

Celebrate technology this Earth Day

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The systematic shift to the use of renewable sources of energy by the world's industrial nations is a development of historic proportions in the early years of the new millennium. Governments are establishing ambitious national goals. There is substantial public and private investment, including research and development and job creation, being committed to this effort to power our economies and daily lives with clean, renewable sources of energy.

According to a report from the Federal Energy Regulatory Commission's Office of Energy Projects, during the first three months of this year renewable energy sources – including wind, water, solar, biomass and geothermal – accounted for 82 percent of all new domestic electrical generating capacity in the United States. A total of 1,546 megawatts (MW) of new capacity was installed from renewables, while 340 MW came from natural gas. No new capacity originated from coal, nuclear power or oil.

The emphasis in recent years on developing renewable sources of energy is continuing, even escalating. It provides a reason to celebrate this Earth Day, April 22.

2012 was a landmark year for the wind energy industry in the U.S. A record 13.1 gigawatts (GW) of capacity was installed, raising total national capacity from wind to more than 60 GW. That is enough to power 15 million homes, or the number of homes in Ohio, Colorado, Iowa, Michigan, Maryland and Nevada combined.

The federal Production Tax Credit (PTC) is largely responsible for this dramatic increase in wind farms. With the possibility that the PTC could expire at year's end, the industry worked quickly to get wind farms up and running. For the first time, according to the American Wind Energy Association, wind energy became the top source of new U.S. electrical capacity. Total U.S. capacity from wind surpassed 60 GW only five months after reaching the 50 GW level.

To lay all of this progress at the doorstep of the PTC, however, does not tell the entire story. Another significant factor in the advancement of wind energy is the development and utilization of new technology. From new state-of-the-art equipment to cutting-edge computer software to develop and manage wind farm projects, new technology is making its presence felt in this renewables revolution.

Many of these new technological developments are aimed at increasing the efficiency of turbine and

overall wind farm operations. That, in turn, stirs development of more wind capacity.

Consider, for example, new multi-megawatt wind turbines, the “Generation Delta” series developed by Nordex. In the new turbine design, increasing the rotor diameter by 17 meters resulted in a 20 percent increase in nominal output.

In addition, GE Energy has a new 2.5 MW wind turbine that operates at low-wind-speed sites. The turbine yields a 15 percent increase in power output compared to its current model. The new design opens up the potential of new vast areas for additional wind farm development.

geoAMPS, a technology company located in the Columbus, Ohio, area, also is advancing the wind industry through the development of software that greatly enhances efficiency of wind farms. Its product called altAMPS, tailored specially to alternative energy projects, is designed for end-to-end management of wind farms during the development, construction and operation phases.

Siting of meteorological towers and wind turbines is a critical early step in wind farm development. And yet, organizational resources are wasted on attempting to site towers and turbines through manual and semi-manual approaches which amount essentially to guesswork. altAMPS takes the guesswork out of siting. A multi-objective adaptive heuristic algorithm can automatically search the wind farm area and provide planners a set of near optimal solutions to meet project criteria.

Organizational resources also are wasted on inefficient methods of dealing with ongoing payment obligations. altAMPS offers a comprehensive and flexible payment program that automates the process of meeting payment schedules, such as lease and royalty obligations. With lease management, automatic reminders, royalty payment calculator and scheduler reminder features, the software can accomplish virtually instantaneously what otherwise can take many hours, even days to complete. In addition, payments can be issued and tracked accurately, decreasing the time spent addressing landowner concerns and even heading off costly legal issues.

These are only a few of the technological advancements being made to advance wind and other renewables.

With momentum increasing worldwide for development of renewable energy, now is the time to commit greater public and private resources to the effort. Public investment leads to innovation, which helps to drive down the cost of renewable sources of energy.

As we celebrate Earth Day this April 22, mankind can celebrate the advancements being made in the development of clean, renewable sources of energy. Those advancements to date represent significant progress in addressing climate change. They are what mankind can build upon to forge a promising future.

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