



Energy Sector Resilience: Strengthening the ability of the Energy Sector to deliver in a changing world

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IEA messages to COP21

To shift the energy sector onto a low-carbon path that supports economic growth and energy access:

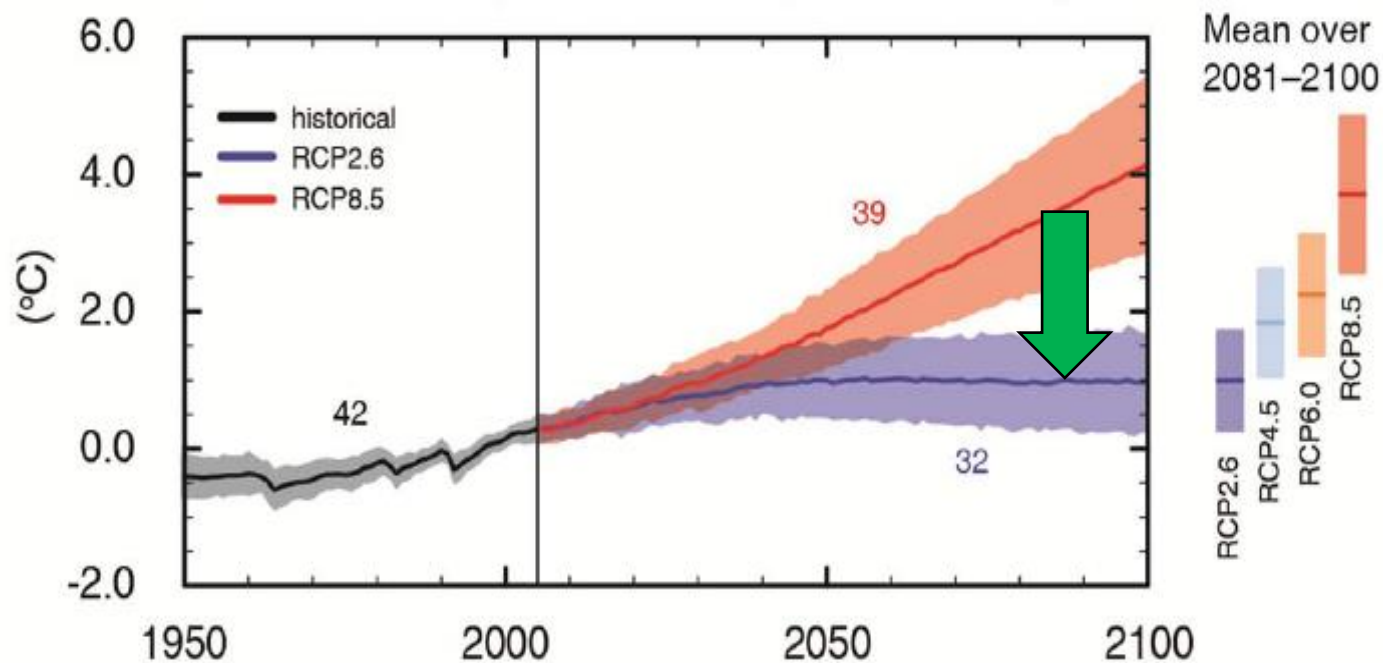
1. Take five key actions, led by energy efficiency and renewables, to peak then reduce global energy emissions.
2. Use the Paris Agreement to drive short-term actions consistent with long-term emission goals.
3. Accelerate energy technology innovation to make decarbonisation easier and even more affordable.
4. Enhance energy security by making the energy sector more resilient to climate change impacts.



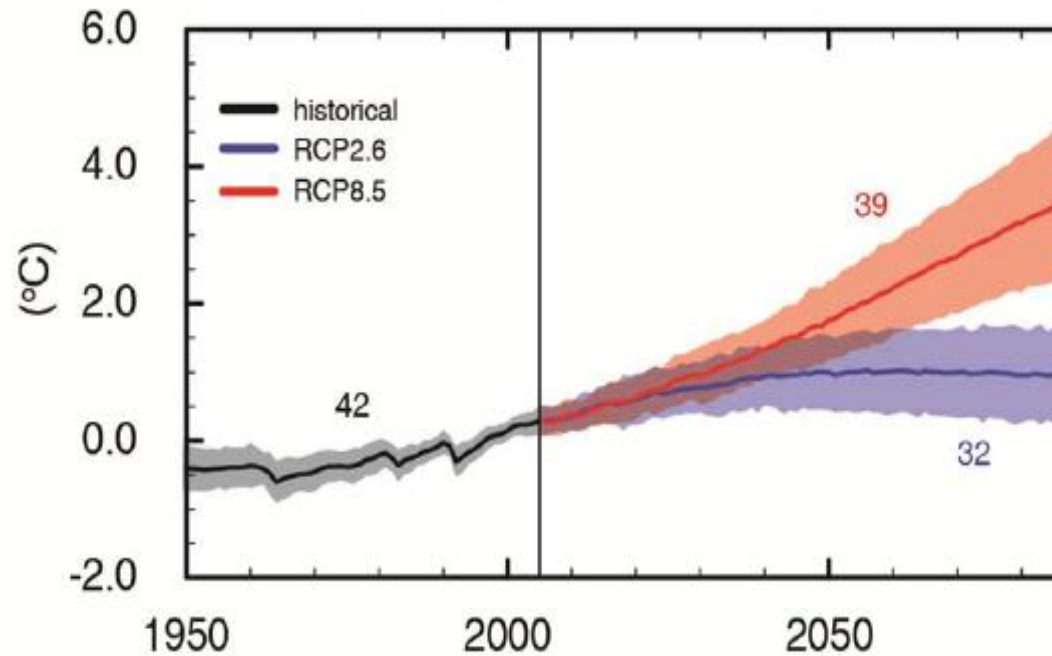
Making the energy sector more resilient to climate change



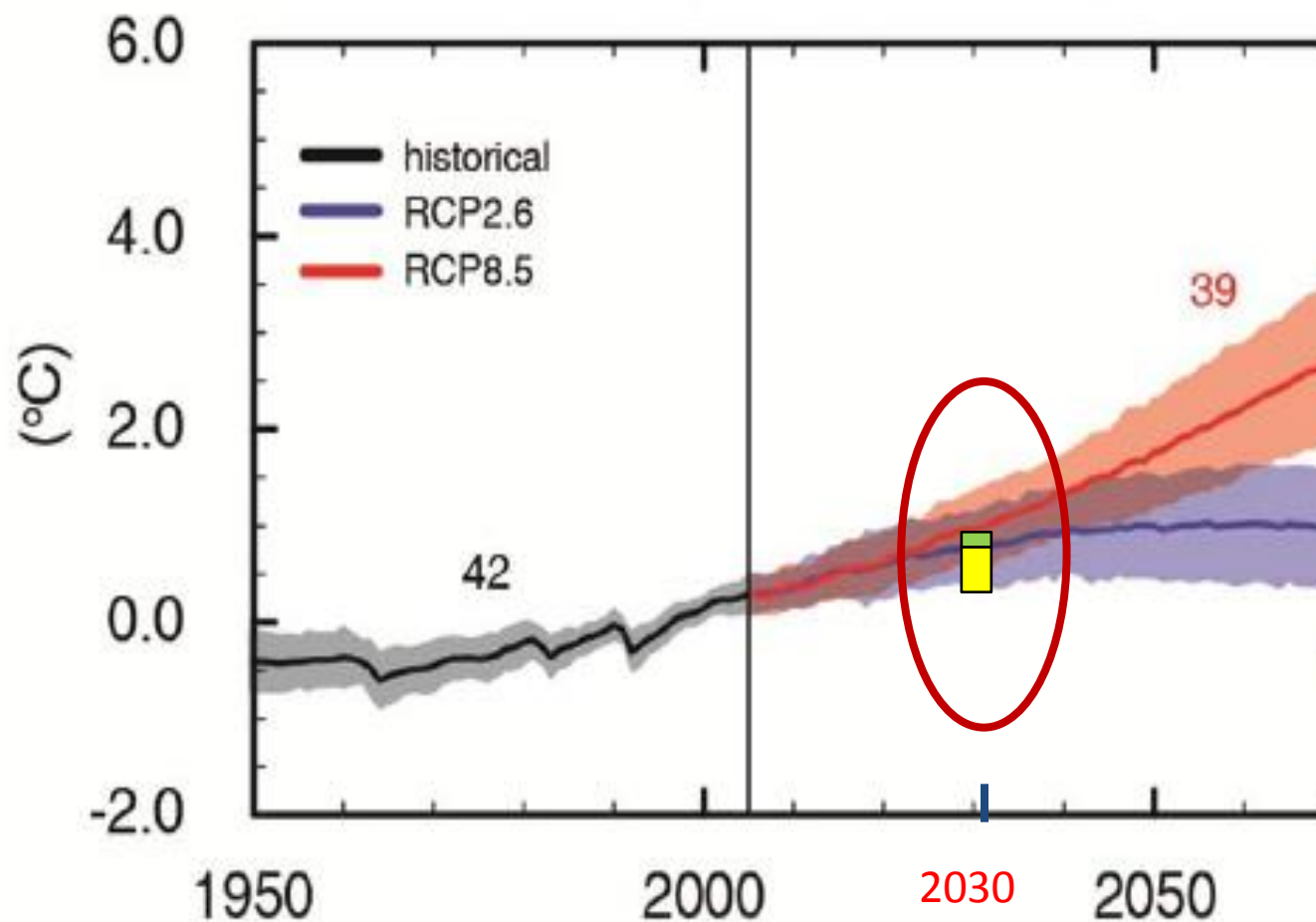
Mitigation



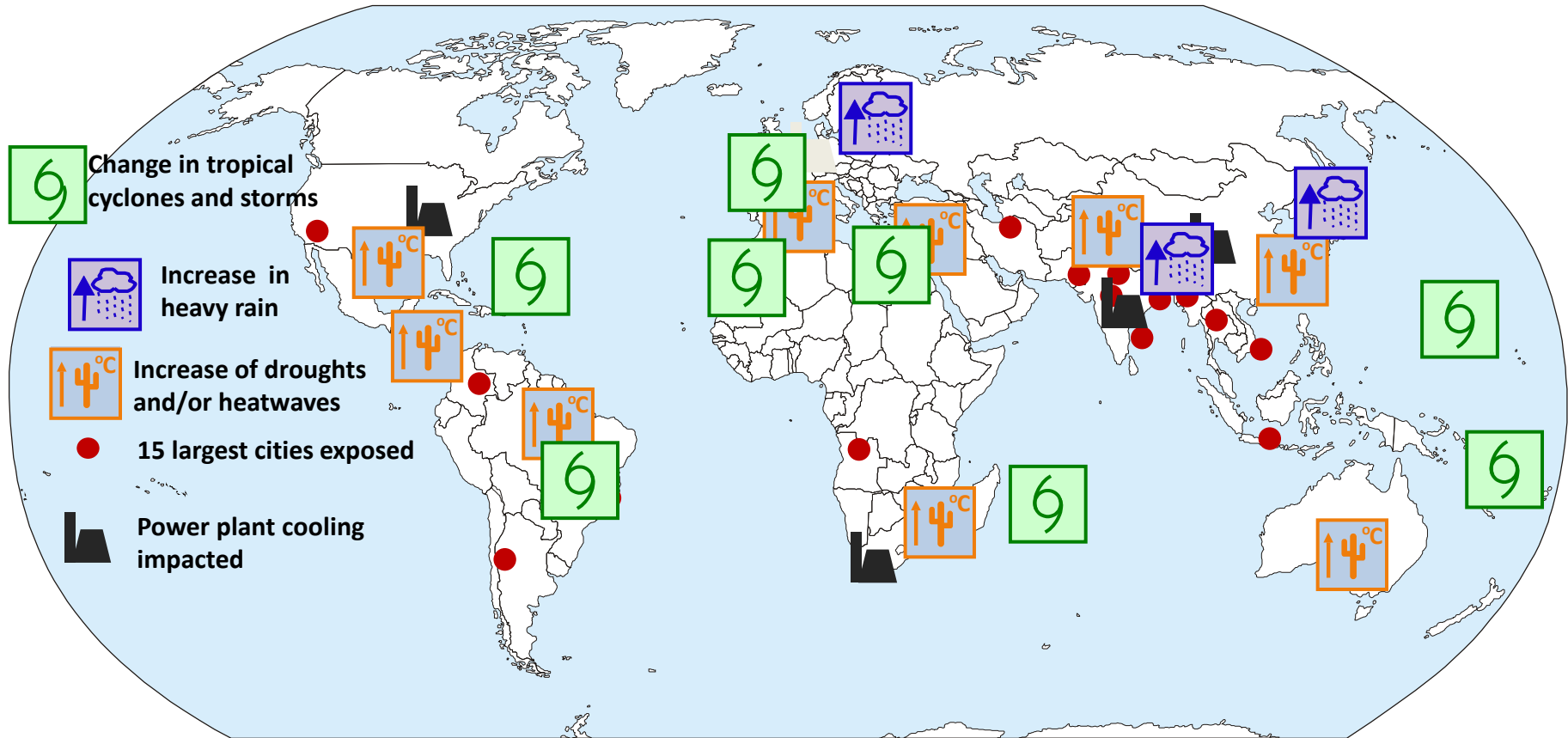
Resilience: an issue in all scenarios



Resilience: an issue in all scenarios



Climate change requires adaptation in the energy sector

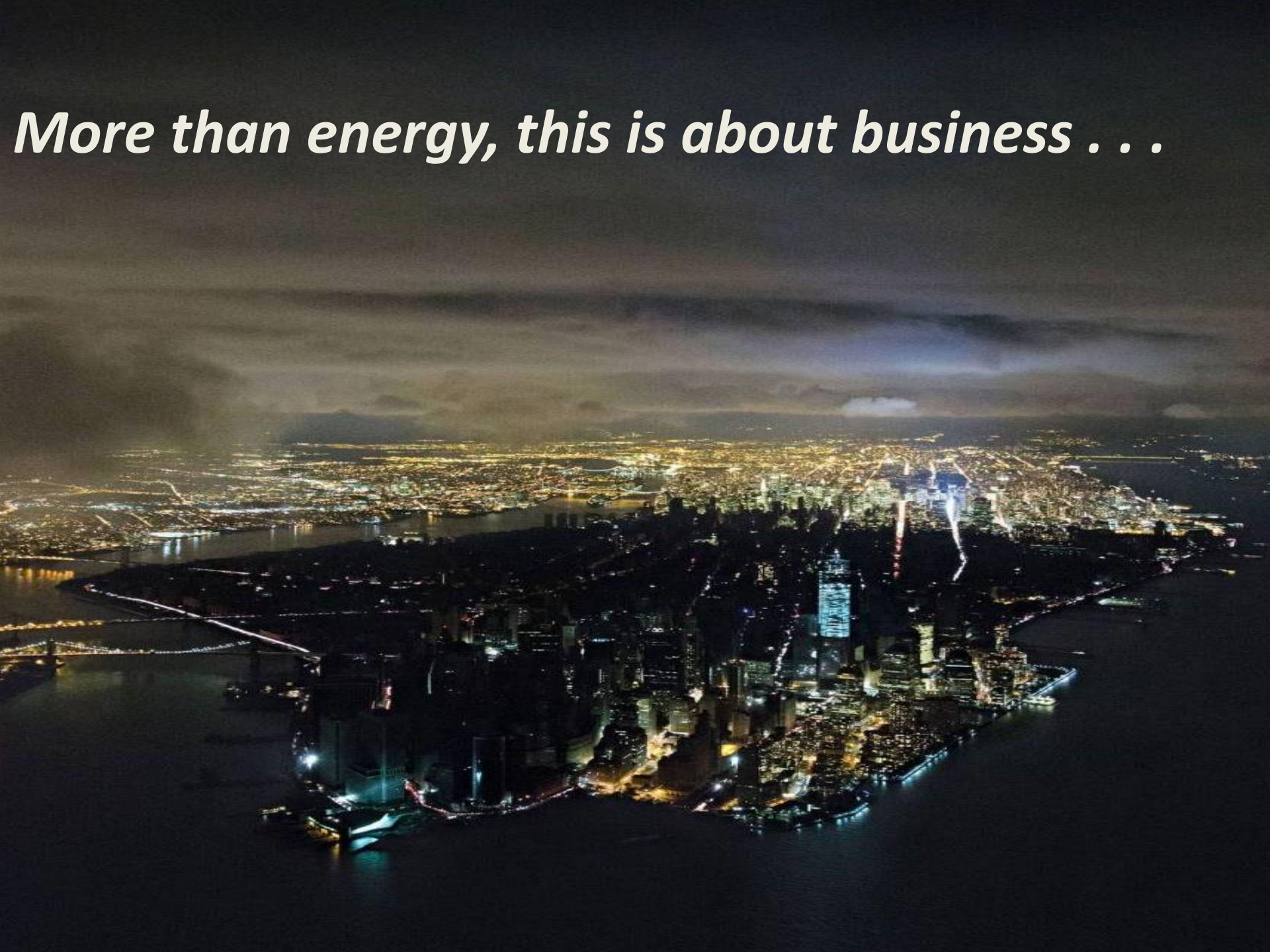


© Natural hazards adapted from Munich RE (2011)

RESILIENCE OF THE ENERGY SECTOR TO CLIMATE CHANGE

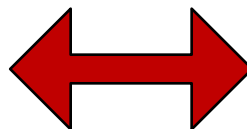


More than energy, this is about business . . .

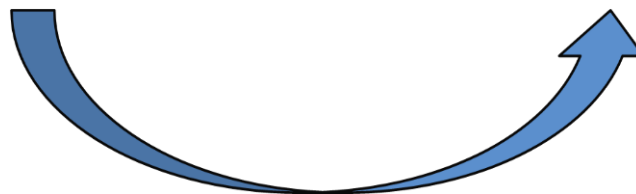


In the climate change space:

Mitigation



Resilience



- Mitigation is powerful resilience strategy
- Synergies between mitigation and adaptation actions should be emphasised (e.g. distributed generation, energy efficiency)
- Mode of decarbonization affects resilience challenge

The resilience “value chain”

- **Robustness:** ability to withstand threats
 - Risk assessment, auditing, reporting
 - Adaptive practices by businesses and governments
- **Resourcefulness:** capacity to maintain essential functions under extreme events
 - Emergency preparedness measures
- **Recovery:** capacity to overcome service interruptions
 - Reactivating systems
 - Pre-deployment of recovery assets

Businesses are the key actors in resilience-building

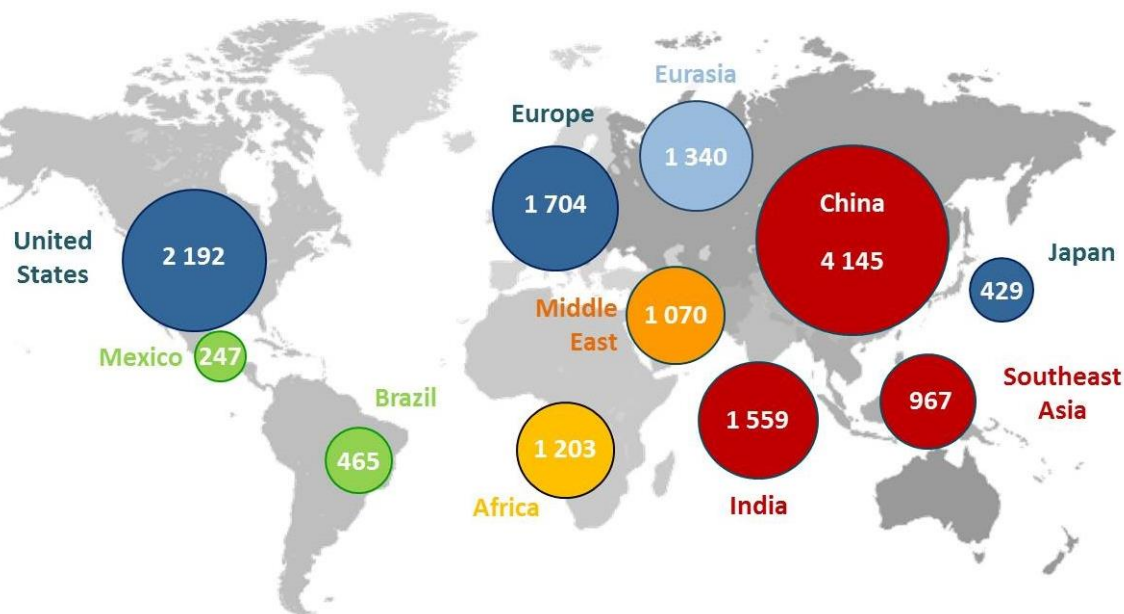
- **Risk management is integral to business decision-making**
 - Climate risk assessment, prevention and management to
 - achieve robustness of assets,
 - resourcefulness of operations during extreme events and
 - quickly recover
 - Insurance
- **Adaptive practices**
 - Management and technical measures
 - Technological and structural measures
 - Training and education
 - Recovery and resourcefulness in addition to robustness

Governments are also key actors in resilience

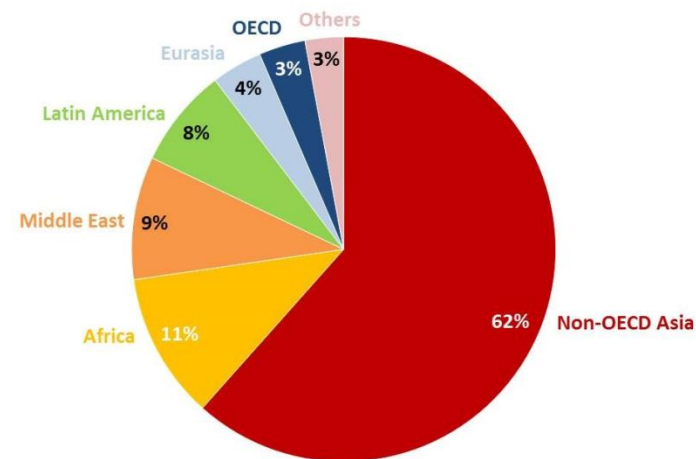
- **Create enabling frameworks/incentives to facilitate/prompt resilience-building by business**
- ... but much more:
- **Awareness raising and modelling**
- **Emergency preparedness and response measures (meteorological, logistical)**
- **Inter-governmental coordination**
 - Domestic: federal, local, etc.
 - International
- **Managing “Own-assets” (utilities, etc.)**

Energy sector resilience challenge expands as asset base expands . . .

Primary Energy Demand, 2035 (Mtoe)



Share of Global Growth, 2012-2035



Over 95% of the projected growth in energy demand between now and 2035 happens outside the OECD (NPS)

IEA: a partner in the effort ...

1. Dialogue facilitation

- 5 Nexus Forum meetings since 2012

2. Data and modelling

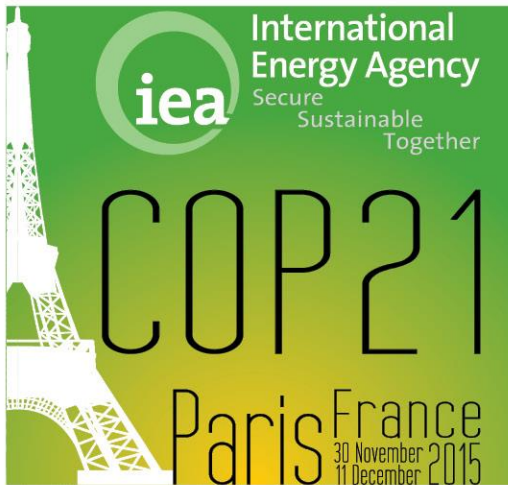
- WEO Special Report 2013: chapters on resilience, WEO 2015: water stress case studies in China, India

3. Research stocktaking on impacts, vulnerability, resilience policies

- PAMs data base, country reviews

4. Policy analysis

- Resilience brochure for the COP 21



Thank you

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