

Annexure-3 to the Directors' Report

# Energy Conservation, Technology Absorption and Foreign Exchange Earnings & Outgo

[Section 134(3)(m) of the Companies Act, 2013, read with Rule 8(3) of the Companies (Accounts) Rules, 2014]

## A. Conservation of Energy

### (i) Steps Taken for Conservation of Energy

During the year, the following measures were taken for energy and resource conservation:

#### a. Electricity

The Company continued its efforts to utilise energy optimally at its manufacturing facilities and office locations in India.

At Chinchwad and Savli, lighting systems were improved by optimising load and switching over to Light Emitting Diodes (LEDs) in workshops. Among the initiatives in Dahej and Jhagadia were the installation of VFDs on the cooling water pump and air dryer, arresting compressed air leaks, and replacing inefficient cooling water pumps with efficient ones. At Chinchwad, a Thyristor-based welding machine was replaced with an inverter-based welding machine.

#### b. Fuel

At the Dahej plant, the company has initiated the switch from natural gas to biomass, and is planning to commission the project in the next year. At Paudh, initiatives such as improving the steam-to-fuel ratio in boiler operation have resulted in saving of 50.2 MT of furnace oil.

All these measures, including solar rooftop installations, have resulted in an annual saving of Rs. 138 lakh.

#### c. Water

The Company remains committed to conserving water by recycling wastewater, harvesting rainwater, reducing water consumption, and reducing water losses in all domestic manufacturing and office locations. These efforts at Chinchwad, Savli, Paudh, Solapur, and Shirwal factories have resulted in saving 2,44,761 m<sup>3</sup> of water during the year.

### (ii) Steps Taken by the Company for Utilising Alternate Sources of Energy:

The Company continues its efforts to utilise alternative sources of energy at the plant and office locations. The Company has initiated purchasing renewable energy through open access at Chinchwad, Paudh and Shirwal plants and has installed solar rooftop capacity of 930 kWp at Sri City this year. A total of 2,172 MWp of solar power will be generated at Savli, Jhagadia, Sri City plants, and Pune offices. This year, the total renewable power generated and consumed was 5.76 lakh units.

## B. Technology Absorption

### 1. Efforts, in Brief, Made Towards Technology Absorption

- The Company initiated the project on methanol production from Indian coal, closely working with the Indian Institute of Technology (IIT) Delhi and NITI Aayog. The project is funded by the Department of Science and Technology, Ministry of Science & Technology, Government of India. The Company has worked on some novel processes for the conversion of Indian coal to methanol. Further, the plant installation and commissioning were completed, and the first batch of methanol was produced in February 2022.
- New applications of multi effect evaporator technology for zero liquid discharge (ZLD) have been stabilised and are being monitored through a remote monitoring system.
- The Company has developed capacitive deionisation (CDI) technology as an alternative to RO-based drinking water treatment. This all-indigenous technology includes the development of advanced electrochemical materials, the coating process, and unique power electronics and embedded controls. The control system has IoT capabilities.

A successful demonstration of five units of 200 L/hr capacity CDI units across India was achieved.

This development will lead to the future business possibility of a CDI system for the Company.

- The Company has developed a thermally activated cooler (TAC) for mobility application that has been integrated on a European coach bus. A THVAC demonstrator bus on a premium European coach was successfully installed as part of THVAC's market deployment strategy. The THVAC integrated coach has been approved for roadworthiness by European regulatory authorities. The THVAC demonstrator bus on-road performance tests yielded impressive fuel savings. A leading Indian bus OEM has shown interest in the THVAC technology and a proof of concept is underway for the latest BS-6 bus.
- In the zero liquid discharge (ZLD) category, the Company has developed a mechanical vapour recompression (MVR) evaporator system. One commercial unit is commissioned, and two are under execution stage in the field. The MEE & MVR series is under development.

## 2. Benefits Derived as a Result of the Above Efforts – Product Improvement, Cost Reduction, Product Development, Import-Substitution, etc.

- The ZLD systems developed by the Company offer nearly 20% cost-benefit compared to existing technologies
- The MEE for ZLD systems developed by the Company offers nearly 20% cost-benefit compared to existing technologies
- CDI provides cost-effective solution to the drinking water segment with reduced wastage of water. As a result, it reduces overall power consumption by 30% when compared to RO

systems, while CDI reduces water wastage by more than 100% compared to RO

- TAC integrated bus provides direct benefit to the end-user in terms of better fuel economy and thus reduces the TCO. The lesser fuel burned for AC due to TAC contributes to a green environment by reducing CO<sub>2</sub> and carbon footprint. The overall fuel savings amount to 5%.
- Mechanical Vapour Recompression (MVR) is a thermal evaporation system that provides an efficient solution under the ZLD category besides Multi Effect Evaporation (MEE) systems earlier developed. This is a new product line for the company with a USP of 10% lower consumption than the competition.

## 3. In the Case of Imported Technology (Imported during the Last Three Years Reckoned from the Beginning of the Financial Year), the Following Information is Furnished:

Technology Imported	Year of Import	If Technology has been Fully Absorbed	If not Absorbed, Reasons and Future Plan of Action (FY 2020-21)	If not Absorbed, Reasons and Future Plan of Action (FY 2021-22)
Wet & Dry Flue Gas Desulphurisation (FGD)	2015	In the process of absorption	Your Company has bagged two orders in FY 2019-20. Wet FGD technology will be absorbed to a great extent by the time these orders are executed and commissioned with assistance from the technology partner	Your Company has bagged a total of four orders, and all are under execution. Wet FGD technology will be absorbed to a great extent by the time these orders are executed and commissioned with assistance from the technology partner

## 4. Expenditure on R&D:

Particulars	Amount in Rs. crore	
	Current Year 2021-22	Previous Year 2020-21
a. Capital	0.12	0.21
b. Recurring	31.25	26.56
c. Total	31.38	26.77
d. Total R&D expenditure as a percentage of turnover	0.5%	0.6%

## 5. Foreign Exchange Earnings and Outgo:

The Company's operations in export markets are elaborated in the Management Discussion

and Analysis section which is a part of the Directors' Report.

During the year, the Company had net foreign exchange inflow of Rs. 686 crore as against a net inflow of Rs. 610 crore in the previous year.

### For and on behalf of the Board

#### Meher Pudumjee

Chairperson  
[DIN 00019581]  
Pune, May 20, 2022