

# Renewable power generation 2012

**T**HIS SPECIAL Renewable Energy Focus power generation focus previews the latest REMIPEG update from **Lahmeyer International** carried out in the first four months of 2013, providing an overview of the status of each renewable power sector to the end of 2012. Overall, it finds that new additions of renewable energy capacity totaled 112GW in 2012, taking global cumulative installed capacity to 1592GW with an estimated annual power generation output of 4547-4811TWh a year.

Over the past decade, the demand for renewable energy worldwide has experienced an increase as a result of various factors associated with environmental, political and economic issues. However, the economic crisis which started in earnest in 2009 has left many governments facing a catastrophic situation of high public debt. In many cases, this has led to cut or remove, immediately or gradually, incentives to generate electricity from renewable sources.

According to the *2012 Q4 Clean Energy Policy & Market Briefing* from **Bloomberg New Energy Finance (BNEF)**, clean energy investment worldwide fell 11% in 2012 to \$268.7bn from a revised figure of \$302.3bn in 2011. The biggest dip was in Spain where investment fell 68% to just \$3bn as its government announced a

moratorium on subsidies for projects not yet approved. In Italy the drop was 51% to \$14.7bn, mainly because of regulatory changes in solar subsidies. In India investment fell 44% while in the USA it fell 32%.

“Policy uncertainty, market over-capacity, and tighter credit conditions in some nations were all to blame, but declining wind, solar, and other equipment costs also played a major role,” the BNEF briefing says. “Despite the significant investment drop, new clean energy generating capacity actually deployed appears to have risen in 2012.”

China was the hotspot for renewable energy with an investment of \$67.7bn in 2012, 20% up on the previous year “thanks to a surge in its solar sector”. BNEF says: “Its total was more than 50% above that of the

second-placed country, the United States, with \$44.2bn.”

Two other key players were South Africa and Japan. South Africa, saw investment leap to \$5.5bn, from just a few tens of millions in 2011, as its tender process for wind and solar led to a string of large project financings, BNEF notes. Meantime in Japan the fresh emphasis on renewable power after the Fukushima nuclear disaster in 2011 and the start of a new subsidy programme helped investment soar 75% in 2012 to \$16.3bn.

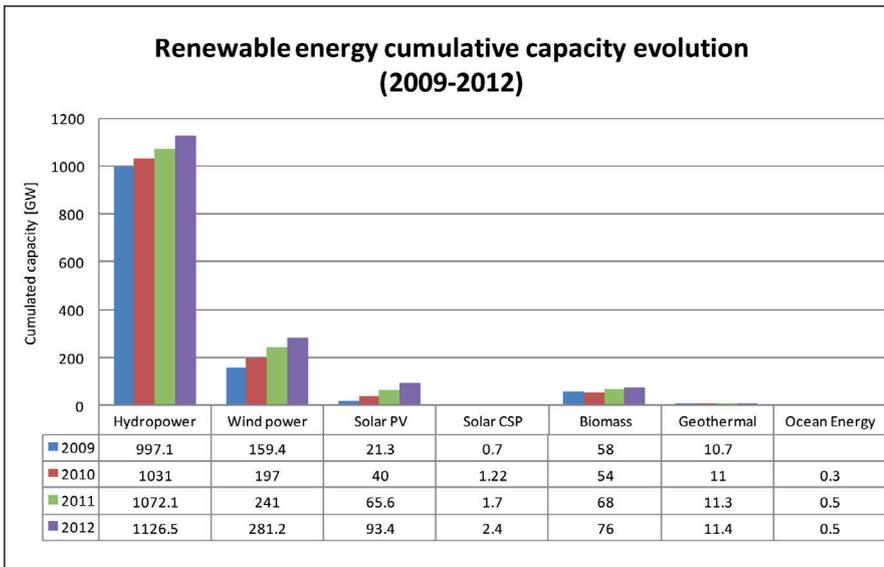
## Shifting markets

Geographic diversification of investment continued in 2012. “The Asia Oceania (ASOC) region overtook EMEA to account for the largest share of total investment,” BNEF says. “The Americas (AMER) trailed far behind.” Moreover, there continues to be a considerable shift from industrial countries to developing and emerging countries: “Brazil, South Africa, India and China – the “BASIC” countries – attracted a record 35% of all investments. Meanwhile, non-BASIC/non-OECD countries received 9% of all funds invested,” the BNEF briefing points out.

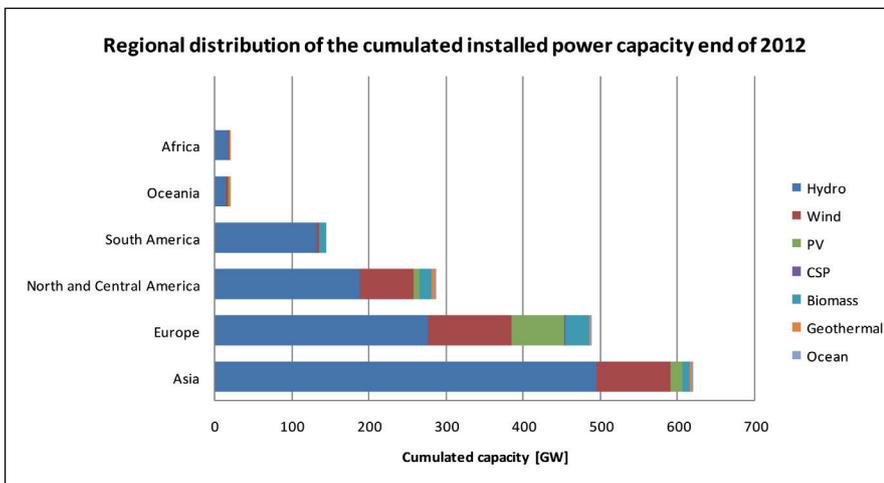
Investment in industrial countries fell 29% to \$132bn, whereas investments in developing and emerging countries increased 19% to \$112bn.

Renewable Energy Type	Cumulated installed capacity 2012 (GW)	New Installed capacity 2012 (GW)	Growth of cumulated installed capacity %	Growth rate of newly installed capacity (2011-2012)	Estimated electricity generation in 2012 (TWh/y)
Hydropower	1,126.5	29.6	3	< 0	3,524
Wind power	281.2	44.9	20	7.7	570
Solar PV	93.4	28.0	43	1.9	109
Solar CSP	2.4	0.7	42	75	4.7
Biomass power (a)	76	8.0	12	< 0	265 – 529
Geothermal power	11.6	0.4	3	0	73
Ocean & tidal energy	0.5	0	0	< 0	1.2
<b>World Total</b>	<b>1,592</b>	<b>112</b>	<b>7.5</b>	<b>-6</b>	<b>4,547-4,811</b>

World-wide installed power capacity of renewable energy technologies for grid connected power generation and estimated annual energy generation in 2012.



Renewable energy cumulative capacity evolution 2009-2012



Regional distribution of the cumulated installed power capacity end of 2012

Just one year ago, the industrial countries invested 2.5 times as much in renewable energies as developing and emerging countries.

The final globally installed capacity of renewable energy for electricity generation is shown in table (previous page). Cumulative installed renewable power capacity grew from 1460GW in 2011 to 1591GW by end 2012. As can be seen, for 2012 the growth rate for the wind power market was moderate again; it is evident this is now firmly a mature market with one digit growth rates, although it remains the leader in terms of new installed capacity and occupies the second position in terms of cumulative capacity.

Hydropower remains by far the largest renewable energy technology with more than three times the cumulative capacity of the wind sector. In fact, hydro constitutes 70% of the total installed renewables capacity and around the 73-77% of all electricity generated by renewables.

All technologies showed growth in newly installed power capacity except hydropower and biomass. The largest growth rate came from concentrated solar power (CSP) technology; however, since the CSP market is still one of the smallest renewable energy markets, the impact of this on the overall renewable electricity market growth is not very visible.

Altogether, due to reductions in newly installed hydro and biomass capacity, total newly installed renewable electricity capacity dropped down by 6%, compared to 2011. Nevertheless, this capacity fall is still smaller than the overall investment decline in the sector: A clear sign that every year more megawatts can be installed per Euro investment, due to the positive trend of cost reductions in renewable installations.

In conclusion, the final figures show that by end 2012 annual electricity generation output from renewables was 4542-4806TWh. If we assume a 5% increase in total electricity generation in 2012, the above estimated total annual electricity generation from renewables represents a 19.5% share of total global electricity supply. Related to the total primary energy consumption world-wide, this represents a contribution of around 3%.

### The REMIPEG databank

With its *Renewable Electricity Market, Installed Power and Annual Electricity Generation (REMIPEG)*, German engineering firm Lahmeyer International has tracked the implementation of renewable electricity capacity around the world since 2008, updating its database annually, with *Renewable Energy Focus* then publishing the results.

Providing totals for newly installed plant, cumulative capacity, and estimated electricity generation output, country-by-country, for each renewable energy generation source, the databank is compiled using publicly available information along with expert information from consultants in the field.

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