



Virtual Workshop on Floating Solar projects

Organised by Government of Odisha and EU-India Clean Energy and Climate Partnership

 20th May, 2022

 11:30 AM – 02:00 PM CET | 3:00 PM – 5:30 PM IST

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EU-Odisha Virtual Workshop on Floating Solar Projects- Event Proceedings



EU-Odisha virtual workshop on floating solar projects

On 20th May 2022, EU-India Clean Energy and Climate Partnership (CECP) project and the Government of Odisha successfully organized a workshop on floating solar in Odisha, offering exchange of information from EU on innovation and best practices in floating solar. The state of Odisha has an overall potential of generating 17.75 GW of electricity from Floating solar Photo Voltaic (FSPV) and proactively conducted feasibility studies across its water surface area for project development at utility scale. Under the Clean Energy Cooperation with India (CECI) project, feasibility studies on 12 water bodies were carried out in the state, namely, hydro reservoirs of Balimela, Upper Kolab, Indravati, Hirakud and Rengali and water irrigation reservoirs of Telengiri, Hariharjore, Mandira, Jambhira, Salandi, Sorada Ghai and Bhajanagar. The study was carried out based on strong desktop assessment with GIS analysis, site visits to the water bodies, environmental, social analysis and sample social consultation workshops. The final study report was submitted to Green Energy Development Corporation of Odisha Ltd. (GEDCOL) in Dec 2019 and accepted after detailed deliberation with Department of energy and state government level.

In alignment with the above feasibility study conducted in the state, a need was highlighted by the Odisha state government to develop two FSPV Detailed Project Reports (DPRs) for the sites of Hirakud and Indravati. The main purpose of the DPR was to focus on the techno-commercial assessment of utility scale FSPV projects, with easy future replication of the project across other water bodies in the state and subsequently highlight the key innovations which can be implemented. The overall objective of this study was to ensure that the best practices, key success factors, including latest European knowledge and research in technology on what is needed for development of an optimized FSPV project, based on relevant experiences of EU member countries in translated into formulation of project DPRs. The activity addressed specific barriers to uptake, upscaling and replication of floating solar PV as one of the five pilots regarding European technical solutions implemented in the Indian context required under the CECP project.

The event was attended by stakeholders from European Commission, representatives from Odisha state government, solar experts, representatives from EU companies and sectoral experts from PwC.

Opening remarks and context setting (Moderator: Mr. Agostinho Garcia, Solar Expert under CECP Project)

Mr. Edwin Koekkoek, First Counsellor – Energy & Climate Action, Delegation of the European Union to India welcomed the participants from Europe and India. He briefed that Europe and India entered into an agreement in 2016 under the EU-India Clean Energy Climate Partnership. In the last few years EU and India have been working very closely on sectors related to renewable energy, energy efficiency including floating solar. He discussed the 2050 net-zero target of EU and 2070 net-zero target of India along with India's 500 GW non-fossil fuel capacity by 2030. He mentioned that the EU is keen to work with India to achieve their own renewable energy and energy efficiency targets as well as targets of India. To do so, there must be an exchange of best practices; collaboration between Indian and EU suppliers working in the areas of renewable energy and energy efficiency. This can be done through webinars, workshops, activities and study tours. The Clean Energy Cooperation with India (CECI) has already carried out feasibility studies for 12 water bodies in Odisha which have already been approved by respective authorities. This study shall build upon the studies conducted for Hirakud and Indravati, translating into development of bankable project DPRs. The DPR on floating solar in the state of Odisha is part of earlier activities with the government of India in which DPR for solar parks were developed.

Sh. Nikunja Bihari Dhal, IAS, Principal Secretary said that Odisha has a limited availability of land, hence Floating solar is a useful proposition. He thanked the EU for supporting this DPR for floating solar project in Hirakud and Indravati. He also discussed the ambitious targets set by the Honorable Prime Minister of India at COP26 for 500 GW of renewable energy by 2030 and climate neutrality by 2070. Odisha distribution utilities have achieved their 100% Renewable Purchase Obligation (RPO) compliance last year and Grid



Corporation of Odisha (GRIDCO) which is bulk supplier of electricity in the state procured 77% more renewable energy in FY 22 vs FY 21. Green Energy Development Corporation of Odisha Ltd. (GEDCOL) has setup a Joint Venture (JV) with National Hydro Electric Power Corporation Private Limited (NHPC) for setting up floating solar projects in India and the JV has already awarded a 300 MW floating solar project for which the tariff came about 40% higher than ground based solar at INR 3.6/unit. The tariff for land based solar power projects has gone to Rs. 2.50/unit. He said that the sector has enormous potential, and the targets can be achieved through combined efforts from the state governments and the private sector.

Presentation on DPR for Floating solar at Hirakud and Indravati

Mr. Agostinho Garcia, Solar Expert under CECP Project presented a DPR for 500 MW Floating PV (FPV) plant in Hirakud reservoir and 160 MW floating PV plant in Indravati reservoir in Odisha. He discussed that the floating solar demand is increasing in India, Australia and Morocco. Some of the reasons that come as a direct benefit from floating PV are that:

- It can be used in densely populated areas
- It can be an alternative in locations with high land costs
- Avoids using land, which can be used for agriculture
- Hydro reservoirs are usually close to the grid and are available

FPV plants are used in waterbodies and are exposed to harsh conditions. As a result, it's critical to examine suitable criteria to maintain the quality of FPV plant components while also avoiding harming water quality and local biodiversity. India's electricity demand has been rapidly increasing and is anticipated to continue to do so in the coming years. To meet the growing demand for electricity, the country's installed capacity must be greatly expanded. About 18,000 km² of water surface area across several states has been identified as suitable for the installation of FPV plants, with a capacity of around 280 GW being possible. Some of the best FPV practices worldwide are:

- China:
 - Support on FPV deployment on otherwise unusable land and artificial water bodies, as opposed to natural water bodies that may have a more complex environmental review process
 - Encourage Renewable Energy (RE) deployment, including FPV deployment, via national targets and regional requirements
- India:
 - India's water reservoirs are expected to hold around 28,000 MW of FPV capacity. Multiple tax incentives and FPV specific auctions are available in India
- Holland:
 - Providing direct financial incentives like production-based incentives can help de-risk FPV systems
 - Encouraging interagency cooperation can help encourage FPV development by reducing the administrative hurdles to deployment

The detailed presentation can be accessed [here](#).

Mr. Deepak Malik, Director- Sustainability and Responsible Business Advisory, PwC India, shared a presentation on preliminary environmental and social impact assessment for Hirakud and Indravati sites.

He discussed on the key Environmental and Social sensitive features in the vicinity of the Hirakud and Indravati site such as forest area, tribal population, dependency on proposed area and surrounding natural calamities. Some of the findings were:

- Indravati River and Indravati Reservoir are identified as key surface water resource from the project area. It is expected that the water requirement during construction and operation phase shall be



catered through the reservoir. Beside catering the requirement for Upper Indravati Hydroelectric Project, the reservoir is currently being used as medium for transportation by the local population of surrounding villages and as a source of livelihood to some extent (fishing activity)

- Mahanadi River and Hirakud Reservoir are identified as key surface water resource from the project area. It is expected that the water requirement during construction and operation phase shall be catered through the reservoir. Beside catering the requirement for Upper Mahanadi Hydroelectric Project, the reservoir is currently being used for fishing activity by 7000+ fishermen, the identified area for FSPV site is being used by ~469 registered (IBB PFCS) and ~400 unregistered fishermen from surrounding villages and as a source of Livelihood.

The detailed presentation can be accessed [here](#)

Presentations from EU companies

Mr. Agostinho Garcia, Solar Expert under the CECP Project, presented EU best practices in FPV covering FPV EU standards, supporting policies and Research & Innovation (R&I). He discussed in detail on

- Floating Photo Voltaic (FPV) EU Standards: To enhance the reliability and safety of FPV projects, industry players have agreed to adopt a set of shared rules and procedures known as Recommended Practices. These recommendations usually combine pre-existing standards for solar PV equipment, like as International Electrotechnical Commission (IEC) and International Organization for Standardization (ISO) norms, with other relevant quality requirements for floating structures, as well as the environmental concerns of FPV locations.
- FPV EU Supporting policies: He discussed the case study from Portugal sharing details of features of floating solar tender. One of the major approaches done by the Portuguese government has been through implementation and development of solar auctions.
- Research and Innovation: The FPV technology is present in several R&I programs engaging the public and private sector. Some of them are:
 - The Green Powered Future Mission: The main focus of the roadmap has been to define a pathway to guide large scale R&I investment, energy policy and boost international cooperation towards a more sustainable future and a shift to clean energy, such as the floating PV
 - EU-SCORES: will demonstrate the combination of offshore wind-wave, and offshore wind - offshore floating solar PV. These demonstrations will prove how the increased power output and capacity installed per km² will help to reduce the amount of marine space needed and will provide knowledge on how to effectively scale-up offshore hybrid systems in Europe
 - Horizon Europe Framework Programme: It is focused on tackling climate change, fostering the UN's sustainability goals and increasing overall EU's competitiveness

The detailed presentation can be accessed [here](#).

Mr. Matthijs Soede, Senior Policy Officer at DG Research and Innovation, European Commission, discussed the need to accelerate renewable energy deployment globally by co-operation with countries outside Europe. As a result of the ongoing war between Ukraine and Russia the EU is now even more dependent on other countries and there is a need to be more dependent and make higher investments in clean energy technology. It is very important to not just focus on rooftop PV or onshore wind only, but on all available technologies and to make use of all the available resources. In this context he referred to [REPowerEU](#) and the [EU Solar Energy Strategy](#) , explaining that the goal is to double the installed 150GW



solar PV capacity by 2025 and 600 GW by 2030. There is a lot of work to be done on R&I, including on the environmental impacts of the sector, to make the supply affordable and this will be possible if all countries work together.

Mr. Deepak Ushadevi, MD & CEO, Ciel & Terre India presented the developments in floating PV. He discussed that floating solar is qualified as the 3rd pillar of solar industry, alongside ground and rooftop PV. Floating solar creates opportunities for renewable energy production and is an answer to societal concerns like:

- Preserving land available: Floating solar tackles land use conflicts related to agricultural lands, industrial areas as well as land required for housing as the world population keeps on growing
- Produce green energy
- Bring adapted solutions to various types of ponds: floating solar is compatible with ponds with ongoing economic activities. In a long run, it can also rehabilitate disused areas while generating profit

He also discussed that people are not scared by the challenges in this industry, but since this is a complex industry, there are solutions that can be learned and implemented.

About company: Ciel & Terre India (Ciel et Terre Solar Private Limited) was established in 2018 as a subsidiary of Ciel & Terre International. They are specialist in the integration of photovoltaic systems and floating PV. The floating PV group's activity is fully-integrated, including technical innovation, manufacturing, project development and design. To view complete profile, click [here](#).

Mr. Aniket Dey, Business Head, FIMER presented the developments in inverters for Photo Voltaic plants. About company: FIMER is one of the largest solar inverter suppliers in the world. Specializing in solar inverters and mobility systems, it has over 1100 employees worldwide and offers a comprehensive solar solutions portfolio across all applications. They have 55 GW of installed capacity and are expanding at 12 GW per year. To view complete profile, click [here](#). The detailed presentation can be accessed [here](#).

Closing Remarks

Sh. Bishnupada Sethi, CMD, GEDCOL thanked the participants and appreciated the presentation given by EU and Indian speakers. He said that the presentations were quite relevant and technical solutions including anchoring and mooring were very important. He highlighted the importance of renewable power to be available at competitive prices. He also thanked EU for the excellent work done for the development of DPR for floating solar project in Odisha.

Vote of Thanks

Mr. Vaibhav, Director, PwC thanked the participants for the presentation and the government of Odisha for their extended support in terms of data and coordination that helped in completing the study and development of DPR for the project sites in Odisha. He concluded the workshop and wished for speedy development of these projects.



EU-Odisha Workshop on Floating Solar PV

20 May 2022 (3:00 PM- 5:30 PM IST/ 11:30 AM- 2:00 PM CET)

Draft agenda

Time (EU- CET)	Time (India- IST)	Agenda
11:30 – 11:35 AM	3:00 – 3:05 PM	Welcome of participants and Overview of EU-India Clean Energy and Climate Partnership <i>Mr. Edwin Koekkoek, First Counsellor- Energy and Climate Action, Delegation of the European Union to India</i>
11:35 – 11:45 AM	3:05 – 3:15 PM	Opening Remarks <i>Sh. Nikunja Bihari Dhal, IAS, Principal Secretary</i>
11:45 – 12:15 AM	3:15 – 3:45 PM	Presentation: DPR for Floating solar at Hirakud and Indravati <i>Mr. Agostinho Garcia, Solar Expert under CECP Project</i>
12:15 – 12:30 AM	3:45 – 4:00 PM	Presentation: Preliminary Environmental and Social Impact assessment for Hirakud and Indravati sites <i>Mr. Deepak Malik, Director- Sustainability and Responsible Business Advisory, PwC India</i>
12:30 – 12:40 AM	4:00 – 4:10 PM	Comments/Queries from Participants on the DPR
12:40 – 12:55 PM	4:10 – 4:25 PM	Presentation on EU best practices in area of Floating solar <i>Mr. Agostinho Garcia, Solar Expert under CECP Project</i>
12:55- 01:10 PM	4:25 – 4:40 PM	Presentation by European Commission <i>Matthijs Soede, Senior Policy Officer at European Commission DG Research and Innovation</i>
01:10 – 01:25 PM	4:40 – 4:55 PM	Presentation on Developments in Floating PV <i>Mr. Deepak Ushadevi, MD & CEO, Ciel & Terre India</i>
01:25 – 01:40 PM	4:55 – 5:10 PM	Presentation on developments in inverters for PV plants <i>Mr. Aniket Dey- Business Head, FIMER</i>
01:40 – 01:45 PM	5:10 – 5:15 PM	Q&A
01:45 – 01: 55 PM	5:15– 5:25 PM	Closing Remarks: <i>Sh. Bishnupada Sethi, CMD, GEDCOL</i>
01:55 – 2:00 PM	5:25 – 5:30 PM	Vote of Thanks <i>European Commission, DG Energy or Delegation of EU to India</i>

Joining Link:

Attendee Link: <https://pwc-indiamc.webex.com/pwc-indiamc/j.php?MTID=m072386890a1bcf62fbb2c19622e8b3of>

Backup link: <https://tinyurl.com/Odishasolar>

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