Solar PV energy in the next 10 years

GW
- Renewables
- Hydraulic
- Fuel
- Nuclear
- Natural Gas
- Coal

Capacity 2014: 5,052 GW
Removals: 817 GW
Increments: 2,035 GW
Capacity 2025: 6,187 GW

33%
14%
5%
26%
20%
5%
8%
Solar PV energy in the next 10 years

GW
- Others
- Biomass
- Solar PV
- Wind

Renewable Capacity 2014: 575
Removals: -44
Increments: 1,001
Renewable Capacity 2025: 1,552

- 4% Others
- 10% Biomass
- 37% Solar PV
- 50% Wind
Solar PV energy in the next 10 years

Solar PV 2014 / 2025

GW

China
EU
USA
India
Japan
Africa
Middle East
ROW

Percentage of total generation (right axis)
Residential
Utilities
Theoretical maximum efficiency

WIND ENERGY
100%

WIND ENERGY SPILLED
59.3%

Commercial efficiency achieved nowadays:
~80% of the 59.3% of the input wind energy

SOLAR ENERGY
100%

SOLAR ENERGY PV PRODUCED
~85%

Commercial efficiency achieved nowadays:
~25% of the 85% of the input solar energy
Enhancing solar cell performance:
- Adjust to solar cell spectral response (filter)
- Solar tracking (tracker)
- Dissipate solar cell temperature (heat sink)

Expanding the use of solar energy:
- Adjust to energy consumption needs (modularity)
- Integration right at consumption points (BIPV)
- Socialize it (access to new markets)
The Solar Holographic Revolution.

FACING THE CHALLENGE

- ~70% less solar cell area (CPV 3X)
- Adjust to cell's spectral response (hologram)
- Passive tracking (hologram)
- Aluminium back cover (heat sink)
- Easy to scale up from 20Wp (modularity)
- Self structured (BIPV)
- Easy to personalize (socialization)
- 50% more annual production (new markets)
Examples of BIPV possibilities and new markets (department stores)

The Solar Holographic Revolution.
SoHo3X
Examples of BIPV possibilities and new markets (urban furniture integration)
Easing solar, easing life... is in

ROADMAP

Higher annual energy production pays while upscaling reduces manufacturing cost

Higher hologram efficiency, higher solar performance:

- Increase solar production per square meter
- Decrease LCOE of a solar plant
- Encourage to use high-tech solar cells
- Boost solar PV urban integration

Higher versatility, higher market opportunities:

- Reach all market segments with a single product
- Gross margin independent of end use
- Make solar PV “cool” to everyone
Literatur

- Mohedano, R., et al. [Wide-angle, high-concentration photovoltaics to compete with flat-plate systems] SPIE Newsroom, July 1st 2013
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- Rodríguez San Segundo HJ, Villamarin Villegas AM and Calo López A [Holographic Solar CPV Module at USD 0.50 per Watt] in Proc. of the 28th European PVSEC (Paris 2013), 484-488