Clean Energy Investment Trends, 2Q 2018

Wind investment in the U.S. spurs global clean energy in first half of year



Wind investment in the U.S. spurs global clean energy in 1H 2018

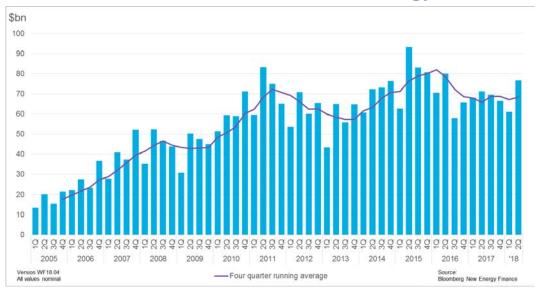
Clean energy investment was \$76.7 billion in the second quarter of 2018, up 8% year-on-year, the increase driven by stronger activity in the U.S. and, to some extent, Europe.

- Global investment in clean energy for the first 6 months of 2018 was \$138.2 billion, with China and the U.S. accounting for 65% of the total.
- The first half of 2018 shows solar investment down 19% compared to the same period last year at \$71.6 billion, with wind up 33% at \$57.2 billion.
- U.S. wind investment stood out in the first half of 2018, reaching \$17.5 billion, up by 121% on its figure in the same period last year.
- Chinese wind investment was resilient, rising 4% to \$17.6 billion in 1H.
- Significant wind power investments included the \$1.5 billion 731.5MW Borssele 3 and 4 offshore wind farm in Dutch waters, the \$769 million 478MW Hale County onshore wind project in the U.S. and the \$627 million 120MW Formosa 1 Miaoli project (the first offshore wind array to be financed in the sea off Taiwan).
- China invested \$35.1 billion in solar in the first half of this year, down 29% from 1H 2017. This reflected a cooling-off in China's solar boom, with the full extent of the government-ordered cutback to be manifest from the second half of the year onwards.

\$76.7bn Global clean energy investment in 2Q 2018

31% Increase in U.S. investment compared to 1H 2017

Global New Investment in Clean Energy



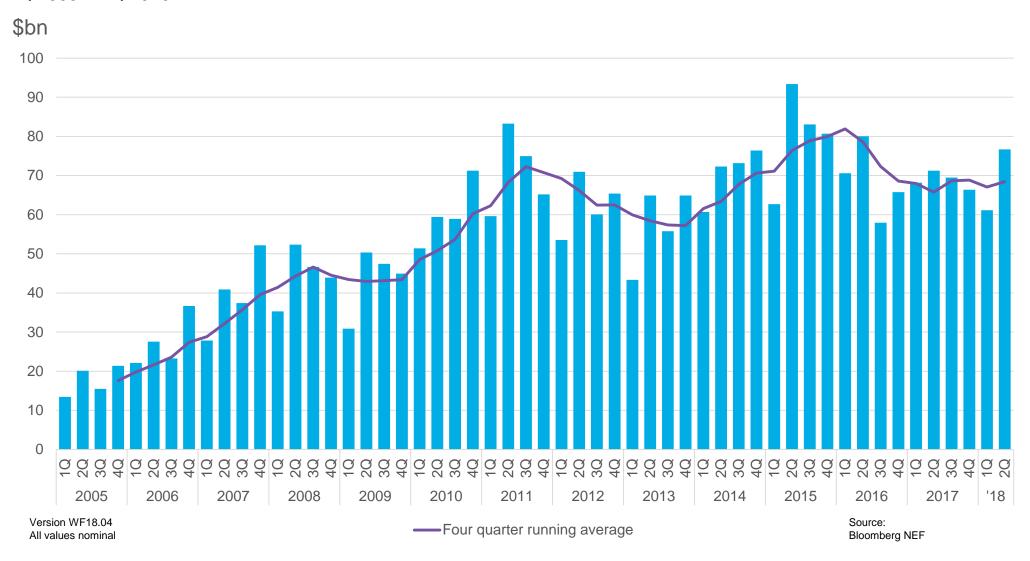
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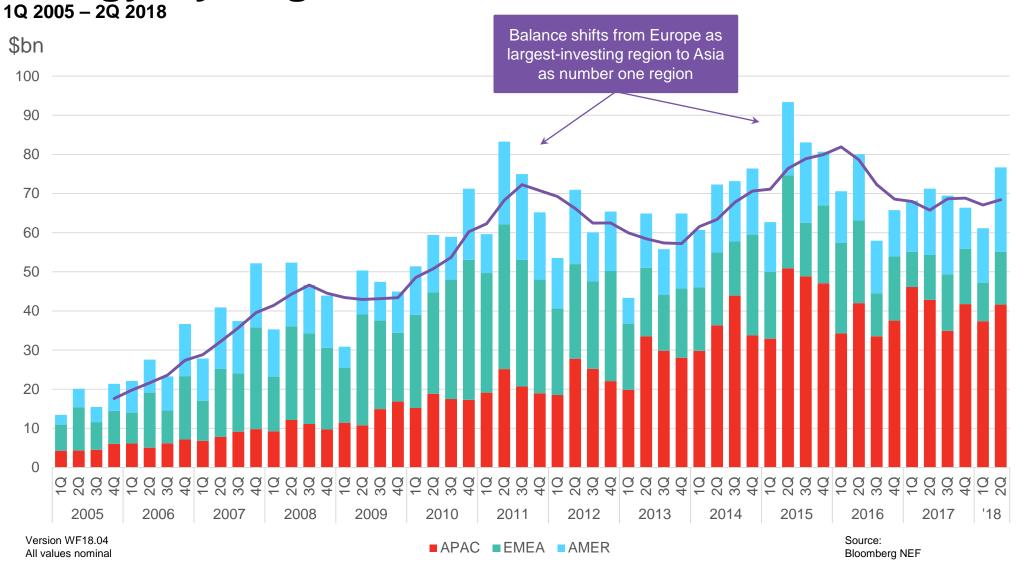
Quarterly Trends, New Investment

Quarterly trends since 1Q 2005

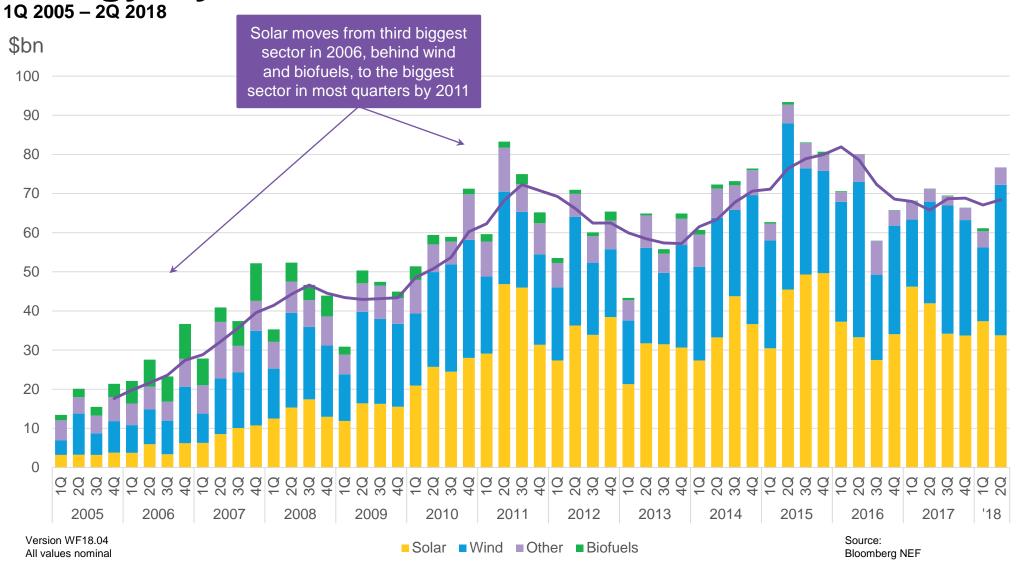
Global New Investment in Clean Energy 1Q 2005 – 2Q 2018



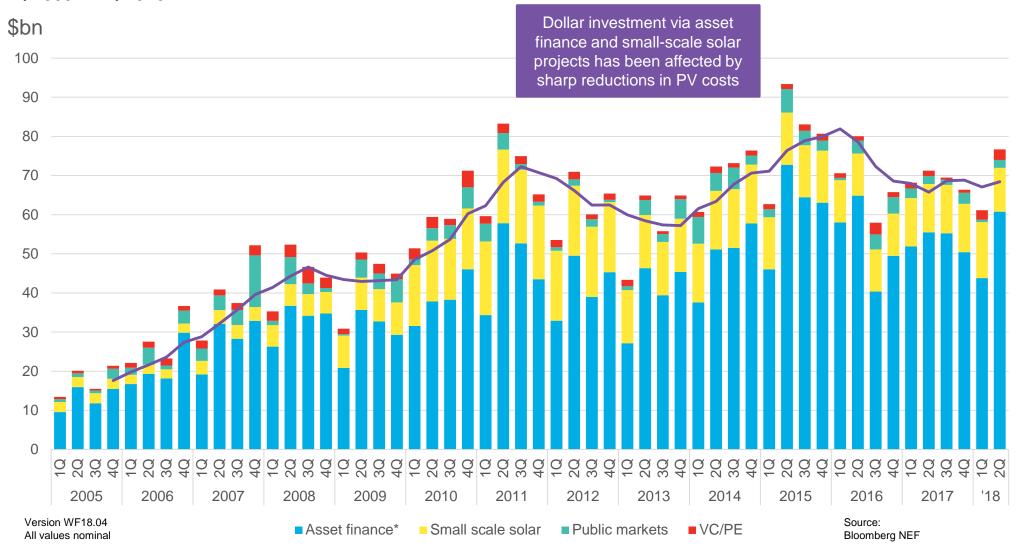
Global New Investment in Clean Energy, by Region



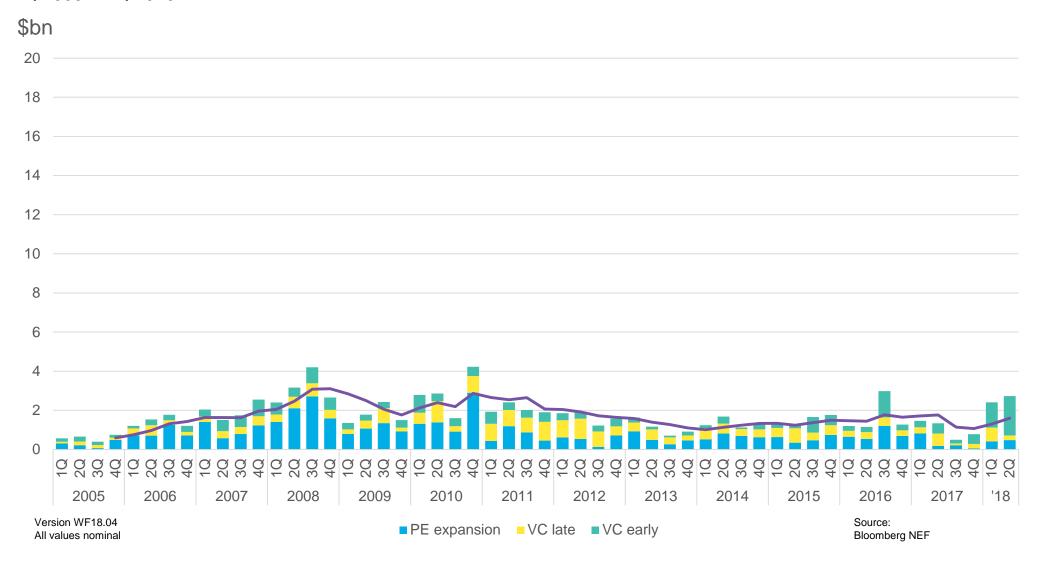
Global New Investment in Clean Energy, by Sector



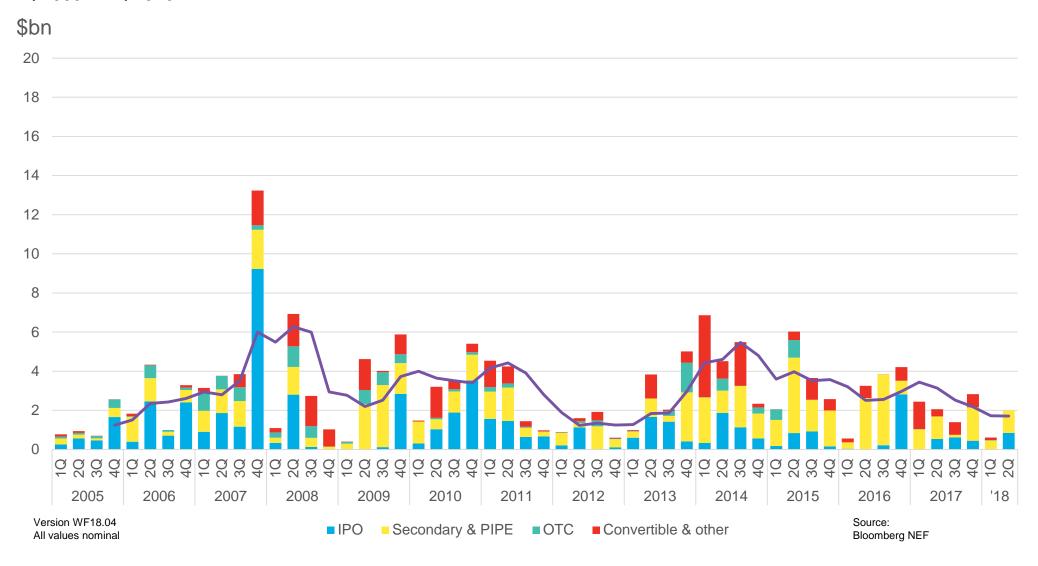
Global New Investment in Clean Energy, by Asset Class



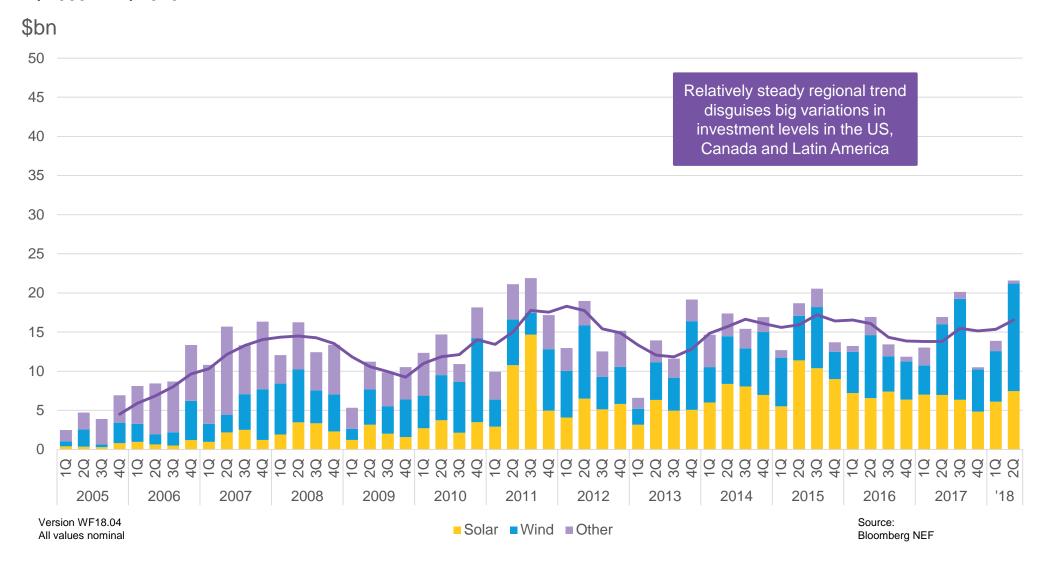
Global New Investment in Clean Energy, VC / PE



Global New Investment in Clean Energy, Public Markets

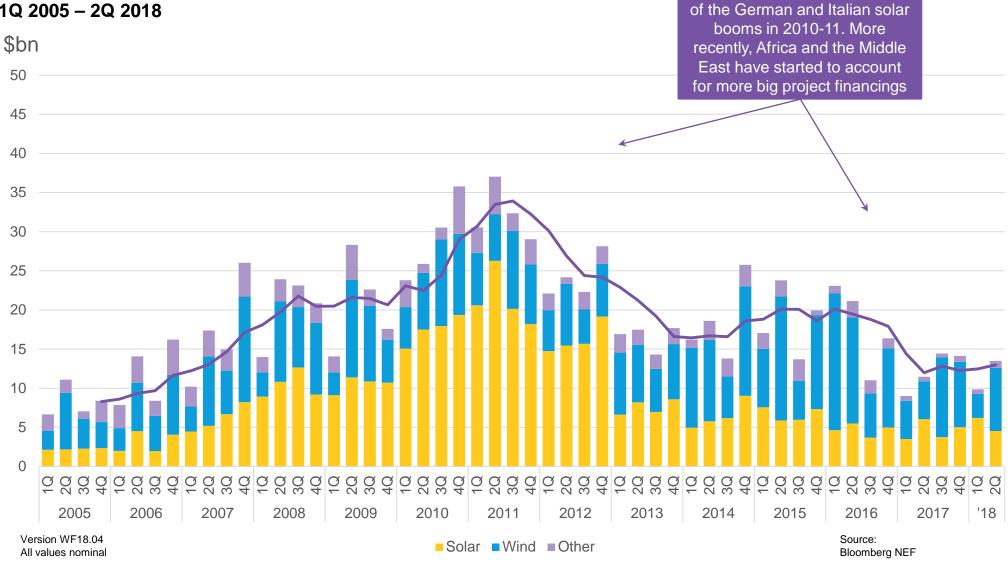


New Investment in Clean Energy AMER



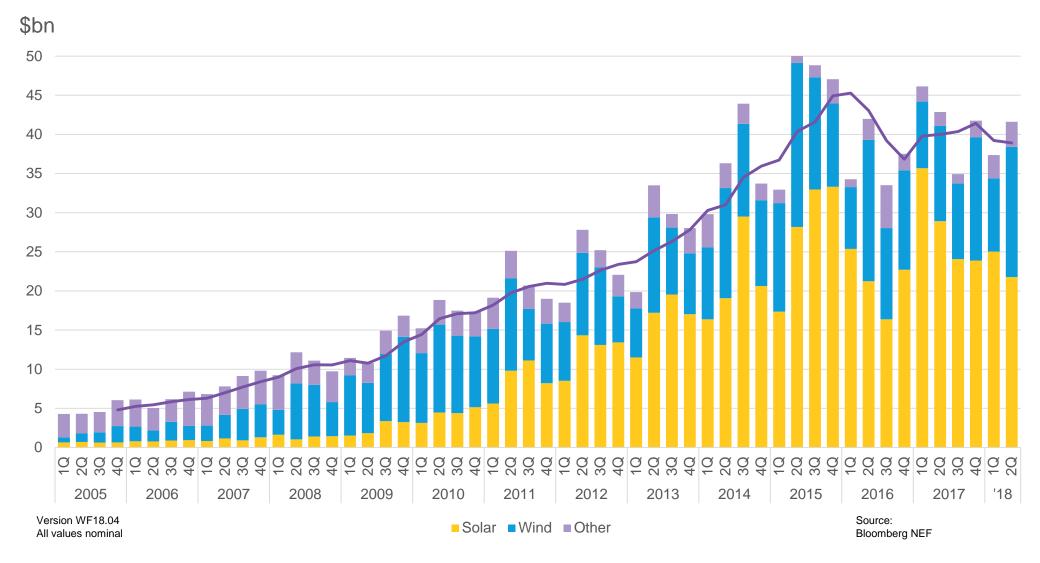
New Investment in Clean Energy EMEA

1Q 2005 - 2Q 2018



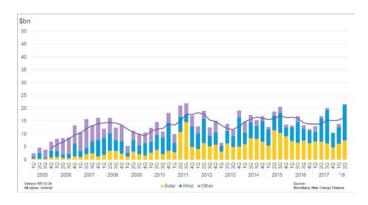
Investment peaked at the time

New Investment in Clean Energy APAC

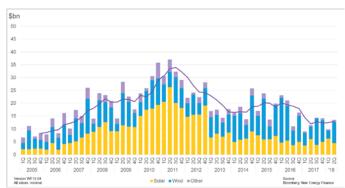


Comparing AMER, EMEA & APAC

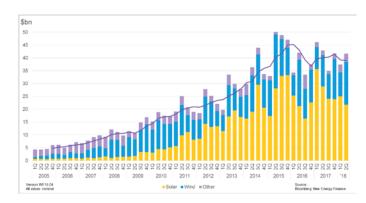
Will AMER break out of the \$15 - \$25bn range?



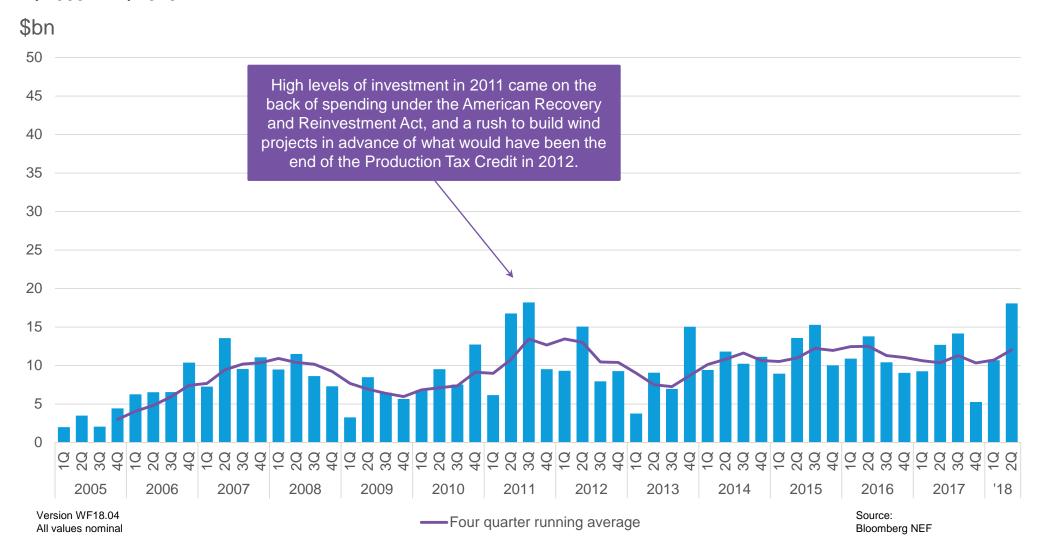
Will EMEA ever experience the highs of 2010 & 2011 again?



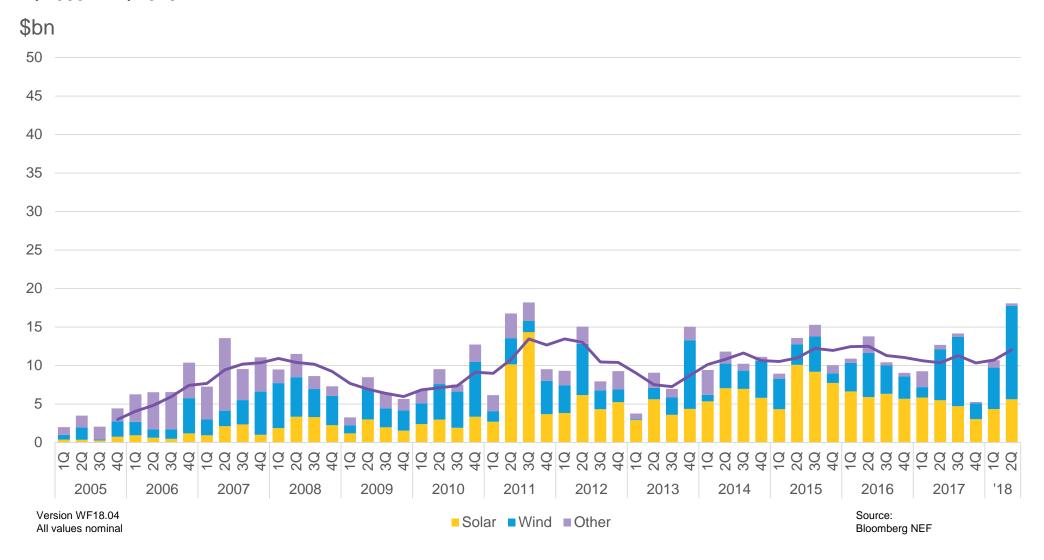
Will APAC continue to be the driver of green investment?



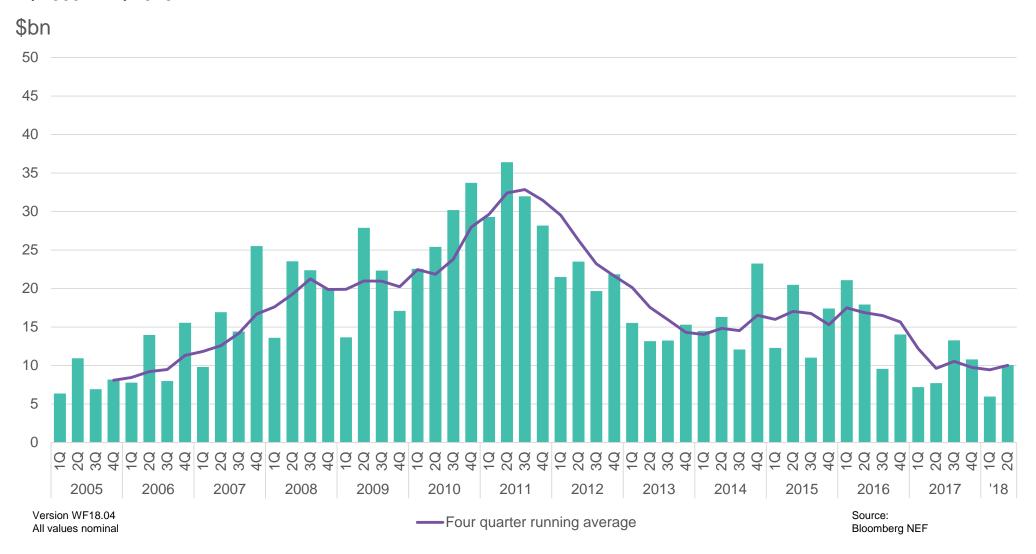
New Investment in Clean Energy United States



New Investment in Clean Energy United States, by Sector

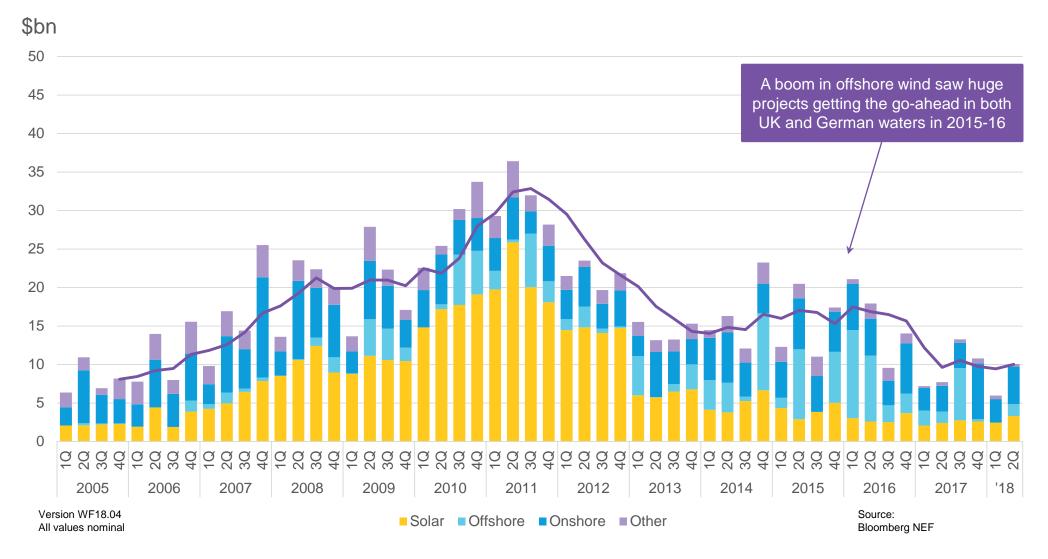


New Investment in Clean Energy Europe

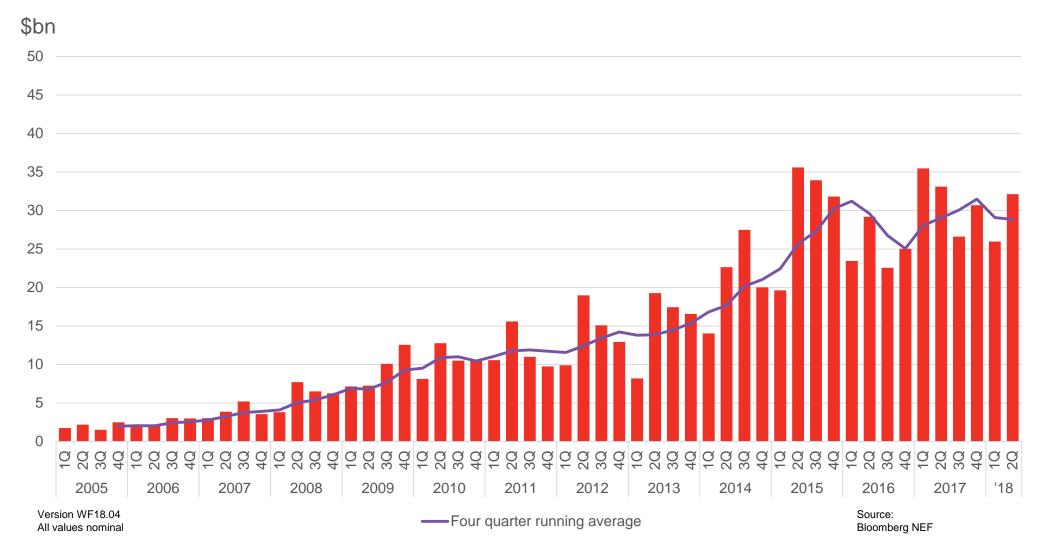


New Investment in Clean Energy Europe, by sector

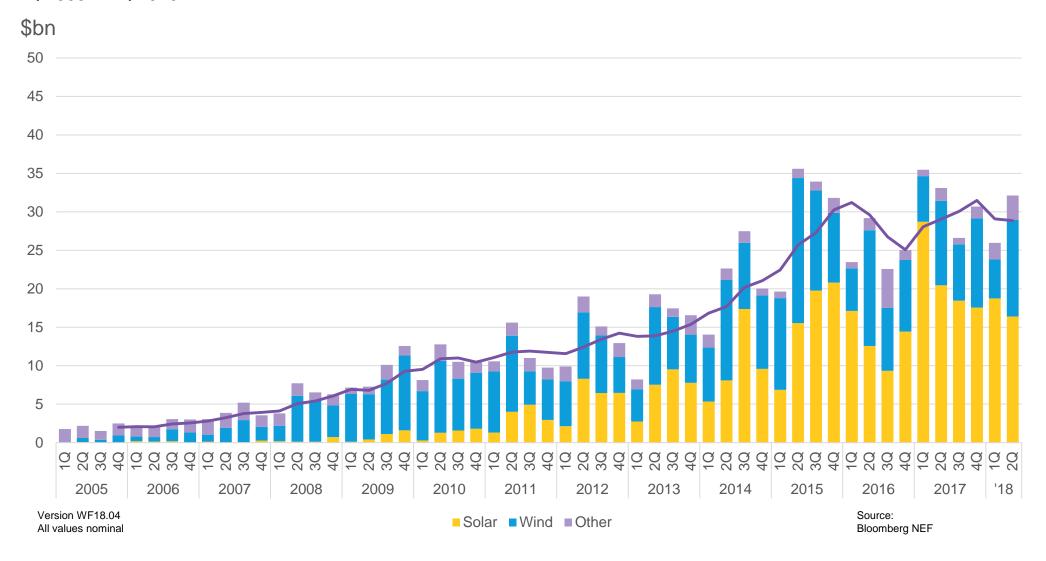
 $1Q\ 2005 - \bar{2Q}\ 2018$



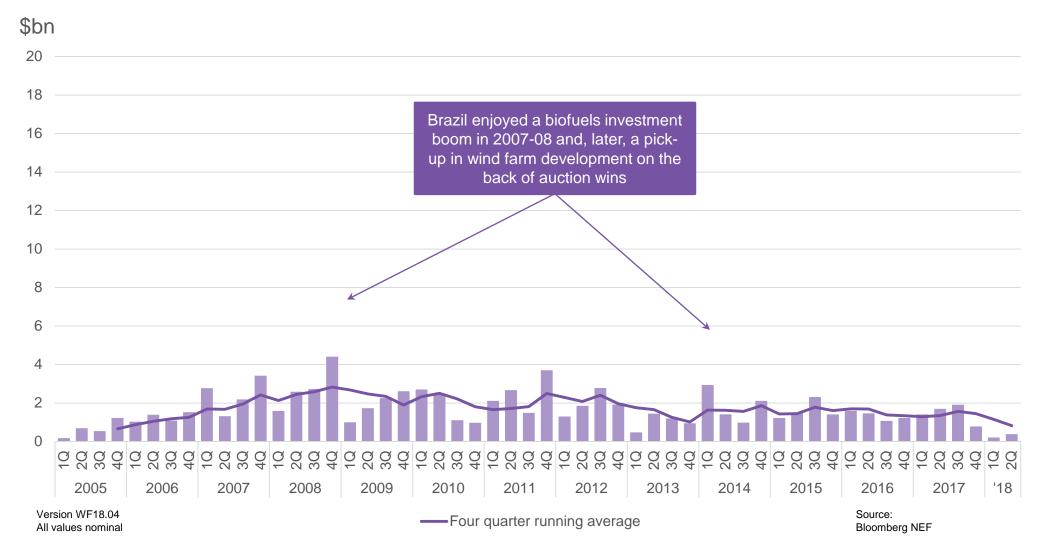
New Investment in Clean Energy China



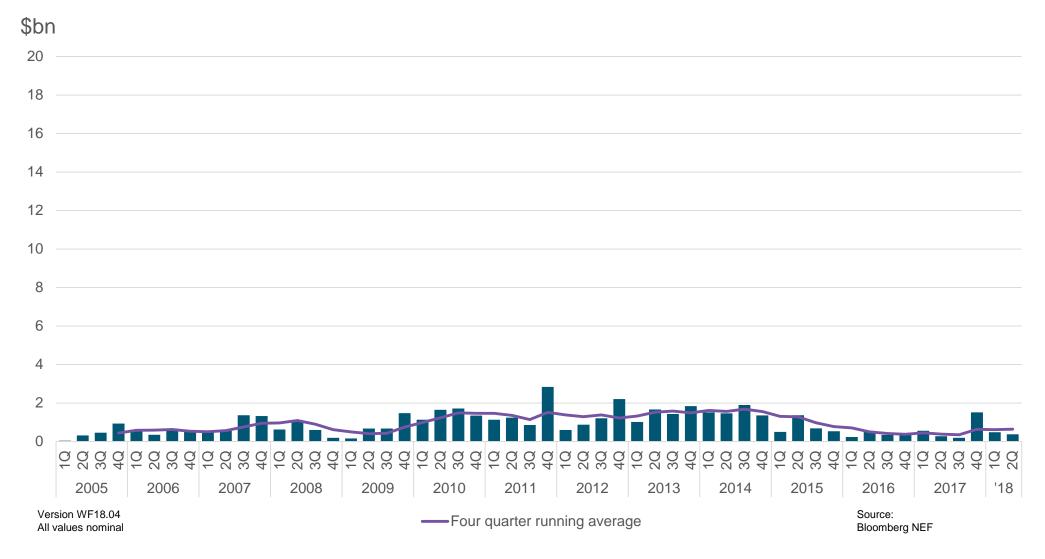
New Investment in Clean Energy China, by sector



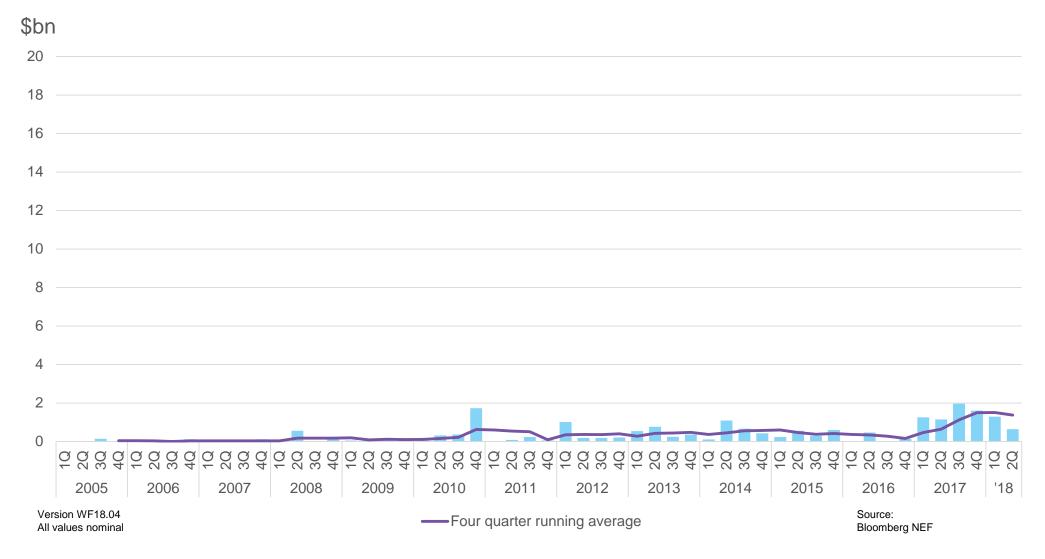
New Investment in Clean Energy Brazil



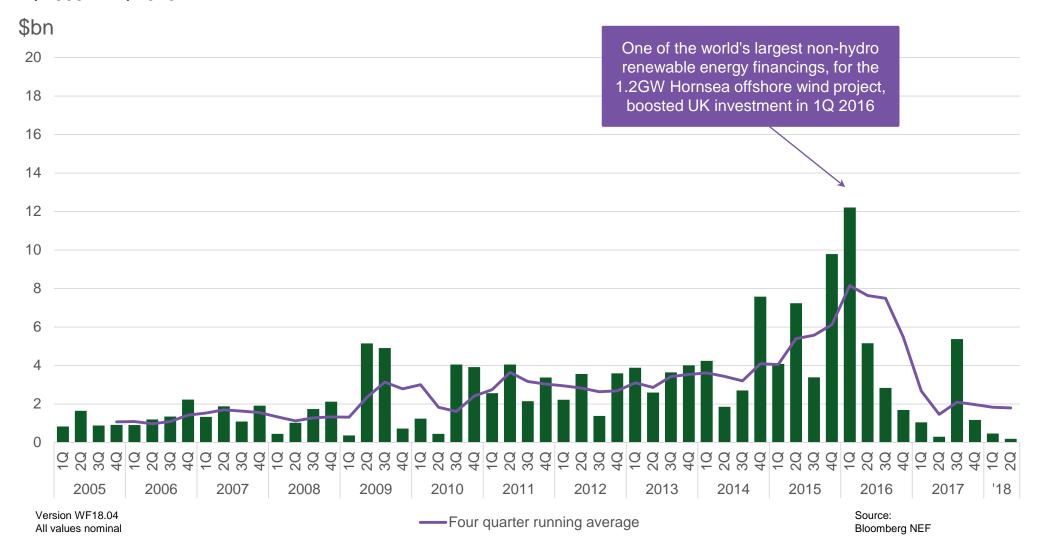
New Investment in Clean Energy Canada



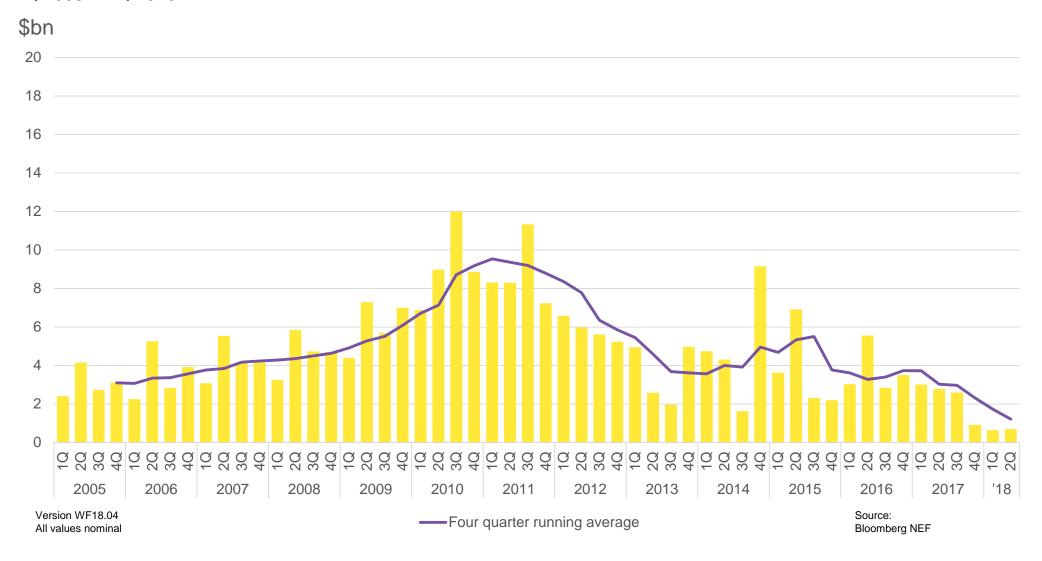
New Investment in Clean Energy Mexico



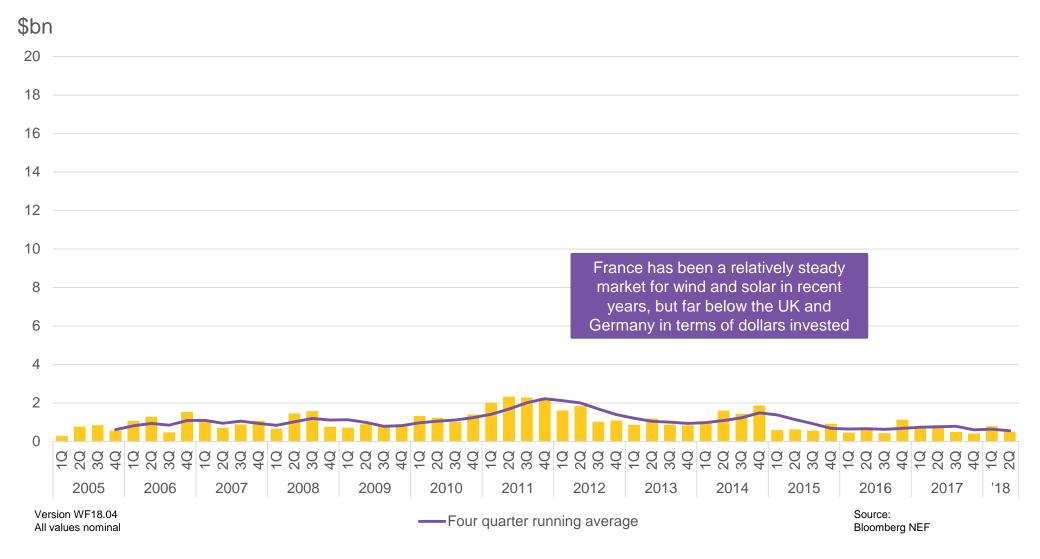
New Investment in Clean Energy United Kingdom



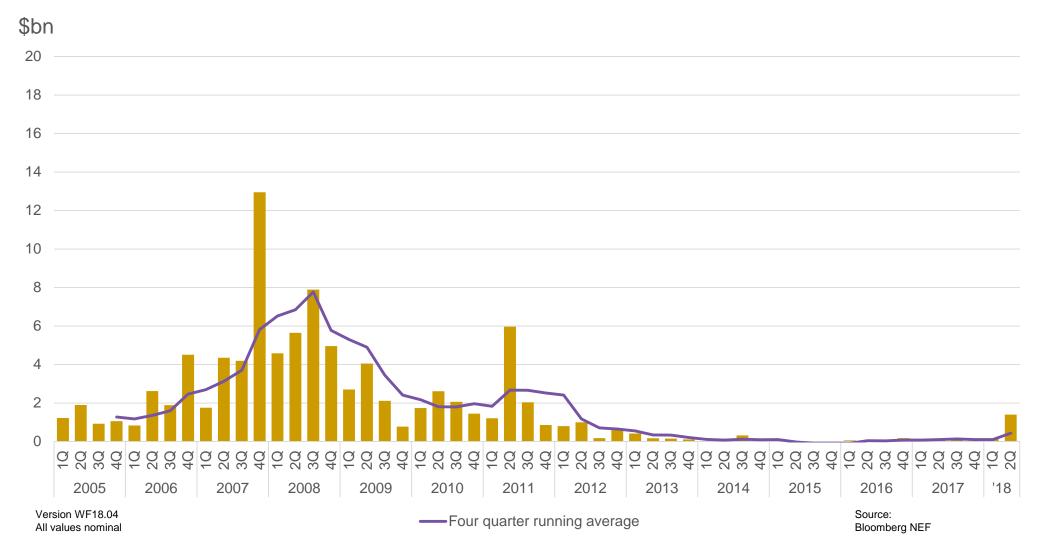
New Investment in Clean Energy Germany



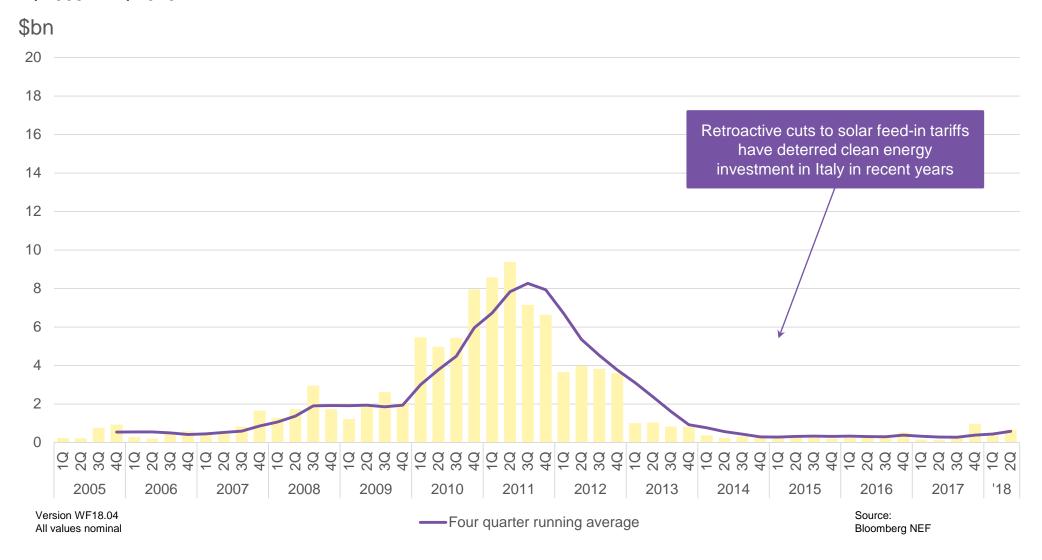
New Investment in Clean Energy France



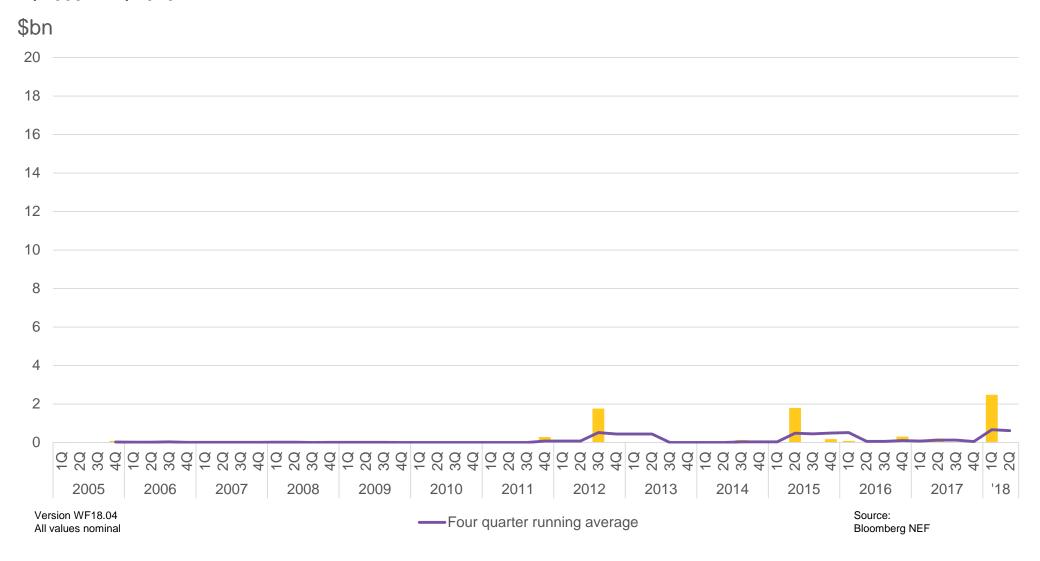
New Investment in Clean Energy Spain



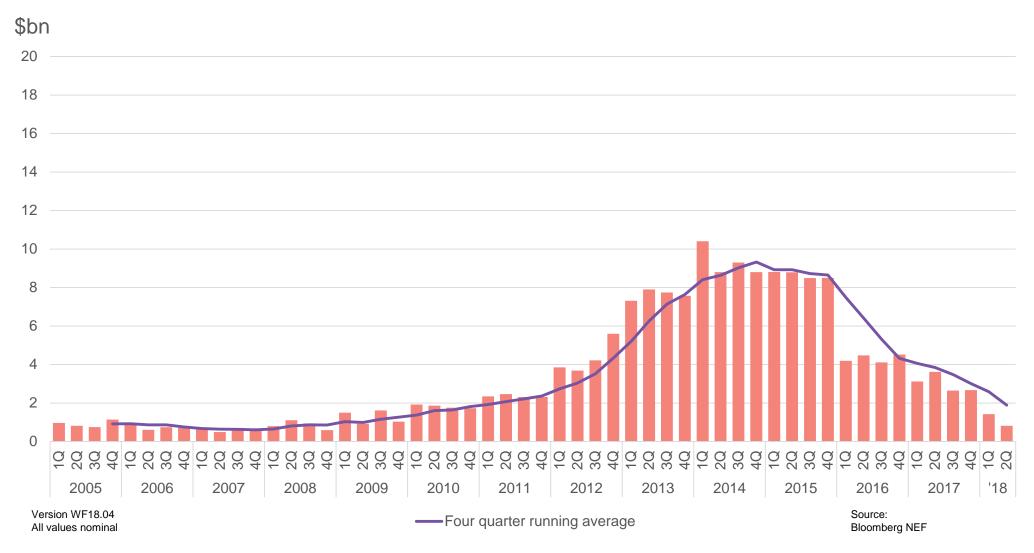
New Investment in Clean Energy Italy



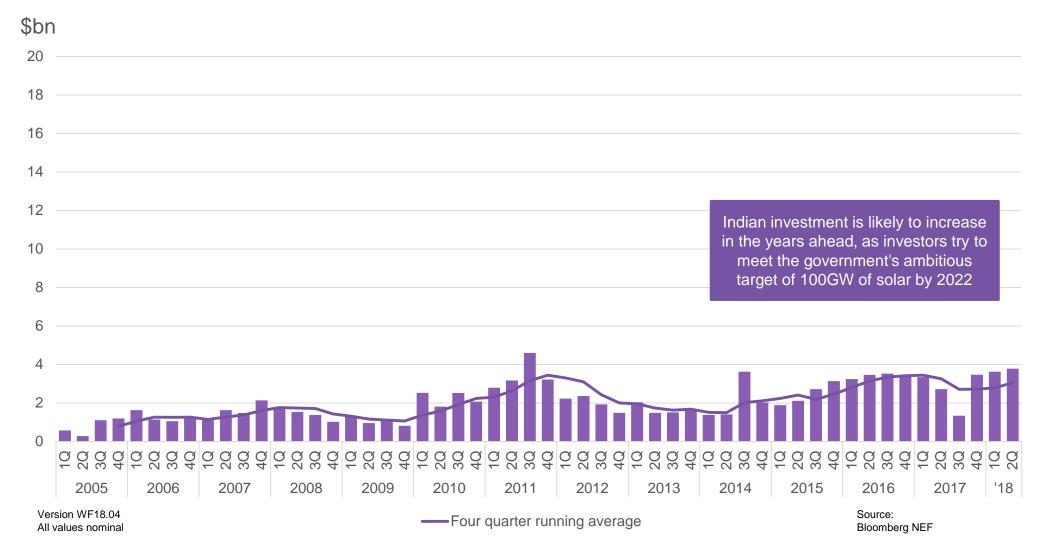
New Investment in Clean Energy Morocco



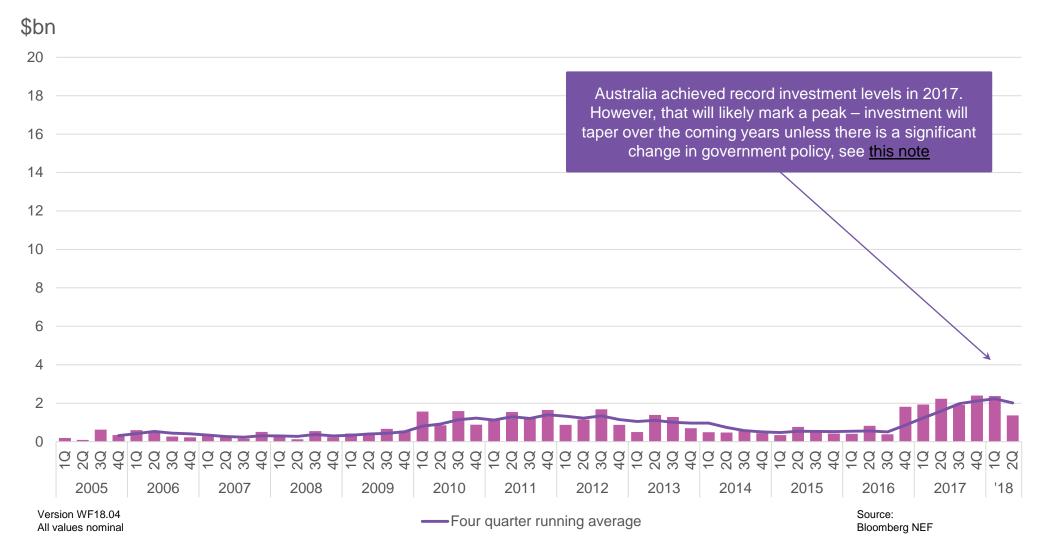
New Investment in Clean Energy Japan



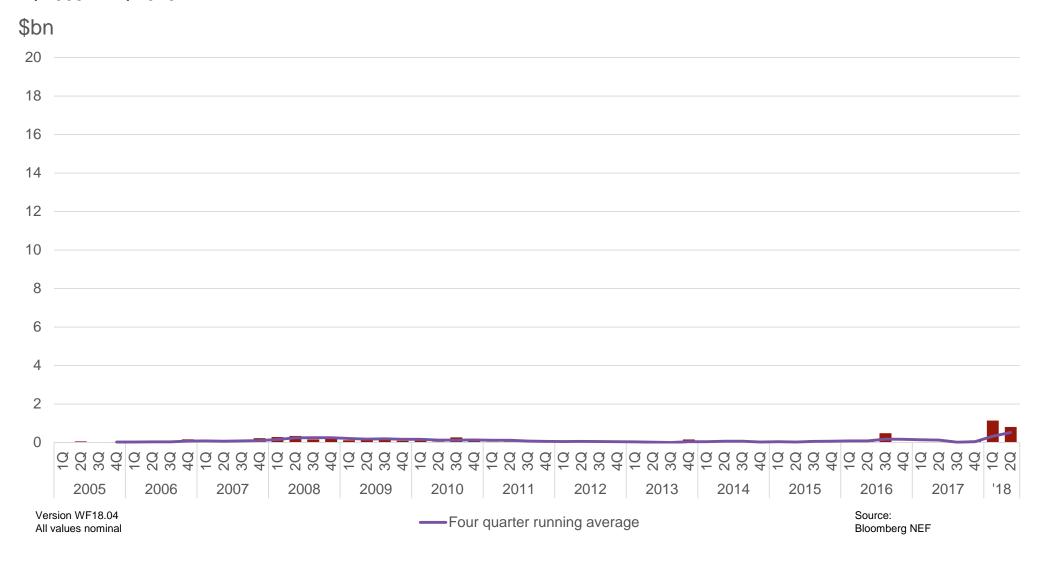
New Investment in Clean Energy India



New Investment in Clean Energy Australia



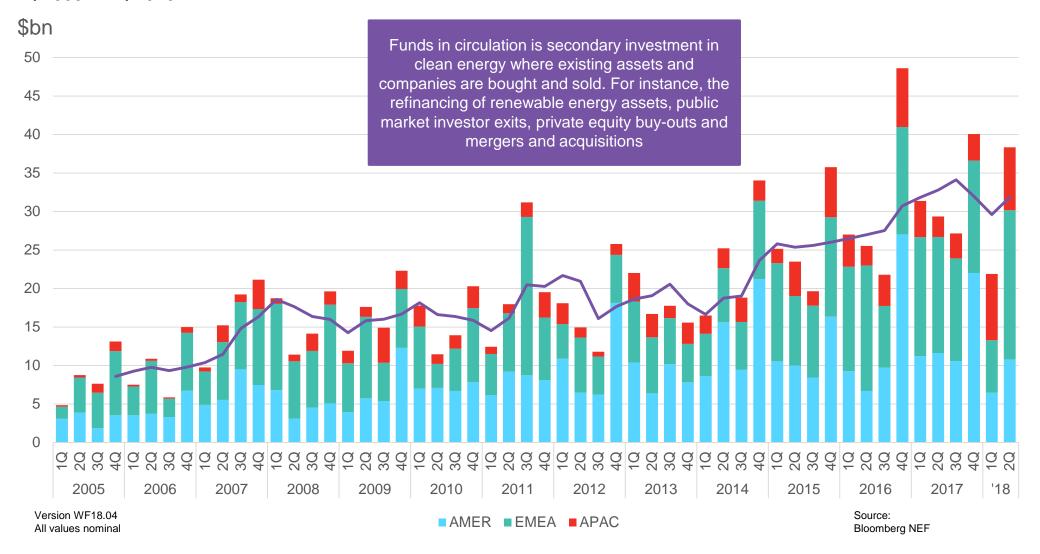
New Investment in Clean Energy Vietnam



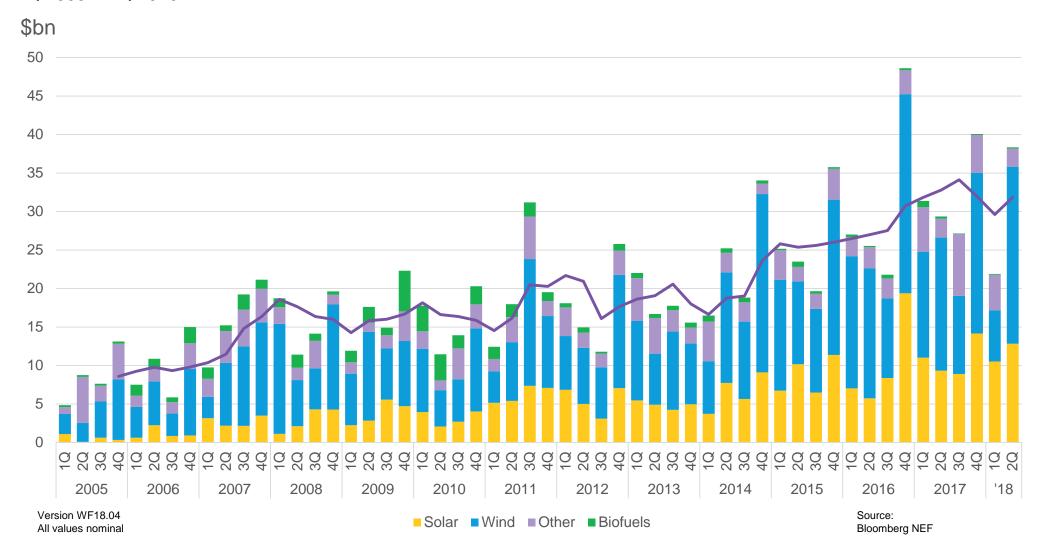
Quarterly Trends, **Funds in Circulation**

Quarterly trends since 1Q 2005

Global Clean Energy, Funds in Circulation, by Region

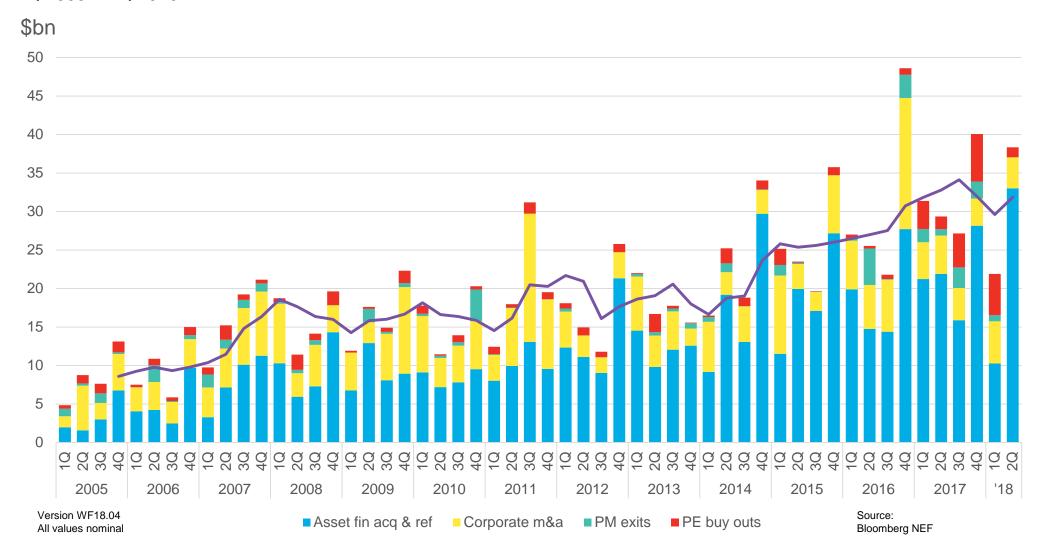


Global Clean Energy, Funds in Circulation, by Sector



Global Clean Energy, Funds in Circulation, by Asset Class

1Q 2005 - 2Q 2018



Top Deals

Top Quarterly Deals for 2Q 2018

Top Asset Finance Deals 2Q 2018

Project Name	Country	Sector	Type of Transaction	Capacity	Value
Borssele III & IV Offshore Wind Farm	Netherlands	Wind	Debt	731.5MW	\$1,659m
EIG Atacama 1 STEG Plant	Chile	Solar	Debt	110MW	\$881m
Hale County Wind Farm	U.S.	Wind	Equity	478MW	\$769m
Formosa I Miaoli Offshore Wind Farm	Taiwan	Wind	Debt	120MW	\$627m
Huanghe Hainan Gonghe Wind Farm	China	Wind	Equity	450MW	na
Geronimo Crocker Wind Farm	U.S.	Wind	Equity	400MW	na

Top Venture Capital / Private Equity Deals

Organisation	Country	Sector	Type of Transaction	Value
Youxia Motors	China	Electrified Transport	VC - Series B / Second round	\$795m
Future Mobility Corporation	China	Electrified Transport	VC - Series B / Second round	\$500m
Wunder	U.S.	Solar	VC - Series B / Second round	\$112m
<u>Proterra</u>	U.S.	Electrified Transport	PE - Expansion capital	\$100m

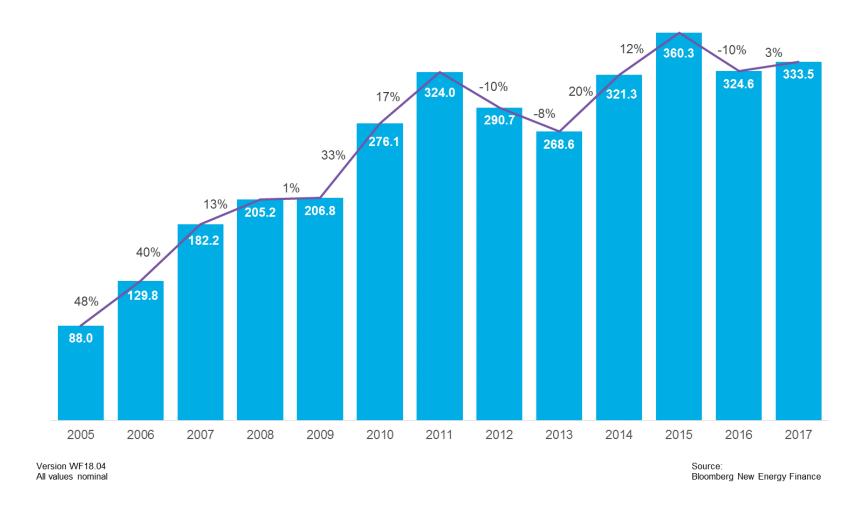
Top Public Market Deals 2Q 2018

Organisation	Stock Exchange	Sector	Type of Transaction	New Equity Raised
Contemporary Amperex Technology	Shenzhen Stock Exchange	Electrified Transport	IPO	\$852.5m
TerraForm Power	NASDAQ	Wind	PIPE	\$650m
Transalta Renewables	Toronto Stock Exchange	Wind	Secondary	\$ <u>112.7m</u>
Daqo New Energy	New York Stock Exchange	Wind	Secondary	\$110m

Annual Trends, New Investment

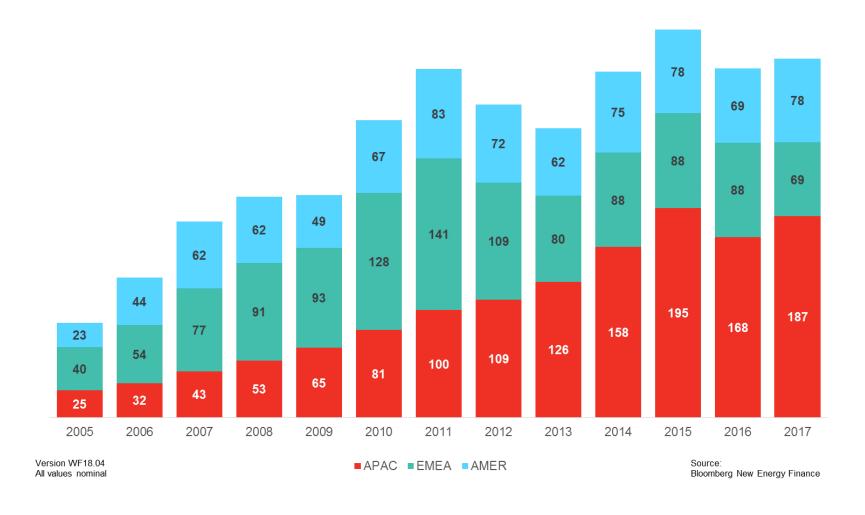
Annual trends since 2005

Global New Investment in Clean Energy 2005 – 2017



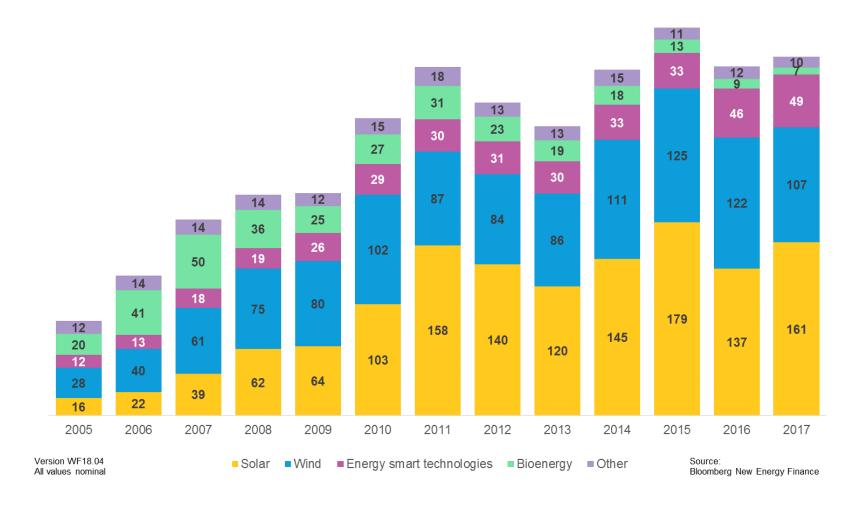
Global New Investment in Clean Energy by Region

2005 – 2017



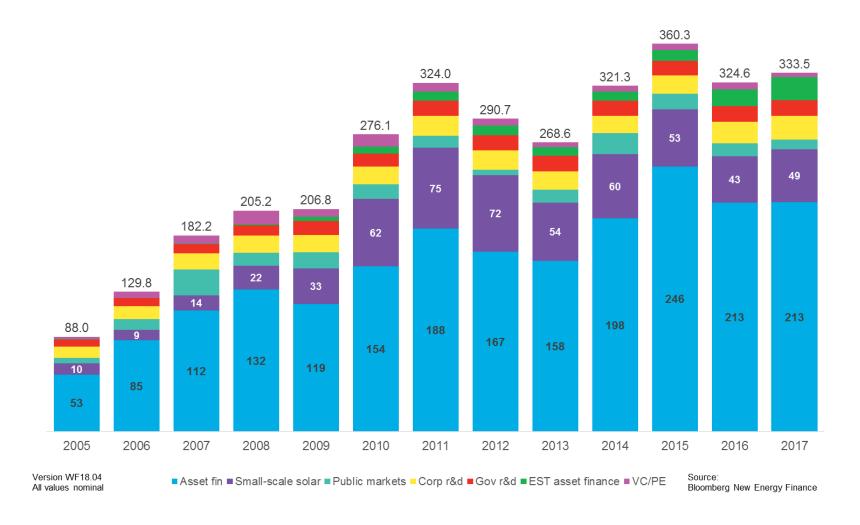
Global New Investment in Clean Energy by Sector

2005 - 2017



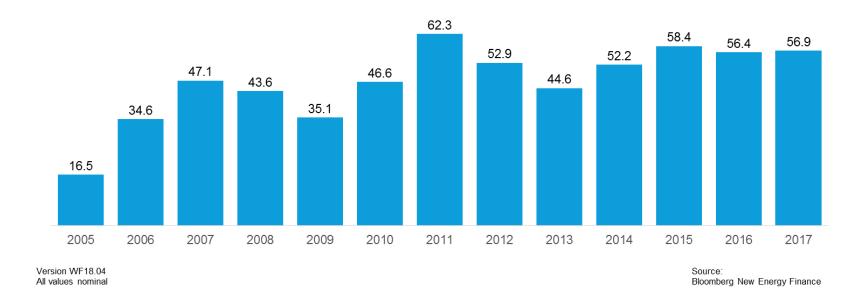
Global New Investment in Clean Energy by Asset Class

2005 - 2017



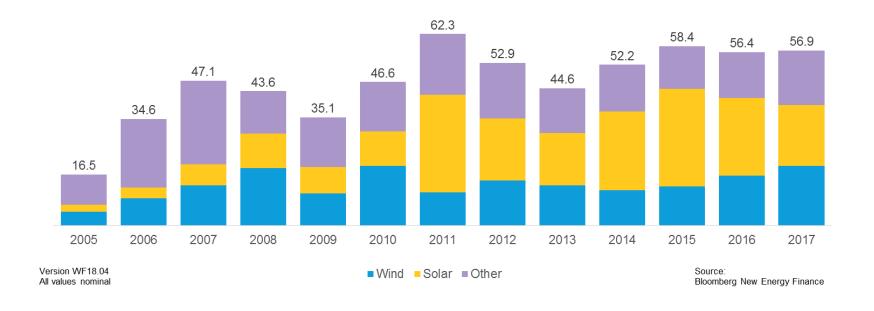
New Investment in Clean Energy United States

2005 - 2017

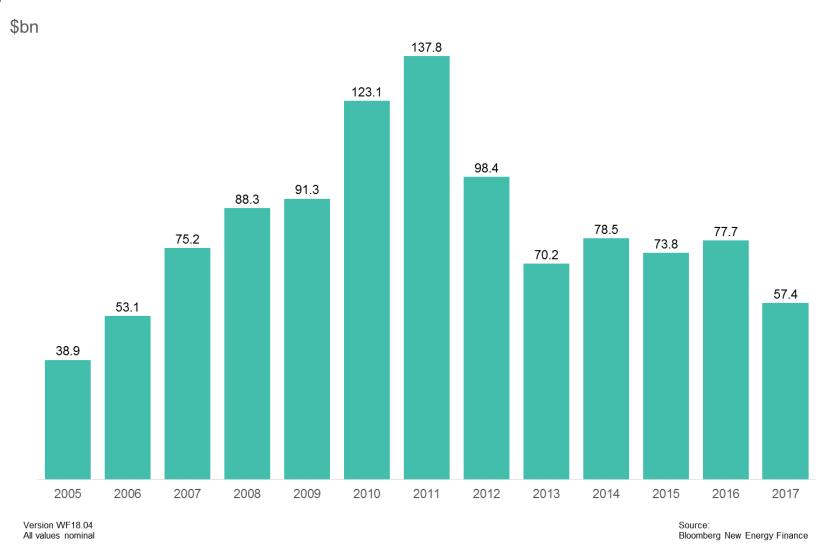


New Investment in Clean Energy United States, by sector

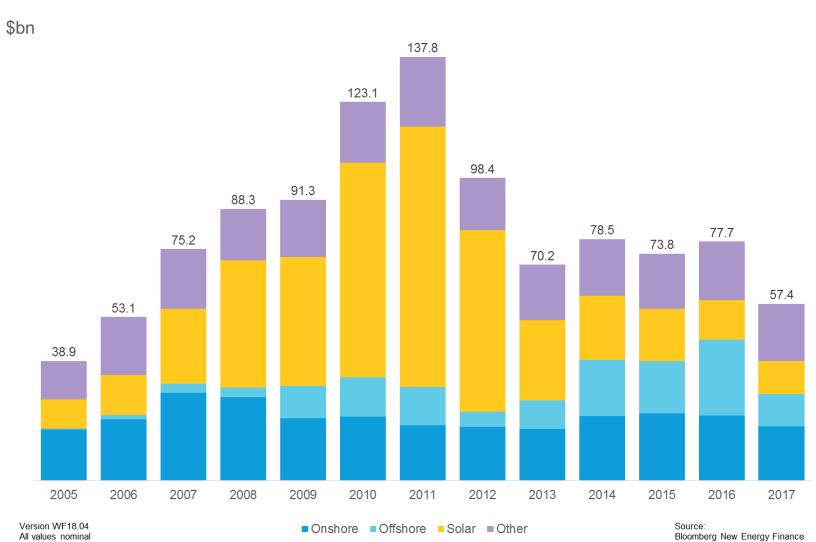
2005 - 2017



New Investment in Clean Energy Europe 2005 – 2017

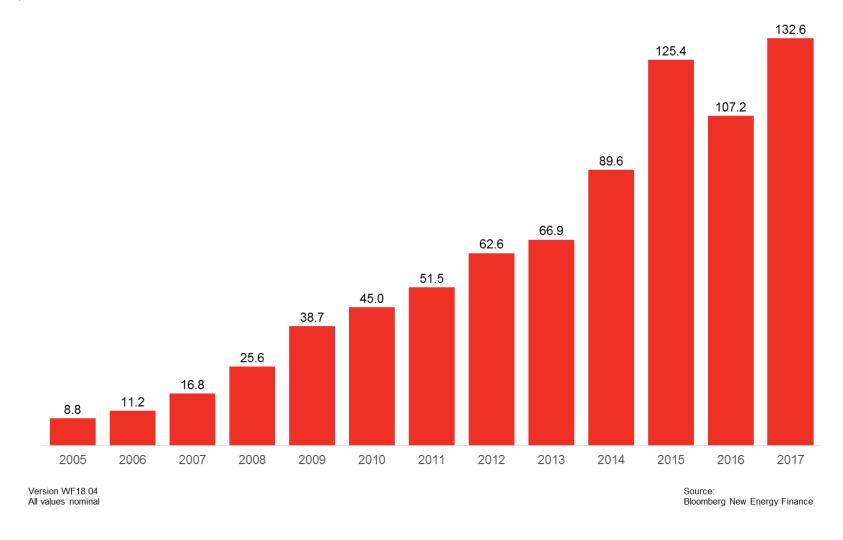


New Investment in Clean Energy Europe 2005 – 2017



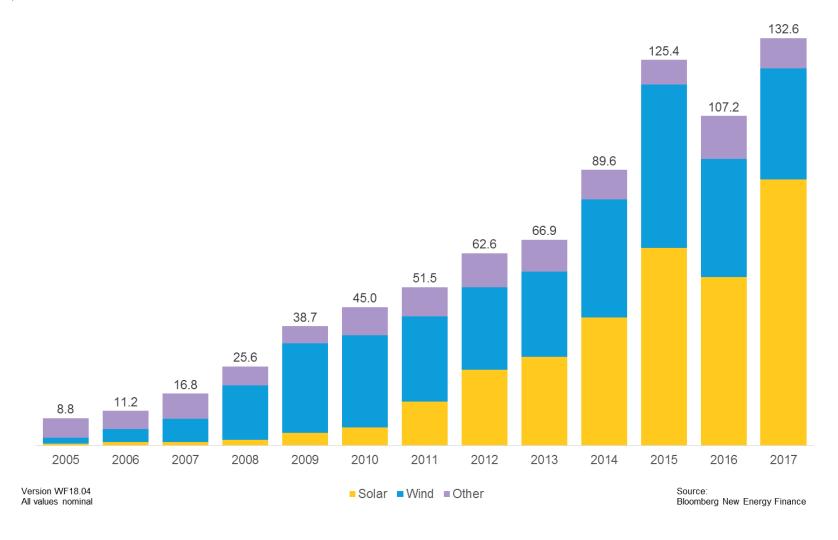
New Investment in Clean Energy China

2005 - 2017



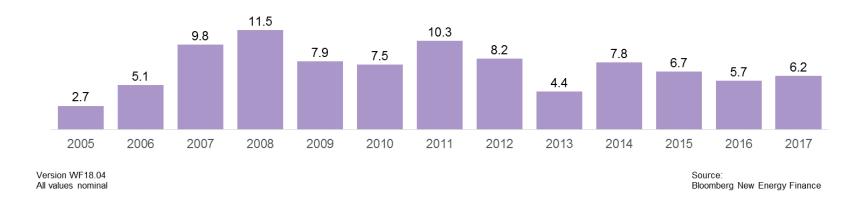
New Investment in Clean Energy China, by sector

2005 - 2017



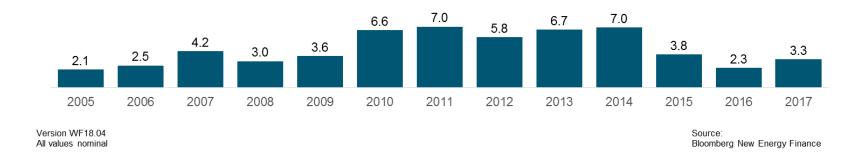
New Investment in Clean Energy Brazil

2005 - 2017



New Investment in Clean Energy Canada

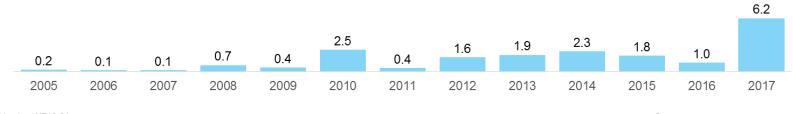
2005 - 2017



New Investment in Clean Energy Mexico

2005 - 2017

\$bn

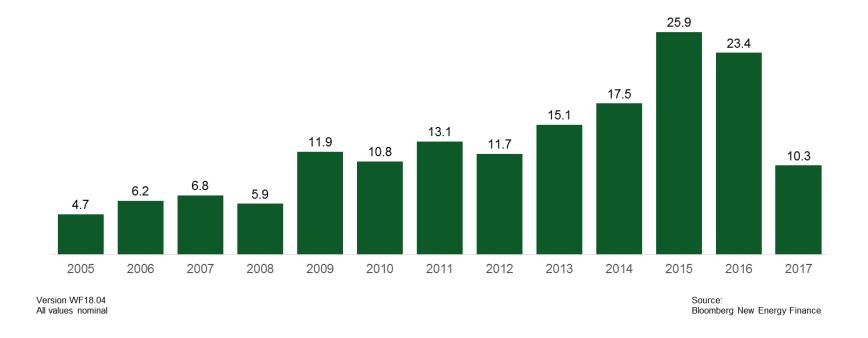


Version WF18.04 All values nominal

Source: Bloomberg New Energy Finance

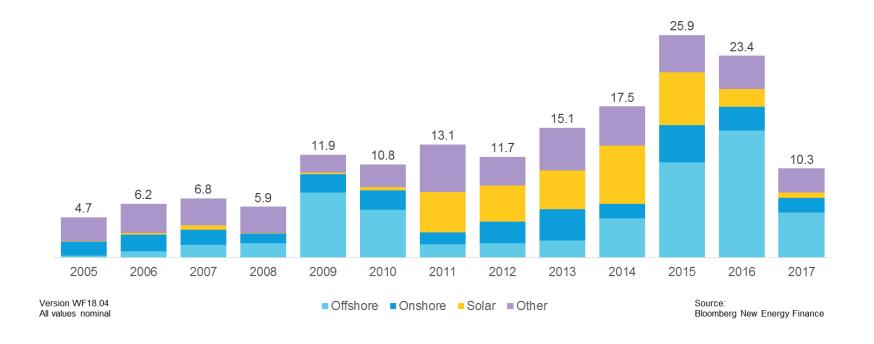
New Investment in Clean Energy United Kingdom

2005 - 2017



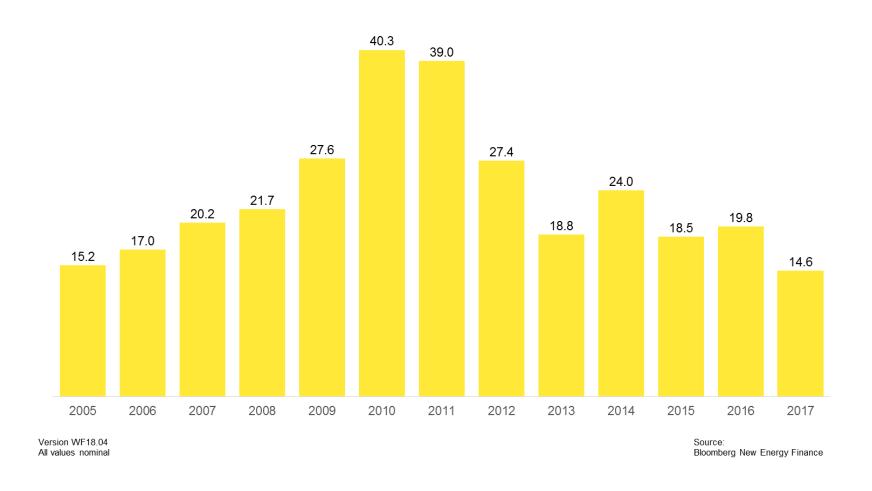
New Investment in Clean Energy United Kingdom, by sector

2005 - 2017



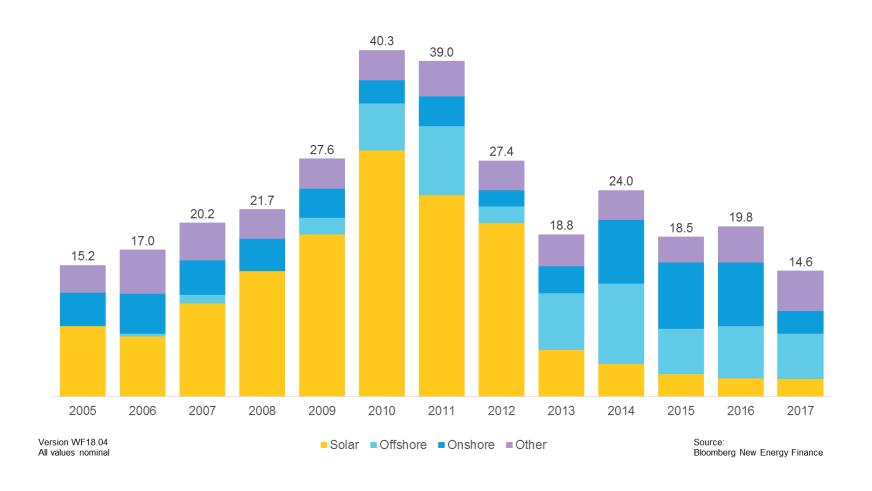
New Investment in Clean Energy Germany

2005 - 2017



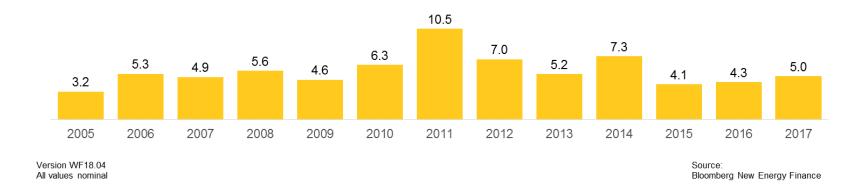
New Investment in Clean Energy Germany, by sector

2005 - 2017

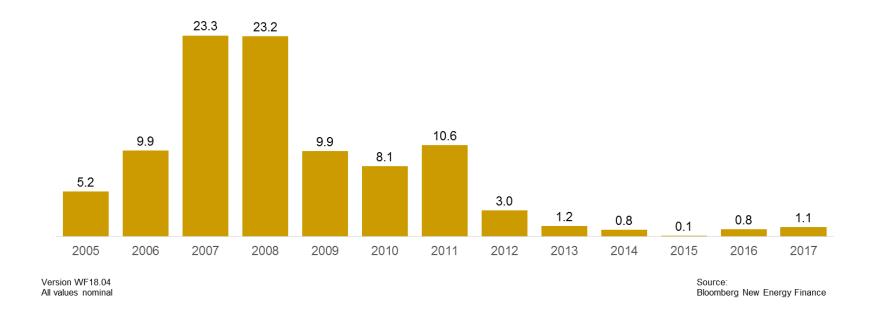


New Investment in Clean Energy France

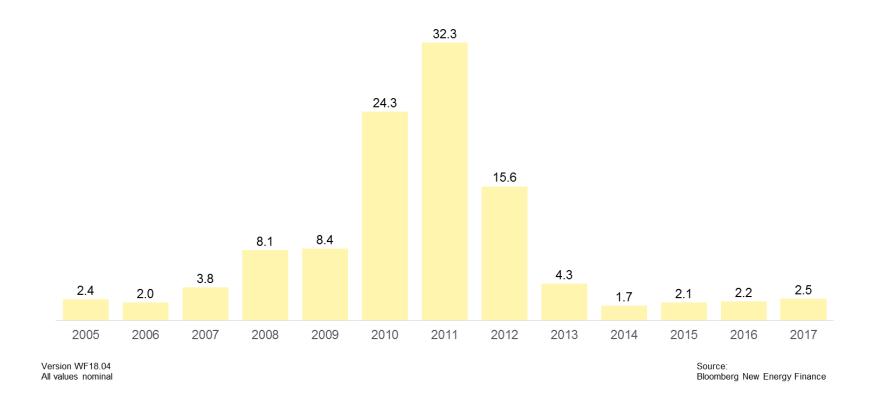
2005 - 2017



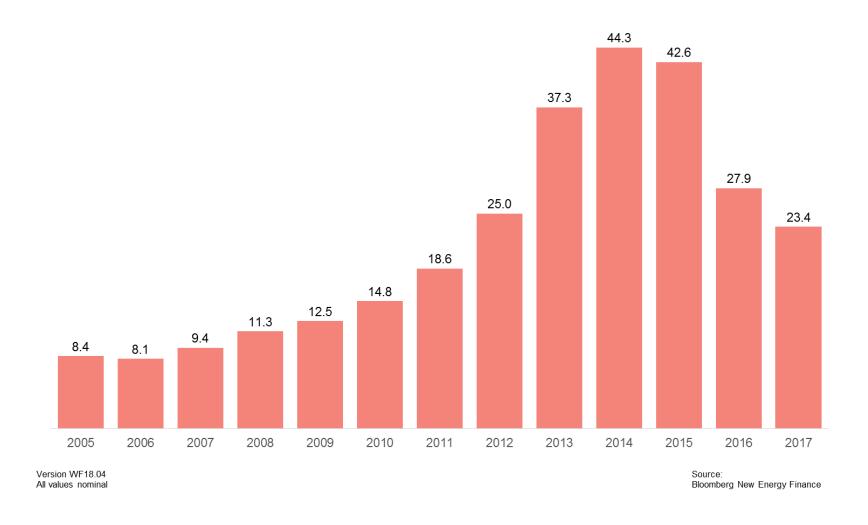
New Investment in Clean Energy Spain 2005 – 2017



New Investment in Clean Energy Italy 2005 - 2017

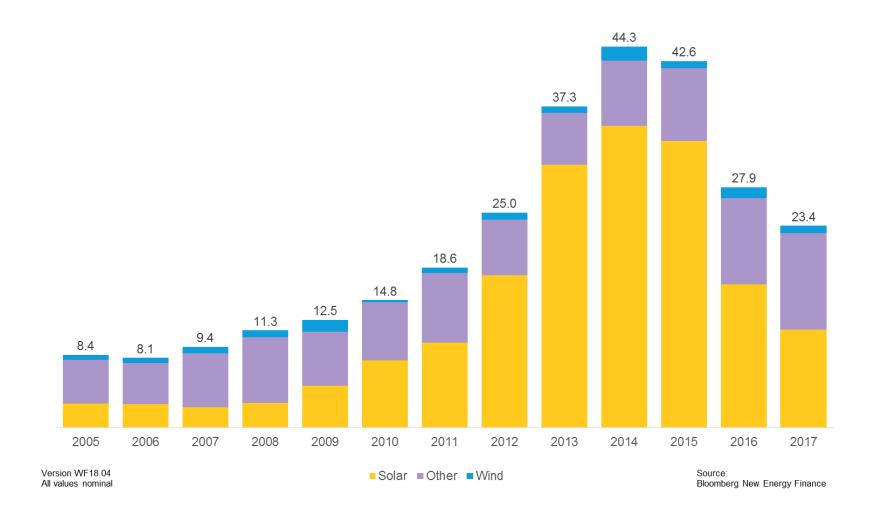


New Investment in Clean Energy Japan 2005 - 2017



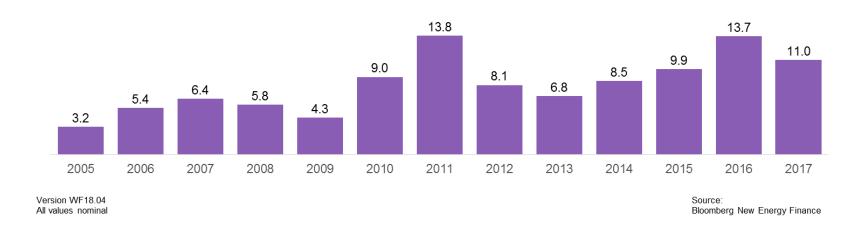
New Investment in Clean Energy Japan, by sector

2005 - 2017



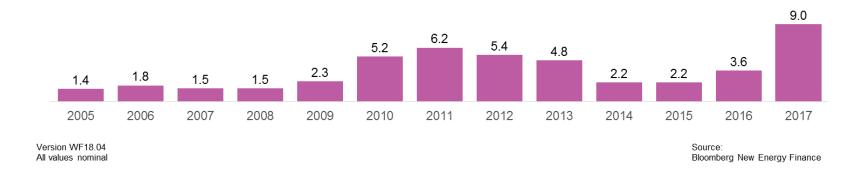
New Investment in Clean Energy India

2005 - 2017



New Investment in Clean Energy Australia

2005 - 2017

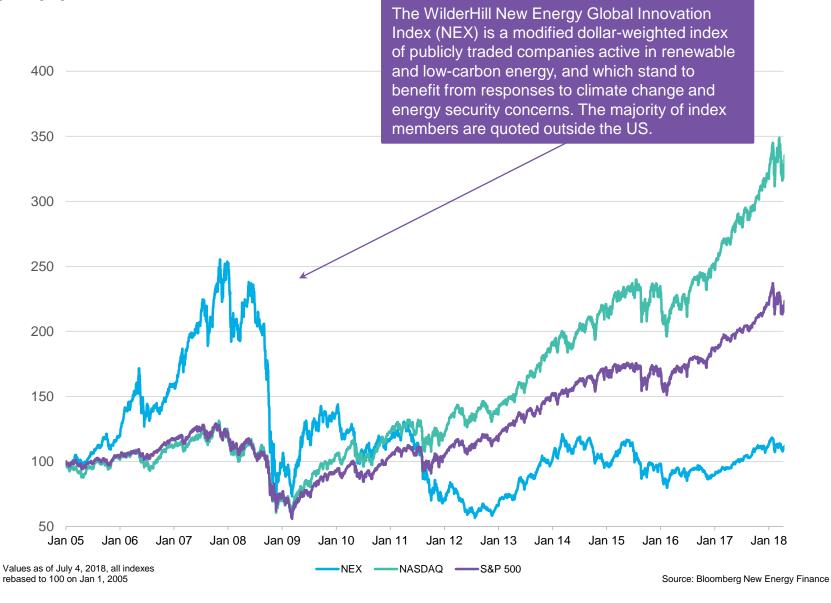


Clean Energy Stock Performance

Clean energy and the stock market

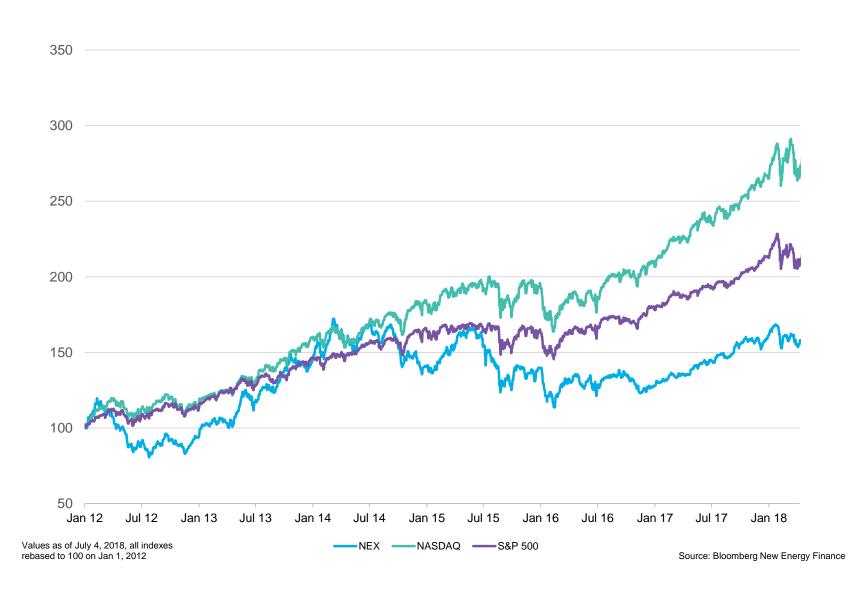
NEX vs NASDAQ & S&P 500

2005 - 2018 YTD



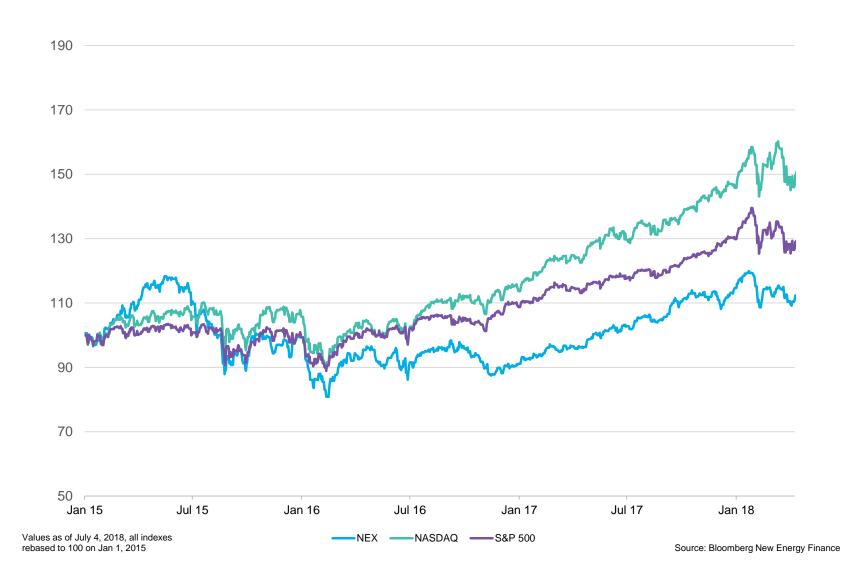
NEX vs NASDAQ & S&P 500

2012 - 2018 YTD



NEX vs NASDAQ & S&P 500

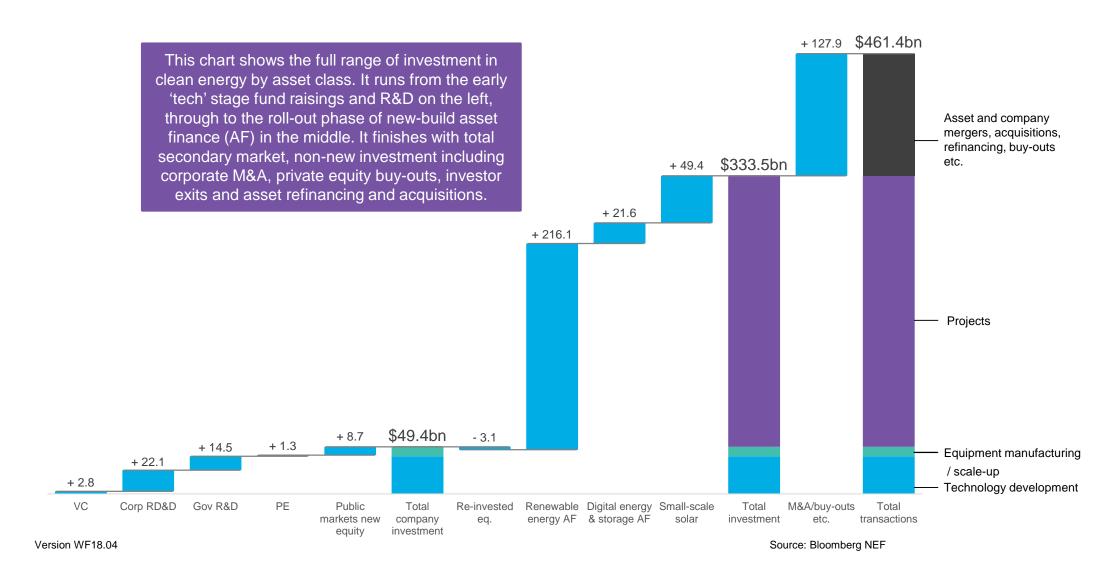
2015 - 2018 YTD



Definitions and FAQs

How Bloomberg New Energy Finance defines clean energy

2017 Clean Energy Investment Types and Flows



Asset classes

Venture capital and private equity (VCPE)

Early and late stage venture capital funding rounds of pure play clean energy companies as well as funds raised privately for the purposes of expansion.

Public markets (PM)

Funds raised by publicly quoted or OTC quoted pure play clean energy companies on the capital markets. This may be through IPOs or follow-on offerings like secondary offerings, private investment in public equity or PIPEs, convertibles etc.

Asset finance

The new build financing of renewable energy generating projects as well as smart metering and energy storage projects - smart metering and energy storage investment are only reported annually. Renewable energy generating projects includes both electricity generating and biofuels producing assets. Projects may be financed off the owner's balance sheet, or through financing mechanisms such as project finance, syndicated equity from institutional investors, or project bonds underwritten by banks.

Re-invested equity

Isolates values for balance sheet-financed project investments by companies who have raised money privately or publicly over the past 12 months. The purpose of this category is to prevent double counting of money raised publicly or privately that has been invested in clean energy assets.

Small scale solar

Given the technical limitations in tracking small-scale solar projects, BNEF's asset finance database excludes projects below roughly 1MW. Unlike utility scale asset investment, small-scale solar investment is based on top-down analyst estimates.

Government r&d

Government r&d figures are sourced from the IEA, IMF, OECD, and various government agencies.

Corporate r&d

The Bloomberg Terminal is used to source corporate r&d figures for key quoted companies in all clean energy sectors.

Sectors

Wind

Electricity generation using wind turbines. Included in this sector, are players across the entire value chain of both onshore and offshore developments. From manufacturers of turbines, components and subassemblies to developers, generators, utilities and engineering firm.

Solar

All technologies which capture energy directly from the sun. These include production of electricity using semiconductor-based photovoltaic (pv) materials, use of concentrated sunlight to heat fluids that drive power generation equipment (solar thermal), and passive methods which use sunlight to heat water. Whilst company level investment of passive methods is recorded, investment in passive projects is not.

Biofuels

Liquid transportation fuels including biodiesel and bioethanol. These can be derived from a range of biomass sources, including sugar cane, rape seed, soybean oil or non-food cellulosic feedstock. Our database excludes producers of base biomass, but includes suppliers of everything from the processing technologies and equipment, through the logistics of distribution, to manufacturers of energy systems which are specially adapted for the use of biofuels and products, and the services on which they depend.

Biomass & waste

Electricity and/or heat produced with bio-based feedstocks, typically through incineration but also through more advanced processes like gasification or anaerobic digestion. This sector also includes waste-to-energy which includes energy produced through landfill gas projects and incineration of municipal and industrial waste.

Energy smart technologies

This sector covers technologies like digital energy, smart grids, power storage, hydrogen and fuel cells, advanced transportation and energy efficiency on both the demand and supply side.

Other renewables

Includes small hydro - hydro projects with capacities smaller or equal to 50MW; geothermal - extraction of useful power from heat stored in the earth; marine - the extraction of tidal, wave and thermal energy from the ocean.

Sectors

Other low carbon tech / services

This sector covers clean energy service companies such as consultants, government agencies and policy makers, NGOs, financial service providers, investors, and clean energy information providers (such as ourselves). It also covers the corporate activity of organizations across the carbon market value chains.

FAQs

Q1: Why is there a difference between the sum of the quarterly figures and the annual figures?

Quarterly figures do not include certain asset classes which we only produce annually. These asset classes are corporate and government r&d and asset finance for energy smart technologies, in other words, smart meters and energy storage investment

Q2: Which countries are included in Europe?

Europe includes all 28 EU countries, and non-EU countries like Switzerland, Norway, Turkey and Russia. The majority of clean energy investment stems from the EU though

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