

COAL

Perspectives on coal in long-term scenarios

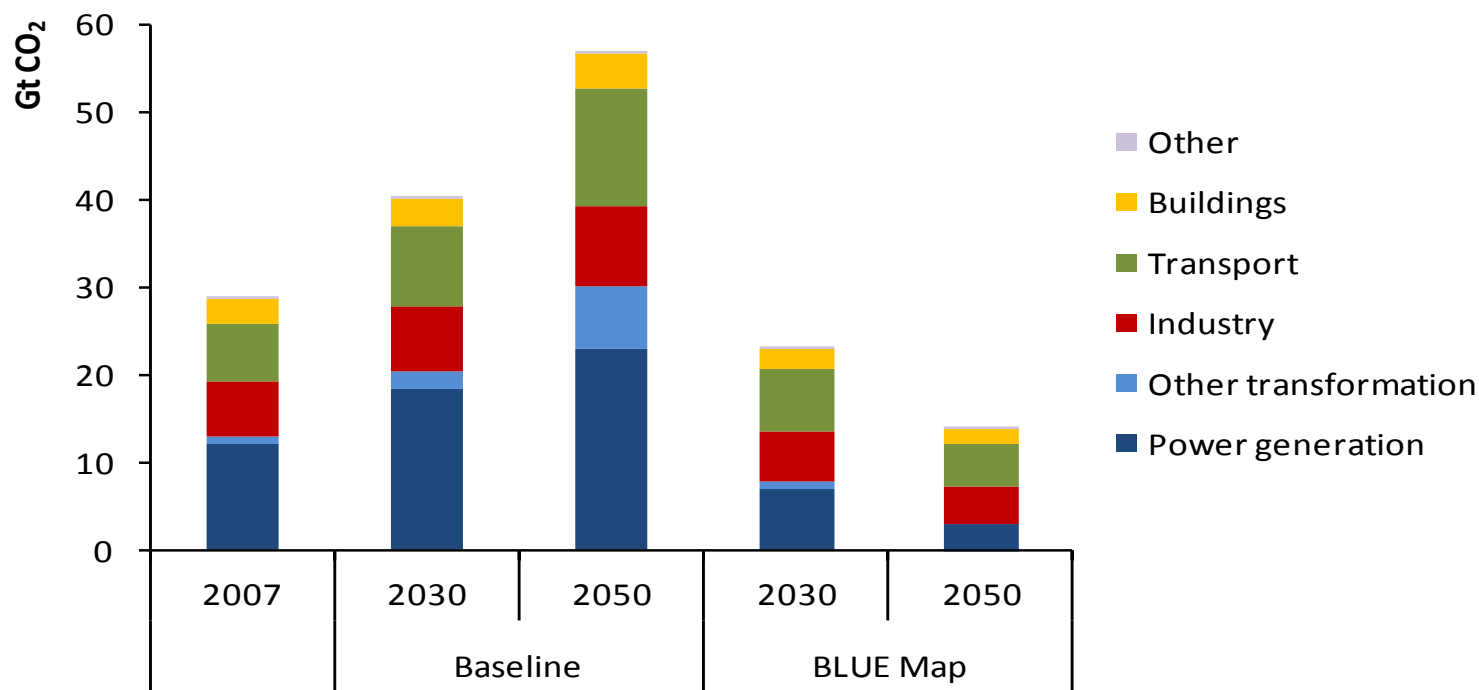
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HELE Workshop, 8-9 June 2011



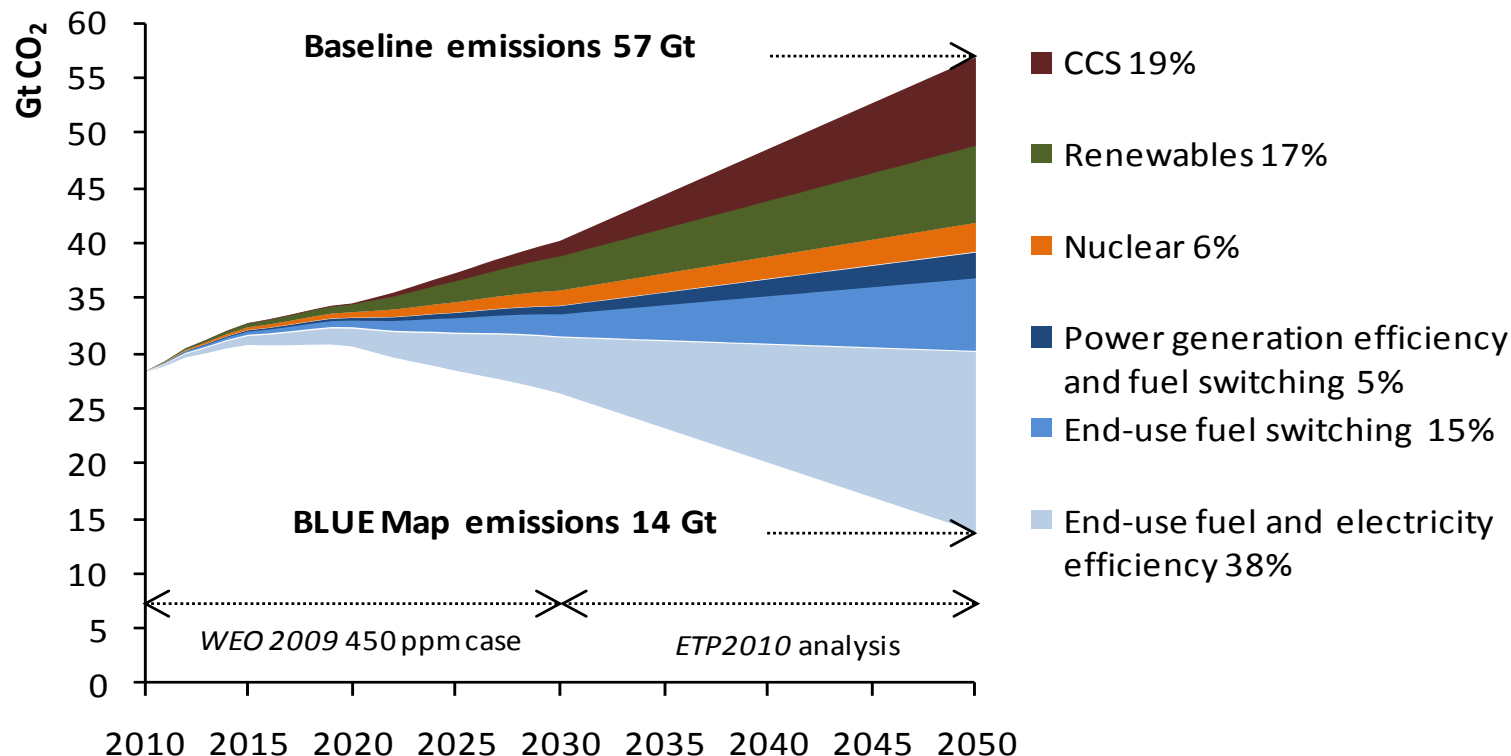
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Global energy-related CO₂ emissions in the Baseline and BLUE Map scenarios



Global CO₂ emissions double in the Baseline, but in the BLUE Map scenario abatement across all sectors reduces emissions to half 2005 levels by 2050.

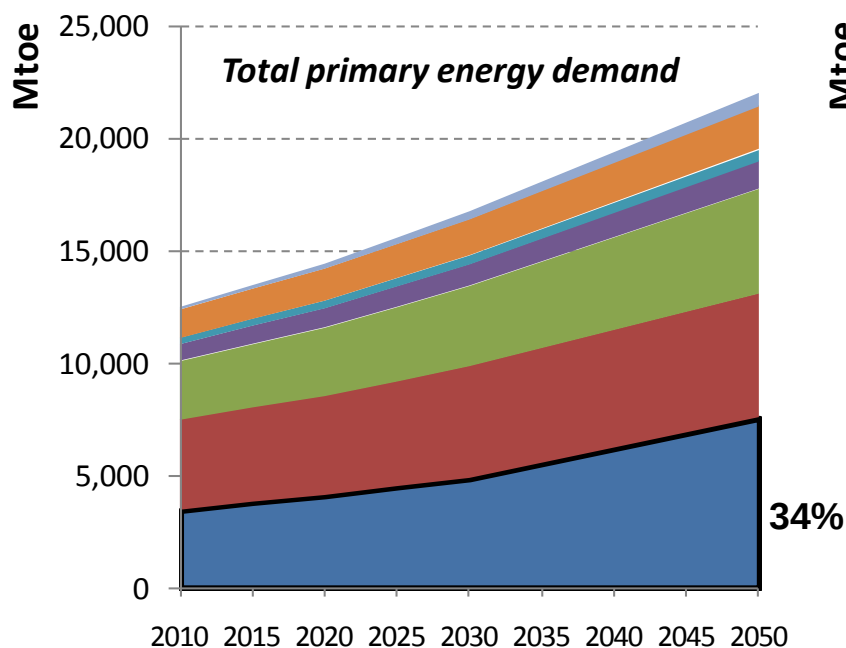
Key technologies for reducing global CO₂ emissions



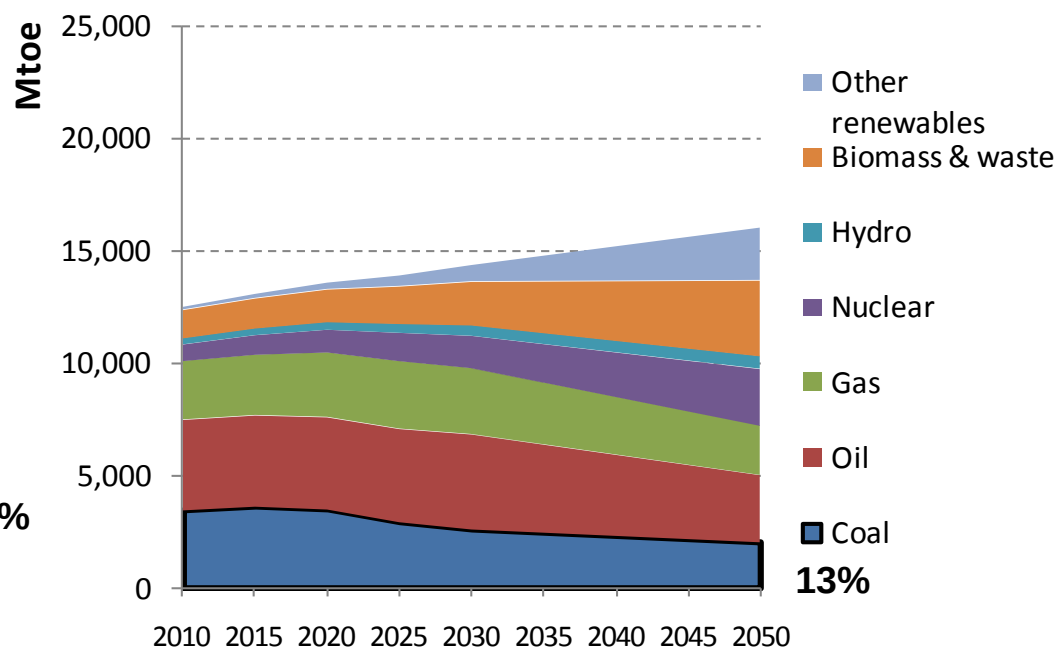
A wide range of technologies will be necessary to reduce energy-related CO₂ emissions substantially.

Two different stories for the future of coal

Baseline



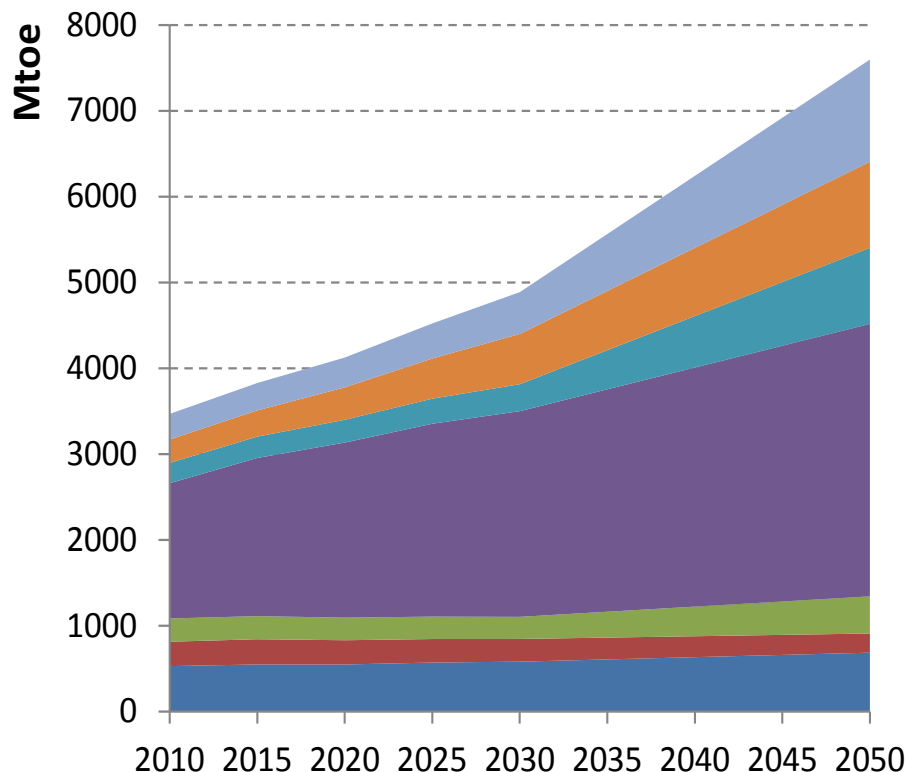
BLUE Map



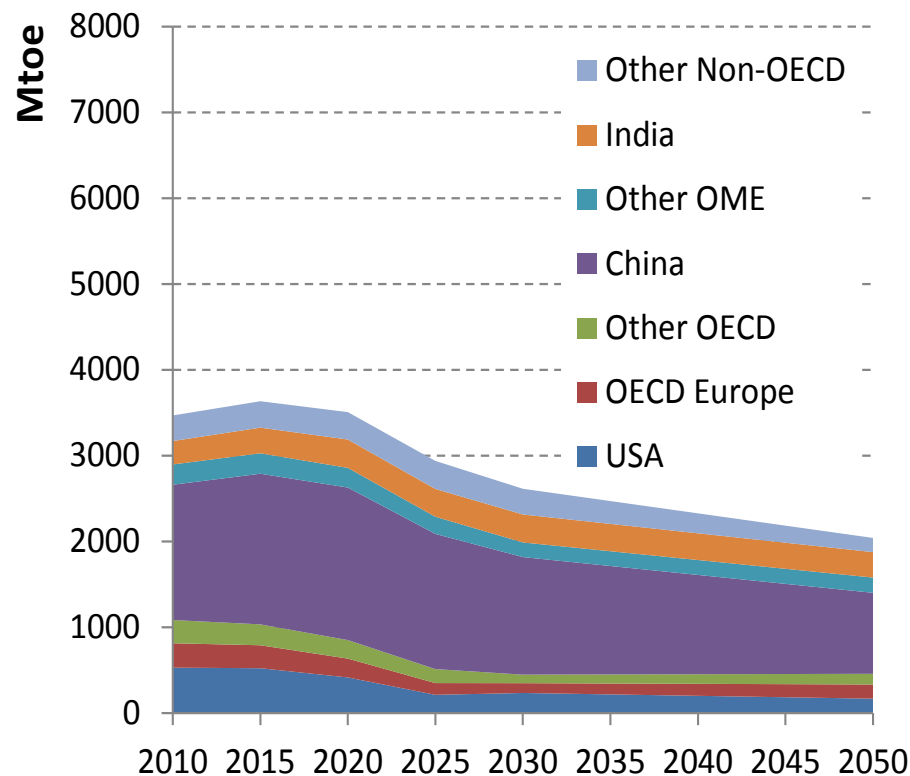
Global primary coal demand more than doubles in the Baseline but falls by around 1/3 in BLUE Map.

Regional primary coal demand

Baseline

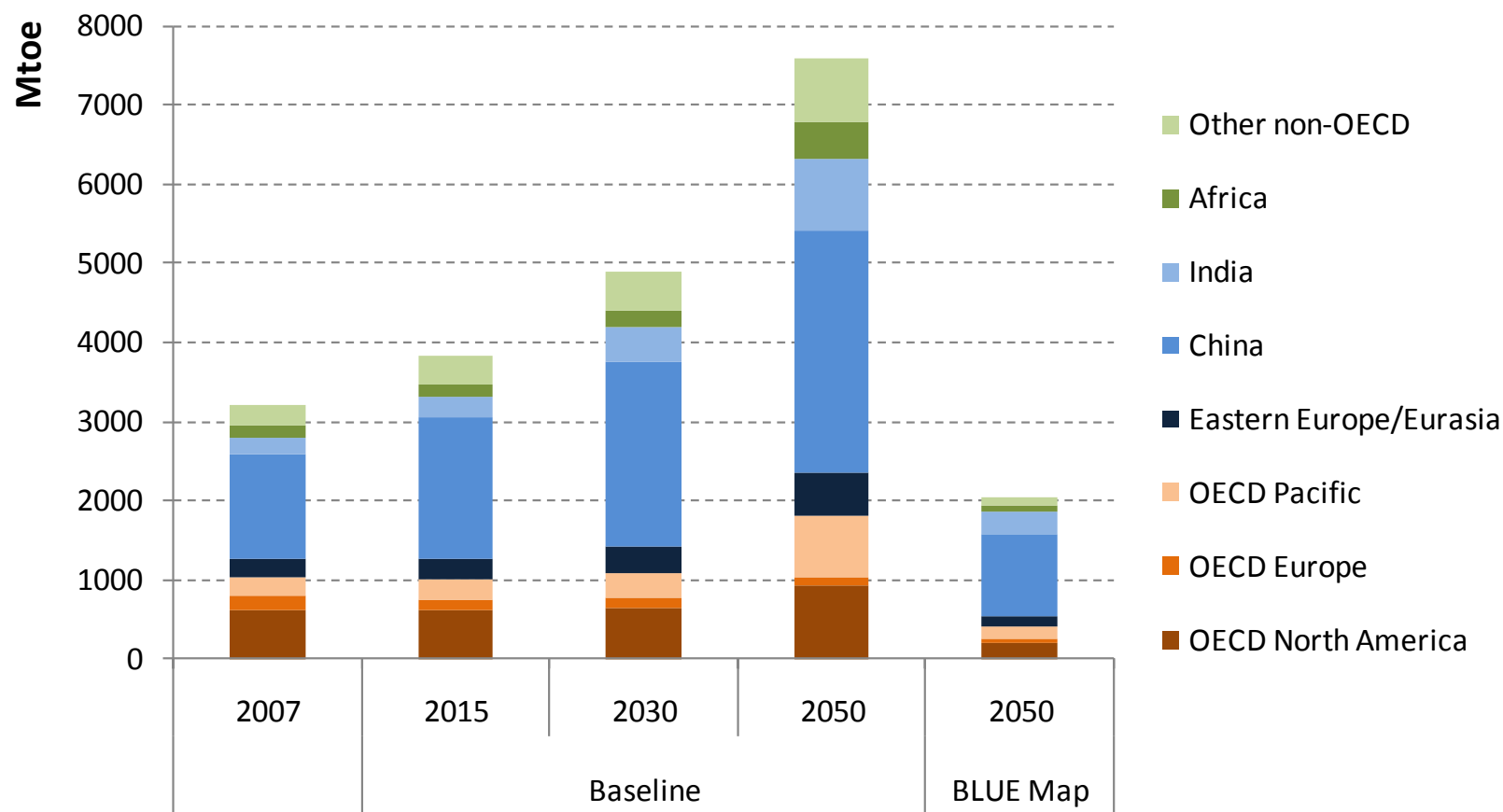


BLUE Map



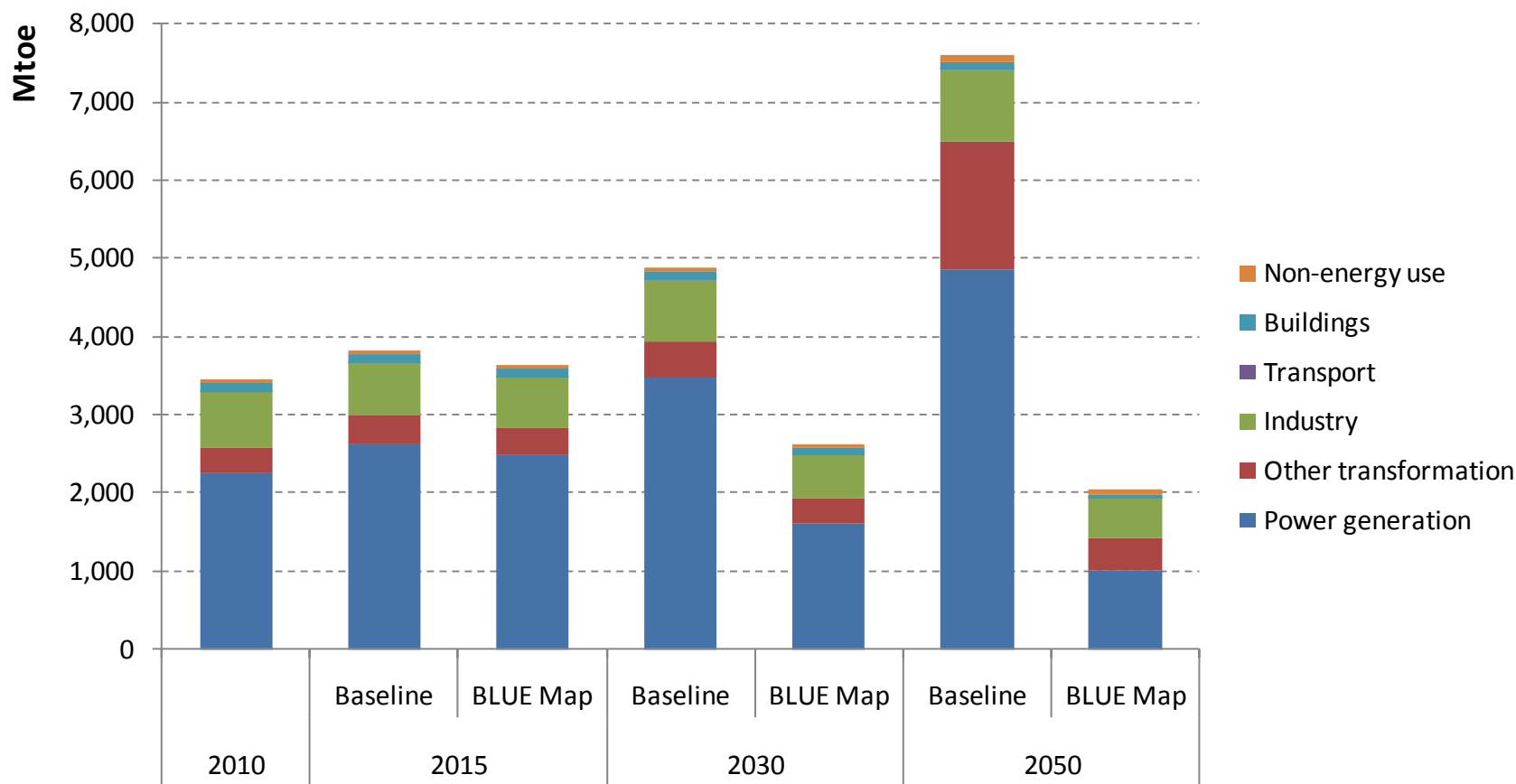
Non-OECD countries are the main coal consumers. In BLUE Map, coal demand decreases in most countries in a range from 70% to 80% relative to the Baseline scenario.

Coal supply



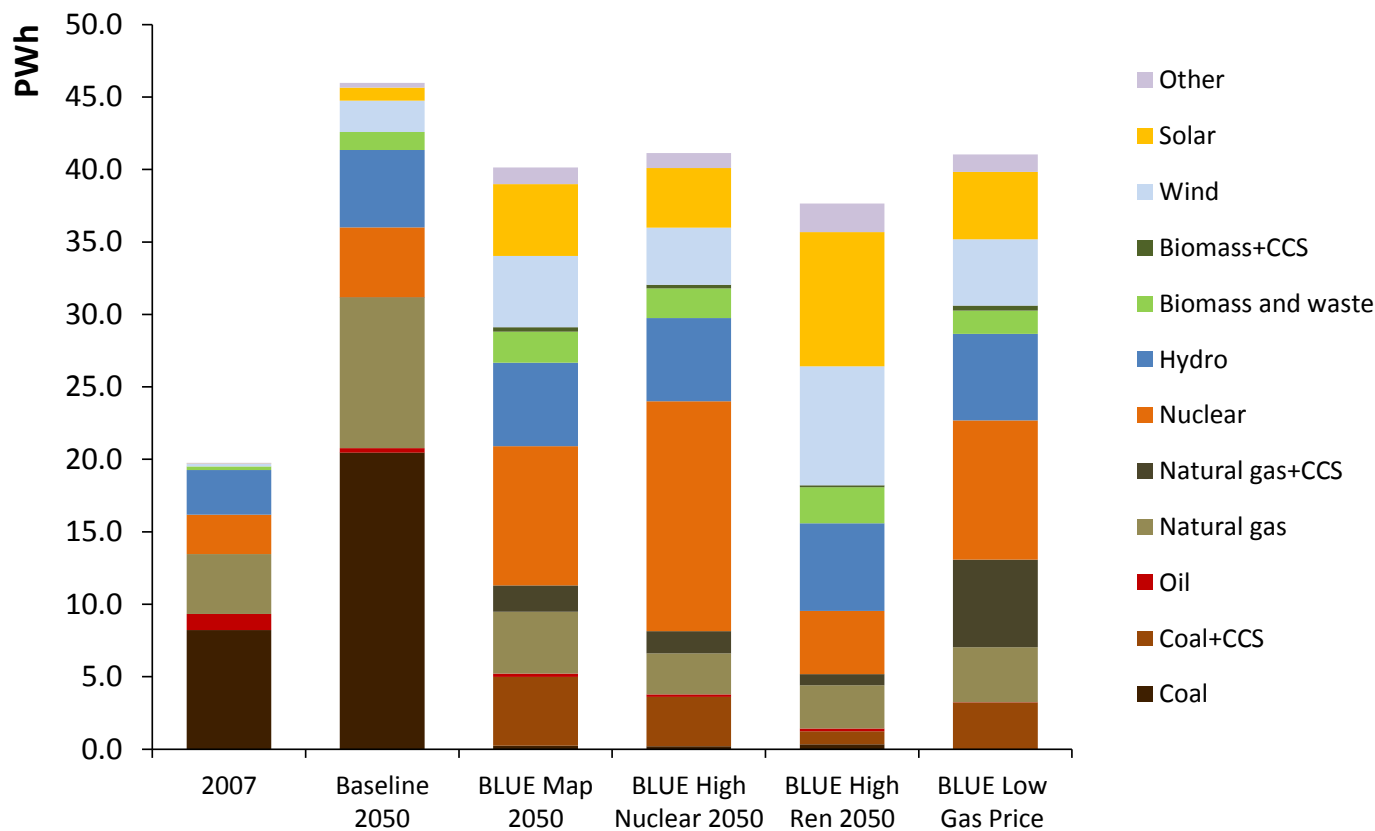
China remains a net importer of coal in the Baseline scenario, but becomes self-sufficient in BLUE Map.

Consumption of coal by sector



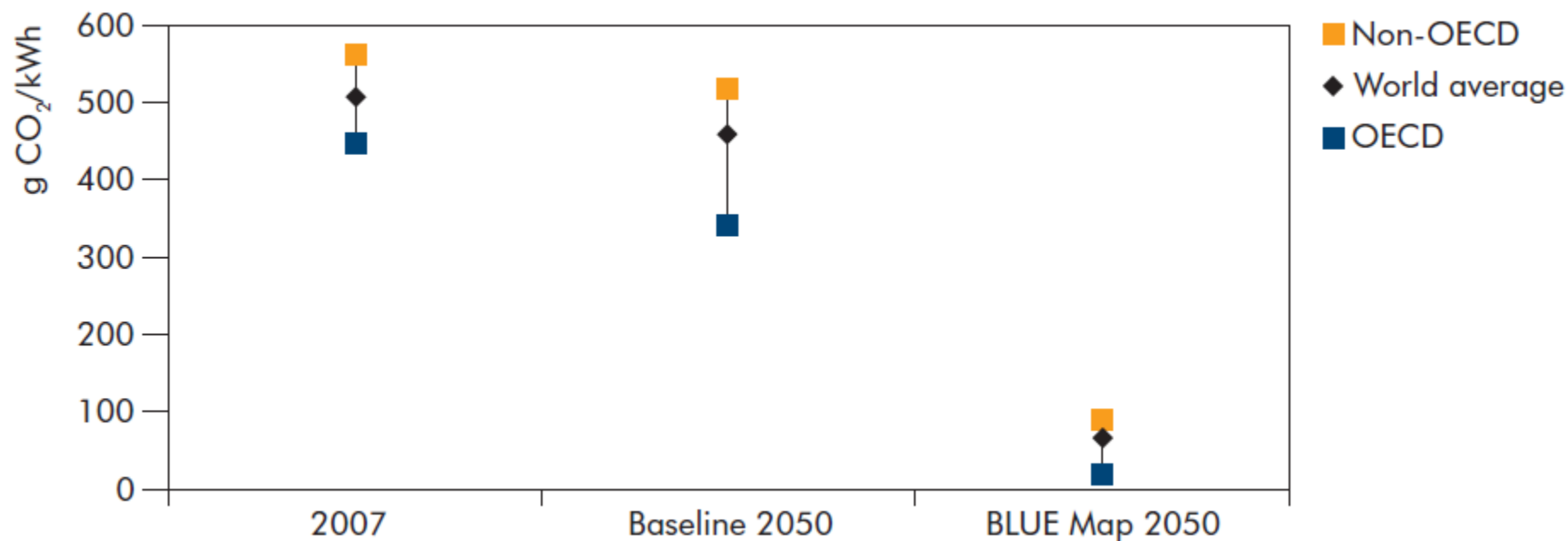
In BLUE Map, coal use in power generation in 2050 is cut by more than three quarters compared to the Baseline.

Decarbonising the power sector – a new age of electrification?



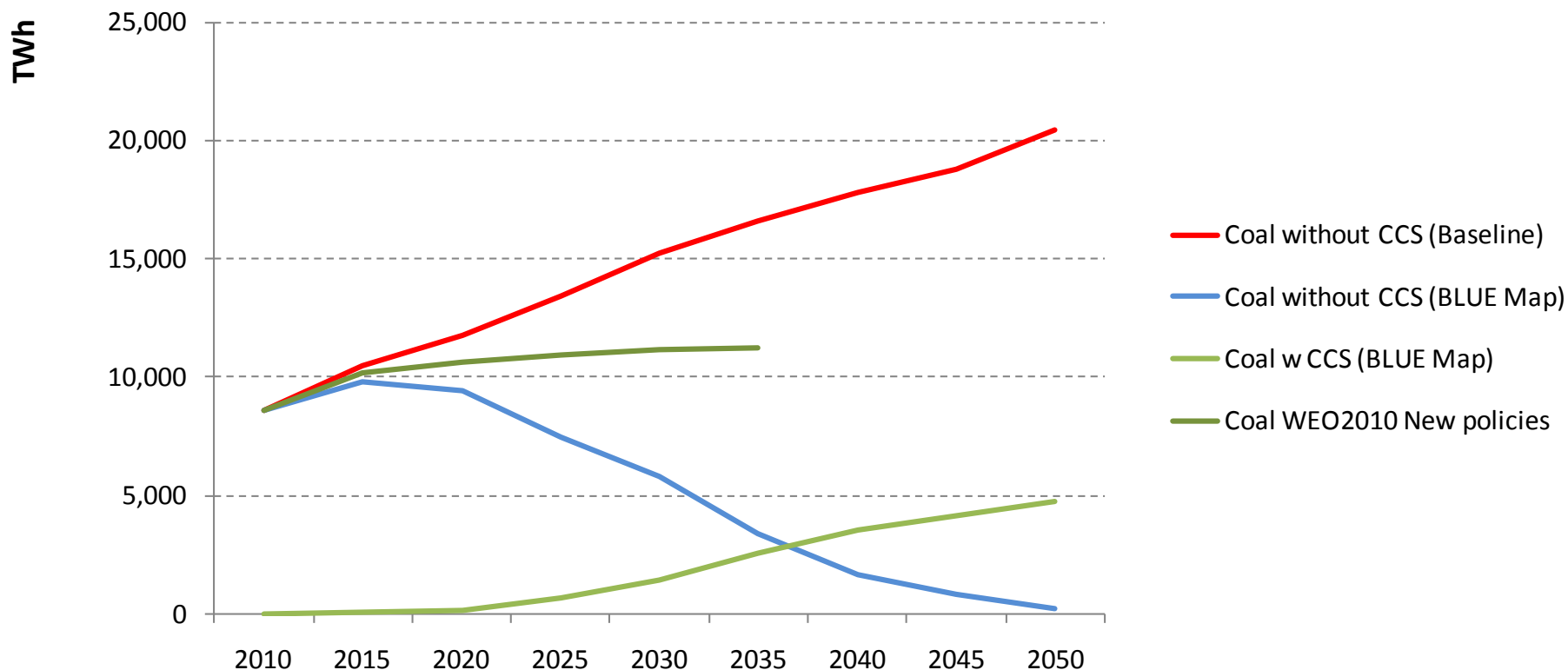
CCS crucial for use of coal in power generation in low-carbon scenarios.

Development of CO₂ intensity in power generation



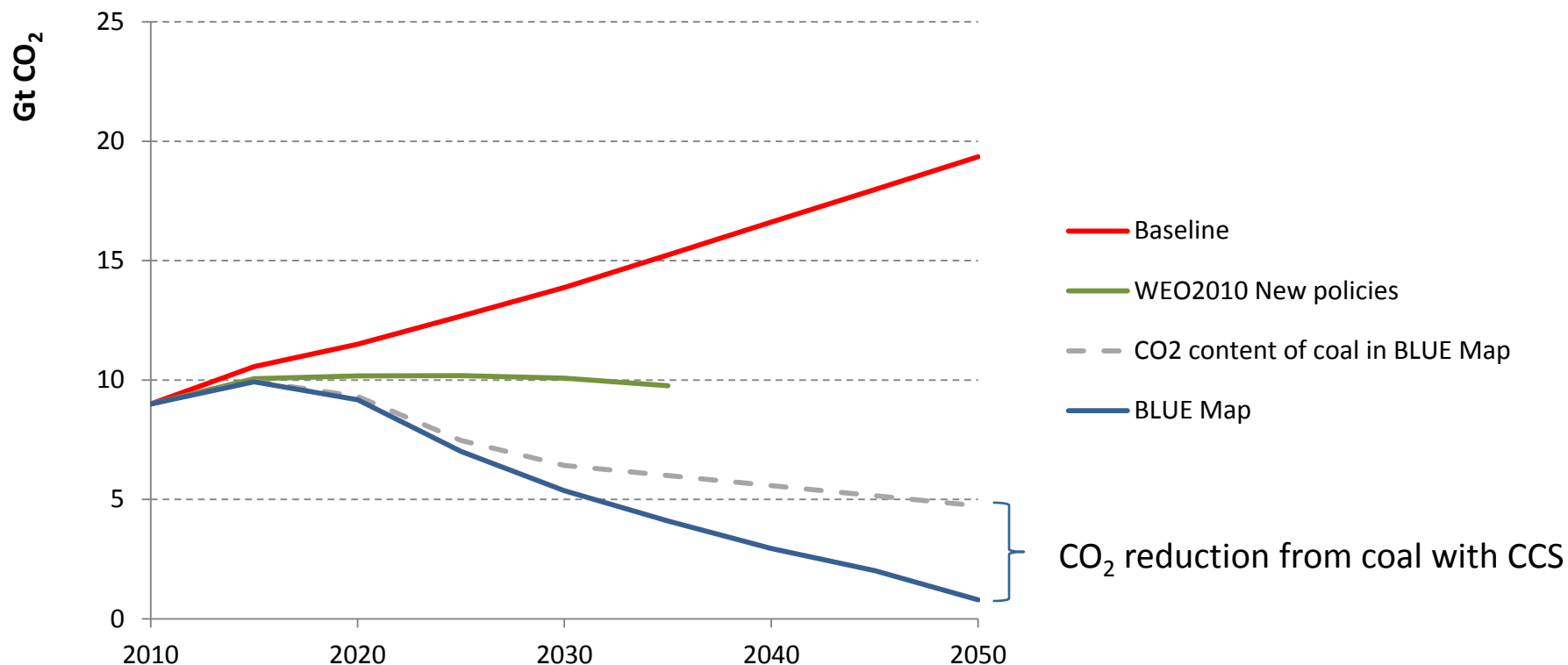
The power sector is virtually decarbonised by 2050 in the BLUE Map scenario.

Global power generation from coal



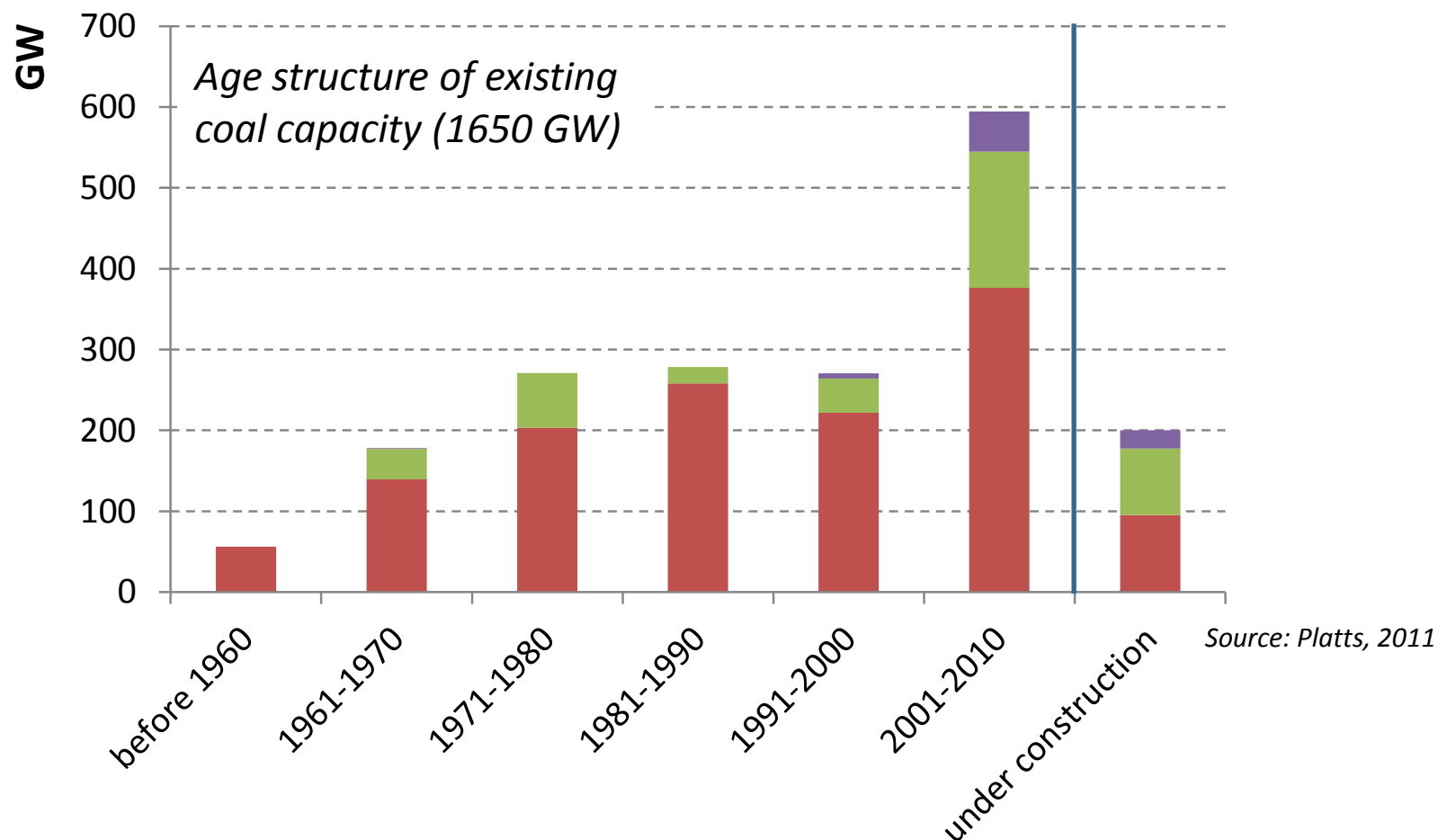
Rapid decline in power generation from coal without CCS, only partially offset by coal with CCS.

CO₂ emissions from coal in power generation



Almost 4 Gt CO₂ are avoided at coal power plants with CCS.

Lock-in into coal?



Still significant additions of subcritical capacity over the last decade and under construction

Summary/discussion points

- Coal major contributor to CO₂ emissions
- To make deep cuts in CO₂ emissions consistent with limiting temperature increase to 2-3 °C (BLUE Map scenario):
 - Drastic reductions in use of coal by 2050
 - Substantial uptake of CCS by 2050
- Given most recent estimates on CO₂ emissions (30.6 Gt for 2010, 13.5 Gt from coal), achieving the BLUE Map scenario becomes more and more challenging.
- Views around the table?

Supplementary slides

	Unit	2008	2030	2050
IEA crude oil imports	Barrel	97	115	120
Natural gas				
<i>United States imports</i>	<i>MBtu</i>	<i>8.3</i>	<i>11.4</i>	<i>11.9</i>
<i>European imports</i>	<i>MBtu</i>	<i>10.3</i>	<i>14.0</i>	<i>14.7</i>
<i>Japanese imports</i>	<i>MBtu</i>	<i>12.6</i>	<i>15.9</i>	<i>16.7</i>
OECD steam coal imports	Tonne	121	109	115

For the Baseline Scenario (in USD per unit)

	Unit	2008	2030	2050
IEA crude oil imports	Barrel	97	90	70
Natural gas				
<i>United States imports</i>	<i>MBtu</i>	<i>8.3</i>	<i>10.2</i>	<i>7.9</i>
<i>European imports</i>	<i>MBtu</i>	<i>10.3</i>	<i>11.0</i>	<i>8.6</i>
<i>Japanese imports</i>	<i>MBtu</i>	<i>12.6</i>	<i>12.5</i>	<i>9.7</i>
OECD steam coal imports	Tonne	121	65	58

For the BLUE Scenario (in USD per unit)