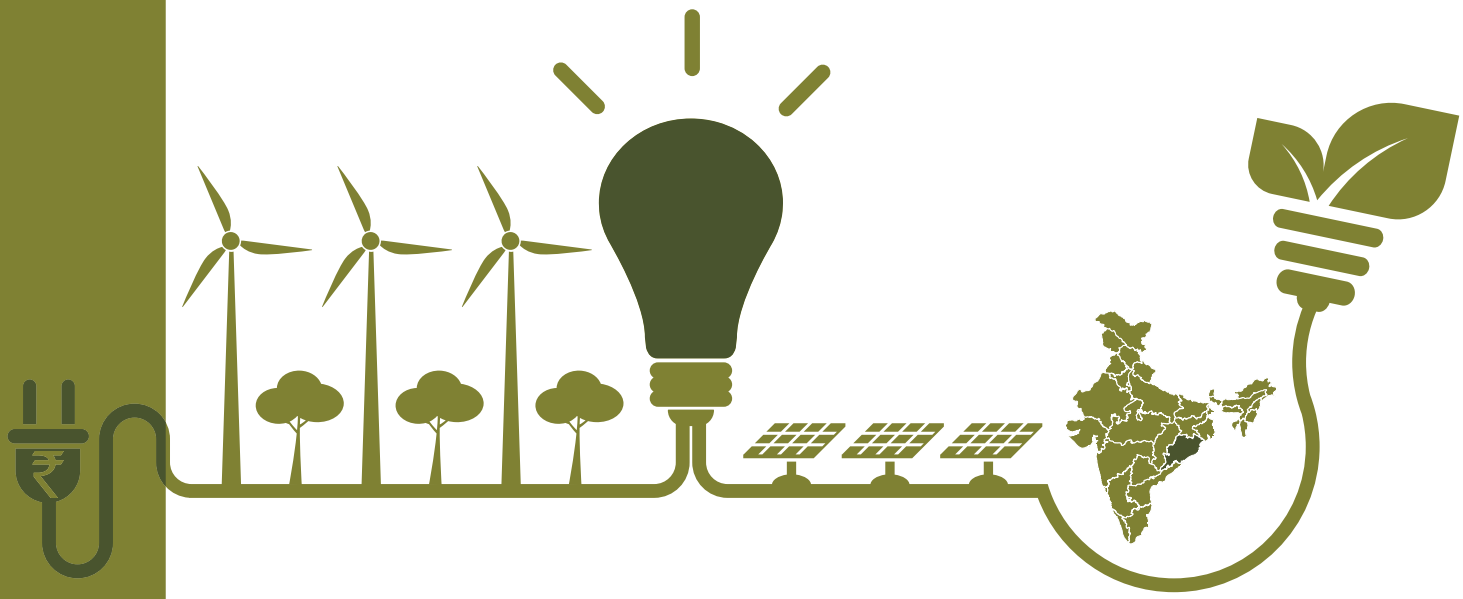
# Climate Mitigation Financing Framework in Odisha

2020



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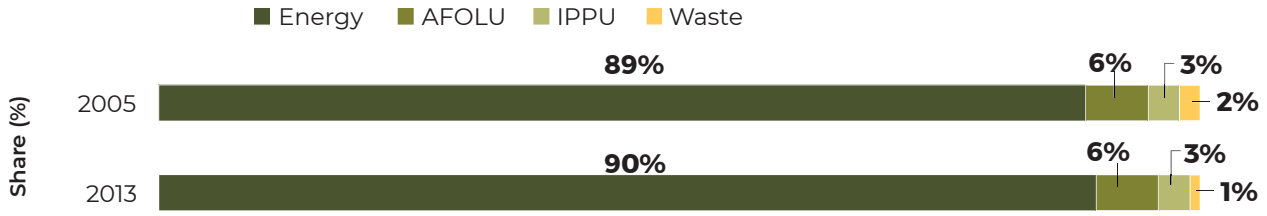
Context

# Green House Intensive Sectors in Odisha

Odisha is one of the most mineral-rich states in India and accounts for almost a quarter of its total coal reserves, which is the second highest after the state of Jharkhand. Between 2011-12 and 2017-18, the Gross State Domestic Product (GSDP) expanded at a Compound Annual Growth Rate (CAGR) of 10.30 per cent to Rs 4.16 trillion, whereas the Net State Domestic Product (NSDP) expanded at a CAGR of 10.08 per cent to Rs 3.63 trillion.[1] Data analysed for many developing economies reveals that there is a positive correlation between increased economic growth and Greenhouse Gas (GHG) emissions.[2] Undoubtedly, the energy sector is major contributor to GHG emissions in Odisha. Emissions of the state grew at an estimated CAGR of 8.02 per cent from 102.6 MtCO2e in 2005 to 190.2 MtCO2e in 2013.[3] In 2013, ~90 per cent of the emissions were from the energy sector while the combined emissions of the industrial processes and product use {IPPU} (~3%), Waste (~1%) and Agriculture, Forestry and Other Land Use {AFOLU} (~6%) sectors were nearly 10 per cent. Notably, the sector-wise contribution of emissions remained almost the same when compared to 2005 levels. In general, emissions from the energy sector arise from two main sub-sectors, viz., Fuel Combustion (Public Electricity Generation, Transport, Industries and Agriculture, Commercial and Residential categories) and Fugitive. In Odisha, the maximum emissions were due to Fuel Combustion with almost negligible emissions from the Fugitive sub-sector (See Figures 1a & 1b).

## Figure 1a: Sector-wide share in GHG emissions in 2005 and 2013




1 Odisha Economic Survey 2017-18. (2020). Retrieved 26 June 2020, from https://pc.odisha.gov.in/Download/Economic_Survey_2017-18.pdf

2 Review Carbon dioxide ($CO_2$) emissions and economic growth: A systematic review of two decades of research from 1995 to 2017. (2020). Science of the Total Environment Volume, 649(1 February 2019), Pages 31-49. Retrieved from https://www.sciencedirect.com/science/article/pii/S0048969718331930

3 GHG Platform India (2018). Retrieved 26 August 2019, from http://www.ghgplatform-india.org/

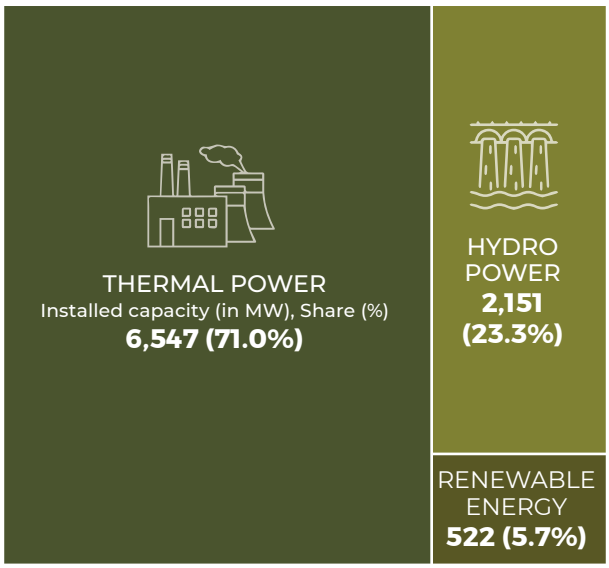
## Figure 1b: Emissions due to Fuel Combustion from Various Sectors (MtCO2e)

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| Public Electricity Generation | 729 | 627 | 673 | 717 | 756 | 794 | 852 | 916 | 964 |
| Industries | 254 | 277 | 335 | 406 | 429 | 502 | 531 | 570 | 624 |
| Transport | 113 | 126 | 139 | 151 | 166 | 182 | 197 | 210 | 222 |
| Residential | 96 | 98 | 100 | 104 | 103 | 104 | 104 | 103 | 106 |
| Fugitive Emissions | 35 | 35 | 36 | 37 | 43 | 46 | 45 | 42 | 40 |
| Agriculture | 14 | 15 | 19 | 20 | 21 | 22 | 24 | 25 | 26 |
| Commercial | 4 | 4 | 5 | 6 | 7 | 7 | 8 | 9 | 9 |
| Fisheries | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 5 |
| **Total** | **1,248** | **1,186** | **1,311** | **1,444** | **1,529** | **1,663** | **1,765** | **1,881** | **1,997** |

Source: GHG Platform India

Despite the expected increase in GHG emissions over the years, Odisha has been giving more thrust to the thermal power plant with 71 per cent share in energy mix **(See Figure 2)**.[4] There is no doubt that if the government follows the same course, it will cause substantive stress on the local ecology as also the forest cover due to environmental degradation (as most of the coal reserves lie in forest areas). This will in turn, impact human health via emissions of particulates, including GHGs, excessive consumption of water and generation of fly ash. Additions of renewable energy (RE) power capacities, introduction of) clean fuels and a reduction in energy consumption have been announced by the Centre as national commitments.

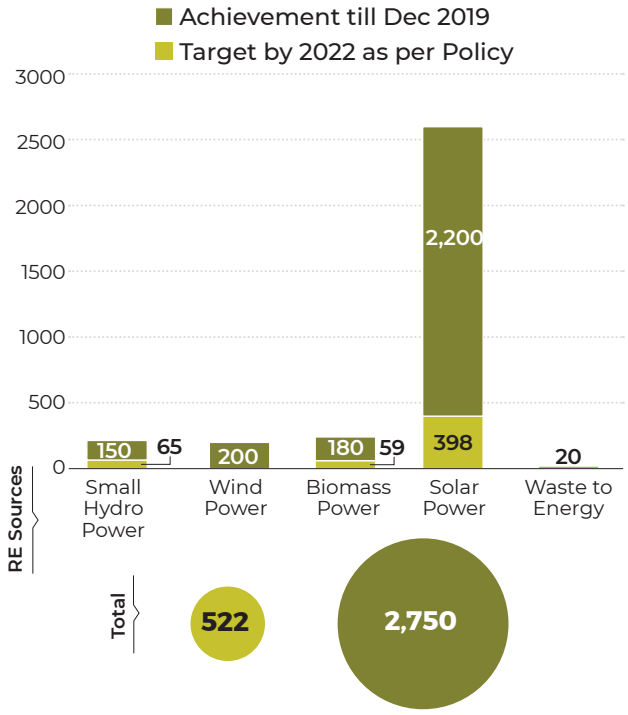
## Figure 2: Installed Capacity (in MW) in Odisha (as on 31.12.2019)




Note: Above includes capacity share from State and Central Utilities
Source: CEA Data

4 CEA. (2019). Monthly Installed Capacity .Available at: http://www.cea.nic.in/reports/monthly/installedcapacity/2019/installed_capacity-12.pdf

## Figure 3: Odisha: Physical Progress in Renewable Energy Capacity Addition (in MW)




Over the years, the Government of India (GoI) had determined long term contribution commitments and targets for climate actions, and most of the state governments had set their targets for these under their climate mitigation policies (Reference to Summary Paper Context). However, there have been instances where states have not been able to achieve these targets. Odisha has achieved a meagre 19 per cent of its Renewable Energy (RE) target of 2750 MW by 2022 and it seems difficult that the state will be able to meet its commitments in the next two years at this pace (See Figure 3).

Experts believe that an insufficiency in public finances to meet an unprecedented requirement of funds for mitigation actions, as also, not using public finances strategically enough are often the major reasons for missing targets. Most state governments have evolved state specific policies on RE where most of them are stating targets. It has also been observed that often there is a vacuum in the information available to investors on existing policy and institutional and financing mechanisms being deployed by state governments. This acts as one of the potential barriers for inviting private investment. There is a need for strategically using available public finances to provide an ecosystem for thriving investment and a mitigation of risks for investors. In this context, the subsequent sections provide information on various policy and financing instruments being deployed by the government of Odisha. It includes a briefing on the existing state instruments to promote RE and other climate-friendly actions such as encouraging Energy Efficiency (EE) and Low Carbon Development (LCD) of transport. It also presents an overview of how the various other states and the Central Government are creating an enabling environment to increase the participation of investors through supportive measures, including those that reduce risks. These investor risk mitigation measures can be an example for Odisha to follow. The policy brief follows the outline given below:

**Section I.** State Policy and Institutional Framework

**Section II.** Policy Implementation through Budgeted Programmes

**Section III.** Odisha State Ancillary Initiatives for encouraging Private Participation

**Section IV.** Centre and State Initiatives for De-risking Investments

**Section V.** Odisha's State Action Plan on Climate Change (SAPCC) & Climate Budget 2020-21

**Section VI.** Recommendations

5 Climate Finance for Reduction of Emissions and Vulnerability Available at: https://climatepolicyinfohub.eu/climate-finance-reduction-emissions-and-vulnerability

6 CEEW( 2020).How national renewable energy database will help policymakers and developers Available at http://cef.ceew.in/masterclass/analysis/how-national-renewable-energy-database-will-help-policymakers-and-developers

Section I

# Odisha Policy and Institutional Framework for Renewable Energy and Energy Efficiency

## 1.1. Odisha's RE Policy

Among climate change mitigation actions (CCMAs), increasing renewable energy capacities is considered a priority action by governments as reflected in India's Intended Nationally Determined Contributions (INDC) for Climate Change and the State Action Plan on Climate Change.[7] In line with its commitment towards RE, Odisha has a unified policy, the "Odisha Renewable Energy Policy, 2016-22", to promote various types of renewable energy.[8] The policy aims to achieve the objective of contributing to the long-term energy security of the state by bringing about a reduction in carbon emissions. The RE Policy acknowledges the importance of creating a conducive environment to encourage public /private /community participation. It places emphasis on enhancing the contribution of RE projects in the total installed capacity of the state through private participation. **(See Box 1 on Vision, Mission and Objective of Odisha RE Policy 2016-22).**

### Box 1: Vision, Mission and Objective of Odisha's RE Policy 2016

#### Vision

- Harness green and clean energy from natural resources in the State of Odisha for benefit of the environment.
- Ensure energy security for the people of Odisha.

#### Mission

- Provide a long term sustainable solution for meeting energy needs.
- Reduce dependence on conventional sources of power.
- Achieve the Renewable Purchase Obligation targets.
- Fulfil the objectives of the State Action Plan for Climate Change.

#### Objective

- Contribute to long-term energy security of the State as well as ecological security by reduction in carbon emissions.
- Create an environment conducive to public /private /community participation and investment in Renewable Energy Projects.
- Enhance the contribution of Renewable Energy Projects in the total installed capacity of the State through private participation.
- Provide a long term sustainable solution for meeting energy needs and reducing dependence on Conventional Sources of Power.
- Create skilled and semi-skilled manpower resources through promotion of technical and other related training facilities.
- Facilitate development of manufacturing units and Research & Development.

7 MOEF& CC, INDC towards climate justice. Available at : http://moef.gov.in/wp-content/uploads/2018/04/revised-PPT-Press-Conference-INDC-v5.pdf

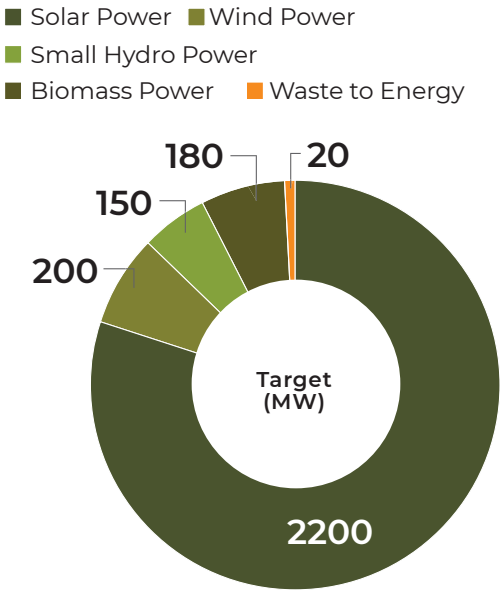
8 Odisha Renewable Energy Policy Available at : https://investodisha.gov.in/download/Renewable-Energy-Policy-2016.pdf

The Policy envisages achieving the 2750 MW target by the year 2022 for addition of the RE capacity in the state with an 80 per cent target foreseen for solar energy. The capacity addition target includes 2200 MW of solar power, 200 MW wind energy, 150 MW of small-scale hydro power, 180 MW of biomass-based power and 20 MW of municipal solid waste-based power capacity. (See Figure 4)

The Policy has also set a Renewable Purchase Obligation (RPO) target of 5.5 per cent each for solar and non-solar power for 2019-20. Along with grid-connected application, it provides directions for various decentralised RE applications such as: (i) RE based small/mini/micro grids up to 1 MW[9]; (ii) Rooftop solar projects; (iii) Solar water pumping for irrigation; iv) Wind Solar Hybrid Projects; (v) Micro/Pico Hydro projects up to 100 KW; (vi) Biomass gasifier for power generation and thermal application; (vii) Solar Thermal Projects; (viii) Biogas-based projects for domestic application and power generation; and (ix) Improved cook stoves.

The Policy provides details of implementation mechanisms such as involved institutions, financing instruments and incentives. It covers various aspects such as land procurement, selling power, setting an external transmission & distribution network, land development, including the provision of power and water supply to the project site etc. In addition, it lays out separate and detailed operational guidelines for various types of RE initiatives, unlike most others states in India, which do not define them explicitly.[10] This provides better clarity on policy coordination for an investor.

## Figure 4: RE Policy Target for Capacity Addition for Various RE Sources




Source: Odisha RE policy document, 2016

## 1.2. Institutions related to RE that investors can approach

Under the State RE Policy, there are different nodal agencies, as shown below, for various RE projects. These are responsible for coordinating different inputs required for the installation of different technologies and sources of RE, such as land identification and allotments, infrastructure development and tariff determination regulations. **(See Figure 5 and Table 1)**

1. The Green Energy Development Corporation of Odisha Limited (GEDCOL) is the nodal agency for all on-grid and hybrid power projects of 1 MW and above capacity 11

9 'Mini Grid' – system having a RE based electricity generator (with capacity of 10 KW and above) and supplying electricity to a target set of consumers through a Public Distribution Network (PDN) while 'Micro Grid', similar to a mini grid but having a RE based generation capacity of below 10 kW. Micro and mini grids generally operate in isolation to the electricity networks of the DISCOM grid (standalone).

10 RE Policy operation guidelines 2016 https://investodisha.gov.in/policy-framework/sectoral-policies/renewable-energy-policy/

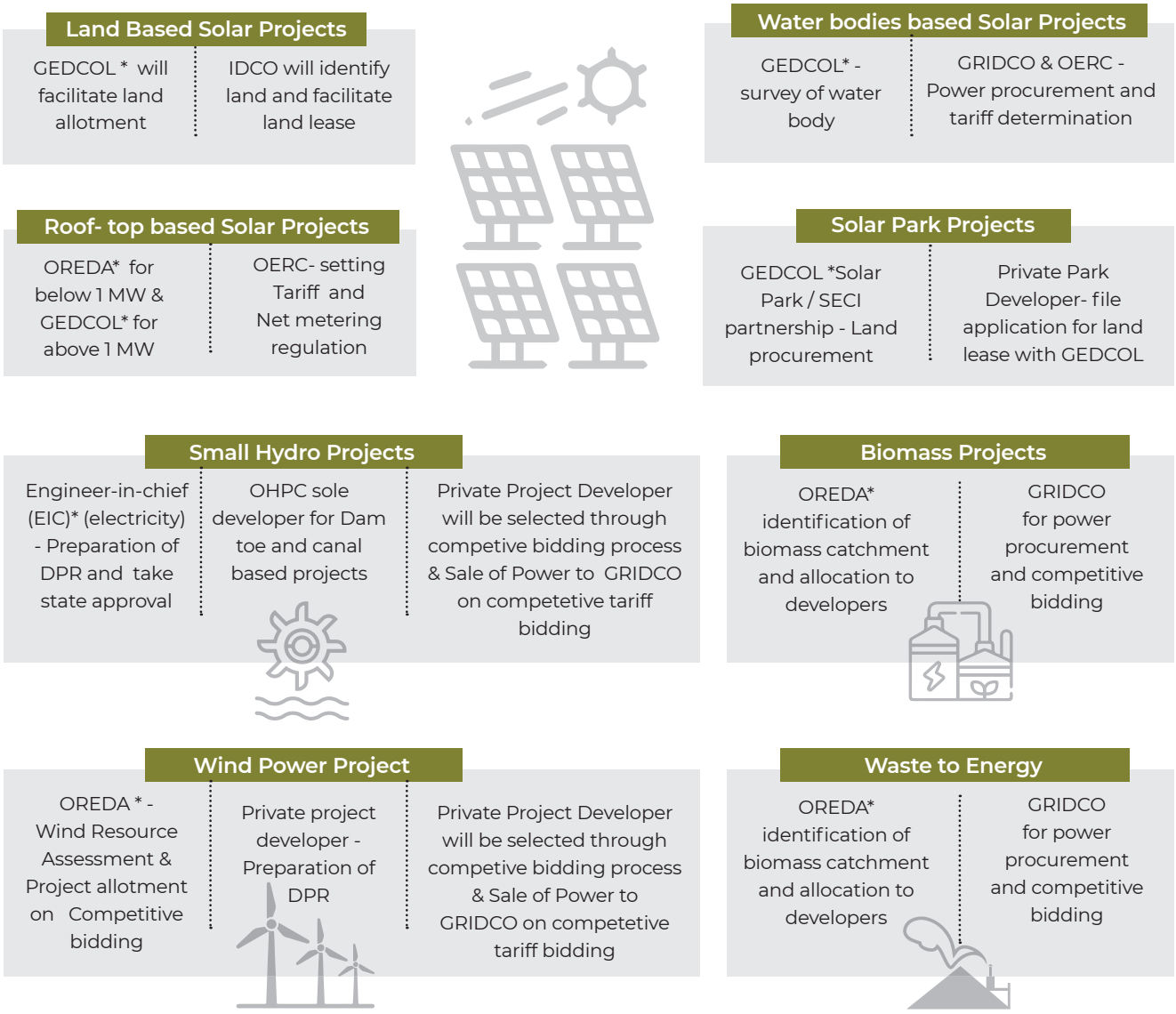
11 GEDCOL stands for Green Energy Development Corporation of Odisha Ltd., a wholly owned subsidiary of Odisha Hydro Power Corporation Ltd. (OHPC) created with the main objective of exploring renewable energy resources in the state.

2. The Engineer-in-Chief (EIC) Electricity is the nodal agency for Small Hydro Electric Power projects

3. The Odisha Renewable Energy Development Agency (OREDA ) is the nodal agency for all RE projects (mainly decentralised RE)

4. The Grid Corporation of Odisha (GRIDCO) and the Odisha Power Transmission Corporation Limited (OPTCL) are responsible for ensuring that requirements of RE generation are factored in while finalising transmission and distribution network plans in close coordination with Nodal Agencies ; they are also responsible for setting tariffs through Power Purchase Agreements (PPAs) in coordination with the Odisha Electricity Regulatory Commission (OERC).

## Figure 5: Implementation Mechanism for Grid-connected RE Projects under State RE Policy, 2016




Source: Odisha RE Policy, 2016 Note: (*) indicates Nodal Agency

12 OREDA constituted as a state Nodal Agency under the aegis of the Department. of Science and Technology, Government of Odisha with a view to popularise the exploitation and use of renewable energy resources in the state.

13 Odisha Power Transmission Corporation Limited (OPTCL) is the State Transmission Utility incorporated as a company wholly owned by the Government of Odisha to undertake the business of transmission and wheeling of electricity in the state.

## Table 1: Institutions that an investor can approach for various types of Renewable Sources and Technologies in Odisha

| Technology | Land | Nodal agency | Sale of Power | Tariff | Remarks |
|---|---|---|---|---|---|
| **Solar**  Land Based | Odisha Industrial Infrastructure Development Corporation (IDCO) identified under Land Bank Scheme as per Industrial Policy Resolution (IPR) 2015 | GEDCOL | Self/ Sale within or outside the state | | |
| On Water Bodies | GEDCOL to survey for database; GEDCOL to coordinate with authorities for clearances; No Lease charges | GEDCOL | GRDICO first rights/ Tender for PPA | Competitive bidding | |
| On Consumer Side of Meter (Roof Top) | Developer to arrange | OREDA ( <1MW), GEDCOL (>1MW) | Self-export excess electricity to Grid | OERC generic tariff | Net metering regulation of OERC apply |
| Solar Parks | GEDCOL - either purchase or lease from Odisha Government; Provide lease to developers for 30 years | GEDCOL/ Private | Self/ Sale within or outside state | Competitive bidding | Net metering regulation of OERC apply |
| **Small Hydro**  | Engineer-in-Chief (EIC) Electricity-cum-Principal Chief Electricity Inspector to identify potential sites | EIC (Electricity) | GRIDCO to have first right of refusal | Competitive bidding | Sale subject to minimum free power allocation to state |
| **Wind**  | Applicant to apply to nodal agency; Facilitation as per IPR-2015; Land for Wind Resource Assessment (WRA) stations may be leased by Govt. | OREDA | GRIDCO shall purchase 50 MW; Self/ Sale within or outside state | OERC sale at generic tariff; Rest: OERC regulations apply | Competitive bidding on premium amount for Govt. lands |
| **Biomass**  | IPR-2015, waste land allocation for cultivation to meet 20% of the annual biomass fuel requirement | OREDA | GRIDCO shall purchase 50 MW; Self/ Sale within or outside state | Competitive bidding | |
| **Waste to Energy**  | Urban Local Body (ULB) to identify and provide; as per IPR-2015 | OREDA | GRIDCO | Generic tariff as per OERC | Responsibility of ULB to collect the MSW; Process and destroy the same at its own cost |

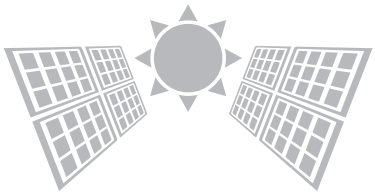
Source: Compilation from Odisha RE Policy, 2016

In order to develop solar capacity in the state, the government is targeting four areas for solar power plants, viz., those based on land, water bodies, on consumer side meters and solar parks. The Odisha Industrial Infrastructure Development Corporation (IDCO) has identified large areas of land under its Land Bank Scheme for RE projects. In order to attract investments, the government had identified large pieces of land under its Industrial Policy Resolution 2015. GEDCOL is the nodal agency for facilitating land allotment. The RE Policy also facilitates Solar Parks to achieve economies at scale as also minimise project risks. There are two modes of implementation of Solar Parks depending upon the implementation agency, namely, GEDCOL Solar Parks and the Private Solar Park Developer Model.

For GEDCOL solar parks, the corporation is responsible for their development and infrastructure facilities. Sometimes, the GEDCOL may develop solar parks under the MNRE scheme for the Development of Solar Parks and Ultra Mega Solar Power Projects. It may also develop these parks in partnership with the Solar Energy Corporation of India Limited (SECI) or other agencies.

Under the Private Park Developer Model, the private developer has to identify a suitable site and procure land for its development. Should government land be identified, the private developer has to apply to GEDCOL for land allotment which would be leased out as per the Odisha Industrial Policy (IPR) 2015. The private developer is responsible for developing the basic infrastructure in solar parks. **(See Table 2: Institutions and Policy Guidance for Setting up Solar Parks)**

## Table 2: Institutions and Policy Guidance for Setting up Solar Parks



| | GEDCOL Solar Parks | Private Developer's Solar Park |
|---|---|---|
| **Description** | • Exclusive area of dedicated norms for development of solar power generation projects, solar manufacturing projects and R&D with basic infrastructure<br>• Aimed at obligated entities like captive power plants<br>• Help achieve economies of scale and reduce risk | |
| **Land** | • GEDCOL shall develop the Solar Parks with all infrastructure facilities<br>• GEDCOL shall either purchase the land or take it on long-term lease from the government<br>• GEDCOL will provide land to project developers on 30 years' lease (facilitation charge per MW to be paid) | • Private developer shall identify, procure land and develop infrastructural facilities<br>• If Govt. land identified, GEDCOL acts as nodal agency and land allocated on lease by GoO, as per IPR 2015 (Max: 5 acre/MW)<br>• GEDCOL will facilitate necessary permits for Govt. lands under Orissa Land Reforms Act, 1960, if necessary |
| **Allocation of Projects** | • Allocation per developer: Min: 10 MW, Max: 30% of land<br>• Competitive bidding on facilitation | • Private developer may sub-let the land for projects |
| **Nodal Agency** | GEDCOL | GEDCOL monitors the project<br>Private developer may sub-let the land but would still be responsible for the timely execution of the project<br>80% of the project to be executed in 5 years; else, fine of 3 times the lease rent per year for every 1 MW shortfall until 80% is completed |

Some of the incentives offered under the Policy are related to the facilitation of project land, tax concessions and fee exemptions. Renewable Energy Manufacturing Units are treated as a priority sector under Odisha's Industrial Policy. **(See Table 3: Incentives Offered under RE Policy)**

## Table 3: Incentives Offered under Renewable Energy policy

| | Incentives |
|---|---|
| **Land** | Land to be provided at IPR rates for the project<br>Exemption from the ceiling on land holdings |
| **Concession in Taxes and Duties** | No stamp duty for land allotted by the Government/IDCO to solar park developers<br>Exemption from electricity duty for self-consumption for 5 years |
| **Exemptions from Certificates, Fees & Charges** | Testing charges of EIC would be waived off<br>Supervision charges shall not be levied by DISCOM/OPTCL<br>No clearance from the State Pollution Control Board (SPCB) would be required for projects except Biomass and Municipal Solid Waste Projects |
| **Special incentives for Renewable Energy Manufacturing Units** | To be treated as Priority Sector under IPR 2015<br>Minimum investment of Rs. 10 crore and employment of 20, to receive benefits of Category 'A1' or 'B1', depending on the location, from IPR 2015 |

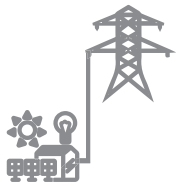
## 1.3 Policy and Institutional Settings for Energy Efficiency and Low Carbon Development of Transport

Other climate mitigation actions, apart from RE, such as Energy Efficiency (EE) and low carbon development of transport, largely follow the central government guidelines. Some of the major central government programmes being implemented in these are EE programmes such as LED based street lighting and EE in the domestic, industrial and building sectors. Most of programmes under EE are centrally sponsored and operated through the Ministry of Power's PSU – EESL. The state designated entity for EE programmes is the Engineer-in-Chief Electricity-cum-Principal Chief Electrical Inspector, Odisha.

Like other states, Odisha has not yet notified its electric mobility policy. The state Commerce and Transport Department has come up with a draft policy, which offers a subsidy of Rs 1 lakh on the purchase of an EV bus, car, and auto. According to a media report, the draft policy is considering giving a rebate in parking fees, charging fees and GST. To promote the manufacturing of EVs in Odisha, a provision needs to be made to provide land at a subsidised price to the promoter.

The Odisha State Road Transport Corporation (OSRTC) provides road transportation facilities to passengers in the state, which largely manages its public transport system through buses. The Department of Commerce and Transport has the responsibility of dealing with bus procurement and the planning of mass transport. The state is also promoting other means

## Table 4: Existing Policy and Intuitional Setup for Various CCMAs - Rural Electrification, Energy Efficiency , Low Carbon Transport & Sustainable Habitat



| | Rural Electrification, Strengthening Power Distribution & Transmission | Energy Efficiency and Energy Conservation (EE & EC) | Low Carbon Development (LCD) of Transport system | Sustainable Habitat (waste to energy, EE street lighting & green buildings etc.) |
|---|---|---|---|---|
| **Policy & Regulations** | National Electricity Policy, 2005 Adopted by state of Odisha | State Energy Conservation (EC) Mission under the Energy Conservation Act, 2001 | Odisha Electric Vehicles Policy Draft 2019[14] | Odisha Energy Conservation Building Code (OECBC) |
| **State Government's Departments and Institutions** | • Power Department<br>• OPTCL<br>• Zonal Electricity Supply Company of Orissa Limited (ESCO) of four regions - CESCO, WESCO, NESCO and SOUTHCO | Engineer in Chief Electricity-cum-Principal Chief Electricity Inspector Odisha | • Department of Commerce<br>• Transport Directorate of Ports and Inland Water Transport | Urban Development Department, Municipal Corporations |

of transport, such as an inland water transport system, which is managed by the Directorate of Ports and Inland Water Transport (IWT), which is responsible for developmental activities of the port sector. It also manages central schemes and externally aided projects for the development of IWT. **(See Table 4)**

14 India Whispers. (2019). Odisha Electric Vehicles Policy coming soon. Retrieved from https://www.indiawhispers.com/2019/11/14/odisha-electric-vehicles-policy-coming-soon/

Section II

# Renewable Energy, Energy Efficiency and Low Carbon Transport Programmes in Odisha

Odisha is implementing various programmes and schemes which are funded by the Centre as Central Schemes. However, to complement these, the state also implements its sector schemes, which are detailed in subsequent sections, along with their covered area. Annexure 1 lists various state sector schemes being implemented for various climate mitigation actions and their allocation over the years. The sections below provide information on schemes for various CCMAs.

## 2.1. Remote Village Electrification

The electrification of rural areas through various initiatives of the state and central government has led to significant strides in the field. The Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and the Pradhan Mantri Sahaj Bijli Har Ghar Yojana are two prominent central schemes in this regard. The major state schemes for rural electrification are the Biju KBK Yojana, the Biju Gram Jyoti Yojana (BGJY), the Rajiv Gandhi Grameen Vidyutikaran Yojana, Implementaion of Non-remunerative Transmission Project in Backward Districts and the Biju Saharanchal Vidyutikaran Yojana.

## 2.2. Energy Efficiency initiatives in Odisha

Exercising the powers conferred by the Energy Conservation Act, 2001, the state government in consultation with the Bureau of Energy Efficiency (BEE), GoI designated the Engineer-in-Chief Electricity–cum-Principal Chief Electrical Inspector, Government of Odisha, as the State Designated Agency (SDA).

The SDA is required to coordinate, regulate and enforce provisions of the Energy Conservation Act 2001 within the state. The office of the Odisha SDA issues directives for energy conservation to various sectors. EESL is funding most of the EE programmes being implemented in the state. Some of the programmes which are being implemented by EESL in partnership with state DISCOMs are: the Atal Jyoti Yojana (AJAY) for solar LED street lighting, GoI's UJALA LED scheme and the Solar Study Lamp scheme. Around 5.2 crore LED bulbs had been distributed till January 2020 under the LED distribution scheme, with the counterpart state scheme called "Ama Ghare LED" (LED bulbs in our houses) scheme. A Public-Private partnership is being used for the purpose of supply, installation, operation and maintenance of public street lighting in Odisha. Launched in July 2017, it is being managed through a special purpose vehicle, namely, NEESL Private Limited with EESL holding 26 per cent equity share. Other schemes, such as the Perform, Achieve and Trade (PAT) scheme for industries, and the Energy Conservation Building Code (ECBC) for building emanating from the National Mission for Enhanced Energy Efficiency (NMEEE) are also being implemented.

## 2.3. Initiatives for Low Carbon Development in the Transport System

Unlike other states, the Odisha government has still not presented a policy for electric mobility. However, there are scattered initiatives for low carbon transport by the government, such as a Low Carbon Mobility Plan (LCMP) under the Smart City Mission and the FAME- II scheme of the Central Government. The state government had prepared a Low Carbon Mobility Plan (LCMP) for Bhubaneshwar under the Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT) project. The project is being implemented jointly by the Bhubaneshwar Development Authority in cooperation with the Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) GmbH. The state government is investing in developing a mass transit system with the addition of buses, which are largely fuel-based. The government has established the Capital Region Urban Transport (CRUT) services, which is geared towards providing bus services in the urban areas of Bhubaneswar, Cuttack, Puri and Konark.

Besides, road transport, the state government in association with the Central Inland Water Transport Corporation Limited is developing its six waterways involving six major rivers of Odisha, viz., Mahanadi, Baitarani, Birupa, Budhabalanga and Subarnarekha. These six waterways were declared as national waterways by the GoI under the National Waterways Act, 2016. These waterways have a huge traffic potential for cargo transportation from mineral and ore extraction industries. Navigation and techno-economic feasibility studies are being conducted and detailed project reports (DPRs) are being prepared by the state government.

**Annexure 1 provides a summary on Odisha State Budget data for Renewable Energy Programmes**

Section III

# Odisha State Ancillary Initiatives for encouraging Private Participation for Renewable Energy Addition

The Odisha Renewable Energy Policy, 2016 duly recognises the significance of providing a conducive environment for encouraging private participation. The government has taken several supportive initiatives in this direction, such as: creating single-window clearance mechanisms for immediate approvals; creation of land banks for solar parks; skilling of technicians/ operators for handling RE equipment/ capacities; developing an online public information portal on RE technologies; and the creation of a dedicated fund, the "Odisha Renewable Energy Development Fund (OREDF)".

## 3.1. Odisha State Land Bank Scheme for Land Cluster Allotment for Solar Parks

In Odisha, the government had identified large areas of land under its Land Bank Scheme for developing solar power projects. The Odisha Industrial Infrastructure Development Corporation (IDCO) is the state's nodal agency for land acquisition. GEDCOL facilitates the allotment of the land on lease as per the Industrial Policy Resolution (IPR) 2015, for developing land based solar power projects. Under this, the government intends to create land banks at critical locations in the state to ensure a ready availability of land for upcoming industries, including solar parks.

This initiative by the state government has reduced time and effort in the iterative process of land identification and acquisition. In case, a suitable area of land is not available, the government has identified land in clusters for developing solar parks.[15]

## 3.2. Single Window Clearance System

The state government has developed the online single window portal, GO SWIFT i.e. Government of Odisha – Single Window for Investor Facilitation and Tracking, interfacing throughout the entire investment lifecycle.[16] The state established a Single Window Clearance mechanism in line with the Orissa Industries (Facilitation) Act 2004 for providing time-bound clearances and approvals. The Industrial Promotion and Investment Corporation of Odisha Limited (IPICOL) functions as the State Level Nodal Agency (SLNA) as also the Technical Secretariat for the State Level Single Window Clearance Authority (SLSWCA).

The Single Window Clearance System is responsible for the following actions:

- Review, process and facilitate project clearances including modernisation, upgradation, and expansion of existing industrial units.

15 MNRE has allocated 1000 MW Solar Park to Odisha for development under its solar park scheme. Approx. 4000 acres of land has been identified at Balasore, Bhogari and Bhhanga districts and land identification across the other districts is also under progress for the development of Solar Parks. This process of land identification is facilitated by GEDCOL in association with IDCO.

16 Government of Odisha (2017), Single Window Clearance System. Retrieved 26 October 2019, from https://industries.odisha.gov.in/PDF/SW.pdf and https://www.newindianexpress.com/states/odisha/2017/apr/30/single-window-nod-for-rs-9468-crore-investment-in-odisha-1599407.html

- Mandatory monthly meetings for analysis and approval of applications.
- Regular monitoring of projects, phase-wise during implementation until production commences.
- Monitor, sanction and facilitate disbursement of incentives applicable under various industries.

## 3.3. Public Information System on Rooftop Solar as a Policy Instrument

Oftentimes, it has been observed that there is no demand for RE technologies due to a lack of information and awareness among consumers. This also reduces the attraction for investment. Public information campaigns can vastly help in improving the RE product demand. The government is implementing the information and dissemination campaign for RE applications. The objective of the programme is to generate mass awareness of non-conventional energy products and devices in terms of their multiple benefits, design features, products availability, etc. OREDA has installed a web enabled tool, the 'OREDA-RTS-WEB-TOOL', which is designed for information on Roof Top Solar Applications for all consumer categories. This provides information on filling the application for availing Net-Metering facilities and subsidy under the Rooftop Scheme as per the eligibility criteria. Consumers can file the application online and contact empanelled vendors. The Public information System can help in reducing barriers in investments due to the lack of customer awareness.

## 3.4. Making Available a skilled workforce - an incentive for investors in RE

The lack of a trained workforce is impeding RE deployment in many states. The preparation of skilled labour will also incentivise RE investors into the state, apart from generating jobs for its youth. The unavailability of appropriately skilled workers has been identified as one of the most prominent challenges in hiring required personnel for the operation of RE projects. According to a survey estimate, RE would need 1.3 million trained workers by 2022, for the country to achieve its ambitious target. The state government has made certain structured efforts to provide skilled and semi-skilled workers for operating its RE projects. It created the Odisha Skill Development Authority (OSDA) in May 2016, which has programmes such as, "Skilled in Odisha" for skilling purposes and "The Nano-Unicorn Entrepreneurship Programme" for linking skilling to entrepreneurship. The state is actively participating in the Central scheme of Deen Dayal Upadhyaya – Grameen Kaushalaya Yojana (DDU-GKY) for training youth for industrial requirements. Some of the training programmes are being funded through Corporate Social Responsibility initiatives of big corporate houses and companies. Among the various offered disciplines, OSDA is operating six training centres for Solar PV Technicians and Solar PV installers (Surya Mitras) for skilled and non-skilled workers through non-industrial training institutes.

## 3.5.Creation of the Odisha Renewable Energy Development Fund (OREDF)

The state government has created an Odisha Renewable Energy Development Fund (OREDF) with a contribution of 5 paise per unit of RE sold outside the state, by the project developer. This Fund will be utilised as a revolving fund for the creation of infrastructure, such as a transmission network, roads and training centres for accelerated development of RE. According to government orders, on-grid RE projects involving innovative / new technologies may be given Viability Gap Funding (VGF) from OREDF.[17]

17 http://www.orierc.org/Suo_Moto_petition_2017-18_to_2019-20__January_2018.pdf

Section IV

# Initiatives for de-risking Investments: Learnings for Odisha

Amidst growing investor stake in RE, the Central government is taking measures for de-risking investors in the sector through various means, such as setting up a Payment Security Mechanism and Fund under SECI, signing of a Tripartite Agreement with State Nodal Agencies, creating "Green Banking" and setting up an Alternative Investment Fund (AIF) sponsored by IREDA etc.[18] Top states with high RE potential, such as Tamil Nadu, Karnataka, Maharashtra, Gujarat, Rajasthan, Madhya Pradesh and Andhra Pradesh are already offering financing mechanisms for averting risks on investments, such as payment security mechanisms.[19] These provide examples and learnings, which Odisha could benefit from.

## 4.1. Payment Security Fund by MNRE

The MNRE has envisaged the Payment Security Mechanism (PSM) and Fund to cover delays in payment to SECI by entities (DISCOM/ state utilities/bulk consumers) so that timely payment to solar power developers can be ensured. MNRE released Rs. 500 crore to SECI in order to operationalise the Payment Security Fund (PSF) set up for the VGF Scheme under JNNSM to cover energy payment risk of grid-connected Solar PV projects. While the guidelines for PSF were issued by MNRE in year 2016, it was actually sanctioned by the President of India in February 2019. According to the PSF guidelines, this Fund will be suitably enhanced through budgetary support from the Government of India. This would cover the 3 months' working capital requirement for the capacities allocated through the Viability Gap Funding under the National Solar Mission, from time to time under various schemes.

## 4.2. Tripartite Agreement

Under this agreement, in the case of default by state-owned DISCOMs, the central government can withhold financial assistance payments to the state governments. Past experience with the tripartite agreement shows that it plays a strong deterrent role against defaults/ delays by DISCOMS. The Tripartite Agreement is specifically applicable to PPAs signed between power producers and SECI. The Solar Energy Corporation of India has attained a beneficiary position in a tripartite agreement between the Government of India, state governments and RBI in February 2017.[20] This has also improved the credit rating of SECI. The lowering of off-taker risk for developers through this TPA mechanism translated into a more aggressive bidding activity, lower tariffs and catalysing investor confidence. For example:

### Case 1: 250 MW Bhadla Phase-IV Solar Park in Rajasthan

The lowest tariff of Rs. 2.44 per kWh, was discovered in the auction conducted by SECI for 250 MW Bhadla Phase-IV Solar Park in Rajasthan in 2017. Experts believe that this fall in solar tariffs is largely the result of the decision of the GoI to

18 https://www.pv-magazine-india.com/2019/12/13/government-committed-to-de-risking-renewable-energy-investments-mnre-secretary/
19 https://mercomindia.com/four-tier-rewa-payment-security-model-responsible-low-bids/
20 https://www.saurenergy.com/solar-energy-news/seci-gets-significant-boost-credit-rating

cover solar power through SECI under the ambit of the Tripartite Agreement, which resulted in reducing the risk perception of investors.

### Case 2: SECI invoking TPA with AP government to clear dues

According to the TPA, in cases of non-compliance with PPAs by state DISCOMs, the developer is compensated using funds that were due to be transferred from the Centre to the state government. This recent experience with a tripartite agreement in the case of Andhra Pradesh shows that it can play a strong deterrent role against defaults/ delays by DISCOMs. Andhra Pradesh owes Rs.20,000 crore in unpaid bills to all power generators, including renewables. According to media reports, the SECI is enforcing a tripartite pact for the first time, to collect Rs. 276 crore in dues from the Andhra Pradesh government from the central devolution.[22]

## 4.3. "Green Window"- New initiatives by IREDA to catalyse finance

In order to leverage limited government funds to attract private capital, the Indian government has announced a new financing approach, that of a "Green Window "as per an announcement made by the MNRE at the COP25 meeting.[23,24] The Indian Renewable Energy Development Agency (IREDA) is planning to set up a dedicated "Green Window" to serve the underserved segments of RE and other technologies.[25] Green windows, like green banks, are public entities created to work with the private sector to increase investment in green energy and bring clean energy financing into the mainstream. Top contenders for the green window include storage, electric mobility, distributed renewables and energy efficiency. Based on the capitalisation of existing green investment banks across the world, IREDA's Green Window needs US$50 million in seed funding. IREDA will allocate initial seed funding of Rs. 140 crores (approximately US$20 million) for the Green Window. The seed capital will be used to leverage additional sources of capital from both private domestic banks and international sources such as development banks, bilateral institutions, climate funds, impact funds, and/or philanthropic sources. Currently, the IREDA is developing an operational plan, which includes the mission, the mandate, target market segments, performance metrics, and a roadmap for the implementation of the Green Window.

## 4.4. Payment Security Mechanisms by State Governments

Counterparty risk associated with delay/default in regular payments by distribution companies is one of the most critical risks that power producers face. Power producers enter into power purchase agreements (PPA) with the State Power Distribution Company for the sale of power on key contractual terms, such as tenure, tariff, billing and the payment security mechanism. However, the poor financial health of the DISCOMs, often lead to delays in payment to power producers with serious cash flow implications for them, hurting their long term business viability. To reduce both, the perception and the quantum of this risk for investors, the state government has ensured multiple levels of payment security in RE PPAs, such as a letter of credit, the default escrow agreement,

22 SECI moves to claim Andhra's dues from central devolution. (2020). Retrieved 26 March 2020, from https://www.eqmagpro.com/seci-moves-to-claim-andhras-dues-from-central-devolution/

23 PIB. (2019). IREDA to Create a Green Window for Green Energy Finance: Shri Anand Kumar. Retrieved from https://pib.gov.in/newsite/PrintRelease.aspx?relid=195728

24 NRDC.org (2019). Fact sheet (December 2019). Available at :https://www.nrdc.org/sites/default/files/ireda-pioneering-catalytic-green-window-india-201912.pdf

25 The term "underserved" refers to market segments that have not received financing proportionate to their potential such as decentralised Renewable Energy technologies, electric vehicles, energy storage etc. This could be due to inadequate policy focus, inherent risk perception, credit quality, disaggregation, or other factors. A good proportion of such market segments are commercially viable and, with support from catalytic finance, are able to scale up to their true potential. https://pib.gov.in/newsite/PrintRelease.aspx?relid=195728 and https://www.cleanfuture.co.in/2019/12/12/ireda-to-create-green-window-for-renewable-energy/

## Table 5: Payment Security Mechanisms by State Governments

| | |
|---|---|
| Payment Security Fund | It is a capital reserve that provides interest-free capital to its beneficiary in case of default in payments by any Power Distribution Company (DISCOM) (typically equivalent to three months of payment for energy sale to the DISCOM). |
| Letter of Credit | A letter of credit (LC) is a standard document offered by banks (typically against a fee to be paid by DISCOM), guaranteeing the beneficiary of payments, i.e. the project developers, the total amount of the letter. The LC can be invoked if the DISCOM defaults on its payment. |
| Default Escrow Agreement | An Escrow is a legal concept in which a financial instrument or an asset (in this case, DISCOM's cash flows) is held by a third party (typically a bank) on behalf of two other parties. A Default Escrow Agreement is signed between the power producer and the DISCOM for an amount typically equivalent to the LC. |
| State Government Guarantee | In case of PPAs signed directly between power producers and state DISCOMs, a fixed amount maybe guaranteed by the state government as an alternative to a tripartite agreement. |

the payment security fund, the tripartite agreement and the state government guarantee. Table 5 lists each one of them with a brief description.

A Four-Tier Security Guarantee is used by the Madhya Pradesh state government under the Rewa Ultra Mega Solar (RUMS) Park. This has boosted the morale of the investor and created confidence in the investor. **(See Box 2)**

### Box 2: Four-Tier Security Guarantee by Madhya Pradesh under Rewa Ultra Mega Solar (RUMS) Park

On September 27, 2017, the state cabinet of Madhya Pradesh approved a state payment guarantee to be provided to solar project developers in the Rewa Ultra Mega Solar (RUMS) Park, thereby completing the multi-tier payment security mechanism that is being provided to solar project developers in Rewa.

The first tier of the security mechanism is a letter of credit provided by off-takers, DMRC, and the Madhya Pradesh Power Management Company Limited (MPPMCL), that equals a one-month bill for the energy generated by developers.

The second tier is a payment security fund operated by Rewa Ultra Mega Solar Limited (RUMSL). It consists of three months of payment assurances in case the off-takers delay or make a payment error. This three-month payment guarantee comes on top of the one-month line of credit provided by off takers. The third tier is the state guarantee that was recently approved by the state cabinet of the Government of Madhya Pradesh. If there are payment delays by off-takers, then the state will step in to pay the difference or the pending amount to the developers. The state government is also providing the fourth tier of payment security by agreeing to bear the cost in cases where a transmission outage lasts beyond 50 hours. These four layers of payment security ensure that, in the case of any delay or even natural calamities that may lead to a transmission disruption, payment to developers is still guaranteed. This has boosted the morale of developers and even those who aren't involved in developing projects at RUMSL are holding it in high regard.

Source: Mercom India

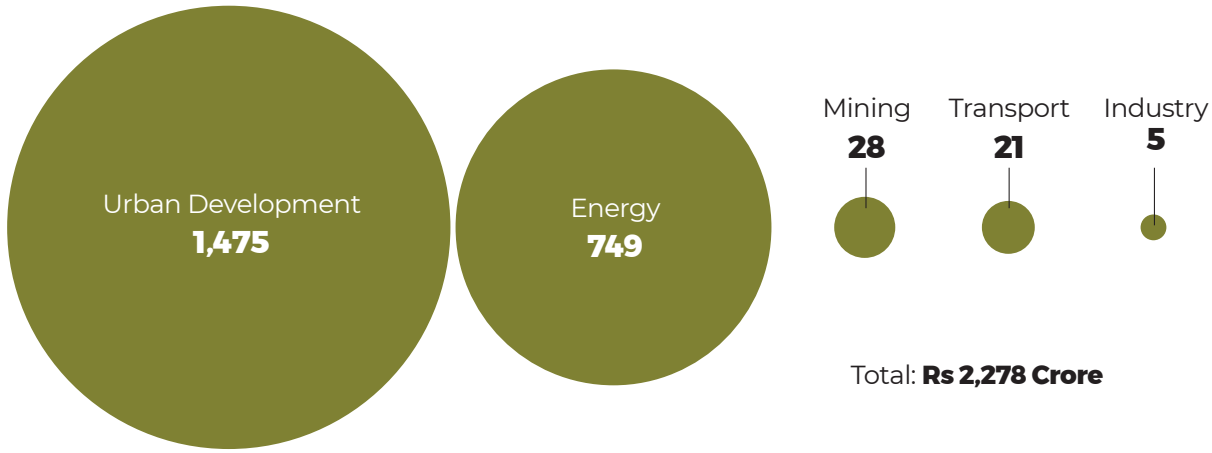
## Section V

# Odisha's Newly Introduced Climate Budget Statement 2020-21 & Financial Requirement under its Action Plan for Climate

Subsequent to the first SAPCC from 2010 to 2015, the state has prepared the second SAPCC from 2015 to 2020. The Odisha SAPCC (2015-2020) has recognised various key priority actionable tasks under various sectors, which have a high potential for climate mitigation.[26] These sectors include Energy, Industry, Mining, Transport, and Urban Development. This SAPCC has received an increased budgetary target than the previous one. In the first SAPCC the budgetary requirement was Rs. 17,049 crore, which has increased to Rs 31,663.58 crore in the second one, showing a raise of 6 per cent. This budgetary target includes both adaptation and mitigation interventions. The financing requirement posed for various climate mitigation actions in SAPCC 15-20 is enumerated in Table 6. It reflects 7.2 per cent of the overall budget requirement of SAPCC 2015-20. The State Action Plan also indicates that any estimation of the cost of climate change adaptation activities and even some mitigation activities are difficult because of the externalities and uncertainties associated with their implementation. The SAPCC projects two-thirds of the requirement to be met through state budgets and one-third to be met through external aid or central sector schemes.

Interestingly, the Odisha budget 2020-21 had introduced a special statement on climate budgeting. The Climate Budget presented a

### Table 6: SAPCC Budget Requirement for Various Sectors for Climate Mitigation Actions (in Rs. crore)




Source: SAPCC Odisha 2015-2020

26 Forest and Environment Department, Government of Odisha (2015), Odisha State Action Plan on Climate Change (2001-2020).Available at :http://climatechangecellodisha.org/pdf/Odisha_SAPCC_2016-2020.pdf

methodology for the appraisal of existing programmes of the government for their climate change impact. The Climate Change impact appraisal presented in the aforementioned Climate Budget suggests that opportunities to incorporate mitigation actions are substantial in the energy sector. The top scheme (with a score above 60 per cent), which is identified as the most climate relevant is, “Assistance to the Green Energy Development Corporation Limited (GEDCOL)”; and the best schemes identified as being most climate sensitive due to climatic disasters, such as cyclones, (with a score above 60 per cent) are the “Biju Korapat, Balangir and Kalahandi (KBK) Yojana”, “Special Programme for KBK districts (RLTAP Scheme)” meant for remote village electrification and the “Agricultural Feeder Separation” programme.

The Odisha Climate Budget 2020-21 through its climate impact appraisal framework is definitely a step in the right direction. This exercise can facilitate an informed debate on designing financial instruments for priority areas.

# Section VI

# Recommendations

**1.** Despite the state of Odisha having many skilling programmes, there is non-availability of data on many fronts. For instance, there are no details to show the number of skilled personnel that have been trained for RE technology installation and operations or the number of skilled personnel required. There is also no information to indicate what the government's specific target is in terms of imparting skills or upgradation vis a vis the requirement for upcoming RE projects in the state. It is also critical to bear in mind that although the workforce requirement for off-grid technologies in remote areas is large, they do not always present full-time employment opportunities. Hence, retraining/ upgrading the skill of the locally placed semi-skilled technician and service provider for off-grid RE technologies could be a way out for making available a trained staff in remote areas. Currently, such programmes for retraining locally available labour are absent in the Odisha Skill Development Programmes and need to be included.

**2.** Odisha has a dedicated fund, the Odisha Renewable Energy Development Fund (OREDF) which should certainly be considered for emulation by other states in India to promote off-grid RE technologies

**3.** The state government has introduced a dedicated Odisha Budget with an appraisal mechanism and a separate budget on climate change – the first state to do so. This budget statement has identified priority climate actions based on their climate relevance and sensitivity. This also provides a measure of transparency to potential investors and improves investor confidence in government policies. Odisha is the first state in the country, which received clearance for the first project with Green Climate Fund (GCF) financing. Odisha's Climate Budget 2020-21 based on a climate impact appraisal framework is definitely a pioneering and positive step in the right direction, which other states in country should follow. However, this Climate Budget could have been improved upon by providing monitoring and verification indicators against each identified priority action, which is currently missing.

**4.** To reduce both, the perception and the quantum of risk for investors, the state government has ensured multiple levels of payment security in RE PPAs. These include a letter of credit, a default escrow agreement, a payment security fund, a tripartite agreement and a state government guarantee. The Odisha government should highlight these mechanisms in their request for proposals to investors.

27 This climate budget presents a brief analysis of the top ten schemes (by budgetary allocation) for various sector based on their relevance and sensitivity scores defined as CC relevant score and CC sensitive score ( CCRS & CCSS), indicating the scope for realignment over a significant portion of the department's expenditure. Additionally, all the schemes analysed have been ranked based on their Climate Change Relevant Score for the purpose of prioritisation by policy makers at the time of budget allocations to ensure maximum benefits from climate change perspectives.

28 For example, the labour demand for installation and maintenance of solar pumps is high, but the need is typically seasonal. Similarly, the maintenance requirements of solar lanterns or SPV off-grid projects are low and do not require large numbers of full-time staff. Several experts recognise the value of retraining existing workers. For instance, for solar water heating (and to a lesser extent solar water pumping), plumbers may be retrained. Electricians are good candidates to undergo training in the installation and maintenance of SPV off-grid projects and lighting systems. Masons, welders and fabricators can be easily trained to build improved cook-stoves and biogas plants.

# Annexure I: Odisha State Budget Data for Renewable Energy (in Rs. crore)

| | 2015-16 A | 2016-17 BE | 2016-17 RE | 2016-17 A | 2017-18 BE | 2017-18 RE | 2017-18 A | 2018-19 BE | 2018-19 RE | 2019-20 BE |
|---|---|---|---|---|---|---|---|---|---|---|
| **ENERGY DEPARTMENT** | | | | | | | | | | |
| **Major head: 2810-New And Renewable Energy** | | | | | | | | | | |
| Minor head: Total 105- Supporting Programmes | | | | | | | | | | |
| 2963- Assistance To GEDCOL | 10 | 10 | 86.2 | 48.1 | 10 | 10 | 10 | 10 | 10 | 10 |
| **DEPARTMENT OF SCIENCE AND TECHNOLOGY** | | | | | | | | | | |
| **Major head: 2810-New And Renewable Energy** | | | | | | | | | | |
| Minor head: 102- Renewable Energy for Rural Applications | | | | | | | | | | |
| Total Programme Expenditure | 2.5 | 0.62 | 0.62 | 0.62 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Minor head: 104- Research Design and Development in Renewable Energy** | | | | | | | | | | |
| 0708- Information Education and Communication | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1525- Use of Solar Photovoltaic System | 6.97 | 1.62 | 1.62 | 1.62 | 16.2 | 13.2 | 16.2 | 0 | 0 | 0 |
| 1525- Use of Solar Photovoltaic System | 1.5 | 0 | 0 | 0 | 0 | 0 | 0 | 6.2 | 2.51 | 6.2 |
| 2833- Roof Top Solar Photovoltaic System for Govt./Agencies Building | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 5 | 15 |
| 2834- Off- Grid Solar Power System | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2750- Renewable Energy Resources Assessment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2999- Solar Photovoltaic Pumps for Irrigation | 16 | 13.5 | 13.5 | 13.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Programme Expenditure** | 24.46 | 15.12 | 15.12 | 15.12 | 16.2 | 13.2 | 16.2 | 16.2 | 7.51 | 21.2 |
| **Minor head: 105- Supporting Programmes** | | | | | | | | | | |
| 2751- Industrial Park | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0016- Administration of Odisha Renewable Energy Development Agency | 0.25 | 0 | 0 | 0 | 1.5 | 1.5 | 1.5 | 0 | 0 | 0 |
| 0016- Administration of Odisha Renewable Energy Development Agency | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 0.88 | 0.88 | 0 |
| **Total Programme Expenditure** | 0.25 | 0 | 0 | 0 | 4.5 | 4.5 | 4.5 | 0.88 | 0.88 | 0 |

# Annexure I: Odisha State Budget Data for Renewable Energy (in Rs. crore)

| | 2015-16 A | 2016-17 BE | 2016-17 RE | 2016-17 A | 2017-18 BE | 2017-18 RE | 2017-18 A | 2018-19 BE | 2018-19 RE | 2019-20 BE |
|---|---|---|---|---|---|---|---|---|---|---|
| **Minor head: 105- Supporting Programmes** | | | | | | | | | | |
| 0016- Administration of Odisha Renewable Energy Development Agency | **3.97** | **3.97** | **3.97** | **3.97** | **4.57** | **4.57** | **4.57** | **4.57** | **4.57** | **4.57** |
| **Minor head: 789- Special Component Plan for Scheduled Castes** | | | | | | | | | | |
| 2999- Solar Photovoltaic Pumps for Irrigation | **0** | **3.5** | **3.5** | **3.5** | **0** | **0** | **0** | **0** | **0** | **0** |
| 1525- Use of Solar Photovoltaic System | **0.68** | **0.16** | **0.16** | **0.16** | **1.5** | **1.5** | **1.5** | **0** | **0** | **0** |
| 0247 - Demonstration of Improved Chullahas | **1** | **0.16** | **0.16** | **0.16** | **0** | **0** | **0** | **0** | **0** | **0** |
| 1525- Use of Solar Photovoltaic System | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1.6** | **0.9** | **1.6** |
| **Total Programme Expenditure** | **1.68** | **3.82** | **3.82** | **3.82** | **1.5** | **1.5** | **1.5** | **1.6** | **0.9** | **1.6** |
| **Minor head: 796- Tribal Areas Sub-Plan** | | | | | | | | | | |
| 1525- Use of Solar Photovoltaic System | **0.85** | **0.22** | **0.22** | **0.22** | **2.3** | **2.3** | **2.3** | **0** | **0** | **0** |
| 2999- Solar Photovoltaic Pumps for Irrigation | **0** | **5** | **5** | **5** | **0** | **0** | **0** | **0** | **0** | **0** |
| 0247 - Demonstration of Improved Chullahas | **1.5** | **0.22** | **0.22** | **0.22** | **0** | **0** | **0** | **0** | **0** | **0** |
| 1525- Use of Solar Photovoltaic System | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **2.2** | **1.2** | **2.2** |
| **Total Programme Expenditure** | **2.35** | **5.44** | **5.44** | **5.44** | **2.3** | **2.3** | **2.3** | **2.2** | **1.2** | **2.2** |

Source: Odisha State Budget Documents

# Report on Climate Mitigation Financing Framework in Odisha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## About the Project

The project studies policy, institutional and fiscal measures which four select states, viz., Andhra Pradesh, Assam, Odisha and Rajasthan are undertaking to mitigate climate change, along with a reflection on the suitability of the budgetary provisions in meeting their State Action Plan on Climate Change (SAPCC).

## About CBGA

CBGA is an independent, non-profit policy research organisation based in New Delhi. It strives to inform public discourse through rigorous analysis of government budgets in India; it also tries to foster people's participation on a range of policy issues by demystifying them.

*For further information about CBGA's work, please visit www.cbgaindia.org or write at: info@cbgaindia.org*

## About SSEF

Shakti Sustainable Energy Foundation works to facilitate India's transition to a cleaner energy future by aiding the design and implementation of policies that promote clean power, energy efficiency, sustainable transport, climate policy and clean energy finance.

*For further information about SSEF's work, please visit www.shaktifoundation.in*