Houston LNG Summit 2004

The Energy Context of LNG in Mexico

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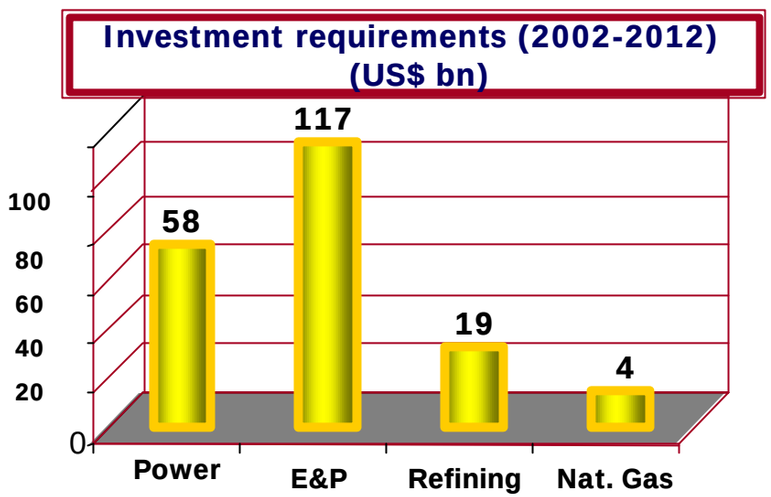
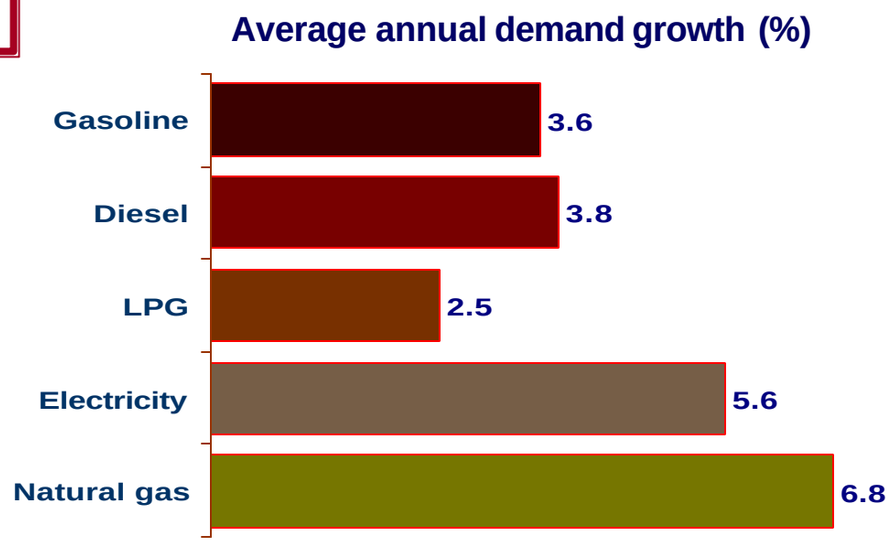
1. Energy supply and demand in Mexico 2003-2012

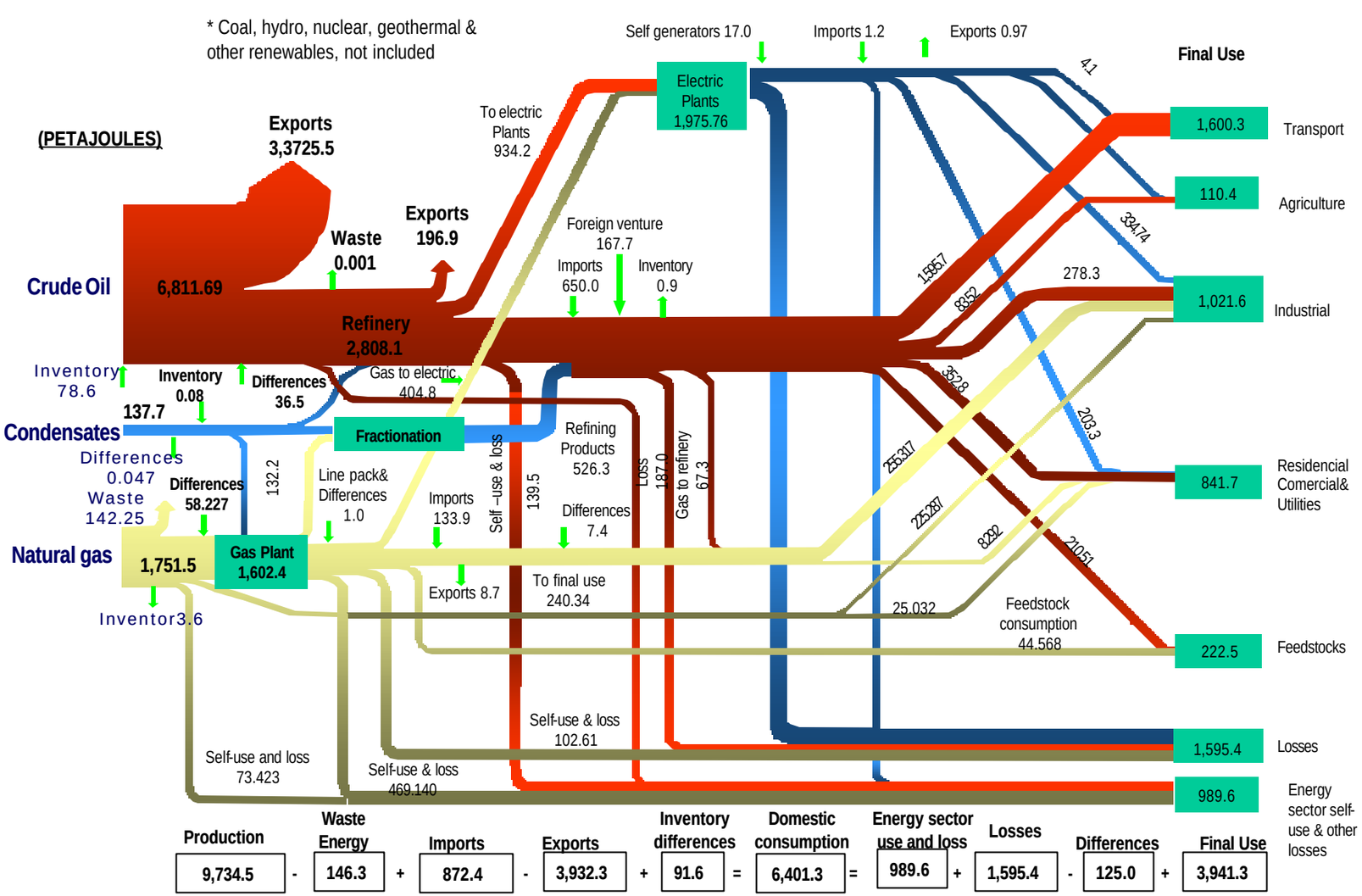
- Primary energy demand is expected to grow 5% per annum to 2012.
- Highest demand growth will be for electricity and natural gas.
- Mexico's energy supply and infrastructure are inadequate. US$ 190 bn are needed to satisfy energy demand within the next ten years.
- Import dependence is: 25% LPG, 20% natural gas, 25% gasoline, and 12% fuel oil (low sulphur). Trade deficit in petrochemicals is US$9 bn every year @.
- Oil and gas resources are abundant: 48,041 MmBbl total oil potential, and 30 Trillion Cubic Feet of gas, but lacking in development.



Source: SENER (2003-2012)

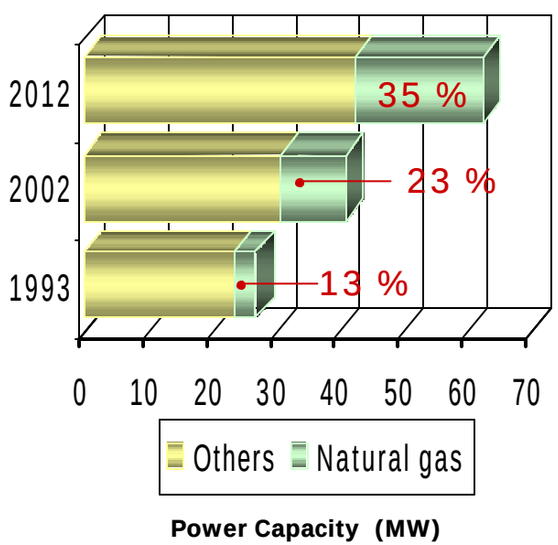


2. Mexico: still a liquids energy economy (National Energy Balance, 2002)

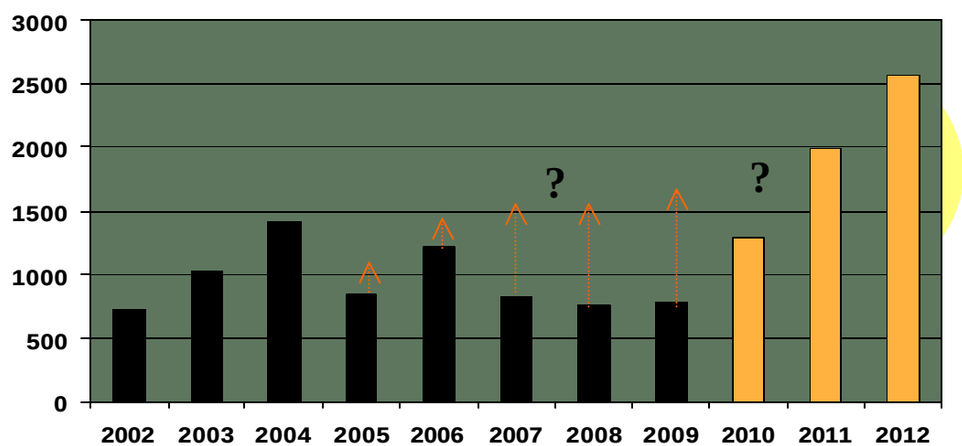


3. Natural gas demand in Mexico (2002-2012)

- Increasing demand for natural gas for power and oil industry (13.9% and 11.1% p.a. , respectively).
- Projected demand for natural gas in 2012 is 9.4 BCFD (from 4.8 BCFD in 2002), or 6.8% growth p.a. Domestic supply may only grow 5% p.a.
- Gas imports could reach 1.2 BCFD between 2004 and 2006, and up to 2.5 BCFD in 2012, depending on domestic production. 50% of domestic gas supply could be non-associated gas.
- Efforts to increase natural gas supply: PEG, MSC's, cross-border pipelines and LNG. Three or four LNG terminals may be built in the future.

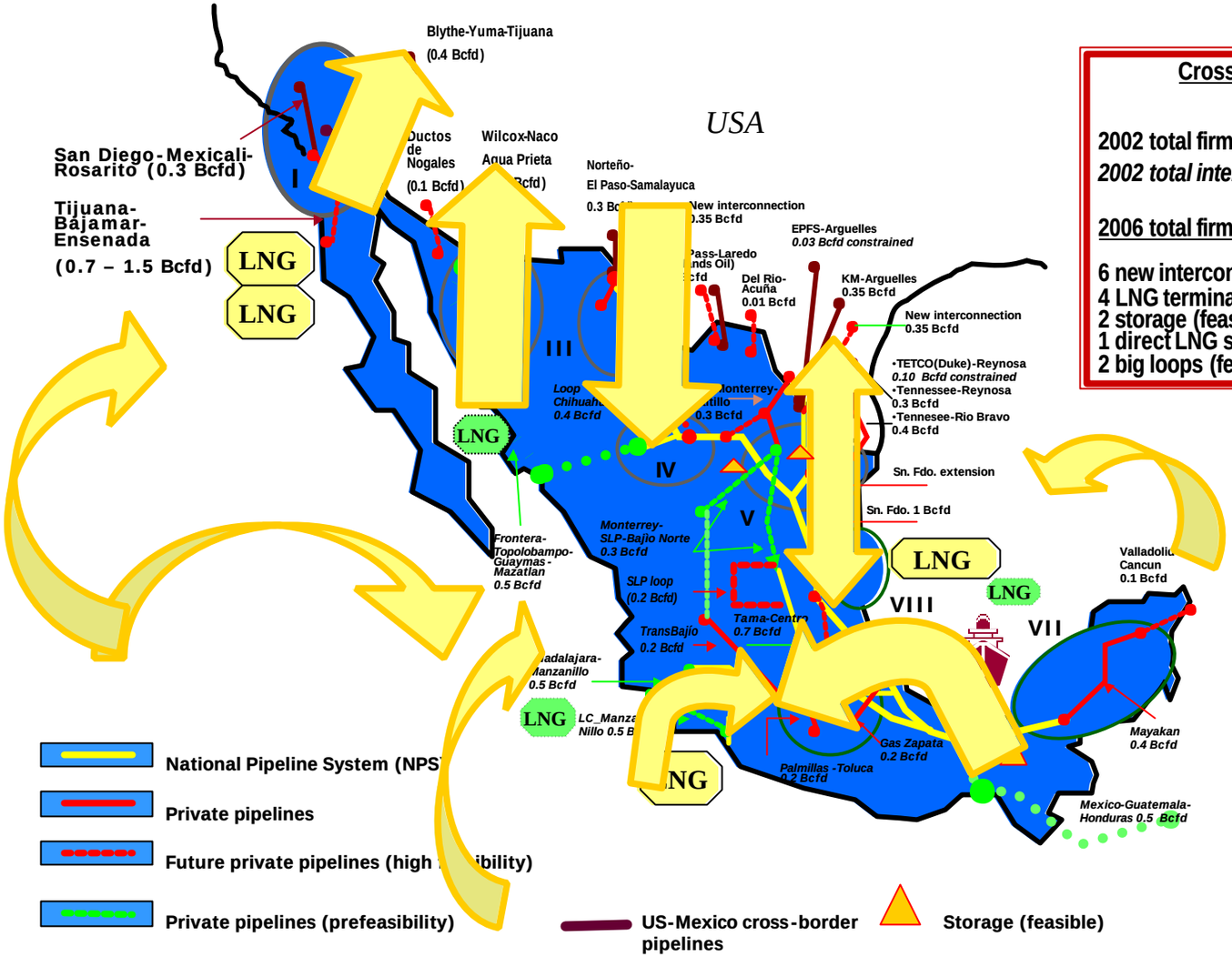


- Natural gas: premium fuel in industry and power generation .
- Power generation will dominate demand for natural gas.
- LNG plants could supply 2 BCFD.
- LPG and fuel oil: still very important until 2011.



Source: based on SENER (2003-2012)

4. Natural gas infrastructure and logistics in Mexico



Cross-border pipeline capacity

2002 total firm: 2.0 Bcfd

2002 total interrup.: 0.2 Bcfd

2006 total firm: 3.0 Bcfd

6 new interconnections
4 LNG terminals (feasible)
2 storage (feasible)
1 direct LNG system (feasible)
2 big loops (feasible)

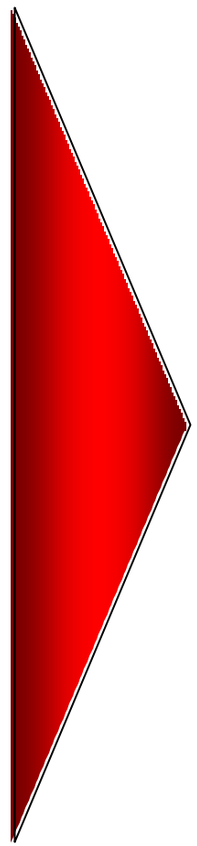
Power clusters

I	2076 MW
II	1633 MW
III	1668 MW
IV	1161 MW
V	3154 MW
VIII	3974 MW
VI	2304 MW
VII	2399 MW
TOTAL	18,369 MW

(5,000 MW less probable)

5. Feasibility of LNG in Mexico

- **Domestic market: growing demand & supply deficit.**
- **Neighbouring market (USA): growing demand, reserve constraint & 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 constraint.**
- **Environmental compliance.**



- Developers and integrated companies have applied for CRE permits. Four permits awarded.
- Regulatory frame-work: storage with regasification.
- Strategic position on Mexican coastline.
- Capture of both domestic and inter-national markets.
- Both state-driven (CFE bid) and market-driven (Pacific)

6. Regulatory aspects of LNG

Technical Regulation

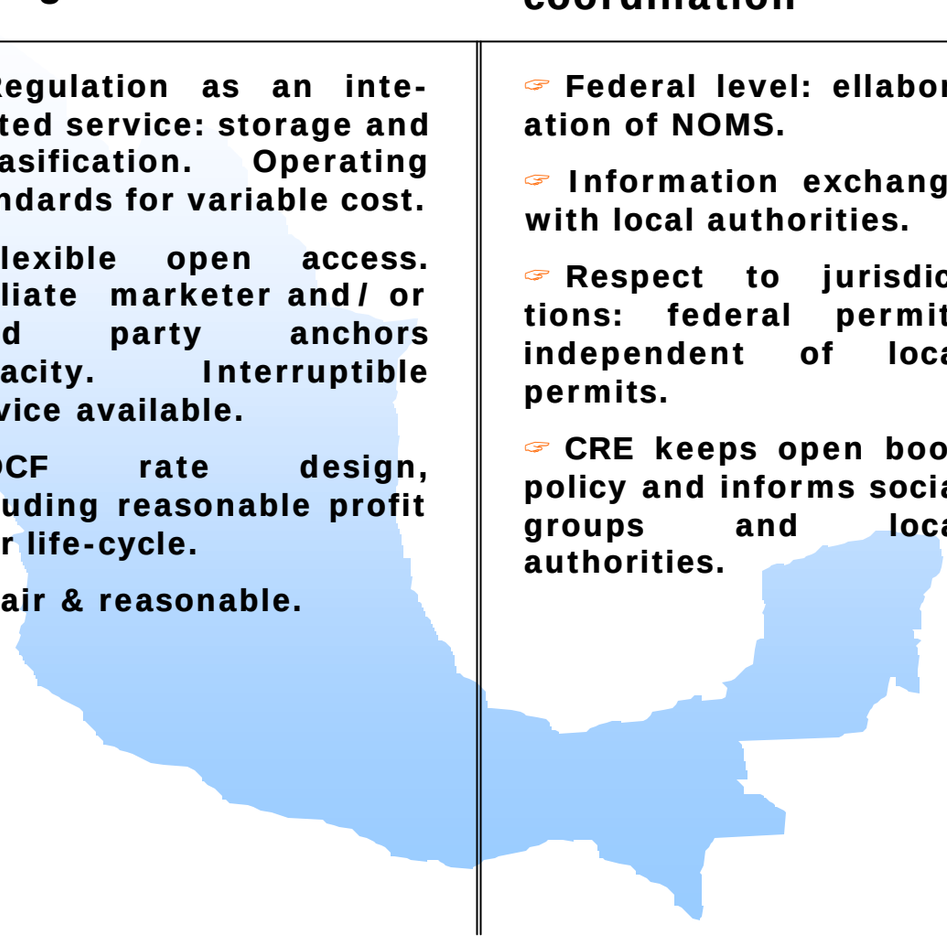
- NOMS: previous emergency NOM; proven international codes and recommended practice; final NOM in process. Includes on-shore and off-shore.
- Utilization of international standards in design,construction, o&m (NFPA 59-A, API 620, EN 1330, EN 1473).
- Pragmatic approach: prescriptive & risk analysis.
- Tanks: double wall, double containment (GBS-SPB off-shore).
- 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: ellaboration 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

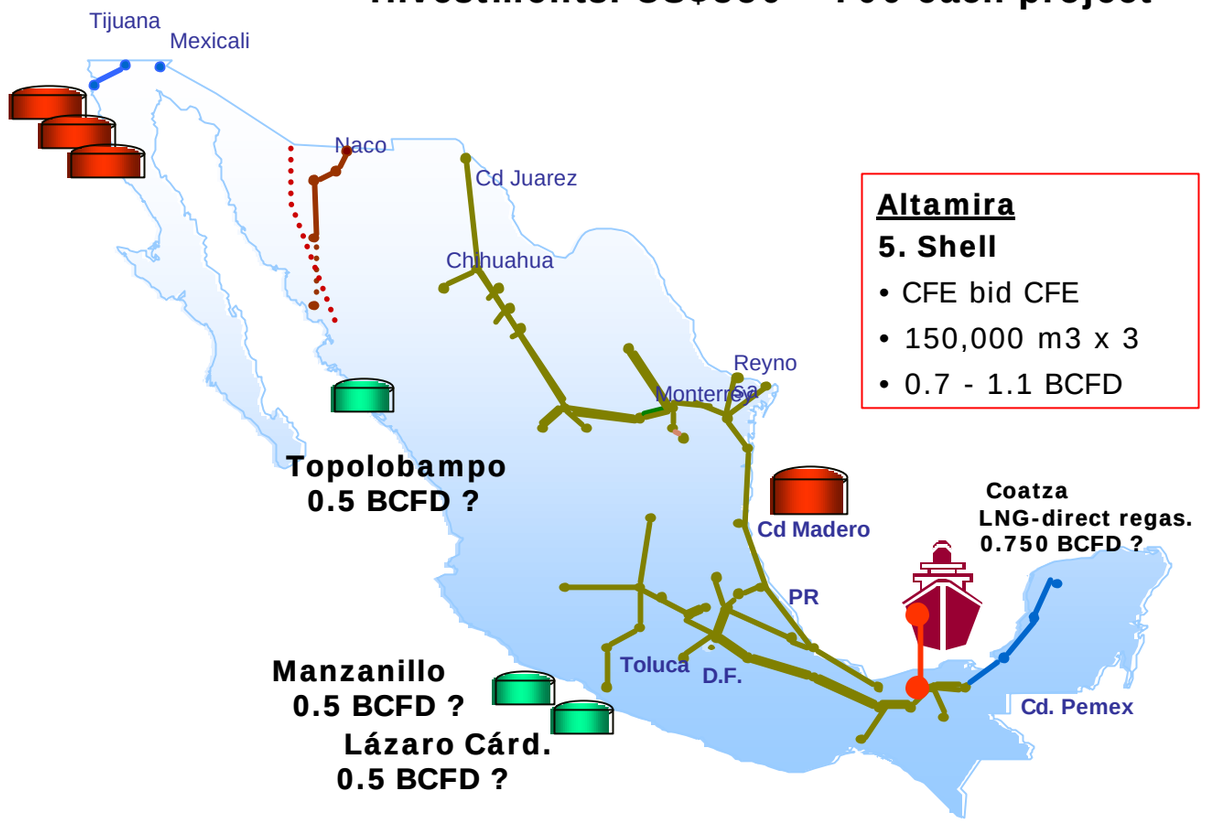
Baja California

1. GNBC (Marathon, etc.)
- 140,000 m^3 x 3
- 0.7 - 1.0 BCFD

2. ECA (Sempra)
- 160,000 m^3 x 2
- 1.0 – 1.3 BCFD

3. Shell B. Cal.
- 170,000 m^3 x 2
- 1.0 – 1.3 BCFD

4. Chevron-Texaco (off-shore GBS)
- 125,000 m^3 x 2
- 0.7 – 1.4 BCFD

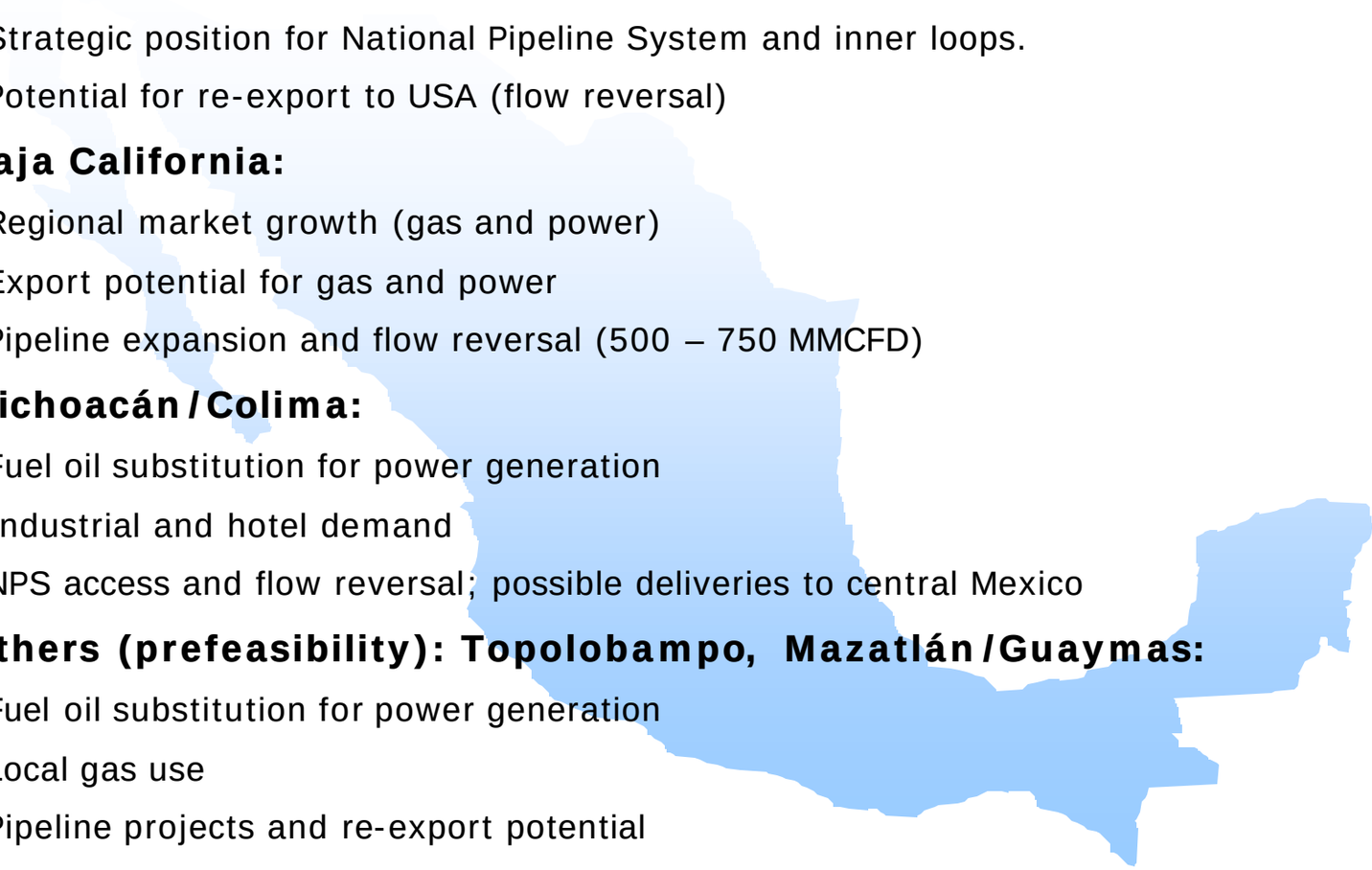


Altamira

5. Shell
- CFE bid 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 and inner loops.
  - 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 stiffle 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.**