Peru’s LNG Sector – An Overview

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Viceminister of Energy of Peru

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Introduction
What’s the Camisea Project?

1. Exploitation of Block 88

2. Transport of Natural Gas and NGL from Camisea to the Coast

3. Natural Gas Distribution in Lima
Location of the Camisea Project
### Investment in Camisea (MMUS$)

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td>757</td>
</tr>
<tr>
<td>Transport</td>
<td>830</td>
</tr>
<tr>
<td>Distribution</td>
<td>60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.647</strong></td>
</tr>
</tbody>
</table>

The Basic Camisea Project started commercial operation on August 5th, 2004
Camisea and its impact on the Peruvian Economy
Comparison of Reserves and Energy Commercial Output

**Reservas Comerciales**
- Uranio: 4.00%
- Carbón: 7.70%
- Petróleo: 8.50%
- Hidroenergía: 27.20%
- Gas+Cond.: 52.60%

**Producción Comercial**
- Uranio: 0.00%
- Carbón: 0.10%
- Petróleo: 59.40%
- Hidroenergía: 21.40%
- Gas+Cond.: 19.00%
Evolution of Proved Reserves of Crude Oil: 1980 - 2003 (MMBls)

Reservas Probadas de Petróleo Crudo
Evolution of Proved Reserves of Natural Gas: 1980 – 2003 (TCFs)*

- Block 56 not included because contract was signed in 2004
Liquid Hydrocarbons Output: 1980 - 2004 (MBPD)
Natural Gas Output:
1994 - 2004 (MMCFD)
Peru: A Country in Deficit (pre-Camisea)

Domestic Production of Crude Oil: 83 thousand barrels per day

Domestic Demand of Oil derivates 143 thousand barrels per day

Deficit ? 60 thousand barrels per day

At current prices (50 US$/Bl), this is equivalent to US$ 3,0 millions per day of trade deficit.
Trade Balance of Hydrocarbons: 1981 - 2004 (MBPD)
Trade Balance of Hydrocarbons: 1981 - 2002 (MMUS$)
Camisea impact on Energy Matrix

- Camisea is producing 400 MMCFD but as the domestic consumption is only 80 MMCFD, most of its production is being reinjected to maintain the reservoir pressure.
- Camisea is producing 34,000 bpd of condensates. Half of that is gasoline for export and the difference is Liquefied Petroleum Gas (LPG) and a small amount of gasoil.
- Royalties for 2005 are projected in US$ 130 million of which US$ 65 million will be transferred as Canon to Cusco (regional and local governments).
Peru: A Country in Deficit (post-Camisea)

Domestic Production of Crude Oil + Condensates:
83 thousand barrels per day +
34 thousand barrels per day

Domestic Demand of Oil derivates
143 thousand barrels per day

Deficit : 60 thousand barrels per day
26 thousand barrels per day

At current prices (50 US$/Bl), this is equivalent to US$ 1,3 million per day of trade deficit. It is less than half of last year deficit.
Economic Impact of Camisea

Benefits

Macroeconomic
- Reduction in energy costs
- Trade balance
- Industrial competitiveness
- Foreign investment

Social
- Canon
- Technology transfer and know-how
- Employment opportunities

Fiscal
- Royalties
- Taxes
- Tariffs

Environmental
- Emissions reduction (CO₂/SO₂/NOₓ)
- Clean fuel
LNG Project: What is it and what does it require?
What are the stages of the LNG Project?

1. Exploitation of Block 56
2. Pipeline expansion
3. Construction of the LNG Plant and Port Facilities
Chain value of LNG – From fields to final markets

Reference Price/ US Market

- Transport: $US 650 MM
- Liquifaction: $US 1,100 MM
- Regasification: $US 500 MM
- Block 56 development: $US 550 MM
- Pipeline expansion: $US 500 MM

Chain value of LNG – From fields to final markets
LNG Requirements

- Reserves
- External market
- Social and environmental standards
- Government support
Block 88 and adjacent Blocks

- BLOCK 57
  - Repsol-Burlington

- BLOCK 56
  - NUEVO MUNDO
  - MIPAYA
  - LA PERUANITA
  - PAGORENI

- BLOCK 58
  - PETROBRAS (in process)

- Camisea
  - BLOCK 88

- Gas Fields
- Wells
- Towns

Scale: 20 km
Total Gas Consumption for the next two decades

- **Uso Vehicular**
- **Uso Residencial-Comercial**
- **Uso Industrial**
- **Uso para Generación Eléctrica - Escenario Hidrotérmico**
## Natural Gas Reserves in Peru

### NATURAL GAS RESERVES IN PERU

<table>
<thead>
<tr>
<th>Zone</th>
<th>Proved TCF</th>
<th>Probable and Possible TCF</th>
<th>Total Reserves TCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>0.4</td>
<td>5.0</td>
<td>5.3</td>
</tr>
<tr>
<td>Central Jungle</td>
<td>0.3</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>South Jungle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 88</td>
<td>8.1</td>
<td>3.9</td>
<td>12.0</td>
</tr>
<tr>
<td>Block 56</td>
<td>3.0</td>
<td>2.0</td>
<td>5.00</td>
</tr>
<tr>
<td>Other areas</td>
<td></td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11.7</strong></td>
<td><strong>17.0</strong></td>
<td><strong>28.7</strong></td>
</tr>
</tbody>
</table>

TCF: $10^{12}$ cubic feet
# Demand Projections for the next 20 years (2005-2024)

**Demand Projection for Camisea Zone Gas**

<table>
<thead>
<tr>
<th>DOMESTIC MARKET REQUIREMENTS hydrothermal scenario (2005-2024)</th>
<th>TCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Generation</td>
<td>1,05</td>
</tr>
<tr>
<td>Industrial, Residential, Commercial &amp; Vehicle uses</td>
<td>2,04</td>
</tr>
<tr>
<td><strong>TOTAL DOMESTIC MARKET</strong></td>
<td>3,09*</td>
</tr>
</tbody>
</table>

**TCF**: $10^{12}$ cubic feet

*/ Conservative scenario. In a more optimistic case this figure increases to 3,97 due to reliance on thermal generation growth only.*
## Reserves vs. Domestic Market Requirements (2005-2024)

<table>
<thead>
<tr>
<th>Total Camisea Zone</th>
<th>Proved TCF</th>
<th>Probable &amp; Possible TCF</th>
<th>Total Reserves TCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>11,1</td>
<td>9,6</td>
<td>20,7</td>
</tr>
<tr>
<td>Domestic Market Requirement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrothermal Scenario (2005-2024)</td>
<td>3,1</td>
<td>--</td>
<td>3,1</td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>8,0</td>
<td>9,6</td>
<td>17,6</td>
</tr>
</tbody>
</table>

**TCF:** $10^{12}$ cubic feet
Gas Requirements for a LNG Project

- Time span considered: 20 years
- Volume of gas considered: 600 MMcfd

Total Gas required in 20 years: 4,3 TCF
## Reserves vs. Domestic + LNG Requirements (2005-2024)

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<th>Total Camisea Zone</th>
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<td>Reserves</td>
<td>11,1</td>
<td>9,6</td>
<td>20,7</td>
</tr>
<tr>
<td>Domestic Market Requirement + LNG Project (2005-2024)</td>
<td>7,4</td>
<td>--</td>
<td>7,8</td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>3,7</td>
<td>9,6</td>
<td>13,3</td>
</tr>
</tbody>
</table>
Potential discoveries with Export Markets

- 6 Wells perforated
  - 5 Discoveries
  - 83% Success
Bolivia Case: Reserves growth

Committed investments in exploration till 2003: 1,676 MMUS$

TPC

Año

Signs contract with Brazil
The companies have to submit Environmental Impact Studies (EISs) to appraise the potential impact which the LNG Project would have on the environment.

The companies participating in the LNG Project will have to implement EISs and corporate environmental and social policies based on complying with the national legislation in force and with international standards (WB, IDB).

Peruvian Government will support the environmental policies of the investors through the GTCI network and the renewed environmental legislation.

Our objective is to achieve sustainable development through the rational exploitation of our resources.
Economic Impact of LNG

- **LNG Project**
  - Investment: 2,150 MMUS$
  - Exports per year: 880 MMUS$
  - Condensates + gas: 463 MMUS$

- **Antamina**
  - Investment: 2,022 MMUS$
  - Exports per year: 722 MMUS$

- **Yanacocha**
  - Investment: 1,200 MMUS$
  - Exports per year: 722 MMUS$
Peru would become net exporter after more than 20 years (from 2009 onwards)
Concluding remarks: Why do we support the LNG Project?

- LNG Project is a national project (as Camisea)
- Investments of US$ 2,150 million
- New employment for 35,000 people (direct and indirect)
- New fiscal revenues
- New resources for the regional and local govt’s
- Hydrocarbons trade deficit reversion
- Incentives for new exploration
- To show the rest of the world that Peru can develop megaprojects with highest standards
- Peru can turn into a Hub in the Southern Pacific
ETHNIC GROUP
MACHIGUENGÁ

End