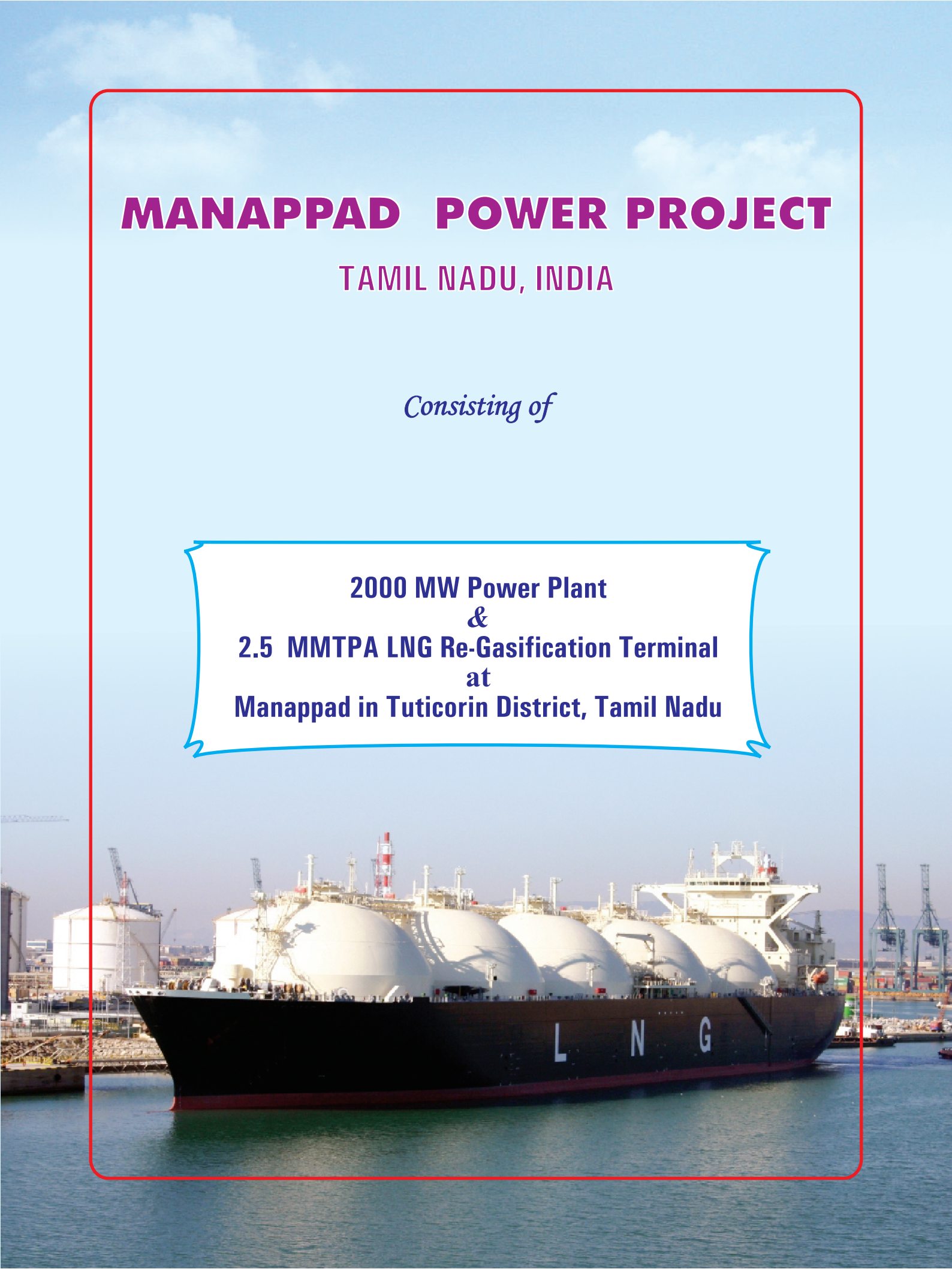
MANAPPAD POWER PROJECT

TAMIL NADU, INDIA

Consisting of

2000 MW Power Plant
&
2.5 MMTPA LNG Re-Gasification Terminal
at
Manappad in Tuticorin District, Tamil Nadu



THE MANAPPAD POWER PROJECT

1. Background

The MANAPPAD 2000 MW Combined Cycle Power Project is jointly promoted by Non-Resident Indians (NRIs) and other investors based in the US, Europe and South East Asia under the Umbrella of Canam Inc Houston, USA. The US based Intech Global Resources Inc., Houston, Texas have signed an MOU with the Tamil Nadu Electricity Board (TNEB) to build a Natural Gas based project on a 'Build, Own and Operate' (BOO) basis in Tamil Nadu, India. Indian Power Projects Limited (IPPL) a 'Power Generating Company' has been registered to develop the Power Project under the terms of the MOU. Indian Gas Limited (IGL), a 'Fuel Supplies and Facilities Company' is also registered under the Indian Companies Act to serve the Power project .

2. Progress

The development of the project progressed diligently. Environmental studies, acquisition of land and engineering studies were carried out and all statutory clearances necessary for the commencement of construction were also obtained for the project. However, the increase in natural gas prices and the decision to move the power project to the site of the LNG regasification terminal caused delay in the implementation of the project. The introduction of the State Regulatory Commission, Power Trading in open markets and the splitting of the State Electricity Boards enhanced investor-confidence in the sector. In the meantime, Global prices of Natural Gas also declined to reasonable levels. The abundance of Shale gas in US and other countries contributes to stabilize Natural Gas prices. In the renewed circumstance IGL and the co-promoters are in the process of renewing the project.

3. Site

LNG tankers require a seawater depth of about 14 m. The sea off Manappad in Tuticorin district (about 70km South of Tuticorin City) offers the features necessary for such a port. At this location, the sea is fairly deep and the seabed is of sand and clay. Hence the port can be built with minimal dredging and can be operated with minimal maintenance.

4. Status

IGL has acquired necessary land for developing the port and the LNG regasification Terminal. The Tamil Nadu Maritime Board of the Government of Tamil Nadu has authorized IGL to develop the Green-Field Port at Manappad. The Manappad port and regasification projects have also obtained statutory clearances for commencement of the project.

The previous approvals are being updated for the power project for current location. The project envisaged at Manappad will consist of:

- 2000 MW Power Plant
- Green-Field Port
- LNG Regasification Facility

5. Project Details

As per the project studies, the project cost of the power plant is about US$ 1800 million, and that for the port and regasification terminal is about US$ 600 million. The project site at Manappad is barren land devoid of human habitation. The power plant will have a gross output of about 2000MW from five or so Combined

Cycle Power Modules. Power modules include gas turbines and common Heat Recovery Steam Generators (HRSG.). It is envisaged that the heating requirement in the regasification plant and cooling requirement of the power plant can be integrated. Such a system using sea water for cooling could lead to considerable savings. Makeup water for the cooling system can be drawn from the sea. Fresh water for cooling bearings and making up boiler feed can be obtained by desalination of seawater. The desalinated water can also be made available for the residents of the nearby villages.

The proposed Manappad Port is designed for all-weather operation around the year. Two break-water Islands of 2900 m and 900 m long and about 2400 m apart will provide a tranquil basin with a depth of about 14 m. An approach trestle from the shore to the western breakwaters will support the cryogenic pipes for LNG. The LNG unloaded from the tankers will be pumped to cryogenic tanks in the LNG regasification terminal onshore.

The regasification terminal will have a capacity to process 2.5 MMTPA of LNG. The plant comprises of two LNG storage tanks of 120,000 m^3 and a set of open rack vaporizers. The vaporizers convert the LNG stored at low temperature to natural gas at normal temperature using heat from seawater. A submerged combustion vaporizer is also designed as a standby. Adequate land is earmarked around the LNG regasification plant for green belting in line with environmental norms.

6. Project Schedule

Action has been taken to obtain the environmental clearance for the power project envisaged at Manappad. The construction time for power plant is much shorter than that for the port. Hence regasification terminal and the port facilities are to be constructed first. The Manappad port and regasification terminal have both received environmental clearances from the TNPCB and the Ministries of Energy and Finance.

Ministry of Petroleum and Natural Gas of the Government of India has given clearance for setting up the regasification facility at Manappad. The Government of TN has given IGL the permission to handle other general cargo also at the port.

The construction of the port and the regasification terminal will take 36 months from the award of the EPC contracts. The first module of the power plant can be commissioned in about 24 months with the other modules following at two months interval. It is proposed to synchronize the commissioning of the first module with availability of gas from the Manappad terminal. The entire project can become fully operational in 44 months.

7. Financing of the Project

The Energy Demand and Supply Scenario projected by the GOI for the next decade gives room for private power producers for marketing power. The promoters of the project have also signed an MOU with the Power Trading Corporation of India Limited (PTC) for off-take of the capacity on a PPA and trading basis. Clarity on LNG supplies is an essential part of this exercise, and the promoters are engaged in discussions with prospective LNG suppliers and international investors.

8. Socio-Economic Benefits

IGL and IPPL are addressing the benefits for the community living around the Project sites such as Drinking water supply, Public Health facilities, Elementary Schools and Centres for women and children etc which will provide additional employment opportunities and benefits

The green belt to be provided around the project facilities has the potential to bring about beneficial climatic changes in the surrounding areas. Further, the large investment will substantially influence the economic growth of the State while spawning industrial activity.

LOCATION MAP
(Not to Scale)

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