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## <u>SolarDuck BV submission for public consultation on the offshore renewable energy</u> (ORE) Future Framework Policy Statement prepared by DECC Ireland

## 1) ORE resource assessment (with reference to section 1.3)

The Sustainable Energy Authority of Ireland (SEAI) has estimated the potential scale of opportunity for ORE technologies in Ireland's waters. The exercise considers wind, wave and tidal technologies, with a gross technical resource capacity of over 600GW identified.

The Government of Ireland has correctly noted that technological innovation will increase ORE opportunity in Irish waters. One such innovation that should be assessed to boost Irish ORE resources is offshore floating solar photovoltaics (OFPV).

Wind and solar PV are the best positioned technologies to drive the acceleration of renewable energy. The cumulative global solar PV capacity is expected to triple between 2022 and 2027, surpassing coal, and is set to become the world's largest installed power capacity. The oceans represent a unique opportunity to further develop solar PV capacity, providing a vast area for installation of solar PV in a way which reduces tension with other human activities and land-use requirements, while remaining close to energy demand centres, and providing the possibility to co-locate offshore infrastructure with wind resources.

Solar PV panels floating in inland waters are not new, but the emergence of offshore floating PV represents a new family of technologies which are distinct from inland floating solar. Due to the harsher offshore environments, the floating substructure design and material selection must withstand the more corrosive environment, and increased wind, waves and currents whilst ensuring safety of personnel and assets and minimizing potential environmental impact.

Currently there are around 10 European technology developers of offshore floating solar systems that already have a pilot plant installed or under development. These are listed below.

Country	Developer Name
Netherlands	SolarDuck
Norway	Fred Olsen 1848
Netherlands	Bluewater & Genap
France	HelioRec
Norway	Moss Maritime
Norway	OceanSun
Austria	Swimsol
Belgium	SeaVolt
France	SolarInBlue
Germany	SINN Power

 Table 1: European OFPV technology developers.

Key aspects to consider in an assessment of offshore floating PV potential include:

- a) local solar resource measured in irradiation
- b) wave conditions, in particular: the height and the steepness of the waves
- c) the distance to a grid connection point (such as an offshore wind farm substation or a substation on land)



d) water depths, preferably in the range of 30-100m. Note that mooring the structures in deeper waters is technically feasible, but the effect on project economics must be analysed

## 2) ORE co-location and technology innovation (with reference to section 4.3)

The Government of Ireland has indicated future focus on the development of multi-purpose sites through co-locating ORE technologies. With reference to this, an assessment should be made of offshore floating solar in hybrid construction with offshore wind, which offers significant savings such as the sharing and optimisation of export infrastructure such as transmission cables and substations.

Another key benefit would be from the inverse correlation of wind and solar power. That is, when wind power is abundant, typically solar power is not, and vice versa. This effect can more closely approximate baseload generation and optimise the use of the export infrastructure and grid connection while exhibiting potentially very low amounts of curtailment for combined wind and solar generation.

There are currently no existing frameworks in Europe or worldwide that specifically accommodate offshore solar in hybrid projects with wind<sup>1</sup>. However, several European countries such as the Netherlands, Malta, Italy, and Greece are developing emerging policy frameworks to accommodate co-location.

One case study that can be pointed to is the Dutch approach, where the government is leveraging offshore wind for OFPV technology development. Offshore wind (OFW) developers are incentivised to develop OFPV through the government making it a requirement in the award of offshore wind tenders.

This is seen in recent wind tenders that have been awarded:

- a. 0.5MW of OFPV to be realized in 2025, as part of winning bid for Hollandse Kust Noord (HKN) wind farm, operational since Dec 2023 (<u>Source</u>)
- b. 5MW of OFPV to be realized in 2026, as part of winning bid for Hollandse Kust West (HKW) wind farm, expected operational in 2026. (<u>Source</u>)

As well as upcoming wind tenders yet to be awarded, such as:

a. Tender points awarded for proposal of up to 50 MW of floating solar in the ljmuiden Ver Beta wind park, to be realised in 2029 (Source: <u>RVO</u>)

Further discussions are underway in various European jurisdictions about incentive frameworks to help demonstrate to developers and investors the huge potential for OFPV to scale up and achieve rapid cost reductions over time.

For further information, please contact:

www.solarduck.tech

<sup>&</sup>lt;sup>1</sup> Further guidelines on offshore floating solar can be found in <u>Floating PV Best Practice Guidelines - SolarPower</u> <u>Europe</u>