



# Report of the assessment of Solar Energy Policy of Odisha



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## Abbreviations

APPC	Average Pooled Power Cost
CERC	Central Electricity Regulatory Commission
CFL	Compact Fluorescent Lamp
CII	Confederation of India Industry
FICCI	Federation of India Chamber of Commerce and industry
FY	Financial Year
GEDCOL	Green Energy Development Corporation of Odisha Ltd
GRDICO	Grid Corporation of Orissa Limited
HCEL	Hindustan Clean Energy Limited.
HHs	Household
IPP	Independent Power Producers
IPR	Intellectual Property Rights
JNNSM	Jawaharlal Nehru National Solar Mission
KWH	Kilo Watt Hour
LOI	Letter of Intent
LPD	Litres Per Day
MOA	Memorandum of Association
mu	Million Units
MW	Mega Watt
NAPCC	National Action Plan on Climate Change
NASA	National Aeronautics and Space Administration
NEP	New Economic Policy
NRSE	New and Renewable Sources of Energy
OER	Orissa Electricity Regulation
OERC	Orissa Electricity Regulatory Commissioner
OHPC	Orissa Hydro Power Corporation Limited
OPTCL	Orissa Power Transmission Corporation Ltd
OREDA	Orissa Renewable Energy Development Agency
PPA	Power Purchase Agreement
PPPs	Public Private Partnership
PV	Photovoltaic
R&D	Research and Development
RE	Renewable Energy
REC	Renewable Energy Certificate
RPOs	Renewable Purchase Obligation
RPPO	Renewable Power Purchase Obligation
SERCs	State Electricity Regulatory Commissions
TV	Television
UI	Unscheduled Interchange
VEMC	Village Energy Management Committee

## Executive Summary

Energy has become one of the key elements in the era of globalization driven economic growth. To achieve targeted economic growth rates it is very necessary to increase consumption levels among diverse actors. One of the key aspects, in this backdrop, for growth is energy. Uninterrupted and quality supply of energy that can satisfy the needs of agricultural, manufacturing and service sectors -- the three pillars of economy -- can only ensure achieving of growth rates. However, severe shortage of energy appears to be creating pitfalls in reaching institutionalized growth rates.

Production of energy has its own impediments in the form of wide spread opposition to construction of big dams envisaged for hydro electricity, thermal power too is facing stiff opposition from various sources due to its adverse contribution to climate change. In this backdrop, research and innovation towards producing energy from renewable source like wind, sun, etc, has received a great boost.

Further, considering the ecological sustainability in the context of solar energy further made solar energy a strong viable option to pursue. The national policy on climate change too emphasized the necessity of adopting solar energy to combat climate change effectively, while simultaneously meeting the country's energy needs. However, reforms in power sector have been initiated as a part of the new economic policy (NEP) adopted by the government of India.

Odisha is the first state in India to proceed with reforms in power sector. However, the state has for long ignored non-conventional sources of energy like solar power. Considering the Sun God temple in Konark, it is ironical that the state government has ignored solar energy for long. The state is adversely affected by prolonged power cuts because of energy production not meeting the consumption demands. By virtue of its geographical location, Odisha state, receives solar radiation of about 5 kmh/sqm/day. Currently, 8 power projects with a cumulative capacity of 8 MW related to solar energy are under implementation by private players by availing state government's incentives.

Using the diagnostic toolkit developed by World Resources Institute (WRI), YSD has undertaken the review of solar energy in Odisha state. The diagnosis toolkit looks at finances, administration, monitoring-revision-reporting, compliance and enforcement. These four form the key functions of the policy making and implementation. Concomitantly, principles of good governance are taken in to account -- role & responsibility, transparency, stakeholder participation, institutional capacity, accountability.

Odisha state enjoyed excess power availability in the state at least until 2010. However, it is important to note that around 10,000 villages/habitats are yet to be electrified in Odisha. Given

the current deficit in power supply in addition to the expansion of power facility to villages with no power hither to, it is only going to further increase the demand for power in Odisha. Thus, it is right time for the government of Odisha to encourage renewable energy sources like solar power.

Solar energy is also encouraged by the government of India through JNNSM, while creating structural space of Independent Power Producers (IPPs) through RPOs. Though solar energy plants are being installed in Odisha, that sector is plagued by problems like high costs, institutional incapacities, lack of awareness and therefore lack of transparency, lack of funds, poor stakeholder engagement, inconsistency in policies particularly with two agencies involved like GEDCOL and OREDA, are some of them that are discussed below. Though a draft solar policy is in place for Odisha, it remains yet to be finalised. The draft policy calls for wide spread consultation and it needs to be armed with implementation approach at the earliest.

## Introduction

Solar energy has become one of the top priorities in pursuing energy supply by various countries across the world. India too has been promoting various renewable and non-conventional sources of energy. Accordingly, the Indian government has pursued hydro-energy, thermal energy, nuclear energy, while concomitantly encouraging wind and solar energy. Until now the development in wind and solar energy sectors has been at a very minimum level with bulk of the country's energy needs being met by thermal energy followed by hydro power. However, in the recent times, particularly in the context of debates over climate change, countries across the world started promoting solar energy as a part of their efforts in combating climate change and producing low carbon emissions in generating power.

Given the context that carbon emissions during energy production amount to the major source of emissions, low carbon emission has become one of the key components in combating climate change. India too has been one of the active participants in promoting clean and green energy as an alternative to the mainstream thermal and hydro-based power. Further, in the context of growth rates, the government is under severe pressure to meet the energy needs of the industry and domestic without compromising on quality. In this backdrop given the opposition to large dams, thermal power plants and nuclear power plants, the viable option it seems to have emerged in the form of solar energy. As a part of its commitment, the government has launched Jawharlal Nehru National Solar Mission (JNNSM) at the national level.

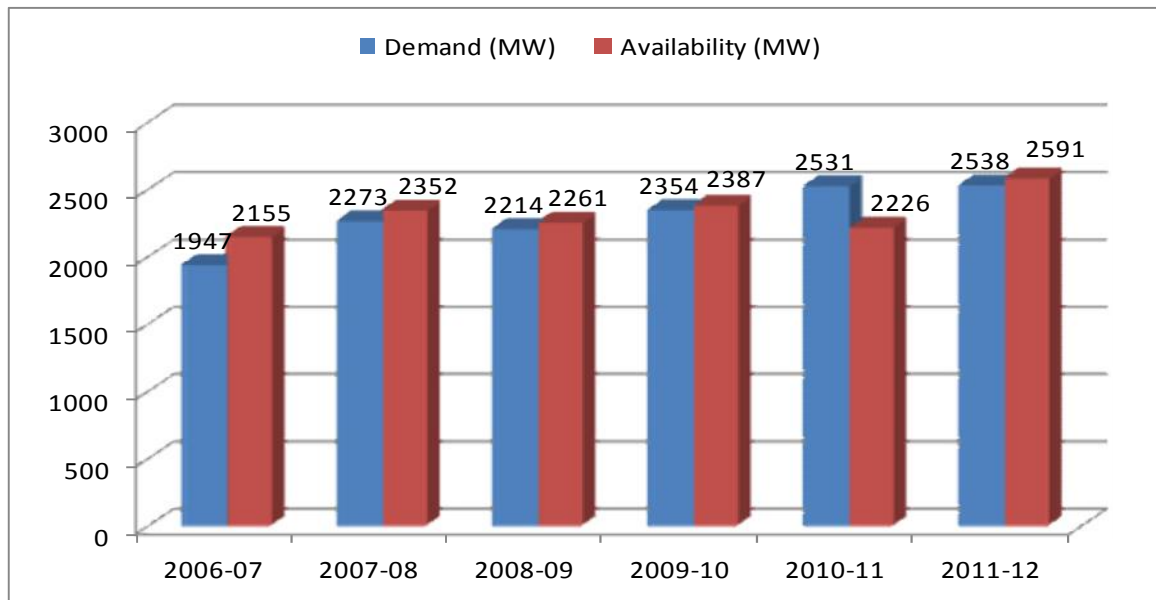
Again at the state level, each state has come up with various programmes to usher in renewable energy sources. However, much of the programmes with regard to renewable energy in general and solar energy in particular appear to be lacking in making swift progress on the one hand and transparency on the other hand. Thus, much of the claims about fighting climate change seem to be only at the rhetoric level rather than substantial implementation of climate friendly policies. In this context Climate Policy Implementation Diagnostic Tool developed by the Open Climate Network (OCN). Convened by the World Resources Institute (WRI), OCN intends to pace up the transformation of energy use to a low-emission, climate-resilient future by providing consistent and credible information that enhances accountability.

The toolkit provides guidance to assess the institutional factors on which effective climate policy implementation depends by looking at key policy functions and principles of good governance. Drawing on publically available information, performance review processes, and semi-structured interviews with key stakeholders from the Government of Odisha the report assesses the implementation of solar energy in Odisha thus far.



## Energy Scenario in Odisha

Chart-1: Energy scenario in Odisha 2006-07 to 2011-12



Source: [http://218.248.11.68/energy/PDF/2013/Power\\_Scenario.pdf](http://218.248.11.68/energy/PDF/2013/Power_Scenario.pdf)

Odisha energy department enjoyed comfortable levels until 2010 when the actual availability was more than the demand. In noting high availability in Odisha until 2010 it is necessary to consider the fact that many rural areas in Odisha are yet to be electrified. However, since 2010 the demand was more than the availability. It is also important to consider the unelectrified pockets within Odisha, which also means if they are added to the demand the availability and demand parity will further increase. It is in this backdrop coupled with the demand for universal electrification of all regions in Odisha that one can witness the increasing stress on renewable energy sectors in general and solar energy in particular.

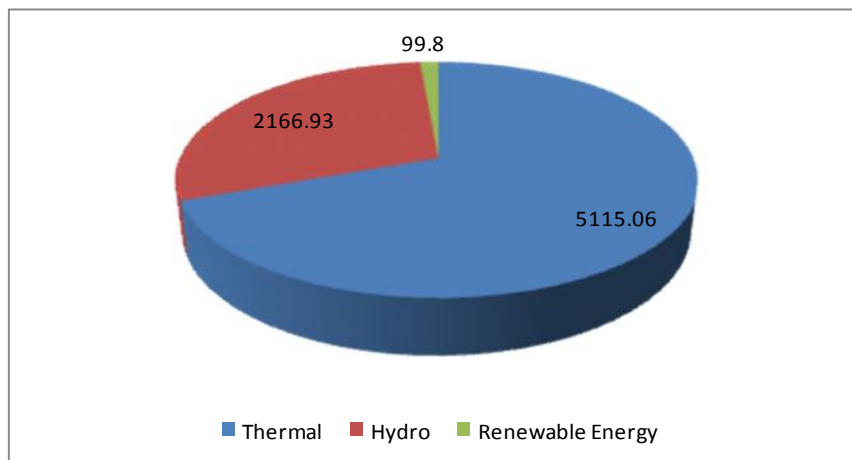
Odisha state has two programmes/schemes in the form of Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) and Biju Gram Jyoti Yojana (BGJY). RGGVY was launched in 2005 by the government of India. It aims to provide electricity to all villages with a population of 100 and more in five years. 90 per cent capital subsidy is envisaged and 10 per cent is given as loan to the state government. This scheme was executed by Odisha. BGJY was launched by the state government in 2007-08 with a target to cover 10,000 habitations with less than 100 population by the 11th plan period and BPL households not covered under RGGVY.<sup>1</sup>

<sup>1</sup> [http://www.odisha.gov.in/pc/Download/Economic%20Survey\\_2012-13.pdf](http://www.odisha.gov.in/pc/Download/Economic%20Survey_2012-13.pdf)

## Installed Capacity in MWs for Odisha<sup>2</sup>

Thermal energy alone has an installed capacity of around 70% of the total power installed capacity in Odisha. Also thermal energy caters to around 75% of the energy needs in Odisha. Renewable energy sources of which solar energy is one component has less than 2% of the installed capacity.

Chart-2 Installed Capacity in MWs in Odisha



Odisha was the first state to initiate power sector reforms in India as a part of the government of India and World Bank's sponsoring of structural reforms in state run bodies (Rout, 2012). Thus, Odisha committed itself to power sector reforms way back in 1993-94. The main objectives of the power sector reforms taken up by Odisha state are as follows:

- To improve efficiency in generation, transmission and distribution of power;
- To ensure financial viability;
- To mobilize private investment in power sector;
- To nurture competitiveness;
- To enhance consumer rights and privileges;

As a part of the reforms, in 1996 Odisha government pulled out subsidies to the power sector to a tune of Rs. 250 Crores. The present capacity addition requirement has been calculated on the basis of the Solar Purchase Obligation of GRIDCO and other Obligated Entities in the state as identified under the OERC-RCPO Regulation -2010.

<sup>2</sup> [http://en.wikipedia.org/wiki/States\\_of\\_India\\_by\\_installed\\_power\\_capacity](http://en.wikipedia.org/wiki/States_of_India_by_installed_power_capacity) accessed on 21st August 2014.

## Sector-wise Distribution of Power Consumers, 2011-12

Table-1: Sector-wise Distribution of Power Consumers, 2011-12

Sector	Rural	Urban	Total	% Rural consumer to total consumers
1	2	3	4	5
Domestic	25.78	9.56	25.35	72.93
Commercial	1.14	1.59	2.73	41.76
Industrial	.04	0.24	0.28	14.29
Others	0.70	0.19	0.89	78.65
<b>Total</b>	<b>27.66</b>	<b>11.58</b>	<b>39.25</b>	<b>70.47</b>

It is evident from the above table that rural consumers dominate in the domestic sector. In terms consumption domestic users (both rural & urban) use only 30% of the total consumption. Industrial sector cuts the big piece with 47.85% utilisation of the total power in the same year 2011-12.<sup>3</sup> Though industrial sector shows less number of consumers, in terms utility it has the highest percentage for obvious reasons.

## Jawaharlal Nehru National Solar Mission (JNNSM)

The Jawaharlal Nehru National Solar Mission was launched on the 11th January, 2010 by the Prime Minister. The Mission has set the ambitious target of deploying 20,000 MW of grid connected solar power by 2022 is aimed at reducing the cost of solar power generation in the country through (i) long term policy; (ii) large scale deployment goals; (iii) aggressive R&D; and (iv) domestic production of critical raw materials, components and products, as a result to achieve grid tariff parity by 2022. Mission will create an enabling policy framework to achieve this objective and make India a global leader in solar energy.<sup>4</sup>

As a continuation to the National Action Plan on Climate Change launched on 30th June 2008, JNNSM was launched in 2010. The main and primary objective of the JNNSM is to establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible.<sup>5</sup>

JNNSM was based on costs, scalability, environmental impact and secured source from energy point of view. Since absolute costs of solar energy are higher than the other sources of power, the JNNSM aims to achieve low cost through long term policy and technological innovation. India has huge potential for solar energy with sun shining nearly 10 to 12 months in many

<sup>3</sup> [http://www.odisha.gov.in/pc/Download/Economic%20Survey\\_2012-13.pdf](http://www.odisha.gov.in/pc/Download/Economic%20Survey_2012-13.pdf) accessed on 21st August 2014.

<sup>4</sup> <http://www.mnre.gov.in/solar-mission/jnnsmission/introduction-2/>

<sup>5</sup> [http://www.mnre.gov.in/file-manager/UserFiles/mission\\_document\\_JNNSM.pdf](http://www.mnre.gov.in/file-manager/UserFiles/mission_document_JNNSM.pdf)

states. The availability of huge solar power makes it possible for both technology routes for conversion of solar radiation into heat and electricity, namely, solar thermal and solar photovoltaic's, effectively be harnessed providing huge scalability for solar in India.

In addition to the above solar energy is environmentally sustainable and is low cost given the thermal and hydro power. Further from secured energy source point of view, solar energy is abundantly available in India and the same can be harnessed to the advantage of energy needs. This is particularly so given the context of deficit with regard to other energy sources like crude oil.

This, JNNSM aims to achieve in three phases: Target Phase-I (2010-2013), Target Phase-II (2013-2017), Target Phase-III (2017-2022). Accordingly, by the year 2022 an additional 22,000 MW of power will be generated from solar energy. The first phase aims to create 2200 MW through solar energy by bringing in private investors. JNNSM also targets decentralized, distributed, off-grid, stand alone, roof top solar power plants, and village electrification among other using solar power.

Under the JNNSM, the power distribution licensees need to procure 0.25 per cent of their requirement from solar energy sources in the first phase between 2009 and 2012. This needs to be increased to three per cent by 2022.<sup>6</sup> The major driving force in developing renewable energy in India is based in Renewable Power Purchase Obligation (RPPO) and for solar energy to RPPO is the key component in implementation. However, the State Electricity Regulatory Commissions (SERCs) defined their respective RPPO Regulations which may create a favorable and neutral/off-putting effect in the growth of renewable energy sector.

Odisha state too has defined RPPO regulations to suit its own state. The following points appear to be creating favorable effect:<sup>7</sup>

1. The state declared a separate RPO for procurement from renewable energy as well as from cogeneration based stations.
2. The state has defined a longer trajectory for RPO targets till 2015-16.
3. Third Party Sale from renewable energy sources has been being exempted from the cross-subsidy surcharge.
4. The State Agency shall develop the formats for submission of quarterly progress report in respect of compliance of renewable purchase obligation by the obligated entities and get them approved by the Commission.
5. `Average Pooled Power Cost` definition is in line with the CERC REC Regulation, 2010.

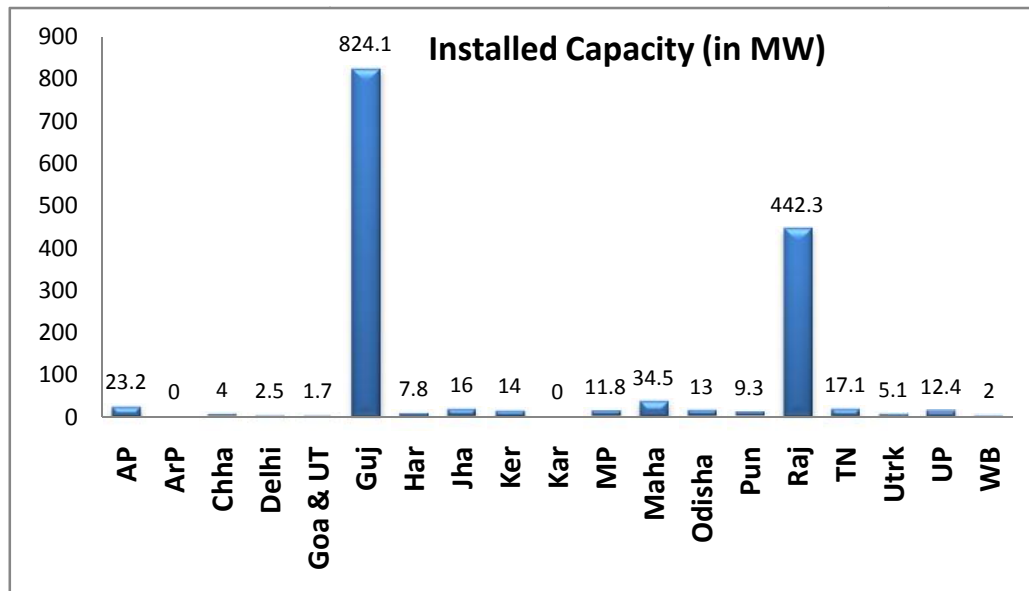
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<sup>6</sup> [http://electricitygovernance.wri.org/files/egi/Clean\\_energy\\_regulation\\_csos\\_india\\_peg\\_oct10.pdf](http://electricitygovernance.wri.org/files/egi/Clean_energy_regulation_csos_india_peg_oct10.pdf)

<sup>7</sup> <http://mnre.gov.in/file-manager/UserFiles/Solar%20RPO/analysis-of-state-RPO-regulations.pdf>

Below is the chart showing installed capacity of solar energy in various states. With Gujarat topping the graph followed by Rajasthan, Odisha secured 8th position with 13 MW of installed capacity of solar energy.

Chart-3: Installed capacity of solar energy (in MW)



Source: <http://www.mnre.gov.in>

### JNNSM in Odisha

First solar power plant under JNNSM was established at Sadeipali under private public partnership (PPP) with an investment of Rs. 16 crores financed by Rural Electrification Corporation, New Delhi and produces 1MW per day.<sup>8</sup> Hyderabad-based Raajratna Energy Holdings Private Limited (REHPL), a company engaged in the development of renewable energy projects has set up the plant.

The plant is spread in 7 acres of land and is promoted under Rooftop Photo Voltaic and Small Solar Power Generation Programme (RPSSGP) Scheme of the Union Ministry of New and Renewable Energy (MNRE). The project was executed by AIC Projects GmbH, Germany and KSK Surya-Hyderabad. The land acquisition for this project started in January-2011 and construction started in February-2011 and was completed in July same year.

A total of 10,000 solar panel power modules have been installed and the solar panels were imported from China. The plant is selling power to GRIDCO at Rs.8.52 per unit. As the sun rays fall on the solar panel, it starts generating power. There is an inverter which after getting 4

<sup>8</sup> <http://panchabuta.com/2011/08/14/orissas-first-solar-energy-plant-comes-up-in-balangir/> accessed on 21st August 2014.

kilowatt energy becomes functional and the inverter converts the DC currents to AC. Even during rainy days, a total of 30 to 40 per cent energy is produced.

### Photovoltaic Solar Power plants in Odisha<sup>9</sup>

Table-2: Photovoltaic Solar Power Plants in Odisha

Sl. No.	Plant Name	Capacity in MWs	Year of Commission
1.	GEDCOL	50	2014
2.	GEDCOL	48	2014
3.	GEDCOL	20	2014
4.	Sunark Solar	10	2011
5.	NTPC Limited	10	2014
6.	Raajarthna Energy Holdings - Bolangir Solar Power Project	10	2011
7.	Tata Patapur	9	2012
8.	Skygen Infrabuild	5	2011
9.	Konark Kranti Energy	5	2011
10.	Sunark Solar	3	2011
11.	Abacus Holdings	3	2011
12.	Orion Solar	3	2011
13.	Skygen Infrabuild	3	2011
14.	M G M Minerals	1	2011
15.	Raajratna Energy Holdings	1	2011
16.	Tata Power	<b>1</b>	<b>2011</b>

In the Phase-I of JNNSM in Odisha at total of 13MW was planned with 8MW in Part-A:8 and 5MW in Part-B: 5MW. Part-A consist of Rooftop PV and Small Solar Power Generation (RPSSGP), where as Part-B consist of Grid Solar PV Projects under Migration Scheme. In the Phase-II 50 MW was announced, while 25MW was awarded. The nodal agency is OREDA, while GRIDCO was to look after power procurement, OERC was resolve issues.

Generation Based Incentive (GBI) was to be equal to the difference between the tariff determined by the CERC and the Base Rate, which will be Rs.5.50 per kWh (for FY 2010-11), which shall be escalated by 3% every year. Sharing of Clean Development Mechanism (carbon credits) Benefits are to be accrued 100% to the developer in the first year of production. After first year the share of GRIDCO will be 10% and there will be 10% increase every year until it reaches to 50%.

<sup>9</sup> [http://en.wikipedia.org/wiki/Solar\\_power\\_in\\_India](http://en.wikipedia.org/wiki/Solar_power_in_India) accessed on 21st August 2014.

Conflict over connecting power stations to local DISCOMS, SERC ruled that 33kv DISCOMS shall connect with cost sharing between the project proponent and DISCOMS

### **History of solar energy in Odisha**

Odisha being located at 17° 49' North - 22° 34' North Latitude & 81° 29' East-87° 29' East Longitude receives good amount of sunshine for over 300 days a year. As per solar radiation map of India the daily average solar radiation incident on Odisha ranges between 5.4 to 5.6 KWh per Sqm. The district wise solar radiation data calculated over the mid coordinates of each district on the basis of NASA data (Annexure I) shows the daily average solar radiation of around 5 kWh per sqm for almost all the districts from the current performance of commissioned mega scale solar power projects it can be concluded that the NASA data hold fairly well for Odisha and the daily average solar radiation of around 5 kWh per sqm is very suitable for commercial exploitation. Odisha is endowed with a potential of solar energy (solar PV power) of 14,000MW, while the feasible potential for power generation in the Solar Photovoltaic (PV) and the Solar thermal routes have been roughly estimated as 8000 MW and 2000 MW respectively.

### **Policy Guidelines on Power Generation from Non-Conventional Energy Sources, 2005 (Solar Policy)**

The government of Orissa has framed policy guidelines with regard to power generation from non-conventional energy sources in December 2005. Accordingly, the policy guideline has identified solar photovoltaic mode, bio-mass (Bio-methanation, Gasification & Cogeneration, Sanitary Landfill & incineration Mode Agro/Animal and Municipal Waste), Wind Energy (Wind Power Generation mode), Ocean/Tidal/Wave Energy (Thermal/Hydro Power Mode), Micro/Mini/small Hydro Energy (Hydro Power Mode), Geothermal Energy (Thermal Power generation mode) as the major sources for power generation from non-conventional energy sources.

Under solar power the eligible producer was identified as any public sector, private entrepreneur, registered NGOs, cooperatives, consortia, etc. The government was to allocate land only in case of availability. The applicant should incur at least 10% of the total project money within 6 months, failing project stands terminated. The operative period was for 10 years with immediate effect. It has provisions for sale of power to bulk suppliers/distribution

licensee on basis of PPA with the prior approval of OERC, while the energy not utilised during the year for captive use was treated as sold to GRIDCO/DISTCO.<sup>10</sup>

Further the developer is allowed, subject to payment of transmission/ distribution and wheeling charges both for captive use and outside the State with prior approval of the OERC. Also energy may be supplied to any area not served by licensee. Banking energy is allowed on annual basis with banking charges of 2.5% of energy dispatched. Such projects are exempted from electricity duty with no transmission charges for CPP or NRSE maintenance for a period for 5 years from COD. Finally, in the event of project work not started within a year of approval of PPA, the MOU and PPA will automatically stand cancelled.<sup>11</sup>

Any cost of grid interfacing connections with regard to connecting with generating units are to be taken care by the project developer. Further, there is no single window system in the policy with the project developer to take permissions from pollution control board, environmental clearance, etc. Odisha state in 2005 had only a policy framework or guidelines towards sourcing power from non-conventional energy sources rather than any specific solar policy.

### Solar Purchase Agreement FY 2011-12 to 2015-16

Table-3: Solar Purchase Agreement FY 2011-12 to 2015-16

Year	Consumption (Grid +Captive) in MU	Minimum Quantum of Solar energy to be purchased (in %)	Quantum of solar power to be harnessed in MU	Cumulative capacity addition in MW
2011-12	44000	0.10	44	28
2012-13	51000	0.15	76.5	49
2013-14	58000	0.20	116	74
2014-15	64000	0.25	160	102
2015-16	70000	0.30	210	135

*Solar Energy Policy in Odisha 2005-06*

Science and technology department of Government of Orissa has resolved policy guidelines for power generation from non-conventional energy sources in letter no No.6971/ST, Bhubaneswar, ST-IV-RE-13/2005, dated, the 3rd December 2005 with an objective to reduce dependence on conventional sources of power generation. Among the other objectives are protecting the environment, generation of employment in large scale, generation of grid-

<sup>10</sup><http://oredaodisha.com/pdf/policy-guidelines.pdf> accessed on 21st August 2014

<sup>11</sup>ibid



quality power from NRSE so as to reduce dependence on conventional sources of power, encourage entrepreneurial investment in NRSE, provide such rational fiscal and promotional incentives so as to provide conducive atmosphere to attract private investment.

### ***Features of the policy***

- This policy has been operative for a period of ten years
- Capable parties can set up power plants under this policy
- Grid Interfacing, required connecting the generating units, constructed by the Developers/Promoters, all at their cost.
- Interconnection lines and substation are to be constructed and maintained by the developer
- The main and check meters should be installed by the developer
- The meter rent/charges does not arise
- Generating Company, intending to set-up a NRSE Plant, does not need a license or prior approval or consent from any authority (Section 7 of the Electricity Act, 2003)
- Developer may utilize the power generated through the power plant for captive use at the place of generation or open access to seek transmission/distribution (approved by OERC, as required under Section 9 of the Act, 2003).
- Developer or a Generating Company shall be allowed to transmit energy outside the State (as determined by the OERC in accordance to Section 62 (1) (a) of the Act, 2003).
- Inside the State the Developer or Generating Company may supply Energy to anyone or any area not served by the Licensees. No license is necessary to generate and distributes electricity in rural areas. (Section 14 of the Act, 2003).
- Banking of Energy generated through a Captive NRSE Plant shall be allowed on Annual basis.

- While the Developer does not acquire the right to sell Energy to Bulk Suppliers/Distribution Licensees, he may be allowed to do so, on a basis of a Power Purchase Agreement (PPA) with the Licensees to be approved by OERC.

### **Incentives**

- In pursuance of the decision taken by all the States and Union Territories regarding reforms in Sales Tax, the Government have decided that no Sales Tax incentives will be extended to the Industrial Units in the State.
- A power plant Generating Power from Non-conventional Sources set up after the effective date shall be deemed to be a new industrial unit. These plants will not be liable to pay Electricity duty. (IPR 2001)
- Government land earmarked for Industry under the "Land Bank" scheme and other Government land wherever applicable will be allotted for units generating power from Nonconventional Sources.
- No transmission charges shall be levied for CPP or NRSE maintenance for a period of 5 years from the date of commissioning.

During 2011-12, against the sanction of 80 sets of solar PV street lighting system by the Ministry of New and Renewable Energy (MNRE), government of India, 55 sets have been commissioned in Sundargarh and Keonjhar district. One 650 KWP-SPV Power plant has been commissioned at Badatamera of Nawarangpur district. Two KWP power plants have been

**Success Story:** Salepada is a small hamlet of the Gatibeda revenue village in Sunabeda GP of Komna block in hostile and inaccessible hilly region. Salepada possesses sufficient shadow free open space and receives adequate solar insolation for about 300 days a year. Average sunshine hours per day are around 6-7 hours. A 2 kw size SPV plant was established. Number of Home lights installed was 85 along with 8 lights for street illumination of the area. Each home received 9 watt CFL for illumination purpose along with a TV point and 8 streetlights of 11 watt each were provided. Illumination for 5 hours per day, 5p.m.- 11p.m., had been fixed. A VEMC had been formed to look in to matters concerning tariff collection, misuse of power, proper maintenance of the power plant by the supplier's authorized representative and to act as a mediating organization between the villagers, the suppliers and the DESI development project office. The villagers pay a monthly tariff of Rs.30/-. Funds thus collected shall be kept in separate bank account and shall be operated as per provision of the MOA for constitution of the VEMC. The interest of the revolving fund provided under the project shall be augmented to funds of VEMC. The day-to-day expenditure on maintenance of power plant will be negligible for a period of 10 years.

**Source:** <http://oredaodisha.com/success.htm>

commissioned at Palia sevashram of Nawarangpur district. In addition, 13 SPV power plants in 13 sevashrams are under progress in Nawarangpur district.<sup>12</sup>

## RPO Regulation

Every Obligated Entity shall purchase not less than 5% of its total annual consumption of energy from co-generation and renewable energy sources under the RPO Regulations from 2011-12 onwards with 0.5 percentage increase every year thereafter, till 2015-16 or as reviewed by the Commission even earlier, if any.

Provided that 0.10 percentage out of the RPO so specified in the year 2011-12 shall be procured from generation based on solar as renewable energy source and shall be increased at a rate of 0.05 percentage every year thereafter till 2015-16 or as reviewed by the Commission even earlier, if any.

## No. of Solar of PV RECs in Odisha

Table-4: No. of Solar of PV RECs in Odisha

Accredited RE Generators Total Capacity: 5.5MW No of Project=3						
Sl. No.	Energy Source	RE Generator	Project No.	Capacity (MW)	Date of Accreditation	Date of Registration
1	Solar PV	Mahanadi Coalfields Limited	001	2	16-07-14	NA
2	Solar PV	MBPS Control & Power System Limited	001	1	16-03-13	NA
3	Solar PV	OCL India Limited	001	2.5	28-01-13	20-05-13

## RE Certificates in Odisha

RE Certificates are issued as per the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 for the obligated entities to purchase electricity under RPO.

<sup>12</sup> [http://www.odisha.gov.in/pc/Download/Economic%20Survey\\_2012-13.pdf](http://www.odisha.gov.in/pc/Download/Economic%20Survey_2012-13.pdf) accessed on 21st August 2014.

In the event of the Obligated Entities fulfilling the RPO by purchase of certificates, the obligation to purchase electricity from generation based on solar as renewable energy source can be fulfilled by purchase of solar certificates only, and the obligation to purchase electricity from generation other than solar can be fulfilled by purchase of non-solar certificates.

The Obligated Entities shall act consistent with the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 notified by the Central Commission in regard to the procurement of the certificates for fulfillment of the RPO under these regulations.

The Certificates purchased by the obligated entities from the power exchange in terms of the regulation of the Central Commission mentioned in clause (1) of this Regulation shall be deposited by the obligated entities to the State Agency in accordance with the detailed procedure issued by the Central Agency. State Agency may develop the required detailed procedure in connection with its own function and submit to the Commission for approval.

The state agency shall submit quarterly report to the Commission on RPO Compliance. Failure to comply with RPO results in penalty, commission may create a separate fund for the obligated entity to pay. Companies with 3rd party PPA can avail REC. Compliance auditors will periodically monitor RPOs. Total REC based Rooftop PV solar power in Odisha is 3.5MW.

The following incentives are provided under the Odisha Draft Policy, 2013:

In pursuance of the decision taken by all the States and Union Territories regarding reforms in Sales Tax, the Government has decided that no Sales Tax incentives will be extended to the Industrial Units in the State.

A power plant Generating Power from Non-conventional Sources set up after the effective date shall be deemed to be a new industrial unit. These plants will not be liable to pay Electricity duty. (IPR 2001)

Government land earmarked for Industry under the "Land Bank" scheme and other Government land wherever applicable will be allotted for units generating power from Nonconventional Sources.

No transmission charges shall be levied for CPP or NRSE maintenance for a period of 5 years from the date of commissioning.

Odisha Renewable Energy Infrastructure Development Fund will be created for accelerated development of solar/renewable energy in the state. This fund will be utilized for creation of infrastructure such as transmission network, roads etc. Further, Single Window System,

training to farmers, youth and individuals, Scope for role of NGOs, Capital Subsidy to farmers, Support in marketing and distribution, and same incentives as provided by the MNRE from time to time.

## **Institutions**

### **Orissa Electricity Regulatory Commission (OERC)**

The Department of Energy was created on 24th April, 1990 after bifurcating the erstwhile Irrigation and Power Department. As mentioned earlier Odisha is the first State in the Country to take up Power Sector Reforms to ensure stable and quality power at a reasonable cost. The Energy Department has Public Sector Undertakings viz: Grid Corporation of Orissa Limited (GRIDCO), Orissa Power Transmission Corporation Ltd (OPTCL), Orissa Hydro Power Corporation Limited (OHPC) and Orissa Power Generation Corporation Limited (OPGC) under its Administrative control. The Orissa Electricity Regulatory Commission (OERC), which is a quasijudicial independent body, ensures a transparent regulatory regime in the power sector of the State.

The department governs various aspects of power sector coordinating with all central and state level power utilities in a manner that the resources and activities are judiciously targeted towards betterment of the society and further,

- i. Formulates plans, policies, acts, rules and undertakes developmental activities.
- ii. Inspects and certifies all electrical installations in the state for adherence/compliance to acts, rules and safety standards. Collects electricity duty against energy sold.
- iii. Investigates for expansion of generation, transmission and utilization of electricity interestingly the department of energy.

### **Orissa Renewable Energy Development Agency (OREDA)**

- The Odisha Renewable Energy Development Agency (OREDA) was constituted as a State Nodal agency in the 1984 under the aegis of Department of Science and Technology. Government of Odisha with the view to popularize the exploitation and use of renewable energy resources in the State. To encourage the development & accelerated utilization of Renewable Energy Sources wherever they are technically & economically viable.
- To improve the access to & availability of Renewable, Decentralized Sources particularly for rural population.

- To contribute towards balanced rural & urban development as well as development of backward, hilly & tribal areas by enabling the use of locally available Decentralized Renewable Energy Sources.
- To create gainful employment opportunity with due importance for ensuring greater access for women & other disadvantaged groups to employment opportunities.
- To reduce environmental degradation resulting from deforestation

main objectives of this Agency, in the development of New & Renewable Sources of Energy, are:

Since its inception, OREDA has provided renewable energy solutions to more than 2.00 lakh households in the state by providing photovoltaic power plants, home light systems, street light systems, Biomass gasifiers and Biogas plants. OREDA has envisioned Provision of minimum illumination to all Remote Un-electrified Villages by 2012, increase the share of Renewable Energy to 10% of the total power mix by 2020 and accelerated use of RE Technology in all sectors of economy. Major programmes being implemented by OREDA are remote village electrification, decentralized distributed generation, renewable energy power projects, off-grid solar power projects, national biogas and manure management program, solar photovoltaic program and energy plantation and bio-diesel production

### ***Achievements of OREDA***

Table-5: Achievements of OREDA

Sl. No	Achievements	Quantity	
		2011-12	2012-13
1	Improved cook stoves for rural HHs	2102950	2102950
2	Remote Villages Electrified	600	946
3	Solar lanterns	9603	9603
4	Solar Home lighting systems	23694	60754
5	Solar street Lighting systems	7399	10986
6	Solar PV Power plants	62	91
7	Solar pumps	56	56
8	Solar cooker	3488	3524
9	Solar stills	192.5 LPD	192.5 LPD
10	Solar Water Heating Systems	138800 LPD	170800 LPD

OREDA has set up four Aditya Solar Shops for easy accessibility of Renewable Energy Technologies to the public at Bhubaneswar, Berhampur, Cuttack and Semiliguda.

## **Green Energy Development Corporation of Odisha Ltd. (GEDCOL)**

In pursuance to Govt. of Odisha in Dept. of Energy Notification No-2296 dated 15/03/2013, Green Energy Development Corporation of Odisha Ltd. (GEDCOL) has been incorporated under the companies act, 1956 as a public limited company on 18.04.2013.

GEDCOL is a wholly owned subsidiary of Odisha Hydro Power Corporation Ltd. (OHPC); a Gold Rated public sector unit of Government of Odisha. The main objective for creation and constitution of GEDCOL is to explore the huge renewable energy resources in the State which are otherwise untapped for a long time.

1. To promote investment in renewable energy projects specially on On-Grid Solar Energy Generation and various green energy sources and to develop and execute renewable projects on commercial/demonstration basis.
2. To plan, organize, implement, maintain, operate renewable energy projects to generate and sell electric power anywhere in India with special emphasis on On-Grid Solar Generation.

GEDCOL acts as the nodal agency for on-grid solar energy and is a board managed company and the Board functions under the Chairmanship of Principal Secretary, Dept. of Energy, Govt. of Odisha and Chairman OHPC. The company is currently functioning at its Regd. Office situated at Bhubaneswar. GEDCOL apart from playing the role of executive agency and executive role, it also plays the advocacy role.

### **Role of OERC**

Orissa Electricity Regulatory Commission (OERC) is a statutory body comprising three members including the Chairman appointed by the State from among persons shortlisted by a Selection Committee in accordance with the procedure laid down in the OER Act, 1995. It is supported by a trained staff of about 20 officers appointed by the Commission.

The Commission is organized to work through 5 divisions namely Secretariat, Law, Engineering, Tariff and Administration. The Engineering Division deals with issue of licenses and all engineering matters excluding those related to tariff.

In accordance with the provisions of the Section 8 (3) of the OER Act, 1995, the salaries and allowances payable to the members of the Commission and the administrative expenses shall be charged to the Consolidated Funds of the State. According to the procedure laid down in

the Act, the State Govt. is required to provide the funds for a financial year on the basis of statement of estimated expenditure submitted by the Commission to the Govt.

The OERC is financially independent since 2003. The Electricity Act 2003 envisages a radical change in vis-a-vis financial autonomy of the Commission is concerned. The Act authorises the State government to establish a fund to be called as State Electricity Regulatory Commission Fund. This fund would receive all the grants, loans, and fees among others. This arrangement would enable the Commission to sustain itself through its own fund, a clear departure from the present system of dependency on Government funding.<sup>13</sup> Overall in practice the OERC's role is limited mainly towards generating consumer awareness, regulating tariff and implementing the policies of energy department.

## **Some Issues**

### **Institutional (In) Capacity**

The Department of Energy was created in 1990 by bifurcating irrigation and power sector. Probably the compulsions of democratic politics dominated by coastal Odisha region allowed the government earlier to combine the department of power with irrigation. After a major correction in 1990, the department itself is one of the youngest in the country. However, it is one of the first sectors where structural reforms were initiated in the early 1990s. In spite of pioneering power sector reforms in the country still many villages remain to be electrified. As on 31st May 2014, 8757 villages were yet to be electrified in the state of Odisha, out of a total of 47677 villages in the state, thus only 81.6% have been covered.<sup>14</sup> Only other two states lagging behind Odisha are Meghalaya (79.5% of electrification) and Arunachal Pradesh (68.2% of electrification). In other words even after two decades after initiating power sector reforms, it appears that the reforms have failed to address the major issues with rural electrification being one of them.

Though OREDA has been identified as the nodal agency for solar energy, role played by other agencies like OERC, GEDCOL, Gridco, etc, becomes crucial in implementing a solar power plant to its logical conclusion. This brings in the issues of coordination between various agencies within the government. For instance, as per the 2005 policy feasibility for grid interfacing of the solar power plant is to be endorsed local DISCOM through Gridco.

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<sup>13</sup> <http://www.orierc.org/organisation.html>

<sup>14</sup> [http://www.cea.nic.in/reports/monthly/dpd\\_div\\_rep/village\\_electrification.pdf](http://www.cea.nic.in/reports/monthly/dpd_div_rep/village_electrification.pdf)



Table-6: Issues regarding solar energy policy

Level	Central Government (Ministry of Power/ Ministry of Finance)	MNRE	CERC
Central	<ul style="list-style-type: none"> <li>▪ Develops national electricity tariff policies, which also cover renewable energy (RE);</li> <li>▪ Provides fiscal incentives for promoting RE energy</li> </ul>	<ul style="list-style-type: none"> <li>▪ Develops national RE laws;</li> <li>▪ Sets technical standards for RE;</li> <li>▪ Conducts resource assessments for RE; supports R&amp;D in RE technologies;</li> <li>▪ Promotes effective use of information technology for RE, manages database;</li> <li>▪ Reviews RE programmes to understand their effectiveness and efficiency</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sets guidelines for feed-in tariff design for different RE technologies;</li> <li>▪ Regulates the regional electricity corporation mechanism;</li> <li>▪ Regulates interstate open access, and third party sales.</li> </ul>
State (Odisha)	State Government  (Dept of Energy & Dept. of Science & Technology)	State Nodal Agency (GEDCOL, OREDA, OHPC)	SERCs (OERC)
	<ul style="list-style-type: none"> <li>▪ Develops state-level RE policy;</li> <li>▪ Provides fiscal incentives for promoting RE sources;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conducts resource assessments for various renewable energy sources;</li> <li>▪ Allocates RE projects and progress monitors;</li> <li>▪ Provides facilitation services to project developers -- Facilitates clearances and land acquisition;</li> <li>▪ Creates awareness and educates the masses about adoption of RE;</li> <li>▪ Maintains database on RE sources</li> </ul>	<ul style="list-style-type: none"> <li>▪ Develops feed-in tariff methodologies for different RE technologies;</li> <li>▪ Determines RPOs and enforcement mechanism;</li> <li>▪ Sets regulations on intrastate wheeling, open access and third party sale</li> </ul>

There are different institutions established by the Government of Odisha through various acts and notifications. Some of them are GEDCOL working towards green energy sources like bio-gas, bio-mass, wind, solar, etc, while OREDA works towards developing renewable energy sources. Interestingly GEDCOL comes under OHPC under the Department of Energy, while OREDA falls under the Odisha Department of Science & Technology. With both GEDCOL and OREDA actively pursuing solar energy independent of each other creates impediments in

pursuing solar energy in the long run. In order to avert such impediments it is essential to build one apex body at the state level looking and dealing specifically with solar energy.

Though single window system is available for clearing solar power projects, STC has to look in to Capacity allocation, clearances from pollution control board, MoEF, forests, Airports Authority and mining are required along with water drawl permission.

### **Are Markets Disinterested?**

The failure of solar energy take off is partially rooted in the risk aversion based disinterest of the market. As Barbara *et al.* argue, in India, technology or innovation is not a barrier for solar energy development. But it is greatly constrained by the structure of domestic energy subsidies and support measures, the risk aversion of banks and the coordination failures of the system of market and state-institutions for renewable energy technology.<sup>15</sup> The volatile policy making process coupled with corrupt practices of implementation are turning away markets from taking deep interest in investing and promoting solar energy type.

Contrary to the above, private investment appears to be attracted towards solar energy in Odisha. As recently as March 2014, three Canadian companies, through a consortium, have proposed to invest about \$1 billion (about Rs 6,100 crore) in Odisha for developing a 500 Mw solar power plant and solar panel manufacturing unit. As the data from the National Aeronautics and Space Administration of the US shows all districts in Odisha get an average solar radiation of 5.5 Kwh/sq m, with around 300 clear sunny days every year, increasingly foreign firms are showing keen interest.<sup>16</sup>

Currently, Odisha is producing 13 MW of on-grid solar power from the units set up by private companies. Further, the firms interested in investing in solar energy are eligible to get exemption from sales tax and electricity duty besides land allocation from the land bank created by GEDCOL.

Similarly, domestic company Hindustan Clean Energy Limited (HCEL), the clean energy arm of New Delhi-based Hindustan Power Projects Ltd, has drawn up a plan to set up a 50 Mw grid interactive solar photo voltaic (PV) project in Odisha. The company is set to invest Rs 400 crore on the project that is expected to help the state to meet its solar power purchase obligation as imposed by regulator Odisha Electricity Regulatory Commission (OERC). According to

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<sup>15</sup> Barbara Harriss-White, Nigel Singh, and Sunali Rohra (2009), " Political Architecture of India's Technology System for Solar Energy", *Economic and Political Weekly* (Mumbai), Vol - XLIV No. 47, November 21.

<sup>16</sup> [http://www.business-standard.com/article/companies/canadian-firms-propose-fdi-for-odisha-solar-project-on-2-500-acres-114030700585\\_1.html](http://www.business-standard.com/article/companies/canadian-firms-propose-fdi-for-odisha-solar-project-on-2-500-acres-114030700585_1.html)

renewable purchase obligation (RPO) fixed for 2013-14, state-owned bulk power purchaser Gridco has to buy six per cent of its energy from renewable sources out of which 0.20 per cent has to be from solar power.<sup>17</sup>

At the same time Odisha state's lower solar RPPO (0.15% in 2012-13) compared to the target as stipulated in the National Tariff Policy of 0.25% by 2012-13 may create a neutral/off-putting effect. As per the prevailing regulations of OERC, HCEL has proposed to sell power for a period of 25 years. TATA-BP and L&T have shown keen interest in developing rooftop solar energy in Odisha.<sup>18</sup> Thus, contrary to risk aversion by private players, it appears that a lot of private players are keenly interested in investing in Odisha on solar energy.

Institutional lacunae include undue delays due to power bidding for buying, where as consumer price is decided by a panel. Land acquisition is a tedious process for solar power projects. Here again, Odisha Industrial Infrastructure Development Corporation (IDCO) oversees land bank, while OREDA oversees solar power projects. As of now only draft policy-2013 exists in Odisha with no concrete policy in place. Further, one of the major challenges in Odisha is the rural electrification.

It is ironic that the Solar Policy for Odisha is being framed by the International Finance Corporation (IFC) and World Bank (WB), rather than any organic framing of the solar policy. As a result the institutional capacity of nodal agencies is under doubt particularly in fastening the projects and also increasing their scale.

### **Lack of Infrastructure Facilities**

Lack of infrastructure facilities like land for setting up solar panels, providing water for the plant, access to hinterlands, etc, are some of the major drawbacks with regard to attracting investment in solar power sector. In spite of grand plans for solar energy both at the central and state level, one of the missing links appear to be land. In the case of decentralized and rooftop solar panels there is no problem, but in the case of huge production using large number of solar panels and storing that energy requires huge amount of land. Given the land situation in contemporary times, it becomes highly difficult for the government or even the private companies to acquire land.

Currently suitable waste lands are identified for setting up solar power project and the same is sold to the selected developers as per the provisions of the IPR, government of Odisha. Alternatively, OREDA will own the land and develop infrastructural facilities and the same is

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<sup>17</sup> [http://www.business-standard.com/article/companies/hindustan-cleanenergy-to-set-up-50-mw-solar-pv-project-114032700842\\_1.html](http://www.business-standard.com/article/companies/hindustan-cleanenergy-to-set-up-50-mw-solar-pv-project-114032700842_1.html)

<sup>18</sup> [http://www.business-standard.com/article/companies/tata-power-l-t-keen-to-set-up-rooftop-solar-projects-in-state-114032000786\\_1.html](http://www.business-standard.com/article/companies/tata-power-l-t-keen-to-set-up-rooftop-solar-projects-in-state-114032000786_1.html)

provided to the selected developers on 30 years lease basis at a pre-determined rent. The land agreement will be terminated if the applicant does not take effective steps to implement the project within 6 months.

Though the plant will be planned close to DISCOMs for easy connection, the cost of connection with the local grid or DISCOM is to be extra on the developer. Pressure on water resources due to solar thermal plants (which require large quantities of water for cooling the steam used to power the electric turbines)

Present transmission network of OPTCL –42 nos. of existing transmission lines are overloaded and 11 of them are critically overloaded. Similarly, 22 nos. of Grid Sub-stations are over loaded which require immediate upgradation. Command areas under 23 Grid Sub-stations are subject to persistent low voltage requiring immediate installation of Shunt Capacitors.

Currently, GEDCOL is in the process of setting up 50 Mw solar power project at Manmunda in Boudh district for which around 250 acres of land will be needed to set up the project. Similarly there is nearly 700 acres of surplus land with the hydro power producer and aims to use it for establishing solar power projects. However, that land alone is not sufficient given the high end targets of the state with regard to solar energy.

Further in the case of Independent Power Producers (IPPs), land acquisition is a huge challenge. Particularly given the context of Odisha where land acquisition is a major problem in the matter of commissioning of new projects. In states like Odisha, this work is processed and finalized in the Revenue Department of the State Government. The parent department and the concerned collectors are also involved in land acquisition proceedings.<sup>19</sup>

Hence, it is essential for GEDCOL, OREDA and OERC to come together and establish land banks by identifying non-agricultural land in all the districts of Odisha. Similarly, the existing land owners can be made partners in the solar energy plants. Similarly, the provision of water and access to hinterlands needs to be considered seriously.

## **Stakeholder Engagement**

It appears on the face of it that solar energy in Odisha is plagued by lack of stakeholder engagement. However, Salepada case study (mentioned in the box) proves that there is stakeholder participation. While it is the case only from one village, yet at the macro level as well as micro level there is lack of engagement from the consumers side. This is precisely because of the structural arrangement made for these agencies that ignores consumers

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<sup>19</sup> <http://orissa.gov.in/e-magazine/Orissareview/2013/Jan/engpdf/63-68.pdf>

participation. Often communities at the local level are involved after setting up the plant and only to run the plant. Such involvement however, would not be of much help in the long run.

### **Lack of Transparency**

Lack of stakeholder engagement in policy making and design has brought the issue of transparency. Lack of transparency in allocating land and sanctioning projects appears to be another issue. Lack of transparency seems to be rooted in lack of stakeholder engagement. There is no campaign, for instance, on customer awareness regarding fixing of tariff. Further given the high absolute costs of solar energy in comparison to coal at least at the entry level, there is not much information of how this will be handled, particularly in the context of private investors.

### **Risks for the IPPs**

There are also region specific risks in the context of Odisha. Much of Odisha is inaccessible due to harsh geographic terrain like hills and forests. In addition to that the strong base of Maoists in tribal dominated regions also holds major risk for solar energy investors. Maoist insurgency particularly in Odisha has taken strong roots in the recent times and is posed against any mining or industrial activity in the area dominated by them. Also the frequent disasters in the form of cyclones pose major threat to solar panels and solar based industry in general on the coastal region. Such risks, both Maoist insurgency and natural disasters pose immense threats to Independent Power Producers (IPPs). The frequent natural disasters often destroy the electricity infrastructure, which might prove detrimental to private investors. The recent cyclone wrecked havoc not only with electric poles and lines, but also with grids (Dash, 2013).

### **Finances**

Traditionally, RE projects in India particularly those undertaken on a large scale have financing problems because of the following reasons:<sup>20</sup>

- i. High Capital Costs,
- ii. Low Plant Load Factors,
- iii. Intermittency or infirm nature of the power generated,
- iv. Access to funds/Subsidy from government,
- v. Policy and Regulatory issues – low tariffs, low or no access to markets,
- vi. Knowledge barriers among financing institutions/banks on renewable energy technologies.

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<sup>20</sup> [http://www.esmap.org/sites/esmap.org/files/The%20World%20Bank\\_Barriers%20for%20Solar%20Power%20Development%20in%20India%20Report\\_FINAL.pdf](http://www.esmap.org/sites/esmap.org/files/The%20World%20Bank_Barriers%20for%20Solar%20Power%20Development%20in%20India%20Report_FINAL.pdf)

The focus of the government on clean energy by providing incentives, experience gained in renewable energy by the developers and also competition between developers has led the markets to overcome many of these barriers in India with specific relation to wind and biomass sector. Since solar is still in its nascent stages of development, some of these barriers still do exist.

Though, introduction of RPPO sounds attractive, in the long term the RPPO requires modification at regular intervals based on the demand and supply of power on the one hand and production of power in other sectors on the other hand. In terms of finance, bulk of the allocations is distributed to other sources of renewable energy sources like bio-mass, wind, bio-waste, etc. In order to streamline solar energy, it is necessary to allocate large amount to solar energy sector rather than distributing resources too thinly.

Bidding process allows the developers to form a syndicate and reduce the prices in their favour. One of the major issues with regard to finances is the capacity of DISCOMs to pay for RECs. DISCOM connected to the project is designated to pay for the RECs. But often each unit is bought at a high cost from the developer makes it financially unviable. Further the cash strapped DISCOMs cannot bear the burden of the high cost RECs.

### **Draft Odisha Solar Energy Policy, 2013**

OREDA has been proactively promoting solar power projects under the Jawaharlal Nehru National Solar Mission with a view to fulfill the solar power purchase obligation of the State as well as for trading Renewable Energy Certificates (REC) in the power exchange. So far 9 Grid Connected Solar Power Projects have been commissioned in the state for a total capacity of 13 MW under JNNSM Scheme. Besides, to meet the Renewable Purchase Obligation (RPO) of GRIDCO, Bhubaneswar OREDA has given letter of intent (LOI) for installation of 30 MW Solar Power Plant in the state. It is expected to commission the above projects during the financial year of 2013-14. Regarding development of off grid solar power plant in the state, OREDA has installed 50kw roof top solar power plant in the secretariat building during the year 2012-13.

The Energy Department has set up a committee towards the end of 2013 to prepare a draft solar policy to promote the use of solar energy in the State to support development and address the problem of energy security. The seven-member committee headed by Joint Secretary, Energy department, Sangamjit Nayak was to examine the draft policy prepared by the Science and Technology department and solicit opinion of energy experts of Confederation of Indian Industry (CII) and Federation of Indian Chamber of Commerce and Industry (FICCI) to

make necessary changes in the draft policy. According to an assessment, the gross renewable energy potential of the State is about 53,820 MW.<sup>21</sup>

The draft policy has set forward the following objectives:<sup>22</sup>

1. Contributing to long term energy security of the State as well as ecological security by reduction in carbon emissions.
2. Providing a long term sustainable solution for meeting energy needs and reducing dependence on depleting fossil fuel resources like coal.
3. Productive use of wastelands, thereby utilizing the non-industrialized areas that receive abundant sunshine for creation of solar power hubs.
4. Creating favorable conditions to solar manufacturing capabilities by providing fiscal incentives.
5. Generating direct and indirect employment opportunities in solar and allied industries like glass, metals, heavy industrial equipments etc.
6. Creation of skilled and semi-skilled manpower resources through promotion of technical and other related training facilities.
7. Creating an R&D hub for innovation in application of solar power technologies and solar based hybrid co-generation technologies which will focus on improving efficiency in existing application and reducing cost of balance of system. For achieving the above objectives in collaboration with other technology institutions, it endeavours to create a Solar Centre of Excellence at OREDA which would work towards applied research including use of locally available raw material for manufacturing solar cells and other components and commercialization of technologies in order to achieve grid parity in terms of both cost and technical requirements.
8. Creation of a performance testing facility in OREDA for different types solar PV and Solar thermal systems as well as their various components and sub components.

The policy mandates tariff based competitive bidding for setting up of solar PV power projects for generation and supply of power to the State grid. The policy also promotes solar power projects of unlimited capacity under the REC mechanism by independent power producers (IPPs) and the power generated from these power projects will be purchased by GRIDCO/DISCOMs at average pooled power cost (APPC) as determined by the OERC from time to time. Draft Solar Policy is yet to be made in to actual policy

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<sup>21</sup> <http://www.newindianexpress.com/states/odisha/Policy-to-Promote-Solar-Energy/2013/12/25/article1964265.ece>

<sup>22</sup> <http://oredaodisha.com/Draft%20Odisha%20Solar%20Policy.pdf>

## Conclusion

In the above back drop, Odisha state has long way to march ahead with regard to solar energy. In Odisha the technological development in solar power sector has taken place. The next step is to attract investors by promoting the financial viability of the solar power technology. Only when the technical and financial viability is proven the market will adopt it and commercialize it for the utility of large numbers.

Though there is huge scope for the development of solar power in Odisha, there is a need for the government to increase RPPO in the context of growing IPPs in solar energy, wind and other sources of energy production. In addition to the above there is also need to further subsidize the initial high costs involved in solar energy. In urban areas there is strong need to encourage off-grid roof top solar power installations to reduce the burden and concentration of bulk power supply to urban areas.

Solar energy due to its inherent structure provides decentralized, cheap and environment friendly energy in the long run. For this the government / department of energy needs to bring in awareness among the public in order to promote solar energy. In addition to the above it is necessary to regularly audit the local energy needs through civil society bodies or community based organizations. Such audits not only give a sense of ownership to the community, but also give information about the changing energy requirements of the people.



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## **About Youth for Social Development**

The **Youth for Social Development (YSD)** is a not-for-profit independent social research and development organisation aspiring to improve the lives of urban and rural poor in Odisha specifically the most vulnerable people, children, youth and women on issues related to governance, participation, youth and child development and climate change.

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