GE's new triple-threat hybrid power plant technology selected to go up in Turkey

June 9 2011, by Bob Yirka

The FlexEfficiency 50 Combined Cycle Power Plant

(PhysOrg.com) -- After recently announcing the development of new natural gas power plant technology, in addition to a partnership with eSolar, GE has now landed a contract with Turkish Developer MetCap Energy to supply the technology for a new power plant to be built in Karaman, Turkey, which will utilize wind, solar and natural gas power to produce a total of 530 mega-watts of power; enough to run 600,000 homes.

The power plant will be a novelty in several respects. The first is that it

will use GE's new "FlexEfficiency" gas turbine, which is essentially a jet engine that produces power by both turning a generator and by capturing the heat from the exhaust and using it to make steam. The second is that it will also add solar energy to the mix by utilizing technology from eSolar; which is also unique. Instead of converting sunlight to electricity, mirrors are used to direct sunlight to a boiler that sits atop a tower; the steam that is produced is then directed to the plant to combine with the steam produced from the back end of the gas generator. The third element is the introduction of wind power to the system using traditional wind generators situated just next to the rest of the plant to funnel power to the plant, which can be used directly by the plant, or fed into the grid.

The power plant will be the first to integrate natural gas with two renewable technologies, and GE claims that the plant will be 70% efficient, an unheard of number in electricity production. Because the system shares components, costs for the renewable parts of the system are much lower than for stand-alone systems.

While the technology behind the gas generator isn't really new, the way the solar component works is, i.e. using 25,000 computer controlled mirrors to keep sunlight firmly fixed on the underside of a water filled tank, producing steam, which is then actually used by another part of the plant. By going this way, part of the cost of the solar system can be borne by the turbine exhaust boiler generator. Also new is the idea of building in add-on capacity to existing generator technology to allow for easy addition or expansion of alternative energy power providers.

One of the traditional difficulties in utilizing renewable resources in power plants has been the variability of the source; the sun doesn't shine at night, or when it's cloudy, or sometimes the wind doesn't blow. By hooking up such technologies to proven reliable power generators, however, the variability can be smoothed out, while power output remains constant. With this new approach, GE, already a world leader in

power plant technology, is clearly expanding the options that will likely contribute to a future filled with hybrid power plant technologies of every imaginable sort.

More information: eSolar press release: www.esolar.com/news/press/2011_06_07

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Citation: GE's new triple-threat hybrid power plant technology selected to go up in Turkey (2011, June 9) retrieved 2 May 2024 from https://phys.org/news/2011-06-ge-triple-threat-hybrid-power-technology.html

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