

World Energy Trilemma Index | 2016

EXECUTIVE SUMMARY

IN PARTNERSHIP WITH OLIVER WYMAN

BENCHMARKING THE SUSTAINABILITY OF NATIONAL ENERGY SYSTEMS

The World Energy Council's definition of energy sustainability is based on three core dimensions: energy security, energy equity, and environmental sustainability. The Energy Trilemma Index ranks countries' energy performance around the world and provides a framework to benchmark progress.

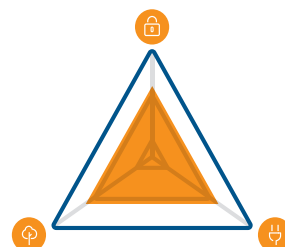
The 2016 Energy Trilemma Index reveals signs of progress on all dimensions of the energy trilemma. Thirteen of the 125 countries assessed achieve a triple-A score. Efforts to increase resource productivity and manage energy demand growth will be key in ensuring a balanced energy trilemma.

Among the countries included in the Index, access to electricity and clean cooking have both increased by 5% to 85% and 74%, respectively since 2000. Meanwhile, cleaner forms of energy are being used to support energy access and economic growth, with renewables making up 9.7% of total primary energy consumption in 2015. A more diversified and low-carbon energy mix will help to improve energy security and environmental sustainability but its positive effects may be stifled by rising energy consumption, which is predicted to increase by up to 46% by 2060.

This year Denmark, Switzerland and Sweden top the Index, with Denmark also achieving the highest score for energy security. While not in the top 10 overall, Luxembourg maintains its position for most equitable (affordable and accessible) and the Philippines is leading the way on the environmental sustainability dimension. In Latin America, Uruguay ranks the highest, while in the Middle East, Israel outperforms its regional peers. In Sub-Saharan Africa, Mauritius performs best, and in Asia, New Zealand remains at the top of the regional leader board.

TRILEMMA INDEX 2016: TOP 10 COUNTRIES

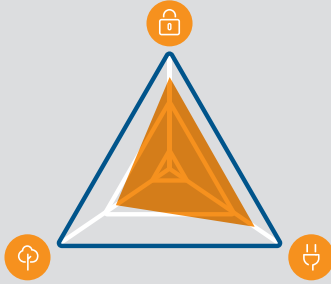
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|----------------|----------------|
| 1. Denmark | 6. France |
| 2. Switzerland | 7. Norway |
| 3. Sweden | 8. Finland |
| 4. Netherlands | 9. New Zealand |
| 5. Germany | 10. Austria |



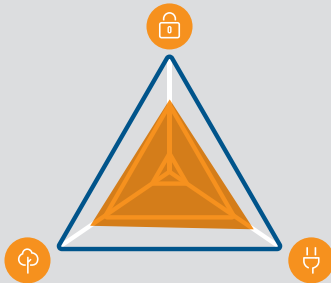


WORLD ENERGY TRILEMMA INDEX 2016: REGIONAL OVERVIEWS

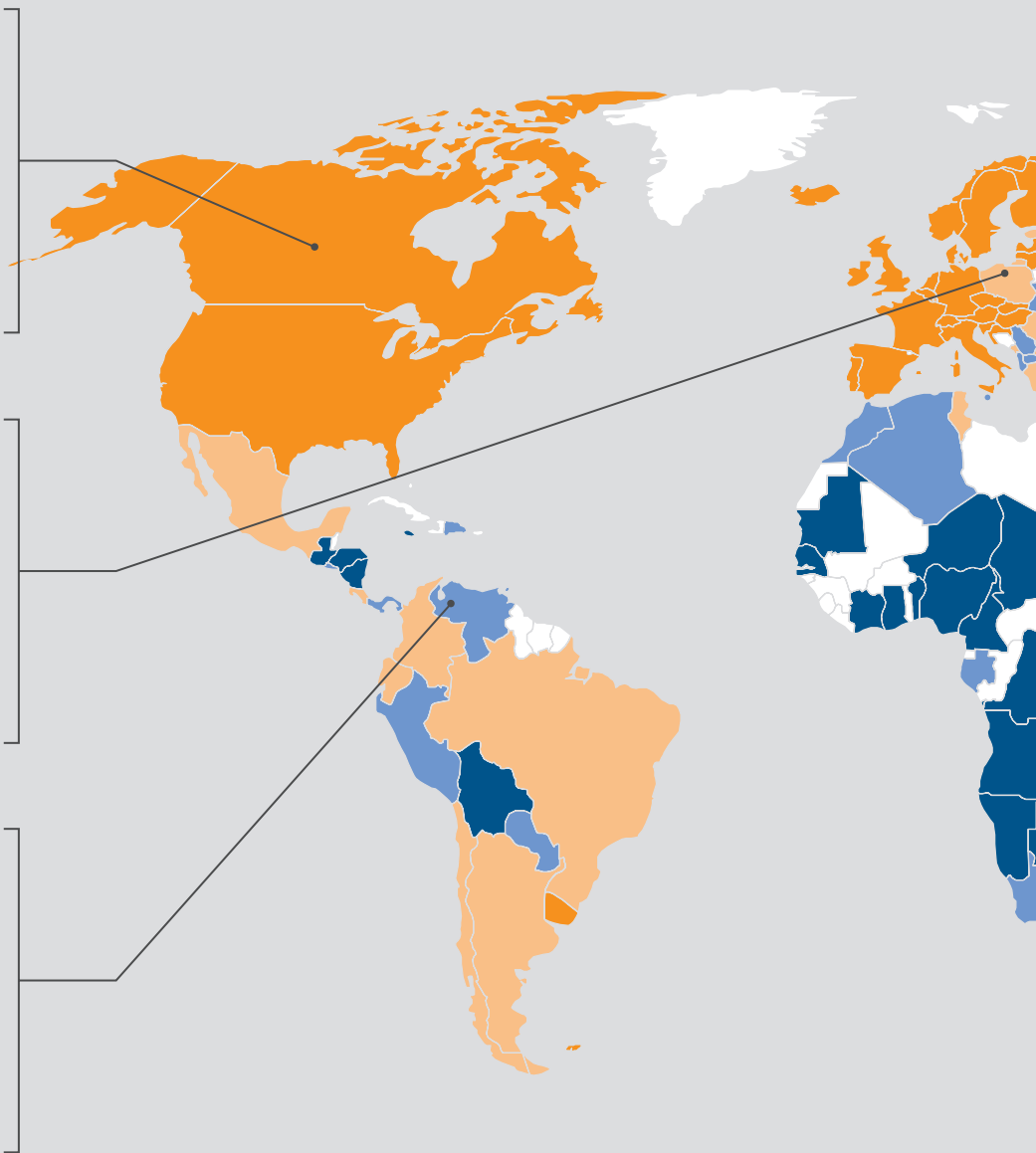
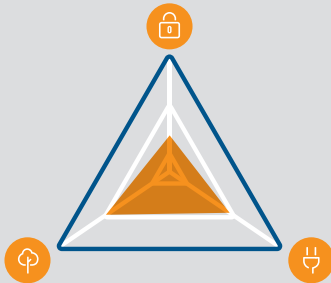
NORTH AMERICA



EUROPE



LATIN AMERICA AND CARIBBEAN



NORTH AMERICA **STRUGGLES WITH AGEING** **INFRASTRUCTURE AND** **EXTREME WEATHER**

With 14% of total global greenhouse gas emissions stemming from North America, the region must improve environmental sustainability and update ageing energy infrastructure to strengthen resilience to emerging risks, including extreme weather events and cyber attacks.

Environmental sustainability is expected to improve significantly due to emission reduction measures such as the development of carbon capture, usage and storage technologies, and further diversification of the energy mix.

EUROPE **MANAGING THE** **ENERGY TRANSITION**

Although European countries lead the 2016 Index, the region still faces the challenge of managing the energy security and affordability risks resulting from the energy transition.

To maintain a strong Trilemma performance, policymakers must focus on energy market design, regional markets, demand management, and designing an effective carbon price to successfully manage the challenging energy transition.

LATIN AMERICA **AND THE CARIBBEAN** **BUILDING RESILIENCE** **AND ENERGY EQUITY**

The Latin America and Caribbean region must work on improving and maintaining its energy security by increasing the energy system's resilience to extreme weather events and improving energy equity.

Diversifying the energy supply with low-carbon sources such as solar and wind and increasing regional interconnection will be key to securing reliable supply. However, large-scale investments are required to finance the development of resilient energy infrastructure.

COUNTRY PERFORMANCE

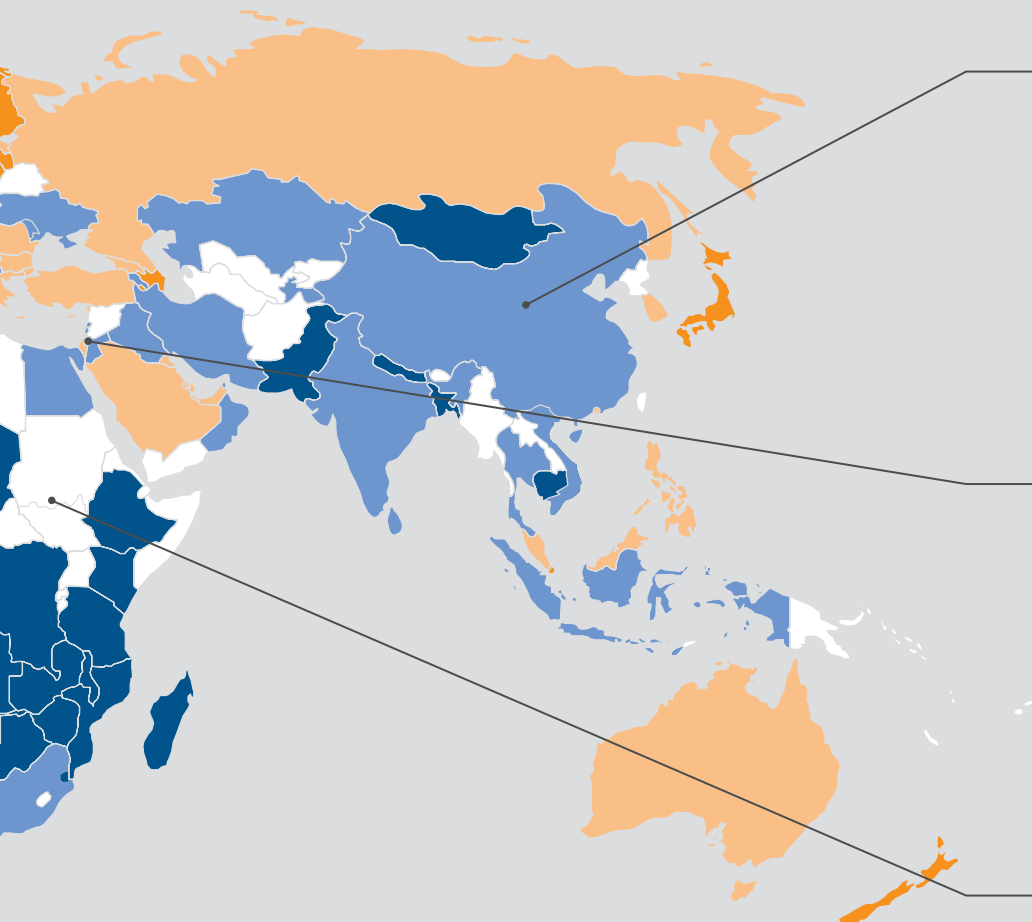
Top 25%

25% – 50%

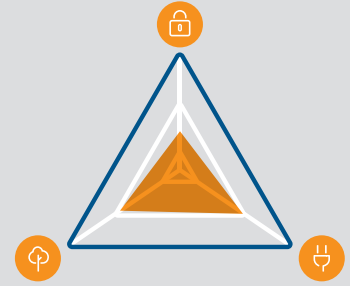
50% – 75%

Lower 25%

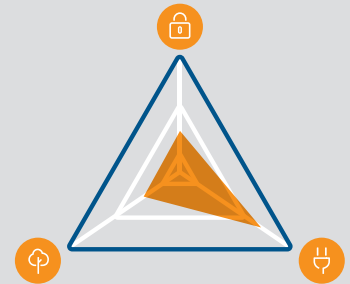
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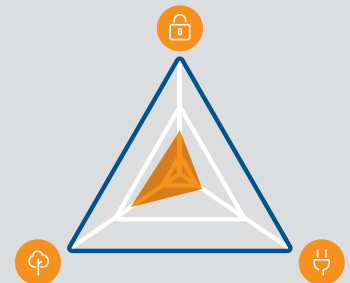
ASIA



MIDDLE EAST AND NORTH AFRICA



SUB-SAHARAN AFRICA



ASIA DECREASING IMPORT DEPENDENCE IN THE FACE OF GROWING DEMAND

Asia faces the challenge of facilitating sustainable growth of its highly energy-intensive, emerging economies while managing increasing energy demand and growing energy import dependence. Improvements on all three trilemma dimensions are possible by increasing the use of renewable energy sources, and by decreasing import dependence through reliable trade relationships and improved infrastructure.

MIDDLE EAST AND NORTH AFRICA DIVERSIFYING AWAY FROM OIL AND GAS

The main challenges for the Middle East and North Africa (MENA) are high energy intensity, greenhouse gas emissions, and use of finite fossil fuel reserves. Combined with water scarcity concerns, these challenges, if not addressed, could threaten the region's energy security and environmental sustainability.

Many MENA countries are focused on improving energy efficiency and diversifying their economies and energy mixes through an increased use of solar and nuclear power. Significant changes to the region's trilemma performance are likely to show towards the 2020s and 2040s.

SUB-SAHARAN AFRICA UNLOCKING RESOURCES AND RENEWABLES POTENTIAL

Sub-Saharan Africa is challenged by the world's lowest levels of energy access and commercial energy use, despite a rich endowment in resources and high renewables potential.

Stable and widely accessible energy supply could act as a catalyst for regional economic development. To unlock the region's resource potential and meet future energy demand, the region must attract investment, build institutional capacity and improve its grid and off-grid energy supply.

ABOUT THIS REPORT

The World Energy Council's definition of energy sustainability is based on three core dimensions: energy security, energy equity, and environmental sustainability. Balancing these three goals constitutes a 'trilemma' and is the basis for prosperity and competitiveness of individual countries.

The World Energy Trilemma Index, prepared annually by the World Energy Council in partnership with global consultancy Oliver Wyman, along with the Global Risk Centre of its parent Marsh & McLennan Companies since 2010, is a comparative ranking of 125 countries' energy systems. It provides an assessment of a country's ability to balance the trade-offs between the three trilemma dimensions.

Use the interactive Trilemma Index Tool and its Pathway Calculator to find out more about countries' trilemma performance and what it takes to build a sustainable energy system. The Pathway Calculator, developed by the World Energy Council in partnership with Oliver Wyman, can be accessed here: www.worldenergy.org/data

WORLD ENERGY COUNCIL

The World Energy Council is the principal impartial network of energy leaders and practitioners promoting an affordable, stable and environmentally sensitive energy system for the greatest benefit of all.

We are the UN-accredited global energy body, representing the entire energy spectrum, with member organisations in over 90 countries.

Further details at www.worldenergy.org and [@WECouncil](https://twitter.com/WECouncil)

The full report can be found at www.worldenergy.org/publications

The interactive online tool can be accessed at www.worldenergy.org/data

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