



# 2022

## WORLD ENERGY ISSUES MONITOR

REGIONAL PERSPECTIVES

## ABOUT

# WORLD ENERGY COUNCIL

The World Energy Council is the world's principal independent and 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 is the premier global energy body, representing the entire energy spectrum, with over 3,000 member organisations in over 90 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](http://www.worldenergy.org) and @WECouncil

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# WORLD ENERGY ISSUES MONITOR 2022

The World Energy Issues Monitor provides a snapshot of what keeps CEOs, Ministers and experts awake at night in nearly 100 countries.

The Monitor helps to define the world energy agenda and its evolution over time. It provides a high-level perception of what constitute issues of critical uncertainty, in contrast to those that require immediate action or act as developing signals for the future. It is an essential tool for understanding the complex and uncertain environment in which energy leaders must operate, and a tool through which one can challenge one's own assumptions on the key drivers within the energy landscape.

This 13<sup>th</sup> iteration of the World Energy Issues Monitor is based on insights of nearly 2,200 energy leaders in 91 countries to provide 51 national assessments across six world regions.

In addition to this report, the [Interactive Issues Monitor Online Tool](#) allows the visualisation of the data that underpins the Issues Maps. This tool has been produced in conjunction with the Council's project partner, Arup

World Energy Issues Monitor 2022, published by the World Energy Council.



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# INTRODUCTION

The 2022 annual edition of the World Energy Issues Monitor Survey was undertaken immediately following the conclusion of the 26<sup>th</sup> Conference of the Parties (COP26), held in Glasgow, UK, during November 2021. This year's survey provides a snapshot in time of the views of close to 2,200 energy leaders from 91 countries. Designed as a horizon-scanning tool, the World Energy Issues Monitor is the largest survey of its kind of senior energy professionals, governments, and civil society.

The survey considers 25 core energy transition issues, which are analysed to give an averaged level of: a) uncertainty; and b) impact that respondents attribute to each energy transition issue. These are displayed pictorially in global and regional maps.

The timeframe of the survey means that the results predominantly reflect the post-COP26 and continuing pandemic context. Although maps commentaries consider the geopolitical environment of early 2022, recent events related to the military conflict in Ukraine have led to important disruptions to energy markets. The survey results provide an overview of the context immediately precedent to the outburst of the conflict and shed light on the key issues that were keeping energy leaders awake at night.

This report focuses on the Issues Survey regional insights. For the full global results and methodology, please refer to the [World Energy Issues Monitor Global Outlook](#). You may find the global, regional and country deep dives and the data that underpins the Issues Maps on the [Interactive Issues Monitor Online Tool](#), produced in conjunction with the Council's project partner, Arup.

In addition, the Council will be soon engaging the world energy community in an Energy Security Pulse Survey for a continued monitoring of the impact of unfolding geopolitical events on energy markets.

## GLOBAL OVERVIEW

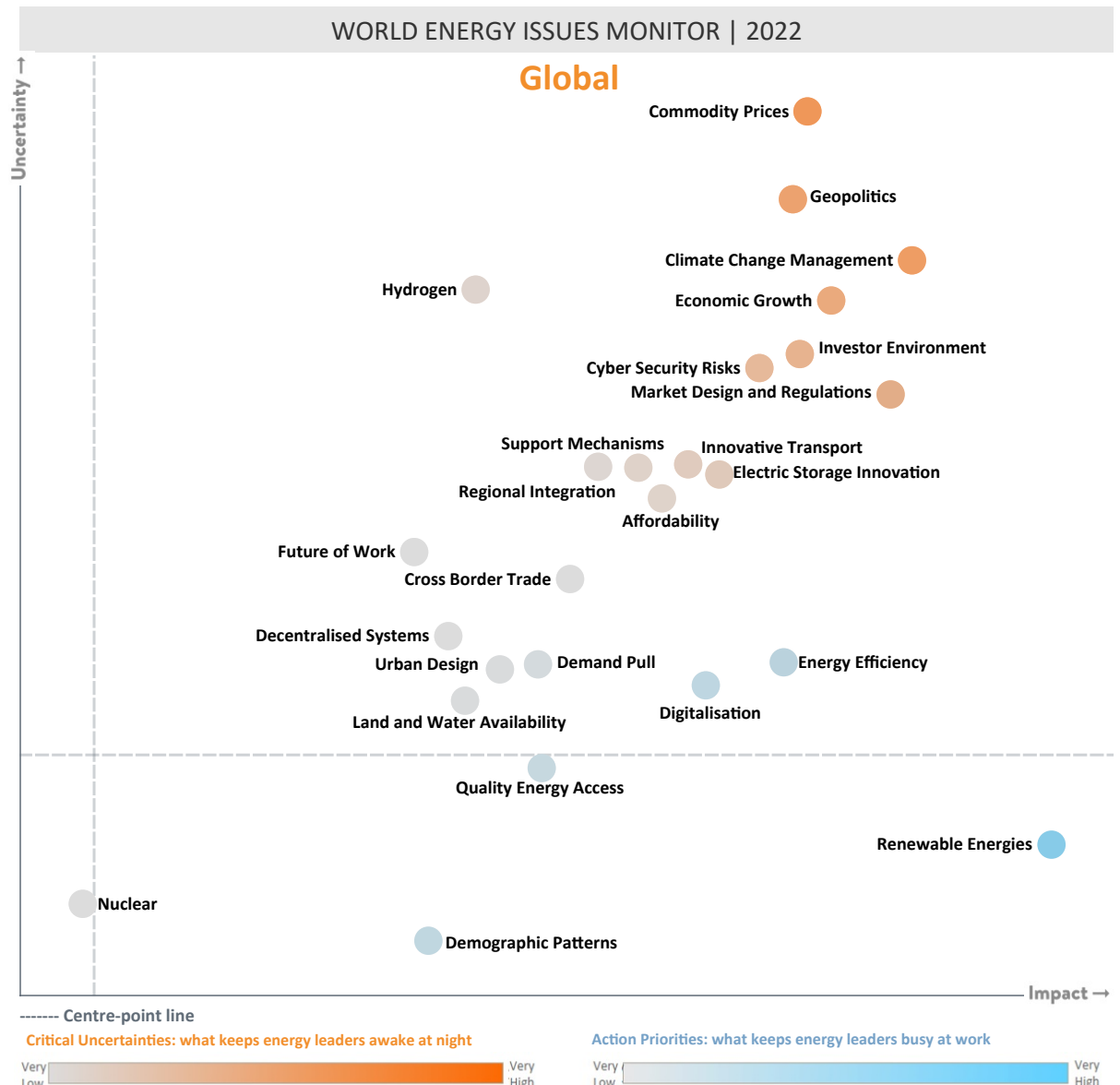
The 2022 World Energy Issues Monitor global survey results and commentaries reflect the perceptions of the Council's worldwide community of energy leaders on the energy decision-making environment between November 2021 and January 2022.

These perceptions call out Commodity Prices and Geopolitics as the most critical issues for energy decision-makers in the context immediately precedent to the escalation of the Russia-Ukraine conflict. The tracking of perceptions over time shows how the perceived uncertainty related to these issues has dramatically increased globally. This year, findings pointed out record price increases in natural gas and obstacles to supply as key drivers of the rising climate of uncertainty. The energy interdependence between many countries contributes to keeping Geopolitics firmly on the uncertainty agenda. In addition, regional deep dives have highlighted how geopolitical tensions within the context of high market interdependencies risk to exacerbate uncertainties even further.

The Council's World Energy Trilemma, assessing the crucial balance needed between energy security, energy equity and environmental sustainability for healthy energy systems, is particularly relevant to understand today's decision-making environment in relation to the Russia-Ukraine conflict. The long-standing climate change challenge, the impacts of the pandemic and a fast-paced evolving decision landscape creates further imbalances within the system.

Building on the Trilemma Index, this Issues Monitor survey iteration has identified issues that affect the energy equity dimension such as energy affordability with the sharpest increase in impact and uncertainty on energy leaders' decision-making choices compared with 2020, suggesting that further imbalances of performance between the Trilemma dimensions can be expected at country and regional levels as we move forward.

Figure 1: 2022 Global Energy Issues Map



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## GLOBAL KEY MESSAGES

**1. Uncertainties increase again across the board.** The most striking finding of this year’s Global Energy Issues Map is the enormous degree of uncertainty ascribed to almost all the issues energy leaders were asked to assess, with Commodity Prices, Geopolitics and Climate Change Management and Economic Growth topping the list.

**2. Equity-related concerns highlight the need to humanise the energy conversation.** Issues that affect Energy Equity such as Commodity Prices, Affordability, Quality Energy Access and Market Design have seen the sharpest increase in impact and uncertainty compared to 2020 and stress the need to humanise energy transition.

**3. Collaboration is seen as key to turning critical uncertainties into action priorities.** Energy leaders’ perspectives point to the importance of stabilising Critical Uncertainties and finding practical ways to reach a point of greater confidence. There is a need to explore the drivers of change and their wider impact on energy and energy+ communities, which includes the adjacent sectors, to allow for stable route mapping.

# REGIONAL OVERVIEW

The survey outcomes and emerging findings were tested with the Council's regional energy communities during a series of virtual workshops held in January and February 2022. The sessions were designed to leverage the power of community in order to identify drivers of change and their wider impact in the different regional energy contexts.

While acknowledging the great socio-economic and political diversity across and within regions, two cross-cutting themes emerged from the discussions:

**1. NEW OPPORTUNITIES FOR INVESTMENT AND POLICY DECISION MAKING:** Public and private sector decision-makers in different regions have pointed out the increasing attractiveness of clean energy technologies as phasing out of fossil fuels subsidies gathers pace.



**AFRICA:** Energy transition is critical to the region and provides significant opportunities for economic growth and equitable transition. Basic energy access is still low, linked to low levels of incomes, but action priorities targeted at maximising the potential of the region's abundant renewables resources and developing associated infrastructure are critical to the region's economic growth and prosperity.



**ASIA:** Most of the existing renewable capacity in the region was stimulated through Feed-in-Tariffs or special programmes. With many of these coming to an end or being reset, there is an opportunity to reframe the policies and adapt commercialisation models to accelerate transition.



**EUROPE:** Continued high levels of uncertainty surrounding the interplay of geopolitics and commodity prices are seen across the region. The impact of consistently high gas and electricity prices on domestic consumers, raises energy affordability up the action priority list for energy leaders in Europe, and has put the spotlight back on the debate around nuclear as a potential opportunity to meet sustainability targets and anticipated demand growth.



**LAC:** Latin America has enormous sustainable energy potential due to its abundance of natural, renewable energy resources. Exploitation of this historically underutilised resource, coupled with electrification of transport systems and the establishment of a green hydrogen economy, provide significant opportunities for economic growth and recovery from the significant toll the pandemic has taken across the region.



**MEGS:** Increased digitalisation initiatives, continued diversification to renewables, and energy efficiency and waste management programmes offer new opportunities for policy leadership and economic growth across the region. But to achieve net-zero targets, policy makers are counting on hydrogen and carbon capture, utilisation and storage (CCUS) technology gains, which will require significant investment and the establishment of multi-stakeholder partnerships.



**NORTH AMERICA:** The impact of the pandemic continues to put severe stress on supply chains, fuel costs and transport costs, fuelling inflation and raising uncertainty in financial markets. But opportunities exist in managing and investing in energy transition, with support for the commercialisation of hydrogen projects for transportation and thermal energy, and a growing acceptance that the timing of investment decisions to meet 2050 targets is becoming critical.



**“Energy matters are now centre stage in a world of more digitally connected, politically contested, interdependent and diverse societies.”**

Dr Angela Wilkinson, Secretary General & CEO, World Energy Council, UK

## ACTION PRIORITIES ACROSS REGIONS

(WHAT IS KEEPING ENERGY LEADERS BUSY AT WORK – FROM HIGHEST TO LOWEST SCORES)

<p><b>AFRICA</b></p> 	<ul style="list-style-type: none"> <li>Renewable Energies</li> <li>Digitalisation</li> <li>Demographic Patterns</li> <li>Energy Efficiency</li> <li>Market Design</li> </ul>	<p><b>ASIA</b></p> 	<ul style="list-style-type: none"> <li>Renewable Energies</li> <li>Digitalisation</li> <li>Demographic Patterns</li> <li>Quality Energy Access</li> <li>Demand Pull</li> </ul>
<p><b>EUROPE</b></p> 	<ul style="list-style-type: none"> <li>Renewable Energies</li> <li>Digitalisation</li> <li>Energy Efficiency</li> <li>Demographic Patterns</li> <li>Quality Energy Access</li> </ul>	<p><b>LAC</b></p> 	<ul style="list-style-type: none"> <li>Renewable Energies</li> <li>Energy Efficiency</li> <li>Demand Pull</li> <li>Urban Design</li> <li>Quality Energy Access</li> </ul>
<p><b>MEGS</b></p> 	<ul style="list-style-type: none"> <li>Renewable Energies</li> <li>Energy Efficiency</li> <li>Demographic Patterns</li> <li>Land &amp; Water Availability</li> <li>Quality Energy Access</li> </ul>	<p><b>NORTH AMERICA</b></p> 	<ul style="list-style-type: none"> <li>Renewable Energies</li> <li>Demographic Patterns</li> <li>Energy Efficiency</li> <li>Quality Energy Access</li> <li>Digitalisation</li> </ul>

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<p><b>COMMON TO ALL REGIONS</b></p> <ul style="list-style-type: none"> <li>• Renewable Energies</li> </ul> <p><b>UNIQUE REGIONAL ISSUES</b></p> <ul style="list-style-type: none"> <li>• <b>Africa:</b> Market Design</li> <li>• <b>LAC:</b> Urban Design</li> <li>• <b>MEGS:</b> Land and Water Availability</li> </ul>	<p><b>FREQUENT OCCURRING ACROSS SEVERAL REGIONS</b></p> <ul style="list-style-type: none"> <li>• Digitalisation</li> <li>• Demographic Patterns</li> <li>• Energy Efficiency</li> <li>• Quality Energy Access</li> <li>• Demand Pull</li> </ul>
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**2. COLLABORATION IS SEEN AS KEY TO TURNING CRITICAL UNCERTAINTIES INTO ACTION PRIORITIES:** Confirming outcomes from the global analysis, regional deep dives have identified willingness to strengthen connections within and between regions to achieve shared objectives and capitalise on synergies.



**AFRICA:** Regional collaboration is seen as key to maximising utilisation of renewable resources, achieving economies of scale and sharing policy best practice with respect to rural electrification, market design and issues surrounding energy privatisation. Joint power projects such as the West African Power Pool and West African Gas pipeline demonstrate the benefits of regional collaboration, along with international interconnection agreements (for example, between Morocco and Spain, and Morocco and Portugal). Collaboration is also seen as key to applying joint pressure on advanced economies, international development partners and global donors to provide resources to support an African green energy and development agenda.



**ASIA:** Despite its diverse geographical, economic and geopolitical characteristics, the region's key critical uncertainties of commodity prices and geopolitics mirror the global Issues Map. The region's energy leaders consider the route to net-zero a global issue that requires inter-regional and international collaboration, and highlights the need for economic development and energy transition to be mutually reinforcing with multiple routes to transition being explored.

***“Leadership uncertainty reflects the complex challenges of coordinating actions on net-zero energy uses, without triggering new threats to regional and global stability.”***

Dr Angela Wilkinson, Secretary General & CEO, World Energy Council, UK



**EUROPE:** The region's collaborative approach is consolidated around the EU's Energy Union. Climate change management across the continent is focused on the EU Green Deal, but there is great uncertainty around what policy will be implemented and how (for example, will carbon pricing be included.) Energy security concerns, intertwined with regional geopolitics are causing significant issues, and considerable uncertainty with respect to commodity pricing. These are recurring issues for the Continent, but questions are being asked about governance of energy and electricity security and overall market design.



**LAC:** Significant gains can be derived from energy diversification across the region, as well as enhanced cooperation and increased energy integration to capitalise on the complementarity of energy resources between countries. Reduction in costs is seen as a driver, along with enhanced energy security resulting from mitigation of the uneven fluctuations in costs, and periodic scarcity of supply due to extreme weather (drought) of the region's main energy resource – hydro. As a developing region, LAC requires the support of international agencies to fund energy transition and reduce investor and regulatory uncertainty.



**MEGS:** Collaboration with other countries and institutions to develop solutions around demand-side management, energy efficiency, carbon capture and storage, hydrogen and smart transportation is seen as critical to the region's energy transition away from its historical strong reliance on oil and gas.



**NORTH AMERICA:** The problem of transition costs and social acceptance across the region is at the forefront of energy leader's minds. Social equity issues are going to be significant if not managed correctly. The response to the COVID-19 pandemic provides an example of how organisations can come together to develop technical solutions – in this case, a vaccine. This exemplifies the power and possibility of collaboration and needs to be replicated in the push to develop technological solutions to the challenges posed by climate change.





## CRITICAL UNCERTAINTIES ACROSS REGIONS


(WHAT IS KEEPING ENERGY LEADERS AWAKE AT NIGHT – FROM HIGHEST TO LOWEST SCORES)

**AFRICA**



- Commodity Prices
- Economic Growth
- Geopolitics
- Regional Integration
- Climate Change Mngmt

**ASIA**



- Commodity Prices
- Climate Change Mngmt
- Geopolitics
- Economic Growth
- Hydrogen

**EUROPE**




- Commodity Prices
- Geopolitics
- Climate Change Mngmt
- Market Design
- Investor Environment

**LAC**



- Economic Growth
- Commodity Prices
- Climate Change Mngmt
- Investor Environment
- Market Design

**MEGS**



- Commodity Prices
- Economic Growth
- Geopolitics
- Climate Change Mngmt
- Innovative Transport

**NORTH AMERICA**



- Climate Change Mngmt
- Cyber Security Risks
- Market Design
- Investor Environment
- Affordability

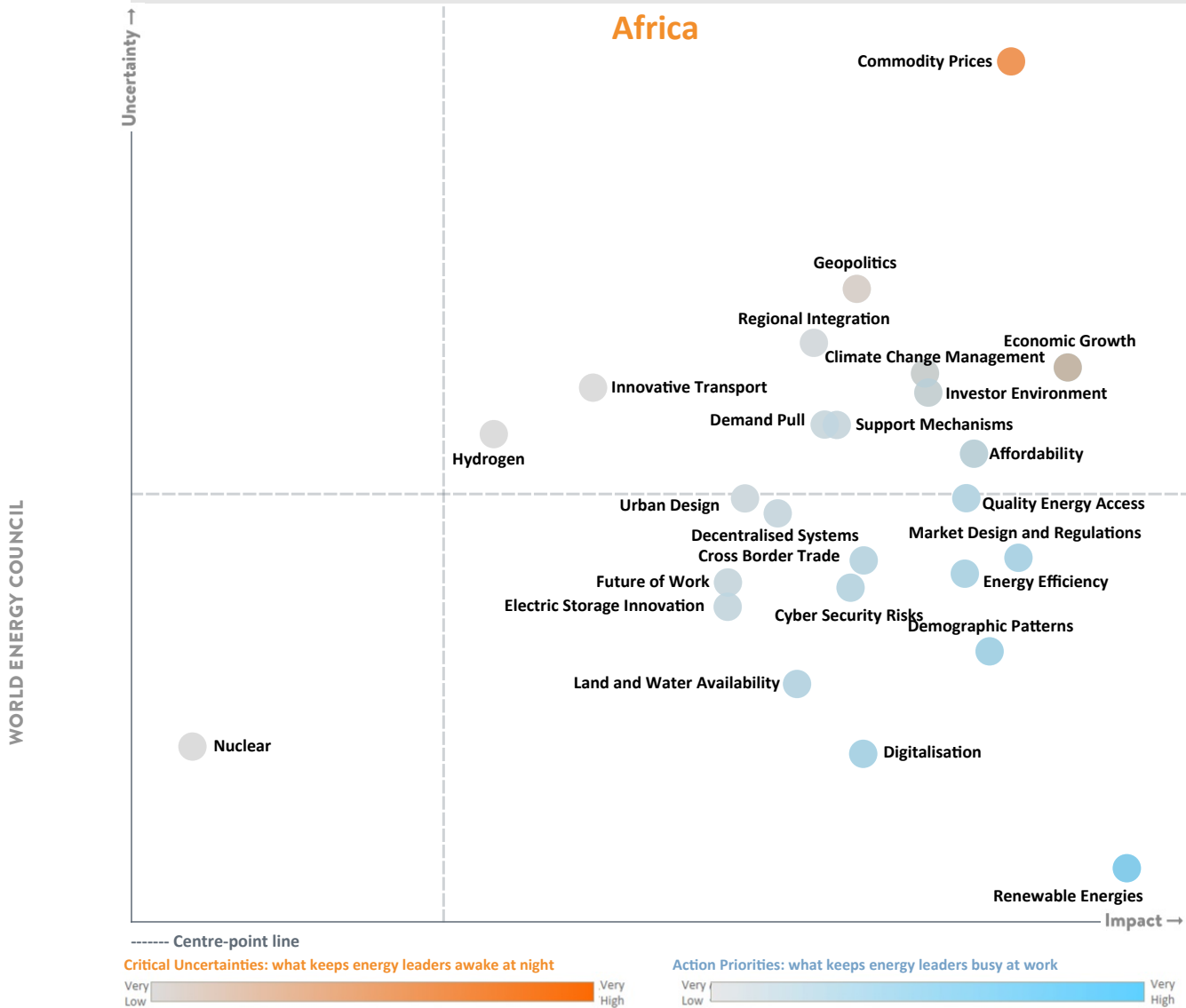
<p><b>UNIQUE REGIONAL ISSUES</b></p> <ul style="list-style-type: none"> <li>• <b>Africa:</b> Regional Integration</li> <li>• <b>Asia:</b> Hydrogen</li> <li>• <b>MEGS:</b> Innovative Transport</li> <li>• <b>North America:</b> Cyber Security Risks and Affordability</li> </ul>	<p><b>FREQUENT OCCURRING ACROSS SEVERAL REGIONS</b></p> <ul style="list-style-type: none"> <li>• Commodity Prices</li> <li>• Economic Growth</li> <li>• Geopolitics</li> <li>• Climate Change Management</li> <li>• Market Design</li> <li>• Investor Environment</li> </ul>
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REGIONAL DEEP DIVE

# AFRICA

WORLD ENERGY ISSUES MONITOR | 2022



The Africa survey results includes perspectives of energy leaders from:

- Algeria
- Egypt
- Morocco
- Cameroon
- Ethiopia
- Niger
- Congo (Democratic Republic)
- Kenya
- Nigeria
- Côte D'Ivoire
- Malawi
- Tunisia

Emerging findings illustrated in the Issues map above were tested with the Council's regional energy community during a digital workshop held on 26 January 2022.

The discussion was facilitated by the views and contributions of the following panel:

- **Prof. Adeola Adenikinju**, Head, Department of Economics, University of Ibadan, Nigeria



- **Nabil Jedaira**, Senior Business Development Manager, EDF, Morocco
- **Dr Izael da Silva**, PhD, Deputy Vice-Chancellor, Research and Innovation, Strathmore University, Kenya
- **Dr Hafez El-Salmawy**, Professor of Energy Engineering, Zagazig University, Egypt

The region’s World Energy Council Member Committees and Future Energy Leaders participated in the audience and contributed with questions and additional inputs.

## OVERVIEW

Consistent with most other regions, **Commodity Prices** are the most Critical Uncertainty in this year’s Issues Monitor, dominating the Africa Issues map. The remaining issues are clustered in the high impact, lower uncertainty area, around the centre point line of the map, with no clear distinction of priorities.

Consistent with the global map, **Renewable Energies** remain a stable Action Priority, with impact and uncertainty accorded similar scores to 2021.

## AFRICA DEEP DIVE

In 2022, more energy issues moved towards being critical uncertainties at the global level, but this is not observed across the Africa region, where **Commodity Prices** stand out as the Critical Uncertainty keeping energy leaders across the region awake at night. The significance attributed to this single issue, is likely to be strongly influenced by the timing of the survey, which was completed in Q4, 2021, when gas prices across the region were showing a 40% rise over the previous year.

Although the region in aggregate is a net exporter of energy, many countries are net importers. This has increased countries’ vulnerability to commodity price fluctuation, and to the related impact that the pandemic has exerted on global markets and supply chains.

Africa’s overall impact on climate change is currently small; yet, the continent remains extremely vulnerable to the effects of global warming. As its young and urban population continues to increase, the region’s impact on the climate is likely to grow and a development approach is required to empower energy transition and mitigate future climate impact.

***“We have the task of educating new generations so they can help the whole planet to navigate the transition”***

Dr Izael da Silva, PhD, Deputy Vice-Chancellor, Research and Innovation, Strathmore University, Kenya

***“The decisions taken at COP26 to move to a net-zero carbon world are ones that Africa cannot ignore, and the region needs to ensure that the policies it implements will enable it to meet the net-zero trajectory. With COP27 convening in Egypt in November 2022, there will be a strong focus on the continent and its ambitions.***

***Africa is a continent with a young population and abundant energy resource. The impact of the region on climate change is minimum but we are the most vulnerable. Where are we at capitalising on turning disadvantages into advantages?”***

Dr Hafez El-Salmawy, Professor of Energy Engineering, Zagazig University, Egypt

## THE CHALLENGE: COMMODITY PRICE VULNERABILITY COUPLED WITH ECONOMIC GROWTH URGENCY

The region's commodity price vulnerability can be explained by the number of its countries which are net energy importers, particularly of coal and gas, and by the regional disparities in access to indigenous resources. However, this has been aggravated by the impact of the COVID-19 pandemic on global markets.

***“Commodity prices are very important as they impact on economic growth, government revenue, foreign exchange rate, and financing of critical public infrastructure, in an oil-exporting developing economy like Nigeria. It is difficult to remove subsidies on energy when poverty and unemployment are high. Anything that impacts on commodity prices, like oil, will have a significant effect on oil-dependent economies.”***

Prof. Adeola Adenikinju, Head, Department of Economics, University of Ibadan, Nigeria

Commodity prices assume particular importance in the region as they are tied to economic growth, government revenue, foreign exchange, and financing of critical public infrastructure. However, the dynamics affecting global commodity prices are exogenous to Africa and are determined by the interplay of forces such as geopolitics, economic recovery and inflation at the global level and in specific trading partner countries, such as China, US, EU and the UK.

Other local issues identified as critically uncertain in Africa include regional unrest, project financing, transition costs and general acceptance of the need for energy transition, and electricity prices. A careful examination of these factors shows that economic growth and a worsening standard of living in many African countries contribute to regional unrest and resistance to energy price increases; it is difficult to remove energy subsidies when poverty and unemployment are high.

Geopolitics is rated highly in this year's Issues Monitor Survey. This can be explained by disruptive events in Morocco, Tigre, and Kenya and long-standing issues in northern Nigeria. Energy transition is not possible without political stability.

## THE OPPORTUNITY: LEVERAGING THE GREEN ECONOMY AND DIGITALISATION FOR ECONOMIC GROWTH

Low energy access is associated with the overall low GDP for Africa. Action Priority issues such as renewable energies, quality energy access, demographic patterns, energy efficiency, aging infrastructure, and rural electrification are consistent with Africa's agenda for economic development.

Across the region it is perceived that decentralisation offers a means to increase accessibility, but there is a need to focus on developing policy priorities and the agenda to move towards a green economy. Kenya has shown that significant progress can be made in rural access via mini grids, solar home systems and grid diversification.

Energy leaders also perceive the energy transition as favourable for Africa – the continent is richer in renewable energies than in oil and gas. The policy priority is to tap into and develop renewable energies as an energy access tool. The energy infrastructure is still predominantly young, but new infrastructure is also needed. Additional problems lie with the capacity of the energy system and consumer acceptance. There is a need to continue progress on building an integrated, decentralised distributed system to deliver a more efficient supply.



***“Rural electrification in Morocco almost at 100% today. Priority is developing smart grids which is a solution for renewables integration and response management. Digitalisation is essential and is a precursor to any programs to achieve energy efficiency. All this is mandatory for Morocco to increase competitiveness domestically and internationally.”***

Nabil Jedaira, Senior Business Development Manager, EDF, Morocco

Digitalisation, coupled with Internet of Things (IoT) integration, is a necessity for the region. Digitalisation reduces the cost of the production of electricity and enables it to be better targeted, whilst optimisation of big data also saves money and brings down investment costs. Digitalisation is also an essential precursor to any energy efficiency programs.

### **THE NEED: COLLABORATION TO CREATE ECONOMIES OF SCALE AND PROMOTE INVESTMENTS**

Energy leaders across the region consider regional collaboration as the key to maximising the utilisation of renewables, achieving economies of scale and sharing policy best practice with respect to rural electrification, market design and resolving issues surrounding energy privatisation. Joint power projects such as the West African Power Pool and West African Gas pipeline demonstrate the benefits of regional collaboration, along with international interconnection agreements (for example, between Morocco and Spain, and Morocco and Portugal).

Collaboration is also seen as key to applying joint pressure on advanced economies, international development partners and global donors to provide resources to support an African green energy and development agenda and ensure energy transition is a just transition, which leaves no-one behind and does not place significant burdens on individuals.

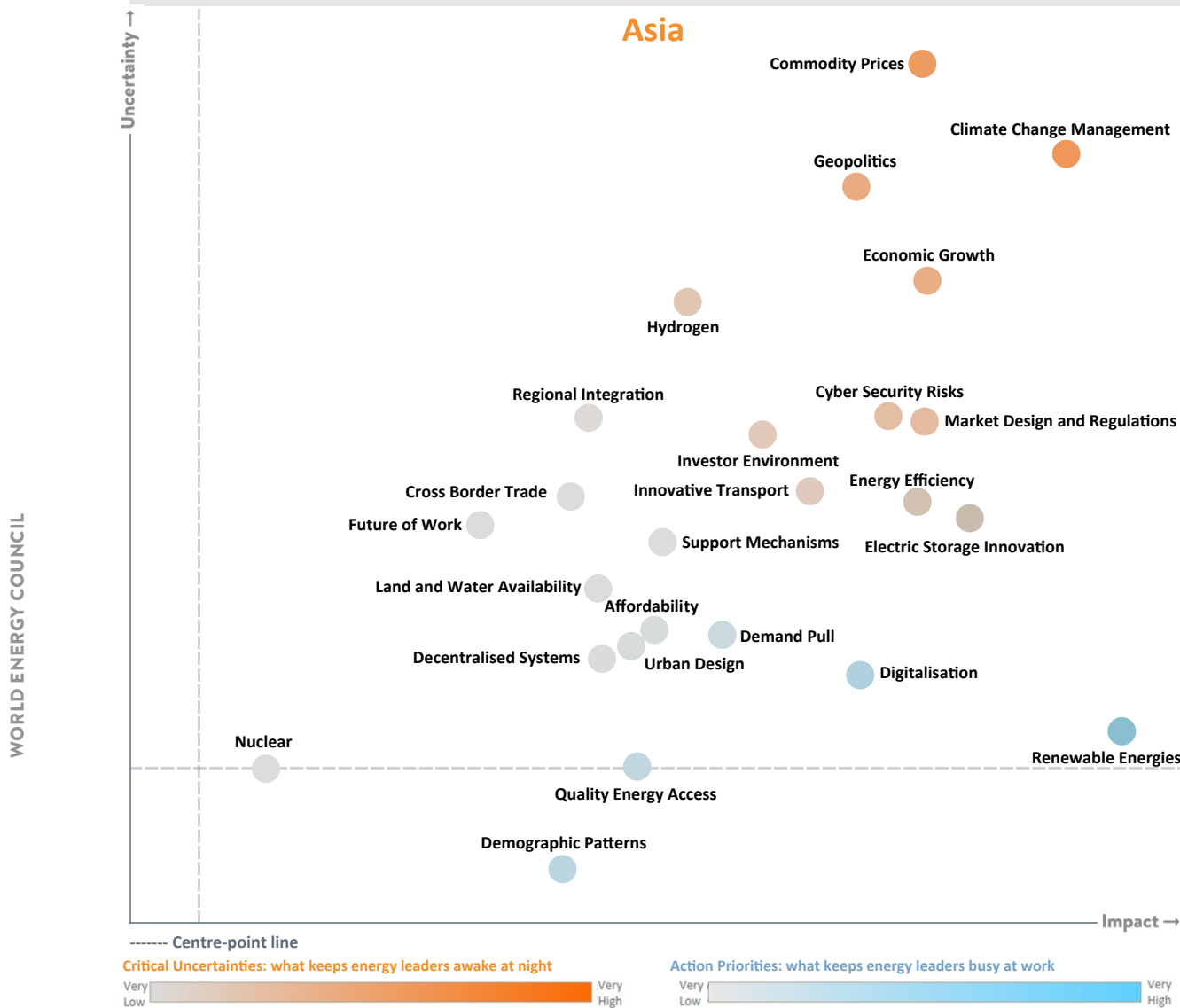
Establishing a favourable investor environment across the region is considered essential to energy transition. Trade agreements and the development of infrastructure projects to attract investment in the region are required, and Pan-African collaboration can improve stability and increase investor confidence.



REGIONAL DEEP DIVE

# ASIA

## WORLD ENERGY ISSUES MONITOR | 2022



The Asia survey results includes perspectives of energy leaders from:

- Australia
- China
- Hong Kong SAR, China
- India
- Japan
- Korea (Republic of)
- Mongolia
- Nepal
- New Zealand
- Singapore
- Vietnam

Emerging findings illustrated in the Issues map above were tested with the Council’s regional energy community during a digital workshop held on 27 January 2022.

The discussion was facilitated by the views and contributions of the following panel:

- **Khiimorisain Purevdorj**, Specialist at Department of Energy Efficiency and Conservation, Energy Regulatory Commission, Mongolia



- **Masaaki Hanaoka**, Senior Executive Director, Japan Energy Association / Secretary General, Japan Member Committee, World Energy Council, Japan
- **Mike Thomas**, Managing Director, The Lantau Group, Hong Kong SAR, China
- **Wei Wei**, Senior Research Fellow, Institute of World Economics and Politics, Chinese Academy of Social Sciences (CASS), China

The region's World Energy Council Member Committees and Future Energy Leaders participated in the audience and contributed with questions and additional inputs.

## OVERVIEW

Consistency is the theme across Asia, with the 2022 Issues Map remaining remarkably aligned between 2021 and 2022. **Commodity Prices** and **Geopolitics** stand out as the Critical Uncertainties, with the region strongly impacted by energy security concerns and large price rises in energy costs. **Hydrogen** scores highly on the Critical Uncertainties quadrant and is accorded more interest than many other regions.

Few issues appear in the Action Priorities quadrant, with **Renewable Energies, Digitalisation and Quality Energy Access** topping the list of what is keeping energy leaders across the region busy at work.

## ASIA DEEP DIVE

With a population of 4.5 billion, representing 40% of the world's total, this large continent is extremely diverse geopolitically, economically and geographically, so care must be taken to avoid generalisations. In this region, energy transition continues to occur at different speeds and via different routes.

### THE CHALLENGE: DIVERSIFYING THE ENERGY MIX IN TIMES OF UNCERTAINTY

Many countries in the region are experiencing rapid population growth which, coupled with weak economic growth, is leading to poverty. The impact of COVID-19 and geopolitics have accelerated the economic and energy disparity that was already evident pre-pandemic.

Fossil fuel dependence raises uncertainty and concerns about energy security, particularly as financial institutions commit to phasing-out investment in coal power projects as a response to decisions taken at COP26. This is of particular concern for Mongolia, which has a greater than 90% dependence on coal power. The country is double impacted by climate change management and commodity prices fluctuations, as it counts on indigenous fossil fuel production for 80% of its growing energy needs, and on imports from neighbouring countries, Russia and China, for the remaining 20%.

Pakistan also perceives high vulnerability to fluctuations in commodity prices, due to being a net importer of natural gas (70% indigenous and 30% imported). This perception has been further aggravated by the significant increases in the price of imported gas in recent months.

In this challenging context, countries across the region see no one single energy source as sufficient to balance the Energy Trilemma of energy security, sustainability and affordability. Instead, there is a shared view that diversified pathways must be followed to reduce risk and achieve carbon reduction/net-zero targets.

***“There is no single energy source we can use to wipe out this uncertainty.”***

Masaaki Hanaoka, Senior Executive Director, Japan Energy Association / Secretary General, Japan Member Committee, World Energy Council, Japan

Yet, Asian countries have pledged carbon neutrality, or committed to massive carbon reduction, which will affect business and social activities. This year’s Asia Issues Map reflects mixed sentiment of anxiety, frustration, significant challenges and economic concerns. Against this environment, energy transition is seen as an imperative, with many countries continuing to invest in renewables, nuclear, hydrogen and sophisticated grid-management systems.

***“Fossil fuels will phase out in a periodic manner as the supply chain and technological constraints for renewables are managed by stakeholders during the energy transition. There is no doubt that natural gas is here to stay for at least another decade.”***

Umair Ahmed, Deputy Manager - Strategy, Engro Corporation, Pakistan/ Future Energy Leader, World Energy Council

## **THE OPPORTUNITY: GREATER CLARITY AROUND RENEWABLES STRATEGIES FOR MULTINATIONALS, AS END-USERS, AND FOR COMMERCIAL INVESTORS**

The region’s existing renewables capacity was stimulated through Feed-in-Tariffs or special programmes. With many of these coming to an end, or being reset, there is an opportunity to reframe the policies and adapt commercialisation models to accelerate transition. This is occurring in China, the Philippines and some other countries across the region. Simultaneously, the cost of renewables technology has fallen, making implementation more favourable.

***“Merchant markets will see they can make more money moving faster towards renewables as they are displacing ever more volatile and expensive fuel, and it will be harder to get funding for long-term gas contracts (too much uncertainty). This uncertainty steels the resolve to move to things that are less exposed to this risk – that will be the shift factor in policy and commercial opportunities.”***

Mike Thomas, Managing Director, The Lantau Group, Hong Kong SAR, China

Technological breakthroughs are seen as key to energy transition. In electric vehicles, there is competition in lithium-ion cells between lithium iron phosphate, and nickel manganese cobalt oxide, and potentially also with sodium-ion batteries. The different technological roadmaps will impact the development of electric vehicles and also alter the demand for different commodities.

With respect to Hydrogen, which features as a Critical Uncertainty in this year’s Asia Energy Issues Map, there are still multiple technical challenges to be overcome. In addition, international supply chains will need to be developed to accommodate the volumes predicted, and existing infrastructure will need to be re-purposed.

***“Market disruption comes down to market design. We need to learn from past problems and review our existing market design.”***

Sam Muraki, Executive Advisor, Tokyo Gas Company / Regional Vice-Chair for the Asia Pacific and South Asia, World Energy Council, Japan





## **THE NEED: FACING THE CHALLENGE OF ENERGY TRANSITION TOGETHER, GLOBALLY**

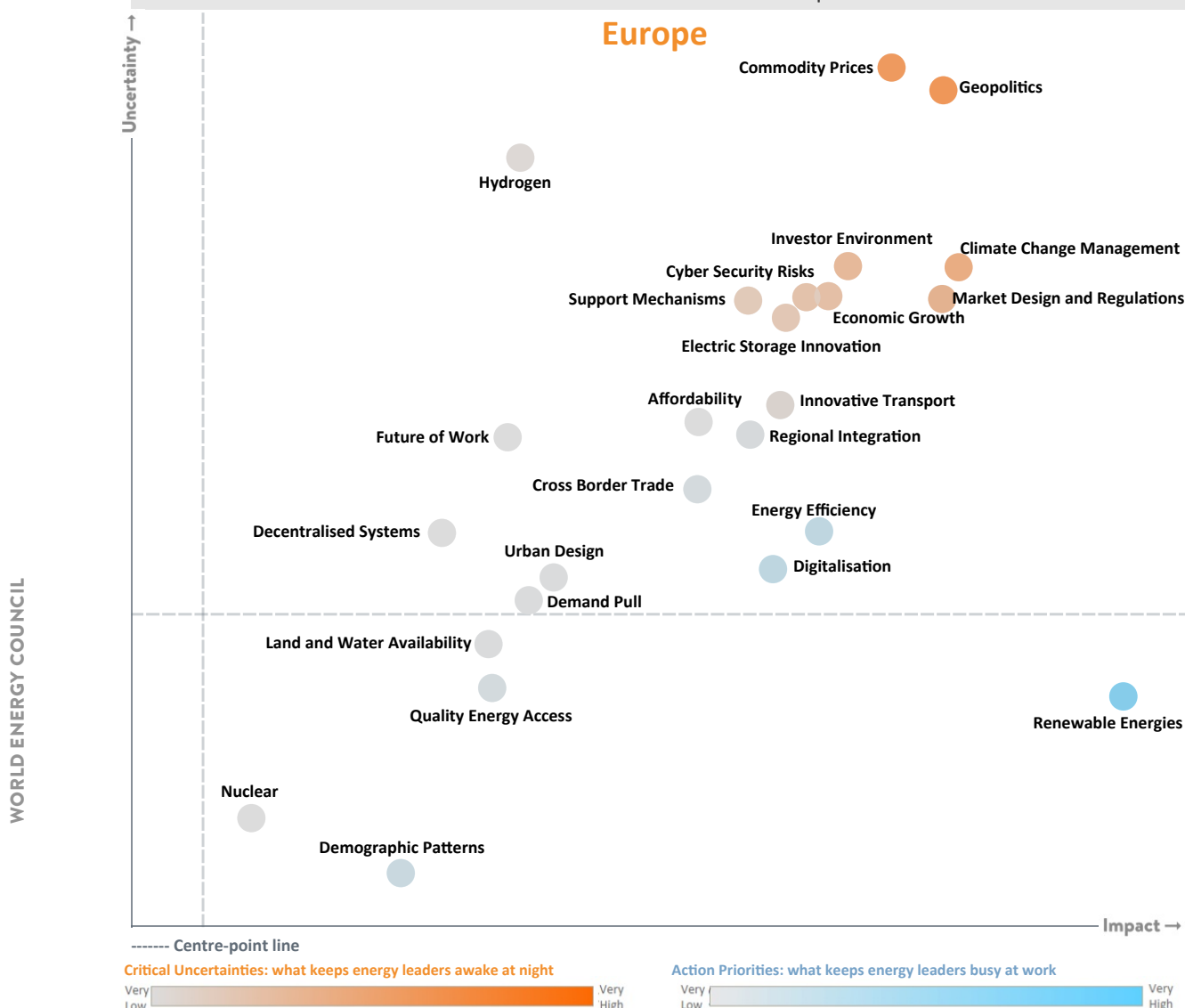
Comparison of the Asian and Global energy Issues maps shows that energy prices and geopolitics increase in uncertainty from 2020 to 2021 regionally and globally.

Within the region, countries share the view that carbon neutrality must be addressed as a global issue, and that international collaboration and global solutions are required. At a country level, the government of Japan has targeted 14 key areas in its carbon-neutral strategy, including demand-side management. The Chinese government continues to emphasise that cutting emissions is not aimed at curbing productivity or achieving zero emissions, that the economic development and green transition should be mutually reinforcing, and that no 'one-size-fits-all' approaches should be adopted.

The region also shares concerns of geopolitical tension and conflict as extremely harmful to international collaboration and of their negative impact on energy transitions. For example, there is close attention to how the escalating conflict in Ukraine can impact LNG markets as prices go up, and as demand and prices become increasingly tied.



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The Europe survey results includes perspectives of energy leaders from:

- Austria
- Belgium
- Bosnia and Herzegovina
- Croatia
- Estonia
- Finland
- Germany
- Greece
- Iceland
- Italy
- Kazakhstan
- Latvia
- Lithuania
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Russian Federation
- Serbia
- Slovenia
- Spain
- Switzerland
- Turkey
- United Kingdom

Emerging findings illustrated in the Issues Map above were tested with the Council’s regional energy community during a digital workshop held on 28 January 2022.

The discussion was facilitated by the views and contributions of the following panel:

- **Alexey Gospodarev**, Executive Director, Russian National Committee, World Energy Council, Russian Federation



- **Andrei Covatariu**, Co-founder, ECERA / Member of the Task Force on Digitalization in Energy, United Nations Economic Commission for Europe
- **Carsten Rolle**, Executive Director, Weltenergieerat Deutschland / Director Energy and Climate Policy, Federation of German Industries (BDI), Germany
- **Fergal McNamara**, Manager, Regulation and Policy, ESB / Chairman Distribution and Market Facilitation Committee, Eurelectric / Chair, Ireland Member Committee, World Energy Council
- **Francisco Laverón**, Head of Energy Prospective Innovation and Sustainability, Iberdrola, Spain

The region's World Energy Council Member Committees and Future Energy Leaders participated in the audience and contributed with questions and additional inputs.

## OVERVIEW

Following the global trend in this year's Issues Monitor, there is an increase in uncertainty across most issues, with **Commodity Prices** and **Geopolitics** standing out as the region's Critical Uncertainties. Both these issues are strongly influenced by energy security concerns and significant price hikes, particularly in gas prices, being experienced across Europe. The rapidly unfolding Russia-Ukraine situation is significantly adding to these pressures and concerns.

**Hydrogen** continues to be viewed with a high degree of uncertainty, but is not yet making a significant impact, whilst **Nuclear** also appears on the Action Priority horizon.

**Renewable Energies** continue to be the focus for Action Priority across the continent, whilst **Quality Energy Access** assumes greater uncertainty as the pandemic continues to impact working patterns and transport.

## EUROPE DEEP DIVE

Results are 'on trend', in that Europe's results reflect the world energy mood. Uncertainty has not decreased in the past year, despite the improved COVID situation. Geopolitics is playing an important role in this environment of continued uncertainty, resulting in energy security and affordability concerns.

### THE CHALLENGE: ENERGY SECURITY AND AFFORDABILITY

The challenges of an uneven post-COVID recovery, a long winter, and regional extreme weather events, such as hurricanes, have all influenced the current high gas prices, which also impact electricity prices. Carbon prices are currently at around EUR80 per ton, and energy prices are higher and not expected to fall back to previous levels anytime soon. Energy leaders predict that volatility in electricity prices is likely here to stay, or even increase. Gas demand is increasing due to harsh European winters and a greater proportion of renewables in the electricity mix. In parallel, there is an increase in supply tensions related to geopolitics across the region.

High commodity prices have a strong impact on domestic consumers, with price volatility inducing affordability issues, which are likely to move to the Action Priority segment of the Issues Map. Bankruptcy among energy traders is increasingly becoming an issue and raises questions about whether increased security measures will be required to secure supply.

Whilst understandably focusing on gas, oil and electricity as key commodities, it is worth noting that the availability of critical metals and human capital (knowledge and expertise) are both factors that contribute to the energy security dimension.

From our World Energy Trilemma, Europe scores low on energy security (particularly if Russian supplies are removed from the mix), exposing disparities in domestic resource availability and import/export balances, as well as flaws in governance of energy and electricity security, which is bringing into question market design and regulation across the region.

***“ Investment in clean energy is rising, but not nearly enough to meet demand, and the phase out of fossil fuel generation.”***

Andrei Covatariu, Co-founder, ECERA / Member of the Task Force on Digitalization in Energy, United Nations Economic Commission for Europe

## THE OPPORTUNITY: IS THERE AN OPPORTUNITY AROUND NUCLEAR?

Nuclear has a positive impact on sustainability, but debates surrounding its deployment are on-going. Nuclear is not clearly defined as a priority at a regional level, though many countries are planning on building new reactors. Nuclear may evoke a different result in the current environment, due to taxonomy debates on whether nuclear and gas should stay in the energy mix long-term. The issue is more on the agenda now than last year. But, is taxonomy the right approach to deal with technology issues?

There are two distinct views on the role of nuclear in Europe:

1. Nuclear in Europe is like the rest of the world. It will be important in some countries but, in general, expansion is not on the horizon. It can be considered as a technology that in general terms won't have a huge impact in the future.

or:

2. Nuclear is a low carbon and reliable source of dispatchable generation. Costs are predictable, which is very important under current price uncertainty. Given the current focus on sustainability and expected demand growth, increasing nuclear capacity may be an affordable solution to fight global warming. The [UN economic commission report](#) shows nuclear power releases less carbon emissions than any other energy source. It also points to the need to have a technology-neutral approach.

## THE NEED: MARKET DESIGN AND COMMITMENT TO PRACTICAL MEASURES

Energy prices have become very salient in European politics, leading to significant government intervention in many countries (e.g., Spain, Romania, France, Italy). Across the region, there is a perception that Issues Monitor scores related to market design, support mechanisms and affordability are spill over effects of current high commodity prices, which is, in turn, a consequence of geopolitics:

***“ All of the price fluctuation are really due to geopolitics and consequent commodity prices increases and this is being confused with the energy transition, which is in fact the solution. This of course explains why Climate Change management is one of the critical uncertainties.”***

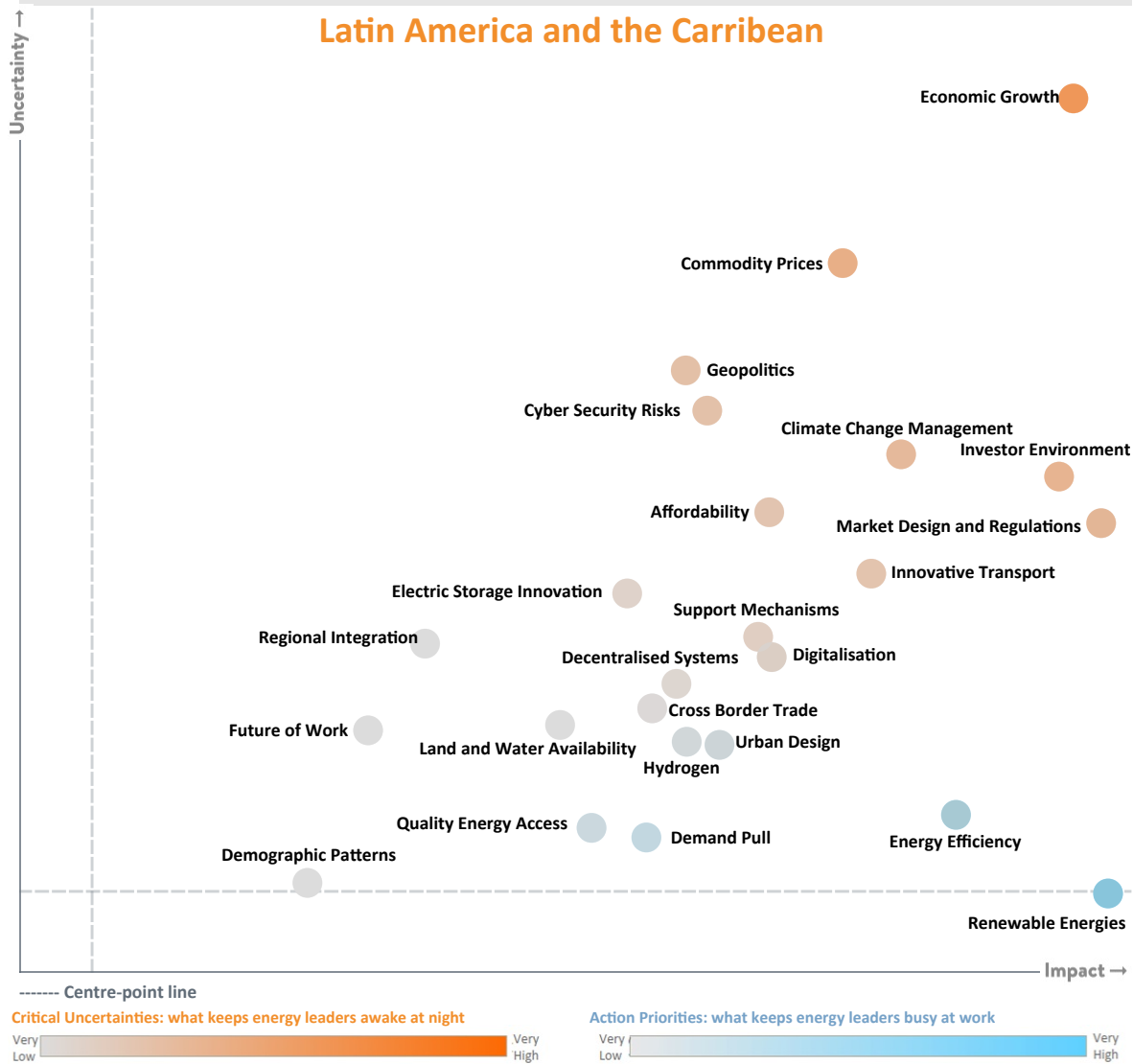
Fergal McNamara, Manager, Regulation and Policy, ESB / Chairman Distribution and Market Facilitation Committee, Eurelectric / Chair, Ireland Member Committee, World Energy Council

Climate Change Management is focused on the EU Green Deal, but there is significant uncertainty around what policy is implemented and how. For example, carbon pricing is controversial and there is uncertainty as to whether it will be included within the Green Deal. There is a need to ensure that investments in decarbonised resources are made at the right level and at a pace that supports climate targets. It will also be necessary to maintain security of gas and oil supply over the coming years. These efforts must be carefully planned, with practical measures, otherwise energy price volatility could increase dramatically, potentially putting the energy transition at risk.



WORLD ENERGY ISSUES MONITOR | 2022

Latin America and the Caribbean



WORLD ENERGY ISSUES MONITOR 2022

The Latin America and the Caribbean survey results includes perspectives of energy leaders from:

- Argentina
- Brazil
- Chile
- Colombia
- Ecuador
- Panama
- Paraguay
- Uruguay

Emerging findings illustrated in the Issues Map above were tested with the Council’s regional energy community during a digital workshop held on 03 February 2022.

The discussion was facilitated by the views and contributions of the following panel:

- **Juan Roberto Paredes**, Senior Renewable Energy Specialist, Infrastructure and Environment Sector, Interamerican Development Bank
- **Noelia Medina**, Adviser to the Director of Energy, MIEM, Uruguay
- **Ricardo Mejia**, Regional Manager Latin America, EPRI

- **Tulio Alves**, Executive Director, Comisión de Integración Energética Regional (CIER)

The region's World Energy Council Member Committees and Future Energy Leaders participated in the audience and contributed with questions and additional inputs.

## OVERVIEW

Showing analogous responses to Africa, the Latin America and Caribbean region reports clustering of all issues in the high impact area of the map, along with higher uncertainty. The map is striking in its depiction of no clear distinction of priorities. No issues fall into the Action Priorities quadrant.

## LATIN AMERICA AND THE CARIBBEAN DEEP DIVE

This year's Issues Map for the Latin American and Caribbean region must be framed in the context of the pandemic. [Interamerican Development Bank \(IDB\) studies](#) show that nearly 33% of all COVID-19 related deaths worldwide occurred in Latin America and the Caribbean, despite the region constituting only 8% of the total world population. In addition, it is estimated that more than 52 million people across the region dropped out of the previously growing middle-class sector in 2020, eroding years of work to grow this segment. Worse, 44 million people fell into poverty in the same year, threatening the future of an entire generation. In addition, more than 39 million jobs were estimated to be lost by 2020, worsening pre-pandemic stagnation and tearing at the social fabric of the region. The situation is further exacerbated by climate change – people on the lowest incomes are the most vulnerable to the impacts of drought, wildfires, sea-level rise and other extreme weather events. IDB estimated that the annual cost of climate-induced damage in the region by 2050, if global warming is not kept below 2°C, will amount to \$100 billion, threatening development gains post-pandemic and far into the future.

It is therefore unsurprising to see **Economic Growth** being deemed the highest Critical Uncertainty for the region, with **Commodity Prices** and **Climate Change Management** also keeping the region's energy leaders awake at night.

The region has a major challenge in guaranteeing the availability of energy to meet demand, with affordable prices and quality, as well as ensuring basic energy access and supply for the entire population, particularly given the environmental challenges some countries are facing. In 2021, the Southern Cone, and Brazil in particular, faced the worst drought in a century, forcing a return to thermal power generation, with an impact on the emission of greenhouse gases. In addition, the worsening economic environment is creating a cost burden and rising inflation, which is significantly impacting the population, with disproportionate effects on the poorest citizens.

With respect to Climate Change Management, COP26 was perceived positively in the region, with targets deemed as being clearer. Almost 20 LAC countries signed up to the global methane-reduction agreement – [The Global Methane Pledge](#). And Argentina, Colombia, Ecuador, Brazil, Chile, Honduras, Peru, Costa Rica, Guatemala, Cuba, Mexico, Panama, Paraguay and Uruguay committed, together with other countries at a global level, to [reduce deforestation and land degradation by 2030](#). Most countries in the region increased their climate change ambition, but Brazil and Mexico, which together consume close to 50% of the region's energy, were less ambitious in their Nationally Determined Contributions (NDCs).

### THE CHALLENGE: LOW ECONOMIC GROWTH AND THE LACK OF LEADERSHIP CLARITY

From this year's Issues Map, **Economic Growth** is clearly accorded the highest degree of uncertainty. Growth rates across the region are averaging between 2% and 6% which, in turn is generating



additional uncertainty with respect to the economic stability of investments and availability of finance. Energy leaders agree that long-term vision, economic monitoring and forecasting are key to stable economic growth, and that job creation and investment need to be brought centre stage.

Social unrest in some countries and the growth of extreme right and left political wings are creating very large uncertainties in terms of political and economic issues, which impact energy policies. The general climate of uncertainty is impacting everyone, including the region's research institutions.

Energy leaders agree that governments must consider long-term planning and include environmental targets as part of their plans for the region's economic recovery.

## THE OPPORTUNITY: TRANSPORT AND TECHNOLOGY INNOVATION

What are the opportunities across the region that can be turned into Action Priorities?

There is much discussion across the region about carbon neutral and net-zero scenarios, with up to 15 million net jobs forecasted to be created across the sector in the next decade. The region is very well positioned to take advantage of energy transition. It houses the world's largest copper and lithium reserves, which are critical to electromobility and energy storage technologies, and is keen to take advantage of the associated innovation ecosystems that are being developed.

***“The research and development priorities are the same for the whole world: we are on the way to look for integrated energy systems. It requires a more integrated approach through digital integration technologies and systems. We need to look at things holistically, comprehensively, unified. Efficient use of electrification, electric mobility, and artificial intelligence - this way we can be more efficient.”***

Ricardo Mejia, Regional Manager Latin America, EPRI

In addition, the region has an abundance of natural resources, particularly renewable energy sources, that are available for exploitation and development.

***“Latin America has enormous energy potential due to its abundance of natural resources, particularly in relation to non-conventional, renewable energy sources, although historically, this potential has been underutilised.”***

Tulio Alves, Executive Director, Commission for Regional Energy Integration (CIER)

Electromobility and the development of the green hydrogen economy with IDB support are also opportunities for the region and instrumental to energy transition. In Uruguay, transport accounts for two thirds of the country's fuel requirements, so it is critical that it is addressed.

Regional energy leaders consider that **Hydrogen** should feature in the Action Priorities quadrant of the Issues Map. Mexico's Federal Electricity Commission (CFE) has taken a lead in hydrogen and expects its green hydrogen plant to start producing clean fuel in 2023. Colombia and Chile are positioning themselves as potential large-scale producers of hydrogen, and Brazil is also expected to launch its hydrogen roadmap this year.

## THE NEED: LONG-TERM VISION AND REGIONAL COOPERATION

According to regional energy leaders, energy transition will require between three and five times the current level of investment, and needs the support of international agencies, as well as the ability to attract capital from the private sector, to be successful.

A high degree of investor uncertainty exists at present, which requires the introduction of regulation to support renewables and infrastructure projects to reduce uncertainty and perceived risk. Uruguay has launched the first sustainable bond for US\$15 million and an award-winning certificate of origin of the energy they consume as a step in this direction.

The [RELAC](#) Initiative (energy compact to boost renewables in Latin America and the Caribbean, with 15 member countries across the region) has an objective of reaching at least 70% of renewable energy in the region's electricity mix by 2030. The current contribution is 58%; the 10% increase required in the next 8 years implies a 15% reduction in emissions and will require long-term vision and increased cooperation to give more certainty to the growth of renewables.

Significant gains can be derived from energy diversification across the region, as well as enhanced cooperation and increased energy integration between countries. Reduction in costs is seen as a driver, along with enhanced energy security resulting from mitigation of the uneven fluctuations in costs and periodic scarcity of supply due to extreme weather (drought) of the region's main energy resource – hydro.



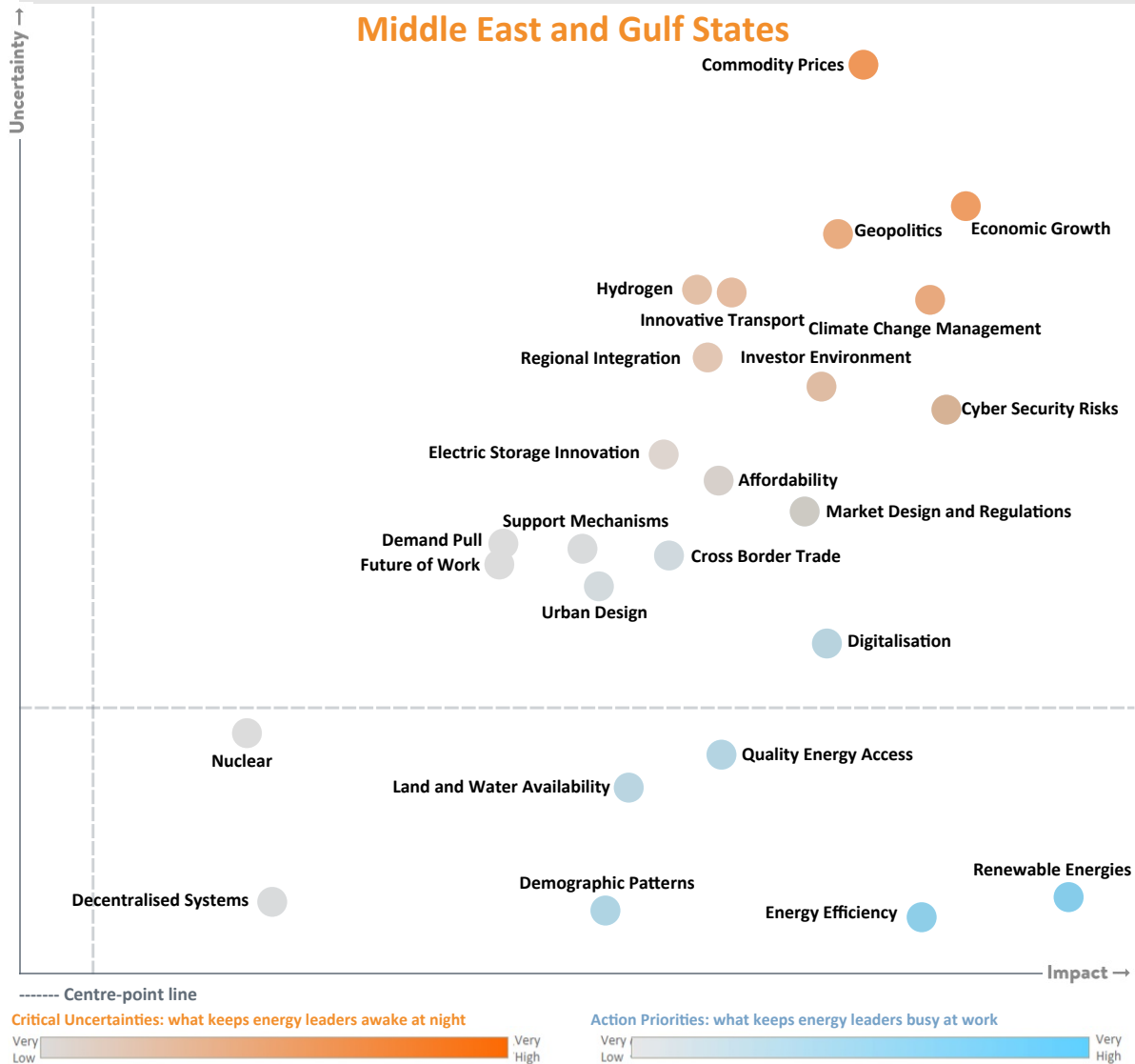


REGIONAL DEEP DIVE

# MEGS

WORLD ENERGY ISSUES MONITOR | 2022

## Middle East and Gulf States



WORLD ENERGY ISSUES MONITOR 2022

The Middle East and Gulf States survey results includes perspectives of energy leaders from:

- Jordan
- Lebanon
- Saudi Arabia
- United Arab Emirates

Emerging findings illustrated in the Issues Map above were tested with the Council’s regional energy community during a digital workshop held on 25 January 2022.

The discussion was facilitated by the views and contributions of the following panel:

- **H.E. Eng Yousif Al Ali**, Assistant Undersecretary for the Electricity, Water and Future Energy Sector, United Arab Emirates
- **Pierre El Khoury**, General Director and President of the Board, Lebanese Center for Energy Conservation (LCEC) / Secretary General, Lebanon Member Committee, World Energy Council, Lebanon

The region's World Energy Council Member Committees and Future Energy Leaders participated in the audience and contributed with questions and additional inputs.

## OVERVIEW

The Middle East and Gulf States (MEGS) continue to be aligned with the overall global Issues Map, with higher uncertainty overall and **Commodity Prices** and **Geopolitics** rising up from Action Priorities to Critical Uncertainties.

**Commodity Prices** top the list of Critical Uncertainties, closely followed by **Economic Growth** and **Geopolitics**, which show enormous shifts over their relative 2021 position. **Hydrogen** also increases up the uncertainty axis.

**Renewable Energies**, **Energy Efficiency** and **Land and Water Availability** remain Action Priorities, as consistent factors in the region's energy transition strategy.

## MIDDLE EAST AND GULF STATES DEEP DIVE

This year's Issues Monitor Survey results cover four countries across the region: two (Lebanon and Jordan) are net oil importers, and two (United Arab Emirates and Saudi Arabia) are oil producers.

The high overall uncertainty rating is strongly influenced by the pandemic context and is particularly reflected in the high scores afforded to **Economic Growth**, **Geopolitics** and the **Investor Environment** in this year's map.

Deeper analysis of the survey results shows additional Critical Uncertainties for the region include Institutional reliability and continuity, the long-term impact of the pandemic, the future of oil and gas demand, greenflation and financial crisis, as well as transition costs and societal acceptance of energy transition.

Energy leaders in the region question whether the high degree of uncertainty across so many issues makes it difficult to take action, and shift into Action Priority mode. Uncertainty impacts decision making and presents a challenge for policy setting.

***“ If climate change is the biggest challenge, uncertainty is only an excuse. This is a challenge of setting policies”***

Dr Mari Luomi, Research Fellow II, King Abdullah Petroleum Studies and Research Center (KAPSARC), Kingdom of Saudi Arabia

There is an acknowledgement that the momentum of a sustainable post-COVID recovery has been lost – and disappointment that there is no real mention of a green recovery even at COP26.

Nationally determined contributions (NDCs) from 6 GCC countries are in place, but despite huge levels of interest in hydrogen and Carbon Capture, Utilisation and Storage (CCUS), very few tangible quantitative targets have been set.

Energy leaders agree that governments need to set clear mid-term targets (through 2030) and implementational roadmaps to deliver on COP26 pledges.



The next two COPs will be held in the MEGS region (COP27 in Egypt in November 2022, and COP28 in the United Arab Emirates in the following year), indicating the region's ambition and commitment to energy transition and climate change mitigation.

### **THE CHALLENGE: OIL & GAS RELIANCE**

The region is still heavily dependent on its indigenous oil and gas reserves, and faces unique challenges when it comes to financing, land allocation and providing an attractive investor environment to facilitate energy diversification and transition.

Countries within the region are, however, looking to global partners to collaborate on energy transition solutions around demand-side management, energy efficiency, CCUS, hydrogen and smart transportation.

***“The UAE exerts efforts towards diversifying energy sources as it is the foundation of achieving a balance between sustainable development and environmental preservation.”***

H.E. Eng Yousif Al Ali, Assistant Undersecretary for the Electricity, Water and Future Energy Sector, United Arab Emirates

### **THE OPPORTUNITY: NEW MOMENTUM FOR DIGITALISATION, ENERGY EFFICIENCY, AND RENEWABLE ENERGY**

New opportunities for the region are presented by diversification to renewable energies, energy efficiency and digitalisation. For countries like Jordan and Lebanon, which do not have sufficient oil and gas resources, there is a pressing need to invest in renewable energies to increase energy security.

Jordan now has a track record in deploying renewable energies and implementing energy efficiency measures. The participation of renewables in the country's energy mix is 25% and the country has a plan to export green energy to other countries, including Europe, in the near future. Coupled with an e-Mobility project and a smart grid and storage initiative, the country is aiming to reach 30% renewables penetration.

The UAE has made significant progress in the past year in renewable energy deployment. Today, the country stands on a large clean energy capacity (solar and nuclear). This is a great achievement, but the country's leadership has more ambitions and is confident of achieving net-zero by 2050. However, more needs to be done on pathfinding to 2050.

The MEGS region lacks transport networks – plans, strategies and investment are all required to improve mobility. This represents a huge challenge and opportunity for the region that will require significant investment.

Hydrogen-fuelled transport is being considered as part of the solution, particularly in the UAE, which is looking to stimulate commercial interest in hydrogen production. In the mid- and short-term, the UAE hopes to showcase the export of blue hydrogen and ammonia by COP28 and believes it can make the case for hydrogen in the UAE.

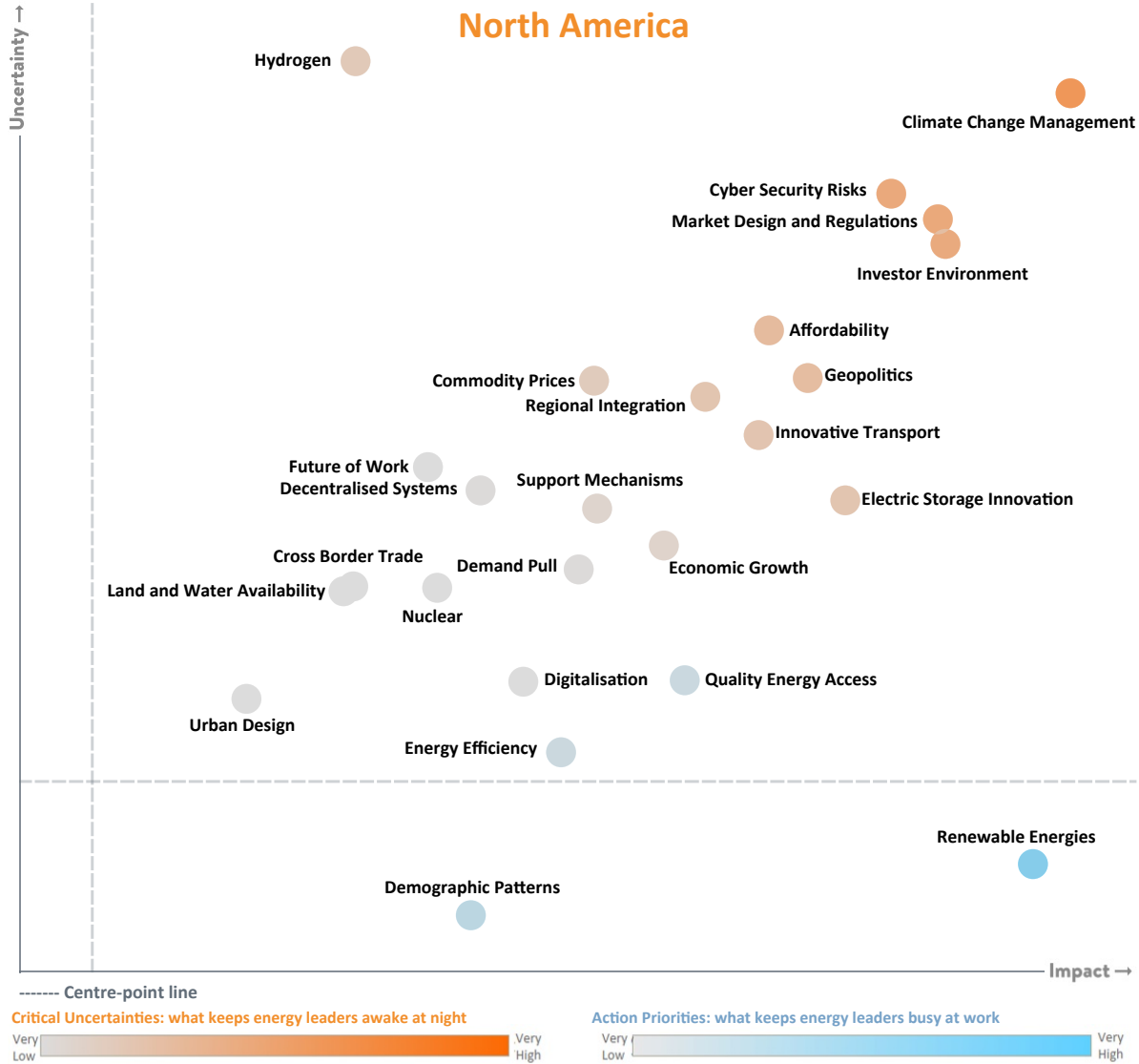
Other issues to be addressed include water and land use/degradation. To counter these environmental challenges, ambitious waste management programmes are being undertaken in Saudi Arabia, Dubai and other Emirates in the UAE. Water availability is a constant challenge across the region and in the UAE in particular, where mangrove planting is being undertaken to tackle water scarcity.

## **THE NEED: TO ACHIEVE NET ZERO THE REGION WILL NEED TO EXCEL ON HYDROGEN ON CARBON MANAGEMENT**

The region is very focused on a net-zero target, as well as consolidating a circular carbon economy framework and carbon policy. The [KAPSARC Circular Carbon Economy Index](#) (of 30 countries) maps how countries are performing on the road to net zero/circular carbon economies.

Hydrogen is becoming more and more interesting for energy leaders and political decision makers globally and across the region. The UAE plans to achieve net zero by 2050 and this can only be done with hydrogen. Saudi Arabia and the UAE are making significant investments and developing partnerships, as are Morocco, Tunisia and Egypt. Costs for green hydrogen will need to be driven down so that the fuel is competitive with natural gas, with blue ammonia and hydrogen seen as transition fuels.

Regional energy system integration, electrification and interdependency are all issues to be addressed and provide focus for future Action Priorities.



The North America survey results includes perspectives of energy leaders from:

- Canada
- Mexico
- United States of America

Emerging findings illustrated in the Issues Map above were tested with the Council’s regional energy community during a digital workshop held on 03 February 2022.

The discussion was facilitated by the views and contributions of the following panel:

- **Mike Howard**, Emeritus CEO, Electric Power Research Institute (EPRI), USA
- **Dan Ford**, Power and Utilities Equity Analyst / Board Member, Electric Power Research Institute (EPRI), USA
- **Neil Wilmshurst**, Senior VP, Energy Systems Resources, Electric Power Research Institute (EPRI), USA
- **Oskar Sigvaldason**, President, SCMS Global / Member, Future of Engineering Committee, Canadian Academy of Engineering, Canada

The region's World Energy Council Member Committees and Future Energy Leaders participated in the audience and contributed with questions and additional inputs.

## OVERVIEW

**Climate Change Management**, with **Commodity Prices** seemingly less of an issue than across the rest of the world. But uncertainty remains high, with the region following the global pattern of clustering uncertainty and few clear Action Priorities.

**Hydrogen** makes an appearance as a critical issue, moving from low to high uncertainty compared with the 2021 map, and **Renewable Energies** remain as a defined Action Priority, with the degree of uncertainty reducing over the past year.

## NORTH AMERICA DEEP DIVE

The investment environment is experiencing a high degree of uncertainty, due to inflation. Rising interest rates raises capital cost, and lowers the amount of capital, leading to a bigger gap between winners and losers.

There is no surprise from the financial market point of view that uncertainty has increased. It has its roots in COVID, and the region sees opportunities and risks in trying to manage global energy transition. A business approach to transition will be key.

### THE CHALLENGE: CLIMATE CHANGE AND MANAGEMENT

Climate change management is in the top five critical uncertainties globally and is the biggest one for the region.

***“There is a growing concern that climate change is recognised as a societal risk, but that there isn’t a common understanding on the potential severity. That uncertainty in being able to quantify the risk at an individual level is causing some confusion.”***

Mike Howard, Emeritus CEO, Electric Power Research Institute (EPRI), USA

North America is in a unique position with respect to climate change management – The Federal Government is a relatively weak regulator, whilst individual states are strong regulators, creating unevenness across the country, impacting on how transition moves forward.

In Mexico, the Issues Map results reflect uncertainty around the energy policy implemented at the beginning of the current federal administration, which has moved away from the 2014 Energy Reform for market liberalisation. The country's Electric Energy Law bill presented in October 2021 is aimed at rescuing the state oil company PEMEX with the view of, together with the national electricity company CFE, achieving energy self-sufficiency. The bill envisions the use of heavy oil and coal for electricity generation. Further uncertainties centre around policy and regulatory frameworks for clean energy, together with issues of import dependence and energy security.

In Canada, uncertainty about climate change is dominant. The country is in the top 10 ranking for emissions per capita and little progress on climate change management has been made in the past 10 years. There is significant frustration, resulting from setting and missing targets because planning and regulatory



frameworks are not in place. Despite a carbon price at federal level, there is recognition in the industry that pricing will not solve the problem on its own and needs to be combined with targeted incentives and regulations. Additional uncertainty surrounds an appreciation of the magnitude of investment needed for transition and the need to stimulate public-private partnerships and cooperation among different levels of government. There are some positives to report – much work has been done in reducing methane emissions. CCS with generation was first built at scale in Canada, at the same time as sequestering hydrogen from refineries, and the country is also now building its first nuclear facility in three decades.

## THE OPPORTUNITY IN UNCERTAINTY: GETTING INVESTMENTS RIGHT

Why does uncertainty continue to increase? Energy leaders in the region think it is because people are more aware of the issues and are increasingly eager for answers. For example, with respect to hydrogen, there is now much greater awareness of hydrogen as part of a future energy system, but it is still not clear what the impact will be and how the technology can be deployed and over what timeframe.

***“Why has the uncertainty in hydrogen gone up, when we always talk about and invest in hydrogen? It’s because more people are more aware that hydrogen is part of the solution. And they are less clear about how it’s going to play out”***

Neil Wilmshurst, Senior VP, Energy Systems Resources, Electric Power Research Institute (EPRI), USA

Concerns about affordability and inflation are also at front of mind. There is severe stress on supply chains, fuel costs and transport costs. Some of this can be traced to the impact of the pandemic and may be transitory, but some of it results from a change in behaviour as a result of decarbonising. There has been a big reaction from companies and markets to not spend as much money as they would usually in response to higher prices.

Another contributor to the climate of uncertainty relates to the timing of investment decisions: When will investment decisions for infrastructure be made with the 2050 target in mind? By the early 2030s most of the infrastructure for 2050 will already be locked in – this leaves just 10 years to solve uncertainties, gain acceptance, and put the financing in place. Uncertainty comes from the ‘closing window’ and concerns about exactly what to build, where to position it and the availability of raw materials.

Additional concerns surround transitioning existing assets in the most cost-effective way. Gas plants are likely to be phased out, but there is no clear timeline or defined roadmap to what will replace them. There will be impact on other components of the energy system and consideration should be paid to bringing new technologies into operation in a timely manner.

***“We have 10 years to get the uncertainties figured out so that the market sees these options as investable. That’s where the uncertainty is coming from, people realise the window is closing, and it’s closing fast”***

Neil Wilmshurst, Senior VP, Energy Systems Resources, Electric Power Research Institute (EPRI), USA

Some very new technologies are seen as essential; for example, hydrogen, particularly for thermal energy in building high-temperature applications in industry. Most work on hydrogen in Canada has been focused on fuel cells for the transportation sector with less emphasis paid to its application in thermal energy. Work in the UK, Germany and the Netherlands shows it may be possible to change natural gas delivery infrastructure to using 100% hydrogen, but this is a long way off. There is progress, but movement from discovery, to building, to commercialisation takes a significant amount of time. Energy leaders think there

is a significant opportunity for Canada to work with the US on the systematic selection of key technologies for energy transition, including hydrogen.

### **THE NEED: TO GET PEOPLE ONBOARD AND TO COOPERATE FOR SHARED GOALS**

The biggest challenge to climate change management is an unhappy population. Across the region, there is massive unhappiness with energy prices, which has slowed down movement on decarbonisation. There is a need to have some environmental context in 'Build Back Better' to make change affordable. Subsidies, nuclear, expansion of credit for renewables, introduction credit for hydrogen, are all considered critical to the affordability of transition and to ensure that the politics of transition are not impacted negatively.

***“The biggest risk to moving forward from a policy perspective is that your population is unhappy. And there is no question that globally we have seen a response that [the] population are unhappy about what has happened to energy prices. That has slowed down the movement that was underway.”***

Dan Ford, Power and Utilities Equity Analyst / Board Member, Electric Power Research Institute (EPRI), USA

The problem of transition costs and social acceptance for the region is therefore very accurate. Transition costs are not known precisely, but astounding numbers are frequently quoted. Will we be able to make those investments? Are there any lessons from dealing with the COVID pandemic that are applicable for climate change management? While COVID is a source of uncertainty, there has been tremendous amounts of investment in R&D to combat the virus, and also unprecedented international collaboration which enabled vaccine development in record time. Our experience of the pandemic shows that international collaboration is possible, but is there the will to transfer this to climate change? This will be a critical factor moving forwards.

But, in all the concerns about policy, technology, finance and infrastructure, it must not be forgotten that energy transition is a human issue. We must consider the future work force – where will they come from? How will they be reskilled? What does the societal impact look like? How are new technologies, such as AI going to be implemented? And will the current mobility/flexibility in working practices initiated by the pandemic continue to be part of the future of work.

Social equity issues are going to be significant if not managed correctly. If energy transition is not made equitable then everyone will lose.





# ACKNOWLEDGEMENTS

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