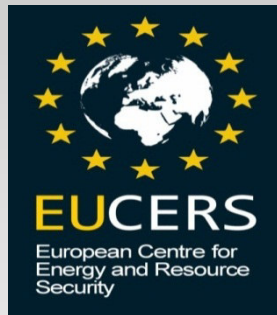


Current Challenges of Energy and Climate Policy in the EU

Presentation – at the Conference «Geopolitics and Economic Development of Europe», KAS/Department of Political Sciences of the University of Zagreb, Zagreb, 30 May 2017



Dr. Frank Umbach

Research Director of EUCERS (London); Senior Associate, CESS GmbH (Munich) & Senior Fellow, Atlantic Council (Washington D.C./USA)

E-Mail: FraUmbach@AOL.COM

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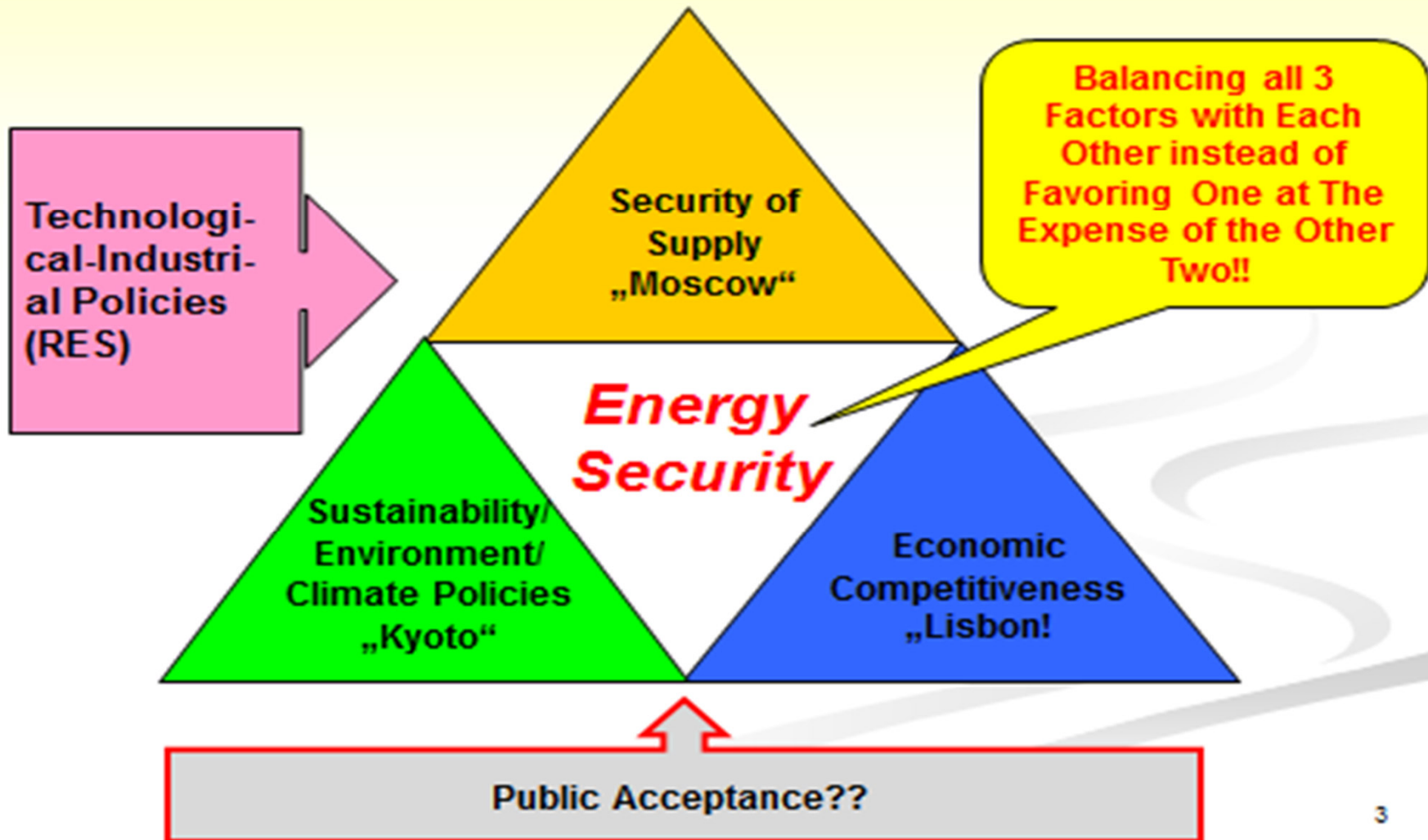
- **Energy Prices and EU Energy Strategy:**

- **Impacts on Energy Supply Security and Economic competitiveness in short-, medium- and longer-term perspective;**

1. Decline of global oil and gas prices: structural factors, not traditionally volatile developments;
2. U.S. shale oil and shale gas revolution:
 - manufactory revival – millions of new jobs;
 - Strengthening global competitiveness of U.S: industry and companies for decades ahead;
3. Decarbonization: fossil fuel (subsidies) vs. RES (subsidies) – cost devel.
4. **EU-Energy Security Strategy:**
 - Balancing the three objectives of the “energy trilemma”;
 - Coal vs. gas
5. **Lesson of German Energiewende:**
 - creating two parallel energy systems, which ultimately need to be subsidized both;
 - Blueprint for other countries and the rest of the world?
 - Feed-in tariff system replicated in China and other countries

Maintaining the Balance within the Energy Triangle and between its Three Objectives

Energy Triangle – Objectives of Energy Security



Paris COP21 Summit

Achievements/Objectives

- mitigation targets, and information about adaptation;
- global warming in the range of 1.5-2.0° C by 2100;
- first half by 2050: hope based on new transparent rules and unified standards;
- zero emissions in the second half of this century.

Failings/Challenges

- final accord (mostly) unbinding (NDCs);
- Implementation process of NDCs uncertain (U.S., China, Brazil, EU-28 at al.);
- **Most oil and gas producing countries not prepared at all for a decarbonized world energy system!**



- COP21 agreement widened the gap between global environmental policies and present worldwide energy megatrends;
- new MIT study: having investigated the likely effects of commitments made under the Paris Agreement; concludes with a 95% predictability: the likely warming will be still in the range between 2.7-3.6°C (best-case scenario);
- ultimately far more drastic changes needed in the forthcoming years and decades prior to 2050 not just for the coal, but as well as oil and gas markets worldwide

Major Challenges of EU-Energy Policies Ahead - Energy Triangle: Challenges and Competing Objectives

1. Security of (Gas) Supply:

- * Reducing Fossil Fuel imports;
- Diversifying Gas Imports;
- Decreasing Gas Import Dependence from Russia;
- Finishing the Internal Energy Market by Liberalization.

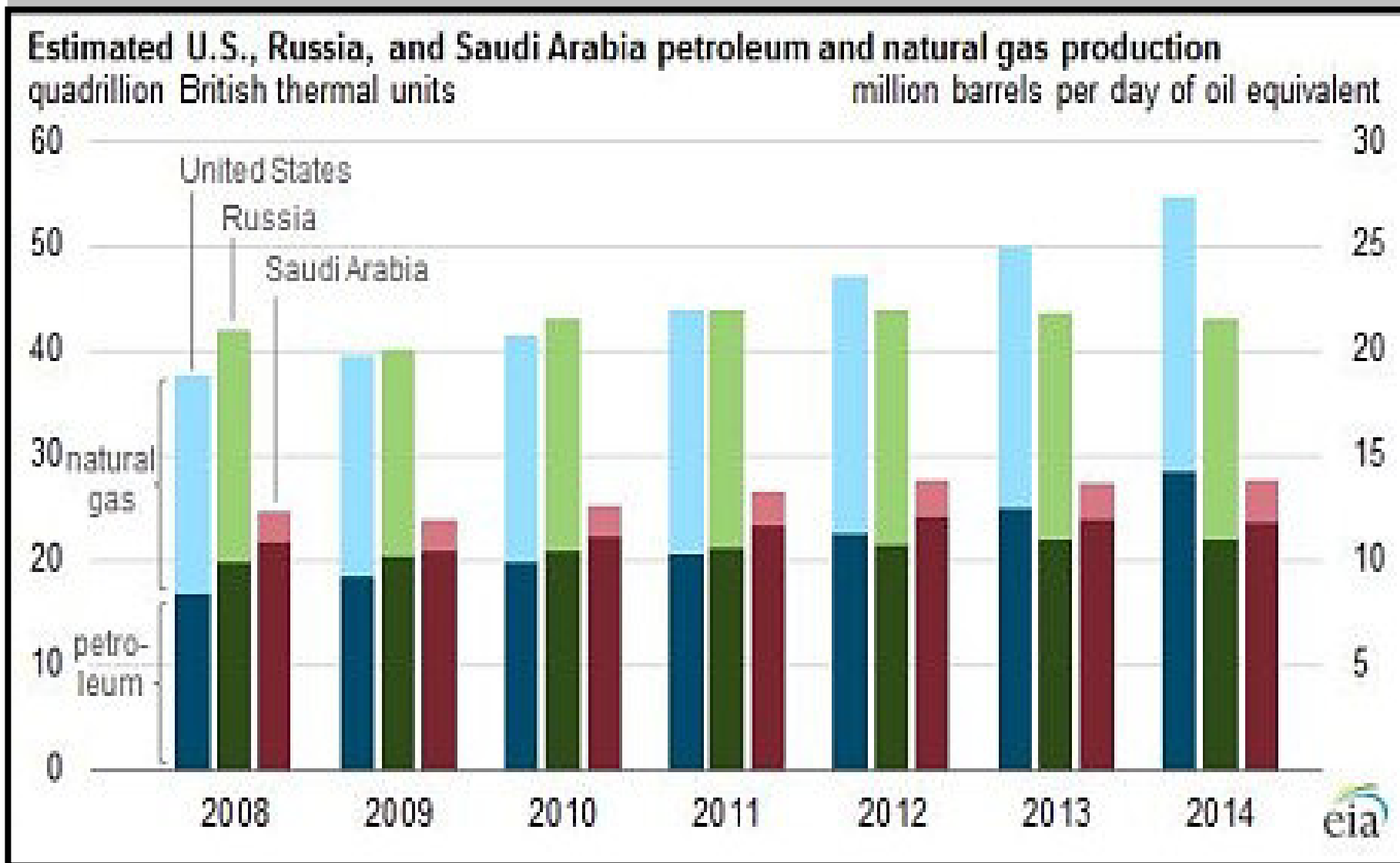
2. Economic Competitiveness:

- Reducing Fossil Fuel Imports;
- High Energy Prices (i.e. Gas towards the U.S.);
- Preventing Investments of Europe's Energy Intensive Industries Going Abroad;
- Technological Innovation beyond RES.

3. Environmental-Climate Protection Challenges:

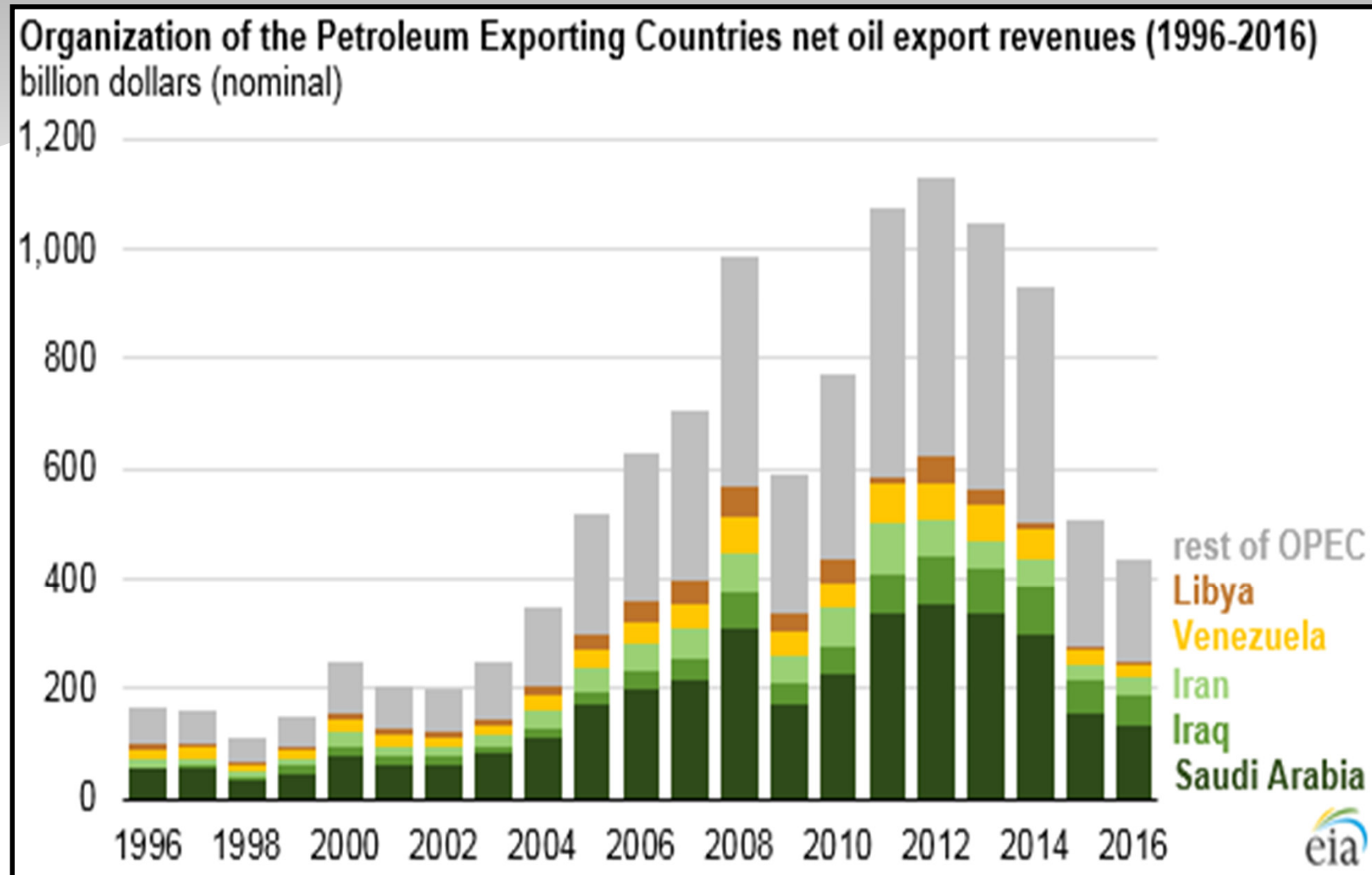
- Long-term Obligation to Decrease up to 95% CO₂-Emissions by 2050;
- Decarbonization Strategy without Undermining Energy Supply Security and Economic Competitiveness;
- Realistic Implementation of the 40%-Target to Reduce CO₂-Emissions by 2030;
- Will U.S. and China Follow Binding Emission-Reductions?
- Market Stability Reserve and ETS-Reform: Sufficient to Make Gas Competitive with Coal?

U.S., Russian, Saudi Arabian Petroleum and Natural Gas Production 2008-2014



Source: EIA 2015

OPEC: Net Oil Export Revenues in Individual Members 1996-2016

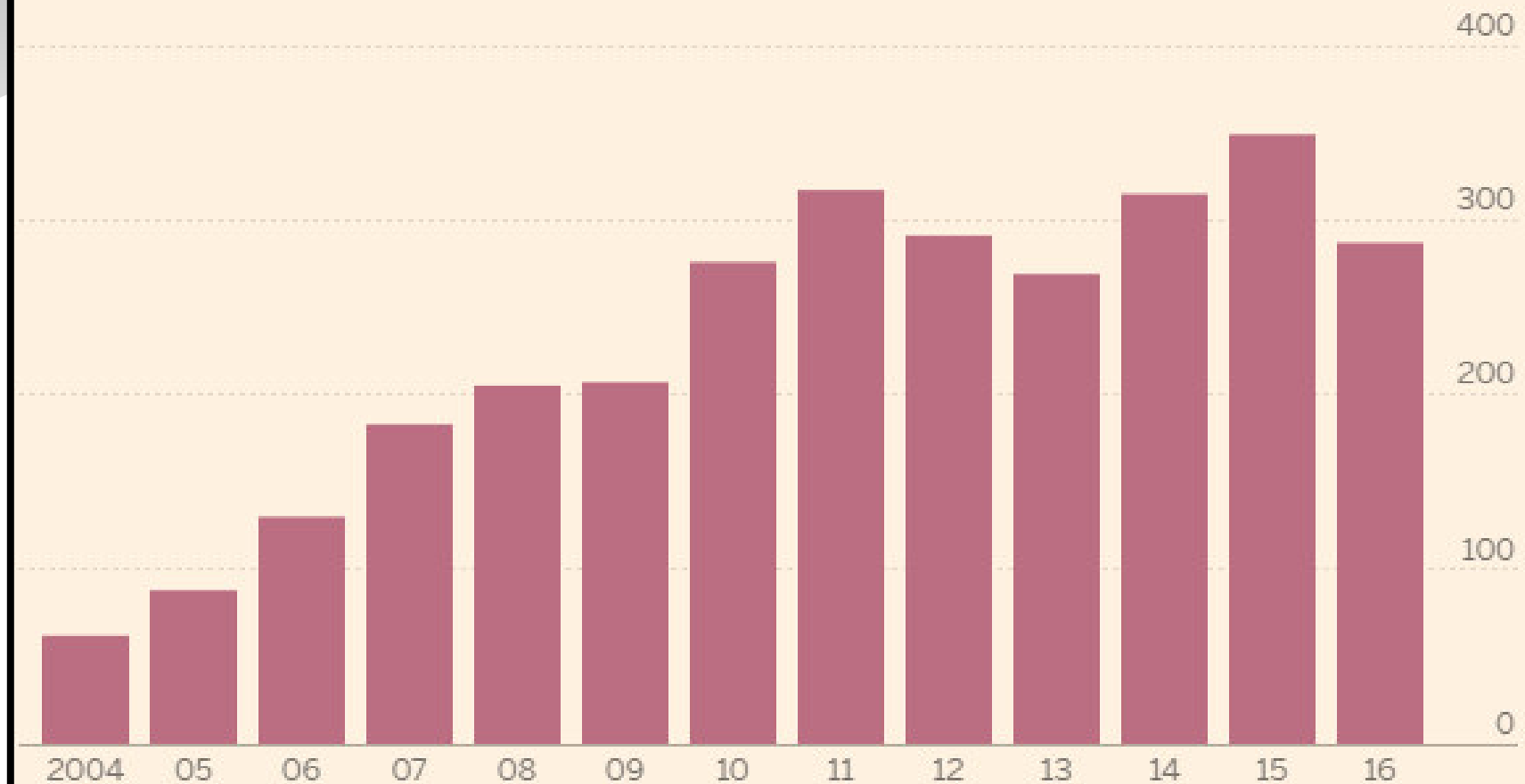


Source: EIA 2017

Clean Energy Investments 2004-2016

New investment in clean energy drops off in 2016

Total annual new investment, \$bn



Includes estimates for undisclosed deals. Includes corporate and government R&D.

Source: Bloomberg New Energy Finance

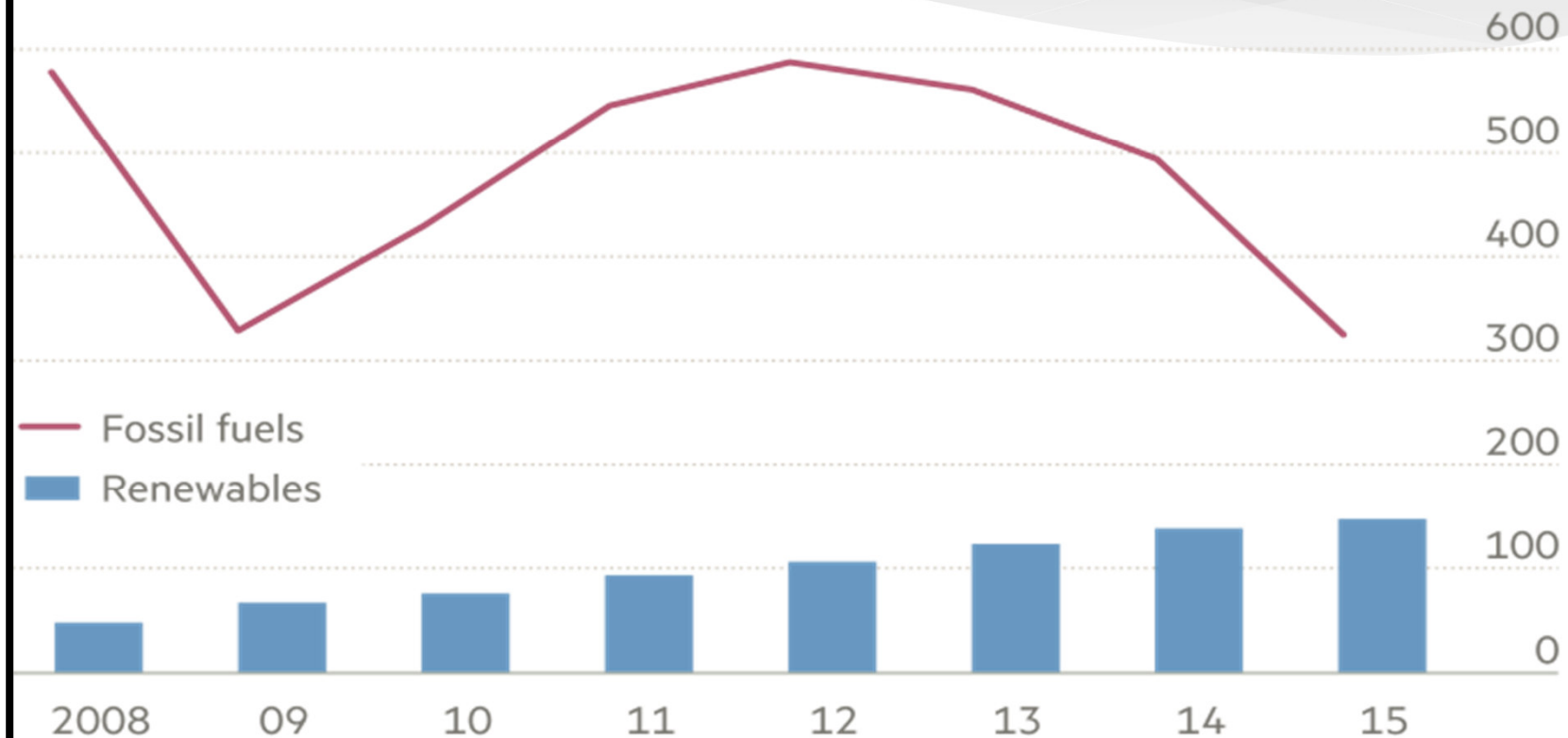
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Source: FT 2017

Green versus Fossil Fuel Subsidies 2008-2015

Green subsidies have risen but fossil fuels receive more support

Global fossil fuel and renewable subsidies (\$bn)



Source: IEA

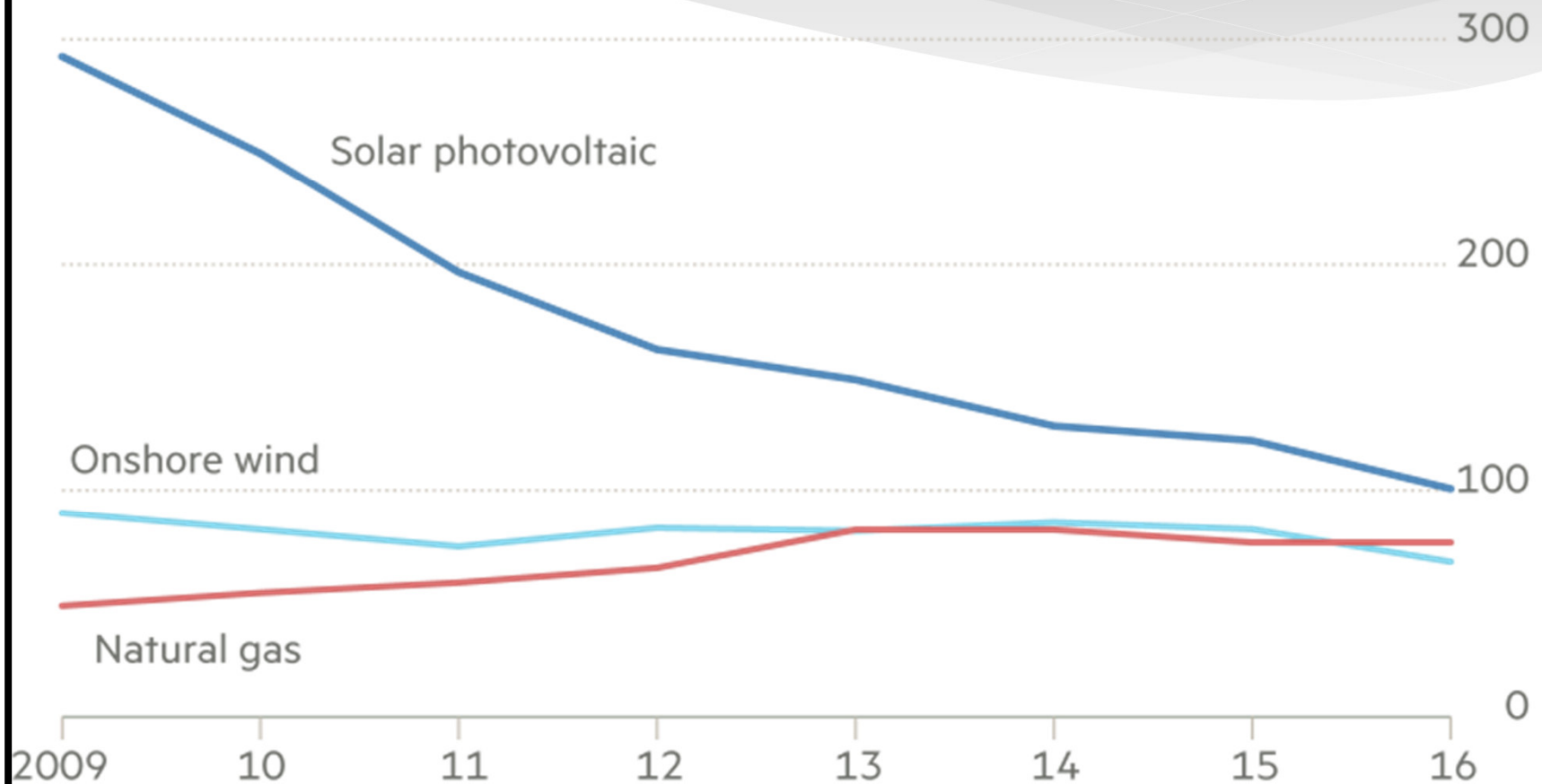
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Source: FT 2017

RES: Falling Costs and Rising Competitiveness 2009-2015

Falling costs have made renewables more competitive

Levelised cost of electricity (\$m per MW)

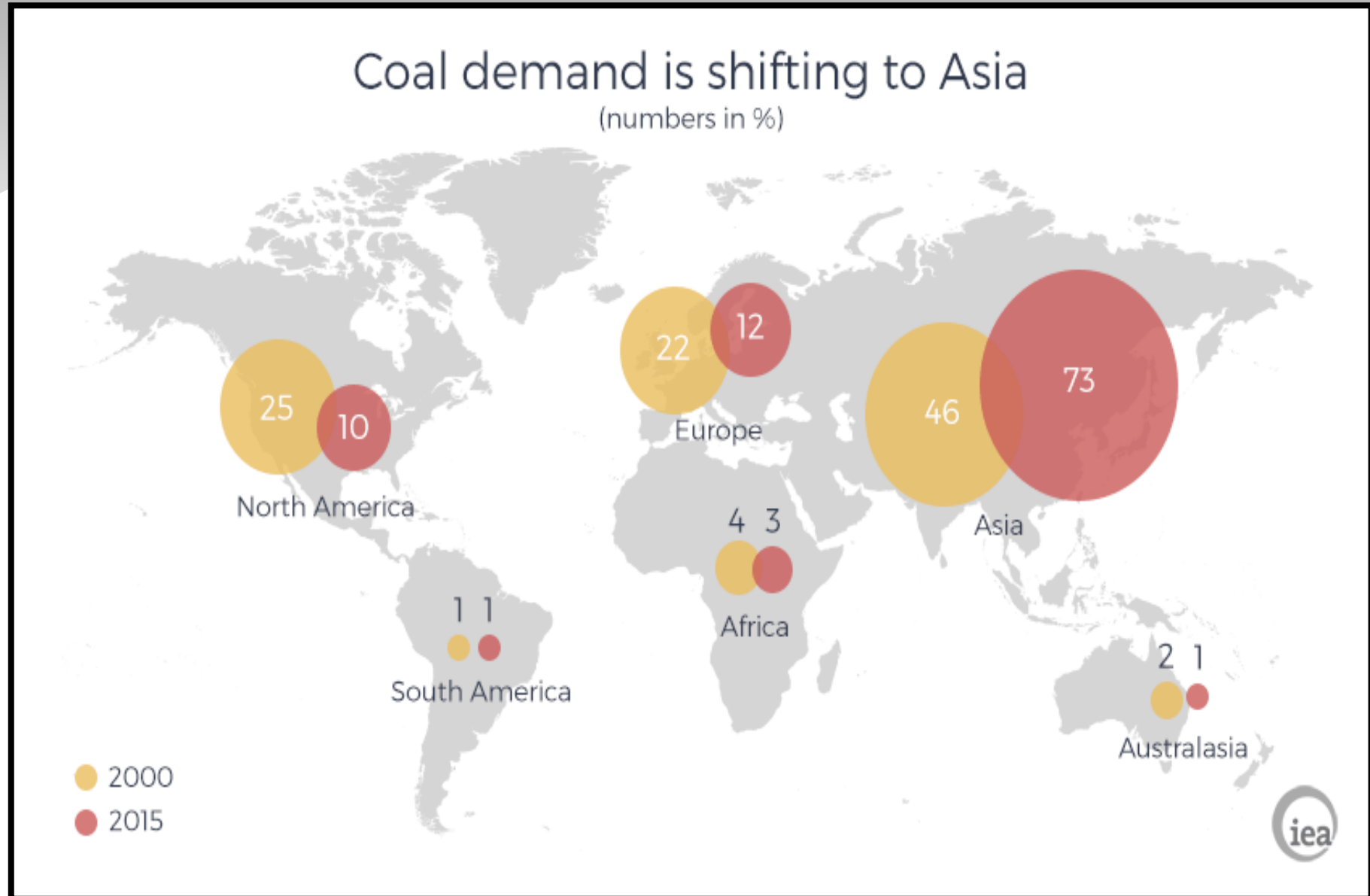


Source: Bloomberg New Energy Finance

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Source: FT 2017

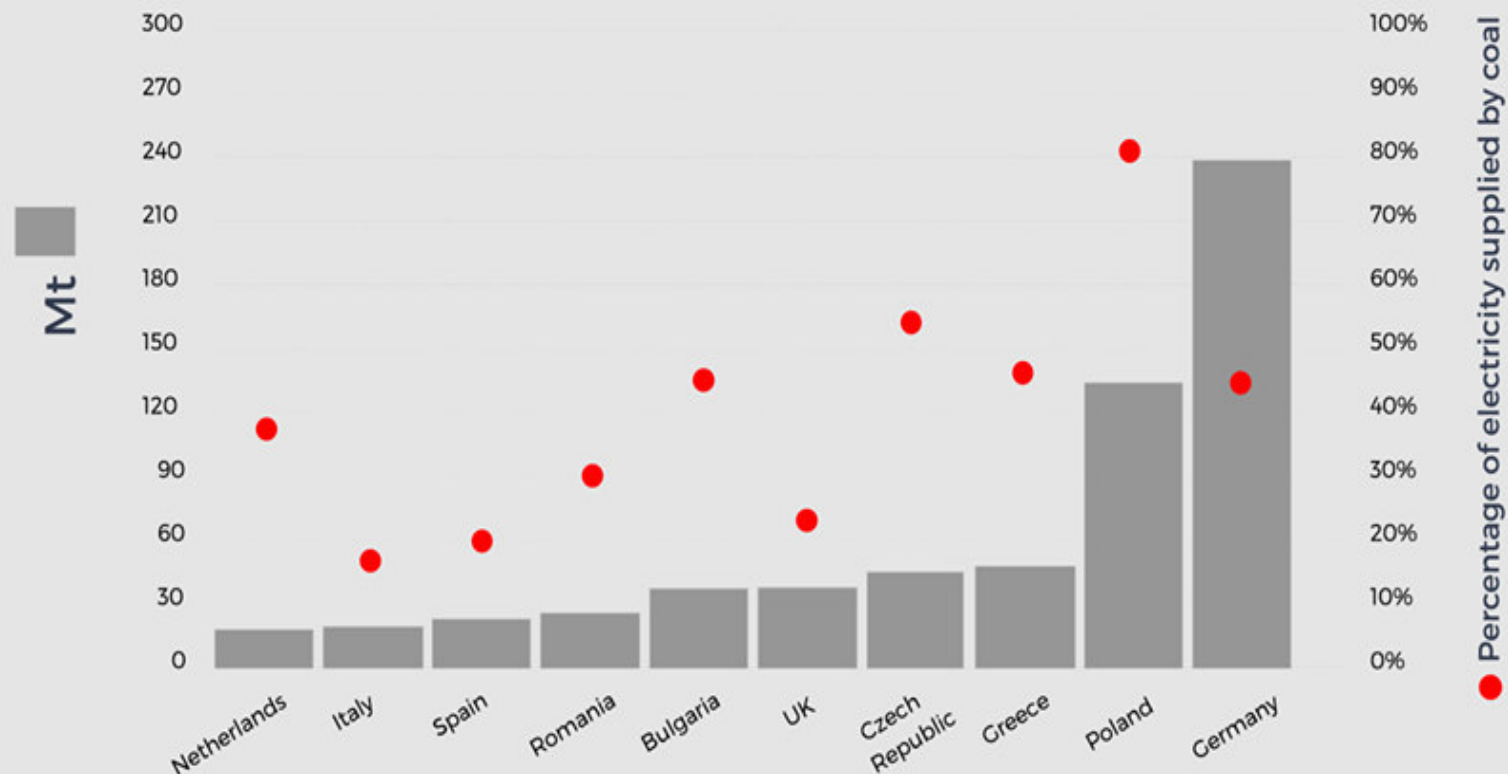
Global Coal Demand Shifting to Asia



Source: IEA 2017

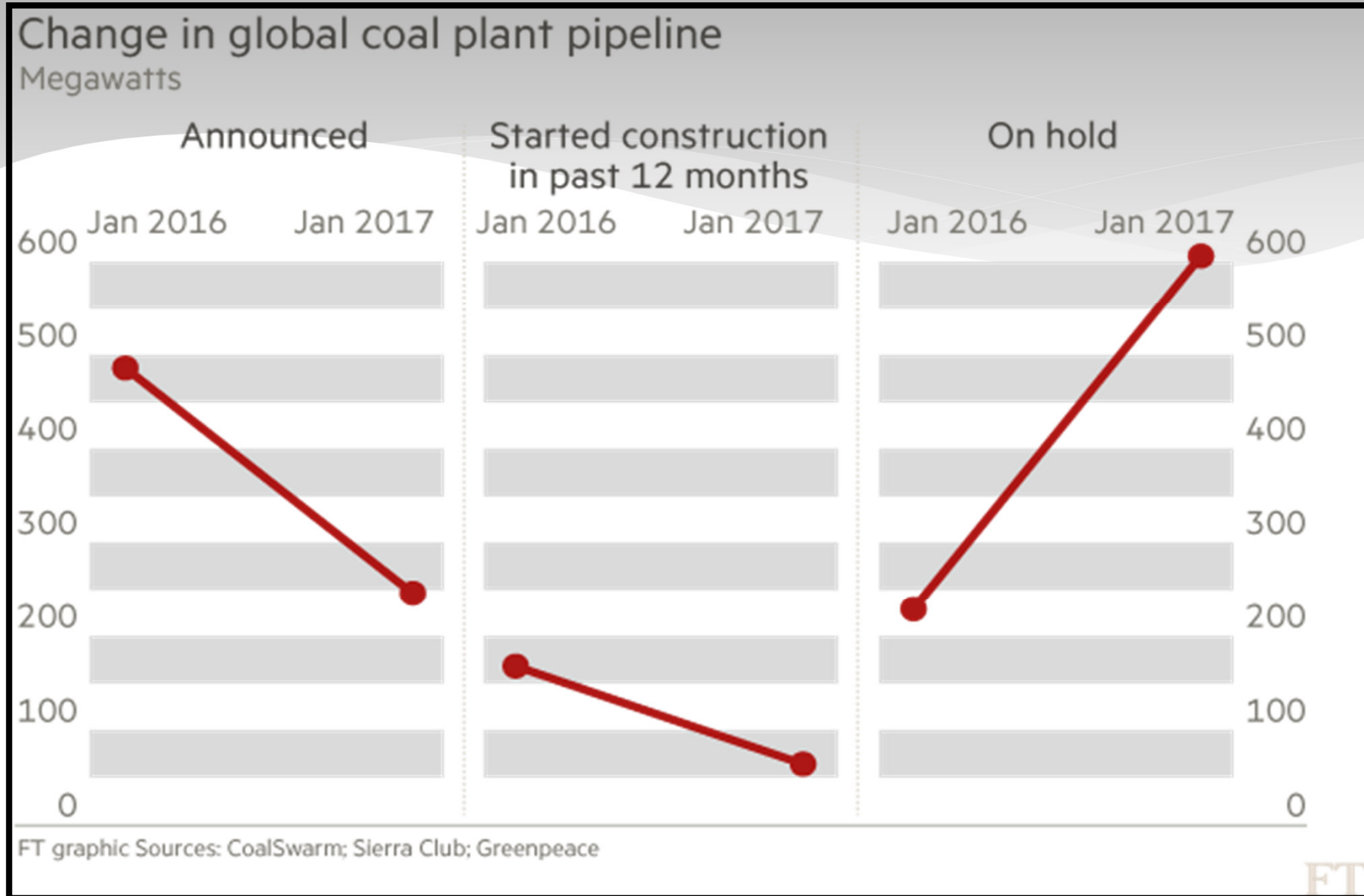
EU Coal Demand and Share in Power (2015)

2015 coal demand and share in power in the 10-largest consumers in the EU



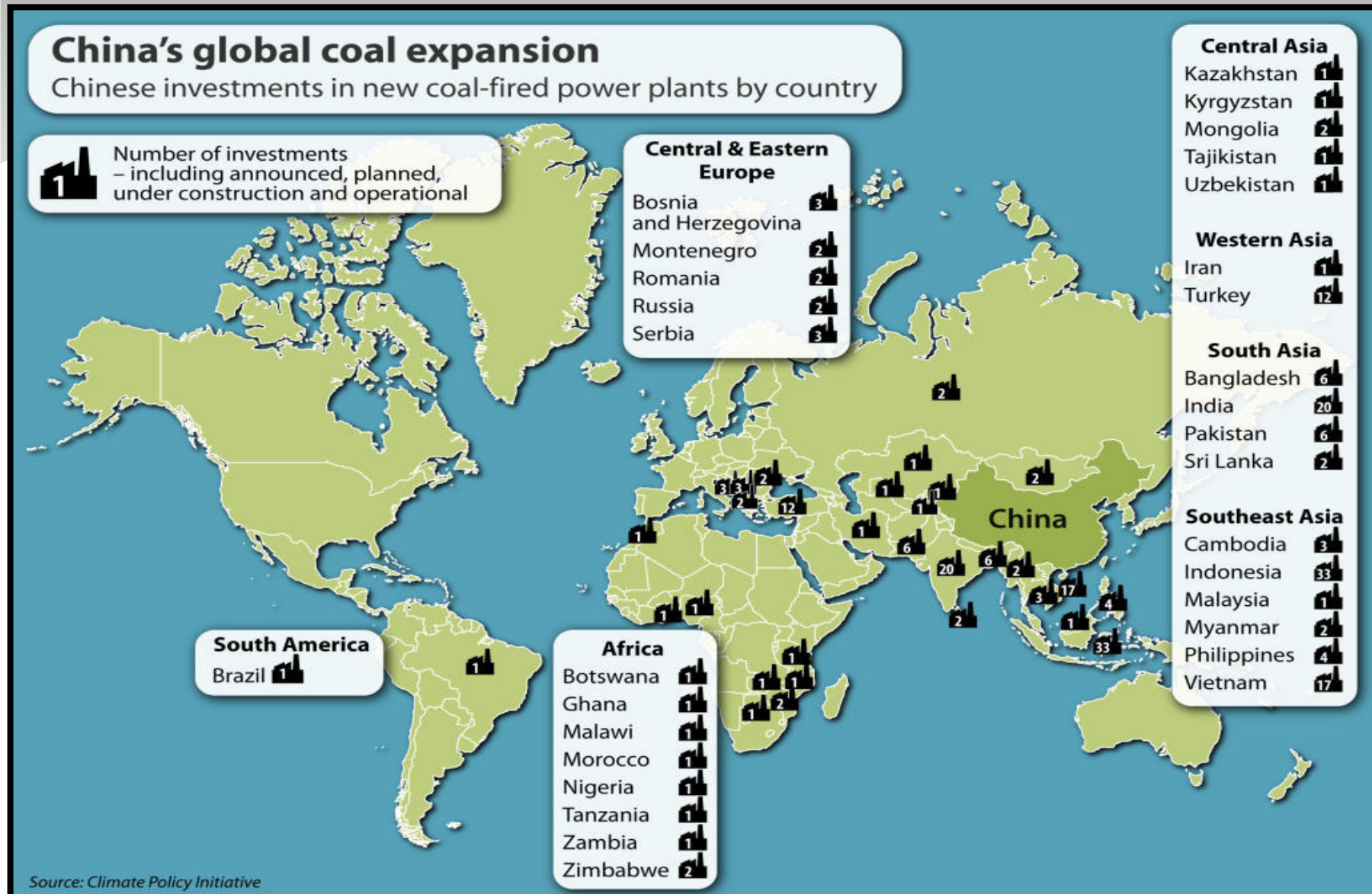
Source: IEA 2017

Declining Coal Power Plants Worldwide



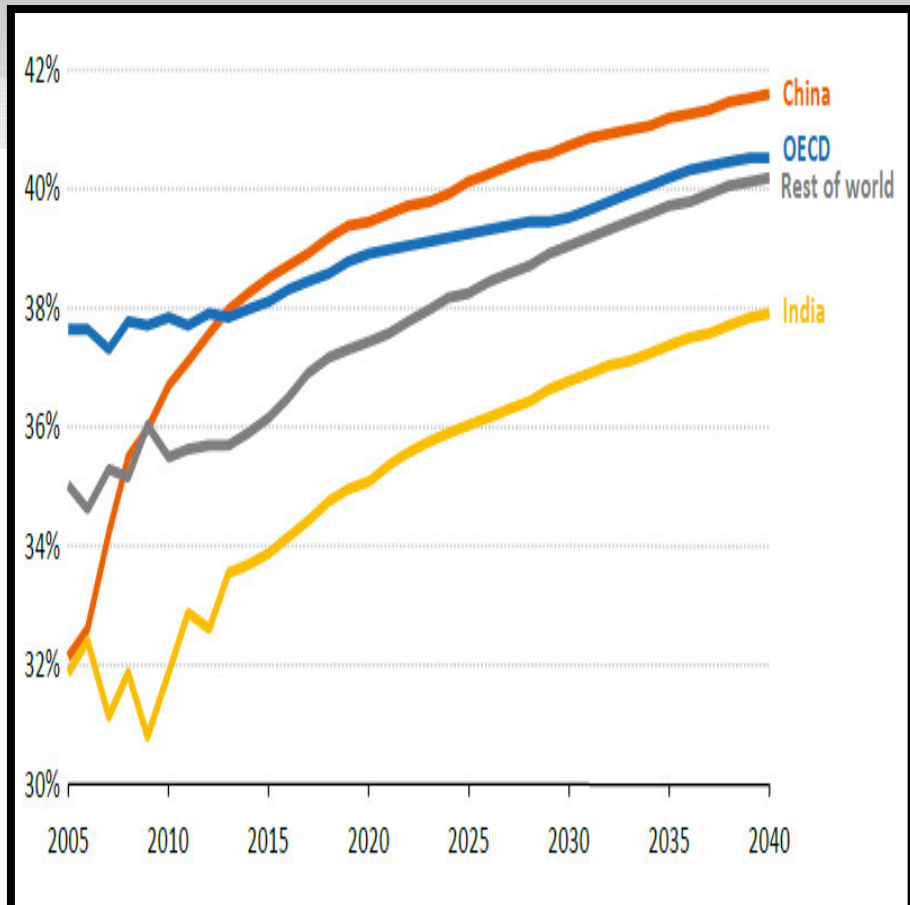
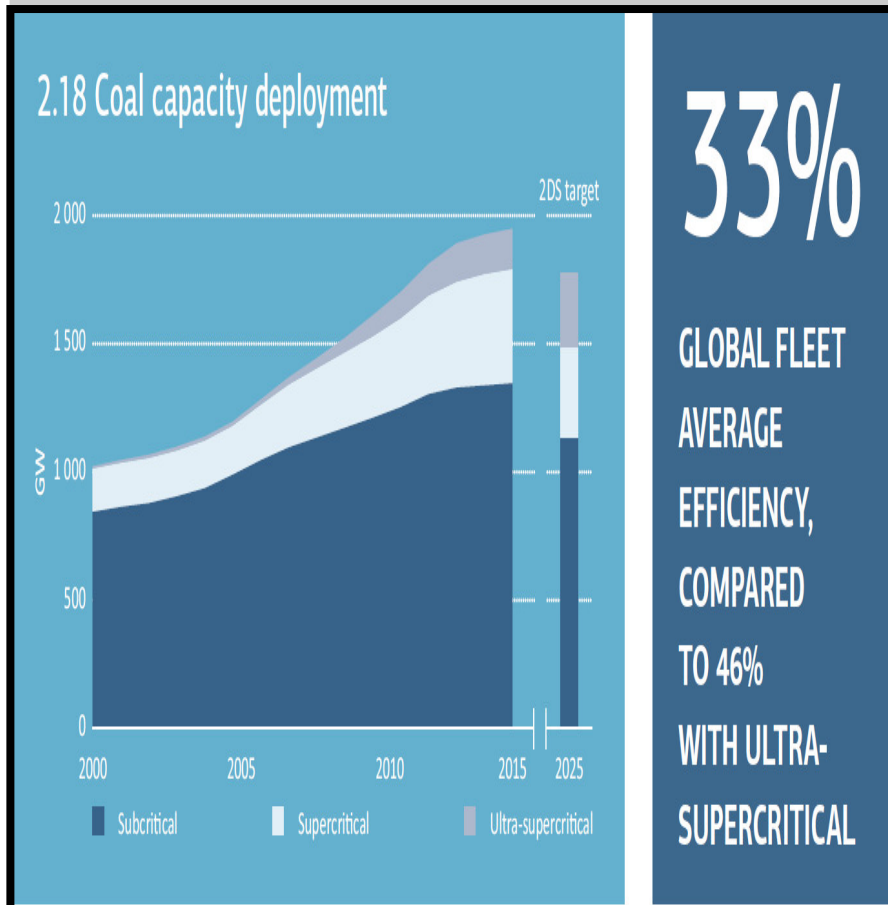
Source: FT 2017

China's Global Overseas Coal Investments (2015)



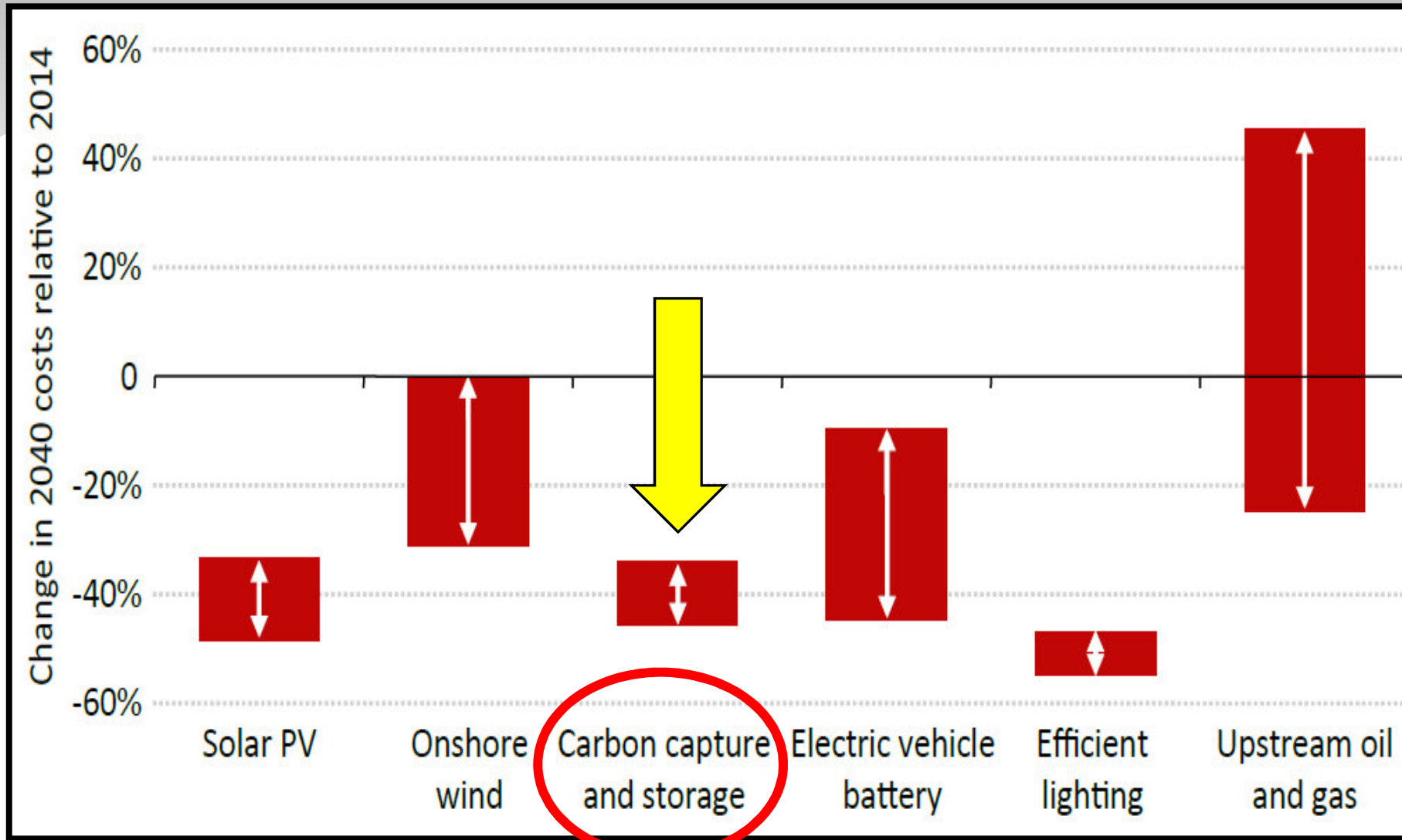
Source: GIS/Climate Policy Initiative 2016/2015

Efficiency Grade of World-Wide Coal-Power Plants (2000-2015/25) and IEA-NPS (2005-2040)



Source: IIEA 2014

IEA: Cost Perspectives of CCS

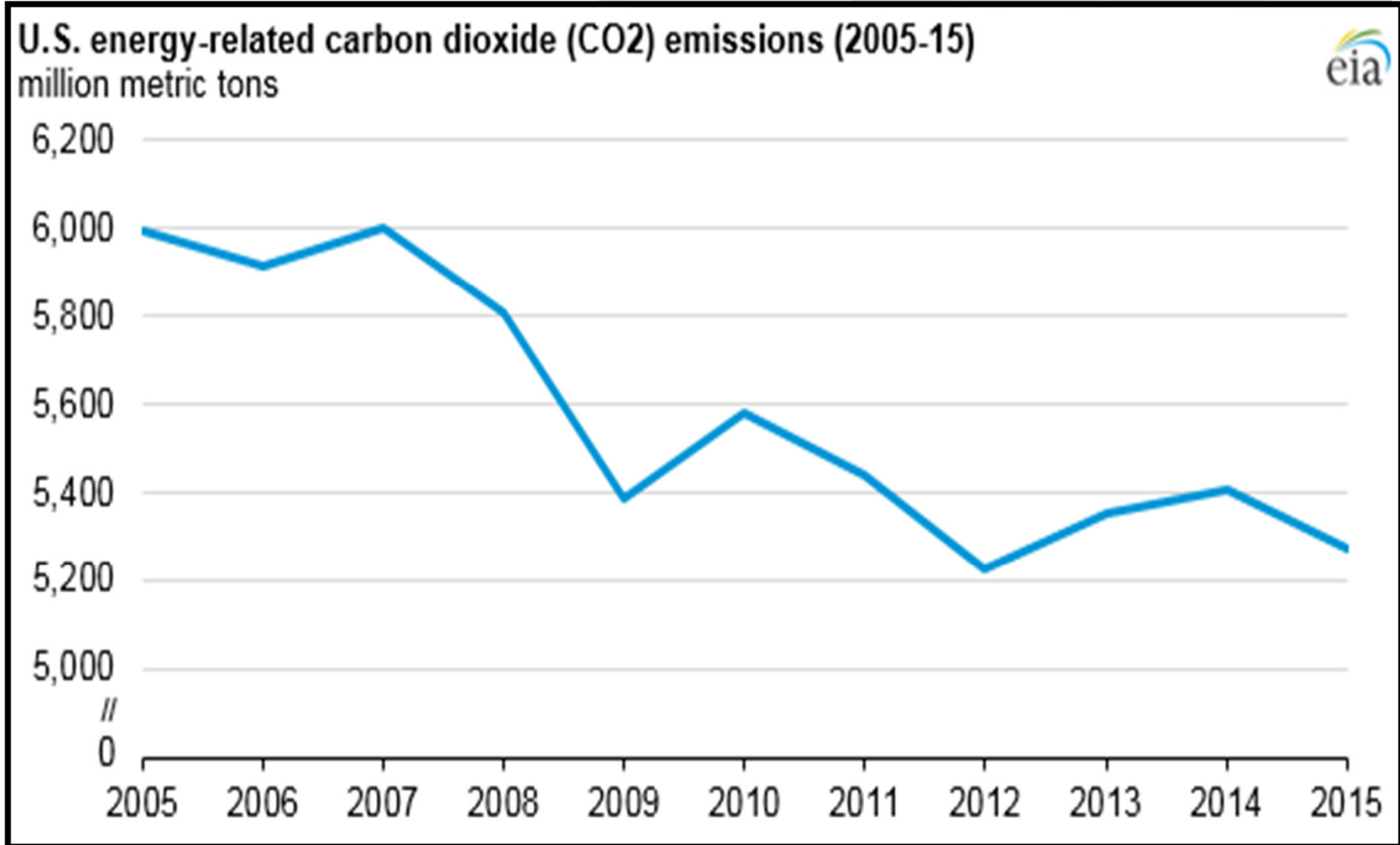


National Emission Reductions = Global Climate Protection? I

■ Carbon Leakage:

- The Kyoto protocol calls for CO₂-reductions to be counted in national member states covering consumption and production, but does include the transport of imports via pipelines and shipping.
- Estimates: >7% of the EU's CO₂ emissions 1990-2008 were simply outsourced to the developing world in the form of manufactured imports.
- These production facilities outside the EU often produce more emissions; and more distant shipping routes need more energy and produce more greenhouse gas emissions (GHGE).
- Risk: any unilateral and overly ambitious climate change policy may merely drive out energy-intensive industries from Europe and Germany, leading to a de-industrialization – with losses in economic competitiveness and often leading higher levels of global emissions.

Is the U.S. Coal-to-Gas Change a Blueprint for Europe?



Source: EIA 2016

National Emission Reductions = Global Climate Protection? II

- National emissions do not automatically lead to global emission reductions due to the impacts of carbon leakage:
 - **Positive-Example: US Coal-to Gas-Change**
 - is not a blue-print for Europe as it cannot be compared;
 - even this positive example of an impressive CO₂-emission reduction is insufficient for the U.S. obligation to decrease its emissions by >80% by 2050;
 - **Negative-Example: Germany's phase-out of hard coal production in 2006 (Russia as a free-rider)**
 - Russian reaction: Putin offered 20% more gas as compensation;
 - Russia increased its coal and gas exports to Germany and used more coal domestically to free up gas for exports (as confirmed by Russia's energy strategy 2030 declared in 2007).
 - **Net-Result of Global Emissions: Russia's GHGE increase was ultimately greater compared with Germany if it would have maintained its domestic hard coal mining and production.**
 - Russia became the largest source of Germany's coal imports,

National Emission Reductions = Global Climate Protection? III

■ Global Climate Protection:

- Adequate strategies for achieving the declared Kyoto-targets and the 2°C-objective need to include life-cycle analyses:
- **Life-Cycle Analyses (taking into account emissions of the entire production-transport-consumption chain over a longer period of 20 years etc.) :**
 - Emissions of domestically produced and consumed coal and conventional as well as unconventional gas lower than coal and gas (LNG, pipeline) imports;
 - **Germany: domestic coal versus imported gas from Russia:**
 - CO₂-emissions from domestic coal consumption not necessarily higher than Russian pipeline gas (i.e. not from Yamal) and LNG imports;
 - Other GHGE like methane even much higher for (ie. pipeline) gas;

Conclusions and Strategic Perspectives I

- Current global energy policies and climate mitigation efforts are still insufficient for reaching the 2°C target – forecasts currently point to a 2.7-3.6°C rise in world temperature by 2100.
- An end of the fossil age is not realistic by 2040/50;
- **Near to mid-term future: coal remains a viable option**
 - to enable economic growth and meet growing demand for energy;
 - a key target of the 2010 Copenhagen accord to tackle the needs of around 1.4 billion people with no electricity supply and another 2 billion little or inadequate access to power;
- No technological alternative to a widespread introduction of CCS/CCUS for all fossil-fuel based thermal power plants and the entire energy-intensive industry.

Conclusions and Strategic Perspectives II

- **Existing strategies for achieving the agreed climate protection targets neither sufficient nor adequate and effective:**
 - Carbon Leakage effects an indicator that worldwide economic realities (i.e. globalization) are not taking into account or are at least underestimated;
 - Need for taking the results of life-cycle emission analyses into account;
 - **Coping with climate change needs not only much more expanded investments in cleaner energy sources, but also addressing high emission assets that are already in place (i.e. coal-fired plants):**
 - Energy efficiency is a critical key factor in mitigating the global challenges of energy security and rising energy consumption. - need to replace no less than 40% of the world's existing power plants offers huge export opportunities for German and European producers as technology leaders in this field;
 - Globally, if all coal-fired power plants would operate at such levels by 2040, worldwide coal-fired emissions would be 17% cent lower..



**Thank you very much
for your attention!**