

**DRAFT OF THE
GOA STATE GOVERNMENT
POLICY TOWARDS
RENEWABLE, SOLAR
ENERGY AND ENERGY
CONSERVATION- GOA 2014**

Drafted by

Goa Energy Development Agency
(GEDA) team for the approval by
the State Govt. of Goa

PREAMBLE

- In view of the fact the State of **Goa does not generate its own electricity**, the challenge before the State Government is not only to meet the ever growing demand for power but also to progressively increase the share of renewable sources in the **power - mix** so as to achieve overall energy security and to meet **the Renewable Purchase Obligation (RPO)**.

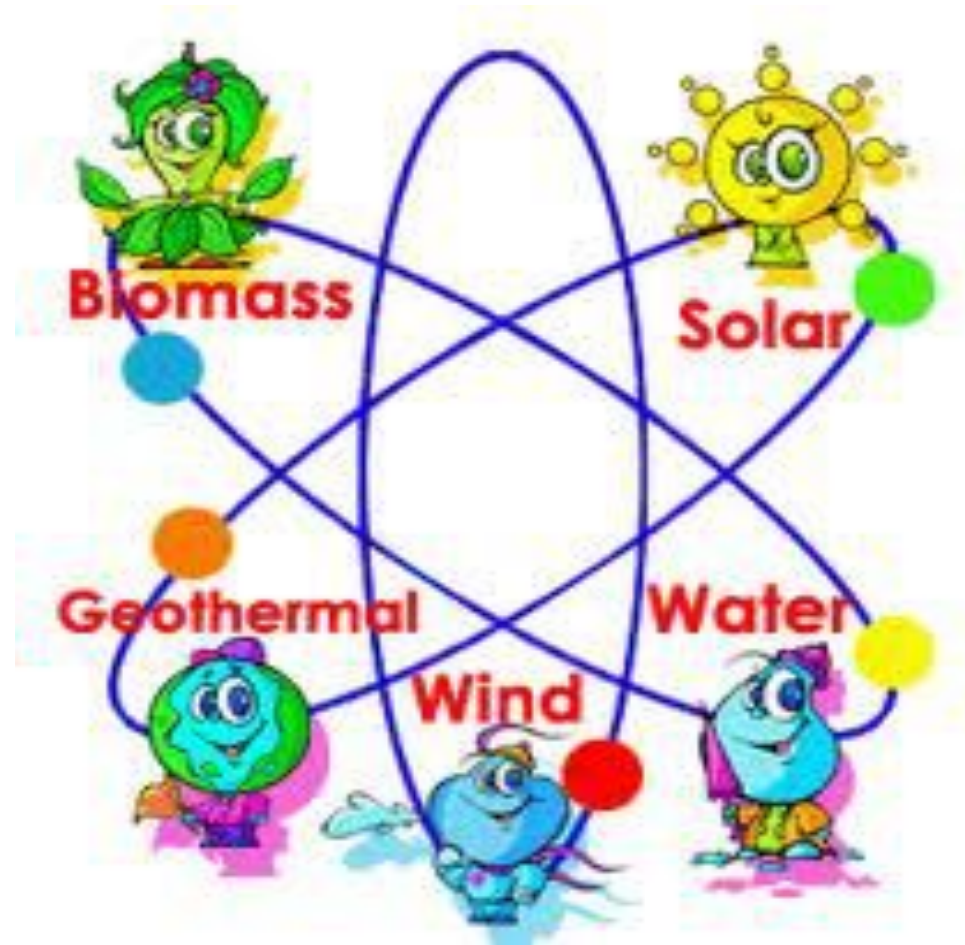
Objectives 1

- To promote generation and use of **clean and green power** by harnessing renewable forms of energy for fossil fuel consumption abatement / substitution.
- To promote **private sector participation** in development of solar PV power and other renewable forms of energy to achieve captive generation of solar renewable power through implementation of roof top solar PV plants, thermal, wind, biomass etc. utilization.
- **Promote environmental awareness** among the people.
- To contribute to **productive use of waste lands**, abandoned mines and utilize the open spaces.

Objectives 2

- To promote simultaneously the **co-generation of power** like waste heat recovery or utilization of recycled resources.
- To enhance skills and **create employment opportunities** at various levels.
- To promote establishment of **local manufacturing facilities** for solar and renewable power plants.
- To build capacity in the State to initiate and sustain, use and effective management of renewable energy technologies.
- To help the State Electricity Department to meet the **RPO obligations**. To ensure strict compliance of RPO obligations by all obligated entities in the state whether private sector or public sector.

Major types of RE sources



Renewable energy sources for Goa

- Solar PV power
- Solar thermal power
- Wind power at low end in the range 1 – 25 KW
- Bio-mass wet food waste and municipal waste
- Dry bio-mass waste of plant origin

Renewable energy/ Green power options

- Solar photovoltaic power generation, Solar thermal power generation, solar-wind hybrid systems and solar applications in domestic and industrial sector and commercial roof top spaces.
- Small wind power projects up to 1-25 KW.
- Power from municipal solid waste, Industrial liquid/solid waste power projects and Bio-fuels.
- Biomass briquetting.
- Biogas projects by utilizing agriculture residues and animal waste.
- Small hydro-electric projects.

Green energy options



Private sector contribution

The Goa State RPO to be shared by private sector Industries consuming more than 2MW power .

- The industries consuming more than 2MW power to be obliged to go for generation of RE/Solar PV generation.
- Industries or establishments like large hospitals, hotels, schools, cooperative residential complexes with large roof area to establish some form of RE devices in their premises.

Policy on Capacity

Capacity cap:

- The minimum project capacity of a Solar Power generation in case of Solar Photovoltaic (SPV) shall be **05 KW** each and Solar Thermal (ST) shall be **100 liters per day (LPD)** equivalent of hot water capacity.
- Non-solar power plants will have lower limit of 05 KW.

Eligible entity:

- **Any company or body, corporate or association or any individual or body of individuals , whether incorporated or not , or artificial juridical person** will be eligible for setting up of RE, solar power generation and biomass utilization plant or co-generation either for the purpose of captive use and / or for selling of electricity, in accordance with the electricity act-2003, as amended from time to time.

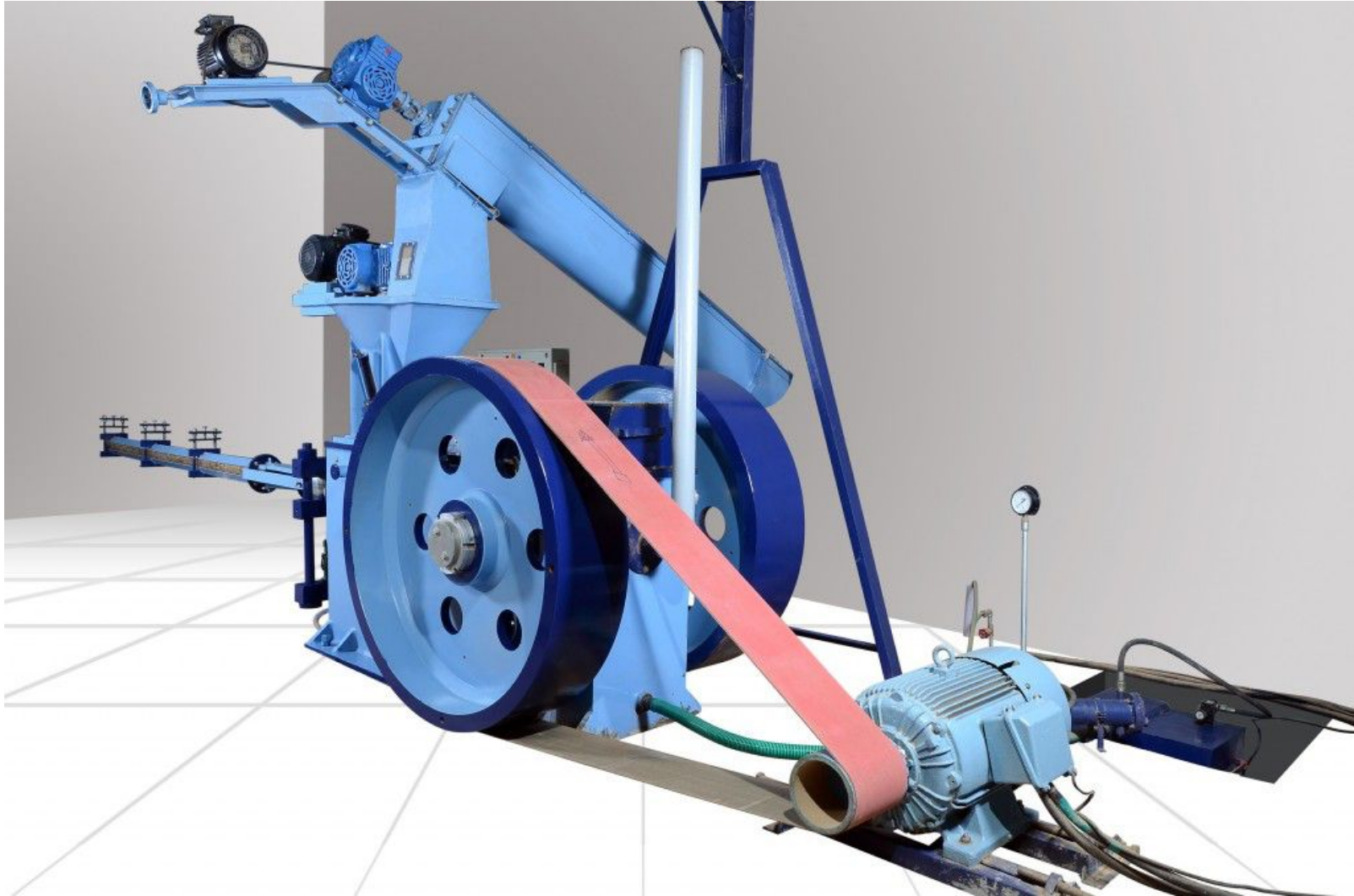
Green State: Green energy potential

- Biomass briquettes are **eco-friendly, renewable** in nature, non polluting and economical. They leave **no carbon footprints**. Hence the use of biomass briquette production and use of stoves for cooking will be encouraged.
- Briquettes are ready **substitute of lignite / coal / wood** in industrial boilers and brick.
- Biomass briquetting is an industry with lot of **employment potential** at local level.
- It protects nature by reducing pollution. It also avoids the decay of agriculture waste contributing to **methane pollution** and help farmers to get supplementary income.

Biomass Briquetting

- Briquetting is a new technology in which all types of **low density** agriculture waste, forestry waste and organic industrial waste is converted into **high density solid cylindrical** shaped blocks.
- It uses very high mechanical hydraulic pressure to compress. It needs no chemical or binder. It is called **briquette / Bio-coal / Pellet or white coal**.
- The briquette raw material may also comprise of bagasse, rice husk, dried cow dung cakes, tree droppings, segregated organic municipal waste and or any other agriculture waste material.

Briquetting machine



Bio mass policy and measures

- 80 - 100% depreciation on plant & machinery in the income tax burden.
- Easily availability of variety of raw materials.
- No sales tax for the first 07 years on production over the sales.
- No excise duty on production in the state.

Employment potential

- Green state of Goa has enormous potential for collection of variety of bio-mass.
- Government will encourage manufacture of briquettes of different sizes.
- It will utilize various types of agricultural waste to produce briquettes.
- It will encourage farmers collect the bio waste, facilitate its use in various applications.
- It will generate enormous rural employment.

Solar and Renewable Energy policy

- Goa State is preparing the renewable energy policy. It is available for comments and feedback.
- Draft policy is available with GEDA and GCCI.
- It considers all the renewable energy options.
- It considers various operational aspects of the tripartite agreement involving central body JERC.
- The private individuals, corporate bodies can set up these power generation units after signing an agreement with the Govt of Goa for tariff.

Conditions of operations 1

- **Operative period:** This policy will come into effect from the date of issuance and shall remain in operation up to 31st July 2024. It is subject to revision in the event of changes in the solar / RE power policy at the centre or some technological breakthrough altering current set up and operation of these plants.

Capacity range

- **Installed capacity:** For private individuals or project facilitators undertakings minimum of 5 KW Solar Power generation shall be allowed for installation at a given location.
- To get central Govt. subsidies on customs duty, excise duty etc, these can be clustered together up to 100 KW in a locality.
- Plants up to 5 MW capacity can be erected at different locations.

Eligible entities

- Any company or body corporate or association or body of individuals , whether incorporated or not , or artificial juridical person will be eligible for setting up of solar power generation and biomass utilization plant or co-generation either for the purpose of captive use and / or for selling of electricity , in accordance with the electricity act-2003, as amended from time to time.
- The entity desiring to set up solar/ renewable /co generative power project, either for sale of power and / or for captive use of power within the state , shall submit a proposal, with requisite details, as may be specified to the Nodal Agency , for qualifying for setting up of the project. The qualifying entity shall be decided by a project approval committee.

Biomass based generation

Any entity desiring to set up biomass utilization plant either for the sale of product or for captive use of the product shall -

- have to submit proposal with details about requisite supply of biomass quantity, details of machine and power consumption.
- specify the raw material sources and
- Confirm that the plant will not have to depend on fresh source as firewood, coal, etc.

Restriction for use of fossil fuel

- No fossil fuel i.e. coal , gas , lignite, naphtha or wood etc. shall be allowed to be continuously used in Solar thermal power or biomass based projects except for initial ignition of the system or maintaining continuity of operation of generation.
- If the fossil fuel is required, the data on the usage for this purpose will have be mentioned in the DPR.

Wheeling charges

- The wheeling of electricity generated from the RE / Solar power generators to the desired locations for self use within the state , shall be allowed at a wheeling charge of 2% of the energy fed to the grid.
- The wheeling charges and T & D losses will not be applicable for the captive solar generators within the state.

Exemption from payment of electricity duty

Electricity generated from the solar power can be utilized for

- Self consumption
- Sale to third party
- Sale to state electricity department

Licensees shall be exempted from payment of electricity duty.

Green roof top power

Goa state will promote green roof top power generation on small as well as on the large buildings and open lands. These could be off grid or grid connected, on net metering basis.



Land, roof top hiring policy

- The private/public land/roof top owner can have understanding with the power generating agency to charge land/roof top area on the occupation basis
- Agreement duration – min. 10 and max. 25 years.
- The land/location ownership will not change hands.
- In the event of eviction of the power generation set up the land owner will have to fully compensate the power generating agency for the remaining period of the power purchase agreement.
- In the event the power generating agency desires to dismantle the set up, it will have to compensate the land/roof top area owner fully for the remaining period of the agreement.

Sale of Power

- Power shall be sold to the distribution licensees in the state at the predetermined tariff per KW/MW unit as per the RE policy
- The Power Purchase Agreement will be reviewed every 5 years for tariff fixation. This is in keeping with the rapid technological changes taking place in the Solar PV field.
- While fixing the tariff for the given capacity in KW/MW of the plant, annual power output based on the type of solar panels will be considered.

Periodic revision and incentives

- The power output from the plant has to be within plus-minus 10% of the rated capacity for the slab of every 5 years.
- In the event the power output falls below the limit, by as much percent, the party will be paid Ru 1.00 less / KW for the % reduction.
- If the party improves the performance by way of upgrading the technology, keeping the same ground/ roof top area to produce more power, an enhanced payment of Ru 1.00 / KW will be made.

SECURITY DEPOSIT

- The developer shall be required to provide bank guarantee @ Rs.?????? per KW at the time of signing of power purchase agreement with distribution licensee and in case the developer fails to achieve commercial operation within time period mentioned in power purchase agreement , the bank guarantee shall be forfeited. The bank guarantee shall be refunded, if the developer achieve commercial operation within time period mentioned in power purchase agreement

Grid connected solar power

- Large scale grid connected solar renewable power projects will be implemented on suitable land banks identified and secured by the developer.
- In case of the projects to be set up on government land or space, selection of the developer will be done by the department or nodal agency through a transparent process.

Renewable energy target by 2020

- It is proposed to generate 50 MW of solar renewable PV power and wind power.
- Install 10,000 units of 100 LPD hot water equivalent of solar thermal installations by 2020.
- 20 MW equivalent of Bio-mass power generation capacity

Time frame for project implementation

Developer shall be required to complete and commission the allotted Solar Power Projects

- Below 500 KW - within the span of 12 months
- Above the 500 KW - within 18 .
- The time of limit of biomass utilization projects will be 12 months from the dates of approval.

RENEWABLE PURCHASE OBLIGATION (RPO)

- The **quantum of power** that can be injected in the grid from all renewable resources i.e. purchase by distribution licensees plus captive consumption plus third party sale **will not be restricted**. It will be allowed to exceed the statutory limit set up by JERC.
- Goa State will promote renewable energy generation to **any extent and even for export** to the other states.

Solar power parks

a common solar power generation facility

- The state government will promote and encourage development of **SOLAR POWER PARKS** to accelerate the development of solar power generation projects and associated manufacturing facilities, through the availability of large areas of suitable land, provision of common infrastructure including grid connection for power evacuation, water access, as well as facilitating the permitting process, internal access roads etc.
- These solar parks may be established at appropriate locations in the state of Goa either by private developers on their own or through PPP model on cost sharing basis.
- Individual industries can either set up their own solar power facility or can contribute to the common pool of production of solar energy undertaken by the State Nodal Agency (SNA) i.e. GEDA.

CATEGORIES OF SOLAR PROJECTS UNDER THE POLICY

- Category I : Projects selected as per the competitive bidding process for selling power to Goa.
- Category II : Project set up under Renewable Energy Certificate(REC) mode.
- Category III: Projects under Jawaharlal Nehru National Solar Mission (JNNSM).
- The operating mechanisms for executing the solar and wind power generation and distribution are given in annexure –I
- In case of Biomass utilization 30% subsidy can be extended towards purchase of capital goods and auxiliary plant equipments

Solar Energy PV projects

- Solar PV power generation

It has to be a business proposition. It could be a Public sector or a private sector undertaking.

- trend is more towards private initiative.
- Domestic small power plant starting with just **1.00 KW roof top** installations. Central Govt. Is promoting it with incentive.
- Large scale 1MW and above plants on PP basis.
- The tariff should be such as to recover plant cost in 5-7 years.

Roof top solar PV set ups

Domestic Rooftop Generation Based Incentives (GBI)

All domestic consumers will be encouraged to put up roof-top solar installations. A generation based incentive(GBI) of Rs. 3/- per unit for two years, Rs. 2/- per unit for next two years, and Rs. 1/- per unit for subsequent 2 years will be provided. A capacity addition of 2MW is targeted under this scheme.

- Consumers desirous of availing GBI shall necessarily install separate meters to measure rooftop generation.

Tariff proposal from a panel maker

- Capital subsidy of 30-50% for solar lights, pumps
- Per unit rate of the order of Rs 12-16.
- Higher preferential tariff of Rs 11/unit as rainy season extends over 4 months.
- Green cess to be charged on polluting industries to pay for green power.
- Policy for open access and REC as in other states.
- Soft loans at interest rates of 3-4%.
- Part RPO load to be fulfilled by large industries.

Promoting Rooftops in Public Institutions

- All new government / local body buildings with more than 200 m² roof top area shall necessarily install solar rooftop PV units
- All the new public buildings, schools, colleges will be encouraged to go for solar power generation.
- Existing Government / local body buildings will be provided with solar rooftops in a phased manner.

Promoting Solar Water Heating Systems

- **The State of Goa shall promote Solar Water Heating**
 - All industrial buildings where hot water is required for processing.
 - All government guest houses, hospitals and nursing homes Health centers , sport complexes
 - Large catering units and industrial canteens.
 - Individual residential buildings with an area of 200 sq. mts. And housing boards.
 - Barracks of police , police training schools, jails.
 - railway platform roofs.

Other solar applications

- Solar water pumping
- Solar drying of agro products
- Solar operated battery vehicles
- Water pumping using wind mill
- Solar water disinfection
- Solar city

BENEFIT TO COMMUNITY

RE projects supplement rural energy needs on a sustainable basis and provide **decentralized energy supply** for agriculture, industry, commercial and household sectors.

RE projects reduce & mitigate the environmental pollution caused by the fossil fuels protecting the climate change,

Generate direct & indirect employment opportunities for rural people leading to socio-economic development in hilly and backward regions.

RE projects also offer CDM benefits that can be shared with community/local bodies.

Role of Department of Electricity

- To mainstream solar applications by facilitating installations and the grid connectivity.
- To evolve and upgrade standards of grid connectivity for the solar power systems at LT and HT level and notify to promote decentralized solar power generation.
- To develop necessary transmission infrastructure based on a renewable power master plan.
- To assess the feasibility and provide connectivity to grid connected solar power in timely manner to the private solar power PPA plants, individual solar power set ups, and industrial solar power parks affiliated to IDC etc.

Financial considerations

- Resort to tariff based bidding for solar energy in meeting RPO, following the guidelines of Joint Electricity Regulatory Commission (JERC).
- To revise and review the tariff position keeping in tune with the technological innovations and cost considerations.
- To provide banking facility for solar energy, incentives in the form of exclusion from open access charges, wheeling charges, T & D loss for solar power.
- To act as single window service provider to all grid connected solar plants in association with other state agencies.

Role of the state nodal agency GEDA

- Goa Energy Development (GEDA) was established to act as coordinating agency to interact with MNRE and JERC for implementing various central policies.
- The Nodal Agency will facilitate and assist the project developers in setting up the RE units and will undertake the related activities to achieve the objectives of the policy.

SINGLE WINDOW CLEARANCE

- The state Government will facilitate and provide requisite clearances through a “**Single Window Clearance Mechanism**”. It will be operated through GEDA.
- The state Government shall constitute a high level empowered committee under GEDA with technical support by to quickly accord necessary approvals / clearances for the proposals.
- Similarly, “Single Window Clearance Mechanism” for execution of Power Purchase Agreement (**PPA**) and for payment to the private entrepreneurs for the electricity sold to the Distribution companies will be considered.

Scope of GEDA activities 1

- **Benefits under clean development mechanism (CDM) :**The Clean Development Mechanism (CDM) provides avenues for earning carbon credit and mitigation of green house gases (GHG) under UNFCCC protocol.
- **R&D promotion and capacity building:** GEDA will promote R&D for local ER resources utilization, take up projects to promote RE in the state, develop manpower skilled in handling RE/solar power plants. The Renewable Energy Mechanic course design is nearing completion. By coming academic year the course will be introduced at ITI and HSSC level.

Scope of GEDA activities 2

- **Publicity and awareness** : GEDA has been conducting popularization programs at various levels, i. e. for schools, colleges, local Women's Self Help Groups, cooperative societies etc.
- **ENERGY CONSERVATION AND ENERGY EFFICIENCY (EC&EE)**: GEDA promotes various measures to promote energy conservation measures especially at the household levels for adopting good handling practices.

Amendments and interpretation

- AMENDMENTS / RELAXATION / INTERPRETATION OF PROVISIONS OF THE POLICY
- Government of Goa will have powers to amend/relax/interpret any of the provisions under this policy.
- Suggestions, amendments, modifications in the draft policy are welcome till 15th Feb 2014.

It is our planet. Let us take care.

