REN21 is a multi stakeholder network dedicated to the rapid uptake of renewable energy worldwide.

**Science & Academia:**
- IIASA, ISES, SANEDI, TERI, Fundacion Bariloche

**NGOs:**
- CURES, GFSE, Greenpeace, ICLEI, ISEP, IREF, RCREEE, WCRE, WFC, WRI, WWF

**Industry Associations:**
- ACORE, ARE, CEC, CREIA, EREF, GWEC, IGA, IHA, IREF, WBA, WWEA

**International Organisations:**
- ADB, EC, ECREEE, GEF, IEA, IRENA, UNDP, UNEP, UNIDO, World Bank

**National Governments:**
- Brazil, Denmark, Germany, India, Norway, Spain, Uganda, UAE, UK
Launched at Vienna Energy Forum on 18 June 2015

Network of over 500 contributors, researchers & reviewers worldwide

The report features:

- Global Overview
- Market & Industry Trends
- Investment Flows
- Policy Landscape
- Distributed Renewable Energy for Energy Access
- Energy Efficiency
- Feature: Using Renewables for Climate Change Adaptation

The report covers:

- All renewable energy technologies
- The power, heating & cooling, and transport sector
- Energy Efficiency
REN21 produces regional status reports on renewable energy and energy efficiency

→ **ECOWAS** launched in November 2014
→ **SADC** to be launched at SAIREC, October 2015
→ **UNECE** report to be launched at COP21, December 2015
→ **EAC** to be launched early 2016
REN21 Renewables Interactive Map

Facilitate access to renewables knowledge through an intuitive and dynamic interface

www.ren21.net/map
A Decade Of Renewable Energy Growth Surpassing Expectations

The evolution of renewable energy has surpassed all expectations.

Global installed capacity and production from all renewable technologies have increased substantially.

Significant cost reductions for most technologies.

Supporting policies spread throughout the world.
Renewable Energy in the World

Renewable energy provided an estimated **19.1%** of global final energy consumption in 2013.

The share of **modern renewable energy** increased to **10.1%**.

The share of **traditional biomass** was of **9%**, same as in 2012.
Renewable Energy “Champions“ - annual investment/capacity additions

<table>
<thead>
<tr>
<th>1. Investment in renewable power and fuels (not including hydro &gt; 50 MW)</th>
<th>China</th>
<th>United States</th>
<th>Japan</th>
<th>United Kingdom</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment relative to annual GDP</td>
<td>Burundi</td>
<td>Kenya</td>
<td>Honduras</td>
<td>Jordan</td>
<td>Uruguay</td>
</tr>
<tr>
<td>Geothermal power capacity</td>
<td>Kenya</td>
<td>Turkey</td>
<td>Indonesia</td>
<td>Philippines</td>
<td>Italy</td>
</tr>
<tr>
<td>Hydropower capacity</td>
<td>China</td>
<td>Brazil</td>
<td>Canada</td>
<td>Turkey</td>
<td>India</td>
</tr>
<tr>
<td>Solar PV capacity</td>
<td>China</td>
<td>Japan</td>
<td>United States</td>
<td>United Kingdom</td>
<td>Germany</td>
</tr>
<tr>
<td>CSP capacity</td>
<td>United States</td>
<td>India</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Wind power capacity</td>
<td>China</td>
<td>Germany</td>
<td>United States</td>
<td>Brazil</td>
<td>India</td>
</tr>
<tr>
<td>Solar water heating capacity</td>
<td>China</td>
<td>Turkey</td>
<td>Brazil</td>
<td>India</td>
<td>Germany</td>
</tr>
<tr>
<td>Biodiesel production</td>
<td>United States</td>
<td>Brazil</td>
<td>Germany</td>
<td>Indonesia</td>
<td>Argentina</td>
</tr>
<tr>
<td>Fuel ethanol production</td>
<td>United States</td>
<td>Brazil</td>
<td>China</td>
<td>Canada</td>
<td>Thailand</td>
</tr>
</tbody>
</table>

REN21 Renewables 2015 Global Status Report
### Renewable Energy “Champions” – total capacity

#### Total Capacity or Generation as of End-2014

<table>
<thead>
<tr>
<th>POWER</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable power (incl. hydro)</td>
<td>China</td>
<td>United States</td>
<td>Brazil</td>
<td>Germany</td>
<td>Canada</td>
</tr>
<tr>
<td>Renewable power (not incl. hydro)</td>
<td>China</td>
<td>United States</td>
<td>Germany</td>
<td>Spain / Italy</td>
<td>Japan / India</td>
</tr>
<tr>
<td>Renewable power capacity per capita (not incl. hydro)</td>
<td>Denmark</td>
<td>Germany</td>
<td>Sweden</td>
<td>Spain</td>
<td>Portugal</td>
</tr>
<tr>
<td>Biopower generation</td>
<td>United States</td>
<td>Germany</td>
<td>China</td>
<td>Brazil</td>
<td>Japan</td>
</tr>
<tr>
<td>Geothermal power capacity</td>
<td>United States</td>
<td>Philippines</td>
<td>Indonesia</td>
<td>Mexico</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Hydropower capacity</td>
<td>China</td>
<td>Brazil</td>
<td>United States</td>
<td>Canada</td>
<td>Russia</td>
</tr>
<tr>
<td>Hydropower generation</td>
<td>China</td>
<td>Brazil</td>
<td>United States</td>
<td>Canada</td>
<td>United States</td>
</tr>
<tr>
<td>Concentrating solar thermal power (CSP)</td>
<td>Spain</td>
<td>United States</td>
<td>India</td>
<td>United Arab Emirates</td>
<td>Algeria</td>
</tr>
<tr>
<td>Solar PV capacity</td>
<td>Germany</td>
<td>China</td>
<td>Japan</td>
<td>Italy</td>
<td>United States</td>
</tr>
<tr>
<td>Solar PV capacity per capita</td>
<td>Germany</td>
<td>Italy</td>
<td>Belgium</td>
<td>Greece</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Wind power capacity</td>
<td>China</td>
<td>United States</td>
<td>Germany</td>
<td>Spain</td>
<td>India</td>
</tr>
<tr>
<td>Wind power capacity per capita</td>
<td>Denmark</td>
<td>Sweden</td>
<td>Germany</td>
<td>Spain</td>
<td>Ireland</td>
</tr>
<tr>
<td>HEAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar water collector capacity</td>
<td>China</td>
<td>United States</td>
<td>Germany</td>
<td>Turkey</td>
<td>Brazil</td>
</tr>
<tr>
<td>Solar water heating collector capacity per capita</td>
<td>Cyprus</td>
<td>Austria</td>
<td>Israel</td>
<td>Barbados</td>
<td>Greece</td>
</tr>
<tr>
<td>Geothermal heat capacity</td>
<td>China</td>
<td>Turkey</td>
<td>Japan</td>
<td>Iceland</td>
<td>India</td>
</tr>
<tr>
<td>Geothermal heat capacity per capita</td>
<td>Iceland</td>
<td>New Zealand</td>
<td>Hungary</td>
<td>Turkey</td>
<td>Japan</td>
</tr>
</tbody>
</table>
Power Sector

- Renewables accounted 27.7% of global power generation capacity and 22.8% of global electricity demand.
- Renewables made up for 59% of net additions to global power capacity.
- Total RE power capacity: 1712 GW, an increase of more than 8.5% over 2013.
Heating & Cooling

Energy use for heat accounted for about half of total world final energy consumption in 2014.

Small but growing modern renewable energy share of final global heat demand: approx. 8%.

Trends:
• Growing interest, although advanced systems represent a small fraction of the global market
• Slow growth but vast potential—key for the energy transition
Transport

Renewable energy accounted for an estimated **3.5%** of global energy demand for road transport in 2013, up from **2%** in 2007.

Primary focus of policies, markets, industry: **liquid biofuels**

Trends in the development of **gaseous fuels** and **electricity** create pathways for the integration of renewables into transportation.

Growing interest in new applications and markets for biofuels.
Wind Power – total global capacity

51 GW of capacity were added

Total capacity: **370 GW**

Offshore, an estimated **1.7 GW** of grid-connected capacity was added in 2014, for a world total exceeding **8.5 GW**

REN21 Renewables 2015 Global Status Report
Solar Photovoltaics (PV) – total global capacity

Solar PV:
- +40 GW added
- Total capacity: **177 GW**

**More than 60% of all PV capacity** in operation worldwide at the end of 2014 was **added over the past three years**.

**Asia** eclipsed all other markets, accounting for almost **60%** of global additions.
Total primary energy demand from biomass was approximately **16,250 TWh** (58.5 EJ).

Biomass was used to produce an estimated **12,500 TWh** (45 EJ) of heat (addition of 9 GW\textsubscript{th}).

Bio-power capacity increased by an estimated **5 GW** in 2014 to a total of approx. 93 GW.
Cumulative capacity of all collector types in operation of 374.7 GWh (+ 44 GWh)

China accounts for nearly 81% of the global market.

2014 Trends:
- focus on glazed water collectors
- slowdown in market growth continued in 2014
- China seeing a trend away from market to commercial
Jobs in Renewable Energy

Global employment continued to increase

An estimated **7.7 million direct or indirect jobs** in the renewable energy industry

Global wind power employment crossed the 1 million jobs threshold in 2014

*Source: IRENA*
Global Investment in Renewable Energy

Global new investment estimated USD 270.2 billion in 2014 (including hydropower USD 301 billion)

Reasons for the increase:
- Increase in solar power installations in China and Japan
- Investment in solar power up 25%
- Record investment in offshore wind projects in Europe
Developed Countries: Annual investment in 2014: USD 138.9 billion (increase of 3% compared to 2013)

Developing Countries: annual investment in 2014: USD 131.3 billion (increase of 36% compared to 2013)
Renewable Energy Policy Landscape


Countries are considered to have policies when at least one national or state/provincial-level policy is in place.

REN21 Renewables 2015 Global Status Report
Renewable Energy Policy Landscape

At least **164 countries** had renewable energy targets.

At least **145 countries** had renewable energy policies in place.

Most policies focus on power: mainly feed-in-tariffs and renewable portfolio standards.

Recent trends: Merging of components from different policy mechanisms.
Power sector: the main focus of policies over the last years

FITs were the most popular type of policy

Net metering or net billing policies were in force in 48 countries as of early 2015, increase of approx. 220%. (2010: 15 countries, 2015: 48 countries)
Distributed Renewable Energy in Developing Countries

15% of the global population still lack any access to an electricity grid.

2.9 billion people lack access to cleaner forms of cooking.

Distributed renewable energy systems offer unprecedented opportunity to accelerate the transition to modern energy services in remote areas, as they are more cost-competitive.

Little quantitative information on DRE markets, but information available indicates that markets are significant, e.g. off-grid solar PV attracted approx. USD 64 billion of investment in 2014.
Distributed Renewable Energy in Developing Countries

Regional differences:
- 23 GW of renewable energy power capacities in Sub-Saharan Africa (excluding South Africa) – less than one third installed in India
- Bangladesh: 3 million SHS operational at the end of May 2014, electrifying 9% of the country’s population

Trends:
- Involvement of the private sector
- Increased recognition of the role renewable energy play for energy access → Increase in development of off-grid renewable energy programmes and creation of DRE institutions
### TABLE R22. DISTRIBUTED RENEWABLE ENERGY MARKETS AND INSTALLED CAPACITIES: EXAMPLES

| Country          | Technology/System | Capacity Added in 2014 | Cumulative at End-2014 | Additional Information
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Africa</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angola</td>
<td>Solar powerwall 2</td>
<td>250 kW</td>
<td>1,077,000 kwh</td>
<td>67% households electrified by REE members</td>
</tr>
<tr>
<td>Senegal</td>
<td>Solar PV (grid)</td>
<td>100 units</td>
<td>230 units</td>
<td>Implemented under the EEEW Programme</td>
</tr>
<tr>
<td></td>
<td>Solar lamps</td>
<td>3,500 units</td>
<td>1,875 units</td>
<td>Implemented under an SNF funded O&amp;M project</td>
</tr>
<tr>
<td></td>
<td>Solar powerwall 2</td>
<td>100 units</td>
<td>100 units</td>
<td>250 people electrified by REE members</td>
</tr>
<tr>
<td></td>
<td>Hybrid mini-grid</td>
<td>26 kW (2012)</td>
<td>Implementing North Korean solar and wind Solar project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biogas digester</td>
<td>100 units</td>
<td>100 units</td>
<td>250 people electrified by REE members</td>
</tr>
<tr>
<td></td>
<td>Improved cookstoves</td>
<td>60,000 units</td>
<td>214,000 units</td>
<td>Implemented under the EEEW Programme</td>
</tr>
<tr>
<td><strong>Sub-Saharan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar home systems (SHS)</td>
<td>1,000 units</td>
<td>1,000 units</td>
<td>1,000 units</td>
<td>Implemented under the SNF funded Small Solar Home Systems project</td>
</tr>
<tr>
<td>Solar PV (grid)</td>
<td>3,000 units</td>
<td>3,000 units</td>
<td>3,000 units</td>
<td>Implemented under the SNF funded Small Solar Home Systems project</td>
</tr>
<tr>
<td>Hybrid mini-grid (PM/diesel)</td>
<td>45 kW</td>
<td>45 kW</td>
<td>45 kW</td>
<td>Implemented under the SNF funded Small Solar Home Systems project</td>
</tr>
<tr>
<td>Biogas digester</td>
<td>1,462 units</td>
<td>1,462 units</td>
<td>1,462 units</td>
<td>Implemented under the SNF funded Small Solar Home Systems project</td>
</tr>
<tr>
<td>Improved cookstoves</td>
<td>24,500 units</td>
<td>24,500 units</td>
<td>24,500 units</td>
<td>Implemented under the SNF funded Small Solar Home Systems project</td>
</tr>
<tr>
<td>Improved cookstoves</td>
<td>845 units</td>
<td>845 units</td>
<td>845 units</td>
<td>Implemented under the SNF funded Small Solar Home Systems project</td>
</tr>
<tr>
<td><strong>South Africa</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar PV (grid)</td>
<td>5,350 units</td>
<td>5,350 units</td>
<td>5,350 units</td>
<td>Implemented under the EEEW Programme</td>
</tr>
<tr>
<td>Biogas digester</td>
<td>901 units</td>
<td>901 units</td>
<td>901 units</td>
<td>Implemented under the EEEW Programme</td>
</tr>
<tr>
<td>Improved cookstoves</td>
<td>104 units</td>
<td>104 units</td>
<td>104 units</td>
<td>Implemented under the EEEW Programme</td>
</tr>
<tr>
<td><strong>Cameroon</strong></td>
<td>Hybrid mini-grids</td>
<td>22 kW</td>
<td>22 kW</td>
<td>22 kW hybrid mini grids operating</td>
</tr>
<tr>
<td></td>
<td>Biogas digester</td>
<td>104 units</td>
<td>104 units</td>
<td>104 units giga watt hours</td>
</tr>
<tr>
<td><strong>Congo</strong></td>
<td>Solar PV (grid)</td>
<td>650 kW</td>
<td>650 kW</td>
<td>650 kW grid</td>
</tr>
<tr>
<td></td>
<td>Solar PV (grid)</td>
<td>530 units</td>
<td>530 units</td>
<td>530 units grid</td>
</tr>
<tr>
<td></td>
<td>Improved cookstoves</td>
<td>144 units</td>
<td>144 units</td>
<td>144 units grid</td>
</tr>
<tr>
<td><strong>Democratic Republic of the Congo</strong></td>
<td>Solar PV (grid)</td>
<td>300 units</td>
<td>300 units</td>
<td>300 units grid</td>
</tr>
<tr>
<td></td>
<td>Improved cookstoves</td>
<td>1,520 units</td>
<td>1,520 units</td>
<td>1,520 units grid</td>
</tr>
<tr>
<td><strong>Ethiopia</strong></td>
<td>Solar PV (grid)</td>
<td>5 kW</td>
<td>5 kW</td>
<td>5 kW</td>
</tr>
</tbody>
</table>

**Additional Information:**
- 67% installed for rural telecom applications, 31% for water pumping, and 21% for home systems. 
- Distributed on national level.
Conclusions

Renewable energy continued to grow in 2014 against the backdrop of increasing global energy consumption, and a dramatic decline in oil prices (second half of 2014). For the first time in 40 years, economic and CO₂ growth has “decoupled” – marking a record year for renewables.

The past decade has set the wheels in motion for a global transition to renewables, but a concerted and sustained effort is needed to achieve it:

- Long-term and stable policy frameworks, which can adapt to changing environment, to sustain and increase investment levels
- Greater attention to the heating and cooling and the transport sector and “energy system thinking”
- Improve information on distributed renewable energy markets in developing countries and improve access to up-front finance

See you at SAIREC 2015
Cape Town, 4-7 October 2015
Outlook GSR2016 - Distributed Renewable Energy

Objective
- Portray the distributed renewable energy market using qualitative and quantitative data
- Highlight the importance growing role of this renewable energy market segment

GSR2016 Milestones
• October 2015:
  • Collection of country/regional information
  • Collection of quantitative data for 2014 (from programmes, projects, industries etc.)
• January: expert peer review
• February: update of quantitative data for 2015

Please send a mail to gsr@ren21.net to participate!
RENEWABLE ENERGY POLICY NETWORK FOR THE 21st CENTURY

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