WORLD ENERGY COUNCIL
CONSEIL MONDIAL DE L'ÉNERGIE
For sustainable energy.

2014 World Energy Issues Monitor

What keeps energy leaders awake at night?

WORLD ENERGY COUNCIL
CONSEIL MONDIAL DE L'ÉNERGIE

Officers of the World Energy Council

Marie-José Nadeau
Chair

Younghoon David Kim
Co-chair

Leonhard Birnbaum
Vice Chair
Europe

Oleg Budargin
Vice Chair
Responsibility for Regional Development

José da Costa Carvalho Neto
Chair
Programme Committee

Arup Roy Choudhury
Vice Chair
Asia Pacific/South Asia

Jean-Marie Dauger
Chair
Communications & Outreach Committee

Hon. Hasan Murat Mercan
Vice Chair
2016 Congress, Istanbul

Bonang Mohale
Vice Chair
Africa

O.H. (Dean) Oskvig
Vice Chair
North America

Brian A. Statham
Chair
Studies Committee

José Antonio Vargas Lleras
Vice Chair
Latin America/Caribbean

Graham Ward, CBE
Vice Chair
Finance

Wu, Xinxiong
Vice Chair
Asia

Taha M. Zatari
Vice Chair
Special Responsibility
Gulf States & Middle East

Christoph Frei
Secretary General

2014 World Energy Issues Monitor

World Energy Council

Published 2014 by:
World Energy Council
Regency House
1–4 Warwick Street
London W1B 5LT
United Kingdom

Registered in England and Wales

No. 4184478
VAT Reg. No. GB 123 3802 48
Registered Office
Regency House
1-4 Warwick Street
London W1B 5LT

ISBN: 978 0 946121 34 2

Contents

1

Foreword by Christoph Frei, Secretary General of the World Energy Council

This is a time of unprecedented uncertainty for the energy sector. Secure, reliable, affordable, clean and equitable energy supply is fundamental to global economic growth and human development and presents huge challenges for us all. Energy demand will continue to increase, driven by non-OECD economic growth. The pressure and challenge to further develop and transform the energy system is immense. To make things more daunting, it is in the context of this uncertainty that today's policymakers and business leaders have to take critical decisions on our future energy infrastructure.

The World Energy Council (WEC) has, for the last five years, produced our **World Energy Issues Monitor** to provide an annual snapshot of the landscape of uncertainties, leveraging the insights of energy leaders and experts from our independent and impartial network across more than 90 countries. The report draws on the commonalities and differences for leaders at the global, regional and national level, before providing a perspective from our community of young energy professionals – our Future Energy Leaders.

Over the last five years we have seen the acceleration and increased complexity of energy drivers as well as policy and investment signals. Today, the primary global issues that keep energy leaders awake and active are:

- **Energy prices**, and high associated volatility, have become the most critical uncertainty for energy leaders for the first time this year, surpassing the global climate framework.
- The lack of global agreement on climate change mitigation remains a key issue, for the fifth consecutive year, without a clear path for the **future of CO_2 prices.**
- **Access to capital** has an increased uncertainty this year, demonstrating the difficulties in the matching of capital with the necessary demand for energy infrastructure.
- **Carbon capture, utilisation and storage (CCUS)** is perceived with rapidly diminishing impact, continuing the clear trend of the past three years and reinforcing the reality check needed around our ability to deliver on climate objectives by 2050.
- **Energy efficiency** remains stable in its positioning as an action priority for the fifth successive year and continues to present an immediate opportunity, but will only be realised with a longer-term approach to financing.

It is with the consideration of such outlined complexity and uncertainty that the WEC promotes the **energy trilemma** approach with the objective to deliver balanced, predictable and stable policy frameworks. It is such balance that mitigates political risk, which too often keeps the necessary investments from flowing.

With the urgency to take critical decisions, more than ever we need an impartial, inclusive and fact-based dialogue on our future. We need to improve our common understanding of the implications of today's decisions and actions so we can make them the ones that deliver the future we want. A key foundation for policy and investment decisions is a thorough understanding of critical drivers and uncertainties, which will define our future. Our **World Energy Scenarios** provide a set of plausible and coherent stories of how our future may unfold, based on a systemic analysis of critical drivers and uncertainties – offering a reference point against which to strengthen the foundation for our capacity to define balanced policies and take informed investment decisions.

I would personally like to take this opportunity to thank the more than 800 energy leaders, including ministers, chief executives and the chairs of our national committees, for their time in contributing to this initiative. In particular, those 24 national committees that have dedicated much effort to ensuring the voice of their national network can contribute directly to the energy debate, by way of the national monitors.

In a world becoming more interconnected, where new technologies foster faster innovations and demand changes in our behavioural responses, the task of understanding the issues that will shape our future becomes ever harder. I hope you will join me in using the insights from this latest iteration of the World Energy Issues Monitor, to challenge our own assumptions of what is of the highest importance as we set the fundamental dialogue that energy leaders must address in the year ahead.

Christoph Frei
Secretary General, World Energy Council

2

Introduction to the World Energy Issues Monitor

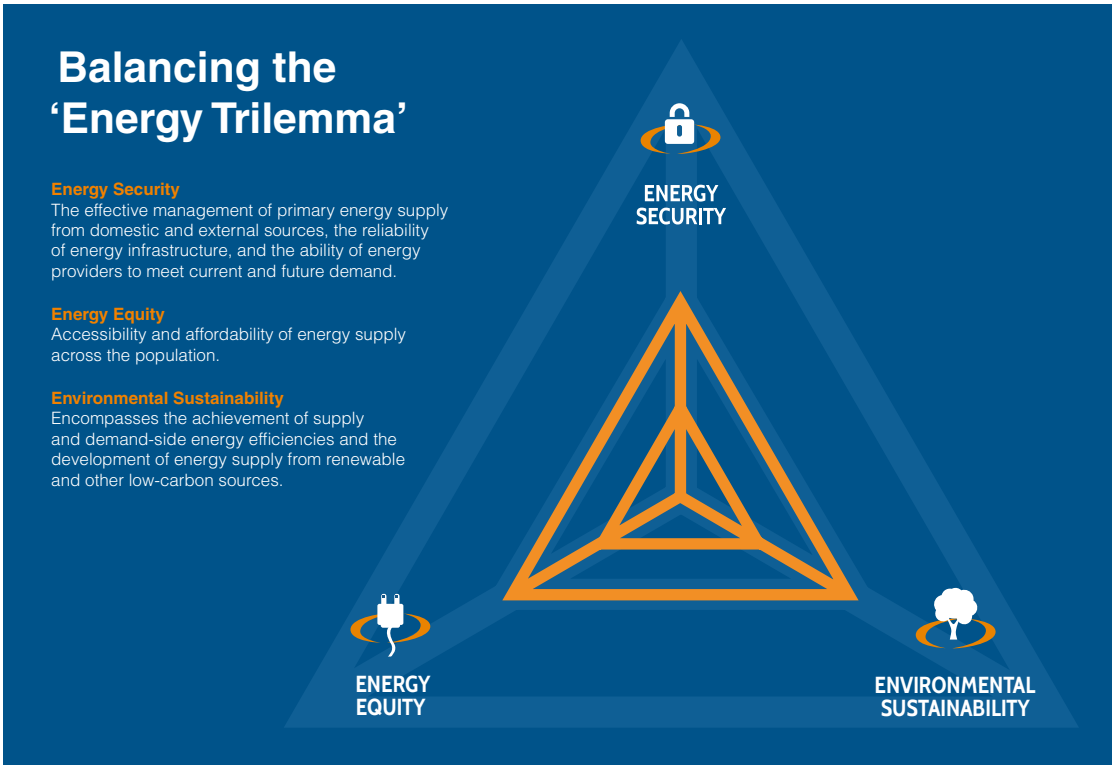
Introduction to the World Energy Issues Monitor

The World Energy Issues Monitor provides a snapshot of what keeps energy leaders awake at night in nearly 90 countries. The monitor helps to define the world energy agenda and its evolution over time. It provides a high-level perception of what constitutes issues of critical uncertainty, in contrast to those that require immediate action or act as a developing signals for the future. As such, it has developed into an essential tool in understanding the complex and uncertain environment within which energy leaders must operate, and a tool through which we can challenge our own assumptions on the key drivers within the energy landscape.

This sixth iteration of the monitor, builds on the pilot of the national assessment undertaken by six countries in 2013, to provide 24 monitors across six regions to highlight differing regional and national priorities. These insights help to ensure that the WEC provides the principal impartial forum to facilitate dialogue among energy leaders on the critical issues affecting the global energy agenda through action-oriented frameworks such as the energy trilemma – enabling policymakers to reassess, evaluate options and deliver smart policy strategies to create a stable environment for long-term investment.

This focus on both regional and national levels reflects the critical role of governments in determining and establishing structures for markets to function if the energy trilemma is to be addressed in the most meaningful manner for each region.

Figure 1
Creating a policy framework that simultaneously delivers secure, affordable, and environmentally sustainable energy – a sustainable energy system – is one of the most important challenges facing governments today. This triple challenge is known as the 'energy trilemma'.



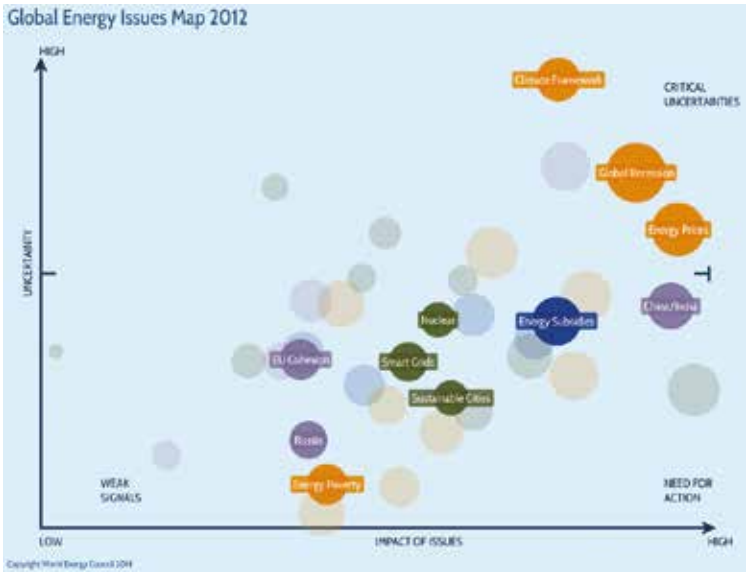
Methodology

The World Energy Issues Monitor is based on an annual survey, comprising 37 issues across four categories: macroeconomic risks; geopolitics; business environment; and energy vision and technology. The survey is completed by ministers, chief executives and leading experts in nearly 90 countries that are members of the WEC. The 2014 monitor is based on insights from 891 energy leaders from 87 countries.

The data for the 2014 World Energy Issues Monitor is input and normalised using statistical software, in order to enable direct comparisons across regions and for different years. The data is normalised by the mean to give a central weighting and standard deviations to give the spread. The resulting issues monitors are then further contextualised by the analyses of WEC national committee chairs and their broader national networks. The resulting product is used as a report, an interactive monitor (**www.worldenergy.org/data**) for tailored results as well as in numerous presentations and meetings.

The Interactive Energy Issues Monitor

Tailor monitors with the issues most important for you; explore the evolution of critical issues across years and in different regions; and download the results in the interactive issues monitor on **www.worldenergy.org/data**



How to use the Issues Monitor for your own company or executive team

Tailored Issues Monitors can be used to benchmark your own understanding of the energy agenda against your regions of activity and to inform and engage government and policymakers regarding the critical issues in your country. If your company or national committee are interested in looking at a bespoke monitor and debriefing with your board or executive team, please contact John Bourne by emailing **bourne@worldenergy.org**.

How to read the Issues Monitor

Categories and individual issues:

- The World Energy Issues Monitor assesses 37 issues in a high-level overview, covering four categories, each of which is represented by a different colour:
  - macroeconomic risks (orange)
  - geopolitics (purple)
  - business environment (blue)
  - energy vision and technology (green)
- See Table 1: The world energy issues

Dimensions/Axes:

- The responses are translated into issue monitors with the three assessed dimensions:
  - The impact of an issue on the energy sector.
  - The degree of uncertainty related to its impact – this forms the x and y axes.
  - The urgency with which we need to address the specific issue – this is represented by the proportional size of the issue bubble, where a larger size corresponds to a higher degree of urgency.

Zones within the Monitor:

- **Critical uncertainties**: Issues with high uncertainty and high impact (in the top-right quadrant) are the 'critical uncertainties' with no clear path of action which keep energy leaders most awake at night. These issues need to be part of the energy leaders' dialogue and scenario analysis.
- **Action priorities**: The issues in the high-impact and low-uncertainty space are those which keep energy leaders most busy (bottom-right, 'action issues').
- **Weak signals**: The low-impact and low-uncertainty issues (bottom-left quadrant) include those of perceived lesser importance or those that are still not fully understood and need further investigation.

Time-tracking Issues Monitors:

- In addition to the critical uncertainties, issues of particular interest for dialogue include those with rapid evolution over time and those with large differences across regions. The arrows on time-tracking Issues Monitors illustrate the evolution of selected issues over the past five years.

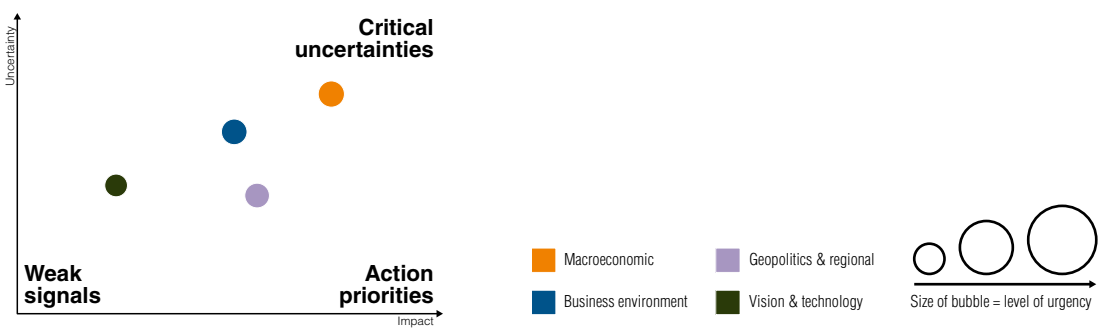


Table 1
The World Energy issues

Macroeconomic risks and vulnerabilities	
Global climate framework uncertainty	*Uncertainty* on outcome and time-horizon of global climate negotiations, i.e. the question of whether there will be a global / regional price on CO_2 and if so, at what level that price would be.
Large-scale accidents	Post-Fukushima nuclear disaster and Macondo oil spill: possibility of potential further energy-related large-scale accidents and implications of changes in governance and safety standards to avoid these.
Global recession	Implication of recession, including e.g. relative decoupling of global economy, impact on subsidies for and trade of green goods.
Capital market constraints	Difficult matching of capital to deliver energy infrastructure.
Commodity prices and volatility	High prices, volatility and inflationary risk.
Energy prices and volatility	High volatility and investment uncertainty ('security of demand' concern).
Currency uncertainty	Exchange rate, insolvency and currency devaluation risks negatively impacting on energy infrastructure investments.
Energy-water-food nexus	Energy-water-food nexus exposing energy supply chain to risks regarding changing water availability and policies to combat hunger.
Talent scarcity	Shortage of future engineering or other energy-relevant skills negatively affecting energy infrastructure development and expansion.
Energy poverty	1.3 billion people are still without access to electricity, 87% in rural areas; new entrepreneurial models, creation of financing mechanisms, focused government policies to deliver solutions.
Energy affordability	Also referred to 'fuel poverty', high or increasing energy prices weighing on household budgets.
Corruption	Slowing down development and development of effective policies.
Energy geopolitics and regional issues	
China/India growth	Shifting demand to East, competition for scarce resources, market uncertainties and sustainability of continued growth rates.
Brazil realising its potential as role model for Latin America	Realising its potential, influence on regional policy, growth and development within the region.
Russia energy diplomacy	Ability to adapt to shale gas context and maintain its importance in the natural gas sector; implications for regional / global gas markets.
EU cohesion	Absence of common energy policy with negative effects on common energy market and regional interconnection.
Middle East/North Africa fragility	Political fragility and potential conflict (e.g. around Suez Canal) affecting global security of supply.
US trade and policy influencing global energy markets	US-driven innovation and policy influencing global energy trade; and affecting priorities in bilateral relations and international security policies.
Terrorism	Physical risks and cyber threats affecting energy markets.

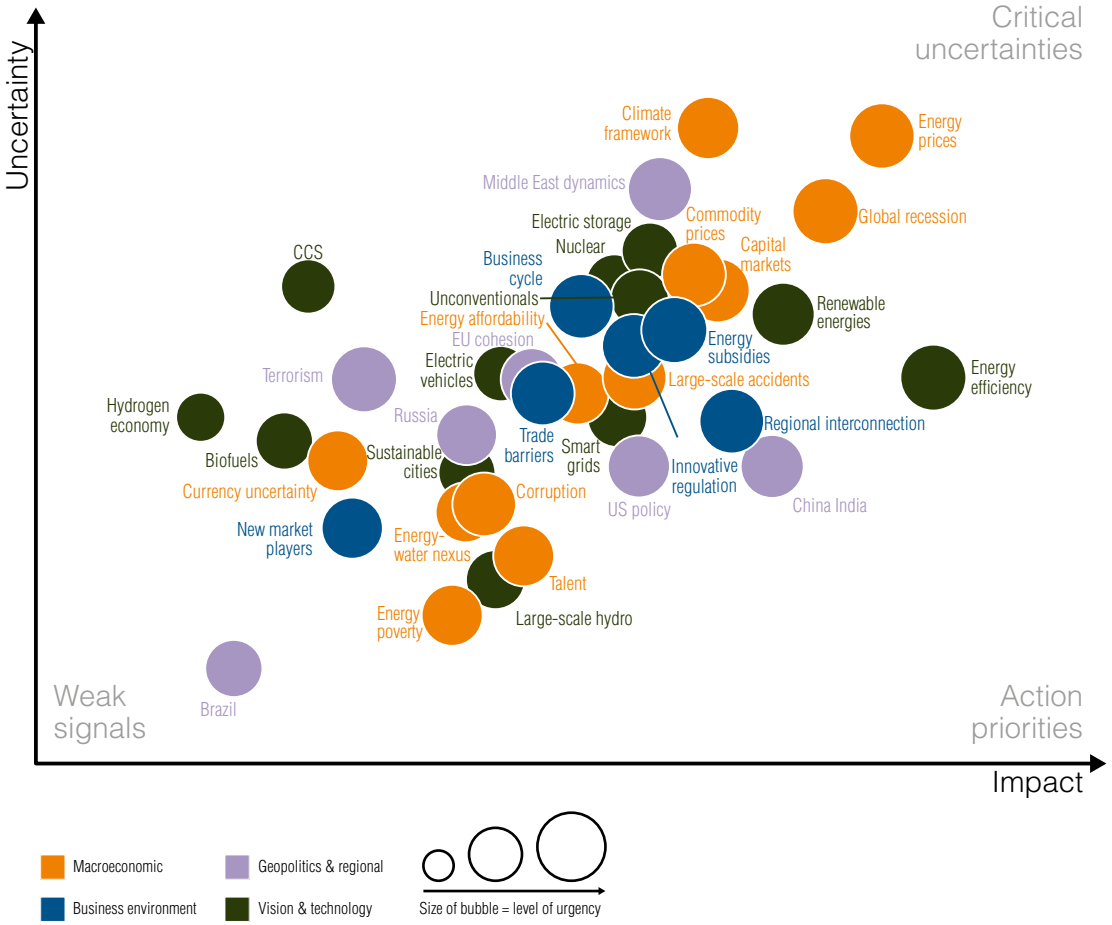
Energy policies and business environment	
Trade barriers	Constraining or enabling green growth (e.g. through technology transfer or lack of).
Regional interconnection	Underdevelopment of regional infrastructure, potentially high cost implications of unequal distribution of resources.
Business cycle	Overcapacity and underinvestment in energy infrastructure as a growth constraint.
Innovative market design and policies	New market designs and policies securing back-up and storage capacity in electricity markets with increasing intermittent renewable energy shares; fragmented regulation leading to ineffective solutions.
Energy subsidies	Uncertainty over subsidy sustainability.
New market players	Diminished resources base of international oil companies; old utilities not fit for decentralised technologies.
Energy vision and technology	
Sustainable cities	Realising resource efficient urbanisation at scale.
Energy efficiency	Overcoming barriers to implementation and achieving its potential
Carbon capture, utilisation and storage (CCUS)	Overcoming barriers to achieving scale, innovative solutions to make projects viable (enhanced oil recovery, CO_2-to-plastic, CO_2-to-algae/biofuels).
Renewable energy	Maintaining traction to achieving scale.
Biofuels	Overcoming barriers to realising potential.
Smart grid	Decentralised solutions and business models taken to scale.
Future mobility/ electric vehicles	Innovative mobility concepts, new transportation modes and fuel sources, including electric vehicles, natural gas vehicles realising potential.
Electricity storage	Cheaper batteries, 'power to gas' storage (of excess generation from renewables) and scalability.
Nuclear	Future of nuclear post-Fukushima.
Hydropower	Overcoming barriers to realising potential.
Unconventional fossil fuels	Shale gas, oil shale, potentially other unconventionals realising potential, altering global oil and gas market dynamics.
Hydrogen economy	Advancing to an achievable incremental vision.

3

Assessing the global energy agenda

High energy price volatility becomes the top critical uncertainty for energy leaders globally

Figure 2
WEC's World Energy Issues Monitor 2014: highlighting 37 issues and their perceived impact, uncertainty, and urgency for global energy leaders and experts globally



WEC's latest Issues Monitor is set in the context of high uncertainty. There has been the need to redefine infrastructure resilience on the basis of emerging risks, and the expectation of changing market designs and evolving business models. The energy sector has also seen a changing geopolitical balance as a result of the shifting energy map.

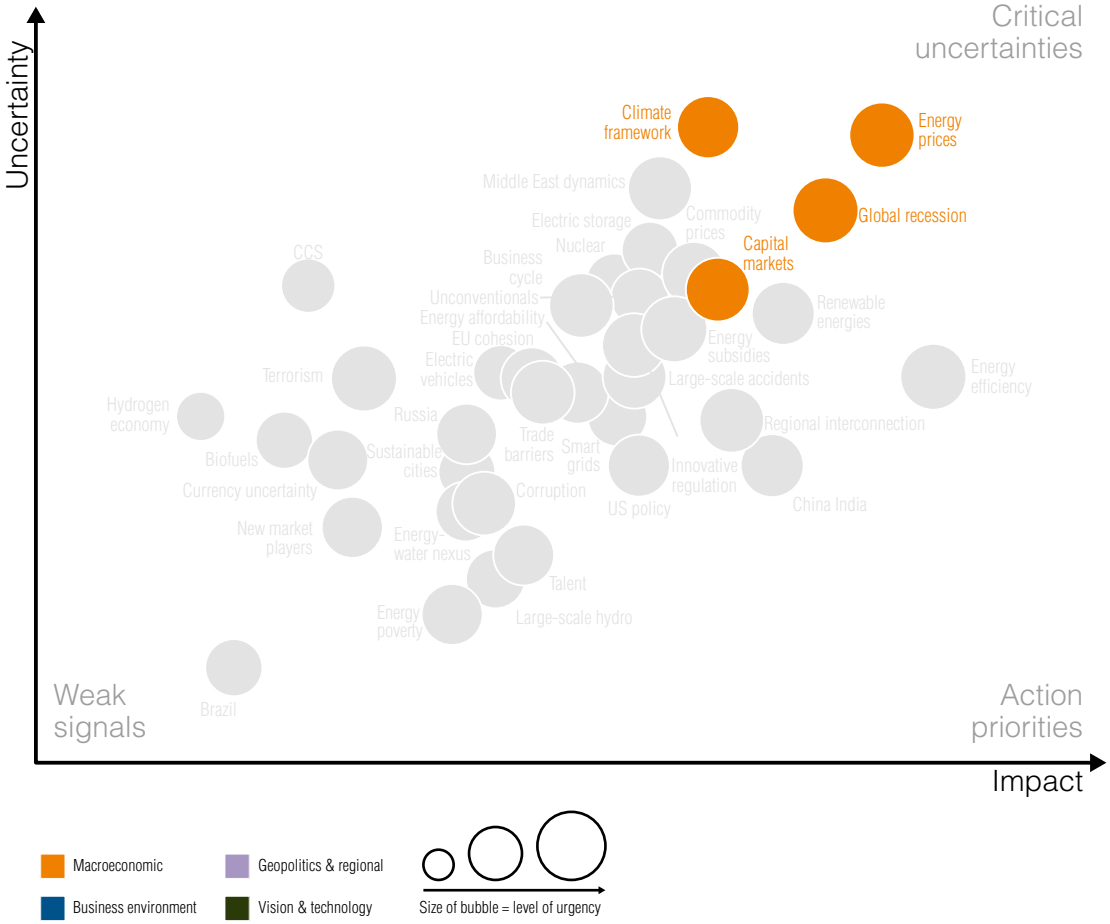
The top issues of uncertainty on energy leaders' agendas include: the high energy price volatility, the continued uncertainty towards a future climate framework, the global recession and access to capital markets.

The 2014 World Energy Issues Monitor shows that high energy price volatility has become the number one critical uncertainty on the energy agenda, replacing the climate framework as the most extreme issue, for leaders and experts globally. The increasing uncertainty attributed to the global climate framework by energy leaders and experts over the past three years, is now coupled by a further development in the perceived lessening impact of the issue. This reinforces the lack of credibility and expectation of a meaningful and timely

outcome for global climate negotiations, as well as the associated questions around whether there will be a global or regional price on CO_2 and, if so, at what level that price would be.

The positioning of energy prices reiterates the importance and interconnectivity of the macroeconomic issues for energy leaders. High energy price volatility is not limited to crude oil and is broader than just the question of low natural gas prices and high differentials between regions that highlight transport bottlenecks to Asia. The coal to gas substitution in the United States (US) electricity mix has resulted in a continued push of discount-priced coal from the US to Europe where modern gas plants are increasingly idle. Meanwhile, old coal plants are increasingly in full motion – pushing Europe's greenhouse gas emissions further away from earlier commitments. Australia, on the way to becoming one of the world's largest liquefied natural gas (LNG) exporters, has re-directed its interest from North America to Asia while US (and Canadian) infrastructure companies have started signing deals with Asian customers. Concern over price volatility also extends to solar, where module costs have collapsed since 2008 from over 4.5 $/Wp to as low as 0.6 $/Wp, and nuclear, where post-Fukushima safety requirements have driven costs upwards.

Figure 3
WEC's 2014 World Energy Issues Monitor: highlighting the top global issues of critical uncertainty (energy prices, global recession, climate framework, capital markets)

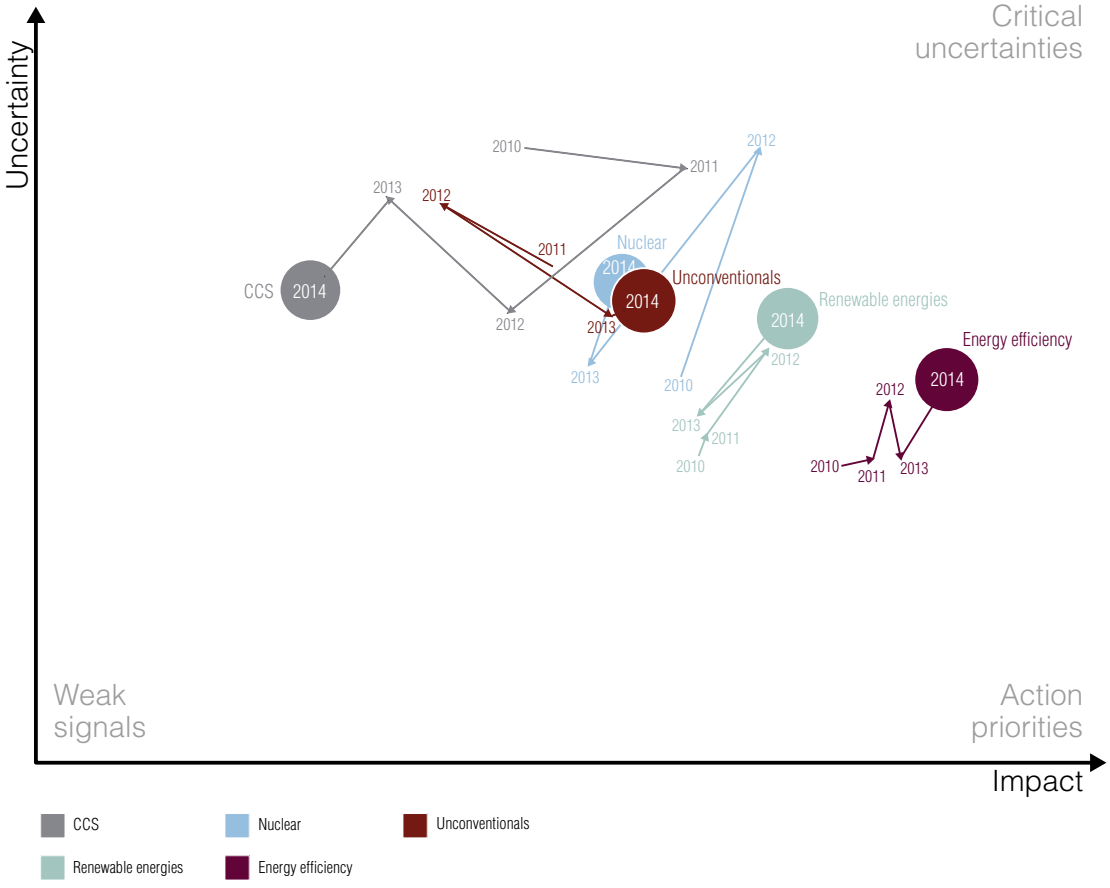


The concern around the global recession remains as one of the most critically uncertain issues for 2014. The wide-ranging and profound implications of the recession, including the relative decoupling of the global economy and impacts on subsidies and trade, are nuanced this year by the continued movement to the critical uncertainties space of capital

markets. This primarily relates to the difficulty in matching the capital with the demand to deliver the necessary energy infrastructure. A number of traditional infrastructure investors have suffered from the financial, then economic crises – on the government side from lower tax revenues, and in the private sector through thinning margins and stranded investments. The question of how large energy projects will be financed in the near future is therefore one that remains critical. As highlighted by the WEC's World Energy Trilemma report series,[1] the enabling of such a framework for energy financing must be based, at the national level, on the establishment of a stable regulatory and legal framework for long-term investment and provide an attractive risk-return profile to meet the competition for capital.

Where energy leaders have changed their views most radically

Figure 4
WEC's 2014 World Energy Issues Monitor: highlighting most rapidly moving issues (CCUS, nuclear, unconventionals) versus very robust action issues (energy efficiency, renewables)



The issue with the most dynamic change over the past years is carbon capture, utilisation and storage (CCUS) which is rapidly continuing its movement to a position of perceived

1 Including the latest report, World Energy Trilemma: Time to get real – the agenda for change, www.worldenergy.org/publications

lesser impact: without a formal price signal or regulatory requirements for CO_2 emission avoidance, this technology is at risk of simply being seen as adding cost and reducing energy efficiency. This must be of highest concern as we lock ourselves into a high CO_2 emission future for the next 40 to 50 years with every new coal plant built. WEC's latest World Energy Scenarios[2] show no plausible scenario that brings us close to meeting climate objectives by 2050 without a significant contribution by CCUS. The two scenarios – 'Symphony' and 'Jazz' – provide an assessment of the potential energy landscape in two extreme situations. Jazz shows a more decentralised scenario and Symphony shows a more orchestrated result. In terms of curbing CO_2 emissions, the Symphony scenario sees the world being able to decrease emissions to 490–535 parts per million (ppm) by 2050. In contrast, the Jazz scenario will see emissions reach 590–710 ppm over the same period. Both emissions levels are in excess of the 450 ppm CO_2 target identified by many.

The issue that is most clearly highlighted as a game changer, with its solid trend towards the 'need-for-action' space, remains unconventionals. This is about unconventional oil (shale oil, tight oil, beyond Canadian oil sands or Venezuelan heavy or extra-heavy oil) as much as it is about the topic of shale and tight gas. The technology revolution is continuing and, while further progress is needed in managing the water and climate nexus, and costs remain too high to make non-associated gas competitive, production volumes continue to increase and have led to the possibility of a North American energy *supply* independence (differing from *price* independence) becoming achievable.

Further projects on unconventionals create interest around the world, including in Argentina, Algeria, Poland, the Ukraine, and China, which will eventually change the global supply map. However, we do not see other countries replicate the US success at the same speed and price for a number of reasons, including geological, the availability of equipment, logistical, legal, financial as well as those related to the water nexus.

Post-Fukushima nuclear remains an issue of continual change since the 2011 monitor, which saw nuclear jump into the high-uncertainty space. Since then, the uncertainty on the nuclear outlook has come down but, with increasing safety costs and low gas prices (in North America), this technology is more exposed than ever to the potential effects of a world in which governments pick technologies rather than markets. This is reflected by the reduced, but stable, impact of the issue for energy leaders in 2013 and 2014. This serves to exacerbate the trend from which the nuclear share of total global electricity production reached its peak of 17% in the late 1980s, but has since been falling and reached 13.5% in 2012.

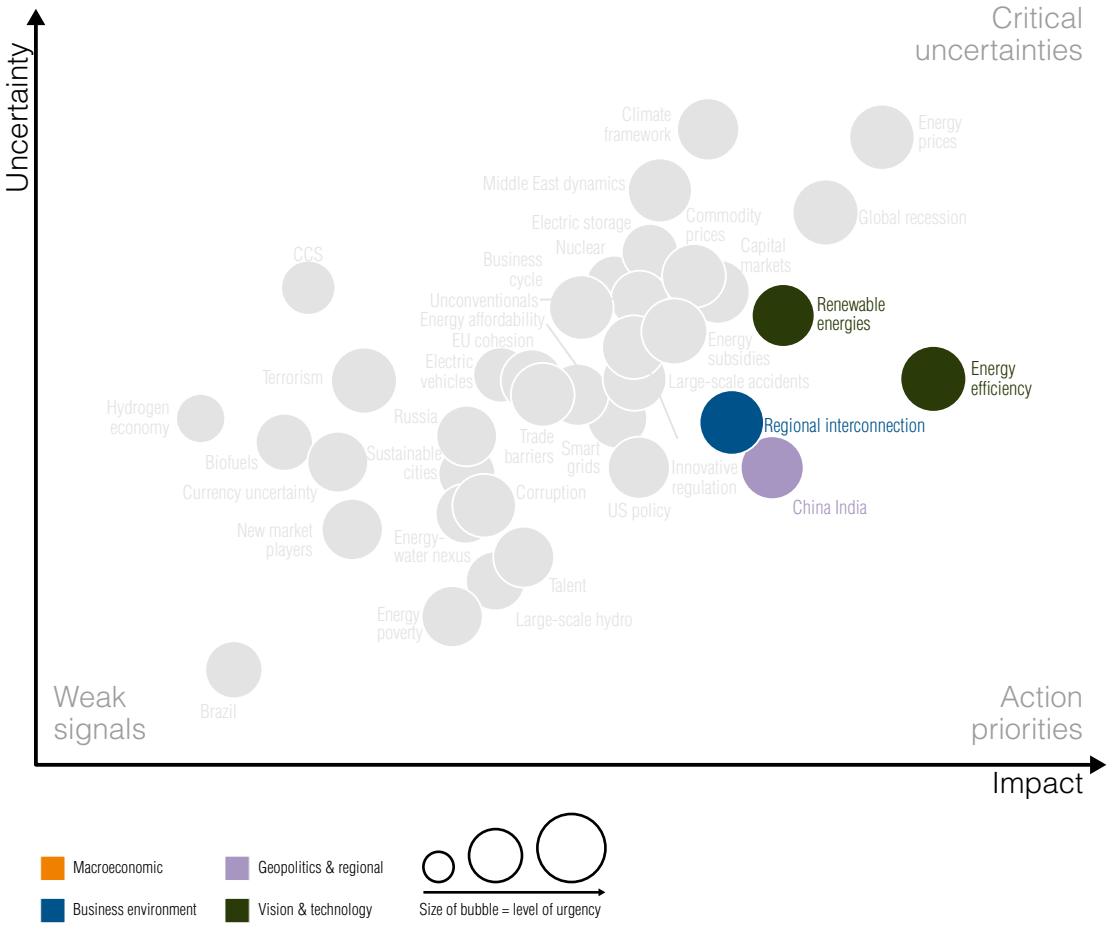
What keeps energy leaders most busy

Renewable energies and energy efficiency have remained dominant issues in the need-for-action space. It is important to note that renewables are not only driven by climate policy, as shown by the weak regional correlation between climate framework uncertainty and renewables. Renewables are seen both as a contribution to diverse and secure supply and a critical enabler to deliver energy to the 1.2 billion people without access today.

Growth is shifting from Europe and North America to the Middle East where demand is growing rapidly and where the solar peak is synchronised with the peak in demand for air conditioning. Large hydropower is back on the agenda with important unused potential in central Africa, Latin America, Russia or Canada.

2 World Energy Scenarios: Composing energy futures to 2050, www.worldenergy.org/publications

Figure 5
WEC's 2014 Global Energy Issues Monitor: highlighting the global action priority issues (energy efficiency, renewables, regional interconnection, growth in China/India)



Regional interconnection, which is often the feasibility basis for large energy projects, is also firmly in the need-for-action space. Meanwhile, energy efficiency presents an immediate opportunity to reduce both energy intensity and emissions. However, as energy-efficient systems are capital-intensive, decision makers must abandon the usual short-term mentality, looking not just at financing projects based on initial costs, but also to take account of the lower costs across a longer project life cycle.

Conclusion

The 2014 World Energy Issues Monitor demonstrates the urgency for energy leaders to take critical decisions in a context of daunting uncertainty. We need, more than ever, an impartial, inclusive and fact-based dialogue on our future: to improve our common understanding of the implications of today's decisions and actions so we can make them deliver the future we want. A key foundation for policy and investment decisions is a thorough understanding of the critical drivers and uncertainties which will define our future. In order to make such decisions achievable, it is clear that we must address the strong regional variation of priorities and solutions in the energy system.

4

Assessing the regional energy agenda

Assessing the regional energy agenda

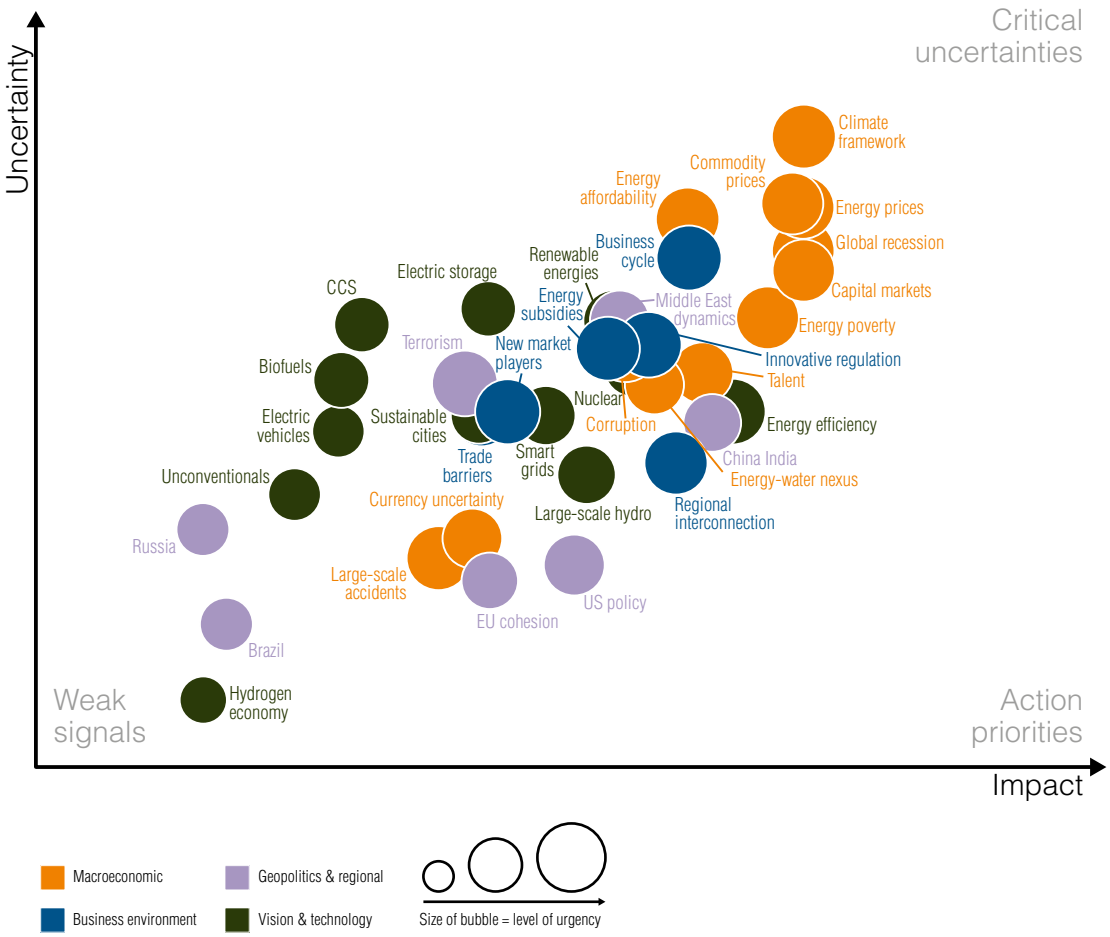
The WEC is uniquely placed, with its extensive network in over 90 countries, to provide bottom-up realities and perspectives. The following monitors build from this network to address the importance in understanding the energy agenda at a more localised level by providing the reality from each WEC region, building upon the themes of the global issues monitor with a more in-depth assessment of the specific challenges for respective energy leaders.

Regional break-down of countries contributing to the Issues Monitor:

- **Africa**
  - Botswana
  - Cameroon
  - Chad
  - Congo (Democratic Republic of)
  - Cote d'Ivoire
  - Ethiopia
  - Gabon
  - Ghana
  - Kenya
  - Namibia
  - Niger
  - Nigeria
  - Senegal
  - South Africa
  - Swaziland
  - Tanzania
  - Zimbabwe
- **Asia**
  - China
  - Hong Kong
  - India
  - Indonesia
  - Japan
  - Kazakhstan
  - Nepal
  - New Zealand
  - Pakistan
  - Philippines
  - South Korea
  - Sri Lanka
  - Thailand
- **Europe**
  - Albania
  - Austria
  - Belgium
  - Bulgaria
  - Croatia
  - Czech Republic
  - Denmark
  - Estonia
  - Finland
  - France
  - Germany
  - Greece
  - Hungary
  - Iceland
  - Ireland
  - Italy
  - Latvia
  - Lithuania
  - Luxembourg
  - Monaco
  - Netherlands
  - Poland
  - Portugal
  - Romania
  - Russian Federation
  - Serbia
  - Slovakia
  - Slovenia
  - Spain
  - Sweden
  - Switzerland
  - Turkey
  - Ukraine
  - United Kingdom
- **Latin America and the Caribbean**
  - Argentina
  - Bolivia
  - Brazil
  - Colombia
  - Paraguay
  - Peru
  - Trinidad and Tobago
  - Uruguay
- **Middle East and North Africa**
  - Algeria
  - Iran
  - Israel
  - Jordan
  - Kuwait
  - Lebanon
  - Libya
  - Morocco
  - Qatar
  - Saudi Arabia
  - Tunisia
  - United Arab Emirates
- **North America**
  - Canada
  - Mexico
  - United States of America

AFRICA

Figure 6
WEC's 2014 World Energy Issues Monitor: Africa



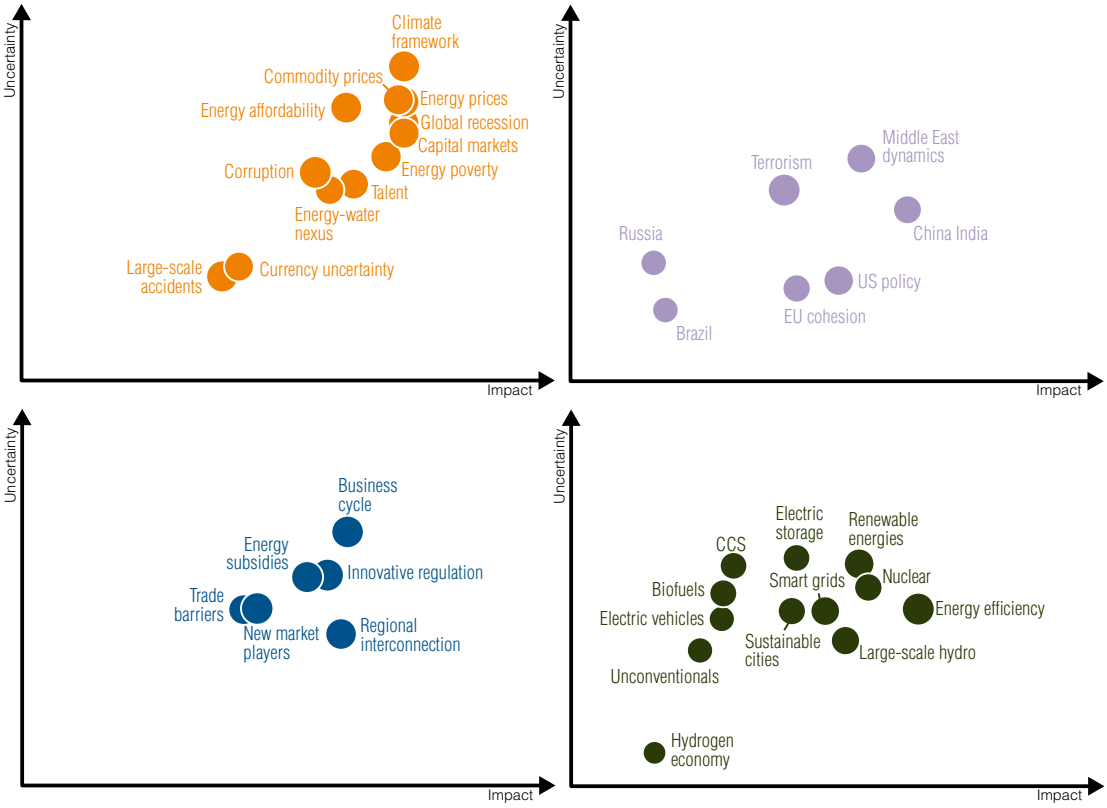
The global recession is continuing to have a critical impact on economic growth in Africa. However, in a positive move, China and India are increasingly focusing on Africa, reinforcing their positions among Africa's largest trading partners. Good prospects are also arising from the hydrocarbon sector, with more initiatives and exploration activities in a greater number of African countries, unveiling a huge potential for new markets.

The top critical uncertainties appearing from the latest Issues Monitor were climate framework, high energy prices and commodity prices, all impacting negatively on the wellbeing and living standards of Africa's population. This year, the climate framework has become even more critical compared with last year's global energy Issues monitor. Africa is dramatically vulnerable to climate change and can suffer more than other world regions because of the difficulty of adapting and responding to the impacts of climate change with insufficient resources. African people are, arguably, becoming more aware that climate change is an urgent and real issue, rather than something that only countries with large CO_2 emissions should worry about.

National governments and regional institutions are seeing stronger interest in energy efficiency, and consequently are taking actions, in terms of policy measures, to encourage energy-efficiency improvements. Nevertheless, electricity supply remains a critical concern,

with growing demand, lack of required investment and increasing power shortages across the continent. This corresponds to energy efficiency's positioning within the monitor highlighted in the action priority zone alongside other issues, such as the importance of cooperation with China and India for a stable investment frameworks and realising necessary infrastructure developments to complement regional interconnection. Only with a focus on these issues will further progress around sustainable development for the continent be a possibility.

Figure 7
WEC's 2014 World Energy Issues Monitor: Africa



Access to affordable and clean energy is essential to accelerating Africa's economic development and enhancing its population's living standards. Much effort should be contributed to create universal energy access, with a focus on enhancing the abundant undeveloped energy resources, including renewable and clean energy sources.

While renewable energy remains a high-priority issue for Africa, with huge potential and opportunities, renewable sources have become more uncertain in 2013 and strong action is needed to address the issue.

Energy talent is one of the highest change issues, having been perceived in the 'weak signals' area last year, which was indeed very surprising to African leaders and energy experts. This indicates that the shortage of skilled and talented energy personnel (or energy talent), alongside issues of energy poverty, are looming, unresolved issues that should be high on the agenda of African leaders.

It appears that Middle East dynamics have lost some of their perceived impact, in contrast to the increasing importance attributed over the past three years. The issue is of a relatively fragile geopolitical nature; however, this may not fully account for the more recent resurgence of political instability in Egypt, Tunisia and Libya.

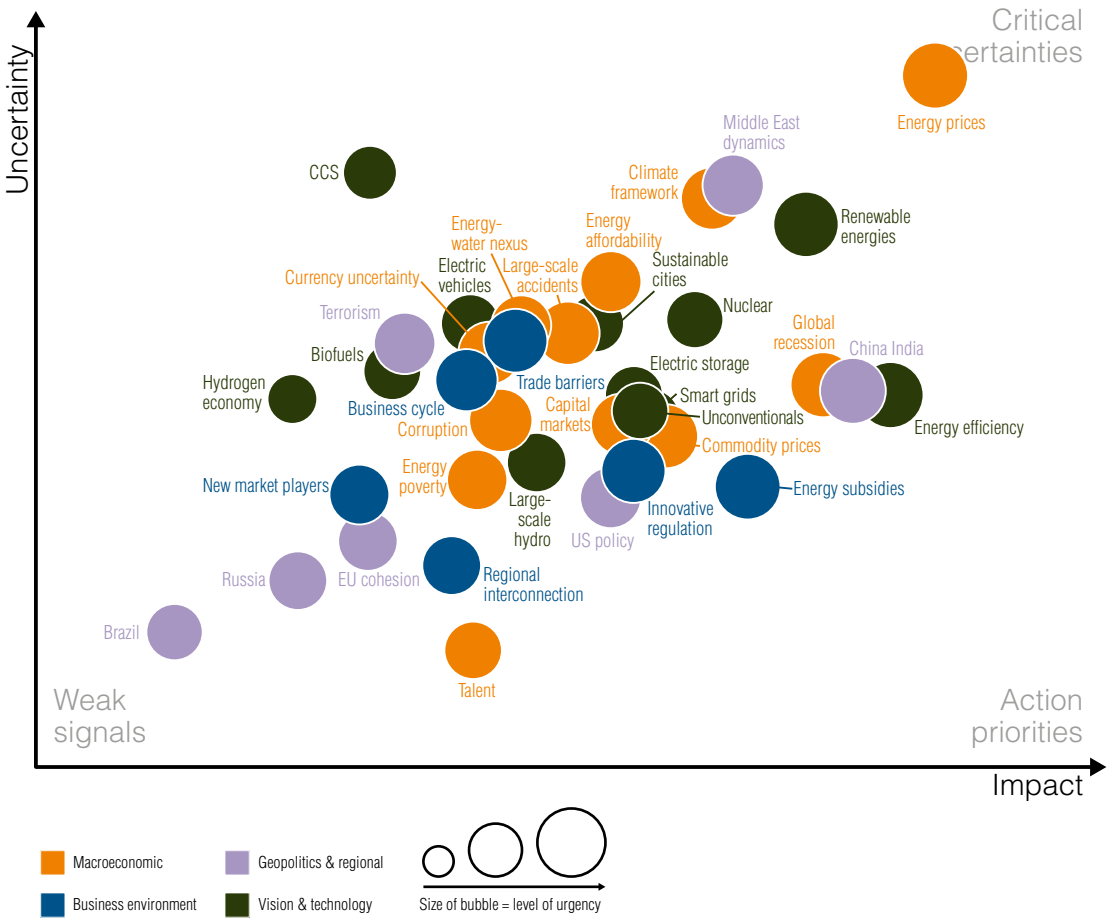
On the contrary, there is no change in the position of the global recession issue which remains critically uncertain. The status of issues such as energy efficiency and energy poverty did not change much in the current monitor and there is still more for energy leaders to do to move them forward with bold actions and stronger support. The Sustainable Energy for All (SE4ALL) initiative is expected to continue to play a role in helping to move these issues forward in 2014.

Other notable issues with great emerging interest this year include US foreign aid policy, which is gaining substantial ground in the need-for-action space. In June 2013, President Obama announced the government's new Power Africa initiative which aims, over the next five years, to address access to electrical power in sub-Saharan Africa. The project is supported by an investment fund leveraged from private US investments.

Finally, this year regional interconnection gained substantial ground, evolving from critical uncertainties to a position in the need-for-action space – this move sends a strong signal that regional interconnection should remain high on the agenda and a key priority for African energy leaders.

ASIA

Figure 8
WEC's 2014 World Energy Issues Monitor: Asia



Despite the global recession, Asia experienced relatively robust economic growth in 2013. Energy consumption in the region grew remarkably, and the rapid motorisation that occurred with the improved living standard of the middle classes resulted in greater dependence on imported oil. Although the region used to be relatively rich in energy resources, energy self-sufficiency is decreasing rapidly.

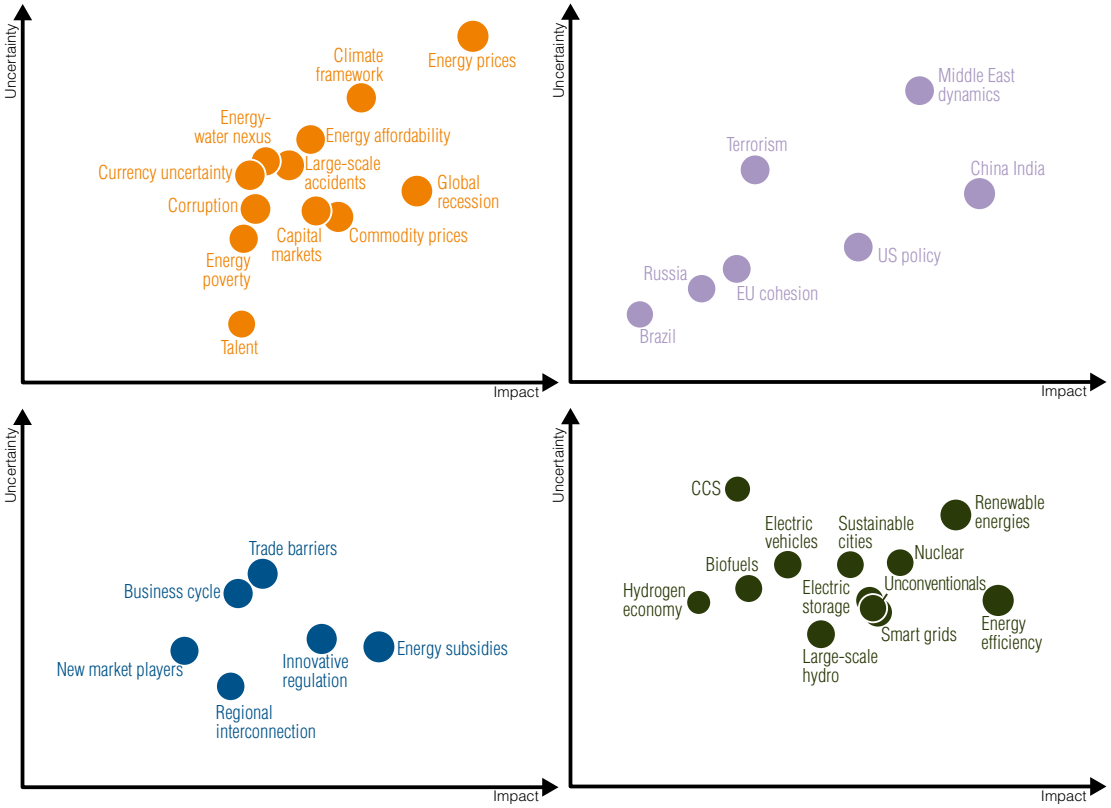
The growing demand and higher dependency on imported fuel are making the region more vulnerable to the fluctuating prices of the world energy market. This trend makes energy prices one of the top critical uncertainties in the region.

Renewable energy is another critical uncertainty. Renewables are one of the important solutions to the energy issues that the region is facing, but the sector is yet to mature and remains slow to penetrate the market due to difficulties in sourcing appropriate technologies and obtaining subsidies to make it competitive.

While the first commitment period of the Kyoto Protocol has ended, the next climate framework remains critically uncertain, especially for a region with high dependence on coal and slow growth of renewables due to non-competitive prices.

Other important aspects revealed by this year's global energy Issues Monitor are China–India and Middle East dynamics which will dictate the energy future for the region. China has become the biggest energy consumer in the world, accounting for almost half of the world's coal consumption. India is expected to overtake China as the world's most populous country by 2030 and has huge potential for economic growth. To satisfy the demand for energy, the region will become more dependent on imported energy, and the relationship between Asia and the Middle East will be further strengthened.

Figure 9
WEC's 2014 World Energy Issues Monitor: Asia



Another issue of concern visible from the survey is the urgent need to tap the energy efficiency potential to help partially meet energy needs in a sustainable manner. Energy efficiency is the easy target to encourage sustainable growth. However, the political compulsion to continue to use energy subsidies to make energy affordable to the masses is not only increasing a country's financial burden, but also deterring the promotion of energy efficiency. This is a current dilemma for policymakers who are trying to find an optimal solution.

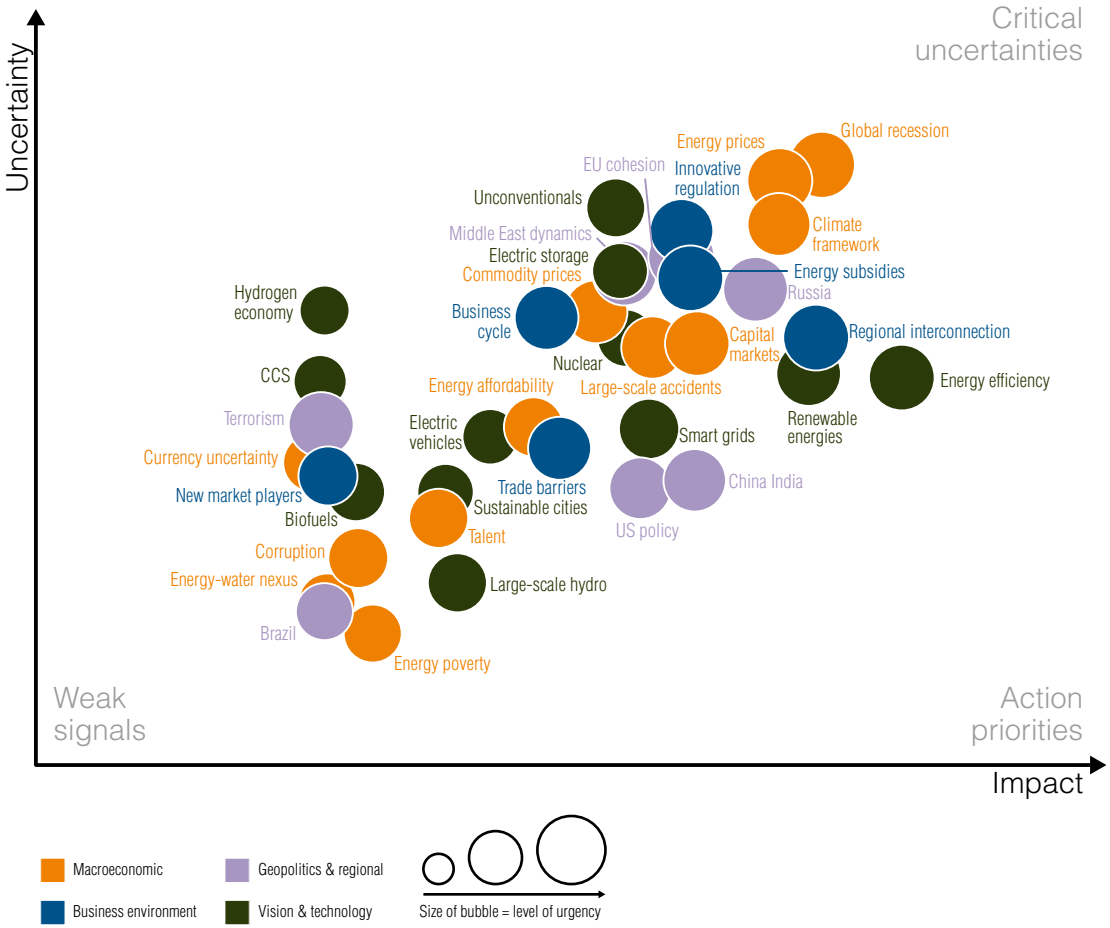
Carbon capture and storage (CCS) remains in the 'weak signals' zone and is a low priority this year. This is due to several factors, ranging from energy prices not reflecting carbon prices, evolving technological issues, and the demands of meeting the rapidly growing need for energy under uncertainty around the global climate framework.

The Fukushima accident caused a global setback in the use of nuclear energy, but its position is recovering within the region. The experts were engaged in revisiting the safety and security issues and rebuilding confidence in nuclear as one of the options to meet the increasing energy demand. Countries with rapidly growing demand for electricity, such as China and India, will actively introduce nuclear as a stable and low-carbon source of energy.

While there is global concern about energy equity and access, with nearly 1.2 billion people not having access to commercial energy and the UN's SE4ALL initiative, energy poverty and energy affordability are low priorities on Asia's energy issues monitor. Expansion of access to sufficient, secure and affordable energy supply by taking into consideration the need of reliable energy infrastructures and less environmental impact to support sustainable development are still the main challenges for the region.

EUROPE

Figure 10
WEC's 2014 World Energy Issues Monitor: Europe



Europe's economy continues to suffer from the current global financial crisis and in particular its own regional economic and financial challenges. While a few countries are slowly easing out of recession, the level and sustainability of growth is still uncertain.

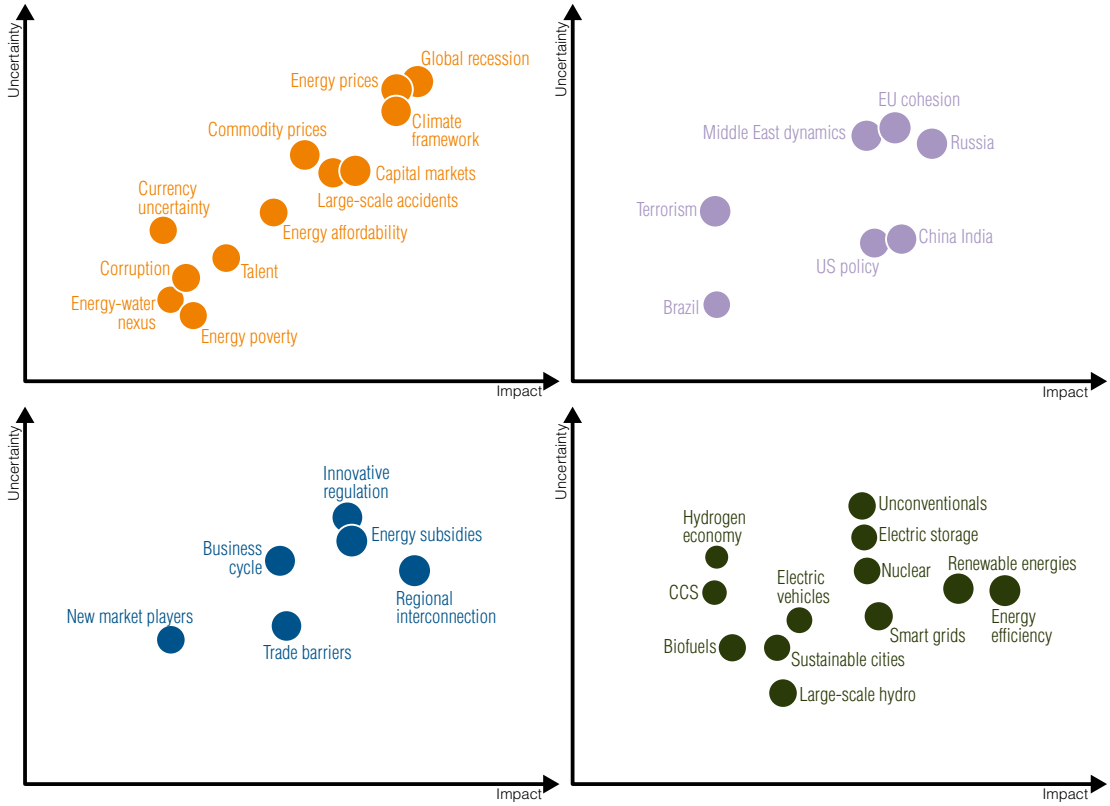
The European economy as a whole does not show serious signs of quick recovery. Energy demand shrunk further in 2013 and energy markets are facing difficulties making profits. Nevertheless, high energy prices are the first concern for European producers and consumers, in large part due to the growing share of renewables in the energy mix. The current very low carbon price does not provide encouraging signals to investors, and the energy-intense companies in Europe are losing competitiveness with their global economic competitors. Therefore, the single race of Europe to mitigate climate change has not been the success initially expected.

Renewables and energy efficiency continue to be at the top of Europe's political agenda. Unfortunately, the low carbon price meant they could not benefit from the European emission trading scheme and, despite efforts, policymakers have not found a solution to successfully reshape the system to make it workable.

The two top critical uncertainties for the WEC's European community are: global recession; and energy prices and cost. While climate change was the number one issue last year, it has slipped to the third position for 2014.

To cope with increasing energy prices, many governments tend to seek national measures, undermining the European Union (EU) internal energy market. Some of these regulatory measures protect customers from high energy prices by putting the burden fully on utility companies. This can lead to a difficult financial situation for individual utilities, making it hard for them to invest in the future.

Figure 11
WEC's 2014 World Energy Issues Monitor: Europe



Enhancing energy efficiency, further successful integration of renewables into the electricity market and the threat of high commodity prices (e.g. oil and gas), due to sharp increases of energy demand in China and India, are the major issues for action. In recent years, energy efficiency and renewables have had an increased impact.

Energy-efficiency measures can significantly contribute to reversing the current trends in energy costs and prices. Actions to support further efficiency improvements are legally framed by the EU Directive on energy-efficiency. The implementation of the Directive, with a priority on the energy performance of buildings, is of crucial importance.

Further market deployment of renewables is set to continue, although many argue their cost-effectiveness and the substantial subsidies allocated to support them are creating serious market distortions and sharp increases of energy prices to end-use consumers.

In replying to a questionnaire about fixing quantitative targets for renewables into the new EU-Framework on Energy & Climate Policies beyond 2020, the majority of WEC's European members consider that EU member states should have their choice of energy mix while preserving a target on CO_2 emissions. At its session in May 2013, the European Council indicated that more flexibility should be given to member states to choose their energy mix.

Compared with last year's survey, the major changes in the new monitor are: CCUS; nuclear; and unconventional energy sources.

The CCUS position has jumped from being a 'critical uncertainty' to very low uncertainty. This might be due to the fact that, apart from some projects, there is currently little interest in deploying CCUS technology. This is driven by a generally low demand for new conventional generation assets in Europe, severe problems with social acceptance for the CO_2 storage sites and the repeated legal problems in the storage site application process.

The slowdown of nuclear uncertainty continues two years after the nuclear accident in Fukushima. Today nuclear energy is much less argued about in the public arena than in 2011 and 2012. In Europe, where nuclear energy is important for electricity production, the perception prevails that the nuclear option remains part of the solution when seeking to achieve the sustainable goals of energy sector. However, we currently do not see signals for short-term investment in new nuclear projects.

Unconventional energy sources moved from a 'critical uncertainty' to an 'uncertainty', demonstrating the strong political and public opposition to shale gas exploration from most of WEC's European members.

Globally, and in Europe, there are five key topics that play a major role as critical uncertainties: renewable energy; energy efficiency; energy prices; climate framework; and the global recession. This shows a greater interdependence among world regions and highlights that Europe cannot isolate itself from the global development.

The views of specific regions are different. For example, Europe views Russia as a critical uncertainty, whereas the world sees Russia as a weak signal. This is related to Russia's position as one of Europe's most important suppliers of gas and oil.

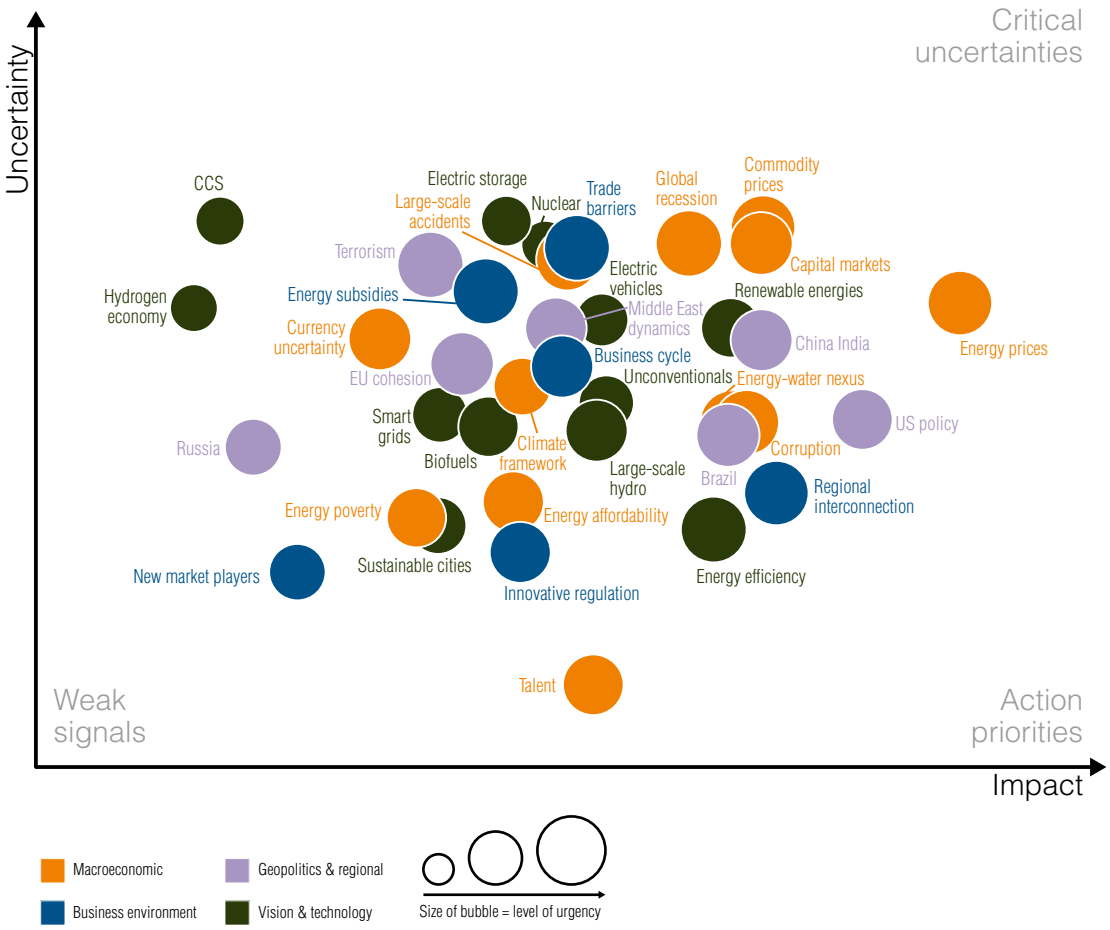
While climate change remains one of the three most critical uncertainties, it was taken over by the global recession and energy prices. It is logical that people's instinct is to prioritise short-term economic and social concerns. And it is likely that the political debate around climate change, the lack of coordination between regions and countries with different levels of economic development, and the low price of carbon are all factors in discouraging the importance of the climate change debate.

Achieving a global gas market and breaking the contractual linkage of gas and oil prices will undoubtedly mitigate the negative impact of commodity prices on the European energy market. In addition, the decision of the European Commission (EC) to link the EU member states' gas pipelines by 2015 will enhance the security of gas supplies.

Competitiveness was a critical issue in Europe as it dealt with energy cost and prices. The cheap price of shale gas and electricity in the US has had an impact on the European economy. Also, the substantial subsidies needed to support renewables are not a sustainable policy instrument in a competitive energy market.

LATIN AMERICA AND THE CARIBBEAN (LAC)

Figure 12
WEC's 2014 World Energy Issues Monitor: LAC



The economic outlook for Latin America and the Caribbean remains relatively positive, but is subject to uncertainty and volatility because of the widespread external context. Although the North American economy is seeing higher growth than the Euro area, economic consolidation is still weak in developed countries. The commodity boom has been able to sustain growth trends in the region despite low productivity, scant diversification of production and persistent structural heterogeneity. Oil-exporting countries in the region are closely following development in energy markets.

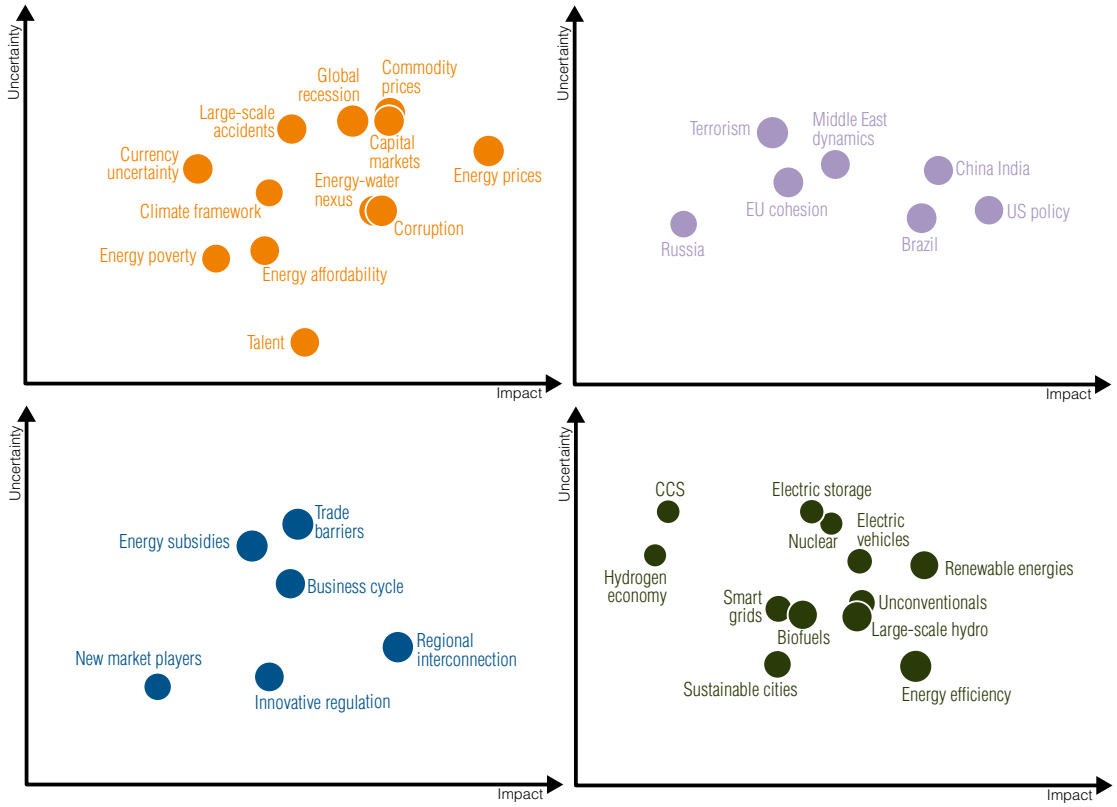
In this context, the first thing to notice is that this energy issues monitor for the region in 2014 shows very important differences compared to last year. The two critical uncertainties are 'energy and commodity prices' and 'capital markets'.

The continuous revaluation of asset prices after the global recession, uncertainty about growth in central economies and the slowdown in emerging markets' economies may hit countries that are commodity exporters (including energy). At the same time large-scale portfolio capital inflows in Latin America have reduced and most economies in the region have seen their currencies depreciated.

Long-term equity investors continue to see enormous potential in sectors connected either to infrastructure or energy and mineral resources. Colombia's energy sector, Peru's mining industry and Uruguay's forestry business are notable foreign direct investment targets. Infrastructure is booming in Brazil because of the energy sectors. The uncertainties come from the dependence of the region on access to international markets as domestic capital markets are still relatively underdeveloped to finance the level of infrastructure needed to sustain growth.

Regional energy integration has been a high priority for the region and is one of the need-for-action issues on the monitor. Integration would help neighbouring countries to better distribute and commercialise their energy resources in order to reduce waste, protect against price volatility, lower transmission losses and increase overall energy security. However, both the logistics and politics of integration have worked against its success.

Figure 13
WEC's 2014 World Energy Issues Monitor: LAC



The other need-for-action issue is energy efficiency. The region could reduce its energy consumption by 10% over the next decade. However, the problem in the region is not only technological but also in the policy, regulatory and institutional framework. Energy subsidies, the lack of efficiency standards, and absence of education and training programmes to inform the public contribute to an inefficient use of energy.

Renewables and CCS are among the highest changing issues. Renewables increased in uncertainty and potential impact, although the contribution of renewables is expected to still be low in 2030 in comparison to conventional sources. In 2010, CCS was a 'critical uncertainty', but it has been progressing to a low impact since then, and now CCS has minimal impact and no need for action.

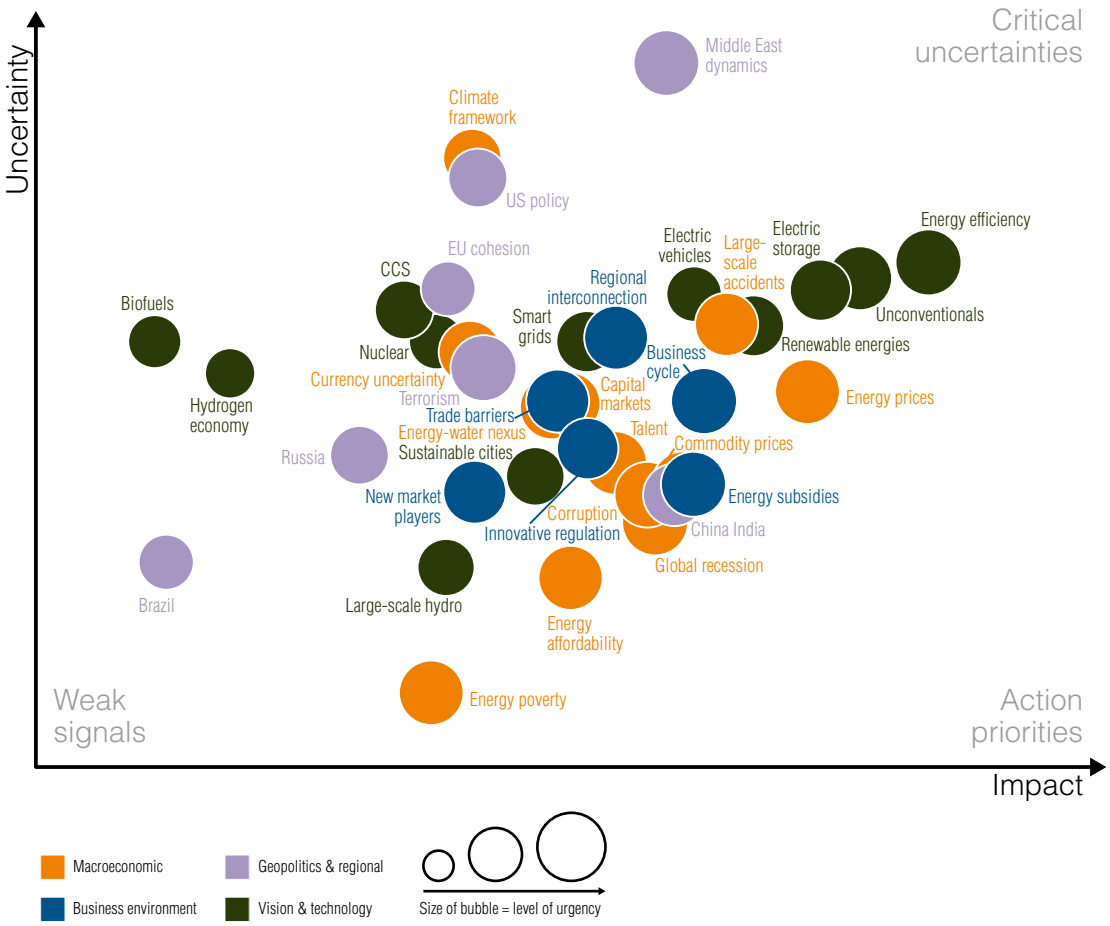
Although issues such as energy prices, commodity prices, capital markets, energy efficiency, and energy poverty have decreased in uncertainty, all of these areas are still important in the context of regional discussions for LAC. Likewise, although the impact of smart grids is perceived as weak on the issues monitor, this variable is very important from an energy-saving perspective in the context of sustainable energy and climate change challenges. Hydropower is the main energy source in the region but it does not show a large impact in this year's World Energy Issues Monitor.

When compared with the global monitor, the regional monitor for LAC shows that energy prices, regional interconnection and global recession have a similar status. The climate framework and energy efficiency show more importance for the world than for LAC, although these issues are important to the region.

From the perspective of balancing the energy trilemma, there are three areas LAC must address: interconnection; stable energy policies; and access to energy and water resources. Energy interconnection would improve the reliability and quality of service, while allowing lower tariffs through economies of scale. Policies that provide regulatory certainty will support energy efficiency in the long term, including the establishment of financial incentives. Finally, accesses to energy and water resources are interconnected and both issues are building a capacity to adapt to climate change. However, not enough has been done to integrate research on climate change, water and energy at the local level in the LAC region countries.

MIDDLE EAST AND NORTH AFRICA (MENA)

Figure 14
WEC's 2014 World Energy Issues Monitor: MENA



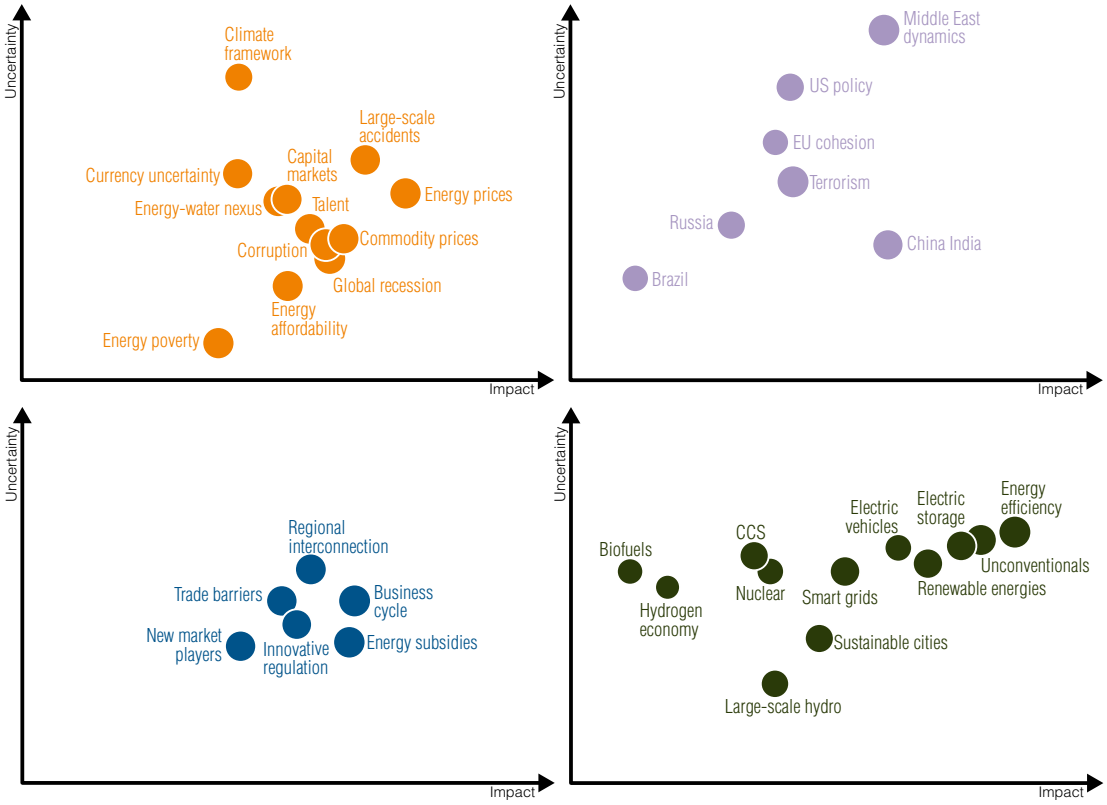
The Middle East and North Africa region remains largely focused on core energy issues. One critical uncertainty is energy efficiency. Without improvements in this area, an increasing proportion of the region's oil and gas production will be absorbed by the domestic market. By increasing energy efficiency, countries can maintain energy exports while promoting economic growth at home.

In addition to energy-efficiency measures, the Middle East is placing increasing importance on the development of renewable energy sources aimed at supplying the domestic market. Saudi Arabia and the United Arab Emirates (UAE) have ambitious renewable energy programmes in place and other countries in the region are following suit. The fact that the region has plenty of sunshine means that solar energy is very attractive. In the past, wind and sandy conditions have had an adverse impact on solar equipment. However, recent technological advances have largely overcome these.

Energy prices continue to be an issue of concern, especially within the context of demand-side energy security. Middle East hydrocarbon producers are acutely aware of the need to balance the high income to fund continued investment in hydrocarbons and to fuel domestic economic growth, without having an adverse impact on demand from export markets.

Other uncertainties include the rise of unconventional oil and gas production in the US. This could have an impact on traditional producers and change the global climate change rules that could have an effect on the hydrocarbons industry.

Figure 15
WEC's 2014 World Energy Issues Monitor: MENA

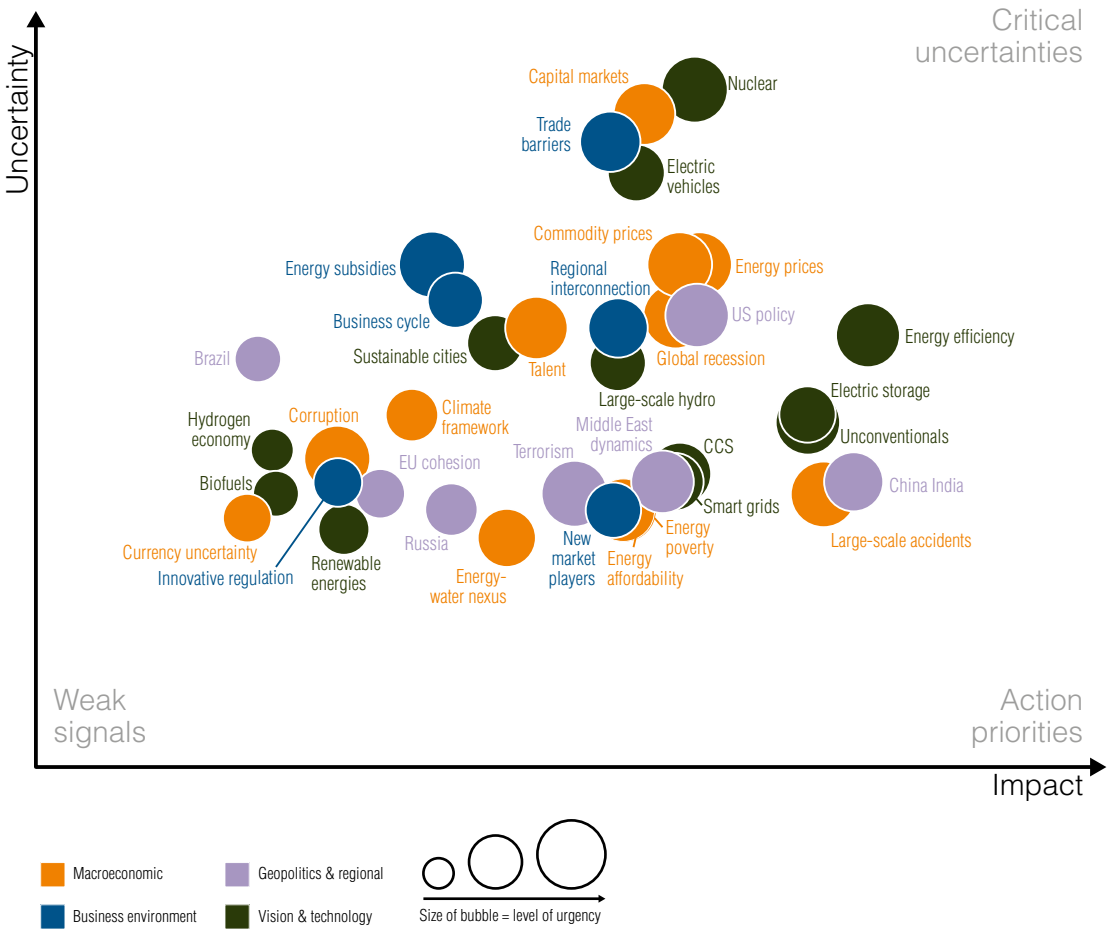


Despite being lower on the agenda, CCS remains an important technology, not just as a way of mitigating carbon emissions, but also as a tool of enhanced oil recovery. Typically, CCS projects in the Middle East involve injecting carbon into oilfields in order to increase oil recovery rates.

As one of the world's largest regions for hydrocarbon resources, the Middle East clearly regards its own regional dynamics as a key concern. This relates not to the resource-holding countries themselves, which remain very stable, but the possible impact on the region caused by instability in the periphery.

NORTH AMERICA

Figure 16
WEC's 2014 World Energy Issues Monitor: North America



In terms of the overall view in North America, the role of unconventional energy sources is very important. Technology advancements led to the commercialisation of shale gas and oil in the US, and the unconventional oil sands production is at a mature stage in Canada. Mexico, with the recent presidential proposal of legal changes in its energy sector, is considering opening up its energy industry to more private investment to substantially accelerate exploration and production of its hydrocarbons. Increase in domestic energy production in all three countries would lead to a real potential for North America as a net energy exporter.

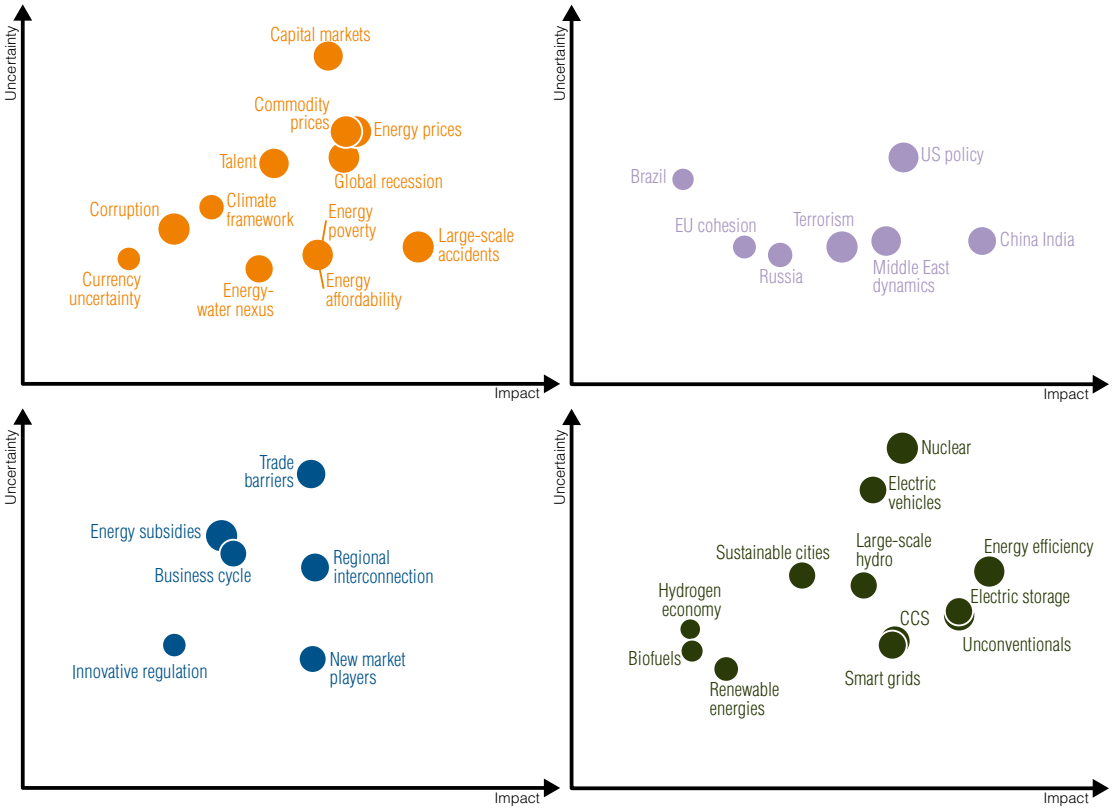
The shale gas boom in the US is leading to reduced demand for Canadian energy in the US market. As a result, Canada now has to reconsider its distribution system, and access to wider markets is increasingly important for its oil and gas producers. In particular, issues around pipeline technology and social license to build energy-delivery infrastructure are critical, as are the elimination of physical and legal barriers to energy trade.

One of the critical uncertainties in this region is the stall of the nuclear energy programmes. Nuclear has experienced an important change in the issues monitor due to Fukushima. Also, greenhouse gas (GHG) regulations and low natural gas prices make it unlikely to see new coal or nuclear plants until 2025, unless some event causes natural gas prices to rise significantly.

The North American monitor shows a high degree of correlation with the global monitor in relation to energy efficiency, which is an obvious need-for-action item in the region. Although it may be argued that progress in this field is much slower than desired, there are some signs of real achievements, such as declining consumption of both petroleum and electricity in the US which is, at least in part, attributable to efficiency improvements.

Another need-for-action item is the issue of China and India. There could be many reasons for this, but there is obviously the need to support China and India so that their energy intensity remains as low as possible without affecting their economic and social progress. Also, it is important that their GHG emissions and their demand for primary energy do not have a large impact on climate change and world markets.

Figure 17
WEC's 2014 World Energy Issues Monitor: North America



Although its position is relatively subdued in the monitor, energy talent is an important issue that needs action from the Canadian perspective. Facing the diminishing US market for Canadian energy, the country needs skilled workers to build the large amounts of energy infrastructure needed over the next 20 years to access new markets abroad and at home.

Climate framework, innovative regulation and renewable energies are in the 'weak signal' area, which shows a strong contrast with the global monitor.

Given the abundance of cheap natural gas, a domestic energy resource with less CO_2 emissions compared to coal, it may not be a surprise that renewables in this region do not have as much impact as in other regions. However, the positions of climate framework and innovative regulation are rather unexpected, because energy investors need certainty about

whether governments will seriously pursue GHG reduction measures and, if so, what those measures will look like.

CCS is another item that shows a sharp contrast with the global monitor, but in the opposite direction. Canada and the US are leading the world on the CCS demonstration projects. Recently the US regulatory authority officially proposed new regulations to impose certain limits on carbon emissions from new coal-fired and gas-fired power plants. This is interpreted to mean that no new coal plant can be built in the US unless it is fitted with CCS. While the rest of the world is getting more sceptical about the outlook of this technology, the impact of CCS in this region is getting stronger and more certain.

5

Assessing the national energy agenda

Assessing the national energy agenda

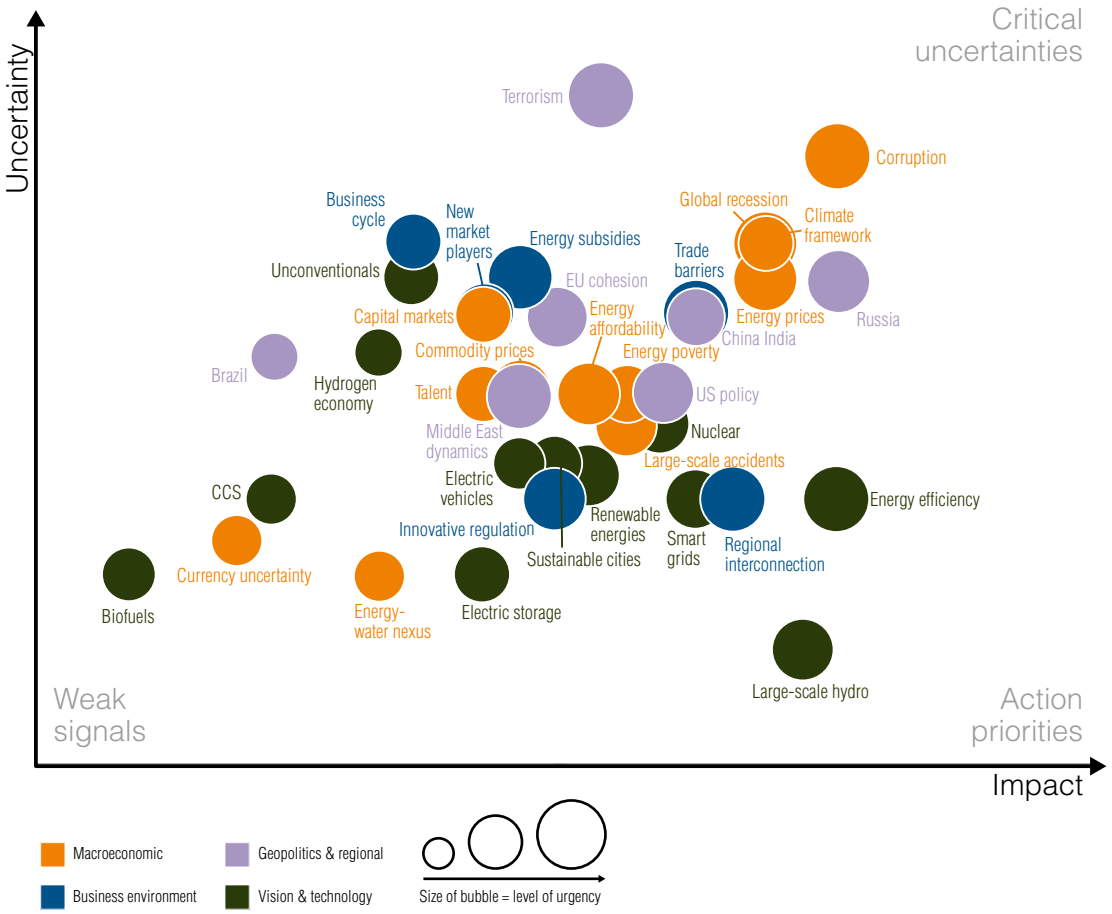
The following monitors build on the global and regional perspectives, to provide an insight into the priorities and critical uncertainties for energy leaders at the national level. Building on from the six WEC national member committees who undertook this process in the last edition of the World Energy Issues Monitor, we now explore the uncertainty and context in which crucial decisions must be taken, for 24 individual countries in 2014.

The following national member committees of the WEC have undertaken the country level assessment for this World Energy Issues Monitor 2014 report:

- Bulgaria
- Colombia
- Estonia
- France
- Germany
- India
- Indonesia
- Italy
- Japan
- Latvia
- Lebanon
- Lithuania
- Mexico
- New Zealand
- Nigeria
- Poland
- Portugal
- Romania
- Serbia
- South Africa
- Spain
- Switzerland
- Turkey
- United Kingdom

BULGARIA

Figure 18
WEC's 2014 World Energy Issues Monitor: Bulgaria



Bulgaria continues to be the country with the highest energy intensity per unit of gross domestic product (GDP) among EU member states. In spite of 50% reduction targets by 2020, as outlined in the National Energy Strategy 2020 (adopted in 2011), there has been no significant progress.

Due to non-refurbished housing, the specific energy intensity of Bulgarian households is very high. Electricity continues to be used by households for heating because of the absence of more efficient alternatives. Also, because of the low incomes of Bulgarian citizens (the country has the lowest GDP per capita), the energy regulator keeps the price of household electricity down; it is the lowest in the EU. Downward pressure on prices is also a key obstacle to the development of a free internal market.

In the gas sector, the country remains more than 90% dependent on a single supplier (Russian Federation). The prices of natural gas in Bulgaria are among the highest in the EU. This is one barrier to achieving the strategic target of increasing the number of households with gas from 2% today to 30% by 2020.

Coal and nuclear continue to be major resources for electricity generation. The closure of old coal power plants has been delayed due to lack of market forces, the low price of CO_2

allowances, and expected exemptions for Bulgarian coal power plants from EU Emission Trading Scheme rules. Furthermore, a lack of interest by investors and uncertainties about the demand for electricity has led to the suspension of a new nuclear power plant project.

The national target for 16% renewables is currently being implemented successfully, but mainly by the inefficient combustion of biomass for heating and, surprisingly, by increased electricity generation from photovoltaics, (PVs), thanks to generous energy subsidies. The low electricity prices have not only delayed the introduction of smart grids, but have also prevented the replacement and rehabilitation of a critically outdated network.

The main surprise – and anxiety – is the rising financial deficit for the energy sector due to high financial obligations for purchasing PV electricity, accompanied by electricity prices decreasing three times in 2013.

In Bulgaria, the top critical uncertainties are:

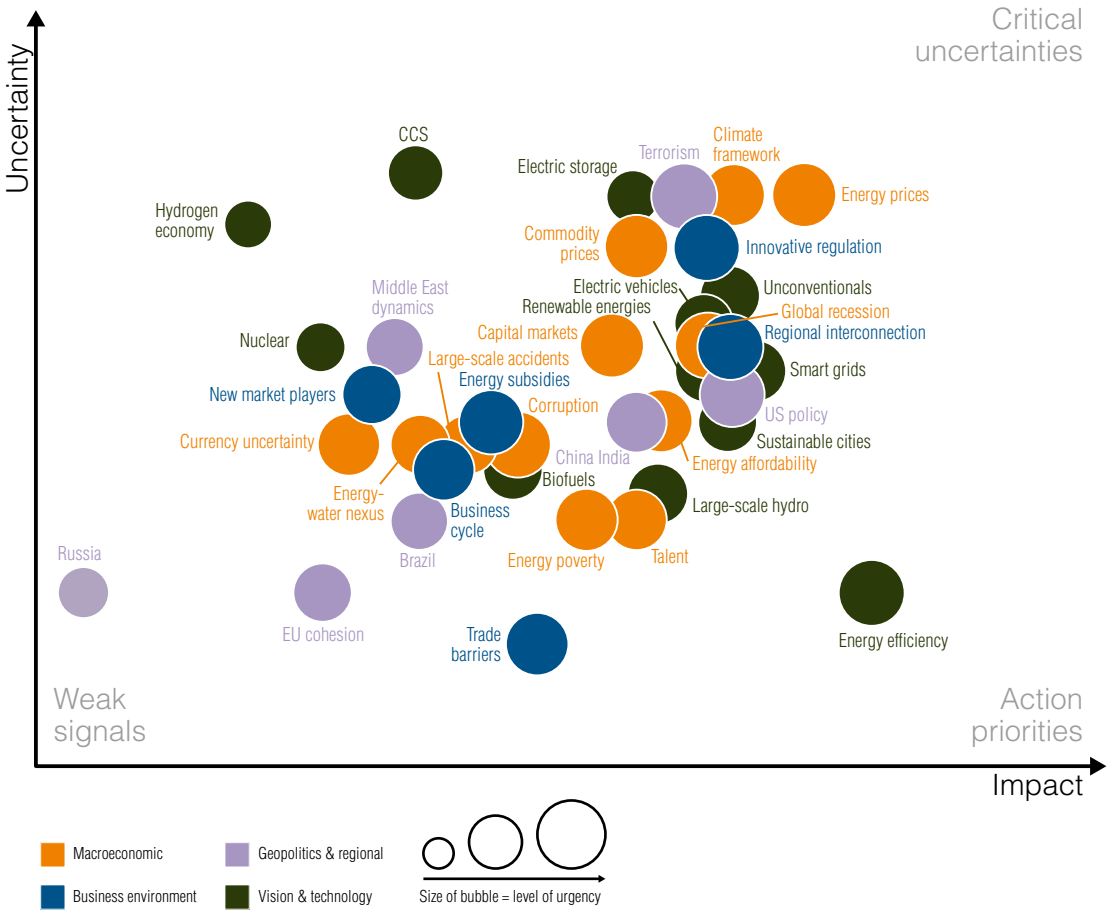
1. Low electricity prices. These protect household customers – but can lead to a difficult financial situation for the utility sector, thereby undermining the development of the energy market.
2. The lack of gas supply diversification. Addressing this issue could help to decrease gas prices, increase security of supply and improve penetration in households.
3. The development of low-carbon energies, including renewable energy sources, without causing market distortions and sharp increases in consumers' energy prices.
4. The global recession, combined with people's low incomes, which has led to political uncertainty and mass distrust in sector decision-makers, especially in terms of suspicions about energy sector corruption.

The three most important need-for-action issues are:

1. Development of a free electricity market to contribute to fair prices. This will mean significantly higher prices for households as well as price signals for energy saving.
2. Energy-efficiency measures to significantly contribute to mitigating the impact of price increases on households. This is also necessary for opening up the market.
3. The modernisation of existing (and development of new) gas and electricity networks to improve security of supply, integration of renewable energy sources and energy efficiency.

COLOMBIA

Figure 19
WEC's 2014 World Energy Issues Monitor: Colombia



The economic outlook for Colombia remains relatively positive, but subject to uncertainty and volatility on account of the broader context of global economic downtown. Although the US economy is seeing higher growth than the euro area, economic consolidation is still weak in developing countries. In addition, Chinese and Indian economies, which have been key drivers of growth in Latin America, are slowing down. In the short term, trade will be hit hardest, but there is room for fiscal and monetary policies to soften the blow. In the medium term, a decline in external demand will expose the limitations of the current growth pattern in Colombia which is based on low added value and on exports of natural resources. The commodity boom has been able to sustain growth trends, despite low productivity and scant diversification.

Energy and commodity prices will continue to consolidate after the global recession. There is uncertainty about growth in central economies and the slowdown in emerging markets will hit countries that are commodity exporters (including energy).

For capital markets, excess global liquidity and the pursuit of high-yield investment alternatives, has led to large-scale portfolio capital inflows in Colombia, driving currencies to record strong gains against the US dollar. Long-term equity investors continue to see enormous potential in sectors connected to infrastructure, energy and mineral resources. High energy

prices directly affect Colombian society and many people cannot afford the energy needed for day-to-day living.

In this year's monitor, energy efficiency has increased impact. To further advance energy efficiency, Colombia must invest in smart energy consumption, minimising loss, and encouraging sustainable living. The factors affecting energy efficiency in Colombia, (as well as in the broader Latin America region), are not simply technological, but also focus on the policy, regulatory and institutional framework. Energy subsidies, the lack of efficiency standards, and the absence of education and training programmes to inform the public, contribute to an inefficient use of energy in the region.

Large-scale hydropower is an area that requires further action in Colombia and has only been developed to a small percentage of its potential capacity. It could also offer multiple benefits for the country in terms of sustainability, reliability and carbon emission reduction.

In previous years, CCS has been identified as a critical uncertainty, but it has quickly become an issue with less urgency and a diminishing sense of impact. However, energy prices continue to be a critical uncertainty for Colombia. This perspective is also reflected at the regional and global level.

Corruption in Colombia is an ongoing concern. There are critical uncertainties about the negative effects on regulation as well as escalating costs in the sector.

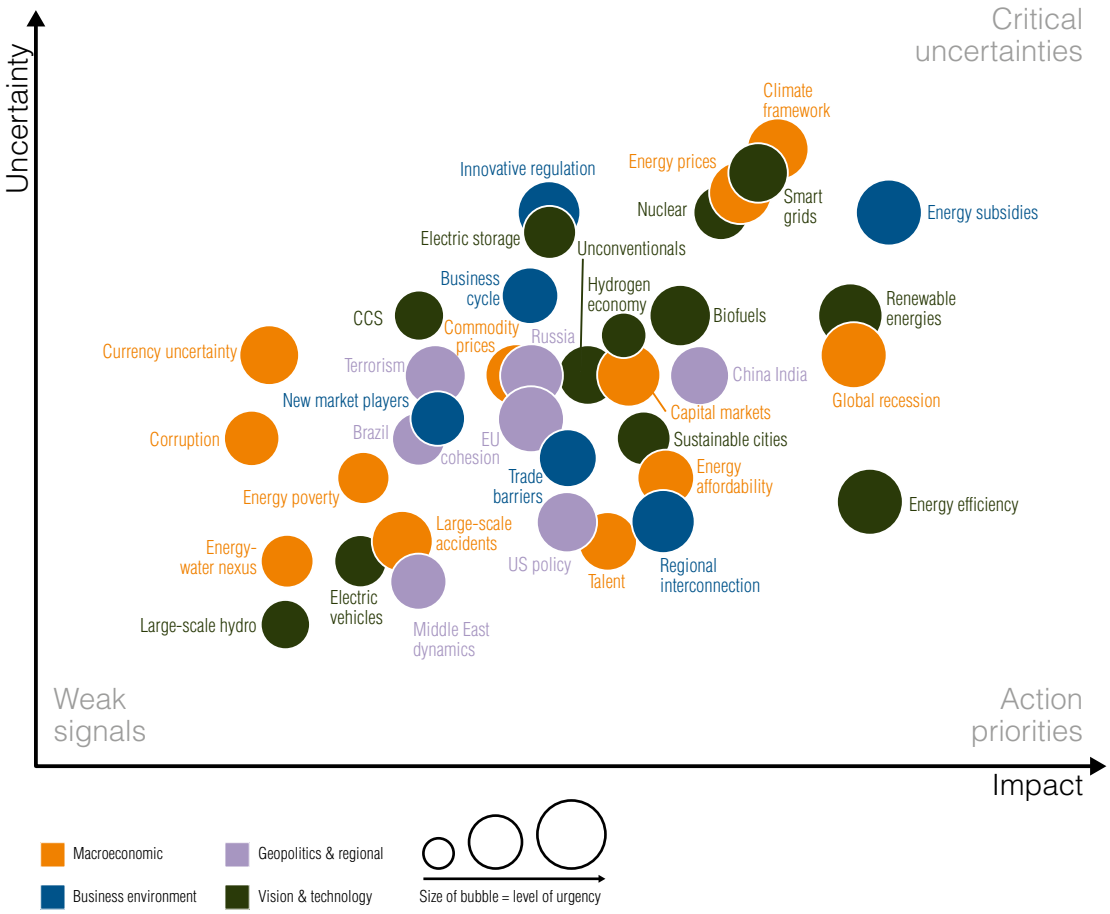
The Colombian monitor shares many parallels with the global monitor; issues such as CCS, unconventionals, energy prices and currency uncertainty, have the same positioning on both graphs. Colombia shares other parallels with the regional perspective: hydrogen economy, energy efficiency, biofuels and energy prices all seem to be perceived in a similar way.

The global recession, energy prices, energy affordability, energy poverty and unconventional energy sources should be urgent interests for Colombia and are reflected as key priorities on the monitor. In particular, energy pricing is a variable with critical uncertainty for Colombian energy leaders. Policymakers and regulators need to work on pricing models that encourage competitiveness for intensive users of electricity. This is important in the context of international trade and increased electricity consumption in Colombia. In this vein, WEC-LAC priorities call for Colombia to better balance the elements of the energy trilemma – energy security, energy equity and environmental sustainability.

One of the most important need-for-action issues in Colombia is energy interconnection. This could help to realise potential social benefits, improve reliability and quality of service as well as enabling lower tariffs. Colombia could integrate with several countries in the Latin American region in order to achieve economies of scale. A second action priority is the issue of energy subsidies. This must be addressed in order to help reduce energy poverty and improve energy affordability. Lastly, the government should implement policies that incentivise energy efficiency. Such policies could relate to regulatory certainty, which supports energy-efficiency development in the long term. They could also establish financial incentives for energy efficiency.

ESTONIA

Figure 20
WEC's 2014 World Energy Issues Monitor: Estonia



Key factors that have shaped Estonia's national monitor are: the opening up of the electricity market at the beginning of 2013, rising energy prices, and plans to further integrate Estonia with its European neighbours through a regional LNG terminal in Estonia.

The top three critical uncertainties regarding energy policy in Estonia include: energy subsidies, the lack of clear goals within the European climate framework, and the future of renewables. Although these are three very separate issues, they are part of a boarder problem in Estonia, in which investors get mixed signals from policymakers about the future of renewables and are therefore reluctant to make any new investments. Although more prominent in Estonia, this issue also occurs at the global and European level. The prominence of this issue in Estonia might be on account of the relatively small scale of the energy sector, which means that all market interventions have a significant impact on all market participants.

Energy efficiency is identified as the most important need-for-action issue by all global experts. The potential for realising energy efficiency in Estonia is a lot higher than in other European countries. One explanation for this cites Estonia's climate, which differs to most of Europe. Cold winters mean that buildings are heated extensively and energy consumption in Estonia is thus higher than the European average. This means that energy-efficiency meas-

ures could have a particularly significant impact. Another explanation acknowledges the Soviet legacy – which has left Estonia with a large number of highly inefficient buildings that urgently need to be renovated and insulated.

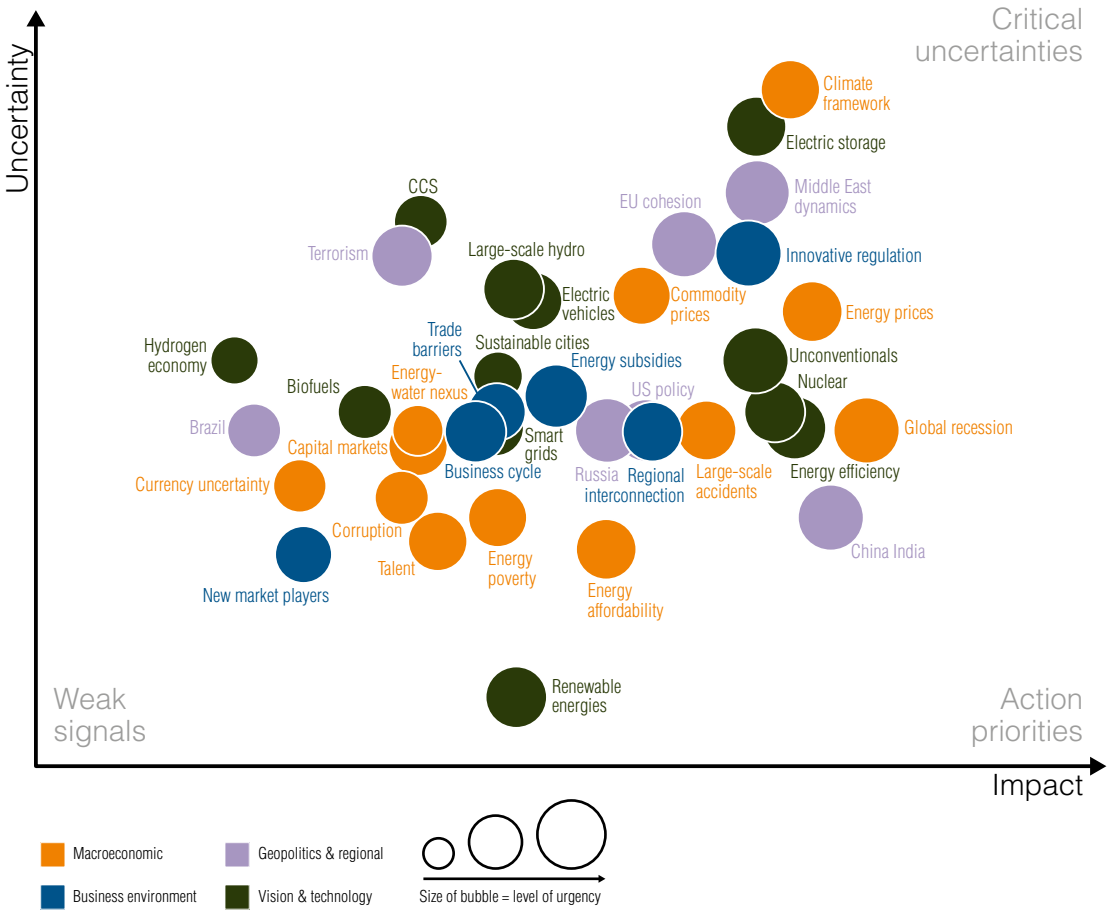
There is a clear consensus that having regional energy markets means lower prices and better security of supply. However, in order to have regional markets, one must first have a sufficient number of regional interconnections.

The question of energy affordability is topical right now as the electricity market was fully liberalised at the beginning of 2013. Free market forces and the end of regulated prices have led to a rise in electricity prices; this experience is fresh and therefore quite prominent on the issues monitor for Estonia.

It is interesting to note that electric vehicles are regarded as a 'weak signal' in Estonia. Electric vehicles currently have a marginal market share. However, it is quite feasible that technology will improve and electric vehicles could have a much larger impact on the transport sector in the future. It is also surprising to find the issue of nuclear power in the quadrant that indicates critical uncertainty. There are no plans for new nuclear plants in this region, so it was rather unexpected to see that, on average, Estonian experts anticipated that nuclear would have a larger impact than European experts did.

FRANCE

Figure 21
WEC's 2014 World Energy Issues Monitor: France



The outcome of international negotiations on the regulation of climate change is the key issue for France. Can we expect a carbon price or carbon value? If so, how, and at which level will the price or value be fixed?

The technological issue of energy storage is also an important issue for France. While currently an uncertainty, progress in energy storage will lead to a real revolution of energy systems, both on the supply side (by limiting the negative effects of intermittency of certain renewables) as well as on the demand side (by offsetting disadvantages of technologies such as electric vehicles, for example).

Two geopolitical issues are also considered to be of critical importance. The first is the political situation in the MENA area. This region is a strategic area for Europe's hydrocarbon supply, but it could also play a 'detonator' role in a volatile region. The second is EU cohesion. In the summer, the EU welcomed its 28th member. Moving forward, EU cohesion will play an important role in enabling Europe to revive its former dynamism and help to establish relevant, steady and clear energy and climate policies.

The organisation of energy markets raises additional issues – and questions concerning the relevancy of institutional frameworks should not be ignored. It is important to discuss and

evaluate the choices made in these areas. Furthermore, energy prices and the availability of raw materials are fundamental issues which affect the evolution of the energy sector.

The following are identified as issues that require immediate action, some of which build on current initiatives. The global economic crisis has been a major determinant of policies and strategies and continues to affect short-term action. The impact of China and India's growth is also a critical uncertainty that keeps energy leaders awake. The evolution of these countries as the world's fastest-growing economies will have significant consequences which are not yet known. These countries have major roles to play in the global energy landscape.

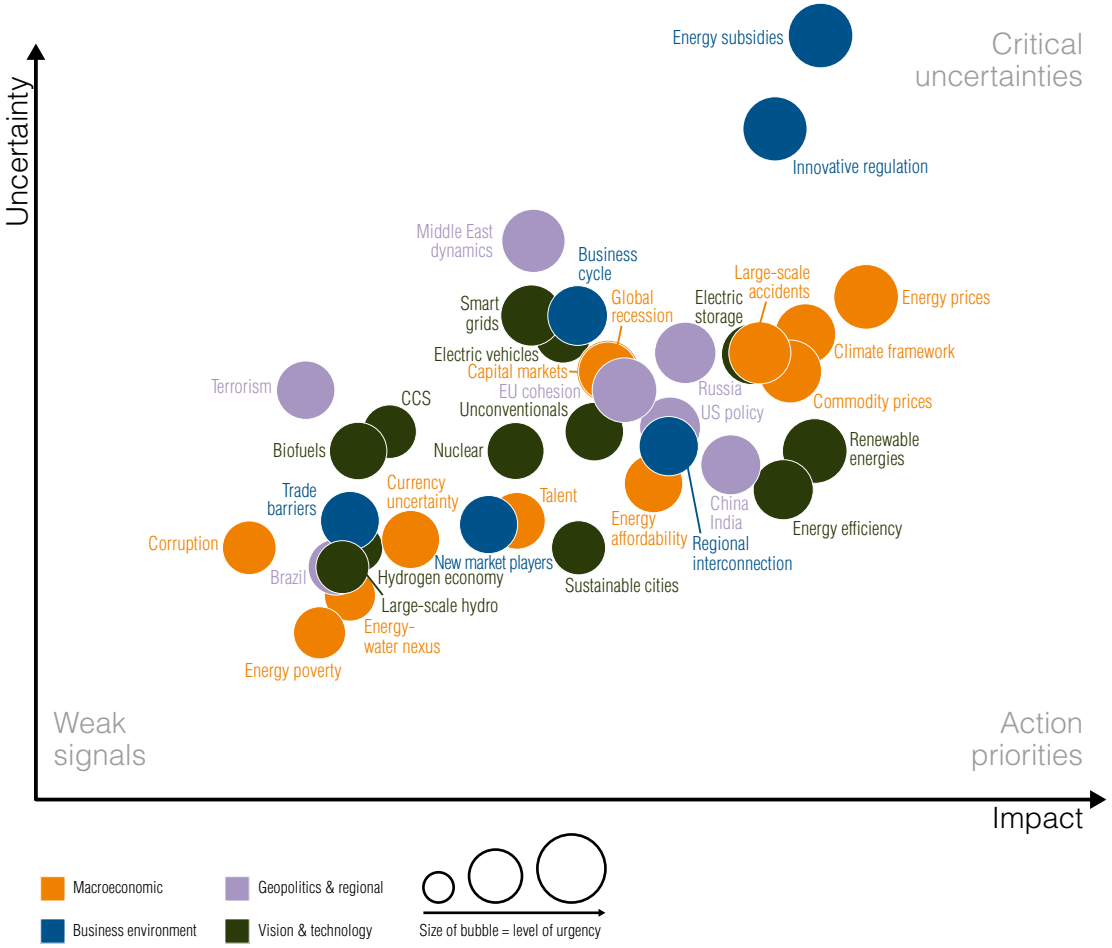
Three technological issues are clustered around the same point on the monitor: unconventional hydrocarbons, nuclear energy and energy efficiency. French leaders find these issues significant, but they do not deem them to have high degrees of uncertainty. The effects of both the Macondo oil well spill in the Gulf of Mexico and the Fukushima nuclear accident present additional concerns and uncertainties. Geopolitical issues to consider include US energy policy as well as the use of energy as a tool for diplomatic negotiations in Russia. Energy poverty is another problem which public policy, business strategy and decision makers are trying to address.

The French monitor indicates that some issues have less importance. Hydrogen and Brazil's energy potential, for example, are issues with 'weak signals' and less urgency. However, it is important to note that the role of biofuels and other new players in the energy market will cause necessary industry adaptations and evolution of exchange rates could have an impact on future investment in energy infrastructure.

The issue of energy access and the availability of skilled energy talent appear to be of less importance in this year's monitor. However, these concerns generally appear high on the agenda from the French perspective and deserve further discussion. Although CCUS technologies can have a limited impact, their consequences remain uncertain. The impact of developments in renewables is regarded as moderately important, though relatively uncertain, while the development of hydro-electricity looks very certain.

GERMANY

Figure 22
WEC's 2014 World Energy Issues Monitor: Germany



The German National Committee identifies the following key observations from the World Energy Issues Monitor across all levels – regional, national and global: CCS has decreased in importance, energy efficiency remains consistently relevant and renewable energies are becoming increasingly important.

The transformation of the energy sector towards an energy system based on renewables still dominates the political debate in Germany. Three years on from the introduction of the German 'Energy Concept,' (the government's innovative approach to securing environmentally sound, reliable and affordable energy), it is clear that the rising price of energy has become increasingly significant for industry, consumers and politicians alike. With the German federal elections also having taken place in 2013, concerns around energy prices have risen to new heights on the national agenda.

The reform of the Renewable Energy Act (EEG) is central to this discussion. Criticism has been directed at a number of elements of the EEG, including the exemptions of the industry from paying the full EEG reallocation charge. While some participants advocated fundamental reform, others wanted only gradual changes to be undertaken. All proposals shared the sentiment that incentives for present renewable installations under the EEG should not be

touched, so that existing regulations for current installations (and thus the EEG reallocation charge) should be preserved until at least 2032.

During the federal election in September 2013, Chancellor Angela Merkel's Christian Democratic Union (CDU) party reached 41.5% of the votes and leads the government's coalition for a third term. After the election defeat of the former coalition partner, (the Free Democratic Party – FDP), the new party in government, (the Social Democratic Party – SPD), has taken over the Ministry for Economy and Energy. The new Energy Minister, Sigmar Gabriel, will be reforming the renewable energy law (by Easter 2014), to impose limits on consumer prices for electricity and review the exemptions from the renewables reallocation charge for some parts of German industry. The European Commission is currently investigating the exemptions that former German governments have provided to big companies as it could distort competition within the EU.

Subsidies for renewable energy and investments in grid infrastructure, designed to integrate increasingly volatile renewable energy into the system, will continue to push electricity prices higher. At the same time, the increasing generation of power from renewables has led to a decrease in wholesale electricity prices. This situation contests the profitability of existing and projected thermal power plants.

Since the government decided to completely abandon the use of nuclear power by 2022, fossil-fuel-fired plants are needed to replace the capacity gap. Coal-fired and oil-fired power plants, used as a back-up in periods of congestion, constitute a challenge to Germany's CO_2 reduction targets. The low carbon price fosters this trend and provides few incentives for investments in low-carbon-emission technologies. Providing a stable power grid is also an issue.

Energy subsidies and innovative regulation are the most critical uncertainties in Germany. The energy market is currently facing an unstable policy framework which has been accompanied by controversial debate. Reform of the EEG is key – and will require further economic integration of renewable energy sources and the securing of electricity supplies through further growth of the renewables share. Reform of the EEG will be necessary as subsidies for renewables lead to constantly rising electricity prices for end consumers – despite falling wholesale prices. The reallocation charge for electricity generated by renewables increased in 2013 to a current total of 5.277 cents/kWh (the average electricity price is 26.06 cents/kWh). In 2013, consumers paid €19.4 billion for the reallocation charge of the EEG. Efficient gas-fired power plants sit idle as they are less and less profitable. The design of the market has found its limits and needs to be promptly reformed.

Renewable energy and energy efficiency are also among the immediate need-for-action issues. Both are fundamental to the transformation needed for a low-carbon energy supply system. According to the 'Energy Concept,' GHG emissions should be reduced by 80–95% in 2050 compared to 1990. Primary energy consumption should be reduced by 50% in 2050 compared to 2008. The political aim is that, by 2050, renewables will represent 60% of the gross final energy consumption and 80% of the gross electricity consumption. However, these political aims have to be realised within a consistent and stable policy framework, ensuring both security of supply and competitiveness of the economy.

Issues that have diminished in relevance over the course of the year mostly relate to international contexts – such as the global recession or Middle East dynamics. Issues related to national energy policies have gained importance in the general debate. National policies tend to have a direct impact on the sector and may well have been prioritised during 2013 as an election year. With these other issues at the forefront of national focus, broader issues

such as the climate framework, CCS, and unconventional energy sources, have lost urgency and relevance compared to last year's monitor.

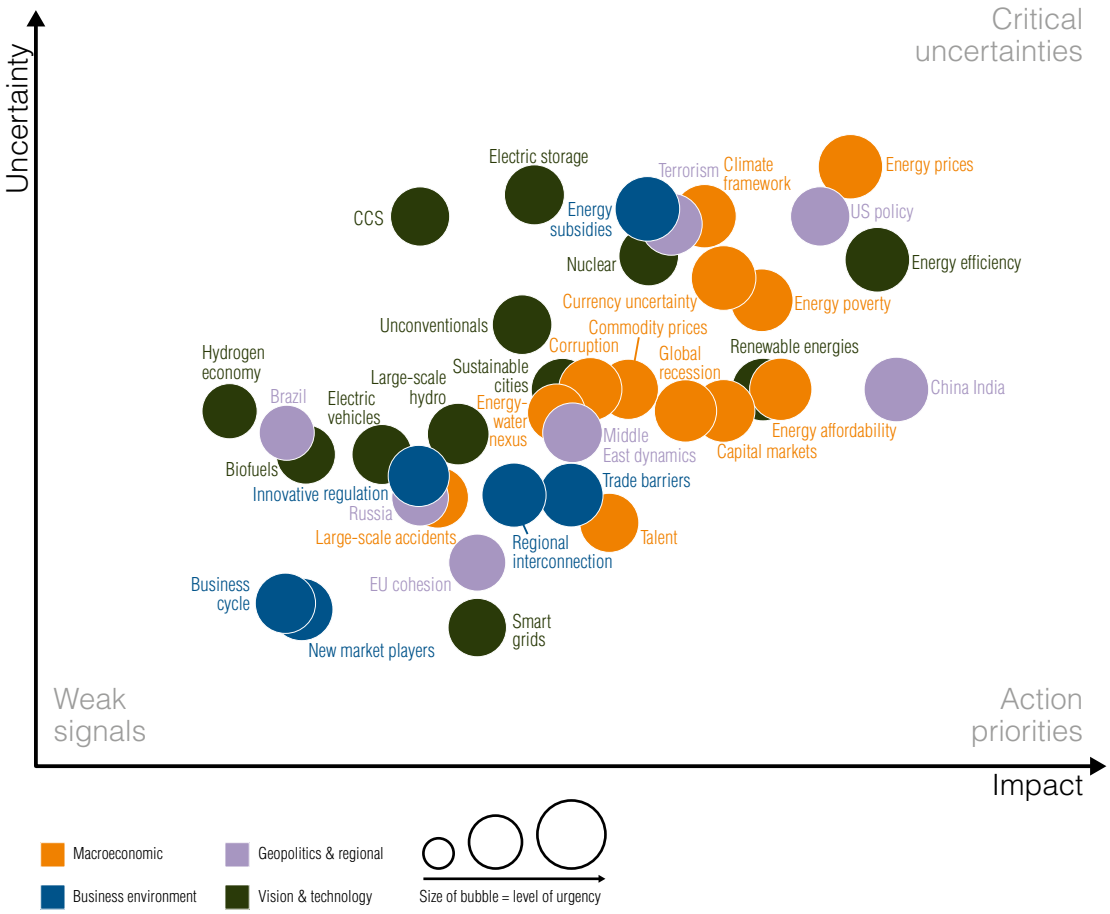
The 'weak signals' have not changed significantly since last year. Macroeconomic questions such as energy poverty, corruption, the energy-water nexus or currency exchange, retain the same degree of uncertainty as last year. However, this year's monitor indicates a greater number of marginal issues, such as CCS and trade barriers, which were more prominent last year.

The transition of energy efficiency from an issue of high uncertainty to an issue of low uncertainty – but with a need for action – is interesting, but the reason for this is unclear and warrants further investigation.

Balancing the elements of the energy trilemma – energy security, energy equity and environmental sustainability – has been addressed many times in WEC Germany's national activities. Our aim as a national committee of the WEC is to illustrate the relevance of international issues to the energy market. International cooperation in Europe, but also on a global scale, is crucial to enable and establish synergies. This is a part of finding a solution to balance the energy trilemma; the German Committee will continue its agenda with these priorities.

INDIA

Figure 23
WEC's 2014 World Energy Issues Monitor: India



India used to be relatively rich in energy resources, but due to rapidly increased demand for energy, energy self-sufficiency is decreasing, particularly with regard to coal and oil. To satisfy the growing demand for electricity, coal is the preferred source of primary energy, but this causes a serious concern over environmental issues including climate change. Furthermore, the issue of energy subsidies is placing an enormous burden on the nations' finances and addressing this issue is one of the major challenges for India's government to solve. However, it is politically very difficult to reduce such subsidies. Uncertainty around fluctuating energy prices and the need to meet ever increasing demands has pushed climate concerns and CCS to positions of lower priority and lower commitment for decision-makers.

The critical uncertainties for India include energy prices, energy efficiency, the climate framework and energy subsidies.

- Energy prices: the growing demand for energy results in higher dependence on imported fossil fuel energy, and this makes the country more vulnerable to fluctuating energy prices in the global market. As a result, both impact and uncertainty are perceived to be high.

- Energy efficiency: Overall energy efficiency is low, but considering the increased demand for fossil fuel (and associated environmental concerns requiring immediate action for the improvement of energy efficiency of the region) the effective dissemination of energy-efficient technologies depends on the reduction of energy subsidies and introduction of efficiency incentives.
- Climate framework: coal is the fastest growing source of energy in the India, but this means CO_2 emissions are also increasing rapidly. The first commitment period of the Kyoto Protocol has ended, but the next climate framework is still nebulous and this makes the prospect of climate policy unclear and uncertain.
- Energy subsidies: increasing consumption of energy to meet the need for rapid economic growth and the political commitment for universal energy access increases the energy subsidies bill.

Action priorities include issues of energy poverty and affordability; addressing both will be critical for improving the economic and social development of India. Renewable energy is also cited as a need-for-action issue. The relatively high generation cost from renewables (other than large hydro), difficulty in obtaining government subsidies, and the speed of technological progress have kept uncertainty around renewables high. However, on the rural side, grid parity is close and in many cases renewables provide the easiest means to deliver energy to the poor.

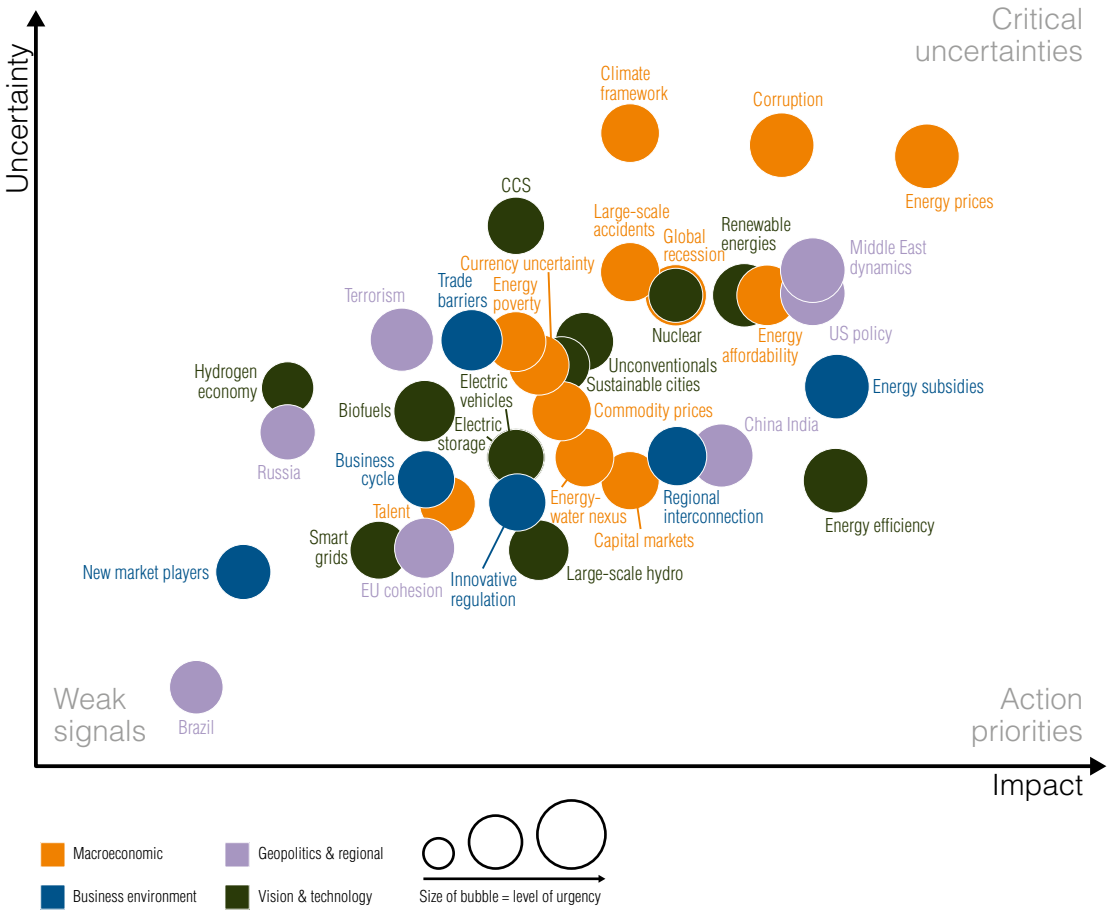
Highest change issues from the Indian monitor include the volatility of energy prices, where the need to meet increasing demand and uncertainties of proven technology have pushed CCS to a position of low priority, demonstrated in the perceived lack of impact in its positioning on the monitor. Post Fukushima is another area of change as following the accident, India witnessed resistance from locals and media for setting up nuclear plants. Over the past year, with greater awareness and advocacy, resistance is now diminishing and nuclear is again emerging on the national energy agenda. On the renewables side, the uncertainty of policy success focused on energy efficiency – the Renewable Energy Certificates (REC) and Perform Achieve Trade (PAT) – have brought efficiency into the critical uncertainties zone.

In contrast, large hydro has seen very little movement on the monitor due to issues of environmental consideration, land acquisition and a long gestation period.

The Indian monitor shares a number of similarities with the regional monitor for Asia, and many issues, such as biofuels and regional interconnection, show a close correlation in their positioning. However, the issue of currency uncertainty is deemed more critical at the national level, with a higher degree of both uncertainty and impact than the global average. This may indicate the growing concern over decreasing energy self-sufficiency.

INDONESIA

Figure 24
WEC's 2014 World Energy Issues Monitor: Indonesia



The Indonesian economy uses a large amount of energy, heavily dominated by industrial and transportation sectors. As the demand for energy grows, the energy sector plays a central role in supporting the country's social and economic development by maintaining a sustainable national energy supply. Priorities will include energy security and energy independence by preserving the domestic energy supply and adequate national reserves. The country will need to expand reliable energy infrastructures and decrease the use of fossil fuels, which are still the major source of energy and a conflict with environmental priorities. Other crucial challenges for national sustainable development will be: developing a reflective energy price; phasing out energy subsidies; increasing energy efficiency and conservation, including energy diversification in the industrial and transportation sectors.

Fluctuating global energy prices are a key area of high uncertainty and high impact on the Indonesian issues monitor. The rapid growth of energy demand has an effect on the increase of imported fossil fuel dependency since fossil fuels are the main energy driver in maintaining the demand and supply balance. Getting energy prices right is a high priority, sending market signals to encourage changes in energy supply and demand, and enabling market conditions to attract long-term investment.

Although energy prices are perceived as the highest impact issue, with the most need for action, a large percentage of the population still do not have access to modern forms of energy, reflected by energy poverty and recognised as a critical uncertainty item on the monitor for Indonesia.

Corruption has been a growing concern in the energy sector which may have had an impact on energy policy, creating uncertainties around energy investments. It creates a perception that investments are not necessarily based on sound analysis and transparent processes. However, the involvement of the Corruption Eradication Commission, which unearthed several corruption cases implicating government officials and private sectors, has delivered some assurance of accountability in energy sector management.

For the climate framework to work to help Indonesia contribute positively to the climate change agenda, it must address: the higher dependence on fossil fuels; slower development and deployment of low-carbon and zero-carbon energy technologies due to the lack of competitive carbon prices; and the absence of an emissions-reduction target at the national level.

The fuel subsidy remains a key issue to be addressed. While the subsidy has been an important issue for some time, the government's relative success in lifting parts of the subsidy this year has only had a limited impact on the fiscal health of the state budget. Continuing to provide an energy subsidy is a deterrent to investment in energy-efficient technologies.

Improvements in energy efficiency for supply and demand are urgently needed to enhance energy security and increase environmental benefits such as reducing CO_2 emissions.

CCS is regarded as having less impact. This could be due to several factors, ranging from unreflective energy prices to the need to meet increasing energy demand. There is general uncertainty around the global climate regime, including whether or not developing countries must take on emission-reduction targets – hence the need for CCS, also has an impact. The drop in the coal price makes it even more competitive against gas, rendering CCS to be classified as a low priority.

The Fukushima nuclear accident has affected the country's policies on nuclear energy and increased public concerns about safety, security and the liability for nuclear damage. However, signs of the recovery of nuclear energy are starting to emerge.

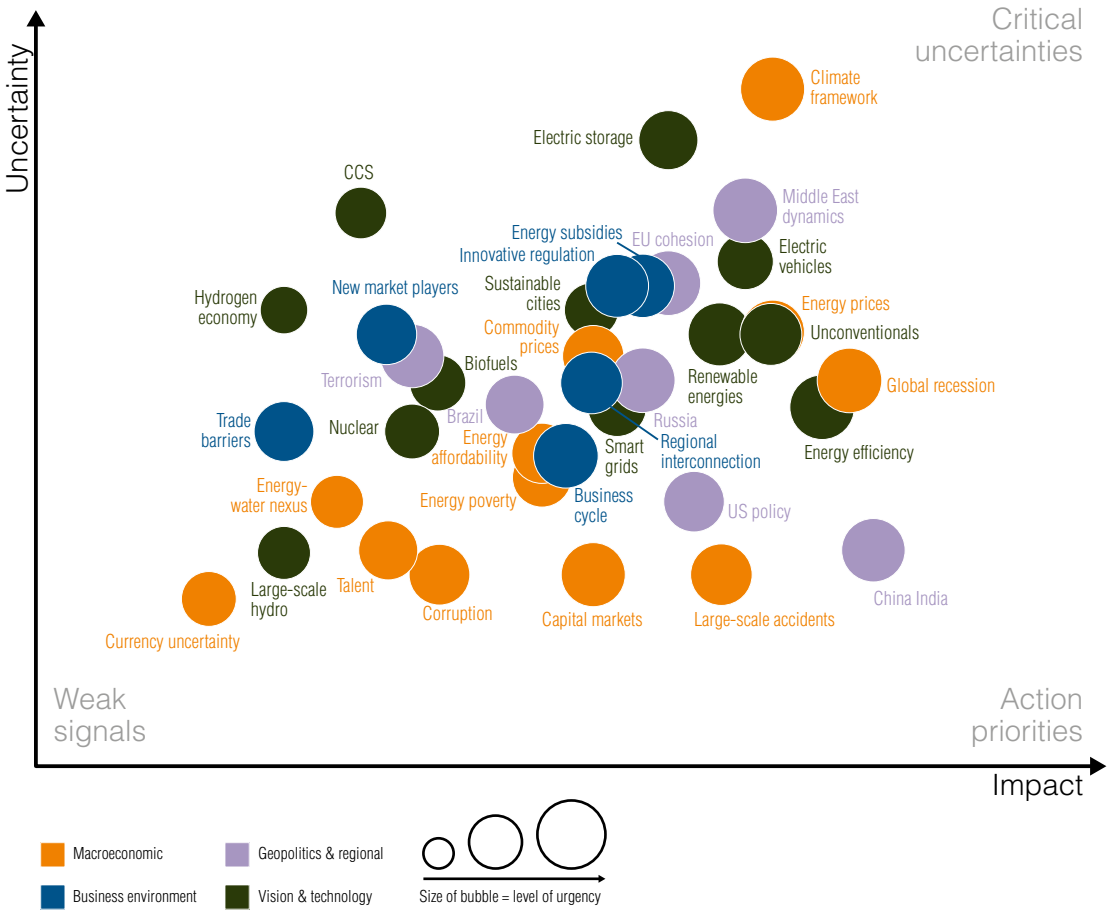
Unconventional energy has been regarded as having a greater impact over the last year. There has been increasing interest in the development of Indonesia's unconventional resources – although with limited success so far. This may be partly explained by the hope that the country will benefit as a result of the US's shale oil and gas revolution.

Energy subsidy and energy prices remain high on the agenda, with a significant impact on the country's energy landscape. Archaic and misleading policies on both fronts have proved to be very politically complex and difficult to radically revise. To date, changes have been incremental. Working on a sustainable energy system remains a top priority. It will be crucial to deploy a fiscally healthy energy system and therefore reflect a fair energy price. For example, a fair carbon price will continue to encourage lower carbon emissions.

The expected future trends for Indonesia include less dependence on fossil fuel energy, with a significant increase in new and renewable sources of energy and energy-efficient technologies. It is also expected to see enhanced expansion of low-carbon and carbon-free energy technologies to help achieve a low-carbon, long-term development direction to steer the national energy system into a sustainable energy path.

ITALY

Figure 25
WEC's 2014 World Energy Issues Monitor: Italy



The Italian energy sector has experienced a decrease in consumption since the 2008 economic crisis. The demand for electricity, natural gas and oil products continues to decrease month-on-month due to a mix of factors, both positive and negative: increased energy efficiency, stagnating economic growth, the decrease of industry and business activities, and the penetration of renewable energies in the electricity generation market.

At the same time, electricity prices have increased due to the growing incentive costs in promoting renewable energy and balancing system costs. This has resulted in a loss of competitiveness for industries operating in Italy.

After the approval of the National Energy Strategy (SEN) in 2012 and the abandonment of new nuclear projects decided via popular referendum, the Italian government has mainly focused its energy policy on gas and renewables. Italy's ambition is to become the gas hub of southern Europe, expanding its share of renewable sources without increasing the cost for the system and its progressive integration through smart grids. In addition, promotion of energy efficiency in the building sector, together with the deployment of renewables in heat production, represents important goals for present Italian energy policy.

The Italian monitor highlights the following critical uncertainties:

1. Climate change policy framework: generally, it is not clear how the future EU climate and energy policies will deliver the market expectation on one single target for 2030, and a single energy market where there will not be an uneven distribution of European Directives across member countries.
2. Storage technology: the need to efficiently integrate the increasing capacity of renewable energies into the energy system, while controlling energy prices, makes storage technology a critical uncertainty that could play a game-changing role in the evolution of the Italian electric sector.
3. MENA issues: as for the top geopolitical uncertainty, the historical integration between Italy and MENA countries (mainly through natural gas pipelines) makes the dynamics in this region a major concern with the potential to have a significant impact on Italian energy businesses and security of supply. However, this might be mitigated by the abundant gas available for spot contracts and LNG infrastructures that could be available in the future.

It is also worth noting that renewable energy and energy prices are perceived as equally critical and uncertain in Italy. In fact, since the large penetration of renewable energies into the Italian power mix, the price of electricity has increased. Macroeconomics and geopolitical issues dominate the need-for-action issues.

The competitiveness of the European energy sector has progressively declined in relation to the US, producing negative effects on the manufacturing and industrial sectors. This situation calls for urgent action. In particular, it is necessary to address the negative impact on the Italian economy of unfair competition from Asian industries that are not obliged to comply with stringent commercial, safety and environmental rules.

The credit crunch is still having a negative impact on Italian business development and the investments needed to optimise and improve the efficiency of energy networks, mainly through technologies such as smart grids.

Energy affordability is also becoming a significant issue as the burden of the energy bill on family budgets is ever increasing.

Among the technologies perceived as ‘low impact’ and ‘uncertain’ it is surprising to identify CCS. In recent years, Italian institutions and energy companies have been involved in setting the regulatory framework and developing pilot projects in the country, in line with the EU strategic energy technology plan. In addition, Italy has been among the first countries in the EU to adopt the directive on the legal framework for underground storage activities, namely the EU Directive on Carbon Storage and Sequestration.

The ‘weak signal’ surrounding the biofuel issue in Italy is also surprising. In fact, during 2013 there were positive developments for the production of second-generation biofuels in the country. In particular, a ministerial decree established a legal framework for bio-refinery installations and a world-class Italian chemistry company inaugurated the first second-generation bioethanol plants in the world.

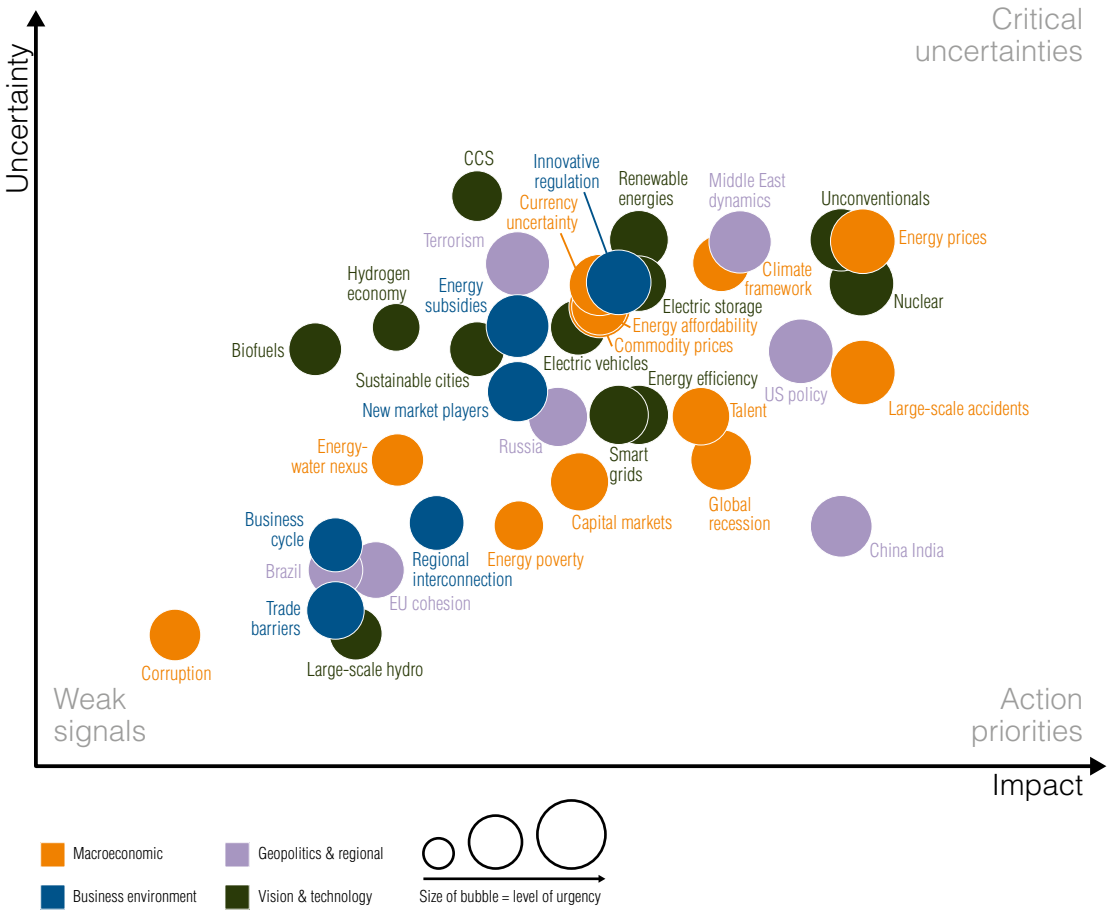
The WEC’s Italian associates feel uncomfortable with the European energy policy framework that is having an impact on the competitiveness of the Italian industry in the country and abroad. At present, energy security and affordability are the main issues that should be addressed with the aim of increasing the country’s economic competitiveness.

WEC Italy will continue to be committed to supporting and promoting the importance of research and development (R&D) and innovation in the energy field. Development and deployment of new technologies is the best way to consolidate energy competitiveness and environmental sustainability.

The WEC should also pave the way for a thorough international debate on the urgency and importance of diverting financial resources from incentive policies to R&D programmes in those energy fields where the European industry has first-class technologies.

JAPAN

Figure 26
WEC's 2014 World Energy Issues Monitor: Japan



In December 2012, the Liberal Democratic Party, Japan's mainstream conservative party, won the general election and Mr Shinzō Abe took office as Prime Minister. His administration started to revive the Japanese economy with a new economic policy called 'Abenomics'. The new government is now reversing the previous government's policy of abolishing nuclear power. Mr Abe said, "Under the new nuclear safety standard, we will foster a new safety culture and restart nuclear plants where safety has been confirmed." The government has decided to take the lead, including provision of financial support, in controlling the contaminated water issue in Fukushima Daiichi nuclear power station.

The Abe administration raises consumption tax from 5% to 8% from April 2014 and will raise it again to 10% from 2015, which could have a negative impact on the future economy.

Critical uncertainties and urgent need-for-action issues in the Japanese monitor are commodity prices, large-scale accidents, nuclear, unconventionals and US policy. All of these issues are linked by the shutdown of nuclear plants following the Fukushima accident. As of 15 September 2013, one in 50 nuclear plants which restarted in July 2012 has been shut down for periodical inspection, resulting in no nuclear operations while the new government review their basic energy policy. The additional annual fuel cost to make up for the loss of nuclear generation has reached more than ¥3trn or US$30bn. This has

been gradually pushing up the price of electricity and other commodities. Japan will import shale gas from the US at a reasonable price, which might have an impact on the global LNG market price.

It is noteworthy that public opinion in Japan shows a preference for renewable rather than nuclear energy after the Fukushima accident. This might be due to insufficient communication of information about energy issues to the public. Electricity is mostly taken for granted, and so more effort is needed to help people understand the benefits as well as potential risks of different energy sources.

China and India are also issues which demand an urgent need for action. These emerging countries are heavily reliant on coal, accounting for about two-thirds of global coal consumption in 2012.

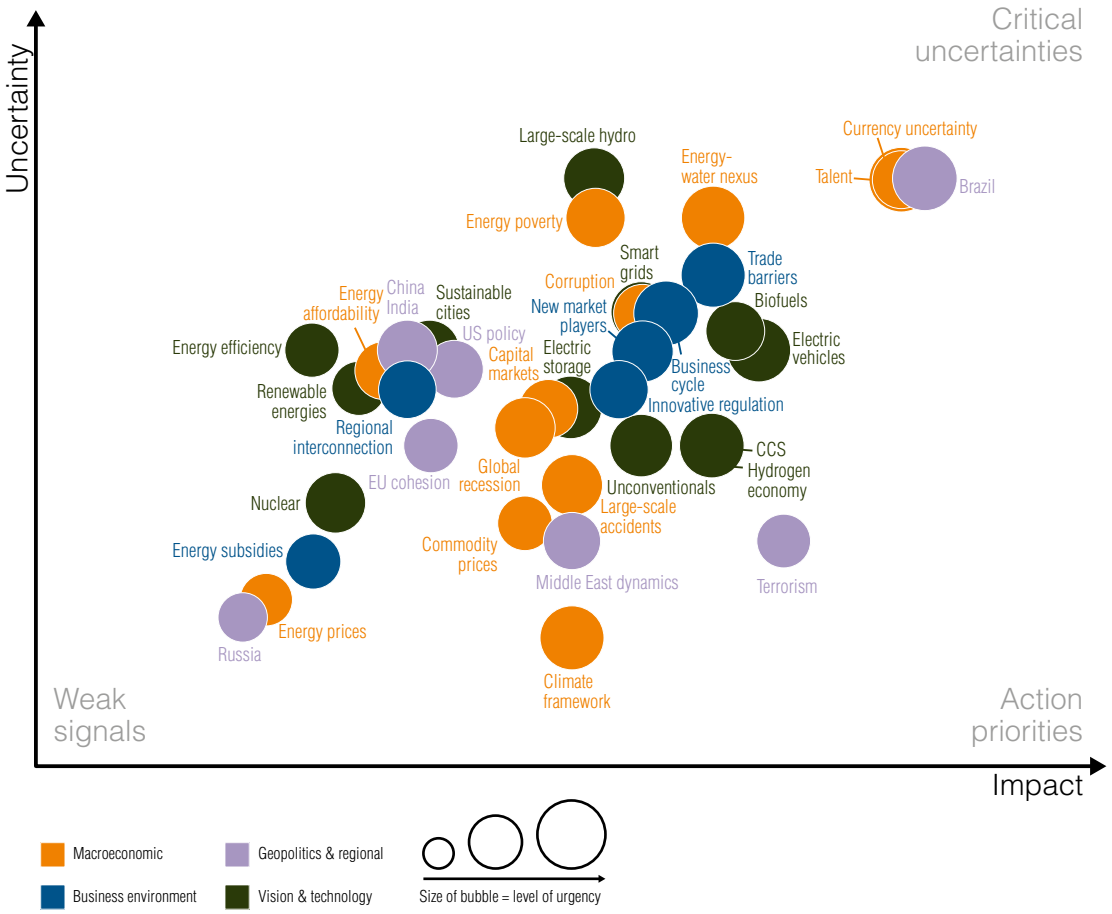
What is unique on the Japanese monitor is that the urgency of renewables, electric vehicles and energy efficiency is lower than that of nuclear and large-scale accidents. This may be due to the impact of Fukushima; given the intensity of the accident and the resulting nuclear shutdown, unconventional fuels, such as shale gas, are thought to be more realistic than renewable energy. As to energy efficiency, Japan has already achieved the world's highest level of energy efficiency on both the supply and demand side. However, further efforts for efficiency improvement are still underway, such as the improved insulation of buildings, for example.

The most important need-for-action issue for Japan is to stabilise the Fukushima Daiichi nuclear power station, solve the contaminated water issue, and restart the nuclear power plants where safety has been confirmed by the newly established Nuclear Regulation Authority.

Another important action for Japan is to support improvements in energy efficiency for supply and demand, particularly greater thermal efficiency for coal-fired power plants in the Asia region.

LATVIA

Figure 27
WEC's 2014 World Energy Issues Monitor: Latvia



Latvia's main energy target is to ensure the country's independence by increasing self-provision of energy resources and integration into the EU energy networks. This is set by the government in their long-term development document, The Strategy of Sustainable Development of Latvia until 2030.

This strategy sets out targets to ensure 50% of renewable energy resources in the final consumption of gross energy by 2030. In 2011, renewables amounted to 33.1%. The strategy also hopes to reduce energy imports from non EU existing suppliers by 50% by opening new energy market routes and developing a sustainable energy infrastructure. Policies are aimed at decreasing the average consumption of thermal energy for heating by 50% which, together with climate correction, will make the total approximately 100kWh/m^2 a year.

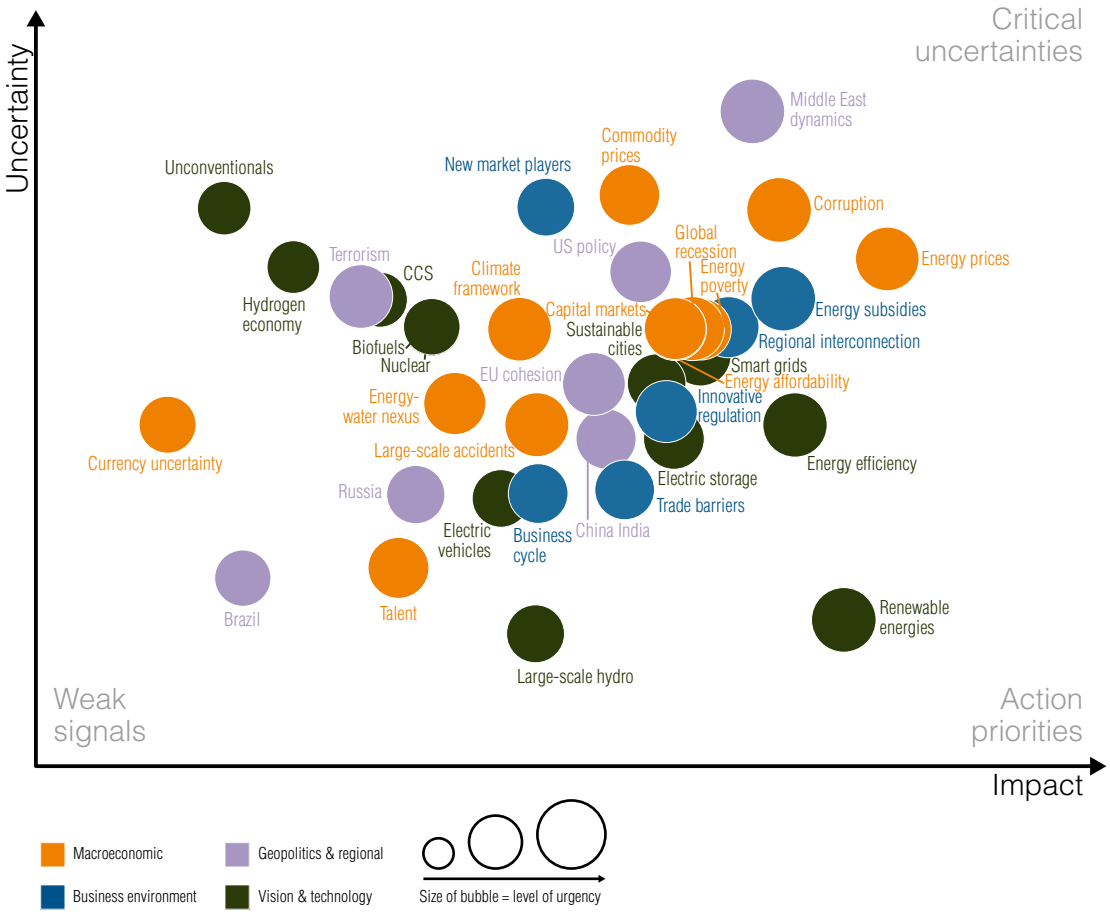
General challenges connected with the long-term development of the Latvian energy sector will be: to strengthen and improve Latvia's role in the Baltics and in the Nordic-Baltic energy market; to ensure the supply of primary energy from different sources in agreement with market-oriented and economically motivated work programmes; to ensure the planning and implementation of energy generation, transportation and storage projects which meet local as well as wider regional requirements; to preserve and develop the function of an energy bridge between Central and Eastern Europe in the sectors of natural gas and electric

energy; and to promote the competitive capacity of the power industry to improve the entire economic structure.

The need to address these priorities is demonstrated by the relatively low impact attributed to regional interconnection on the monitor, and the uncertainty currently surrounding trade barriers. The vast spread between different issues within the technology and vision area implies that, within the development of such an increasingly market-oriented framework, there will be distinct winners and losers.

LEBANON

Figure 28
WEC's 2014 World Energy Issues Monitor: Lebanon



Lebanon's issues monitor is a valuable tool that highlights the urgent need to address energy prices and implement a renewable energy strategy to work alongside the national energy-efficiency action plan to highlight the needs of the Lebanese energy sector.

Renewable energy remains the most certain issue with highest impact in Lebanon. As anticipated, the highest critical uncertainty is identified as Middle East dynamics. Energy prices and energy subsidies are also issues that should be addressed to enable further development of energy efficiency and renewable energy.

Unconventional energy resources appear as uncertain, but with little impact. This appropriately reflects the Lebanese outlook that regards more mature resources (such as PV, wind and hydropower) with greater trust – especially given the high potential for such energy production in Lebanon.

Both energy prices and corruption are perceived as having high impact with relatively high uncertainty. An explanation for this acknowledges that, on average, consumers pay the country's electricity sector supplier, Electricité du Liban (EDL) around 9.1c/kWh for electricity, a relatively low price for renewable energy to compete with. However, electricity supply is

complemented by private suppliers. This increases the cost of electricity to around 17c/kWh which is shared in a 50% split between EDL and private companies.

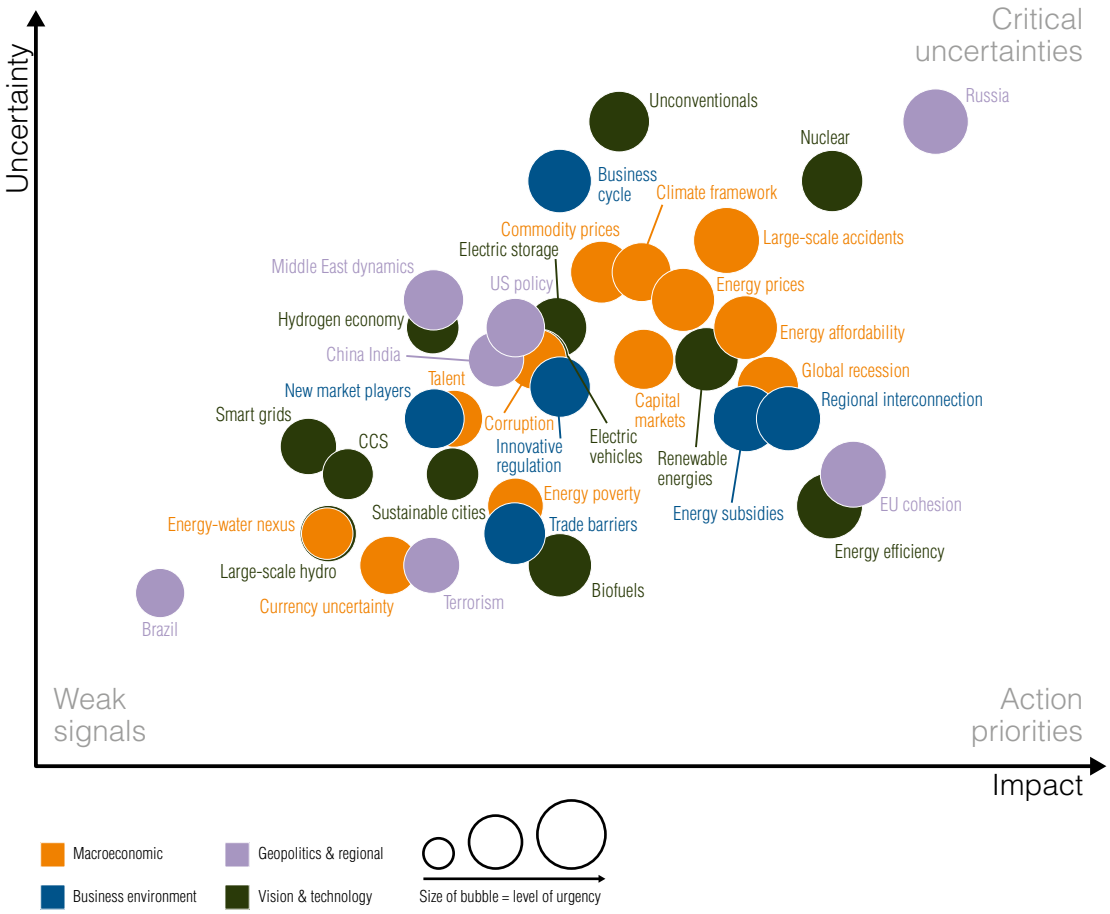
Middle East dynamics are found to have an important impact with high uncertainty. This is not a surprise for a small country at the heart of Middle Eastern dynamics, and reflects general uncertainty around development within the region.

In terms of energy policy, energy subsidies are found to be the issue deserving most attention. EDL's electricity selling price is around 9.1c/kWh, with more than 11c/kWh of energy subsidies. Reduction or reallocation of these subsidies could have a significant impact on both the development of renewable energy and energy-efficiency measures in Lebanon.

Finally, renewable energy is perceived to be the issue that requires most attention, and with very low uncertainty. This outlook is likely to be accountable to Lebanon's rich renewable resources, combined with the high need for electricity to complement EDL's supplies and replace high-priced private generators.

LITHUANIA

Figure 29
WEC's 2014 World Energy Issues Monitor: Lithuania



Energy efficiency is a top priority issue for Lithuania and is clearly visible on the Lithuanian national monitor. Lithuania considers energy efficiency to be an important need-for-action issue, with solutions such as dwelling renovation. As indicated by the monitor, rising energy prices are an issue for Lithuania, associated with the drastic increase in oil and natural gas prices that primarily hit the population as incremental payments for heating. Lithuania pays the highest price in the region for natural gas. There are no alternative energy suppliers and the market is not operating effectively.

The decommissioning of the Ignalina nuclear power plant is another sensitive issue for the country. Lithuania lost its main load generator while electricity prices increased across the Baltic region. The Fukushima disaster has hit nuclear development around the world. Although the shale gas revolution was initiated in the US, the industry's presence in Europe could potentially provide new opportunities for Lithuania in diversifying its energy supplies.

The construction of the new Visaginas nuclear power plant is a very important development. The highest degree of uncertainty, attributed to this issue of nuclear, relates to poorly diversified primary energy supply and Lithuania is making every effort to deal with this matter urgently.

Increasing energy efficiency through use of the EU Cohesion Policy is one of the priority tasks for the government of Lithuania. The aim is to reduce Lithuania's energy dependence on a single supplier and secure resources at market prices by developing an energy infrastructure consisting of LNG terminals, gas and electrical interconnectors. This is directly linked to the provision of affordable energy to residents and industry.

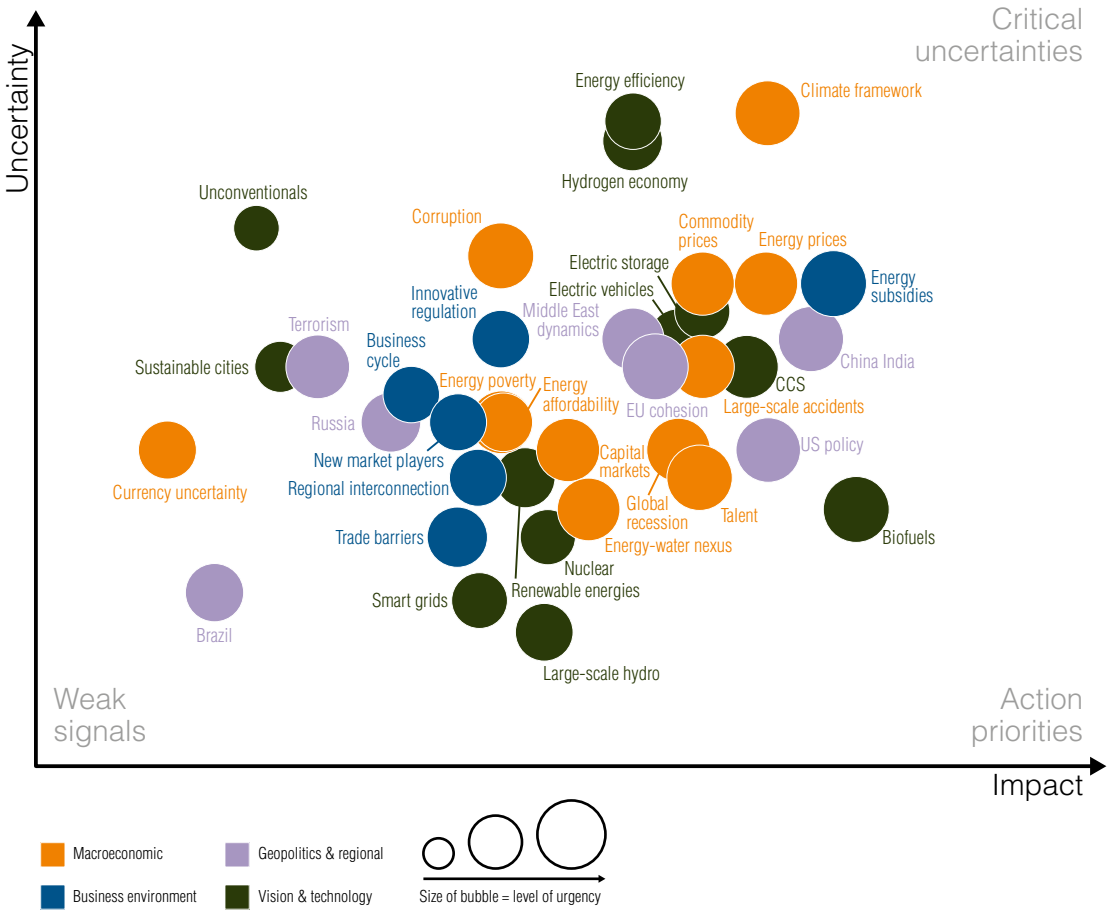
The use of biofuels has further increased opportunities for energy diversification. In order to diversify the supply of energy, the country needed to increase the use of local fuels, biofuels, peat and waste. For Lithuania, this is reflected in the higher perceived impact and lower uncertainty – implying a great need for action – in comparison to the positioning of biofuels at both the European and global level.

A further feature of Lithuania's energy issues monitor highlights the need to address energy affordability. However, this issue is not considered to be as important from the global and European perspective. This may be associated with a relatively small purchasing power of the population and the country's high energy services prices.

Lithuania is sceptical about smart grids and takes more notice of the developing projects across the globe and in Europe. The national monitor suggests that a particular need-for-action issue for Lithuania is the use of biofuels. Undoubtedly the top global issue is renewable energy, which has different weight in different countries, depending on geographical positioning. Lithuania, situated in the colder climate zone, places a higher priority on the use of biofuels for heat.

MEXICO

Figure 30
WEC's 2014 World Energy Issues Monitor: Mexico



While the overall crude oil production in Mexico has declined in recent years, deep water crude oil and shale oil and gas resource estimates indicate a large potential increase in both oil and gas production for the future. As a result, the new government sent Congress a proposal to initiate the opening of the energy market to the private sector, both in oil and gas as well as electricity, arguing that the public sector was not in a position, technically or financially, to effectively exploit these new resources. The new government also established a new organisation, the Comisión Intersecretarial de Cambio Climático, to deal with the national climate change strategy, incorporating the notion of 'adaptation' as an important component alongside the one of 'mitigation' which has prevailed so far.

There are three main critical uncertainties for Mexico's leaders: the perception of a lack of action on energy efficiency, the freeze on nuclear power, and the proposed energy sector reform.

Although a national energy strategy has already been approved and should enable reform of the energy sector, the programme to implement the new strategy is making slow progress. As a result, there is increasing uncertainty as to whether Mexico will be able to achieve its stated goals. Furthermore, although the base for legal restructuring of the energy sector

has been defined by Congress, uncertainty around the legal reform of the sector remains. This creates an important obstacle for new energy investments in the country.

Progress on the promotion and regulation of energy efficiency and conservation programmes is perceived to be slow.

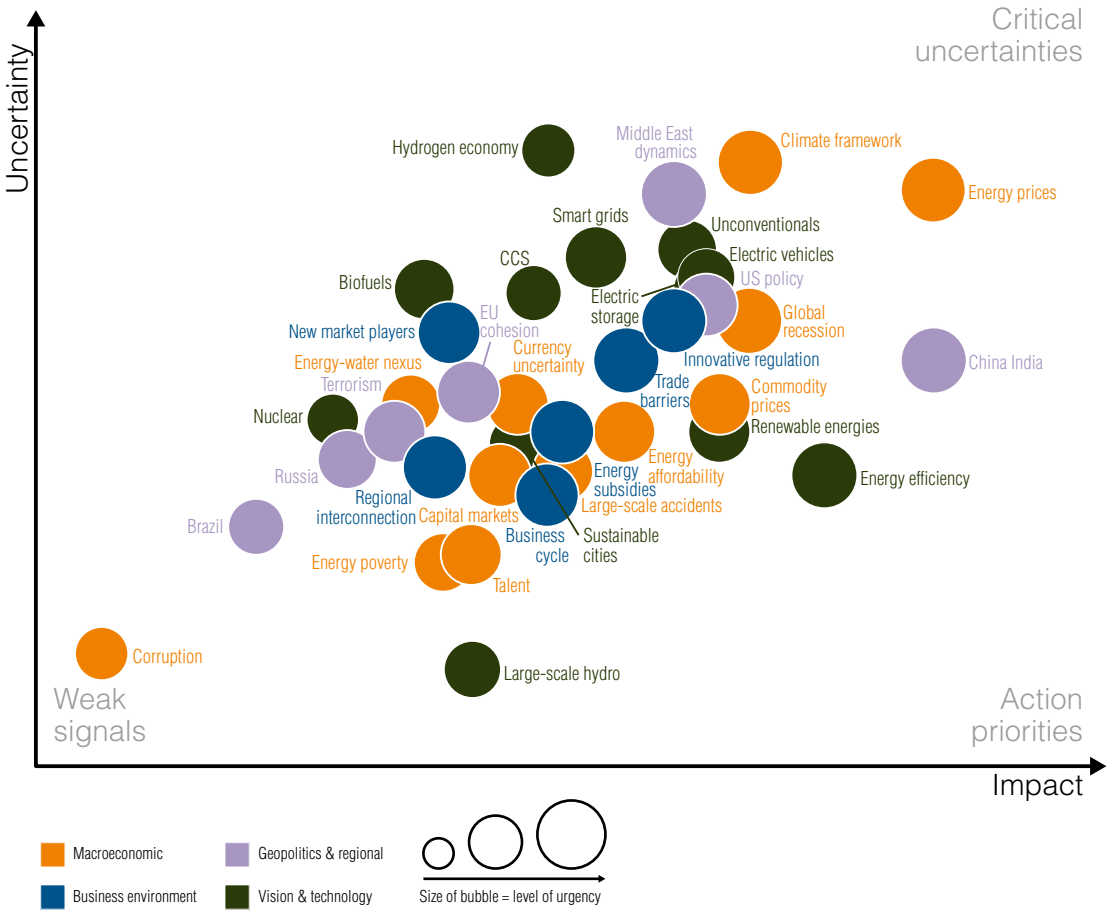
The General Law on Climate Change has the objective of securing 35% of Mexico's electricity from low-carbon technologies by 2024. In this context, there may be a growing demand to revive the nuclear programme, since it is unlikely that renewables alone will meet this objective.

The lack of human resources (or energy talent) for the energy transition is another issue acknowledged by the new energy strategy. According to the monitor, energy leaders in Mexico perceive this issue with great urgency and call for immediate action.

Overall, energy leaders in Mexico do not anticipate serious problems in satisfying the projected growth of energy demand in the near or medium-term future. The real challenge is identifying the type of supply needed to satisfy demand in sustainable terms, while encouraging less intense energy demand overall.

NEW ZEALAND

Figure 31
WEC's 2014 World Energy Issues Monitor: New Zealand



As a small, highly trade-dependent and open economy, New Zealand relies on its sound institutions, its world-leading ability to produce primary products and rich endowment of natural resources (such as minerals, petroleum, water and moderate climate) to prosper. These factors are reflected in the World Energy Issues Monitor.

There is alignment between the three monitors (local, regional and global) on the main critical uncertainties. The climate framework, energy prices and Asia (China and India) emerge as the critical uncertainties facing New Zealand. The global financial crisis has blended into the broader set of issues, with New Zealand now emerging strongly from the recession.

New Zealand is one of the few countries with an emissions trading scheme. There is concern around ongoing uncertainty during the transition to a global price on carbon about the international climate change negotiations and the nature of the associated 'rules', especially as they relate to land-use, land-use change and forestry (about 50% of New Zealand's emission profile is associated with agricultural gases).

The geographical location and trade-dependent economy makes New Zealand vulnerable to high energy costs, especially international oil price prices. While an oil exporter, New Zealand imports all of its fuel oil. Therefore, Middle East dynamics rank highly given the impact

on the price of oil and oil products, which in turn can affect supply and demand, and the economic viability of alternate transport fuels.

Over the past decade, New Zealand's trade focus has shifted from Europe to Asia. The country is increasingly trading with China, India and the rest of the Asian region where there are high economic growth rates and relatively low fossil fuel reserves. As an 'energy-hungry' region looking for innovative solutions, New Zealand is increasingly well placed. Policy developments in Asia inevitably have an impact on the New Zealand economy.

Critical uncertainties highlighted in the survey are energy efficiency, renewable energies, commodity prices and energy affordability.

The country is making good progress with energy efficiency. The export-driven economy has a high energy component but with rising energy prices. There is more that can be done to encourage more efficient use of transport and electricity. Some government assistance is available to the residential and business sectors to implement energy-efficiency initiatives. However, liberalised and competitive fuel and electricity markets are transmitting cost-reflective prices to end consumers. With a carbon price, the case for greater assistance is yet to be made. Energy executives remain to be convinced.

The same is true of renewable energy. On average, around 70% of New Zealand's electricity supply comes from renewable sources (hydropower, geothermal, wind). This has been largely achieved without the need for subsidies or support from a carbon price. Future tranches of generation are, for the foreseeable future, also likely to be renewable, with thermal generation covering for intermittency of other renewables such as solar, wind and hydro. But energy executives worry about the decentralisation of the power sector with the integration of solar energy and the development of renewable sources of transport fuels. Energy affordability, as in the UK, is increasingly being played out in the political sphere – and policy changes are on their way.

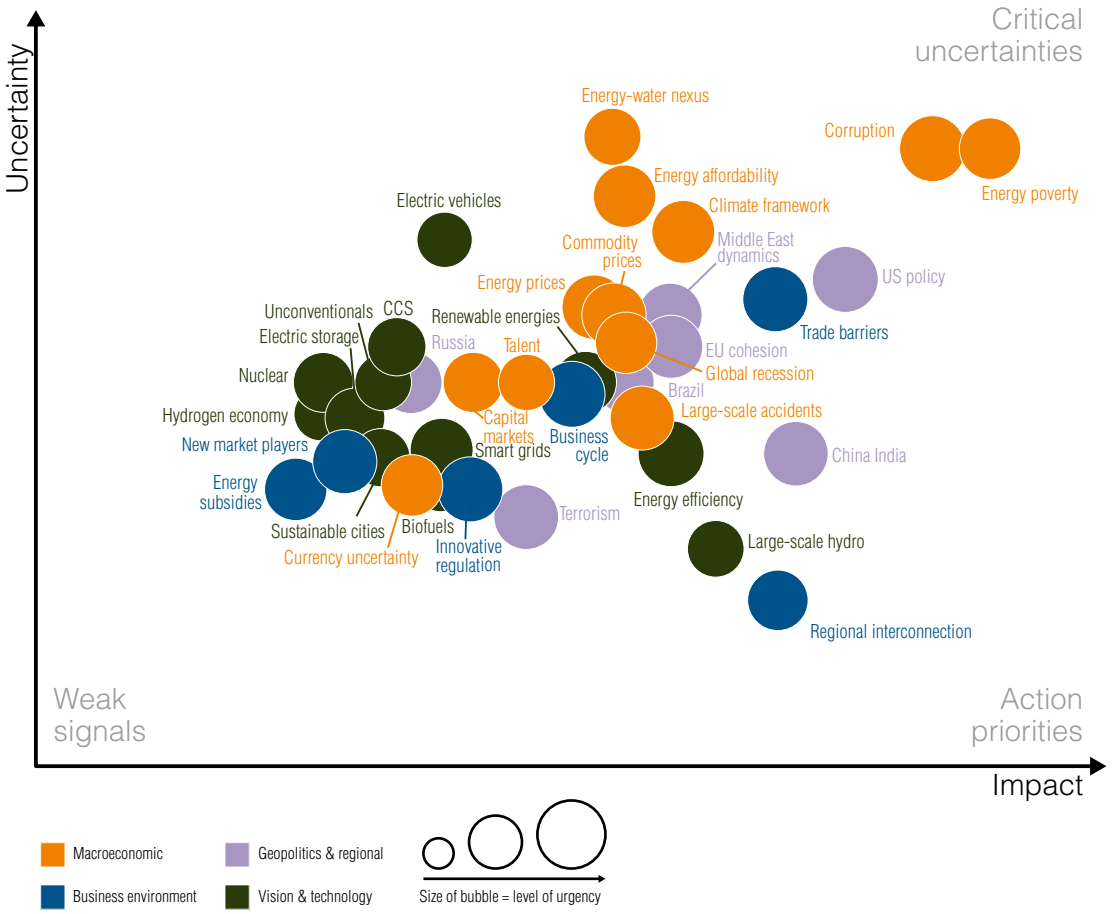
We are surprised and interested to see that respondents viewed the need-for-action issue of electric vehicles as a higher priority than biofuels, despite biofuels technology requiring less infrastructure change than electricity generation. This is possibly due to environmental concerns around alternative biomass energy and the perceived greater environmental benefit of electric vehicles (provided sustainably generated electricity is being used).

Electric and battery technology advances will be critical in order for electric vehicles to become more mainstream. It is also notable that New Zealand rates the hydrogen economy more highly than others. This is possibly in recognition of the limitations around biofuels and battery electric vehicles as solutions for sustainable low-carbon transport.

Finally, we note with some pride that 'corruption' has fallen off the bottom of the New Zealand issues monitor.

NIGERIA

Figure 32
WEC's 2014 World Energy Issues Monitor: Nigeria



Largely driven by the oil sector, the Nigerian outlook for economic growth remains positive. This growth is not inclusive, however, as it does not translate into poverty reduction and shared prosperity. The proposed oil and gas industry reforms of the Petroleum Industry Bill have not yet been voted on by the National Assembly. This remains a source of concern to the industry key stakeholders and operators, with implications for investments. The country's power supply remains unstable and unreliable, with poor performance and a weak infrastructure. This negatively impacts business, social and economic development. Cooperation with China, India and Brazil has been strengthened, and has resulted in more opportunities for the energy sector.

Energy poverty and corruption are identified as the top critical uncertainties for Nigeria; both these factors have significant impacts on the country's sustainable development. Although equipped with extensive and diverse energy resources, more than half of the Nigerian population still have no access to electricity. As in many African countries, the challenge of modern energy access is acutely visible here. Together with six other countries, Nigeria is now part of President Obama's Power Africa Initiative, aimed at accelerating investment in Africa's power sector and improving electricity access over the next five years. Corruption is another critical uncertainty and has been an ongoing concern for the Nigerian Administration. In spite of many efforts to improve transparency, it remains a critical issue yet to be solved.

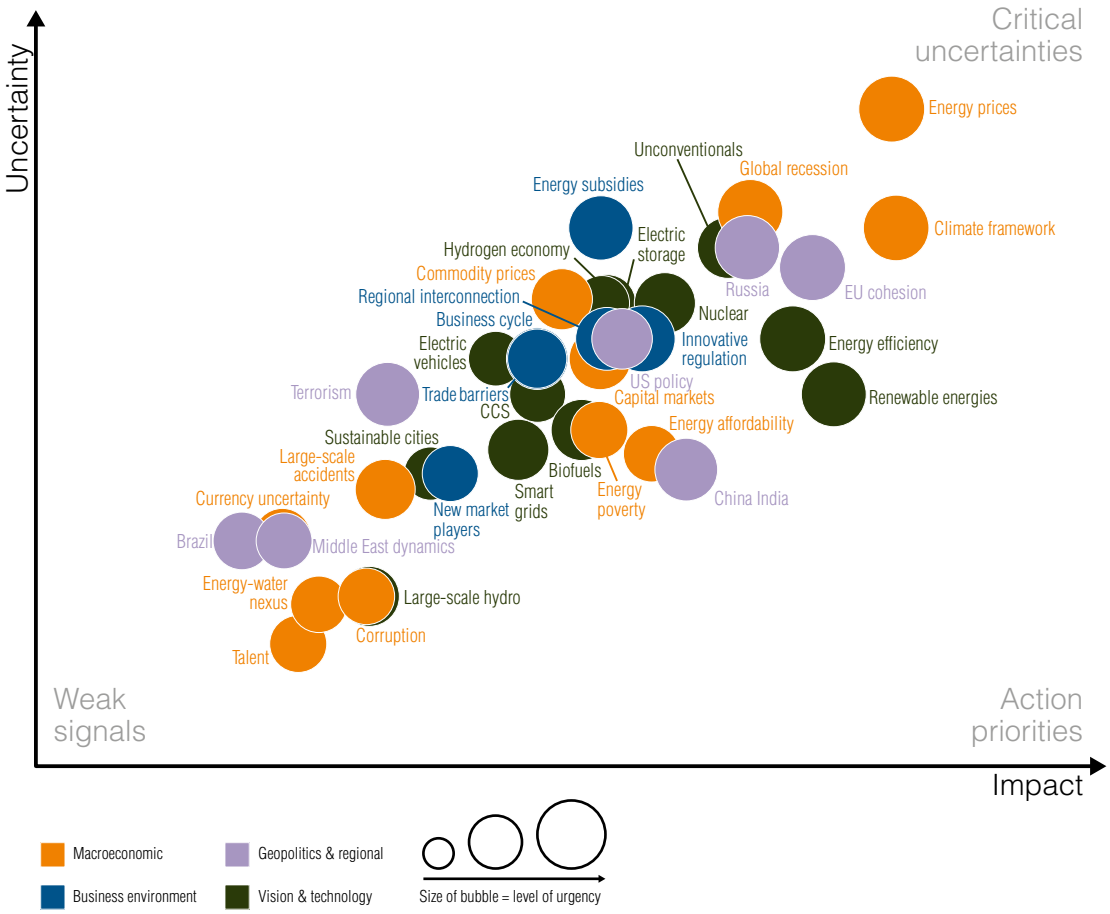
The most important need-for-action issues in Nigeria include: China and India, large-scale hydro, renewable energy and energy efficiency. Nigeria's cooperation with China and India is being reinforced. As emerging countries with similar challenges to Nigeria, much can be learned from their cases and success stories. With a huge potential of about 15 GW (with less than 1.4% exploited thus far), large-scale hydropower is perceived as a clean renewable energy option that needs to be further developed to meet energy needs in a sustainable way. Energy efficiency and renewables are perceived as critical instruments for sustainable energy growth and have been on the agenda of the Nigerian energy sector for some years. Appropriate policy measures should be implemented, however, to strengthen the regulatory and institutional framework.

It is quite surprising that issues such as terrorism, energy subsidies and sustainable cities are identified as weak signals. Terrorism is still a crucial and important issue in Nigeria – and related risks are prevalent, (such as, for example, security challenges arising from crimes and religious conflicts in certain states). Sustainable cities are another key concern for Nigeria, and it is surprising that this issue is not identified with more urgency on the national monitor. The country has a growing population of over 160 million inhabitants. Irreversible migration processes result in ever more crowded cities that lack the needed infrastructure to sustain this volume of inhabitants. Fuel subsidies continue to generate much debate and controversy in Nigeria. In 2012, some subsidies were partially removed following outbreaks of extreme violence. The capital market is another important challenge and it is surprising that this matter is perceived with less urgency. Nigeria is a country in need of substantial financial resources and there is an ongoing struggle to finance its poor energy infrastructure.

Many critical uncertainties must be addressed in order for Nigeria to realise its ambitious 'vision' to be among the top 20 countries in the world by 2020. As mentioned, energy poverty, large-scale hydro, energy efficiency, energy-water nexus and talent are some of the most important issues to be addressed.

POLAND

Figure 33
WEC's 2014 World Energy Issues Monitor: Poland



Poland's energy security depends on ensuring appropriate energy supplies at a reasonable price while observing environmental protection regulations. Climate protection requirements and the climate and energy package adopted by the EU mean that Poland must switch its electricity generation to low CO_2 emission technologies to ensure sustainable development. Currently, the country focuses on using all available technologies to enhance energy security, reduce emissions and retain economic efficiency.

Improvements in energy efficiency stabilise the demand for fuel and energy and reduce dependence on imports. Greater energy efficiency also reduces the power sector's environmental impact by reducing emissions. The development of renewable energy sources, including the use of biofuels and clean coal technologies, together with the considered introduction of nuclear energy, also have positive effects.

Development of renewable energy production is very important for meeting the primary objectives of the country's energy policy. Increasing the use of renewable energy sources means greater independence from imported energy supplies, better use of locally available raw materials and increased diversification of the sources of supply.

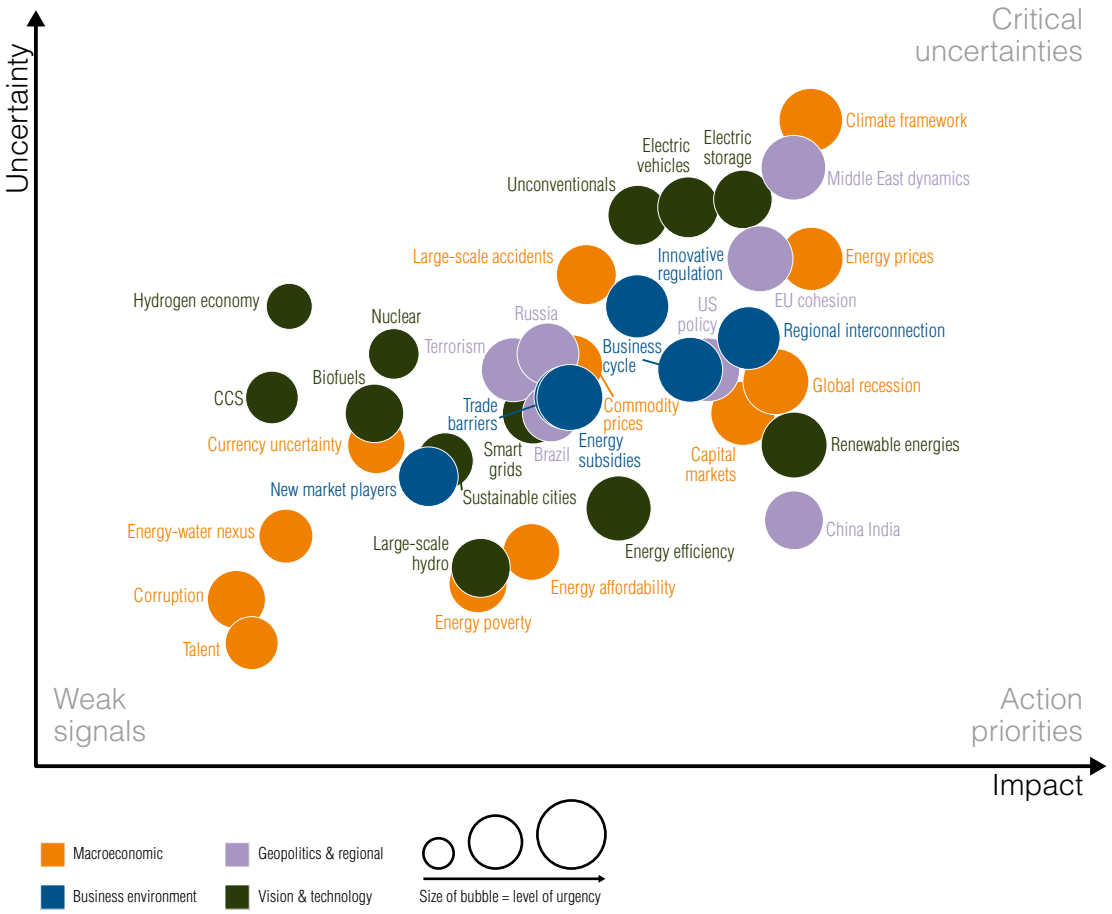
With the expected dynamic development of renewable energy sources, innovative technologies and solutions which ensure the stability of the power system will become increasingly important – for example, smart grids and energy storage. Popularising the use of electric vehicles is an important part of reducing environmental impact and improving energy storage.

Competitive fuel and energy markets are conducive to lowering production costs and reducing fuel and energy prices. A competitive and integrated energy market can also counteract price increases (crude oil or gas prices for example) triggered by external factors such as policy mechanisms. In this context, new investments in cross-border infrastructure are at the centre of interest for Poland. Stronger connections with a common, integrated EU energy market are important for security of supply and price stability.

Making Poland's energy strategy work will mean actively applying the available instruments of both community policy and foreign policy. Poland's energy policy will be supported by actions taken in the international community (within the EU forum in particular), aimed at shaping European and global energy policy. The specific characteristics of Poland – its deposits of energy resources and the realistic potential for changing energy-generation technologies – must be taken into account in this context.

PORTUGAL

Figure 34
WEC's 2014 World Energy Issues Monitor: Portugal



Portugal is among the leading countries for renewable energy. In 2012, 58% of the total generating capacity was from renewable plants and 38% of total electricity generation was from a renewable origin. Ambitious energy-efficiency targets are also being pursued. The country's per capita consumption is quite low by European standards, while specific consumption (energy/GDP) is relatively high. This highlights the need to further increase the competitiveness of the economy. With this aim, the government is pursuing energy cost reduction, namely by adjusting feed-in tariffs. Particular attention has been paid to electricity grid and to gas infrastructures development, in order to promote competition, increase security of supply and reduce energy costs.

The climate framework is regarded as a critical uncertainty. The lack of a worldwide consensus on GHG policy abatement makes investment decisions difficult. Portugal imports almost 80% of its energy and the behaviour of energy prices will be a major factor for Portuguese financial and economic recovery.

Middle Eastern dynamics are an obvious concern for a South European country that receives part of its supplies, namely natural gas, from the MENA region. Regional interconnection is also a critical uncertainty for the country. The integration of international markets is a

necessary condition for Portugal's own energy market to better function – and will develop the country's potential as a renewable energy exporter. EU cohesion will influence the economy and, in particular, investment in infrastructures, as European funds will be required to reinforce the Spanish-French interconnection capacity.

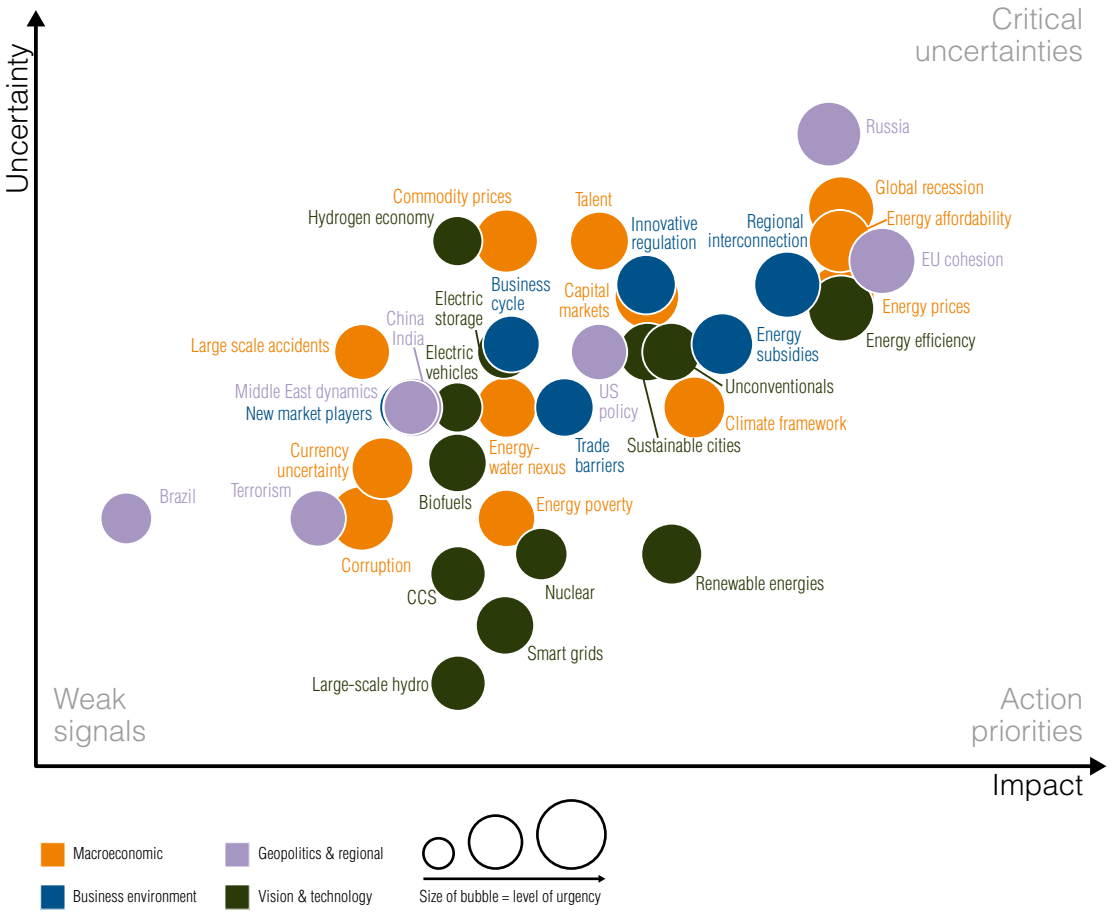
Renewable energy is positioned in the area between 'critical uncertainties' and 'need for action.' This is particularly interesting. It clearly reflects the commitment to building a strong renewable sector, while acknowledging ongoing uncertainties such as the difficulties of financing investment, the fear of policy changes and the challenges of integrating a large share of renewables into the electricity sector. Global recession and capital markets, (positioned in the same area of the monitor), are factors that must receive permanent attention from Portuguese investors, given the impact of these issues on the economy and on investment decisions. With regard to geopolitical and regional perspectives, attention paid to China may reflect the strong equity position of that geographic area in Portuguese energy sector companies.

It may be a surprise to find that electric vehicles are a critical uncertainty for Portugal when, on the European monitor, this issue appears as a weak signal. This may reflect national expectations for the future of the electric mobility project that was launched in 2008. This involved the installation of charging points countrywide, but received little adhesion from the public. Nevertheless, both the electric-charging equipment and the billing information technology developed by local companies (allowing for a competitive supply system for powering electric vehicles), are now finding their way into foreign markets.

The aims of the WEC's energy trilemma are parallel to the EU energy policy targets, which provide the framework for the Portuguese energy sector.

ROMANIA

Figure 35
WEC's 2014 World Energy Issues Monitor: Romania



Total energy consumption relative to GDP in Romania is twice the European average. Since 2010, the economic growth in Romania has been approximately 2% per year, while electricity consumption has decreased by 5–7% per year. In this regard, the global recession, and its localised impacts in Romania, remains a critical issue on the national monitor.

Romania's energy strategy's aim has also been to create a functional, stable and transparent electricity market. In that context, Romania sold 15% of its state-owned energy stocks from production companies Nuclearelectrica and Hydroelectrica on the Bucharest stock exchange. In 2014, the same percentage is set to follow from Romgaz, the largest natural gas producer in Romania.

Romania's specific environmental conditions and regulations have allowed the development of energy generation capacity through wind power plants, which has grown the share of wind production from approximately 0.5% in 2010 to over 8% in 2013.

The increasing share of renewable energy in the energy mix has actually had an impact on the price of electricity in Romania with a limitation on the delivery of green certificates granted for wind and solar energy. The importance of these two issues is reflected on the

national monitor by the positioning of renewable energies as an action priority as well as energy prices as a critical uncertainty.

The energy sector in Romania is therefore expected to recover fully after 2017. Two energy companies were established by joining lignite plants and lignite mines in Oltenia and the coal plants and some coal mines in the Jiu Valley.

Romania failed to bring domestic and foreign private capital to continue the Cernavodă Nuclear Power Plant, reflecting the issue's placement as a weak signal with a limited perception of the impact of nuclear and a low degree of uncertainty around this impact. The Nabucco project failure led to a greater orientation towards domestic energy resources of all types – conventional, unconventional and renewable.

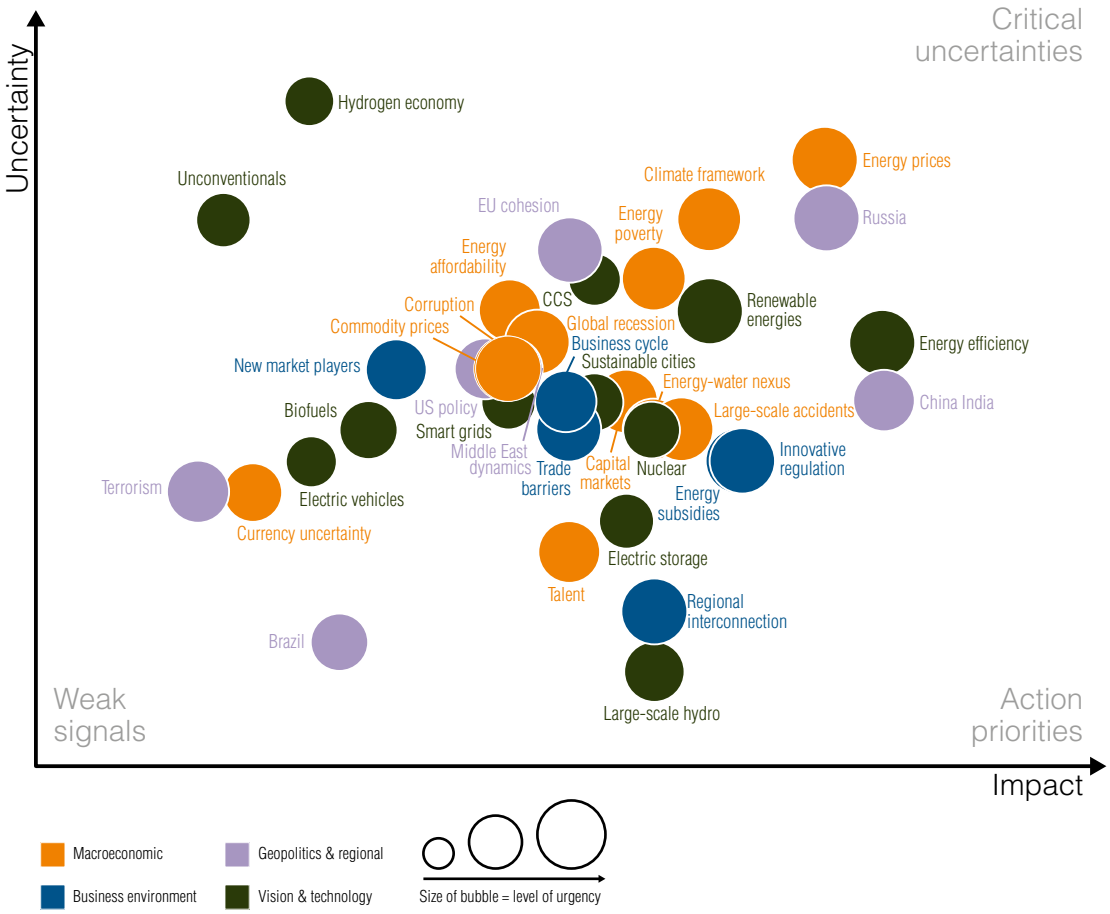
The critical uncertainties for Romania include the global recession but also the challenges of regional interconnection including the state of the EU cohesion as well as the position of Russia. The country's economic recovery after the financial crisis of 2008–2010 depends on regional and European economic developments. Romanian dependency on imports is 20% for natural gas (single source) and 40% for oil. The price volatility of those imports affects the economy and standard of living of the population, hence the high degree of uncertainty and impact for energy affordability on the national monitor for Romania.

Other uncertainties also include the recently introduced new tax for the entire energy infrastructure.

Romanian energy leaders perceive that issues that need urgent action are largely based on renewing the current infrastructure. Currently, most of the Romanian power plants are state-owned and established between 1965 and 1980 with lower efficiency levels. It is perceived by the energy community that efficiency efforts must be made to develop Romania's capability to achieve the targets set by the EU energy policy.

SERBIA

Figure 36
WEC's 2014 World Energy Issues Monitor: Serbia



In addition to the global financial crisis, Serbia's economy has been suffering from a recession for more than two decades. In spite of this downturn, energy demand and consumption in Serbia continue to grow on account of low energy efficiency and, in particular, very low electricity prices. As a consequence of the long-term lack of investment in new energy-generation capacities, the energy infrastructure remains out of date. An ever-increasing dependence on oil and gas imports endangers the security of Serbia's energy supply.

Serbia is a signatory country of the Energy Community Treaty for South Eastern Europe and is obliged to apply environmental protection measures according to EU standards. Given that the economy does not show any signs of recovery, and the energy sector is under serious pressure to implement such measures, it may be difficult to acquire investment for new coal-based facilities alongside treaty obligations to increase the share of renewables in gross final energy consumption from 21% in 2009 to 27% in 2020.

Restructuring of the power sector is underway in Serbia. The market is already open for high-voltage consumers, and the overall market opening will increase to above 40% of the total power supply at the beginning of 2014, when an additional 3,200 medium-voltage consumers will also be free to choose their suppliers.

Market liberalisation is also foreseen for natural gas consumers. Construction of the South Stream gas pipeline across Serbia will increase the possibility of producing cleaner electricity from gas. Costs are expected to be offset by selling heat from cogeneration plants located in the vicinity of several larger towns.

The Serbian energy sector is facing a critical uncertainty regarding the recovery of the national economy which would enable consumers to pay energy bills at cost-reflective prices. These costs should include environmental protection measures as well as subsidies paid for renewables. An effort to maintain the security of energy supply by use of imports may put additional pressure on energy prices, further reducing energy affordability for consumers.

The South Eastern Europe region as a whole suffers from a deficit of generating capacities. Threats of price volatility at the electricity market also affect Serbia, particularly in the long term, when the use of coal may be discouraged. The same applies to the price volatility of natural gas, as it is currently imported from a single supplier. Furthermore, the regulatory measures already implemented to protect vulnerable customers from higher energy prices, (placing the burden entirely with the utilities), can lead to an even more difficult financial situation for investments in the new energy capacities needed.

Serbia urgently needs to enhance energy efficiency in both production and consumption. Energy efficiency is a high priority in the Serbian energy strategy. The new law on the efficient use of energy was enforced early in 2013, and is expected to help establish a specific fund for subsidising energy-efficiency projects. Although energy-efficiency measures can significantly contribute to reversing the trends in energy costs and prices, and further market deployment of renewables is expected to contribute to employment, these issues remain critical for action, even if the current economic recession in Serbia eases.

The country must also integrate more renewables into its power, heat and mobility markets. Renewable energy has become a higher priority following this year's mandate (by the Serbian government of the National Renewable Energy Action Plan) to increase the share of renewables in the gross final energy consumption. Up until now, renewable energy sources have not been studied in detail and there is not enough reliable data on their availability to meet the 2020 goals, irrespective of the favourable feed-in tariffs already implemented in Serbia.

There also needs to be an increase in electricity tariffs for end consumers, creating major social issues due to current high unemployment.

Serbia may be particularly sensitive to the climate change issue. This is because of its indigenous coal resources which enable about 70% of electricity to be generated by thermal power stations. With Serbia's accession to the EU, these stations could face obligations under the expected new protocol on reduction of CO_2 emissions. The climate change issue is therefore one of the most critical uncertainties that Serbia currently faces. In spite of its importance, however, it remains overshadowed by the current economic recession and energy prices issues.

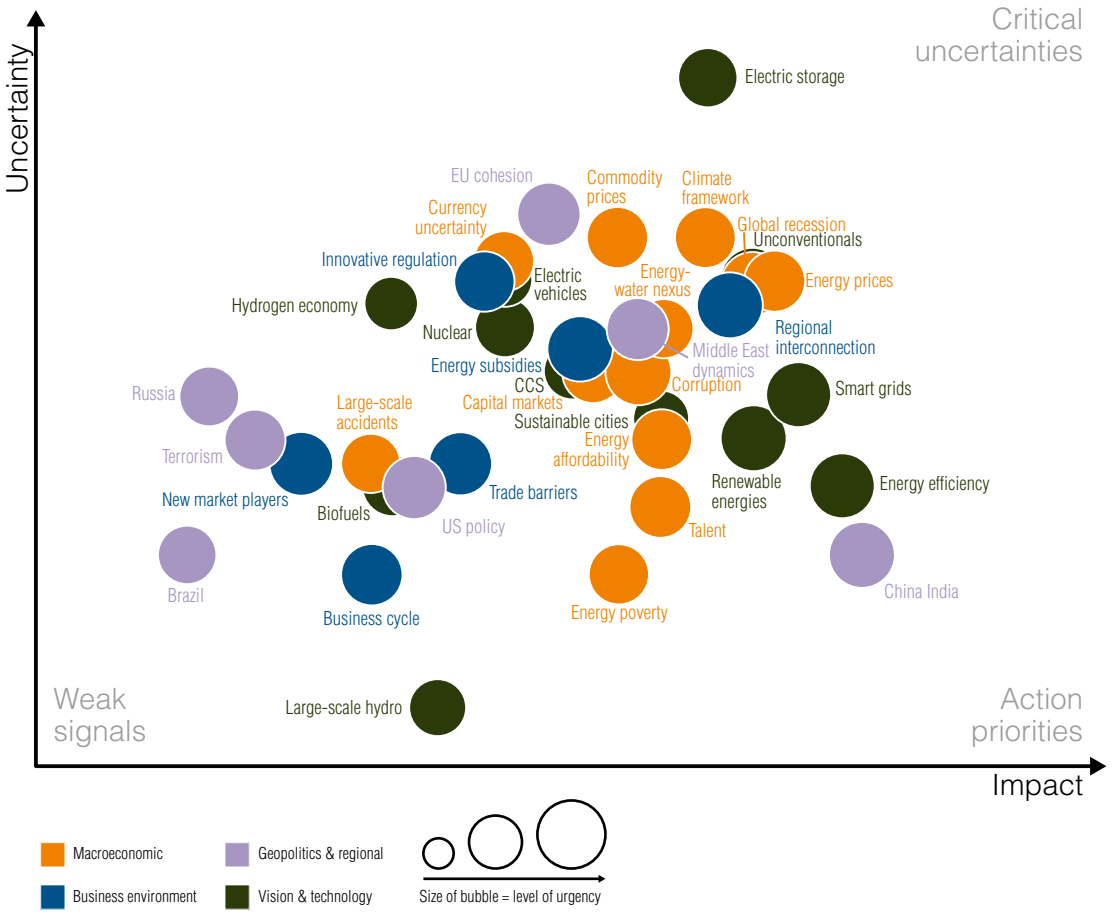
In terms of Serbia's current economic conditions, security of power supply may become a more difficult issue. While the generating capacities in the past have been ahead of the local consumption, no new capacities have been introduced in the last 20 years. The generation infrastructure is over 30 years old and is obsolete. While the demand for energy continues to grow, the local utility supplier is unable to invest in new generation alone, and the existing regulatory framework discourages foreign investment.

As a signatory of the Energy Community Treaty for South Eastern Europe, Serbia's energy priorities are similar to the WEC's energy trilemma agenda of setting up a balanced approach to security of supply, environmental improvements and social aspects. As mentioned above, energy efficiency is a priority for the overall chain of energy production, transportation and use.

Of course, Serbia should be using policy incentives and market solutions to focus on the economic aspects of its energy sector. In doing so, Serbia will enable the necessary dialogue with the EU during the accession talks, to help enhance local policymaking for renewable energy, energy efficiency and energy prices. These discussions will also improve the country's participation in the EU 2030 Framework for Climate and Energy Policies and its contribution to global development.

SOUTH AFRICA

Figure 37
WEC's 2014 World Energy Issues Monitor: South Africa



South Africa continues to experience rapidly increasing electricity and liquid fuel prices and the pricing of both has a significant impact on the disposable income of consumers.

The South African economy is performing poorly as result of labour unrest, poor productivity, increasing prices and close links to the poorly performing economies of its trading partners. In addition, despite two successful rounds of renewable energy bids, electricity supply in the country remains tight. The coal-based programme to address this shortage is well behind schedule. Transport fuel costs are also increasing due to global oil prices and the weakening South African rand.

Electricity storage is one of South Africa's top critical uncertainties. Given the growing interest in solving the country's electricity shortage with renewable energy technologies, a viable energy storage solution becomes more critical.

Given that South Africa is now moving to the implementation of climate change mitigation measures (like carbon tax), there are high levels of uncertainty around the impacts that may emerge. In particular, uncertainty related to unintended consequences, and impacts on the economic and social structure, are creating concern.

Unconventional energy sources and the global recession are two areas that are ranked at similar levels of uncertainty on the South African issues monitor. The lack of clarity around the quantity and accessibility of fracked gas from the Karoo region means the future for unconventionals is uncertain. The impact of the global economy via South Africa's major trading partners, especially from Europe, places this issue in the 'uncertain' sector.

The most important need-for-action issues are:

1. China and India: These two economies are the primary growth driver for the global economy and China has become a major trading partner with South Africa.
2. Energy efficiency: The major challenge with this issue is not to simply reduce energy consumption. In order for South Africa to grow, the absolute quantum of energy needs to increase but the value created by this increased use of energy must also increase.
3. Smart grids: Given the growth anticipated in the generation of electricity by renewable sources as a result of the successful, government-driven roll-out of two renewable energy programmes, smart grid technology is a critical issue to resolve. Smart grids are also expected to contribute towards energy efficiency and play an important part of the long-term solution for electricity generation.

There have been a number of energy-efficiency awareness campaigns driven by the government and the public utility, Eskom, focusing on the critical shortage of electricity. The country has seen a sharp escalation in the price of electricity as well as liquid fuels and it is likely that these higher prices are driving the heightened focus on energy efficiency. The imminent implementation of a carbon tax is likely to reinforce the focus on this issue.

Another change on South Africa's energy monitor is a renewed focus on renewable energy. The renewable energy programmes driven by government have caused a shift in this issue.

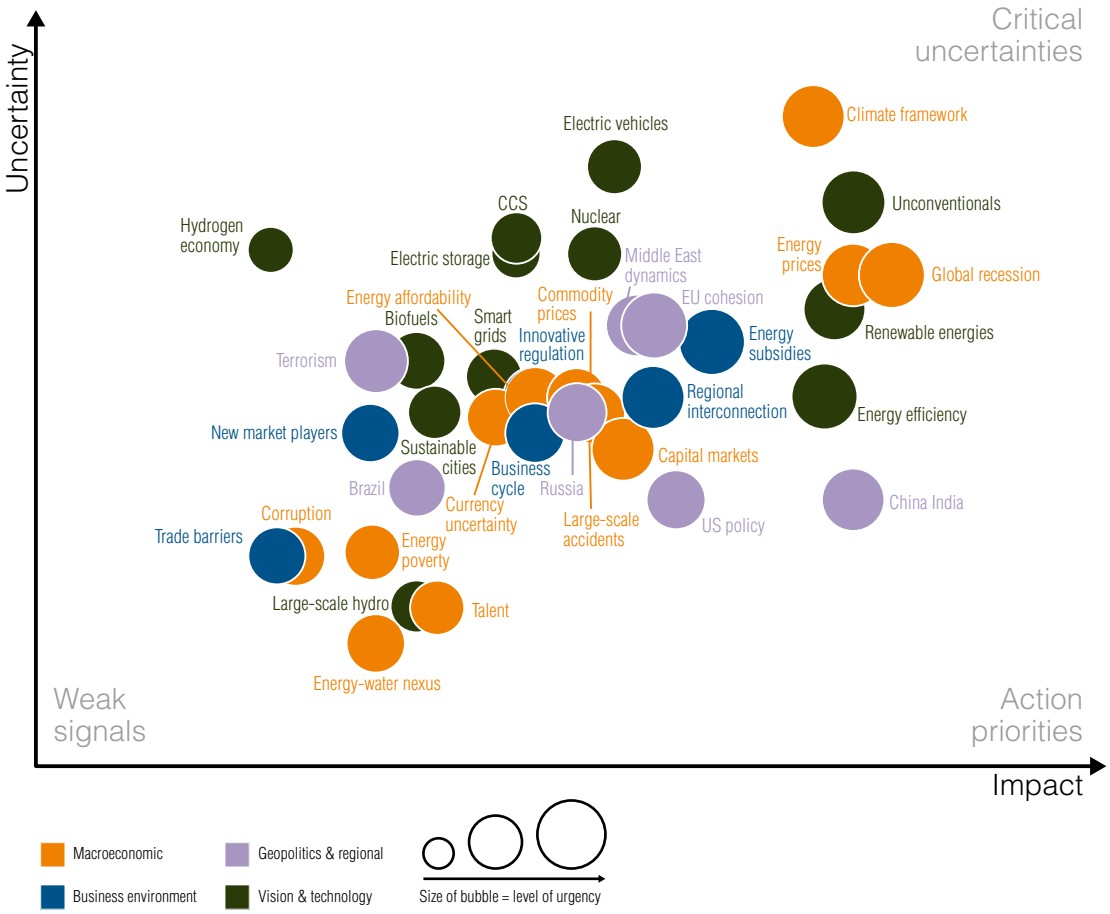
The proposed carbon tax and its impact on coal-based electricity generation and coal-based liquid fuels production is likely to create a change in the importance of CCS.

It is surprising to see how much lower the issue of energy poverty is ranked for South Africa compared to the African monitor. Also it is interesting to see that macroeconomic issues are seen to have a lower impact than in Africa and worldwide. When assessing the critical issues for Africa, it is interesting to see the role of macroeconomic factors dominating the critical uncertainties, with energy efficiency less certain an issue than in South Africa and globally.

The critical uncertainties highlighted on the energy issues monitor align with the areas of concern that South Africa is currently focusing on. This reaffirms that, by working on the WEC priorities, energy policy leaders in South Africa will support its energy goals for the future.

SPAIN

Figure 38
WEC's 2014 World Energy Issues Monitor: Spain



Spain faces a hectic yet challenging future. The economic recession suffered by the country in recent years has caused a significant energy demand decrease which has influenced the national energy agenda. Nevertheless, there has been recent evidence of economic recovery.

Spain has had a tariff deficit since 1997 and sustains an excess of power generation capacity. However, it is the Spanish government's intention to balance this deficit with new, recently approved energy reform policies.

Spain retains high energy dependence, mainly due to an energy mix mostly based on hydrocarbons (almost 65% of its primary energy demand). Because Spain's own hydrocarbon production is almost nonexistent, it is crucial to diversify the energy mix and to reinforce the production of indigenous resources.

The EU's objective of achieving an integrated energy market is a great opportunity for the country to improve its current status as an 'energy island' and to significantly improve its capacity through interconnection with the EU power grid shared with other member states.

The Spanish Issues Monitor shows three clearly defined clusters of issues. First are those issues which indicate 'weak signals' (such as trade barriers, corruption or hydrogen economy) and are lower-ranking priorities for the country. Second, the largest group (positioned in the centre of the monitor) show issues that are neither critical nor unimportant, but which have shifted toward the critical sector (such as energy affordability, capital markets and regional interconnection). Finally, the last cluster shows critical uncertainties and need-for-action issues, such as the global recession, unconventionals, climate framework, renewables and energy efficiency.

The global economic downturn is a critical uncertainty, not only for Spain, but also across Europe and worldwide. The global economic situation frames all the issues, to a greater or lesser extent.

Specifically for Spain, there is great concern in developing non-conventional energy resources, reflecting the uncertainty surrounding the development of shale gas/oil in Europe. Spain is watching this issue with interest. The expansion of unconventional resources also has an impact on energy prices and global commercial routes, thereby affecting Spanish energy imports.

The critical position of renewable energy on the monitor reflects the industry's desire to adapt and modernise the energy grid system while maintaining the country's long-term commitment to renewable and low-carbon energy. There is a concern related to energy prices, reinforcing the need to work gradually towards removing the tariff deficit without creating increases in the cost of electricity. This issue requires immediate attention in national policymaking.

The high degree of uncertainty for the climate framework could be due to the country's concern about the price of CO_2 – an issue under current debate in the European arena. It probably reveals that there is a lack of definition in the related climate targets for the medium-term and that, despite the tremendous efforts made in the field of renewables during the last decade, the country must retain its commitment to sustainable energy for the future.

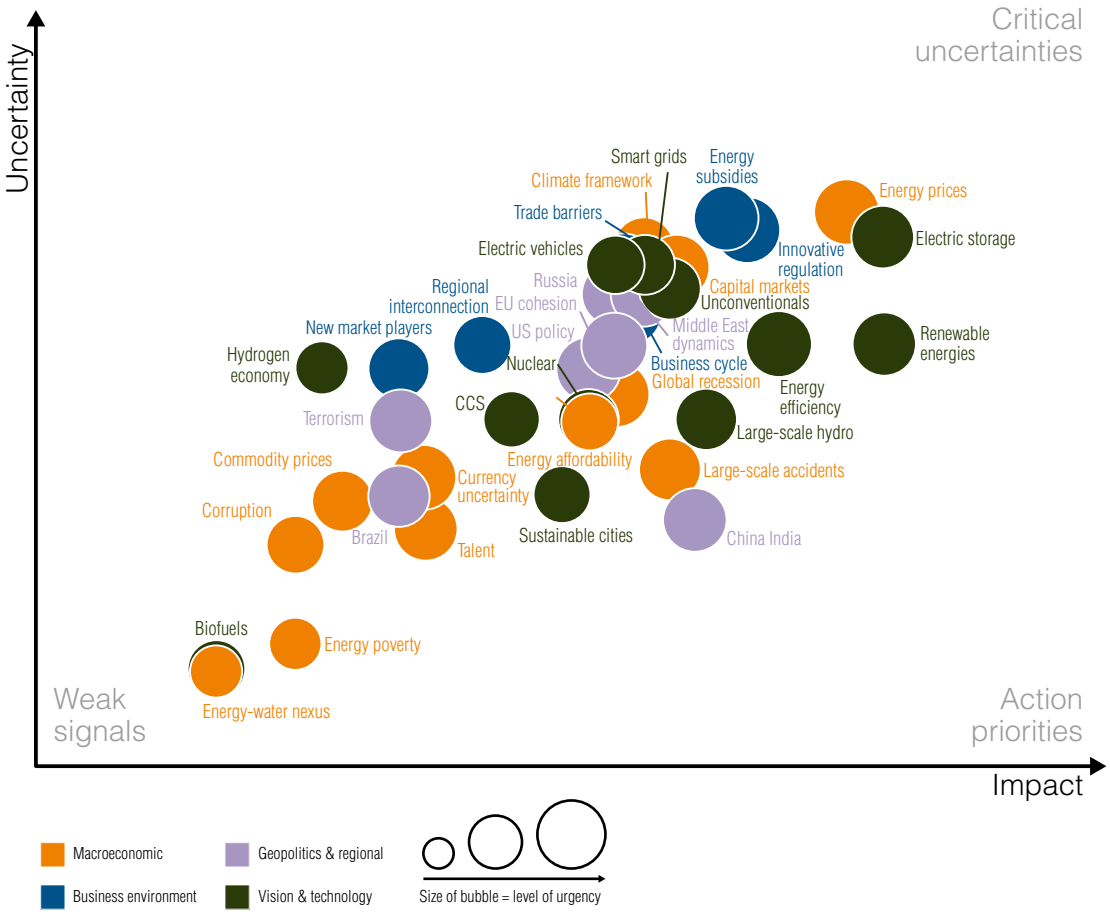
The most important need-for-action issue is energy efficiency. It is a top priority – as it is globally and for Europe. The Spanish government included energy efficiency as one of the main objectives of its 2013 energy reform policies. In doing so, the country aligns itself with the EU's objectives and seeks to balance the elements of the WEC's energy trilemma.

An immediate improvement of the bilateral relations with China and India is also a need-for-action issue. The growth potential in these relationships could create new ways of energy development for the sector-related Spanish companies. The country's past and current experience with Latin American countries might serve as a guide that would give Spain a crucial advantage in enhancing these bilateral relations.

Surprisingly, the regional interconnection in the centre of the Spanish monitor does not reflect the importance of the issue as a key factor in the integration of Spain in the European energy market.

SWITZERLAND

Figure 39
WEC's 2014 World Energy Issues Monitor: Switzerland



The Swiss Issues Monitor 2014 shows a concentration on three important and critical issues: energy prices, electric storage and renewable energies. Geopolitics has moved into the background, along with nuclear energy.

In September 2013 the Swiss government's final Energy Strategy 2050, which includes intermediate objectives until 2035, was submitted to parliament. It now contains more changes concerning the sectors mobility (European emissions standards) and heating and cooling (intensified energy-focused building refurbishment), but for the most part, it is still aimed at a rapid change in electricity production.

Until now, Switzerland has mainly produced its electricity without CO_2 emissions: up to 60% being hydro and up to 40% nuclear. The Swiss Energy Strategy does not propose closure of existing nuclear power plants, but has abandoned the construction of new ones based on today's technology (generation III). The strategy aims to develop energy-efficiency measures and foster renewable electricity production. It also intends to rely partly on gas-fired electricity. Furthermore, the electricity grid has to get smarter, to be redesigned and strengthened. For now, however, there are few incentives to invest in the electricity sector.

If parliament passes the proposal in 2014 or 2015, there is likely to be a referendum in which Swiss citizens will have to accept or reject the strategy and its legal consequences.

The Swiss parliament has proposed and adopted a law (in June 2013) stipulating that energy-intensive companies can be relieved from feed-in tariff remuneration at cost. This legislation has been adopted much faster than as anticipated in the government's Energy Strategy 2050.

Energy prices have been affected by the feed-in tariff remuneration at cost and low-cost electricity development in Germany. There are also increasing and distorted final prices influenced by state subsidy measures, with adverse impacts on Germany's neighbouring countries. As a consequence, electricity storage is a top priority issue in Switzerland. The water stored in its reservoir lakes has played an important part in generating hydropower, but these are no longer profitable under the current circumstances.

Renewable energies, an important necessity in the energy mix, also face an uncertain future following the proposed nuclear phase-out. This will be critical to meeting the aims of the climate framework.

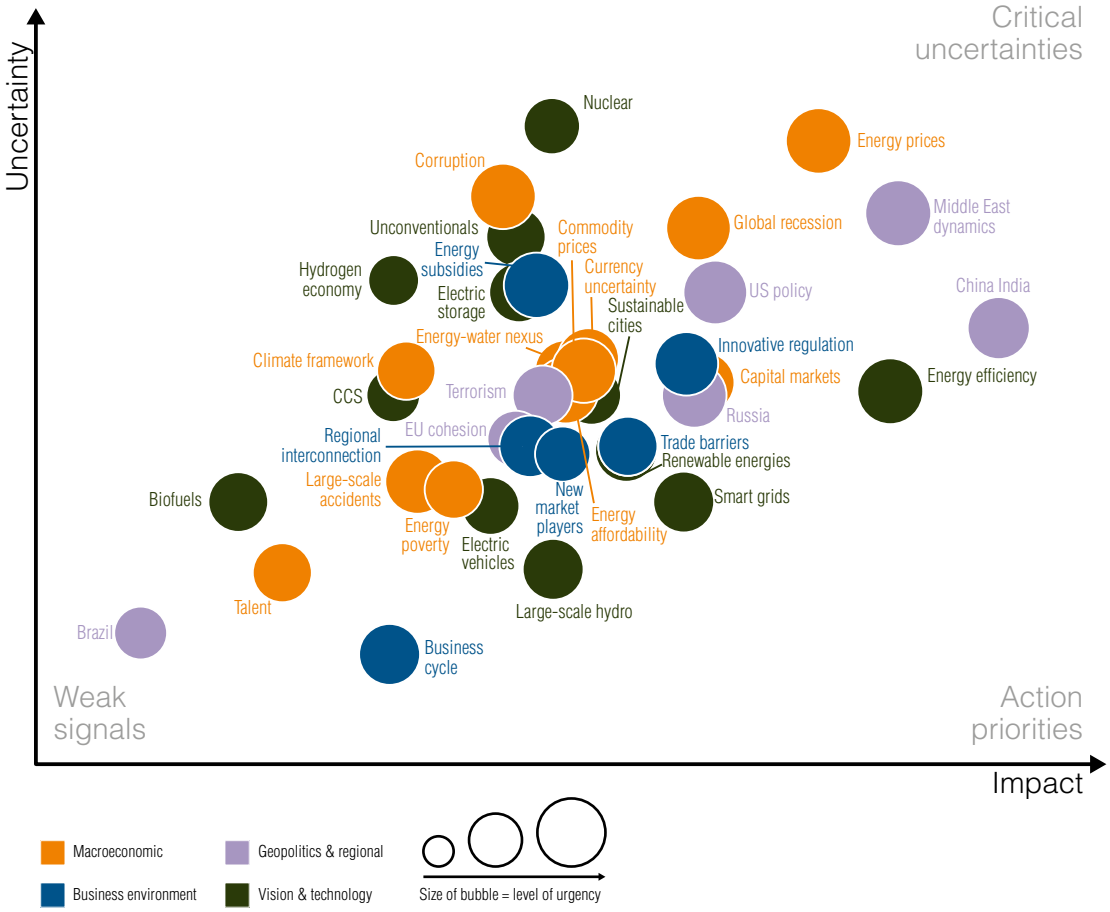
One way to counteract rising energy prices as well as meet the climate framework obligations is to focus on energy efficiency. This will be an increasingly important issue for Switzerland as it becomes a priority in Europe in light of the global economic situation.

While the accidents at Fukushima and Macondo have diminished unconventionals and nuclear as priority issues, regional interconnection and renewable energy have risen as high-priority issues Europe-wide. Therefore, the development of smart grids and new energy production infrastructures are emerging issues.

Uncertainties around innovative regulation and price subsidies contribute to concerns about energy prices and the electric storage problems. It is surprising that the topic of a new market design has not been recognised as a strong need-for-action issue. A stronger approach to more innovation in energy regulation systems is needed.

TURKEY

Figure 40
WEC's 2014 World Energy Issues Monitor: Turkey



Energy prices are considered the issue of the most critical uncertainty in Turkey. This issue relates to the country's high rate of taxation for energy consumption, with 65% taxes on gasoline prices.

About 73% of energy consumption in Turkey comes from imported energy which represented, in 2012, a cost to the country of more than $60bn. The surging capital markets have had a direct impact on petroleum and other fossil fuels and uncertainties in these markets directly affect fluctuations in energy prices. The increased volatility of energy prices has had a strong impact on the economy and on Turkish energy consumers making the issue the most critical uncertainty and becoming a priority area for the energy leaders within the country.

Geopolitics and dynamics in the Middle East are another set of issues with a high degree of uncertainty, given the proximity with Turkey and the ongoing political unrest in the region which puts significant risk and the need for necessary mitigation on the agenda of energy leaders in Turkey. In contrast to the rest of Europe, geopolitical developments in China and India are also important for the Turkish energy scene given the extent of investment from China on energy infrastructure within Turkey.

While the availability of skilled energy personnel, or energy talent, is an uncertainty in Turkey and across Europe, the deficiency of talent in the energy sector is not considered the greatest challenge in Turkey, because of the country's relatively young and educated population, ready to take up employment opportunities – reinforced by the issue's position as a weak signal.

The lack of progress on a climate framework agreement is an issue of concern, but strongly differentiated at the national level in comparison to both the regional and global, by the perception in Turkey of a far more limited impact and lack of urgency.

Surprisingly, despite the relatively high frequency of accidents in the industry, large-scale accidents are not regarded as an important issue. Such perceptions may be closely linked to the uncertainty surrounding nuclear development in a post-Fukushima context, which, given the absence of nuclear power stations in Turkey, may be the justification for its positioning as a weak signal.

A further geopolitical issue to note is the positioning of cohesion in the EU, which is regarded as a matter of high involvement but with limited impact at present reflecting Turkey's ongoing dialogue for full membership of the EU.

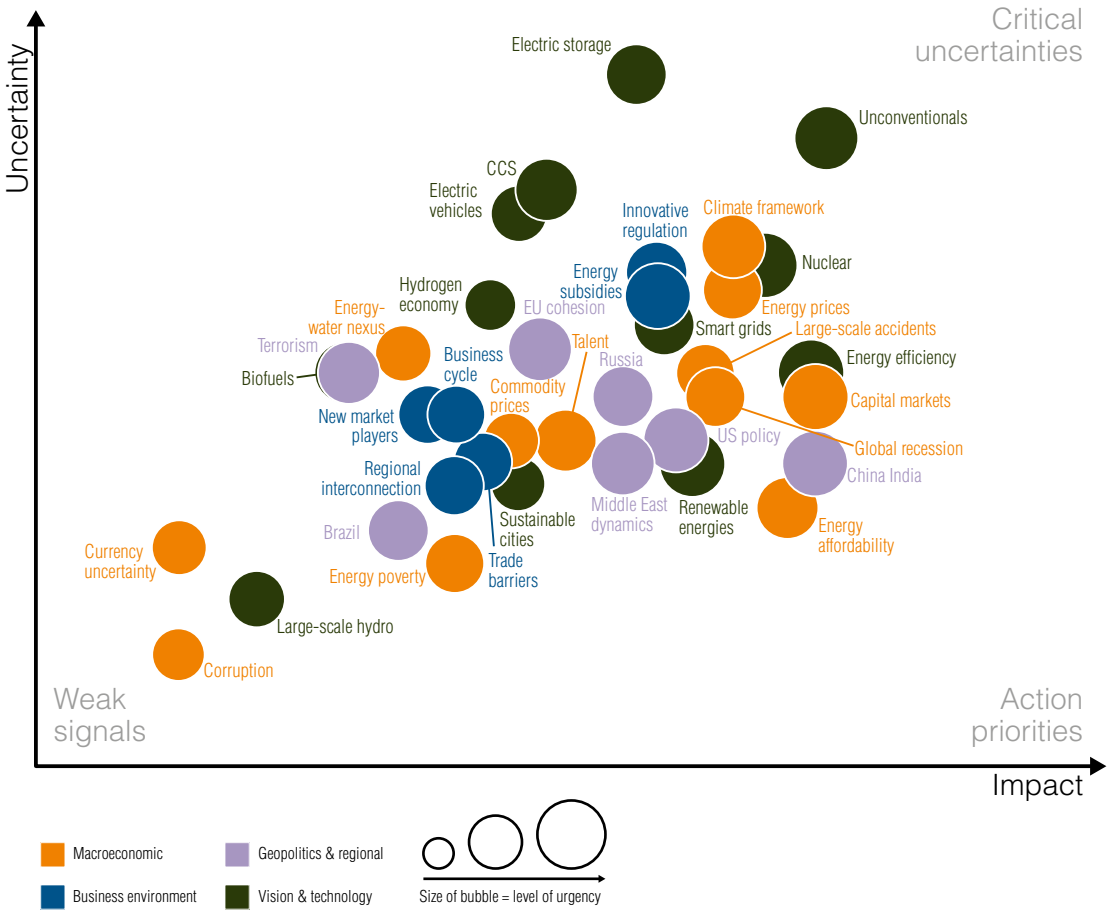
Innovative regulation is a priority for the business environment as it can help to attract investors. The liberalisation of energy markets in Turkey started 10 years ago. As a result, the relatively new market needs clear and comprehensive regulation.

Energy efficiency is identified as a high-impact issue which requires immediate action both in Turkey and the broader European region. This factor will have important implications for the development of energy policies in the future. Moreover, research into energy efficiency in Turkey indicates that there is huge potential for further increasing the efficient use of energy. The current regulation regime for energy efficiency is deemed to be satisfactory.

Uncertainty around the use of nuclear power plants in Turkey is ongoing as the country tries to meet growing energy demands while fulfilling environmental targets. Turkey has been developing new hydropower projects which are mostly complete but more large-scale sources of power generation are needed to meet the goals of energy security, access and environmental sensitivity.

UNITED KINGDOM

Figure 41
WEC's 2014 World Energy Issues Monitor: United Kingdom



Recent developments in the United Kingdom (UK) have been influenced by many factors in 2013, including extreme political and public sensitivity to the increase in energy bills, demonstrated by the issue of energy prices as a critical uncertainty within the national monitor for the UK. The focus on energy costs has caused some questioning of the need for renewable energy, especially the more expensive forms. The closure of several power stations has increased the awareness and understanding of the risk to existing electricity supply due to lack of investment in future electricity generation. This corresponds to the issue of access to capital having an extremely high impact, in the action priority zone of the monitor. The UK energy landscape has also been affected by the implementation of the government's Electricity Market Reform policies. The way UK Electricity Market Reform is implemented, especially the contracts for differences and the capacity mechanism, will have major consequences for the market in the future – factors which account for the positioning of innovative regulation as another critical uncertainty at the top of energy leaders' agendas within the UK.

The top critical uncertainties for the UK also include the level of future electricity demand. This will have a major impact on the security of energy supply. There is also uncertainty around the level of carbon pricing. There is much opposition to the UK carbon price support

mechanism and the Emission Trading Scheme is not generating a meaningful price at present. The development of low-carbon electricity will be affected, not least through the government's Levy Control Framework.

Action issues for the UK include the commitment to public funding of CCS projects, if it is to move from an issue of extreme uncertainty as in the current monitor. This would enable fossil fuels to continue to be used in a low-carbon future. The UK must also address the lack of investment in the energy sector. To encourage investment, clarity and consistency is needed in public policy and in the structure of the retail electricity market, the nature of regulation, the future of 'green levies', and around the funding of CCS.

There is a need for political stability and predictability, but this is unlikely to happen until after the UK's general election in 2015.

Important issues and innovations to note include the UK's mandatory smart meter rollout, in line with the higher perceived impact for the issue of smart grids for the UK versus the European and global level, as well as the introduction of the Green Deal energy scheme to help homes and businesses make energy-saving improvements, and the creation of the world's first Green Investment Bank to fund sustainable projects. New retail market regulation, including limitations to the number of available tariffs, has been implemented with the intention of making the market clearer, simpler and fairer.

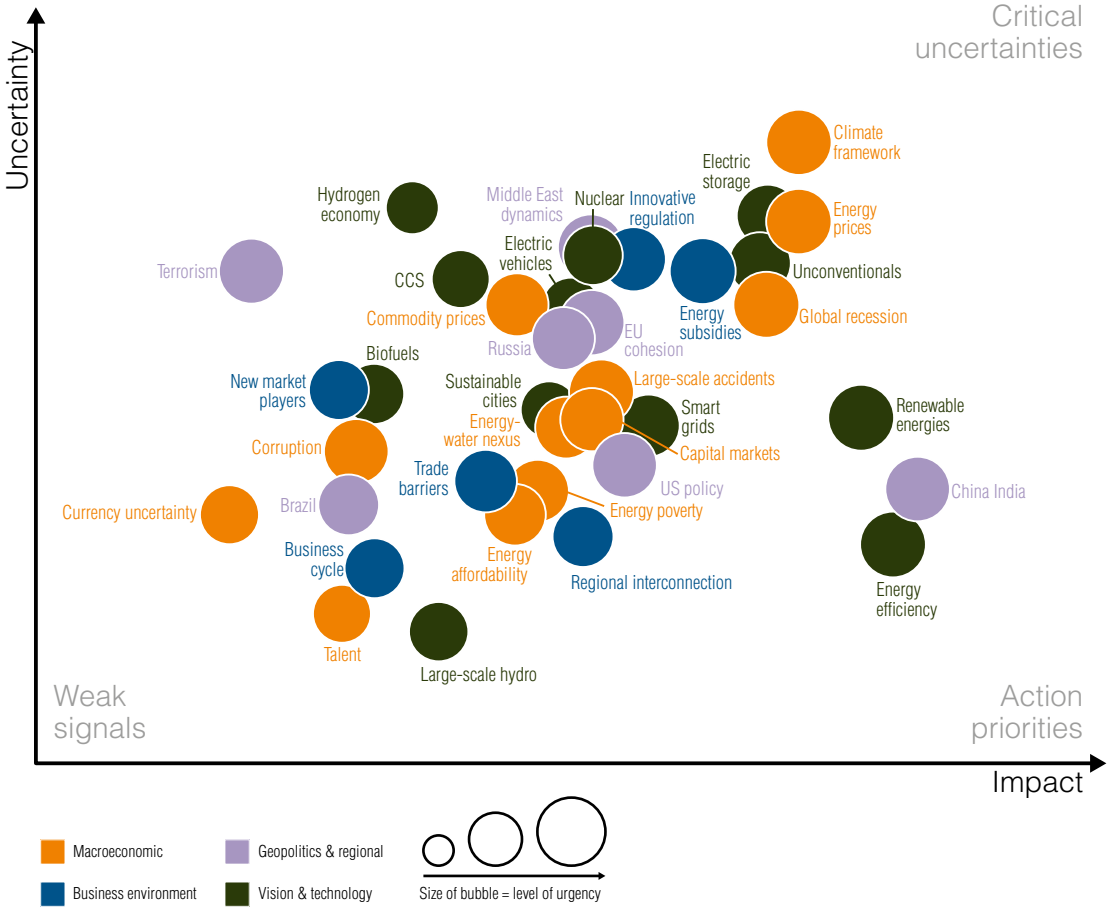
6

Assessing the Future Energy Leaders' agenda

Assessing the Future Energy Leaders' agenda

WEC's Future Energy Leaders (FELs) are a global community of young professionals who share a commitment to shaping the global energy future. Made up of 100 carefully selected young professionals from diverse sectors, in over 40 different countries, FELs represent the future of energy leadership. FELs participate in network activities through a designated programme that enables them to further their experience, knowledge and skills in an energy-focused environment, contributing to WEC's global dialogue and helping to shape energy solutions for tomorrow. The WEC looks at its community of next generation leaders to inform the energy debate through their fresh thinking, innovative ideas and new approaches to business.

Figure 42
WEC's 2014 World Energy Issues Monitor: Future Energy Leaders



The climate framework, serving to consolidate global efforts to reduce pollutants and mitigate negative impacts of climate change, remains the primary critical uncertainty for the FELs community. While the negative impacts of climate change are now widely (though not universally) acknowledged, the actual consequences are difficult to predict. The lack of collective commitment from the global community to address these issues leaves the FELs community facing two major uncertainties:

- How best to tackle challenges associated with climate change.
- How best to determine which policies should be implemented at global and national levels.

Macroeconomic factors such as energy prices, for example, are clear signals that the global recession remains high on the FELs agenda. As prices of primary energy resources decline, the appeal and interest in investing in new technology developments also declines. It is important to note, however, that high energy prices can prevent people from directly accessing energy, which in turn contributes to ongoing energy poverty.

FELs pay much attention to advancements in electric storage and the development of unconventional resources. If such technologies become widespread, electric storage could become a game-changer. Indeed, as storage technologies grow, the need for peak electricity production will decline. However, this is likely to require more power production overall because of the increased use of electric vehicles in cities.

In contrast to the global monitor, which cites renewable energies as a critical uncertainty, the FEL perspective identifies renewables in the need-for-action space. This suggests the FEL outlook for renewables is more positive than that of the existing generation of energy leaders and that future leaders believe the development of renewables will have a significant impact on the future global energy mix.

Related to renewable development, though perceived with much less certainty, is the issue of energy subsidies. Like the existing energy leaders, this issue is identified in the top-right quadrant of the monitor and is considered to be a critical uncertainty. Improved access to effective energy subsidies will facilitate innovation and research. Ineffective subsidies can, however, create market signals which result in negative social outcomes and should be avoided. Further development of renewable energy technologies will require upgrading existing power grid systems in order to successfully manage decentralised power generation and distribution.

Surprisingly, FELs do not identify terrorism and corruption as critical long-term barriers to energy development. Unfortunately, many countries are still suffering from these problems. Equally surprisingly, FELs do not view lack of talent as an issue that requires immediate attention. There may be many reasons for this view, but one explanation suggests that FELs are more ready to pool together their resources in order to tackle today's energy challenges.

Finally, the FELs outlook identifies a need for further investment into advancing energy-efficient technologies. Long-term, market-driven price signals will drive these investments and innovation. New technologies will play a fundamental role in meeting the growing energy demand from the emerging countries, providing clean, affordable and reliable energy for all.

PROJECT PARTICIPATION

Thanks go to all the WEC national member committees for their active participation in the development of the 2014 World Energy Issues Monitor. Further thanks go to the WEC regional Vice Chairs for their support in the regional assessments and to each of the energy leaders, experts and policymakers who kindly provided their insights on an anonymous basis.

Principle Contributors/Project Team of the World Energy Council

Christoph Frei (Secretary General); Latsoucabé Fall (Regional Manager, Africa); J.K. Mehta (Regional Manager, South Asia and Asia Pacific); Slav Slavov (Regional Manager, Europe); Paul Mollet (Regional Manager, Middle East, Gulf States and North Africa); Nicolás Depetris Chauvin (Regional Manager, Latin America and the Caribbean); Stuart Neil (Senior Director); John Bourne (Senior Manager); Ori Chandler (Senior Manager); Florence Mazzone (Senior Manager); Yoshiyuki Tsuji (Director)

National Monitoring and Assessment contributing member committees of the World Energy Council

Bulgaria; Colombia; Estonia; France; Germany; India; Indonesia; Italy; Japan; Latvia; Lebanon; Lithuania; Mexico; New Zealand; Nigeria; Poland; Portugal; Romania; Serbia; South Africa; Spain; Switzerland; Turkey; United Kingdom

FEL Advisory Board Contributors

Nathan Bittle (New Zealand); Bruno Benedetti (Canada); Anna Illarionova (Russia)

Project Management

John Bourne (Senior Manager, World Energy Council)

Member Committees of the World Energy Council

Albania
Algeria
Argentina
Austria
Bahrain
Belgium
Bolivia
Botswana
Brazil
Bulgaria
Cameroon
Canada
Chad
China
Colombia
Congo (Democratic Republic)
Côte d'Ivoire
Croatia
Cyprus
Czech Republic
Denmark
Egypt (Arab Republic)
Estonia
Ethiopia
Finland
France
Gabon
Germany
Ghana
Greece
Hong Kong, China
Hungary
Iceland
India
Indonesia
Iran (Islamic Republic)
Iraq
Ireland
Israel
Italy
Japan
Jordan
Kazakhstan
Kenya
Korea (Republic)
Kuwait
Latvia
Lebanon
Libya
Lithuania
Luxembourg
Mexico
Monaco
Morocco
Namibia
Nepal
Netherlands
New Zealand
Niger
Nigeria
Pakistan
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Romania
Russian Federation
Saudi Arabia
Senegal
Serbia
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Swaziland
Sweden
Switzerland
Syria (Arab Republic)
Taiwan, China
Tanzania
Thailand
Trinidad & Tobago
Tunisia
Turkey
Ukraine
United Arab Emirates
United Kingdom
United States
Uruguay
Zimbabwe

Patrons of the World Energy Council

Alstom
Bloomberg New Energy Finance
Electricité de France
Emirates Nuclear Energy Corporation
Eskom
GDF SUEZ
GE Power and Water
Hydro-Québec
Korea Electric Power Corp.
Oliver Wyman
PricewaterhouseCoopers
Saudi Aramco
Siemens AG
SK Innovation
Tokyo Electric Power Co.
Verbundnetz Gas AG

The World Energy Council (WEC) is the principal impartial network of leaders and practitioners promoting an affordable, stable and environmentally sensitive energy system for the greatest benefit of all. Formed in 1923, WEC is the UN-accredited global energy body, representing the entire energy spectrum, with more than 3000 member organisations located in over 90 countries and drawn from governments, private and state corporations, academia, NGOs and energy related stakeholders. WEC informs global, regional and national energy strategies by hosting high-level events, publishing authoritative studies, and working through its extensive member network to facilitate the world's energy policy dialogue.

Further details at **www.worldenergy.org** and **@WECouncil**

To view the World Energy Issues Monitor online, scan below

World Energy Council
Regency House 1–4 Warwick Street
London W1B 5LT United Kingdom
T (+44) 20 7734 5996
F (+44) 20 7734 5926
E info@worldenergy.org
www.worldenergy.org

For sustainable energy.
ISBN: 978 0 946121 34 2