Rashtriya Chemicals & Fertilizers Limited (RCF) is one of the most revered Public Sector Undertaking (PSU) of the Ministry of Fertilizers of Government of India. GoI has accorded Mini Ratna Status to RCF. It was established in 1978 after re-organization of Fertilizer Corporation of India (FCI). RCF manufactures Urea and complex fertilizer (NPK) along with variety of industrial chemicals that are important for manufacture of dyes, leather, pharmaceutical intermediates etc.

RCF, Trombay is commonly known as fertilizer process and chemical factory which is spread over an area of 765 acres including township. The company has acquired various accreditations like ISO 14001, OHSAS 18001, ISO 9001, ISO 50001, PSM, Protect & Sustain Protocol of Product Stewardship etc. During identification of critically polluted industrial areas by CPCB in December 2009, the CEPI Index of Chembur Industrial Area has been calculated equivalent to 69.19 (less than 70) and as such does not fall under critically polluted industrial zone. The individual pollution index for Air has been calculated equivalent 59.75, just below the critical limit of 60. Similarly, the pollution index for water has been calculated equivalent to 50.75 and for land it is 46.00.

With a view to reduce energy consumption, RCF intends to install Gas Turbine Generator (GTG) and Heat Recovery Steam Generation (HRSG) at RCF, Trombay Unit. Total power requirement of RCF Trombay at present is 40.7 MW (approx.) and average steam requirement is about 184 MT/hr (approx.). The total power required is supplied by TATA power and steam required for the complex is generated in the existing gas fired boilers. RCF had appointed PDIL to conduct a Techno- Economic Feasibility Study for installation of GTG for power generation, HRSG for part steam generation and balance steam from gas fired boiler.

The basic objective of the study was to find out the reduction in Energy Consumption of RCF Trombay Unit especially specific energy consumption of Ammonia-V and Urea plant and find out the possible economics of installing GTG at RCF, Trombay complex. To meet the objective of the study, PDIL has prepared the TEFR for installation of GT-HRSG and submitted the same to RCF.

**Project Location**
RCF Trombay Unit is located in Chembur Industrial Area in Mumbai, Maharashtra. Geographically, Trombay unit is located at geo-coordinates of 19°02’10.579" North
BRIEF SUMMARY OF GT-HRSG PROJECT OF RCF, TROMBAY

and 72°53'19.233" East at an altitude of about 6m from MSL. Eastern Express Highway is located at a distance of about 1 km from the unit. Chhatrapati Shivaji International Airport is located in north direction at a distance of about 6 km from Trombay Unit.

Scope of Study

The basic objective of Pre-Feasibility Study is to reduce the Sp. energy consumption of Ammonia-V plant from 8.73 GCal/MT to about 8.40 GCal/MT and Sp. Energy consumption of Urea from 6.75 GCal/MT to about 6.45 GCal/MT. In order to achieve the desired target, it is proposed to install 02 nos. of GTG of 32 MW ISO rating (2×32 MW) and 02 nos. of HRSG units of 65 MTPH capacity each (2x65 MTPH).

Energy Saving

There shall be no power import from TATA, which shall result in effective energy saving but increase in natural gas import. The overall energy saving is summarized below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Savings</th>
<th>Energy Saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>9212 Sm³/HR</td>
<td>76.0 GCal/HR</td>
</tr>
<tr>
<td>Steam Generation in NSGP</td>
<td>-12900 Sm³/HR</td>
<td>-106.43 GCal/HR</td>
</tr>
<tr>
<td>GTG &amp; HRSG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>40727 KWh/hr</td>
<td>116.48 GCal/HR</td>
</tr>
</tbody>
</table>

Energy saving of overall Trombay complex shall be 86.05 GCal/HR.

Saving of Natural Resource

After implementation of proposed energy saving scheme, there will be reduction in steam consumption compared to existing system. The lower the steam generation, more is the saving in water consumption. At the same time, due to changeover from steam turbine drive to motor driven generator, there shall be reduction in cooling water circulation to the extent reduction of steam going through condensing type steam turbine. The reduction in cooling water circulation will certainly decrease the make-up water requirement.

The reduction in make-up water due to above is given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item</th>
<th>(m³/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Due to reduction in steam</td>
<td>27.03</td>
</tr>
<tr>
<td>2.</td>
<td>Due to reduction in CW Circulation</td>
<td>25.85</td>
</tr>
<tr>
<td></td>
<td>Total reduction in make-up water</td>
<td>52.88</td>
</tr>
<tr>
<td></td>
<td>Total reduction in make-up water</td>
<td>≈ 1270</td>
</tr>
</tbody>
</table>
Hence, about 1270 m$^3$ of process water shall be saved per day after implementation of the proposed energy saving scheme.

**Annual Savings**
The total annual savings, likely to be achieved after implementation of proposed changeover scheme, is expected to be around **Rs. 213.45 crore**. The net annual savings due to stoppage of external power has been worked to **Rs. 268.17 crore** and **Rs. 2.30 crore** for saving in Water. However, for natural gas, additional cost of **Rs. 57.02 crore** will be incurred. Besides above, RCF Trombay unit has to retain the power demand agreement with TATA Power for at least half of the total consumption. For that, it is envisaged that RCF has to pay around **Rs 50 lakh** per month to TATA Power. All above mentioned savings and costs are against total investment of **Rs. 481.61 Crore**.

**Estimated Cost of Project**
The estimated cost for the facilities installed for the proposed changeover scheme has been worked out to **Rs. 481.61 Crore**.

**Project Implementation Schedule**
The total time schedule for completion of project would be about **24 months** after receipt of approval from concerned authorities & statutory body.

**Need & Justification**
The need and justification of the proposed project is summarized as under:
- It will reduce overall energy consumption leading to a substantial reduction in pollution load.
- It will totally stop the dependency of RCF Trombay Unit over TATA Power with regard to power supply of about 40 MW.
- The 40 MW power from TATA will be available for national grid.
- It will reduce the consumption of natural resource like water which in turn will have positive impact on environment
- It will impose positive impact on the consumption pattern of electricity in near-by area
- It will reduce the subsidy burden of Government of India (GoI).
- It will maintain the profitability of RCF.
• It will maintain stability in indigenous / domestic market for Urea.
• It will check the import possibility of fertilizers to some extent and yield national savings
• There will be temporary employment generation during construction period.

Conclusion & Recommendation

Conclusion
The proposed project is limited only to installation of GT-HRSG to get self reliance to meet power requirement without any change in the production rate of final product Urea & Ammonia.

The EIA notification of 14th September 2006 related to the proposed project is silent on the accords of EC for modernisation without change in the rate of product/product mix. As per Clause 7 (II), the project requires a critical review and due diligence to fix the methodology of EIA study.

Further, as per CPCB (report published in December, 2009), the proposed project area (Chembur Industrial Area) does not fall in critically polluted zone and have CEPI index of 69.19 (< 70). Hence, it does not require validation of environmental report by RO, MoEF. However, the environmental report is being submitted in every six months to RO, MoEF Bhopal as per relevant notification and no adverse comment is received so far.

Recommendation
The proposed project fulfills the aims & objectives of EIA by reducing energy consumption, waste generation and exploitation of natural resources. The adoption of the proposed project is essential keeping in view the survival of industries and implementation of new techno-economical feasible process of production.

Considering the status of environment around Chembur Industrial Area and results of financial study, it is strongly recommended that the proposed modifications may be implemented at the earliest in the interest of nation as well as RCF.