CHINA'S COAL DEMAND BOOM – THE END OF CHEAP STEAM COAL FOR EUROPE?

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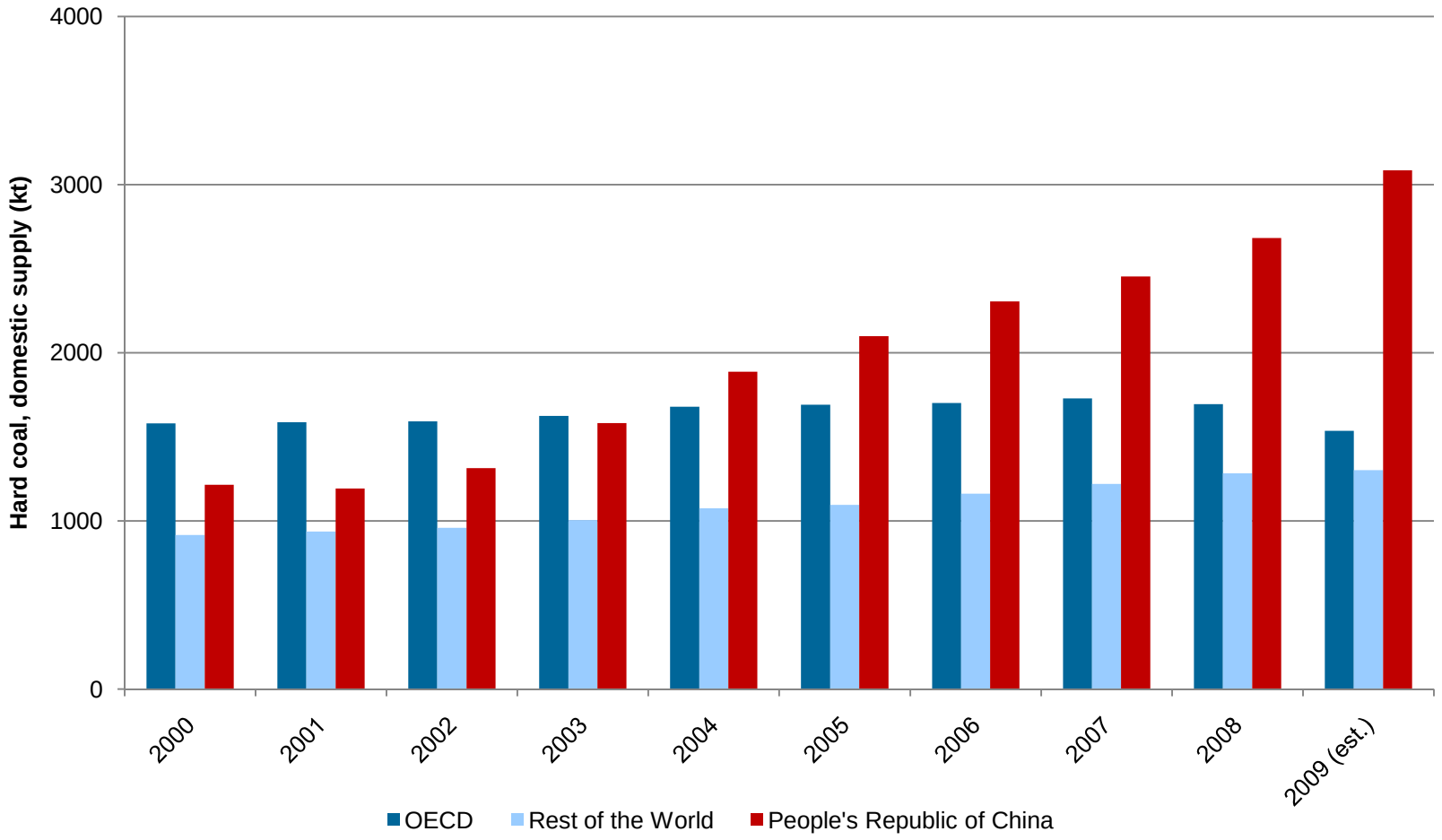
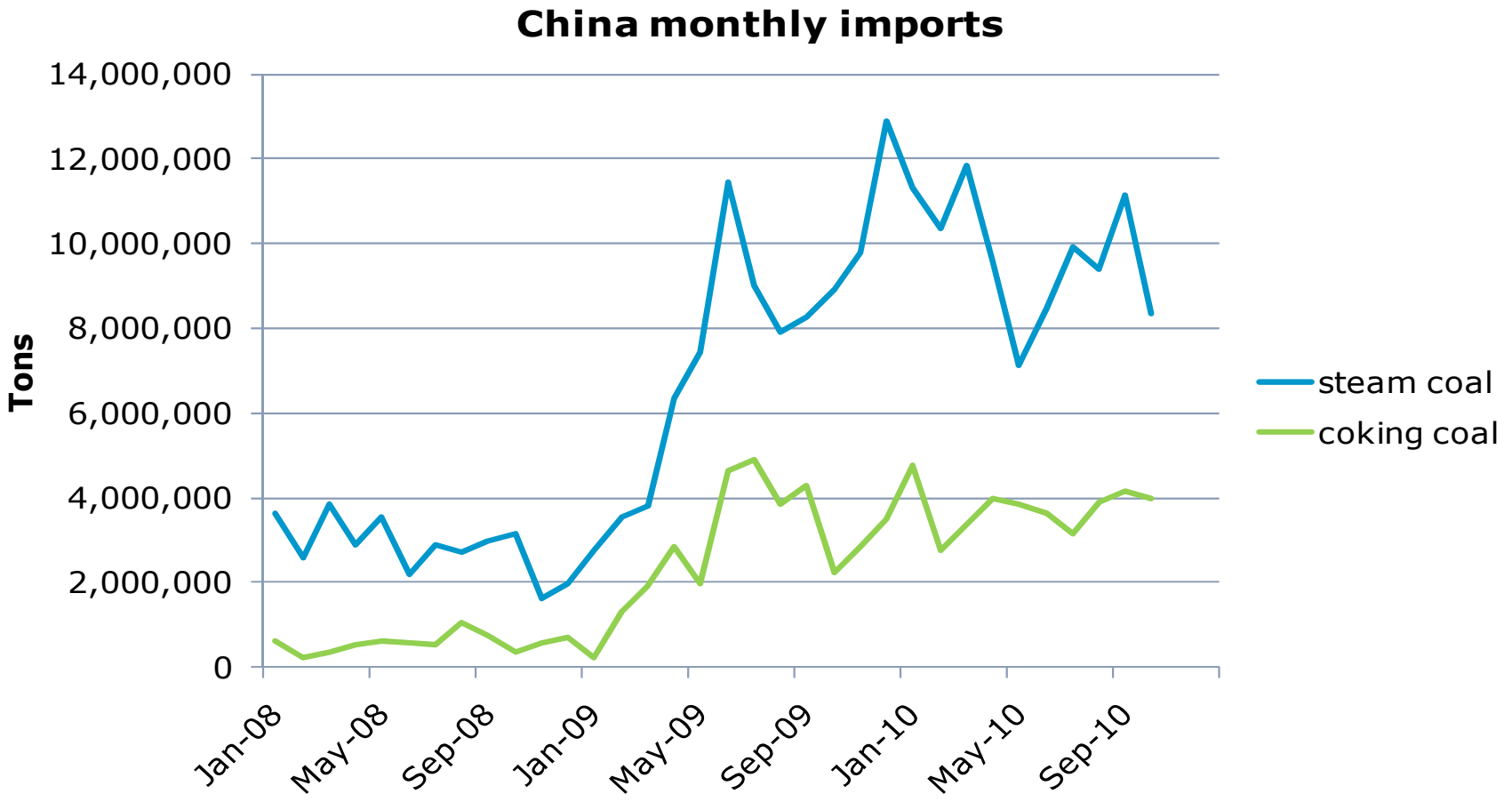
Chinese hard coal demand grew by more than 150% in the last ten years



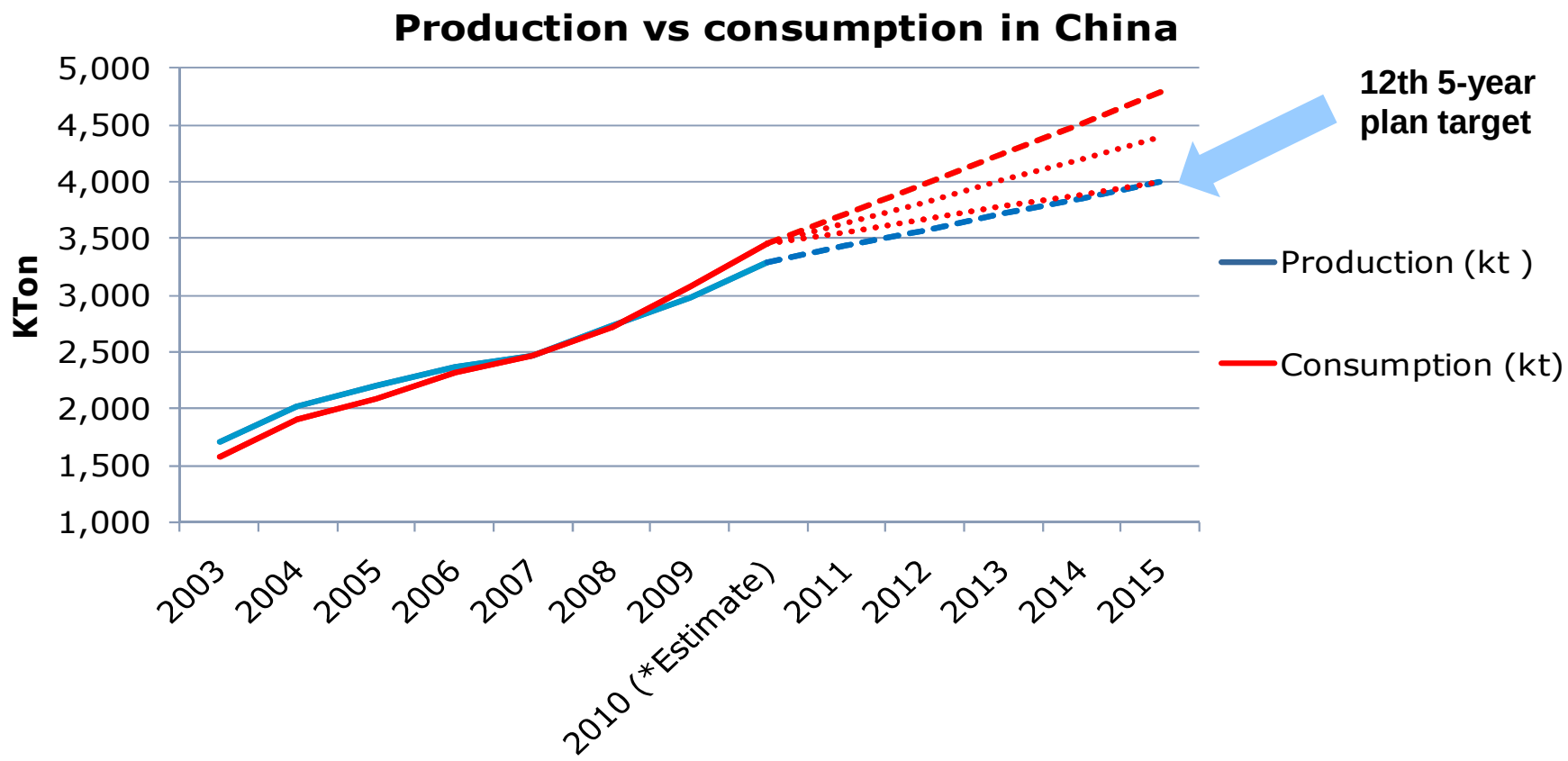
Chinese imports will make up ~20% of global trade market in 2010



- China became a net importer of coal in 2009 (roughly 110 Mt net).
- In 2010, Chinese imports were around 147 Mt.

Source: IEA

Chinese coal demand key for future imports and therefore global coal prices



- Chinese coal production is likely to be planned around 4 Bt for 2015 but **transport** will be a challenge
- GDP growth, development of energy intensity, and deployment of nuclear, gas and renewables will be the key factors in determining coal demand.

Source: IEA

Future scenarios for coal-based energy transport in China

Current situation in China	▪More than 60% of coal is transported via railway, another 15% by trucks ▪Some HVDC lines for mine mouth coal-fired power plants already exist ▪Coal imports are cost competitive compared to domestic production in Chinese coastal demand centres

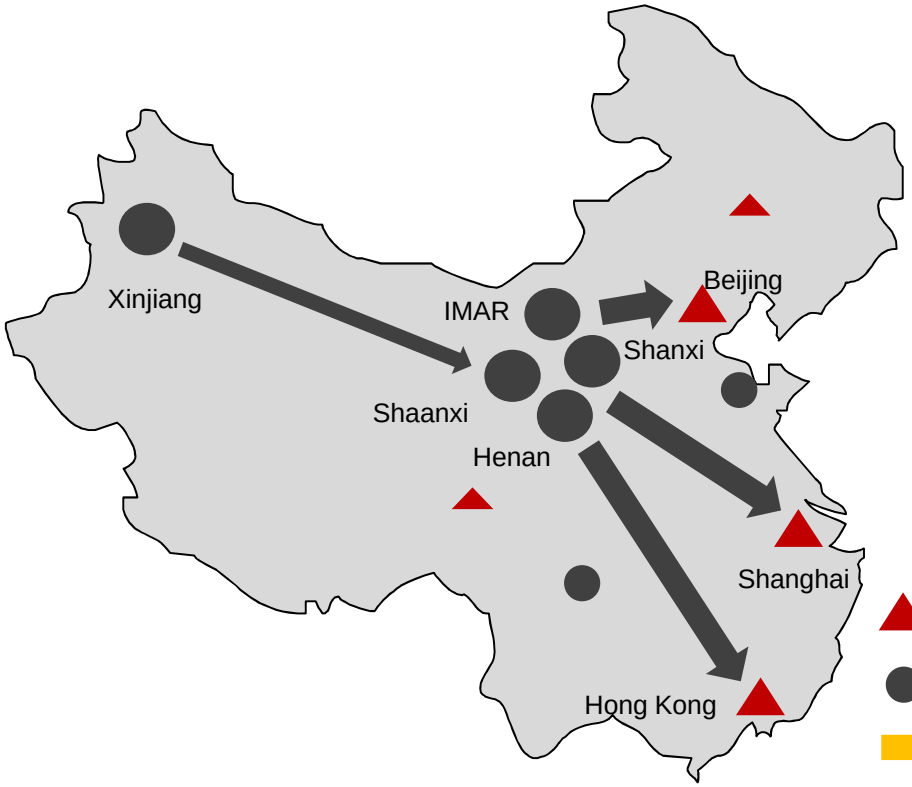
Future

Coal-by-train	▪May cover the largest part of future coal supply ▪Massive expansion of railway capacity during last years
Coal-by-wire	▪**Until now:** Several demonstration HVDC projects ▪**Hindrances** 1. Weak central planning institutions 2. Remuneration schemes of Chinese TSOs do not give enough investment incentives

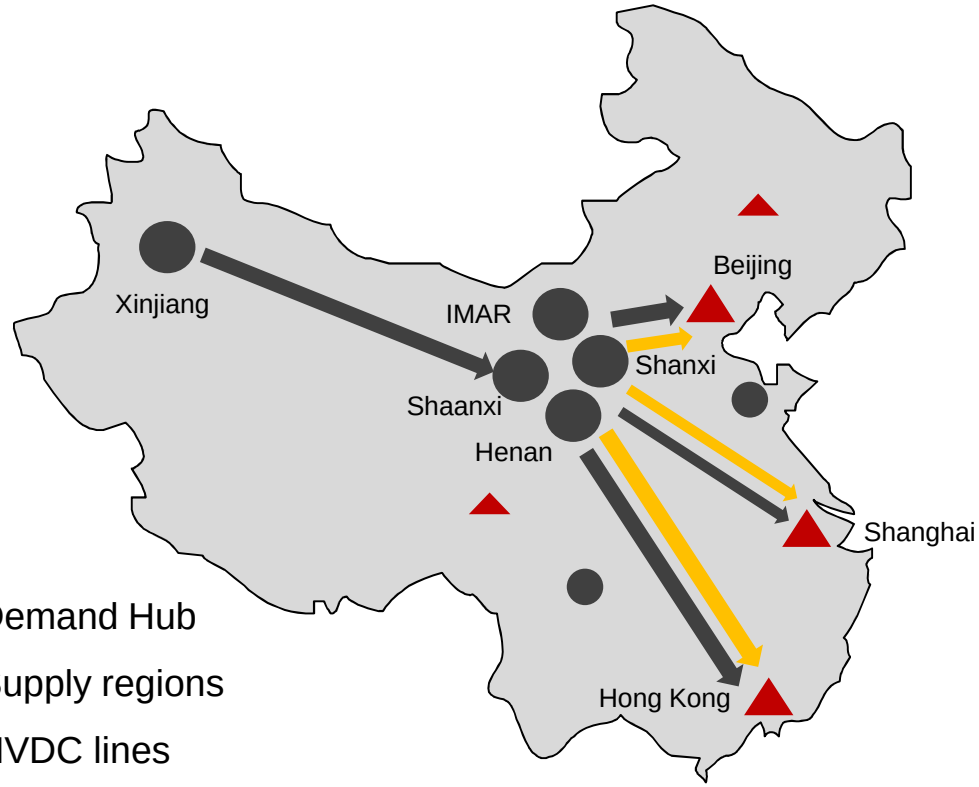
Chinese import volumes are heavily influenced by inland transportation costs and capacities

We analyze two scenarios with different assumptions on Chinese domestic transport infrastructure

Coal-by-train 2030



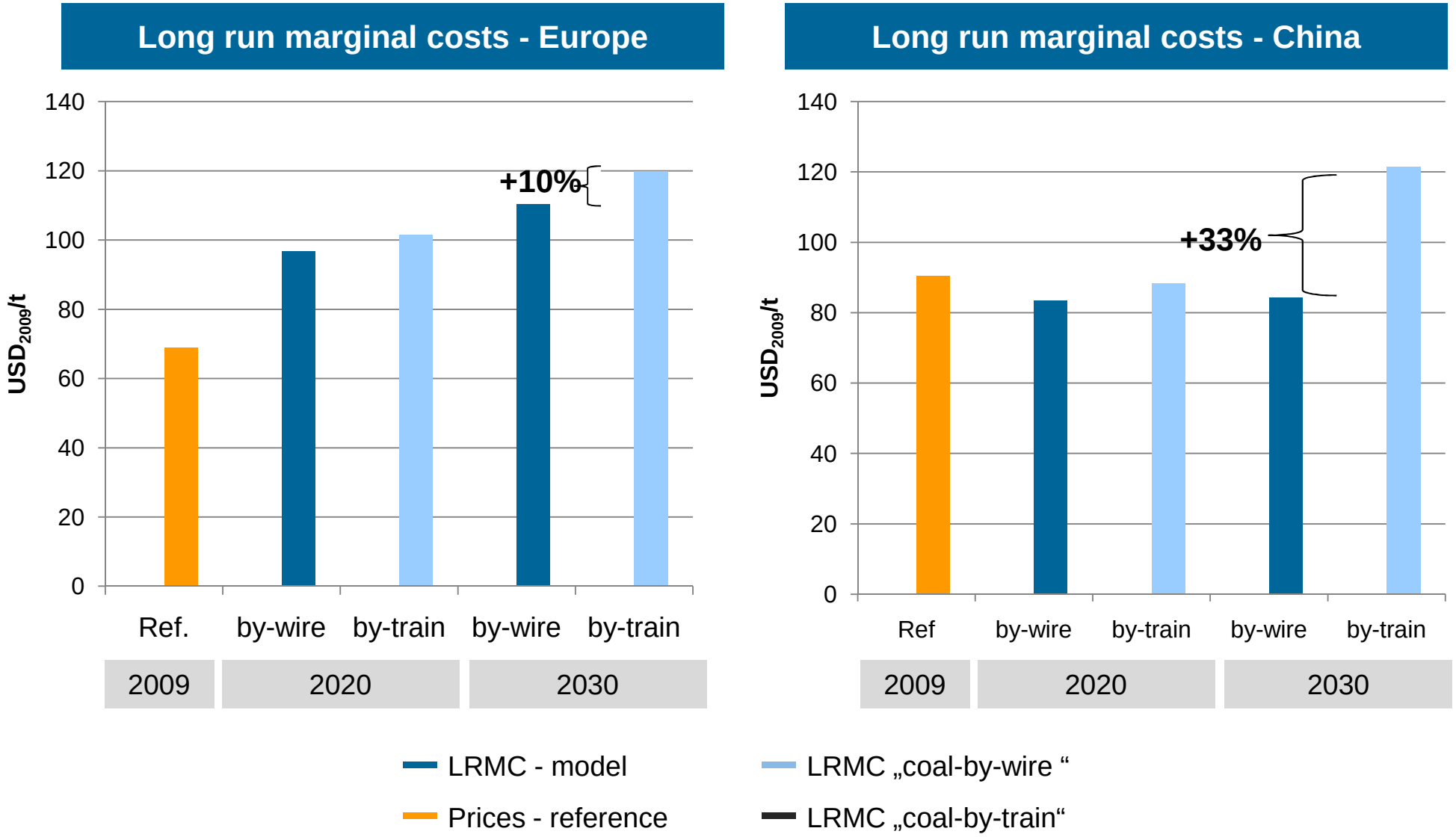
Coal-by-wire 2030



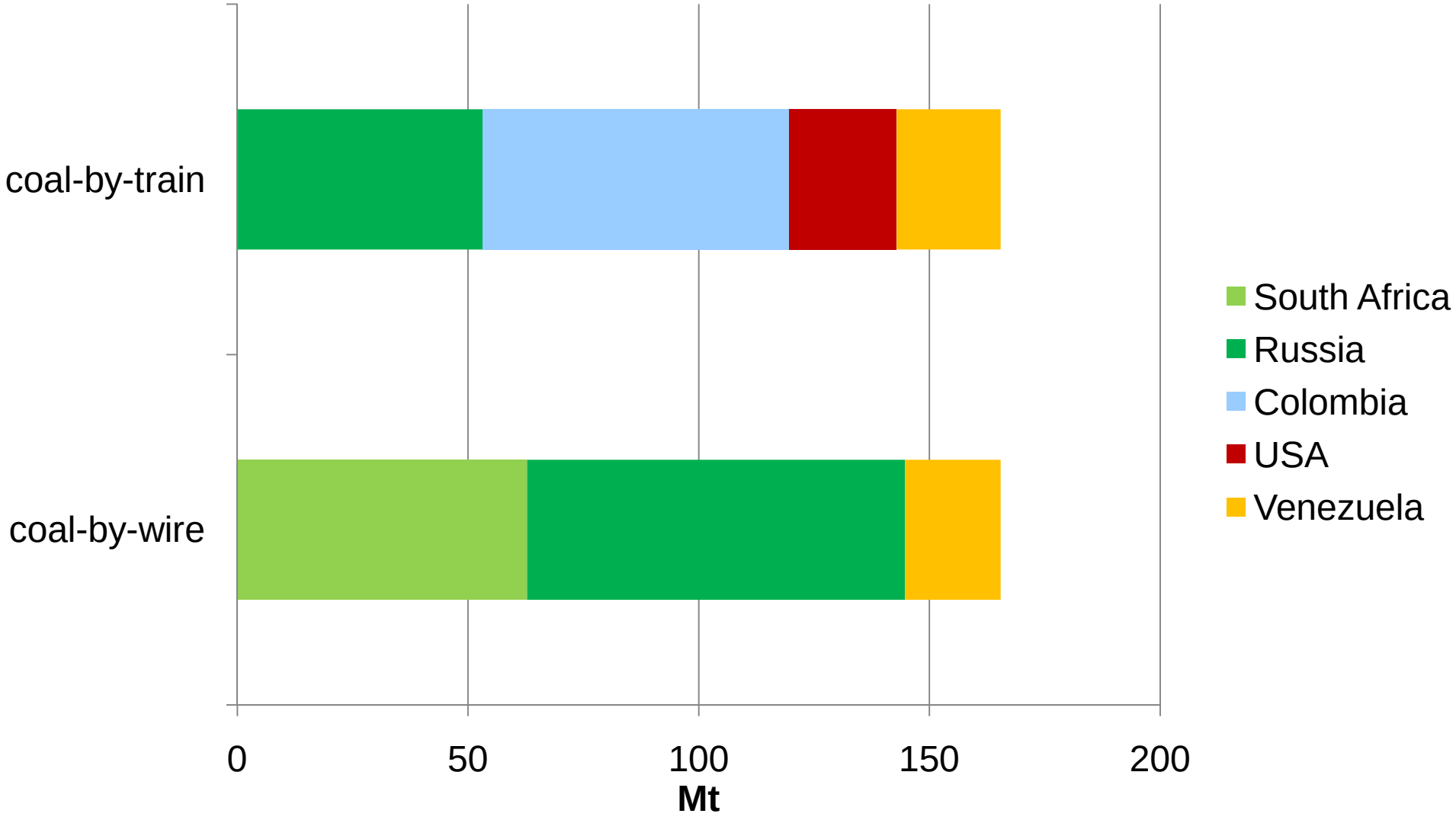
Demand Hub
Supply regions
HVDC lines
Conventional transport

Development of coal demand and oil price levels are based on IEO 2010 (EIA)

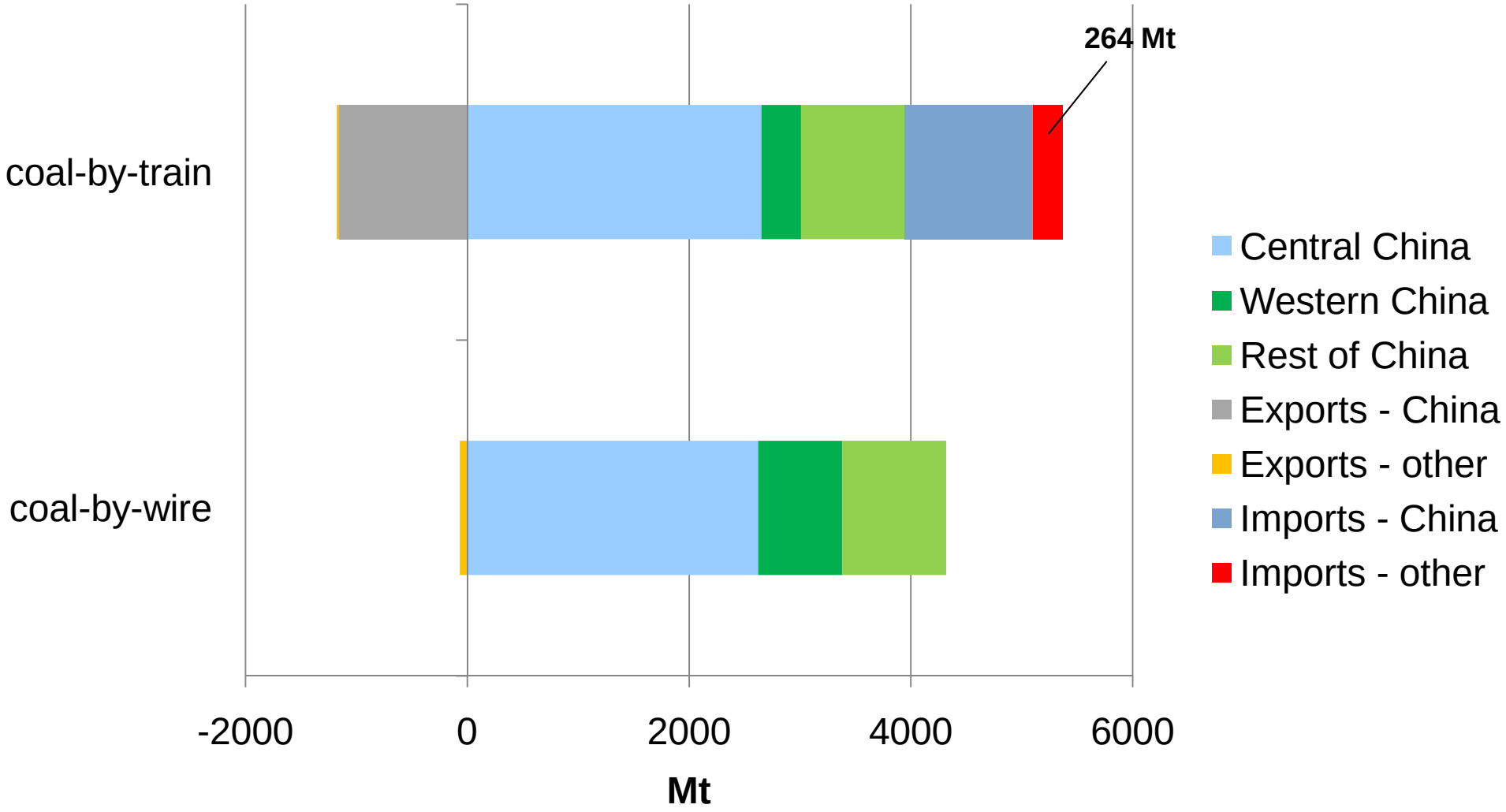
Fundamentals support supply costs of 110+ $/t for European imports



Europe: In the “coal-by-wire” scenario, the role of the marginal supplier switches from the US to Russia



China: In the “coal-by-wire” scenario, China is able to cover its coal consumption through domestic production



Besides coal-by-wire, several other developments influence if China will be able to cope with its growing coal import dependency

Measures to cope with coal consumption in new 12th 5-Year Plan:

- More “moderate” economic growth rates planned
- Planned reduction of energy intensity
- Strong increase of gas-fired power generation until 2015
- Massive expansion of renewables and nuclear plants

Broader context and implications for Europe

- It now matters “if a sack of rice topples over in China”
- Future European coal import prices will be set in the Pacific, by Chinese im- and exports
- Future import prices for steam coal may not be as cheap and stable in the future as anticipated by many. This has implications on fuel switching potential and new coal-based power generation in Europe
- Chinese energy strategy is not only relevant for global oil and gas markets, but also for global coal markets

Thank you for your attention

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Backup

Welfare effects of HVDC investments are positive, especially if we look at China only