RENEWABLES 2014 GLOBAL STATUS REPORT

LATIN AMERICA CESC WEBINAR

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Executive Secretary

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Network of over 500 contributors, researchers & reviewers worldwide

The report features:
• Global Overview
• Market & Industry Trends
• Investment Flows
• Policy Landscape
• Distributed Renewable Energy in Developing Countries
• Feature: Tracking the Global Energy Transition (10 years of RE progress)

The report covers:
• All renewable energy technologies
• The power, heating & cooling, and transport sector
A DECADE OF RENEWABLE ENERGY GROWTH SURPASSING EXPECTATIONS

Projected levels of renewable energy for 2020 were already surpassed by 2010.

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

Significant cost reductions for most technologies

Supporting policies spread throughout the world.

<table>
<thead>
<tr>
<th></th>
<th>START 2004</th>
<th>END 2012</th>
<th>END 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INVESTMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New investment (annual) in renewable power and fuels</td>
<td>billion USD</td>
<td>39.5</td>
<td>249.5</td>
</tr>
<tr>
<td><strong>POWER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewable power capacity (total, not including hydro)</td>
<td>GW</td>
<td>85</td>
<td>480</td>
</tr>
<tr>
<td>Renewable power capacity (total, including hydro)</td>
<td>GW</td>
<td>800</td>
<td>1,440</td>
</tr>
<tr>
<td>Wind power capacity (total)</td>
<td>GW</td>
<td>715</td>
<td>960</td>
</tr>
<tr>
<td>Bio-power capacity</td>
<td>GW</td>
<td>&lt;36</td>
<td>83</td>
</tr>
<tr>
<td>Bio-power generation</td>
<td>TWh</td>
<td>227</td>
<td>350</td>
</tr>
<tr>
<td>Geothermal power capacity</td>
<td>GW</td>
<td>8.9</td>
<td>11.5</td>
</tr>
<tr>
<td>Solar PV capacity (total)</td>
<td>GW</td>
<td>2.6</td>
<td>100</td>
</tr>
<tr>
<td>Concentrating solar thermal power (total)</td>
<td>GW</td>
<td>0.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Wind power capacity (total)</td>
<td>GW</td>
<td>48</td>
<td>283</td>
</tr>
<tr>
<td><strong>HEAT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar hot water capacity (total)</td>
<td>GW</td>
<td>98</td>
<td>282</td>
</tr>
<tr>
<td><strong>TRANSPORT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethanol production (annual)</td>
<td>billion litres</td>
<td>28.5</td>
<td>82.6</td>
</tr>
<tr>
<td>Biodiesel production (annual)</td>
<td>billion litres</td>
<td>2.4</td>
<td>23.6</td>
</tr>
</tbody>
</table>
Renewable energy provided an estimated 19% of global final energy consumption.

The share of modern renewable energy increased to 10%.

The share of traditional biomass was of 9%.
## RENEWABLE ENERGY CHAMPIONS - annual investment/capacity additions

<table>
<thead>
<tr>
<th>Investment in renewable power and fuels</th>
<th>China</th>
<th>United States</th>
<th>Japan</th>
<th>United Kingdom</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of GDP 2012 (USD) invested</td>
<td>Uruguay</td>
<td>Mauritius</td>
<td>Costa Rica</td>
<td>South Africa</td>
<td>Nicaragua</td>
</tr>
<tr>
<td>Geothermal power capacity</td>
<td>New Zealand</td>
<td>Turkey</td>
<td>United States</td>
<td>Kenya</td>
<td>Philippines</td>
</tr>
<tr>
<td>Hydropower capacity</td>
<td>China</td>
<td>Turkey</td>
<td>Brazil</td>
<td>Vietnam</td>
<td>India</td>
</tr>
<tr>
<td>Solar PV capacity</td>
<td>China</td>
<td>Japan</td>
<td>United States</td>
<td>Germany</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>CSP capacity</td>
<td>United States</td>
<td>Spain</td>
<td>United Arab Emirates</td>
<td>India</td>
<td>China</td>
</tr>
<tr>
<td>Wind power capacity</td>
<td>China</td>
<td>Germany</td>
<td>United Kingdom</td>
<td>India</td>
<td>Canada</td>
</tr>
<tr>
<td>Solar water heating capacity</td>
<td>China</td>
<td>Turkey</td>
<td>India</td>
<td>Brazil</td>
<td>Germany</td>
</tr>
<tr>
<td>Biodiesel production</td>
<td>United States</td>
<td>Germany</td>
<td>Brazil</td>
<td>Argentina</td>
<td>France</td>
</tr>
<tr>
<td>Fuel ethanol production</td>
<td>United States</td>
<td>Brazil</td>
<td>China</td>
<td>Canada</td>
<td>France</td>
</tr>
</tbody>
</table>
## RENEWABLE ENERGY CHAMPIONS – total capacity

### Total capacity or generation as of end-2013

<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>Canada</td>
<td>Germany</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>India</td>
</tr>
<tr>
<td>Renewable power capacity per capita (not incl. hydro)²</td>
<td>Denmark</td>
<td>Germany</td>
<td>Portugal</td>
<td>Spain / Sweden</td>
<td>Austria</td>
</tr>
<tr>
<td>Biopower generation</td>
<td>United States</td>
<td>China</td>
<td>Indonesia</td>
<td>Mexico</td>
<td>Italy</td>
</tr>
<tr>
<td>Geothermal power</td>
<td>China</td>
<td>Brazil</td>
<td>United States</td>
<td>Canada</td>
<td>Russia</td>
</tr>
<tr>
<td>Hydropower</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>United Arab Emirates</td>
<td>India</td>
<td>Algeria</td>
</tr>
<tr>
<td>Solar PV</td>
<td>Germany</td>
<td>China</td>
<td>Italy</td>
<td>Japan</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</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>Spain</td>
<td>Portugal</td>
<td>Ireland</td>
</tr>
</tbody>
</table>

### HEAT

<table>
<thead>
<tr>
<th>Solar water heating</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>United States</td>
<td>Germany</td>
<td>Turkey</td>
<td>Brazil</td>
<td></td>
</tr>
<tr>
<td>Solar water heating capacity per capita</td>
<td>Cyprus</td>
<td>Austria</td>
<td>Israel</td>
<td>Barbados</td>
<td>Greece</td>
</tr>
<tr>
<td>Geothermal heat</td>
<td>China</td>
<td>Turkey</td>
<td>Iceland</td>
<td>Japan</td>
<td>Italy</td>
</tr>
</tbody>
</table>
POWER SECTOR

Renewable energy comprise **26.4%** of global power generation capacity

**22.1%** of global electricity was produced from renewable energy

Renewables accounted for **56%** of new installed power capacity in 2013.

Total RE power capacity: **1,560 GW**

Hydropower accounts for around half of the Latin America region’s installed electric capacity.
HEATING & COOLING

Small but growing renewable energy share of final global heat demand: approx. 10%

Trends:
- Increasing use of renewables in combined heat and power plants
- Renewables in district systems as best practice for RE integration in cities
- Growing use of renewable heat for industrial purposes
- Hybrid solutions in building renovation

The share of heat from renewables in Brazil was 43%.
TRANSPORT

Liquid biofuels met about 2.3% of total transport fuel demand.

Growing interested in gaseous biofuels and hybrid options (e.g. biodiesel-natural gas buses, or electric-diesel transport)

Limited, but increasing initiatives to link electric transport systems with RE, particular at city/regional level
HYDROPOWER

Total global hydropower capacity: **1,000 GW**

**40 GW** of **new capacity** were commissioned in 2013, presenting a **4%** increase.

**Steady industry growth**, driven by:

- China’s expansion
- modernisation of ageing hydropower facilities
- increasing recognition of the potential for hydropower to complement other renewable technologies, such as variable wind and solar power
Solar PV had a **record year** in 2013:
- About **+39 GW** added
- Total capacity: **139 GW**

For the first time, more **PV capacity** was added than wind capacity, accounting for about one-third of renewable power capacity added during the year.

**China** accounted for a **third** of global capacity additions, followed by Japan & the U.S.
35 GW of capacity were added (down 10 GW from 2012).

Total capacity: 318 GW

Wind market slowed down following several record years (mainly steep drop in US market).

Offshore wind had a record year: +1.6 GW added
CONCENTRATING SOLAR POWER (CSP)

Total CSP capacity: **3.4 GW**

With **+0.9 GW** added, this represents an increase of **36%**

Markets continue to expand with projects coming online in the United Arab Emirates, India and China.

Trends towards larger plants
Total primary energy consumption of biomass was approx. **57 EJ** in 2013.

Modern biomass **heat capacity**: 296 GW<sub>th</sub> (increase of 1 %)

Global **bio-power capacity**: 88 GW (increase: + 5 GW)

Latin America is the second most important region for the production & consumption of ethanol (after North America).
About **455 MW** net additions came on line, bringing total global geothermal capacity to **12 GW**.

The use of low-temperature fields for power and heat continued to expand.
SOLAR THERMAL HEATING & COOLING

Solar water and air collector capacity: ~330 GW\textsubscript{th}

2013 Trends:
- large domestic systems
- growing interest district heating & cooling as well as industrial applications
- industry consolidation

China added a capacity of 44.7 GW\textsubscript{th} and accounts for 80% of the global market.
JOBS IN RENEWABLE ENERGY

Global employment continued to increase.

An estimated **6.5 million direct or indirect jobs** in the renewable energy industry.

Noteworthy shifts along the value chain segments and from manufacturing to installation and maintenance.

*Employment information for large-scale hydropower is incomplete and not included.

Data source: IRENA
Global new investment estimated USD **214.4 billion** in 2013, down **14%** from 2012.

incl. hydropower > 50MW, it reached **USD 249.4 billion**.

Reasons for the decline:
policy uncertainty, retroactive support reductions, sharp reductions in technology costs

**Net investment in new renewables power capacity** outpaced fossil fuels for the fourth year running.

Does not include investment in hydropower >50MW
22% decrease in investment in 2013, despite record capacity additions of more than 32%.

Main reason: low module prices.

Opportunities for new markets to be developed.
Global New Investment in Renewable Power and Fuels, by Region, 2004–2013


Data include Government and corporate R&D

Developed Countries: annual investment in 2013: USD 122 billion
Developing Countries: annual investment in 2013: USD 93 billion
At least **144 countries** had renewable energy **targets**.

At least **138 countries** had renewable energy **policies** in place, out of which **95** are developing countries (up from 15 in 2005).

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

Revision and retroactive reductions in several countries, mainly in Europe and the US.
Energy access and the use of distributed renewable energy increased.

On all continents except Africa, growth in population electrified is bigger than the growth in total population.

Rural energy markets are increasingly being recognised as business opportunities.

Increasing development of mini-grids.
Global perceptions of renewable energy have shifted considerably. 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:

- More-rigorous integration of renewable energy
- A levelised playing field for the entire energy sector
- Long-term and differentiated stable policy frameworks to sustain and increase investment levels
- Greater attention to the heating and cooling and the transport sector
- Improved energy data to monitor advancements in achieving a renewable energy transition

CONCLUSIONS