

Towards a low carbon economy: transforming the energy system

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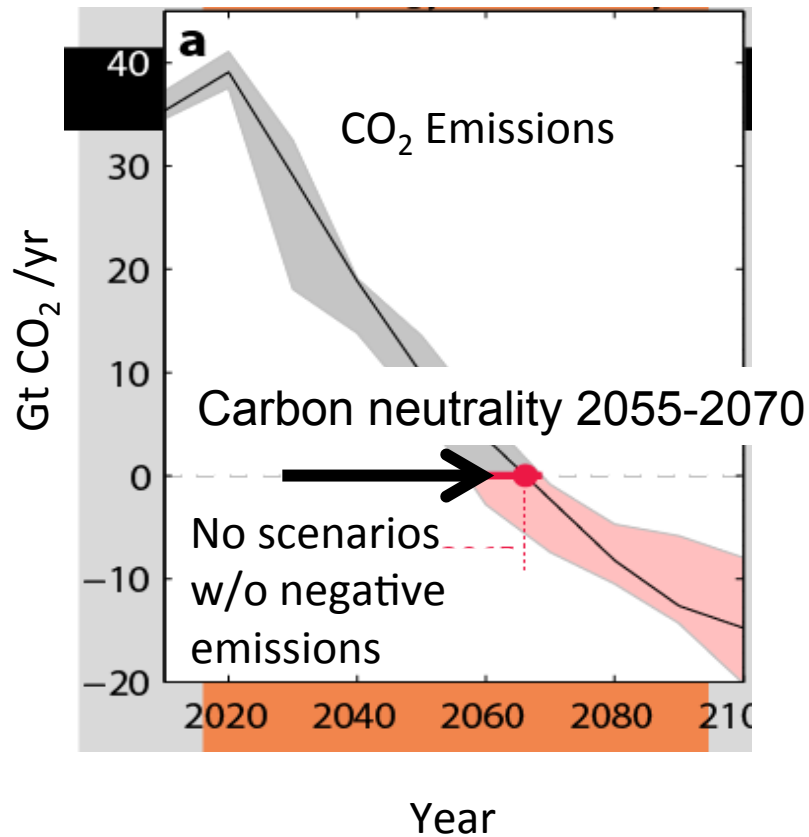
LCS-Rnet annual meeting

Paris, June 15-16, 2015

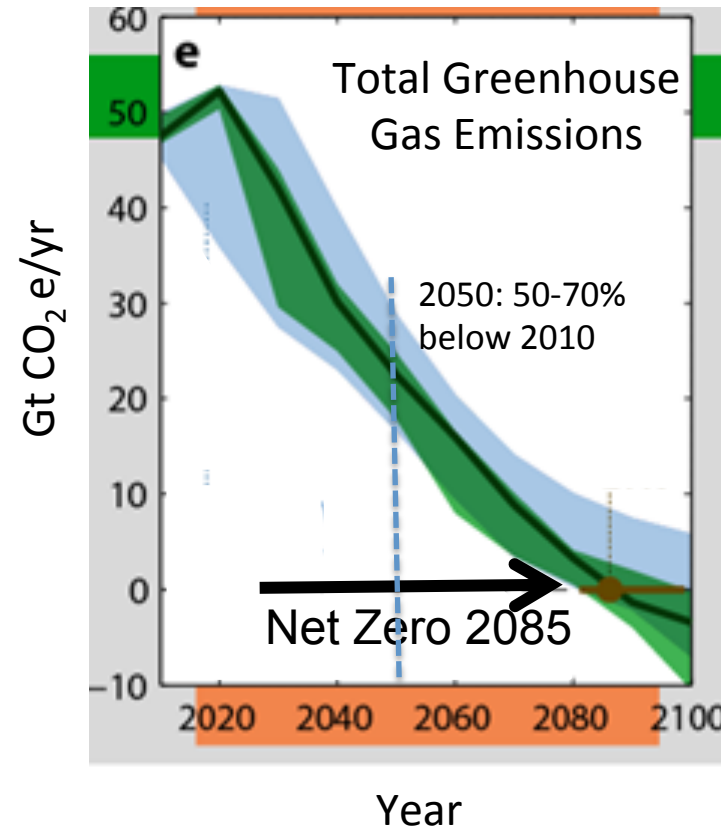
IPCC AR5 “2 degree messages”

- Net zero GHG emissions by the end of the century
- Global GHG emissions 40-70% below 2010 by 2050
- Database includes scenarios that follow least cost decline after 2010

Delay in action: implications for still meeting the 2 degrees limit with “likely” chance



Net Zero CO₂ Emissions ≈ 2055-2070
Net negative CO₂ < 20 GtCO₂/yr



Net Zero Total Greenhouse Gas Emissions ≈ 2080-2100
Blue: IPCC AR5 range

Has this sunk in?

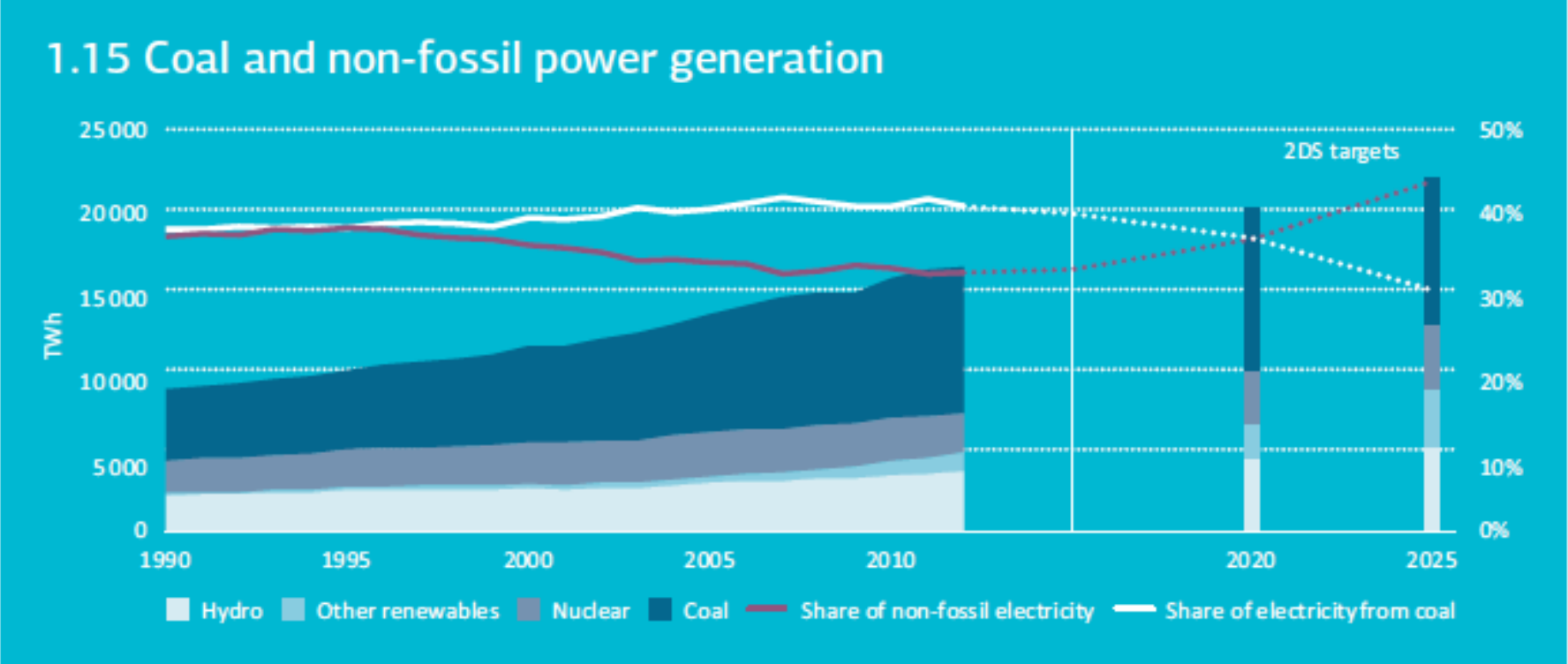
- G7 Germany communique: “decarbonisation of the global economy over the course of this century”
- Worldbank Decarbonising Development Report: “carbon neutrality by the end of the century”

What does it take?

(compare to IEA 2 DS)

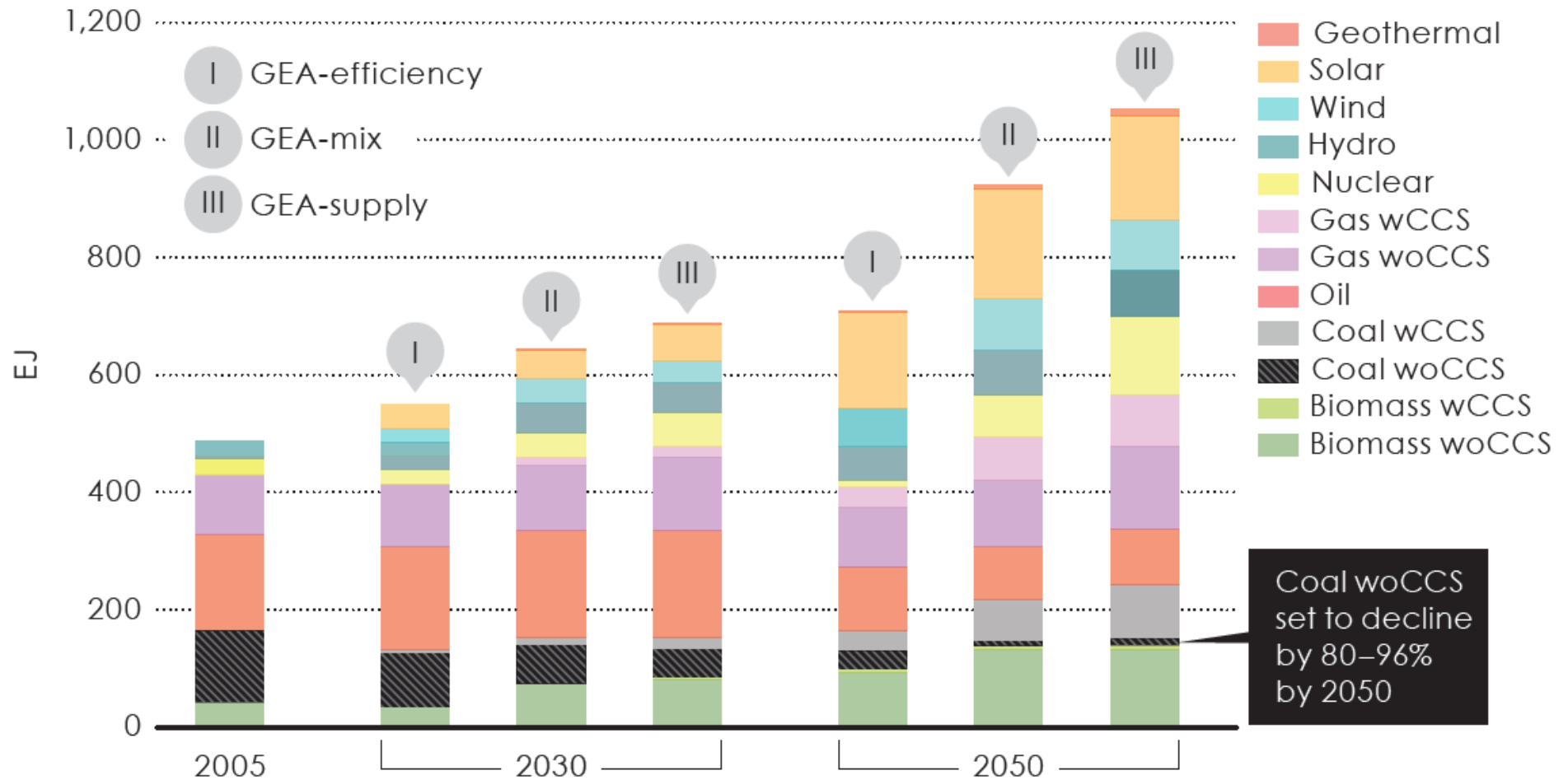
- Strong improvement of end-use energy efficiency
- Zero carbon electricity supply by 2050
- Significant market share of CCS and/or nuclear
- Strong electrification of transport and building sector
- Flexible electricity system (high intermittent RE)
- Negative emissions technology available at scale by 2050
- Removing fossil fuel subsidies
- Create carbon price

Actual developments vs 2DS target



Source: IEA, Tracking Clean Energy Progress, 2015

2 °C: no room for new unabated coal plants



Source: Riahi et al, 2012 in Global Energy Assessment

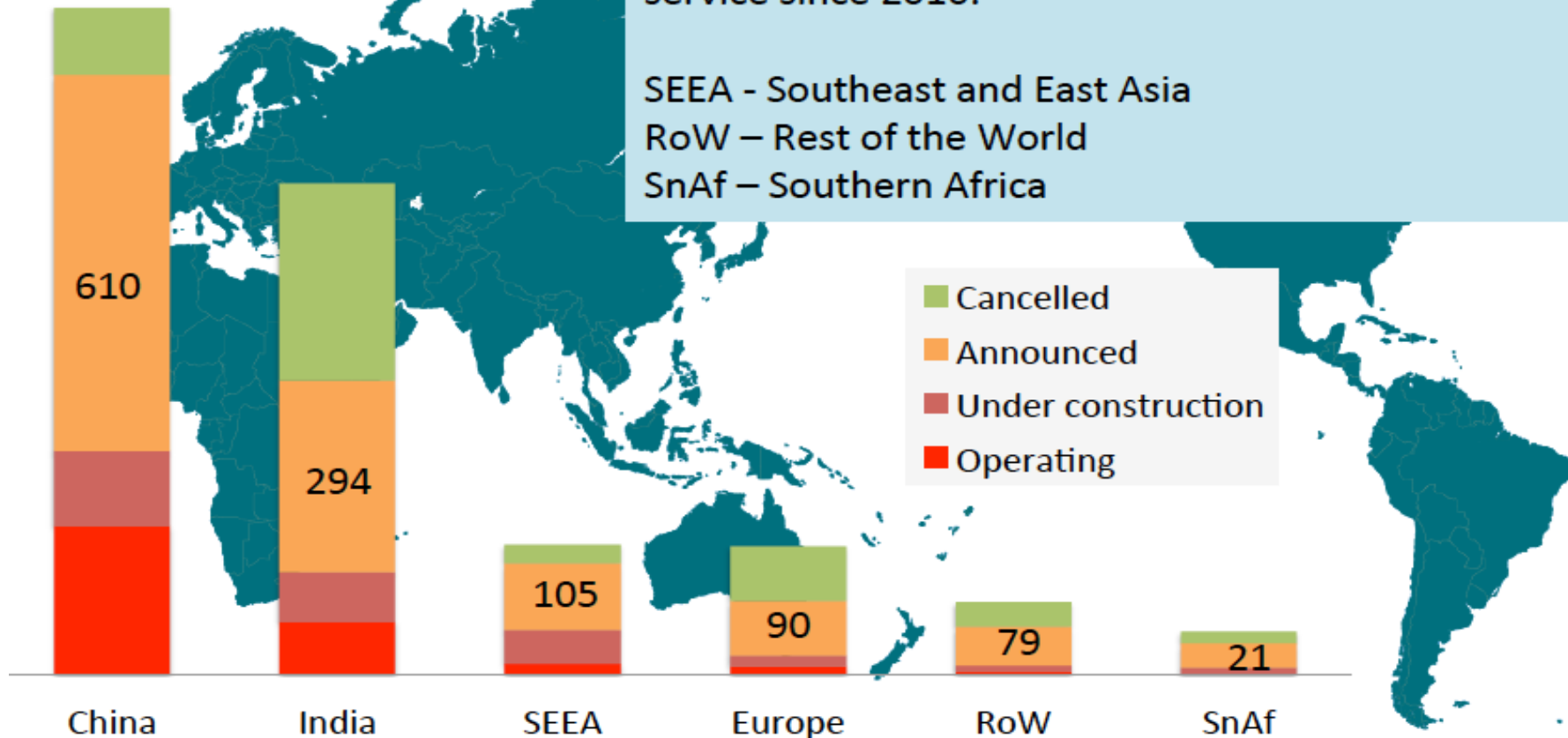
Coal in IEA scenarios

- IEA 2 DS scenario assumes high rate of closure of older coal plants: > 2 plants (GW) closed for 1 new plant (GW) built
- No superstrong energy demand reduction

Pipeline of coal plants (November 2014)

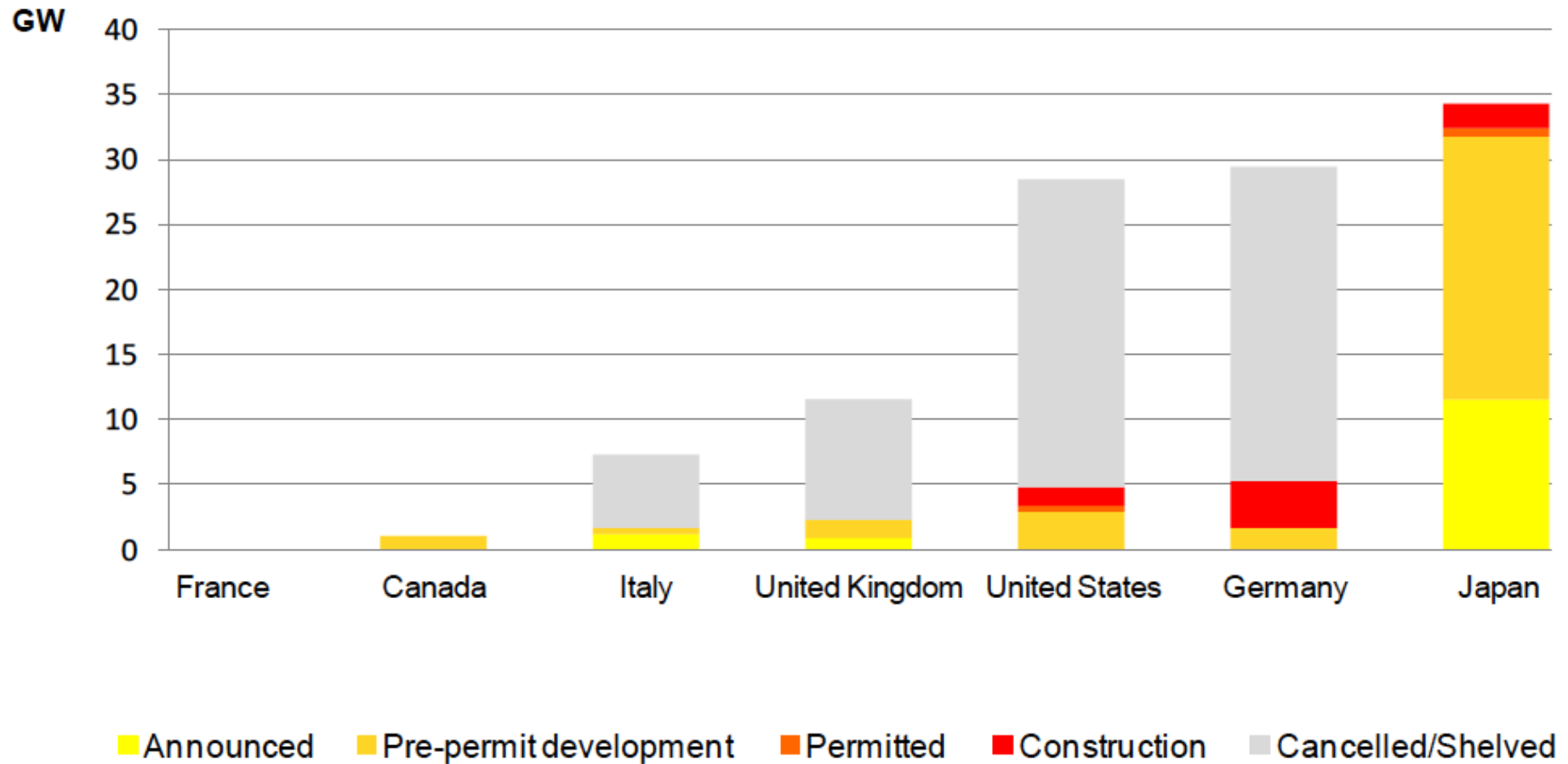
This chart shows the global distribution of the coal pipeline, showing the specific number in the 'announced' category. Note we are not including in these slides the existing coal fleets other than the GW that has entered service since 2010.

SEEA - Southeast and East Asia
RoW – Rest of the World
SnAf – Southern Africa



Source: European Climate Foundation

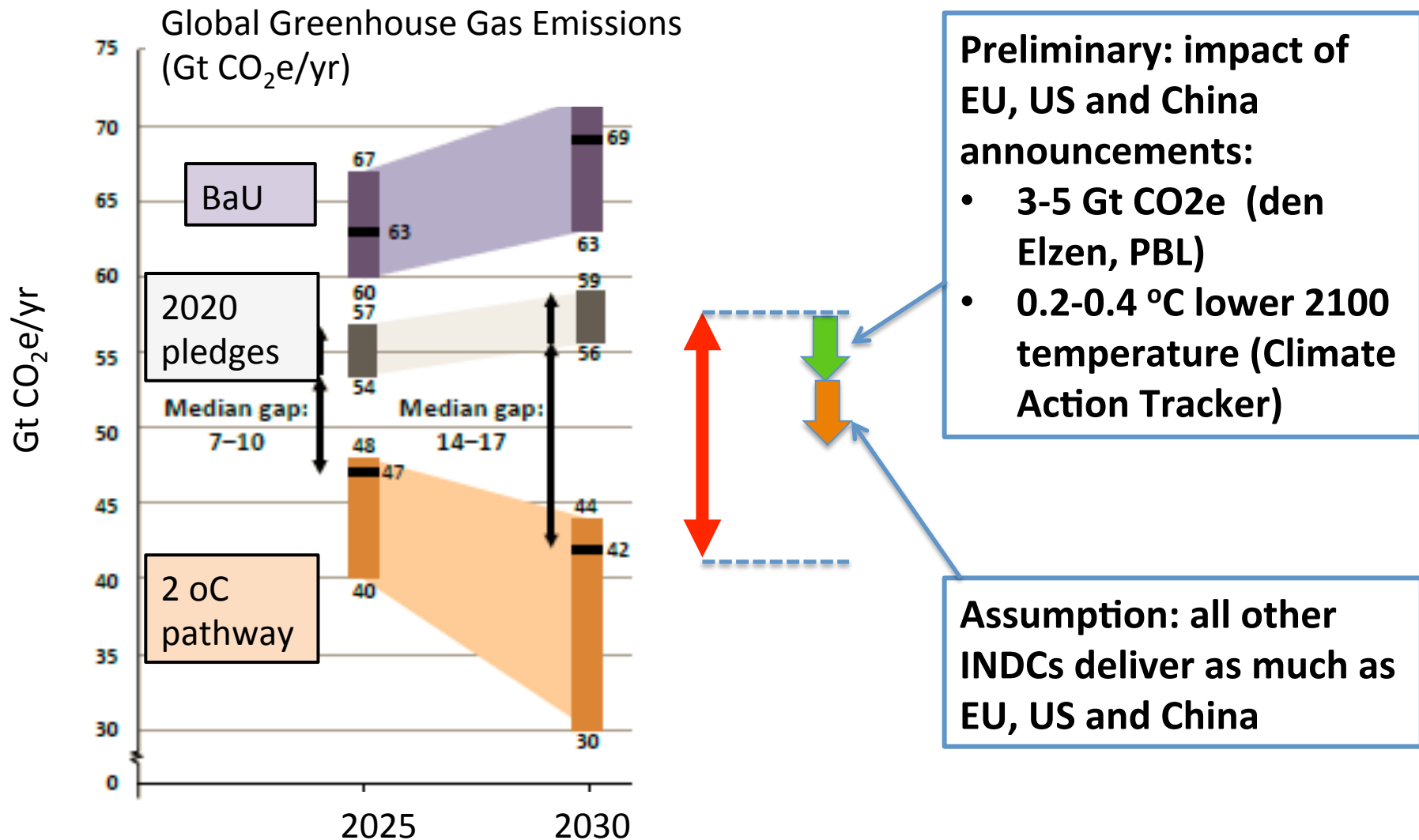
G7 coal expansion plans since 2010



Note: UK and Canada plants have CCS provisions

Source: Let them eat coal, Oxfam, 2015

INDCs only go half way



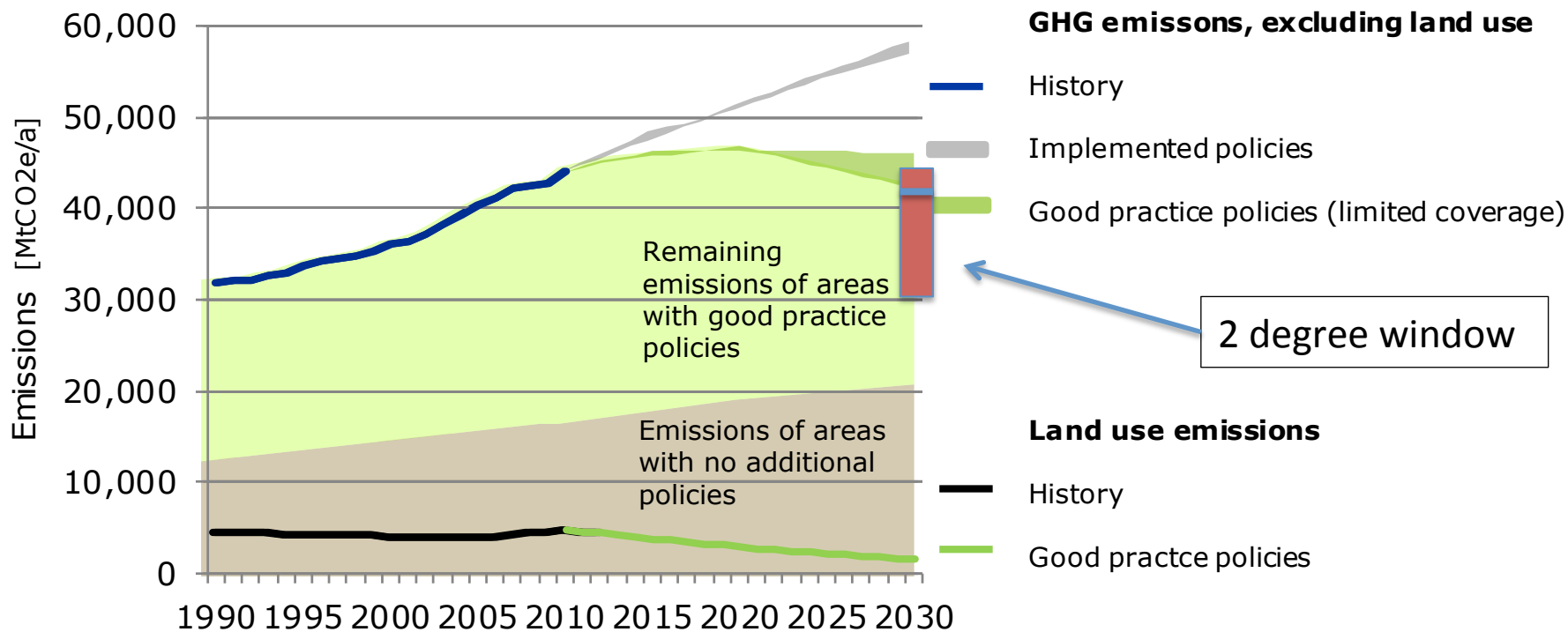
Source: UNEP Emissions Gap report 2014

International Collaborative Initiatives

- Subnational and corporate actors (some with national governments)
- More than 180 initiatives, covering renewable energy, energy efficiency (buildings, industry, transport), methane, HFCs...
- Only few with tangible commitments and scale
- Additional reduction 2020:
 - UNEP: >2 Gt CO₂e
 - NEAA: 0.4-0.8 Gt CO₂e (large overlap with 2020 pledges)

The impact of applying best practice policies

- Global emissions



Best practice policies (NewClimate et al)

- **Increase renewable share in electricity through country dependent policy mix**
 - +1.5% growth in share of RE (no nuclear) generation per year and replace coal before other energy carriers, no new coal fired power plants, starting today
- **Emission reductions from production of fossil fuels**
 - Move from today to good practice values in 2030: Oil and gas: 77.4 ktCO₂e/Mtoe
- **Promotion of industrial energy efficiency through country specific policy instruments**
 - 1% better than development under current efforts
- **HFC and other F-gas emission reductions**
 - Reductions below baseline : 2018: 10%;2022: 35%;2029: 70%;2033: 85%
- **Standards for efficiency of appliances and lighting**
 - Average efficiency improvement of 1.8% per year
- **Energy efficiency of the building envelope (heating/cooling)**
 - Moving linearly to 0 kWh/m² in 2030
- **Efficiency / emission standards light duty vehicles**
 - Linear from today's level towards a fuel economy standard of 47.5 km/l in 2030
- **Support Electric cars driven by renewable electricity**
 - Starting from today's share to 10% of new vehicles in 2020, 20% in 2030
- **Emission reduction from deforestation**
 - Decreasing deforestation with 22% in 2020, and 44% in 2030.

Why insufficient action?

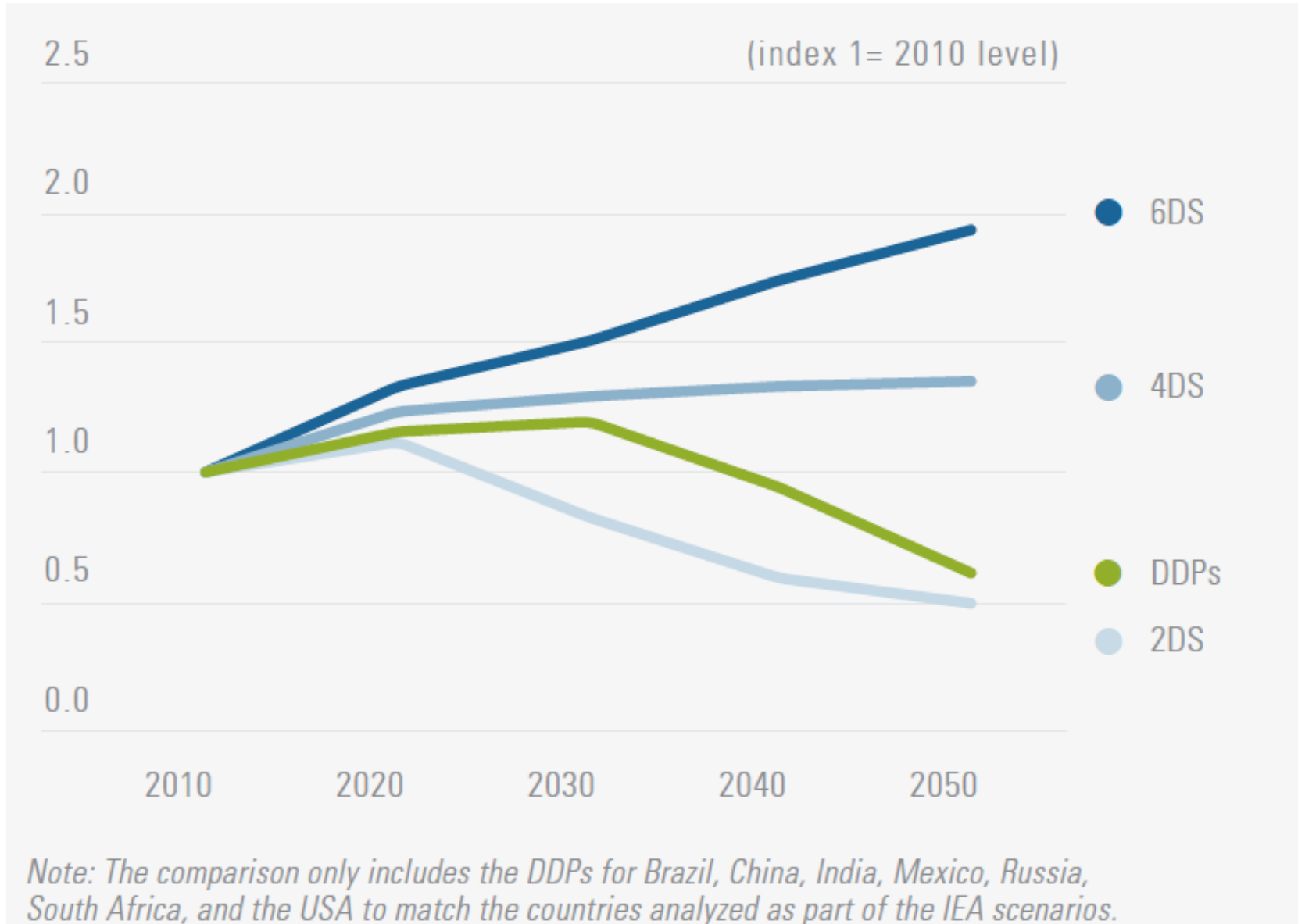
- Too easy: lack of political will
- Also: lack of the “right” information from research
 - Global modeling not seen as relevant for national decision making
 - National models have serious limitations (CPR study India)
 - Too much focused on climate only
 - Mostly about cost of taking action, ignoring benefits
 - Climate feedback on economy and benefits of avoided climate change ignored
 - Modeling assumptions often too optimistic about policy (simple carbon tax, global carbon market, equity not considered or not practical, etc)

Bottom-up analysis: Deep Decarbonisation Pathways Project

- Backcasting from global carbon budget
- Bottom up scenarios for 2 °C consistent futures till 2050
- 16 countries (70% of global energy/ industry emissions)
- Socio-economic/ development objectives fully included
- No equity principles applied (“who pays” left open)

Not yet enough.....

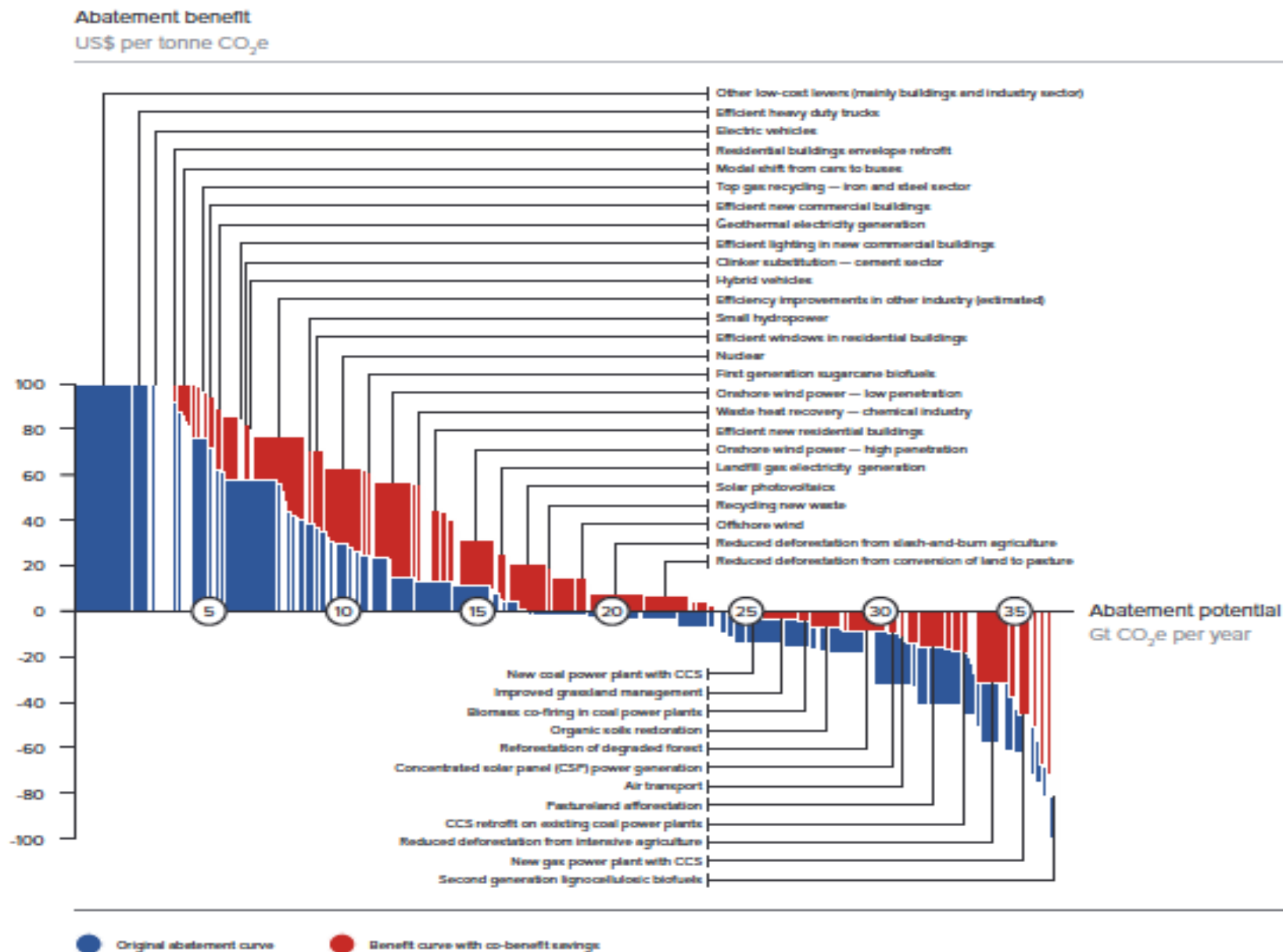
(Energy related CO2 from 7 DDP country studies compared to IEA/ETP scenarios)



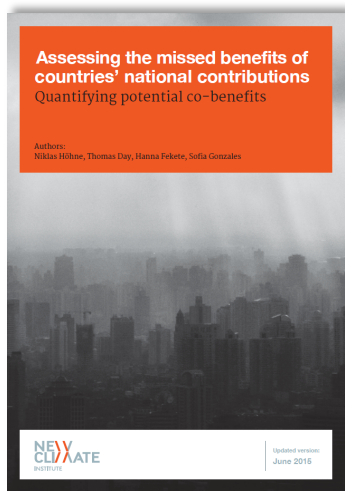
Multiple benefits analyses

- Climate often co-benefit from actions with primary economic/ development benefits
- More relevant to decision makers
- Start analysis from what is needed for economic growth and development
- Include the benefits of avoided climate change

Marginal abatement benefit curve 2030

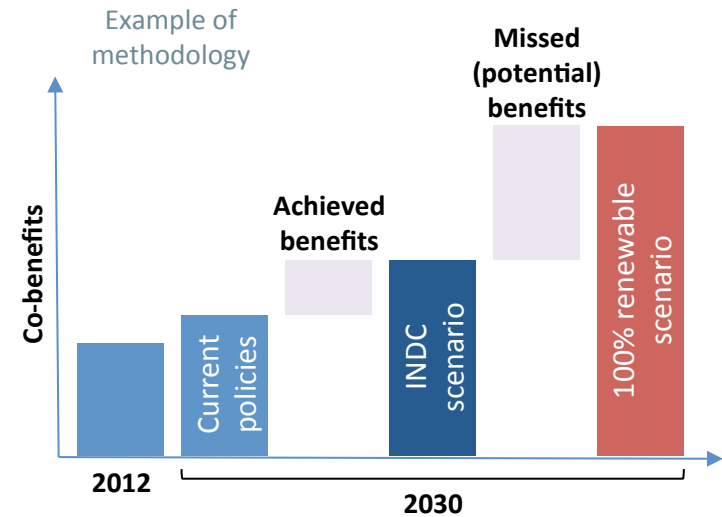


Assessing the achieved and missed co-benefits of INDCs



Published March 2015 and June 2015

- » Consideration of co-benefits can reduce perceived costs and increase ambition
- » The “missed” co-benefits are scales larger than those achieved by the countries analysed
- » Supported by CAN international



Combined results for: EU, US, China, Canada, Japan	Co-benefits in 2030 (per year)		
	Cost savings from fossil fuel imports	Prevented deaths from air pollution	Jobs created in the renewable energy sector
Achieved by INDCs (compared to current policies)	USD 41 billion	115,000 deaths	1 million jobs
Potential in 100% renewable scenario (additional to INDC)	USD 514 billion	1.3 million deaths	3 million jobs

<http://newclimate.org/2015/03/27/indc-cobenefits/>

Green Growth towards Low Carbon Society as positive perspective

- Traditional belief: acting on climate is bad for the economy
- Strong evidence: Green Growth is better (OECD, Worldbank, Regional Development Banks, New Climate Economy Initiative, etc)
- Co-benefit quantification essential step
- Analyse how to do it on national and subnational level

Thank you

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