

# **Non-Conventional Energy Development Agency, UP.**

**Welcomes the Delegates**

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# **Investment opportunities in Renewables in the State of Uttar Pradesh**

# UTTAR PRADESH : AT A GLANCE

- **TOTAL POPULATION (CrS) - 16.60**
- **RURAL POPULATION (CrS) - 13.16(80.33%)**
- **AREA (SQ.KM.) - 240928**
- **DISTRICTS - 70**
- **BLOCKS - 902**
- **VILLAGES - 97134**
- **FAMILIES (THOUSAND) - 21050**
- **PER CAPITA ELEC.  
CONSUMPTION (UNIT) - 138**



# NEDA

- Non-Conventional Energy Development Agency was set up as Nodal Agency in U.P. for promotion of renewables.
- Head Office at Lucknow and has 55 District Offices in the state.
- Has a qualified & trained manpower of more than 500 employees



# Potential in Renewables in UP

- **Solar Energy**
- **Bio Energy**
- **Micro-hydel Energy**
- **Wind Energy**



# Solar Energy

- **Solar Photovoltaic**

- A high production technology and low end use technology area

- **Solar Thermal**

- A medium production technology and low end use technology area



# Solar Energy

## 1. Applications of PV Technology

- Lighting system
- Water pumping
- Stand Alone power generating units
- Grid Interactive power generating units

## 2. Applications of Solar Thermal

- Water Heating
- Cooking
- Air heating
- Buildings



# Investment potential in Solar Energy (PV)

## Household lighting in rural areas:

- Rural households :2.1 crore in around 97000 villages, Using of kerosene for essential lighting.
- Solar PV system having two CFL's costs around Rs. 12500.00 per system.
- To replace 50% kerosene lamps cost of investment required will be Rs. 21600 crores.
- Replacement to save 6245 lac litres of kerosene and to prevent 24 mt of CO<sub>2</sub> emissions annually.



# Investment potential in Solar Energy (PV)

## Water pumping in rural area

- 35 lacs bore wells exist which are either diesel or electricity operated
- To replace 10% of these bore wells by solar pumps, the investment requirement is 10540 crores.
- Investments to save 3.67 lac kl of diesel and will save 330 lac tons of CO<sub>2</sub> emission per annum in the atmosphere



# Investment potential in Solar Energy (Thermal)

## Solar Water Heater

- A low production technology and low maintenance product.
- State Government has made it mandatory for commercial establishments such as nursing homes, hospitals, hotels and for residential houses constructed on a plot area of more than 500 sq mts.
- In Industry Solar water heaters could provide preheated water upto 80°C for boilers.



# Investment potential in Solar Energy (Thermal)

- A 1000 lpd SWH system saves around 15000 units of electricity or 1800 litres of furnace oil per annum.
- Saving CO<sub>2</sub> emissions to the tune of 15 tons per year.
- If in commercial sector –
  - 100 hotels install 1000 lpd capacity
  - 1000 nursing homes install 500 lpd capacity
  - 200 hospitals install 2000 lpd capacity
- Savings in electricity will be 15 Mwh and CO<sub>2</sub> emissions 150 thousand tons per annum.



# Investment potential in Solar Energy (Thermal)

- **In domestic sector if –**
  - 5 lac urbanites install a 200 lpd SWH system
  - Saving in electricity will be 150 Mwh per annum
  - Saving in carbon dioxide emission to the tune of 1.5 million tones per annum



# Investment potential in Solar Energy

The investments required to achieve installations in commercial and domestic sector are of the order of Rupees 2020 Crore.



# Present Scenario

- PV programme is mainly government driven programme and is a large programme in UP.
- For lighting activity and other small applications market mode is developing.
- Solar thermal programme is mainly in market mode.



# Probable commercial activities could be:-

- **Manufacturing Units**
  - a. Solar PV cells
  - b. Solar modules
  - c. Solar PV Systems compatible batteries
  - d. Units to develop electronics for PV system
  - e. Collector plate for Solar Water Heating System.



# Probable commercial activities are:-

- f. Evacuated tubes for SWH system.**
- g. Complete thermal collector**
- h. Solar Cookers**
- i. Air heaters**
- h. Fabrication units for assembling**
- Marketing outlets for PV and thermal products**



# Present Scenario

- UP has only one Solar PV cell and module manufacturing unit, and one battery manufacturing unit. No unit is manufacturing solar thermal collectors.
- Other units are only assembling unit or fabricators.
- Due to low power availability demand is high in rural as well as in urban sectors.
- UP has taken up a large programme of village electrification using solar PV and suppliers are a few.



# Government Support

- **For manufacturers financing is available through IREDA.**
- **Subsidies are available for the consumer by state government and by central ministry.**
- **For development of market in market mode, 11 Solar shops are operating and 54 solar shops are in the process of opening.**
- **IT benefits as depreciation to the tune of 80% per year are available for projects.**



# Government Support

- **NEDA conducts regular awareness programmes for promotion of systems.**
- **A customer support centre has been opened by NEDA.**
- **Service centres have been established in nearly all the districts of the state.**
- **Interest subsidy scheme through banks is available to the consumers.**
- **Capital subsidy is available to commercial and institutions not availing soft loan facility.**



# Bio - energy

## Biomass

- Assessed potential of 1400 MW of power generation from biomass.
- High production technology and high end use technology area

## Co-generation

- Assessed potential of < 1000 MW in sugar mills
- High production technology and high end use technology area



# Bio - energy

## Waste to Energy

- Assessed potential of 176 MW
- High production technology and high end use technology area

## Biofuels

- Power generation from Jatropha etc, assessment is that 25 lac tons of oil will be available after 3-4 years
- Medium to low production technology and low end use technology area



# Biomass

- **Technologies**

- **Gasification: Low end power generation, upto 500 kw or in multiples of 500 kw**

- **Combustion: High end power generation, in MW range**

- **Large quantities of Agro waste and forest waste are available in the state**



# Bio-mass

- Good response from captive power producers using rice husk as feed stock
- Only one manufacturer of gasifier units in the state.
- State has more than 1200 rice mills in operation
- Central ministry is providing attractive subsidies, and Income tax benefit, as depreciation, is available.
- Investment opportunities are to the tune of Rs. 5600 Crore.



# Co-generation

- Largest sugar cane producing state
- Sugar mills in government, co-operative and private sector are around 125
- 10 new sugar mills are likely to come up.
- Exportable surplus to the grid is around 1000 MW



# Co-generation

- **Central ministry is providing attractive subsidies, Income tax benefit, as depreciation, is available to power producer.**
- **CDM benefits could be availed.**
- **Technology is imported from outside the state.**
- **Investment opportunities are of Rs. 5000 Crore.**



# Waste to Energy

- **Assessed potential is 176 MW in major cities.**
- **Along with IL&FS is developing projects in selected cities**
- **Projects are based on**
  - **Integrating solid and liquid wastes of the cities.**
  - **Setting up of SPV and open bidding.**
- **Projects are eligible for CDM benefits**
- **Technology is not available in the state.**
- **Investment potential is of Rs. 1200 Crore .**



# Bio-fuels

- Development of bio-fuels for power generation is a thrust area.
- Jetropha, being one of the major sources, is now being cultivated at a large scale.
- Other existing sources such as Mahua are being attempted for power generation at a pilot scale.
- Large potential is available for setting of power generation units.
- Policy for bio fuels development is in the making.
- Investment opportunities are in oil extraction and power generation to the tune Rs.5000 Crore.



# Small Hydro

- **Assessed potential on canal falls and dam toes upto 25 MW is 167 MW.**
- **NEDA takes up projects up to 3 MW, whereas Laghu Jal Vidyut Nigam takes up projects above 3MW up to 25 MW.**
- **57 potential sites have been identified.**
- **An elaborate investor friendly policy is under preparation.**
- **Central Ministry provides attractive benefits.**
- **Investment opportunity in this sector is Rs. 750 Crore.**



# Wind Energy

- Power generation potential from wind is low in Uttar Pradesh.
- However, assessment of suitable wind velocities is under way at some sites.



# State Policies

- **Tariff structure for renewables:**
  - **Co-generation: Rs 2.86 per unit (base year 05-06)**
  - **Small hydro: Rs. 3.39 per unit for 1st year**
  - **Other renewables: Rs 2.50 per unit (base year 2005-06)**
- **Purchase of electricity by DISCOMS to extent of 7.5% of the power from renewables made mandatory.**



# State Policies

- **Municipal solid waste**
  - Land for project to be made available at Rupee 1.00/m<sup>2</sup>.
  - Waste to be made available by Municipal Corporation, free of cost.
  - Power to be bought by UPPCL.
- **Small Hydro**
  - New State Policy is under active consideration.



# THANK YOU

