WORLD ENERGY COUNCIL

WORLD ENERGY

# Trilemma Index

## SUMMARY

# 2021

*In partnership with Oliver Wyman*

# ABOUT

WORLD ENERGY COUNCIL

## WORLD ENERGY TRILEMMA INDEX 2021

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.

Formed in 1923, the Council represents the entire energy spectrum, with over 3,000 member organisations in over 80 countries, drawn from governments, private and state corporations, academia, NGOs and energy stakeholders. We inform global, regional and national energy strategies by hosting high-level events including the World Energy Congress and publishing authoritative studies, and work through our extensive member network to facilitate the world's energy policy dialogue.

Further details at www.worldenergy.org and @WECouncil

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The World Energy Council's definition of energy sustainability is based on three core dimensions: Energy Security, Energy Equity, and Environmental Sustainability of Energy Systems.

Balancing these three goals constitutes a 'Trilemma' and balanced systems enable prosperity and competitiveness of individual countries.

The World Energy Trilemma Index has been prepared annually since 2010 by the World Energy Council in partnership with global consultancy Oliver Wyman, along with Marsh McLennan Advantage of its parent Marsh McLennan Companies. It presents a comparative ranking of 127 countries' energy systems, and provides an assessment of a country's energy system performance, reflecting balance and robustness in the three Trilemma dimensions.

Access the complete Index results, national Trilemma profiles and the interactive Trilemma Index tool to find out more about countries' Trilemma performance and what it takes to build a sustainable energy system can be found at: https://trilemma.worldenergy.org

World Energy Trilemma Index 2021, published by the World Energy Council in partnership with OLIVER WYMAN.

FOREWORD

# MAKING (COMMON) SENSE OF OUR CHANGING RELATIONSHIPS WITH ENERGY

***The world needs more sustainable energy and our relationship with energy and, consequently, with each other, is shifting and transforming. The need to involve more people and diverse communities in being better able to appreciate and navigate the role of energy in everyday life has never been greater.***

***Today's energy leadership landscape is crowded, competitive, often confusing, and increasingly costly. Confrontation and extreme polarisation have become commonplace.***

***In my role as the Secretary General and CEO of the World Energy Council, I am often asked to make sense of world energy developments by increasingly diverse energy interests – incumbent energy producers, new power suppliers, investors and academics, regulators and journalists, climate and poverty activists. I do not have a crystal ball, but I can harness the wisdom of the crowd.***



## Building new energy bridges for another century

It is not easy to be impartial and impactful, but it is what we are and have been for nearly 100 years. As a charity, our work and insights are non-proprietary and, as such, are well used, which we take as a huge compliment, and as the 6th Secretary General and CEO, I can assure you that our prime focus is on increasing our impact in driving a step change in global energy transitions.

There are several areas where we continue to excel in forging new common sense and leveraging our 'built in' scale to progress better energy for all people and a healthy planet.

Our self-organising, locally deep and globally networked energy community is open to all and second to none. Our membership base connects diverse energy interests across all corners of the planet, different spheres of government, civil society, academia and business, and reaches beyond the energy industry. Our investment for over 40 years in Future Energy Leaders and our more recent championing of Start-up Energy Transition Entrepreneurs, is our antidote to the institutional curse of 'pale, male, stale'. We are refreshingly old and arguably one of the world's first 'phone a friend' energy communities

We understand that context matters and that that 'no one size fits all' when it comes to energy transitions and power transformations. The depth and breadth of our network enables us to support societies to appreciate the scope and scale of the global energy transition challenge and to learn with and from the increasing diversity in energy solutions.

The triannual World Energy Congress and annual World Energy Week provide a rare venue for honest dialogue, productive disagreement, and networked collaboration. We are excited to be marking the start of our centenary year with the St Petersburg 25th World Energy Congress, Russia, in October 2022. It will be a moment to remember – an important checkpoint for our Humanising Energy vision and its impact, and a chance to add our voices to the global call for action on sustainable development and climate neutrality at the start of a pivotal decade of delivery.

## The technocratic race to zero...

The proliferation of net zero targets and roadmaps in the run up to the COP26 UNFCC meeting is a promising start, but success will be determined by people and practicalities, not political promises and plans.

Energy literacy remains poor across many stakeholder groups. Not in the sense of professional knowhow and engineering expertise, although capabilities are unevenly spread. But rather in the general lack of appreciation and understanding that, for all of us, our relationship with energy is changing.

Energy agendas meanwhile remain technocratic, supply-centric, and highly territorial. Some advocates wrangle over the colour of new fuel types, whilst billions of people have no connection to electricity or lack access to quality energy for clean cooking, better health, and new livelihoods. Some voices are powerful, yet many remain literally power-less.

No wonder, silent majorities often appear disinterested or paralysed. Who is not confused by the overwhelming analysis of the problem, the different roadmaps, and the multitude of 'high level' summits and proclamations?

Energy 'citizens' across all geographies are staring into a thick fog of uncertainty. They seek greater clarity about their role. Some are hoping 'someone' else will fix the system so that their behaviours don't need to change. Others are looking for new ways to self-organise and play their part.

In driving forward action with many more hands on the wheel, it is also important to take a good hard look in the rear-view mirror to understand whether we are heading in the right direction.



## Where the World Energy Trilemma Index fits in

This is where the annual World Energy Trilemma Index, now in its 11th year, fits in. It seeks to provide a comprehensive and comprehensible rear-view mirror.

Before travel became restricted, the World Energy Trilemma Index was often the first thing mentioned by Council stakeholders upon my arrival. After 'hello and welcome', a usual question was why aren't we higher in the global ranking!

The World Energy Trilemma Index was one of the first energy policy decision-support tools to recognise that binary trade-offs are not sufficient and a new integrated policy framework is essential in designing sustainable energy systems that meet the connected challenges of energy security, energy equity and affordability and environmental sustainability. As the name suggests, the World Energy Trilemma Index, enables us to look at new energy realities and policy design challenges through three lenses.

The World Energy Trilemma Index is the only retrospective tool in the unique World Energy Transition Leaders Toolkit. The other tools support forward pathfinding:

- The World Energy Transition Radar detects real time signals of recovery and transition actions to clarify the speed and direction of global energy transition.
- The annual World Energy Issues Monitor takes a snapshot of the present risk and opportunity landscape.
- The World Energy Scenarios provide new and alternative stories of the future of world energy, which have been co-created by members across the world.

Societies everywhere are searching for new and better ways to address globally connected challenges in an era of energy for people and planet, peace and prosperity. New energy developments are changing all our relationships as we recover from crisis, repair the planet, renew the wellbeing of whole societies, and better prepare for future shocks by building in resilience now.

The World Energy Trilemma Index is a trusted tool used by stakeholders across the energy spectrum and can play a vital role in convening impact-orientated conversations around energy.



## Humanising Energy – A better way to build forward together!

As the world learns how to navigate the emerging energy–cyber–climate stress nexus and avoid a global winner–takes–all technology race to zero, the World Energy Trilemma framework will continue to evolve into a flexible tool that can be used to improve the quality of policy design at all levels of society and global energy governance matters.

Societies have never built back better. By humanising energy societies can build forward together!

**Dr Angela Wilkinson**
Secretary General
& CEO

**Sir Phillip Lowe**
Chair
World Energy Trilemma

# EXECUTIVE SUMMARY

This is the second year that the Council has published the World Energy Trilemma Index during the COVID-19 pandemic, which continues to threaten health and disrupt the global economy. The Trilemma is an annual measurement of national energy systems that relies upon historic data to assess historic past energy policy performance and, as such, the impact of the pandemic is not yet fully reflected in the data. While further insights into the effect of the pandemic on energy are becoming visible, such as depressed demand and fragmented local recoveries, the longer-term implications for energy systems and transition remain unclear.

National context is critical to how countries develop their different energy policies, based upon their domestic circumstances with varying natural resources, geographies, and socio-economic systems. These differing contexts lead to a divergence of systems that means that there can be no single path for a successful energy transition; instead, each country must determine its own best energy policy pathway with respect to its national situation and priorities. Such diversity means that direct comparisons between the rankings and scores of countries in the Trilemma are less informative, but instead should help provide an opening for a dialogue, with countries learning from and with each other about what policies work in what circumstances and why. The Energy Trilemma Index can help countries and energy stakeholders to prioritise those areas of energy policy to improve most and explore which options might be more appropriate.

## 2021 RESULTS

This year, 127 countries have been ranked into 101 places, as some have achieved the same scores. The overall top ten ranks for the 2021 Trilemma continue to be dominated by OECD countries, with European countries performing particularly strongly, reiterating the importance of having longstanding active energy policies. The top three ranking countries remain the same as in 2020, with Sweden just overtaking Switzerland to the top spot, and Denmark remaining in third place. All three countries have overall scores of 83 and above. Canada, New Zealand and the United States break the OECD European monopoly (Table 1).

**Table 1: 2021 Top Trilemma performers**

TOP 10 RANK **OVERALL PERFORMERS**

| Rank | | Grade |
|---|---|---|
| 1 | Sweden | AAAa |
| 2 | Switzerland | AAAa |
| 3 | Denmark | AAAa |
| 4 | Finland | AAAa |
| 4 | United Kingdom | AAAa |
| 5 | France | AAAa |
| 5 | Austria | AAAa |
| 6 | Canada | AABa |
| 7 | Germany | AAAa |
| 8 | Norway | BAAa |
| 9 | New Zealand | AAAa |
| 9 | United States | AABa |
| 10 | Luxembourg | CAAa |
| 10 | Spain | ABAa |

WORLD ENERGY TRILEMMA INDEX 2021

Source: World Energy Council

**Table 2: 2021 Top Trilemma improvers**

TOP 10 COUNTRIES **OVERALL IMPROVERS**

| Rank | | Grade | Improvement since 2000 |
|---|---|---|---|
| 82 | Cambodia | CDDd | 57% |
| 83 | Myanmar | BDCd | 34% |
| 59 | Dominican Republic | DCBc | 33% |
| 80 | Kenya | BDBc | 33% |
| 88 | Ethiopia | DDCd | 31% |
| 76 | Honduras | CDBd | 28% |
| 53 | Thailand | CCCb | 26% |
| 78 | Nicaragua | CDBd | 26% |
| 60 | Sri Lanka | CCBc | 25% |
| 51 | China | BBDb | 25% |

Source: World Energy Council

Since 2000, those countries that have shown the greatest improvement in their Trilemma scores illustrate the critical importance of increasing access and diversifying energy systems. The overall top three improving countries since 2000 are Cambodia, Myanmar and the Dominican Republic that may have low overall ranks but have made significant and sustained efforts to improve their energy systems. (Table 2)

The **Energy Security** dimension highlights the importance of strong energy policies to make the most of domestic resources while diversifying and decarbonising energy systems. Canada, Finland and Romania once again top the Energy Security list that is heavy with OECD and European countries (Table 3). Brazil is the only non-OECD / European country to feature in the top ten energy security list, due to its significant hydrocarbon resources and decarbonised power system, which provide security through diversity. While significant natural resource endowment can underpin good performance, over-reliance on abundant domestic hydrocarbon resources can also be a "resource" curse leading to reduced diversity and declining performance for some hydrocarbon-rich countries. As ever, diversifying a country's energy mix improves energy security scores and leads to a stronger emphasis on system resilience (Table 4).

**Table 3: Top 10 Rank Performers in Energy Security**

| TOP 10 RANK **PERFORMERS** | | |
|---|---|---|
| 1 | Canada | 77.5 |
| 2 | Finland | 75.3 |
| 3 | Romania | 75.1 |
| 4 | Latvia | 74.9 |
| 5 | Sweden | 74.5 |
| 6 | Brazil | 73.5 |
| 7 | United States | 73.3 |
| 8 | Bulgaria | 73.1 |
| 9 | Czech Republic | 72.8 |
| 10 | Germany | 71.9 |
| Rank | | Score |

Source: World Energy Council

**Table 4: Top 10 Improvers in Energy Security**

| TOP 10 RANK **IMPROVERS** | | |
|---|---|---|
| 1 | Malta | 113% |
| 2 | Cambodia | 104% |
| 3 | Jordan | 83% |
| 4 | Cyprus | 66% |
| 5 | Kenya | 59% |
| 6 | Jamaica | 54% |
| 7 | Tajikistan | 53% |
| 8 | Dominican Republic | 52% |
| 9 | Tanzania | 51% |
| 10 | Singapore | 51% |
| Rank | | Improvement since 2000 |

Source: World Energy Council

The **Energy Equity** top ten ranking comprises producer countries with low energy costs for consumers – implicit subsidies – that are becoming more challenging to sustain in the current decarbonising environment. Qatar, Kuwait and the UAE head the list of the top ten performers for the dimension; all are small, wealthy nations with high GDP and low energy prices through subsidy and/or significant easily extractable energy resources (Table 5). Price subsidies (either explicit or implicit) tend to hinder energy supply diversification and reduce Trilemma scores in the other dimensions. The greatest improvers since 2000 share a common focus on policies to increase access to energy and to make energy more affordable to consumers. Nepal, Cambodia and Kenya have seen significant improvements in access to electricity, largely due to implementation of government policy (Table 6). Access to reliable and affordable energy is an enabler of economic prosperity, but greater focus is now needed on the quality of energy supply. More than 800 million people remain without access to basic energy, particularly in Sub-Saharan Africa – continued progress on UN Sustainable Development Goal 7 is an imperative, with pathfinding from top improving countries providing practical examples.

### Table 5: Top 10 Performers in Energy Equity

TOP 10 RANK **PERFORMERS**

| Rank | | Score |
|---|---|---|
| 1 | Qatar | 99.9 |
| 1 | Kuwait | 99.8 |
| 1 | UAE | 99.8 |
| 2 | Oman | 99.6 |
| 2 | Bahrain | 99.6 |
| 3 | Iceland | 99.2 |
| 4 | Luxembourg | 99.0 |
| 5 | Ireland | 98.4 |
| 6 | Switzerland | 98.0 |
| 7 | Saudi Arabia | 97.4 |
| 7 | Israel | 97.3 |
| 8 | United States | 97.1 |
| 9 | United Kingdom | 96.8 |
| 10 | Denmark | 96.4 |
| 10 | Austria | 96.4 |

Source: World Energy Council

### Table 6: Top 10 Improvers in Energy Equity

TOP 10 RANK **IMPROVERS**

| Rank | | Improvement since 2000 |
|---|---|---|
| 1 | Nepal | 212% |
| 2 | Cambodia | 134% |
| 3 | Kenya | 129% |
| 4 | Benin | 121% |
| 5 | Ethiopia | 108% |
| 6 | Bangladesh | 102% |
| 7 | Sri Lanka | 80% |
| 8 | Iraq | 80% |
| 9 | Mongolia | 78% |
| 10 | Nigeria | 73% |

Source: World Energy Council

In the **Environmental Sustainability** dimension, the top ten rank showcases strong policy efforts to decarbonise and diversify energy systems with Switzerland, Sweden and Uruguay heading the list (Table 7). A diversified energy system, supported by strong policy instruments to reduce greenhouse gas emissions significantly, coupled with energy efficiency measures, deliver a strong performance in the environmental sustainability dimension. Driving down energy intensity can assist countries yet to decarbonise their energy mix. However, ensuring an inclusive decarbonisation that leaves no communities behind will be essential to humanise energy transition.

The greatest improvers since 2000 show continued policy efforts together with some anomalies – Ukraine reduced imports and increased nuclear generation since 2015 (Table 8).

### Table 7: Top 10 Performers in Environmental Sustainability

TOP 10 RANK **PERFORMERS**

| Rank | | Score |
|---|---|---|
| 1 | Switzerland | 88.2 |
| 2 | Sweden | 86.3 |
| 3 | Uruguay | 85.4 |
| 4 | Norway | 84.4 |
| 5 | Panama | 83.7 |
| 6 | Brazil | 83.4 |
| 7 | Denmark | 82.9 |
| 8 | France | 82.7 |
| 9 | Albania | 82.5 |
| 10 | United Kingdom | 81.3 |

Source: World Energy Council

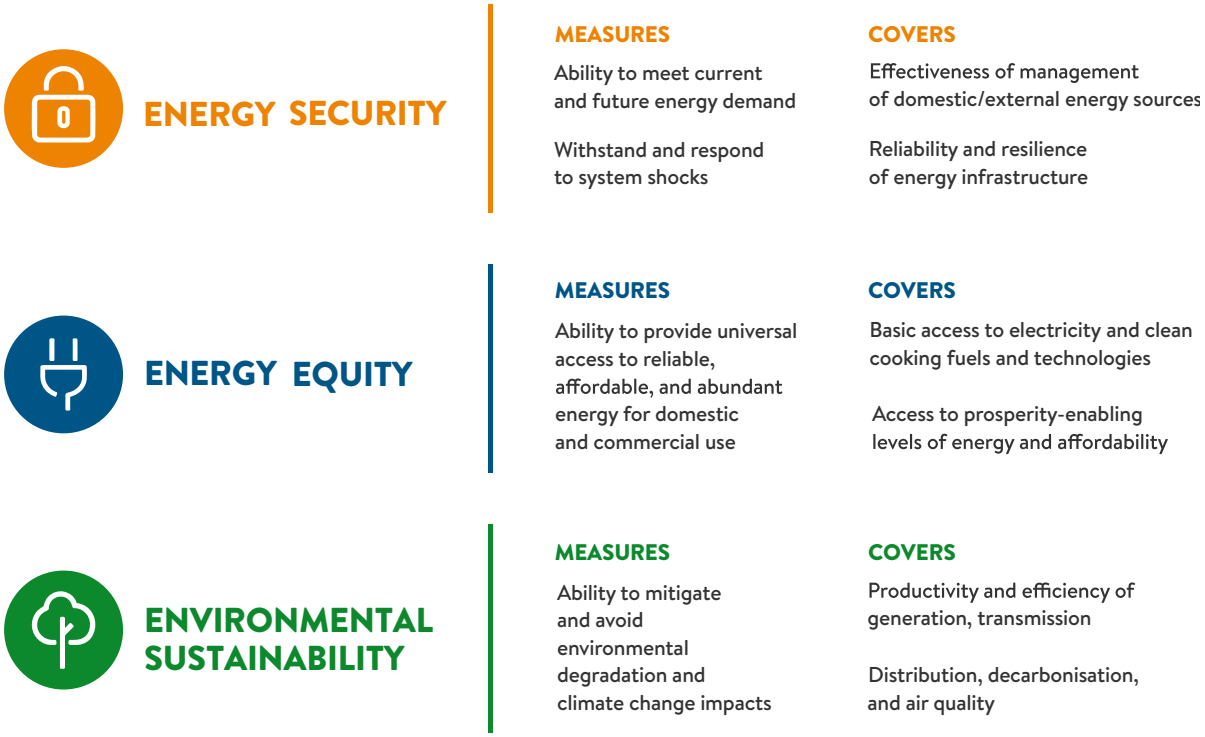
### Table 8: Top 10 Improvers in Environmental Sustainability

TOP 10 RANK **IMPROVERS**

| Rank | | Improvement since 2000 |
|---|---|---|
| 1 | Denmark | 30% |
| 2 | Azerbaijan | 28% |
| 3 | Ukraine | 22% |
| 4 | Myanmar | 22% |
| 5 | Thailand | 22% |
| 6 | China | 21% |
| 7 | Ireland | 20% |
| 8 | Panama | 20% |
| 9 | Malta | 20% |
| 10 | Serbia | 19% |

Source: World Energy Council

**Figure 1: World Energy Trilemma Index dimensions**




Source: World Energy Council

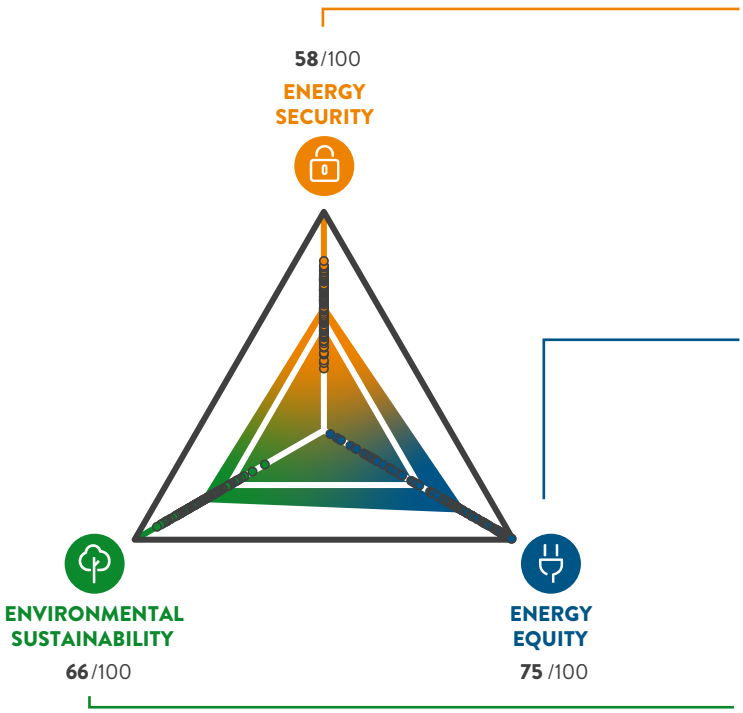
The global energy sector is facing unprecedented change as countries strive to decarbonise and shape a more inclusive energy transition as they seek to recover from the economic shocks generated by the pandemic.

Energy policies and regulations tend to lag the market changes and generally move forward in incremental steps, but they can occasionally leap-forward to reframe energy markets to enable new technologies and business models. As a result, the Energy Trilemma Index also must evolve continually to ensure that it remains relevant by including the indicators that best reflect the evolving energy sector and by modifying data sources or indicator coverage.

In addition, we must not lose sight of the impact of the COVID-19 pandemic. We anticipate that the challenges and opportunities presented by post-pandemic recovery will reshape energy policies and the agenda for energy transition. Here the Trilemma can help the dialogue as a pathfinding tool to a more equitable, sustainable and affordable energy future.

# 2021 TRILEMMA RESULTS

## World Energy Trilemma Index



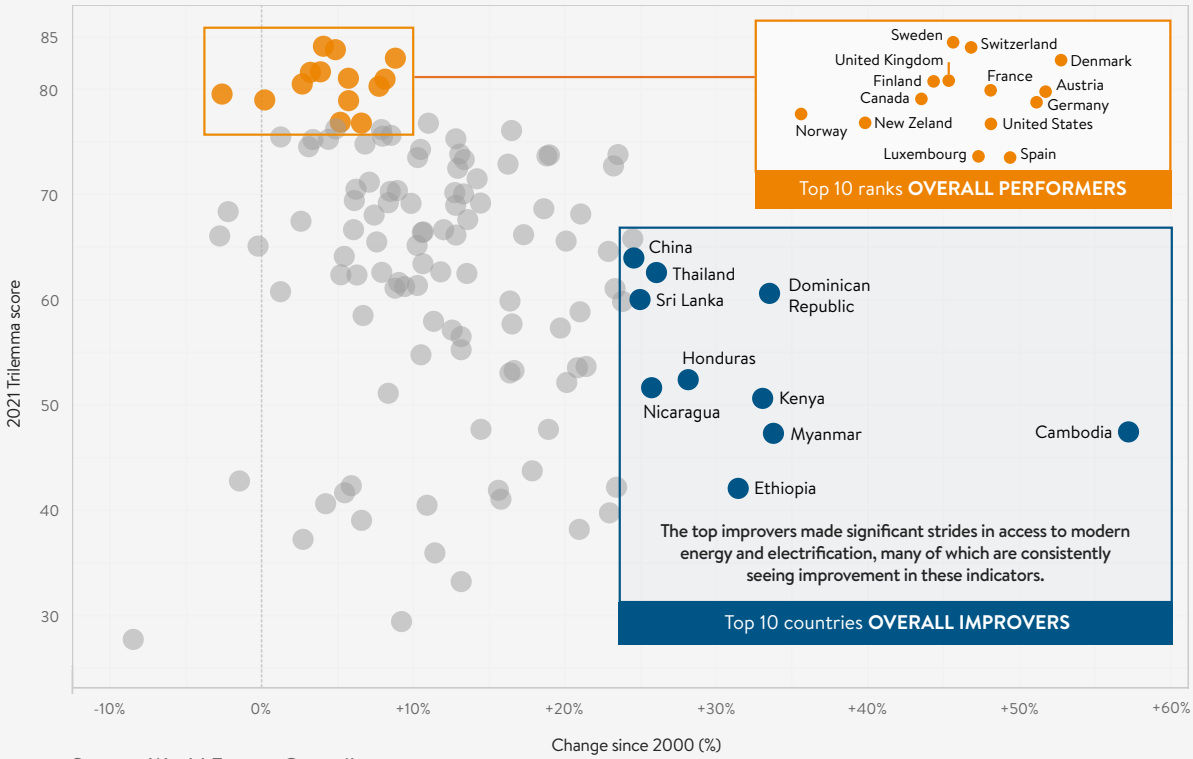

Reflects a nation's capacity to meet current and future energy demand reliably, withstand and bounce back swiftly from system shocks with minimal disruption to supplies.

Assesses a country's ability to provide universal access to affordable, fairly priced and abundant energy for domestic and commercial use.

Represents the transition of a country's energy system towards mitigating and avoiding potential environmental harm and climate change impacts.

Source: World Energy Council

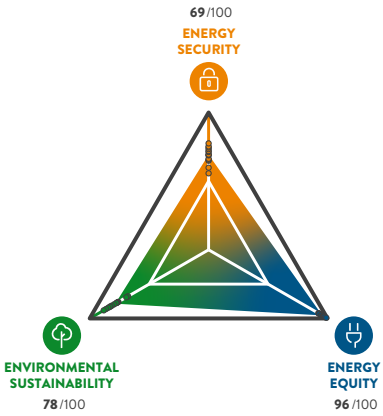
### 2021 Trilemma score against the difference of 2000 score




Source: World Energy Council

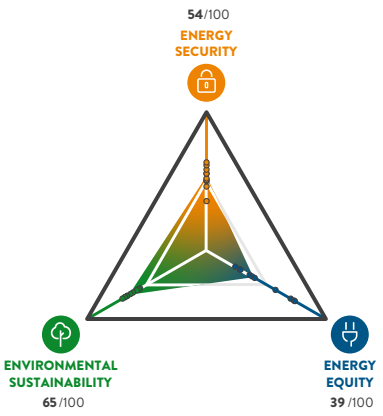
# 2021 TOP PERFORMERS AND IMPROVERS

## TOP 10 RANK OVERALL PERFORMERS




| Rank | | Grade | Score |
|---|---|---|---|
| 1 | Sweden | AAAa | 84.2 |
| 2 | Switzerland | AAAa | 83.8 |
| 3 | Denmark | AAAa | 83.0 |
| 4 | Finland | AAAa | 81.7 |
| 4 | United Kingdom | AAAa | 81.7 |
| 5 | France | AAAa | 81.1 |
| 5 | Austria | AAAa | 81.0 |
| 6 | Canada | AABa | 80.6 |
| 7 | Germany | AAAa | 80.4 |
| 8 | Norway | BAAa | 79.6 |
| 9 | New Zealand | AAAa | 79.1 |
| 9 | United States | AABa | 79.0 |
| 10 | Spain | ABAa | 76.9 |
| 10 | Luxembourg | CAAa | 76.9 |

## TOP 10 COUNTRIES OVERALL IMPROVERS

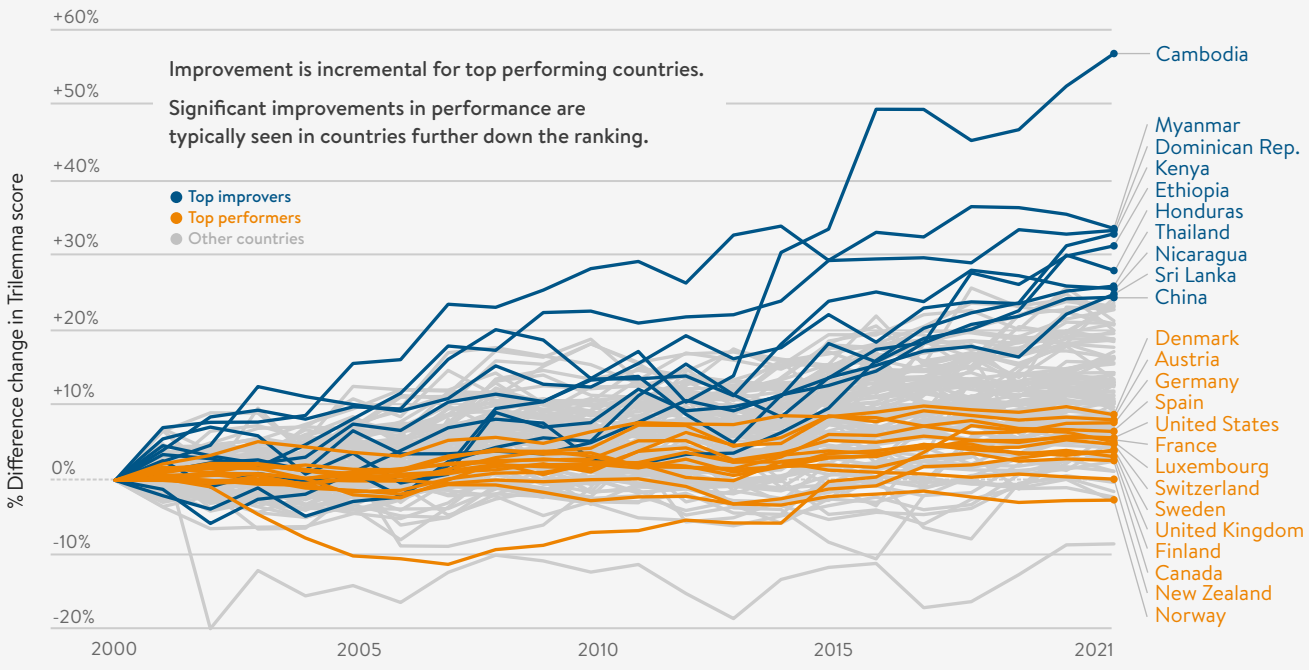



| Rank | | Grade | Score | Improvement since 2000 |
|---|---|---|---|---|
| 82 | Cambodia | CDDd | 47.5 | 57% |
| 83 | Myanmar | BDCd | 47.4 | 34% |
| 59 | Dominican Rep. | DCBc | 60.7 | 33% |
| 80 | Kenya | BDBc | 50.7 | 33% |
| 88 | Ethiopia | DDCd | 42.1 | 31% |
| 76 | Honduras | CDBd | 52.5 | 28% |
| 53 | Thailand | CCCb | 62.7 | 26% |
| 78 | Nicaragua | CDBd | 51.7 | 26% |
| 60 | Sri Lanka | CCBc | 60.1 | 25% |
| 51 | China | BBDb | 64.0 | 25% |

Source: World Energy Council

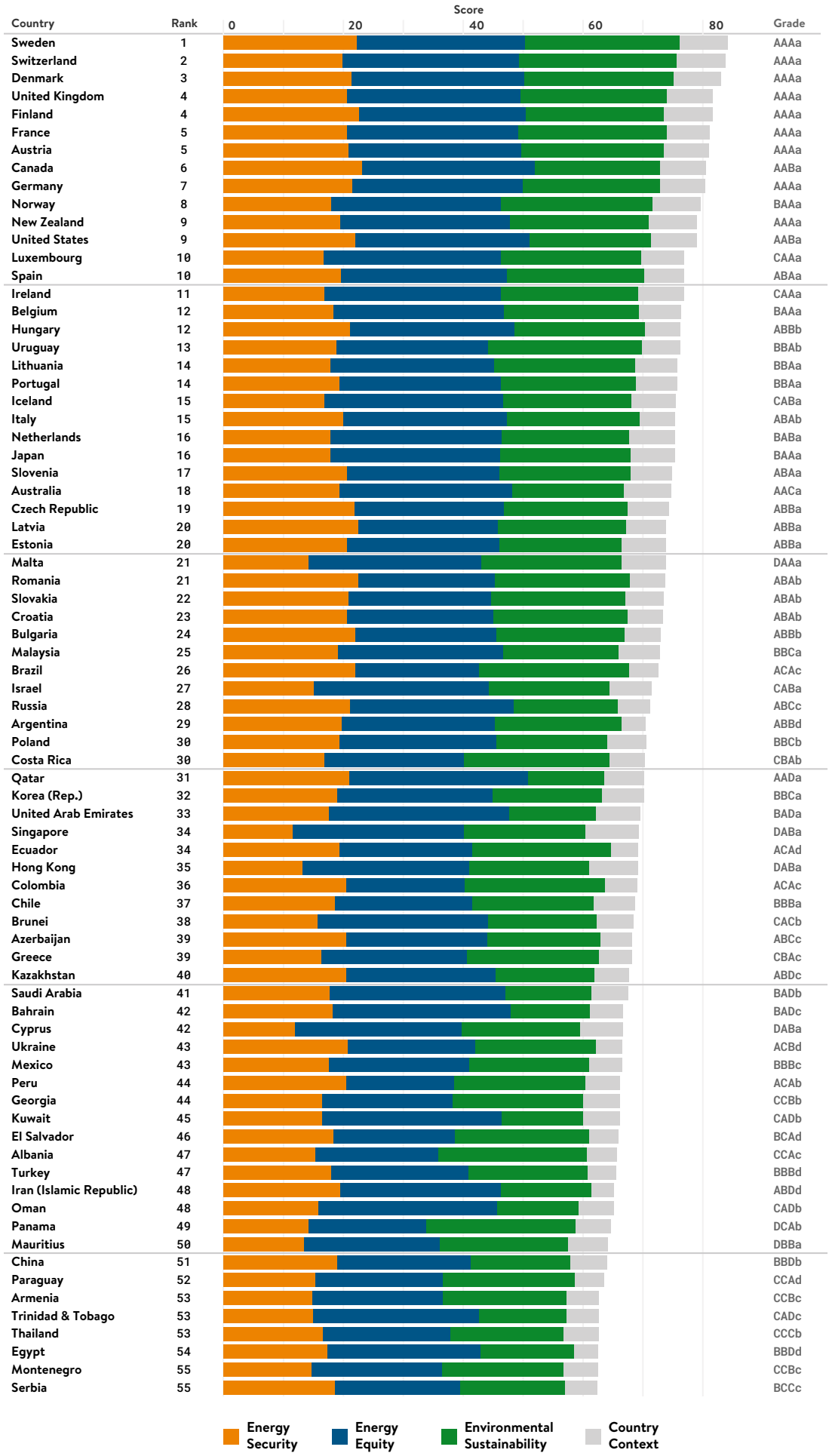
Score is rounded to one decimal point. Countries share a rank if difference in their score is less than 0.1.

## 2021 Trilemma Indexed trends since the baseline of 2000

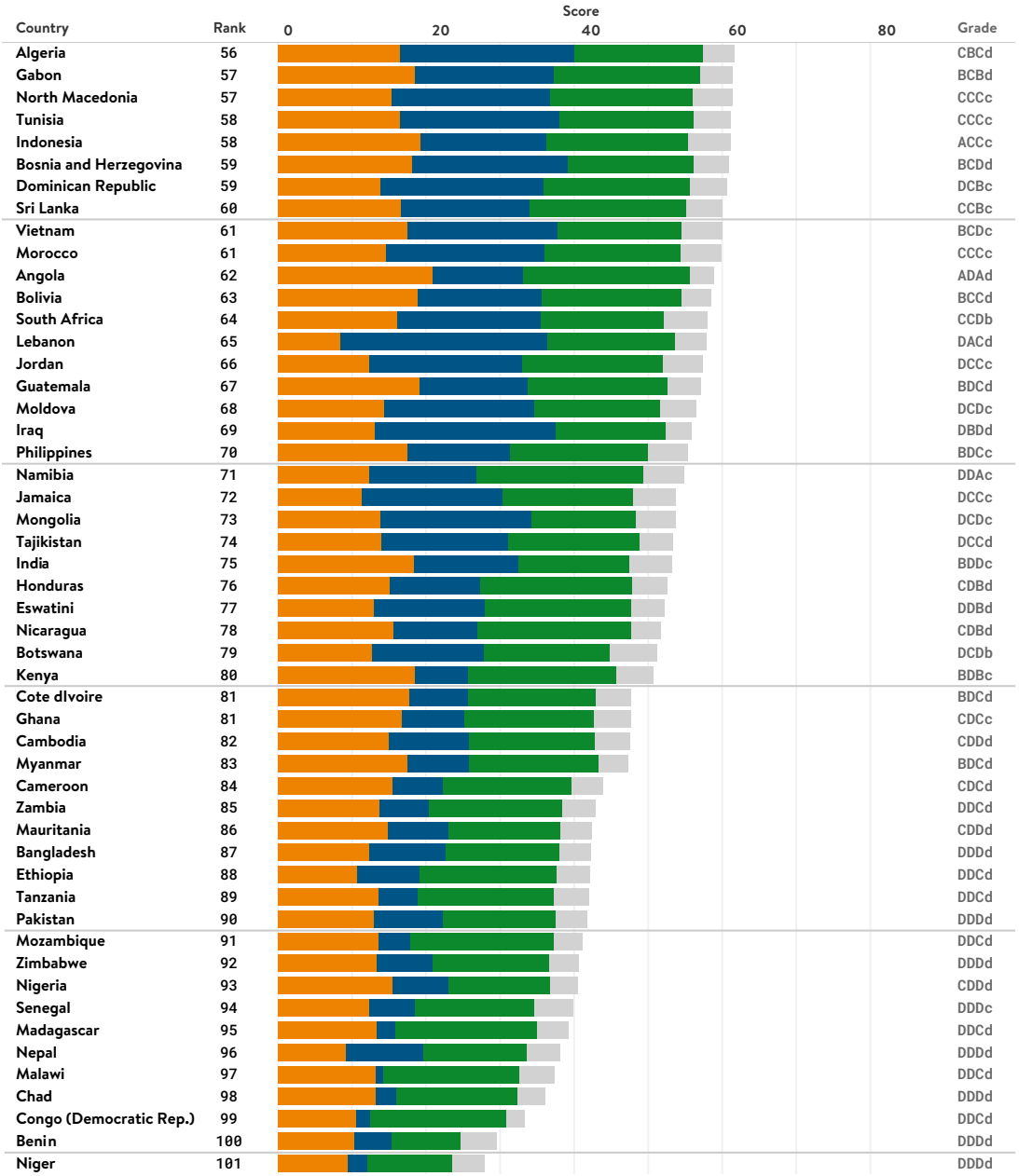



Source: World Energy Council

# 2021 WORLD ENERGY TRILEMMA INDEX




WORLD ENERGY COUNCIL




| Country | Rank | Grade |
|---|---|---|
| Algeria | 56 | CBCd |
| Gabon | 57 | BCBd |
| North Macedonia | 57 | CCCc |
| Tunisia | 58 | CCCc |
| Indonesia | 58 | ACCc |
| Bosnia and Herzegovina | 59 | BCDd |
| Dominican Republic | 59 | DCBc |
| Sri Lanka | 60 | CCBc |
| Vietnam | 61 | BCDc |
| Morocco | 61 | CCCc |
| Angola | 62 | ADAd |
| Bolivia | 63 | BCCd |
| South Africa | 64 | CCDb |
| Lebanon | 65 | DACd |
| Jordan | 66 | DCCc |
| Guatemala | 67 | BDCd |
| Moldova | 68 | DCDc |
| Iraq | 69 | DBDd |
| Philippines | 70 | BDCc |
| Namibia | 71 | DDAc |
| Jamaica | 72 | DCCc |
| Mongolia | 73 | DCDc |
| Tajikistan | 74 | DCCd |
| India | 75 | BDDc |
| Honduras | 76 | CDBd |
| Eswatini | 77 | DDBd |
| Nicaragua | 78 | CDBd |
| Botswana | 79 | DCDb |
| Kenya | 80 | BDBc |
| Cote dIvoire | 81 | BDCd |
| Ghana | 81 | CDCc |
| Cambodia | 82 | CDDd |
| Myanmar | 83 | BDCd |
| Cameroon | 84 | CDCd |
| Zambia | 85 | DDCd |
| Mauritania | 86 | CDDd |
| Bangladesh | 87 | DDDd |
| Ethiopia | 88 | DDCd |
| Tanzania | 89 | DDCd |
| Pakistan | 90 | DDDd |
| Mozambique | 91 | DDCd |
| Zimbabwe | 92 | DDDd |
| Nigeria | 93 | CDDd |
| Senegal | 94 | DDDc |
| Madagascar | 95 | DDCd |
| Nepal | 96 | DDDd |
| Malawi | 97 | DDCd |
| Chad | 98 | DDDd |
| Congo (Democratic Rep.) | 99 | DDCd |
| Benin | 100 | DDDd |
| Niger | 101 | DDDd |



## What does the country's performance show?

### GRADE

***Range of values:*** A (best), B, C, D (worst)
***Example:*** AAAa, ABAc, BCDb, DCDd
***Meaning:*** A grade is given for performance in three main dimensions (1st letter for Security, 2nd Equity, 3rd Sustainability) which cover 90% of the overall grade and an additional dimension (4th letter for Country Context) which covers the remaining 10%. The value of the grade depends on which quartile the country's score falls into:

- Grade A: top 25% countries
- Grade B: between top 25% and 50%
- Grade C: between 50% and 75%
- Grade D: between 75% and 100%

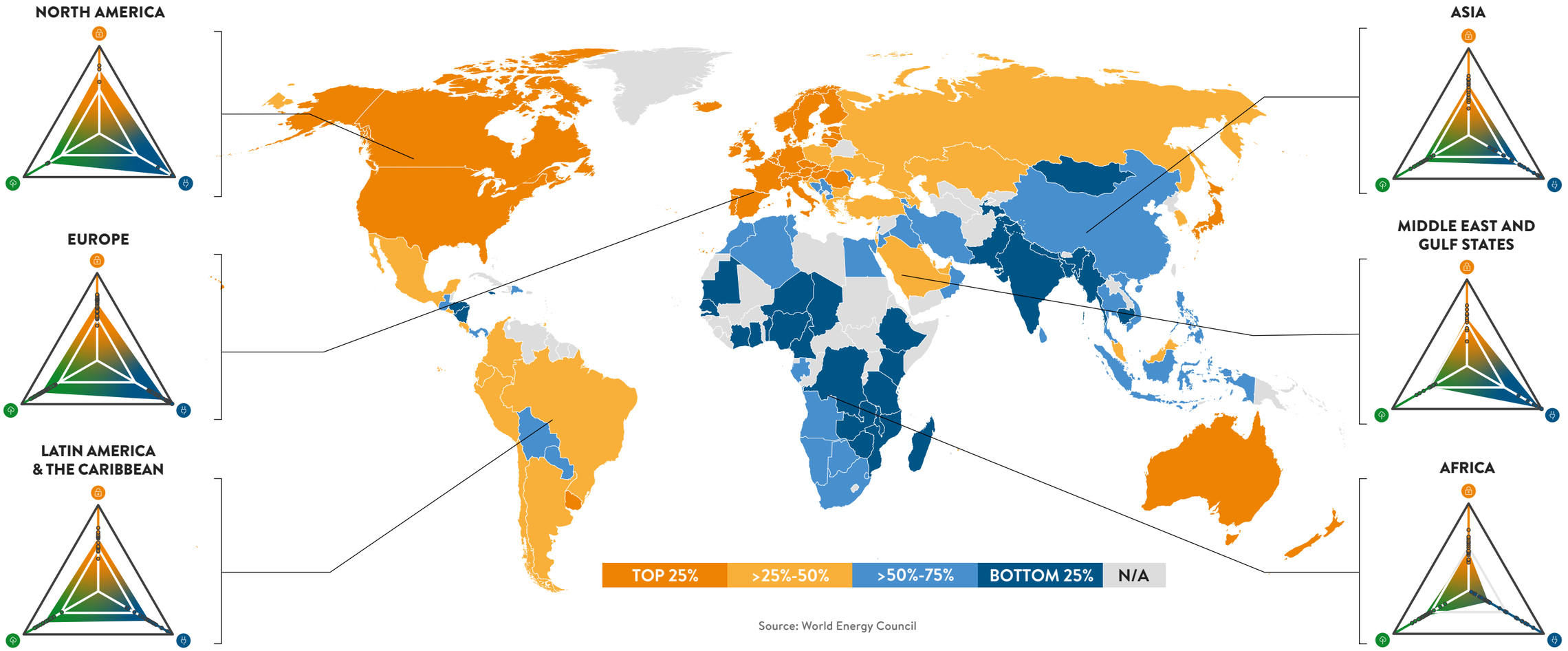
### RANK

***Range of values:*** 1 (best) ... 101 (worst)
***Example:*** Shared rank 4 determined by the 4th best score value of 81.7
***Meaning:*** The rank only provides a short and limited information about a country's performance – it only informs where the country lies in the full Index, therefore the grade, the score, the context and especially the full indexed history of the country's performance should be taken into account when comparing with other countries.
We have used a dense ranking approach because some scores are tied at one decimal place.

### SCORE

***Range of values:*** 100 (best) ... 0 (worst)
***Example:*** 84.3, 53.4, 32.1
***Meaning:*** A score value is given for overall performance as well as for each dimension (Security, Equity, Sustainability, Country Context) determined by country's performance in the indicators.
The score can change even if the underlying data did not change, reflecting performance changes of other countries, who may have improved in a given indicator.

*Please note that because the Methodology has evolved direct comparisons of ranking, grades and scores to previous reports is not possible. Historical performance has been recalculated using the same revised Methodology back to the Index year 2000.*




Source: World Energy Council

## NORTH AMERICA

### CHALLENGES AND OPPORTUNITIES FOR ENERGY TRANSITION

As significant energy producers and consumers, energy is a critical component of North American economies, with energy transition therefore posing big challenges alongside major opportunities. Federal and national policy disparities in the US and Canada can hinder energy transition, impacting particularly on Energy Sustainability, which shows the greatest variation across the continent.

2021 marked the return of the US to the Paris Agreement, and the earmarking of substantial funds to support environmental and energy infrastructure investment. Canada enacted its Net Zero Accountability Act, setting legal requirements to achieve net-zero emissions by 2050, whilst Mexico has prioritised energy self-sufficiency above sustainability.

Energy Security is considered a strength, with continued resource diversification a characteristic of all three nations.

Energy Equity is considered a low-profile policy issue with widespread access to energy and energy services across the continent, but quality access and cost concerns are emerging.

## EUROPE

### SUSTAINABILITY AT THE HEART OF THE ENERGY AGENDA

Europe continues to show leadership in balancing the Trilemma, occupying eight of the top 10 places in this year's Index. Whilst the effects of the pandemic continue to be felt, the region's overall energy agenda is firmly geared towards sustainability. Fossil fuels continue to play a declining role, with low carbon energy generation driven by renewables rising to 38% of EU electricity in 2020, overtaking coal and gas as the main electricity source for the first time.

For the countries of the EU, the Green Deal provides a robust framework for achieving ambitious climate-neutrality goals. And outside the EU27, decarbonisation is also firmly on the policy agenda. Progress in Energy Security is being achieved through diversification and interconnection, but further pressure to phase-out coal is required.

The region scores highly in Energy Equity, improving scores this year, but the pandemic has exposed some societal vulnerability and heightened concerns over energy affordability and accessibility.

## LATIN AMERICA & THE CARIBBEAN

### RENEWABLES SET TO SHAPE THE FUTURE

The deployment of renewables continues to keep pace with rising energy demand as oil and gas demand declines, with renewables firmly set to shape the future of energy across the region as countries seek to diversify.

The region scores well on the Sustainability dimension due to its significant hydro resource and the opportunities presented for hydrogen production using low-cost renewable energy for export. But, for some countries, the reliance on oil exports continues to be a major issue.

Energy equity scores have improved across the region, primarily through subsidies, but the lack of comprehensive regulatory frameworks, economic uncertainty and political stability continues to hamper balanced energy transition.

## ASIA

### INNOVATION THE KEY TO EQUITY IMPROVEMENTS

Covering a large and diverse region, Asia spans the 2021 Trilemma ranking with countries at the top and bottom of the index. While strides continue to be made in terms of Energy Equity, primarily through technology advances in 5G, Internet of Things and AI, as well as the development of energy storage systems, the region as a whole still struggles with Energy Security and Sustainability.

Energy Security is an issue for many countries with overall scores generally below the global average. Many rely heavily on energy imports to meet exponential growth in energy demand. Low levels of interconnectivity pose an additional challenge, which is difficult to overcome due to low levels of inter-governmental trust.

Environmental Sustainability remains flat, but an increasing number of governments have announced net-zero targets by 2050 and China has committed to net-zero by 2060. With these ambitious goals, and coordinated specific action plans, significant improvements are anticipated for future years.

## MIDDLE EAST AND GULF STATES

### ENERGY DIVERSIFICATION AND INTERCONNECTIVITY BECOMING APPARENT

Energy Equity remains a strength across the region, with near-universal, affordable energy available in most countries.

However, resource distribution is uneven and although moves to improve the interconnectivity of gas and electricity grids are becoming apparent, Energy Security performance is lower that would be expected for such a resource-rich region.

Energy Sustainability still lags, but several Middle Eastern countries have set ambitious targets for renewables for 2030 and 2050 as part of energy diversification strategies. Concepts around creating a circular carbon economy are gaining traction, though the cost is inhibiting large-scale carbon capture and storage initiatives. Hydrogen production is considered an opportunity for the region, with Saudi Arabia and the UAE both investing in hydrogen projects.

## AFRICA

### PROGRESS IN ENERGY EQUITY CONTINUES BUT ENERGY SECURITY REMAINS CHALLENGING

Despite wide geographical, demographic and economic disparities, significant progress in Energy Equity has been made across the continent. Although overall Energy Equity scores remain low, a steady year-on-year increase is apparent. But much still remains to be achieved, with access to clean, affordable and reliable energy urgently required to improve livelihoods and lifestyles. Further progress on Africa's Energy Equity challenge requires bold action to improve infrastructure, promote regional energy integration and improve public sector governance.

Environmental Sustainability has been the focus for the top five performers in the region, all of which have developed and implemented national climate action plans. However, sustainability is still a challenge for most of the region.

Energy security remains poor in many countries due to lack of investment, unreliable power generation, resource shortage, etc. but slight improvements have been seen in some areas. Top performers are focusing on energy diversification, energy efficiency and infrastructure investments to improve this dimension.

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