

Floating solar power Plant

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Solar module

Floating system

Mooring device

Under water cable



Contents

- 1. ADB's sustainable values**
- 2. Introduction of floating solar power**

- ❑ **ADB Strategies toward High Level Technologies**
 - **New ideas and Innovative technologies**
 - **Protect environment and vulnerable people**
 - **Increase of energy efficiency**
- ❑ **Floating Solar power could be one of solutions**



• Introduction of Floating solar power

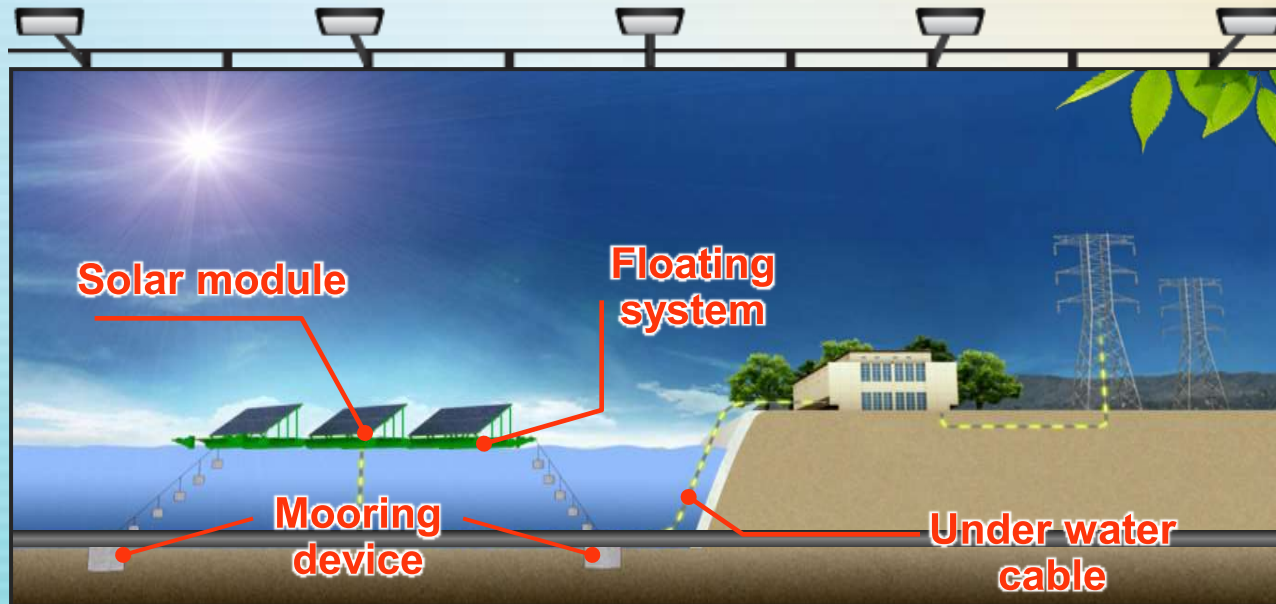
▣ Background in development

- ▣ An alternative for a land-based PV system with side effects.
 - Causes deforestation, land grab and resettlement issues



• Introduction of Floating solar power

□ Major components of Floating PV system



● Core technologies ●



Solar module adequate for water surface environment



Mooring devices that stabilize the buoyancy tank



Stable floating system



Under water cable that sends the generated electricity

• Introduction of Floating solar power

□ Development history in Korea

2009



▪ 2.4kW Pilot Plant

2011



▪ 100kW demonstration plant

2012



▪ 500kW commercial plant

2013-2016



▪ 1&2MW solar power plant

• Introduction of Floating solar power

□ Development and construction process



• Introduction of Floating solar power

□ Technical optimization through demonstration plant

- Construction cost down : 30%, Reduction of Construction period : 70%
- The progress of environmental examination and evaluation

100kW
Plant

2011



H Steel + General bolts



Integral buoyancy tank



Construction on the land

500kW
Plant

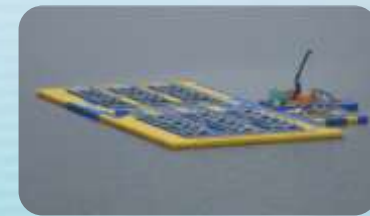
2012



Al Profile + T bolts



Separated buoyancy tank



Construction on the water

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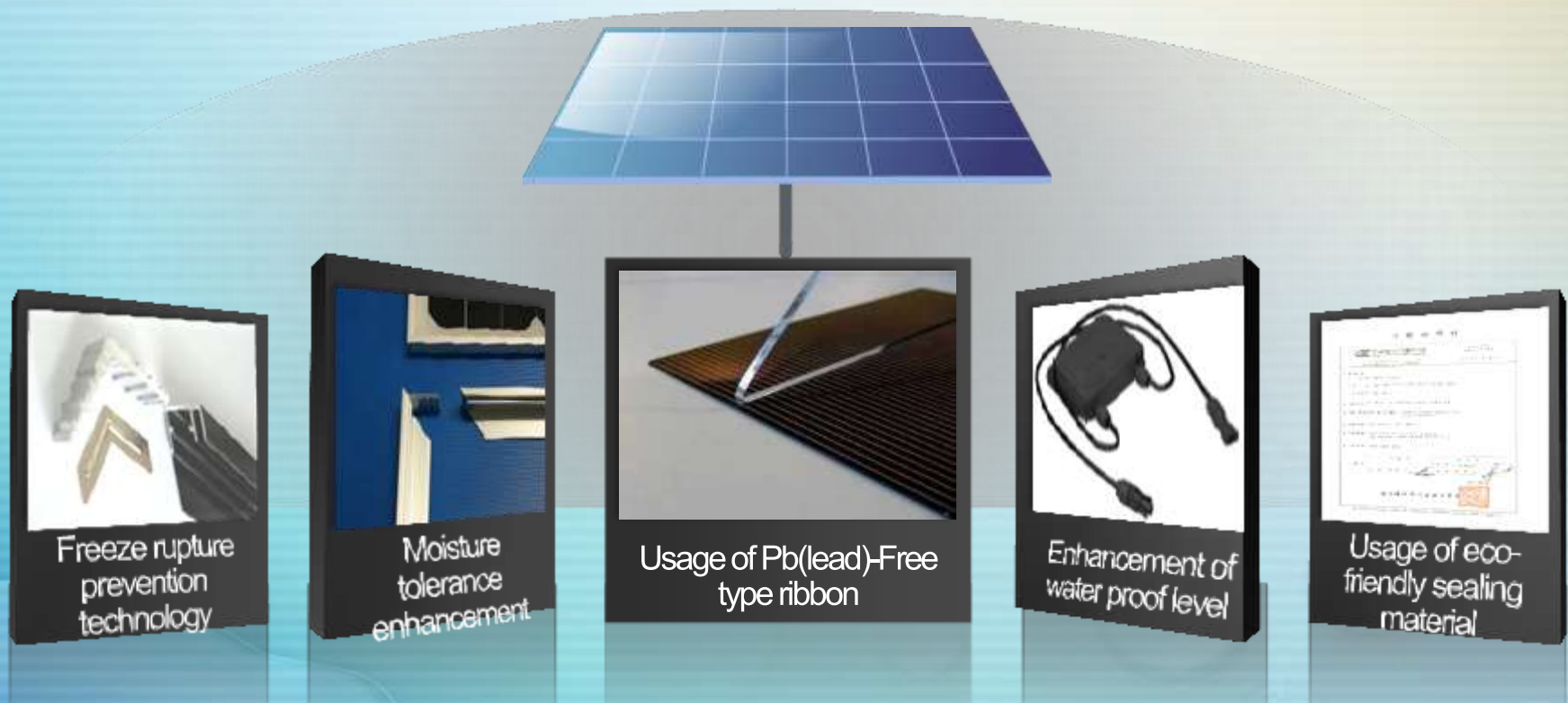
Comparison on 100kW and 500kW

Class	100kW Demonstration Plant	500kW Commercial Plant
Scale	67.5m × 25m	103.5m x 71.2m
Annual generation	144MWh (Powers 30 households yearly)	657MWh (Powers 155 households yearly)
Generation Facility	- Volume : 100kW - Inverter : 45kW × 2 Unit, 10kW × 1 Unit	- Volume : 500kW - Inverter : 500kW x 1 Unit
Structure	Steel+FRP+Al (H-Beam)	Al (Profile)
Mooring device	Multi-sinker wire suspension	Multi-sinker wire suspension
Design Condition	- Wind speed : 20m/s - Water velocity : 0.5m/s - Wave height : 0.1m	- Wind speed : 30m/s - Water velocity : 0.5m/s - Wave height : 0.1m

• Introduction of Floating solar power

Technical optimization (1)

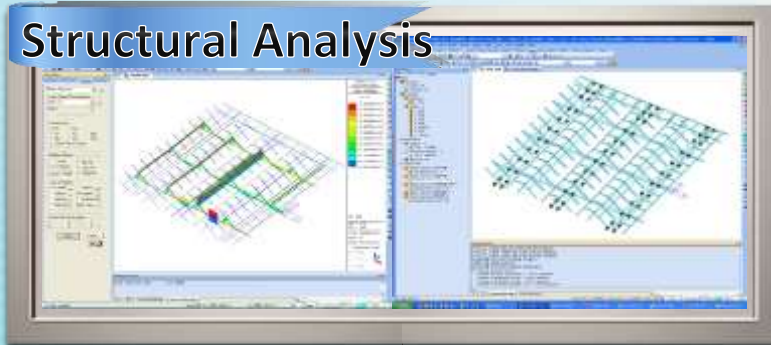
the module development designed for floating PV plants



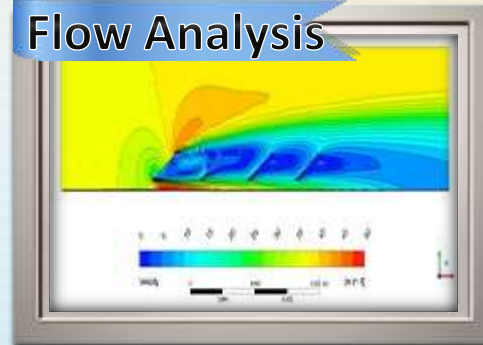
Technical optimization (2)

Buoyancy development specified for floating solar power

Structural Analysis



Flow Analysis



Proven ideal model via application of various materials and design condition

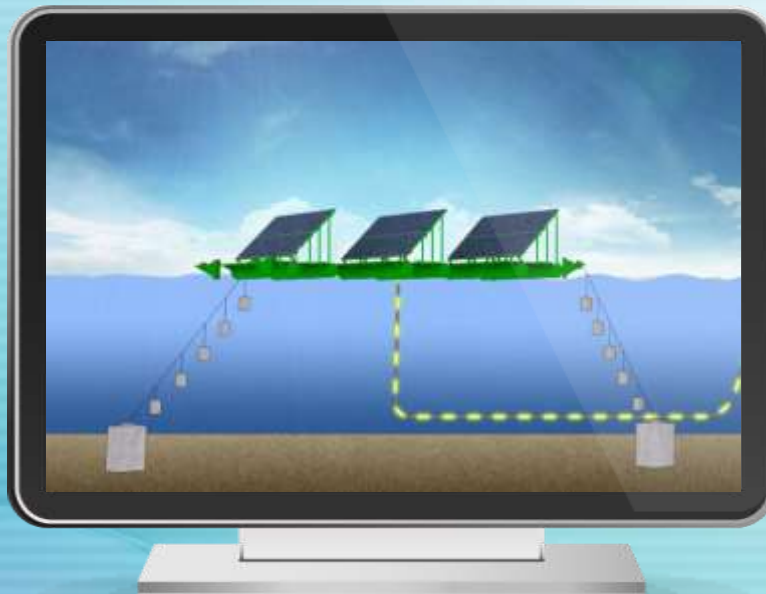


Application of environment friendly material

Technical optimization (3)

Development of the mooring device following to water level

Concept picture



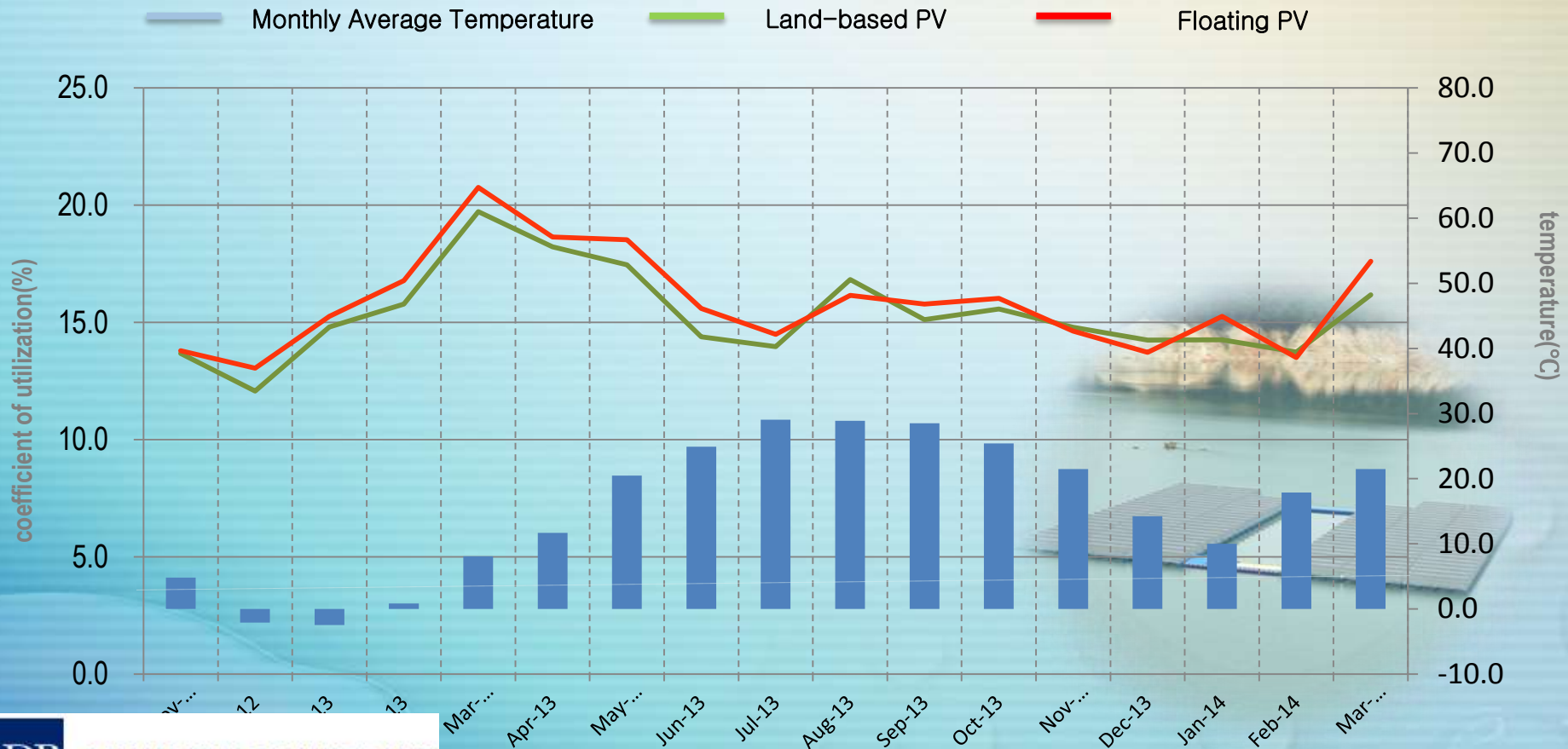
response to water level



• Introduction of Floating solar power

Technical optimization (4)

10 % increase of generation energy



• Introduction of Floating solar power

■ Project specifications

- Capacity : 2MW(completion year : Mar. 2016)
- Project cost : US \$ 5.6 million
- Period : Oct. 2015 – Mar. 2016
- Annual energy : 2,781MWh, Plant factor : 15.87%
- Water area occupied
 - 1MW/13,200m²(114m*114m)



Thanks

The background is a gradient of blue, transitioning from a darker blue at the top to a lighter blue at the bottom. On the left side, there is a dynamic splash of water with many small droplets and bubbles. In the center, there are several concentric ripples on a surface, suggesting water has been dropped. A thick, dark blue curved line sweeps across the bottom right corner of the image.