Market and market structure

Renewable energy industry in Europe.
*The radical changes due to **solar panels**.*

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Before solar energy

The treat of new entrants

Mediate
Because solar panels are a new invention in an existing market. Investment in R&D is high for example

Bargaining power of suppliers

Low
The generation of renewable energy is mostly dependant on natural elements. Tools, products and other sources can be provided by multiple firms.

Renewable energy industry ***before*** *the invention of solar panels*

(Highly) concentrated market

Bargaining power of customers

Mediate
There are a few renewable energy options but fossil fuels are the standard.

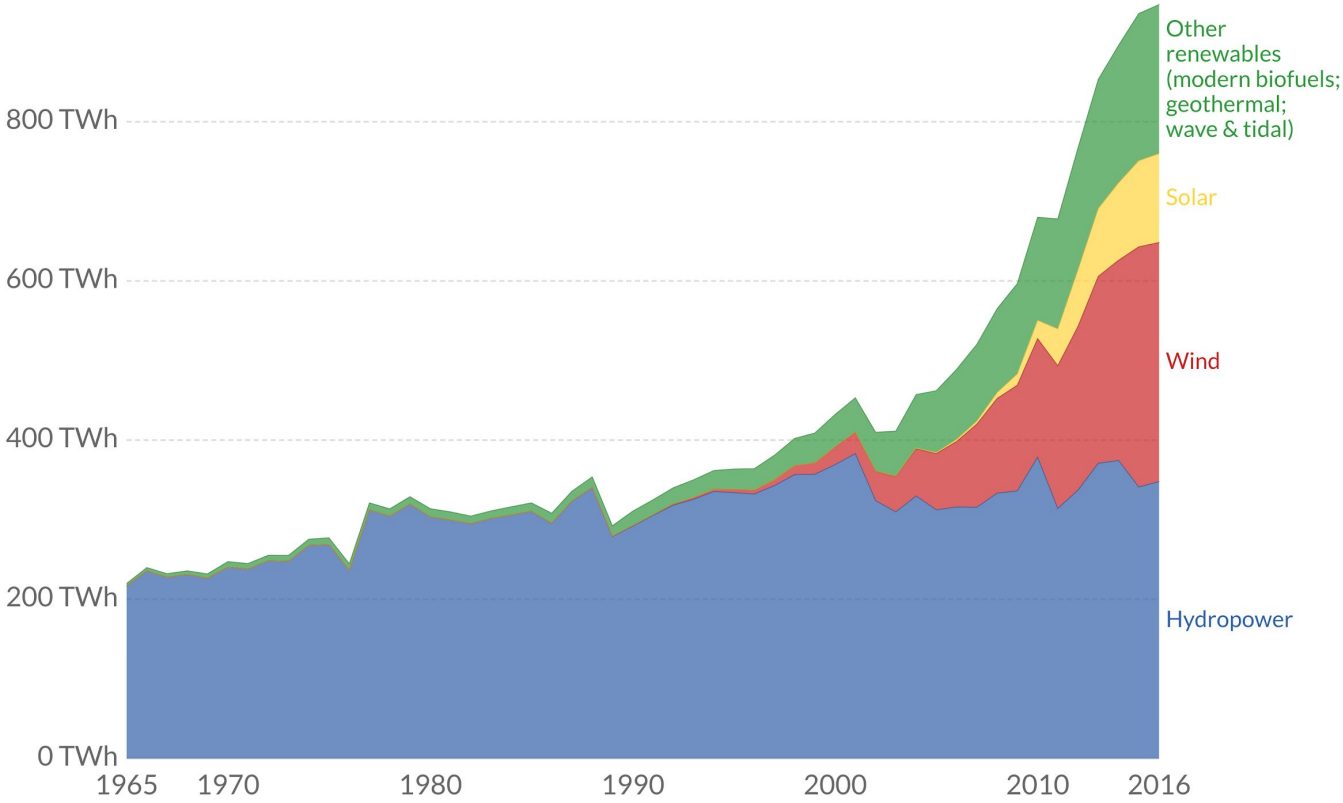
The threat of substitute products or services

Mediate
There are a few renewable energy options. Most competitions comes from fossil fuels

Modern renewable energy consumption, European Union

Total renewable energy consumption, measured in terawatt-hours (TWh) per year. This data includes all renewable energy sources with the exclusion of traditional biomass.

Our World in Data



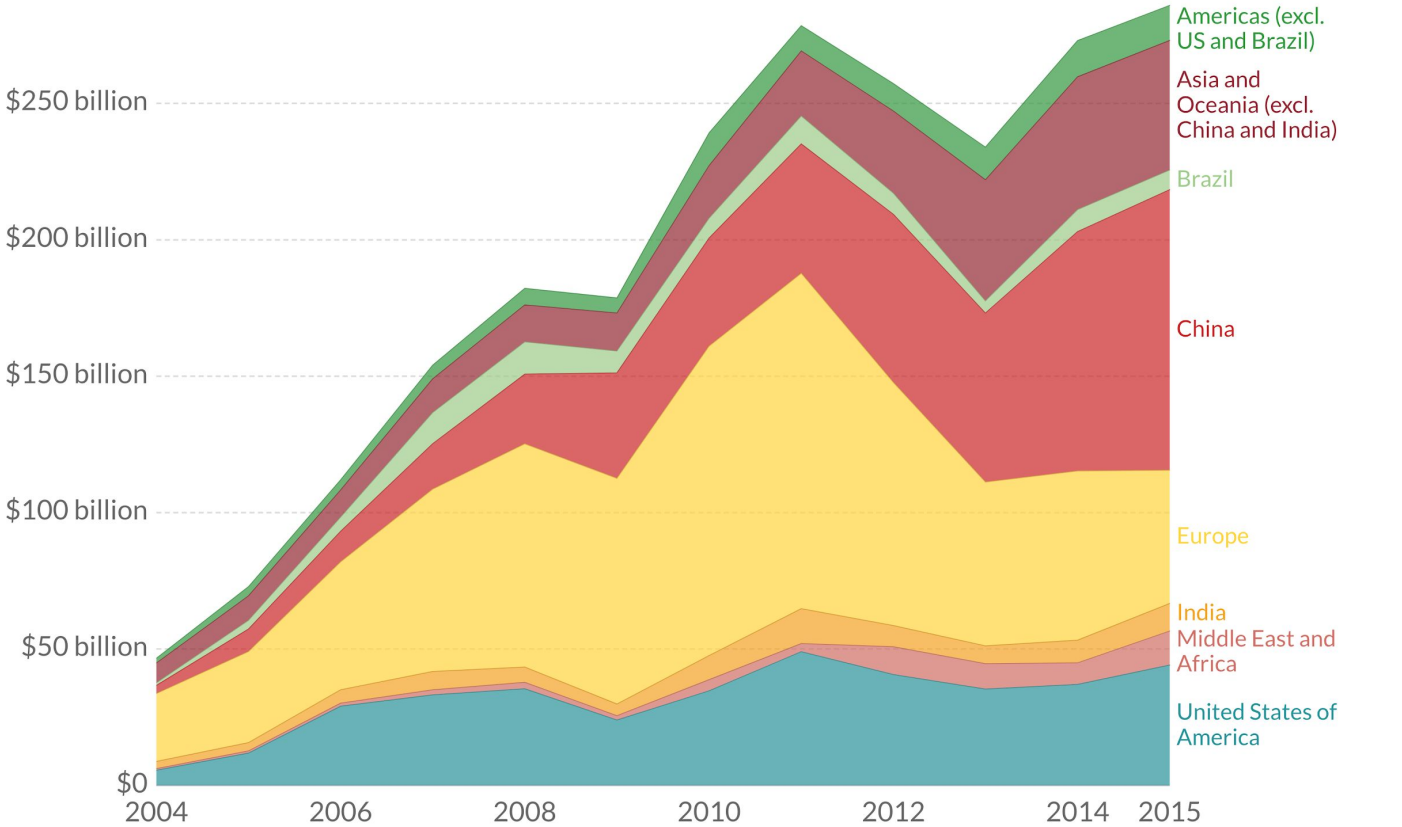
Source: BP Statistical Review of Global Energy

^ **Rise of solar energy**

Renewable Energy Investment

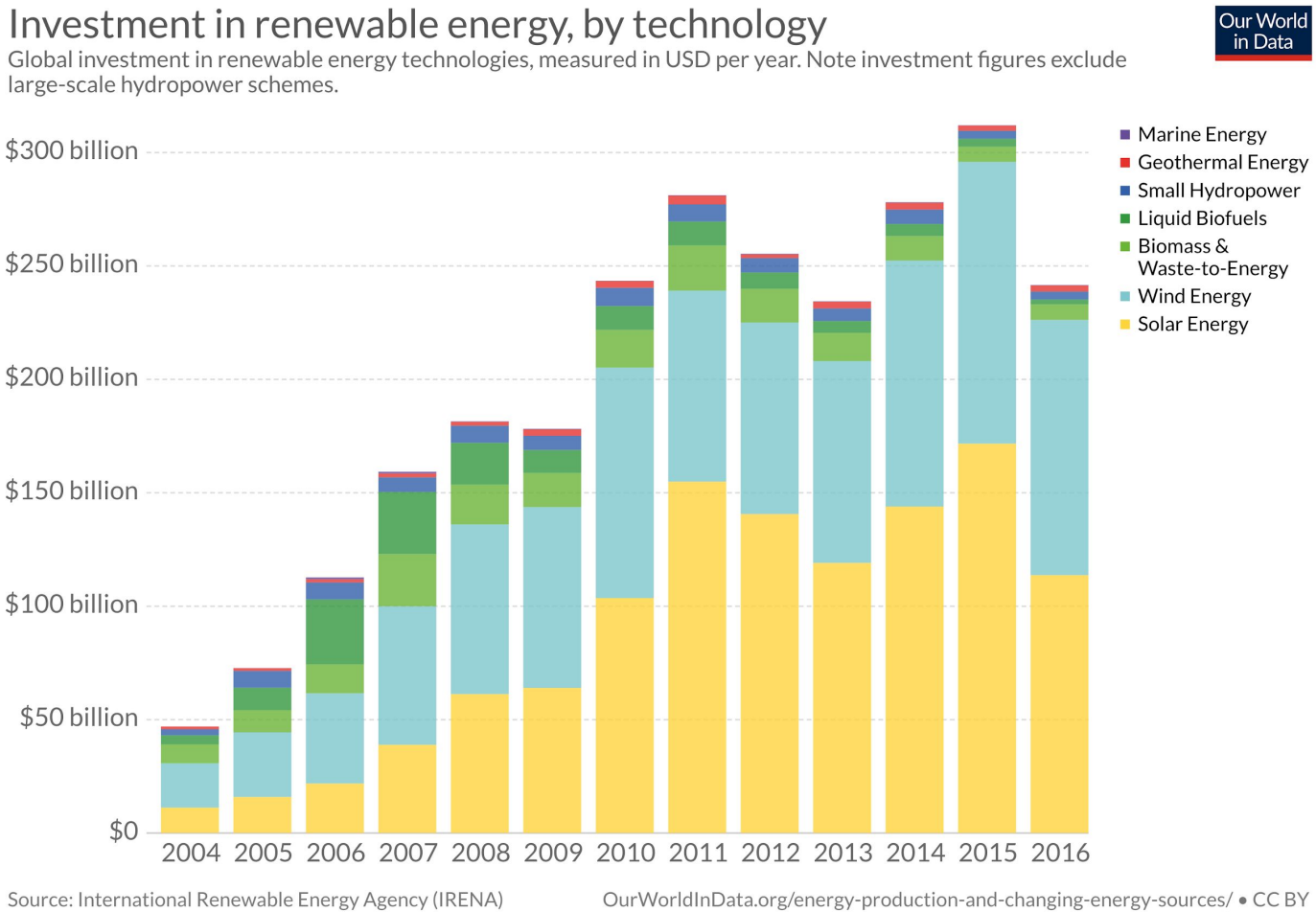
Investment in renewable energy technologies per year in billion US dollars by region.

Our World in Data



Source: International Renewable Energy Agency, 2017

Invention of solar energy

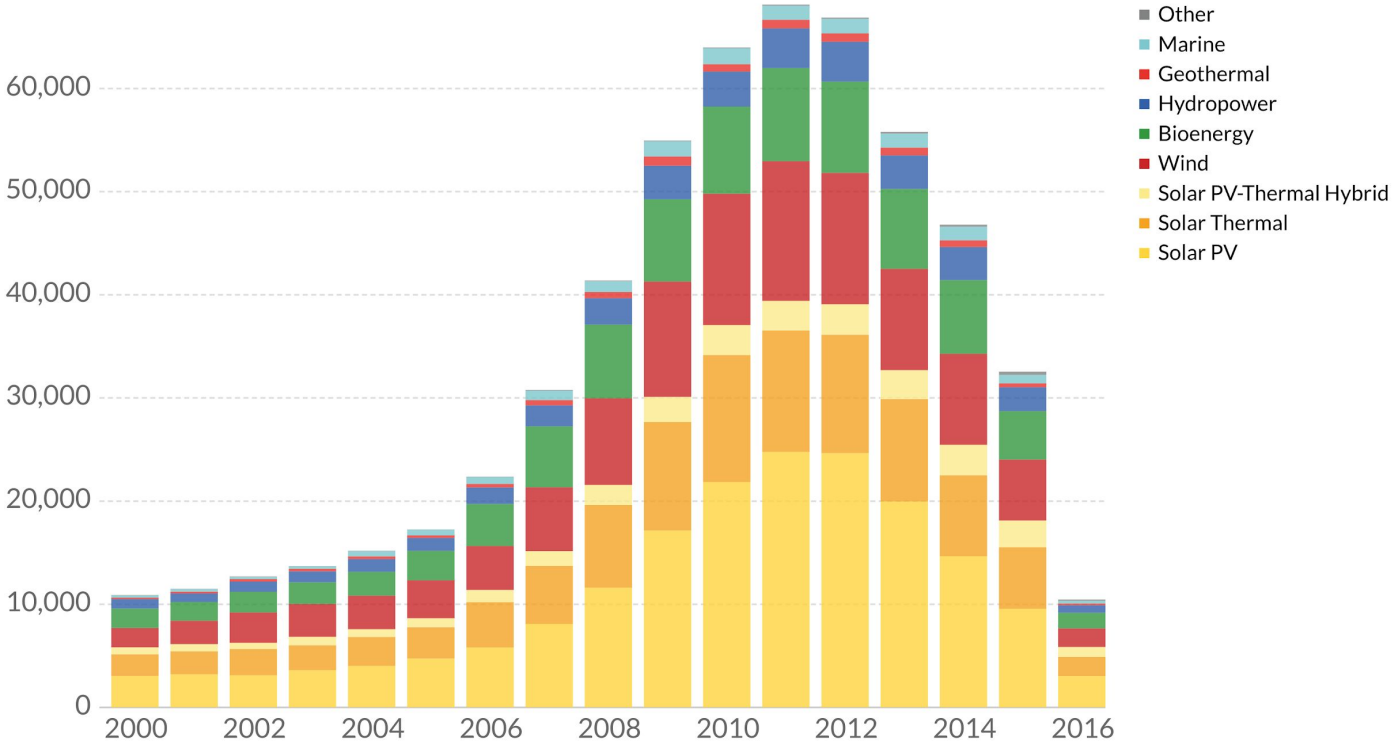


* Global numbers

Number of patents filed for renewable energy technologies, World

Global number of patents filed under each renewable technology category per year. Note that figures for 2014-16 may be subject to a time lag; processing times of patent applications vary and some patents submitted over this period may not yet be recorded in statistics. These figures will be updated with time if additional patent applications are recorded.

Our World in Data

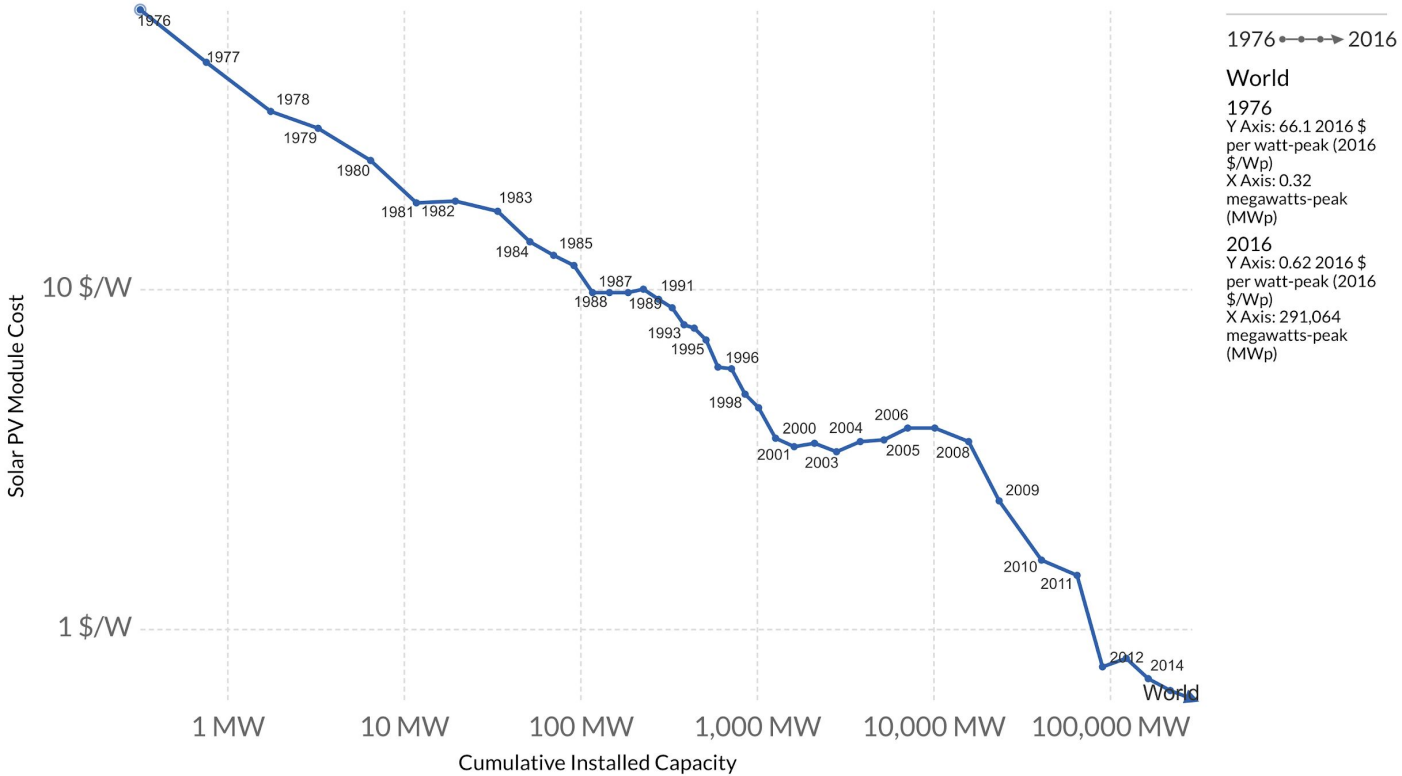


Source: IRENA (& EPO PATSTAT)

Solar PV module prices vs. cumulative capacity, 1976 to 2016

Solar photovoltaic (PV) module prices (measured in 2016 US$ per watt-peak) versus cumulative installed capacity (measured in megawatts-peak, MWp). This represents the 'learning curve' for solar PV and approximates a 22% reduction in price for every doubling of cumulative capacity.

Our World in Data

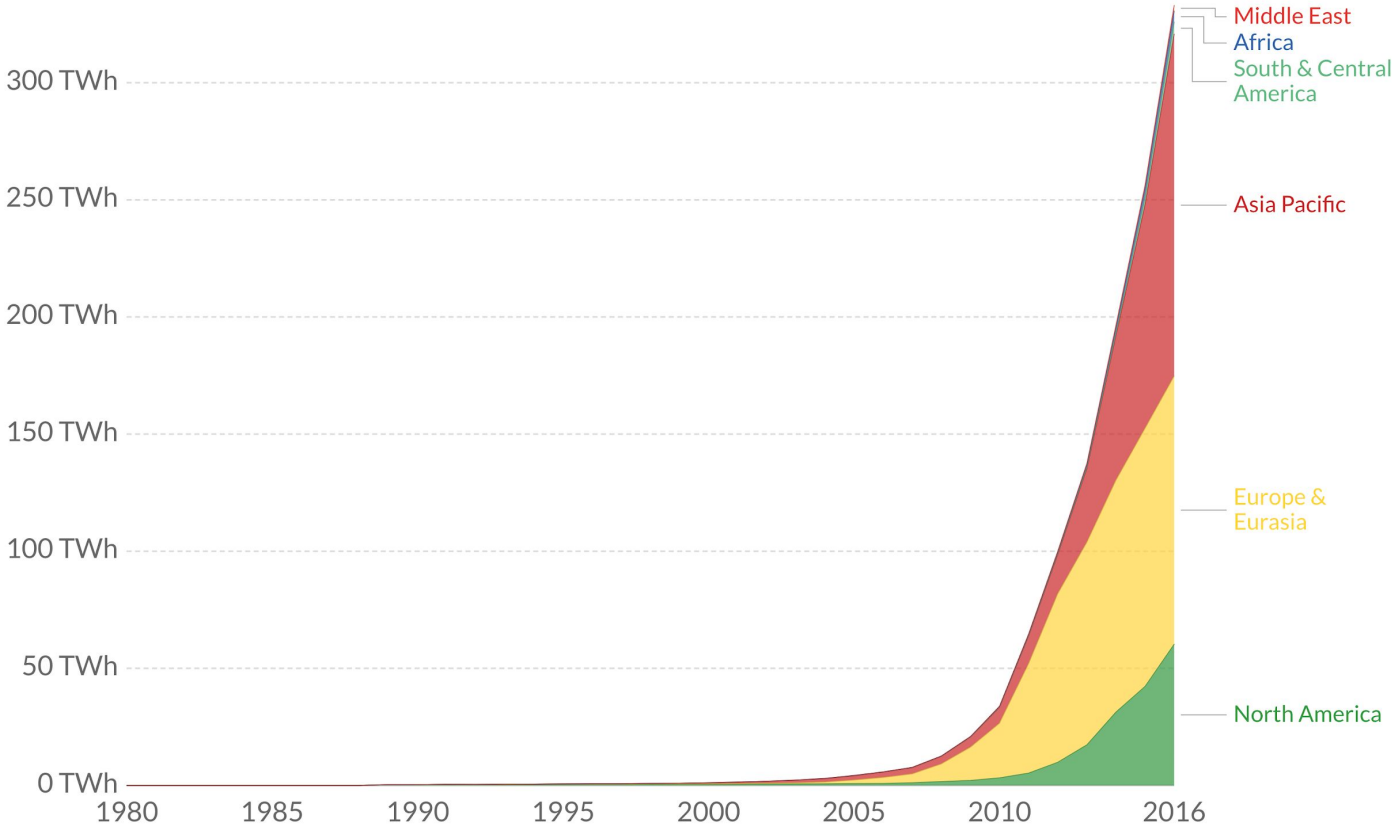


Source: Lafond et al. (2017); IRENA; SolarServer

Solar PV energy consumption by region, terawatt-hours

Solar photovoltaic (PV) energy consumption by region, measured in terawatt-hours (TWh) per year.

Our World in Data



Source: BP Statistical Review of Global Energy

After solar energy

The threat of new entrants

Mediate
(Low) Government policy because of subsidies
(High) Capital requirements

Bargaining power of suppliers

Low
Big number of suppliers

*Renewable energy industry **after** the invention of solar panels*

(Highly) concentrated market

Bargaining power of customers

High
There is a lot of competition from other companies that create solar panels
Customers buy it once

The threat of substitute products or services

Mediate
The substitutes are less accessible.

Top Solar Panel Manufacturers in 2019

2018 RANK	COMPANY	HEADQUARTERS
1	JinkoSolar	China
2	JA Solar	China
3	Trina Solar	China
4	LONGi Solar	China
5	Canadian Solar	Canada
6	Hanwha Q-CELLS	South Korea
7	Risen Energy	China
8	GCL-SI	Hong Kong
9	Talesun	China
10	First Solar	USA

*Source: pv-tech.org