International Energy Agency

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IEA'S ROLE IN ENERGY SECURITY
WITH FOCUS ON OIL SECURITY

University of Economics, February 19 | Prague

Jan Bartos, Energy Policy and Security Division

What is the IEA?

- Autonomous agency linked to Organisation for Economic Co-operation & Development (OECD)
- Acts as energy policy advisor with some 250 staff based in Paris.

Goals:

- *Energy security*
- *Environmental protection*
- *Economic growth*
- *Engagement worldwide*

Activities:

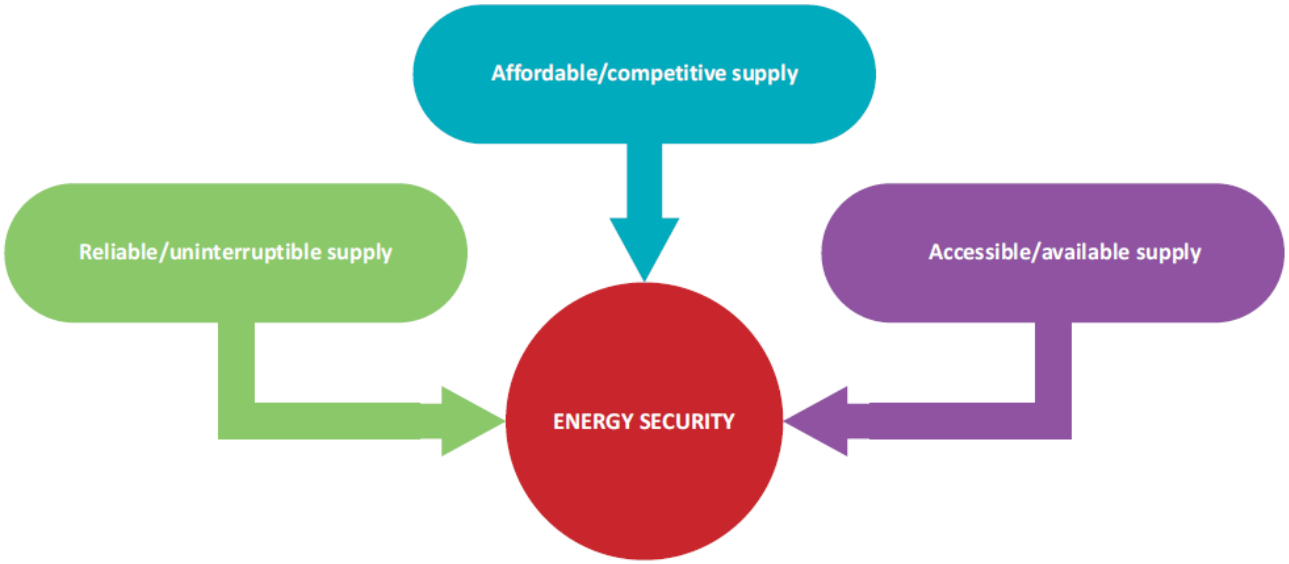
- *Co-ordinates efforts to ensure energy security*
- *Conducts policy analysis*
- *Links research activities and governmental directives*
- *Compiles energy statistics*
- *Reviews energy policies and programs*
- *Convenes, mobilizes science and technology experts*
- *Promotes co-operation with key non-member countries*

Establishment of IEA

- **IEA established against backdrop of 1973-1974 oil crisis**
  - Avoiding competition for limited resources
  - Coordinated mechanisms for response
  - Safety net
- **Today, energy security as urgent as ever**
  - Oil security remains cornerstone
  - IEA move to a more comprehensive approach beyond oil

IEA definition of Energy Security

"Uninterrupted availability of energy sources at an affordable price"



Energy security relies on markets

- **Under normal circumstances:**
  - market balances supply & demand smoothly
- **Preconditions:**
  - Sufficient interconnections
  - Diversity of supply (countries & fuels)
  - Robust infrastructure for seasonal fluctuations (ports, pipelines, storage)
  - Appropriate government regulations (e.g. public service obligations)
- **All-risk, cross-sectoral approach**

Economic costs of disruptions

- Higher oil import costs, GDP losses
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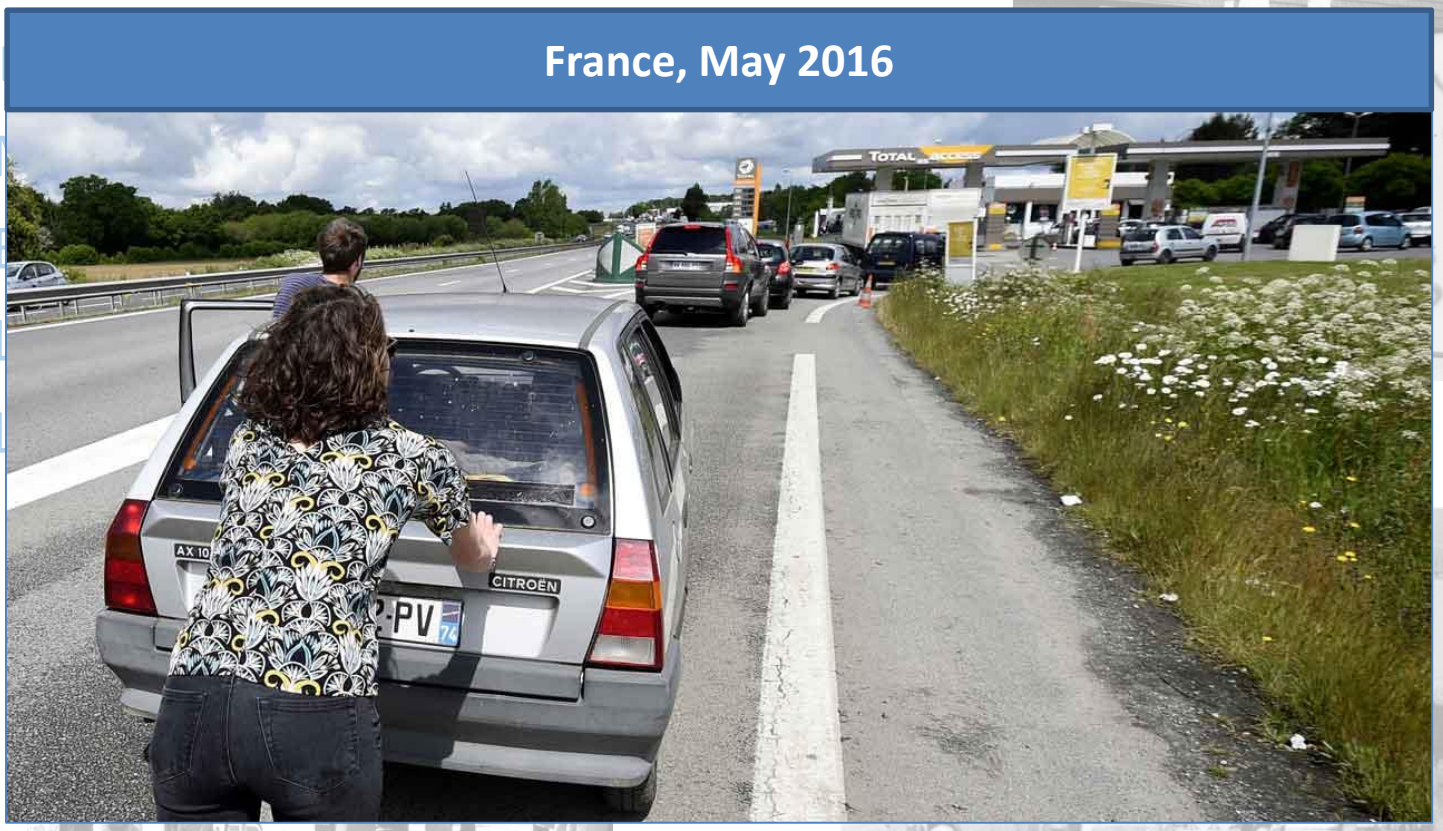
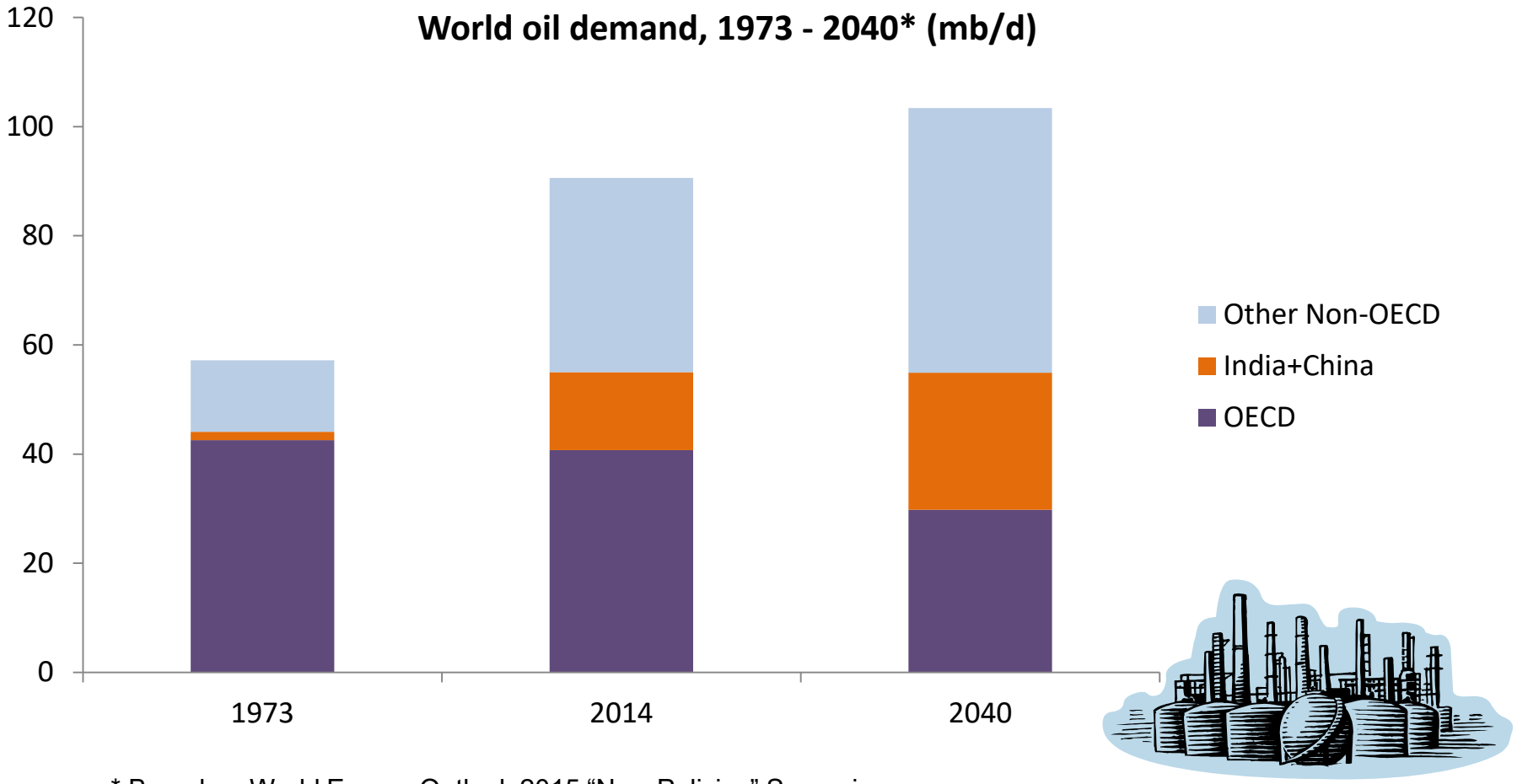
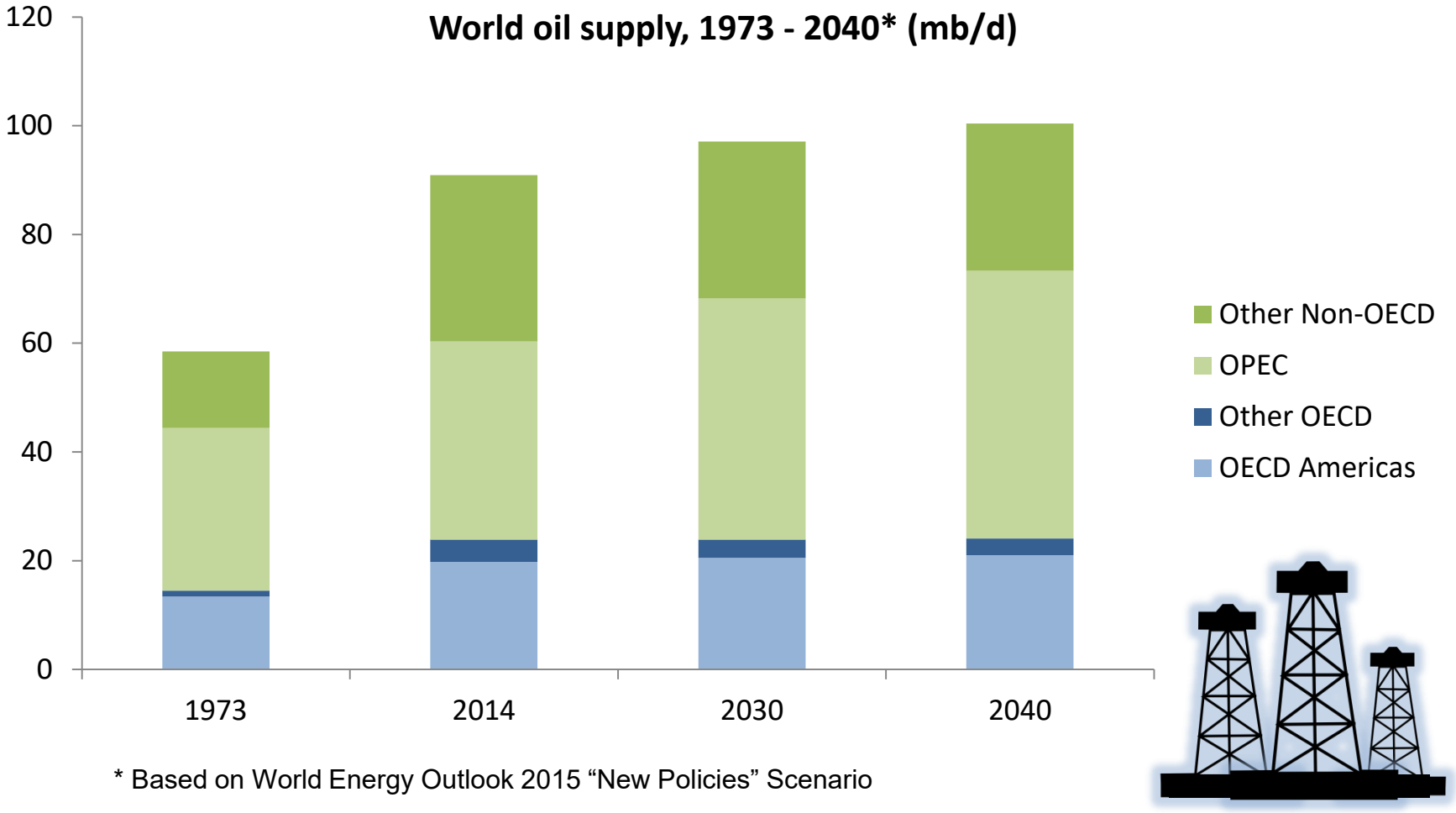


Growing importance of non-OECD



* Based on World Energy Outlook 2015 "New Policies" Scenario

Shifting supply



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Emerging economies continue to drive global energy demand

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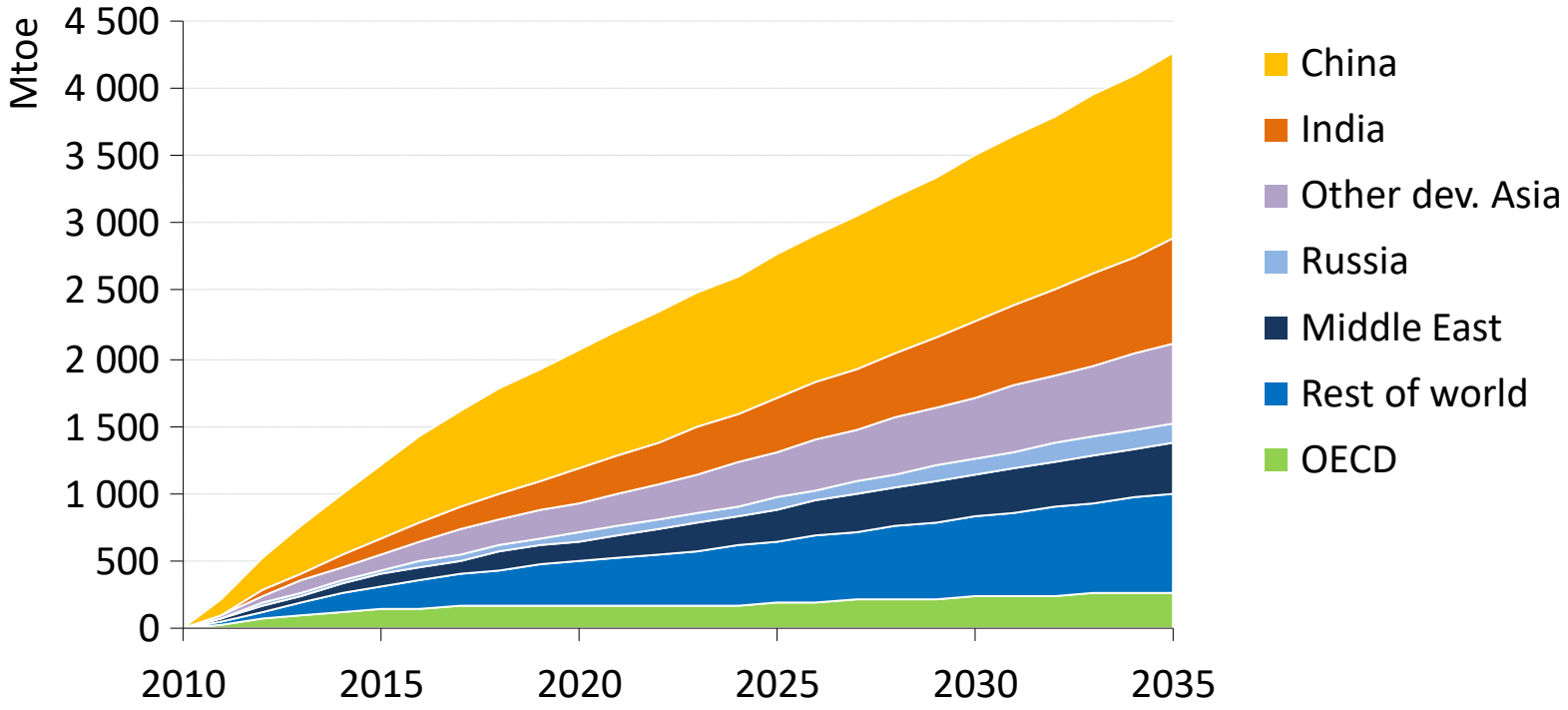
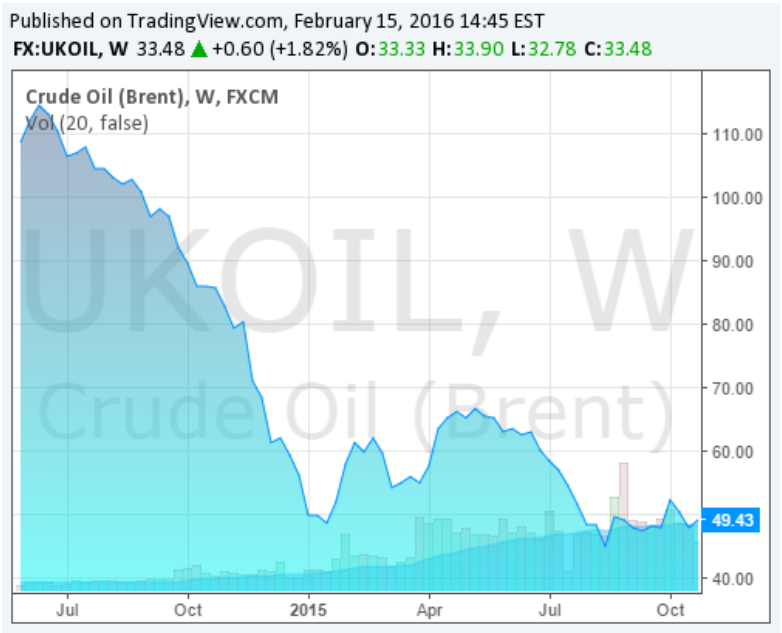
Growth in primary energy demand in WEO New Policies Scenario



Global energy demand increases by one-third from 2010 to 2035, with China & India accounting for 50% of growth

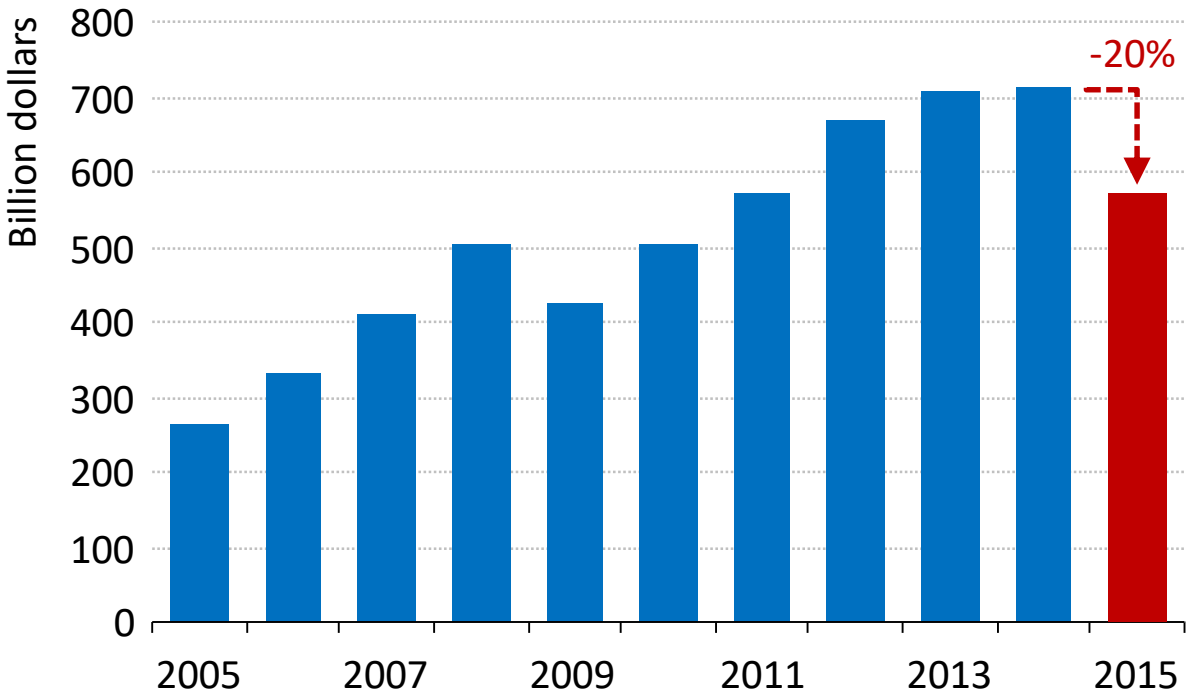
But oil is so cheap now!



- Does it change anything?
- Yes but maybe not the way we like…

Longer-term risk from lower prices hitting upstream oil & gas investment

World upstream oil and gas capital investment (WEO 2015)



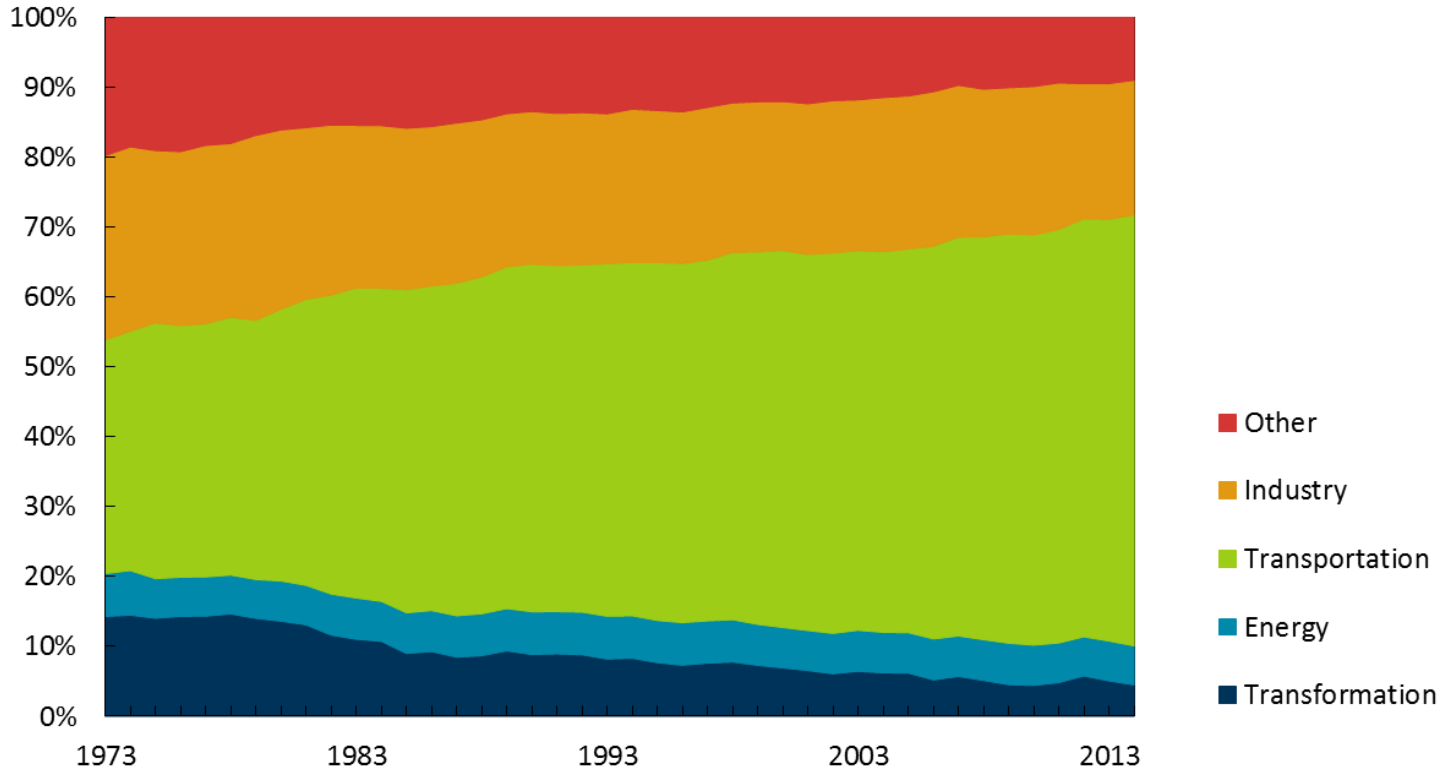
- *Trend continues in 2016 and 2017*
- *Two consecutive years of reduced upstream spending last seen in 1980s*
- *New fields can be more challenging with higher geological & technical risks*

What does it mean if oil prices stay lower for much longer?

- Much more resilient non-OPEC supply & higher output from *stable* Middle East could hold oil price close to $50/bbl until 2020s
- Oil importers gain, each $1/bbl reduction is $15 billion off import bills; major window of opportunity to press ahead with subsidy reform
- If lower prices persist for decades, reliance on Middle East oil gets back to 1970s levels; risk of sharp market rebound if investment falls short
- Lower prices could undercut essential policy support for the energy transition: weaker incentives mean 15% of efficiency savings are lost
- Reduction in revenues to key producers & boost to global oil demand growth make *prolonged period of lower prices progressively less likely*

Oil use focused in transport

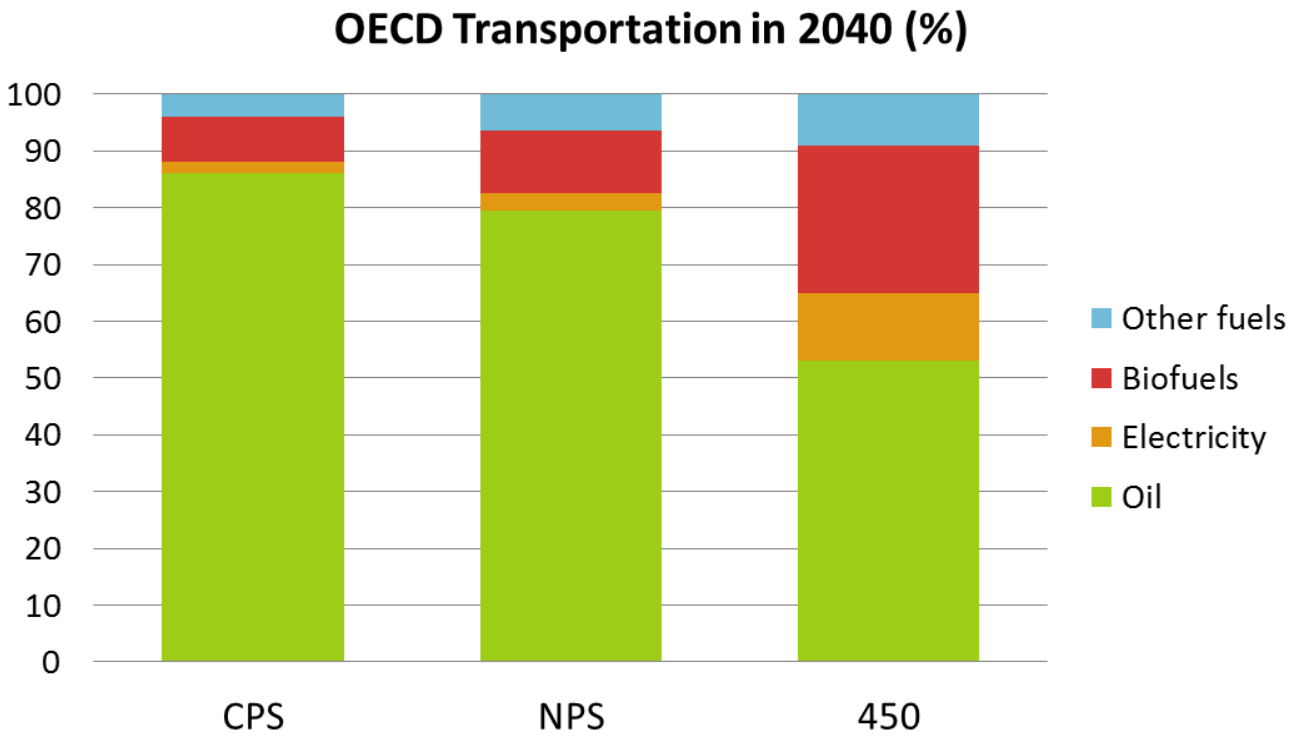
OECD Oil consumption by sector 1973-2014

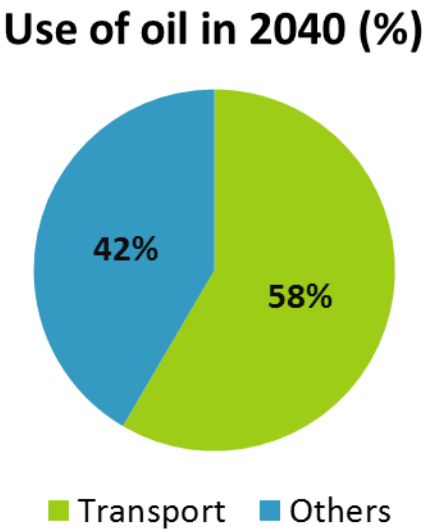


- *Increased oil use in transportation (60%) and expected to rise*
- *Accentuates potential economic impact of a disruption*

So what about this?

Probably not so soon…



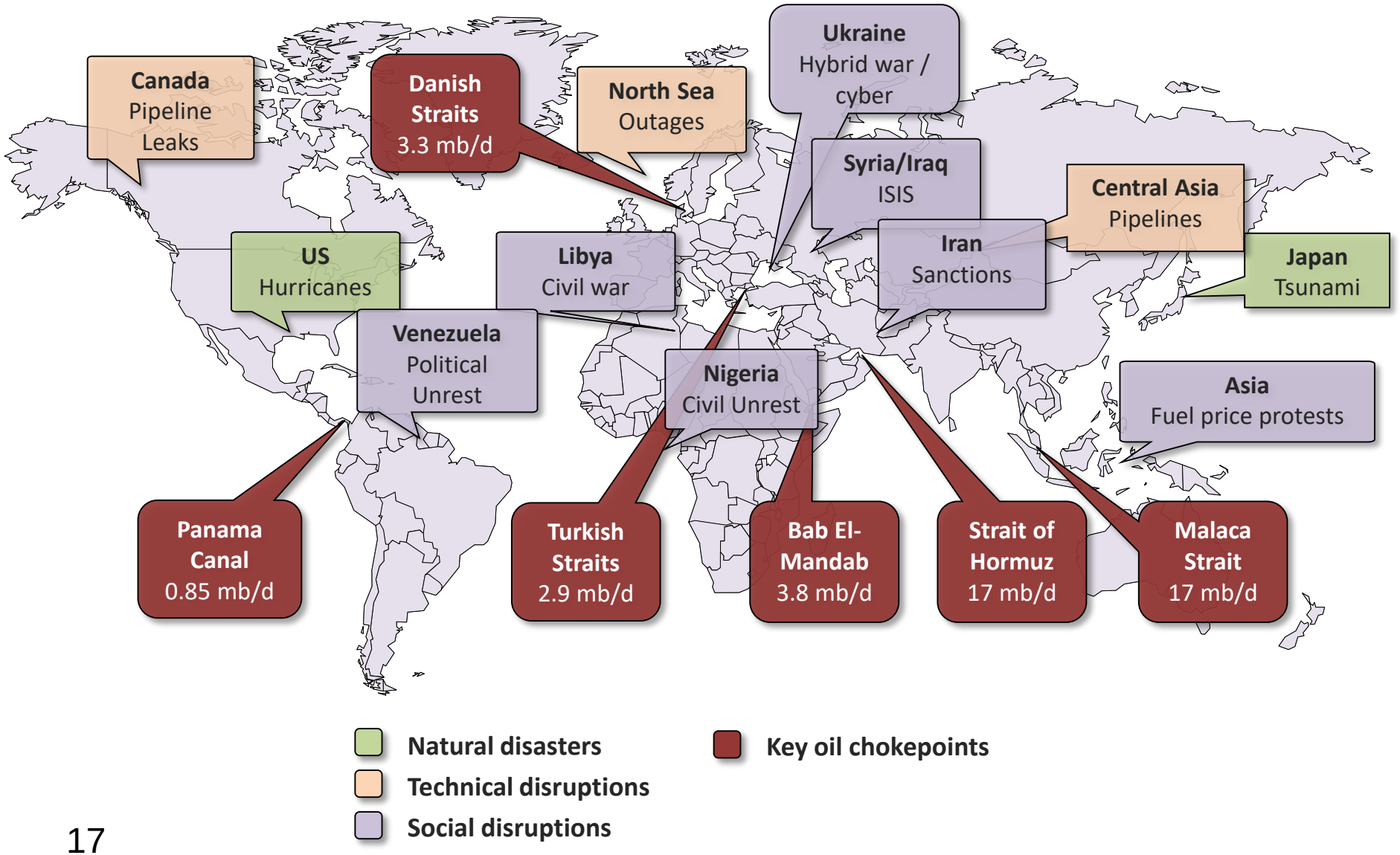


CPS: *WEO 2014* Current Policies Scenario
NPS: *WEO 2014* New Policies Scenario
450: *WEO 2014* 450 Scenario

And gas? Electricity?

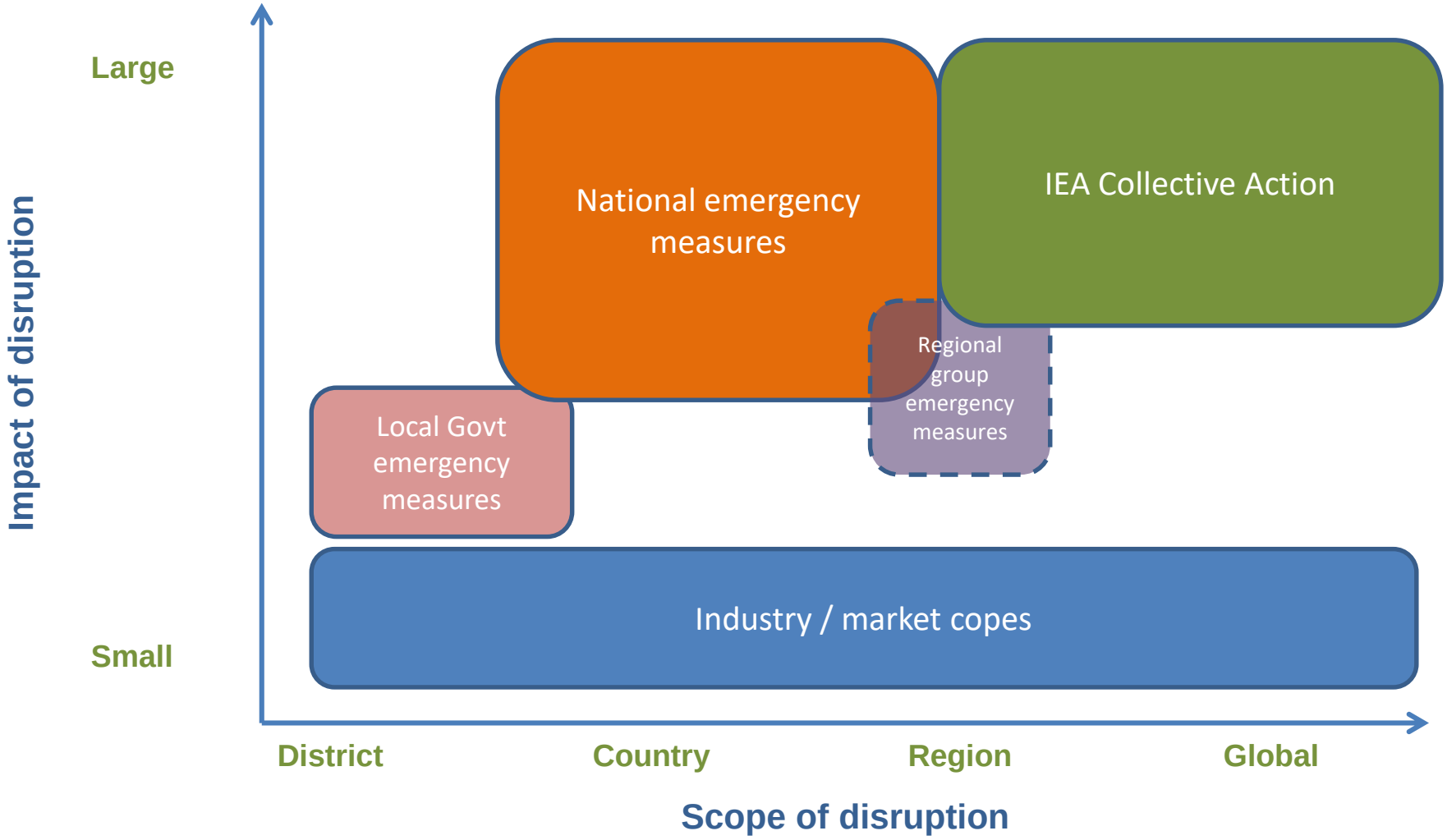
- **Natural gas has an ever greater role**
  - Growing demand
  - Gas markets more integrated;
  - More vulnerability (long pipelines; LNG)
- **So does ELECTRICITY**
  - Growing demand
  - Increased share of variable renewables (solar, wind)
  - Closely linked to secure gas supply (flexibility)
- **There will always be various threats to supply**
  - Cross-sectoral: Cyber, climate change effects…

Different factors for disruptions



Who deals with an oil disruption?

IEA retains operational role for oil security



Member gov. responsibilities

- Legislation:
  - to ensure participation in IEA decisions with appropriate emergency measures
- National Emergency Strategy Organisation (NESO)
  - "Crisis team"
  - Co-ordinates emergency operations
  - Interfaces with domestic oil industry
  - Interfaces with IEA emergency operations
- Data collection
  - Monthly Oil Statistics
  - Emergency questionnaire

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IEA oil emergency response measures

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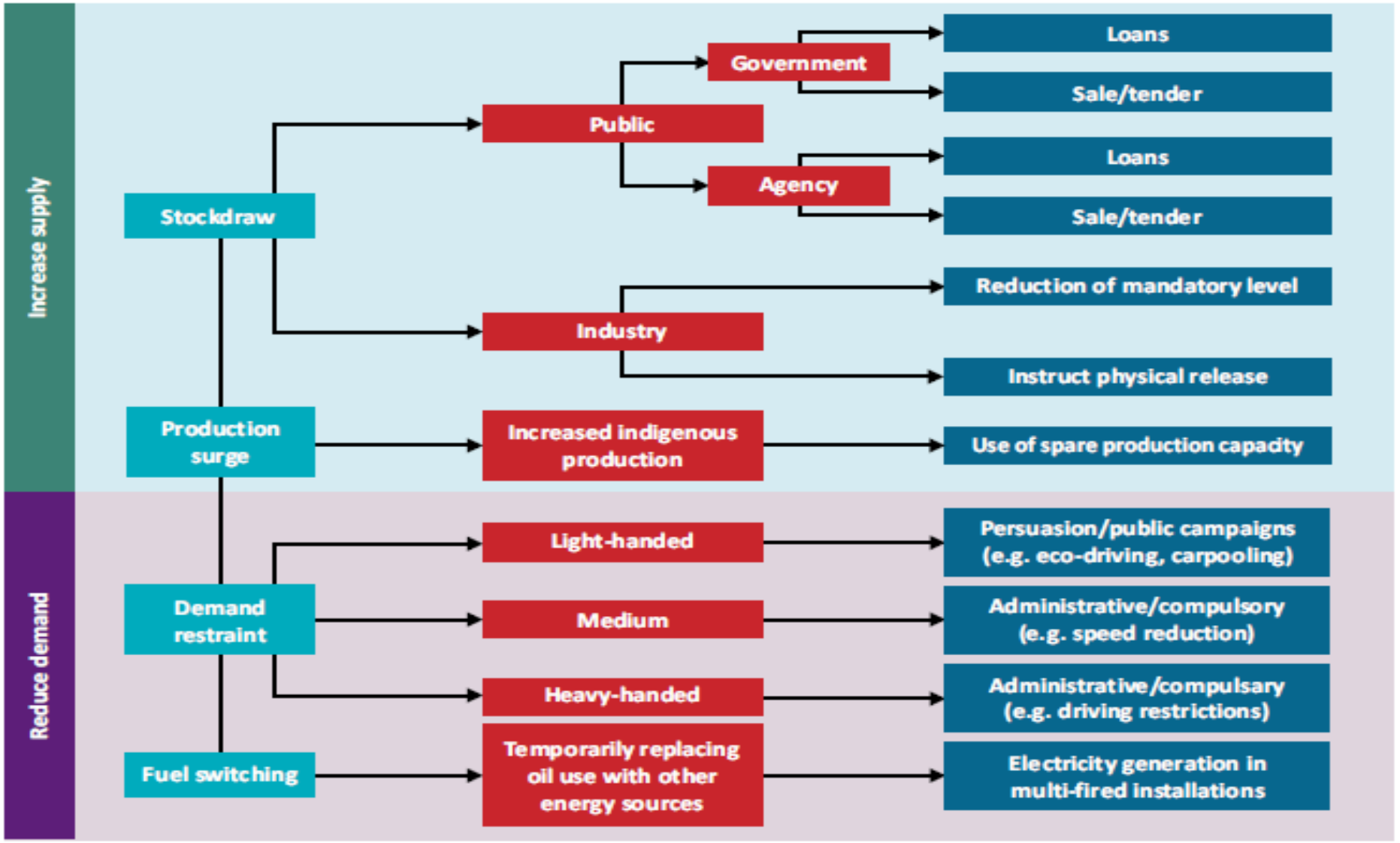
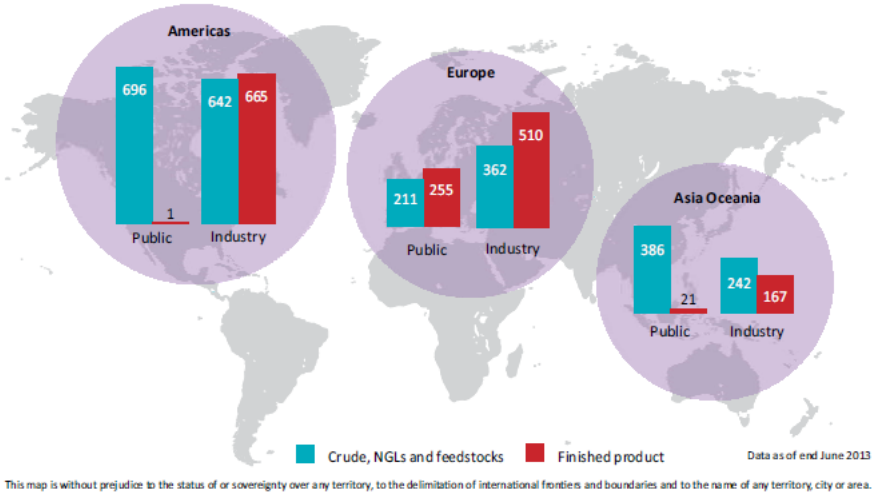


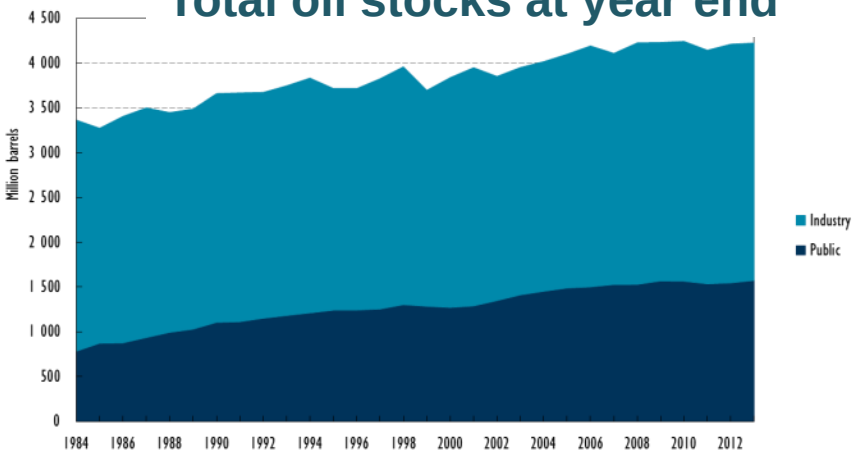
Supply-side measures

- **Stock-draw**
  - Most commonly used & most effective measure
  - IEA countries obligated to hold at least 90 days net-imports
  - 4.2 billion barrels: 1.5 public stocks for emergency
- **Production Surge**
  - Very limited as non-OPEC production at max economic efficiency
  - Little or no spare capacity outside OPEC
  - Good oilfield practices limit extent of short-term surge

Total oil stocks in IEA regions

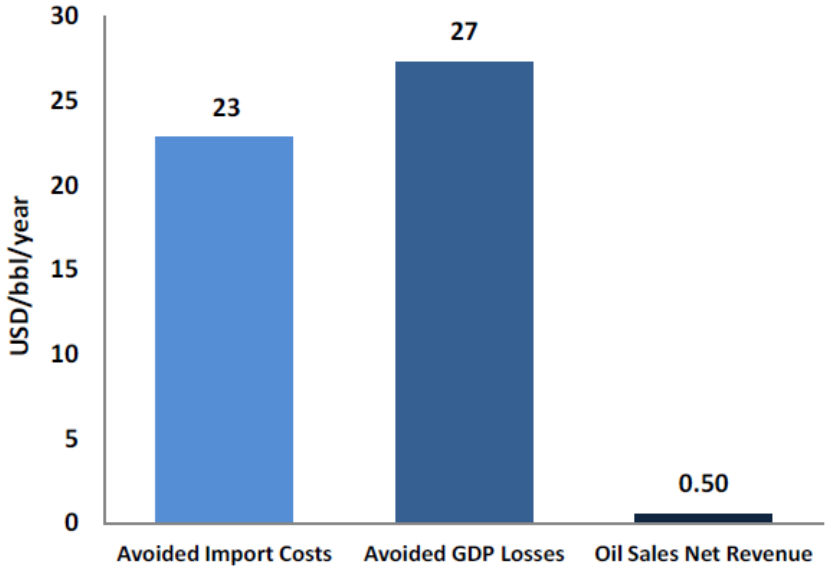


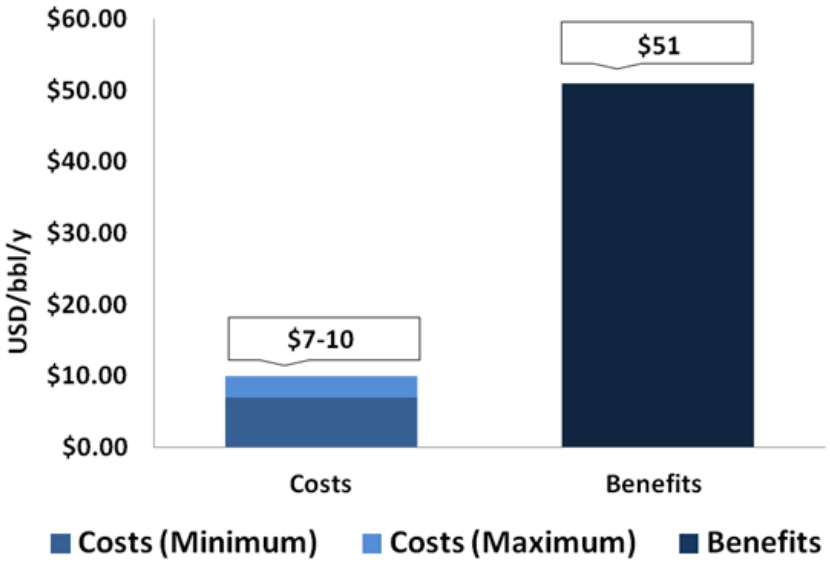
Total oil stocks at year end



Economic benefits of stocks

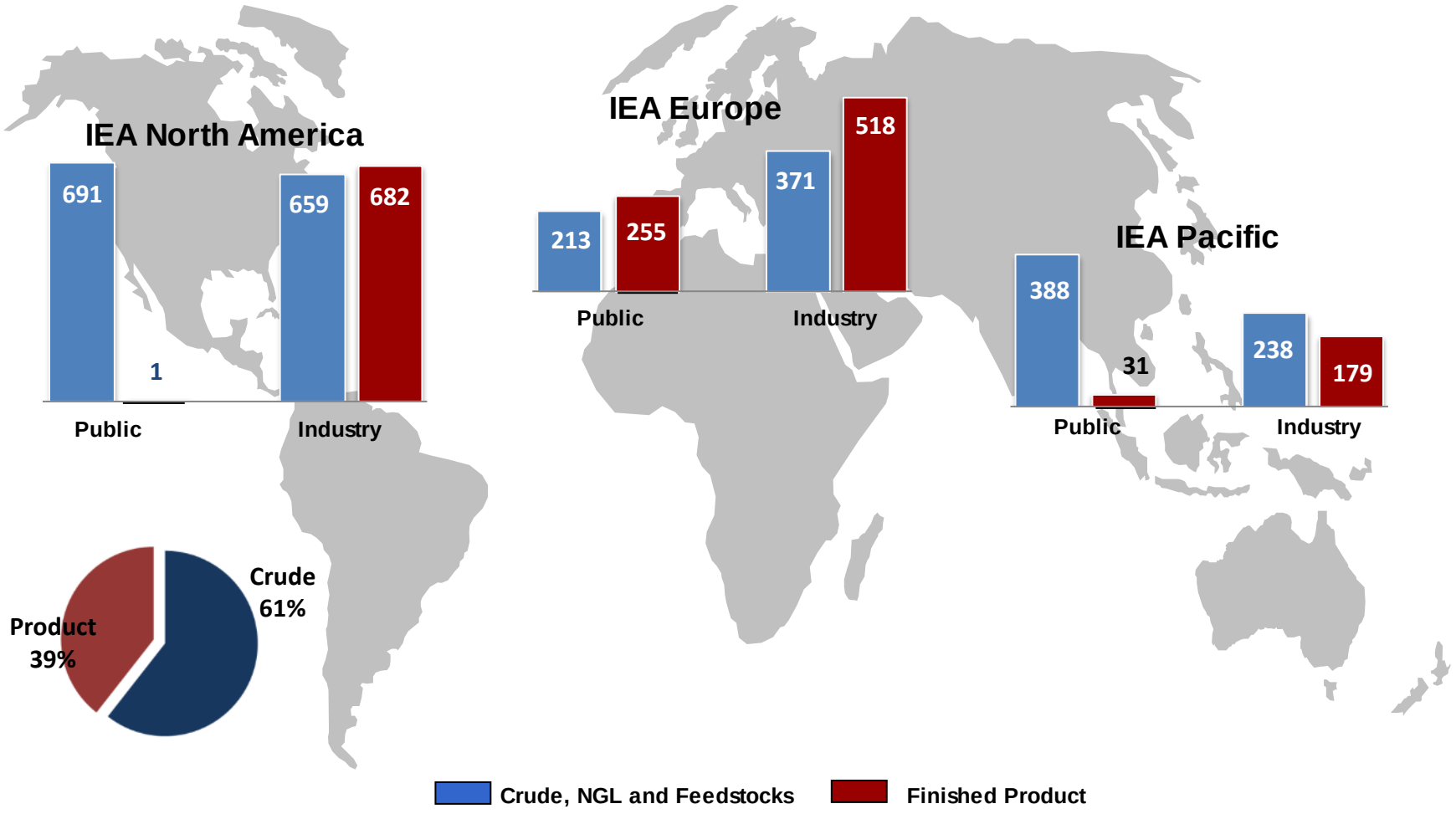
Indicative annual benefits and costs per barrel of stock
(Source: IEA analysis of costs and benefits of stockholding, 2013)





- **Payoff from "insurance"**
- **Over 30 years period USD 3.5 trillion avoided costs**

Total IEA stocks by type



Demand-side measures

- **Demand restraint**
  - Most policies focus on transportation sector
    - Wide range of measures, from light to heavy
    - **Danger of further strangling economy!**
    - Short-term can lead to long-term behavioral changes & fuel efficiencies (car-pooling, smart truck logistics etc.)
  - Some potential in reduced heating
- **Fuel switching**
  - Significant decline since 1970s
  - In 2015 only 2% oil in electricity generation (25% in 1973)
  - Virtually no potential for short-term switching in transport
- **Other**
  - Relaxation of regulation, e.g. on fuel quality specifications

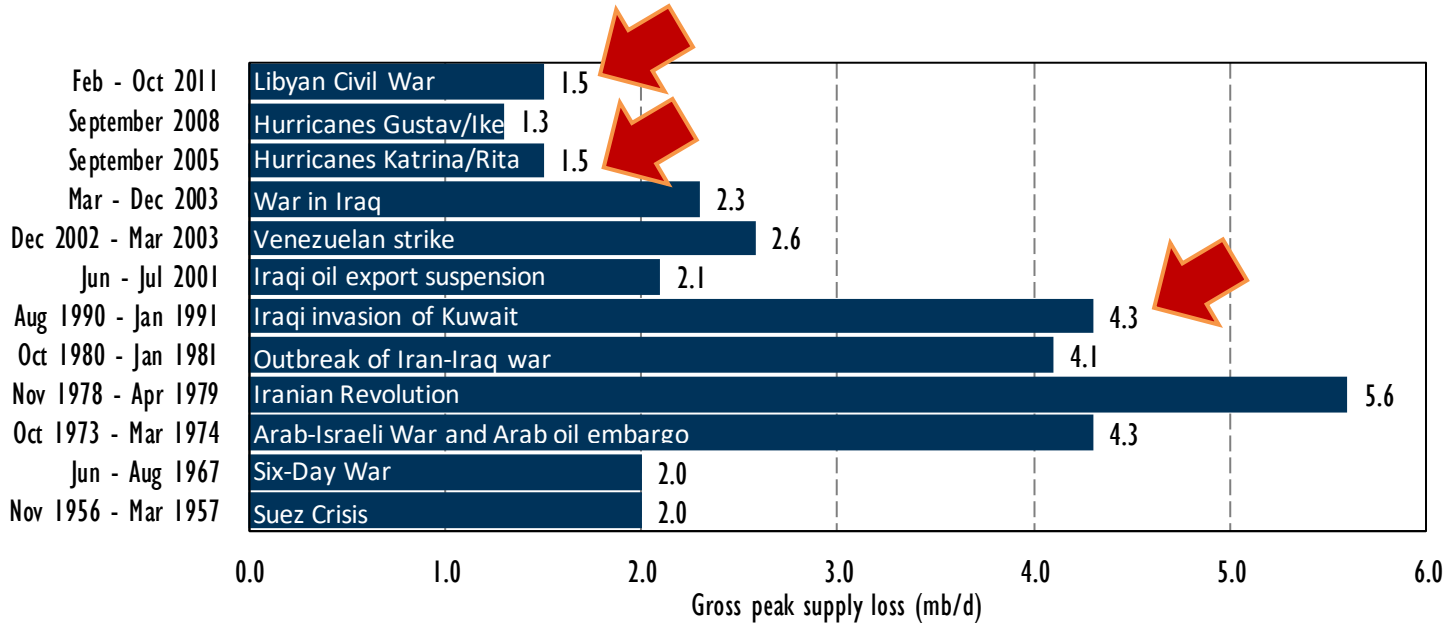
Considerations for action

- Need to respond promptly to those oil supply disruptions which appear capable of causing severe economic harm
- Market will always balance supply & demand, given time & freedom of price movement… But will disruption cause severe economic harm?
- Need to understand market context of disruption:
  - Analysis helps answer whether market can cope with disruption using available resources (commercial stocks and/or OPEC spare capacity)?
- If action is needed, speed & unity of response are key factors
  - Delayed/hesitant response can exacerbate situation
  - Decision on action will likely need to be made before all necessary information is available

IEA collective action objectives

- **Market will balance supply & demand**
- **Purpose of IEA Collective Action: limit extent & impact of sudden supply disruption**
  - Mitigate economic damage by temporarily replacing disrupted supplies to stabilize the market
  - Market still sets price & allocates
- **Managing prices is not the purpose of IEA Collective Action**
  - Distorted market signals worsening long-term balance
  - Finite so ineffective over time
  - Some IEA countries specifically ban use of emergency stocks for price management

Major oil supply disruptions



- **Disruption severity is not only measured in oil lost**
  - Other factors are key in evaluation:
    - Level of commercial inventories, likely duration, available spare capacity, quality of lost crude, seasonality, logistics etc.
  - Each disruption must be assessed individually – market context is critical

Energy security wider than oil

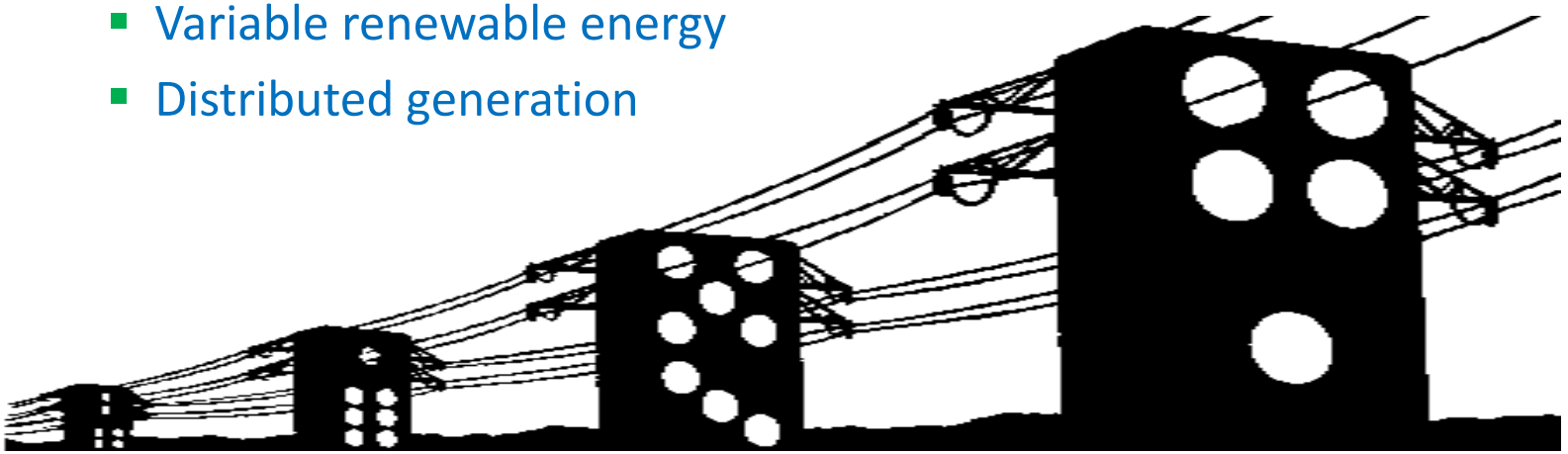
- **Share of oil in world energy mix declining but will still remain most important fuel in foreseeable future**
  - Regional industry changes impacts on energy security?
    - E.g. European refining sector restructuring
    - Shale gas & oil story in USA – new "market-driven" OPEC for emergencies?
- **Natural gas has increasing role**
  - Gas markets more integrated; more shipped via long pipelines & LNG -> increasing distances lead to increased potential for vulnerabilities
- **Electricity: demand is set to grow faster than any other final form of energy (more than 2/3 expansion 2011-2035)**
  - Increased share of variable renewable generation (VRG) must be integrated without jeopardizing security
  - Natural gas gaining prominence in providing base load flexibility & peak power = gas & electricity market intertwined in security, cost & reliability

Gas emergency response measures

- **Use of alternative supply routes**
  - *Diversity of supply routes & sources is key*
  - *Pipeline (inc reverse capacity), LNG (spot cargoes)*
- **Stocks (storage)**
  - *Industry and/or public stocks*
  - *Underground and/or LNG storage*
- **Spare capacity**
  - *Domestic production, gas in pipelines*
- **Demand-side measures**
  - *Interruptible contracts (pre-negotiated)*
  - *Public appeal (Government campaigns)*
  - *Fuel-switching*

Electricity supply security

- Ability of power system to maintain reliable power supplies in real-time response to:
  - unexpected shocks
  - sudden disruptions
    - loss of largest generation
    - Loss of largest network components
  - rapid changes in aggregate, load & fuel supply conditions
    - Variable renewable energy
    - Distributed generation



Strengthening emergency response

- **Emergency response reviews**
  - Peer reviews on emergency preparedness & policies
  - Focus on oil, gas, electricity security of supply
  - Emergency response procedures
  - Institutional arrangements to identify / improve weaknesses
  - Mostly member but also partner countries
- **Emergency response exercises**
  - Biennial exercises testing processes, decision making, communication, data…
  - Workshops for new, complex issues
  - Tailored exercises for some partner countries
- **IEA involvement with G7, G20, EU…**

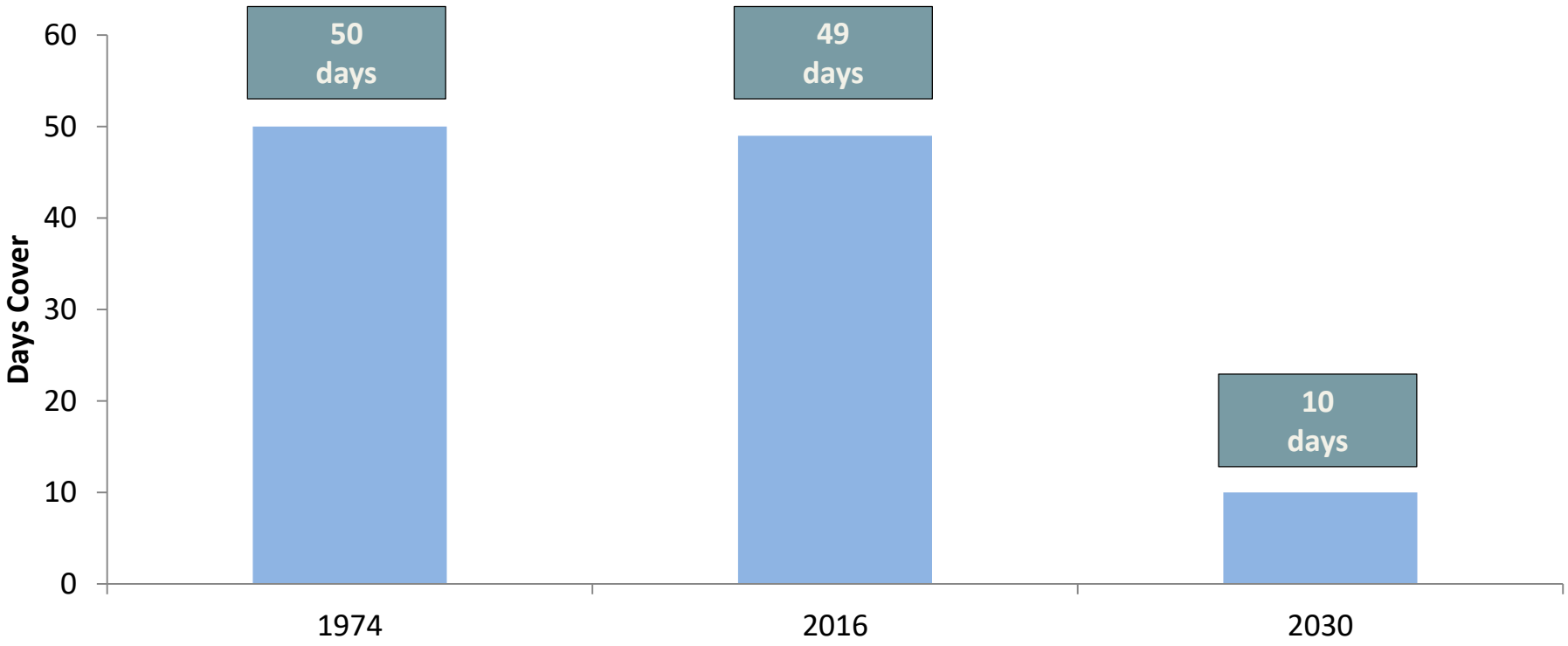
What about other countries?

- **Supply-side**
  - China & India building Strategic Reserves, others exploring options
  - Some low-level industry obligations in ASEAN countries
- **Demand-side**
  - Some demand restraint / management policies but frequently undermined by subsidies
- **Important to keep extending involvement and cooperation**

Work with Partner Countries

- **Active programme with non-member countries (association/joint statements/ MoU/ work programmes):**
  - Accession countries: Chile, Mexico
  - China (workshops, ERE)
  - India (workshops, ERE, ERA)
  - ASEAN/APEC (workshops, ERE)
  - Thailand (workshops, ERE, ERA)
  - Indonesia (ERA)
  - Colombia (ERA)
  - G7/G20, Energy Community, others

Future IEA Stock Coverage?

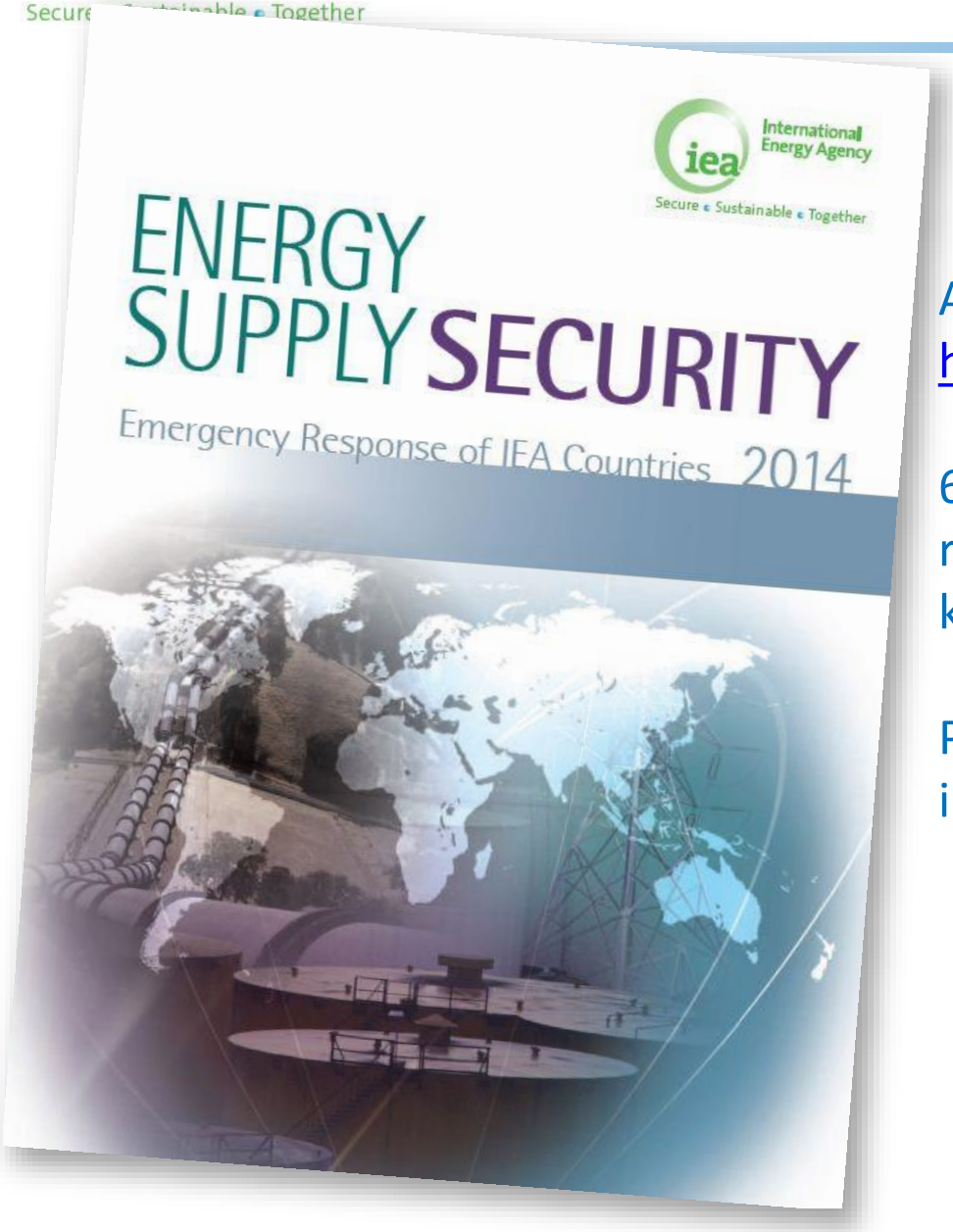


IEA oil stockholding requirements will become less effective in responding to supply disruptions as emerging economies make up an increasing share of global demand

Conclusions

- Demand growth driven by non-OECD – changing energy security perspectives
- Global & more integrated energy markets create new energy security challenges
- Need for global dialogue & cooperation
- Threats to energy security come from many sources
- Flexibility is crucial with efficient & transparent markets
- Government policies must complement efficient markets

For more information



Available for download at
http://www.iea.org/topics/energysecurity/

600 pages describing the emergency response policies for oil and gas of IEA and key partner countries.

PDF files for whole publication and individual chapters.

Thank you!

Jan.bartos@iea.org

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