

Asia-Pacific LNG model



Strategic Behavior in Global LNG Markets: Outlook for the Asia-Pacific Region

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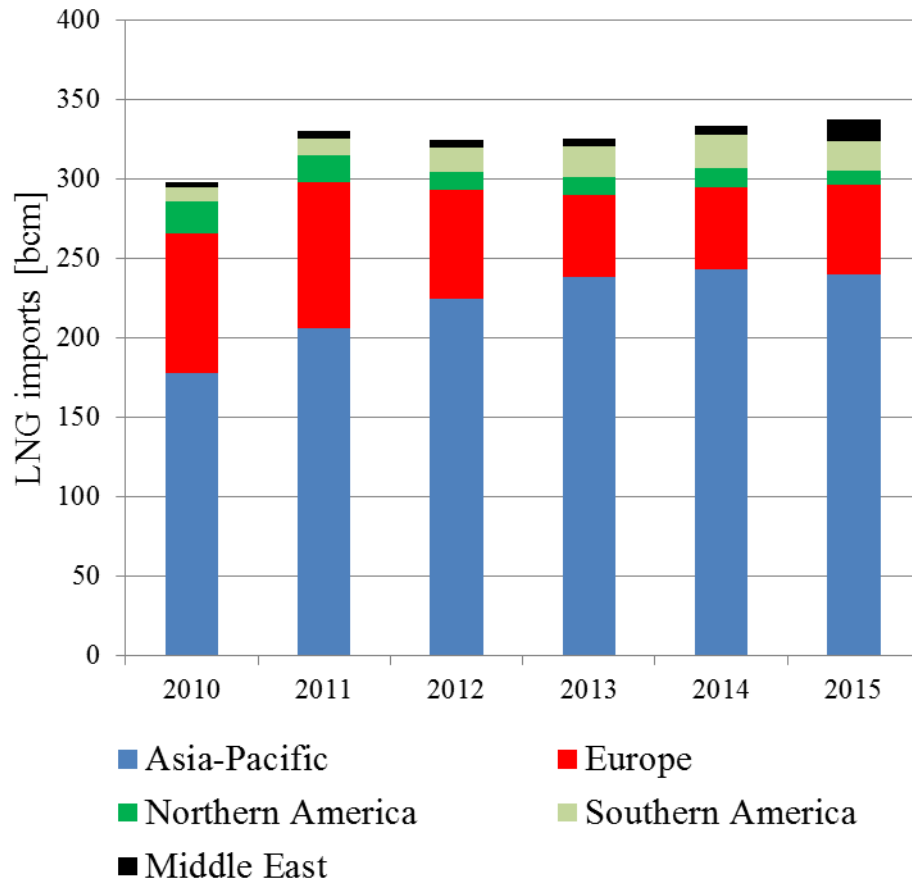
Dresden, 8 April 2016



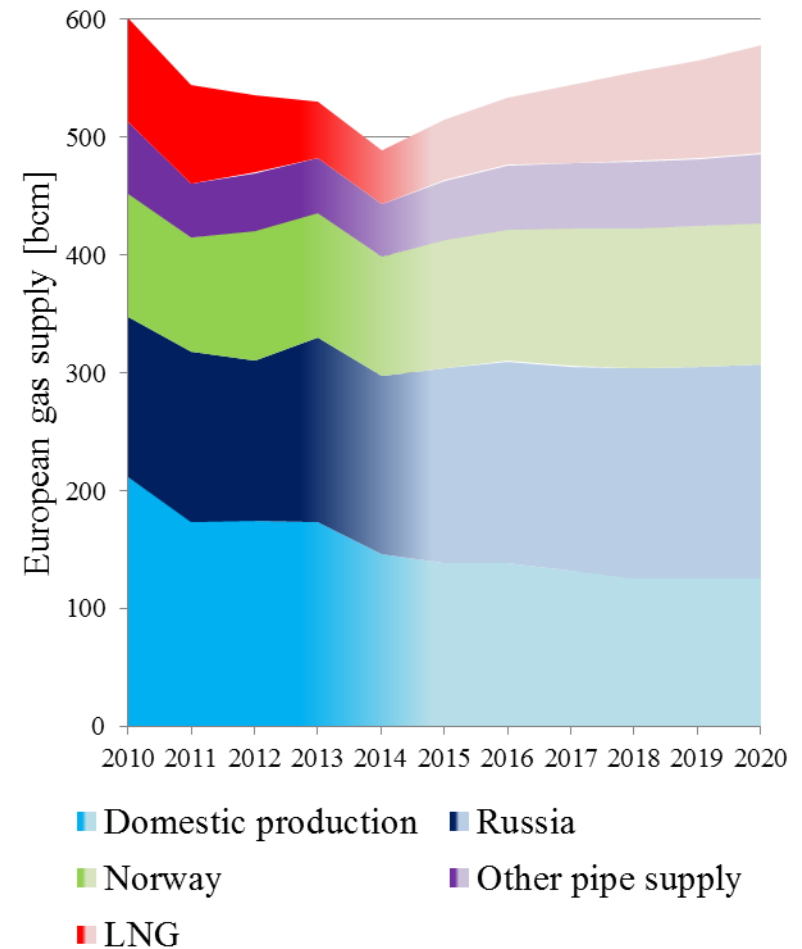
**DRESDEN
concept**
Exzellenz aus
Wissenschaft
und Kultur

- 1) Introduction**
- 2) Model approach**
- 3) Base case results**
- 4) Scenario results**
- 5) Conclusion**

1 Global LNG trade and Europe

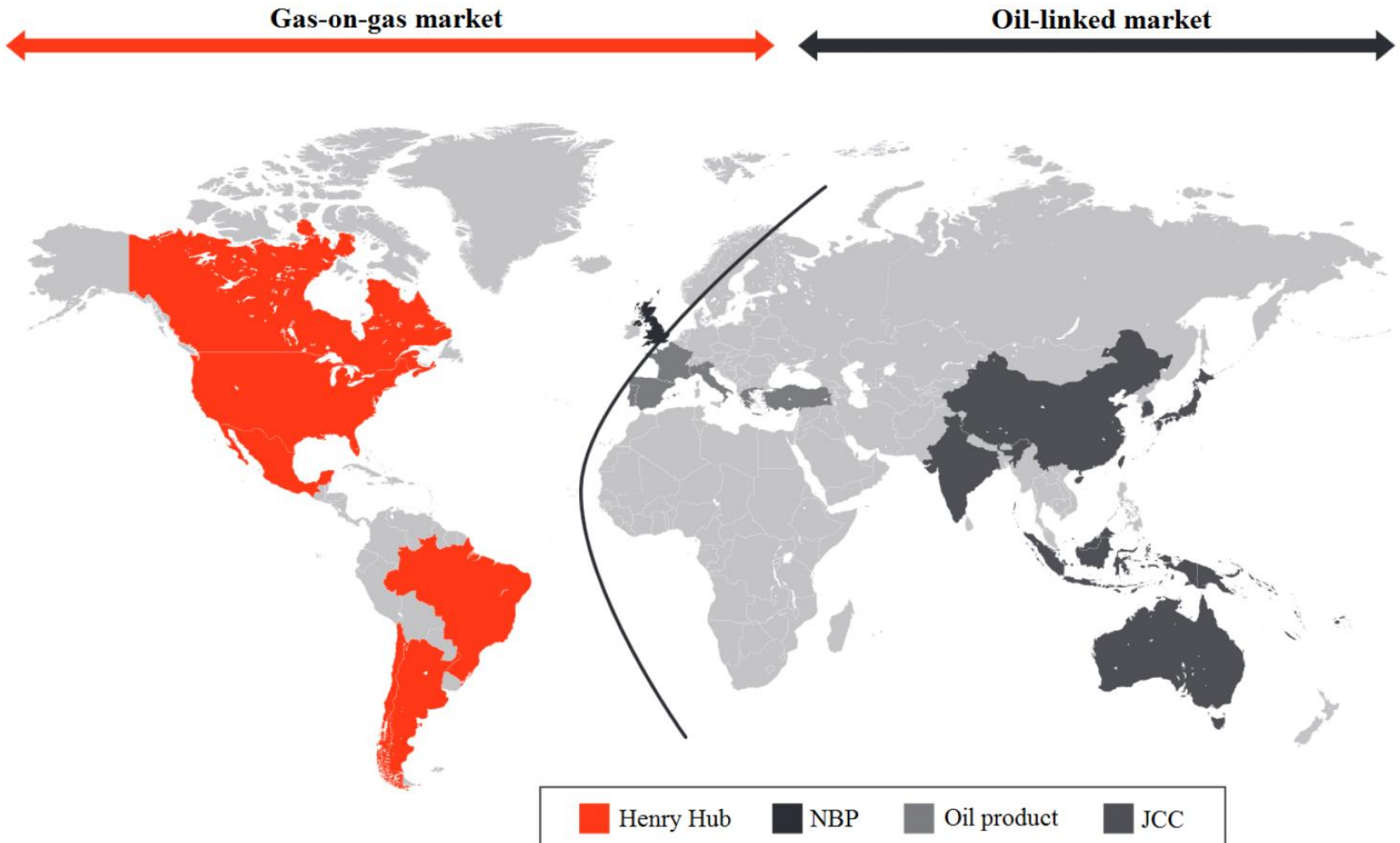


Source: BP Statistical Review (2015), GIIGNL (2016)



Source: Own research

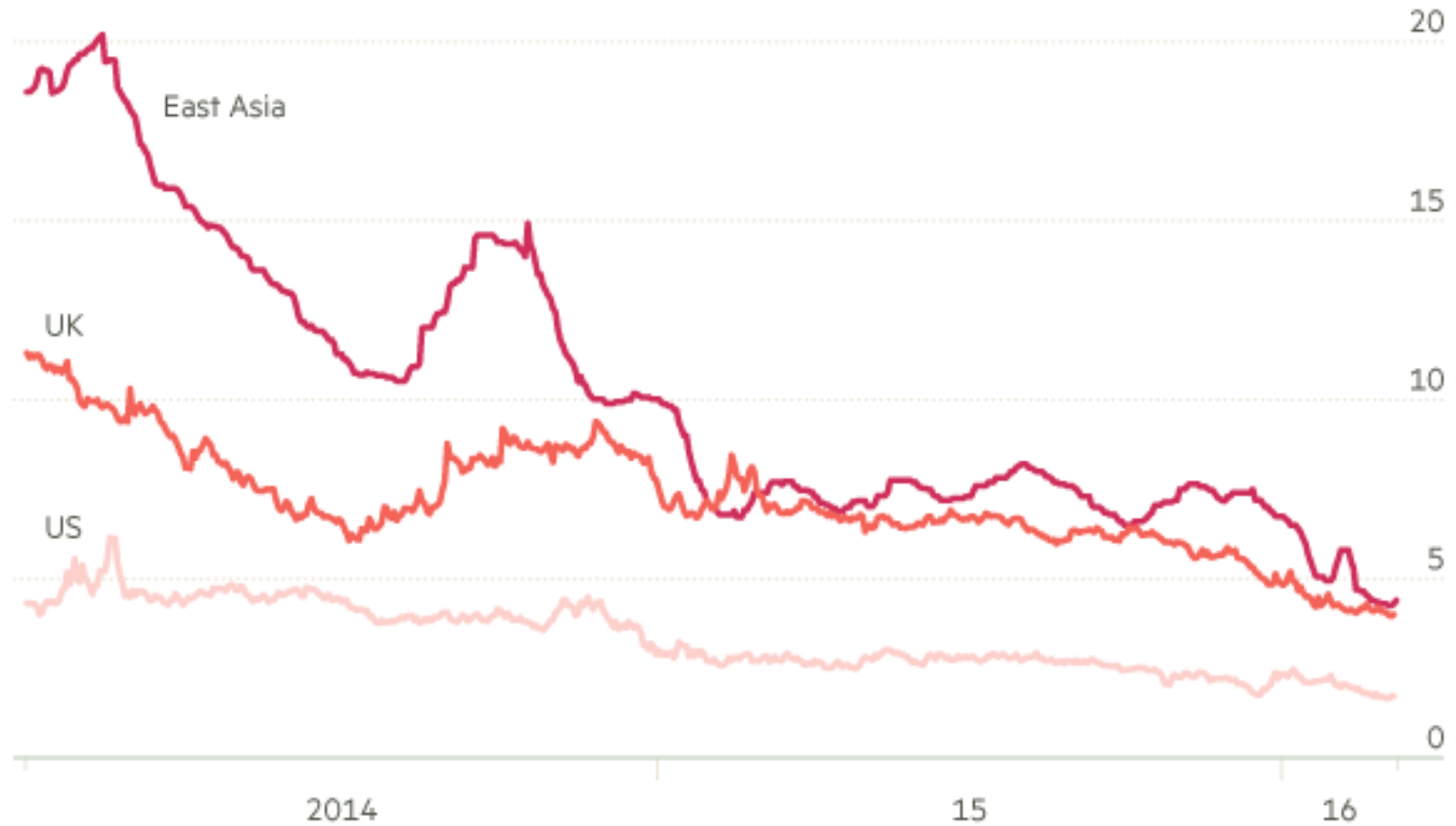
1 Differences in gas price indexation



1 Plummeting natural gas prices

Natural gas prices

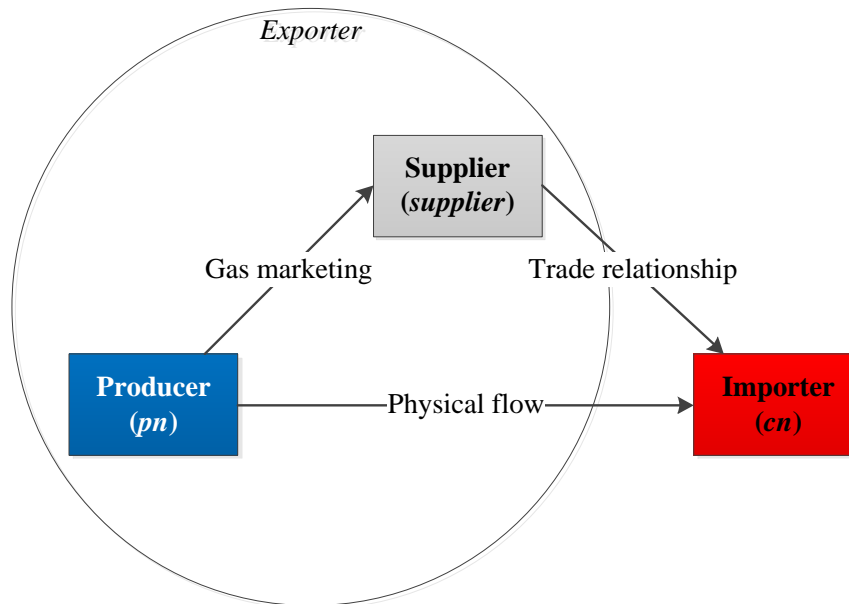
\$ per million Btu



Source: Financial Times (14 March 2016)

Objective

- Interaction of long-term and spot trade (prices and trade flows)
- Equilibrium model based on (strict) Cournot oligopoly

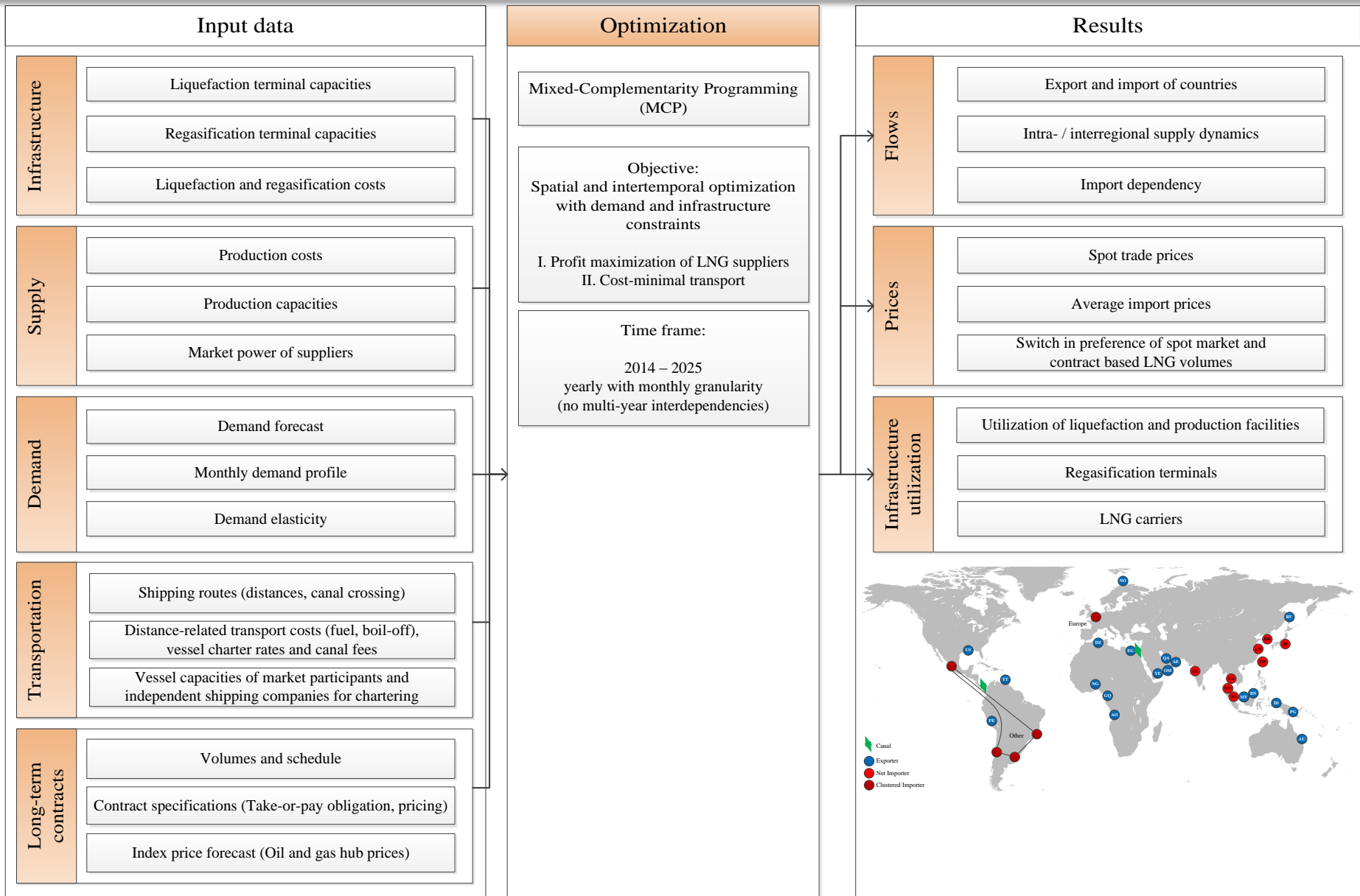


NOT included:

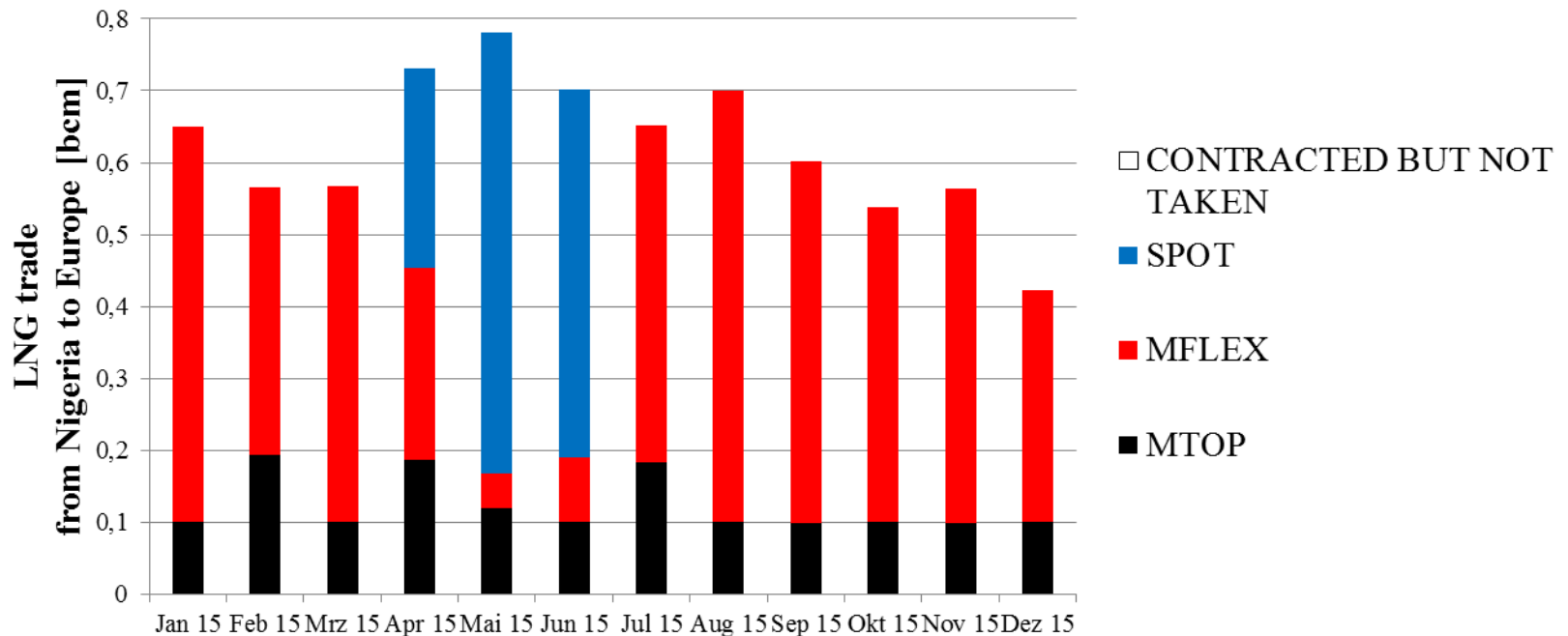
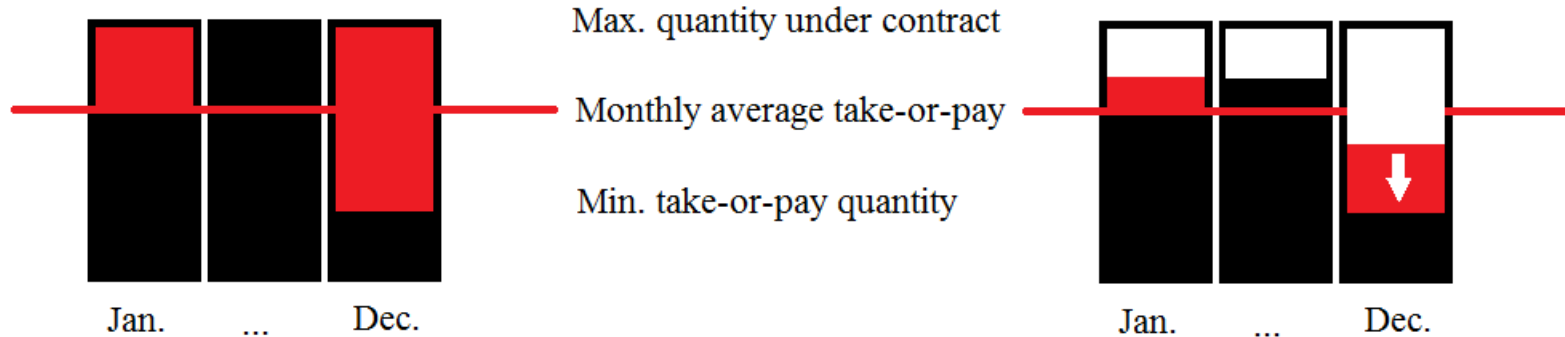
- Domestic gas markets
- Storage
- Investment decisions

- Interpretation and calculation via GAMS
- Isolated, fundamental model with 19 + 8 + 2 nodes

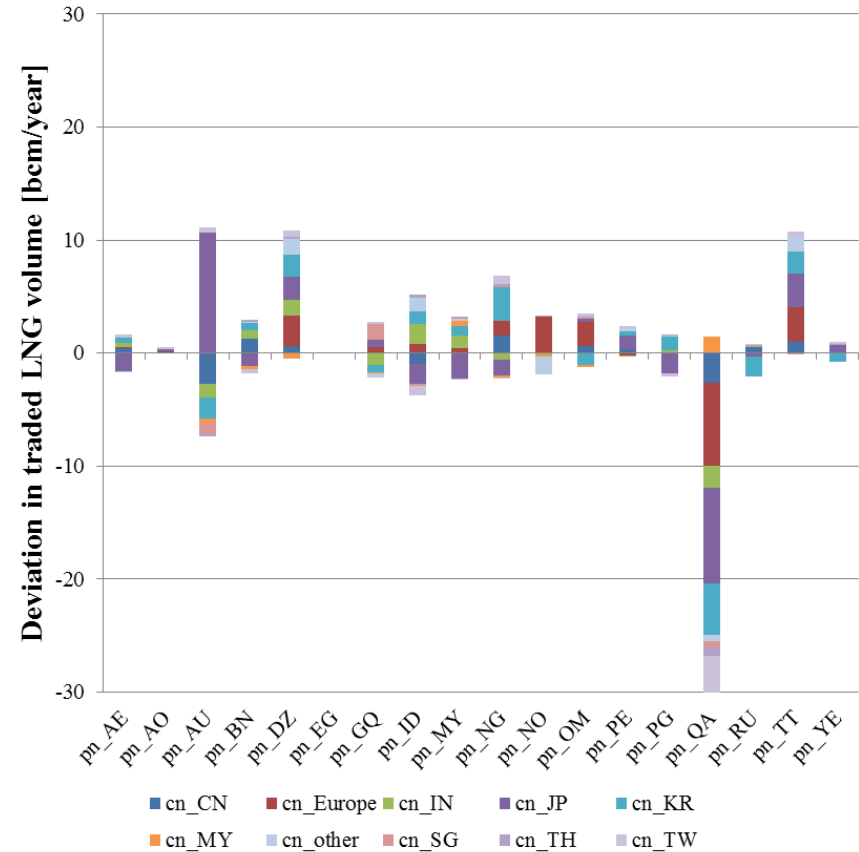
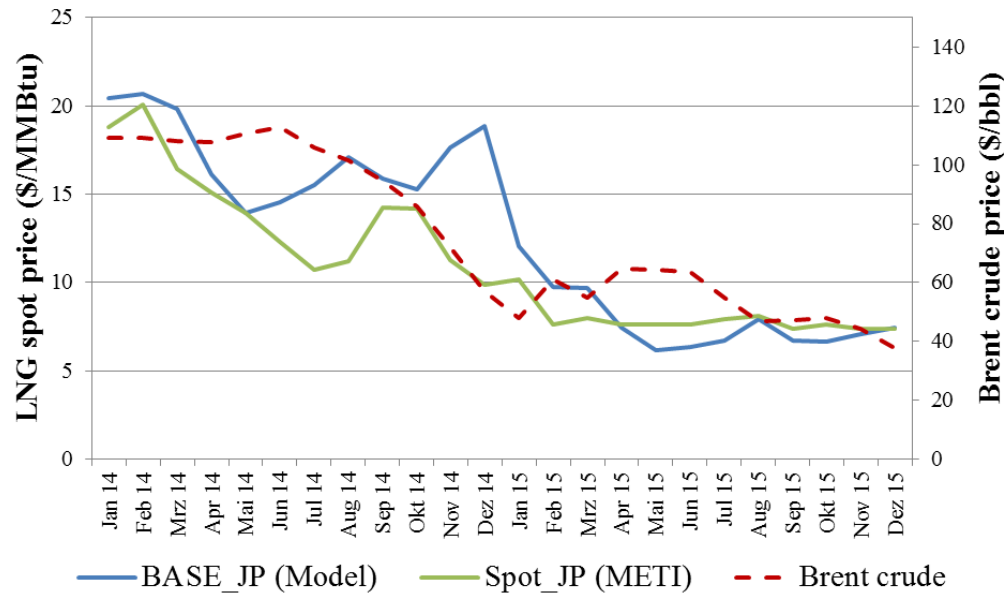
2 Model Approach



2 Implementation of long-term contracts



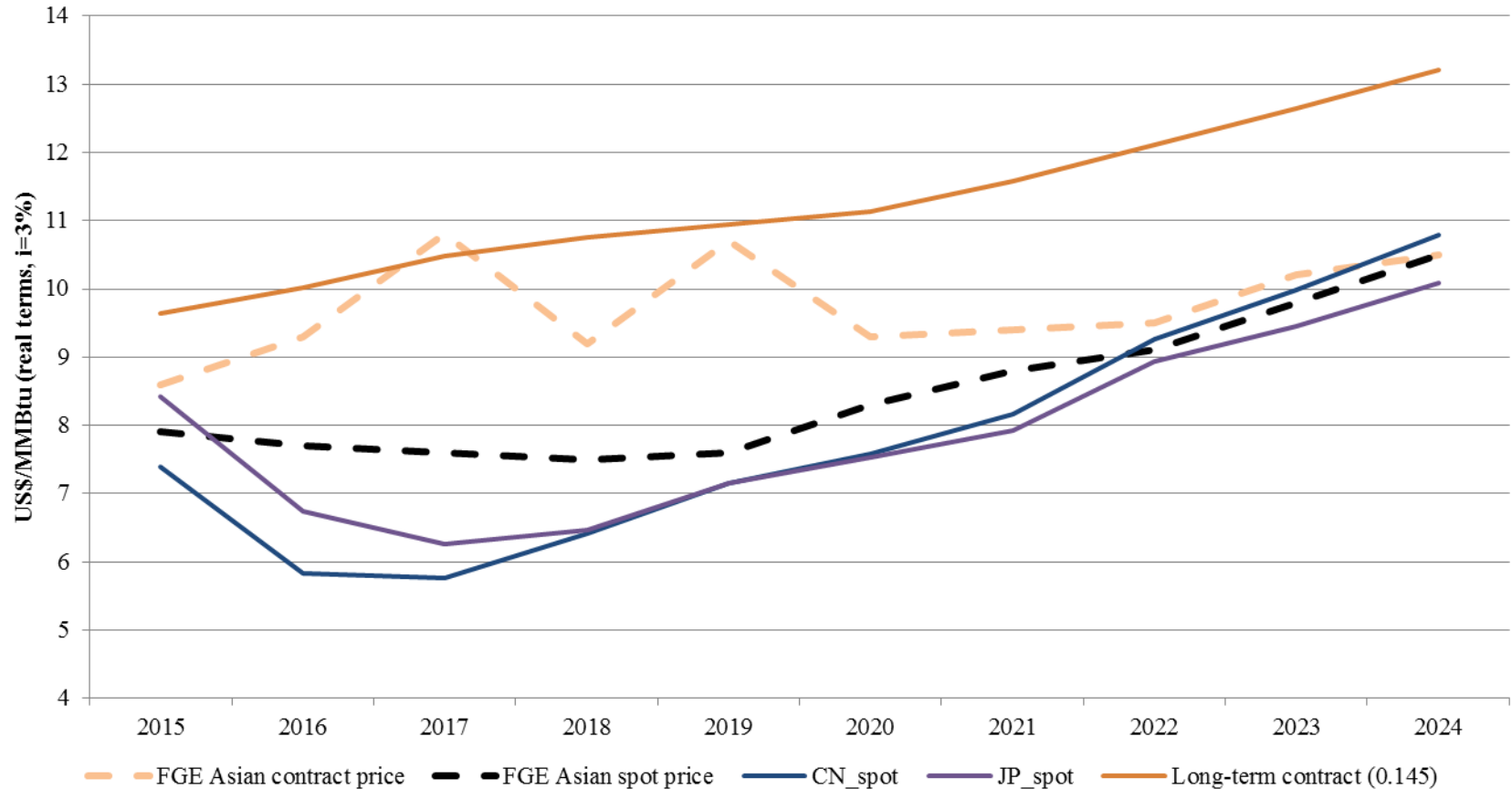
3 Calibration (2015)



3 (Continuous) decline of LNG spot prices 2016-18



Base Case

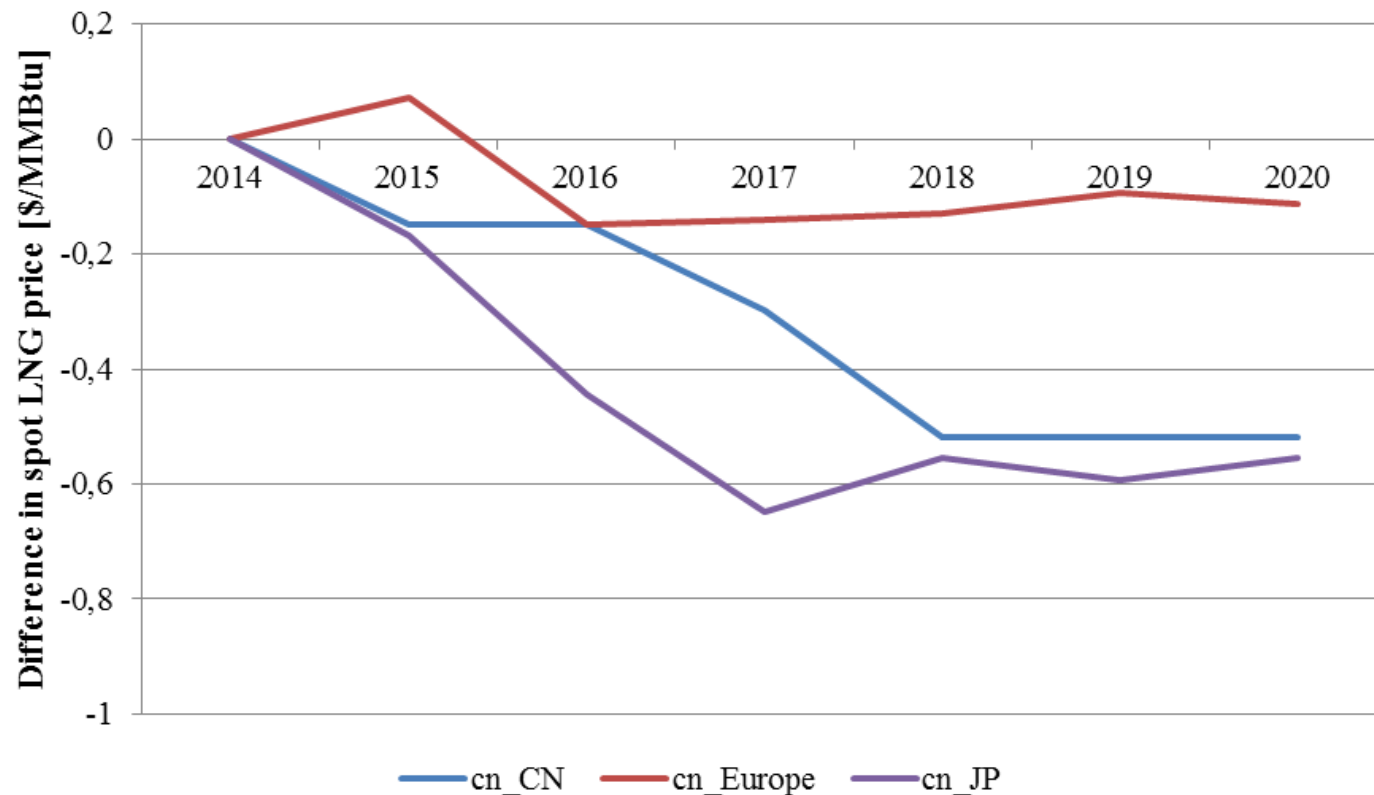


Source: FGE (2015)

4 Japanese nuclear restart induces downside risk

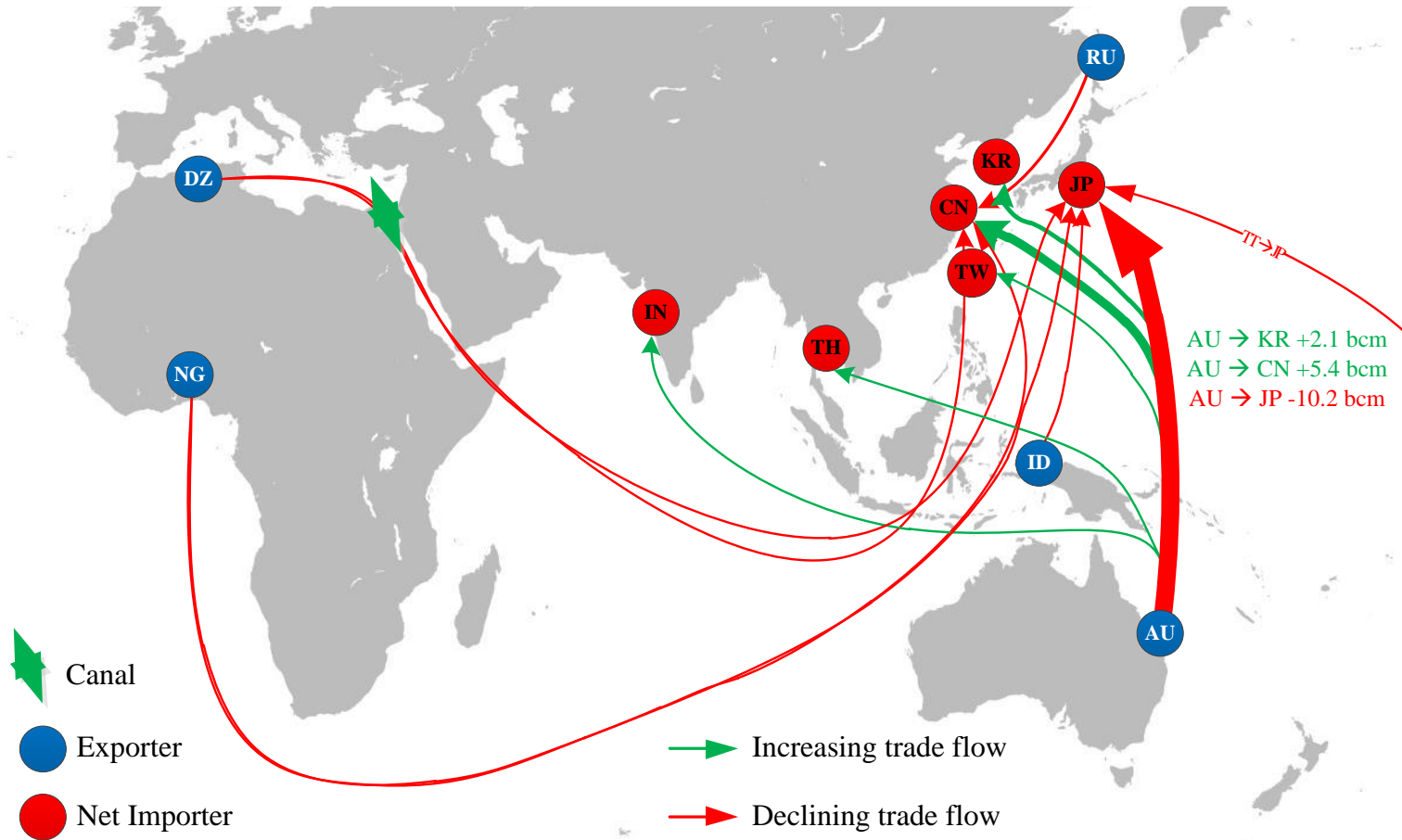


Japanese nuclear power comeback (10 reactors within 18 months)



4 Japanese nuclear restart shifts spot trade flows

Japanese nuclear power comeback (10 reactors within 18 months)



Results

- LNG supply glut and highly uncertain demand
- Spot market becomes more established
- Coal (<2\$/MMBtu) remains the strongest competitor of LNG in Asia

Further research

- Continuous calibration process (Conjectural variation, contract data)
- Improve contract approach (consider re-negotiations of expiring contracts)
- “Crude-oil vs. LNG” price sensitivity of model results
- Extend objectives by strategic behavior of shipowners