

# World Energy Trilemma Index | 2017

**EXECUTIVE SUMMARY  
IN PARTNERSHIP WITH OLIVER WYMAN**

## MONITORING 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 rates countries' energy performance around the world and provides a framework to monitor progress.

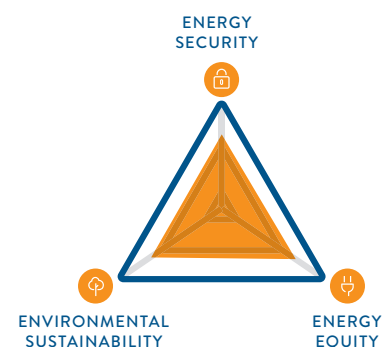
The 2017 Energy Trilemma Index reveals signs of progress on all dimensions of the Energy Trilemma. Efforts to increase resource productivity and manage energy demand growth will be key in ensuring a balanced Energy Trilemma.

Among the countries included in the Index, access to electricity and clean cooking have both increased by 7% to 87% and 75%, respectively since 2000. Meanwhile, lower carbon forms of energy are being used to support energy access and economic growth, with renewables making up 19.3% of final global energy consumption worldwide 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 final energy consumption, which is predicted to increase by up to 46% by 2060<sup>1</sup>.

Eight of the 125 countries assessed achieved a triple-A score, down from 13 in last year's index. This year Denmark, Sweden and Switzerland top the Index once more, 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 2017: TOP 10 COUNTRIES

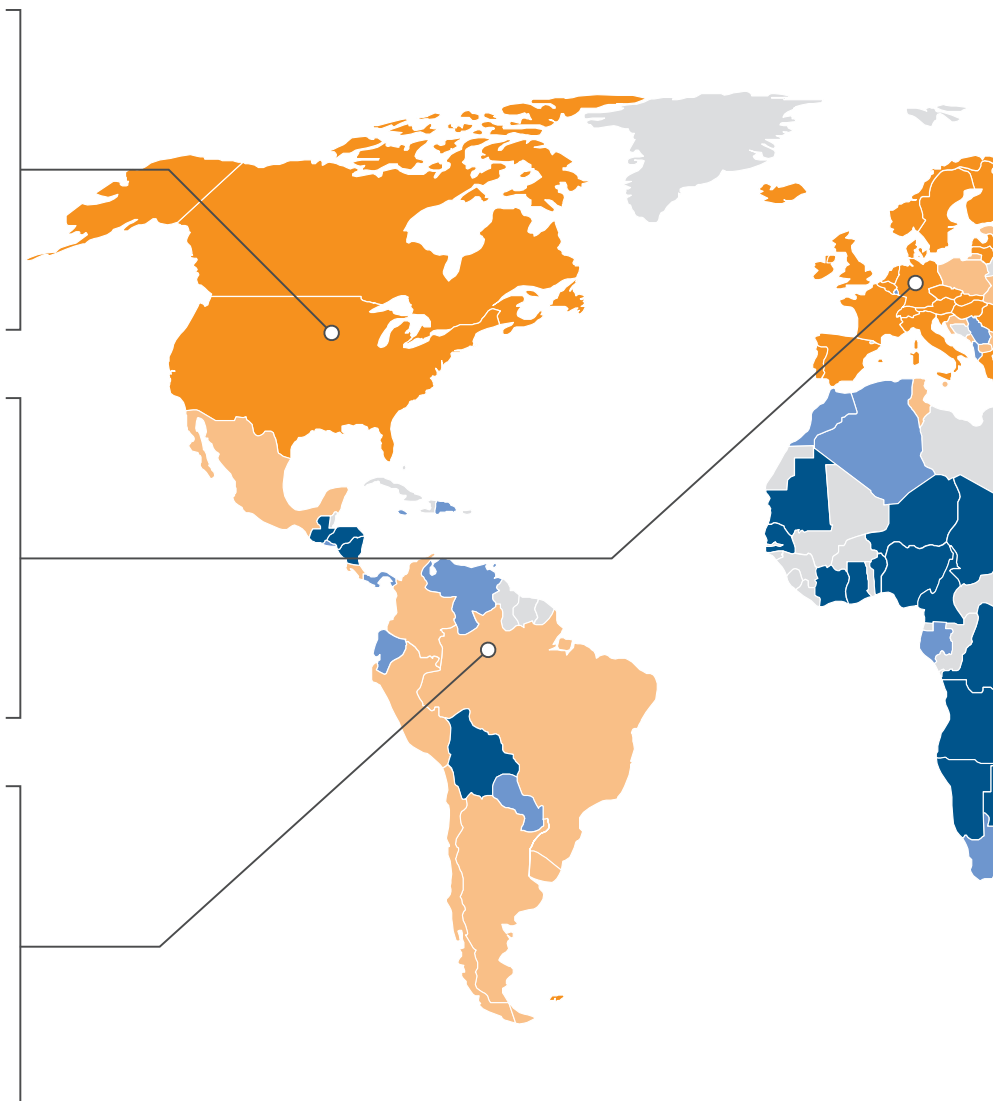
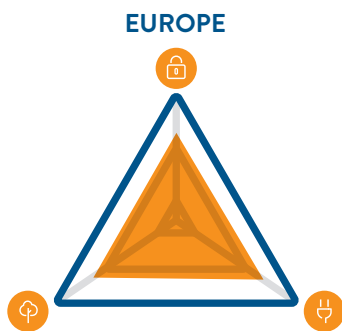
- |                          |                       |
|--------------------------|-----------------------|
| <b>1. Denmark</b>        | <b>6. Germany</b>     |
| <b>2. Sweden</b>         | <b>7. Norway</b>      |
| <b>3. Switzerland</b>    | <b>8. France</b>      |
| <b>4. Netherlands</b>    | <b>9. New Zealand</b> |
| <b>5. United Kingdom</b> | <b>10. Slovenia</b>   |



1. [https://www.worldenergy.org/wp-content/uploads/2016/10/World-Energy-Scenarios-2016\\_Full-Report.pdf](https://www.worldenergy.org/wp-content/uploads/2016/10/World-Energy-Scenarios-2016_Full-Report.pdf)



# WORLD ENERGY TRILEMMA INDEX 2017: REGIONAL OVERVIEWS



## NORTH AMERICA

### CONTINUED STRUGGLES WITH EXTREME WEATHER AND AGING INFRASTRUCTURE

North America remains the second highest performing geographic region on the Index, although aging infrastructure and extreme weather events continue to test the resilience of its energy systems. Additional uncertainty comes from the potential effects of a US withdrawal from the Paris Agreement. Despite this, the integration of distributed energy resources is providing opportunities for all three countries to improve their energy systems and help balance the Energy Trilemma.

## EUROPE

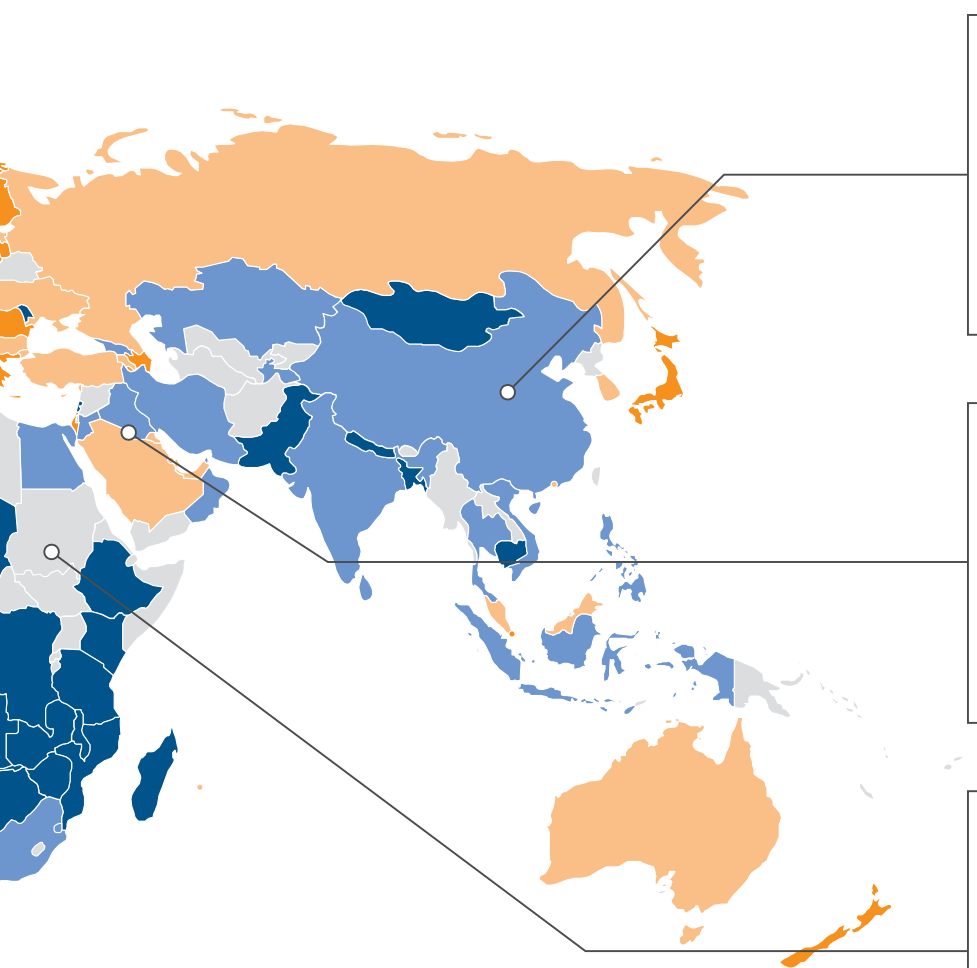
### LEADING TRANSITION BUT NEED REGULATIONS TO EVOLVE TO REALISE DISTRIBUTED ENERGY RESOURCES POTENTIAL

Europe continues to dominate the Trilemma Index in 2017, with nine European countries occupying the top ten places globally and all countries placing inside the top 100. European countries need to guard against complacency and maintain their focus on balancing the competing dimensions of the Energy Trilemma. Key challenges remain with navigating the energy transition and ensuring that governance and regulations remain fit for purpose in a fast-evolving energy system.

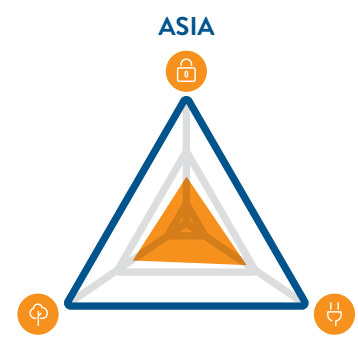
## LATIN AMERICA AND CARIBBEAN (LAC)

### POSITIVE STEPS TOWARDS ENERGY RESILIENCE AND SUSTAINABILITY

The region faces many challenges that include extreme weather, poor diversification of energy sources, and societal issues such as widespread inequality. However there are positive signs to be seen with many countries setting ambitious goals for emissions, reductions and EV adoption. Greater interconnection between countries, large-scale investments in infrastructure, and regional co-operation are still needed in order to effectively balance the Energy Trilemma.



**COUNTRY PERFORMANCE**



**ASIA**

**RISING DEMAND FROM ECONOMIC GROWTH CREATING CHALLENGES**

After 2040, the region will be the most important economic area in the world and it is because of this growth that Asia is facing the challenge of making progress on all three trilemma dimensions. The expected increase in the use of distributed generation and distributed energy resources can assist with meeting goals in energy security, energy equity, and environmental sustainability and reduce current reliance on energy imports.

**MIDDLE EAST AND NORTH AFRICA**

**VAST POTENTIAL FOR DIVERSIFICATION**

MENA retains strong scores in the energy access and affordability dimensions but faces significant challenges in energy security and environmental sustainability. Combined with growing water scarcity, the region's rising demands for electricity, water, and cooling, if not addressed, could threaten energy security and environmental sustainability. Going forward, distributed generation, especially solar and wind renewables, is expected to be increasingly deployed throughout the region to diversify energy sources, reduce GHG emissions, and improve energy access, especially in remote areas where off-grid electricity is less expensive than extending the existing power grid.

**SUB-SAHARAN AFRICA**

**DISTRIBUTED ENERGY RESOURCES OFFERS POTENTIAL TO ADDRESS KEY ENERGY ACCESS CHALLENGE**

Energy access remains a key challenge for the region, despite significant resources and renewables potential. With almost 65% of the total population lacking access to electricity in 2014, the region must attract investment, build institutional capacity, and improve its on-and-off-grid energy supply in order to unlock the region's resource potential and meet future energy demand. Global climate threats only add extra complexity to the successful management of the Energy Trilemma.

## 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 the prosperity and competitiveness of individual countries.

The World Energy Trilemma Report 2017, prepared in partnership with global consultancy Oliver Wyman, along with the Global Risk Centre of its parent Marsh & McLennan Companies, tapped into the global insights of the traditional and emerging players in the electricity sector – including policymakers, regulators, traditional utilities, large consumers, prosumers, and technology providers – to capture a wide range of views on the evolution of the energy sector.

The report identifies key focus areas for regulators and policymakers in the context of balancing the Energy Trilemma and driving forward progress on each dimension of the Energy Trilemma. This report will help further the dialogue by:

- Providing insights on the perspectives from across the evolving electricity sector to identify areas of convergence, divergence and lessons for policymakers
- Insights from global and regional energy sectors and countries at various stages of infrastructure development and Energy Trilemma challenges
- Examine the issues through the perspective of managing country level energy performance on the critical Energy Trilemma

## 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](http://www.worldenergy.org) and [@WECouncil](https://twitter.com/WECouncil)

The full report can be found at [www.worldenergy.org/publications](http://www.worldenergy.org/publications)

The interactive online tool for the World Energy Trilemma Index can be accessed at <https://trilemma.worldenergy.org/>

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