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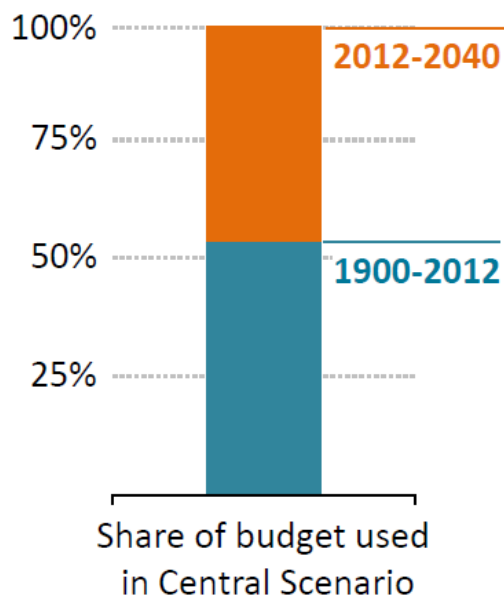
IEA In-depth Review of the EU 2014: *Energy Union and the outlook for 2020-2040*

Sylvia Elisabeth Beyer
International Energy Agency
Ljubljana, 24 April 2015

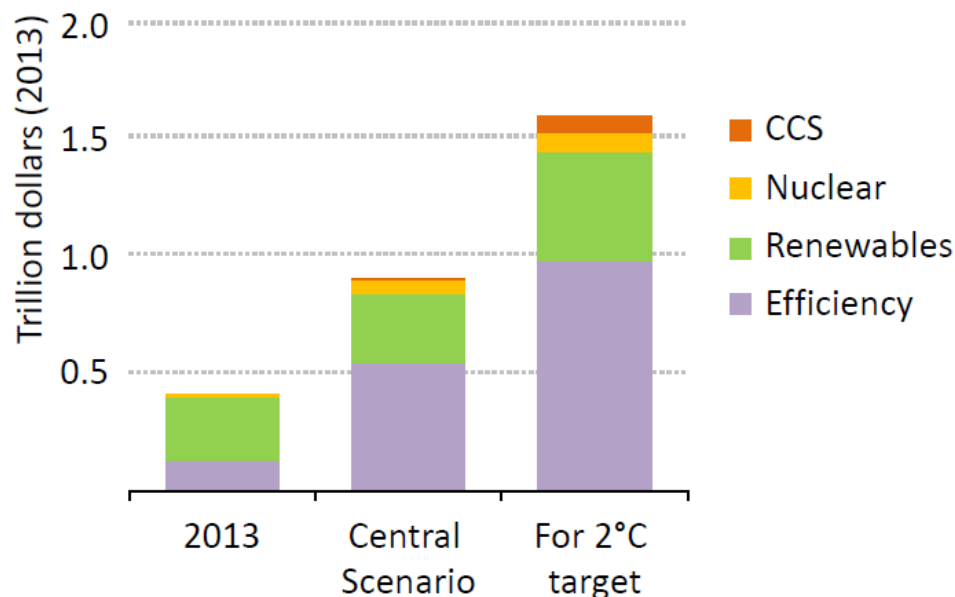
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The 2 degree target requires four times the current low-carbon investment

World CO₂ budget for 2 °C
~2300 Gt

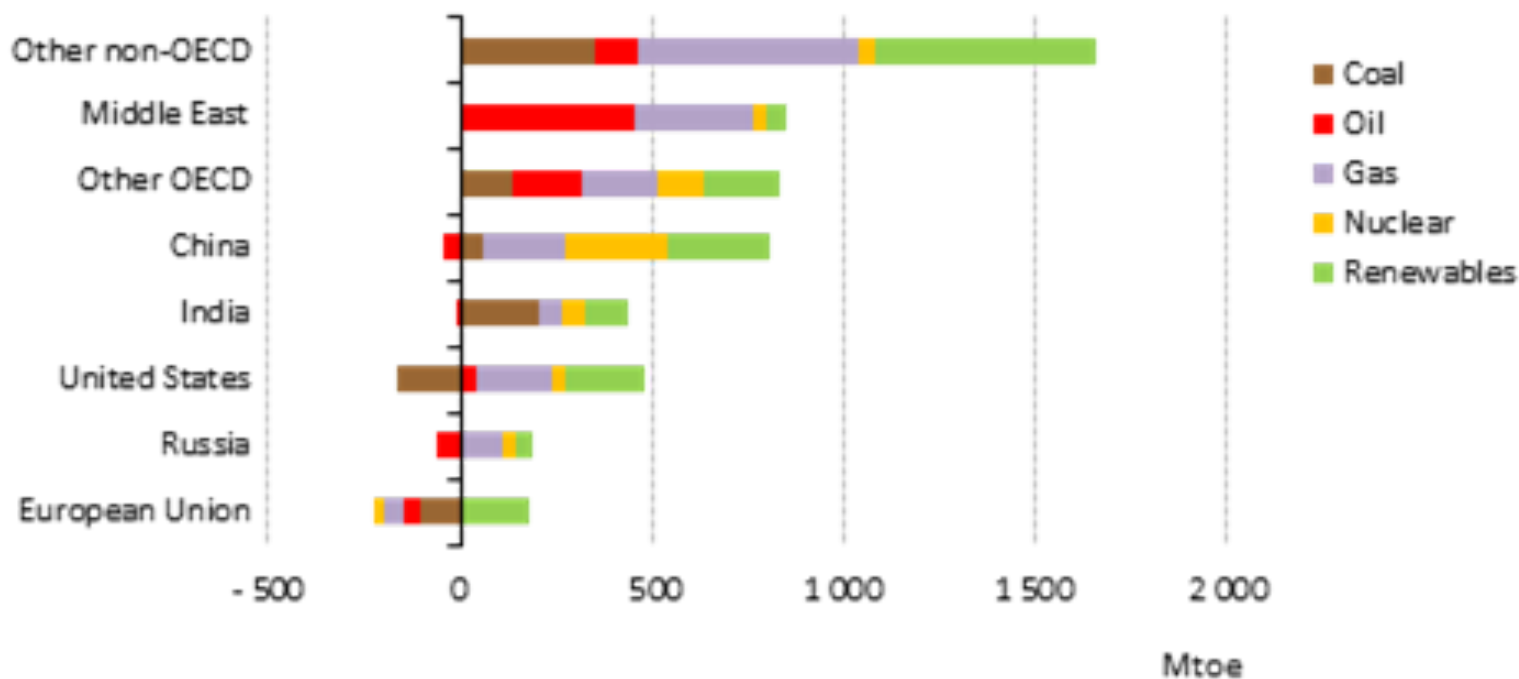


Average annual low-carbon investment, 2014-2040



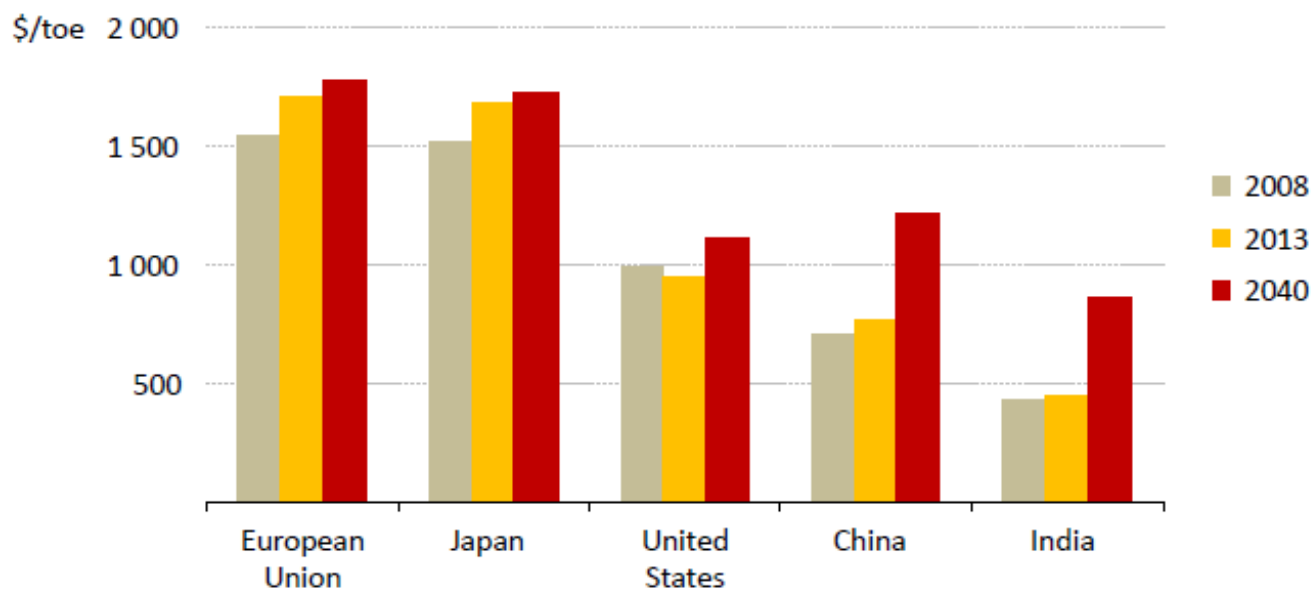
Source: IEA, *World Energy Outlook*, OECD/IEA, Paris, November 2014.

Change in energy production by region in the New Policies Scenario, 2012-2040



Source: IEA, *World Energy Outlook*, OECD/IEA, Paris, November 2014.

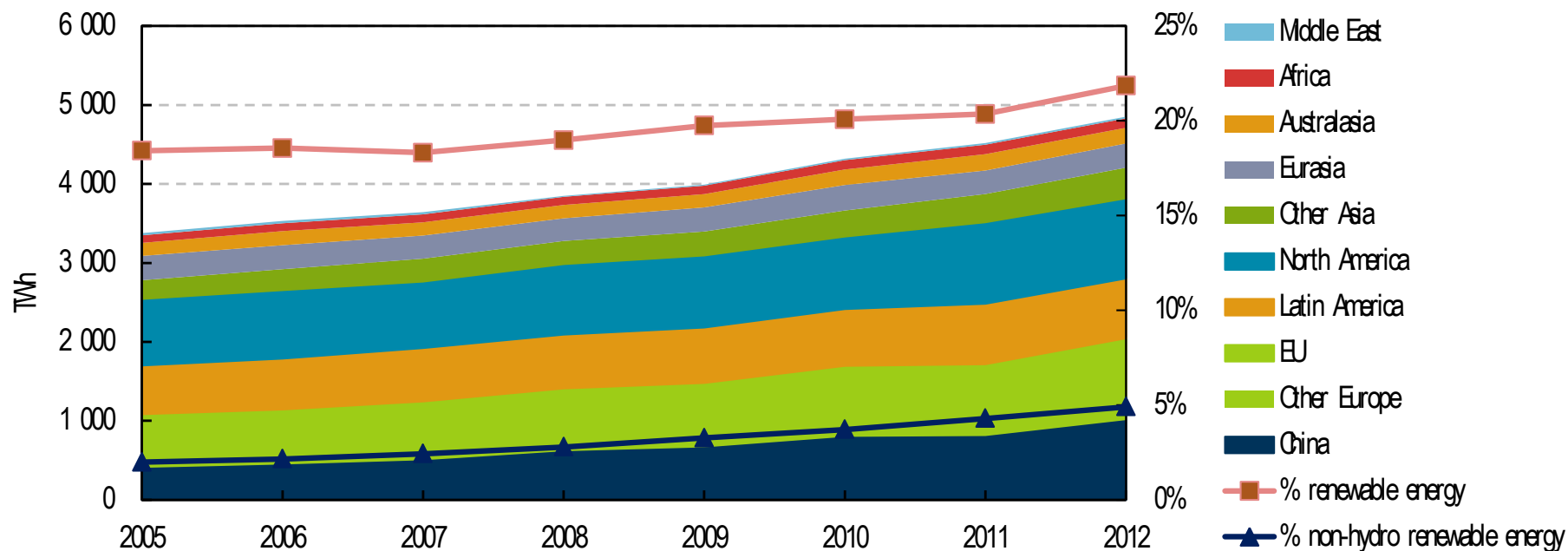
Competitiveness and cost to energy consumers



Weighted average of energy paid by consumers. All economies face higher costs, but the pace of change varies: China overtakes the US, costs double in India & remain high in the European Union & Japan

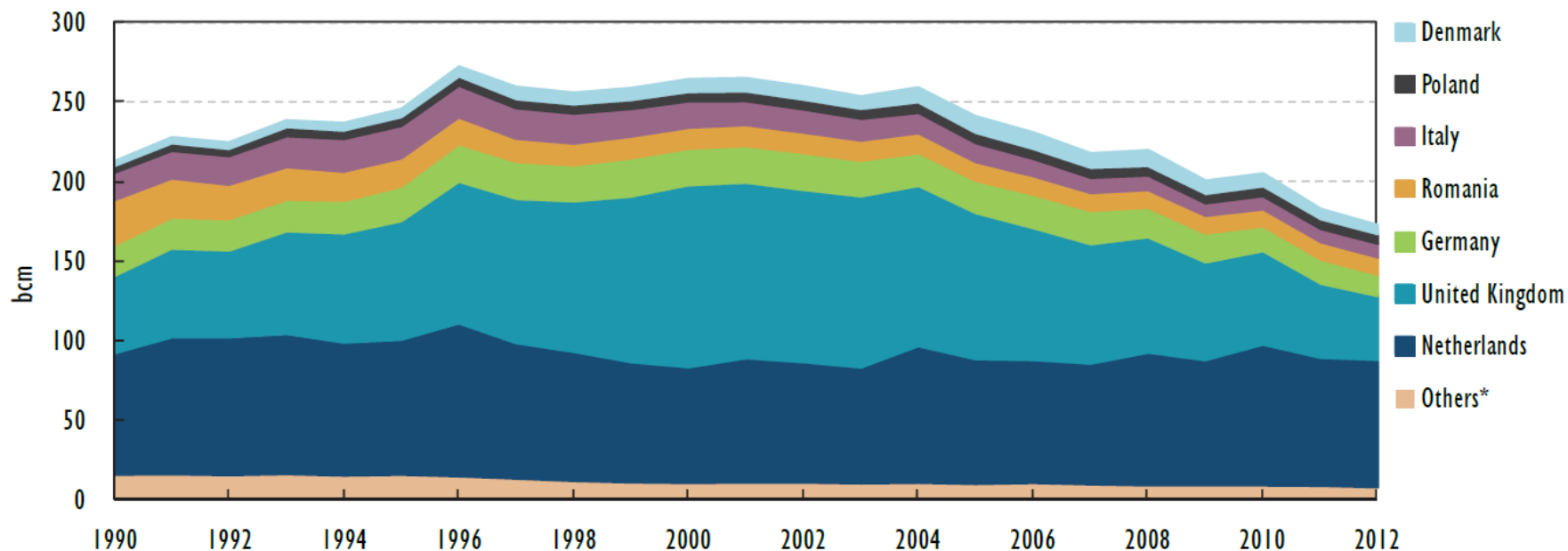
Source: IEA, *World Energy Outlook*, OECD/IEA, Paris, November 2014.

EU renewable-based generation on track to target, but global renewable energy growth is strong



The EU growth in renewable energies has been impressive, but there might be a shortfall of 9% RES-E to 2020, as not every country or technology is on track. EU share in the global market is decreasing, staying behind the growth rates of emerging and developing countries.

Fast declining gas production in the EU



* Others includes other European Union member states which produced gas in each year.

Dependence on pipeline imports on the rise, as gas production declines fast and LNG imports are low (-50% since 2010).

80 bcm of unconventional gas by 2035 could be harnessed, if supportive regulatory and political framework and sufficient public confidence.

Outlook for the EU to 2020-2040

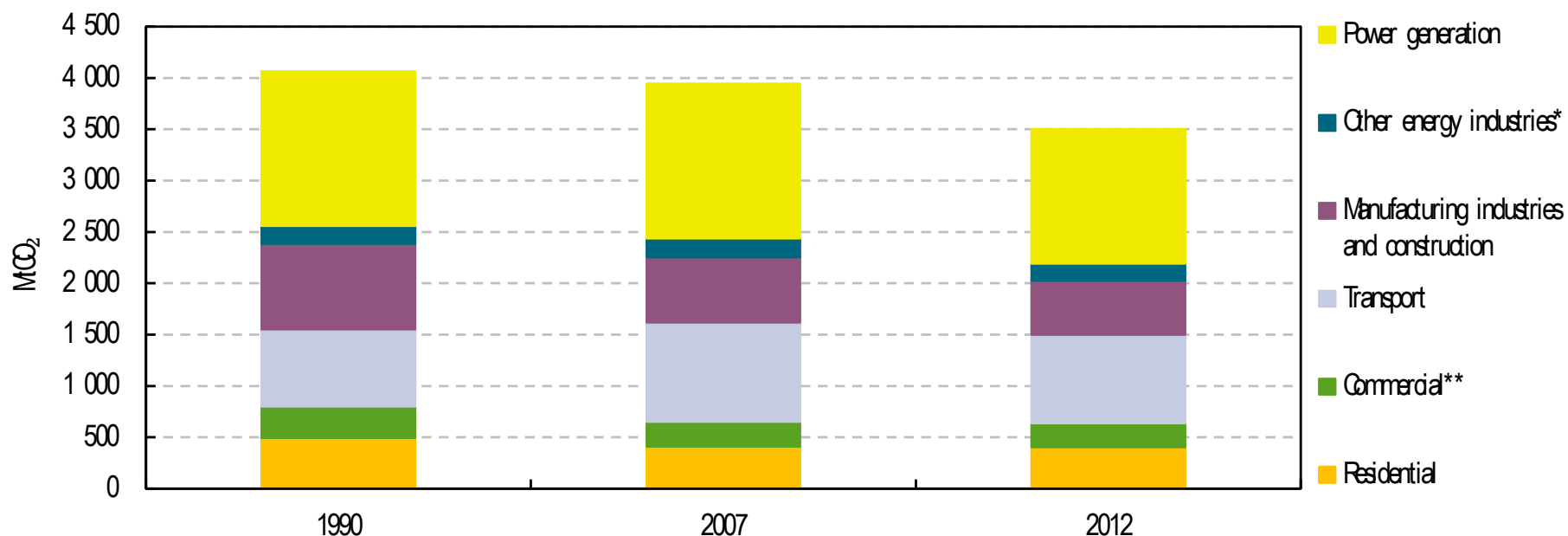
- Flat demand and fast declining oil and gas production, growth in renewable energies and imports.
- Rising EU energy costs vis-à-vis trade partners.
- Energy security concerns, in gas and electricity, need to be addressed. Large benefits from energy efficiency / renewables.
- The EU is in the midst of the energy system transformation which requires new rules.

EU decarbonisation goals 2030-2050

GHG reductions compared to 1990	2005	2030	2050
Total	-7%	-40% to -44%	-79% to -82%
Power (CO ₂)	-7%	-54% to -68%	-93% to -99%
Industry (CO ₂)	-20%	-34% to -40%	-83% to -87%
Transport (including aviation, excluding maritime)	+30%	+20% to -9%	-54% to -67%
Residential and services (CO ₂)	-12%	-37% to -53%	-88% to -91%
Agriculture (non-CO ₂)	-20%	-36% to -37%	-42% to -49%
Other non-CO ₂ emissions	-30%	-72% to -73%	-70% to -78%

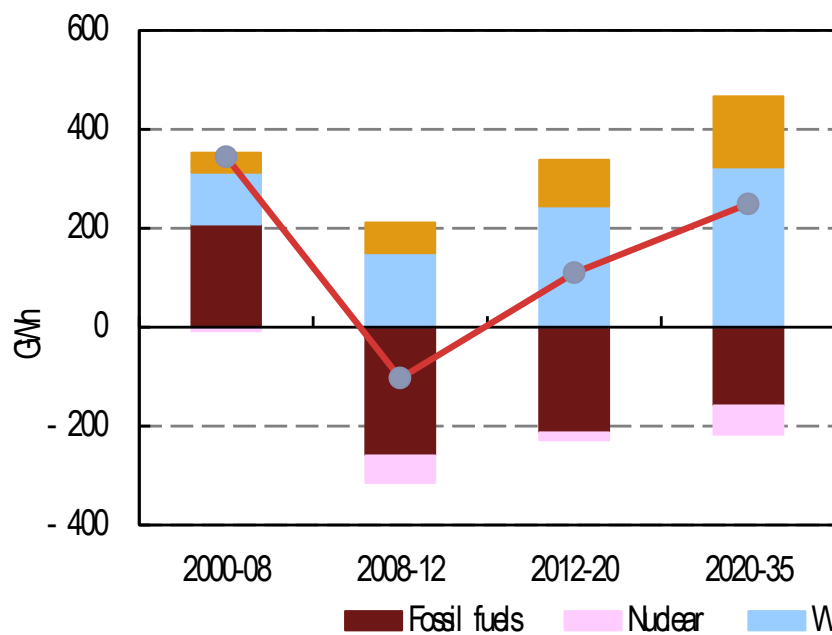
Source: European Commission, *Low-carbon economy roadmap 2050*, 2011.

Power generation and transport are top emitters

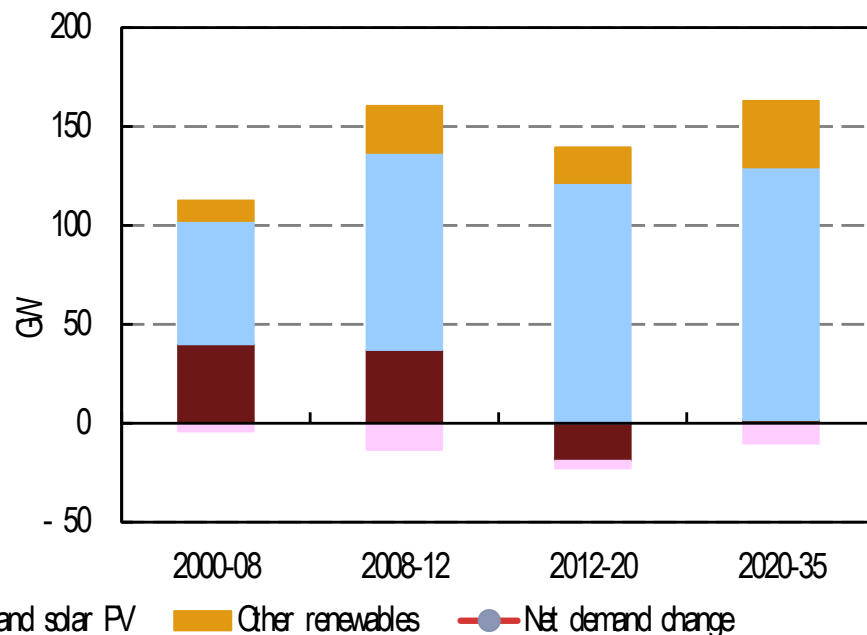


Power generation remains the largest emitters in 2012. Emission trading scheme saw a carbon price collapse from EUR 30 to EUR 6 per tCO₂ since 2008. The EU saw the revival of coal, as EU natural gas prices are consistently above global coal and carbon prices during 2009-14.

Net incremental demand / generation



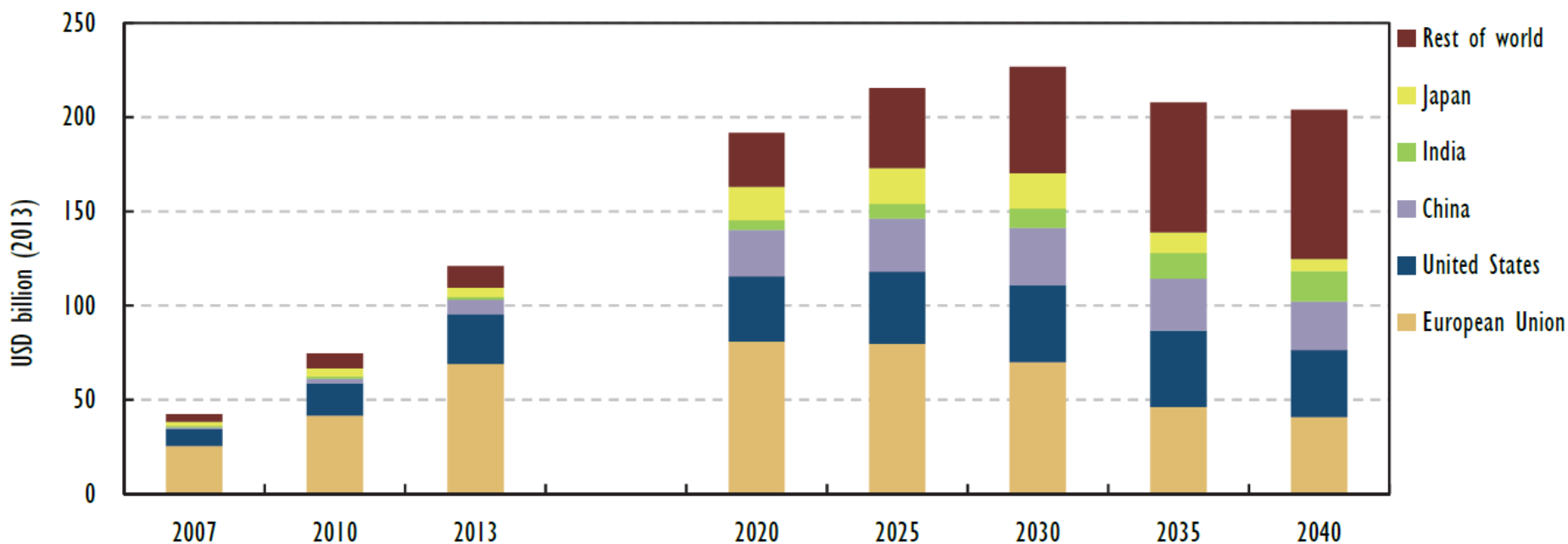
Net capacity additions



Making the most of generation diversity within the EU, including from renewables, can ensure adequacy. A more interconnected market is of key importance!

Source: IEA, *World Energy Investment Outlook*, OECD/IEA, Paris, June 2014.

EU renewable energy subsidies on the rise

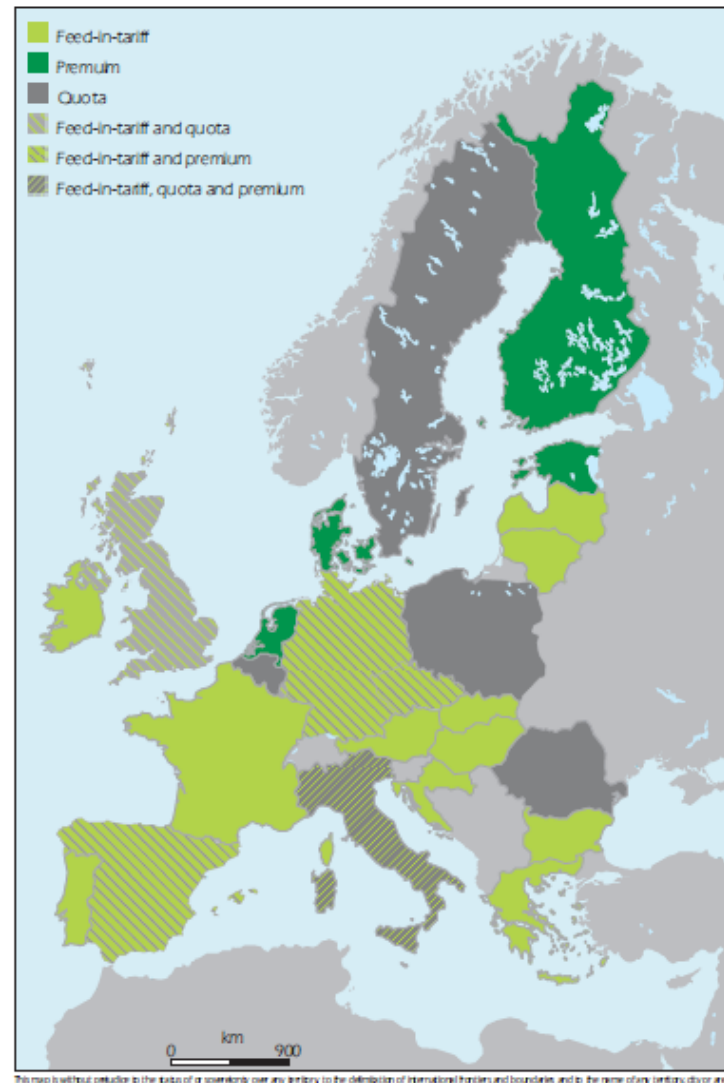


Subsidies to renewable energy in the EU reached EUR 52 billion in 2013. They are set to grow to EUR 64 billion in 2025, but technology costs are coming down.

Source: IEA, *World Energy Outlook*, OECD/IEA, Paris, November 2014.

EU on a learning curve to manage the cost of the transition – Lessons to be learned

2020 targets have been driving the renewable energy deployment, at a higher cost than needed, as support schemes were not optimal.



Reconciling energy and climate policies

Timely adoption of market-based and governance rules for 2030

Climate and Energy Framework:

- **Strengthen and enforce energy efficiency requirements in buildings (i.e. renovations), appliances, lighting, equipment, transport and district heating and cooling systems in cities.**
- **Swiftly reform the EU-ETS to reduce the surplus in allowances and ensure a consistent carbon price signal under varying economic conditions and varying abatement from other policies.**
- **Complement the EU-ETS with policies to attract investment in low-carbon technologies through sector-specific measures to enhance technology innovation and address non-economic barriers.**
- **Track all energy subsidies and reduce distortive impacts of public intervention.**

Reinstate a commitment to an internal energy market

- **Boost interconnectivity of the EU energy network**
- **Electricity:**
 - Integrate intra-day and balancing electricity markets across borders.
 - Enlarge coordination on system operation and adequacy assessments to the level of regionally interconnected systems.
 - Ensure market rules remunerate electricity generation value depending on time, location and system service provision.
- **Natural gas:**
 - Secure effective use of gas storage and LNG across the borders, develop (un-)conventional gas production potential in the EU, and diversify gas supplies, in dialogue with consumer and producer countries.
- **Phase out regulated retail prices and create more competitive retail markets, with stronger demand-side response, dynamic prices and choice for consumers.**



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Thank you for your attention.