Lockheed Martin—Supporting Global Energy and Climate Challenges

As a global security company, Lockheed Martin recognizes the economic and strategic challenges posed by a dependence on foreign oil, the potential destabilizing effect of climate change, and the vulnerability of the aging U.S. power grid. That is why we are bringing decades of relevant experience and more than 133,000 innovating minds to help address global energy and climate challenges.

Energy Efficiency: Over the last four years, Lockheed Martin's energy services practice has grown into one of the nation's largest implementers of energy efficiency programs for utility customers.

- **Efficiency for Utilities:** Whether residential or industrial, we manage programs to ensure that our utility customers conserve energy, increase operation efficiencies, and maximize capital spending. To help utilities, we coordinate financial incentives; provide marketing, customer recruitment, contractor management and technical services; identify and implement large energy efficient capital improvement projects in their facilities; and help utilities adopt digital technologies.
- **Federal Energy Management Program:** Lockheed Martin is approved by the U.S. Department of Energy to help the government reduce its energy costs and environmental impact through increased energy efficiency, additional use of renewable energy, and improved utility management decisions at Federal sites.

Alternative and Renewable Power Generation: Lockheed Martin teams are bringing engineering and manufacturing expertise to the research, design and production of the next-generation of alternative energy solutions. For example, we are applying composite manufacturing processes from space programs to capture energy from the depths of the ocean.

- **Ocean Thermal Energy Conversion:** Lockheed Martin is involved in Ocean Thermal Energy Conversion, a process that generates power from the thermal differences between the surface and the ocean depths. The process works by drawing warm surface seawater into an evaporator heat exchanger to boil a fluid with a low boiling point. The vapor from this "working fluid" drives a turbine that generates electricity and is then condensed back into a liquid when it passes through a heat exchanger cooled by seawater pumped up from the deep ocean. A potential byproduct of a variation of this process is fresh drinking water, which could provide additional benefit to developing coastal communities around the world. Recently, Lockheed Martin has won two U.S. government contracts to take steps toward potentially building pilot plants.
- **Wave Power:** Lockheed Martin announced in January 2009 that it is collaborating with a company named Ocean Power Technologies to develop a utility-scale wave power generation project in North America, likely off the West Coast.
- **Concentrated Solar Power:** At our plant in Moorestown, NJ, workers this year completed building a large test bed for concentrated solar energy technology that Lockheed Martin intends to leverage for utility-scale solar power plants. The Solar System Test and Engineering Site (SolSTES) Array provides our engineers with the opportunity to integrate and test a variety of solar technologies and materials, and to conduct production modeling. Concentrated solar energy array uses its curved mirrors to focus sunlight on pipes filled with oil, which flow through the system and heat water into steam, ultimately driving a turbine generator. A typical solar array field could power about 65,000 homes.
- **Wind Power**: WindTracer, a Doppler lidar (light detection and ranging) system developed by Lockheed Martin to detect dangerous wind conditions at airports, can also be used by wind farm developers to select locations with the strongest and most-consistent winds.
- **Biofuels/ Biomass:** Another alternative energy being pursued by Lockheed Martin on a large scale is synthetic fuels, or biofuels, from non-food sources. Our team is using a thermo-chemical process that gasifies biomass, turning it into a steam that can be further converted into fuels. Our Owego, NY, plant is powered by the technology.