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WAVES OF CHANGE

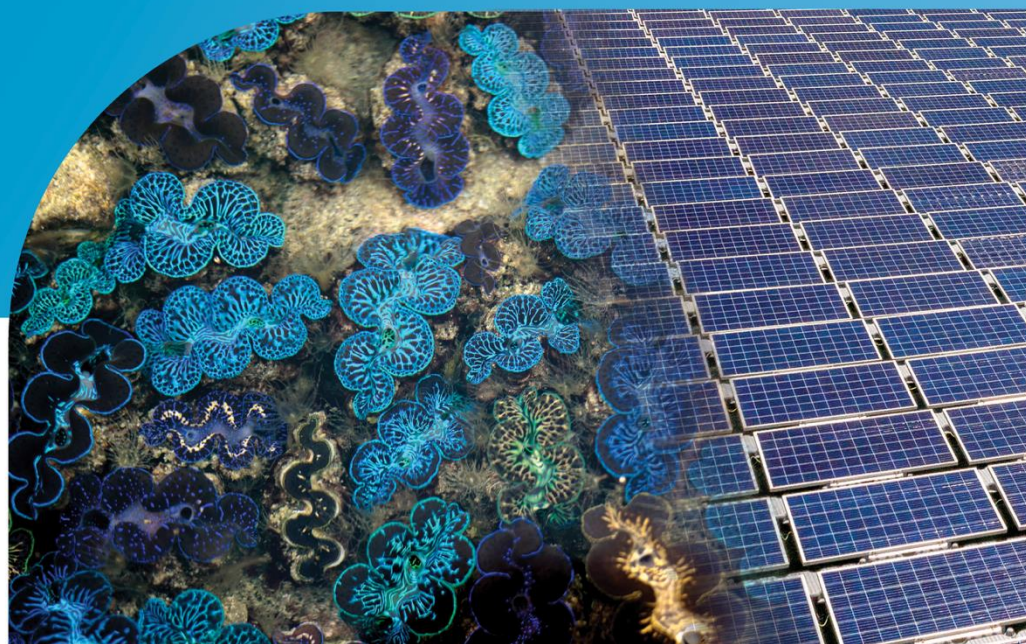
Harnessing Technology to Power the Sustainable Blue Economy

Workshop Two

25–28 May 2026 • Busan, Republic of Korea



Ministry of Oceans
and Fisheries



01

Floating
Solar

02

Benefits

03

SCOTRA

04

Reference

90%?

How did we get this number?

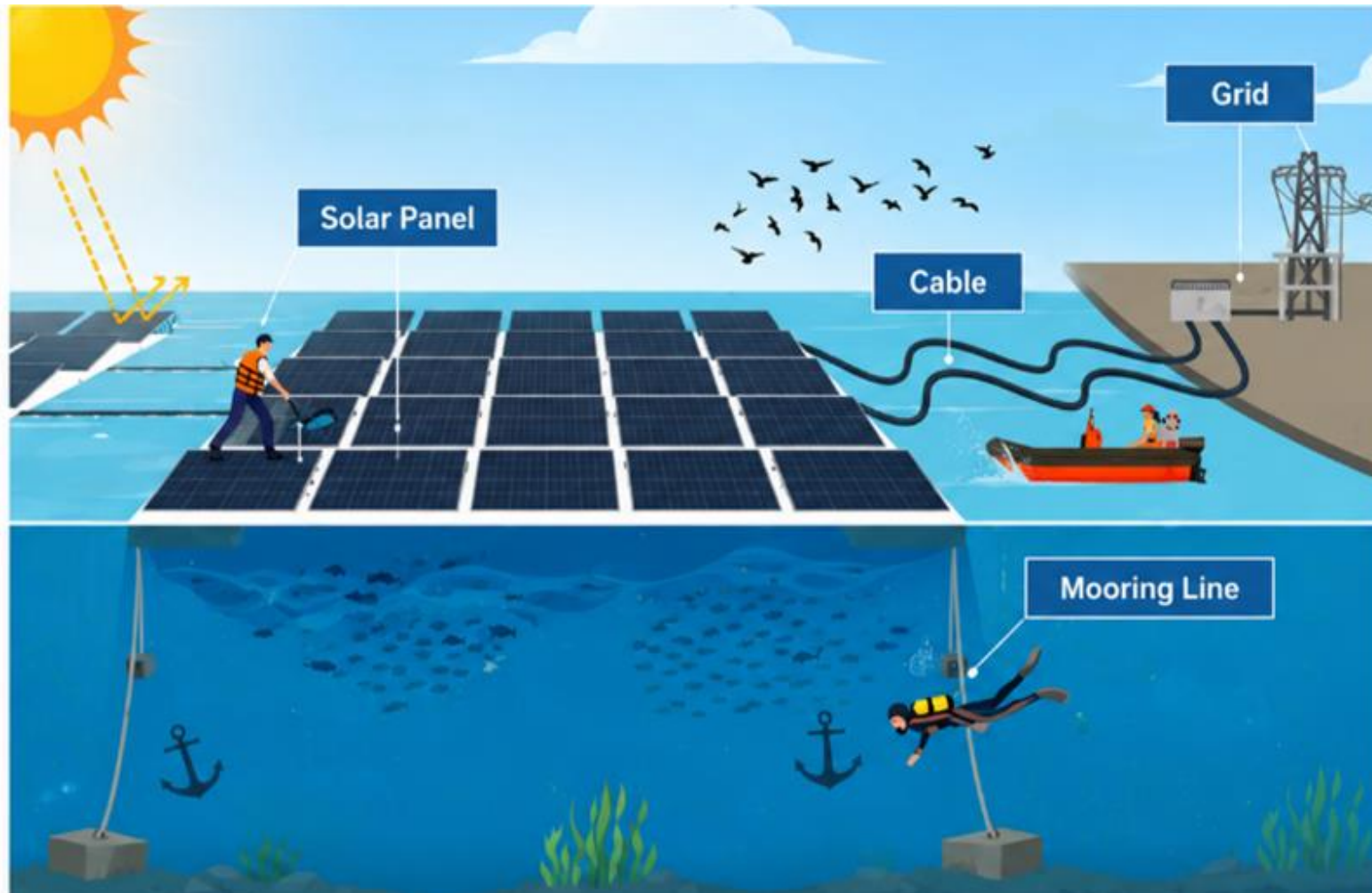
According to IEA research, renewable energy accounts for only 10% of total energy use in island states.

An aerial photograph of a floating solar farm. The image shows a grid of dark blue solar panels floating on a body of water. Interspersed among the panels are several large, circular, blue-green plants with intricate, web-like patterns, likely a type of aquatic vegetation. The water is a deep blue, and the overall scene is a blend of technology and nature.

01. Floating Solar

What is Floating Solar System?

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What

Solar panels are mounted on floating platforms.



Where

Reservoirs, lakes, treatment basins, and seas.



How

Electricity is sent to shore through cables, similar to ground-mounted solar.

An aerial photograph showing a solar farm on the right side, with rows of dark blue solar panels. On the left side, there is a field of blue-green plants with a complex, branching structure, possibly a type of seaweed or algae. A semi-transparent blue rectangular box is overlaid in the center of the image, containing the text '02. Benefits' in white.


02. Benefits


Decarbonization through Energy Transition



High energy efficiency compared to fossil fuels when applied to island nations

Significant Cost Reduction up to 70~80%

 **Diesel Power Generation**



Fuel cost (including transport) per kWh
0.25~0.50
USD/kWh

- ❗ High fuel price volatility
- ❗ Increased logistics costs for remote islands



 **Floating Solar (Floating Solar PV)**



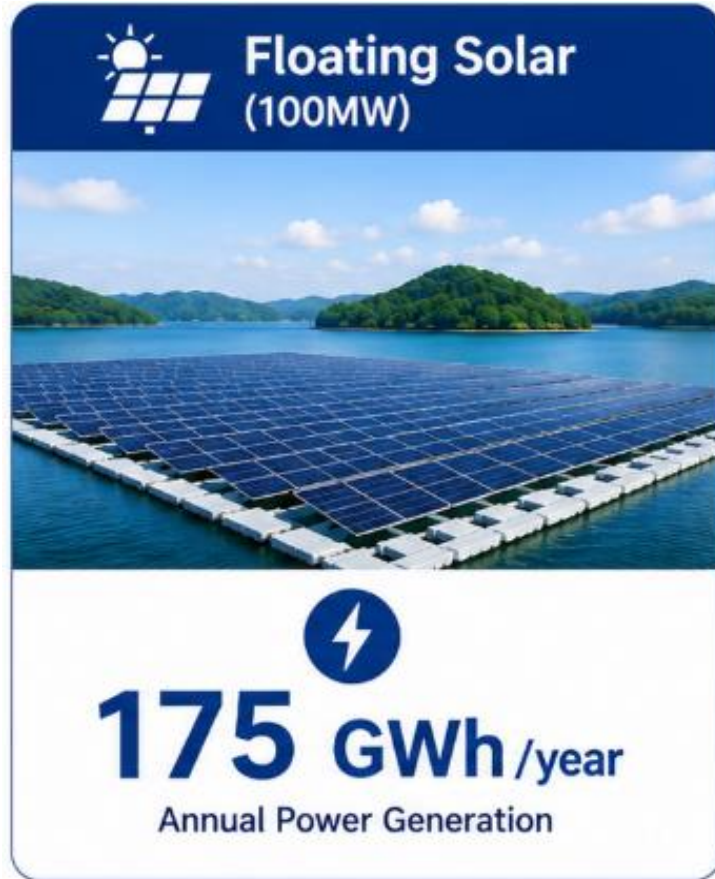
Cost of electricity generation per kWh
0.05~0.12
USD/kWh

- ✅ Additional improvement in cooling efficiency by floating structure: approx. **5~15%** increase

Decarbonization through Energy Transition

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Replacing Diesel Generation Is Equivalent to 21 million Trees to Absorb Trees



 Diesel Emission Factor: 0.7 – 0.9 tCO₂/MWh

Stabilization of Marine Ecosystems

Contributing to Ecosystem Conservation By Providing Artificial Reefs and Habitats

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1. Artificial Reef Effect & Creation of Marine Resources



Provides spawning grounds for marine species



Offers shelter and habitat for juvenile fish



Installation of anti-scour structures and artificial reefs can increase the population of major fish species by approximately **1~3 times**.

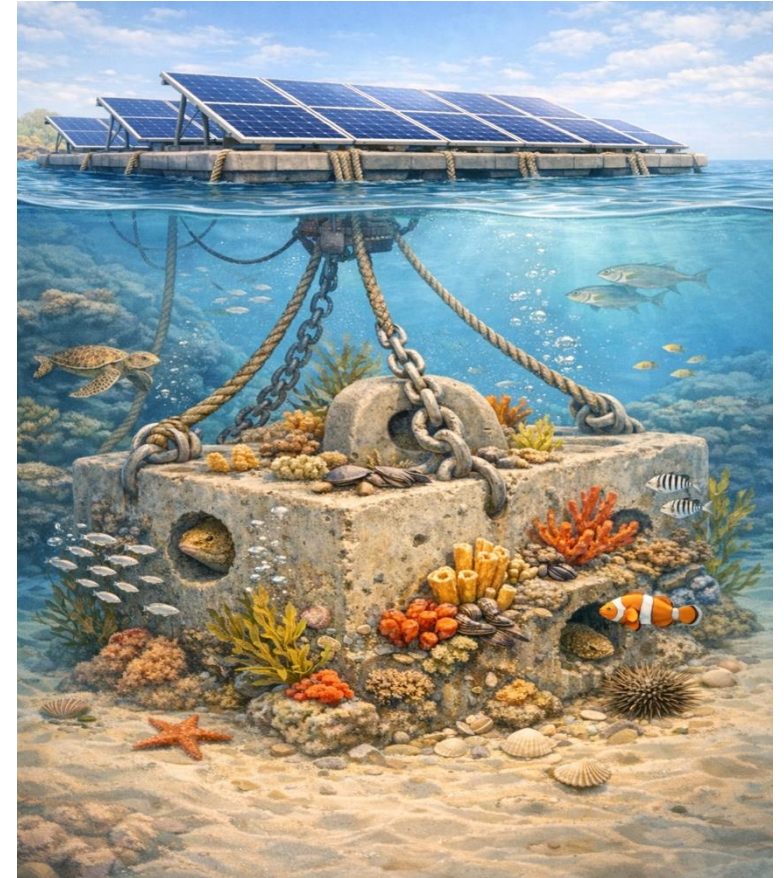
2. Artificial Platform for Marine Life



Functions as an artificial shelter for marine organisms



Can serve as a resting area for marine mammals



Stabilization of Marine Ecosystems

Improving Water Quality by Suppressing Algal Blooms



Main causes of algae growth:

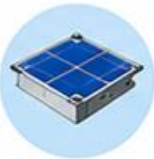
Rising water temperature and blocked sunlight.



SCOTRA minimizes algae growth risk

through an optimized design that secures adequate spacing and maintains natural water circulation.

Unit Coverage Area



4.20 m²

Water Surface Coverage Ratio



10.60%

Light Penetration Rate

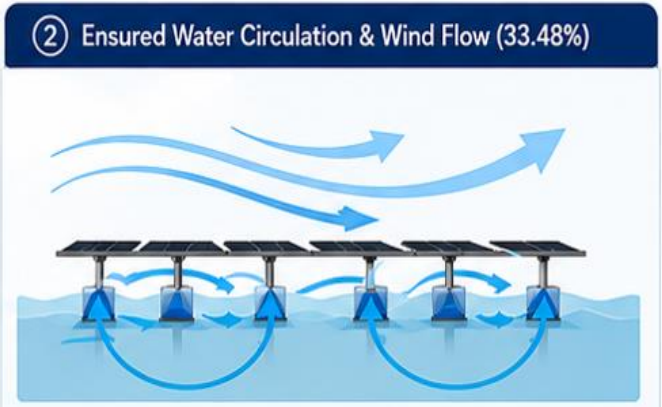
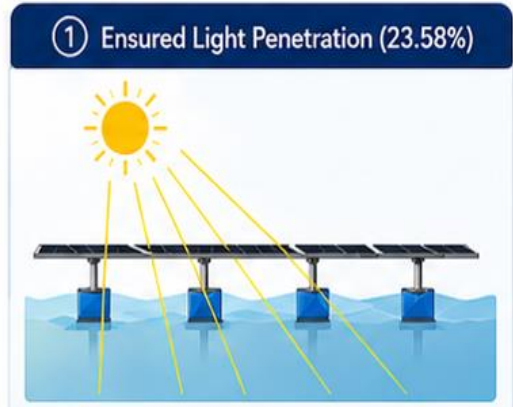


23.58%

Wind Flow Rate



33.48%



Stabilization of Marine Ecosystems

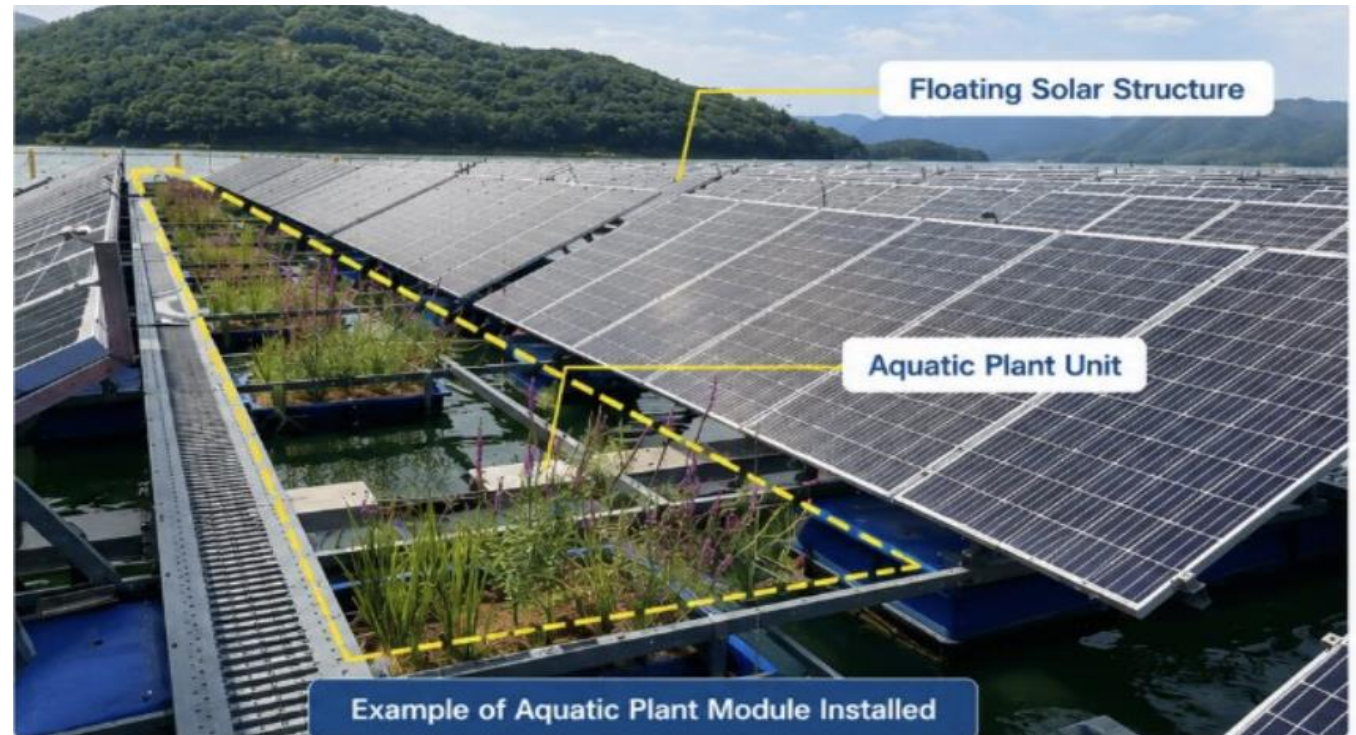


Case Study: Enhancing Aquatic Biodiversity with Integrated Artificial Reef Systems

Purpose: Installation of aquatic plant module to identify water purification and fish spawning functions

Period: 2023 – 2025

Site: Chungju Dam (Chungcheongbuk-do, Chungju-si)

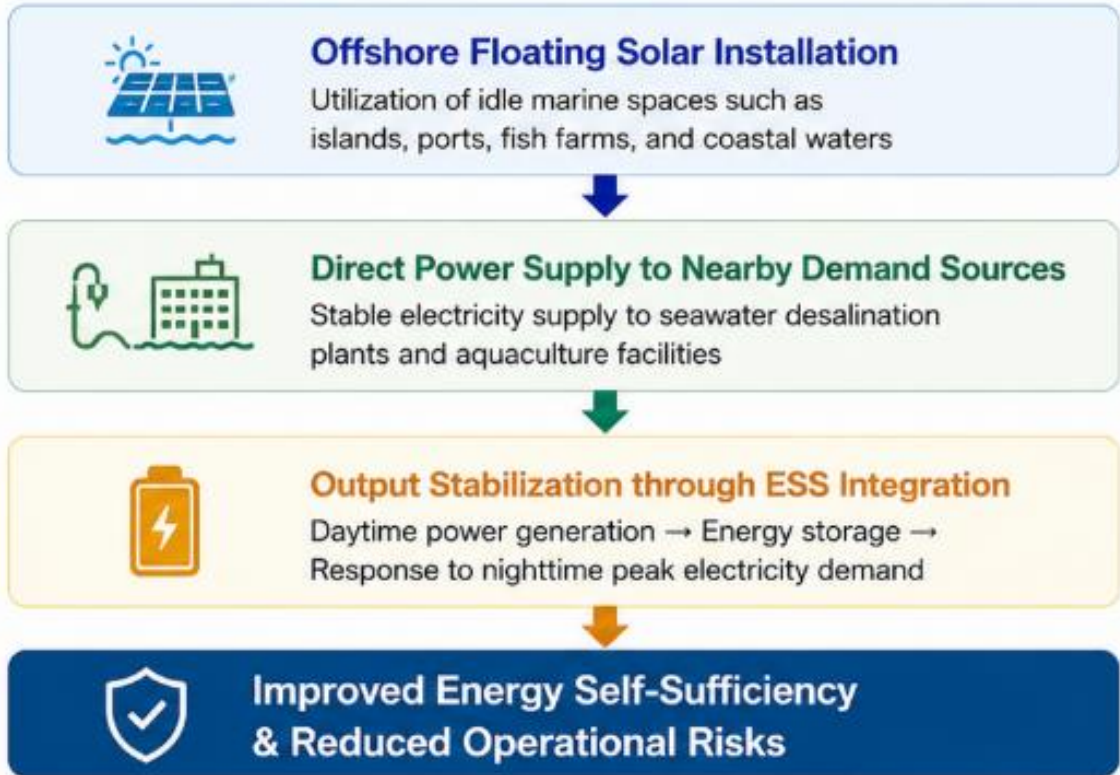


Hybrid Offshore Solar Applications

Stable Power Supply Model Based on Offshore Solar Energy



Hybrid Floating Solar System



Installation Reference		
Country	Hybrid Type	Key Achievements & Features
China	FPV + Fishery	World's largest floating solar-aquaculture hybrid complex
Taiwan	FPV + Clam Farming	Increased productivity through water temperature regulation
Canada	FPV + Cold-Water Fish Farming	Optimization for winter water surface anti-freezing technology
Maldives	FPV + Desalination + Tourism	Island-based energy and drinking water self-sufficient resort



An aerial photograph showing a solar farm on the right side, with rows of blue solar panels. On the left side, there is a field of blue flowers, possibly cornflowers, with intricate patterns on their petals. A semi-transparent blue rectangular box is overlaid in the center of the image, containing the text '03. SCOTRA' in white, bold, sans-serif font.

03. SCOTRA

Floating Solar Power Expert, *Total Solution Provider*



50 +

Completed Floating Solar Projects



350MW+

Cumulative Installed Capacity



536,700 tons (94,000 cars/year) Carbon Emission Reduction



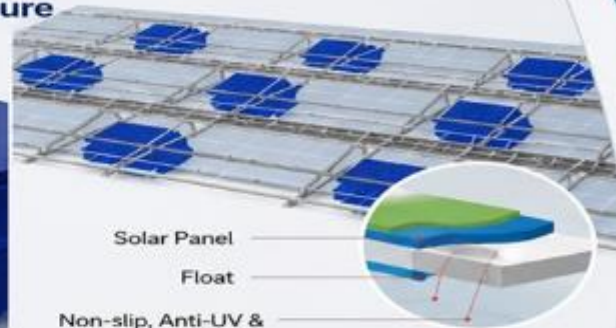
2,000+

Floating Structures Built (Marinas, Pontoons, etc.)

SCOTRA Floating Solar Structure



High-Density HDPE Material
Highly durable and eco-friendly



Solar Panel

Float

Non-slip, Anti-UV & Chemical Coating



Everything on the water



Driving Decarbonization and Coexistence with Nature.
SCOTRA

An aerial photograph of a coral reef. The left side shows various types of coral, including branching and brain corals, in shades of blue, green, and brown. The right side shows a grid-like pattern of solar panels, suggesting a juxtaposition of nature and technology. A solid blue rectangular box is overlaid on the center of the image, containing the text '04. Reference' in white.

04. Reference

Efforts for Commercialization

SCOTRA Offshore Floating Solar Projects in Korea

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2020 Siwha Lake 100kW



Location
Ansan,
Gyeonggi-do

Water Type
Inland Water
(Lake)

Capacity
100kW

2021 Saemangeum 100kW



Location
Gunsan,
Jeollabuk-do

Water Type
Inland Water
(Inner Sea)

Capacity
100kW

2022 Busan 100kW



Location
Busan,
Busan

Water Type
Coastal Water
(Sea)

Capacity
100kW

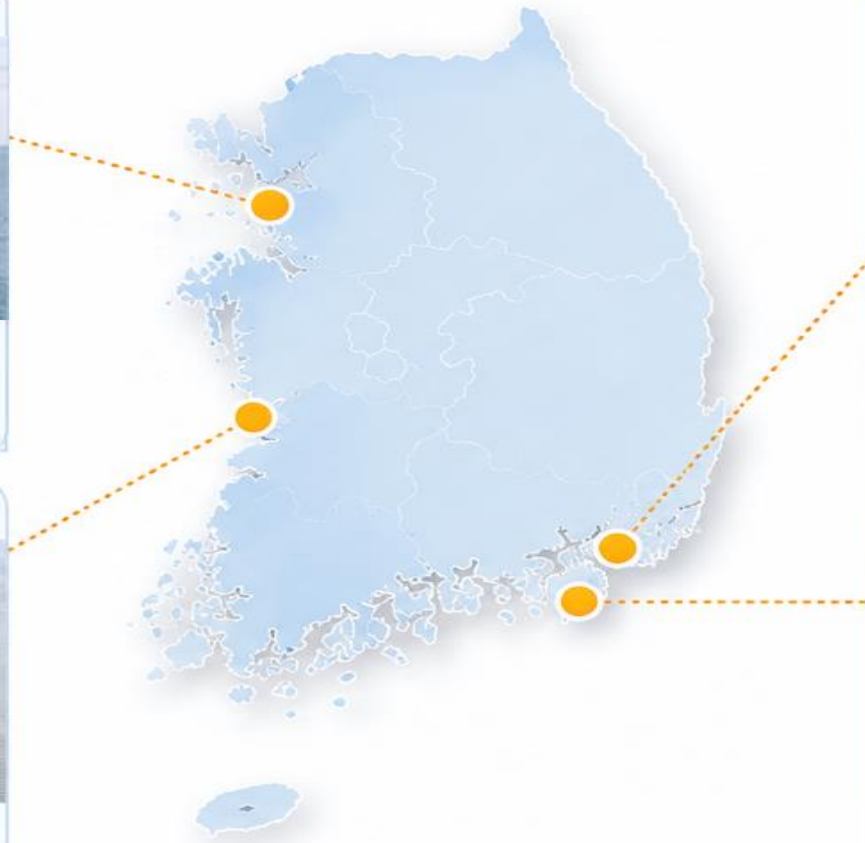
2022 Geoje 500kW



Location
Geoje,
Gyeongsangnam-do

Water Type
Coastal Water
(Sea)

Capacity
500kW



Efforts for Commercialization

Saemangeum (Inland Sea) 100kW Offshore Solar Demonstration Facility



Efforts for Commercialization

Geoje-si (Nearshore) 500kW Offshore Solar Demonstration Facility

Location : Geoje-si, Gyeongsangnam-do, Korea

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Efforts for Commercialization

Sihwaho (Inland Sea) 100kW Offshore Solar Demonstration Facility

Location: Ansan-si, South Korea

ADB



Efforts for Commercialization

100kW Offshore Solar Demonstration Facility

Location: Oryukdo Island, Busan

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Weather Condition

2022 Typhoon Hin Namno

- Max wind speed : 37.4m/sec, max
- Instantaneous wind speed: 43.7m/sec



해상태양광 연구과제
부산 오륙도 앞 바다
스코트라(주)

Efforts for Commercialization



The Philippines Camotes Island Floating Solar ODA Project
(Capacity: 600Kw, completed in 2024)

PROJECT LOCATION

Camotes Island, Philippines

Supporting energy access and sustainability in off-grid island communities through floating solar power.



-  **CAPACITY**
600kW
-  **TECHNOLOGY**
Floating Solar PV (FPV)
-  **PROJECT TYPE**
ODA (Official Development Assistance)

FLOATING SOLAR POWER PLANT (FPV)



-  **Clean Energy**
Generate renewable electricity with zero emissions
-  **Sustainable Solution**
Contribute to climate resilience and environmental protection
-  **Community Impact**
Improve energy access and support local development
-  **International Cooperation**
Strengthen partnership between Philippines and Korea

Efforts for Commercialization



Overseas Test Bed Implementation Plan (Expected in 2027- 2029)

ODA FIJI PROJECT
(Floating Solar + Seawater Desalination)

The diagram illustrates the ODA Fiji Project, which combines floating solar panels with seawater desalination. It shows a circular inset with labels for 'Floating Solar Panels', 'Desalination Facility', and 'Supply of Clean Water'. The background features a tropical island with a beach and turquoise water.

Project Goal
Establish a sustainable, eco-friendly energy-water solution through floating solar power and seawater desalination.

BAHRAIN – PROPOSED OFFSHORE SOLAR T/B SITE
Under Promotion with Private Sector ('26~'27)

The map shows the island of Bahrain with major cities labeled: Budaiya (الخبيع), Manama (المنامة), Isa Town (مدينة عيسى), Riffa (الرفحاء), and Malkiya (المالكية). A red location pin marks the proposed offshore solar site in the Gulf of Persia. An inset map shows a detailed view of the site with a 65.0 M scale bar. A compass rose is located in the bottom right corner.

<Bahrain Port>

SCALE: 1 / 3,000

Bibliography

The logo for the Asian Development Bank (ADB), consisting of the letters 'ADB' in a white serif font on a dark blue square background.

Leng et al. (2022), "Environmental impacts of floating solar photovoltaics: A review", Renewable and Sustainable Energy Reviews.

Lopes et al. (2023), "The potential of floating solar photovoltaics to mitigate climate change Impacts", Nature Sustainability.

Yoon (2018), "Evaluation of Fishery Resource Enhancement by General Artificial Reefs in South Korea", 2018, vol.21, no.2, pp. 116-129 (14 pages)

An aerial photograph showing a large solar farm on the right side, with rows of blue solar panels. The left side of the image is dominated by a field of colorful flowers in shades of blue, purple, and yellow, growing in a field. The text "Thank you!" is centered in the middle of the image.

Thank you!