

FUTURE COAL MARKETS IN THE LIGHT OF CLIMATE AND NATIONAL POLICIES - SCENARIOS WITH THE COALMOD-WORLD MODEL

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OVERVIEW

The future of coal markets and in particular the development of the international coal trade are highly unpredictable as they are determined by a large number of disparate factors. Among those are the future of the global carbon regime, the fuel mix of individual countries and regions, the domestic policies vis-à-vis coal exports, and global macroeconomic and demographic trends. Given the breadth of possible development paths, a scenario analysis is a useful exercise to structure the discussion of future coal markets and trade. This paper discusses different scenarios on the future of coal markets and coal trade in the light of climate policy initiatives, of corporate strategies, and of national policies using the COALMOD-World model.

METHOD

The COALMOD-World model is a multi-period equilibrium model until 2030 of international and domestic steam coal markets that simulates yearly trade flows and endogenous investment decisions [1]. We include two types of players, the producers and the exporters. The producers can sell to the domestic and the export market. We take into account the different qualities of coal by including the different energy contents depending on the coals' origin. Data sources include the IEA [2,3] and various national sources.

We specify a base case and simulate the following seven scenarios:

- Climate policies: European Climate Effort, and World-Wide Climate Effort,
- Market power scenarios: Market Power by Exporters Only, and Market Power by Exporters and Producers,
- National policies: Doubling of Chinese Coal Demand, South Africa Export Capacity Restriction (30 mtpa), and Indonesia Export Capacity Restriction (50 mtpa).

RESULTS

In the Base Case, we observe a strong increase in world coal consumption over time, starting from less than 4000 Mt in 2006 to more than 6000 Mt by 2030 (Fig. 1). China remains the largest single player in the market, with its share in world consumption growing from 52% to 64%. India is a growing market, where its increasing domestic production is complemented by imports that rise even faster, and increase nine-fold between 2006 and 2030. The total volume of international, seaborne trade increases by 60% between 2006 and 2030, but its share in total consumption stays constant at approx. 14%.

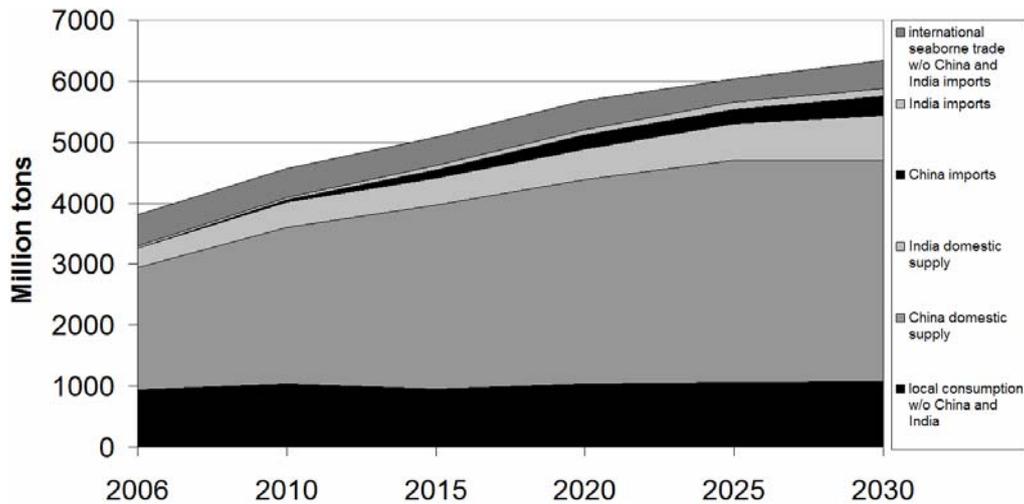


Fig. 1: World-wide aggregated consumption and trade in the base case until 2030, in mtpa

Climate policies result in lower coal consumption and, hence, do not impose additional constraint on the global coal market. Interestingly, while a European Climate Effort scenario drives global prices down and allows more imports to Asia, the World-Wide Climate Effort scenario sees increased imports in Europe. We also analyze the effects of market power for the case where only the exporters have market power and the case of both exporters and producers exerting market power. While in the second case all consumers are equally adversely affected we find that in the exporters' market power case the effects vary greatly depending on the consumers.

National policies may also affect global markets significantly. First, a doubling of the Chinese consumption has some regional effect on the Asian consumption nodes as the combination of reduced Chinese exports and increased imports from Southern China drive up the prices. Second, the Indonesian export restriction only affects China, and China can compensate these quantities by domestic supplies at little more costs. But, third, the biggest effect on trade flows can be seen in the South African restriction scenario. The geographic location of South Africa with its ability to supply both the Atlantic and the Pacific basin causes the biggest change in trade flows, in the case of the export restriction.

CONCLUSIONS

The various scenarios, covering a wide range of issues and future market determinants, show the breadth of the possible reactions from the different players involved in the market and highlight the power of scenario analysis using the COALMOD-World model. We find that the most significant trend identified is a shift over time of the trade flows from the Atlantic Basin to the Pacific Basin due to an increased import demand in Asia. Independently of which scenario will come true, the global steam coal market, considered rather dull in the past, is on the brink of exciting changes and major new developments.

REFERENCE

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