Gas on Gas Competition in Shanghai

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Sources of Gas for Shanghai

- Pinghu pipeline
- 1\textsuperscript{st} West-East Gas Pipeline
- Puguang pipeline
- Imported LNG (2009)
- 2\textsuperscript{nd} West-East Gas Pipeline (2011)
- Additional LNG Imports?

Implications for “competition”
Measuring Concentration

Herfindahl Index (HHI)

\[ HHI = \sum_{i=1}^{n} \left( S_i \times 100 \right)^2 \]

where

n = number of suppliers;
Q_i = available capacity of supplier i; and
D = market demand
Three Categories of Market Concentration

- Unconcentrated: HHI below 1000;
- Moderately Concentrated: HHI between 1000 and 1800; and
- Highly Concentrated: HHI above 1800.
Measuring Competition

Residual Supply Index (RSI)

An RSI exceeding 120% is an indicator of a reasonably competitive market

\[ RSI_i = \left( \sum_{i=1}^{n} \frac{Q_i}{D} \right) - \frac{Q_i}{D} \]
Supply Scenarios

1. Low demand growth (L): additional gas = LNG
2. Moderate demand growth (M): additional gas = domestic
3. High demand growth met by pipeline (H-P)
4. High demand growth met by LNG (H-L)
5. Very High demand growth met by pipeline (VH-P)
6. Very High demand growth met by LNG (VH-L)
Figure 1: HHI
Figure 2: RSI
Figure 3: Supply in Scenario L
Figure 4: Supply in Scenario M
Figure 5: Supply in Scenario H-P
Figure 6: Supply in Scenario H-L
Figure 7: Supply in Scenario VH-P
Figure 8: Supply in Scenario VH-L