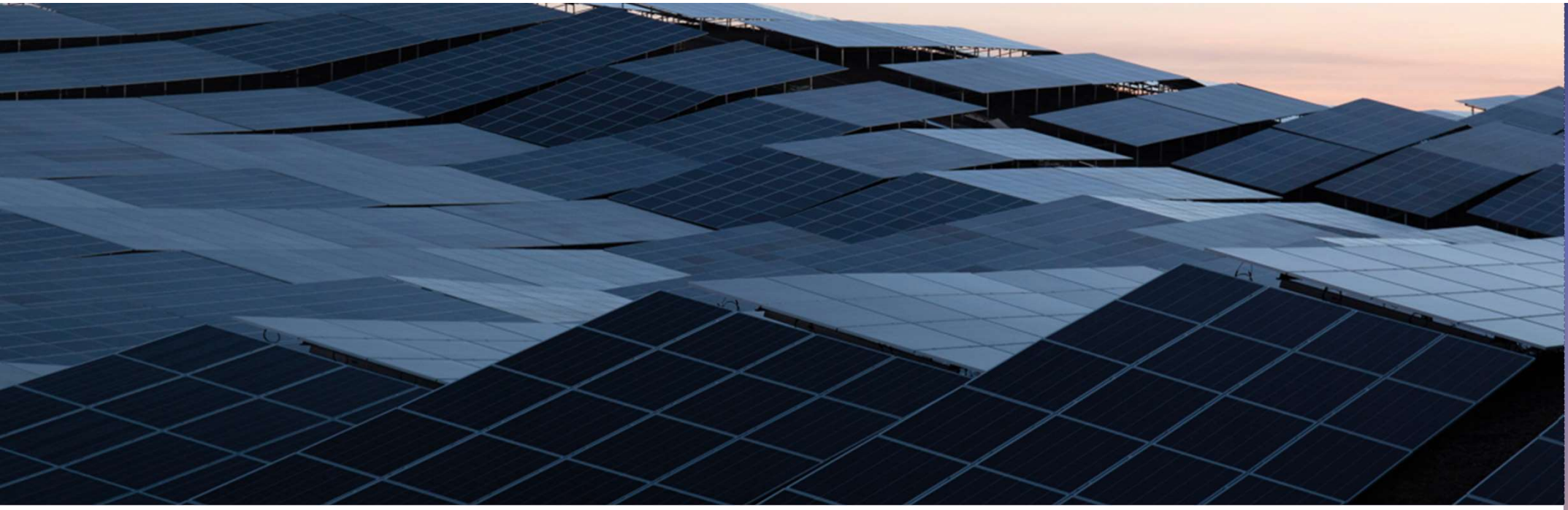

Floating PV systems

Opportunities, Challenges, and Future Perspectives

Sara Golroodbari
Utrecht University

ETIP Photovoltaics

The European Technology and Innovation Platform for Photovoltaics

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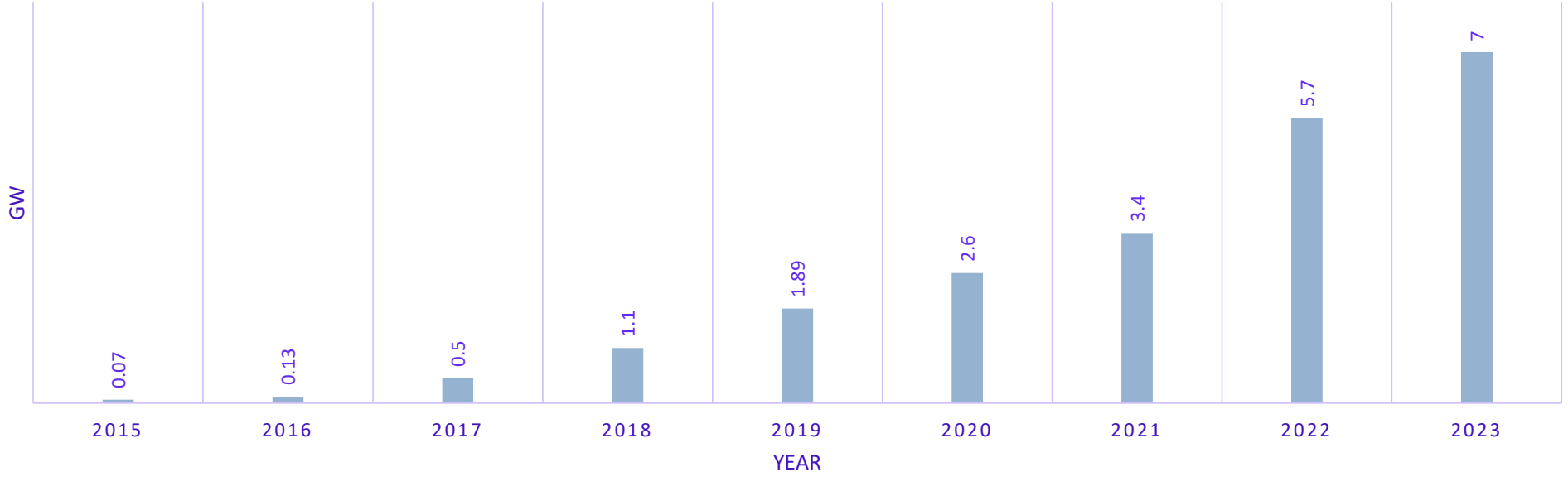
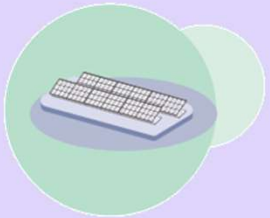
The cumulative FPV

FPV capacity grew further, reaching up to ~7 GW.

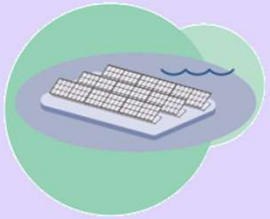


Floating PV can be categorized as:

TRL 8 **Wave category 1**

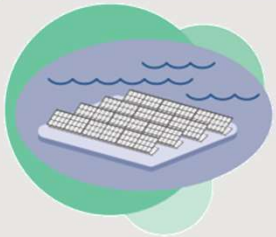


Static freshwater bodies
• no waves, limited wind
• shallow water, basins, ponds



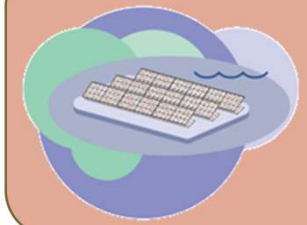
Onshore water bodies
• small to medium waves of 1m
• water areas within 1-3km^2

TRL 6 **Wave category 2**

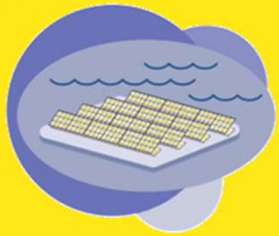


Large Onshore water bodies
• medium waves more than 1m in height
• water areas between 3 & above km^2

TRL 4 **Wave category 3**



Nearshore FPV
• any location in reasonably sheltered areas
• significant wave height up to 3m



Offshore FPV
• any location in unsheltered water
• significant wave height greater than 3m

TRL 3 **Wave category 4**

KPIs that can be utilised for capturing progress

KPI	Target value	Year	
Standardization		Onshore	Offshore
Legislation/Permits	Wholistic standards for system design and installations based on environmental (biodiversity), economic, sustainability and social aspects.	2027	2030
Insurance	Safety standards and system standards to allow for insurance.	2030	2035
Cost			
LCOE	Onshore: Water savings and other dual usage to enable lower LCOE than terrestrial PV systems	2030	
CapEx & OPEX	Offshore: 100% more than terrestrial PV system with similar capacity		2032
	Onshore: 5% more than terrestrial PV system with similar capacity	2028	

KPIs that can be utilised for capturing progress

KPI	Target value	Year	
Technology			
PV Panels	Designing robust and reliable solar modules including coating, encapsulations, back sheet appropriate for being contact with water, movement, and salinity	2030	2035
Lifetime	30 years for PV modules defined as 80% of initial performance (degradation ≈ 0,6%/year)	2030	2035
Structure	Designing new structure with fully/partially recyclable materials.	2030	
	Optimized structure including floater, mooring, and anchoring systems for higher performance, better heat transfer and robustness in both near shore and harsh conditions i.e. wave categories 3 and 4.		2035
Electronics	Designing higher IP electronics for offshore applications.		2030
	Robust and reliable energy transmission technologies (under water cable, hydrogen, etc.)		2035
Social and Community	Studies about accessibility and energy equity for FPV system deployments.	2030	
O & M	Optimization of operation and maintenance routines to decrease the frequency between failures, and maintenance (including cleaning)	2032	2035

KPIs that can be utilised for capturing progress

KPI	Target value	Year	
Data			
Modelling	Methodology for dynamic inputs (i.e. irradiation, u-value, albedo, losses, etc.) for performance analysis compatible with commercial software like PV syst. to be used for system performance guarantee and yield assessments.	2030	2035
Data Logging	Data measurement and management from different climates zones and different technologies to be implemented for digitalization.	2030	2035

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