The report features:

- Global Overview
- Market & Industry Trends
- Distributed Renewable Energy for Energy Access
- Investment Flows
- Policy Landscape
- NEW: Enabling Technologies and Energy Systems Integration
- Energy Efficiency
- Feature: Deconstructing Baseload
In 2016 investors were able to acquire more renewable energy capacity for less money.

- 176 countries had **renewable energy targets**, renewable energy auctions were held in 34 countries in 2016 – more than double the year before.

- **Newly installed renewable power capacity set new records** in 2016, with 161 gigawatts (GW) added, increasing the global total by almost 9% relative to 2015.

- For the fifth consecutive year, **investment in new renewable power capacity** was roughly **double the investment in fossil fuel generating capacity**, reaching USD 249.8 billion.

- 2016 was the **third year in a row where global CO₂ emissions** from the energy sector remained stable despite a 3% growth in the global economy and an increased demand for energy.
Another extraordinary year for renewable energy

Total global capacity was up 9% compared to 2015, to 2,017 GW at year’s end (921 GW not including hydro)

- Solar PV - 47% of newly installed renewable power capacity in 2016
- Wind - 34%
- Hydropower - 15.5%
As of 2015, renewable energy provided an estimated **19.3%** of global final energy consumption.

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Renewable Energy in the World

*Estimated Renewable Energy Share of Total Final Energy Consumption, 2015*

- Fossil fuels: 78.4%
- Nuclear power: 2.3%
- All renewables: 19.3%
- Modern renewables: 10.2%
- Traditional biomass: 9.1%
- Biomass/geothermal/solar heat: 4.2%
- Hydropower: 3.6%
- Wind/solar/biomass/geothermal power: 1.6%
- Biofuels for transport: 0.8%

*REN21 Renewables 2017 Global Status Report*
### Renewable Energy “Champions”

#### Annual Investment/Net Capacity Additions/Production in 2016

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<th>Category</th>
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<tr>
<td>Investment in renewable power and fuels (not including hydro &gt; 50 MW)</td>
<td>China</td>
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<td>United Kingdom</td>
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<tr>
<td>Investment in renewable power and fuels per unit GDP³</td>
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<td>Hydropower capacity</td>
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<td>Solar PV capacity</td>
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<td>Concentrating solar thermal power (CSP) capacity²</td>
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<td>China</td>
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<td>Wind power capacity</td>
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<td>Solar water heating capacity</td>
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<td>Biodiesel production</td>
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<td>Fuel ethanol production</td>
<td>United States</td>
<td>Brazil</td>
<td>China</td>
<td>Canada</td>
<td>Thailand</td>
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</tbody>
</table>
Renewables comprised 30% of the world’s power generating capacity and 24.5% of global electricity demand.

**China** is home to more than one-quarter of the world’s renewable power capacity.
Modern renewable energy supplies approx. 9% of total global heat demand.

In 2016, the vast majority of renewable heat continued to be supplied by biomass, with smaller contributions from solar thermal and geothermal energy.

Deployment of renewable technologies in this market continued to be constrained by factors such as comparatively low fossil fuel prices and a relative lack of policy support.
In 2016, **liquid biofuels** provided around **4%** of world road transport fuels, which account for the majority of transport energy use.

**Biogas** use in transport grew substantially in the **United States** and continued to gain shares of the transport fuel mix in Europe.

Further **electrification** of the transport sector has the potential to create a **new market** for renewable energy and to facilitate the integration of **variable renewable energy**.
176 countries had renewable energy targets
126 countries had power policies
68 countries had transport policies
21 countries had heating and cooling policies

Number of Renewable Energy Regulatory Incentives and Mandates, by Type, 2014-2016

Note: Figure does not show all policy types in use. In many cases countries have enacted additional fiscal incentives or public finance mechanisms to support renewable energy. Heating and cooling policies do not include renewable heat FITs (e.g., in the United Kingdom). Countries are considered to have policies when at least one national or state/provincial-level policy is in place. A country is counted a single time if it has one or more national and/or state/provincial-level policies. Some transport policies include both biodiesel and ethanol; in this case, the policy is counted once in each category (biodiesel and ethanol). Tendering policies are presented in a given year if a jurisdiction has held at least one tender during that year.

Source: REN21 Policy Database.
The renewable energy sector employed 9.8 million people in 2016 - a 1.1% increase over 2015.
Global new investment in renewables was USD 241.6 billion in 2016.

For the fifth consecutive year, investment in new renewable power capacity was roughly double that in fossil fuel capacity.
Renewable energy investment in Japan fell 56% to USD 14.4 billion. Investment in small-scale capacity fell 69%, to its lowest level since 2011 (USD 8.5 billion).

Source: BNEF.
Global Investment in Renewable Energy

Solar and wind power continue to lead for money committed during 2016, each accounting for roughly 47% of total investment.
An estimated **USD 249.8 billion** was committed to constructing new renewable power plants, compared to:

- **Fossil fuel capacity**: USD 113.8 billion
- **Nuclear capacity**: USD 30 billion

Source: BNEF.
**Solar PV**

75 GW of solar PV capacity was added worldwide bringing the global solar PV capacity totaled 303 GW.

In 2016 approx. 8.6 GW of solar PV was installed in Japan, bringing the country’s total to 42.8 GW.
China added **34.5 GW** (up 126% over 2015), increasing its total solar PV capacity 45% to **77.4 GW**, far more than that of any other country.
55 GW of wind power capacity added

Global total increased 12% to 487 GW

2016 saw Japan add about 0.2 GW of capacity, pushing Asia’s total above 203 GW.

Wind Power Global Capacity and Annual Additions, 2006-2016

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Wind Power

At least 24 countries met 5% or more of their annual electricity demand with wind power.

Enough global capacity to meet 4% of total electricity consumption.

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Global bio-power capacity increased 6% in 2016 to **112 GW**

Generation increased 6% to **504 TWh**

Japan was the 5th biggest generator of electricity from biomass in 2016, producing 38 TWh.
0.4 GW of new geothermal power generating capacity came online in 2016, bringing the global total to an estimated 13.5 GW.

Indonesia and Turkey were in the lead for new installations.

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Global grid-connected and stationary energy storage capacity in 2016 totalled an estimated **156 GW**.
Grid-connected battery storage grew by 50% in 2016


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Global sales of EVs reached 775,000 units

More than 2 million passenger EVs were on the world's roads by year's end (1% of the light vehicle market)

So far, little linking of renewable energy and electric mobility

Global Passenger Electric Vehicle Market (Including PHEVs), 2012-2016

By the end of 2016, 2 million passenger EVs were on the world's roads. EVs accounted for around 1% of global passenger car sales.

REN21 Renewables 2017 Global Status Report
By end-2016, at least 149 countries had enacted one or more energy efficiency targets.

Of these countries, 56 adopted a new target in 2015 or 2016.

Countries with Energy Efficiency Targets, 2016

Source: REN21 Policy Database.

REN21. Renewables 2017 Global Status Report
Traditional baseload generators such as coal and nuclear are beginning to lose their economic advantage and may no longer be the first to dispatch energy.

A number of countries and regions – including Denmark, Germany, Uruguay and Cabo Verde – have integrated high shares (from 20-40%) of variable renewable energy.
Conclusions

→ Record installed capacity, however progress not fast enough to reach Paris Agreement goals
→ Fossil fuels must be left in the ground
→ Focus on dispatchable renewable energy & flexibility options to integrate high-shares of renewables – shift away from baseload
→ Increased effort to speed up sustainable energy access
→ Policy matters: system approach needed for linking power, heating and cooling as well as transport sector
→ More use of enabling technologies such as storage, EVs, etc.