

four years, pending Congressional appropriations. Three hubs established in 2010 each received \$24 million: Fuels from Sunlight, Energy Efficient Systems Design, and Modeling and Simulation for Nuclear Reactors.

For detailed information on the Battery and Energy-Storage Hub and the Fuels from Sunlight, both of which are managed by the DOE Basic Energy Sciences program, visit <http://science.energy.gov/bes/research/doe-energy->

innovation-hubs/. General information about all of the hubs is available on the DOE website <http://energy.gov/hubs>.

**Kendra Redmond**

### EC releases report analyzing strategic energy technologies

<http://ec.europa.eu/dgs/jrc>

A new edition of the European Commission (EC) Strategic Energy Technologies review has been published. This “2011 Technology Map,” produced by the EC’s in-house science service, the Joint Research Centre (JRC), provides a European and worldwide analysis of 15 low-carbon energy technologies, energy efficiency in industry, energy performance of buildings, and electricity storage in the power sector. Compared with the 2009 Technology Map, the steep increase of wind and solar (photovoltaics) generation capacity in the European Union (EU) and worldwide is highlighted. On a global scale, hydropower continues to be the technology most widely used, providing 88% of electricity generated from renewable sources.

The study provides data covering the full spectrum of the energy system, allowing policymakers and the research community to identify potential opportunities and gaps to achieve the transition to a low-carbon society. A necessary condition for the timely market rollout of some of these technologies is an acceleration of their development and demonstration.

Among the updated data are findings that show that the wind sector has seen significant changes in 2010 as compared to 2008, with deployment growing 29%

in the EU to 84.3 GW of installed capacity and 65% globally (to 200 GW), largely driven by China.

Photovoltaics electricity-generation capacity worldwide has continued its growth rate, almost tripling from 14 GW in 2008 to 39 GW in 2010 (and 70 GW at the end of 2011). With a total installed capacity of almost 30 GW in the EU, the Member States have made a significant step toward the target of 84 GW they committed in the National Renewable Energy Plans for 2020.

Since the adoption of the EU Renewables Directive in 2009, the development of advanced biofuel production processes has rapidly gathered pace. Major oil companies are now involved in large-scale demonstration projects in Europe and North America using non-food, waste, and lignocellulosic feedstocks, mainly to produce bioethanol. The EU National Renewable Energy Action Plans predict that advanced biofuels will contribute 2.7 Mtoe to the transport sector by 2020, approximately 11% of the total biofuel contribution.

Hydropower is the most widely used form of renewable energy with 3190 TWh generated worldwide in 2010. This corresponds to 16% of the global gross electricity generation and 88% of electricity from renewable resources. More-

over, the global hydropower potential is considered to be around 7500 TWh/y. In the EU, hydropower accounts for 11.6% of gross electricity generation. Nevertheless, the European hydropower potential is already relatively well exploited and expected future growth is limited.

About 37% of final energy consumption is taken by the building sector (households and services), with roughly two-thirds used for space conditioning (temperature and ventilation), and the remaining one-third is mostly electricity used for installations and appliances. The requirement of nearly zero energy buildings from 2018 to 2020, as mentioned in the EU directive on energy performance of buildings, requires the development of new design approaches, supported by short- and long-term research activities, focusing more on the energy flows in, to, and from the buildings. The JRC is supporting European legislation by assessing technical requirements for standardization in relation to energy performance of buildings.

Power storage technologies have gained increased interest in the light of developments in renewables and distributed generation. Also, a new chapter in the 2011 Technology Map looks at the energy efficiency and CO<sub>2</sub> emission reduction measures being undertaken in the cement, iron and steel, and pulp and paper industries. □

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