The Role of High Efficient Technology in ETP2010 Scenario

-High Efficiency, Low Emissions Coal Technology-
1st Workshop , 8-9 June 2011

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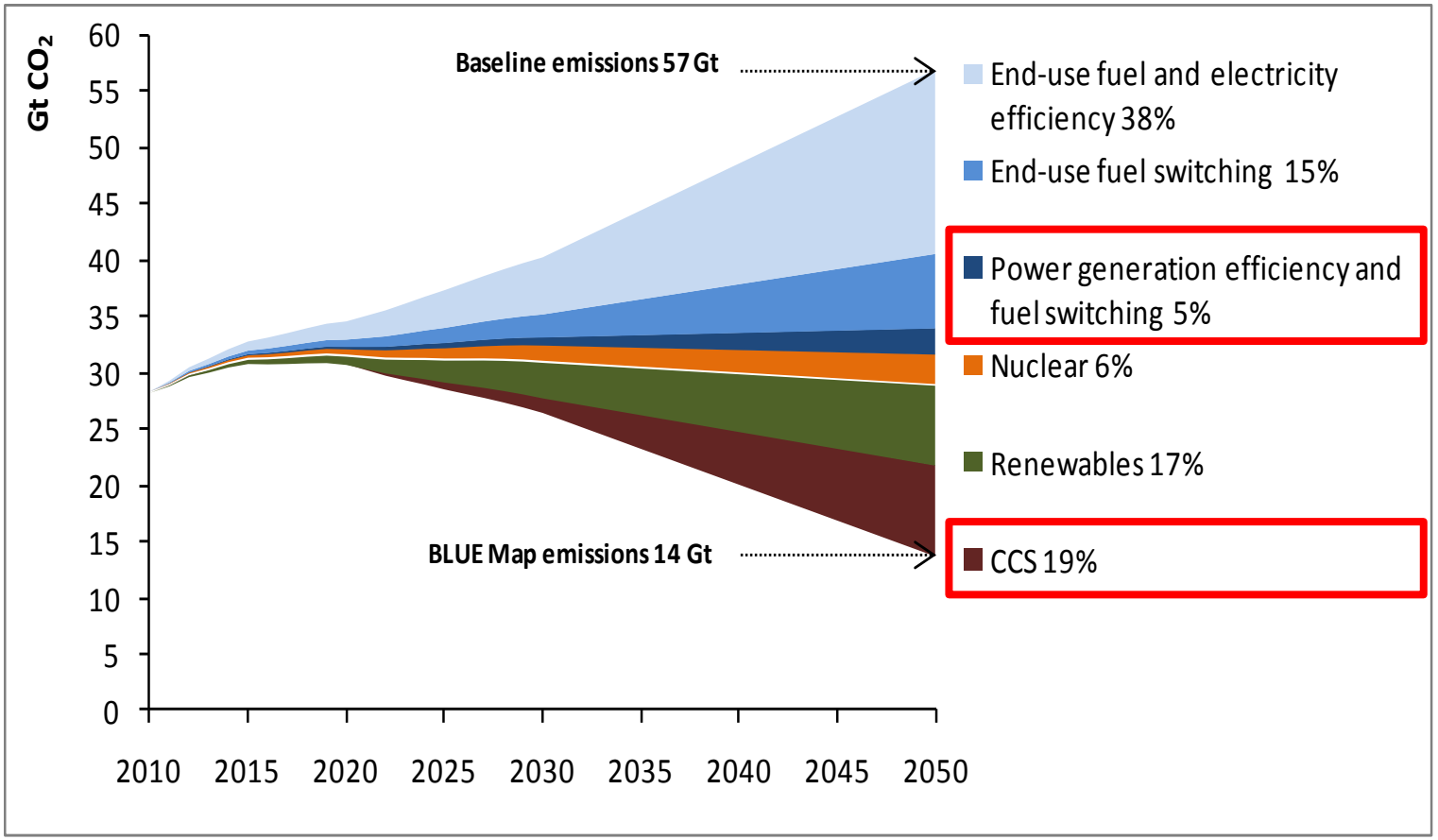
Key technologies for reducing global CO_2 emissions



source: IEA Energy Technology Perspectives 2010

A wide range of technologies will be necessary to reduce energy-related CO_2 emissions substantially.

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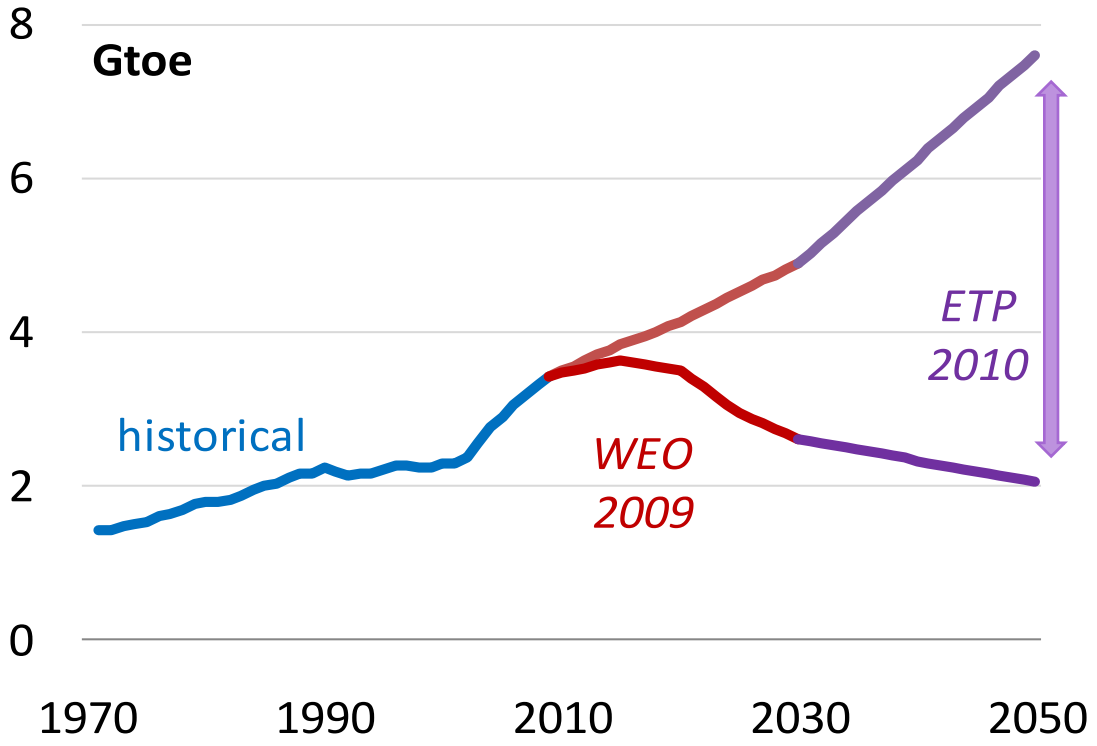
- Economic Growth
- Engagement Worldwide

Quantitative evaluation is necessary for the implementation of appropriate regulation, financial investment.



Provided results in this evaluation;
- Projection of Coal Generation for next 40 years in key areas based on ETP 2010 scenario
- Role of Plant Efficiency in order to reduce CO_2 emission

Energy Security

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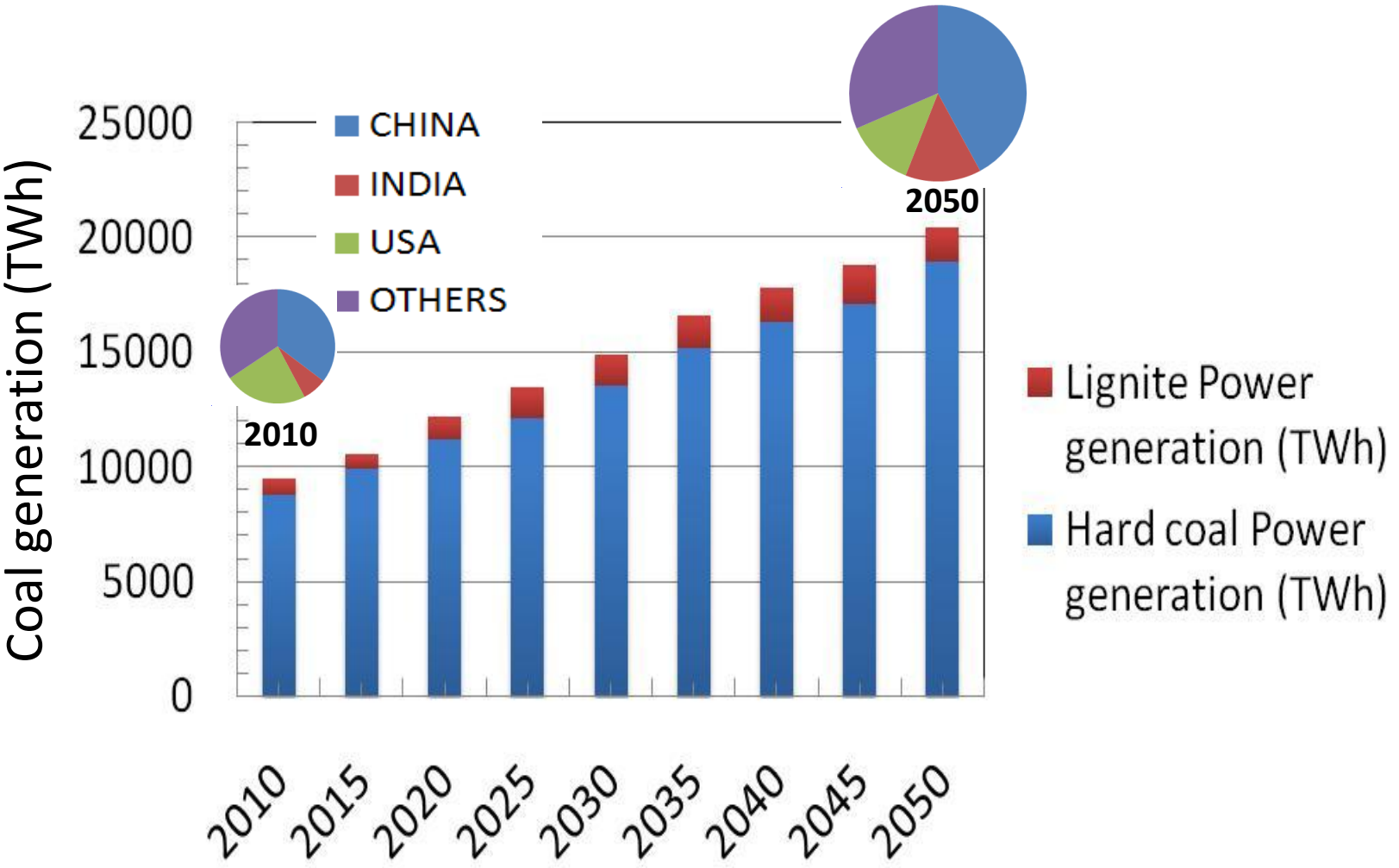
Coal Generation in ETP2010's Baseline Scenario



World coal generation in 2050 will be two times higher than that of 2010. China, India and USA will remain main countries in 2050.

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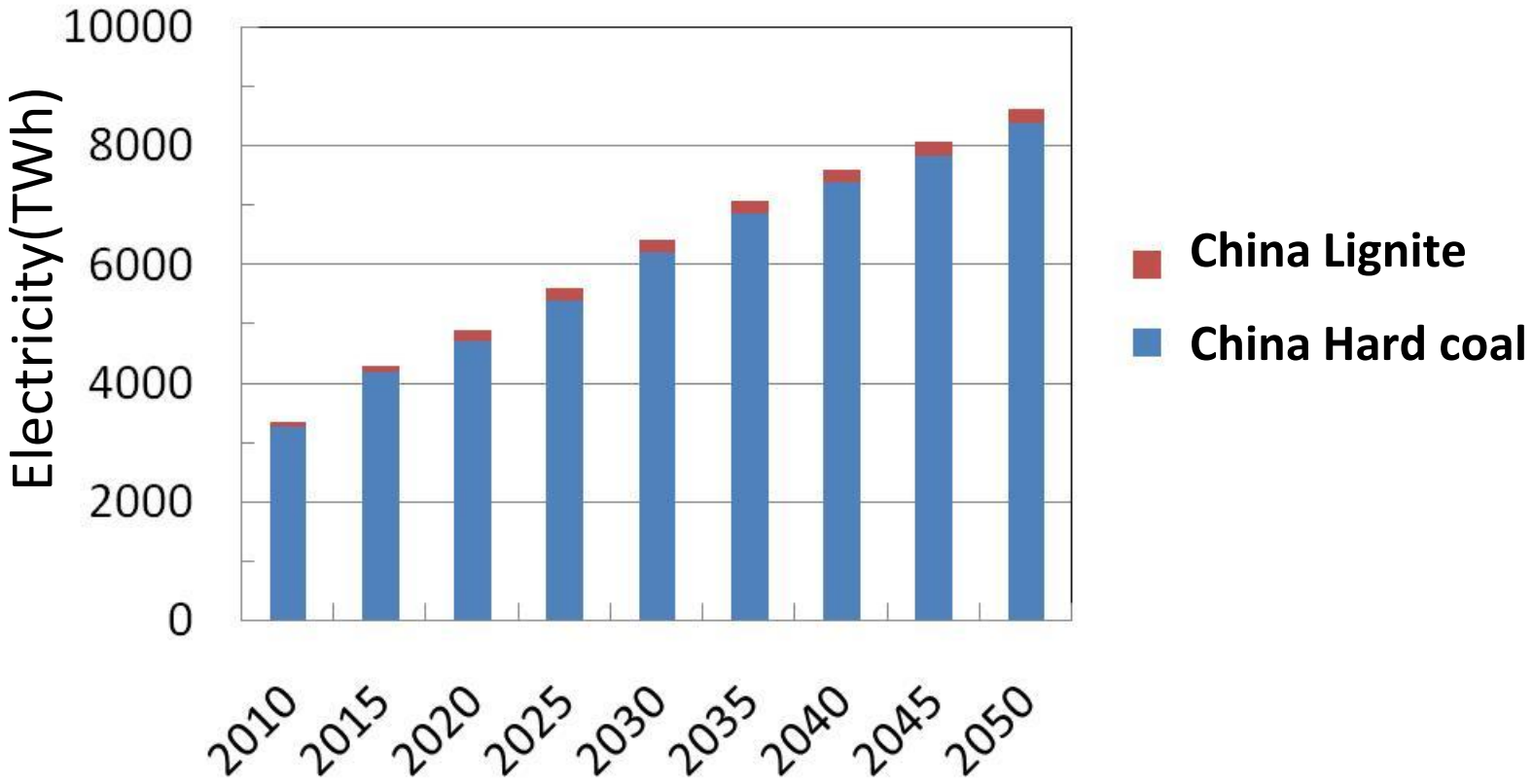
Increase of Coal Generation in China(Baseline). Plant efficiency effect on CO_2 emission will be evaluated by employing different cases next.



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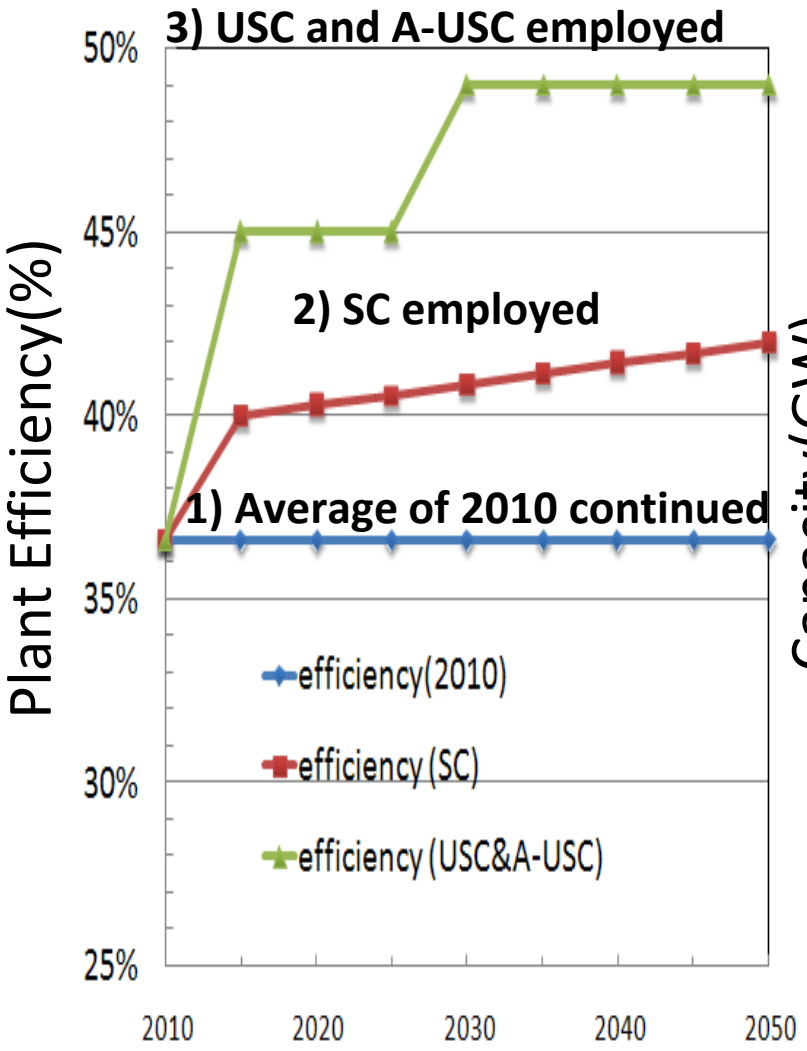
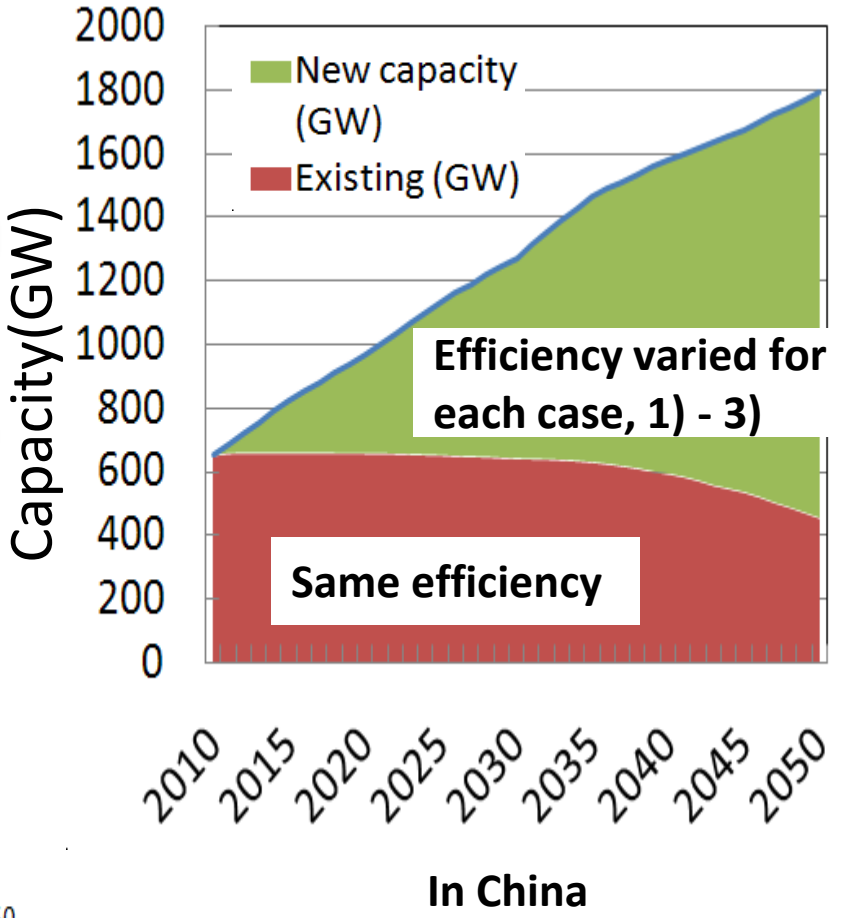
In order to calculate efficiency effect on CO_2 emission, following three cases are employed.





In China

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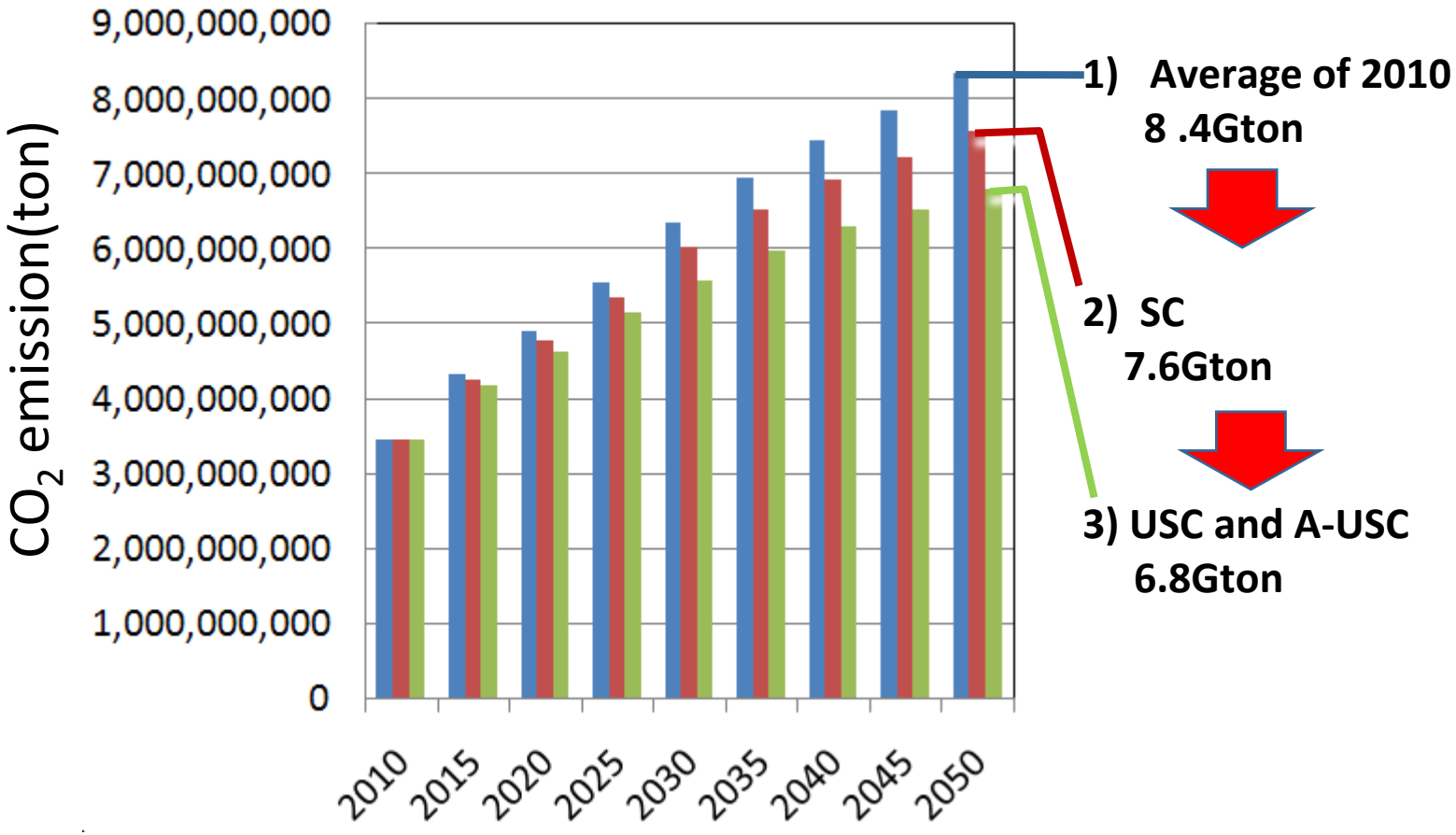
CO_2 reduction by efficiency improvement in China (baseline scenario)



In China, CO_2 reduction over 1Gton would be expected by enhancing efficiency in 2050 (baseline scenario).

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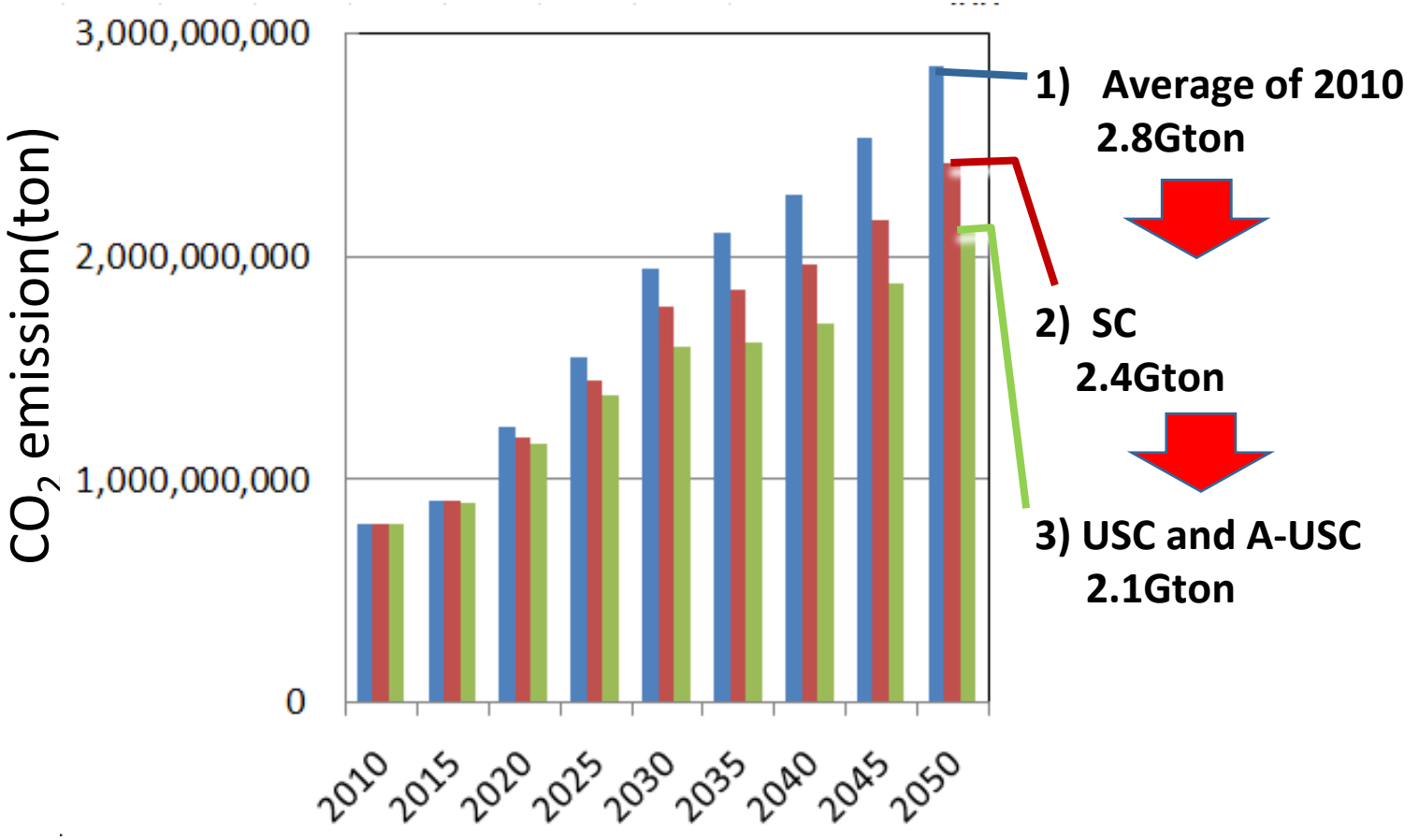
CO_2 reduction by efficiency improvement in India (baseline scenario)



In India, roughly 0.5Gton reduction would be expected by enhancing efficiency in 2050 (baseline scenario).

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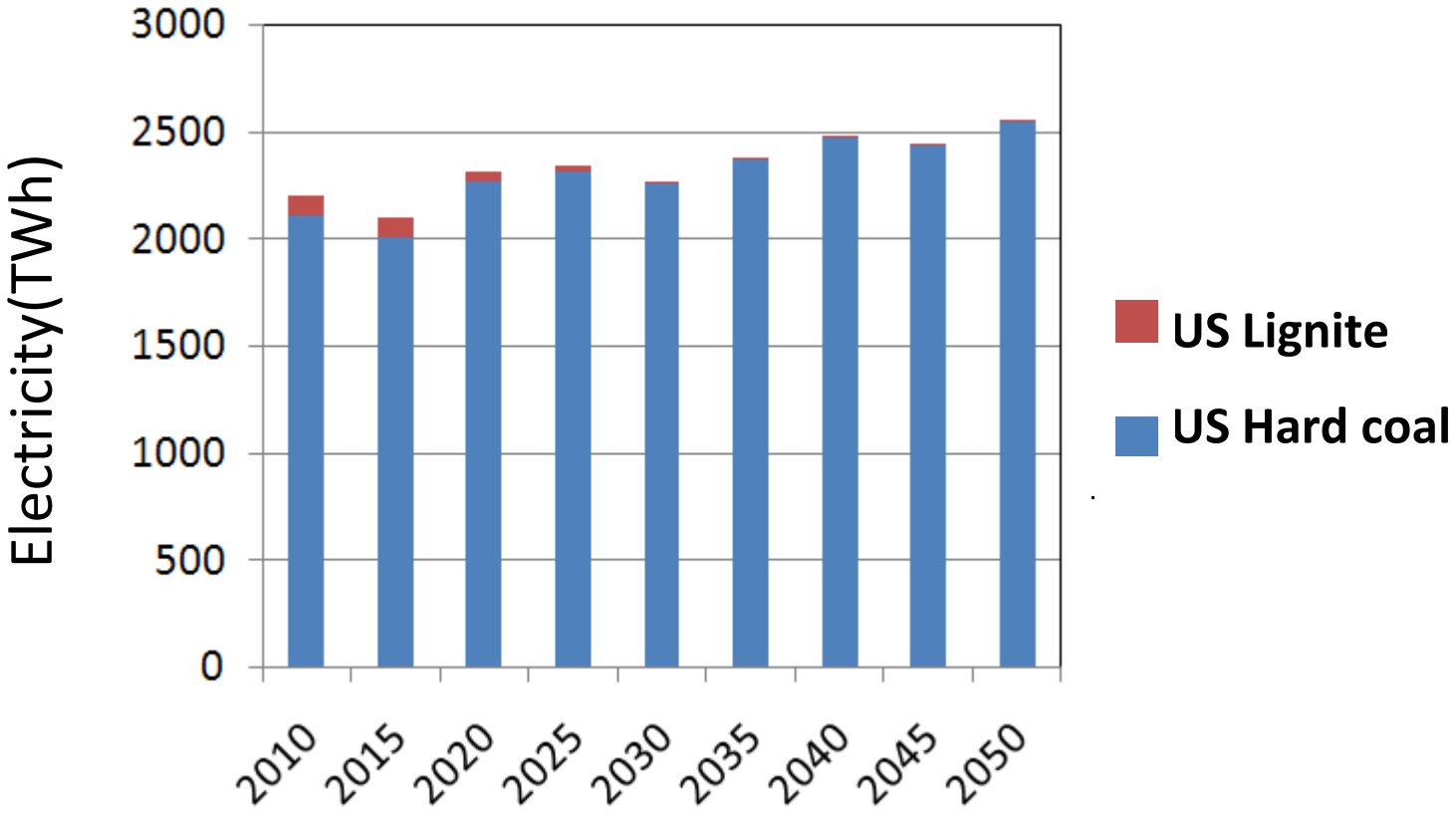
Electricity increase of Coal generation in USA (Baseline scenario).



In US , electricity increase in 2050 is only 15% from that of 2010(baseline scenario).

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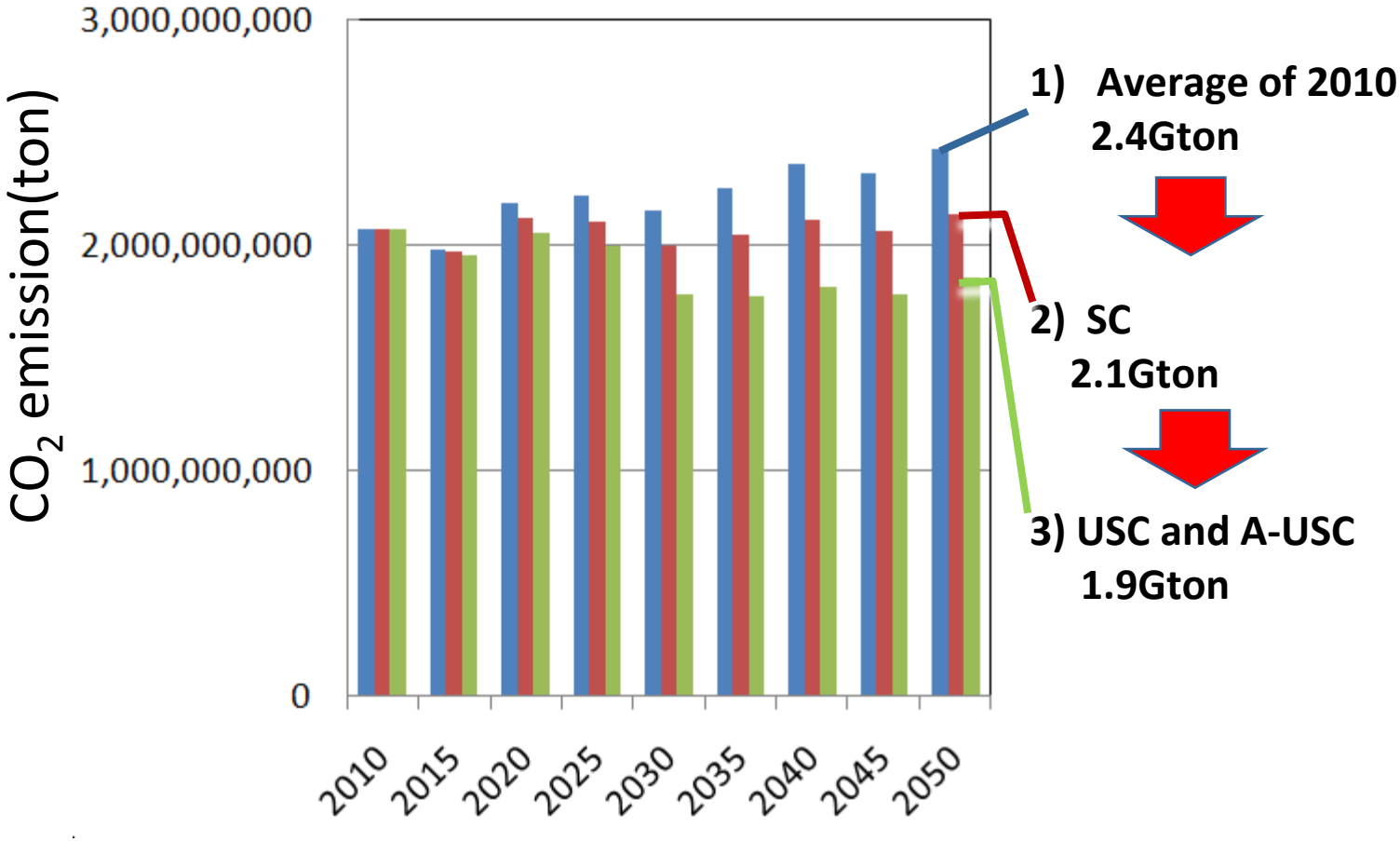
CO_2 reduction by efficiency improvement in US (baseline scenario)



Even in US , CO_2 reduction is not a small amount by employing high efficient coal generation.

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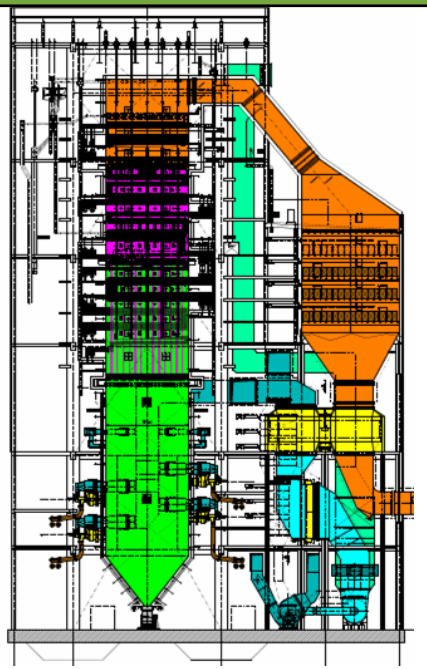
Efficiency improvement would make a significant contribution to CO_2 reduction. In addition, deployment of USC and A-USC is a realistic path as OECD countries have a lot of knowledge/experiences for this technologies.

USC(600°C)

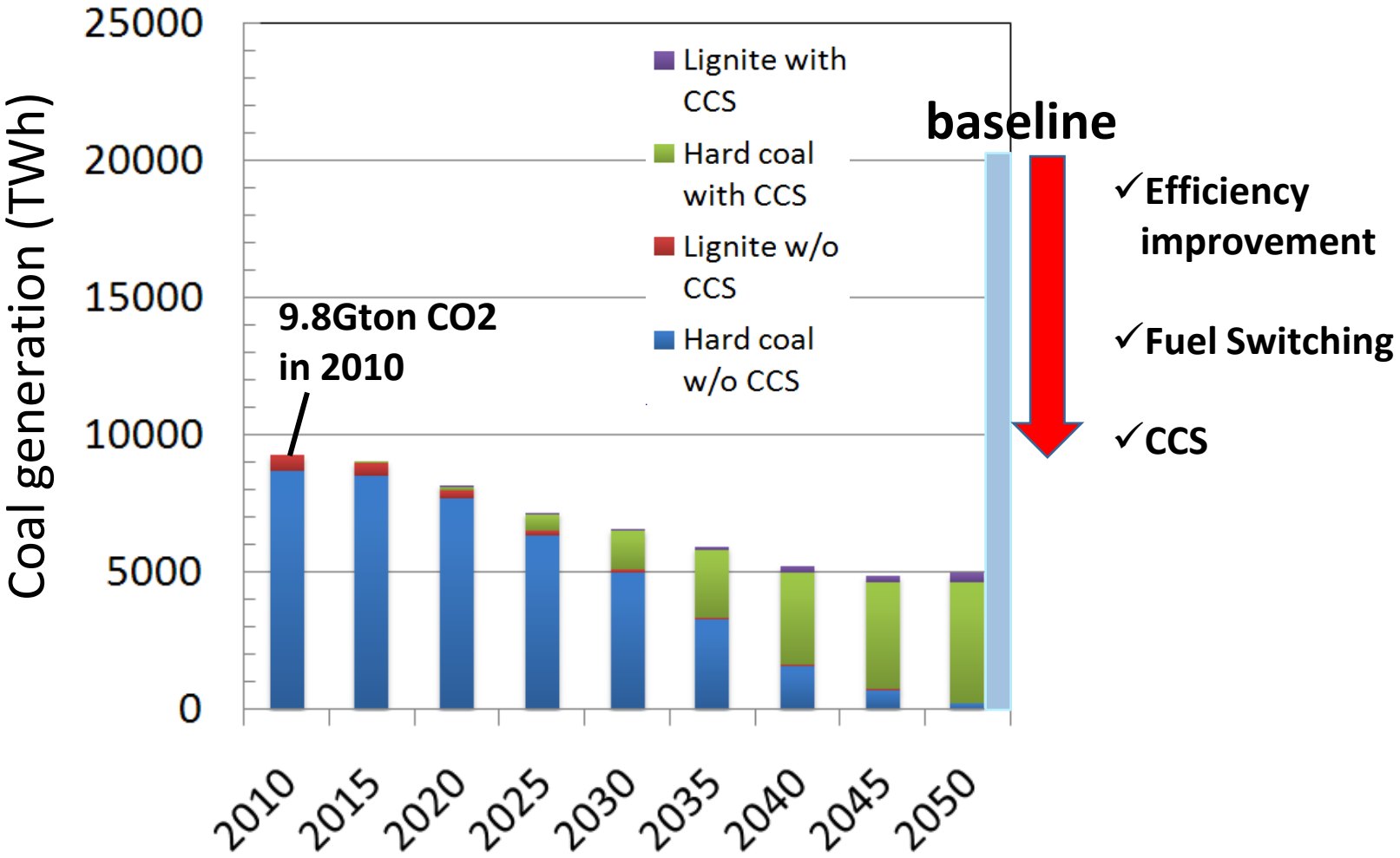
TEPCO Hitachinaka No.1, Japan
(Boiler; Babcock-Hitachi)
(600°C/600°C 25MPa 1000MW)
(Operation; 2003/12-)

Advanced USC(700°C)



Basic design for
E.ON 50+ Project, Germany
(Boiler; Hitachi Power Europe)
(700°C/720°C 35MPa 500MW)

Coal Generation in BLUE Map Scenario



15,000TWh from Coal Generation must switch to other fuels or equip CCS to realize BLUE Map scenario in 2050.

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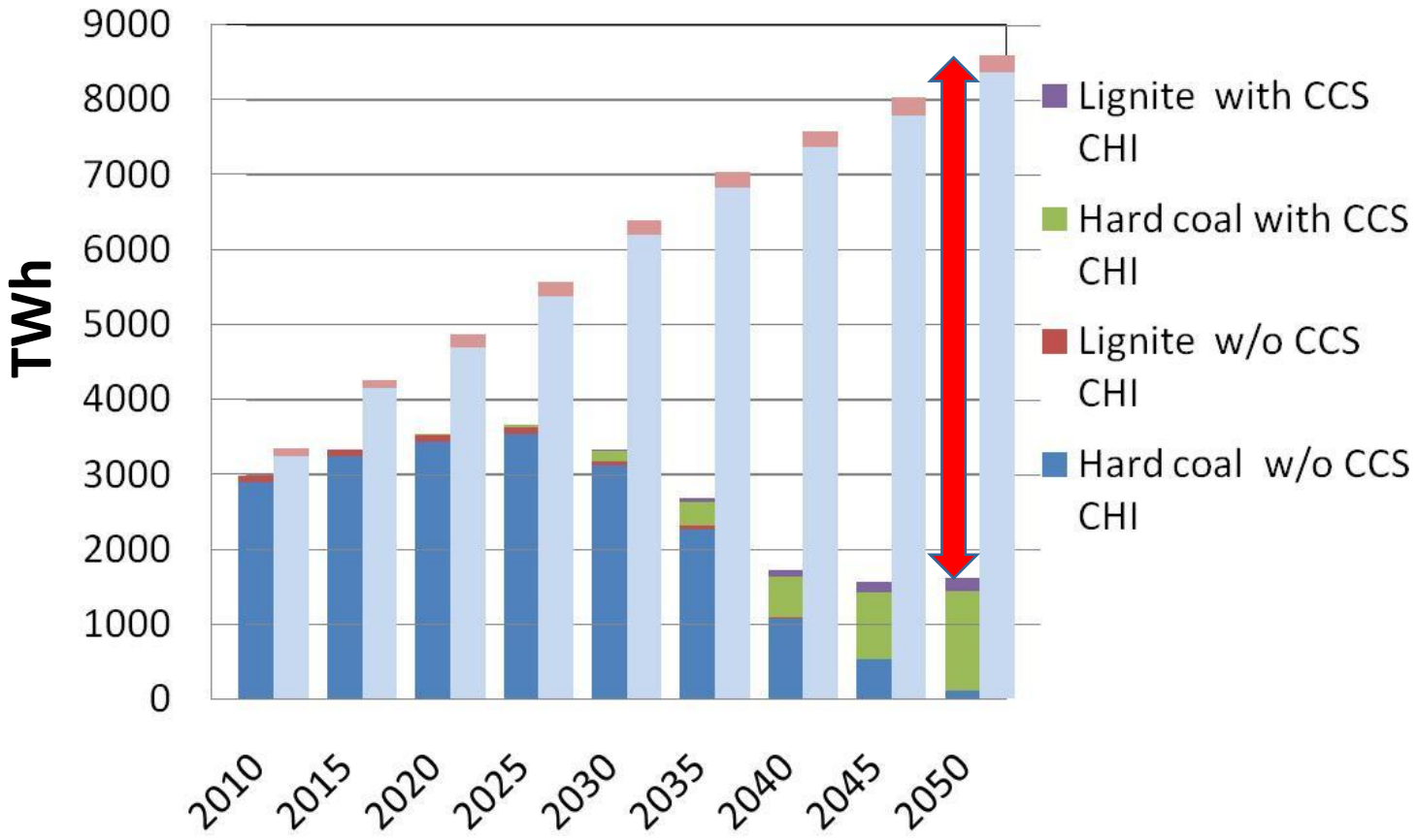
Gap between baseline and BLUE Map in China; 6700TWh in 2050



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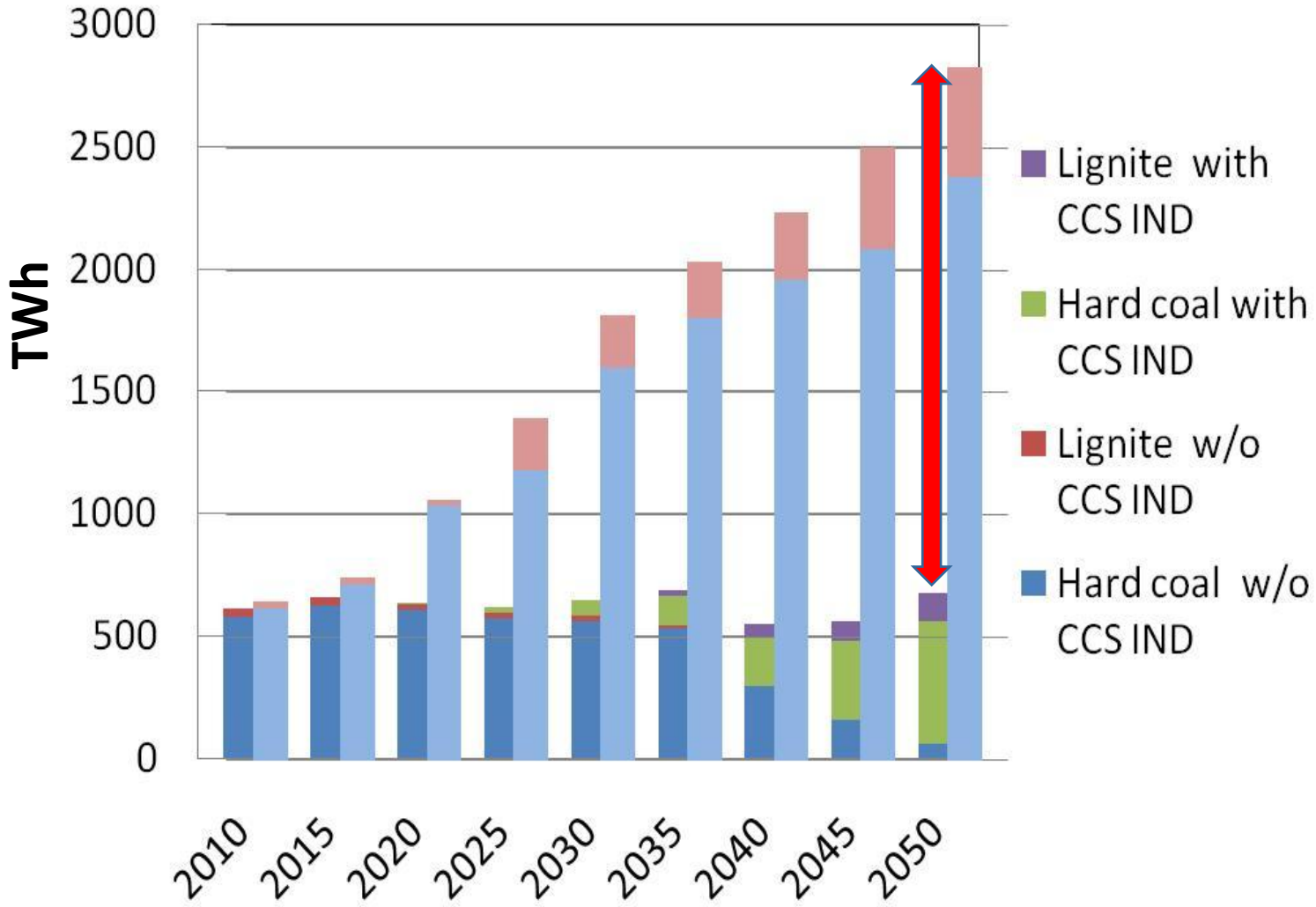
Gap between baseline and BLUE Map in India; 2000TWh in 2050



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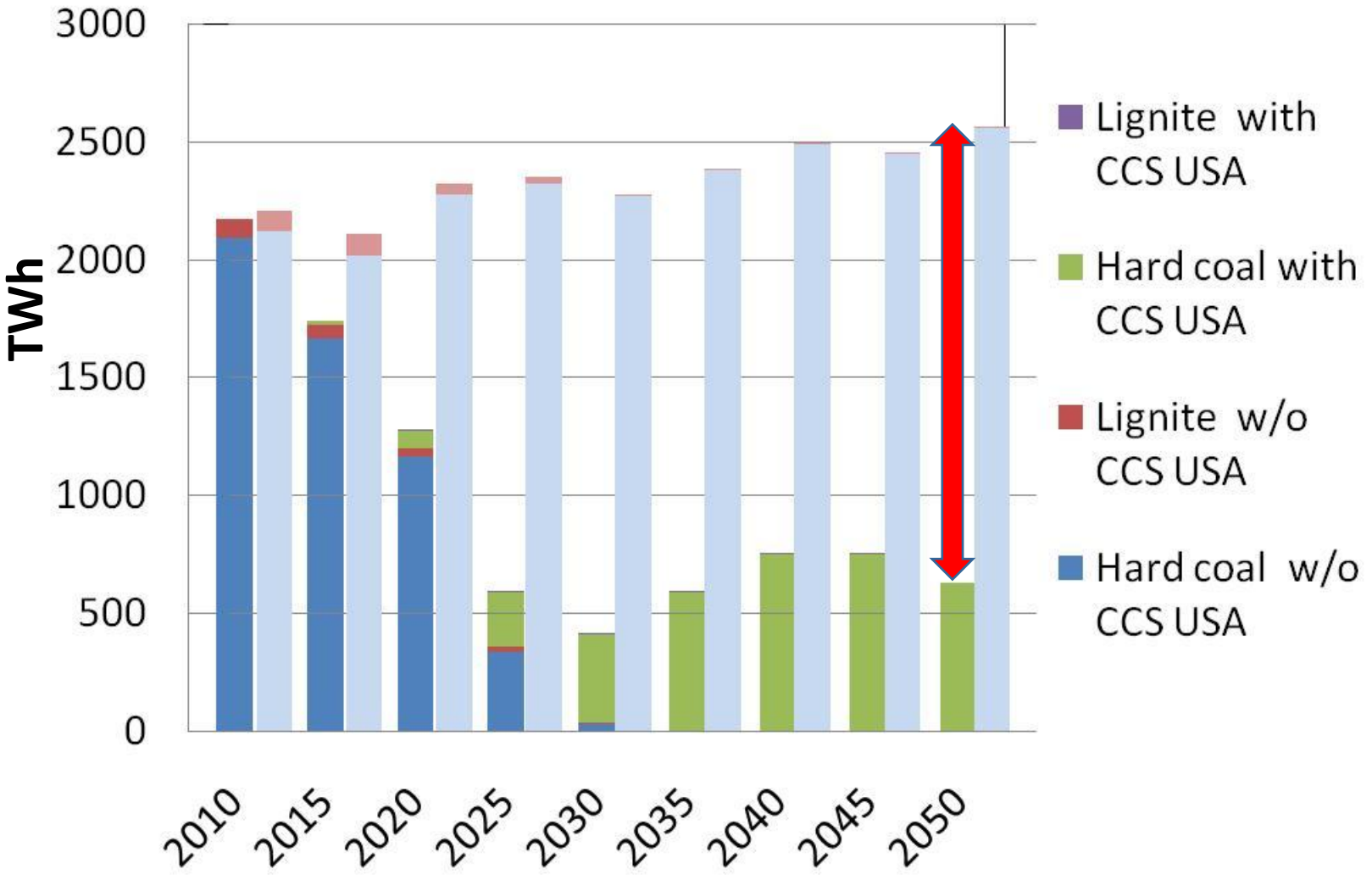
Gap between baseline and BLUE Map in US; 1900TWh in 2050



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Discussion points

- Employing high efficient technology is indispensable in baseline scenario. However, we need more effort to reduce CO_2 emission from baseline scenario.
- In this regard, how much demand will be really needed for each country? In addition, is regulation of plant efficiency acceptable in order to reduce CO_2?
- There is a large gap between baseline and BLUE Map scenario. Not only efficiency improvement, fuel switching, and CCS but other measures is to be implemented?

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