



# Extended Annual Review Report

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Project Number: 39921  
Loan Number: 7245- LN2256  
November 2012

## Loan Petronet LNG Limited Dahej Liquefied Natural Gas Terminal Expansion Project (India)

In accordance with ADB's public communication policy (PCP, 2005), this extended annual review report excludes information referred to in paragraph 126 of the PCP.

Asian Development Bank

## CURRENCY EQUIVALENTS

Currency Unit – Indian rupee/s (Re/Rs)

At Appraisal 31 March 2006			At Project Completion 30 September 2012		
Re1.00	–	\$0.022	Re1.00	–	\$0.019
\$1.00	–	Rs44.70	\$1.00	–	Rs52.89

## ABBREVIATIONS

ADB	–	Asian Development Bank
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EPC	–	engineering, procurement, and construction
FIRR	–	financial internal rate of return
LNG	–	liquefied natural gas
PLL	–	Petronet LNG Limited
RRP	–	report and recommendation of the President
SIEE	–	summary initial environmental examination
TCA	–	time charter agreement
WACC	–	weighted average cost of capital
XARR	–	extended annual review report

## WEIGHTS AND MEASURES

m <sup>3</sup>	–	cubic meter
MBTU	–	million British thermal unit
MMTPA	–	million metric tons per annum
MMSCMD	–	million metric standard cubic meters per day
TBTU	–	trillion British thermal unit

## NOTES

- (i) The fiscal year (FY) of the Government ends on 31 March. The fiscal year of Petronet LNG Limited ends on 31 March.
- (ii) In this report, "\$" refers to US dollars.

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## BASIC DATA

### Petronet LNG Limited for the Dahej LNG Terminal Expansion Project (Loan No. 2256 – India)

<b>Key Dates</b>	<b>Expected</b>	<b>Actual</b>
Concept Clearance Approval		August 2005
Board Approval		August 2006
Loan Agreement		27 July 2007
Loan Effectiveness		27 July 2007
First Disbursement		11 July 2008
Physical Completion Date		9 March 2009
Commercial Operations Date		15 July 2009
Financial Closing		27 July 2007
Months (effectiveness to commercial operation date)		24 months

  

<b>Project Administration and Monitoring</b>	<b>No. of Missions</b>	<b>No. of Person-Days</b>
Due Diligence	1	33
Project Administration	1	12
Extended Annual Review Mission	1	10

## EXECUTIVE SUMMARY

In August 2006, the Board of Directors of the Asian Development Bank (ADB) approved a direct loan of Rs6.75 billion supported by a partial credit guarantee from German development cooperation through KfW Bankengruppe to Petronet LNG Limited (PLL) for the Dahej Liquefied Natural Gas Terminal Expansion Project. The funds, sourced from ADB's ordinary capital resources, were to be used to finance the expansion of an existing liquefied natural gas (LNG) import and regasification terminal at Dahej, Gujarat with a capacity of 5.0 million metric tons per annum (MMTPA) to 7.5 MMTPA. The facility was later expanded to 10.0 MMTPA.

ADB helped finance PLL's first-phase terminal through an equity investment approved in January 2004. The first-phase terminal commenced commercial operations in April 2004 with a capacity of 5 MMTPA. ADB still has a 5.2% minority equity stake in PLL.

PLL implemented the first-phase terminal and the project on a build–operate–transfer basis under a 30-year concession, which ends in December 2035 when the port will be transferred to the Gujarat Maritime Board. PLL will own the regasification facility for 90 years. The expansion project was completed on 9 March 2009 within the estimated cost and on time.. It commenced commercial operation in July 2009.

Evaluation of the project is based on four main criteria: (i) development impact, (ii) profitability of ADB's investment, (iii) quality of ADB's work, and (iv) ADB's additionality. The results of this analysis were aggregated to derive an overall rating for the project.

The development impact of the project is rated *excellent*. It was evaluated in four categories: (i) private sector development; (ii) business success; (iii) contribution to economic development (economic sustainability); and (iv) environment, social, health, and safety performance. The contribution to private sector development is rated *excellent*. PLL's model of public–private partnership, which restricts government control to 50% or less and provides full operational flexibility, is being replicated in the downstream investment by the promoters. Following the commissioning of PLL's terminal, new pipelines—notably expansion of the Hazira–Bijaipur–Jagdishpur pipeline, the Dahej–Uran pipeline, and the Gujarat State Petronet Limited pipeline—have been built and have enhanced connectivity and reach to new customers. Beyond-project impacts include construction and commissioning of two other LNG terminals—in Hazira and Maharashtra.

PLL is rated *excellent* for business success and economic contribution.

PLL's environmental, social, health, and safety performance is rated *satisfactory*. The environmental and social impacts of the project's construction activities, such as dust, noise, and emissions from heavy construction equipment and vehicles, were insignificant and confined within the project site with no communities on or near the site. Environmental impacts during operations have been negligible due to the nature of LNG and the associated technology that results in almost zero emissions. There were no direct and negative social impacts as the project did not require any new land acquisition. No indigenous people were affected by the project. PLL has a well-defined corporate social responsibility framework and undertakes socioeconomic development programs around its work centers (Dahej and Kochi) to help communities become self-reliant. These efforts are mostly in the areas of education, civil infrastructure, health care, sports and culture, and entrepreneurship in the community. PLL also supports water management and disaster relief in and around Dahej and Kochi.

The investment outcome of PLL is rated *satisfactory* with timely principal and interest payments. ADB's work quality is rated *satisfactory* and additionality is rated *excellent*. PLL was the first LNG import and regasification operation in the country. ADB's involvement in the policy dialogue associated with PLL led to the delicensing of this segment and deregulation of input and output pricing. ADB had provided long-term, fixed-rate local currency financing which was not available in India at the time the loan was processed. ADB's further participation in PLL catalyzed cofinancing for the project and provided comfort to other lenders regarding project viability, transparency, and governance practices.

Overall, the project is rated *highly successful*. ADB's participation in the project demonstrates that (i) availability of local currency financing with a fixed interest rate is much needed in infrastructure development; and (ii) ADB's involvement strengthened PLL's operations as a private sector entity and stimulated private sector participation in the project and in the sector, thereby promoting the concept of a public–private partnership.

## I. THE PROJECT

### A. Project Background

1. In August 2006, the Board of Directors of the Asian Development Bank (ADB) approved a direct loan of Rs6.75 billion supported by a partial credit guarantee from the German development cooperation through KfW Bankengruppe to Petronet LNG Limited (PLL) for the Dahej Liquefied Natural Gas Terminal Expansion Project. The guarantee covers up to Rs3.375 billion, or 50% of amounts outstanding under the ADB loan. The funds sourced from ADB's ordinary capital resources were used to finance the expansion of an existing liquefied natural gas (LNG) import and regasification terminal at Dahej, Gujarat with a capacity of 5.0 million metric tons per annum (MMTPA) to 7.5 MMTPA. The facility was later expanded to 10.0 MMTPA.

2. This is ADB's second intervention in PLL. ADB approved in January 2004 an equity investment in PLL to finance the first phase of PLL's Dahej terminal. ADB subscribed to and still holds a 5.2% minority equity stake in PLL. The existing first-phase terminal, with two LNG storage tanks, has a capacity of 5 MMTPA. It was completed on time and below budget and started commercial operation on 9 April 2004. Production reached full capacity of 5 MMTPA in March 2005.

3. PLL is implementing the first-phase terminal and the project on a build–operate–transfer basis under a 30-year concession, which ends in December 2035 when the port will be transferred to the Gujarat Maritime Board. PLL will own the regasification facility for 90 years.<sup>1</sup>

4. PLL is a public limited company established under the Companies' Act, 1956.<sup>2</sup> The sponsors are four state companies—Bharat Petroleum Corporation Limited, the Indian Oil Corporation Limited, GAIL (India) Limited, and the Oil and Natural Gas Corporation Limited—with a 50% aggregate ownership of PLL. Other shareholders are GDF International (10.0%), ADB (5.2%), and public investors (34.8%).

5. The project was consistent with ADB's energy sector strategy<sup>3</sup> which strongly encourages ADB interventions to support private sector participation in the energy sector to take advantage of the higher operational efficiencies that private operators can achieve and to meet the large capital requirements. Also, the strategy promotes a shift to cleaner fuels and processes, which in India includes a shift from coal to natural gas.

### B. Project Features

6. The Dahej terminal was the first LNG import and regasification terminal in India, designed with a phase I capacity of 5 MMTPA, expandable to 10 MMTPA. The project covers the expansion of capacity from 5.0 MMTPA to 7.5 MMTPA. The project to a large extent used existing facilities, consisting of (i) marine facilities; (ii) unloading facilities; (iii) two full containment LNG storage tanks each with a net capacity of 148,000 cubic meters (m<sup>3</sup>); (iv) a boil-off gas recovery system for recondensation of boil-off gas; (v) send out facilities, including shell-and-tube and submerged combustion vaporizers; (vi) auxiliary facilities including a gas-fired captive power plant with three 7.6-megawatt gas turbines, electrical and control systems,

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<sup>1</sup> PLL will maintain its access to and use of the port terminal under a port user agreement with the Gujarat Maritime Board. The concession agreement was signed on 20 December 2005.

<sup>2</sup> The shares of PLL were publicly offered in March 2004.

<sup>3</sup> ADB. 2000. *Energy 2000: Review of the Energy Policy of the Asian Development Bank*. Manila.



utilities production, metering, and a fire and gas detection and protection system; and (vii) a jetty.

7. The additional facilities under the project included (i) the third and fourth LNG storage tanks with capacity of 148,000 m<sup>3</sup> each, (ii) one additional compressor for the boil-off gas recovery system, (iii) another set of send-out facilities with in-tank pumps, (iv) two additional gas turbines, and (v) other minor associated facilities.

8. Pursuant to an LNG sales and purchase agreement dated 31 July 1999, PLL is obligated to purchase 7.5 MMTPA of LNG (5.0 MMTPA for first phase of Dahej and 2.5 MMTPA for Kochi) from the Ras Laffan Liquefied Natural Gas Company (II) (Rasgas II) based in Qatar on a take-or-pay basis for 25 years.<sup>4</sup> Two dedicated tankers, with a capacity of 138,000 m<sup>3</sup> each, transport LNG from Qatar. The transport arrangement (awarded by international competitive bidding) is covered by two 25-year time charter agreements (TCAs) which end on 30 April 2028.

9. A third TCA was executed on 21 February 2006 to cover 2.5 MMTPA of additional LNG supply from Rasgas II. The third tanker, with a capacity of 155,000 m<sup>3</sup>, was delivered on 16 November 2009.

10. The regasified LNG from the first-phase terminal and expansion terminal is being purchased by GAIL (India), the Indian Oil Corporation, and Bharat Petroleum as off-takers under gas sales and purchase agreements. The three off-takers have, in turn, signed gas sales contracts for the supply of regasified LNG with their respective consumers. The regasified LNG is marketed in the states of Delhi, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, and Uttar Pradesh. The consumers of regasified LNG are mainly existing consumers whose current demand is unmet or who are currently using liquid fuels such as naphtha, fuel oil, or low sulphur heavy stock.

### **C. Progress Highlights**

11. The expansion project was completed on 9 March 2009. The project cost was competitive and, since it was an expansion, sharing of common facilities with the existing terminal resulted in a substantially lower overall cost. The expansion project began commercial operations on 15 July 2009, compared to the original target of September 2009. The EPC contract was awarded as a fixed-time contract with heavy liquidated damages for delay, thereby mitigating the risk related to project completion delays. The entire expansion work was completed without interfering with the productive capacity of the existing operating terminal and with minimum shutdown for tie-in of the new facilities. The expanded facility has flexibility for enhanced capacity by way of an additional vaporization unit using waste heat. The investment summary of the project is in Appendix 1.

12. In May 2007, the structure of the ADB loan was revised. This was due to a rapid expansion of PLL operations after ADB Board approval in August 2006, which included construction of the new LNG terminal at Kochi. The Kochi terminal was funded through a consortium of Indian lenders, the International Finance Corporation, and Proparco. The Kochi terminal, located at Puthu Vypeen Island, is anticipated to have a capacity of 2.5 MMTPA with

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<sup>4</sup> The sales and purchase agreement is on a take-or-pay basis for 25 years at a fixed price of \$2.53 per million British thermal units (MBTU) for the first 5 years of the contract (January 2004–December 2008). For the remaining contract period, the LNG price will fluctuate with the Japan crude-oil cocktail price of crude oils with a cap and a floor.

provision for expansion of up to 5.0 MMTPA. The terminal consists of two storage tanks, a vaporization system, utilities, and marine facilities. The Kochi terminal is expected to be completed in the fourth quarter of 2012.

13. PLL has commenced construction of the second LNG berth (jetty) in Dahej to mitigate associated risks of port operations at the existing jetty and also increase the capacity of the terminal from the current 10 MMTPA. It is scheduled for commissioning by the end of September 2013.

## II. EVALUATION

### A. Project Rationale and Objectives

14. The project's objectives as set out in the report and recommendation of the President (RRP)<sup>5</sup> were to help promote India's sustainable economic development by providing cleaner and lower cost energy, increase the supply of energy by providing additional natural gas to industry and household users, and enhance energy security by diversifying the energy base. These objectives were relevant and were achieved by the project. The project was the first LNG terminal in the country and has been supported by ADB since conceptualization. ADB's participation mobilized investment in the gas sector from other sources.

### B. Development Impact

#### 1. Private Sector Development

15. Industry reports show that India is among the largest gas consumers in the world, using around 185 million metric standard cubic meters per day (MMSCMD). India is also the sixth-largest LNG importer in the world, with 45 MMSCMD of regasified LNG being imported annually. Domestic gas supplies were approximately 140 MMSCMD in 2011–2012 against estimated demand of 243 MMSCMD. The deficit of approximately 103 MMSCMD is projected to double in 2017. There is still a large untapped market for gas, and importation of LNG will play a vital role in meeting the growing gas demand–supply gap. Major users of natural gas are power plants, refineries, fertilizer manufacturers, city gas distribution companies, and the steel industry. Despite the rapid growth in demand for gas in India over the past decade, gas accounts for only 11% of primary energy consumption. This share is projected to increase significantly, reaching 20% by 2025.

16. PLL is the first company in India to import LNG and was instrumental in shaping the growth of the Indian natural gas sector. It has set up high industry efficiency benchmarks in LNG operations and market development. The expansion of the Dahej terminal from 5 MMTPA to 10 MMTPA contributed to reducing the gas demand–supply gap in the country. In January 2012, PLL decided to increase its capacity at Dahej by an additional 5 MMTPA. This capacity addition will optimally use the additional jetty being constructed in Dahej, which is expected to be commissioned by September 2013. In addition, the regasification plant in Kochi will enable PLL to expand its reach and supply of natural gas in the south Indian market.<sup>6</sup>

<sup>5</sup> ADB. 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Petronet LNG Limited for the Dahej Liquefied Natural Gas Terminal Expansion Project in India*. Manila.

<sup>6</sup> When operations commence at the Kochi terminal, it will be the only provider of natural gas in its target states of Karnataka, Kerala, and Tamil Nadu.

17. Private sector development at the company level was manifested in the transfer of the know-how and skills required for operating and managing an LNG terminal, for the first time in India, through technical support by GDF International (GDFI). This started during the first phase of the terminal and continued with the expanded operation of the terminal, with training conducted regularly by GDFI.

18. Following the commissioning of PLL's terminal, the new pipelines (notably expansion of the Hazira–Bijaipur–Jagdishpur, Dahej–Uran, and Gujarat State Petronet Limited pipelines) have ensured that connectivity has improved, resulting in access to new customers. The wider company impacts include construction and commissioning of two other LNG terminals in India. These are the Shell LNG terminal of 3.6 MMTPA at Hazira, Gujarat and the 2.0 MMTPA terminal at Ratnagiri, Maharashtra. ADB's close cooperation with the government in developing the Dahej terminal supported the creation of an enabling environment for private sector investment to develop infrastructure for gas imports.

19. The private sector development impact of PLL is rated *excellent*. Private sector development indicators and ratings are presented in Appendix 2.

## **2. Business Success**

20. PLL's financial performance for FY2009–FY2012 exceeded appraisal targets. No material problems with supply, plant operation, off-take, or gas pricing risks have arisen since the expanded terminal became operational. PLL has an assured market for its entire production and negligible market risks, given the long-term access to LNG from Rasgas II under a gas purchase agreement and a long-term gas sale agreement with the intermediate off-takers Bharat Petroleum, GAIL (India), and the Indian Oil Corporation.

21. In FY2010, with the Dahej expansion completed and in operation, PLL imported 124 LNG shipments against 104 shipments in FY2009, representing 7.4 MMTPA. About 384.4 trillion British thermal units (TBTU) of regasified LNG were sold in FY2010 compared to 321.3 TBTU in FY2009. The pilot project for loading LNG in cryogenic road tankers was successfully developed and implemented. In FY2010, 542 tankers were loaded and supplied to customers in Gujarat and Maharashtra.

22. The project is rated *excellent* for business success.

## **3. Economic Sustainability**

23. The project is rated excellent for economic sustainability.

## **4. Environment, Social, Health, and Safety Performance**

24. The project was classified environment category B, involuntary resettlement C, and indigenous peoples C. The first-phase terminal was assigned environment category A. Environmental and social impacts were largely addressed at the time of initial project development. The expanded terminal is classified category B as it only involved the construction of two additional storage tanks and associated equipment. The environmental impact assessment (EIA) reports for the onshore storage and regasification facilities and for the marine facilities were updated. The two EIA reports were submitted to the Ministry of Environment and Forest in April 2005 and received environmental clearance from the ministry in November 2005. The summary initial environmental examination (SIEE) was prepared in line with ADB's

environmental and social safeguard policies and information disclosure for environment category B projects. The SIEE was based on the existing EIA documents as well as the two updated EIA reports, and was posted on the ADB website in August 2006. The SIEE indicated that the project would have no significant environmental impacts during construction and operation due to the nature of the project and its site. Project risks would be minimized through rigorous enforcement of international design and operational standards.

25. The impact of construction activities of the two LNG storage tanks, such as dust, noise, and emissions from heavy construction equipment and vehicles, was insignificant and confined within the existing project site with no communities nearby. There were no reported environmental problems during construction of the project. Environmental operational impacts have been negligible due to the nature of LNG and the associated technology that result in almost zero emissions.

26. The project did not require any new land acquisition and therefore did not have any direct and negative social impact. There are no indigenous peoples affected by the project. PLL has a well-defined corporate social responsibility program. It undertakes socioeconomic development programs to supplement efforts to meet the priority needs of the community with the aim of helping them become self-reliant. These efforts were generally around PLL's work centers (Dahej and Kochi), mostly in the areas of education, civil infrastructure, health care, sports and culture, and entrepreneurship in the community. PLL also supports water management and disaster relief in and around Dahej and Kochi to help bolster sustainable social development.

27. The expanded facility has flexibility for enhanced capacity operations by way of an additional vaporization unit utilizing waste heat.

28. PLL promoted job creation during construction and operation. The EPC contractors employed 2,070 workers at the peak of construction in 2008. PLL maintains harmonious and cordial industrial relations with its staff, has a strong management team, follows strong corporate governance practices in line with regulatory requirements, and maintains a high standard of public disclosure and transparency in its operations. No person-days were lost due to strikes and lockouts. PLL continues to increase the number of staff hired locally. As of March 2012, the company had 313 employees, compared to 240 in 2006.

29. The rating for environment, social, health, and safety performance of the project is *satisfactory*.

### **C. ADB Investment Profitability**

30. ADB's investment profitability is rated *satisfactory*.

### **D. ADB Work Quality**

31. ADB's effectiveness in the area of screening, appraisal, and structuring is rated *excellent*. The project is in line with ADB's country, energy sector, private sector development, and environmental protection strategies. PLL was the first step in commercializing the gas sector's LNG import segment, and the policy dialogue associated with PLL has led to delicensing of this segment and deregulation of input and output pricing. The expansion of PLL's terminal augmented supplies of an environmentally friendly fuel and displaced the use of more polluting fuels at competitive costs. The successful operation of PLL demonstrated that,

with careful planning and structuring, the concept of a public–private partnership in infrastructure development can be implemented successfully. Monitoring and supervision quality is *satisfactory*.

32. ADB's role and contribution to the project is rated *satisfactory*. The project supported the country strategy and program<sup>7</sup> objectives of removing impediments to the liberalization and growth of privately financed energy infrastructure in India.

### E. ADB's Additionality

33. ADB's additionality is rated *excellent*. ADB provided long-term fixed-rate local currency financing which was not available in India at the time that the loan was processed. Through loan covenants and representation on the board of PLL,<sup>8</sup> ADB has strengthened the neutrality of PLL's decision making as an autonomous and commercial private sector entity. ADB's further participation in the project (Dahej I and II) catalyzed cofinancing for the project and provided comfort to other lenders on project viability, transparency, and good governance practices adopted by the company because of ADB's contribution to governance.

### F. Overall Evaluation

34. The project's overall rating is *highly successful*, with development outcome and ADB's additionality being rated *excellent* (Table 1).

**Table 1: Evaluation of the Dahej LNG Terminal Expansion**

Item	Excellent	Satisfactory	Partly Satisfactory	Unsatisfactory
<b>Development Outcome</b>	<b>X</b>			
Private Sector Development	X			
Business Success	X			
Economic Sustainability	X			
Social and Environmental Impacts		X		
<b>ADB Investment Profitability</b>		<b>X</b>		
<b>ADB Work Quality</b>		<b>X</b>		
Screening, Appraisal, and Structuring	X			
Monitoring and Supervision		X		
Role and Contribution		X		
<b>ADB's Additionality</b>	<b>X</b>			
	<b>Highly Successful</b>	<b>Successful</b>	<b>Partly Successful</b>	<b>Unsuccessful</b>
<b>Overall Rating</b>	<b>X</b>			

ADB = Asian Development Bank, LNG = liquefied natural gas.

Source: Asian Development Bank.

## III. LESSONS

35. The project demonstrated the following factors that could be replicated in designing new projects:

<sup>7</sup> ADB. 2003. *Country Strategy and Program (2003-2006) India*. Manila.

<sup>8</sup> Up until August 2010, ADB had representation on the PLL board.

36. **Local currency financing.** ADB provided local currency long-term financing with a fixed interest rate which is much needed in infrastructure development in India. Financial institutions in India have limited capacity to provide financing that promotes affordability and sustainability of projects and avoids a mismatch in the borrowing currency and the currency of revenue. The local currency loan also catalyzed risk participation by KfW which otherwise could not provide financing in Indian rupees.

37. **Stimulating private sector development.** ADB's involvement in PLL helped strengthen PLL's operation as a private sector entity and promoted the concept of a public-private partnership. Corporate governance was facilitated with the assignment of an ADB independent director to the board of PLL and strengthened governance provisions in PLL. ADB's presence as a lender to the project allayed financiers' concerns and helped raise financing for subsequent growth.

38. The successful implementation of the first LNG terminal in India led to the development of two other LNG terminals, at Hazira and Ratnagiri. Thus, ADB's support has had demonstration effects and has promoted private sector investment in the gas sector.

**BASIC DATA**  
**Investment Summary**

**A. Investment Identification**

1.	Country	India
2.	Investment Number/Loan Number	7245/LN2256
3.	Type of Business	Conventional Energy Generation and Operation
4.	Project Title	Dahej LNG Terminal Expansion Project
5.	Investee Company/Borrower	Petronet LNG Limited
6.	Sponsors	BPCL, GAIL, IOCL, and ONGC
7.	Amount of Approved ADB Assistance - Direct Loan	Rs6.75 billion (\$150 million equivalent)
8.	Environment Category	B. Summary of environmental impact assessment submitted in July 2006

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ADB = Asian Development Bank, BPCL = Bharat Petroleum Corporation Limited, GAIL = GAIL (India) Limited, IOCL = Indian Oil Corporation Limited, LNG = liquefied natural gas, ONGC = Oil and Natural Gas Corporation.

## PRIVATE SECTOR DEVELOPMENT INDICATORS AND RATINGS: INFRASTRUCTURE

Impact of the Project	Rating: Impact to Date <sup>a</sup>	Potential Impact (Sustainability) and Risk to its Realization Impact <sup>a</sup> Risk <sup>b</sup>	Combined Rating <sup>c</sup>	Justification / Annotations	
1. Beyond Intermediary and Investee Company Impacts					
1.1 Private Sector Expansion Contribution by a pioneering or high-profile project that facilitates or paves the way for more private participation in the sector and economy	Excellent	Satisfactory	Low	Excellent	PLL’s model of PPP which restricts government control to 50% or less and provides full operational flexibility is being replicated by promoters in downstream projects. Two new LNG terminals have been developed and are in operation at Hazira, Gujarat and Ratnagiri, Maharashtra.
1.2. Competition. Contribution of new competition pressure on public and/or other sector players to raise efficiency and improve access and service levels in the industry	Satisfactory	Satisfactory	Low	Satisfactory	The natural gas sector is evolving and is largely supply deficient.
1.3. Innovation Demonstration of efficient new products and services, including in areas such as marketing, distribution, tariffs, production, and technology, and in ways to cover or contain costs and manage demand	Excellent	Satisfactory	Low	Excellent	PLL developed a pilot project of loading LNG in cryogenic road tankers to supply customers in Gujarat and Maharashtra. For consumers not connected with gas pipelines, PLL initiated marketing of LNG directly to consumers across the country through overland transportation using LNG trucks or hubs. This significantly facilitates distributed captive power generation, city gas, and such other industries not connected to the pipeline network, and thus makes use of the existing road network.  The management of PLL is in active discussion about direct use of LNG in vehicles and trains which will help replace diesel.
1.4. Links Relative to investments, contribution of the project of notable upstream or downstream links to business clients, consumers, suppliers, key industries, etc. in support of growth	Excellent	Satisfactory	Low	Excellent	Following the commissioning of PLL’s terminal, new pipelines, notably the expansion of Hazira-Bijaipur-Jagdishpur, Dahej–Uran, and Gujarat State Petronet Limited pipelines, has increased connectivity and has allowed gas access to new customers.



Impact of the Project	Rating: Impact to Date <sup>a</sup>	Potential Impact (Sustainability) and Risk to its Realization		Combined Rating <sup>c</sup>	Justification / Annotations
<b>1.5. Catalytic Element</b> Contribution by pioneering and/or catalytic financing, mobilizing, or inducing more local or foreign market financing and/or foreign direct investment in the sector	Excellent	Satisfactory	Low	Excellent	ADB participation catalyzed cofinancing for the project and provided comfort to other lenders in respect of project viability, transparency, and good governance practices adopted by the company because of ADB's association with it.
<b>1.6. Affected Laws, Frameworks, Regulation</b> Contribution to (i) better laws and sector regulation for PPPs, concessions, joint ventures, and BOT and BOOT projects; and (ii) liberalization of markets as applicable for better sector efficiency	Satisfactory	Satisfactory	Medium	Satisfactory	Imports in the gas sector have been deregulated.
<b>2. Company Impact With Wider Potential</b>					
<b>2.1. Skills Contribution</b> Contribution to new strategic, managerial, and operational skills with actual or potential wider replication in the sector and industry	Satisfactory	Satisfactory	Low	Satisfactory	PLL personnel are exposed to skills which are of an international standard. GDF provided support for operational skills training of employees at Dahej.  As of March 2012, PLL has a total of 313 employees as against 240 in 2006.
<b>2.2 Demonstration of New Standards</b> As seen in new ways to operate the business and compete, and in investee performance against relevant best industry benchmarks and standards	Excellent	Satisfactory	Low	Excellent	PLL introduced not only service standards but also a professional work ethic and corporate governance to the company and arguably to the sector as a whole. Its human resource policies and programs are geared toward improving worker compensation and promoting strong worker–corporate relations.  PLL personnel are considered highly productive.
<b>2.3 Improved Governance</b> As evident in standards set in corporate governance; stakeholder relations; environmental, social, health,	Satisfactory	Satisfactory	Low	Satisfactory	As part of PLL's efforts to strengthen corporate governance, its board of directors formulated a risk management policy, which puts in place a risk management structure with clear definition of roles and responsibilities, as well as a risk portfolio involving a continuous process of risk

Impact of the Project	Rating: Impact to Date <sup>a</sup>	Potential Impact (Sustainability) and Risk to its Realization Impact <sup>a</sup> Risk <sup>b</sup>		Combined Rating <sup>c</sup>	Justification / Annotations
and safety fields; and/or in good energy conservation standards, etc.					identification, risk assessment, control assessment and risk monitoring, review, and communication.  To achieve the objective of energy conservation and technology absorption, PLL has installed a scheme for reducing power requirements for air-conditioning by harnessing cold energy from LNG by installing chilled water systems.
<b>3. Overall Private Sector Development Rating</b> The rating ( <i>excellent</i> , <i>satisfactory</i> , <i>partly satisfactory</i> , or <i>unsatisfactory</i> ) is not an arithmetic mean of the individual indicator ratings, and does not have fixed weights. Actual impact (positive or negative), potential future impact, and the risk to its realization need to be considered.	Excellent	Satisfactory	Low	Excellent	

ADB = Asian Development Bank, GDF = Gaz de France, LNG = liquefied natural gas, PLL = Petronet LNG Limited, PPP = public-private partnership.

<sup>a</sup> Excellent (4), satisfactory (3), party unsatisfactory (2), unsatisfactory (1).

<sup>b</sup> Risk: low (4), modest (3), medium (2), high (1).

<sup>c</sup> The combined rating should weigh impacts and risk to its sustainable realization.

Source: Asian Development Bank.