



Appendix

List of Lower 48 LNG Export Projects

US Lower 48 Project Status at the Department of Energy (DOE)

Project		Requested Volume (bcf/d)	FTA	Non-FTA
Sabine Pass LNG	T1-4	2.2	Approved Sep. 2010	Approved May 2011
	T5	0.5	Approved Jul. 2013	Pending (Apr. 2013)
	T6	N/A	Not yet applied	Not yet applied
Freeport LNG	T1-2	1.4	Approved Feb. 2011	Approved May 2013
	T3	1.4	Approved Feb. 2012	Pending (Dec. 2011)
Lake Charles LNG*		2.0	Approved July 2011	Pending (May 2011)
Cove Point LNG		1.0	Approved Oct. 2011	Pending (Oct. 2011)
Cameron LNG		1.7	Approved Jan. 2012	Pending (Dec. 2011)
Jordan Cove LNG		1.2 FTA, 0.8 NFTA	Approved Dec. 2011	Pending (Mar. 2012)
Oregon LNG		1.3	Approved May 2012	Pending (July 2012)
Corpus Christi LNG		2.1	Approved Oct. 2012	Pending (Aug. 2012)
Lavaca Bay LNG		1.4	Approved Aug. 2012	Pending (Oct. 2012)
Gulf Coast LNG		2.8	Approved Oct. 2012	Pending (Jan. 2012)
Elba Island LNG		0.5	Approved Jun. 2012	Pending (Aug. 2012)
Gulf LNG		1.5	Approved Jun. 2012	Pending (Aug. 2012)
CE FLNG		1.1	Approved Nov. 2012	Pending (Sep. 2012)
Golden Pass LNG		2.6	Approved Sep. 2012	Pending (Oct. 2012)
South Texas LNG		1.1	Approved Jan. 2013	Pending (Dec. 2012)
Main Pass Energy Hub**		3.2	Approved Jan. 2013	Pending (Feb. 2013)
Venture Global LNG		0.7	Pending (May 2013)	Pending (May 2013)
Waller Point LNG		0.2	Approved Dec. 2012	Not yet applied
Magnolia LNG		0.5	Approved Feb. 2013	Not yet applied
Gasfin LNG		0.2	Approved Mar. 2013	Not yet applied

List of Canadian LNG Export Projects

Project	Status	Train Size (mmtpa)
BC LNG T1	FEED Completed	0.9
BC LNG T2	FEED Completed	0.9
Goldboro LNG	Proposed	5.0
Kitimat LNG T1	In FEED	5.0
Kitimat LNG T2	In FEED	5.0
LNG Canada T1	Pre-FEED	6.0
LNG Canada T2	Pre-FEED	6.0
LNG Canada T3	Pre-FEED	6.0
LNG Canada T4	Pre-FEED	6.0
Nova Scotia LNG	Proposed	4.5
Pacific Northwest LNG T1	In FEED	6.0
Pacific Northwest LNG T2	In FEED	6.0
Prince Rupert LNG T1	Proposed	7.0
Prince Rupert LNG T2	Proposed	7.0
Prince Rupert LNG T3	Proposed	7.0
West Coast Canada LNG T1	Proposed	5.0
West Coast Canada LNG T2	Proposed	5.0
West Coast Canada LNG T3	Proposed	5.0
Western Canada LNG (Floating)	Proposed	2.0
Woodfibre LNG	Proposed	2.1

Upstream Terminology

- **“Core Areas”** are regions that are material to the company and can produce a stable stream of positive net cash flows, often sufficient to provide cash for investment in other areas. More than replacement level investment is needed to maintain core area status.
- **“Focus Areas”** are generally significant contributors to projected new source production and reserves growth in the medium- to long-term. Focus areas are typically consumers of cash flow until significant production levels are achieved.
- **“Harvest Areas”** produce positive net cash flow but due to lack of geological potential or other upside and/or competitive factors, investment activity is typically at replacement/minimum levels.
- **“New Venture”** areas are new to the subject company and may be unexplored to fairly mature. The company owns few assets and activity is usually in the exploration or appraisal stage.
- **“Exit/Potential Exit”** are areas where for reasons including lack of materiality, limits to future growth, or changes in strategy, the company has or is expected to make a decision to exit.

Gas Market Forecast Involves an Iterative Process



Policy drivers

Macro Context / Political Drivers

- Political Themes
 - Political Stability / Legitimacy
 - Government priorities
- Economic outlook
 - GDP
 - Government Balances
 - External Balances
- Main Economic Themes
 - Inflation as a concern
 - Subsidies / budget impact
 - Other

Gas Demand Analysis

- Energy Demand by sector
- Population growth
- Economic growth forecasts
- Economic structure (primary, secondary and tertiary)
- Energy intensity (overall, sector-specific)
- Fuel mix outlook driven by
 - Abundance / availability / cost for each fuel
 - Energy security and other government drivers
 - Environmental concerns
 - Penetration trends between fuels
 - Project-specific information: additions or closures.

Gas Production Analysis

- Base Production
- New Projects
- Proven but undeveloped
- Exploration potential

Export and Import projects

- Risk Outlook by project
- Contracts / Estimated flows

Country Balance

- Estimated import needs / export potential
- Inflection points

Gas Pricing

- Domestic supply
- Pipeline and LNG imports and exports
- Domestic demand

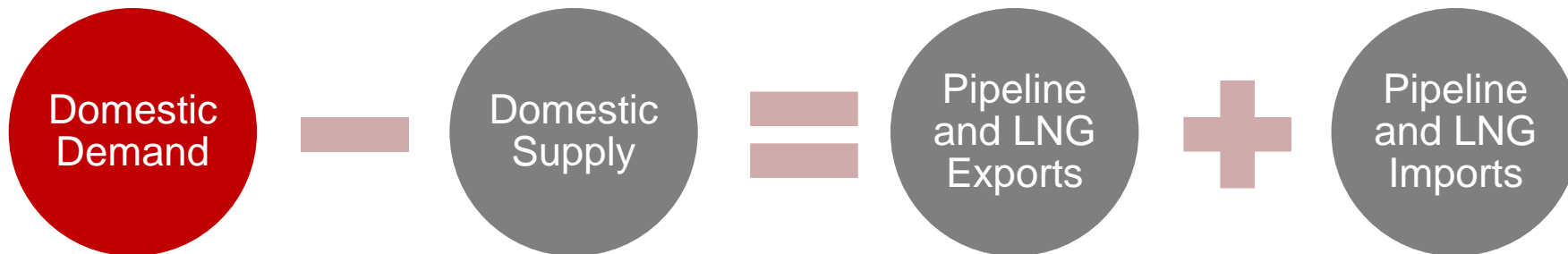


Fundamentals



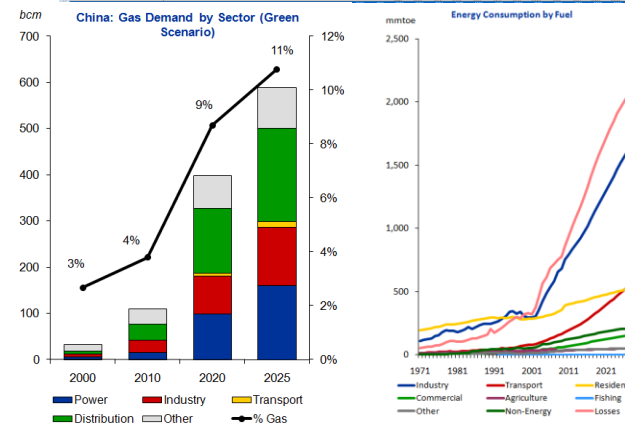
Policy drivers inform market fundamentals; and fundamentals create policy imperatives

How We Look at Gas Markets: Integrated S-D (1/5)

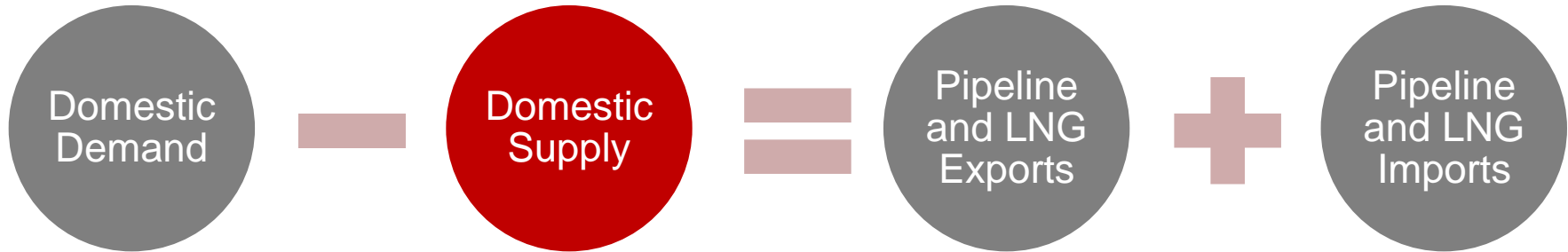


- Demand is forecasted in two steps:
- **Energy demand forecast** driven by
 - Population growth
 - Economic growth forecasts
 - Economic structure (primary, secondary and tertiary)
 - Energy intensity (overall, sector-specific)
- **Fuel mix outlook** driven by
 - Abundance / availability for each fuel
 - Cost of supply
 - Energy security
 - Environmental concerns (if any)
 - Government policy
 - Penetration trends between fuels
 - Project-specific information: additions or closures.

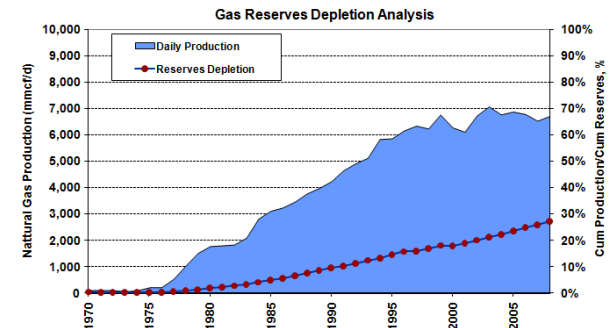
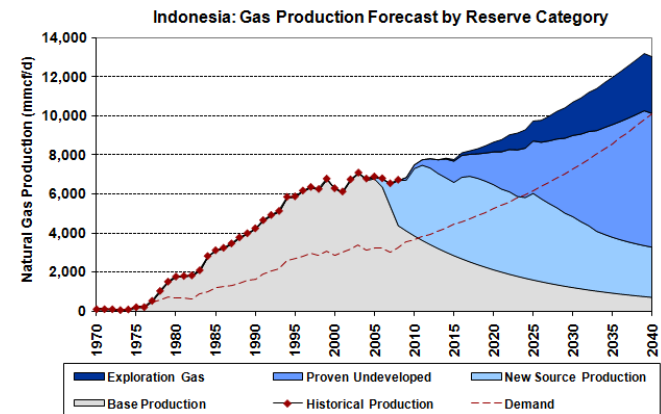
The screenshot shows a detailed Excel spreadsheet with multiple columns representing years from 2000 to 2025 and rows representing various energy sectors and fuels. The data is organized into several sections, including 'Energy Demand', 'Energy Intensity', and 'Fuel Mix'. The spreadsheet is used for forecasting gas demand and fuel consumption in China.



How We Look at Gas Markets: Integrated S-D (2/5)

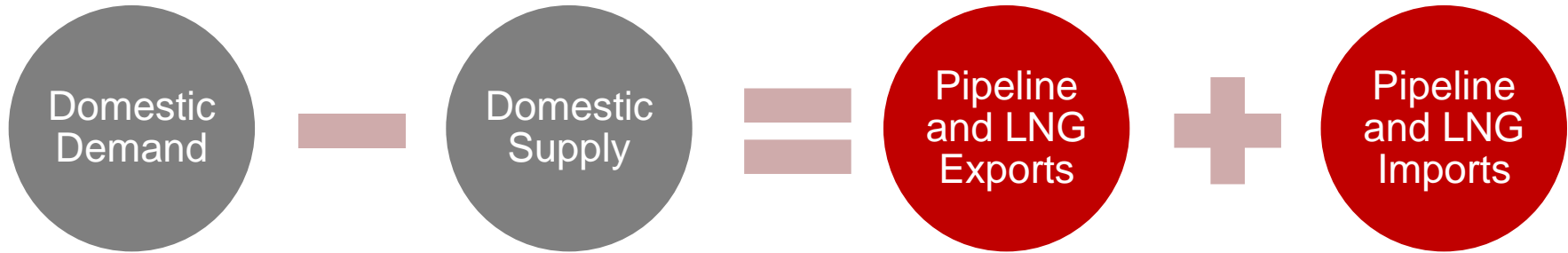


- Production taken from PFC Energy's Global Gas Supply Forecast (GGSF) Service which offers a robust supply outlook for natural gas for 56 countries out to 2040. A GGSF country model contains several pieces:
 - Base production** from existing and declining fields, often provided on a field-by-field basis (where possible).
 - New projects** from PFC Energy's global upstream database
 - Proven but undeveloped reserves** with PFC Energy-estimated risked production forecasts (how soon before difficult gas or remote reserves are developed?)
 - Exploration potential** based on an expected value analysis
- The models also contain a **P10 to P90** range for total gas and gas liquids production using a Monte Carlo simulation.

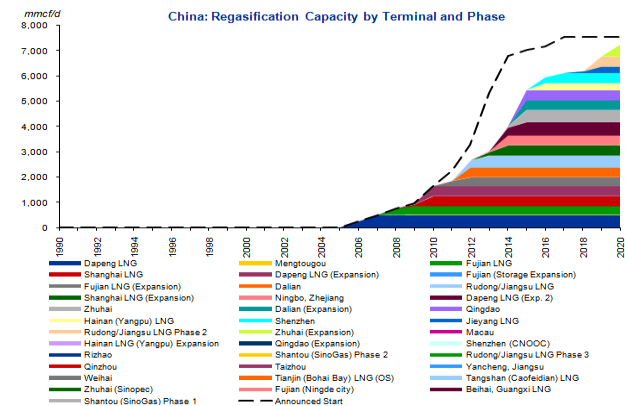
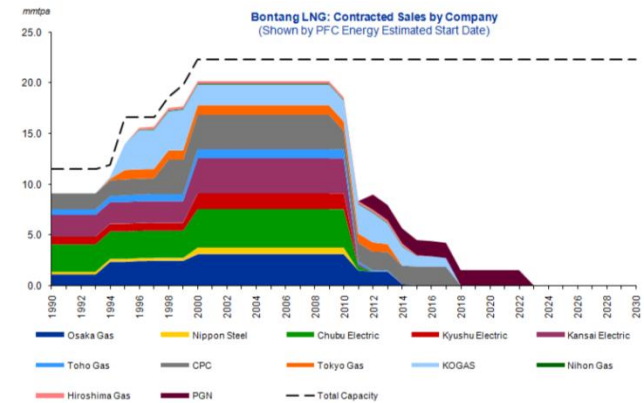


Depletion Analysis: Indonesia has currently depleted 27% of its gas reserves.

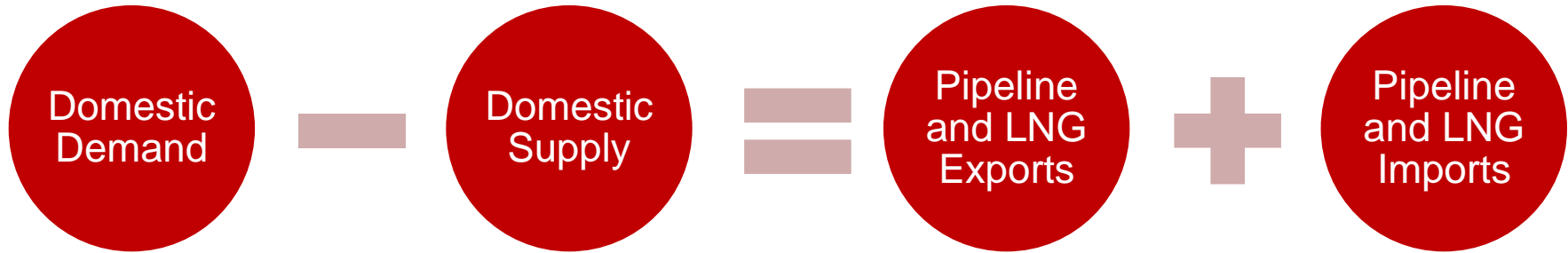
How We Look at Gas Markets: Integrated S-D (3/5)



- Exports and imports are forecasted based on two categories:
- Project Level Forecasts** based on PFC Energy's risk methodology that examines: feedstock availability, politics and geopolitics, domestic demand needs, environmental regulation, project economics, market, technical and operational feasibility, and partner alignment. We risk each project to provide our internal expected start date for operations.
 - Liquefaction projects
 - Cross-border pipelines
 - Regasification terminals
- Contract database.** We maintain a regularly-updated, in-house database that catalogues every pipeline gas and LNG contract, including both final agreements as well as early-stage agreements. We are thus able to assess how much gas is contracted to go to each market over time.

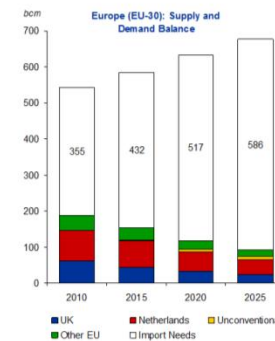


How We Look at Gas Markets: Integrated S-D (4/5)



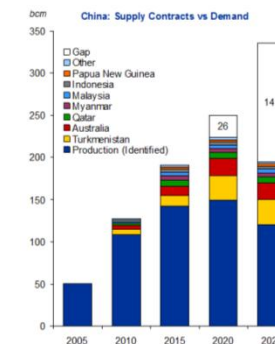
- Supply and demand are brought together to create a S-D balance for a region / country. The intention is to ask the following questions:
- Imports.** How much does the country need to import and by which date? How much of that gas is currently contracted? How much might increased domestic supply reduce import needs?
- Exports.** How much can a country export? Are exports sustainable and to what extent do they depend on new projects, proven but undeveloped reserves or exploration gas? How much of a country's export capacity is currently contracted?
- Inflection Points.** Will a net importer turn into a net exporter or vice versa? By what date? How much does the country need to import / can export?

Europe (EU-30): Supply and Demand Balance



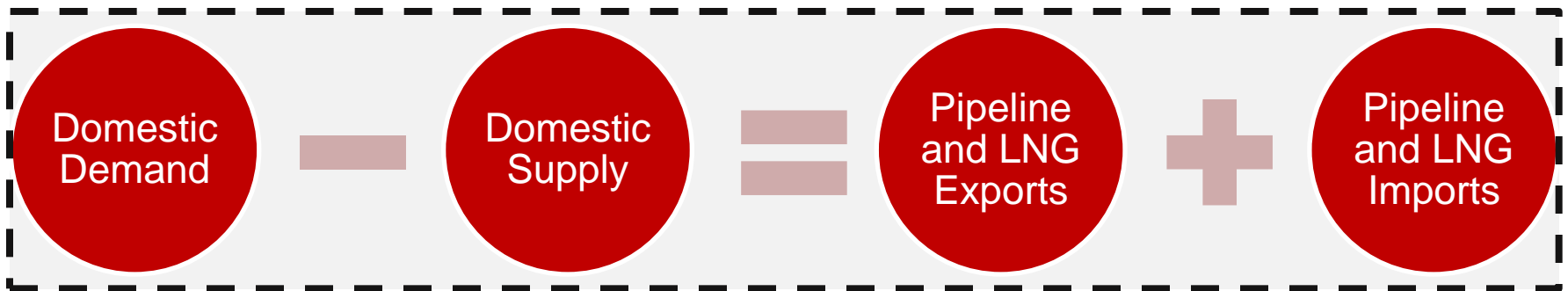
- Given the growth in demand and the decline in production from within Europe, the Continent will have to rely more on imports.
- In 2010, Europe imported ~355 bcm; by 2020 that needs to rise to 517 bcm, an addition of 162 bcm.
- By 2025, the incremental need is 231 bcm.
- Import dependence is expected to rise from 65% in 2010 to 85% in 2025.

China Supply and Demand Gap



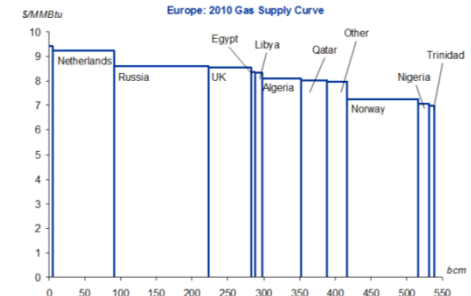
- China's existing supply contracts easily cover expected demand until 2015 (and in fact, if all the supply materializes, demand could end up higher).
- By 2020, the country faces a 26 bcm gap that could be met with production upside or with more imports
- As the country reaches 2025, however, the supply-demand becomes bigger as demand continues to rise and supply from identified projects falls. To meet that gap, the country will need further production growth and more imports.

How We Look at Gas Markets: Integrated S-D (5/5)



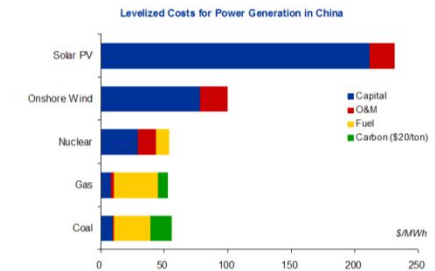
- **Domestic supply**
 - Cost of domestic supply (GSA, PSC terms, regulated prices)
 - Changes to domestic supply (deepwater, unconventional)
- **Pipeline and LNG imports**
 - Gas pricing for contracted volumes
 - Price estimate for yet-to-be-contracted supplies (incl. spot)
 - Blended average price with domestic supply
- **Pipeline and LNG exports**
 - Gas pricing for contracted volumes
 - Domestic pricing vs. exports interaction (e.g. netback)
- **Domestic demand**
 - End-user ability to pay
 - Inter-fuel competition
 - Domestic price-setting regime / regulation / reform
 - Domestic industry structure / level of competition

Europe: 2010 Cost Curve



Gas into Europe varied from as low as \$7/MMBtu in 2010 to as high as \$9.4/MMBtu. These are cif prices at various European import locations.

Gas Relative to Other Fuels



At a long-term average price of \$7/MMBtu, coal remains the cheapest option in China; but with a \$20/ton carbon tax, gas would be the cheapest option relative to both nuclear and coal. Renewables are currently too expensive to compete with fossil fuels.