

WORLD  
ENERGY  
COUNCIL

# THE WORLD'S ENERGY AGENDA & ITS EVOLUTION

ISSUES MONITOR 2019



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# ABOUT THE WORLD ENERGY COUNCIL'S ISSUES MONITOR

In an era where the energy landscape is in **constant transition**, energy leaders must pay attention to many different signals of change and **distinguish key issues from the noise**.

The Issues Monitor identifies shifting patterns of connected issues which are shaping energy transitions.

Maps can be used in the following ways:



To promote a **shared understanding** of successful energy transitions



To appreciate and contrast **regional variations** to better understand differing priorities and areas of concern



To follow the evolution of specific **technology trends** related to the energy sector

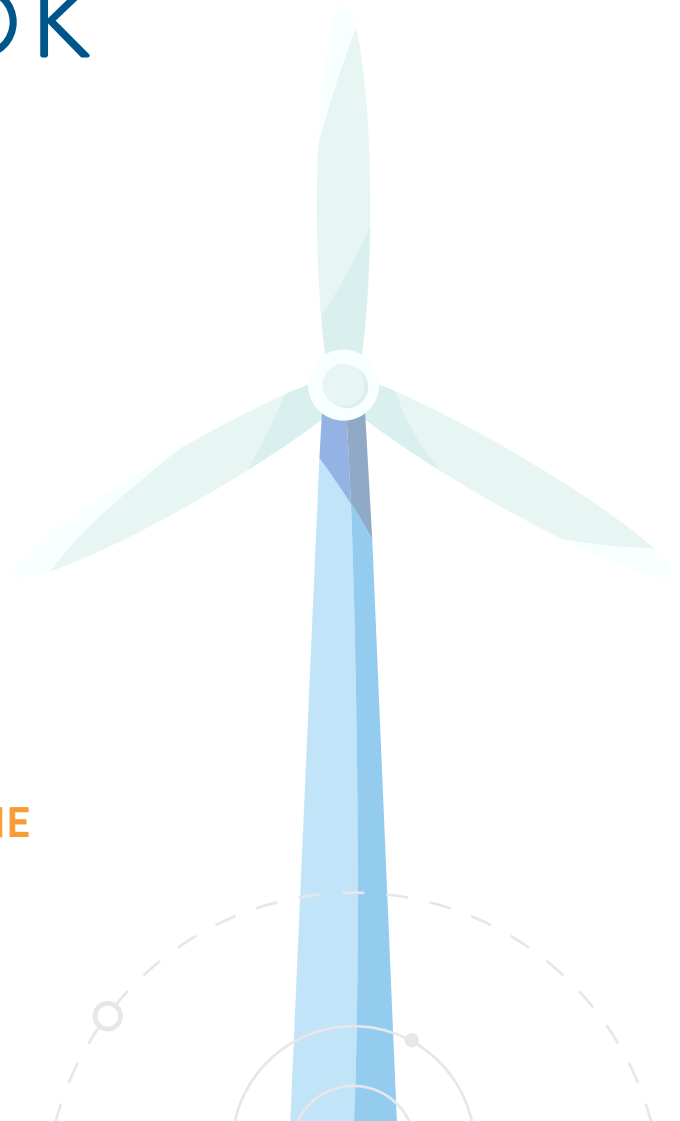
# + 01 GLOBAL OUTLOOK

The Council observes four key strategic priorities for energy leaders to consider in 2019. They are:

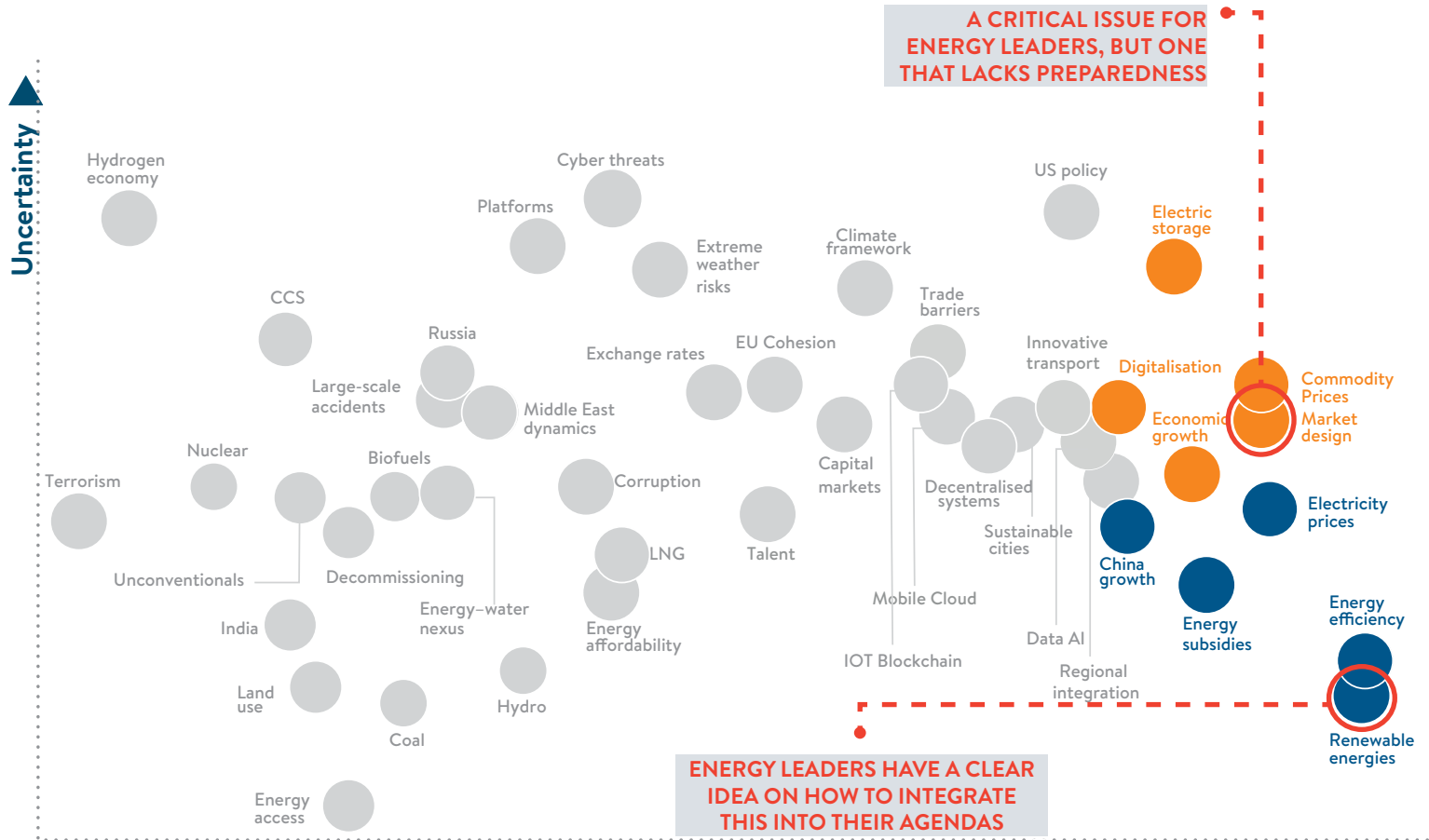
- A.** Market design rules will need to be updated to incorporate the growing move towards decentralisation
- B.** Electrification is being used as a means to decarbonise the energy sector
- C.** Global strategic competition and the rise of nationalism will impact the pace of the Energy Transition
- D.** Lithium and cobalt will play a growing role in commodity market risks, traditionally dominated by oil and gas price fluctuations

+ **“IMAGINING A BETTER ENERGY FUTURE IS TANTALISING: REALISING IT CANNOT BE DONE ALL AT ONCE OR BY WORKING ALONE.”**

Dr Angela Wilkinson -Sr. Director, World Energy Council



# GLOBAL OUTLOOK



## World Energy Issues Monitor 2019 - Global

Impact ▶

- Critical uncertainties: what keeps energy leaders awake at night
- Action priorities: what keeps energy leaders busy at work

Less urgent ○ ○ ○ More urgent

# + 02 TRACKING INNOVATION

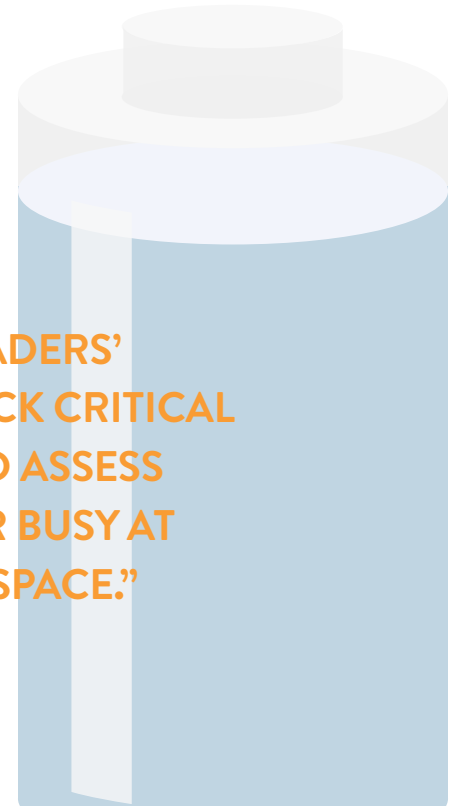
The time-tracking of global leaders' views on energy issues can reveal important trends around critical issues

**A.** Renewable energies, innovative transport, decentralised systems, digitalisation, and electric storage are the biggest movers towards higher impact since 2008

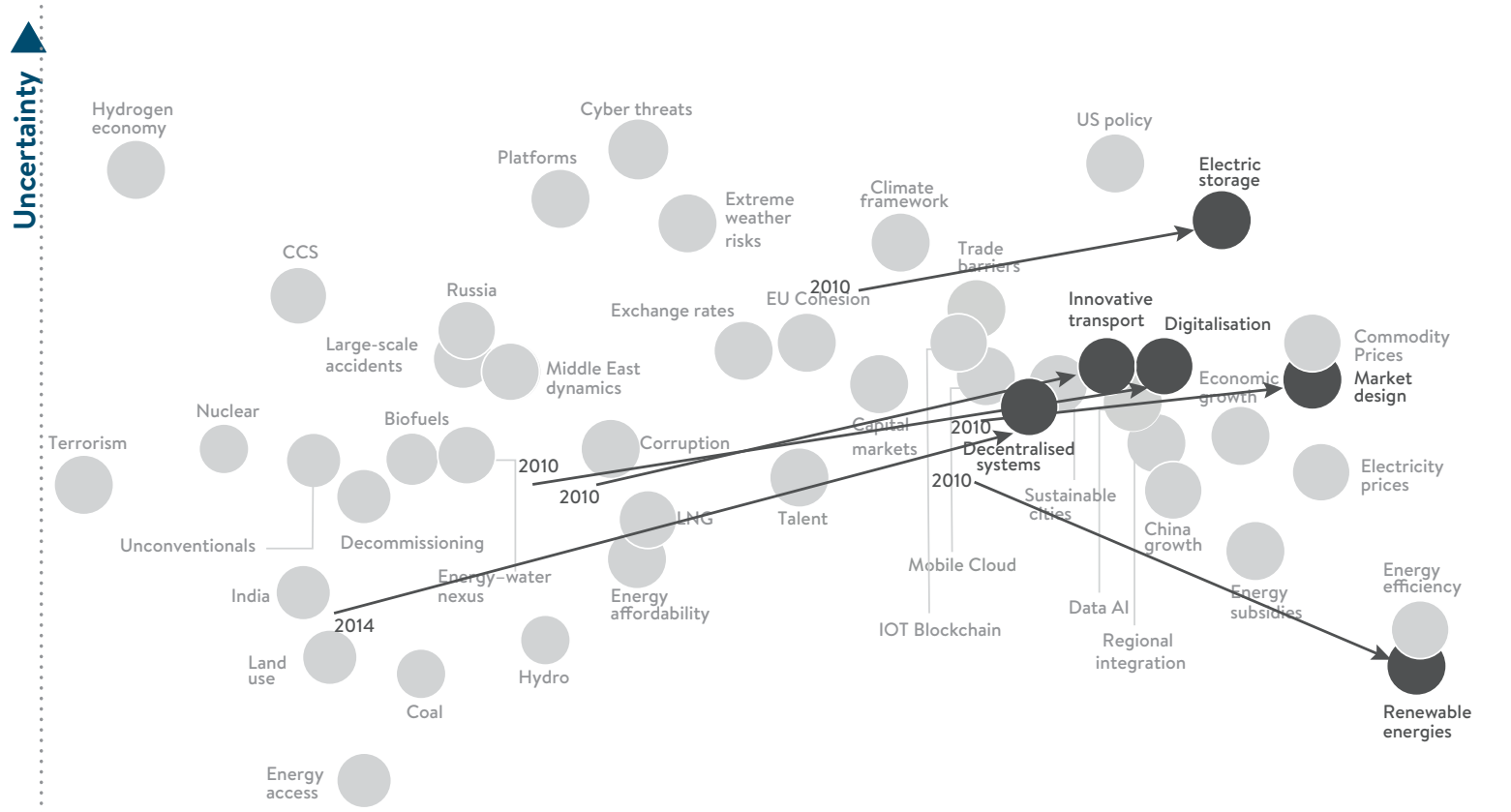
**B.** The energy-transport-information nexus emerges as the key innovation cluster shaping global Energy Transition over the past decade

**“THE ISSUES MONITOR HAS BECOME THE ENERGY LEADERS’ FOREMOST PLATFORM TO IDENTIFY, SHARE AND TRACK CRITICAL ISSUES SURROUNDING THE ENERGY TRANSITION AND ASSESS WHICH ONES KEEPS THEM MOST AWAKE AT NIGHT OR BUSY AT WORK AND HOW THESE CHANGE ACROSS TIME AND SPACE.”**

Dr Christoph Frei, Secretary General, World Energy Council



# TRACKING INNOVATION



## World Energy Issues Monitor 2019 - Global - Innovation

Impact

● Timetracking of select issues from 2010 to 2018

Less urgent More urgent

# 03

## + EUROPE

### Survey Participation

32 European countries

### Key Action Priorities ●

Energy Efficiency  
Renewable Energies  
Electricity Prices

### Key Critical Uncertainties ●

Electric Storage  
Data AI  
EU Cohesion  
Market Design

### Action Priorities ●

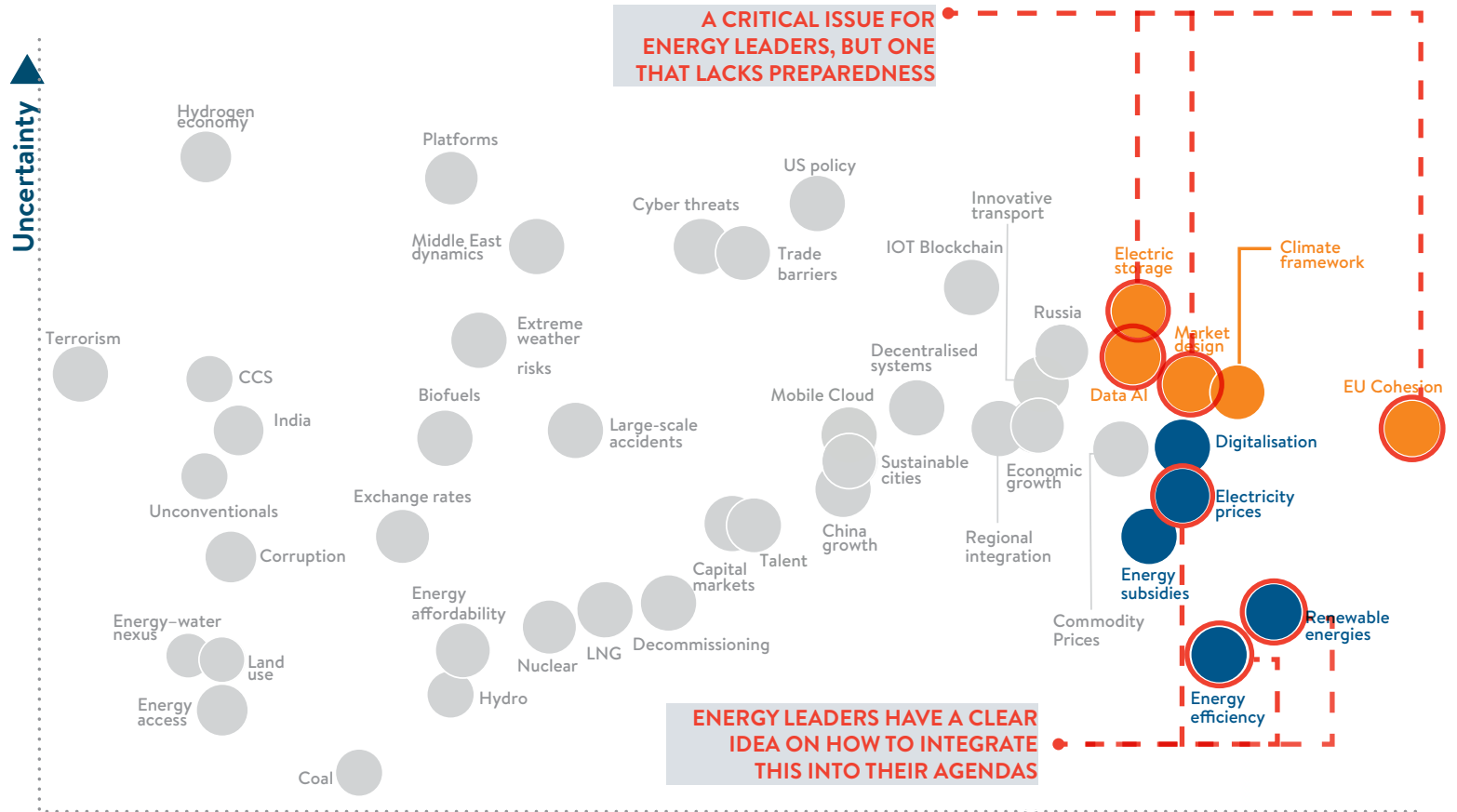
**Energy Efficiency** and **Renewables** have become stronger investment priorities, supported by increased **energy and carbon prices** in the EU and new regulatory frameworks developed under the new EU energy package. This has the potential to set European countries and the whole region into a forefront in the **Energy Trilemma Index**.

### Critical Uncertainties ●

Key Critical Uncertainties in Europe are associated with the technology cluster – developments in **Electric Storage, Internet of Things and Artificial Intelligence** are followed with interest, but their applications still face doubts among legislators, consumers and companies. The **European Parliament elections** in May 2019 also generated uncertainty about possible impact on energy and climate regulation. Concerns also remain high regarding the necessary evolutions of **Market Design**, especially in the electricity sector, to secure the significant investment levels ahead to ensure electricity security.



# EUROPE



## World Energy Issues Monitor 2019 - Europe

Impact

● Critical uncertainties: what keeps energy leaders awake at night

● Action priorities: what keeps energy leaders busy at work

Less urgent More urgent

# EUROPEAN UTILITIES

## Survey Participation

232 responses from European Utilities

## Key Action Priorities ●

Energy Efficiency  
Renewable Energies  
Digitalisation

## Key Critical Uncertainties ●

Market Design  
Data AI  
Energy Subsidies

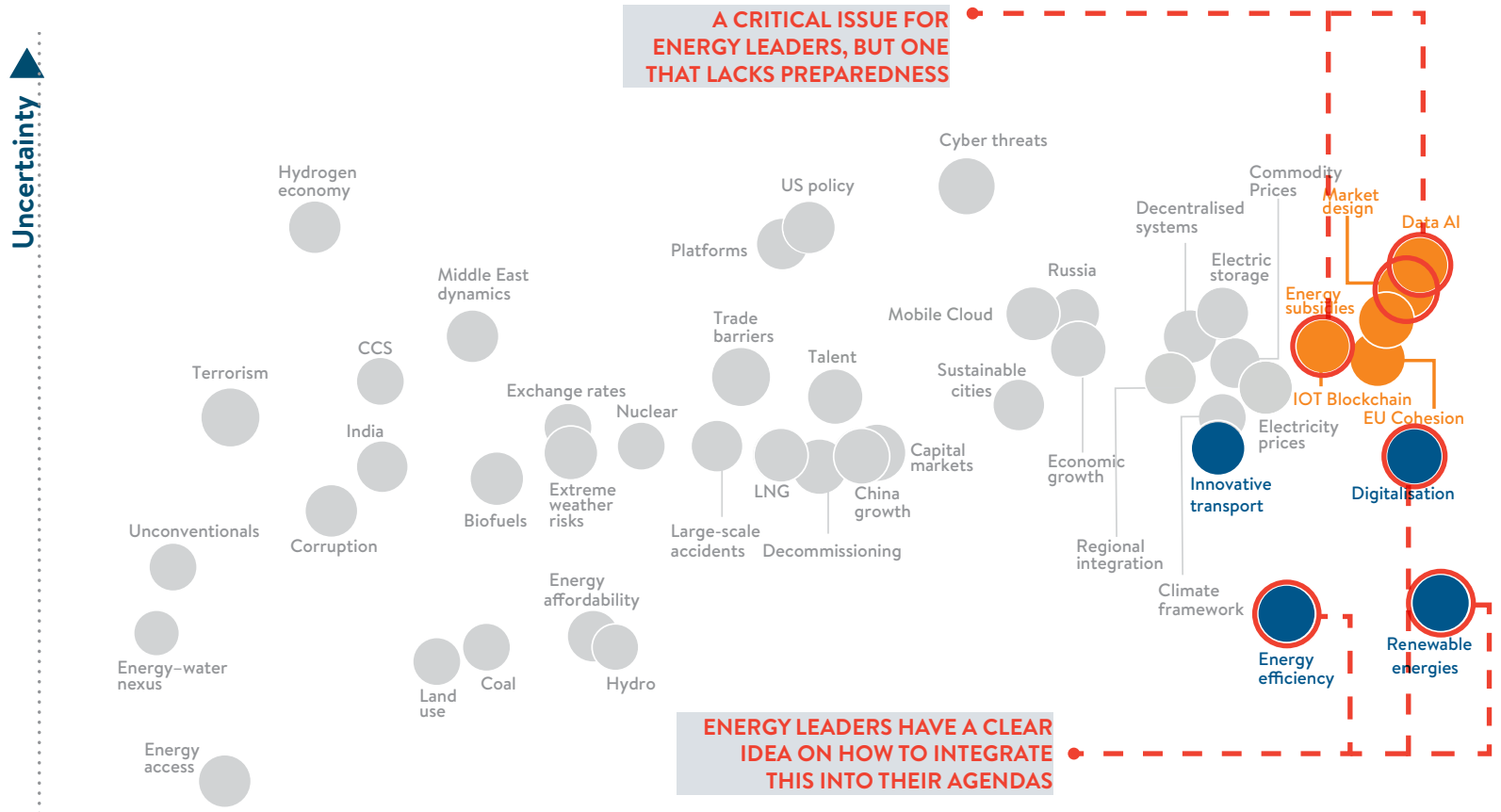
## Action Priorities ●

Survey results for European utilities indicate an alignment with the regional European focus on **Energy Efficiency** and **Renewables** as action priorities. The price reduction of renewable technologies has led to significant investments into these sources, driving a greater focus on grid development and on enabling resource flexibility. **Digitalisation** appears with less uncertainty for utilities in comparison with the regional perspectives, as utility leaders highlight the positive impact of digital technologies on demand and resource management.

## Critical Uncertainties ●

The European utilities survey also shows that innovation in **Market Design** is of significant leadership interest. Market regulations are seen as particularly relevant to manage uncertainties around the use of **Data AI** and **Energy Subsidies** towards a cost-competitive integration of variable renewable energies.

# EUROPEAN UTILITIES



## World Energy Issues Monitor 2019 - Europe - Utilities

Impact ►

- Critical uncertainties: what keeps energy leaders awake at night
- Action priorities: what keeps energy leaders busy at work

Less urgent ○ ○ ○ More urgent

# 05

## + E.DSO

### Survey Participation

22 E.DSO members

### Key Action Priorities ●

Digitalisation  
Innovative Transport  
Electric Storage

### Key Critical Uncertainties ●

Cyber Threats  
Talent  
EU Cohesion

### Action Priorities ●

The DSOs Energy Issues survey highlights high confidence around **Digitalisation** and the ability to manage customer data. Further progress in this area, through the growth of Blockchain for instance, is regarded as potential future drivers of uncertainty. Attention is being put on the management of additional load of **Innovative Transport** (e.g. EVs) and on ensuring that DSOs are able to meet the increase in demand. At the same time, **Electric Storage** systems are being incorporated in distribution networks across the region to facilitate management of peak energy demand, integration of renewables and distributed energy sources and maximise efficiency overall.

### Critical Uncertainties ●

**Cyber Threats** loom as a critical uncertainty for DSOs, who are concerned that the larger the system is, the weaker it can be. Each energy meter and each automated substation face the daily risk of being hacked. Attracting the right **Talent** to be prepared to manage digitalised systems is also a concern for DSOs, because of the challenge of competing with the new players in the technology sector. Uncertainties also revolve around **EU Cohesion** as DSOs rely on the need for a harmonised regulatory framework across the region to facilitate and optimise operations.



# 06

## ENTSO-E

### Survey Participation

26 ENTSO-E members

### Key Action Priorities ●

Market Design  
Digitalisation  
IoT Blockchain

### Key Critical Uncertainties ●

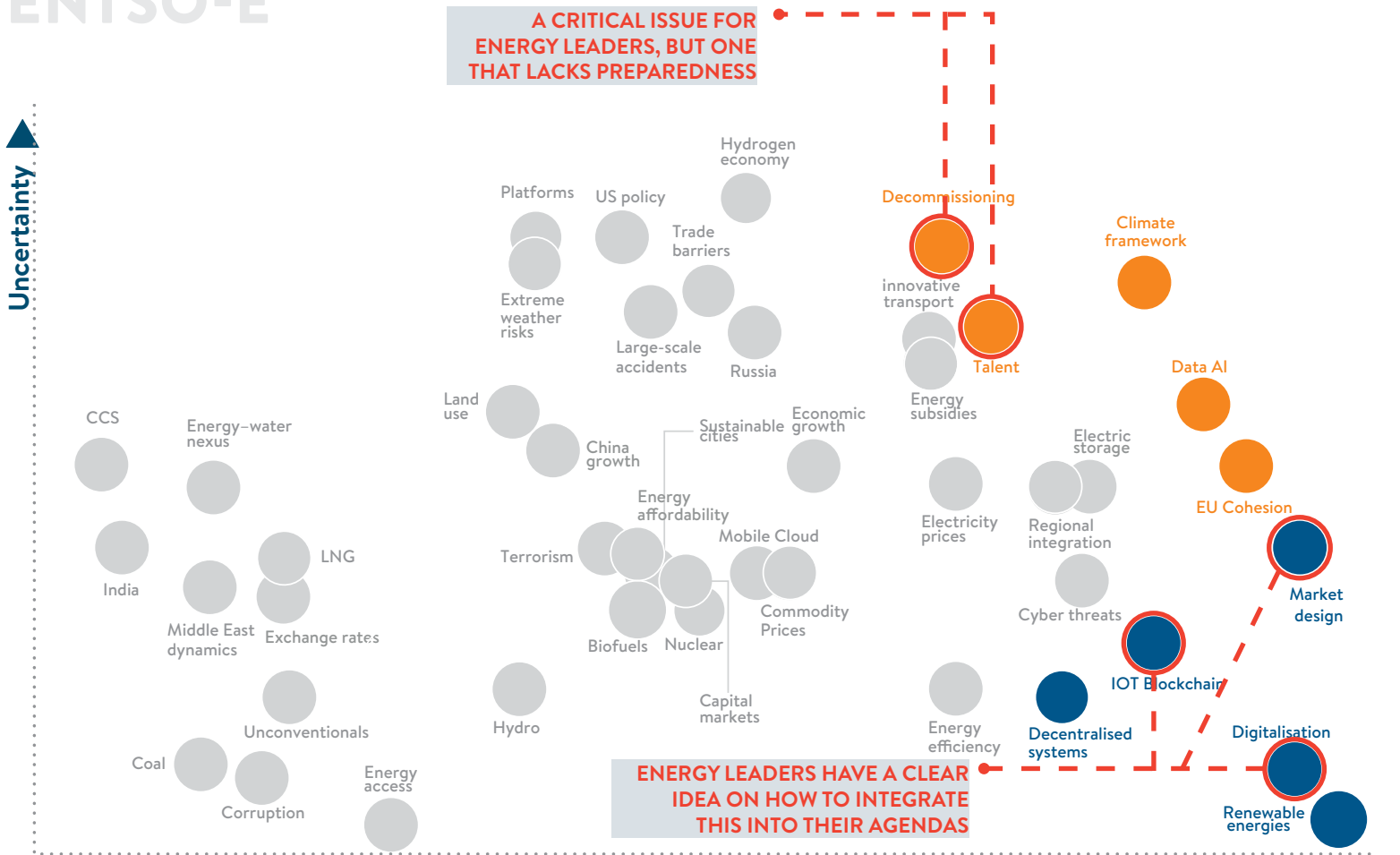
Decommissioning  
Talent  
EU Cohesion

### Action Priorities ●

European TSOs treat **Market Design** as an action priority, as leaders are busy at work identifying strategies to achieve the energy mix target for Europe while, at the same time, building the capacity market. The survey also indicates high confidence around **Digitalisation** and the use of artificial intelligence and machine learning for asset management, system operation and market integration. A particular attention is being given to **IoT Blockchain** as a digital tool for the grid.

### Critical Uncertainties ●

According to European TSOs, **Decommissioning** is a critical uncertainty due to concerns around reliability. If, for instance, nuclear and natural gas are no longer part of the energy mix then the replacement those resources to maintain the 50Hz frequency is a significant concern. The interviews revealed that the fast phasing out of nuclear and coal, as for example in Germany, and the replacement with variable renewables drives concerns regarding the need for a fast adaptation of the power system operation. Similar to DSOs, the ever-rapid need for **Talent** to manage systems digitalisation, new energy mix and changes in energy demand patterns remains an uncertainty. **EU Cohesion** dynamics also drive concerns around security of supply and impact on business models.



## World Energy Issues Monitor 2019 - European Transmission System Operators

● Critical uncertainties: what keeps energy leaders awake at night

● Action priorities: what keeps energy leaders busy at work

Less urgent More urgent

# COMPARING ISSUES - DSOs, TSOs AND GLOBAL

Issues that are considered action priorities for European DSOs and TSOs are seen as **Critical Uncertainties** from a Global perspective.



## DIGITALISATION

The confidence of European DSOs and TSOs on Digitalisation is largely based upon the successful integration of Data AI to optimise operations and enhance efficiency. From a Global perspective, this issue is seen with much less confidence due to uncertainty around market rules to incorporate changes brought by Digitalisation.

## ELECTRIC STORAGE

Electric Storage integration is being actioned as a priority for European DSOs as a resource to maximise efficiency and flexibility. The issue is seen with lower impact for TSOs, even though successful pilots have been carried out with use of storage for frequency control. From a Global perspective, the general trend towards integration of variable renewables, the incorporation of EVs and reliance on battery intense applications has driven to higher impact and uncertainty attributed to the price of storage technologies.

## MARKET DESIGN

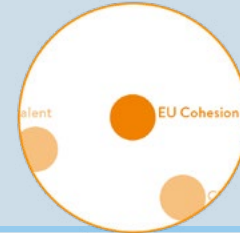
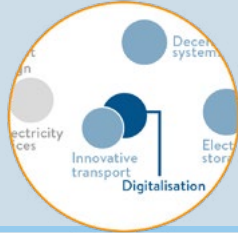
Market Design is an Action Priority for European TSOs, with special concerns around the integration of variable renewables and the development of the capacity market. This issue appears with less impact for DSOs who are more worried about rules emerging from the Climate Framework and the European Union. At the Global level, Market Design appears as a Critical Uncertainty due to lack of clarity on the coordination between decentralised and centralised energy systems.



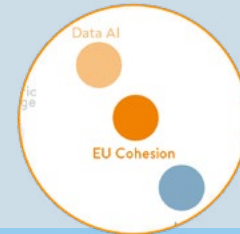
# COMPARING ISSUES - DSOs, TSOs AND UTILITIES

European DSOs and TSOs are aligned with Utilities' views on Digitalisation and EU Cohesion.

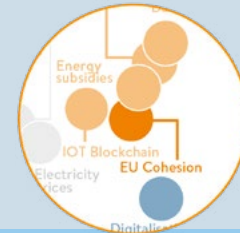
DSOs



TSOs



UTILITIES



## DIGITALISATION

The fact that European DSOs, TSOs and Utilities see Digitalisation as an Action Priority clearly distinguishes these stakeholder group perspectives from the overall Regional and Global perspectives. This difference in perceptions also highlights that progress towards digitalisation is being strongly influenced by actions taken by DSOs, TSOs and Utilities.

## EU COHESION

DSOs, TSOs and Utilities have all highlighted EU Cohesion as an issue of Critical Uncertainty in this year's survey. Concerns revolve mostly around the possible impact of changes in the current status of the EU membership on the regulation and commercialisation of energy across the region. In addition, the fact that the survey was held in the months preceding the May EU Parliamentary Elections has driven higher attention to these issues.

# MEETING GLOBAL VISIONS


Managing global Energy Transitions and enabling the benefits of sustainable energy to be shared by everyone is the most pressing and urgent leadership challenge of modern times.

The Issues Monitor survey is a practical and flexible tool that can be used by energy leaders as a reality check to define and clarify the current state of global, regional and national Energy Transitions.

It can also be used to forge a global energy leadership agenda that facilitates new and better collaborative innovation in meeting global visions and goals.

# METHODOLOGY

# GLOBAL SURVEY RESULTS

+ **01**  
ANALYSIS OF **42**   
ISSUES AFFECTING  
THE ENERGY SYSTEM

+ **02**  
PARTICIPATION  
OF NEARLY **2,300**   
ENERGY LEADERS IN  
**86 COUNTRIES**

+ **03**  
MAPS  
SEVEN  
GLOBAL

SIX  
REGIONAL  
FIFTY  
NATIONAL

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