Trends in Energy – Alerts for South Africa

by

Brian A Statham

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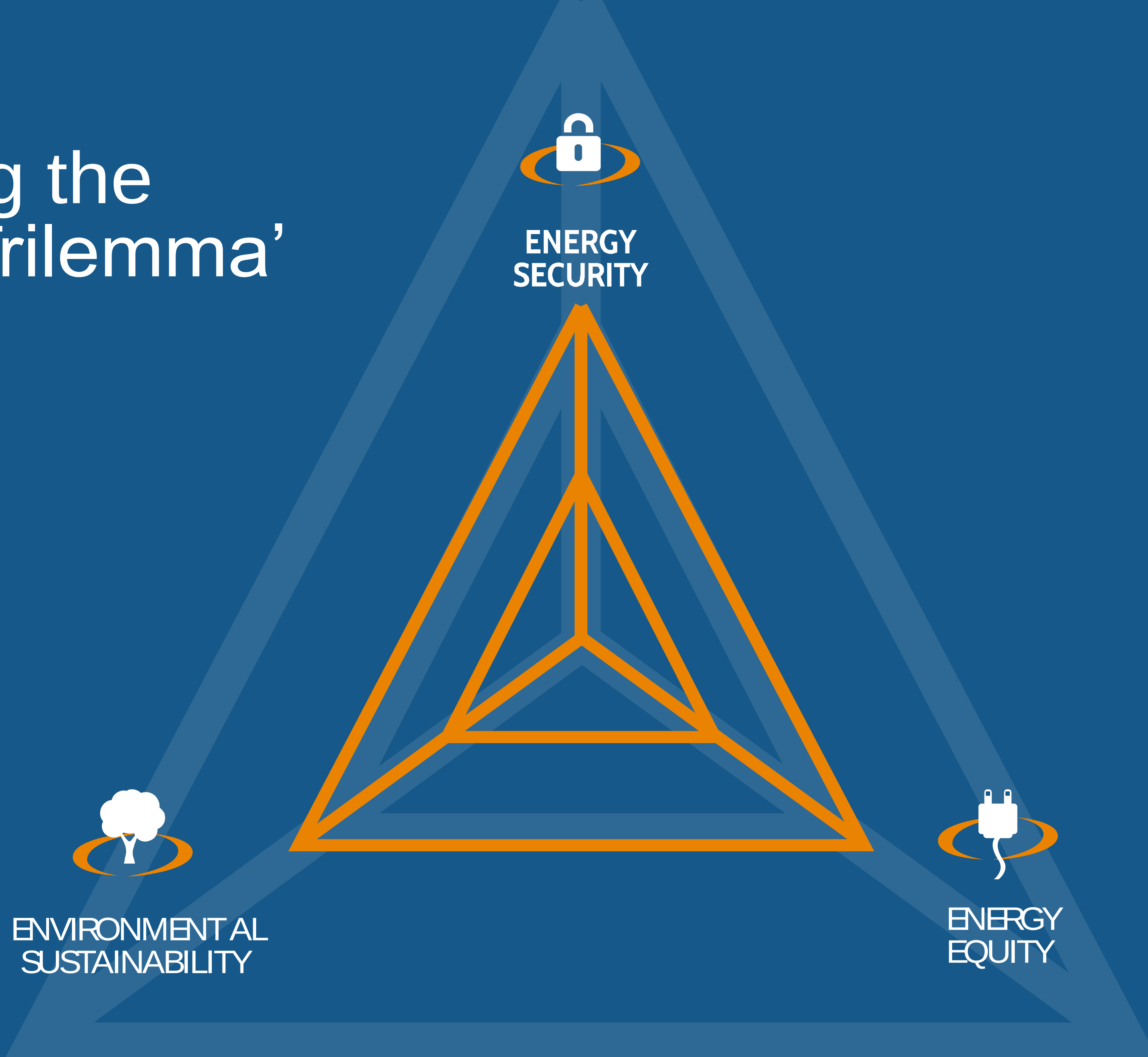
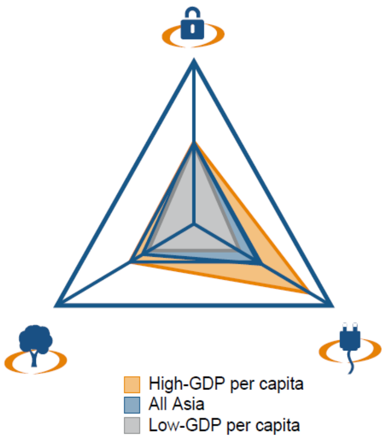
Time for Action!

- Consider where South Africa is relative to
  – Global situation
  – Sub Saharan Africa
- Important to understand perspectives and implications

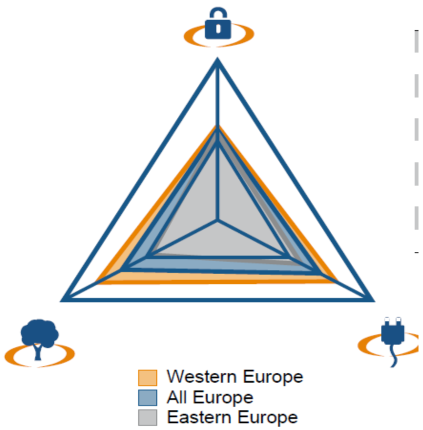
Balancing the 'Energy Trilemma'



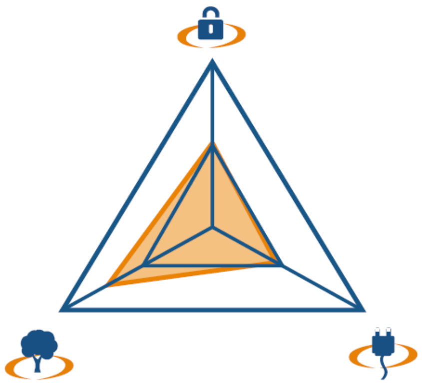
REGIONAL OUTCOMES



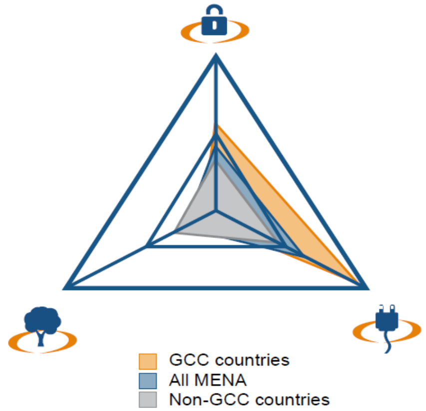
Asia



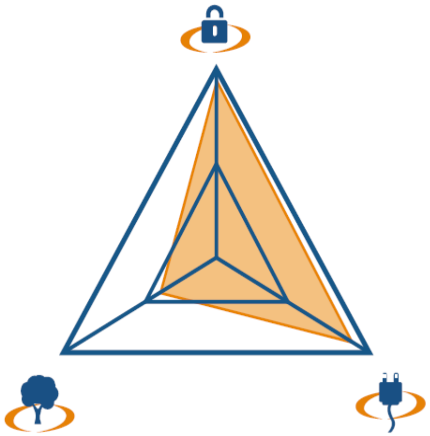
Europe



Latin America



Mid-East & N Africa



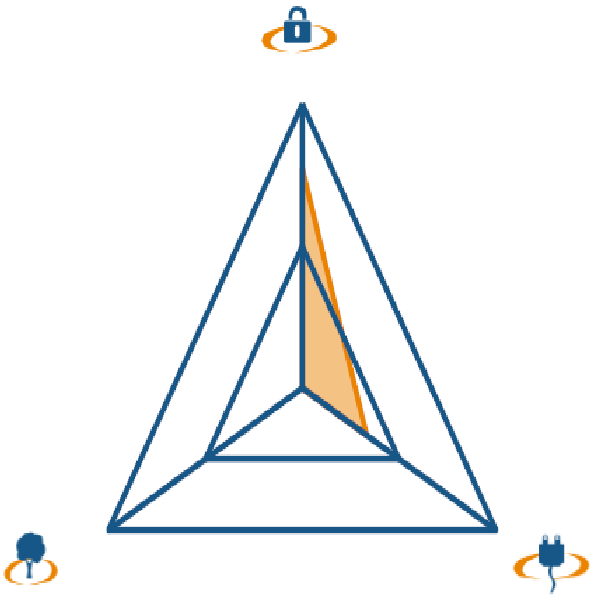
North America

Sub-Saharan Africa

BRICS COUNTRIES

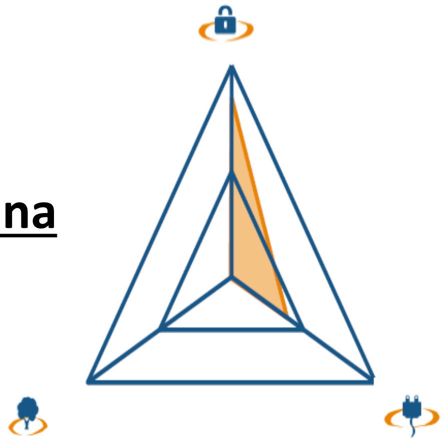
Brazil

Russia

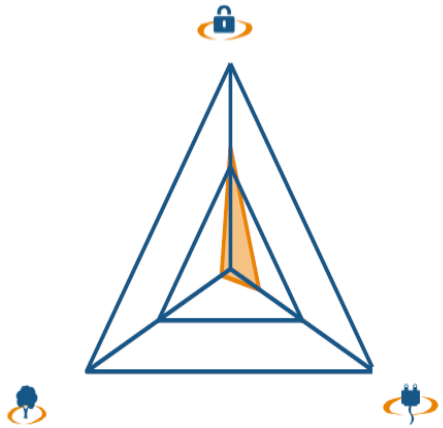


South Africa

China



India



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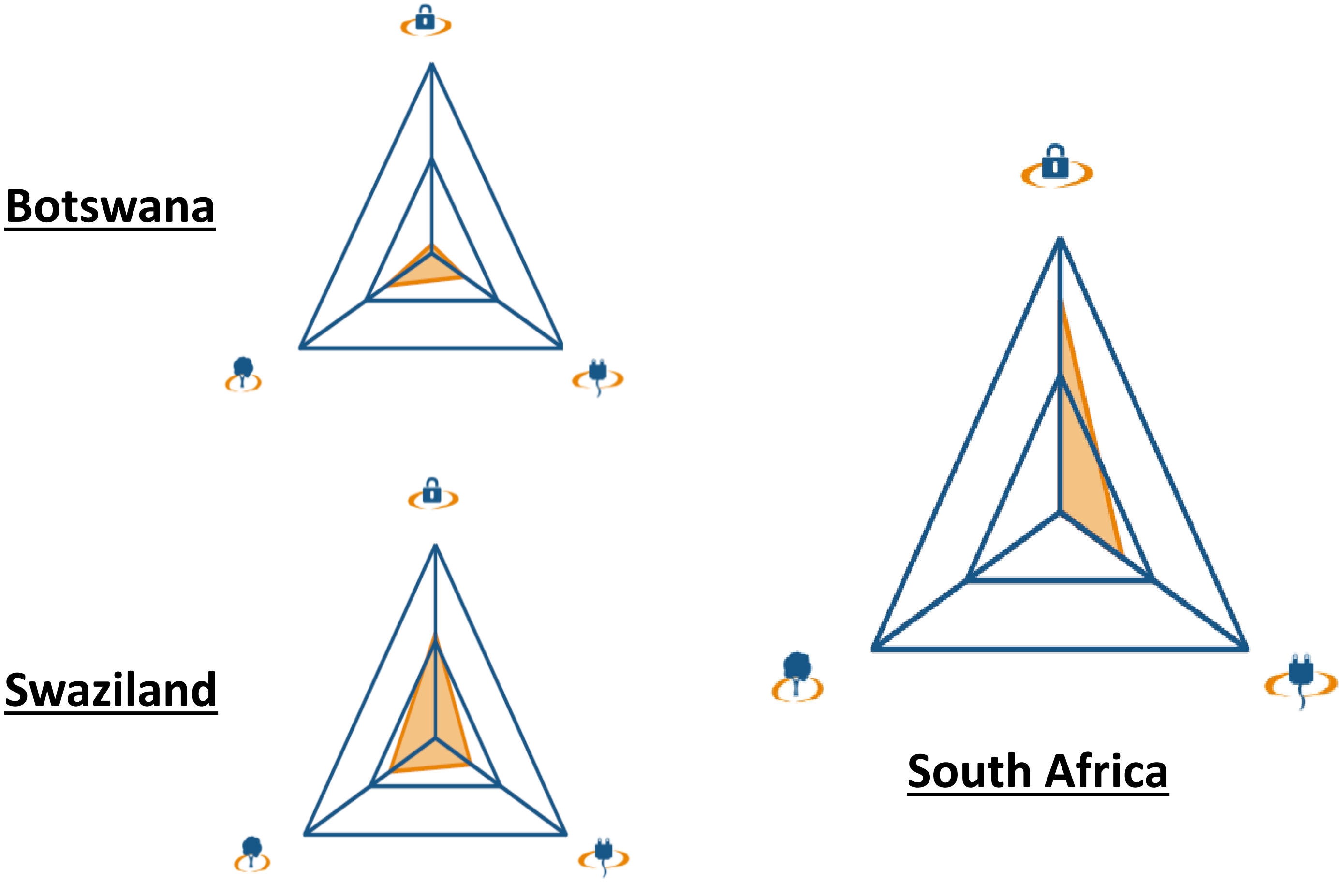
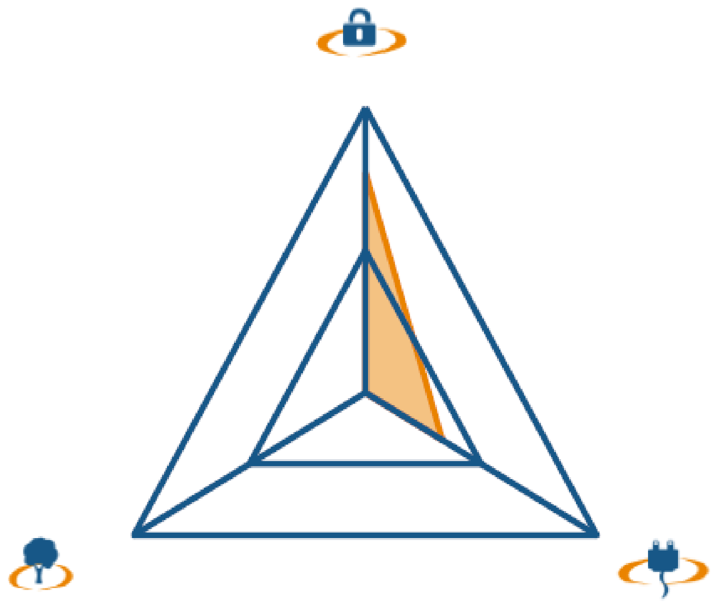
NEIGHBOURING COUNTRIES



SOUTH AFRICA

TRILEMMA BALANCE



INDEX RANKINGS AND BALANCE SCORE

	2013	2014	2015	Trend	Score
Energy performance	93	96	93	→	
Energy security	43	42	30	→	B
Energy equity	78	85	87	→	C
Environmental sustainability	128	129	130	→	D
Contextual performance	51	46	45	→	
Political strength	52	53	55	→	
Societal strength	84	76	76	↑	
Economic strength	20	24	26	→	
Overall rank and balance score	**79**	**83**	**84**	→	**BCD**

AFRICA RANKING

WORLD ENERGY COUNCIL ENERGY TRILEMMA RANKINGS 2015 - AFRICA		
COUNTRY	**RANK**	**BALANCE**
Mauritius	41	ABD
Gabon	42	AAC
Algeria	57	BBC
Ghana	70	BBD
Tunisia	71	BBC
Cameroon	73	ABD
Cote d'Ivoire	75	ACD
Namibia	78	BCD
Nigeria	79	ACD
Chad	80	BBD
Angola	83	ACD
South Africa	***84***	***BCD***
Egypt	85	BBC
Swaziland	92	BCC
Congo (Dem Rep)	96	BBD
Botswana	99	CDD
Morocco	100	CCD
Mozambique	104	BCD
Ethiopia	105	BCD
Macedonia	106	CDD
Zambia	109	BDD
Kenya	111	BDD
Mauritania	118	CCD
Tanzania	119	BDD
Libya	120	CCD
Madacascar	121	BDD
Niger	122	BDD
Malawi	124	BDD
Zimbabwe	125	CDD
Senegal	129	DDD

Balance

- Security
- Equity
- Sustainability

Energy Issues Maps 2015

[Published 2016]

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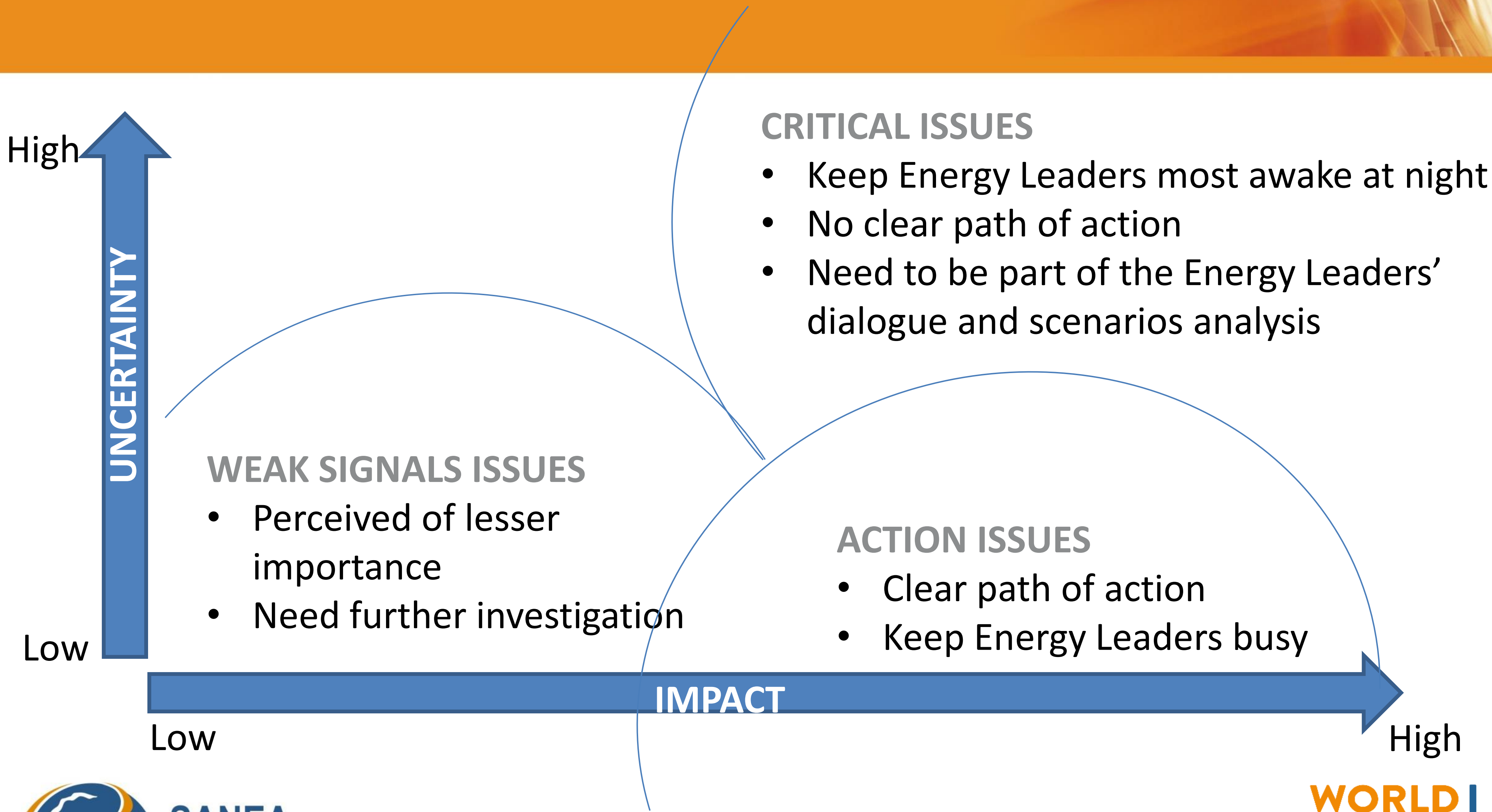
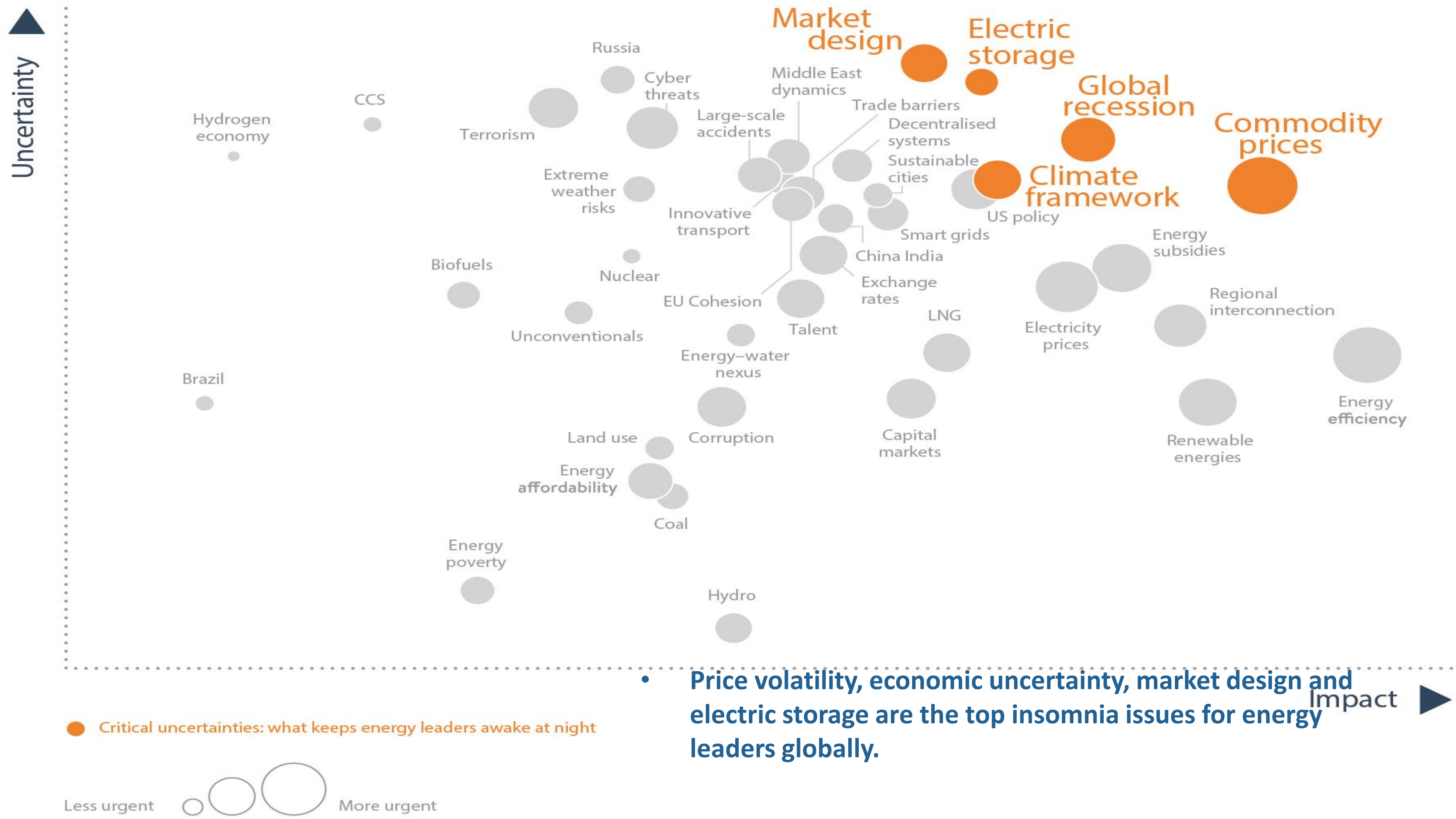
How to read the Energy Issues maps ?

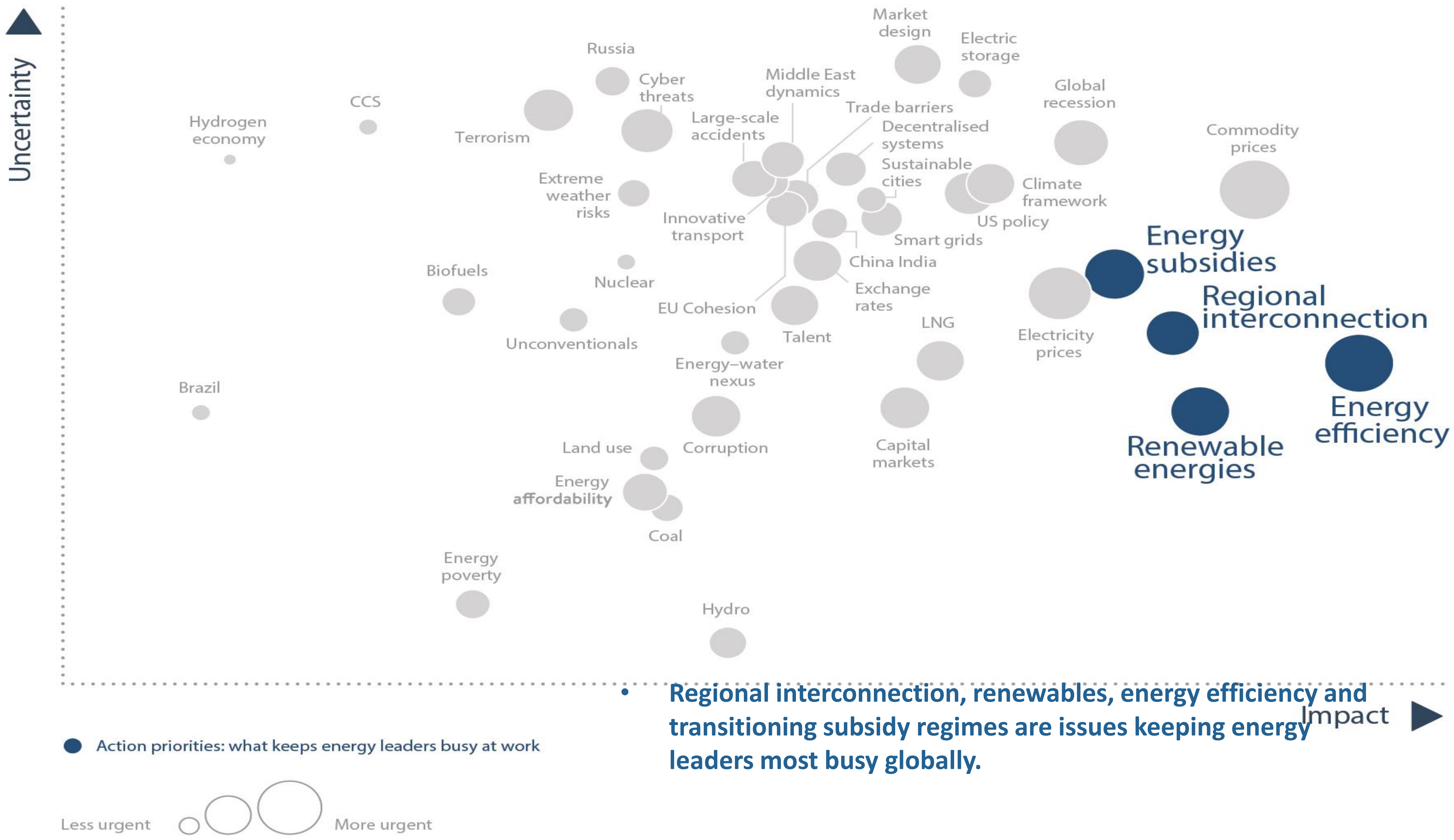


What keeps energy leaders awake at night? Global 2016



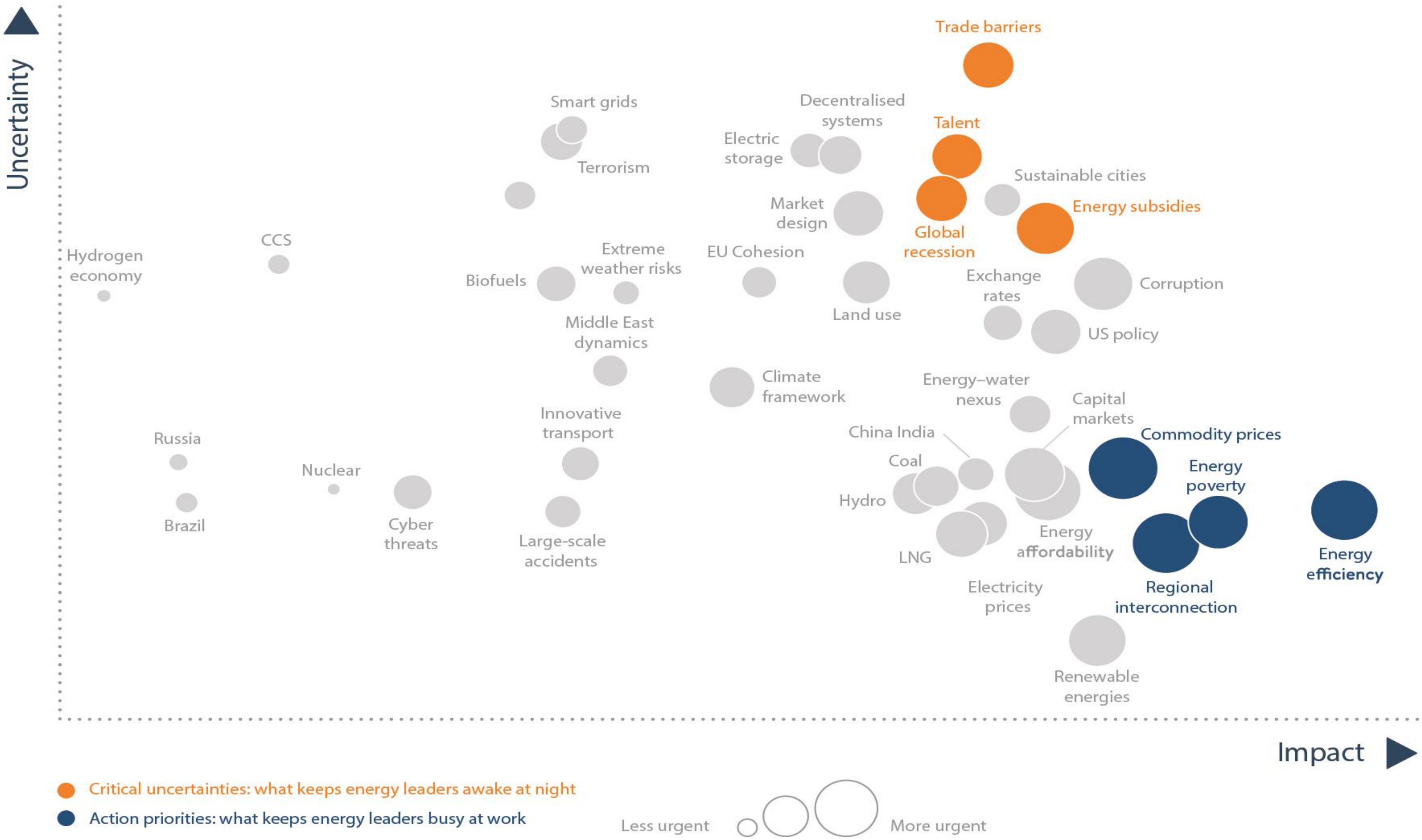
- **Price volatility, economic uncertainty, market design and electric storage are the top insomnia issues for energy leaders globally.**

What keeps energy leaders busy at work? Global 2016

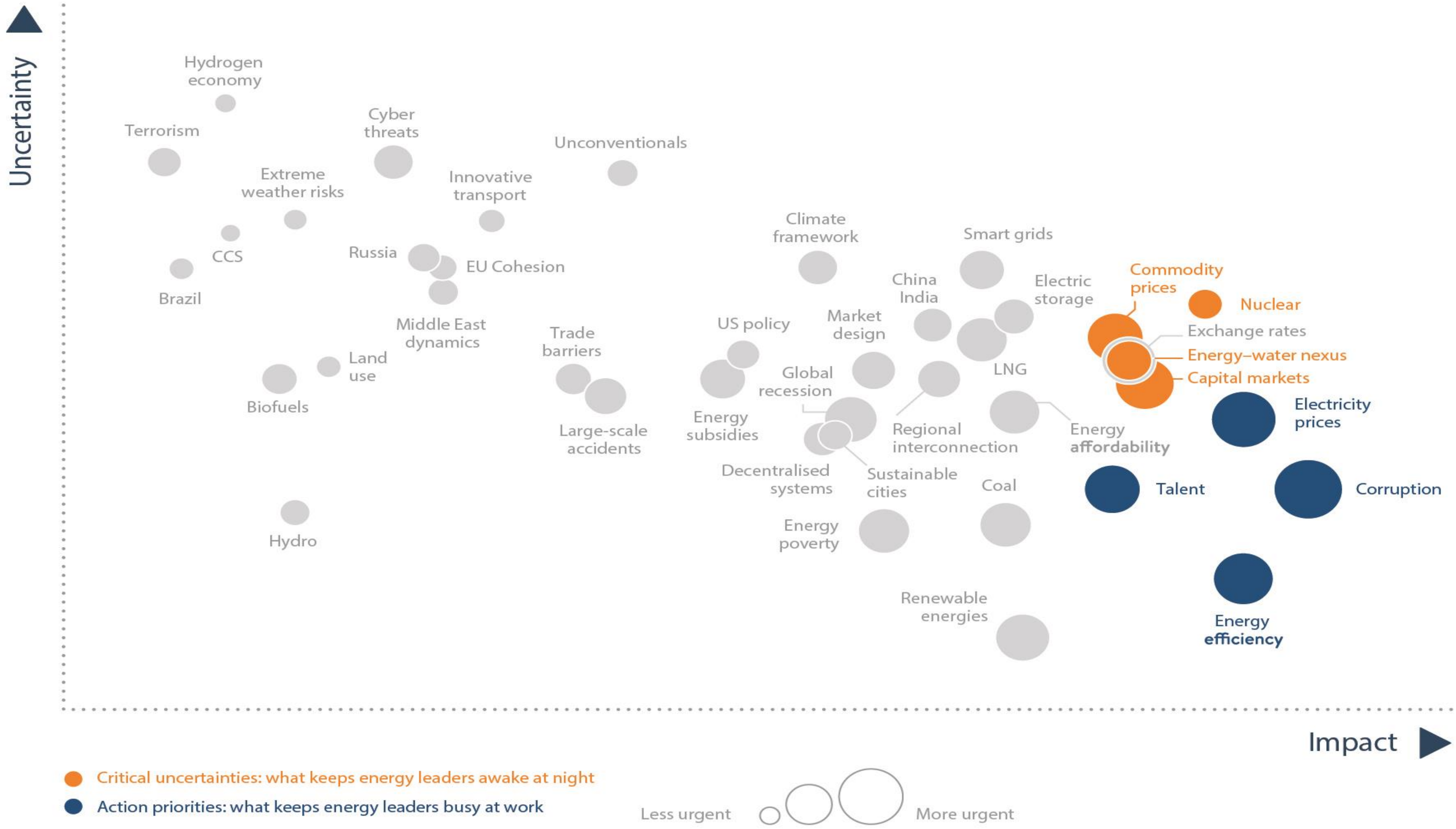


- **Regional interconnection, renewables, energy efficiency and transitioning subsidy regimes are issues keeping energy leaders most busy globally.**

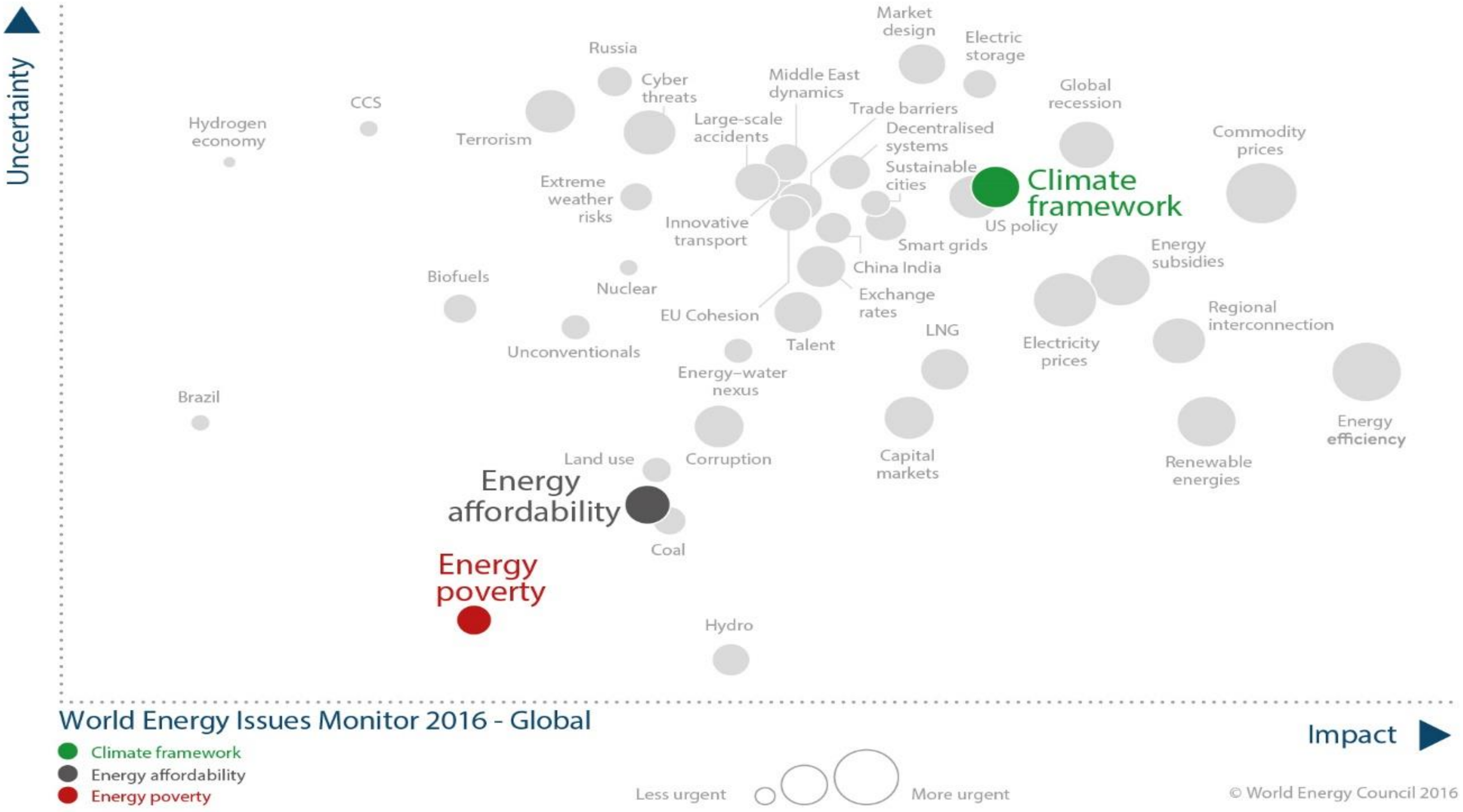
Critical uncertainties and action priorities Africa 2016



South Africa 2016



Global



Uncertainty
Market design
Electric storage
Russia
Cyber threats
Middle East dynamics
Global recession
CCS
Hydrogen economy
Terrorism
Large-scale accidents
Trade barriers
Decentralised systems
Commodity prices
Sustainable cities
Climate framework
Extreme weather risks
US policy
Innovative transport
Smart grids
Energy subsidies
Biofuels
Nuclear
China India
Exchange rates
EU Cohesion
Regional interconnection
LNG
Electricity prices
Unconventionals
Talent
Energy–water nexus
Brazil
Energy efficiency
Land use
Corruption
Capital markets
Renewable energies
Energy affordability
Coal
Energy poverty
Hydro
World Energy Issues Monitor 2016 - Global
Impact
Climate framework
Energy affordability
Energy poverty
Less urgent
More urgent
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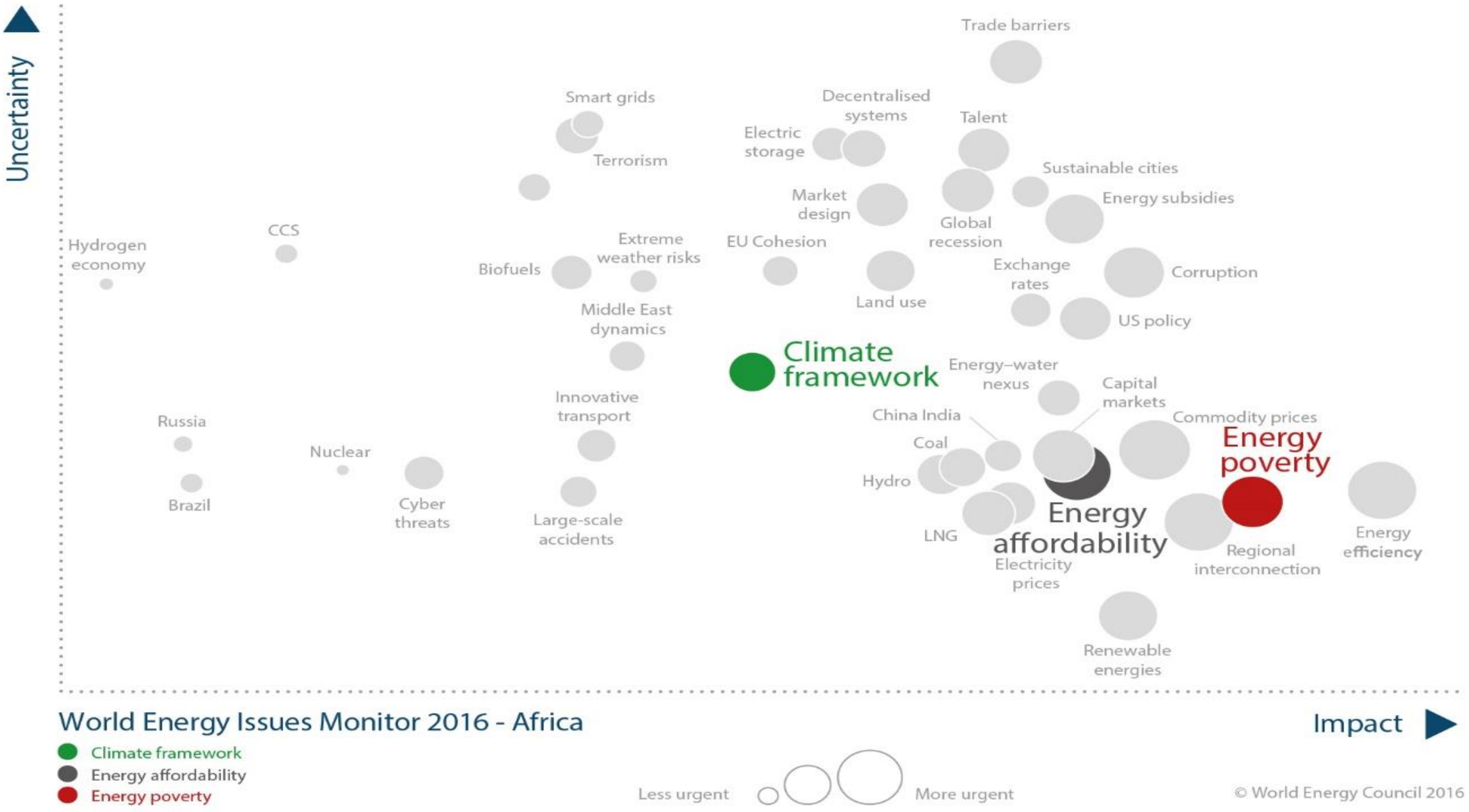
Africa



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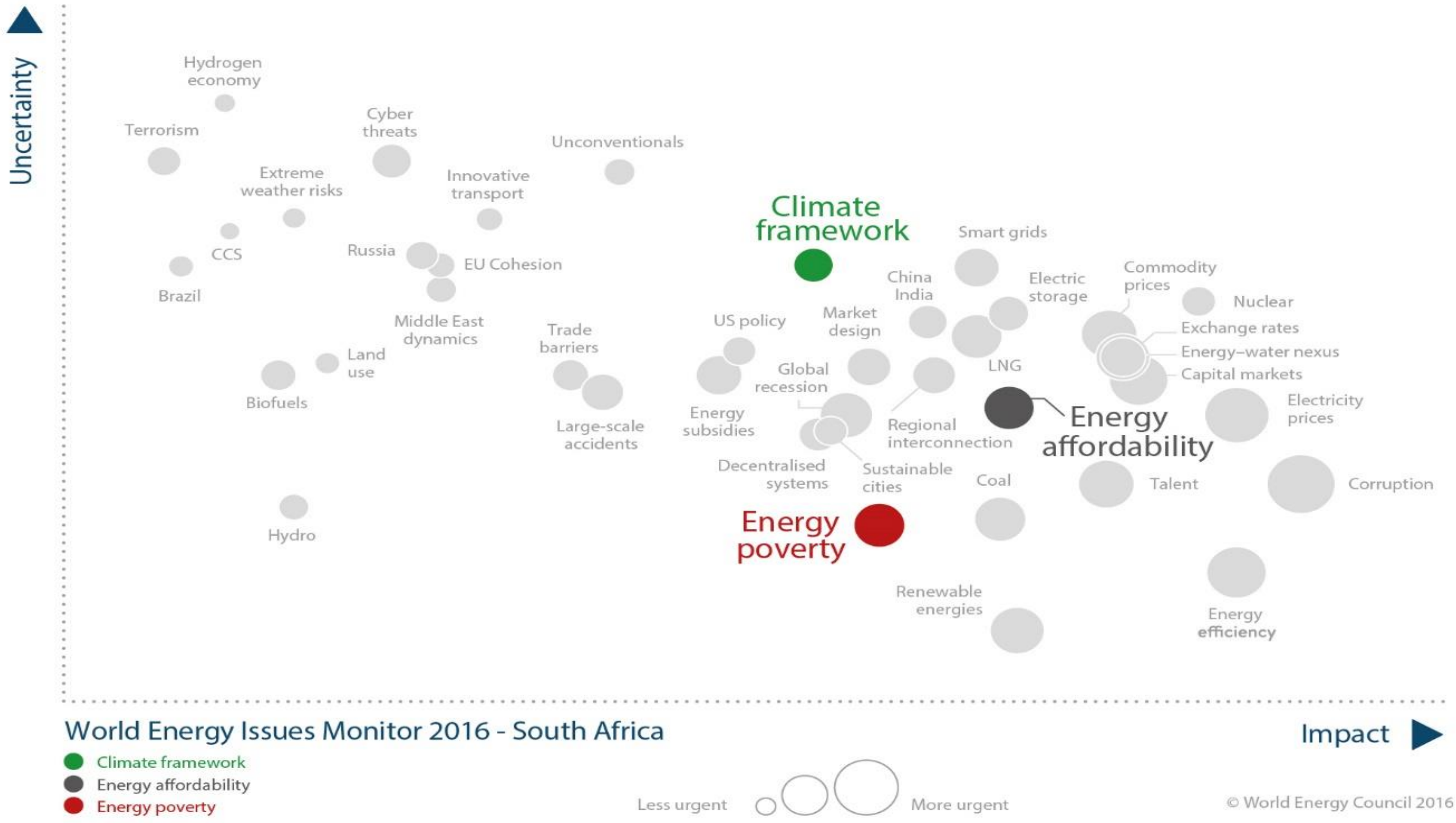
South Africa



TRENDS AND ALERTS

POWER GENERATION

- Eskom's monopoly is irrevocably ended.
- IPP's, with private ownership, are taking an increasing share of the market.
- Eskom's performance will be exposed to independent benchmarks.
- New skills sets will be required to manage new relationships and interfaces.
- Technology choices controversial
  - Nuclear vs Coal vs Gas vs Renewables

POWER TRANSMISSION

- The shape of the grid is changing.
- Power flows are changing.
- Sizing may become a problem.
- The system is much more complex from a grid management point of view.
- Grid stability is less sure.
  - Intermittent Renewables vs Stable Nuclear
  - Consumer behaviour

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POWER DISTRIBUTION

- Hiatus of maintenance during EDI Re-structuring becoming manifest now and worsening.
- Embedded generation causing system complexities.
- Solving Gx performance problems will expose Dx performance weakness.

POWER DISTRIBUTION [2]

- Security of Supply and Pricing concerns leading to Grid Defections.
- Grid Defections impact revenue causing price increases for remaining consumers – encourages more defections.
- More difficult to fund subsidies for the impoverished.
- Exacerbates “service delivery” concerns.
- Need a new Municipal Funding Model

ELECTRICITY FOR ALL

- ~20% of South Africans still without formal connection.
- Local Gx and micro-grids necessary.
- Over-regulation, patronage and entitlement are constraints.
- Conflict over roles of Public vs Private sectors.

OIL SUPPLY

- US Shale gas & oil
  - Significant increase on supply side
  - Prices of oil down; fight for market share
  - Return of Iranian supply will keep prices down for longer
  - Dislocation of global oil and gas prices

OIL SUPPLY

- No secure domestic oil fields.
- Size of SA market makes us a “price taker” for imports. *(600 000 bbl/d vs 92 mill bbl/d)*
- Security of Supply concerns
  - Increased refining capacity ? or
  - Increased Import Facilities ?

    (context – excess Global refining capacity)

LIQUID FUELS

- Liquid Fuel specs increasingly out of synch with modern engine & emissions requirements.
- Refinery capacity and capability stalled.
- Cost recovery mechanism for refinery upgrades uncertain.
- Future Import capability / capacity limited.
- Exposure to off-shore pricing indices and weakening Rand
- Affordability of more CTL & GTL being questioned.

NATURAL GAS

- There is little readily available Natural Gas locally
  - Current Mozambique finds are largely committed.
  - SA may get access to some portion of local Moz govt allocation from current fields
- Unique global position developing – markets moving from regional to global due to volume, distributed availability, mobility – overall impact on price
- Serious likelihood of initiating a gas based industry in SA on imported LNG
  - The complexity of creating the infrastructure should not be underestimated
  - Requires an anchor customer – Gas to Power.
  - GTP – good match/balancer for Renewables in the Grid
- Broader industrial development using gas
  - Need major investment in gas transmission & distribution infrastructure
- Shale gas, if confirmed, is still +10 years away.
- Exposure to off-shore pricing indices and Rand currency exchange rate.
- International trend shows with increased availability of gas, it is displacing liquid fuels in certain sectors – long haul transportation (road/rail); hub & spoke fleet operators

GOING FORWARD

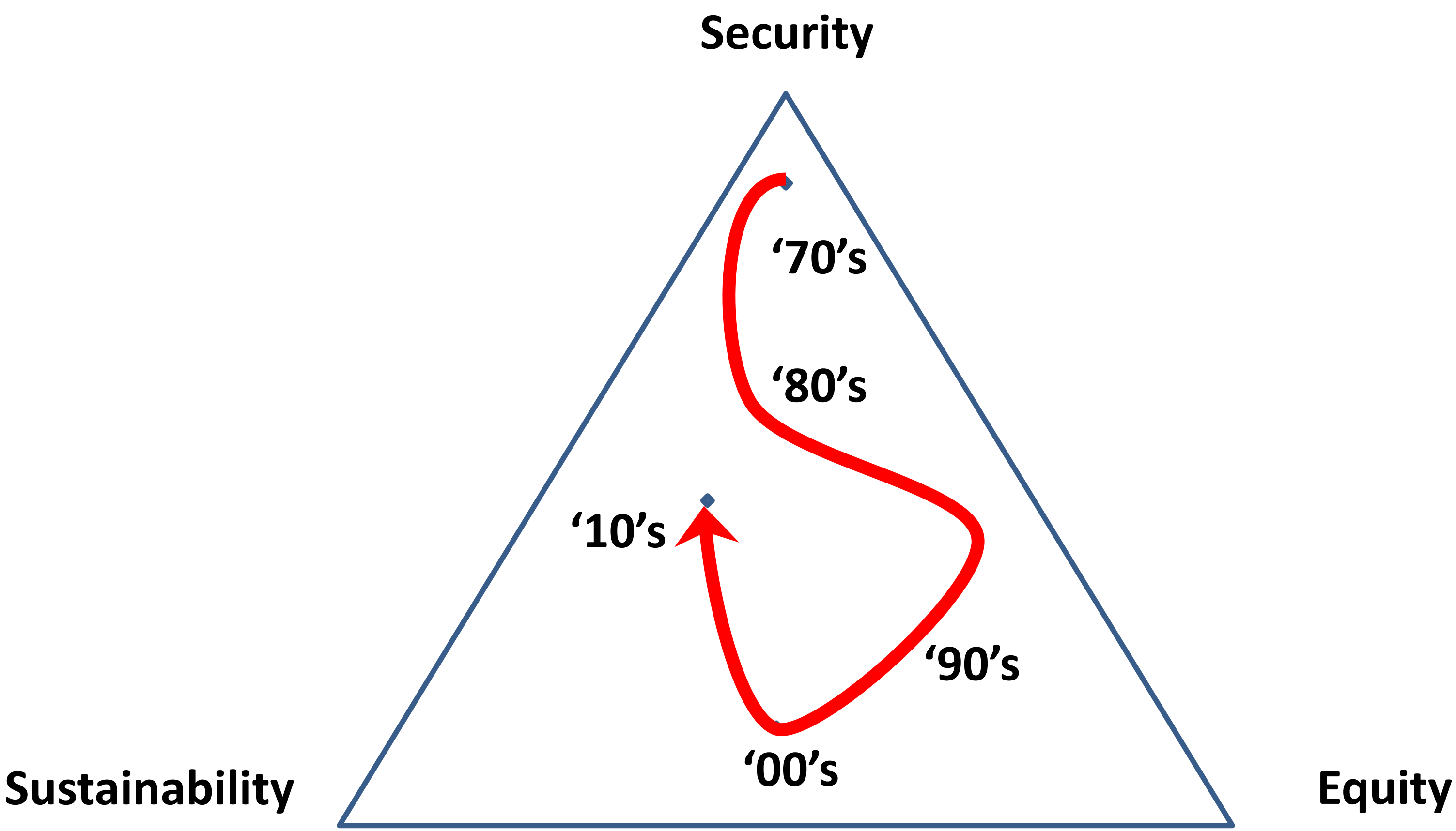
Going Forward

- South Africa's Trilemma performance is similar to India and China. For RSA, these may be better role models than EU countries.
- Need to prioritise 'Equity' ahead of 'Sustainability'.
- Service delivery will be an issue with general dissatisfaction.
- Instability and lack of policy clarity will deter private and foreign investment.
- All sectors will be vulnerable

Going Forward [2]

- Transport [road and rail] is vulnerable to liquid fuel sector problems.
    - Standards
    - Pricing
    - Sourcing
- Gas is someway off before it will be a viable alternative for liquid fuels or electricity.
- Grid defections exacerbate the problem.
- Off-grid ‘enclaves’ will not survive if distribution channels collapse.

Focus of Energy Conversation [RSA]



CONCLUSIONS

Conclusions

- South Africa faces some very difficult energy policy decisions
  - Role of cheap coal in the energy mix
  - Source of liquid fuels [CTL; GTL; own refineries; fully imported]
  - Promotion of natural gas & development of related infrastructure
  - Blending energy systems
    - electricity in transport,
    - gas in power
  - Engaging private sector capabilities
  - Environmental pathways.

Conclusions [2]

- Consumers [mainly electricity] also have difficult choices
    - Go off-grid, control costs, but take on security of supply risk [No grid back-up]
    - Improve security of supply with own back-up but take on additional cost of back-up system
    - Limit demand to manage short term costs
    - Drive energy efficiency for mid-term benefits
    - Engage with supplier to improve supplier performance

Context

- This has to happen against a backdrop of Central Planning vs Consumer Activism.
- We would do well to remember that
  - ***Clear plans inspire Confidence.***
  - ***Clear vision inspires Courage.***
- We need a healthy dose of both if we are to succeed in unleashing the full potential of SA and the African Continent.

Thank you

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