



Bankability of floating PV projects

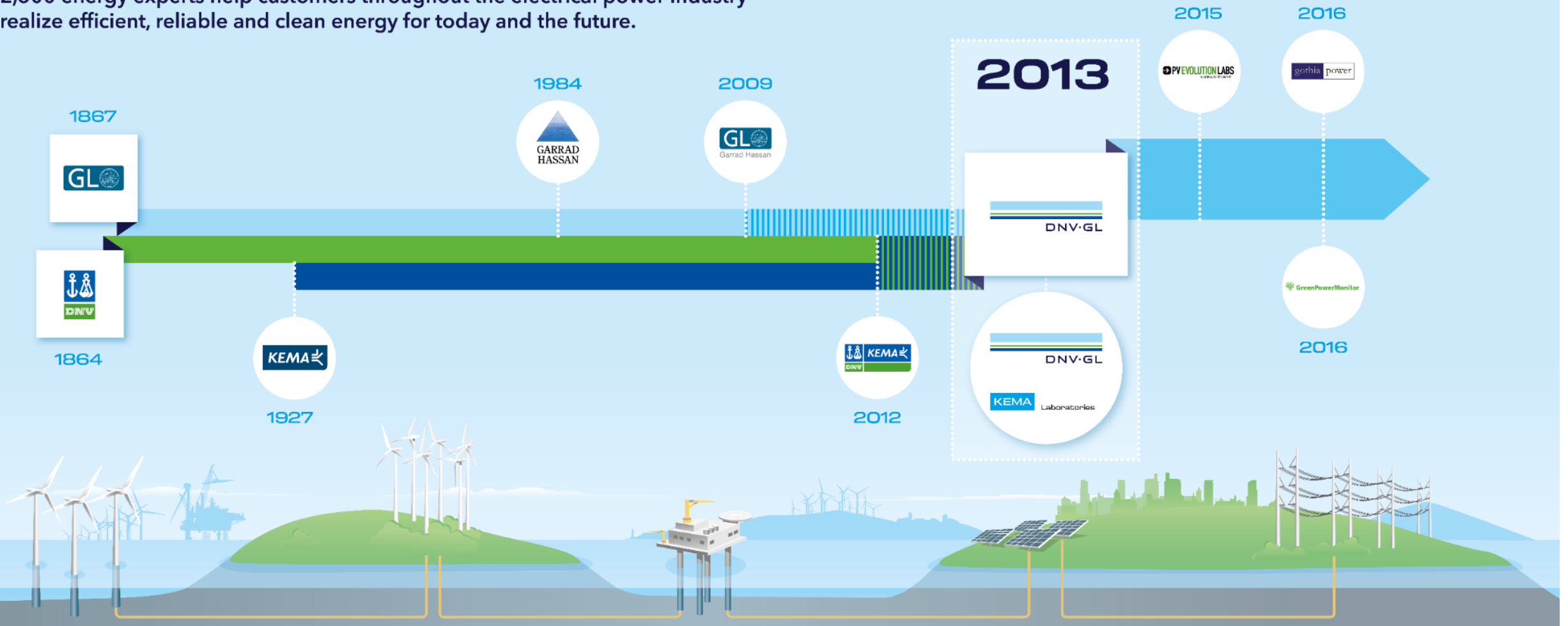
Sunday 2018, Bussum

Jasper Lemmens

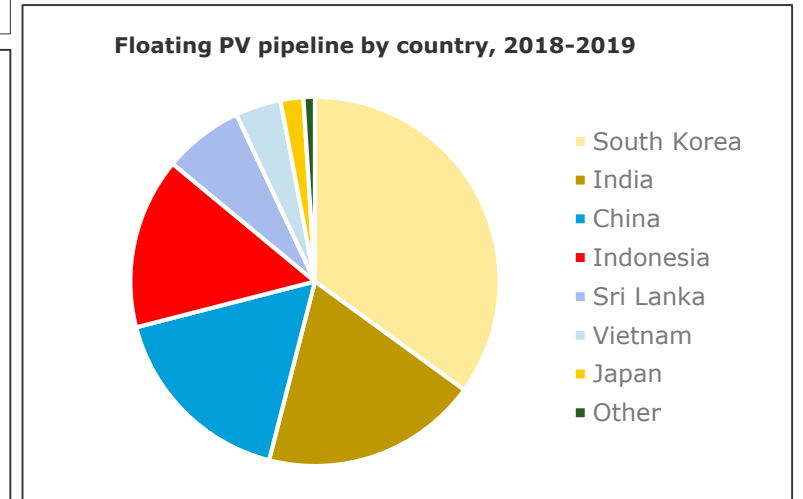
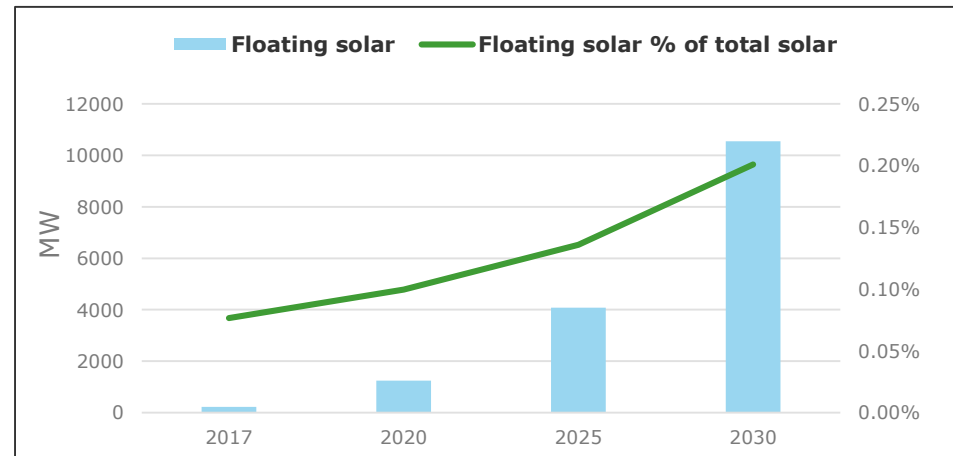
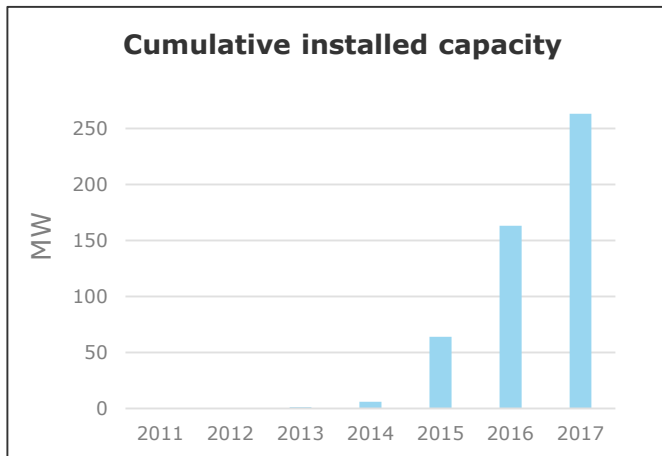
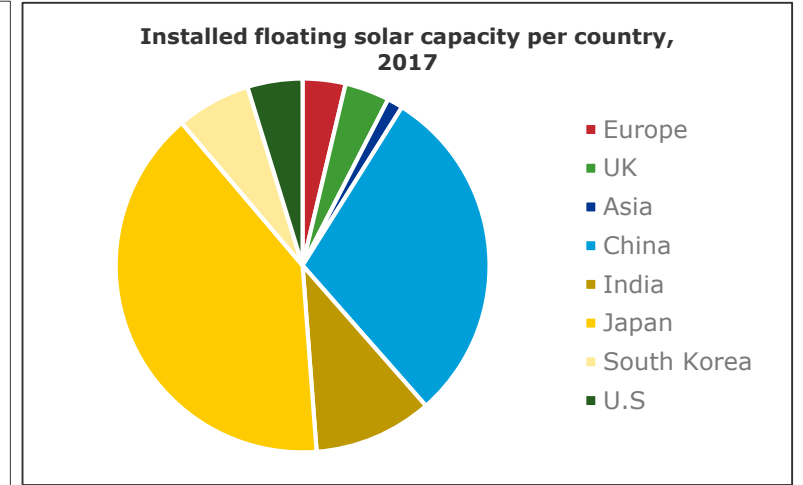
07 November 2018

About DNV GL - Energy

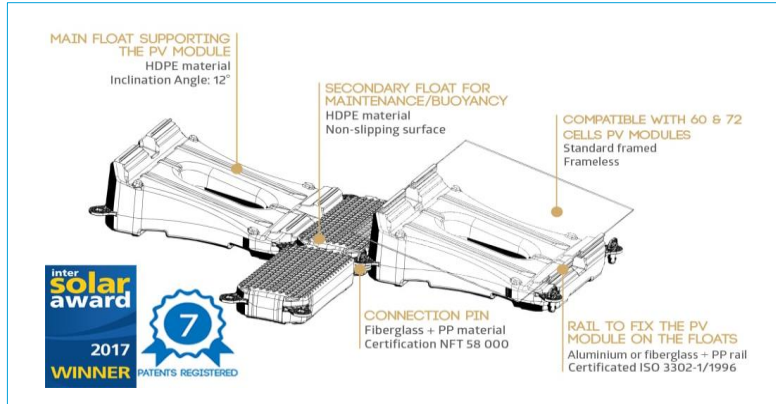
2,500 energy experts help customers throughout the electrical power industry realize efficient, reliable and clean energy for today and the future.



Asia leads the way in the global floating PV market



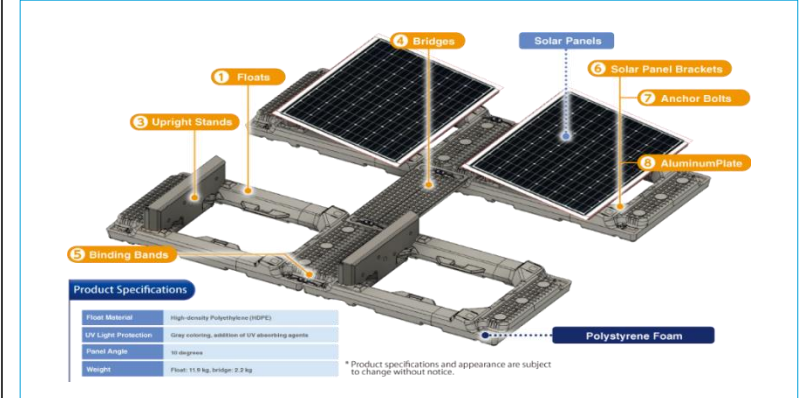
One clear market leader in structure concepts



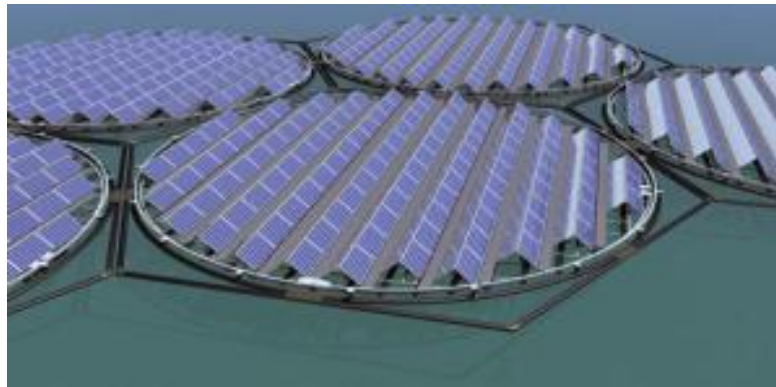
Hydrelia by Ciel & Terre



Scotra



Sumitomo Mitsui



Floating tracking cooling concentrator by Koiné



SolarSea by Swimsol



Ocean Sun

Global projects



40 MW Huainan - China



18.7 MW Gunsan - South Korea



7.5 MW Saitama - Japan



50 MW Tengeh - Singapore



150 MW Guqiao - China



103 MW Shihwa Lake - South Korea

European projects



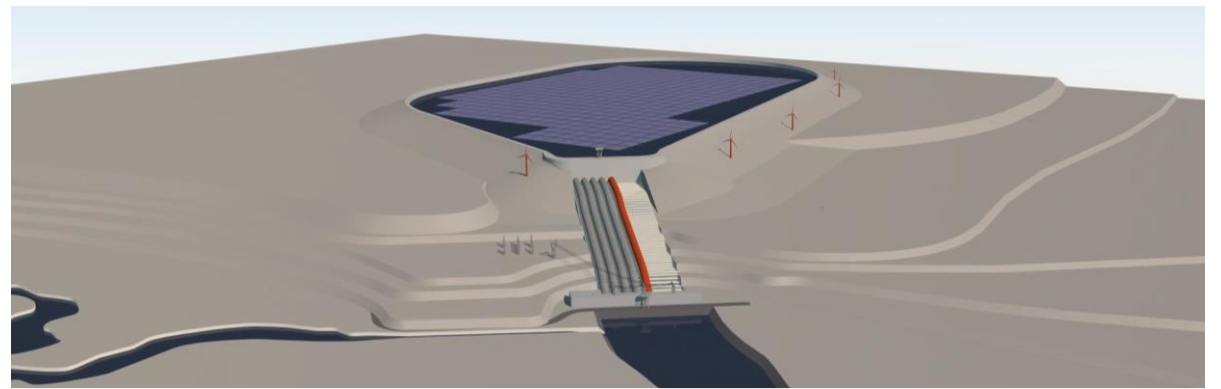
6.4 MW Queen Elizabeth II - UK (completed March 2016)



1.8 MW Lingewaard - NL (completed June 2018)



17 MW Piolenc - FR (under construction)



200-250 MW Kruonis - LT (planning phase)

Which potential advantages and potential challenges are facts or myths?

POTENTIAL ADVANTAGES

- Land saving
- Lower site and site-preparation costs
- Increased cooling due to higher wind speed
- 10-15% Increased energy yield because of cooling effect of water
- Integration with water-based activities
- Integration with hydropower reservoirs
- Reduction of soiling losses
- Reduction of water evaporation
- Reduction of algae growth
- Increased irradiance because of water reflection

POTENTIAL CHALLENGES

- Anchoring/Mooring structure
- Negative impact on water basin ecosystem
- Lack of floating structure standardization
- Resistance to waves
- Resistance to wind
- Resistance to UV exposure
- Resistance to corrosion (especially in salty water)
- Higher safety requirements for workers
- Complexity of tracking systems
- Uncertainty in assessing energy yield

Floating solar 2018 - facts and myths



Facts or myths?

**go to:
www.kahoot.it**

Floating solar 2018 - facts and myths



10-15% Energy Yield increase

Some studies show > 10% gain

Data only from tropical regions

Missing details of analysis of the causes of the final gain

SITE SPECIFIC

Increased reflection from water

Albedo of water is 0.07 and affecting only the most external rows

Albedo of traditional system surroundings is 0.2-0.4

FALSE

Lower site and site-preparation costs

Lease of water surface is lower because of less use competition

No civil works needed

TRUE

Reduced soiling

Less dust

Material deposition due to humidity

Bird droppings

SITE SPECIFIC

Negative impact on water ecosystem

No impact on water temperature below certain cover ratio

Reduced algae growth

Proven combination with aquaculture

FALSE

Thank you for your attention!

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