



Border Energy Forum

LNG in the Context of Natural Gas in Mexico

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1. Natural gas growth in Mexico



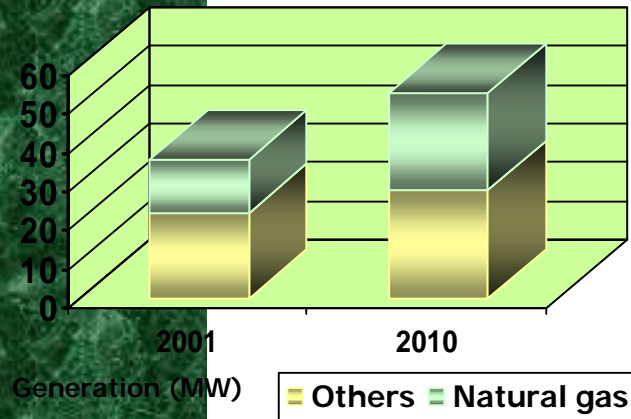
Natural gas demand is expected to grow at 7.4% p.a., from 4.3 BCFD in 2001 to 8.8 BCFD in 2011. Domestic supply, however, could grow only at 5.9% p.a.



Gas imports could reach over 1 BCFD between 2003 and 2005 and go down a bit until 2008, depending on domestic production. Imports would pick up in 2010-11. Up to 50% of domestic gas could be non-associated gas.

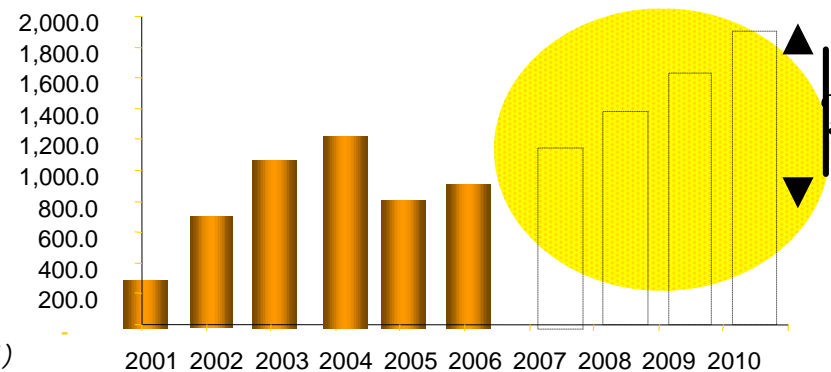


Ongoing efforts to increase natural gas availability: PEG, MSC's, cross-border pipelines and LNG. Three or four LNG terminals may be built in the near future.



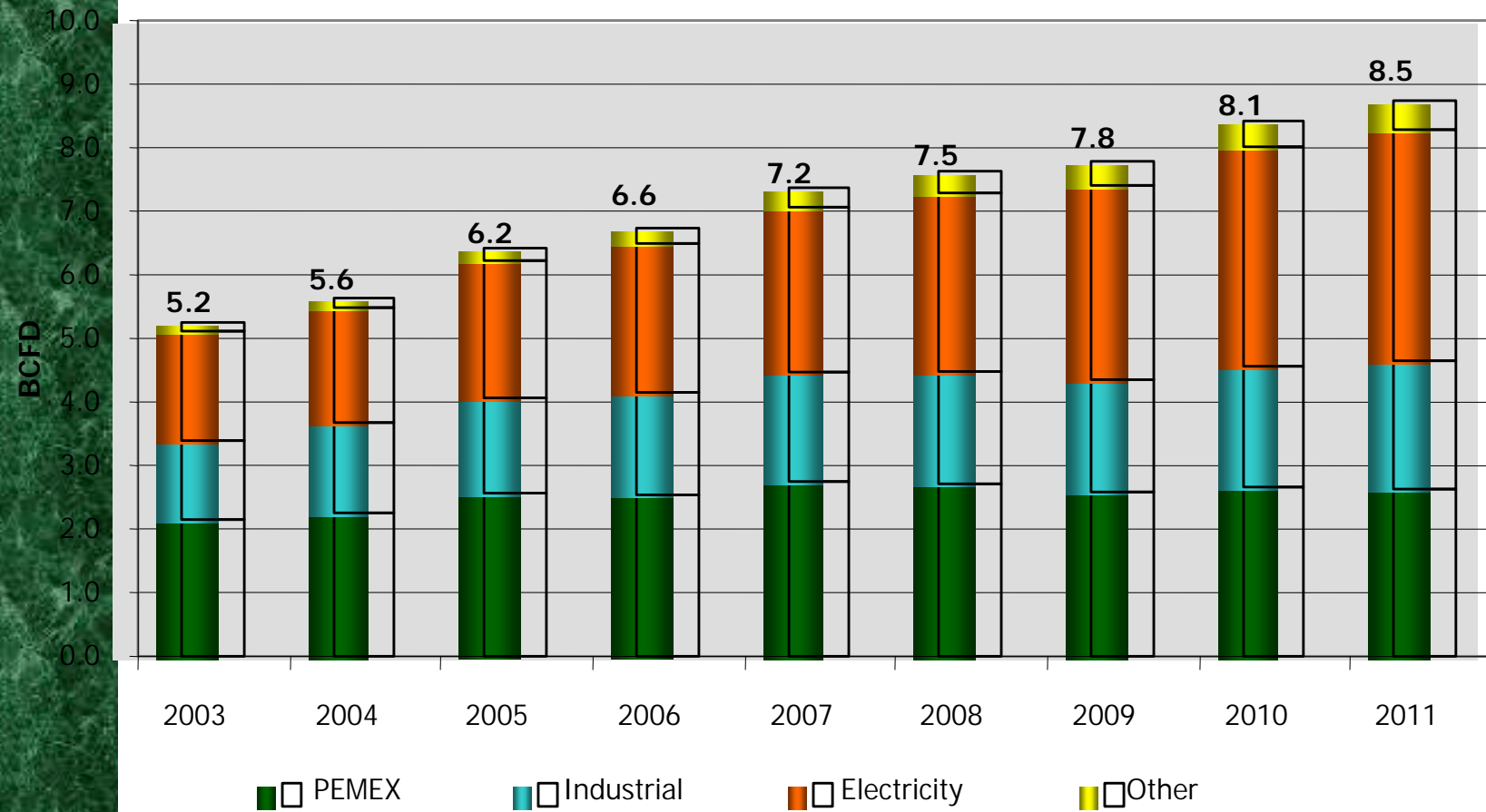
- Natural gas: most favoured fuel for power generation and industrial use.**
- Power generation will dominate demand for natural gas.**
- LNG plants could supply 1.8 BCFD.**
- LPG and fuel oil: still very important until 2011.**

Natural gas imports



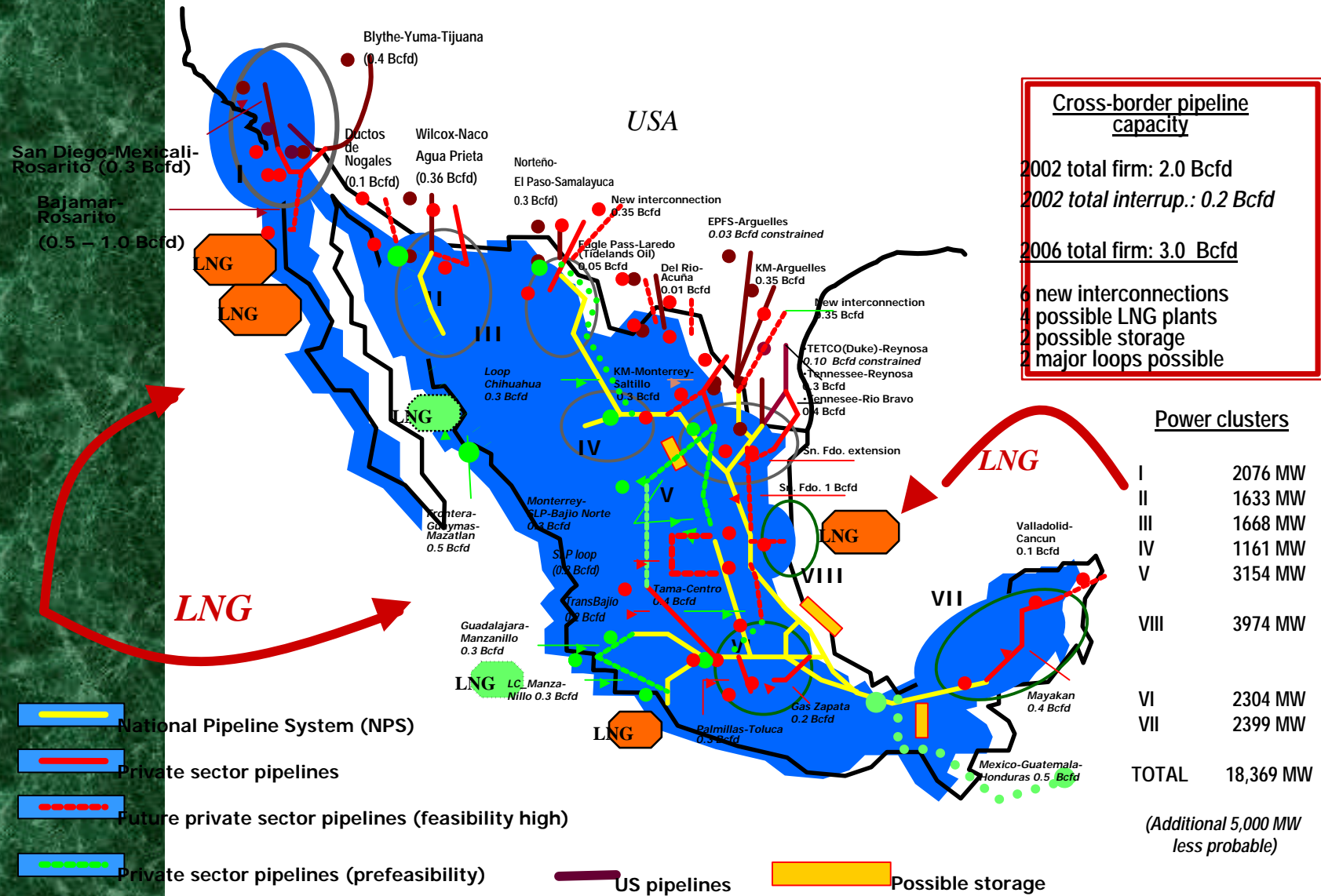
Source: based on SENER (2001-2011)

2. Projected Natural Gas Demand by Sector



Source: Based on IPD Latin America & own estimates

3. Natural Gas infrastructure & logistics



4. LNG reference costs

LNG Value Chain



EXPLORATION & PRODUCTION	LIQUEFACTION	SEA TRANSPORTATION	STORAGE & REGASIFICATION
\$0.7-\$1.2/MMBtu	\$0.9-\$1.4/MMBtu	\$0.7-\$1.2/MMBtu	\$0.3-\$0.6/MMBtu

TOTAL: US\$ 2.6 – 4.4 / MMBtu


Sources: SHELL, MARATHON, CMS, CHEVRON-TEXACO, BG, BP

5. Feasibility of LNG in Mexico

 Domestic market: growing demand & supply deficit.

 Neighbouring market (USA): growing demand, reserve decline & growing imports.

 High availability of remote sources (stranded gas).

 Lowering cost of LNG & price competitiveness.


 Import diversification.

 Strategic balance between imports/exports to and from USA.

 Integration LNG/Power, peak shaving/swing management.


 Least cost possible for Mexico given supply limitations.


 Environmental compliance.

 Both developers and integrated companies have applied for CRE permits. Four permits awarded.

 Regulatory framework: storage with regas.

 Strategic position on Mexican coastline.

 Capture of both domestic and international markets.

 Both state-driven (CFE bid) and market-driven (Pacific)

6. Regulatory aspects of LNG

Technical Regulation

- ☞ NOMS: previous emergency NOM; proven international codes and recommended practice; final NOM under public hearing. Includes on-shore and off-shore.
- ☞ Insure utilization of international standards in design, construction, o&m (NFPA 59-A, API 620, EN 1330).
- ☞ Pragmatic approach: prescriptive & risk analysis.
- ☞ Strict oversight and certification.

& Economic Regulation

- ☞ Regulation as an integrated service: storage and regasification. Operating standards for variable cost.
- ☞ Flexible open access. Affiliate marketer and/or third party anchors capacity. Interruptible service available.
- ☞ DCF rate design, including reasonable profit over life-cycle.
- ☞ Fair & reasonable.

Institutional coordination

- ☞ Federal level: elaboration of NOMS.
- ☞ Information exchange with local authorities.
- ☞ Respect to jurisdictions: federal permits independent of local permits.
- ☞ CRE keeps open book policy and informs social groups and local authorities.

7. Permit applications and future projects

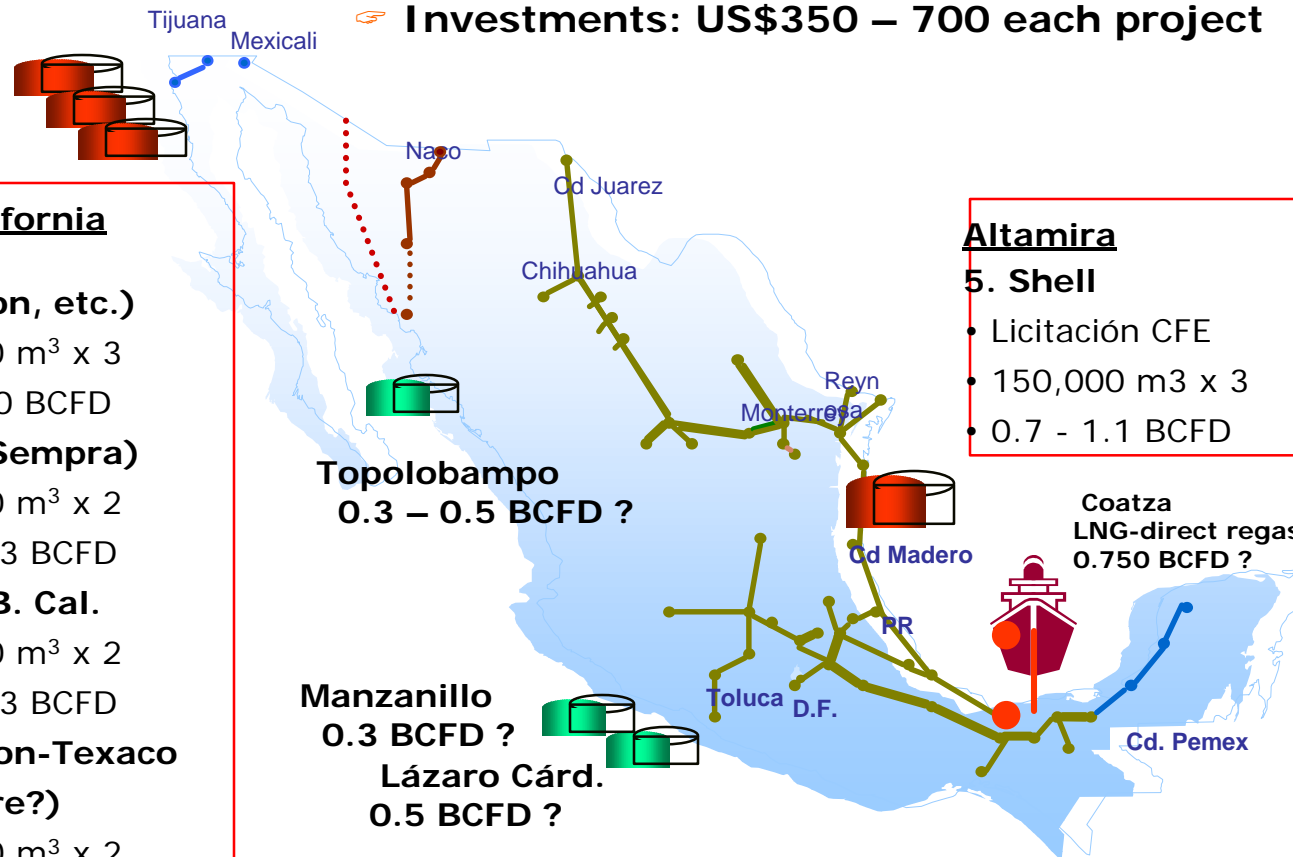
- ☞ Five applications submitted, four granted
- ☞ Commercial operation: 2006
- ☞ Investments: US\$350 – 700 each project

Baja California

1. GNBC (Marathon, etc.)
 - 140,000 m³ x 3
 - 0.7 - 1.0 BCFD
2. ECA (Sempra)
 - 160,000 m³ x 2
 - 1.0 – 1.3 BCFD
3. Shell B. Cal.
 - 170,000 m³ x 2
 - 1.0 – 1.3 BCFD
4. Chevron-Texaco (off-shore?)
 - 125,000 m³ x 2
 - 0.7 – 1.4 BCFD

Altamira

5. Shell
 - Licitación CFE
 - 150,000 m³ x 3
 - 0.7 - 1.1 BCFD





8. LNG projects and their markets

☞ **Altamira:**

- Power plants (combined cycle) and North East - Center demand.
- Strategic position for National Pipeline System
- Potential for re-export to USA (flow reversal)

☞ **Baja California:**

- Regional market growth (gas and power)
- Export potential for gas and power
- Pipeline expansion and flow reversal (500 – 750 MMCFD)


☞ **Michoacán/Colima:**

- Fuel oil substitution for power generation
- Industrial and hotel demand
- NPS access and flow reversal; possible deliveries to central Mexico

☞ **Others (prefeasibility): Topolobampo, Mazatlán/Guaymas:**

- Fuel oil substitution for power generation
- Local gas use
- Pipeline projects and re-export potential

CONCLUSIONS


 Natural gas demand will continue to expand rapidly. Insufficient supplies or inadequate infrastructure will stifle Mexico's development and increase economic costs and environmental impact.

 LNG is strategically important for Mexico:

 North-West: significant US dependence on energy imports coupled with high energy demand and investments in Mexico;

 North-East: supply insurance and import diversification. Also price competition; could re-export to US;

 West coast: supply balance, flow reversal and price competition.

 Cross-border energy trade and interconnections will continue to grow and flows will be bi-directional. USA and Mexico are INTERDEPENDENT: political wisdom and policy vision are needed.

 LNG development in Mexico will create significant energy infrastructure, attract large investments (energy and non-energy related), and foster economic growth.