	122	123	91
129	Senegal	DDD	127	113	106
130	Benin	DDD	128	118	109

Figure A-8

2014 Energy Trilemma Index ranking and balance score

Source: World Energy Council/Oliver Wyman, 2014

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
1	Switzerland	AAA	22	5	1
2	Sweden	AAA	20	19	6
3	Norway	AAB	45	15	5
4	United Kingdom	AAA	9	22	18
5	Denmark	AAB	6	47	9
6	Canada	AAB	1	2	56
7	Austria	AAB	44	10	8
8	Finland	ABB	26	16	37
9	France	AAB	41	11	10
10	New Zealand	AAB	16	28	42
11	Germany	BBB	27	42	27
12	United States	AAC	8	1	83
13	Australia	AAD	10	3	98
14	Netherlands	BBB	55	33	31
15	Spain	ABB	37	46	24
16	Colombia	AAC	5	63	4
17	Slovakia	ABB	15	37	34
18	Luxembourg	AAD	109	4	23
19	Costa Rica	ABB	51	56	2
20	Qatar	AAD	3	6	103
21	Belgium	ABB	65	29	32
22	Ireland	ABC	69	39	13
23	Japan	ABB	62	20	41
24	Slovenia	BBB	52	40	45
25	Portugal	ABB	53	65	22
26	Malaysia	ABC	28	21	84
27	Hong Kong, China	ABD	101	9	60
28	Czech Republic	ABC	12	38	87
29	Italy	ABC	70	48	21
30	Brazil	ABC	29	86	19
31	Iceland	ABC	94	18	36
32	Croatia	ABC	74	31	26
33	Hungary	BBB	43	53	35
34	Taiwan, China	ACC	75	14	86
35	United Arab Emirates	ABD	47	8	102
36	Ecuador	ABB	23	52	28
37	Lithuania	ABC	90	45	20
38	Mexico	BBC	30	43	74
39	Uruguay	ABC	91	41	7
40	Peru	ABC	18	97	38
41	Singapore	BBD	124	35	50
42	Poland	BBC	32	36	91
43	Latvia	ABD	96	59	14
44	Panama	ABC	86	50	17
45	Tunisia	BBB	36	58	57
46	Mauritius	ABD	107	60	15
47	Bahrain	ABD	40	13	126
48	Guatemala	BBC	31	73	29
49	Gabon	ABC	33	89	12
50	Russia	ABD	2	44	104
51	Greece	ABC	59	23	82
52	El Salvador	ABC	61	71	11
53	Chile	BCC	89	55	67
54	Romania	ACC	4	78	95
55	Korea (Rep.)	BCD	98	25	85
56	Kazakhstan	AAD	13	17	118
57	Albania	ACC	83	84	3
58	Philippines	BBC	34	93	51
59	Angola	ABD	25	100	25
60	Argentina	ABC	14	96	44
61	Barbados	BBD	117	34	40
62	Bolivia	ACC	7	88	70
63	Cyprus	BCD	106	32	77
64	Trinidad and Tobago	BBD	50	30	112
65	Malta	BCD	128	51	65

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
66	Israel	BCD	104	27	88
67	Bulgaria	ACD	24	80	109
68	Saudi Arabia	ABD	68	7	125
69	Indonesia	ACD	17	64	106
70	Cameroon	BBD	38	111	30
71	Azerbaijan	ABD	21	57	99
72	Oman	ACD	97	12	124
73	Turkey	BCC	63	76	69
74	China	ACD	19	82	127
75	Estonia	BCD	71	68	115
76	Kuwait	BCD	79	26	121
77	Paraguay	ACD	81	103	16
78	Georgia	BCD	102	67	39
79	Algeria	BCC	80	49	78
80	Sri Lanka	BCC	77	83	49
81	Nigeria	ACD	11	108	81
82	Venezuela	BBC	56	62	73
83	South Africa	BCD	42	85	129
84	Armenia	CCC	92	66	75
85	Egypt	BBC	58	54	89
86	Côte d'Ivoire	BCD	35	110	66
87	Vietnam	BDD	39	99	101
88	Namibia	BCD	123	92	46
89	Iran	BCD	66	24	120
90	Thailand	CCD	95	77	107
91	Botswana	CDD	126	98	71
92	Swaziland	CCD	72	94	79
93	Mozambique	BCD	67	124	61
94	Ukraine	BCD	54	74	116
95	Montenegro	CCD	116	69	93
96	Ghana	CCD	78	106	76
97	Dominican Republic	BCD	111	87	54
98	Mongolia	BDD	49	95	128
99	Mauritania	BDD	48	115	94
100	Congo (Dem. Rep.)	BBD	46	126	58
101	Chad	BCD	85	121	48
102	Macedonia	CDD	103	75	111
103	Malawi	BCD	93	129	33
104	Kenya	BCD	84	114	63
105	Nicaragua	BDD	100	101	59
106	Tajikistan	BCD	82	107	53
107	Honduras	BDD	114	102	55
108	Jordan	BDD	112	61	114
109	Nepal	BDD	125	117	43
110	Niger	BCD	57	127	92
111	Morocco	CCD	118	72	96
112	Jamaica	CCD	121	79	90
113	Zambia	BDD	108	118	62
114	Libya	CCD	73	91	108
115	Ethiopia	BDD	99	119	47
116	Serbia	CDD	105	70	119
117	Cambodia	CDD	115	113	64
118	Pakistan	BDD	60	104	97
119	Syria	BCD	64	81	117
120	Madagascar	CCD	88	125	72
121	Tanzania	BDD	110	128	52
122	India	CDD	76	105	123
123	Lebanon	CDD	127	123	68
124	Moldova	CDD	119	90	113
125	Bangladesh	CDD	113	112	80
126	Yemen	CDD	87	109	110
127	Senegal	CDD	122	116	100
128	Benin	DDD	129	120	105
129	Zimbabwe	DDD	120	122	122

Figure A-9

2013 Energy Trilemma Index ranking and balance score

Source: World Energy Council/Oliver Wyman, 2013

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
1	Switzerland	AAA	19	6	1
2	Denmark	AAA	3	25	10
3	Sweden	AAA	24	14	6
4	Austria	AAB	33	7	7
5	United Kingdom	AAA	11	8	19
6	Canada	AAB	1	2	60
7	Norway	AAB	51	10	8
8	New Zealand	AAB	15	26	37
9	Spain	AAA	22	16	23
10	France	AAB	44	5	9
11	Germany	ABB	31	11	30
12	Netherlands	ABB	42	23	35
13	Finland	ABB	37	21	45
14	Australia	AAD	10	3	97
15	United States	AAC	12	1	86
16	Japan	ABB	48	17	33
17	Belgium	ABB	63	13	34
18	Qatar	AAC	8	9	95
19	Luxembourg	ABD	107	4	29
20	Ireland	ABC	82	30	15
21	Costa Rica	ABB	57	45	2
22	Slovakia	ABB	20	38	48
23	Portugal	ABB	55	53	20
24	Colombia	AAC	5	85	4
25	Slovenia	BBB	60	27	42
26	Argentina	ABB	14	33	38
27	Taiwan, China	ABC	71	22	59
28	Italy	ABC	69	34	24
29	Panama	ABB	53	58	18
30	Croatia	ABC	66	31	21
31	Hungary	BBB	46	42	44
32	Czech Republic	ABC	16	32	90
33	Iceland	ABC	96	15	41
34	Brazil	ABC	27	86	17
35	Ecuador	ABB	25	62	28
36	Tunisia	BBB	28	57	56
37	Malaysia	BBC	34	40	92
38	Bahrain	AAD	23	19	125
39	Greece	ABC	54	18	81
40	Hong Kong, China	ABD	99	24	58
41	Mexico	BBC	29	47	75
42	Lithuania	ABC	93	46	26
43	Latvia	ABD	98	54	14
44	United Arab Emirates	BBD	49	37	102
45	Peru	ABC	21	96	43
46	Uruguay	ACC	92	67	5
47	Singapore	BBD	124	43	51
48	Poland	BBC	38	39	94
49	El Salvador	ABC	68	64	11
50	Barbados	ABD	118	41	25
51	Saudi Arabia	ABD	45	12	124
52	Romania	ACC	9	70	88
53	Mauritius	ABD	109	60	16
54	Russia	ABD	2	61	99
55	Bolivia	ACC	4	84	71
56	Gabon	ABC	35	92	12
57	Chile	BCC	90	56	72
58	Kazakhstan	ABD	6	35	116
59	Angola	ABD	7	104	31
60	Albania	ACC	87	76	3
61	Guatemala	BBC	40	75	36
62	Oman	ACD	78	20	120
63	Cyprus	BCD	104	36	80
64	Korea (Rep.)	BCD	103	49	85
65	Philippines	BBC	39	93	54

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
66	Kuwait	**BCD**	73	28	122
67	Israel	**BCD**	102	29	83
68	Estonia	**BCD**	65	51	117
69	Sri Lanka	**BCC**	72	80	40
70	Bulgaria	**ACD**	26	77	108
71	Malta	**BCD**	128	48	65
72	Georgia	**ACD**	106	66	22
73	Indonesia	**ACD**	17	83	104
74	Paraguay	**ACD**	84	99	13
75	Turkey	**BCC**	64	82	70
76	Egypt	**BBC**	47	59	84
77	Venezuela	**BBC**	41	55	82
78	China	**ADD**	18	101	126
79	South Africa	**BCD**	43	78	128
80	Congo (Dem. Rep.)	**BBD**	30	121	27
81	Azerbaijan	**BCD**	32	74	98
82	Cameroon	**BBD**	62	107	39
83	Montenegro	**BCD**	115	71	57
84	Nigeria	**ACD**	13	111	79
85	Armenia	**CCC**	95	69	73
86	Macedonia	**BCD**	89	50	106
87	Syria	**BBD**	52	52	113
88	Algeria	**CCC**	86	68	74
89	Thailand	**CCD**	91	88	101
90	Namibia	**BCD**	123	94	49
91	Iran	**BCD**	75	44	119
92	Swaziland	**BCD**	61	98	76
93	Côte d'Ivoire	**BCD**	36	108	68
94	Malawi	**BCD**	74	129	32
95	Mongolia	**BDD**	50	100	129
96	Jordan	**BDD**	119	63	107
97	Ukraine	**BCD**	59	73	114
98	Trinidad and Tobago	**CCD**	79	95	115
99	Botswana	**BDD**	126	97	62
100	Honduras	**BCD**	111	90	52
101	Vietnam	**CDD**	77	102	105
102	Ghana	**CCD**	85	105	77
103	Mozambique	**CCD**	67	124	66
104	Chad	**BCD**	83	123	50
105	Morocco	**CCD**	110	79	96
106	Serbia	**CDD**	101	65	118
107	Tajikistan	**BCD**	81	109	61
108	Kenya	**BCD**	88	114	63
109	Lebanon	**CCD**	127	87	89
110	Dominican Republic	**BDD**	114	106	55
111	Nepal	**BDD**	125	122	46
112	Ethiopia	**BDD**	97	119	47
113	Nicaragua	**CCD**	100	91	87
114	Pakistan	**BDD**	56	103	100
115	India	**CDD**	76	110	121
116	Tanzania	**BDD**	117	125	53
117	Libya	**CCD**	70	72	123
118	Cambodia	**CDD**	121	113	67
119	Mauritania	**BDD**	58	117	112
120	Zambia	**BDD**	108	120	64
121	Jamaica	**CDD**	116	81	110
122	Niger	**CCD**	80	127	91
123	Bangladesh	**CDD**	113	115	78
124	Madagascar	**CDD**	105	126	69
125	Moldova	**CDD**	122	89	109
126	Senegal	**CDD**	120	118	93
127	Yemen	**CDD**	94	112	111
128	Benin	**DDD**	129	116	103
129	Zimbabwe	**DDD**	112	128	127

Figure A-10

2015 mapping of the balance scores using the heat map system

Source: World Energy Council/Oliver Wyman, 2015

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
1	Switzerland	AAA	9.30	9.68	10.00
2	Sweden	AAA	8.83	8.75	9.37
3	Norway	AAB	7.51	8.68	9.61
4	United Kingdom	AAB	9.76	7.75	8.44
5	Austria	AAB	6.66	9.37	9.22
6	Denmark	AAB	9.92	5.65	9.14
7	Canada	AAC	10.00	9.92	4.57
8	France	AAB	6.89	9.06	9.06
9	Finland	AAB	8.29	8.83	6.12
10	New Zealand	ABB	7.82	7.36	6.43
11	Netherlands	BBB	7.67	7.28	6.51
12	United States	AAC	9.84	10.00	2.71
13	Germany	BBB	8.13	6.51	6.66
14	Uruguay	AAB	8.68	6.66	9.76
15	Spain	AAB	5.81	8.29	8.21
16	Belgium	ABB	6.20	8.06	6.89
17	Australia	AAD	9.61	8.99	1.55
18	Colombia	AAB	9.06	5.58	9.84
19	Luxembourg	ABD	1.93	9.84	7.67
20	Costa Rica	ABB	5.11	5.96	9.92
21	Malaysia	AAC	8.60	8.21	4.18
22	Ireland	ABC	4.49	6.74	8.99
23	Singapore	ABD	0.77	8.91	8.13
24	Slovakia	ABB	8.06	7.44	6.20
25	Slovenia	BBB	6.58	6.97	6.97
26	Hungary	BBB	6.97	7.13	7.05
27	Hong Kong, China	ABC	3.10	9.37	4.96
28	Qatar	ABD	7.28	9.76	2.24
29	Lithuania	ABC	4.18	7.05	8.37
30	Taiwan, China	ABC	5.89	9.14	2.63
31	Italy	ABC	5.19	6.20	8.21
32	Japan	ABC	3.64	8.60	6.27
33	Ecuador	ABB	9.68	5.27	7.98
34	Portugal	ABC	5.27	4.80	8.06
35	Iceland	ABC	2.86	8.37	7.44
36	Czech Republic	ABC	8.37	7.67	2.48
37	Brazil	ABC	6.74	4.03	8.75
38	United Arab Emirates	ABD	6.43	9.61	2.09
39	Latvia	ABC	3.56	6.58	8.60
40	Peru	ABC	7.98	3.56	7.28
41	Mauritius	ABD	1.86	6.27	9.45
42	Gabon	AAC	9.45	2.63	9.30
43	Chile	BBC	5.65	6.12	3.79
44	Croatia	BBC	4.10	6.89	7.51
45	Poland	BBD	7.59	7.59	2.01
46	Albania	ABC	5.50	3.41	9.68
47	Argentina	ABD	9.37	2.09	7.75
48	Mexico	BBC	7.20	5.34	3.87
49	Russia	ABD	8.91	7.20	1.70
50	Philippines	BBC	6.04	2.86	7.36
51	Saudi Arabia	ABD	6.27	9.53	0.77
52	Panama	ABD	2.01	5.89	8.91
53	Bahrain	ABD	6.12	9.22	0.15
54	Korea (Rep.)	ACD	2.24	8.52	2.79
55	Azerbaijan	ABC	9.22	4.88	4.34
56	Romania	ACC	8.52	4.26	2.55
57	Algeria	BBC	4.65	6.04	5.96
58	Guatemala	ACC	4.41	4.18	8.83
59	Estonia	BCD	4.96	5.11	2.32
60	Paraguay	ACD	4.80	2.32	9.53
61	Cyprus	BCD	2.09	7.82	3.64
62	Greece	ACC	3.41	8.37	3.25
63	Oman	ACD	3.79	9.30	0.54
64	Georgia	BCC	4.26	4.65	6.74
65	Indonesia	ACC	8.75	3.17	4.26

Index	Country	Balance score	Energy security	Energy equity	Environmental sustainability
66	Trinidad & Tobago	ABD	5.34	7.51	1.47
67	Bolivia	ACC	8.99	3.02	4.10
68	El Salvador	ACC	2.63	4.96	8.68
69	Israel	BCD	1.08	8.13	3.33
70	Ghana	BBD	7.13	1.78	6.82
71	Tunisia	BBC	4.03	5.50	5.50
72	Malta	BCD	0.07	5.81	5.11
73	Cameroon	ABD	8.21	1.47	7.20
74	China	ACD	8.44	3.87	0.07
75	Côte d'Ivoire	ACD	9.14	1.70	4.72
76	Turkey	CCC	4.57	4.41	3.95
77	Kazakhstan	ABD	7.90	6.35	0.93
78	Namibia	BCD	1.70	2.94	7.90
79	Nigeria	ACD	9.53	1.39	5.19
80	Chad	BBD	7.44	0.62	7.82
81	Bulgaria	BCD	6.35	3.87	1.39
82	Kuwait	BCD	2.48	7.98	1.00
83	Angola	ACD	4.88	1.62	8.52
84	South Africa	BCD	7.75	3.33	0.00
85	Egypt	BBC	5.73	3.79	6.04
86	Sri Lanka	BCC	2.40	3.48	7.59
87	Barbados	BCD	1.24	6.43	3.56
88	Venezuela	BCC	4.34	5.73	4.49
89	Thailand	CCD	2.55	5.19	1.78
90	Vietnam	BDD	6.51	2.55	2.17
91	Iran	BBD	5.58	7.90	0.46
92	Swaziland	BCC	5.42	2.71	3.48
93	Iraq	BBD	7.05	6.82	1.16
94	Mongolia	BCD	6.82	2.79	0.23
95	Armenia	CCD	1.55	4.57	3.72
96	Congo (Dem. Rep.)	BBD	7.36	0.15	5.89
97	Jordan	BCD	1.31	5.42	3.10
98	Montenegro	CCD	0.93	4.49	2.86
99	Botswana	CDD	0.46	2.48	3.41
100	Morocco	CCD	2.17	4.10	3.17
101	Tajikistan	BCD	3.95	1.86	6.35
102	Dominican Republic	BCD	0.85	3.25	5.73
103	Nepal	BDD	0.54	1.00	7.13
104	Mozambique	BCD	3.48	0.38	5.58
105	Ethiopia	BCD	3.02	0.69	6.58
106	Macedonia	CDD	1.39	4.72	1.00
107	India	BDD	5.96	2.01	0.62
108	Pakistan	BCD	4.72	1.93	4.41
109	Zambia	BDD	2.32	0.77	5.42
110	Ukraine	CCD	3.25	5.03	0.69
111	Kenya	BDD	1.78	1.24	5.65
112	Serbia	CDD	2.71	4.34	0.31
113	Bangladesh	CCD	2.79	1.47	5.03
114	Nicaragua	BDD	1.47	2.24	4.88
115	Cambodia	CDD	0.69	1.08	4.65
116	Honduras	BDD	0.38	2.17	4.80
117	Jamaica	CDD	0.31	3.72	1.93
118	Mauritania	CCD	2.94	0.85	4.03
119	Tanzania	BDD	1.62	0.23	5.34
120	Libya	CCD	3.17	2.40	2.40
121	Madagascar	BDD	1.16	0.07	5.27
122	Niger	BDD	5.03	0.23	0.38
123	Syria	CCD	3.72	3.64	1.24
124	Malawi	BDD	1.00	0.00	5.81
125	Zimbabwe	CDD	3.87	0.46	0.85
126	Yemen	CCD	3.33	1.16	2.94
127	Moldova	CDD	0.00	3.10	1.31
128	Lebanon	CDD	0.62	0.54	3.02
129	Senegal	DDD	0.23	1.31	1.86
130	Benin	DDD	0.15	0.93	1.62

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