Global Perspective in Sustainable Energy

by

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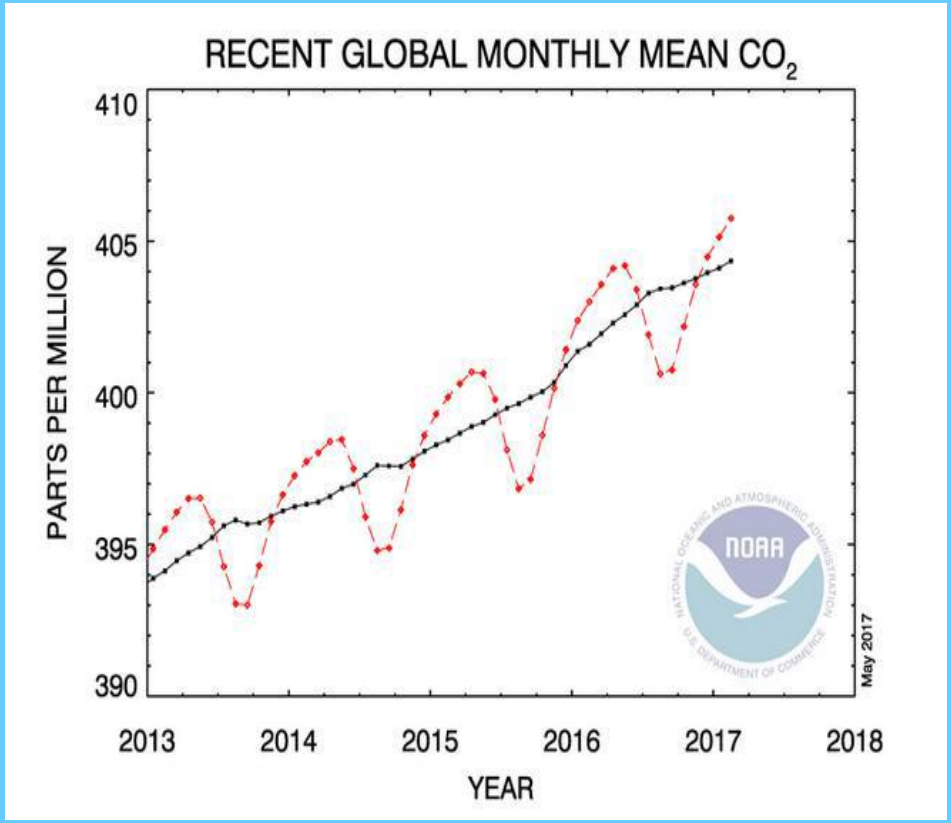
The overarching Problem

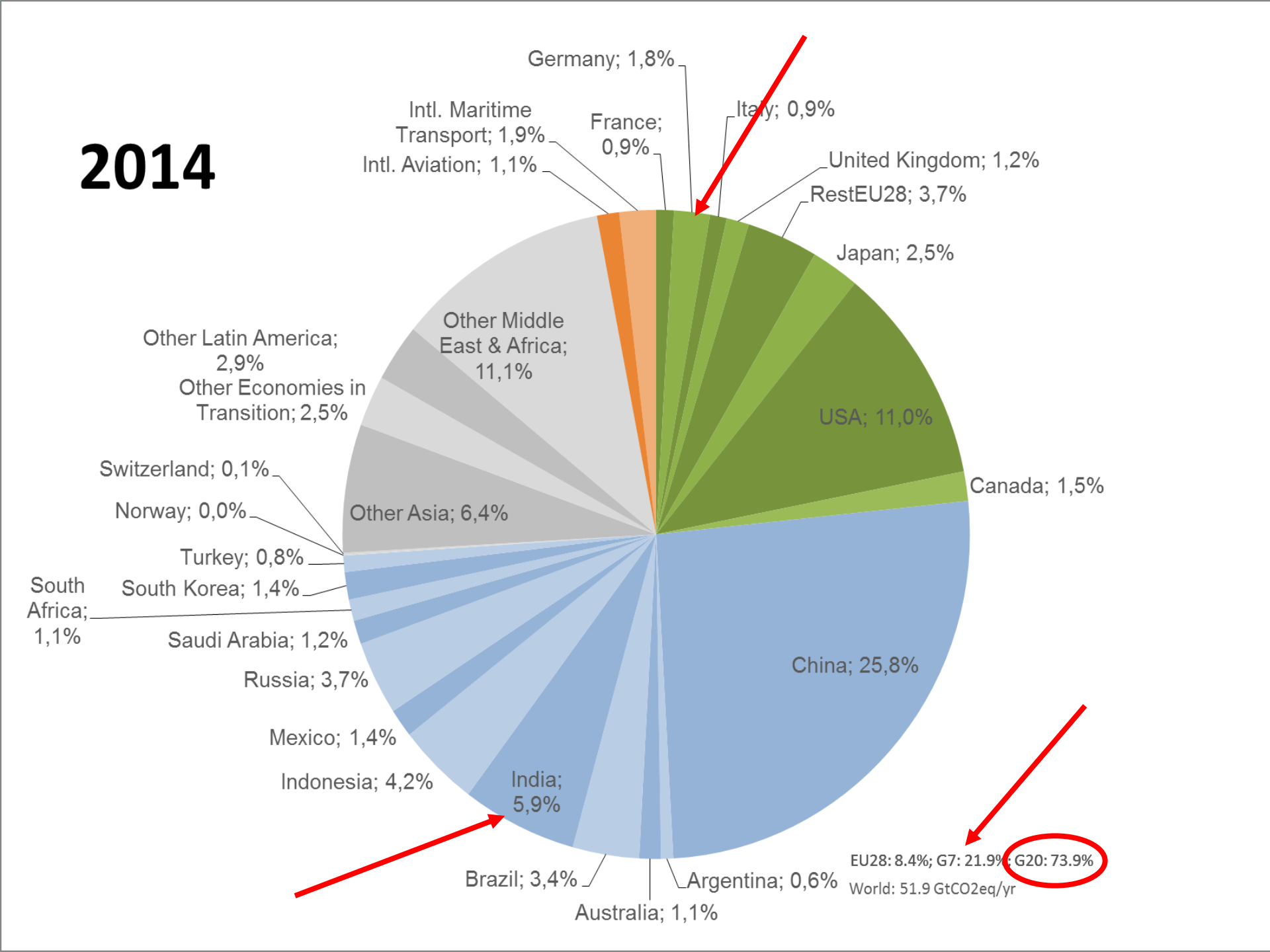
CO_2 – Concentration in the atmosphere

Period 2010 – 2016
CO_2 concentration in the Atmosphere:
2010: 389 ppm
2016: 404 ppm

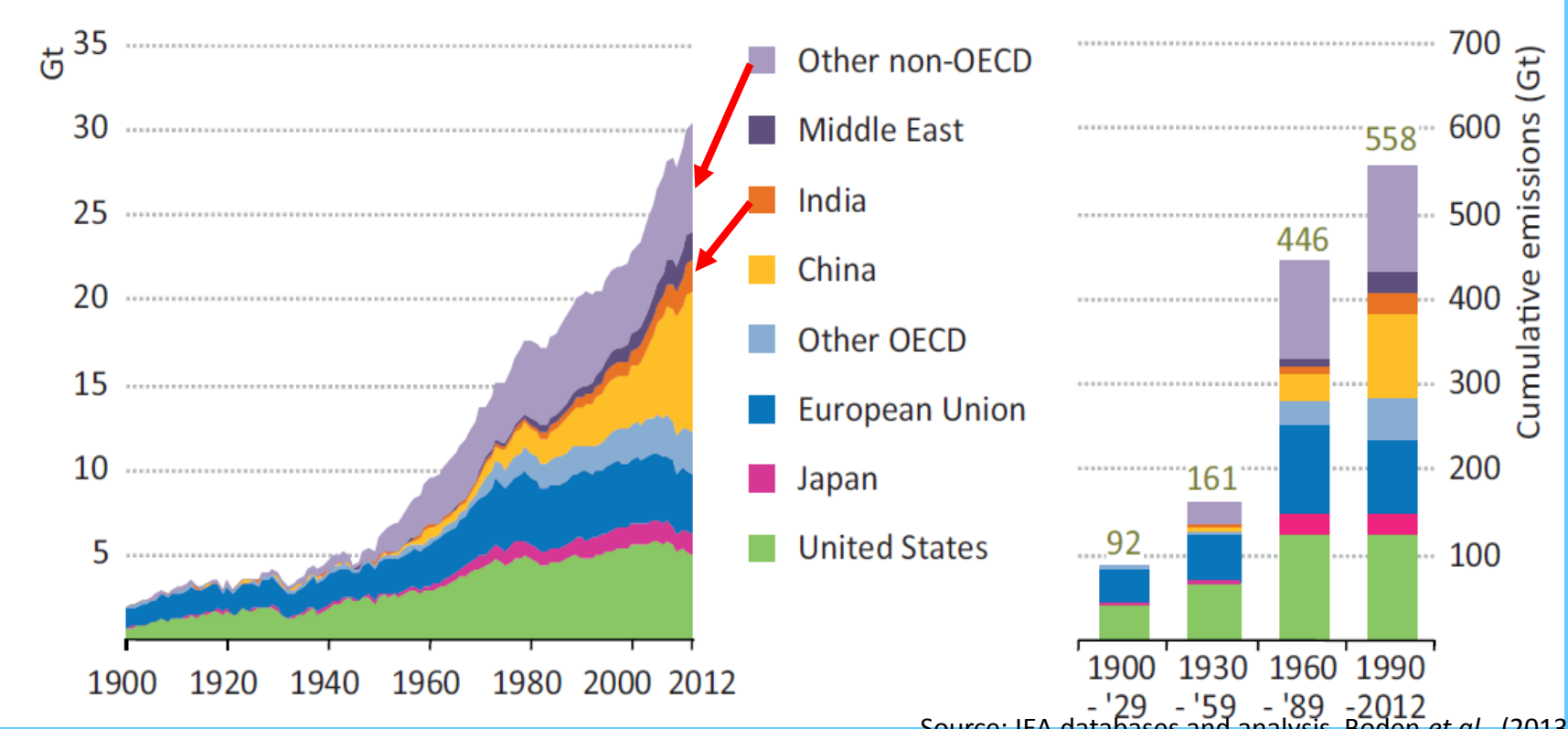
2010: 39% above pre-industrial level
2016: 44% above pre-industrial level



Main Emitters


2014
Germany; 1,8%
Intl. Maritime Transport; 1,9%
France; 0,9%
Italy; 0,9%
Intl. Aviation; 1,1%
United Kingdom; 1,2%
RestEU28; 3,7%
Japan; 2,5%
Other Middle East & Africa; 11,1%
Other Latin America; 2,9%
Other Economies in Transition; 2,5%
USA; 11,0%
Switzerland; 0,1%
Canada; 1,5%
Norway; 0,0%
Other Asia; 6,4%
Turkey; 0,8%
South Africa; 1,1%
South Korea; 1,4%
Saudi Arabia; 1,2%
China; 25,8%
Russia; 3,7%
Mexico; 1,4%
Indonesia; 4,2%
India; 5,9%
Brazil; 3,4%
Argentina; 0,6%
Australia; 1,1%
EU28: 8.4%; G7: 21.9%; G20: 73.9%
World: 51.9 GtCO2eq/yr

GHG emissions from energy sector by region, 1990 – 2012



Source: IEA databases and analysis, Boden *et al.*, (2013).

Distribution of resource

- 25% used by G7 states
- 25% used only by China
- 25% used by G20 – without G7 and China
- 25% used by the rest of the world – 176 states

20 states are using 75% of the resources (energy) worldwide

Consumption trends are not sustainable

IEA, World Energy Outlook – reference scenario:

- **Global primary energy consumption to rise by more than half up to 2030**
- **Share of fossil fuels in global energy consumption to increase up to 2030**
- **In 2030 the global energy balance will be dominated by oil and coal – use of natural gas increasing more slowly than previously expected – nuclear energy and biomass declining – strong increases**
- **Energy prices will rise sharply due to the excess demand**
- **Global energy-related CO_2 emissions to increase by 55 % up to 2030 – with over three quarters of this increase occuring in developing countries.**

Guidelines

Paris (COP 21 – December 2015)

Very ambitious targets

- **Long term target to limit global warming**
- **Holding the increase in the global average temperature to well below 2°C above pre industrial level…**
- **…pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels**
- **Global target to limit greenhouse gas emissions**
- **Parties aim to reach global peaking of GHD-emissions as soon as possible…**
- **…to undertake rapid reductions thereafter in accordance with best available science**
- **Create a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century**
- **Support sustainable development and efforts to eradicare poverty**

Paris – what does it require?

- **Global transformation to a „low carbon society and a low carbon economy“**
- **The window for fossil fuels is closing fast**
- **Invention of new consumtion and production patterns – linkage to the SDG‘s**
- **Saving of finite resources and substituting finite resources (e.g. renewables, recycling)**
- **innovation and creativity**
- **improvement, development and implementation of resource saving technology, infrastructure.**
- **Behavior change of all actors**

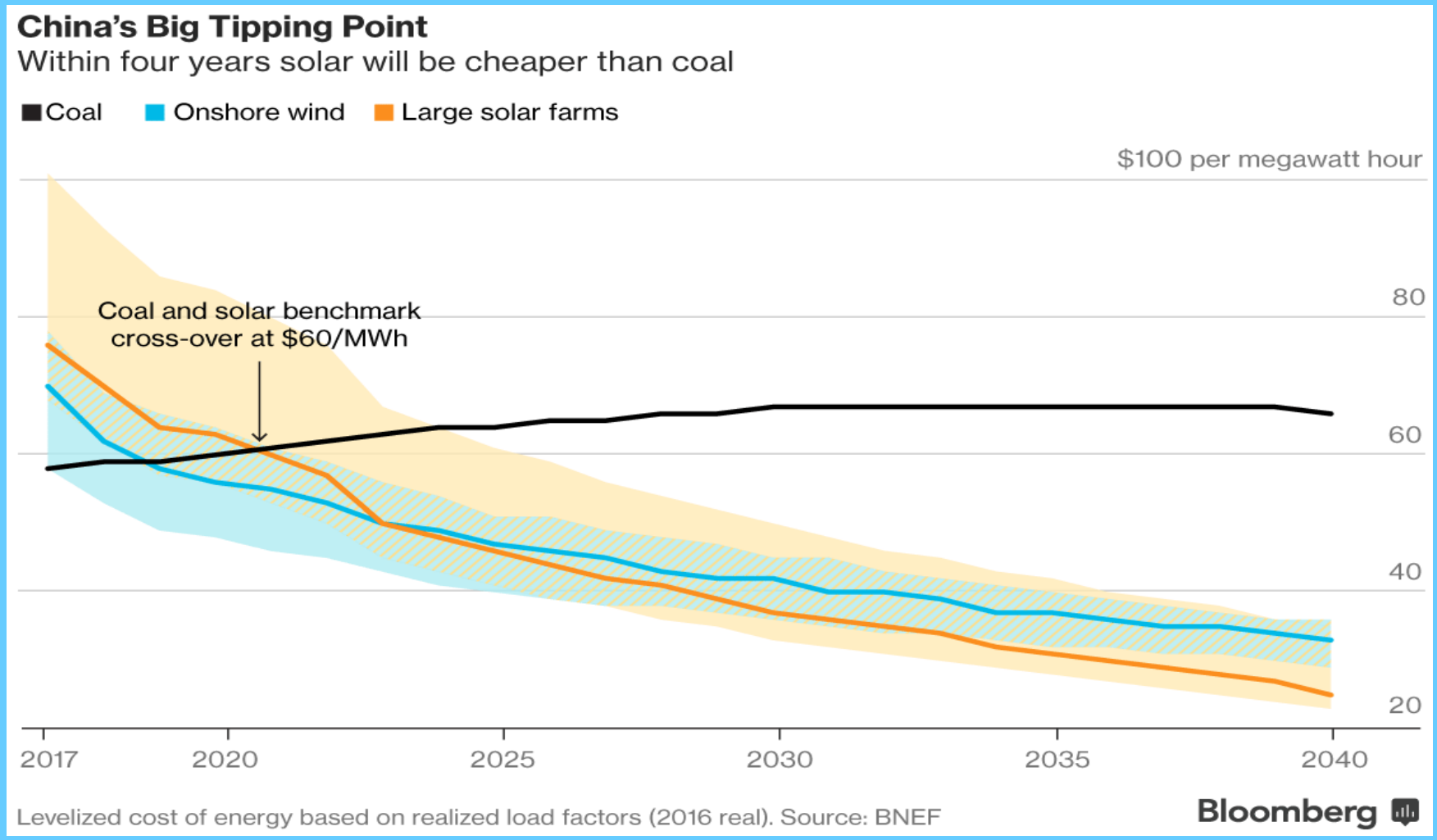
Paris – what does it require?

- Development of National Action Plans to combat Climate Change
- Contributions by all sectors
- Cross sectoral approaches/Concepts (sector coupling)
- Transparent monitoring, reporting and verification
- Top down as well as bottom up approaches
- Linking supply side with demand side

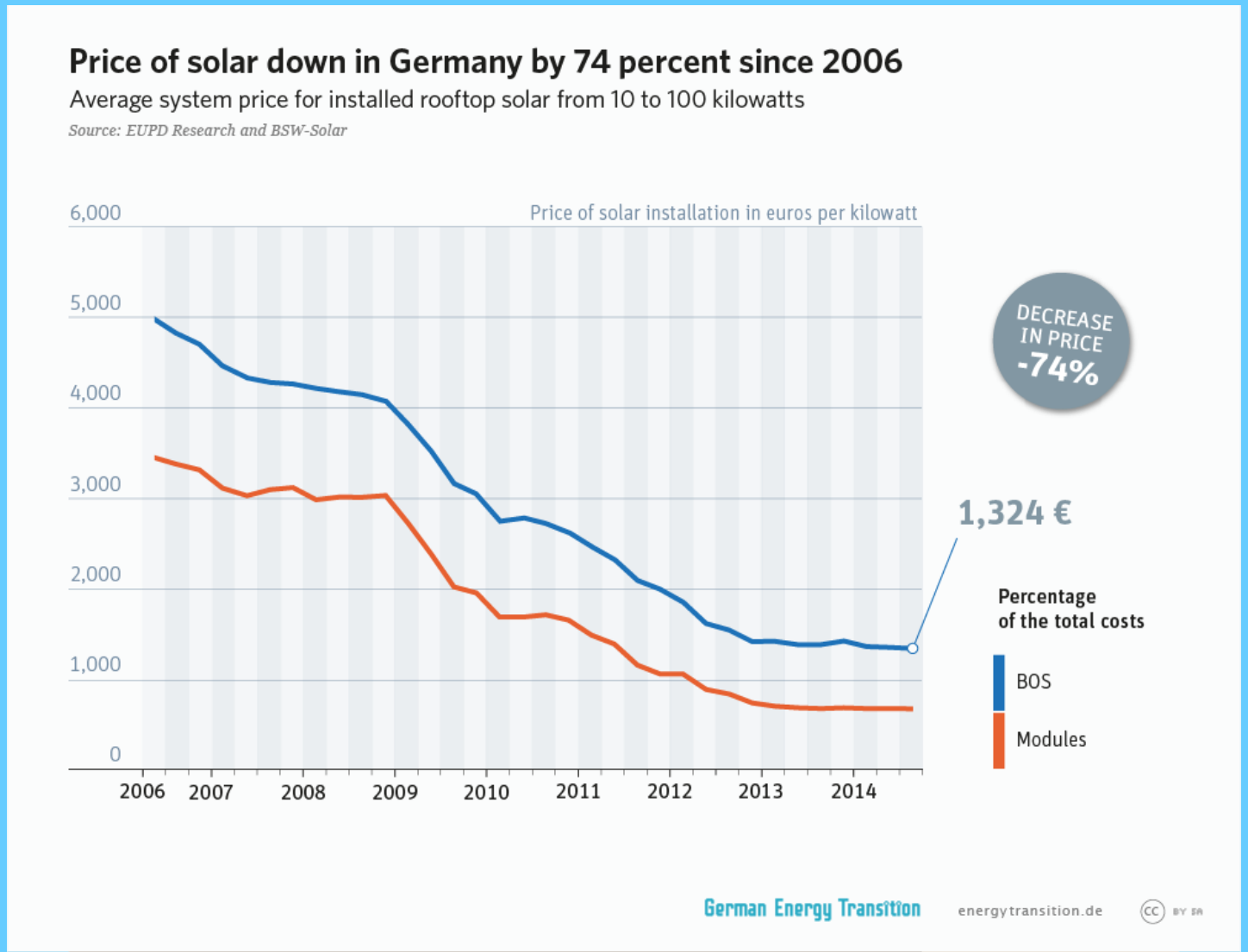
Overarching targets

- **Energy security**
- **Affordability**
- **Environmental and Climate Protection**

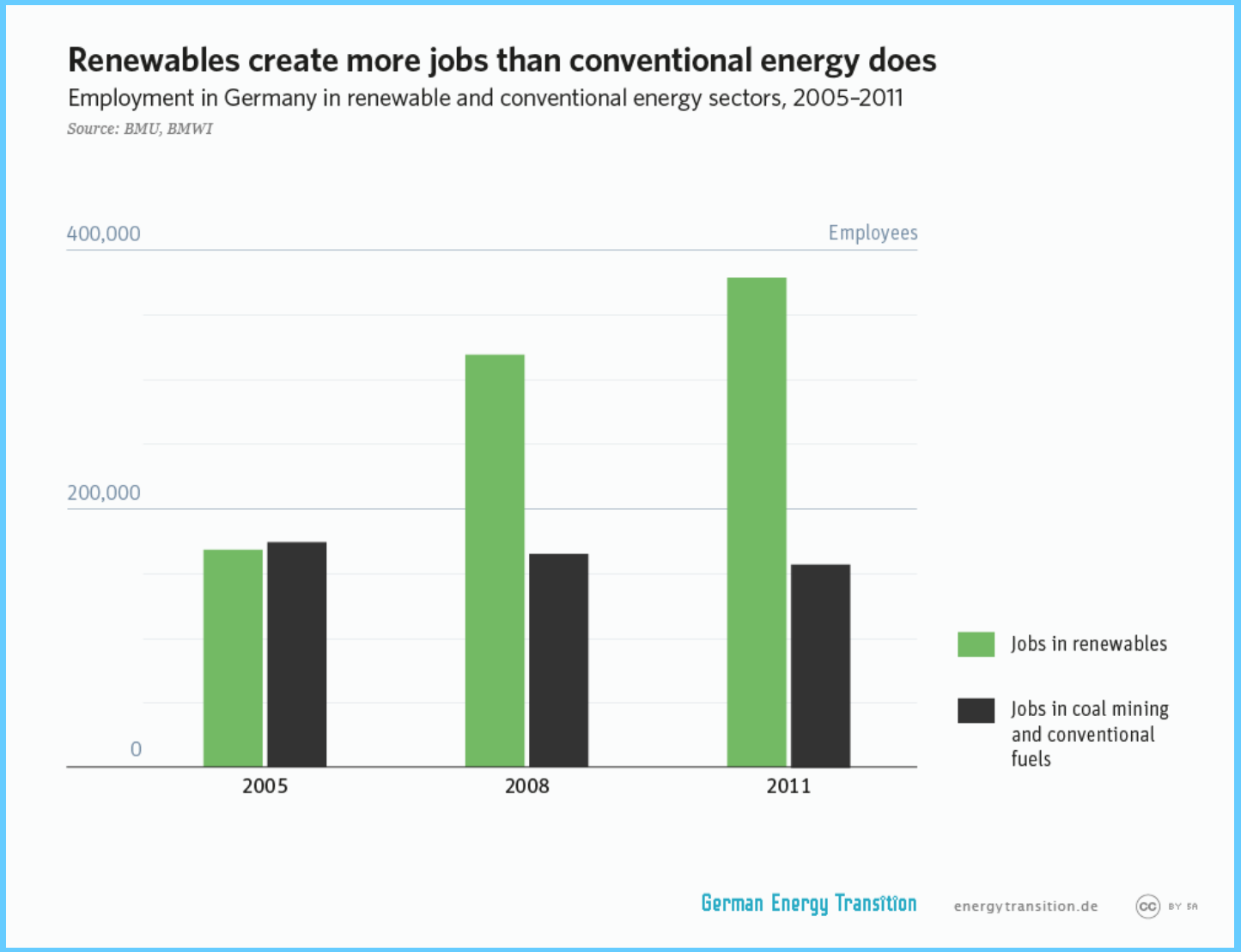
Analysis by Bloomberg on Energy Transition (May 2017)



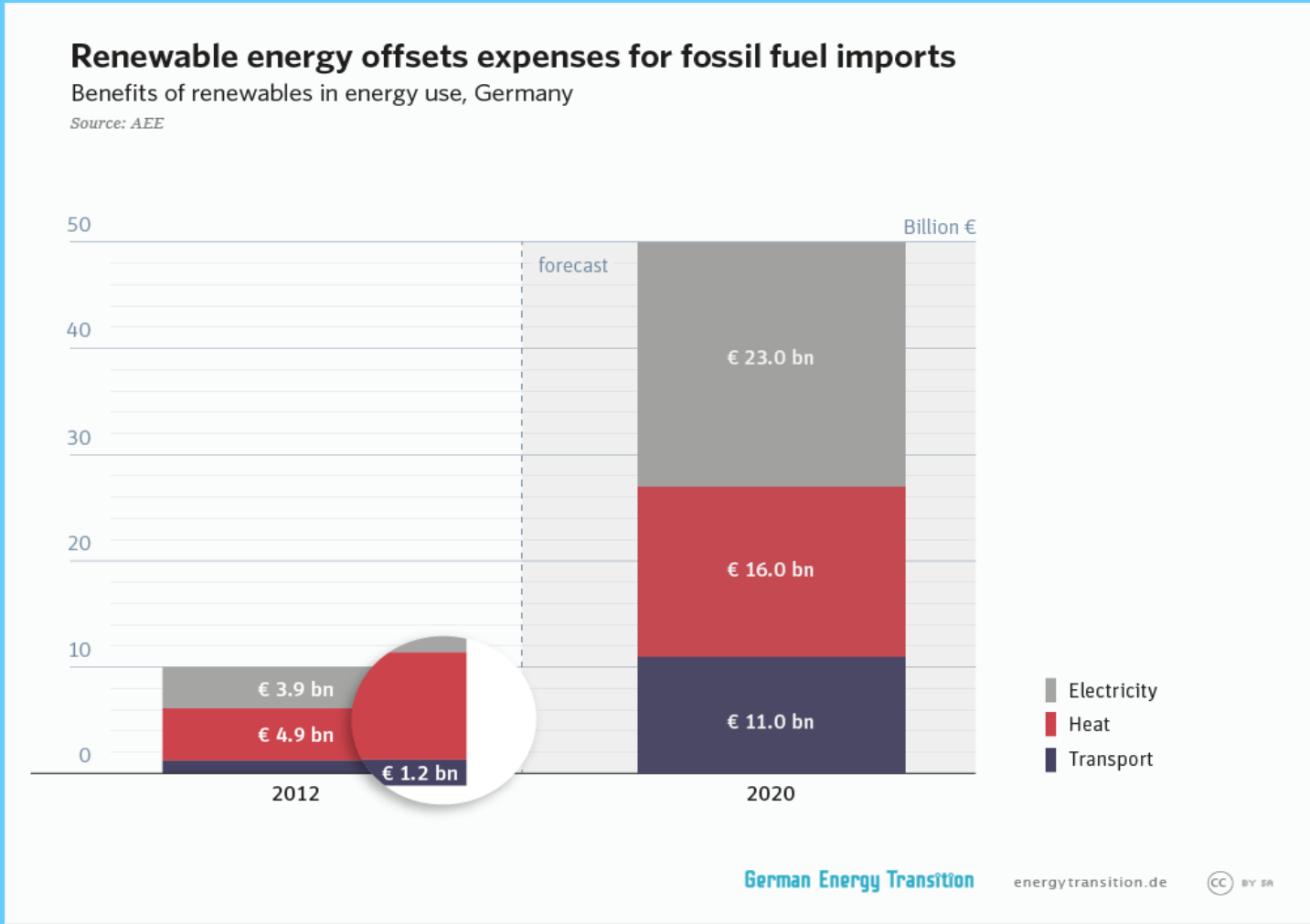
Average system price of solar installed rooftop solar down 74 % since 2006



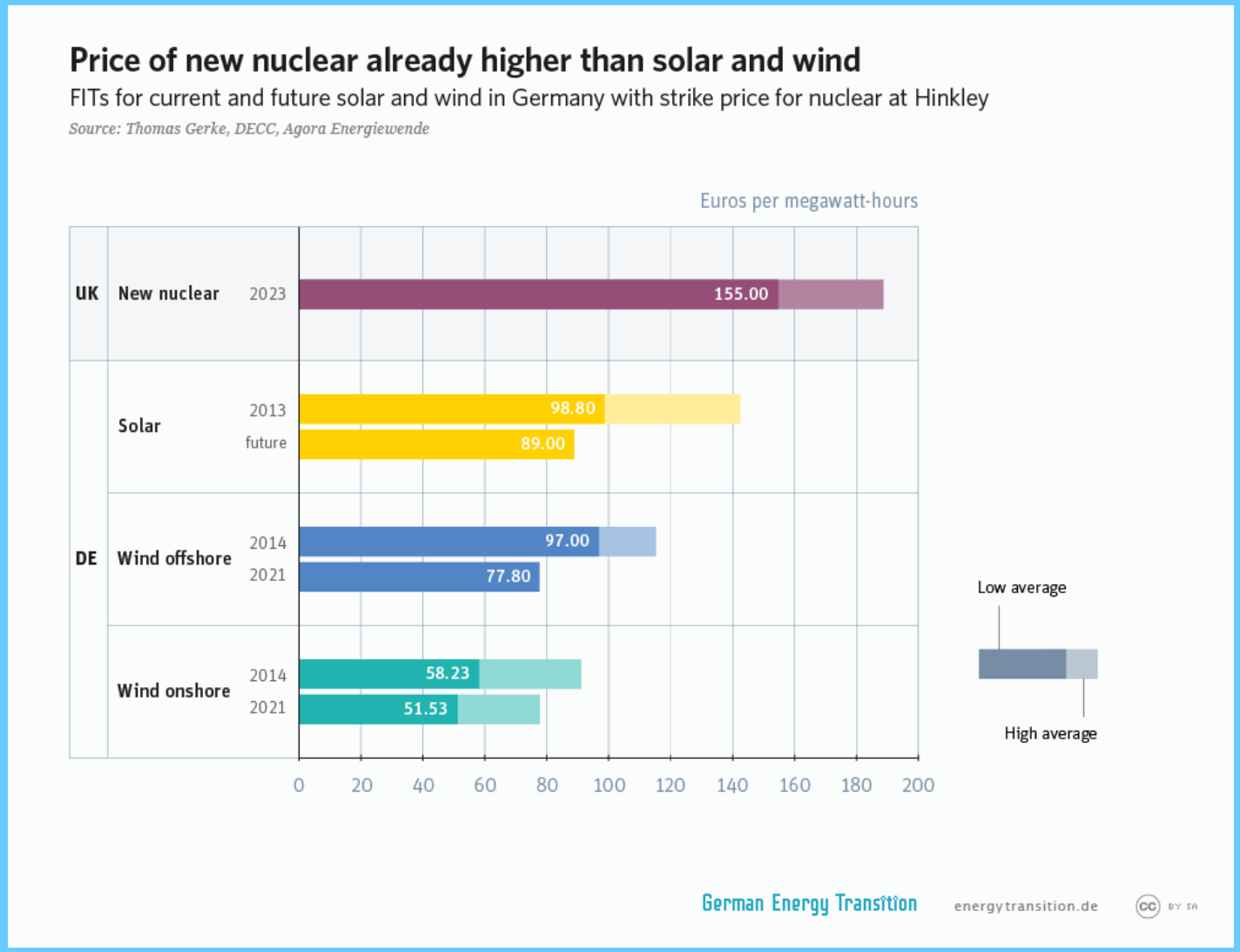
Renewables creates more jobs than conventional energy does – The German case



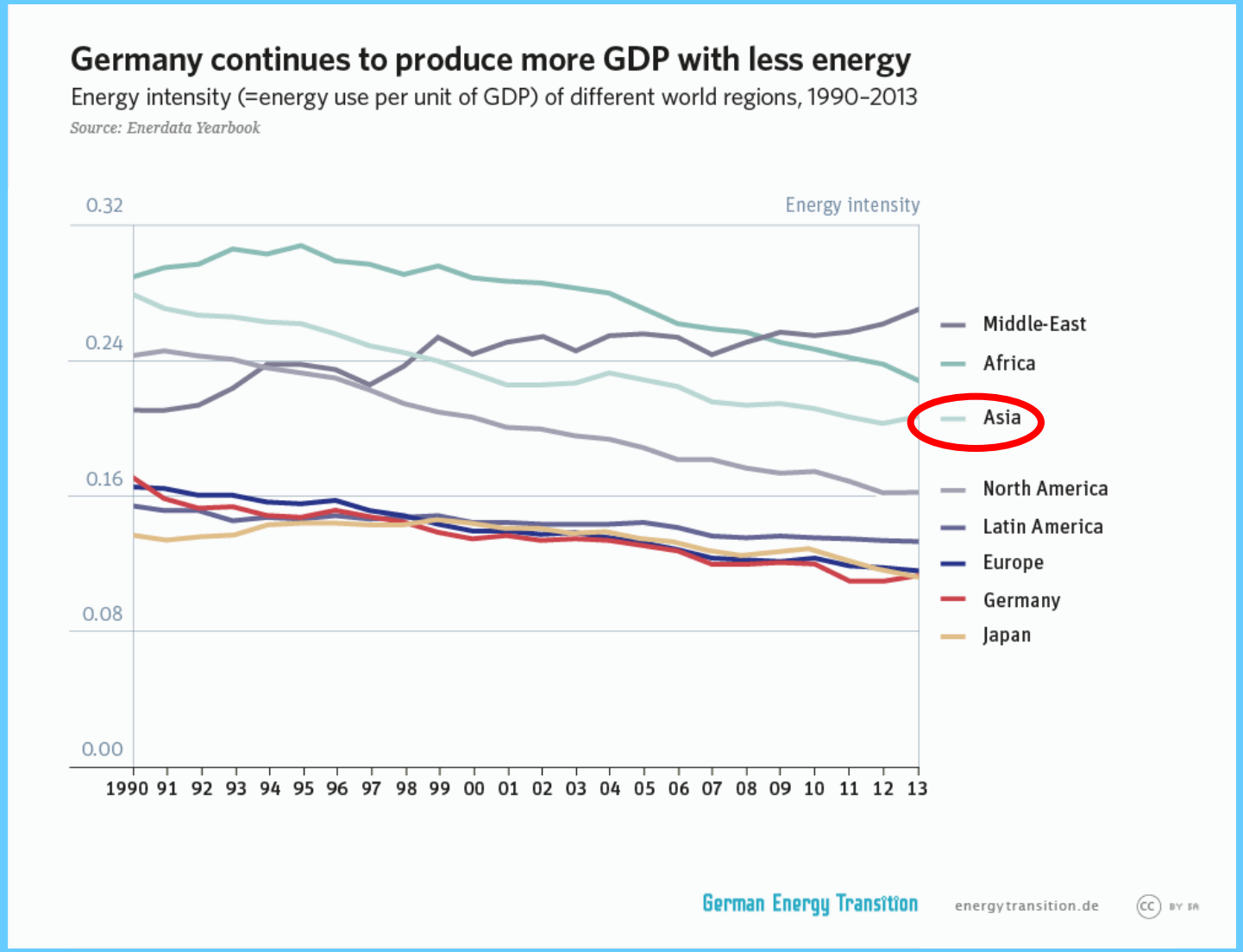
Renewable energy offsets expenses for fossil fuel imports up to EUR 50bn in 2020 - equivalent of EUR 600 per capita for each German



Investment for new nuclear is already much higher than solar and wind



Germany continues to generate more GDP with less energy



A road to sustainable energy

The Roadmap

Short term

- **Optimization of technologies and infrastructures which are in place including supply and demand structures and sector coupling**

Mid term

- **Replacement of traditional energy sources, technologies and infrastructure through future oriented structures focussed on the improvement of energy efficiency, renewables, storages, load management, resource saving waste management etc.**

Long term

- **Creation of a low carbon economy and society**

Building bridges to the future - How could the process look like?

- Implementation of the NDCs
- Review of the NDCs/National Programmes and shifting the ambition on a higher level
- Creating Roadmaps for Energy Transition – there is no single Masterplan for every country around the world - but we can learn from each other
- Carbon pricing
- Top down as well as bottom up approaches to creat synergies between top and down, but also between sectors and actors
- Being aware of possible „lock in effects“
- Research and Development
- Public procurement and support to speed up market development
- Education, information and advice are crucial elements of a comprehensive concept

Three things are needed to create a success

Time

Money

Acceptance

Transfer of Technology, Finance and Capacity Building

- **Technologytransfer**
- **Strengthen technological cooperation and support**
- **Focus on innovation – improvement of traditional techniques and invention and implementation of new techniques**
- **Strengthening cooperation to to improve the ability of the developing world to combat Climate Change and to restructure the existing energy systems**
- **Last but not least - Using the 100 billion US$/y for sustainable investment in order to achieve additional reduction of greenhouse gases**

Thank you very much for your attention!