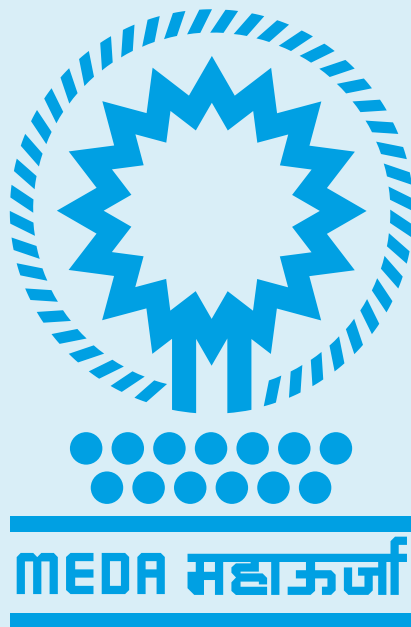




# **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)**

( A Govt. of Maharashtra Institution )

## **ANNUAL REPORT - 2018-19**



## PREFACE

### DIRECTOR GENERAL

It gives me immense pleasure to present this Annual Report of Maharashtra Energy Development Agency (MEDA) for F.Y. 2018-19. Renewable energy is integral part of the energy sector in the state. To step forward, MEDA is contributing for promotion of renewable energy in the state. In this FY under comprehensive RE policy-2015 achievement of 412.975 MW & aims to capacity addition of 14,400 MW upto 2020. This flagship policy will definitely increase the contribution of renewable energy sources in the basket of electricity.

The potential of wind energy is assessed to be 9400 MW in Maharashtra. MEDA has taken big strides in wind power generation. Grid-connected wind power projects of as much as cumulative 4792.01 MW capacity have been commissioned upto F.Y. 2018-19. MEDA also continues its wind monitoring exercise - the largest in the country, with 409 wind monitoring stations installed by March 2019. MEDA has also initiated the solar resource assessment programme in the state. We are the first state in the country to set up Solar Radiation Resource Assessment Stations (SRRA) on its own. SRRA will generate accurate and investment-grade solar radiation data, so far MEDA and NIWE jointly installed 17 SRRA station in the state.

There is a continuous effort on exploiting the potential of other renewable energy sources like Bagasse and solar. During the year 2018-19, bagasse cogeneration power projects of 329.7 MW and Solar PV projects of 41 MW capacities have been commissioned. The capacity installation of renewable energy projects during 2018-19 adds up to 412.975 MW capacity additions in one year.

MEDA has been promoting the Off-grid RE sector as well, along with the grid connected RE power generation. Among off-grid RE sector, MEDA has big achievement in implementing Atal Solar Agricultural Pump Scheme i.e., 7000 pump sets as well as achievement of 50 MW capacity installation under central sponsored Grid Connected Roof Top Solar Scheme in State. In AMRUT Mission, MEDA implementing the grid connected solar power project for water pumping stations and water & sewage treatment plants of Urban Local Bodies.

MEDA is also working as the State Designated Agency for energy conservation / energy efficiency activities in the State. The energy conservation activities are being promoted through various schemes from the state budget and Bureau of Energy Efficiency (BEE) funds. The two important schemes launched by MEDA, through which financial assistance is given for demonstration projects of energy efficiency in government buildings and in urban local bodies have been receiving enthusiastic response. So far, 113 demonstration projects completed upto FY 2018-19. The schemes relating to energy audit have also gained momentum. These schemes have introduced and strengthened the concept of energy audit in the industry and government sector. Under State Level Energy Conservation Award Scheme In the last 14 years of Award Scheme (2003-2019), the participating units have collectively saved approx. 4662 Crore & during FY 2018-19 its around Rs.447 Crores. In energy terms, 2969 Million kWh of electrical energy and 484 MW equivalent avoided capacity was saved through the energy conservation measures by the all-participating units during FY 2018-19.

Apart from State's EC schemes, MEDA also implemented BEE energy conservation programmes includes Energy Efficiency Demonstration projects in various sectors, Energy Efficient measures in 100 Government Schools, Modern Energy Efficient Village campaigning programmes, Workshops / Trainings on Energy Conservation programmes, Development of materials on Energy Conservation for its incorporation in the ITI and Diploma Engg. College Curriculum of the State, Energy Conservation Day and Energy Conservation Week, Establishment of Energy Conservation Building Code in state and Perform, Achieve & Trade (PAT) Scheme.

MEDA participated in several national and state level exhibitions to disseminate knowledge about renewable energy and energy conservation. MEDA has represented Maharashtra by participation in II<sup>nd</sup> RE INVEST held at New Delhi in October 2018 by Ministry of New and Renewable Energy, GoI. With a different and public-oriented outlook, I am sure that, MEDA with its inspired team will keep up the tradition of excellence in the spheres of renewable energy and energy conservation.

**Director General, MEDA**



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## 1. INTRODUCTION

Maharashtra Energy Development Agency (MEDA) registered under Societies Registration Act – 1860, commenced actual functioning from July 1986. MEDA's mandate is to undertake development of renewable energy and facilitate energy conservation in the State of Maharashtra, as a State Nodal Agency. Controlling body of MEDA is the Governing Body, with Hon. Minister for Non-conventional Energy, Maharashtra State, as a Chairman, Hon. Minister of State for Non-conventional Energy as a vice Chairman, Secretaries / Principal Secretaries of six other departments of Govt. of Maharashtra are as Members and Director General, MEDA, as a member secretary.

The broader objective is to promote, develop and diffuse knowledge in the various fields of Renewable Energy Source and assist the Government of Maharashtra and the Govt. of India in the efforts to develop and promote Renewable and alternate energy sources / technologies, evolve and promote energy conservation measures.

Life of today is impossible without energy. At present more than 62% of the total energy is based on fossil fuel (coal, mineral oil, natural gas). While remaining 38% is through hydroelectric projects and RE projects. When the electricity is generated by using the conventional sources, green house gases are emitted, i.e., carbon monoxide, carbon dioxide and sulphur dioxide etc. which when released into atmosphere cause global warming. The increase in temperature due to global warming has become a threat for the very existence of the human race. Further, taking into account the scarce availability of conventional energy sources and ill-effects of their uses, it is the need of hour to produce energy that is pollution free and eco-friendly.

The Govt. of Maharashtra in line with the policy of Central Govt. has adopted the policy of achieving the target of renewable energy up to 13.75% of conventional energy in the State and accordingly declared policies from time to time. Among various non-conventional energy sources, Wind Energy is one of important resources that has been widely tapped in the state. Besides this, Biomass, Bagasse, Small Hydro, Urban & Industrial Waste & Solar Energy are other main resources of renewable energy. The potential of various non-conventional energy sources and its achievement is given below.

### **A) POWER GENERATION FROM RENEWABLES: MEDA'S NEW FRONTIER:**

Maharashtra is second in the country in production of power from renewables by having around **8754.318 MW** installed capacity **upto 31/03/2019**. (Including Small Hydro).

Sr. No.	Source	Potential in country (MW)	Potential in the state (MW)	Achievement (MW) (31/03/2019)
01	Wind	49130	9400	4792.01
02	Bagasse co generation	5000	2200	2283.55
03	Biomass	16881	781	215.00
04	*Small Hydro Power (SHP)	15000	732	366.475
05	Urban waste	1700	287	3.00
06	Industrial waste	1700	350	35.833
07	Solar Photovoltaic & Solar Thermal Power	20-30 / Sq.k.m.	49/sq.km.35/sq.km.	1058.45
	<b>Total</b>	<b>89411</b>	<b>13750</b>	<b>8754.318</b>

\* Small Hydro Power Projects are implemented by Irrigation Department, Govt. of Maharashtra.

**B) CUMULATIVE ACHIEVEMENTS UPTO 31ST MARCH, 2019 :**

Sr No	Particulars	Cumul. Achievet. upto 31 <sup>st</sup> March, 2018	Achvt. in 2018-19	Cumul. Achievet. upto 31 Mar, 2019
<b>1</b>	<b>POWER GENERATION</b>			
01.	Wind Power Project	4781.81	10.6	4792.01
02.	Bagasse co generation Power Project	1953.85	329.7	2283.55
03.	Biomass Power Project	215.00	0	215.00
04.	Small Hydro Power Project	335.525	30.95	366.475
05.	Urban waste	3.00	0	3.00
06.	Industrial waste	34.713	0	35.833
07.	Solar Thermal & Photovoltaic	1017.45	41	1058.45
	<b>Total</b>	<b>8341.348</b>	<b>411.85</b>	<b>8754.318</b>
<b>2</b>	<b>Energy Conservation Programme</b>			
a	Energy Audit (Nos.)	1089	223	1312
b	Walk Through Energy Audit (Nos.)	2408	561	2969
c	Waster Heat Recovery	11	0	11
d	Replacement of CFL at Gram panchayat (CFL) & (LED – 11696 Nos.)	159966	0	159966
e	Demo Project in Govt. / Semi Govt. office buildings of Energy Conservation (Nos)	90	16	106
f	Installation of EC Devices in Municipal Councils-(Nos)	36	2	38
3	Wind Monitoring Stations	409	0	409
4	Solar Radiation Assessment Centres	8	0	8

Sr No	Particulars	Cumul. Achievet. upto 31 <sup>st</sup> March, 2018	Achvt. in 2018-19	Cumul. Achievet. upto 31 Mar, 2019
5	Common Study Room	18603	0	18603
6	Village Electrification (Villages)	586/703	0	586/703
7	Solar Power plants in Govt. Buildings	113	0	113
8	Briquetting Project (Nos.)	170	0	170
9	Solar Energy Applications in Ashram Shala – Solar Home Light, Street Light, Water Heating System & Power Packs	10	0	10
10	Wind Solar Hybrid System in Ashram Shala & Hostels (Nos.)	20	0	20
11	Exhibitions (Nos.)	288	17	305
12	Wind Solar Hybrid System (Nos./kW)	293/2283	0	293/2283

**C) Grants received from State Govt. in 2017-18 & 2018-19.**

(Rs. in lakhs)

Sr. No	Programme	2017-18	2018-19
1	Non-Conventional & Renewable Sources of Energy (NRSE) - 28100034	1760.00	4275.12
2	Maharashtra Energy Development Fund / Green Cess Fund (GCF) - 28100123	8940.00	18264.24
3	Solar Agriculture Pump - 28100902	0.00	1751.09
4	13 <sup>th</sup> Finance Commission - 28100911	40150.00	20762.40
	<b>TOTAL</b>	<b>50850.00</b>	<b>45052.85</b>

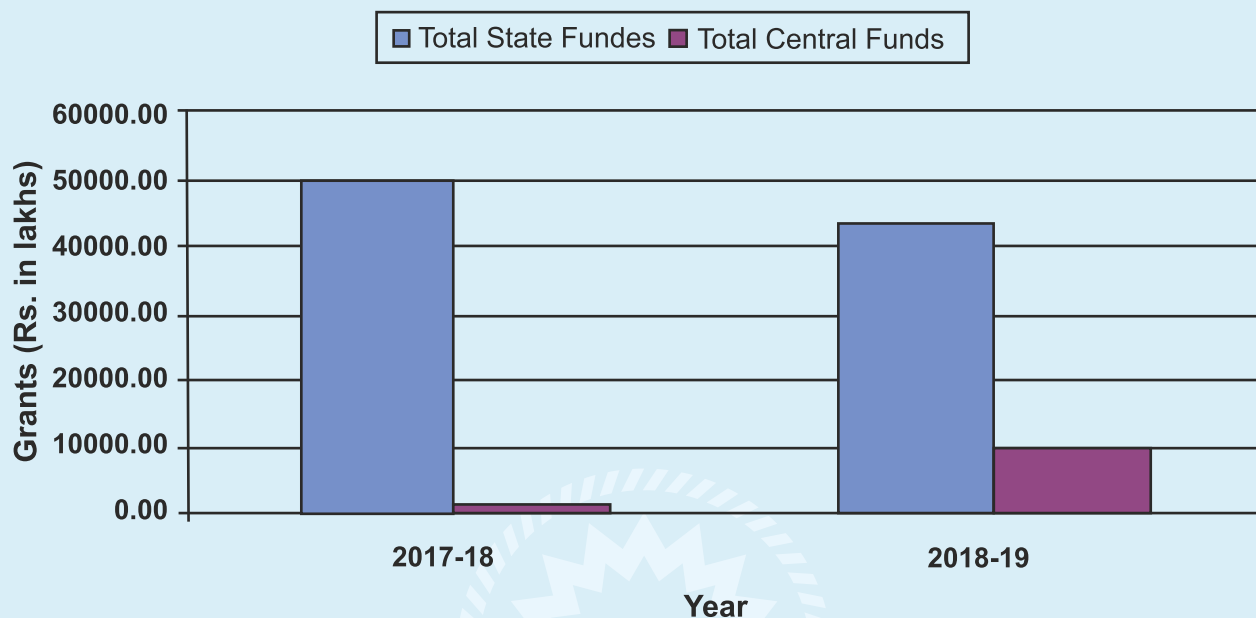
**D) Comparison between State and Central Govt. Plan Grants in 2017-18 & 2018-19.**

(Rs. in lakhs)

Year	2016-17	2017-18
Total State Funds	50850.00	45052.85
Total Central Funds	378.51	10657.52
Total	51228.51	55710.37



### Comparison between State & Central Govt. Grants



MEDA महाऊर्जा

## 2. WIND POWER PROJECTS

### I. Wind Energy :

Wind Energy is the energy created due to uneven heating of the earth's surface and rotation of earth. Uneven heating causes difference in the air pressure, which causes air to flow from high pressure region to low pressure region. This phenomenon is termed as 'wind'. Wind contains tremendous amount of energy which can be utilized to generate power on a large scale.

### II. History :

The application of wind energy for producing electrical energy was introduced later in the 20<sup>th</sup> century. By 1910 several hundred wind turbine generators rated between 5 KW and 25 KW were in operation in Denmark. By 1930s several wind power generators were installed in various parts of the world. But due to the higher cost of installation, the increase in number of systems was very less. By the early 1960s, interest in wind power as a viable and alternative source of power generation somewhat declined because other energy sources were simple and easily available. Wind energy was not found to be cost-effective in comparison with the fossil fuel systems of that age. After the oil crisis in 1970s, wind turbines have been developed on commercial



scale and have received more importance after 1980, the second oil crisis. Presently it is one of the major sources for supplementing energy needs of many countries including India.

### III. Progress in India :

India is now recognized as a leading country in the world for the development and utilization of renewable energy, particularly in wind power development. In fact, power generation from wind has emerged as one of the most successful programs in the renewable energy sector. With an installed capacity more than 34200 MW, India is the 4<sup>th</sup> largest wind-power producing nation in the world. Most of this capacity has come through private investment. Billions of units of electricity have been fed to various State grids from these projects. World's largest wind resource assessment program is also initiated to support these efforts. New initiatives have been taken for re-assessment and expansion of the wind resource data base; and motivating large private sector corporations, public sector units and power utilities to set up wind power projects. Local manufacturing capacity has been established and its and wind turbine components are being exported to USA, Europe and several developing countries.

#### **IV. Wind Power Projects in Maharashtra :**

Wind Energy has paramount importance in the field of New & Renewable Energy Sources. Naturally, the Ministry of New and Renewable Energy, New Delhi has undertaken the Wind Energy program all over the country very intensively through nodal agencies in their respective states. In Maharashtra, this program is implemented through MEDA. 51 sites have been identified of more than 200 w/m<sup>2</sup> wind power density in the state of Maharashtra with the help of NIWE, Chennai. Potential for wind power projects in the state is of 9400 MW. GOM has formulated conducive policy framework which has



evoked positive response from entrepreneurs and investors to set up commercial wind power projects. With the declaration of attractive and conducive policies on Wind Power Projects, many private sector investors have been inspired to set up their projects in Maharashtra.

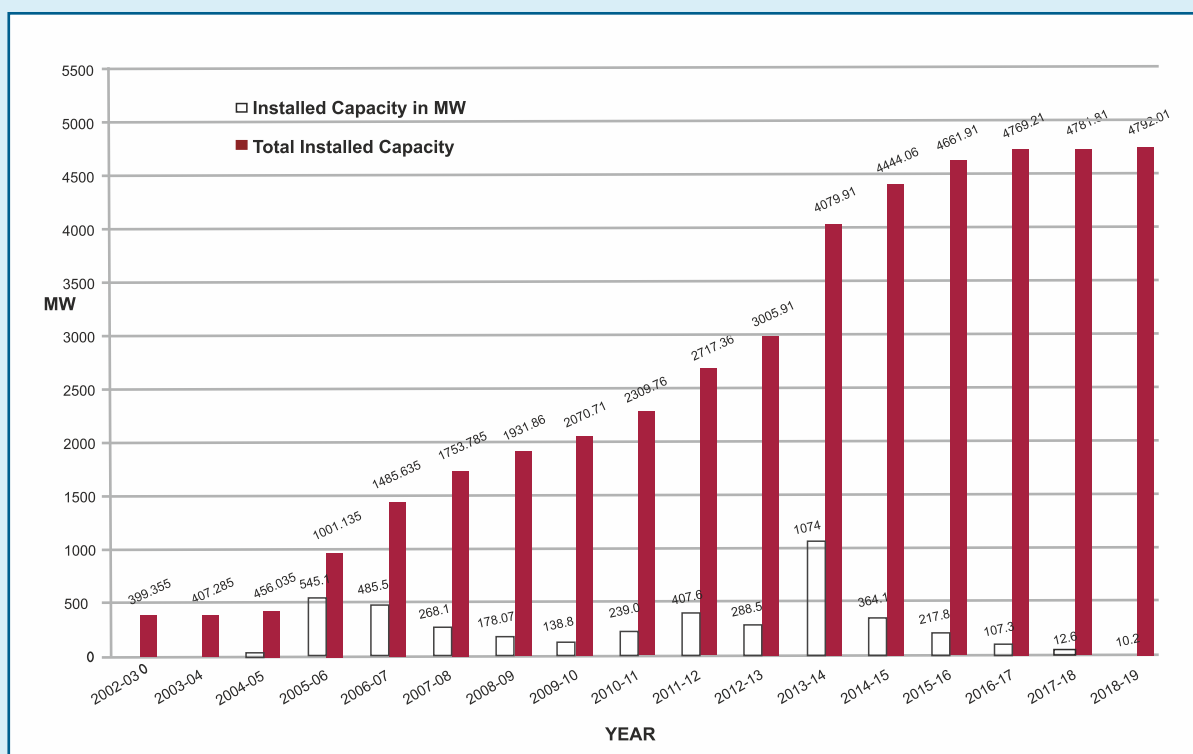
Govt. of Maharashtra has declared comprehensive policy for grid connected power projects based on New & Renewable (Non-Conventional) Energy Sources - 2015 vide Govt. Resolution No. NCE-2015/C.R. 49/Energy-7 dated 20<sup>th</sup> July 2015 & its amendment vide GR. No. NCE-2016/C.R.110/Energy-7 dated 3<sup>rd</sup> December 2016 and its methodology vide Govt. Resolution No. NCE-2015/C.R. 49/part-8/Energy-7 dated 9<sup>th</sup> September 2015.

#### **Renewable Energy Policy for Maharashtra – 2015**

Target: - 5000 MW

1. Target for sale of power to Distribution Licensees: - 1500 MW Achievement: - 1493 MW
2. Target for sale of power inside the state: - 500 MW (Captive/Group Captive/Third Party Sale)  
Achievement: - 133.3 MW
3. Target for sale of power outside the state: - 3000 MW (Captive/Group Captive/Third Party Sale)  
Achievement: - Nil

Cumulative Capacity of projects set up and commissioned by the private sector up to March 2019 is as follows



Wind power project had fed 7575.353 Million units of electricity in the state grid in FY 2018-19. Year wise installed capacity of wind power projects in the state of Maharashtra up to March 2019 is as follows :

Year Upto	Installed Capacity in MW
2002-03	399.355
2003-04	7.93
2004-05	48.75
2005-06	545.1
2006-07	484.5
2007-08	268.15
2008-09	178.075
2009-10	138.85
2010-11	239.05
2011-12	407.6
2012-13	288.55
2013-14	1074



Year Upto	Installed Capacity in MW
2014-15	364.15
2015-16	217.85
2016-17	107.30
2017-18	12.6
2018-19	10.2



### 3. BAGASSE BASED CO-GENERATION POWER PROJECTS

#### Introduction –

Bagasse is a by-product produced during crushing of cane in sugar factory. Bagasse is an excellent renewable source for generating steam and power. In view of continuous shortage of power and limited fossil fuel reserves this source of renewable energy is more acceptable.

Sugar industry is the backbone of the Indian agriculture sector. There are 225 registered sugar factories in the state. Power is co-generated from bagasse which is left after extraction of juice from cane in sugar industry. Along with the saving of fossil fuels, cogeneration also allows to reduce the emission of greenhouse gases (particularly CO<sub>2</sub> emission). The production of electricity being on-site, the burden on the utility network is reduced and the transmission line losses eliminated.



The available surplus power potential as estimated by VSI, Pune in the state through co-generation is about 2550 MW (on installed capacity). To tap this power potential, GoM declared an attractive policy on 20-7-2015.

With advancement of technology, it has become possible to utilise the raw material from (bagasse) sugar industry as fuel in most efficient manner for generating surplus power. Due to this many sugar factories opted to go for efficient cogeneration. The surplus power now being fed in to the grid is approximately 1300 MW. Therefore, there is still enough potential left to be tapped.



The available power potential with the cooperative sugar factories can be harnessed provided they are financially supported. In view of this, Urjankur Nidhi Policy has been declared by GoM for financing all types of RE projects. This fund can be utilized for the co-generation. Further an exclusive scheme for Cooperative sugar factories for setting up Cogeneration projects has also been declared by cooperative dept. GoM in the year 2008 in said scheme 5-10% contribution is to be borne by co-operatives. For setting up cogeneration with 30% from SDF and 60 % will come from Banks / FIS as a loan.

## 1) Technical Information and Application –

### Principle –

Cogeneration or Combined Heat and Power (CHP) is defined as the sequential generation of two different forms of useful energy from a single primary energy source, typically mechanical energy and thermal energy. Mechanical energy can be used to drive an alternator for producing electricity. Thermal energy can be used either for direct process applications like sugar manufacturing or for indirectly producing steam.



Bagasse is fed into the high-pressure boiler for producing high-pressure steam. This steam is injected into backpressure or extraction condensing turbine. The turbine is coupled to turbo generator for producing electricity. The condensing turbine is used during off-season whereas the backpressure turbine can be used only during the crushing season.

### Basic components of Bagasse Cogeneration power project –

Boiler, Turbine, Generator, Water/Air Cooled Condenser, Electrostatic precipitator (ESP)

**Application** – The surplus power generated from cogeneration route is fed into the grid. This helps to generate additional revenue to the factory.

## 2) Govt. Policies Announced –

### A) MNRE Policy –

The MNRE, GoI vide sanction No. 3/141/2017-CPG dated May 11<sup>th</sup>, 2018 is extending Central Financial Assistance (CFA) to Bagasse Cogeneration power projects at the rate of Rs.25 Lakh/MW.

\* The policy details can be seen at [www.mnre.nic.in](http://www.mnre.nic.in)

### B) State Policy -

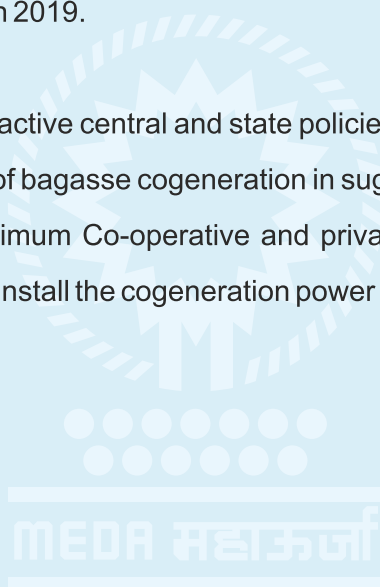
GoM declared Integrated Non-conventional Energy Generation policy dated 20-07-2015 and its implementation methodology 09-09-2015.

**C) MERC Order -**

Financial Year	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff (Rs/kWh)	Benefit of Accelerated Depreciation (if availed) (Rs/kWh)	Net Tariff (Rs/kWh)
During FY 2018-19	2.28	4.17	6.45	0.14	6.31

**D) Achievement for the current year –** The total installed capacity of bagasse cogen projects in the FY 2018-19 is 329.7 MW which has raised the total co-gen capacity in the state to 2283.55 MW by the end of March 2019.

**E) Next Year Plan –** Having attractive central and state policies for cogeneration, target of 100 MW is fixed for implementation of bagasse cogeneration in sugar factories during the FY 2019-20. It is expected that the maximum Co-operative and private sugar factories will avail the benefit of this scheme and try to install the cogeneration power projects in following year.





## 4. SMALL HYDRO POWER PROJECTS

### Introduction –

Hydro Power is a renewable and pollution free resource. The importance of decentralized power generation has made Small Hydro Power (SHP) an attractive venture. It has short gestation and almost negligible impact on environment. The necessity to secure energy security and abates global warming renewable energy projects are gaining more attention not only in the developing countries but also in the developed ones. Small hydro is significant for off-grid, rural, remote area applications in far flung isolated communities having no opportunity of grid extension for years to come. Small Hydro is operationally flexible, suitable for peaking support to the local grid as well as for stand alone applications. Small Hydro power projects serves to enhance economic development and living standards especially in remote areas. In India Hydro power projects, up to 25 MW capacities are classified as Small Hydro.

In order to develop this sector, the Govt. of Maharashtra vide its policy dated 8<sup>th</sup> December, 2005, has mandated MEDA for developing small hydro power projects up to 5 MW capacities on Run of the River, K T Weir and Water Falls in the state.

### 1) Technical Information and Application Principle

The hydro power potential is determined on the available discharge of water and height from which it is available. The kinetic energy of water impinging on the blades of turbine rotates the turbine and generates mechanical energy. This turbine is coupled to alternator which converts mechanical energy to electrical energy.

### Basic component of SHP

- **Civil components** Diversion weir, Intake, Power Channel, De-silting tank, Forebay, Penstock, Power House, Tail race etc.
- **Electro-mechanical components** Generator, Protection Control, Hydro Turbines, Gates, Valves Transmission and Distribution etc.

- a) **Application** - The micro / mini and small hydro power projects have less damaging effect on the environment and therefore are preferred. Such projects could be taken up in the remote areas where the transmission lines have not reached, availability of water is seasonal and requirement of energy is less.

## 2) GOVT. POLICIES

- **MNRE Policy:** - The MNRE, GoI vide Policy No 14(03)2014-SHP dated 2<sup>nd</sup> July 2014 is extending central financial assistance to Small hydro power projects. The brief details are furnished as below

- a) **Financial support for identification of new potential SHP sites and preparation of plan and preparation of DPR –**

1. Rs. 6.00 lakhs for each project up to 1 MW capacity.
2. Rs.10.00 lakhs for each project above 1 MW up to 25 MW capacities. (For State Govt. dept. / Agencies / Local Bodies)

- b) **Financial support to set up new SHP projects Upto 25 MW in private, Co-operative, joint sector etc.**

Area	Above 0.1 MW and Upto 25 MW
Maharashtra	Rs. 1.00 crores/MW limited to Rs. 5 crores/project

\* The project developers / owners are required to contribute a minimum of 50 % of approved project cost.

- c) **Financial support to set up new SHP projects Upto 25 MW in Government / State / Public sector**

Area	Above 100 KW & Upto 1000 KW	Above 1 MW and Upto 25 MW
Maharashtra	Rs. 35,000 / KW	Rs. 3.5 crores/MW limited to Rs. 20 crores/project

\* A minimum of 10% of the total project cost is required to be borne by the state implementing agency or the owner of the project.

- d) **Financial support for renovation and modernization of existing SHP projects Upto 25 MW in Government sector**

Area	Upto 1000 KW	Above 1 MW and Upto 25 MW
Maharashtra	Rs. 10,000 / KW	Rs. 1.00 crores/MW limited to Rs. 10.00 crores/project

\* A minimum of 50% of the total project cost is required to be borne by the Central / State implementing agency or the owner of the project.

**e) Financial support for Micro Hydel Projects**

**Micro Hydel projects Upto 100 KW capacity:**

Area	Amount of CFA
Maharashtra	Rs. 1,25,000 / KW

- The policy details can be seen at [www.mnre.nic.in](http://www.mnre.nic.in)

**State Policy :**

GoM declared Integrated Non-conventional Energy Generation policy dated 20-07-2015 and its implementation methodology 09-09-2015.

The policy benefits are furnished as below –

- a) Capital Subsidy – Rs.50,000 per kW upto 25 MW limited to Rs. 1.00 Cr per project for all types of hydro projects (to be availed after commissioning of project and producing certificate of export of power by distribution licensee)
- b) Evacuation expenses – Estimated cost and actual expenditure incurred for transmission line whichever is less will be considered subject to maximum Rs.1 Cr./ project after commissioning of project

The details of the policy could be seen at [www.mahaurja.com](http://www.mahaurja.com)

Besides above, the Water Resources Dept. GoM has declared SHP policy on 15<sup>th</sup> September, 2005 regarding development of small hydro power projects through private sector. This policy is still in continuation.

**3) MERC Tariff:** - The Maharashtra Electricity Regulatory Commission (MERC) has declared tariff for sell of power generated from small hydro power projects of different capacities for the FY 2018-19. The tariff details of the MERC tariff order are as below -

**Tariff for Micro, Mini and Small Hydro Projects 2018-19**

Type of SHP		Tariff Period	Levelized Tariff from 1 <sup>st</sup> April 2018 to 31 March, 2019	Benefit of Accelerated Depreciation (if availed)	Net Levelized Tariff (upon adjusting for accelerated depreciation benefit if availed)
		years	(Rs / kWh)	(Rs / kWh)	(Rs / kWh)
<b>Small Hydro Projects</b>					
Mini and Micro Hydro Projects	500 kW and below	35	5.64	0.28	5.36
	above 500 kW and upto and including 1 MW	35	5.14	0.28	4.86
Other Small Hydro Projects	above 1 MW and upto and including 5MW	35	4.64	0.28	4.36
	above 5MW and upto and including 25MW	13	3.92	0.26	3.66

More details are available on website: [www.mercindia.org.in](http://www.mercindia.org.in)

**4) Achievement in the current year-**

- The total installed capacity of Small Hydro Power Projects in the FY 2018-19 is 30.95 MW and the cumulative installed capacity of commissioned Small Hydro Projects in the state arrives 365.475 MW.

**5) Next Year Plan**

- Having attractive central and state policies for Small Hydro Power Projects, target of 20 MW is fixed for implementation of Small Hydro Power Projects during the FY 2019-20.





Power House



Machine Hall



Sub Station

## 5. INDEPENDENT BIOMASS BASED POWER PROJECTS

### Introduction :

Biomass is one of the important natural energy resources. Biomass is fuel that is developed from organic materials, a renewable and sustainable source of energy used to create electricity. Agricultural residues, forestry residues and woods are the main source of biomass. Biomass can either be used directly or converted into other form of energy such as biofuel.

The Ministry of New and Renewable Energy (MNRE), GoI with the help of ORG-Marg, Jaipur has conducted state level biomass assessment study for Maharashtra. This study shows the available biomass power potential in Maharashtra to be 781 MW.

The state government has been promoting energy generation from biomass power project. MEDA is giving technical support and guidance to induce private investment into this sector and ensures speedy implementation of the projects. At present, there are 19 nos. Biomass Power Projects of totalling 215 MW commissioned in the State.

### I -Technical Information and Application :

#### a) Principle :

The basic principle of operation is based on Rankine Cycle. In an Independent Biomass Power Project, biomass is burnt in furnace and medium to high pressure steam is produced. This steam is injected into turbine coupled with turbo generator for producing energy. The low-pressure steam released from turbine exhaust is condensed and pre-heated water is recycled to the boiler.

#### b) Basic components of Biomass Power Project :

Boiler, Turbine, Condenser, Cooling Tower, Electrostatic Precipitator

#### c) Type of Biomass used are as follows :

The types of biomass used in the project are usually the ones which are used for burning purposes viz: domestic heating, cooking in rural areas. A few names are:

Coconut shell, Jute sticks, Maize stalks, Ground nut straw/shell, Tur stalks, Chilly stalks, Rice husk, Juliflora etc.

## **II – Application :**

The power produced from biomass power project is utility grade power and can be fed into the grid. Plant Load Factor from such projects could reach 80% and above. In order to set-up such project, it is essential to observe the - availability of sufficient surplus biomass in the vicinity of the project. Further water linkage & grid accessibility is essential for smooth functioning of the project.

## **III - Projects Taken-up :**

Biomass Power project is being promoted in all districts of Maharashtra. With the available power potential, it has been decided to establish projects up to 300 MW capacity of the Non-Conventional Energy Policy dated 20-07-2015. MEDA has so far sanctioned 37 biomass-based power projects totaling 410.5 MW capacities projects in the state.

## **IV - Govt. Policies :**

### **a) MNRE Policy :**

The Policy details can be seen at [www.mnre.gov.in](http://www.mnre.gov.in).

### **b) State Policy :**

GoM has declared the Integrated RE policy on 20-07-2015. For Biomass Power Projects the policy benefits are furnished as below:

#### **1. Evacuation :**

Financial assistance for laying transmission line is available from green cess (33 KV & above) after commissioning of project; subject to maximum Rs.1.00 Crores / project.

## 2. Capital Subsidy :

Capital subsidy of Rs.1.00 Crores / project is given after commissioning of the project.

### c) **MERC Tariff :**

The regulatory tariff for sell of power from independent biomass power project in the year 2018-19 is as below :

Financial Year	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff (Rs/kWh)	Benefit of Accelerated Depreciation (if availed) (Rs/kWh)	Net Tariff (Rs/kWh)
During FY 2018-19	2.15	5.29	7.44	0.14	7.30

The detailed tariff order can be seen at [www.mercindia.org.in](http://www.mercindia.org.in)

### V – Next Year Plan :

MEDA is going to call expression of interest for developing biomass power projects according to policy target.





## 6. SOLAR POWER PROJECTS – OFF GRID AND GRID CONNECTED

### 1. ATAL SOLAR AGRICULTURE PUMP YOJANA - 2

MNRE, New Delhi has sanctioned total 7,000 Nos. of solar agriculture pump. First sanction for 2,000 Nos. of pumps was issued on 18<sup>th</sup> October, 2017 and second sanction for 5,000 Nos. of pumps on 10<sup>th</sup> November, 2017. Government of Maharashtra has also issued G.R. for solar agriculture pump on 3<sup>rd</sup> November, 2018. Central financial assistance will be available 25% of benchmark cost for 3 hp pump and 20% of benchmark cost for 3-5 hp pump. MEDA by following due tender procedure has issued work order to 19 Nos of companies for installation of these 7000 no's of pumps. Installation of all 7000 Solar Pumps is completed



### 2. GRID CONNECTED ROOFTOP SYSTEM SCHEME(MH-GCRT)

#### ➤ MH-GCRT 2017-18

- Ministry of New and Renewable Energy, GoI has announced a scheme for implementation of grid connected rooftop solar power plant with maximum 30% central financial assistance on 26<sup>th</sup> June, 2014. MEDA has received Sanction from MNRE, GoI for cumulative project capacity of 100 MW vide its letter dated 26<sup>th</sup> April, 2016. Under this scheme MEDA achieved 55 MW capacity installations for around 6000 nos. of beneficiaries.



➤ MH-GCRT 2018-19

MEDA has received Sanction from MNRE, GoI for cumulative project capacity of 50 MW vide its letter dated 15<sup>th</sup> February 2018. Under this scheme MEDA achieved 50 MW capacity installations for around 6040 nos. of beneficiaries.



### 3. INSTALLATION OF OFF-GRID SYSTEM ON GOVERNMENT / SEMI-GOVERNMENT OFFICES BUILDING

- Government of Maharashtra announced scheme for off-grid solar power plant on Government / semi-government offices building on 13<sup>th</sup> February, 2013. Under this scheme 1 to 20 kWp off grid power plants are installed on Government / semi-government offices with 100% financial assistance. This scheme is initiated in F.Y. 2012-13. Till date around 77 power plants are installed. For F.Y. 2018-19, Work orders are issued to 5 manufacturers for installation of 451 Govt. / semi-Govt buildings. Installation work is in progress.



#### **4. ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION (AMRUT) SCHEME**

- As per the Government of Maharashtra GR dated 17<sup>th</sup> December, 2018, the projects regarding Solar Energy under Amrut Abhiyan and the Maharashtra Suvarnajayanti Nagarothan Mahaabhiyan are implemented by MEDA. Under This Scheme Installation of Grid connected solar power projects is done for water pumping stations, water treatment plants and sewage treatment plants under the premises of Urban Local Bodies. (Municipal Corporations / Municipal Councils) The Benchmark cost of MNRE is followed for the projects i.e., Rs.45,000/- per kWp. The manufacturer shall be responsible for 5 years of CMC as per MNRE norms. The project is expected to generate 15 Lakhs units per MW. Under this scheme MEDA has published tenders for Grid connected solar Power projects at 12 Municipal Corporations / Municipal Councils / Nagarpanchayat for 18.354 MW. Following tender procedure process for issuance of work order for Municipal Corporations / Municipal Councils / Nagarpanchayat is in progress.

#### **5. PRADHAN MANTRI SAHAJ BIJLI HAR GHAR YOJANA (SAUBHAGYA) SCHEME**

- Central Government of India declared Pradhan Manti Sahaj Bijli Har Ghar (Saubhagya) Yojana on 20<sup>th</sup> October, 2017. According to Guidelines of Saubhagya it is proposed to install 250-Watt Solar Home Light System with 5-year CMC at remote villages which does not have conventional electricity. REC has given Sanction of Rs. 117.80 Cr for 23560 Household to be electrified by off-grid mode. In this Regards MSEDCL informed about electrification of 30538 No. of households by solar home light systems in total 849 villages / Wadipada. Accordingly, MEDA has published tender. MEDA issued Work order to 3 Manufacturers. As per list provided by MSEDCL installation of Solar Home Light Systems is completed.



## 6. RENEWABLE ENERGY GOM POLICY-2015 - GRID CONNECTED SOLAR POWER GENERATION PROJECT SCHEME

- Government of Maharashtra has declared a composite RE Policy 2015 on dated 20<sup>th</sup> July 2015. Target ~ 7500 MW MAHAGENCO ~ 2500 MW with PPP mode Private Developers ~ 5000 MW Project capacity ~ Min. 1 MW Sale of Power PPP mode ~ Sale to MSEDCL at preferential tariff for RPO compliance. To develop 10% of PPP target on places viz. lakes, canals, local self Govt. land. Developer ~ Sale to DISCOMs at competitive bidding with consent from MERC, Captive & 3<sup>rd</sup> Party Sale within / outside state & REC route. Electricity Duty – exempted for captive consumption upto 10 years from DoC. Target for Grid Connected Solar Power Projects Under GoM Policy 2015 ~ 7500 MW 1116.46 MW of Solar Project Commissioned till date.

## 7. INSTALLATION OF SOLAR WATER HEATER SYSTEM ON GOVERNMENT / OTHER ORGANIZATION :

- Government of Maharashtra announced scheme for Solar Water Heater System on Government / Other Organization on 11<sup>th</sup> February, 2016. Under this scheme 500 LPD & above water heater systems are installed on Government / Other Organization with Rs.1500/- Per Sq. Mt area financial assistance from Govt. of Maharashtra. Till date around 1159.8 Sq. Mt area of solar water heater system is installed.





#### **8. INSTALLATION OF CONCENTEARED SOLAR THERMAL SYSTEM (CST) ON GOVERNMENT / OTHER ORGANIZATION**

- Concentrated solar thermal system generates solar power by using mirrors or lenses to concentrate a large area of sunlight onto a receiver. Electricity is generated when the concentrated light is converted to heat (solar thermal energy), which drives a heat engine (usually a steam turbine) connected to an electrical power generator or powers a thermo chemical reaction. Government of Maharashtra announced scheme for Concentrated Solar Thermal System (CST) on Government / semi-government offices building on 11<sup>th</sup> February, 2016. Under this scheme Rs. 4000/- Per Sq. Mt area financial assistance from Govt. of Maharashtra.



## 7. BIO-ENERGY

India is recognized as one of the fastest growing economies of the world. Improving living standards, increasing populations, industrial expansions in the country has possessed serious challenges on energy sector and accelerated the energy demand, due to which basic energy needs of thousands of millions of its citizens are yet to be fulfilled. The rising energy demand in India is expected to lead to a further increase in the use of fossil fuels. Hence, this will not only lead to growing GHG emissions and increased environmental problems, but will also to vast social problems such as inequalities between rural and urban populations, health-related disorders, and other community-level issues. Bio-energy, solar, wind and small hydro have been identified as the thrust areas of renewable energy development in India. Bio-energy is one of the key focus areas of renewable energy programs in India and its resources are relatively uniformly available in India compared to other renewable sources.

Bio-energy is the energy derived from waste like urban, industrial & agricultural residues etc. and which can also be utilized as a feedstock in the manufacture of biofuels. Mainly, Generation of wastes is the one of the environmental growing concern in today's society. Due to rapid growth in urbanization and industrialization the collection, treatment and safe disposal of wastes has become a matter of concern. In recent years, technologies have been developed & those are helpful in generating substantial quantity of energy by treatment on different wastes resulting in its safe disposal and provide opportunities for meeting energy needs in a sustainable manner, improving quality of life and protecting the environment, including addressing climate change. Energy in the form of biogas, Bio-CNG, heat or power is seen as additional benefits, which improves the viability of such projects. Also, there exist huge potential in the state for setting up small scale decentralized biogas energy recovery projects based on biodegradable organic waste viz. animal waste, segregated MSW etc.

Realizing the potential, Ministry of New and Renewable Energy (MNRE), GoI has initiated several programs with encouraging fiscal and financial support. MNRE-GoI is also promoting the various technological options for setting up projects for recovery of energy from wastes. Beside this, Maharashtra Energy Development Agency (MEDA) has also come up with RE policies to support such projects in the state.

The brief information of various schemes/programmes promoted by Government of Maharashtra and Ministry of New and Renewable Energy, GoI is furnished below;



### Government of Maharashtra policy

**A) Comprehensive Policy on Decentralized (off-grid) Energy Generation Projects based on New & Renewable Energy (Non-conventional) Energy Sources-2016 dated 11.02.2016 & its methodology dated 08.06.2016.**

- **Eligible projects for subsidy:**

- Municipal Corporations/Corporations/ Urban Local Bodies or Gram panchayat's Government/Semi-government organizations (viz. Prisons, Animal Husbandry Departments Bull rearing centres/Pedigree of bull's frozen semen laboratory etc., canteens of Industrial/Commercial organizations etc.) or private mode or Individual person etc.

**Subsidy:**

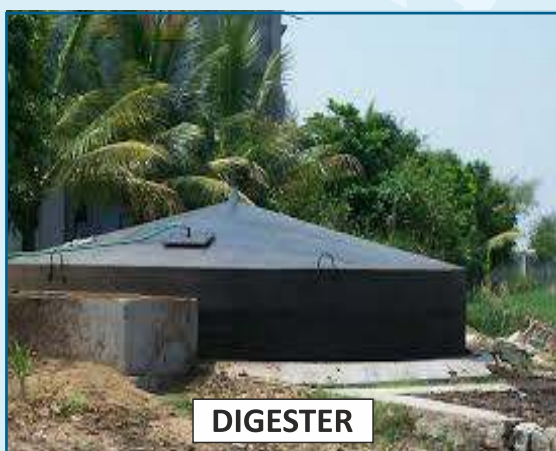
Capacity Range	Eligible Subsidy
3 kW - 250 kW	Rs. 40,000 per kW

**Achievement in this year.**

Sr. No.	Name of Project	Capacity (kW)
1.	M/s BAIF Development Research Foundation at Village-Tilekarwadi, Post- Uruli Kanchan, Tal. Haveli, Dist. Pune.	12
2.	M/s Parbhani Agrotech Pvt. Ltd., A/p Ranjani, Tal. Ghansawangi, Dist. Jalna.	60
3.	M/s. Tasty Bite Eatables Limited, Gat No.490, Bhandgaon, Pune Solapur Highway, Tal. Duand, Dist. Pune	80
4.	Shri. Zumbarlal Dnyaneshwar Murkute A/p Chandkhed, Tal. Maval, Dist. Pune	12
5.	M/s. Geetanjali Breeders Pvt. Ltd., at Gat No. 353, Karnalwadi, Tal. Purandar, Dist. Pune	36
6.	Shri. Deepak Narayan Kargal at Gat No. 623, A/p Golegaon, Tal. Shirur, Dist. Pune	12
7.	M/s Om Chicks (I) Pvt. Ltd. at Gat No. 435/11, Khutbav, Tal. Daund, Dist. Pune	100
<b>Total</b>		<b>312</b>

● Proposed plan for next year :

Sr. No.	Name of Project	Capacity (kW)
1.	Shri. Namdev Laxman Ghojge, A/p Jambhavade, Tal. Maval, Dist. Pune	24
2.	Shri. Haribhau Maruti Sutar, A/p Chale, Tal. Mulshi, Dist. Pune	24
3.	M/s Avee Broilers at Gat No. 375, A/p Shirsane, Tal. Chandwad, Dist. Nashik	168
4.	M/s Indo Count Industries Ltd., T-3, Kagal-Hatkanangale, Five Star MIDC Industrial Area, Dist. Kolhapur	200
5.	Shri Vinod Ramkrishna Kulkarni	192
	<b>Total</b>	<b>608</b>





**B) Biomass Briquette/Pellet Scheme dated 11.09.2007 :**

- **Eligible projects for subsidy :** Proprietary firms/Partnership firms/Company etc.
- **Subsidy:** 20% of the briquette/pellet machine cost or max. Rs. 4 lakhs whichever is less.
- **Achievement :**

Sr. No.	Name of Projects
1.	M/s Saikrupa Agro, Gat No. 336, Dhawalgaon, Shrigonda, Ahmednagar
2.	M/s Walvekar Bio-Energy, Gat No. 440, A/p Khandobawadi, Tal. - Palus, Dist. Sangli
3.	M/s Moreswar Bio-energy, Sr. No. 105, At- Ghonsar, Tal. Risod, Dist. Washim
4.	M/s Chintamani Agro Industries, Gut No. 13/1D, Dadgaon, Tal. Karanja (Lad), Dist. Washim
5.	M/s Sakshi Bio Fuels, Gat No. 185, At Nagapur, Tal. & Dist. Beed
6.	M/s Satyam Eco Energy, E-8/2, Add. MIDC, Latur
7.	M/s Chhogalal Industries, Plot no. M-37, MIDC-IV-Growth Centre, Kumbhari, Akola
8.	M/s.Bhavana Engineering Industries, Butibori Industrial Area, Plot No.H-26-1, Dist-Nagpur
9.	M/s. AaroHi Biocoals, Survey No. 44/4, plot no. 4, At Sawali (Bu), Karanja, Wardha
10.	M/s Sayali Agro Industries Nimbhora Lahe , Tal. Nandgaon Khandeshwar, Amravati
11.	M/s. Mahale Bio Fuels, Gat No. 121, Plot no. 375, Paturda Phata, Village Warwat Khanderao, Tal. Sangrampur, Dist. Buldhana
12.	M/s. Dilasa Agro Processors Pvt. Ltd., Gat no. 72, in front of Hindustan Awas, Waladgaon, Aurangabad
13.	M/s. PitruChaya Agro At. Palaskhed TL. Chandur Rly Dist. Amravati
14.	M/s. G.M. Eco Friendly Briquettes At. Malkhed Rly, tq. Chandur railway, Amravati
15.	M/s. Jadhav Briquetting Industry, Plot No. 77 & 78 MIDC, Pusad, Dist. Yavatmal
16.	M/s. Shashwat Agro Industry, Opposite Tina Oil Mill MIDC Area Mu. Warvanti, Latur
17.	M/s Hira Biofuel, Gat no. 63, MIDC, near Wine park, Sandgewadi, Tal. Palus, Dist. Sangli
18.	M/s Agro Energy Industries, Plot no. C-90/2, Hingna MIDC, Nagpur
19.	M/s Green booster Bioenergy, Khurchanpur, A/p Lehegaon, Tq. Daryapur, Dist. Amravati



20.	M/s S.T.R Bio Energy, 99/2, Mauje- mahuli Jahagir, Tal. &Dist. Amravati
21.	M/s Sahyadri Agro Industries, Plot No-84, MIDC Miraj, Tal.Miraj, Dis. Sangli

• **Proposed plan for next year :**

Sr. No.	Name of Projects
1.	M/s Sadguru Agro Power, Gat No. 182, Karanjkheda T-Point, Vasadi, Kannad, Aurangabad
2.	M/s Sun Eco, Gut No. 89, Jangamwadi, Tal. Hatkanangale, Dist. Kolhapur
3.	M/s Chatrapati Urja Company, S.N. 28/2, Manglur Road, Village Savargaon, Tal. Majalgaon, Dist. Beed
4.	M/s. Piyush Bio Fuels, S.no.-11/12 k. Muja Heti Kundi, Tal. Karnja Dist. Wardha
5.	M/s Shiro Pharmachem Pvt. Ltd., Gat No. 2321, Pomendi, Tal. Guhaghar, Dist. Ratnagiri
6.	M/s Sumlex Biocoals, S/No.654, Solewadi, Tal. -Asti, Dist.-Beed

• **Central Government Programmes: -**

A) **Biogas Power/Thermal (Off-Grid) Programme dated 29.11.2018**

• **Central Financial Assistance:**

Sr. No.	Capacity Range (kW)	Power Generation (□/kW)		Thermal Application (□/kW <sub>eq.</sub> )	
		SC/ST	Others	SC/ST	Others
1.	3-20	40,000/-	35,000/-	20,000/-	17,500/-
2.	20-100	35,000/-	30,000/-	17,500/-	15,000/-
3.	100-250	30,000/-	25,000/-	15,000/-	12,500/-

• **Achievement in this year:**

Sr. No.	Name of Project	Capacity (kW)
1.	Shri. Amey B. Patil, Handugari, Tal. Bhum, Dist. Osmanabad	36
2.	Shri. Surendra S. Girme, Nangaon, Tal. Daund, Dist. Pune	24
3.	M/s Kamshet Dairy Farm, Village – Govitri, Maval, Dist. Pune	33
4.	Shri. Sant Lahanuji Maharaj Sansthan, Takarkheda, Arvi, Dist. Wardha	12
5.	M/s Akhil Bhartiya Shri Swami Samarth Gurupeeth, Trimbakeshwar, Dist. Nashik	12
6.	M/s Shrirang Kisanlal Sarda, Shenit, Tal. Igatpuri, Dist. Nashik	120
7.	M/s Modern Dairy Maid Pvt. Ltd., Adsare (Khurd), Post-Taked, Taluka-Igatpuri, Dist.-Nashik	24
8.	M/s Bhagyalaxmi Dairy Farms Pvt. Ltd., A/p Sultanpur, Manchar, Tal. Ambegaon, Dist. Pune	75
	<b>Total</b>	<b>336 kW</b>

• **Proposed Plan For Next Year :**

<b>Sr. No.</b>	<b>Name of Project</b>	<b>Capacity (kW)</b>
1	M/s. Ahmednagar District Goat Rearing and Processing Co-op. Fed. Ltd., A/p Wadgaon Tandali, Ahmednagar -414006	37.5
2	M/s Avee Broilers, A/p Shirsane, Tal. Chandwad, Dist. Nashik-423101	175
3	Shri. Shubham Bhaskar Ghule, at Village Dhandarphal, Tal. Sangamner, Dist. Ahmednagar	12.5
4	Mr. Shivaji Manikrao Pawar, A/p Muli, Tal. - Gangakhed, Dist.- Parbhani	6.25
5	Mr. Gujeba Abaji Mehetre, Dahid Khurd, Tal. Buldhana, Dist. Buldhana	6.25
6	Mrs.Rukminbai Khobaraji Bhumare, Muli, Tal. Gangakhed, Dist. Parbhani	6.25
7	M/s Indo Count Industries Ltd., T-3, Kagal-Hatkanangale, Five Star MIDC Industrial Area, Dist. Kolhapur	200
8	M/s Geetanjali Breeders Pvt. Ltd., At Karnalwadi, Post. Gulunche, Tal. Purandar, Dist. Pune	36
9	M/s Om Chicks (I) Pvt. Ltd., Khutbav, Tal Daund, Dist. Pune	100
10	M/s Parbhani Agrotech Pvt. Ltd., Ranjani, Tal. Ghansavangi, Dist. Jalna	62.5
11	Shri. Zumbarlal Dnyaneshwar Murkute, At Pachane, Post. Chandkhed, Tal. Maval, Dist. Pune	12
12	Shri. Deepak Narayan Kargal, A/p Golegaon, Tal. Shirur, Dist. Pune	12
13	Shri. Praveen Pralhadrao Sawarkar,, At village Yelwan, Tal. & Dist. Akola	12
14	Shri. Shivam Bharat Jadhav, A/p Pusegaon, Tal. Khatav, Dist. Satara	24
15	Shri. Haribhau Maruti Sutar, Post. Chale, Tal. Mulshi, Dist. Pune	24
16	Shri. Namdev Laxman Ghojge, Post. Jambhavade, Tal. Maval, Dist. Pune	24
17	M/s Bhagyalaxmi Dairy Farm, Sultanpur, Post. Manchar, Tal. Ambegaon, Dist. Pune	250
	<b>TOTAL</b>	<b>1000.25 kW</b>

**B) Programme dated 30.07.2018 on Energy from Urban, Industrial & Agricultural Waste/Residues**

• **Objectives:**

- To promote setting up of projects for recovery of energy from Urban, Industrial & Agricultural wastes;
- To create conducive conditions & environment with fiscal and financial regime, to develop, demonstrate and disseminate utilization of wastes and residues for recovery of energy.

• **Eligible projects for subsidy :**

The scheme provides Central Financial Assistance for following applications;



**i) Project based on Biogas production**

Output	Capital Subsidy	Description
Biogas	Rs. 1 Crore Per 12000 m <sup>3</sup> Biogas/day (Max. Rs. 10 Crore/project)	Biogas generation from Urban Waste/ Agricultural Waste/ Industrial Waste/ Effluents or mix of these wastes. (Distillery waste is excluded)

**ii) Project based on Power generation**

Output	Capital Subsidy	Description
Power	Rs. 3 Crore Per MW (Max. Rs. 10 Crore/project)	Power generation based on Biogas generated from Urban Waste/ Agricultural Waste/ Industrial Waste/ Effluents or mix of these wastes.  In case, developer wants to set up power generating unit at already existing Biogas generation unit, in that case, the applicable CFA will be only Rs. 2 crore per MW.

**iii) Project based on Production of Bio-CNG**

Output	Capital Subsidy	Description
Bio-CNG/ Enriched Biogas	Rs. 4 Crore Per 4800 kgs of Bio-CNG/day generated from 12000 m <sup>3</sup> of Biogas/day. (Max. Rs. 10 Crore/project)	Bio-CNG generation based on Biogas generated from Urban Waste/ Agricultural Waste/ Industrial Waste/ Effluents or mix of these wastes  In case, developer wants to set up Bio-CNG unit at already existing Biogas generation unit, in that case, the applicable CFA will be only Rs. 3 crores.

**iv) Project based on Biomass Gasifier**

Output	Capital Subsidy	Description
Gasifier Thermal/ Electrical in Industries/ Villages	Electrical <ul style="list-style-type: none"> <li>Rs. 2500 per kW with dual fuel engines.</li> <li>Rs. 15000 per kW with 100% gas engines.</li> </ul> Thermal <ul style="list-style-type: none"> <li>Rs. 2 lakh per 300 kW for thermal applications</li> </ul>	Biomass Gasifier based Captive Power and thermal applications in industries.  Distributed off-grid power for villages using Biomass Power Systems.

- **Achievement in this year: (Proposal forwarded to MNRE for CFA)**

S.N.	Name of Project Promoter	Capacity (MWeq.)
<b>Industrial Waste to Energy: -</b>		
1.	M/s Sanstar Ltd., Karvand, Dist. Dhule	1.125
2.	M/s Gujrat Ambuja Exports Ltd., Dist. Jalgaon	2
<b>Total</b>		<b>3.125 MWeq.</b>

- **Proposed plan for next year:**

S.N.	Name of Project Promoter	Capacity (MWeq.)
<b>Industrial Waste to Energy: -</b>		
1.	M/s Embio Ltd. Raigad	1.5 MW

### **C) National Policy on Biofuels dated 04.06.2018**

#### **Salient Features :**

- An indicative target of 20% blending of ethanol in petrol and 5% of biodiesel in diesel is proposed by 2030
- Reinforcing ongoing ethanol/biodiesel supplies through increasing domestic production
- Setting up Second Generation (2G) bio refineries
- Development of new feedstock for biofuels
- Development of new technologies for conversion to biofuels
- Creating suitable environment for biofuels and its integration with main fuels.
- Blending ethanol in petrol through Ethanol Blended Petrol (EBP) Programme using ethanol derived from multiple feedstock
- Development Second Generation (2G) ethanol technologies & its commercialization
- Blending biodiesel in diesel through Biodiesel Blending Programme exploring multiple feedstocks including straight vegetable oil in stationery, low RPM engines
- Focus on drop-in fuels produced from MSW, industrial wastes, biomass etc.
- Focus on advanced biofuels including bio-CNG, bio-methanol, DME, bio-hydrogen, bio-jet fuel etc.
- Government of Maharashtra is planning to set up Biofuel Board in the State.

## 8. ENERGY CONSERVATION

With the intent of legislature to provide energy efficiency in Indian economy, the National Energy Conservation Act, 2001 came into force on 1st March 2002. The Government of India has set up Bureau of Energy Efficiency (BEE) on 1st March 2002 under the provision of the Energy Conservation Act, 2001. The mission of Bureau of Energy Efficiency is to assist in developing policies and strategies with a thrust on self-regulation and market principles with the primary objective of reducing energy intensity of the Indian economy within the overall framework of the Energy Conservation Act, 2001. This will be achieved with active participation of all stakeholders, resulting into accelerated and sustained adoption of energy efficiency in all sectors.

The EC Act provides that “Every State Government may, by notification in consultation with BEE, designate the State Nodal Agency for the implementation of the Act at State level.” Accordingly, the Government of Maharashtra vide notification dated 12<sup>th</sup> March, 2003, designated the Maharashtra Energy Development Agency (MEDA), as the Designated Agency to co-ordinate, regulate and enforce the provisions of the Energy Conservation Act and implement schemes under the said Act within the State.

MEDA has been awarded with 2<sup>nd</sup> Prize in National Energy Conservation Award (NECA), Delhi for the best performance State Designated Agency in Energy Conservation & Energy Efficiencies activities.

**MEDA has implemented various State Government Energy Conservation programmes in the Maharashtra State :**

### **1. Save Energy Programme**

MEDA has implemented energy conservation programme in different sectors, since inception. Under “Save Energy Programme” MEDA provides financial assistance to conduct Detailed Energy Audit in various potential sectors. MEDA has done remarkable work up to March, 2019 and total 1312 energy audits have been carried out in various sectors, which has resulted in substantial energy saving in the various sectors.

### **2. Walk Through Energy Audit (SME scheme)**

Scheme aims to promote energy efficiency in small and medium enterprises (SMEs) by providing technical and financial assistance for conducting walk through energy audit. MEDA provides financial assistance to Empanelled Auditing Firm of Rs.3000/- per unit (SME). Under this scheme, around 2969 Walk through Energy Audits in SMEs have been completed upto March, 2019.

### **3. Scheme for implementing demonstration projects in Government/ Semi Government/ Urban Local Bodies buildings**

There is scope of around 20-25% energy saving in building sector. A scheme is designed for Government/ Semi Government and Urban Local Bodies for implementation of energy conservation demonstration projects in their buildings. Under this programme financial assistance upto Rs. 25 lakhs per building is provided. Under this programme total 106 buildings are covered upto March, 2019.

### **4. Energy Efficiency in Streetlights in Municipal Councils / Municipal Corporations/ Maharashtra Jeevan Pradhikaran.**

Street lighting system of municipal and other bodies uses around 1.5 to 2% of State's total energy consumption while water pumping system uses around 4% of State's total energy consumption. 25-30% energy savings can be achieved by installation of energy saving devices in street lighting and water pumping systems. Under this programme financial assistance upto Rs. 20 lakhs for energy efficiency measures in street lighting and Rs. 5 lakhs for energy efficiency measures in water pumping systems are provided. Under this programme total 38 Municipal Councils / Corporations are covered upto March, 2019.

## 5. State Level Energy Conservation Award Scheme

The Energy Conservation Award Scheme motivates the participating units to undertake serious efforts in energy saving by implementing energy conservation measures and adoption of latest energy efficient technologies. During FY 2018-19, the participating units have saved approx. 2969 Million kWh of electrical energy, which is equivalent to the energy generated from a 484 MW thermal power.

In the last 14 years of Award Scheme (2003-2019), the participating units have collectively saved approx. 4662 Crore & during FY 2018-19 its around Rs.447 Crores. In energy terms, 2969 Million kWh of electrical energy and 484 MW equivalent avoided capacity was saved through the energy conservation measures by the all-participating units during FY 2018-19. The progressive industrial units and other establishments have already realized the cost effectiveness of energy conservation measures. It is hoped that State Level Energy Conservation Award Scheme would help in motivating the other energy consumers in joining and promoting of a nation wise energy conservation movement.

### YEAR WISE ENERGY SAVINGS ACHIEVED BY PARTICIPATING UNITS IN MEDA'S ENERGY CONSERVATION AWARD SCHEME

Year	Award Scheme	No. of participating units	Annual Saving in Rs. Crores	Equivalent Electrical Energy Saving (Electrical +Thermal)	
				Million kWh	Equivalent Avoided Capacity in MW
2003-04	1	46	150	317	25
2004 -05	2	50	200	400	37
2005 -06	3	75	292	584	45
2006 -07	4	68	394	789	90
2007-08	5	113	502	964	114
2008 -09	6	117	515	1031	117
2009 -10	7	67	304	608	88.9
2011- 12	8	113	330	2100	308
2012-13	9	114	349	2880	422
2014-15	10	110	155	1843	270
2015-16	11	136	421	2640	386
2016-17	12	120	316	2430	355
2017-18	13	100	287	2210	327



<b>2018-19</b>	14	87	447	2969	484
<b>Total 14 Years</b>		<b>1316</b>	<b>4662</b>	<b>21765</b>	<b>3068.9</b>

**Apart from State's Energy Conservation schemes, MEDA also implemented BEE Energy Conservation programmes as follows;**

**1. Energy Efficiency Demonstration projects in various sectors**

The energy efficiency demonstration projects are proposed to be implemented in the areas of (a) drinking water systems in the area of Municipal Corporations, Municipal councils, Maharashtra Jeevan Pradhikaran etc., (b) Retrofitting of appliances in Government/ semi-government building, heritage sites, government hospitals etc., (c) implementation of LED street lighting programme at cultural, tourism important places, pilgrim places etc. MEDA has initiated the survey (walk through energy audit) in Government/semi-government buildings for ascertaining the energy saving potential and based on the outcomes, project will be implemented in potential Government/semi-government buildings.

**2. Energy Efficient measures in 100 Government Schools**

Under this scheme, existing conventional luminaries and fans are proposed to be replaced with LED fixtures and BEE star rated super-efficient fans. Simultaneously disseminating awareness amongst school children by way of establishing energy clubs, organizing debates, quiz programs, etc. are also proposed. MEDA has undertaken initial survey of 100 Government schools in the State of Maharashtra, so that these energy efficient measures could be implemented in the identified government schools.

**3. Modern Energy Efficient Village campaigning programmes**

Under this scheme, existing inefficient equipment like household lamps, fans, gram panchayat common load i.e., street lights, water pumps (agriculture, drinking water, etc.), old luminaries / inefficient electrical equipments in panchayat bhavan, community centres, healthcare centres etc. are proposed to be replaced with energy efficient BEE star labelled appliances.

Accordingly, the scheme is under implementation in two villages; viz (i) Village Dhanora, Tal. & District Yavatmal & (ii) Village Dudhgaon, Tal. & District Osmanabad.

**4. Workshops/Trainings on Energy Conservation programmes**

MEDA conducted various workshops, seminars and capacity building programme of energy professionals in the area of Energy Conservation Building Codes, Capacity Building of DISCOMs, Energy Efficiency in Industrial clusters and Energy Efficiency Financing for Financial Institution.





## 5. Development of materials on Energy Conservation for its incorporation in the ITI and Diploma Engineering Curriculum of the State.

MEDA has developed curriculum on Energy Conservation & Management for its incorporation in Diploma Engineering Curriculum in co-ordination with Educational Consultant and committee experts and the same has been submitted to Director, MSBTE for its incorporation in Diploma Engineering curriculum. MSBTE has now incorporated the course material on Energy Conservation & Management in Diploma Engineering curriculum.

## 6. Establishment of Energy Club

MEDA has established total 102 Energy clubs in schools in State of Maharashtra under BEE program "Student Capacity Building Program." Under this program, MEDA provided financial assistance of Rs. 5000/- per school. Through these established energy clubs, various energy conservation activities are implemented by schools like – Elocution competitions, Essay competition, Painting competition, Slogan Competition, Quiz contest and celebration EC week etc.

## 7. Energy Conservation Day and Energy Conservation Week:

Every year MEDA celebrates National Energy Conservation day on 14<sup>th</sup> December and Energy Conservation week from 14<sup>th</sup> to 20<sup>th</sup> December on large scale. Following activities have taken up during the week for creation of awareness.

- Industries, Industries association, all government departments, all local government organizations have been asked to celebrate the EC day and EC Week by carrying out various activities like:
  - Administer Energy Conservation pledge by employees.
  - Display of banner and posters at various locations to create mass awareness.
  - Distribution of pamphlets giving tips on energy conservation and energy pledge.
  - Energy conservation slogan competition for employees and their wards.
  - Seminar for employees on energy conservation activities in the plant
- MEDA also distributed leaflets, banners and posters to more than 1551 Government/ Semi-Government Offices, Designated Consumers and State Level EC Award participants.

- The promotional material was specifically prepared for celebration of the energy conservation day and week.

#### **8. Establishment of Energy Conservation Building Code in state**

In line with Energy Conservation Act 2001, Central Government in consultation with Bureau of Energy Efficiency had notified ECBC in 2007 applicable for the commercial building and amendment in the ECBC in 2017. Thereafter, Central Government vide notification dated 13<sup>th</sup> February, 2018 in consultation with Bureau of Energy Efficiency has notified the Energy Conservation Building Code Rules, 2018 which is applicable to commercial building having connected load of 100 KW or above or contract demand of 120 kVA or above.

In line with the ECBC, 2017 and ECBC Rules, 2018, MEDA is in process of preparation of draft Maharashtra Energy Conservation Building Rules as per the climatic condition of the State and will submit the draft to Government of Maharashtra for further necessary consideration.

#### **9. Perform, Achieve & Trade (PAT) Scheme:**

PAT scheme is a regulatory instrument to reduce specific energy consumption in energy intensive industries, with an associated market-based mechanism to enhance the cost effectiveness through certification of excess energy saving which can be traded.

Under this scheme, reductions in specific energy consumption targets are assigned to Designated Consumers (DCs) for a three-year cycle. Verification of the performance of DCs at the end of the cycle is carried out by a cadre of energy professional i.e., Accredited Energy Auditors empaneled with Bureau of Energy Efficiency.

MEDA periodically reviewed the energy conservation measures implemented by Designated Consumers in line with target set out by BEE under various PAT schemes.

As on date, for PAT I to PAT IV, around 80 DC's from 13 various energy intensive sectors are identified by BEE in the Maharashtra State.



## 9. PUBLICITY AND MASS AWARENESS PROGRAMME

During 2018-19 MEDA carried out wide publicity campaigns through various media like exhibition, electronic media, print media etc.

### Exhibitions:

**1. Non-Conventional Energy and Energy Conservation Exhibition-2018** - MEDA Division office, Nagpur organized this exhibition at Hyderabad House, Nagpur from 28th to 29th April, 2018. This exhibition was inaugurated by Hon'ble Shri. Devendra Fadnavis, Chief Minister of Maharashtra in Presence of Hon'ble. Shri. Nitinji Gadkari, Minister of Central Road & Transport Gov. of India, Hon'ble Shri. Chandrashekhar Bawankule, Minister of Energy, New & Renewable Energy Govt. of Maharashtra & other delegates. All solar powered schemes were demonstrated in this exhibition. MEDA Information Brouchers was distributed among the Peoples who visited the MEDA Stall.



**2. Shining Maharashtra 2018** – Sansa Foundation organized "Shining Maharashtra 2018" exhibition at Solapur from 26<sup>th</sup> to 28<sup>th</sup> September, 2018. This Exhibition was inaugurated by Shri. Avinash Dhakne, Commissioner, Municipal Corporation Solapur along with other delegates.

National Highway Authority of India, Ministry of water Resources, Ministry of Earth Sciences, MEDA, NCERT, Botanical Survey of India, Bamboo mission, Consumer Affairs, NIC, Coconut Development board etc. participated in this exhibition. MEDA stall displayed information about New & Renewable Energy & Energy Conservation schemes through Digital boards. There was good response from farmers and students for MEDA stall.

**3. Non-Conventional Energy and Energy Conservation Exhibition-2018** - MEDA Division office, Nagpur organized this Exhibition from 13<sup>th</sup> to 22<sup>nd</sup> September 2018 at Pantheon Colony, Manish Nagar, Nagpur on Occasion of Ganesh Festival. Hon. Shri. Devendraji Fadnavis, Chief Minister of Maharashtra State, Hon'ble Shri. Chandrashekhar Bawankule Minister of Energy, New & Renewable Energy Maharashtra was present for this inauguration. This exhibition was inaugurated by Hon'ble Shrimati Nandatai Jichkar, Mayor Nagpur Municipal Corporation. In this Exhibition MEDA Demonstrated live demo project of grid connected solar system, Chief Minister Solar Agriculture Feeder, Solarized drinking



water supply system, Solar Street Lights, Solar Water Heating System, Solar Cooker etc. Information about advantages of Non-conventional Energy & Energy Conservation products was given to the people who visited MEDA stall at exhibition. Information brochures were distributed among the Peoples who visited the exhibition.

**4. Live Demo Model Exhibition** - MEDA Division office, Nagpur organized live demo model exhibition at Bapukutee Sevagram Ashram, Wardha from 29/9/2018 to 2/10/2018. This program was inaugurated by Shree. Shailesh Naval, District Collector, -Wardha. In this Exhibition MEDA Demonstrated live demo of grid connected solar system, LED **High mast**, Solar Street light, Solar water heater, Solar rural water supply schemes etc. Information regarding renewable energy was given to farmers, students. Information brochures distributed to visitors.

**5. Pratibha Sangam** - This exhibition was organized by Akhil Bhartiya Vidhyarthi Parishad, Maharashtra at Dayanand Shikshan Sanstha Sabhagrah, Latur from 28<sup>th</sup> -30<sup>th</sup> Sept, 2018. MEDA Division office, Latur participated in this exhibition. This Exhibition is inaugurated by Hon'ble Shri. Sambhaji Patil Nilangekar, Guardian Minister of Latur. Poets, Writers, Actors from Maharashtra and Goa States participated in this exhibition. About one thousand people visited MEDA Stall. Information about Renewable energy project was given to visitors.

**6. Krishithon - 2018** - Human Service Foundation and Media Exhibitors Pvt. Ltd. organized Krishithon -2018 exhibition at Nashik from 22 to 26 Nov. 2018. MEDA Division office, Nashik participated in this exhibition. MEDA stall displayed information about Solar Agriculture Pump, Solar Roof Top system, Solar Power Project etc. through Digital boards. Agriculture related gov. dept. Agricultural product manufacturing Companies, fertilizers companies participated in this exhibition. About one lakh people visited to exhibition. MEDA information brochures, books distributed to visitors.

**7. Agrovision - 2018** - Agro vision – 2018 Agricultural Exhibition held at Reshimbagh ground, Nagpur from date 23th to 26th November 2018 which organized by Agro vision Foundation, MM Active Sci-Tech Communication, Purti Power and Sugar Ltd. This exhibition was inaugurated by Hon'ble Shri Yogi Adityanath, Chief Minister of Uttar Pradesh in presence of Hon'ble Shri. Devendra Fadnavis chief Minister of Maharashtra, Hon. Shri.Chandrashekhar Bawankule, Minister of Energy, New & Renewable Energy, State Excise Maharashtra and Hon. Shri. Chandrakant Patil Minister of Revenue, Relief and Rehabilitation, Public Works Govt. of Maharashtra.

In this exhibition MEDA Demonstrated Live Demo model of grid connected solar system, Chief Minister Solar Agriculture Feeder, Solar drinking water supply, Solar





Street Lights, Solar Water Heating System, Solar Cooker etc. around 5 lakh peoples visited this exhibition.

**8. Environ Expo - 2018** - Confederation of Indian Industry (CII) Western Region organized Environ Expo - 2018 from 6th to 8th Dec. 2018 at the Auto cluster exhibition center, Pimpri - Chinchwad, Pune under the chairmanship of Mr. M.S. Unnikrishnan, Managing Director and CEO, Thermax Ltd. This exhibition was inaugurated by Ms Meher Pudurjee, chairperson, Thermax Ltd, along with Mr. Viren Joshi, Chairman CII Pune Zoner Council and other Delegates. MEDA positively supported the CII Environ Expo - 2018 by actively participating and show casing various initiatives, offering and services on the show floor. MEDA created significant awareness amongst the relevant stakeholder by various policies and initiatives implemented by MEDA.

**9. Agrotech - 2018** - MEDA District office, Akola participated in Agrotech 2018 exhibition which was held at Dr. Punjabrao Deshmukh Krushi Vidyapeeth, Akola from 27<sup>th</sup> to 31<sup>st</sup> Dec. 2018. This exhibition inaugurated by Minister of Agriculture, Govt. of Maharashtra along with other delegates. MEDA displayed the information about New and Renewable Energy and Energy Conservations Scheme through Digital boards. During exhibition about 2 to 2.5 Lakhs people visited MEDA stall.

**10. Krushi And Saras Mahotsav 2019** - Krushi Tantradnyan Vyavsthapan Yantrana organized District krushi and saras Mahotsav at Chandrapur from 11<sup>th</sup> to 15<sup>th</sup> Jan., 2019. MEDA District office, Chandrapur participated in this Exhibition. MEDA stall Demonstrated demo model of Grid connected Solar System and Solar Agriculture Pump etc. MEDA information brochures and books were distributed among the people who visited the MEDA Stall.

**11. Dipex -2019** - Akhil Bhartiya Vidhyarthi Parishad, Maharashtra and Srijan Trust organized "Dipex -2019" from 2<sup>nd</sup> to 5<sup>th</sup> March, 2019 which was held at Padmabhushan Dr. Vikram Sarabhai Nagar, Shri. Guru Govind Singhji Engineering and Technical Institute, Nanded. This exhibition was inaugurated by Hon'ble Shri. K.K.Agarwal, Chairman, National Board of Accreditation, Dr.Vinod Mohitkar Director, M.S.B.T.E. Dr. Y.V. Joshi Director, S.G.G.S.I.E.T. Nanded and other delegates.

**12. Zilha Krushi Mahotsav – 2019** - Atma Niyamak Mandal, Amravati organized "Zilha Krushi Mahotsav -2019" from 10<sup>th</sup> -14<sup>th</sup> Jan. 2019 which was held at Science core ground, Opp. S.T. Stand Amravati. This exhibition inaugurated by Hon. Shri. Pravin Pote, Guardian Minister of Amravati in presence of District Collector and CEO of Zilla Parishad Amravati. MEDA Divisional Office, Amravati participated in this exhibition. MEDA Stall displayed the information about Renewable Energy and Energy Conservation schemes through Digital boards.

**13. Krushik 2019** - Krushik Exhibition was organized by Agricultural Development Trust from date 17<sup>th</sup> to 20<sup>th</sup> Jan., 2019 at Krushi Vigyan Kendra, Baramati. In this exhibition companies, government departments and prestigious industries were participated. Information related to Non-Conventional



energy and energy conservation schemes has given to people who visited MEDA stall. Information brochures was distributed among the people.

**14. Krushi Mahotsav 2019** - Zilha Parishad, Sangli Organized Krushi Mahotsav - 2019 Exhibition held at Islampur, Tal. Walva, Dist. Sangli, from 9<sup>th</sup> to 13<sup>th</sup> Jan. 2019. MEDA Division office, Kolhapur participate in this exhibition. MEDA stall displayed information about Solar, Wind, Biomass, Bagasse, Cogens etc. project and energy conservation Scheme etc through Digital boards.

**15. Engineering Expo 2018** - MEDA Division office Aurangabad participated in Engineering Expo-2018 Exhibition from 14th to 17th Dec. 2018 which held at Ayodhya nagari ground, Railway Station Road, Aurangabad. More than 1500 people visited to MEDA Stall. MEDA information brochures and books were distributed among the people who visited the MEDA Stall.

**16. Zilha Krushi Mahotsav 2019** - MEDA District office Yawatmal participated in Zilha Krushi Mahotsav-2019 exhibition from 27th feb to 3rd March 2019 which held at Yawatmal. MEDA Stall Displayed the information of New and Renewable Energy and Energy Conservation schemes through Digital boards.

**17. 2nd Global RE-INVEST India** - The second Global Renewable Energy Investment Meeting and Expo (RE INVEST-2018) was organised by the Ministry of New and Renewable Energy at India Expo Mart, Greater Noida, NCT Delhi, India from 3rd to 5th Oct., 2018. It was inaugurated by Hon'ble Shri. Narendra Modi, Prime Minister of India in the presence of Secretary General of United Nations Antonio Guterres. 2nd Global RE-INVEST also hosted First Assembly of International Solar Alliance (ISA) which is an alliance of 121 Countries. The objective of the alliance is to work for the efficient exploitation of solar energy to reduce the dependence of fossil fuels.

It also hosted Meeting of the Energy Ministers of Indian Ocean Rim Association (IORA) which consists of 22 coastal countries boarding the Indian Ocean. It is based on principle of strengthening economic co-operation particulars on trade facilitation & investment, social development of the region. Maharashtra Energy Development Agency (MEDA) participated in this exhibition as a Partner State. In this exhibition, MEDA Demonstrated model of Grid-connected solar rooftop, solar pump for small water and tap drinking water supply scheme, Chief Minister Solar Agriculture feeder scheme. There was good response from the people.

### **Publicity through Print Media –**

**Advertisements** – Advertisements are published in various leading newspapers, magazines and special supplements to promote renewable energy and energy conservation aiming at the target group of industries, private investors etc.


**Information Brochures** – To illustrate various renewable energy programmes being implemented by MEDA and renewable energy technology MEDA printed around 40000 information brochures. These brochures were distributed among the peoples to create awareness of Renewable Energy and Energy Conservation.

## 10. HUMAN RESOURCE AND ORGANIZATION DEVELOPMENT

### HUMAN RESOURCE MANAGEMENT

Human Resource Development plays an important and vital role in effective management of an organization.

Maharashtra Energy Development Agency, during financial year 2018-19, has nominated its staff members from various levels for short- and long-term training courses all over India. This was particularly done taking into consideration their job requirements and academic qualifications. The details of category-wise staff attended various training courses during the period is as under.



Account Officers	- 02
Sr. Assistant	- 02
Computer Assistant	- 01
Steno Typist	- 01
Sr. DTP Operator	- 01
Sr. Lib Assistant	- 01
Sr. Telephone Operator	- 01

MEDA has spent 4.46 lakhs on these training programs during financial year 2018-19.

## 11. RPO, REC and R & D PROGRAMME

### Renewable Purchase Obligation (RPO)

Maharashtra Electricity Regulatory Commission (MERC) has declared (Renewable Purchase Obligation, Its Compliance and Implementation of REC Framework) Regulation, 2010 vide its order dated.7th June 2010. For implementation of this regulation MEDA has been designated as State Agency in Maharashtra State.

Renewable Purchase Obligation (RPO) is the obligation mandated by the Maharashtra Electricity Regulatory Commission (MERC) under the Act, to purchase minimum level of renewable energy with respect to the total consumption by the Obligated Entity.

As per MERC (Renewable Purchase Obligation, Its Compliance and Implementation of REC Framework) Regulations, 2016. RPO obligation shall be applicable to all Distribution licensees, Open Access Consumers and captive users within the Maharashtra, subject to the following conditions:

- (a) Any person who owns a grid-connected Captive Generating Plant based on conventional fossil fuel with installed capacity of 5MW and above, or such other capacity as may be stipulated by the state commission from time to time and consumes electricity generated from such plant for his own use shall be subject to RPO to the extent of a percentage of his consumption met through such fossil fuel based captive source:
- (b) Any person having a contract demand of not less than 5MVA and who consumes electricity procured from conventional fossil fuel-based generation through open access shall be subject to RPO to the extent of a percentage of his consumption met through such fossil fuel based open access source:

Captive user(s) consuming power from grid connected fossil fuel-based cogeneration plants are exempted from applicability of RPO.

Every Obligated Entity may meet its RPO target by way of (i) Own generation or procurement of power from RE developer or (ii) Purchase from other licensee or (iii) Purchase of renewable energy certificate or (iv) Combination of any of the above options.

Obligation to purchase electricity generation based on solar as RE source can be fulfilled by purchase of solar REC only. Obligation to purchase electricity generation based on non-solar as RE source can be fulfilled by purchase of non-solar REC only. Procurement of REC's issued for RE generation outside the State of Maharashtra as well as REC's issued for renewable energy generation within the State of Maharashtra shall be considered as an eligible instrument for the purpose of RPO compliance.

RPO Targets as per MERC's RPO-REC Regulation 2016 are as below:

Year	Quantum of purchase (In %) from Renewable Energy sources (In terms of energy equivalent in KWh)		
	Solar	Non-Solar (other RE)	Total
2016-17	1.00%	10.00%	11.00%
2017-18	2.00%	10.50%	12.50%
2018-19	2.75%	11.00%	13.75%
2019-20	3.50%	11.50%	15.00%

Others details of RPO can be viewed from RPO / REC TAB on MEDA website [www.mahaurja.com](http://www.mahaurja.com).

## REC (Renewable Energy Certificate) Mechanism

### Ref.

- 1) CERC REC Regulations, 2010.  
[www.recregistryindia.nic.in/pdf/REC\\_Regulation/2\(a\)CERC\\_Regulation\\_on\\_Renewable\\_Energy\\_Certificates\\_REC.pdf](http://www.recregistryindia.nic.in/pdf/REC_Regulation/2(a)CERC_Regulation_on_Renewable_Energy_Certificates_REC.pdf)
- 2) CERC REC regulation 2010 (First Amendment)  
[https://www.recregistryindia.nic.in/pdf/REC\\_Regulation/REC\\_Amendment\\_Regulation.pdf](https://www.recregistryindia.nic.in/pdf/REC_Regulation/REC_Amendment_Regulation.pdf)
- 3) CERC REC regulation 2010 (Second Amendment)  
[www.recregistryindia.nic.in/pdf/REC\\_Regulation/Second\\_Amendment\\_Notification.pdf](http://www.recregistryindia.nic.in/pdf/REC_Regulation/Second_Amendment_Notification.pdf)
- 4) CERC REC regulation 2010 (Third Amendment)  
[www.recregistryindia.nic.in/pdf/REC\\_Regulation/REC\\_Regulations\\_3rd\\_Amendment.pdf](http://www.recregistryindia.nic.in/pdf/REC_Regulation/REC_Regulations_3rd_Amendment.pdf)
- 5) CERC REC regulation 2010 (Fourth Amendment)  
[www.recregistryindia.nic.in/pdf/REC\\_Regulation/REC\\_Regulations\\_Fourth\\_Amendment\\_30.03.2016.pdf](http://www.recregistryindia.nic.in/pdf/REC_Regulation/REC_Regulations_Fourth_Amendment_30.03.2016.pdf)
- 6) Revised Approved Procedure dated.16-03-2018  
[https://www.recregistryindia.nic.in/pdf/Procedure\\_REC/CERC\\_REC\\_Procedure\\_16-03-2018.pdf](https://www.recregistryindia.nic.in/pdf/Procedure_REC/CERC_REC_Procedure_16-03-2018.pdf)

REC (Renewable Energy Certificate) is a market-based instrument to promote renewable energy and to address the mis-match between available RE sources and the requirement of the obligated entities to meet their renewable purchase obligations.

For meeting the RPO targets Purchase of renewable energy certificate is an option for obligated entities. Obligation to purchase electricity generation based on solar as RE source can be fulfilled by purchase of solar REC only. Obligation to purchase electricity generation based on non-solar as RE source can be fulfilled by purchase of non-solar REC only. Procurement of REC's issued for RE generation outside the State of Maharashtra as well as REC's issued for renewable energy generation within the State of Maharashtra shall be considered as an eligible instrument for the purpose of RPO compliance. Others details of REC can be viewed from MERC website [www.recregistryindia.nic.in](http://www.recregistryindia.nic.in)

### Significant Characteristics of the REC Framework

- Maharashtra Electricity Regulatory Commission vide its order dated. 01.07.2010 has designated Maharashtra Energy Development Agency (MEDA) as a State Agency to undertake functions as envisaged in MERC (Renewable Purchase Obligation (RPO), its Compliance and REC Framework Implementation) Regulations, 2010.
- MEDA as a State Agency will give REC Accreditation only to RE Generators. REC would be issued to RE generators and to the eligible Distribution Licensee. Grid connected RE Technologies approved by MNRE would be eligible under this scheme.
- There will be a Central Agency designated by the Central Commission i.e., National Load Dispatch Centre (NLDC) for registration of RE generators participating in the scheme.
- The RE generators will have two options - either to sell the renewable energy at preferential tariff fixed by the concerned Electricity Regulatory Commission or to sell the electricity generation and environmental attributes associated with RE generation separately.



- On choosing the second option, the environmental attributes can be exchanged in the form of REC. The REC once issued shall remain valid for One thousand and ninety-five days from the date of issuance of such Certificate and up to 31.03.2017, whichever is later.
- The Central Agency NLDC will issue the REC to RE generators. The value of REC will be equivalent to 1MWh of electricity injected into the grid from renewable energy sources.
- The REC will be traded only in the Power Exchanges approved by CERC within the band of a floor price and a forbearance (ceiling) price to be determined by CERC from time to time.
- There are two categories of RECs, viz., solar RECs and non-solar RECs.
  - a) Solar RECs are issued to eligible entities for generation of electricity based on solar as renewable energy source & non-solar RECs are issued to eligible entities for generation of electricity based on renewable energy sources other than solar.
  - b) The solar certificate shall be sold to the obligated entities to enable them to meet their renewable purchase obligation for solar, and non-solar certificate shall be sold to the obligated entities to enable them to meet their obligation for purchase from renewable energy sources other than solar.
- The price of REC would be determined in power exchange. REC would be traded in power exchange within the forbearance price and floor price determined by CERC from time to time.
- Supreme Court Order dated 8.5.2017 in Civil Appeal Nos. 6083/2017 and 6334/2017 regarding CERC order dated 30.3.2017 on REC Floor & Forbearance Price.
  - a) Obligated Entities/Power Exchanges shall deposit the difference between floor price prevalent earlier (i.e., Rs.1500/MWh) and the floor price as determined vide order dated 30.3.2017 (Rs.1000/MWh) with the Commission in SB A/C No. 209900301170005, Bank Corporation Bank Branch K.G. Marg New Delhi-110001, Bank IFSC, CORP 0002099 Branch Code, 2099.
  - b) Deposit of the differential amount shall be subject to the outcome of the Appeal No.105/ 2017 by the Appellate Tribunal for Electricity and further order of the Commission in the regard.
  - c) Trading in Solar REC's shall remain suspended until further orders, since stay order dated 8.5.2017 in Civil Appeal No. 6334/2017 filed by Green Energy Association in case of Solar REC's is still in operation.

The floor and forbearance price as determined by the Commission are as under :

	<b>Non solar REC ( /MWh)</b>	<b>Solar REC ( /MWh)</b>
Forbearance Price	2900	2500
Floor Price	1000	1000

- The distribution companies, Open Access consumer, Captive Power Plants (CPPs) will have option of purchasing the REC to meet their Renewable Purchase Obligations (RPO). Pertinently, RPO is the obligation mandated by the State Electricity Regulatory Commission (SERC) under the Act, to purchase minimum level of renewable energy out of the total consumption in the area of a distribution licensee.
- There will also be compliance auditors to ensure compliance of the requirement of the REC by the participants of the scheme.

On national level REC mechanism has been started in November 2010. Accordingly, MEDA received applications from RE generators for getting accreditation to their projects. MEDA in first stage scrutinize the application & enclosures submitted by RE generator. In second stage carry out field inspection & confirm the eligibility of project and after that issue an approval to concern RE project for accreditation.

**Accreditation status:**

Particulars	Total Capacity accredited till 31 <sup>st</sup> March 2019	
Source	Nos. Of Project	MW
Wind	161	462.33
Solar PV	59	96.65
Small Hydro	10	31.5
Others	1	1.668
Bio-mass	3	37.5
Bio fuel Co-generation	21	156.192
Total	255	785.84

**R&D (Research & Development)**

**MNRE activities under NEW TECHNOLOGIES:**

**1) Hydrogen Energy :**

MNRE has been supporting a broad-based Research Development and Demonstration (R&D) programme on Hydrogen Energy and Fuel. Projects are supported in industrial, academic and research institutions to address challenges in production of hydrogen from renewable energy sources, its safe and efficient storage, and its utilization for energy and transport applications through combustion or fuel cells. With respect to transportation, major work has been supported to Banaras Hindu University, IIT Delhi, and Mahindra & Mahindra. This has resulted in development and demonstration of internal combustion engines, two wheelers, three wheelers, and mini buses that run on hydrogen fuel. Two hydrogen refueling stations have been established (one each at Indian Oil R&D Centre, Faridabad and National Institute of Solar Energy, Gurugram).

<https://mnre.gov.in/new-technologies/hydrogen-energy>

**2) Energy storage :**

Energy storage can play a very important role in grid integration and balancing of variable generation sources. By increasing the system's overall flexibility, it can improve power quality, reduce peak demand, enhance capacity of distribution / transmission grids, avoid/reduce deviation penalties etc. Use of energy storage systems by residential, commercial or industrial consumers, in conjunction with renewable energy has potential to improve power quality and reliability for such consumers. This would also allow for minimization of diesel consumption from back-up power applications. Energy storage is the main component of EVs both in terms of cost and performance determination. The thrust for electric mobility utilizing indigenous modern and reliable energy storage would significantly reduce the country's dependence on imported fossil fuels and energy storage systems. The NITI Aayog is coordinating the work relating to energy storage.

<https://mnre.gov.in/new-technologies/energy-storage>

### 3) Ocean Energy :

As per a study conducted by the Indian Institute of Technology, Chennai in association with CRISIL Risk and Infrastructure Solutions Limited in December 2014, the tidal power potential is estimated at around 12,455 MW. The potential areas with low/medium tidal wave strength are in the Gulf of Khambat, Gulf of Kutch & southern regions in Gujarat, Palk Bay- Mannar Channel in Tamil Nadu, and Hoogly river, South Haldia & Sunderbans in West Bengal. Tidal energy is still in Research & Development (R&D) phase and has not been implemented on a commercial scale in India. The earlier efforts for harnessing tidal power were not successful due to high capital cost ranging from Rs. 30 crore to Rs. 60 crore per MW.

<https://mnre.gov.in/new-technologies/ocean-energy>

### 4) Geothermal Energy :

Geo-thermal resources in India have been mapped by Geological Survey of India (GSI). Broad estimate suggests that there could be 10 GW geo-thermal power potential. Present efforts are towards establishing cost-competitive geo-thermal potential in India.

<https://mnre.gov.in/new-technologies/geo-thermal-energy>



#### Geothermal Power

Geothermal energy is the natural heat generated within the earth due to radioactive activities. Earth has a large reservoir of geothermal heat and its potential has not been completely exploited for the process heat or power generation. The survey conducted by the Geological Survey of India regarding the available stored energy in the upper 3 km- depth range, estimates the potential of  $40.9 \times 10^{18}$  calorie in 13 well-defined and structurally controlled "Geothermal Provinces" [A. B. Dhaulakhandi et.al. SESI Journal 6(1): 9-27, 1996].

Among these provinces, Maharashtra shares

West Coast (Konkan) geothermal province

Narmada-Tapi Garben geothermal province

Godavari valley geothermal province.

Some of the identified sites are Tapi basin, Jalgaon, Dhule and Salbardi hot spring in Maharashtra. Nearly 340 hot springs have been identified in the country having temperatures in the range of  $60^{\circ}\text{C}$  -  $120^{\circ}\text{C}$ .



Some of the possible use patterns of geothermal energy are space heating, binary-cycle power generation, food processing, refrigeration, cold storage etc. Space heating and refrigeration have already been tried successfully at Manikaran, (Himachal Pradesh) and Puga (J&K). A pilot power plant of 5 kW based on close loop organic Rankine cycle was installed in Manikaran. Most of the geothermal sites are in low and moderate temperature range



**Deep Hot Spring Illustration**

The initial high cost and negligible low running cost make them commercially viable in the long run with a payback period of around 8 years. Based on the tried and tested technologies abroad, geothermal energy needs to be utilized specially for socio-economic development of the backward hilly areas. With suitable governmental support, private investment can be an attractive proposition.

#### **Overview**



**Ocean Waves**

#### **Wave Power**

Sea waves are the result of transfer of mechanical energy of wind to wave energy. The wave quality varies for different periods and seasons. It is possible to have a realistic formula to calculate the overall wave energy potential. A general study of the wave nature has shown that there is potential of 40,000 MW along the Indian coasts.

A similar study along the coast of Maharashtra has shown that there are some potential sites such as Vengurla rocks, Malvan rocks, Redi, Pawas, Ratnagiri and Girye, possessing an average annual wave energy potential of 5 to 8 kW/m and monsoon potential of 15 to 20 kW/m. Considering this, the total potential along the 720 km-stretch of Maharashtra coast is approximately 500 MW for wave energy power plants. Fortunately, after decades of research and development activities all over the world, some technologies are now available commercially. We need to explore the possibility of wave energy power plants at the identified sites by inviting proposals from private investors / promoters / technology providers from all over the world. They attract the private investment to the tune of Rs3000 crores. The Govt. of Maharashtra and Govt. of India have plans to announce policies to attract private investors in this field on BOO (Build Own Operate) basis.

#### **Energy Potential of Sea Waves**

Wave energy is, in fact, the storage of mechanical energy of wind in the sea water. Sea waves are variable in nature and their height and width changes with time and season.

The average potential along the Indian coast is around 5 to 10 kW /m. India has a coast line of approximately 7500 km. Thus, the total potential comes to around 40,000 MW. Even a 15% utilization would mean the availability of approximately 6000 MW. Generally, it has been observed that the western coast is more useful than the eastern coast. This is because the former has more stable waves and is less vulnerable to cyclones that can damage the power plant.



## Available Technologies

All over the world many types of technologies have been tried way back since 1970s. They are

- Cockerel raft
- Flexible Bag energy Converter
- Submerged circular cylinder converter
- Clamp wave energy converter
- Oscillating water column Converter
- Ocean swell powered renewable energy Converter

Of these, the oscillating water column converter (OWC) has been found to be more dominant due to its simplicity and adaptability to use the existing coastal structure of sea harbours. The OWC system consists of a chamber in the sea exposed to wave action through an entrance at the bottom or on the side. The air inside the chamber gets pressurized or expanded owing to the wave action.

The air movement through a small opening from or into the chamber, depending on the pressure inside, is used to drive an air turbine. This technology has been tried at Vizhinjam along the Kerala coast, near Thiruvananthapuram by National Institute of Ocean Technology, Chennai. (150 kW).

## Status in Maharashtra

MEDA sponsored a study, conducted by Centre for Earth Science Studies, Thiruvananthapuram, to find the wave energy potential along the Maharashtra coast. The study completed in 1994, has shown the Maharashtra coast has an annual wave potential ranging between 4 to 8 kW per metre of the length of the wave crest. During the monsoon, i.e., between June and August, the potential is quite high, i.e., 12 to 20 kW/m. The wave energy potential of the most feasible sites in Maharashtra is estimated as given in the following table: -

Wave power at selected sites along Maharashtra coast					
OFF SHORE Avg.Wave Power kW/m			COASTAL Avg.Wave Power kW/m		
Site	Annual	(Jun-August)	Site	Annual	(Jun-August)
Vengurla Rock	8.01	20.61	Girye	5.90	14.21
Square Rock	6.79	16.64	Vijaydurg	5.86	13.58
Redi	6.35	16.57	Ambolgarh	5.74	13.48
Malvan Rock	6.91	16.73	Kunkeshwar	5.64	13.35
Kura Inset	5.79	13.74	PawaPoint	5.36	13.10
			Wagapur	5.70	13.10

The Vengurla and Malvan rocks and Redi are on the top among the offshore locations. In the other group, Pawas and Ratnagiri top the list followed by Girye and Miyet point.

## DEVELOPMENT IN MAHARASHTRA

Power Generation Projects based on Wave Energy are not yet commercially established in India.

## 12. FINANCIAL REPORT



MEHTA SHAH & COMPANY  
CHARTERED ACCOUNTANTS

To,  
The Director General,  
Maharashtra Energy Development Agency,  
Yerawada,  
Pune

**Subject:- Financial Statements and Audit Report for the year ended 31<sup>st</sup> March 2019.**

Dear Sir,

We hereby submit the Balance Sheet, Income & Expenditure Account of Maharashtra Energy Development Agency and our Audit Report thereon for the year ended 31<sup>st</sup> March 2019.

Our Audit Report is subject to and inclusive of the notes on accounts attached with the Financial Statements and Audit Observations Report attached as Annexure.


We are thankful to your team for co-ordination extended to us during our audit.

Thanking you,

Yours faithfully,

FOR MEHTA SHAH & CO,  
Chartered Accountants  
F.R. No. 106315W

*Mundada*

 WDEEP R. MUNDADA  
Partner  
M. No.120096  
Place: Pune  
Date: 23/10/2019



A/1/1, Amitshree Apts., 852, Bhandarkar Institute Road, Pune-04.  
Tele/Fax: 9595330518, 8983600518. Email: mehtashah83@gmail.com

THE BOMBAY PUBLIC TRUSTS ACT 1950  
(SCHEDULE VIII (Vide Rule 17(2) )  
MAHARASHTRA ENERGY DEVELOPMENT AGENCY ( Registration No. F-11906 )  
BALANCE SHEET AS AT 31ST MARCH, 2019

FUNDS & LIABILITIES	SCD.	AMOUNT (RS)	AMOUNT (RS)	PROPERTY & ASSETS	SCD.	AMOUNT (RS)	AMOUNT (RS)
TRUSTS FUNDS OR CORPUS TRUST FUNDS Balance as per last Balance Sheet Adjust- ment during the year		208,921,993	208,921,993	IMMOVABLE PROPERTIES (at cost)	F (A)		121,470,0
				FURNITURE & FIXTURES	F (B)		10,806,1
				OTHER FIXED ASSETS	F(C)		802,577,7
				BUILDING WORK IN PROGRESS	F(D)		199,500,0
OTHER EARMARKED FUNDS Development Fund (created under the provision of the Trust Deed of Scheme or out of the income ) Infrastructure Rd/WPP fund Publicity Fund Depreciation Fund		2,422,169,771		ADVANCES	E	27,591,869	27,591,8
		177,137,801		CASH AND BANK BALANCE			
		4,554,459		a) In Current / Saving Account		5,227,019,828	
		663,898,950	3,267,760,981	b) Fixed Deposits		8,113,088,335	
				c) Cash in hand		22,666,824	13,362,774,9
LIABILITIES				OTHER CURRENT ASSETS	G	349,350,293	349,350,2
For Expenses	A	436,792,735					
For Beneficiary Contributions	B	369,661,389		DUTIES & TAXES			36,194,6
For Rent & Deposits	C	433,192,750	1,239,646,874				
GRANTS PAYABLE TO GRANTORS INCLUDING GREEN CESS FUND	D	869,994	869,994				
INCOME & EXPENDITURE ACCOUNT							
Balance as per last Balance Sheet		5,813,626,425					
Add - surplus as per Income and Expenditure a/c		4,379,439,462					
Add -Income in respect of previous year			10,193,065,887				
<b>TOTAL</b>			<b>14,910,265,729</b>	<b>TOTAL</b>			<b>14,910,265,7</b>

Notes forming part of Balance Sheet

As per our report of even date  
FOR MEHTA SHAH & CO.  
Chartered Accountants  
\* R. No. 106315W

SANDEEP R. MUNDADA  
Partner  
M. No.120096  
Place : Pune  
Date: 23/10/2019

The above Balance Sheet to the Best of our belief contains a true account  
of the Funds and Liabilities and of the Property and Assets of the Trust.  
FOR MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Hon. Director General  
Place : Pune  
Date : 23/10/2019

THE BOMBAY PUBLIC TRUSTS ACT, 1950  
(SCHEDULE IX (Vide Rule 17(2) )  
**MAHARASHTRA ENERGY DEVELOPMENT AGENCY ( REGISTRATION NO. F - 11906 )**  
**INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2019**

EXPENDITURE	SCHEDULE	AMOUNT (RS)	INCOME	SCHEDULE	AMOUNT (RS)
<b>TO EXP IN RESPECT OF PROPERTIES</b>					
Rates and Taxes		1,101,165	Interest	J	406,406,208
Depreciation		64,238,745	Grants	K	5,651,106,056
Establishment Expenses	H	192,129,032	Income from Other Sources (in details as far as possible)	L	125,461,647
		-			
Expenditure on objects of the Trusts					
a) Religious					
b) Educational					
c) Medical Relief					
d) Relief of Poverty					
e) Other Charitable objects	I	1,546,067,506			
Surplus carried over to Balance Sheet		4,379,439,462			
<b>TOTAL</b>		<b>6,182,975,910</b>	<b>TOTAL</b>		<b>6,182,975,910</b>

Notes forming part of Income and Expenditure Account

As per our report of even date  
**FOR MEHTA SHAH & CO.**  
Chartered Accountants

**SANDEEP R. MUNDADA**  
Partner  
M. No.120096  
Place : Pune  
Date: 23/10/2019



**FOR MAHARASHTRA ENERGY DEVELOPMENT AGENCY**

Hon. Director General  
Place : Pune  
Date : 23/10/2019



**MAHARASHTRA ENERGY DEVELOPMENT AGENCY**  
**SCHEDULES FORMING PART OF BALANCE SHEET**  
**AS AT 31 st MARCH 2019**

PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE A</b>		
<b>LIABILITY FOR EXPENSES</b>		
RECOVERY OF EMPLOYEES ON DEPUTATION	23,974	
GROUP INSURANCE SCHEME	219	
LIB E C Act 2001 BEE- 1604	40,340,011	
LIB ENERGY CONSERVATION FUND 2012	16,794,410	
LIB INFRASTRUCTURE ROAD MAINTAINANCE	296,537,042	
RPO RENEWABLE PURCHASE OBL	23,116,664	
EC ENERGY EFFNT ST LIGHT FITTING 15-16	15,295,794	
LIB SERVICE TAX	3,000	
LIB TDS 2% CONTRACTOR PAY-1461	(5,773)	
LIB.TDS CGST1% ON CONTRACTOR (DIVISIONAL OFF.)	(320,660)	
LIB.TDS.IGST ON CONTRACTOR (DIVISIONAL OFF.)	(214,975)	
LIB. T D S ON CONTRACTOR (DIVISIONAL OFF.)	(215,290)	
LIB.TDS ON NON-RESIDENT SEC.-195 (10%)	(947,028)	
LIB TDS ON RENT	5,302	
LIB.TDS SGST1% ON CONTRACTOR (DIVISIONAL OFF.)	(341,042)	
LIB.BANK STALE CHEQUE	2,425,000	
LIB. OUTSTANDING FUND [BANK]	22,180,884	
SALARY PAYABLE	1,778	
SUNDRY CREDITORS	(372,813)	
LABOUR WELFARE CESS	40,081	
LIABILITY TDS	14,876	
LIABILITY TDS PROFESSIONAL PAY	(9,340)	
RURAL VILLAGE ELECTRIFICATION	22,440,620	436,792,735
<b>Total of Schedule A</b>		<b>436,792,735</b>

PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE B</b>		
<b>LIABILITY FOR BENEFICIARY CONTRIBUTION</b>		
BEN. CONT PMKKKY ENERGY & WATERSHED DEVEP	1,242,000	
BEN. CONT. BIOGAS POWER GENRATION	1,500,000	
BEN. CONT. HIGHMAST PROJECT	3,000,000	
BEN. CONT. KHASDAR NIDHI	2,926,666	
BEN. CONT. SOLAR HYBRID SYSTEM	7,650,000	
BEN. CONT. SOLAR POWER PLANT	253,654,854	
BEN. CONT. SOLAR ROOF TOP	61,792,465	
BEN. CONT. SOLAR WATER HEATER	2,999,480	
BEN. CONT. SPV SOLAR WATER PUMPING SYSTEM	34,768,680	
BEN. CONT. WIND SOLAR HYBRID SYSTEM	127,244	369,661,389
<b>Total of schedule B</b>		<b>369,661,389</b>



PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE C</b>		
<b>OTHER LIABILITIES- For Rent and Other Deposits</b>		
EARNEST MONEY DEPOSIT	16,594,354	
SECURITY DEPOSIT	76,139,048	
DEPOSIT RECEIVED	-	
PENALTY RECOVERED	10,000	
WPP SECURITY DEPOSIT	340,308,750	
C P F [Deput. M S E B]	(14,862)	
TECHNICAL SERVICE CHARGES DEPOSIT	155,460	433,192,750
<b>Total of schedule C</b>		<b>433,192,750</b>

PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE D</b>		
<b>GRANTS PAYABLE TO GRANTORS</b>		
LIB GREEN CESS FUND 1419	815,124	
LIB TSP GRANT 1606	39,275	
LIB GRANT FOR SPECIFIC PURPOSE	15,595	869,994
<b>Total of schedule C</b>		<b>869,994</b>

PARTICULAR	AMOUNT (RS.)	AMOUNT (RS)
<b>SCHEDULE E</b>		
<b>ADVANCES- To Employees</b>		
PROJECT OFFICE	391,556	
H.O. EMPLOYEES	893,105	
COMPUTER ADVANCE	386,537	
FESTIVAL ADVANCE	461,001	
ADVANCE FOR FUEL	184,466	
ADVANCE TO DIRECTOR GENERAL	15,160	
HOUSE BUILDING ADVANCE	22,072,946	
ADVANCES TO SUPPLIERS	430,848	
ADVANCE FOR OFFICE PREMISES (MUMBAI)	2,756,250	27,591,869
<b>Total of Schedule E</b>		<b>27,591,869</b>



PARTICULAR	AMOUNT (RS.)	AMOUNT (RS)
<b>SCHEDULE G</b>		
OTHER CURRENT ASSETS		
DEPOSIT FOR RENT	1,191,199	
ELECTRICITY DEPOSIT	7,388	
OTHER CURRENT ASSETS	348,151,706	349,350,293
<b>Branch and Division</b>	*	
PROJECT OFFICE-AKOLA DIVISIONAL OFFICE	(3,819,053)	
PROJECT OFFICE-AMRAVATI DIVISIONAL OFFICE	(6,682,982)	
PROJECT OFFICE-AURANGABAD DIVISIONAL OFFICE EXPS.	(14,831,464)	
PROJECT OFFICE-CHANDRAPUR DIVISIONAL OFFICE EXPS.	(3,939,313)	
PROJECT OFFICE-KOLHAPUR DIVISIONAL OFFICE EXPS.	(10,758,345)	
PROJECT OFFICE-LATUR DIVISIONAL OFFICE	(6,536,788)	
PROJECT OFFICE-NAGPUR DIVISIONAL OFF EXPS	(24,439,051)	
PROJECT OFFICE-NASIK DIVISIONAL OFFICE EXPS	(8,522,343)	
PROJECT OFFICE-PUNE DIVISIONAL OFFICE EXPS	(8,369,340)	
PROJECT OFF- MUMBAI DIVISIONAL OFFICE	(19,511,471)	
PROJECT OFFICE-REGIONAL DIR.OFFICE PUNE EXPS	(1,758,176)	
HEAD OFFICE PUNE	109,190,325	
<b>Total of Schedule G</b>		<b>349,350,293</b>





**MAHARASHTRA ENERGY DEVELOPMENT AGENCY**  
**SCHEDULES FORMING PART OF INCOME EXPENDITURE ACCOUNT**  
**FOR THE YEAR ENDED 31<sup>st</sup> MARCH 2019**

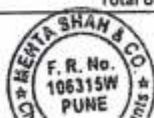
PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE H</b>	*	
<b>EASTABLISHMENT EXPENSES</b>		
STAFF EXPENSES	95,605,687	
TRAVELLING EXPENSES	10,925,191	
VEHICLE EXPENSES	11,582,131	
RENT	6,450,112	
TELEPHONE EXPENSE	1,232,971	
REPAIRS & MAINTENANCE	1,951,066	
POSTAGE & TELEPHONE	504,781	
PRINTING & STATIONERY	1,152,879	
OFFICE EXPENSES	50,741,644	
INSURANCE EXPENSE	1,282,472	
INTERNET EXPENSES	379,235	
ELECTRICITY EXPENSES	1,138,429	
BOOKS AND PERIODICALS	10,783	
MEMBERSHIP EXPENSES	(1,300)	
MEETING ALLOWANCE & EXPENSES	605,023	
COMPUTERS EXPENSES	732,901	
PUBLIC RELATIONS EXPENSES	2,438,812	
PROFESSIONAL CHARGES	1,587,037	
ADVERTISMENT & PUB (ADMN)	3,294,791	
XEROX EXPENSE	216,507	
BANK CHARGES	58,104	
PROJ.EXPS--GST	239,778	192,129,032
<b>Total of Schedule H</b>		<b>192,129,032</b>

PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE I</b>		
<b>Schedule I1</b>		
<b>EXPENSES INCURRED FROM STATE FUND</b>		
<b>13TH FINANCE COMM.16-17</b>		
Proj.Exps.Biogas Power Project -13 Fin.2016-17	11,040,000	11,040,000
<b>13TH FINANCE COMMISSION 2018-19</b>		
Proj.Exps.Biogas Power Project 13th Fin Com 2018-19	1,440,000	1,440,000
<b>GREEN CESS FUND 2016-17</b>		
Proj.Exps.-Rajbhavan Pune Special Proj 2016-17	7,330,508	7,330,508
<b>GREEN CESS FUND 2017-18</b>		
Proj.Exps.Bagasse Co-Gen P P Cap.Sub-Gcf 17-18	50,000,000	
Proj.Exps.Bagasse Co-Gen P Proj.GCF 17-18 Evaucatio	100,573,081	
Proj.Exps.- Infrs.Road Repair [ GCF] 17-18	300,480,206	
Proj.Exps.Small Hydro Capital Sub-Gcf 17-18	20,000,000	
Proj.Exps.Small Hydro Proj Evaucation-Gcf 17-18	19,717,335	490,770,622

  
**MENTA SHAH & CO.**  
**Chartered Accountants**  
**F. R. No.**  
**106315W**



<b>GREEN CESS FUND 2018-19</b>		
Proj.Exps Wind Power Proj.Evacuation-GCF 2018-19	161,700,000	161,700,000
<b>N R S E 2014-15</b>		
Energy Conservation 5062		
E C- Save Energy Prog (Energy Audit)	169,492	169,492
<b>N R S E 2015-16</b>		
Proj.Exps Energy Conservation 5062 [15-16]		
E C-E C Measures in Govt./semi Govt Bldg 15-16	(215,532)	
E C-Energy Efficient St Lt Fitting-N 15-15	(1,744,665)	
Proj. Exp Rural Vill Electrification N 15-16	1,432,144	(528,053)
<b>N R S E 2017-18</b>		
Proj.Exps Energy Conservation [5062] 17-18		
Energy Conservation	1,029,500	
E C-E C Public Awareness Prog [N 17-18]	1,447,056	
E C-E C Measures in Govt./semi Govt Bldg N 17-18	24,624,099	
E C-Energy Cons Award Prog [N 17-18]	1,480,004	
Proj.Exps Site Survey	243,500	
E C- Save Energy Prog (Energy Audit)	3,847,515	
Ec Energy Audit ( Walk Through) Prog	564,344	
EC-Inst of EC Devices Municipal Council N 17-18	8,987,500	
Proj. Exp Rural Vill Electrification N 17-18	15,994,026	
Proj.Exps-Advt & Publicity 5506 [N 17-18]	1,173,729	
Proj.Exps -Biomass Briquetting [N 2017-18]	267,744	
Proj.Exps SPV Power Plant (N 17-18)	31,380,035	
Proj.Exps Wind Monitoring [N 17-18] 5043	2,624,693	93,663,745
<b>N R S E 2018-19</b>		
Proj.Exps Energy Conservation-N 2018-19		
EC EC Mesures in Govt./Semi Govt.Bldg N-18-19	5,000,000	
E C-Public Awareness Prog. N 2018-19	29,500	
Proj.Exps Biomass Briquetting [N-2018-19]	4,729,473	
Proj.Exps Wind Monitoring 5043 [N 2018-19]	412,490	10,171,463
<b>T S P REGULAR 15-16</b>		
E C-Energy Efficiency St Light Fitting [T 15-16]	(1,168,752)	(1,168,752)
<b>Total of Schedule 11</b>		<b>774589025</b>
<b>Schedule 12</b>		
<b>EXPENSES INCURRED FROM CENTRAL FUND</b>		
MNRE GRID CONNECT SOLAR ROOFTOP PLANT PROG.	96,688,166	
MNRE GRID CONNECT SOLAR ROOFTOP 40.36 CR	109,734,511	
MNRE GRID CONNECT SOLAR ROOFTOP SYS 27.00 CR	56,400	
MNRE PM SAHAJ BIJU SAUBHAGYA SCHEME (DDUGJY)	101,377,233	
MNRE SKILL DEVELOPMENT PROG.	9,295,750	
MNRE SOLAR PARK PROJ.EXPS.	(85,000)	
MNRE SOLAR WATER HEATING SYSTEM PROJ EXP 6016	98,677,650	
MNRE SPV PROJECT [SOLAR SHOPPEE -6097	85,000	
MNRE WIND MONITORING STATIONS 6043	251,843	
MNRE SOLAR CITY PROGRAMME	10,000	
MNRE WIND SOLAR HYBRID SYSTEM-6044	6,587,500	422,679,053
<b>Total of Schedule 12</b>		<b>422,679,053</b>



<b>Schedule 13</b>		
<b>EXPENSES INCURRED FROM BENEFICIARY FUND</b>		
BEN PAY SOLAR POWER BASE PUMPING SYSTEM	21,877,539	
BEN. CONT. SOLAR.ROOF TOP	5,853,412	
BEN.CONT. - ENERGY AUDIT	90,000	
BEN.PAY SOLAR WATER HEATING SYS.	1,194,013	
BEN.PAY SOLAR COOKING SYSTEMS PROJ.	319,952	
BEN.PAY.SOLAR POWER PLANT 8274	35,695,669	
BEN PAY. WIND SOLAR HYBRID SYSTEM	1,007,820	66,038,405
<b>Total of Schedule 13</b>		<b>66,038,405</b>
<b>Schedule 14</b>		
<b>EXPENSES INCURRED FROM OWN / DEV FUND</b>		
DEV FUND ADVT & PUBLICITY EXPENSES-7506	14,764,345	
DEV FUND CHALKEWADI PROJECT EXPS 7047	2,642,448	
DEV FUND ENERGY CONSERVATION 7062	1,823,767	
DEV FUND EXIBITION EXPENSES 7502	3,070,526	
DEV FUND FOREIGN TOUR	19,668,744	
DEV FUND G'PACHGANI W F EXPS 7048	41,400	
DEV.FUND GRID CONNECT.SOLAR ROOFTOP PLANT PROG.	2,243,000	
DEV FUND MOTHIA WIND FARM EXPS 7049	1,948,346	
DEV FUND RESEARCH & DEVELOPMENT 7055	10,000	
DEV FUND SAUTADA WIND FARM EXP	384,134	
DEV FUND SPV SOLAR POWER PLANT	2,282,322	
DEV FUND SPV WATER PUMPING SYS	223,645,300	
DEV.FUND - STAFF WELFARE ACTIVITIES	3,451,804	
DEV FUND TRAINING PROG. EXPENSES	847,058	
DEV FUND VIJAYDURG PROJECT EXPS 7046	574,483	
DEV FUND WIND MONITORING STATION7043	2,760,287	
DEV FUND - WORKSHOP ON SOLAR / WASTE TO ENERGY	2,603,059	282,761,023
<b>Total of Schedule 14</b>		<b>282,761,023</b>
<b>Total of Schedule 1</b>		<b>1,546,067,506</b>

PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE J</b>		
<b>INTEREST RECEIVED</b>		
FROM BANK AND INVESTMENTS	406,406,208	406,406,208
<b>Total of Schedule J</b>		<b>406,406,208</b>



PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE K</b>		
<b>GRANTS RECEIVED</b>		
<b>SCHEDULE K1</b>		
GRANT RECEIVED FROM CENTRAL GOVERNMENT		
CENT.SUB.- MNRE SOLAR ROOF TOP PROJ	771,336,657	
CENT.SUB.- SAHAJ BULEE SAUBHGYA	152,770,240	
CENT.SUB- SOLAR WATER HEATING SYS IREDA	68,448,914	
CENT.SUB.SPV POWER PUMPS PROG.- 4099	61,292,000	
CENT.SUB SURYAMITRA SKILL DEVELOPMENT PROG.	2,174,190	
CENT.SUB. WIND SOLAR HYBRID SYSTEM-4044	9,730,800	1,065,752,801
<b>Total of Schedule K1</b>		<b>1,065,752,801</b>
<b>Schedule K2</b>		
GRANT RECEIVED FROM STATE GOVERNMENT		
ATAL SAUR KRUSHI PUMP YOJANA 18-19 - 1	96,536,550	
ATAL SAUR KRUSHI PUMP YOJANA 18-19 - 2	78,573,250	
STATE GRANT 13TH FINANCE 2018-19	2,076,240,000	
STATE GRANT GCF 2018-19	1,826,424,800	
STATE GRANT NRSE 2018-19	427,512,000	4,505,286,600
<b>Total of Schedule K2</b>		<b>4,505,286,600</b>
<b>Schedule K3</b>		
BENEFICIARY SHARE RECEIVED		
BEN.CONT. ATTAL SOUR KRISHI PUMP-2	61,099,898	
BEN.CONT.SOLAR PUMPING POJECT	870,790	
BEN. CONT.- SOLAR POWER PLANT	14,314,700	
BEN. CONT.- SOLAR ROOF TOP	3,736,267	
BEN.CON.SOLAR OFFGRID TESTING FESS	45,000	80,066,655
<b>Total of Schedule K3</b>		<b>80,066,655</b>
<b>Total of Schedule K</b>		<b>5,651,106,056</b>

PARTICULAR	AMT (RS)	AMT (RS)
<b>SCHEDULE L</b>		
<b>INCOME FROM OTHER SOURCES</b>		
RECT ACCREDITION FEES & CHARGES 4620	6,059,507	
RECT APPLICATION FORM FEES	4,579	
RECT FOREIGN TOUR - MAHAGENCO / MAHATRANSCO	6,453,941	
RECT INTEREST ON ACCREDITATION	66,409	
RECT MISCELLANOUS INCOME 4603	35,379	
RECT OTHER INCOME 4649	3,558	
RECT REGISTRATION FEES-4602	28,849,352	
RECT SERVICE CHARGES 4655	3,972,358	
RECT S R R A STATION DATA FEES	3,700	
RECT TENDER FEES-4601	5,638,770	



RECT TRANSFER AND CLEARANCE FEES-4622	4,441,000	
RECT WIND FARM CHALKEWADI M S E D C L 4647	3,019,730	
RECT WIND FARM GUDEPANCHGANI MSEDCL	2,378,511	
RECT WIND FARM JAGMIN (CHALKEWADI-2)	23,476,037	
RECT WIND FARM MOTHA MSEDCL	4,449,570	
1 % TECHNICAL SANCTION FEES	11,052,538	
3 % CONSULTANCY FEES	1,778,630	
5% PROJECT MANAGEMENT FEES	23,739,453	
DISCOUNT RECEIVED	• 3,889	
RECT. EXHIBITION STALL RENT	36,736	125,463,647
Total of Schedule L		125,463,647





**CHANDRAPUR DIVISION**

PARTICULAR	AMOUNT (Rs.)
BOM 60297959731	691664
bom 60297961570	27708585
<b>Grand Total</b>	<b>28400248</b>

**KOLHAPUR DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank of Maharashtra Kolhapur 7577	3071392
Bank of Maharashtra (Project) Kolhapur-4424	7887279
<b>Grand Total</b>	<b>10958671</b>

**LATUR DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank of Maharashtra Latur Project	15992190
Bank of Maharashtra Office Exp	704249
<b>Grand Total</b>	<b>16696439</b>

**MUMBAI DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank OF Maharashtra Nanman Points	14466080
Canara Bank Nr Point Mumbai	1319366
<b>Grand Total</b>	<b>15785446</b>

**NAGPUR DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank of Maharashtra 60277208983	43876996
Bank of Maharashtra Civil Line Nagpur	2842420
Bank of Maharashtra - Khasdar Dr Vikas Mahatme	173763
Bank of Maharashtra - Khsdar Kr Upal B Tumane	158924
State Bank of India - Current A/c - 37918595902	10000
<b>Grand Total</b>	<b>47062103</b>

**NASHIK DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank Of Maharashtra Dwarka Br	1142543
Project MEDA, Nashik	3985909
<b>Grand Total</b>	<b>5128452</b>

**PUNE DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank of Maharashtra (Lokmangal Branch)	1410776
Bank Of Maharashtra ( M P Fund )	2397624
Bank of Maharashtra ( Project )	4193061
<b>Grand Total</b>	<b>8001461</b>



**[MEDA] 2018-19****Bank Accounts**

1-Apr-2018 to 31-Mar-2019

**HEAD OFFICE**

PARTICULAR	AMOUNT (Rs.)
Axis Bank Ltd 918020015963471	294104180
Axis Bank Saving A/c No 289074	2026993
Bank of Maharashtra Bonbunder	52570
Bank of Maharashtra - EC	2116665
Bank of Maharashtra Erandwana	5884231
Bank of Maharashtra Parvti	7949
Bank of Maharashtra Yerawada	94005
Canara Bank Ramwadi Pune	55024680
Canara Bank State Grant A/c - 000005	4467457444
ICICI Bank 349101000165 GCRT	470857
ICICI Bank - Acct 349101000164-Saubhagya	3082352
ICICI Bank - CA 550	19700855
IDBI Bank Saving Account FD Road Br-8009	100760963
Punjab National Bank - Deccan Br	1570420
Punjab National Bank, Kalyani Nagar	1089782
State Bank of Hyderabad Laxmi Rd	1492475
Union Bank of India Agakhanpalace	34464132
Union Bank of India Kothapur	74311
<b>Grand Total</b>	<b>4989474863</b>

**AKOLA DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank of Maharashtra Akola Admini A/c 1398	1123410
Bank of Maharashtra Akola Project A/c1999	2497390
Punjab National Bank A/c	7207350
<b>Grand Total</b>	<b>10828150</b>

**AMRAVATI DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank of Maharashtra Amravati-A/c	2257209
Bank of Maharashtra Project Account Amravati	64891473
<b>Grand Total</b>	<b>67148682</b>

**AURANGABAD DIVISION**

PARTICULAR	AMOUNT (Rs.)
Bank of Maharashtra Aurangabad	468750
Bank Of Maharashtra Project Account8899	25982723
<b>Grand Total</b>	<b>26451473</b>

**REGIONAL DIRECTOR OFFICE**

PARTICULAR	AMOUNT (Rs.)
Union Bank on India-Regional Div	1083840
Grand Total	1083840

TOTAL	.5227019828
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FIXED ASSETS SCHEDULE - F

Sr. No.	Particulars	Gross as on 31.03.2018	Additions in	Adjust.	Less for the year	Total 31.03.2018	Depreciation as on 31.03.2018	Depr writt back during the year	Depreciation for the year	Total Dep as at 31.03.2018	Net as at 31.03.2018	Net as at 31.03.2018
		1	2	3	4	5	6	7	8	9	10	11
<b>IMMOVABLE PROPERTIES</b>												
1	Building (H.O.)	4,566,829	1,883,516			5,450,345	4,181,148		1,36,587	4,317,435	2,162,312	415,081
2	Land (Vadga)	1,925,578				1,925,578					1,925,578	1,925,578
3	Building (C ward)	3,613,346				3,613,346	3,201,512		41,173	3,242,786	370,560	411,734
4	Land (C ward)	1,401,950				1,401,950					1,401,950	1,401,950
5	Land (Sasale)	16,604,242				16,604,242					16,604,242	16,604,242
6	Land (Metha)	2,410,482				2,410,482					2,410,482	2,410,482
7	Building (Vadga)	3,106,818				3,106,818	2,808,921		21,790	2,910,711	196,107	217,897
8	Road (Thoragar)	2,349,053				2,349,053					2,349,053	2,349,053
9	Building guest house	4,180,500				4,180,500	2,998,952		118,155	3,117,107	1,062,393	1,062,393
10	Mumbai Office	6,571,064				6,571,064	4,770,262		180,080	4,950,342	1,620,722	1,620,722
11	Land (Pansubre)	388,335				388,335					388,335	388,335
12	Land (G. Pachgaon)	444,947				444,947					444,947	444,947
13	Land MEDA HO	54,045,000				54,045,000					54,045,000	54,045,000
14	Building at Kolhapur office	3,296,500				3,296,500	2,019,369		127,713	2,147,282	1,149,418	1,149,418
15	Pedestrian Park building	4,262,817				4,262,817	10,177,351		408,547	10,585,898	3,076,919	3,076,919
16	H.O. Land (Vadga)	174,886				174,886	59,504		7,528	107,132	67,754	67,754
	<b>SUB TOTAL (A)</b>	<b>119,972,447</b>	<b>1,883,516</b>			<b>121,456,025</b>	<b>30,337,820</b>		<b>1,040,673</b>	<b>31,378,493</b>	<b>90,077,532</b>	<b>89,234,627</b>
<b>FURNITURE AND FIXTURES</b>												
17	Furniture & Fixture	7,253,015	182,387			7,435,402	5,108,114		223,609	5,331,723	2,103,678	2,144,901
	<b>SUB TOTAL (B)</b>	<b>7,253,015</b>	<b>182,387</b>			<b>7,435,402</b>	<b>5,108,114</b>		<b>223,609</b>	<b>5,331,723</b>	<b>2,103,678</b>	<b>2,144,901</b>
<b>OTHER FIXED ASSETS</b>												
18	Vehicles	18,270,866	9,615,105			27,885,971	9,242,121		2,190,978	11,436,959	12,448,973	9,030,745
19	Project Equipments	2,190,807				2,190,807	1,430,565		118,261	1,521,683	669,125	767,205
20	Office Equipments	6,270,771	438,765			6,709,536	4,565,259		352,246	4,997,615	1,721,923	1,595,702
21	Electrical fittings	577,885				577,885	567,308		7,558	514,366	53,520	70,577
22	Computers	14,970,645	4,435,634			19,406,279	12,890,489		1,800,681	14,695,180	4,448,100	1,810,146
23	Computer Software Purchased	487,301				487,301	144,542		136,544	281,865	205,415	342,359
24	Software Purchased	3,600,050	209,596,025			213,196,075	50,025		57,866,060	55,625,378	154,427,925	2,700,000
25	P & M (Vadga)	50,825,378				50,825,378	50,825,378			58,768,095		
26	Elect. inst. (Vadga)	9,619,893				9,619,893	9,619,893			9,619,893		
27	P & M (C. Ward)	78,074,338				78,074,338	78,074,338			78,074,338		
28	P & M (H.Q.)	911,531				911,531	911,531			911,531		
29	P & M (Metha)	98,038,000				98,038,000	98,038,000			98,038,000		
30	Elect. inst. (C. Ward)	15,959,070				15,959,070	15,959,070			15,959,070		
31	P & M (Thoragar)	69,387				69,387	69,387			69,387		
32	P & M (G. Pachgaon)	82,472,000				82,472,000	82,472,000			82,472,000		
33	Elect. inst. (G. Pachgaon)	15,314,428				15,314,428	15,314,428			15,314,428		
34	Elect. inst. (Metha)	526,622				526,622	526,622			526,622		
35	P & M (C. Ward)	142,447,000				142,447,000	142,447,000			142,447,000		
36	Books & Journals	173,525				173,525	173,525			173,525		
37	Pedestrian Park Machinery	404,570				404,570	404,570			404,570		
38	Sever. Waste (Approx.) Machinery	25,251,334				25,251,334	25,251,334			25,251,334		
	<b>SUB TOTAL (C)</b>	<b>580,185,352</b>	<b>220,089,532</b>			<b>800,274,884</b>	<b>563,877,546</b>		<b>62,430,381</b>	<b>676,288,247</b>	<b>173,966,537</b>	<b>16,327,486</b>
	<b>Grand Total (A+B+C)</b>	<b>1,797,260,814</b>	<b>2,085,993,435</b>			<b>3,883,254,249</b>	<b>1,372,263,456</b>		<b>1,664,673</b>	<b>2,017,586,792</b>	<b>1,016,667,847</b>	<b>307,207,024</b>
	<b>Sub Total (D)</b>	<b>1,797,260,814</b>	<b>2,085,993,435</b>			<b>3,883,254,249</b>	<b>1,372,263,456</b>		<b>1,664,673</b>	<b>2,017,586,792</b>	<b>1,016,667,847</b>	<b>307,207,024</b>
	<b>Grand Total (A+B+C+D)</b>	<b>3,584,521,628</b>	<b>4,171,986,870</b>			<b>7,655,241,119</b>	<b>2,744,526,912</b>		<b>3,329,341,760</b>	<b>4,325,902,359</b>	<b>2,033,334,891</b>	<b>614,413,848</b>









## **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)**

( A Govt. of Maharashtra Institution )

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