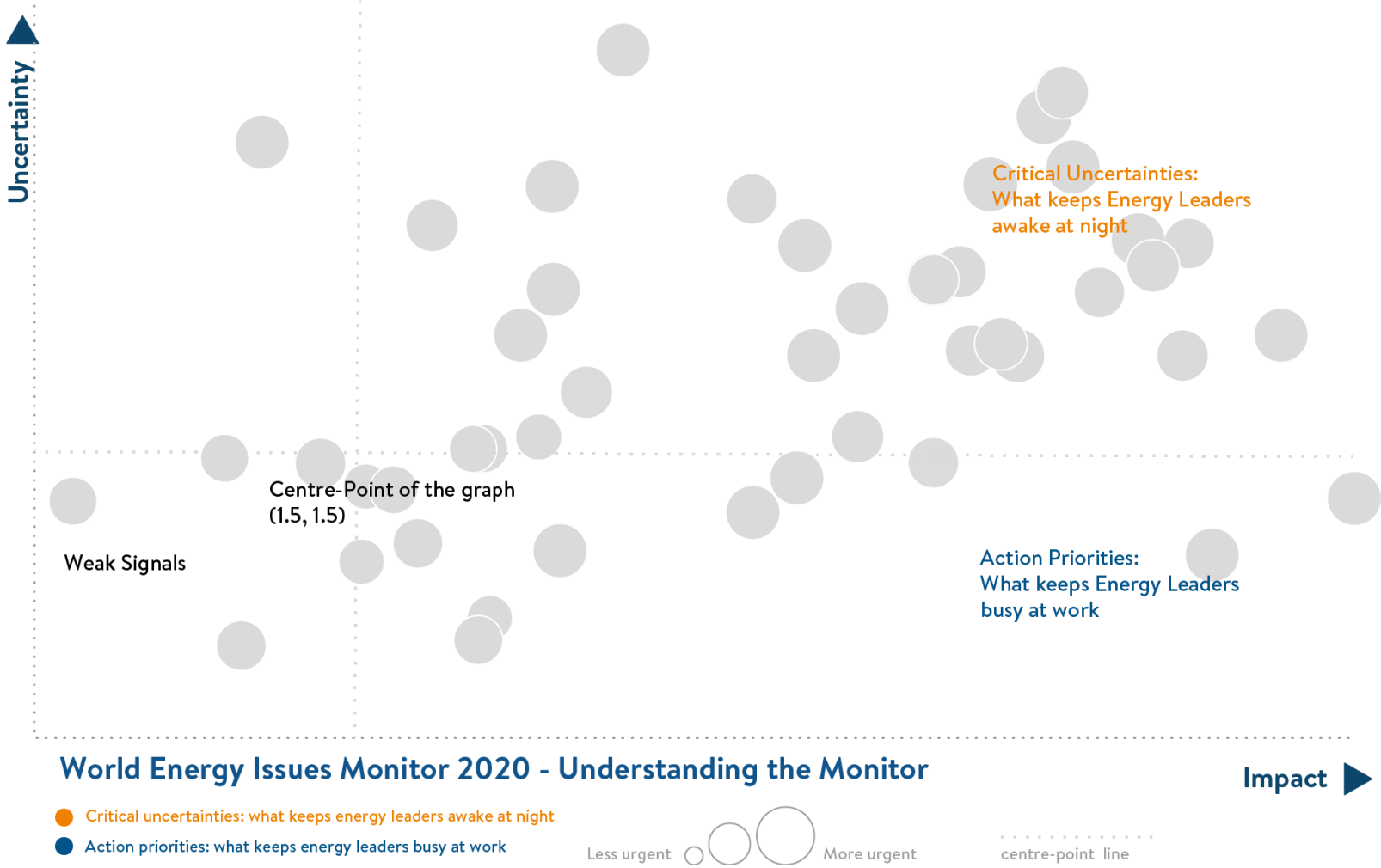
WORLD ENERGY COUNCIL

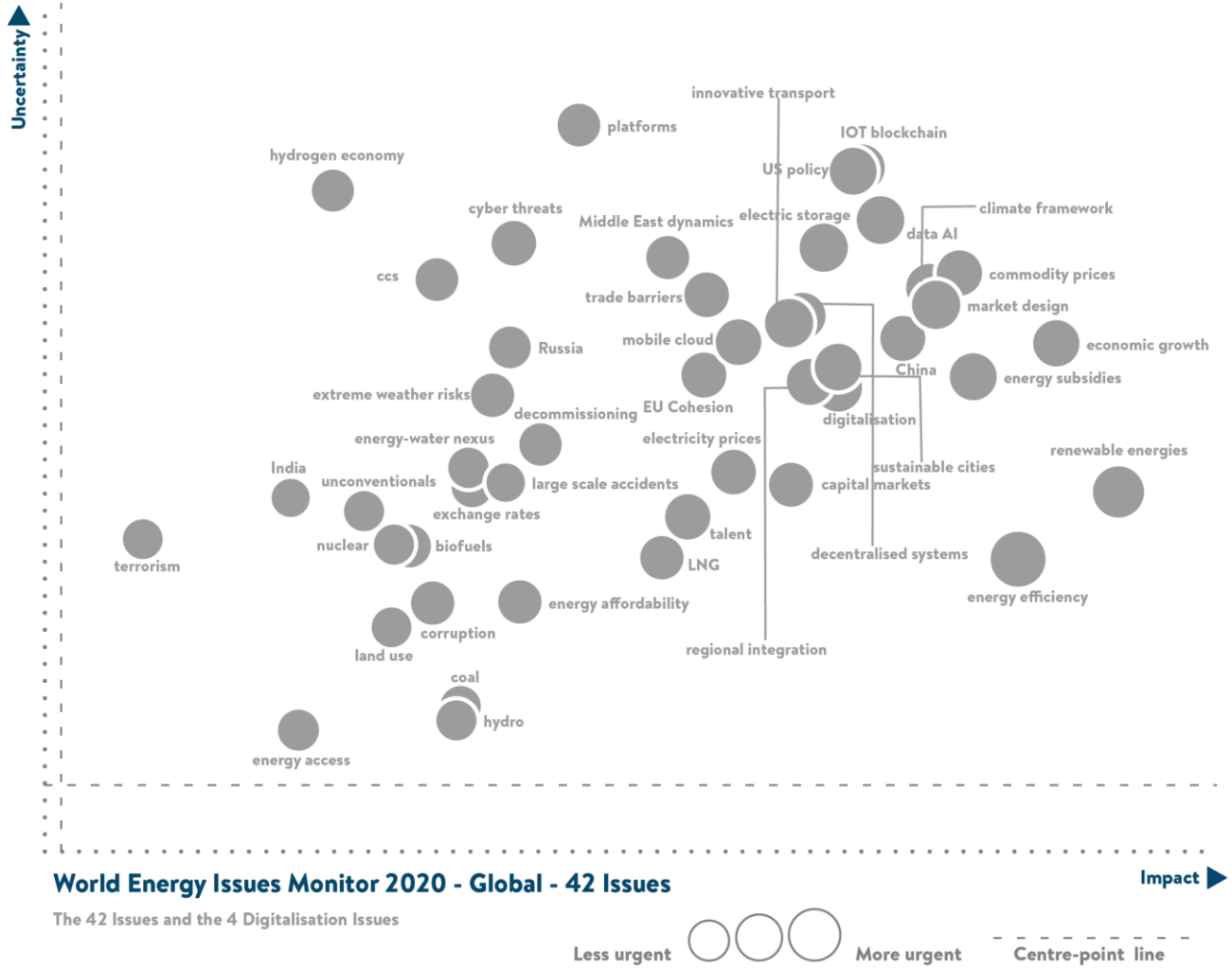
GLOBAL PERSPECTIVES

Understanding the Issues Monitor



- ✓ **Impact** – How strong do you perceive the potential impact of the issue (e.g. nuclear) to be on the energy sector in your country? This impact may be positive or negative.
- ✓ **Uncertainty** – How unsure are you about the selected issue in terms of its impact on the energy transition?
- ✓ **Urgency** – How soon do you think the energy sector in your country needs to react to the issue?

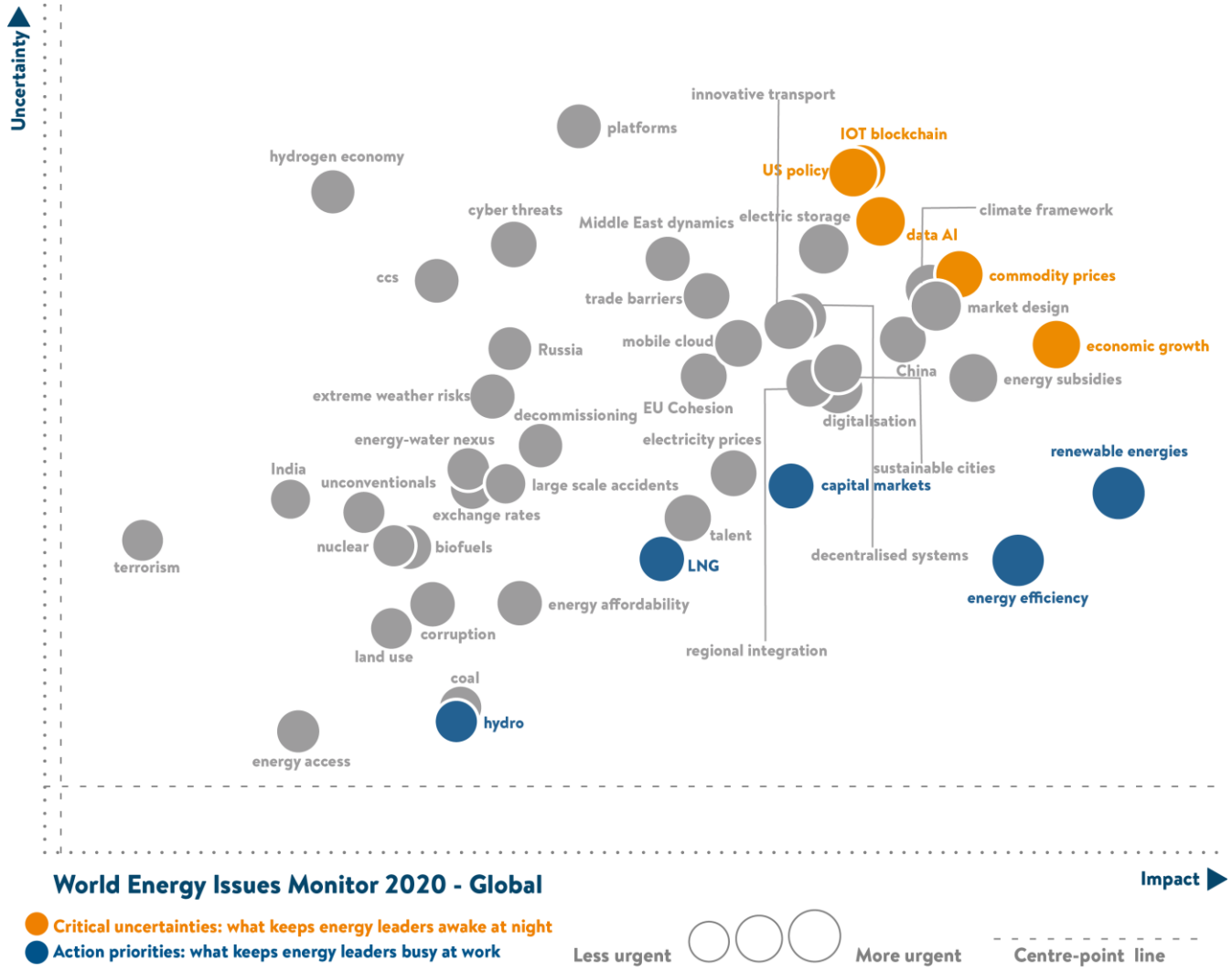
The 42 Energy Issues



- The Council has been conducting the Issues Monitor survey since 2009.
- The survey looks at 42 issues (and 4 digitalisation-specific issues) and how they are perceived by energy leaders from different parts of the world.
- These 42 issues show the progression of the energy transition in terms of the operation of the energy system.

Reality Check

What's on the Agenda & What's Driving Uncertainties?



Critical Uncertainties

- Data AI
- Commodity Prices
- Economic Growth

Action Priorities

- Renewable Energies
- Energy efficiency
- Capital markets

Global Perspectives

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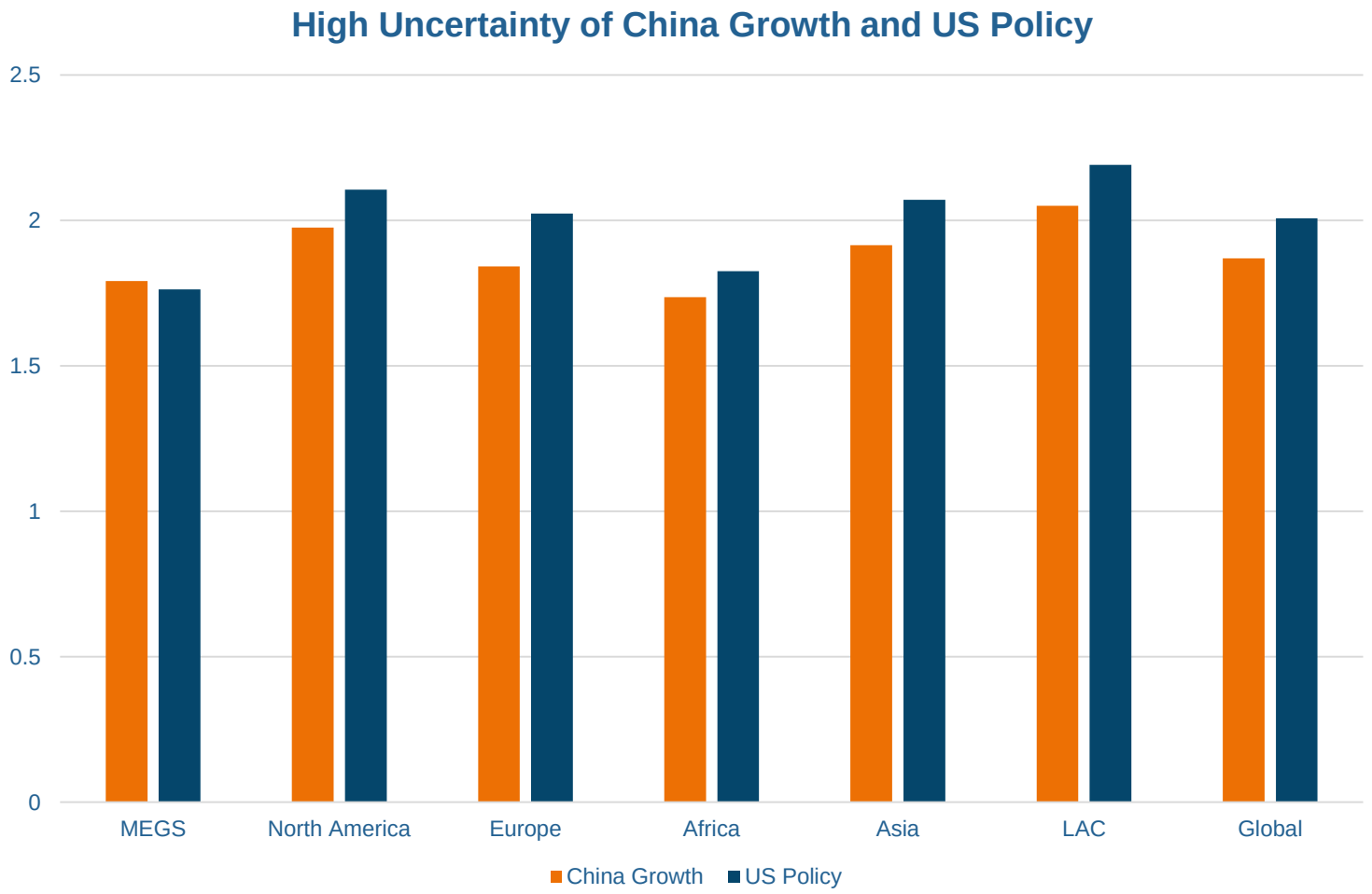
MACROECONOMICS and geopolitical issues define critical uncertainties

REGIONAL INTEGRATION is a "desired" means of improving energy security

TECHNOLOGY issues define action priorities

Macroeconomic and Geopolitical issues

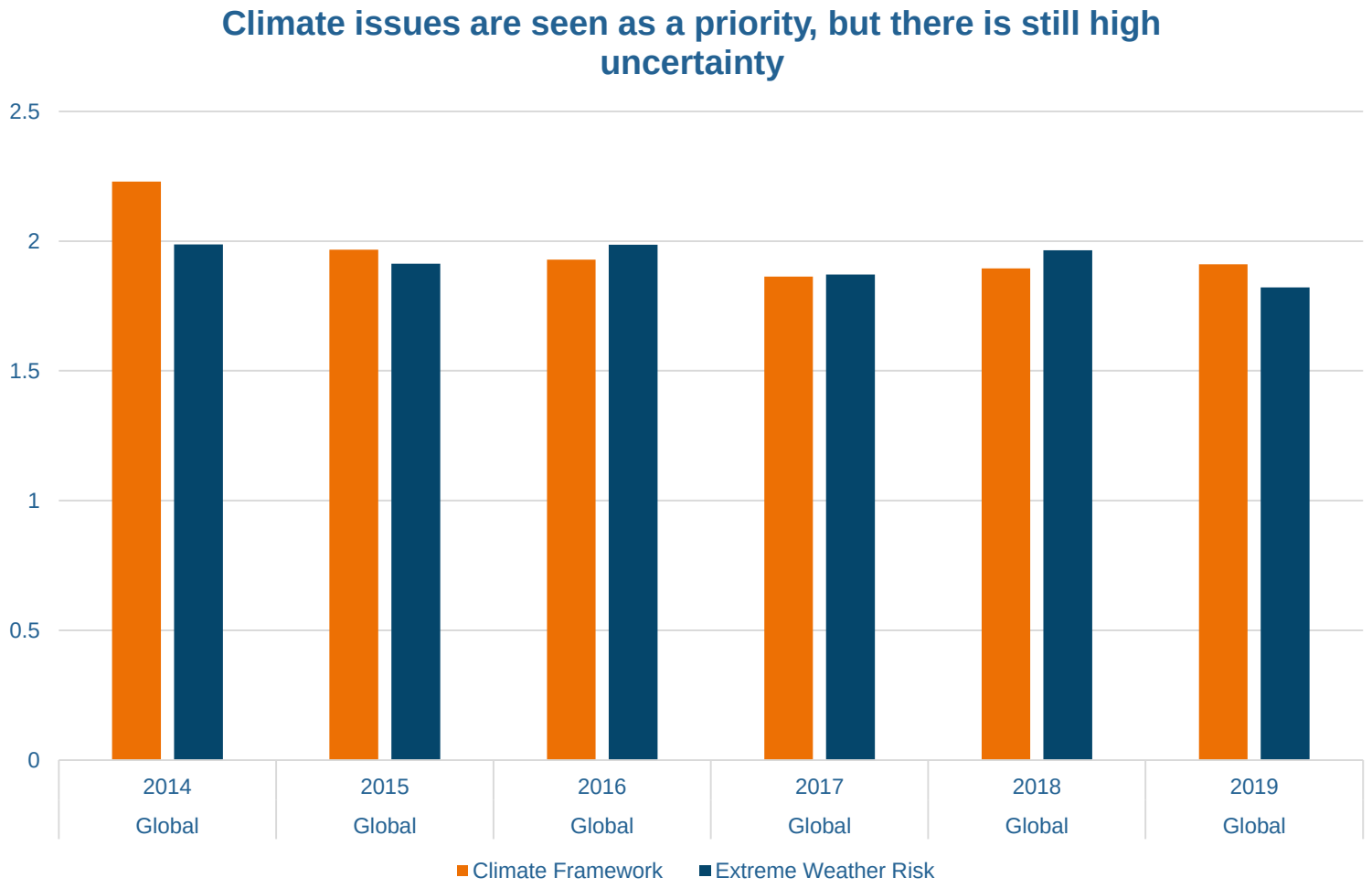
China Growth and US Policy



The strained trade relations between the **United States and China** have led to higher uncertainty across all regions.

Macroeconomic and Geopolitical issues

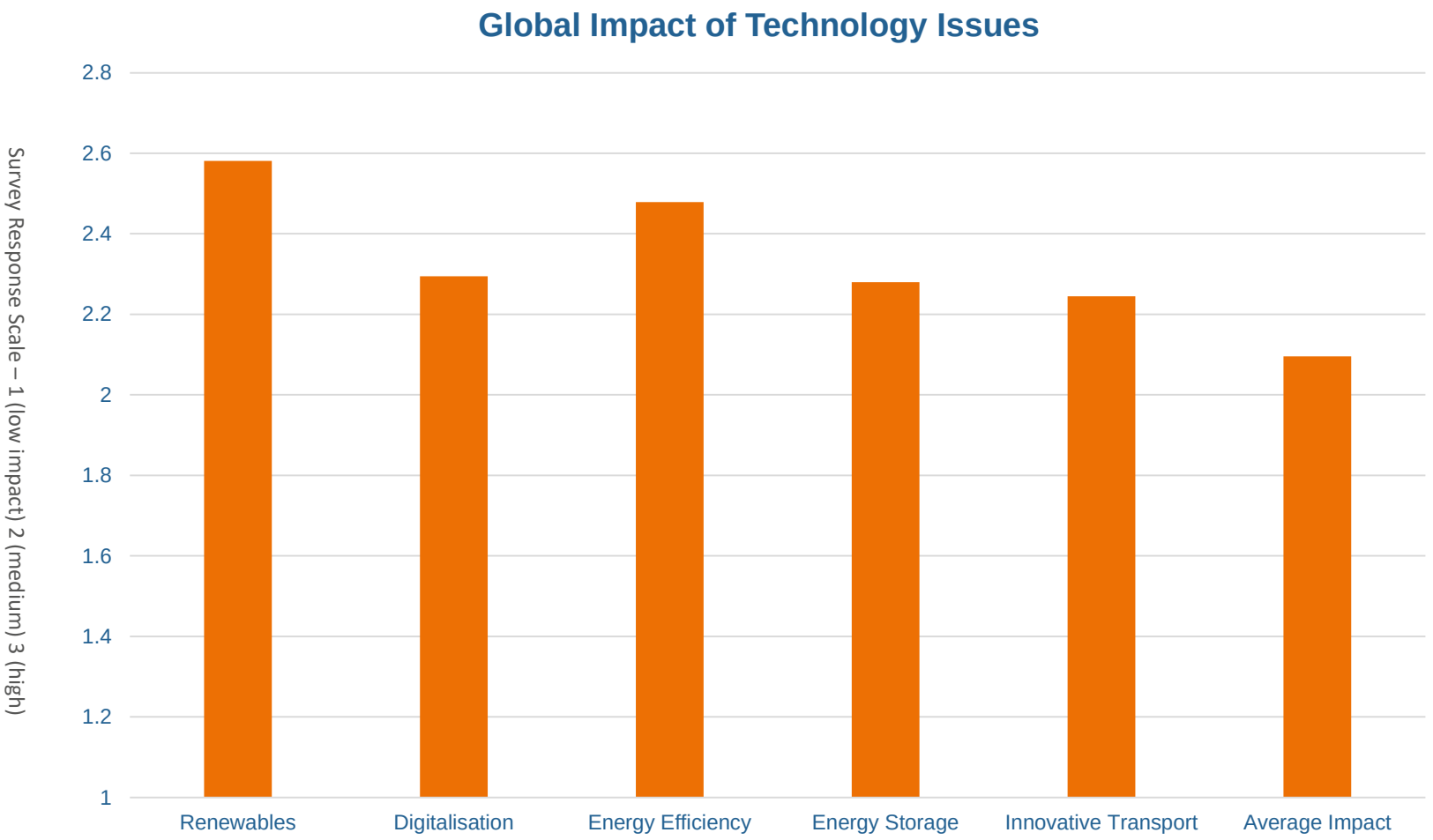
Climate Framework and Extreme Weather Risks



Uncertainty remains around the impact of intensifying **Extreme Weather Events** and the need to adopt **climate adaptation and mitigation** measures,

Technology issues

Renewables, Digitalisation, Energy Efficiency, Energy Storage, Innovative Transport



Countries are beginning to act with governments to design pathways for the wider adoption of **renewables, digitalisation, energy efficiency, energy storage**, and other **innovative technologies** as part of national energy transitions.

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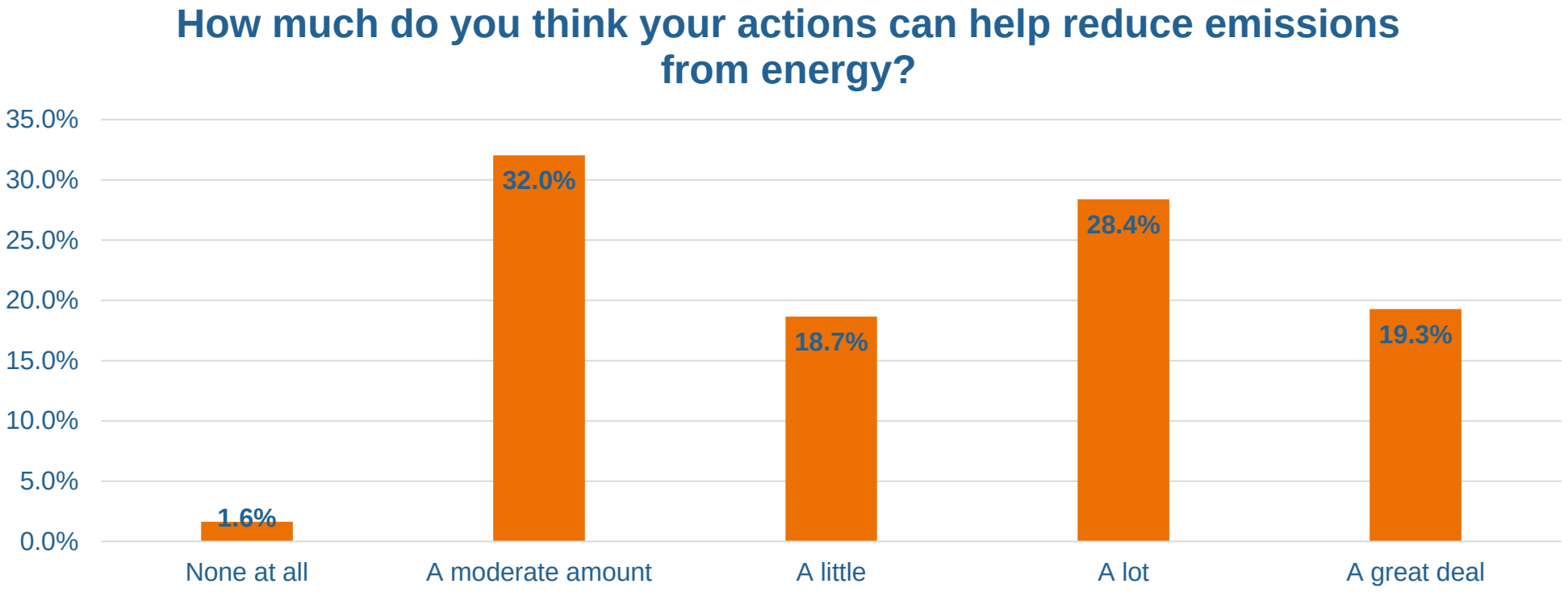
KEY TRENDS

Tracking Issues

By looking at the time evolution of perceptions around energy issues and adding the views of 550 energy consumers in 50 countries on the Transition, we have observed three key trends:

- **Customers** are set to play a decisive role in the transition evolution in the coming decade as they become more empowered through technology and information
- **Carbon Capture & Storage** is being increasingly perceived as an important resource among Oil & Gas sector stakeholders
- **Nuclear power** has a promising future in the European energy mix

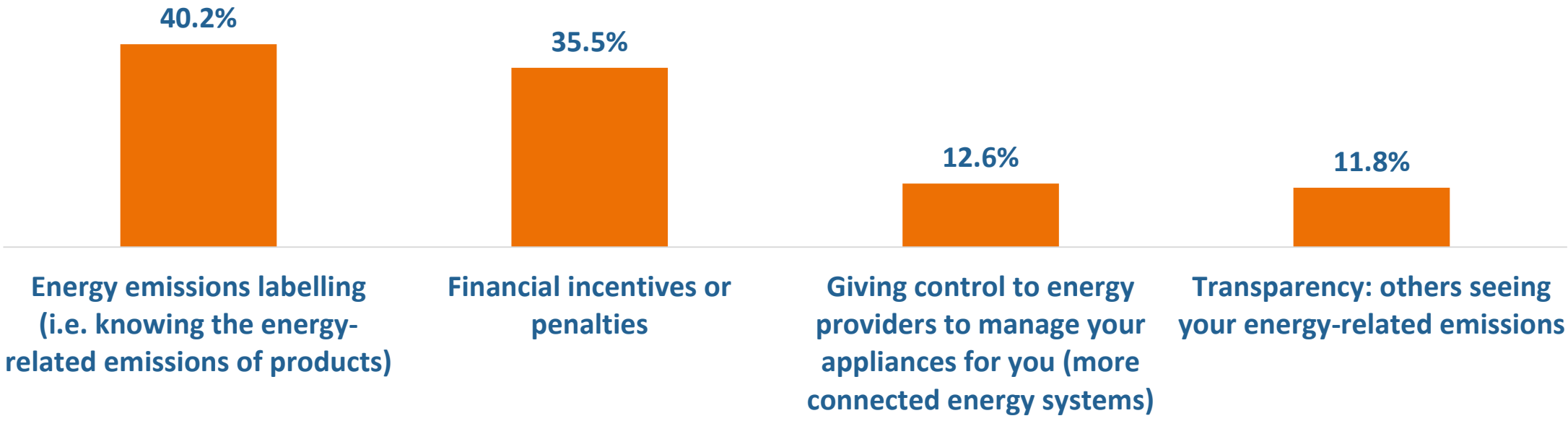
A NEW PULSE:
The 2020s may be the decade of the customer



Nearly 50% of respondents believe that their actions don't contribute to reducing emissions.

Customer Pulse

What would encourage you to better manage your energy consumption?



As energy systems are getting more efficient, costumers will become for the first time equipped with the necessary instruments to drive the direction of decarbonisation.

WHAT WE ARE TRACKING:
CCS is gaining in importance within the Oil & Gas sector

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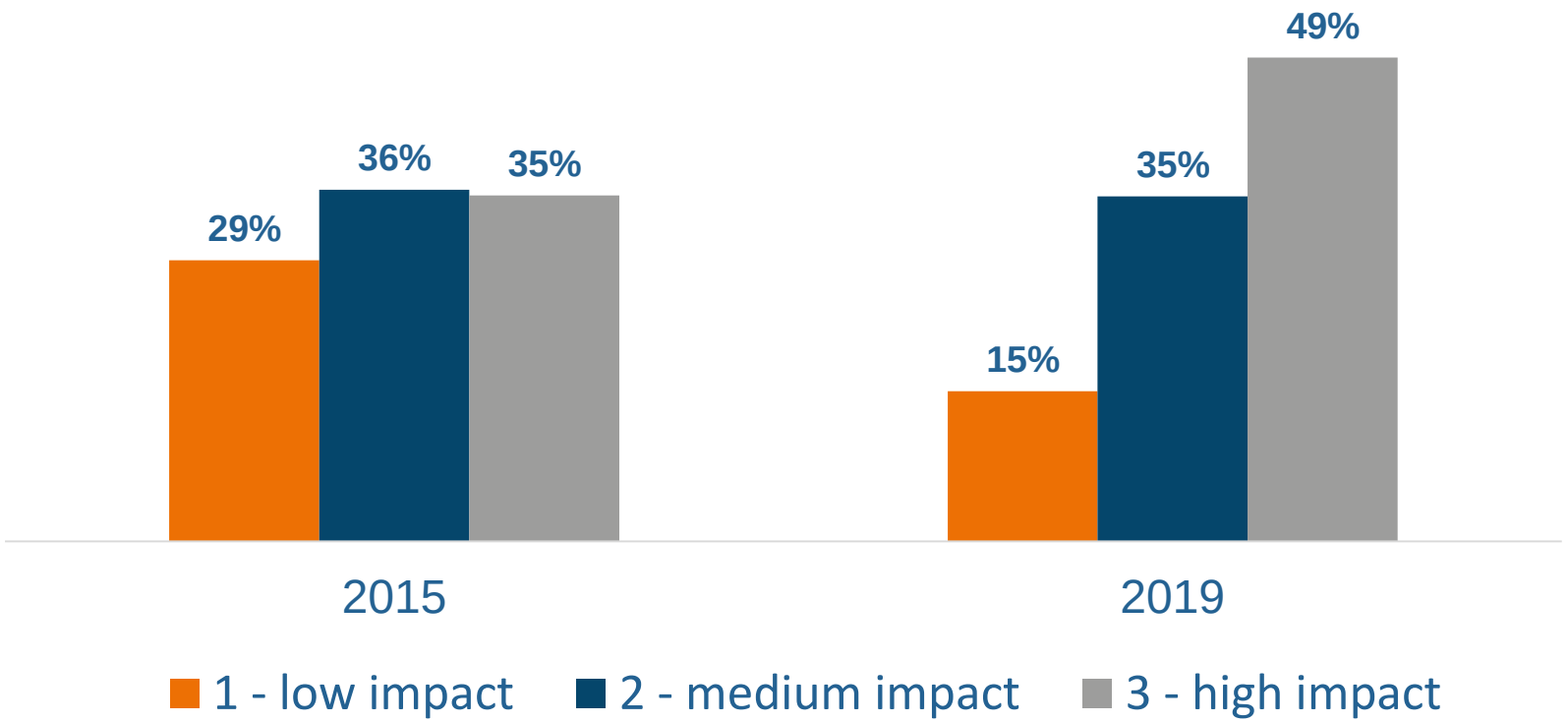
Growing impact of CCS for the global Oil and Gas Sector



CCS is increasingly being viewed as an option for deeper and faster decarbonisation.

A DIFFERENCE IN OPINION:
Nuclear power is here to stay in Europe

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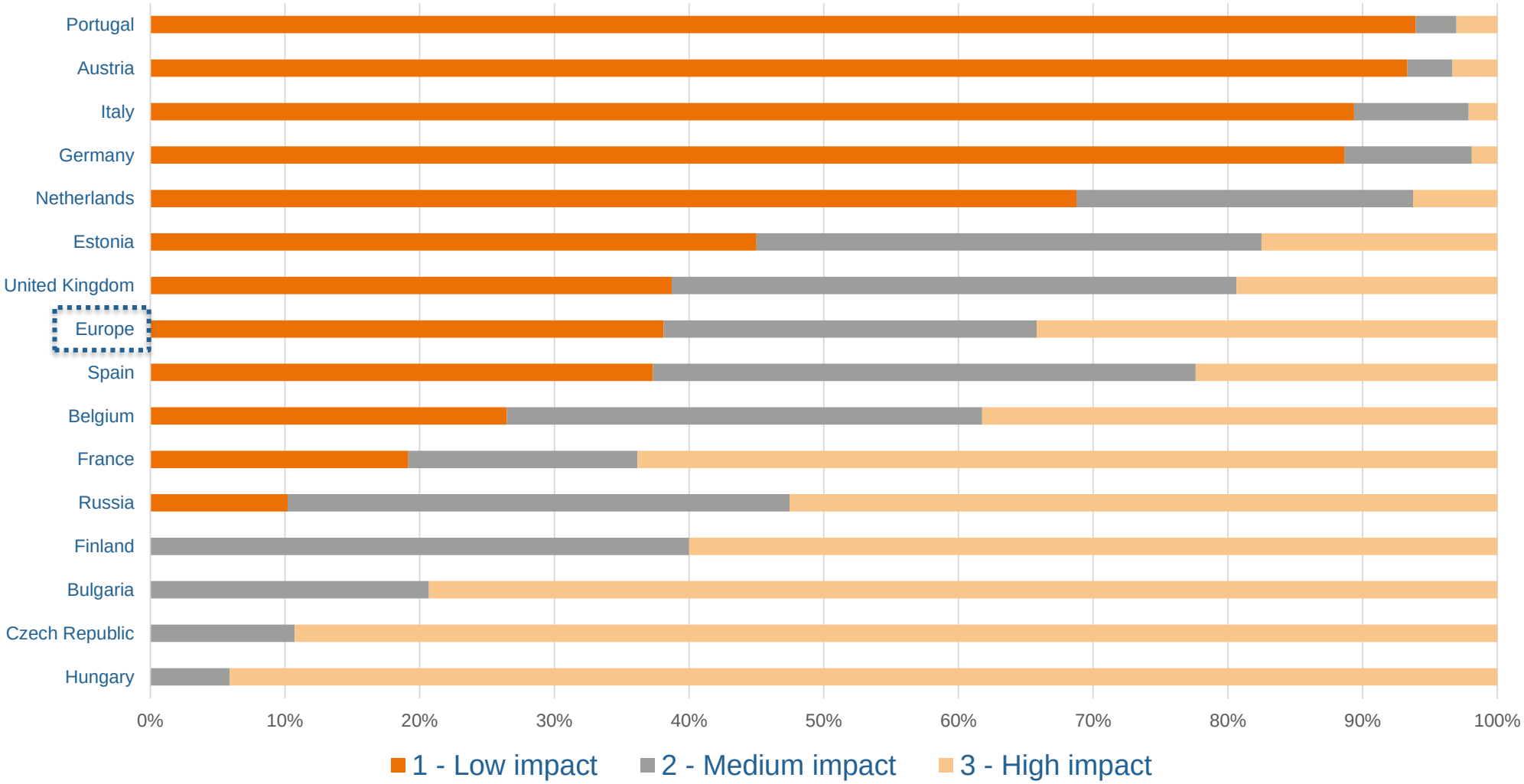
Impact of nuclear - disparities in selected countries in Europe



* The Europe Average in this chart is calculated from the responses of European countries in this Issues Survey. For a comprehensive list of countries included in the survey see page 168 of the full Issues Monitor Report.

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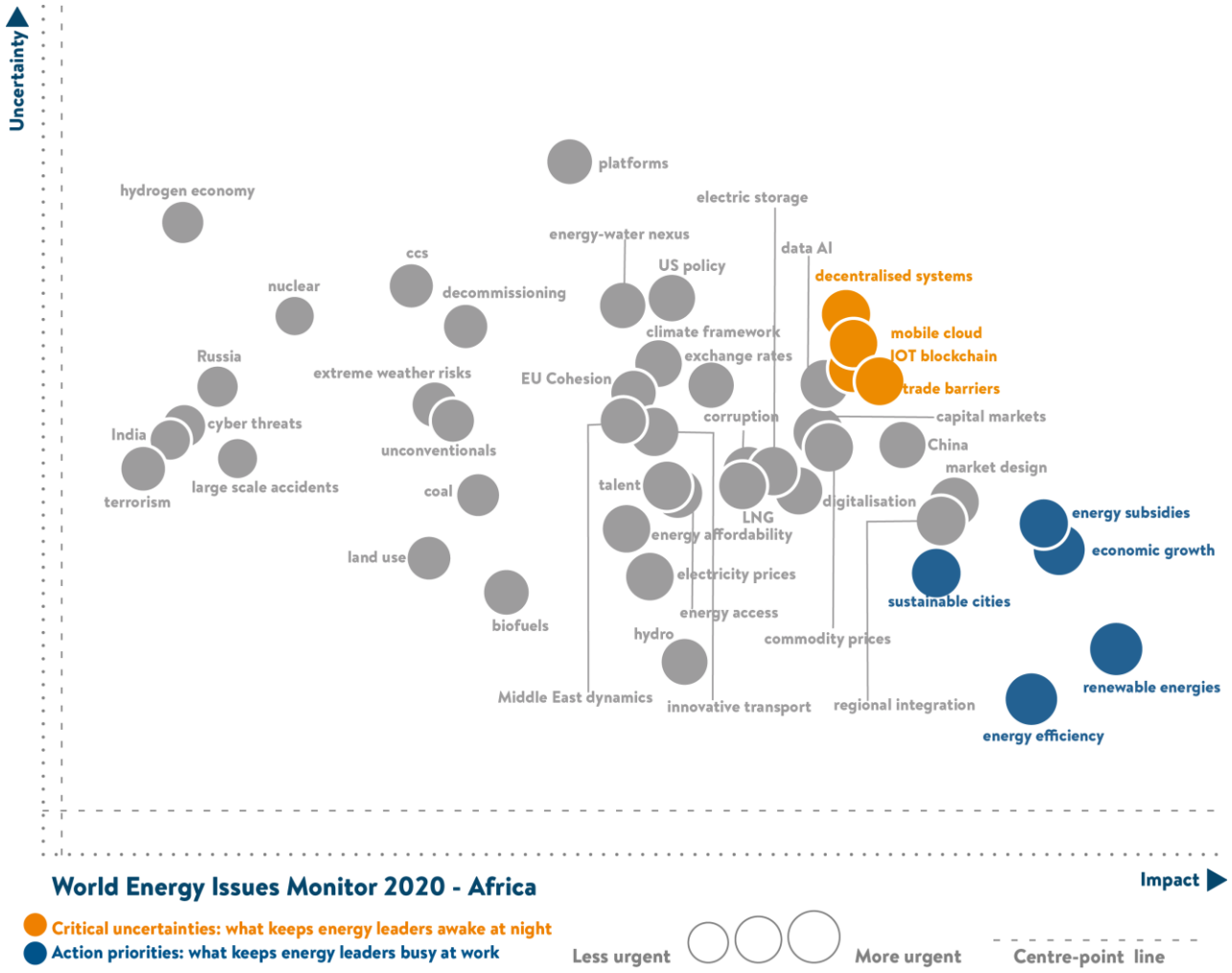
REGIONAL PERSPECTIVES

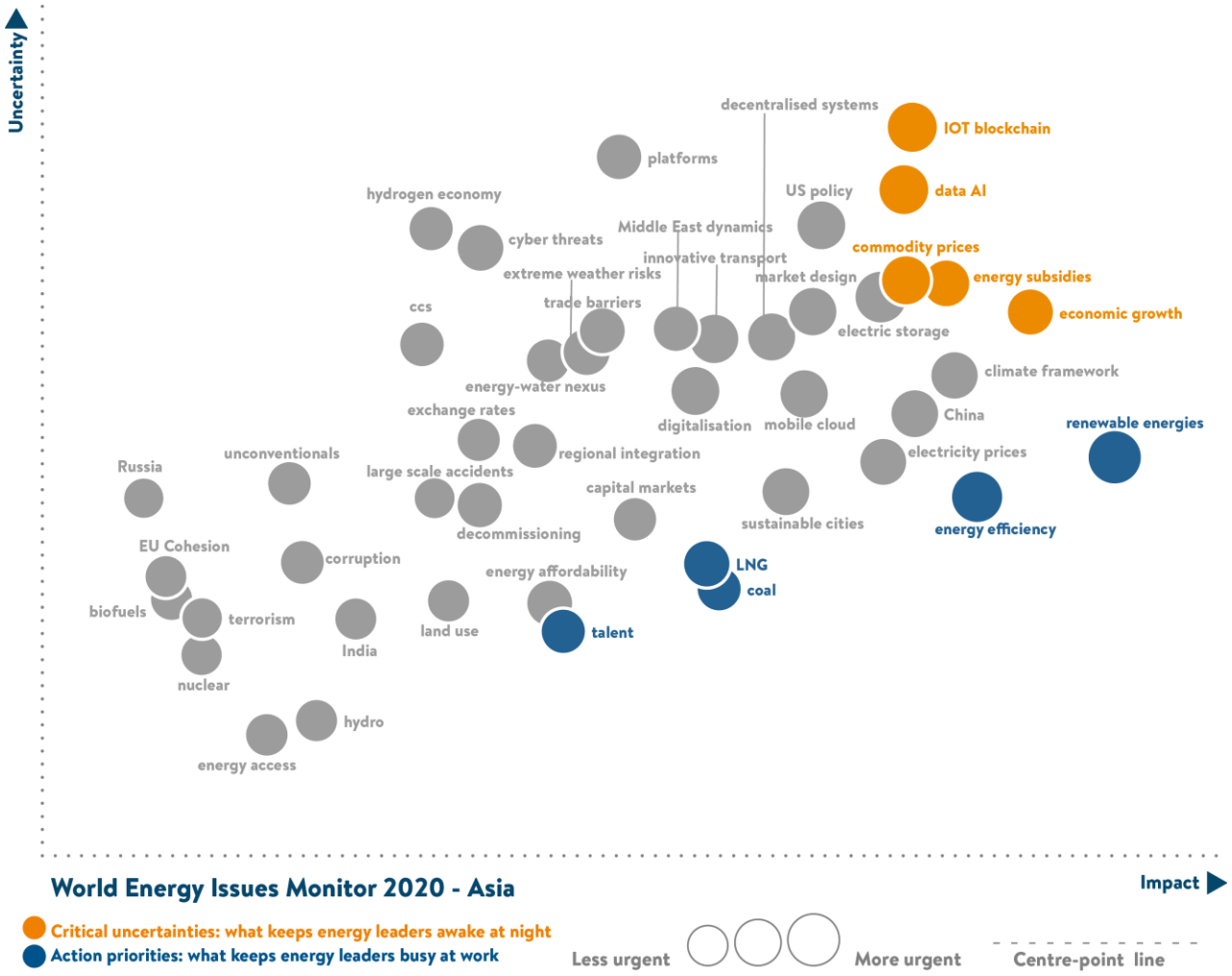
Regional Overview: AFRICA



- Africa energy leaders flag **Decentralised Systems, Mobile Cloud and Trade Barriers** as the three main Critical Uncertainties for the region.

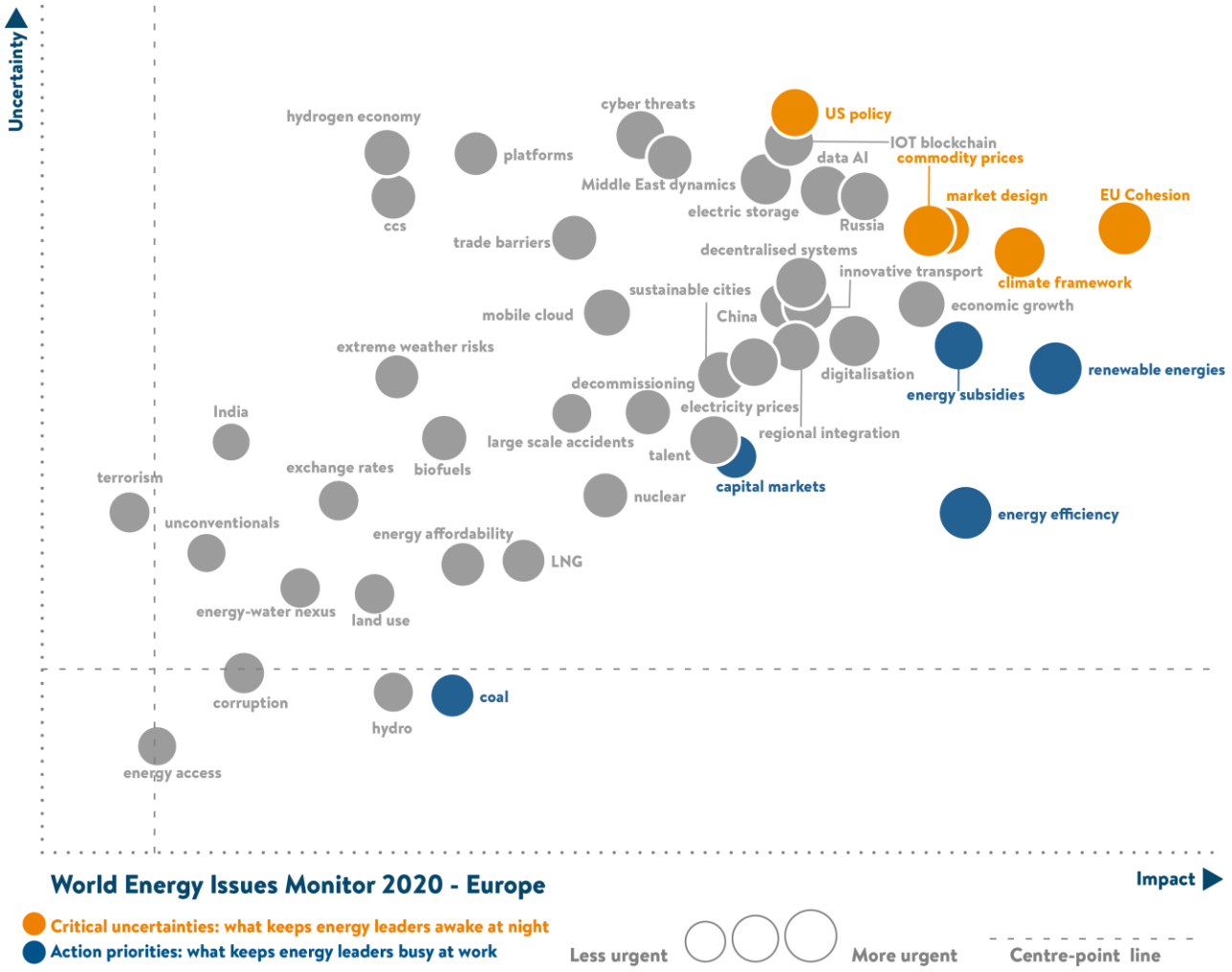
- Action Priorities revolve around **Economic Growth. Energy Efficiency and Renewable Energies** remain the two priority issues.

Regional Overview: ASIA



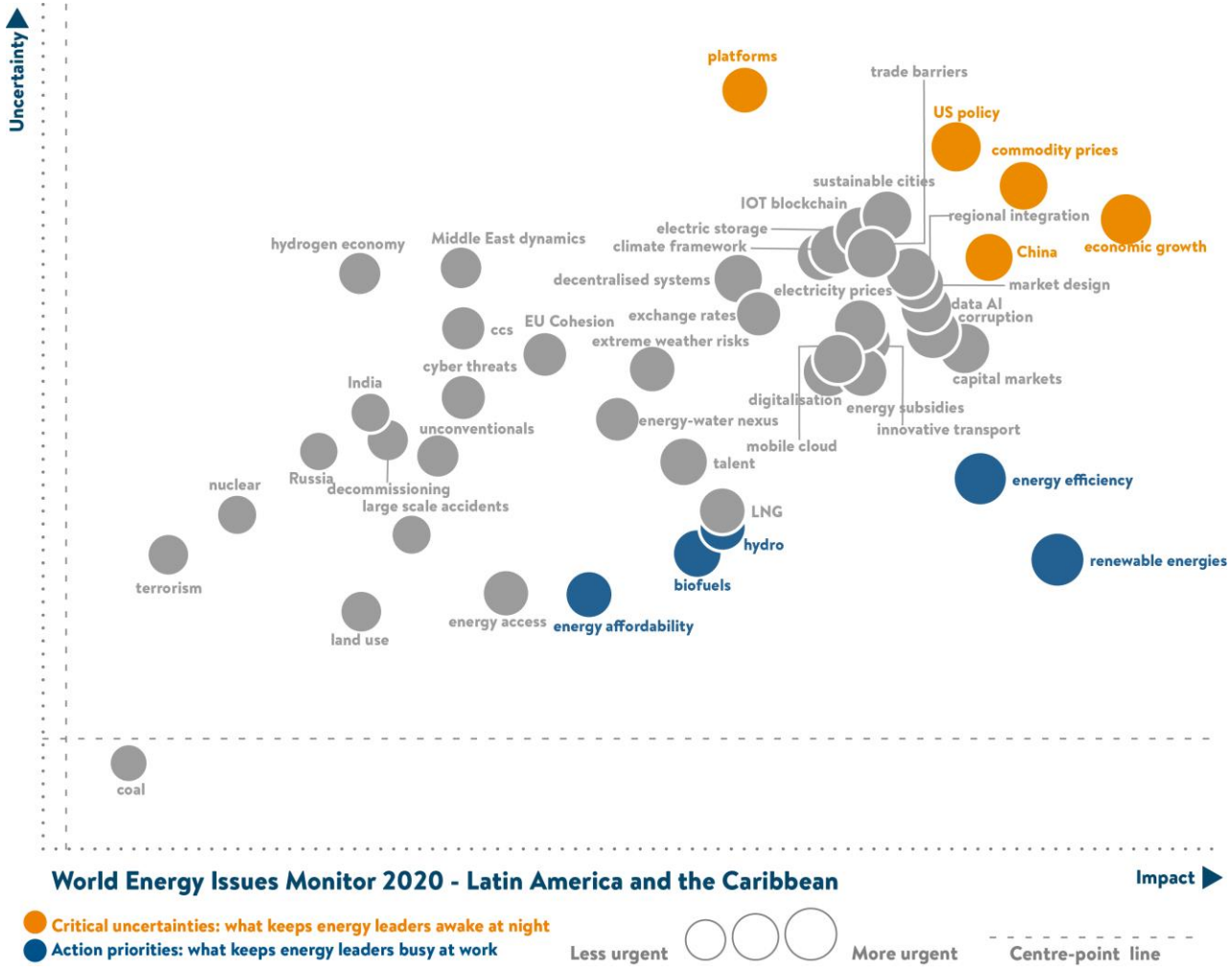
- Evolving dynamics around **US and China trade relations, Russia and the Middle East**'s role as fuel suppliers, and import dependence keep Asian energy leaders awake at night.
- Action Priorities are led by **decarbonisation and digitalisation** issues. Innovative technology is being adopted to address the energy security challenge while promoting economic development.
- The **Hydrogen Economy** issue is seen with increased impact in the region, particularly in China, Japan and Australia.

Regional Overview: EUROPE



- Europe's Critical Uncertainties revolve around **EU cohesion, a changing energy mix and energy security concerns** driven by commitments to the Climate Framework and EU decarbonisation policies.
- Among security challenges is the ability to **attract adequate investments** and, for some countries, overreliance on a single supplier or on a single fuel source.
- Action Priorities remain consistent with last year's efforts to **decarbonise and enhance the efficiency** of energy systems.

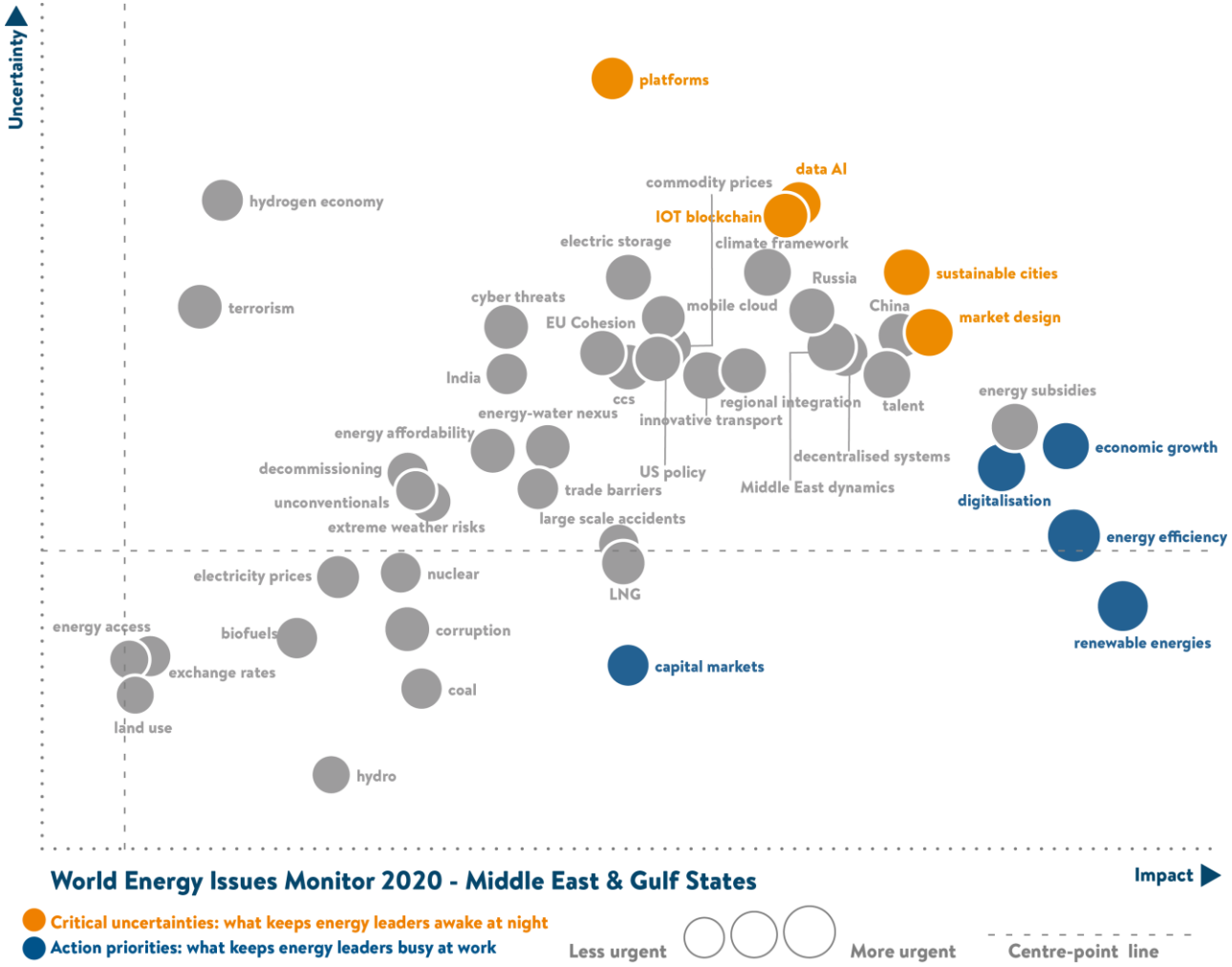
Regional Overview: LATIN AMERICA AND THE CARIBBEAN



- **Economic Growth and Geopolitics** define the Latin America and Caribbean's uncertainties landscape. **Digital technologies** are also perceived as Critical Uncertainties based on their potential to enhance environmental sustainability and improve public services in urban areas.

- Action Priorities are focused on **decarbonisation and renewable technologies**, which are seen as solutions for improved affordability and sustainability of the sector. **Energy Efficiency** appears as the big theme, with clear improvement measures being implemented across the region.

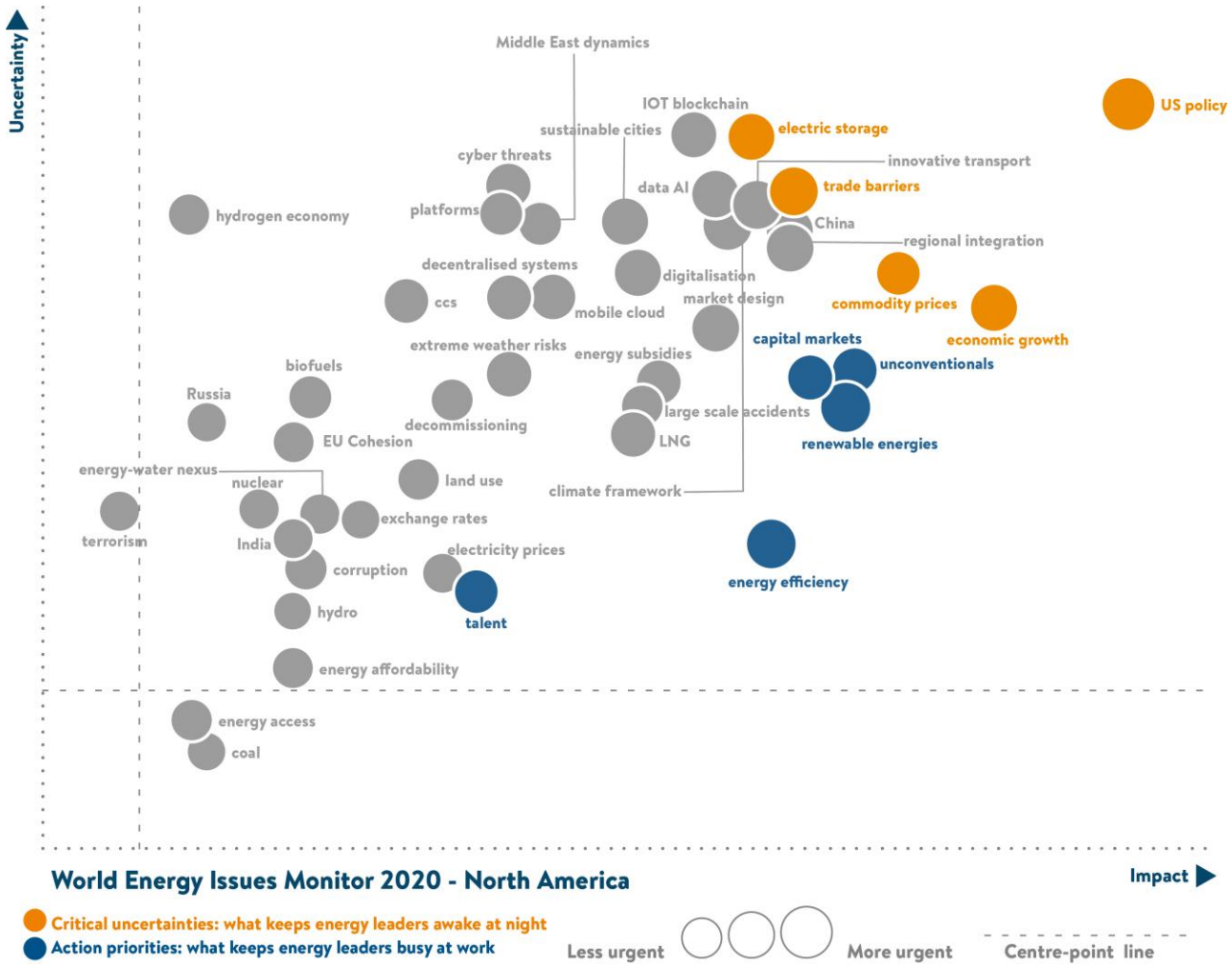
Regional Overview: MIDDLE EAST AND GULF STATES



- Energy leaders in the MEGS region are preoccupied with the growth in **digitalisation and technologies such as Data AI and IoT Blockchain**, which are seen as potential solutions for enhanced energy efficiency and reliability, but also raise the challenge of cyber threats.

- The key Action Priorities, **Energy Efficiency and Renewable Energies** are interrelated. Renewables deployment is expanding rapidly with the UAE leading the way.

Regional Overview: NORTH AMERICA



- **Geopolitics and macroeconomic issues** define the uncertainties landscape for Mexico, the US and Canada. While these concerns are primarily focused around **regional dynamics, China and the Middle East** also play an important role in defining perceptions.

- **Energy technologies** appear consistently as Action Priorities for the three **countries, with Energy** Efficiency playing the biggest role. **Regional integration** also influences perceptions in the Actions section.

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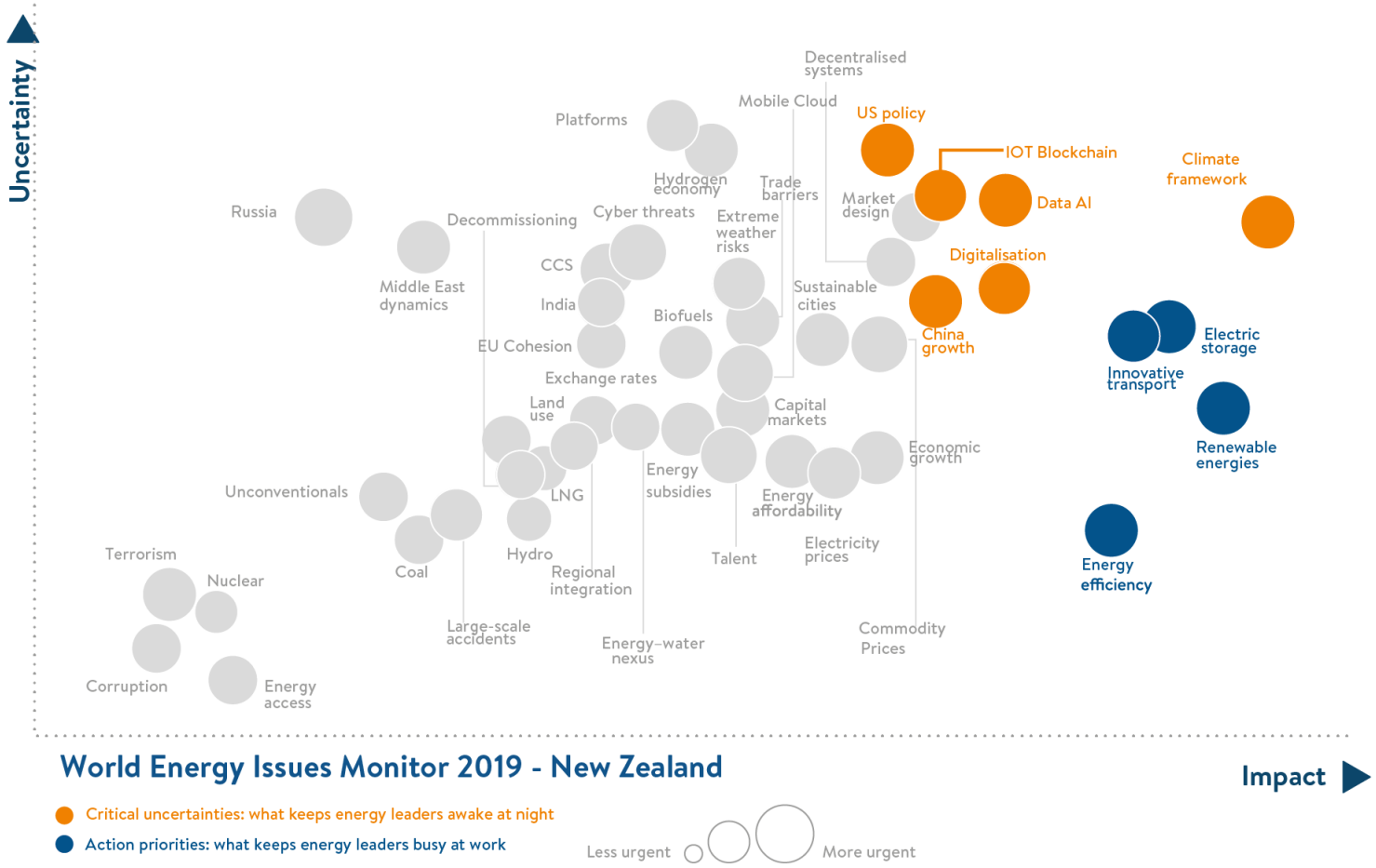
NEW ZEALAND

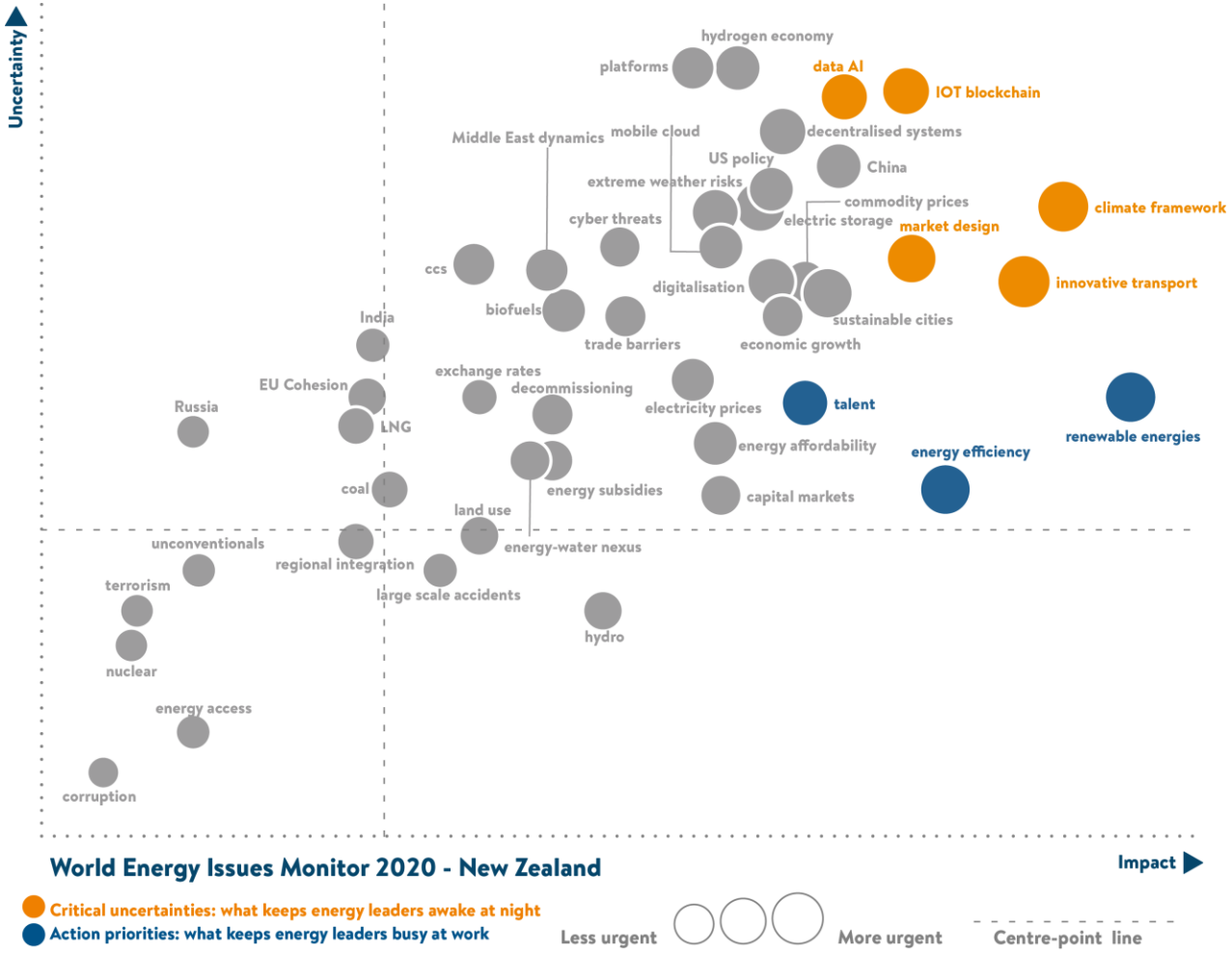
World Energy Issues Monitor
New Zealand Issues Map - 2019



- In 2019, energy executives highlighted concerns about the impact of **digital technologies** while we saw the re-emergence of economic issues such as **Climate Framework** and policy signals coming from the **US and China**.

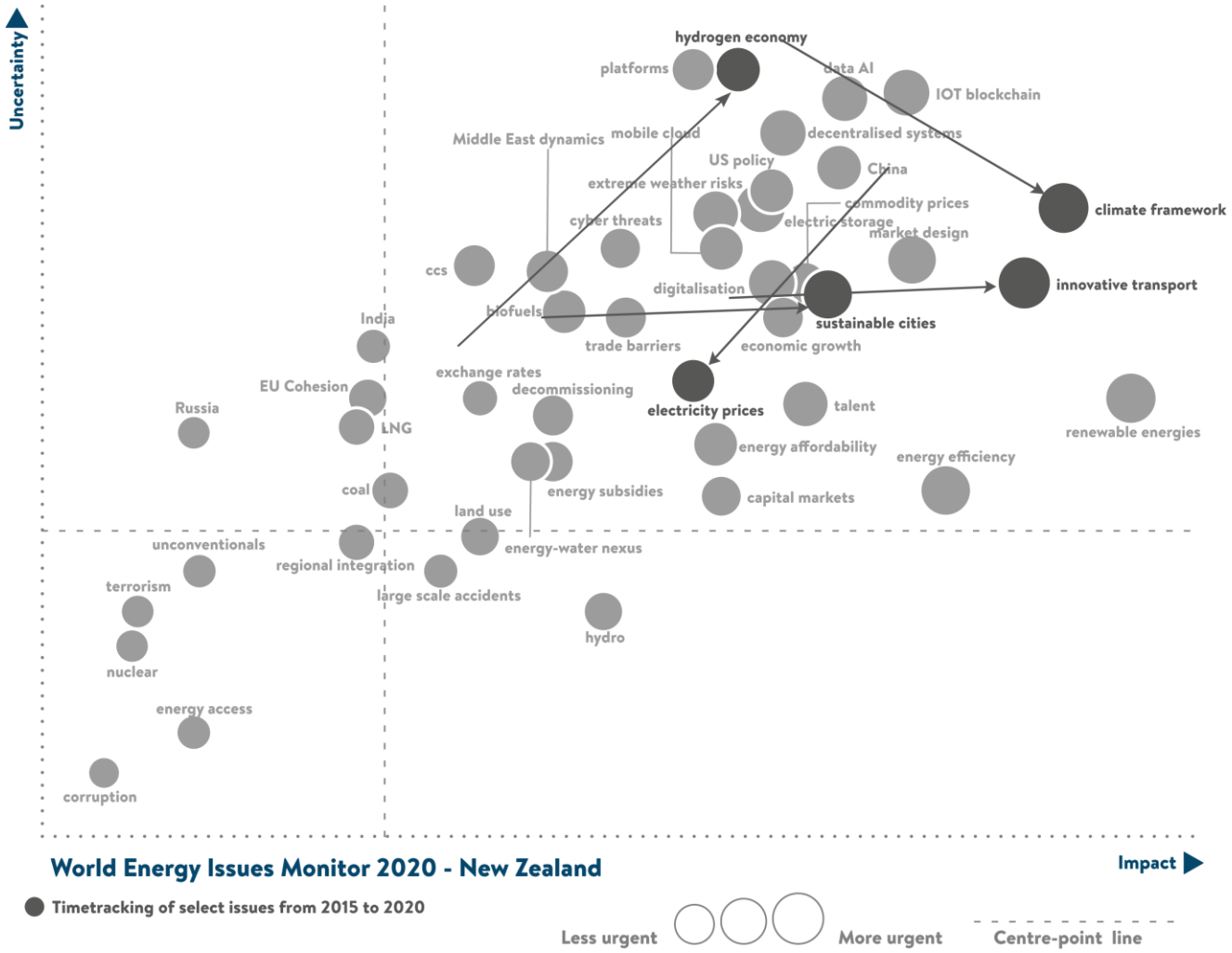
- **Energy Efficiency** was joined by **Innovative Transport** and **Storage** solutions as Action Priorities, as businesses increasingly express a confidence to bring these to the market in light of stronger signals from New Zealand's government.

World Energy Issues Monitor
New Zealand Issues Map - 2020



- Critical Uncertainties and Action Priorities have remained fairly similar to the previous year's perspectives, with the former revolving around **digitalisation issues** and the latter revolving around **sustainability issues**.

World Energy Issues Monitor
New Zealand Biggest Movers



- A 6-year tracking of New Zealand's energy leaders' perspectives on energy issues show that priority attention is being given to **Climate Framework, Innovative Transport and Sustainable Cities**.
- **Electricity Prices** lose in uncertainty and impact, moving towards the **Weak Signals** area.
- **Hydrogen Economy** emerges from a Weak Signal towards the Critical Uncertainties are, highlighting an increasing importance and impact being attributed to this issue.

World Energy Issues Monitor

New Zealand – Public-Private Sector Perspectives

A separated look at public and private sector perspectives on energy issues show an alignment of views between the two stakeholder groups

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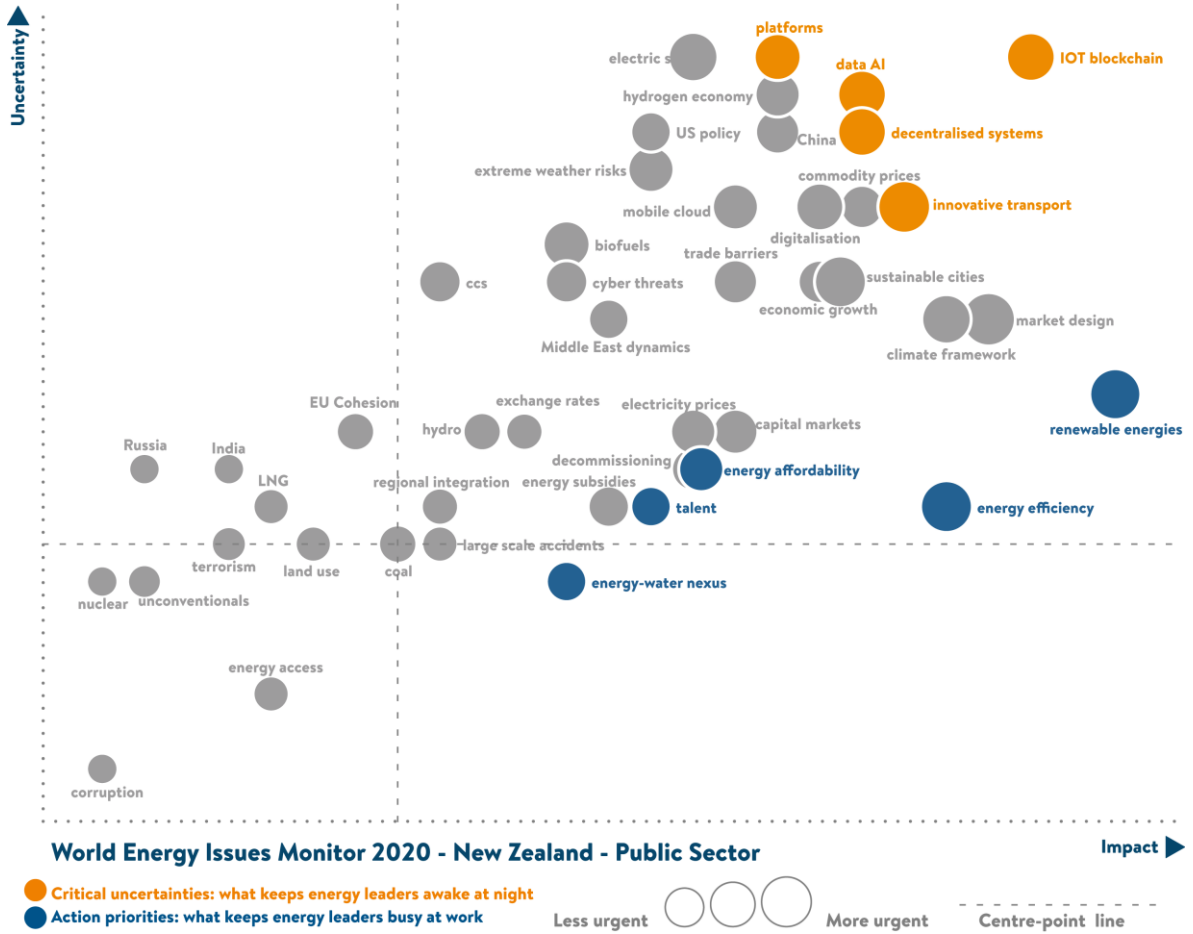
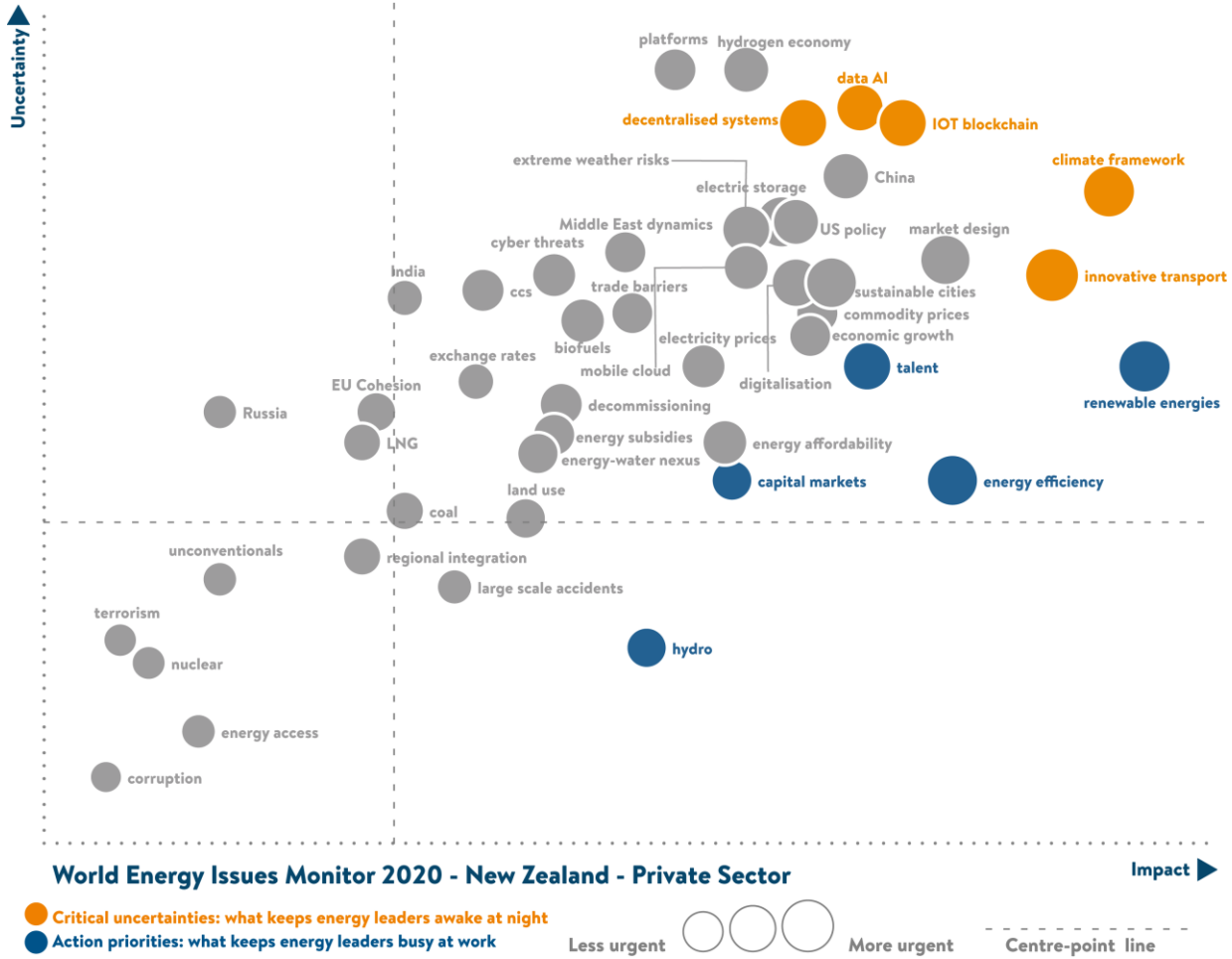
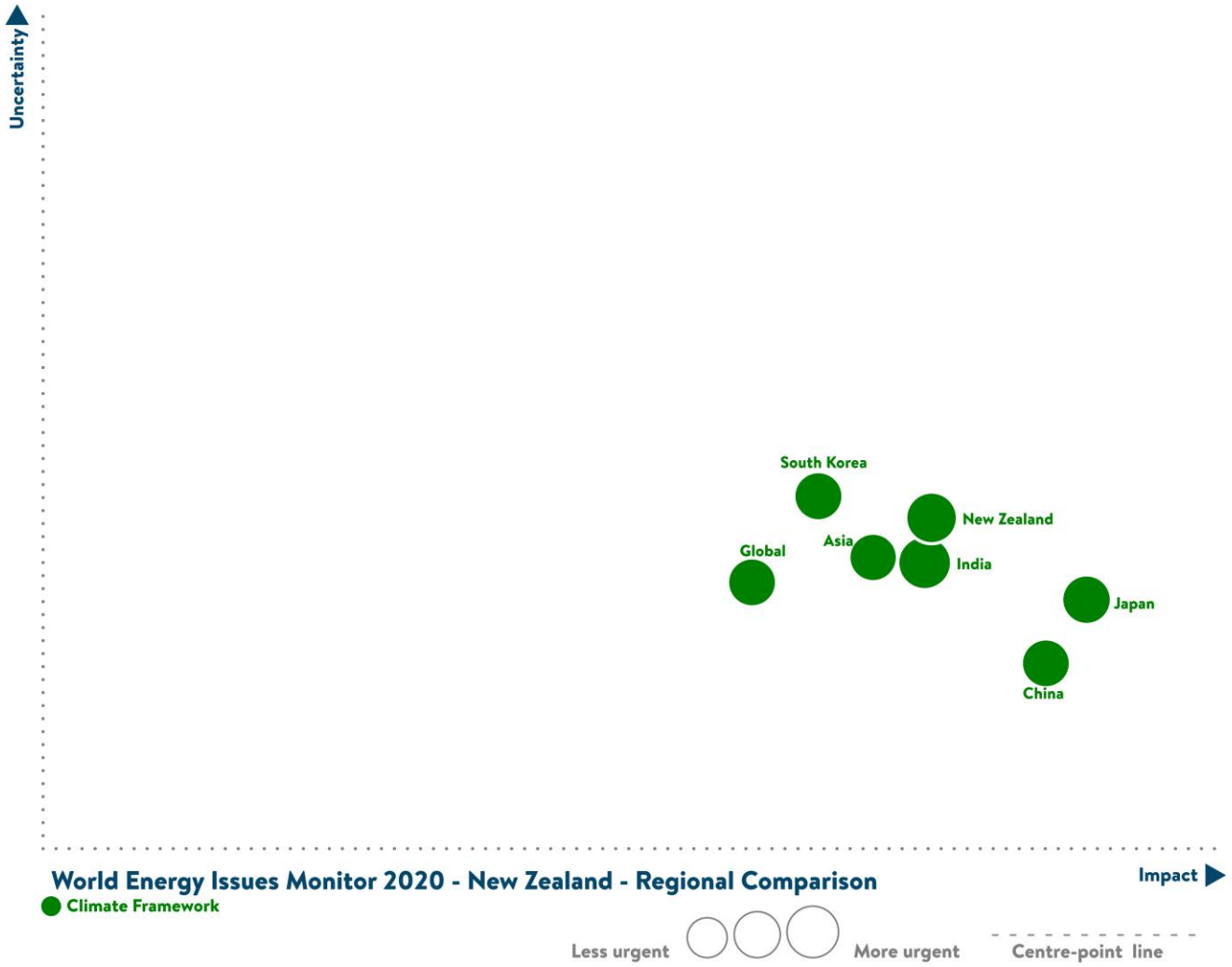


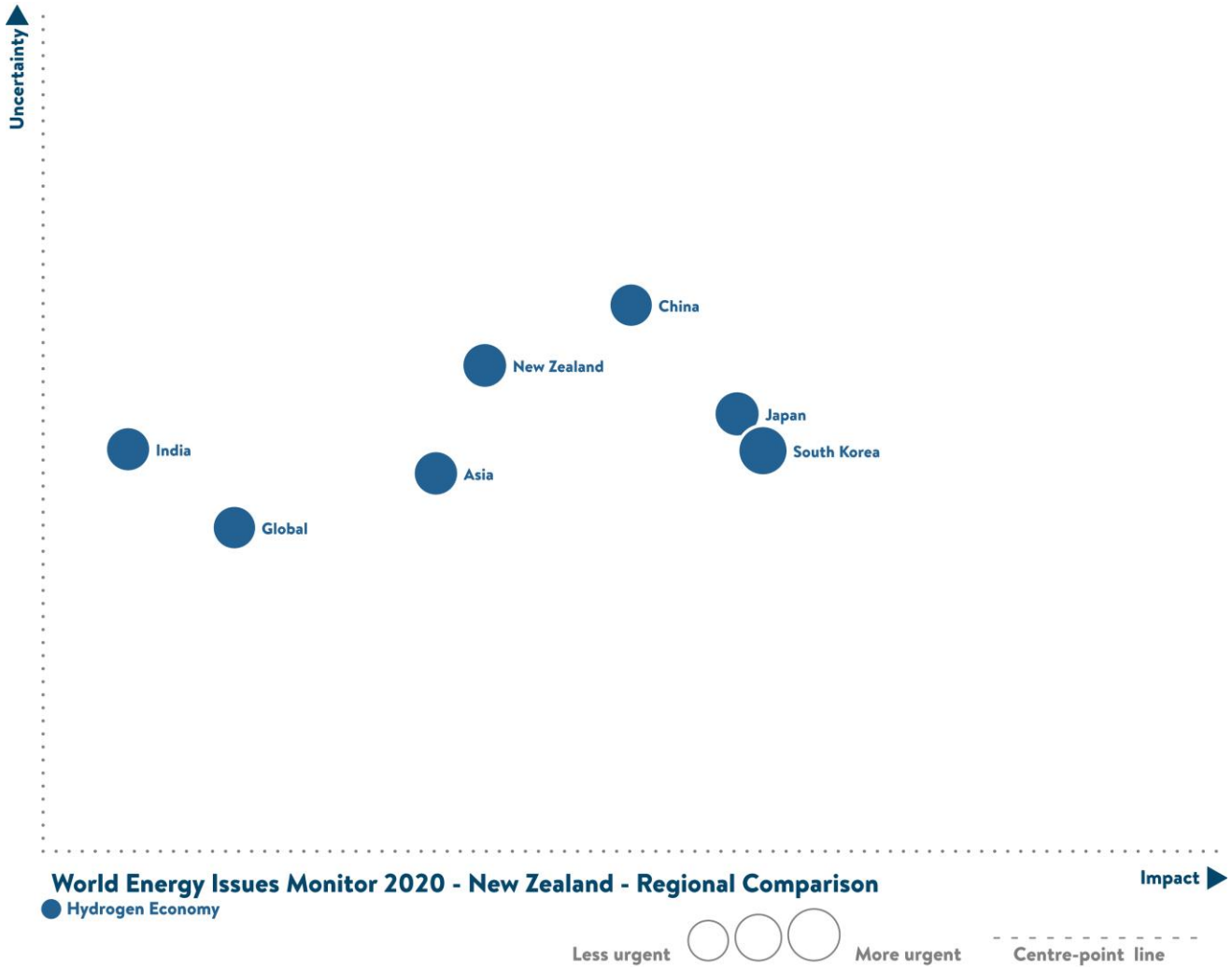


World Energy Issues Monitor
New Zealand – Regional Comparison – Climate Framework



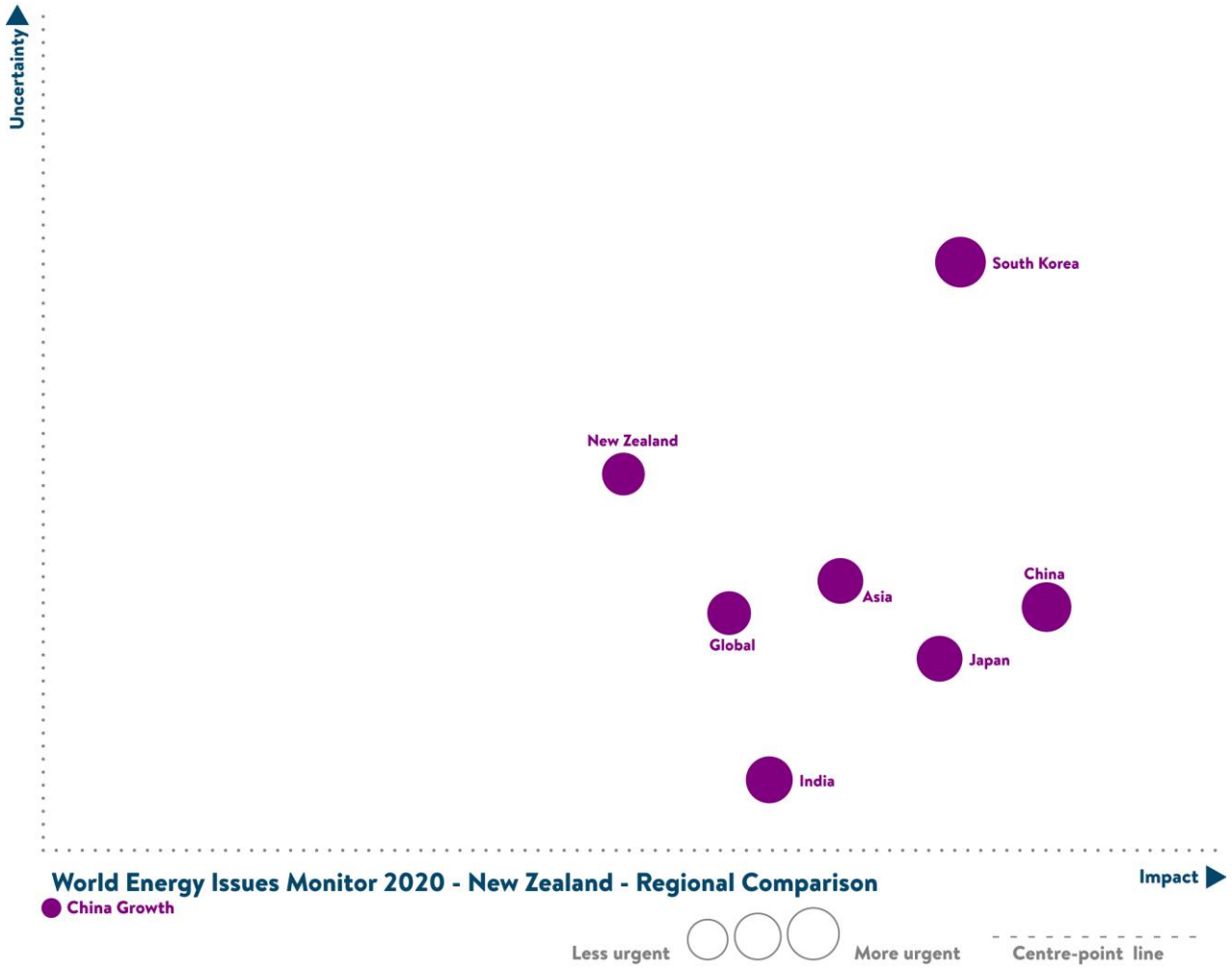
- New Zealand attributes **higher impact to the Climate Framework issue if compared with Global and Regional perspectives**, with the exception of Japan and China.
- New Zealand has passed its **Zero-Carbon Bill** into law, committing the country to net zero carbon by 2050. This sets a clear goal but highlights the need for an action plan.
- More work is underway with part of the Act being the reform of the **New Zealand Emissions Trading Scheme (NZ ETS).**

World Energy Issues Monitor
New Zealand – Regional Comparison – Hydrogen Economy



- Along with South Korea, Japan and China, New Zealand sees the Hydrogen Issue with **higher impact than the global and regional average.**
- The country has set a goal to reach **100 per cent** renewable electricity by 2035 and to transition to a **clean, green and carbon neutral economy by 2050**.
- Given the country's abundance of renewable energy, government initiatives are exploring how these sources could be used to produce **hydrogen as a next generation fuel in a sustainable way**.

World Energy Issues Monitor
New Zealand – Regional Comparison – China Growth



- New Zealand's energy leaders perceive China Growth with **lower impact** in comparison with regional and global perspectives.
- China is New Zealand's **largest trading partner** in goods and second largest overall including trade in services. The terms for exchange between the two countries are governed by the New Zealand–China Free Trade Agreement signed in 2008.
- Through the **Belt and Road Initiative**, the New Zealand Government has expressed interest to expand relations beyond trading goods, proposing collaboration on **sustainable development issues** along the new Silk Roads.

World Energy Issues Monitor
New Zealand – Regional Comparison – US Policy

- New Zealand's views on **US Policy is seen with much lower impact and lower uncertainty** when compared with regional and global views on the same issue.