



ईडी-सीएचटी/2937

दिनांक: 01 अक्टूबर, 2021

श्री राजेश सैनी,  
उप मुख्य वित्त एवं लेखा अधिकारी,  
तेल उद्योग विकास बोर्ड,  
प्लॉट नंबर-2, सेक्टर-73,  
नोएडा (यूपी) - 201 301

**विषय : वर्ष 2020-21 के लिए ओआईडीबी की वार्षिक रिपोर्ट के लिए सीएचटी से संबंधित जानकारी**

महोदय,

कृपया अपने पत्र संख्या 5/11/2021-ओआईडीबी दिनांक 27 जुलाई 2021 का अवलोकन करें। जैसा कि वांछित है, उच्च प्रौद्योगिकी केन्द्र (सीएचटी) से संबंधित वर्ष 2020-21 के लिए ओआईडीबी की वार्षिक रिपोर्ट में शामिल करने के लिए जानकारी संलग्न है।

इस रिपोर्ट की सॉफ्ट कॉपी dcfao.admn.oidb@nic.in पर ईमेल के माध्यम से भेजी गई है। तेल उद्योग विकास बोर्ड द्वारा प्रदान की गई वित्तीय सहायता से शुरू की गई परियोजना से संबंधित कुछ तस्वीरों की सॉफ्ट प्रतियां भी आपके आवश्यक कृपया के लिए भेज दी गई हैं।

धन्यवाद सहित,

भवदीय,

पी. रमन

(पी. रमन)

कार्यकारी निदेशक (कार्यवाहक प्रभारी)

संलग्न.: उपरोक्त अनुसार

## Material for inclusion in the OADB's Annual Report for the year 2020-2021

### 1.0 Introduction

Centre for High Technology (CHT) was established in 1987, to act as the Technical Wing of MoP&NG for implementation of scientific and technological programmes of Govt. of India. Major functions of CHT include:

- Performance Benchmarking of Refineries and Pipelines
- Performance Improvement in Refineries through Best Practices, Special Studies, Operational Improvement and Process Technology
- Energy Efficiency Improvement in Downstream Hydrocarbon Sector
- Petroleum Product Quality Improvement
- Sharing of Best Practices and Information & Knowledge Dissemination
- Integration with Alternative Energies and New Initiatives in Downstream Sector for Future Sustainability
- Promoting Innovations and R&D in Downstream Hydrocarbon Sector. Co-ordination of activities of Scientific Advisory Committee (SAC) on Hydrocarbons of MoP&NG
- Reduction of Water foot print
- Development of import substitute fuels, chemicals and catalysts

During the year 2020-21, an amount of Rs 15.25 crore was received by CHT as grant-in-aid from OADB. Out of this fund, Rs 1.47 and Rs 2.65 crore were released by CHT for R&D projects and special studies respectively during the year.

### 2.0 Major activities undertaken during 2020-21 are as under:

#### 1. Performance Benchmarking of PSU refineries and pipelines

##### (a) Performance Benchmarking of PSU refineries

Performance benchmarking of PSU refineries is being conducted regularly since 2010 by CHT through M/s Solomon Associates (SA), USA. A long-Term Agreement upto 2028 has been made with SA for undertaking benchmarking of the PSU refineries. The study for PSU Refineries for 2020 cycle is in progress.

## **(b) Performance Benchmarking of PSU Pipelines**

Performance Benchmarking Study for Pipelines (Liquid, Gas, LPG) and SPMs for 2018 cycle was initiated for the first time through M/s Solomon Associates (SA), USA. The contract agreement for the second i.e. 2020 cycle was signed on 10<sup>th</sup> November 2021 and the study is in progress.

## **2. Energy Efficiency improvement**

### **1. PAT (Perform, Achieve and Trade)**

PAT is a market based regulatory instrument to reduce specific energy consumption in the energy intensive sector of the economy. PAT is one of the initiatives under The National Mission for Enhanced Energy Efficiency (NMEEE), which is one of the eight missions under the National Action Plan on Climate Change for enhancing energy efficiency, to enhance the cost effectiveness through tradable energy saving certificates.

Refinery sector was included in PAT cycle-2 (2016-17 to 2018-19) along with Discoms & Railways to the eight energy intensive sectors, already covered in PAT cycle-1. Under the scheme, each refinery, including PSU and Private Sector, is mandated to meet the Specific Energy Consumption Targets. The targets are set higher for refineries which have higher specific energy consumption and hence higher potential for energy saving. The energy saving targets were assigned by BEE (Bureau of Energy Efficiency) in consultation with CHT, an associated office under MoP&NG.

The energy reduction Target for refining sector in PAT cycle -2 was set at 5.49% equivalent to 1.01 Million TOE. Against this, the actual energy reduction of 8.05%, equivalent to 1.48 Million TOE was achieved.

For the current PAT cycle-6 (2020-21 to 2022-23), the sectoral energy reduction Target of 5.49% has been retained, which is equivalent to energy saving target of 1.17 Million TOE.

### **2. Long term energy saving Target till 2030 in PSU refineries**

A Roadmap on specific energy consumption for PSU Refineries, aligned with India's NDC of 33-35% reduction in Specific Energy Consumption by 2030 over the base year of 2005, have been prepared. The roadmap has prepared based on various studies conducted both in-house as well as through consultants. The targets are also assigned for midterm (2023-24) based on already identified energy saving scheme as well as long-term (2030) for each PSU refinery.

### **3. Annual audit on furnace efficiency and steam leaks**

In order to improve energy efficiency and reduce energy consumption, CHT in association with the refineries organize surveys every year in the areas of 1) Furnace/Boiler efficiency and 2) Steam leak. These two areas are taken up every alternate year. Survey in area of Furnace/Boiler efficiency was carried out in Jan 2020.

### **3. Refinery Performance Improvement Programme (RPIP)**

CHT in coordination with the refineries finalized refinery-wise global consultants for carrying out refinery performance improvement programme for 15 PSU refineries which aims at yield and energy improvement. RPIP Phase -I has already commenced in seven refineries (HPC-Mumbai and Visakh, BPC-Mumbai and Kochi, IOC-Panipat, Paradip and Mathura) and the programme is under various stages of implementation

In the second phase, EOI was floated again on 30<sup>th</sup> July 2020, to identify new consultants over and above the existing ones who are already carrying out RPIP Phase I. Consultant shortlisting through EOI is complete and refinery specific tender shall be floated once clearance is received from the refineries (IOC-Barauni, Gujarat, Haldia, Bongaigaon, Guwahati, Digboi, CPCL-Manali and NRL).

### **4. Special studies for the PSU refineries**

#### **Development of Water Consumption Norms and Reduction of Water Footprint for Refineries**

CHT in association with refineries carried out a study through EIL for Development of Water Consumption Norms and prepared a roadmap for Reduction of Water Footprint in refineries with short term (<2 years) and long term (>2 years) targets.

#### **Feasibility study for production of ethanol using waste gases through M/s LanzaTech, USA**

The study for BPCL-Mumbai Refinery has been completed. The study for Numaligarh Refinery (NRL) is in progress.

#### **Feasibility & Business Model for Reference Fuel by EIL & IOC R&D:**

Reference Fuels are used by OEMs for testing their vehicles. These fuels are imported mainly from Germany. The study has been planned in three phases. The study for Phase-1 (Paper Blend using LP Model) has been completed and Phase-2 (lab blending) is in progress. It is possible to make Reference Gasoline from IOC-PR

streams based on the Laboratory study. Quality issue of Reference Diesel being addressed using different grades of Bio-diesels and additives.

#### **5. Refining & Petrochemicals Technology Meet (RPTM)**

With a view to keep abreast with the technological developments and disseminate information, CHT organises RPTM every year in association with one of the PSU oil company on different theme of relevance. The event is attended by large number of process licensors, catalyst suppliers and delegates from India and abroad. The last 24<sup>th</sup> RPTM was organised along with MRPL in Bengaluru during 19<sup>th</sup> to 21<sup>st</sup> January, 2020. The event had presentation of 80 oral papers spread over 15 Technical Sessions and 78 papers in Poster Sessions along with 16 Exhibition Stalls and was attended by around 1500 delegates/invitees from India and abroad. The 25<sup>th</sup> RPTM was planned in Mumbai in association with HPCL but could not be held due to COVID-19 pandemic.

#### **6. Implementation of PM JI VAN Yojna**

Pradhan Mantri JI-VAN Yojana was announced in March, 2019 for promotion of 2G ethanol by providing Viability Gap Fund (VGF) for setting up of 12 commercial units (combined capacity of ~40 crore litre per annum) and 10 demonstration units at semi commercial level. CHT has been nominated as nodal agency for implementation of PM JI VAN Yojana. Request for Selection (RFS) for shortlisting of eligible Project Developers (PD) was issued on 26<sup>th</sup> August, 2019. The project proposals were evaluated by SAC and based on its technical recommendation, Steering Committee of CHT for PM JI-VAN Yojana, approved VGF / Financial assistance for 4 commercial projects and 1 demonstration project.

As advised by SAC, it is proposed to incorporate few amendments in the scheme to enlarge the scope and solicit broader participation. Subsequently, RFS shall be issued for remaining 8 Commercial and 9 Demonstration projects after the amendments.

#### **7. Indigenous Technology Development**

CHT co-ordinates the activities of Scientific Advisory Committee (SAC) on Hydrocarbons of MOP&NG in identifying and funding of research projects for downstream hydrocarbon sector. SAC approves and steers projects of national importance and refining operations. SAC is headed by Dr. Anil Kakodkar, an eminent Scientist and DAE Chair Professor, BARC.

During 2020-21, SAC had three meetings till December 2020. SAC had detailed review of the on-going projects and new project proposals.

During the year, M/s EIL along with BPC Kochi has developed indigenous Desalter Technology under the project funded by CHT.

ED CHT has been nominated as Technology officer to represent MoP&NG. CHT provided input for the development of Science, Technology and Innovation Policy (STIP) of Govt. of India.

#### **8. Hydrogen Research**

SAC has identified hydrogen research and its promotion of as one of the major focus areas. CHT has funded various projects for carrying out research and demonstration of technologies including production of hydrogen from different pathways (including electrolysis of water and biomass gasification), development of fuel cell buses in tie-up with vehicle manufacturer as well as transport operators, storage and dispensing of hydrogen, production of HCNG and demonstration of HCNG fuelled buses in Delhi.

#### **9. Development of Catalyst Manufacturing Plant in India :**

The Refining Industry employs many catalytic processes where catalysts play major role in operation and profitability improvement. However, there is no major catalyst manufacturing facility in India and the country is mostly dependent on catalyst import leading to vulnerability of this sector. It is with this intent that MoP&NG constituted a Committee for Setting up of Catalyst Manufacturing Unit in India vide F. No. R-11029/34/2020-OR-II/E-34716 dated 6<sup>th</sup> August,2020. Catalyst suppliers from across the world were invited for the deliberations with the committee to understand their capabilities & intent. Out of eight potential catalyst suppliers, the Committee shortlisted five potential ones for detailed specific interaction. The committee suggested the path forward to materialise the intended purpose and concluded that in the coming years, the burgeoning refinery and petrochemical industry would require a secure supply of huge quantity of different types of catalysts, hence, it is imperative to invest in the indigenous production of catalyst and associated research and development. Committee recommends formation of Joint Venture/s among interested partners wherever there is synergy in the catalyst manufacturing value chain. The details of the JV can be formulated based on the mutual agreement among the prospective partners. Catalyst manufacturing units demand huge investment and a suitable government policy to bolster the initiative. The committee is of the view that policy intervention by the government is required to promote indigenous catalyst manufacturing. A report including above activities submitted to MoP&NG in month of Feb 2021. Further discussions with the prospective partners is led by HPCL.

#### **10. Integrated Monitoring and Advisory Council (IMAC)**

During 2<sup>nd</sup> meeting of IMAC chaired by Hon'ble Minister, P&NG, it emerged that holistic and coordinated strategy in close coordination with all IMAC Member Ministries is imperative towards the exercise of Reassessment of the Roadmap to implement the Hon'ble Prime Minister's vision of reducing oil import dependency. Accordingly, 6 Working Groups have been constituted for monitoring the progress on various initiatives, schemes, projects and strategies taken under respective Member Ministries domain with a view to augment Supply of energy, Savings in energy as a means to achieving oil import reduction.

Meetings of the Working Group on R&D and Innovation as well as of Working Group on Biofuels, constituted under IMAC were held. The baseline as well as final report has been submitted to MoP&NG.

#### **11. Report on enhancing Production of Petrochemicals in Refineries**

A Committee was constituted by MoP&NG to undertake detailed study on Business Opportunity for Petrochemicals in India. The Committee identified major petrochemicals based on consumption, value, import, growth and capacity in India including projected capacity addition for identified petrochemicals. The detailed report was submitted to MoP&NG.

#### **12. Stream Sharing among Refineries**

A summary has been submitted to MoP&NG regarding losses incurred by refineries due to not sharing of intermediate streams on account of dual tax regime.

#### **13. Study on Additional Strategic/Operational Crude Oil Storage**

Creation of petroleum reserves is one of the several contingency measures to meet the energy security. A Committee was constituted by MoP&NG to carry out detailed study on all aspects of common crude oil storage in the country. The report has been submitted to MoP&NG.

#### **14. Awards**

CHT is actively associated with the following Annual Awards instituted by Ministry of Petroleum & Natural Gas, Government of India:

- Refinery Performance Improvement Award
- Saksham Awards based on Steam Leak and Furnace Efficiency Surveys
- Innovation Award

The Awardees for the first two categories are selected by the selection committee set up by MoP&NG. For Innovation Awards, nominations for the following three

categories were invited from the Industry and the Awardees are selected by the committee constituted by Chairman, SAC, based on guidelines of Governing Council of CHT:

- i) Best Indigenously Developed Technology
- ii) Best Innovation in Refinery (refinery/ group/ individual)
- iii) Best Innovation in R&D Institute (institute/ group/ individual)

These awards are presented during the Inaugural function of the Refining & Petrochemicals Technology Meet (RPTM).

#### **15. Activity Committee Meetings**

With the aim of sharing of best operational practices & improvements and dissemination of information on latest developments, CHT organised various two nos. online Activity Committee Meetings in critical areas/ technologies in refining sector and pipelines operations. Activity Committee Meet on “Strategies for Turnaround Management” was organized by CHT for the first time virtually in collaboration with HPCL-Visakh Refinery. The Activity Committee Meet on Digitalization in Refining Business Process was also held online in association with BPCL-Kochi Refinery.

#### **16. Swachhata Ranking for Oil & Gas PSUs & attached offices**

MoP&NG, its attached offices and Oil & Gas CPSEs under the administrative control of MoP&NG celebrated Swachhata Pakhwada fortnight from 1<sup>st</sup> to 15<sup>th</sup> July, 2020. During Swachhata Pakhwada, Oil & Gas CPSEs and attached offices of MoP&NG were ranked based on the Swachhata Index developed by Centre for High Technology. The awards were presented to the winners by Hon’ble Minister of Petroleum & Natural Gas and Steel on 14<sup>th</sup> December, 2020.