

Floating Solar

The „White Knight“ for the Mega Solar Industry

„White Knight?

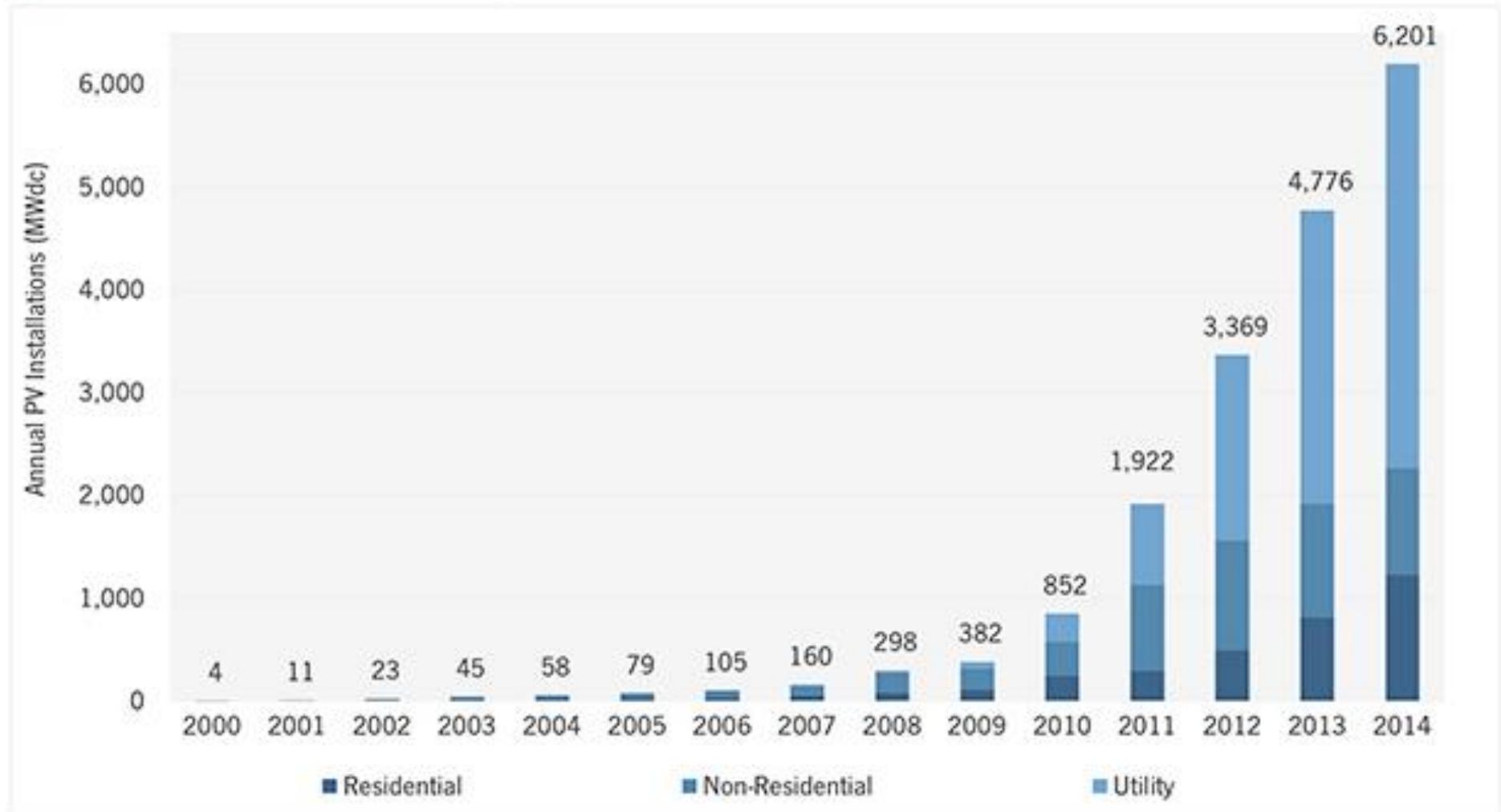
White

Knight



Explosive Growth of Solar industry

Figure 1.1 Annual U.S. Solar PV Installations, 2000-2014



Clear Felling



Clear Felling





SOLAR – ENEMY OF FARMERS?

Food vs. Energy – Part 2

BloombergBusiness 

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**Solar Parks on Fertile Land
Are New Adversary of India's
Farmers**

“There’s plenty of arid land available, but they are far away from substations and costs for evacuating electricity are much higher because of transmission losses.” (CEO, MBH Power, which bought agricultural land for a Mega Solar power station in Gujarat.)

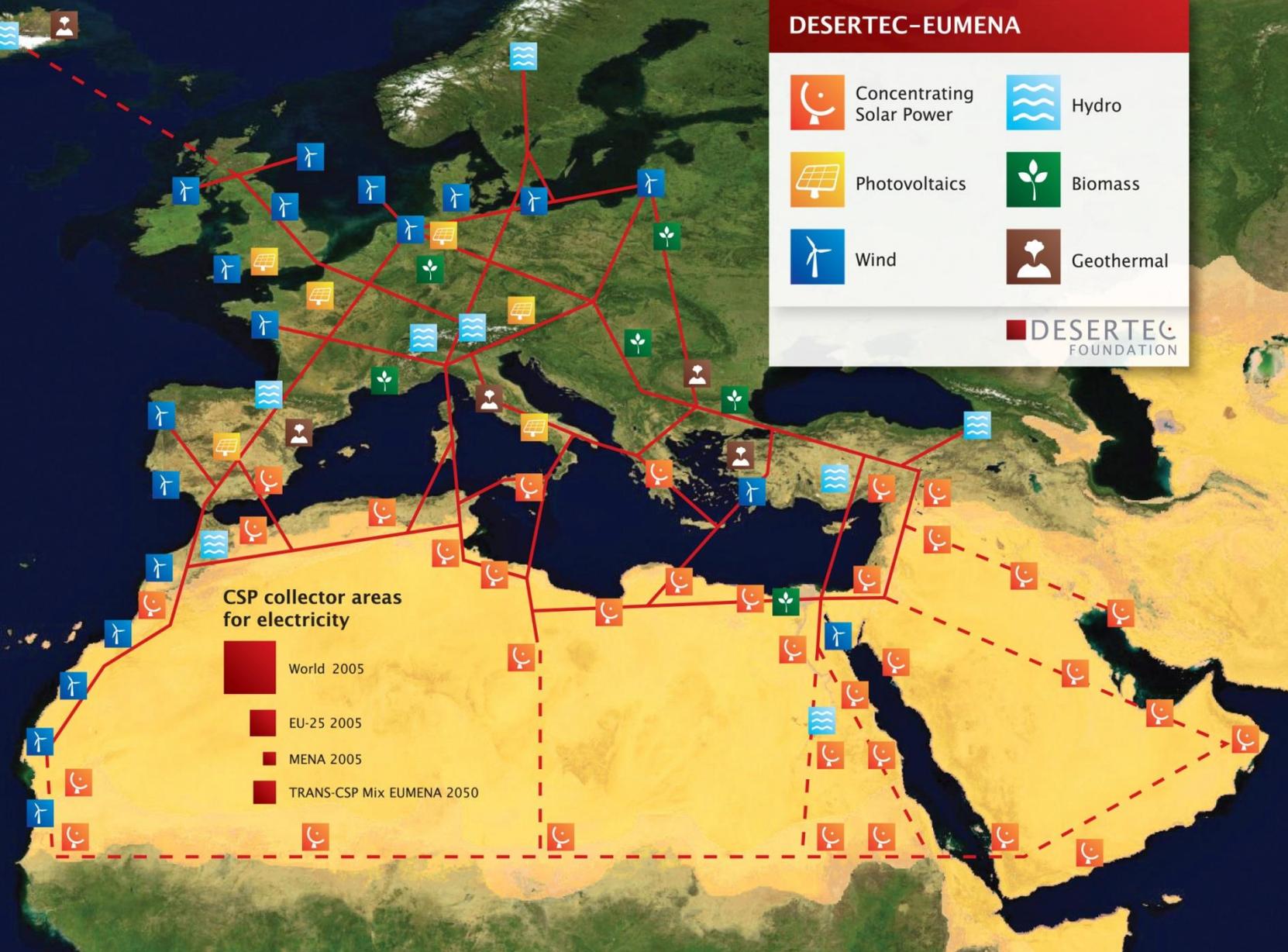
“Farmland is favored even though prices can be as high as 10 times those of wasteland parcels.”

“Integrating solar plants with the grid and the stability of the grid are important issues in far-flung areas. If it makes more sense to put up panels on farmland, **companies will choose to buy farmland.**”

DESERTEC-EUMENA

	Concentrating Solar Power		Hydro
	Photovoltaics		Biomass
	Wind		Geothermal





CSP collector areas for electricity

-  World 2005
-  EU-25 2005
-  MENA 2005
-  TRANS-CSP Mix EUMENA 2050

California – Land speculators see silver lining in solar projects

- Solar companies and land speculators are gobbling up scarce private land in the California deserts, **driving prices up 10- to 20-fold, or even higher.**
- Desolate acreage that a few years ago might have sold for **less than \$500 an acre** can now fetch as much as **\$20,000 an acre or more.**



Solar Act of 2012

- Ended large scale solar installations on NJ open space and farmland.
- Encouraged development on closed Landfills and Brownfields.

(Engineering and site prep costs \$\$\$)



What's left are large
rooftops and
FLOATING SOLAR!



North Branch
Absecon Creek

Garden State Pkwy

Seasor Park

Atlantic City Reservoir

Wescoat Rd

30

Garden State Pkwy



gettyimages
Bloomberg

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Tengeh Reservoir - Singapore



Power Plant Cooling Ponds – India



Cooling Ponds (8.75 MW)



Balbina Dam – Brazil



Brazil Announces Huge 350 MW Floating Solar Power Plant

April 6th, 2015 by [Anand Upadhyay](#)

Balbina Dam



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+Hansさん



Balbina Dam, State of Amazonas

11 枚の写真・付近を検索



航空写真

リオ・ネグロ
Rio Negro

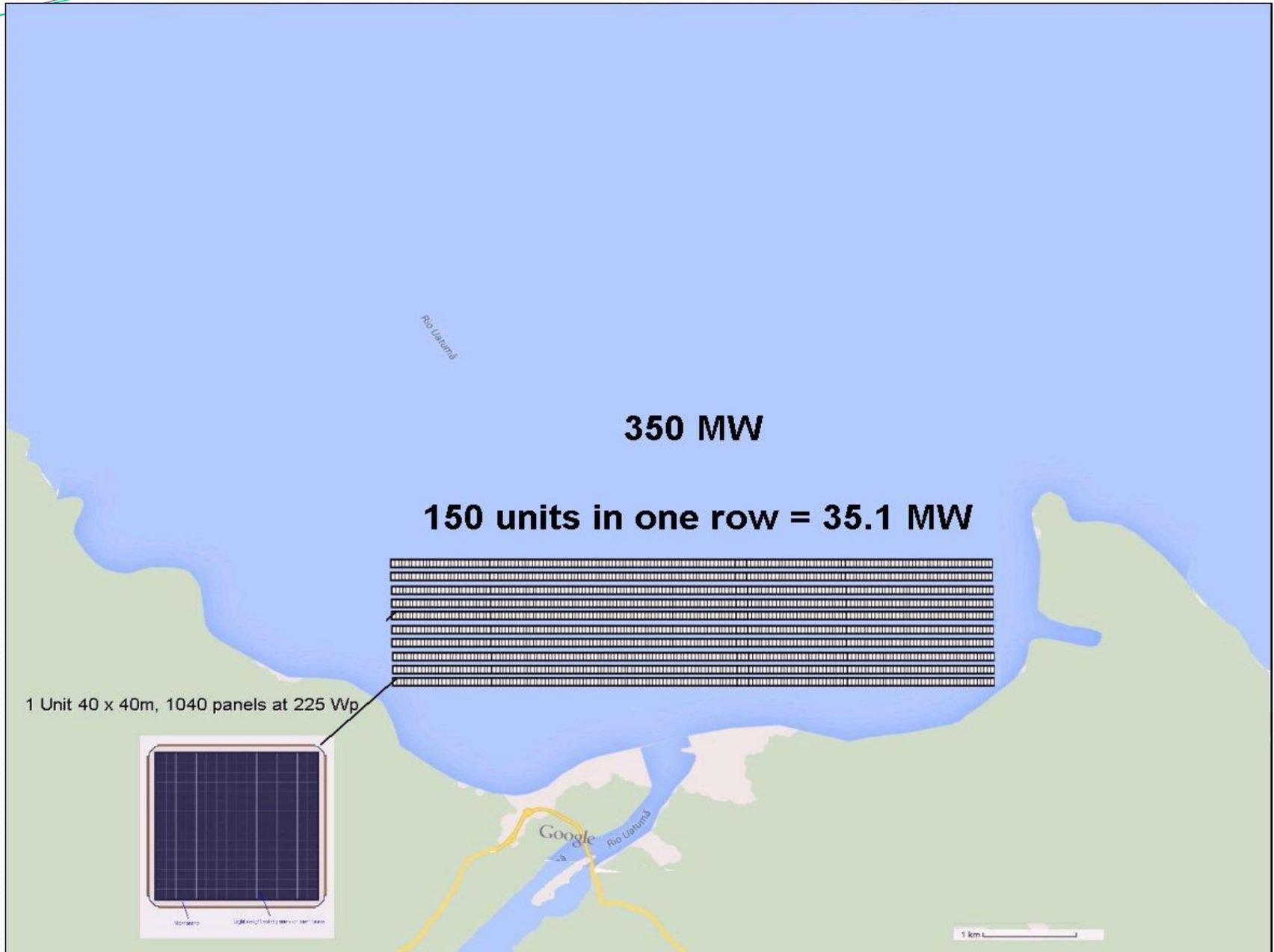
プレジデnte
フィゲイレド
Pres.
Figueiredo

AM-240

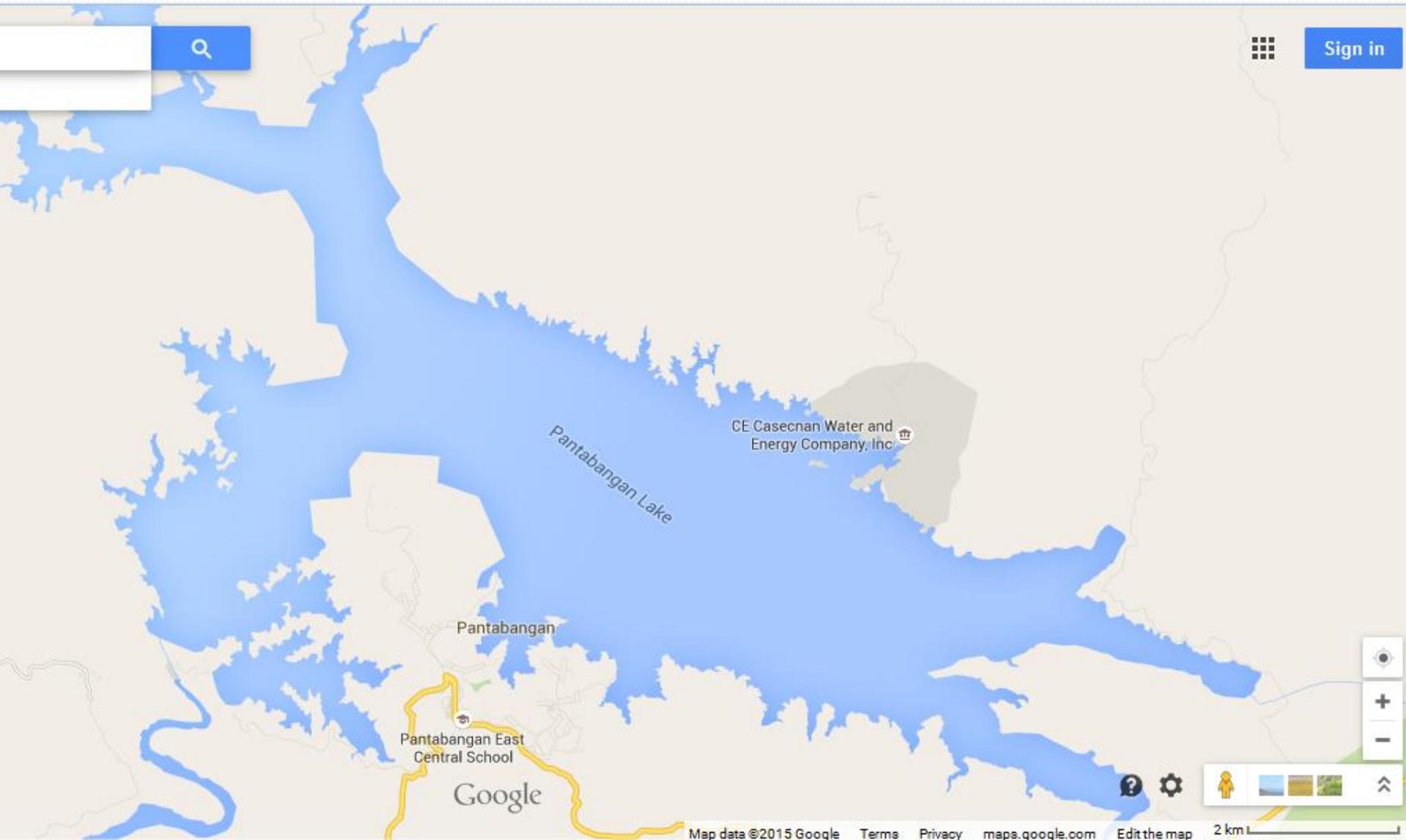
Balbina Dam

Google

Balbina Dam – Brazil (350 MW)



Pantabangan Dam



Main Advantages

- **Use of surfaces that serve no other purpose.**
- **No trees have to be cut, no civil engineering work is needed**
- **2nd generation does not need racks for mounting anymore.**
- **Water proximity lets panels operate cooler.**

Main Advantages

- **Evaporation reduction, which can be up to 3m per annum (California!)**
- **The development of green algae is also reduced.**
- **No significant environmental impact.**
- **Theft is much more difficult and risky.**
- **Highest soft cost reduction potential in the industry.**

First Solutions

Land-based solar



...combined with a float

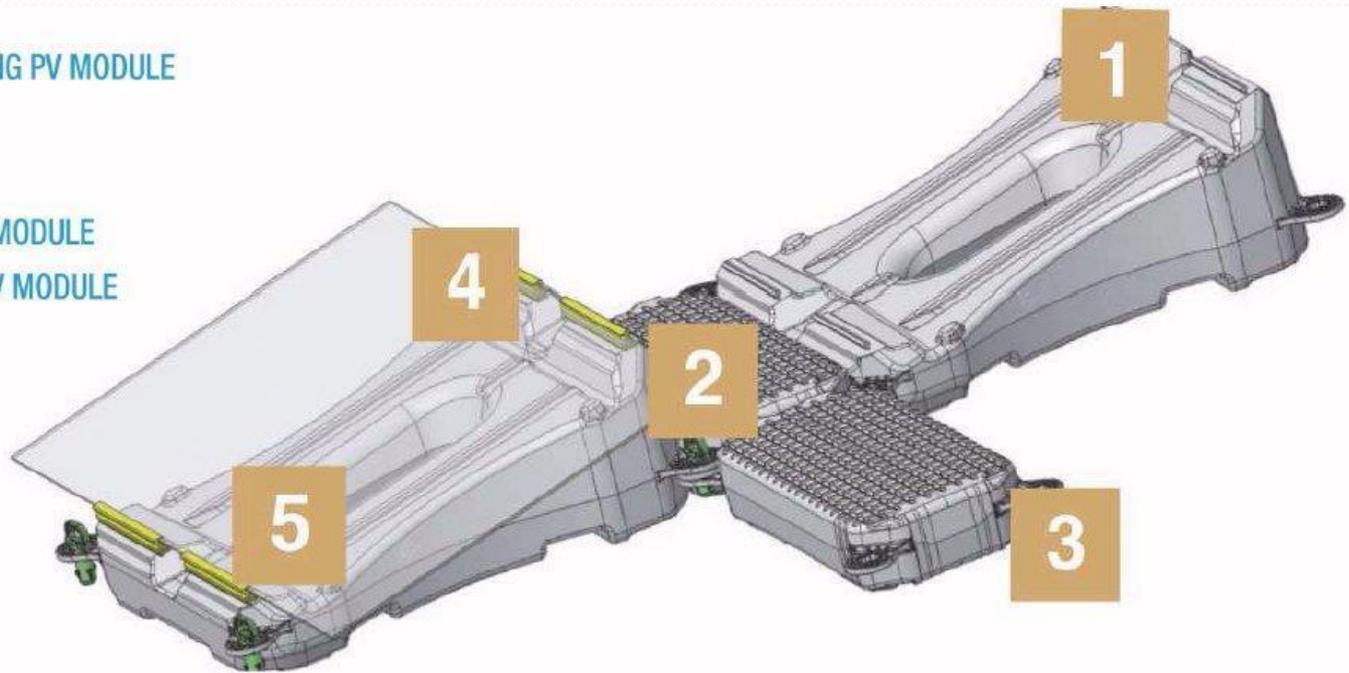


Created the first generation

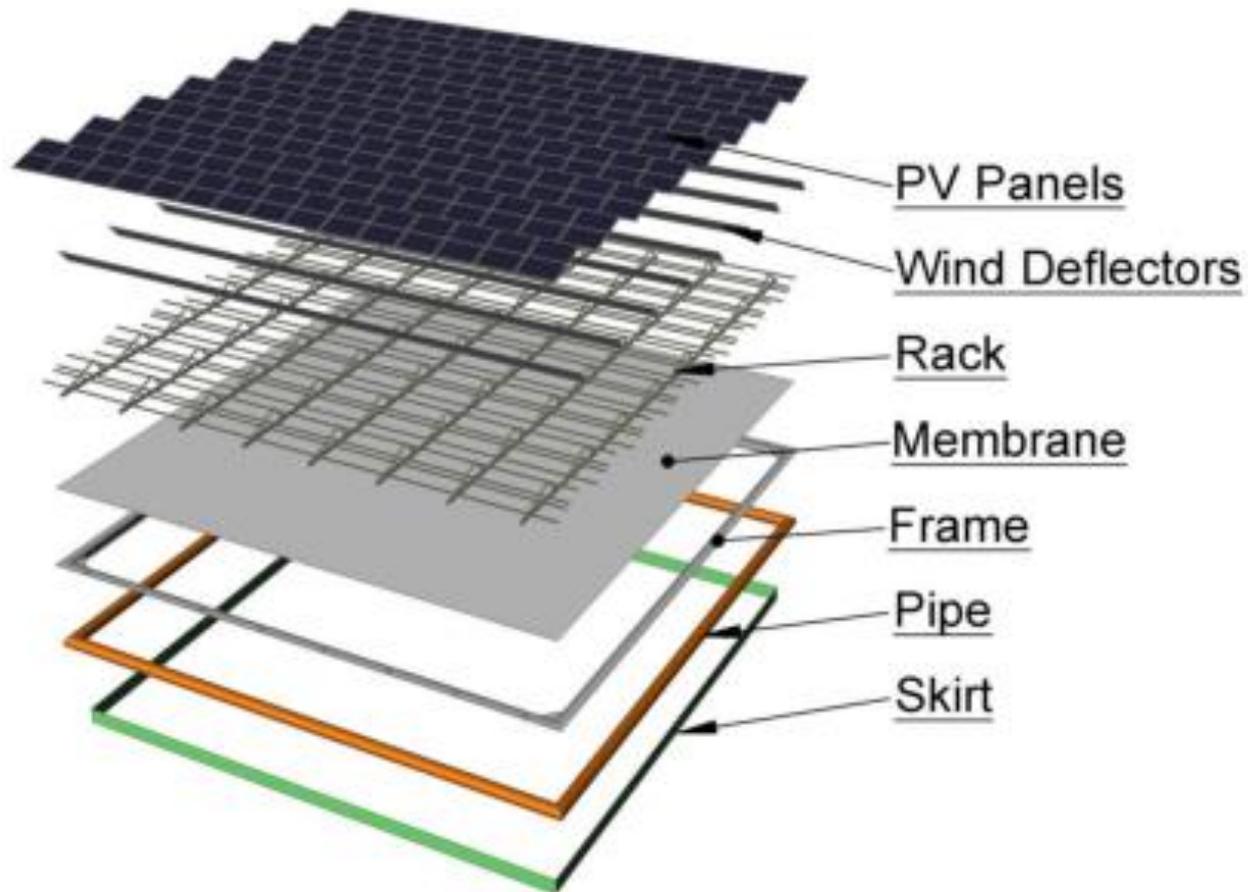


Second Generation

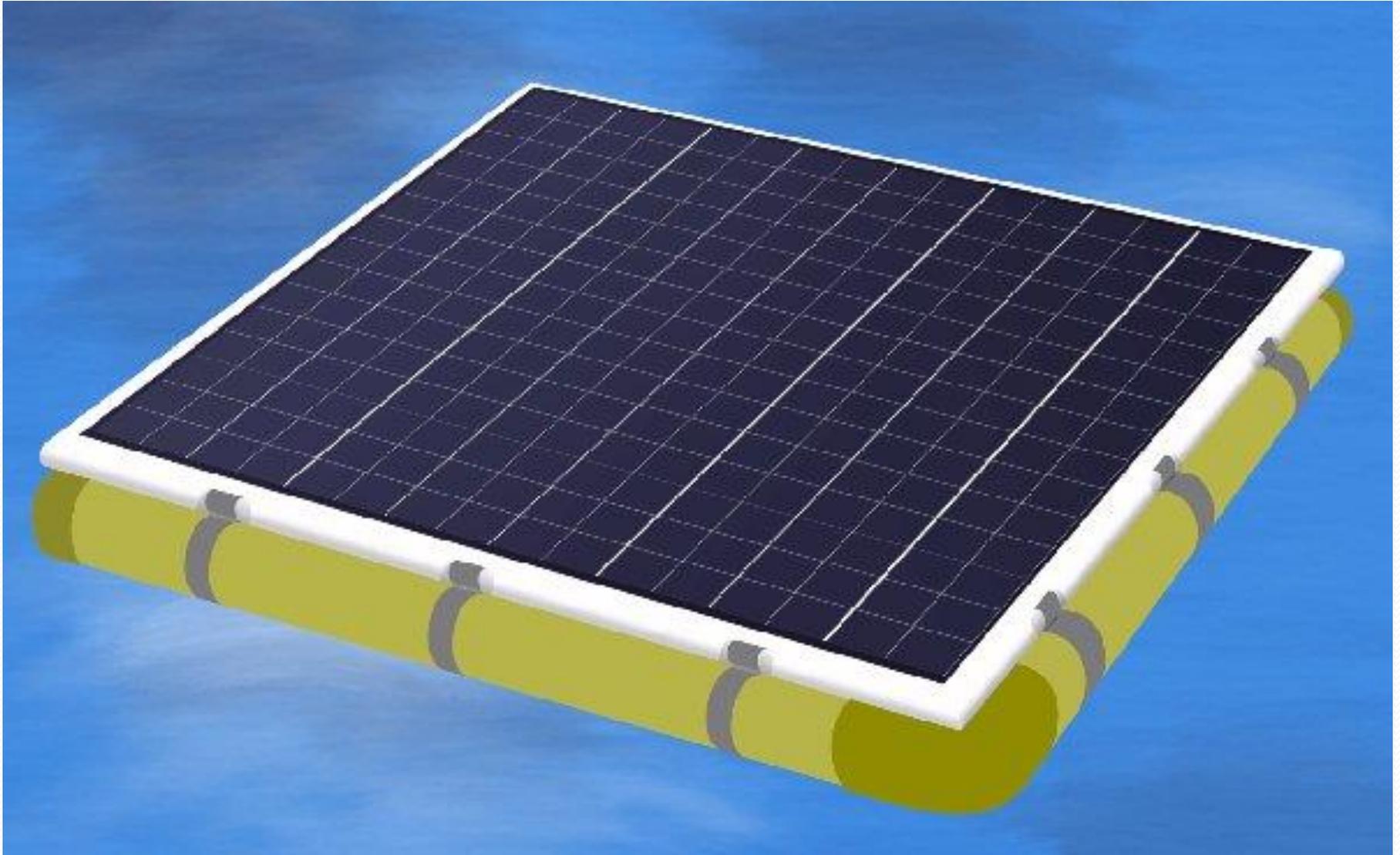
- 1 MAIN FLOAT SUPPORTING PV MODULE
- 2 SECONDARY FLOAT
- 3 TAB CONNECTION
- 4 GASKET TO MOUNT PV MODULE
- 5 STANDARD 60 CELLS PV MODULE



Second Generation



Generation 2.5



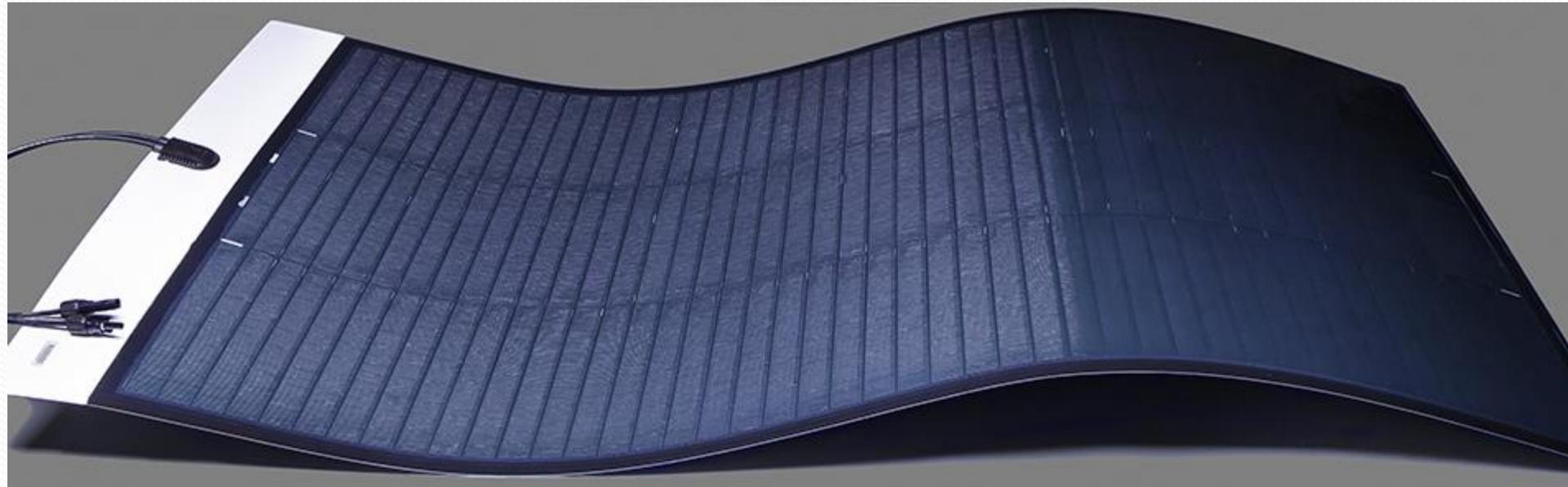
AGC Light Joule Panels

(Image)



Use of Flexible Panels

- ❑ No racks necessary
- ❑ Installation on salt water possible
- ❑ Yield on yearly average higher than silicon panels



2 Workers – 26 panels per hour



JUST BOND MODULES TO MEMBRANE

Fourth Generation

- **Total System Integration**

- **1 MWp under \$1 million if mass produced**

Fourth Generation

(Image)



Own Plans

- ❑ **Setting up a holding company in Singapore**
- IP provision and basic engineering**
- ❑ **Partnering with EPC and developers in various markets**



Thank you!