Capital Sun Group

The brightest ideas under the sun

SOLAR THERMAL TECHNOLOGIES LOWER COSTS AND REDUCE EMISSIONS IN ETHANOL PRODUCTION

Opinions vary about the trade offs associated with producing ethanol from corn feed stocks. What is a constant with cellulosic or corn ethanol is the fact that combustion is the source of heat in an ethanol production plant. The energy required from combustion could be greatly reduced for cellolosic or corn ethanol processes if solar thermal is employed.

Taking the more controversial example of corn ethanol, averaging the findings in three corn ethanol studies indicates that thermal input is 11.4 megajoules per liter of ethanol versus 3.7 Mj/l for electricity. Fuel/Thermal input accounts for 81% of industrial process energy to operate a dry mill ethanol plant. Using the higher heat value of ethanol of 23.6 Mj/l, process thermal energy equals 48% of the energy content of a liter of ethanol made from corn.

The coming expansion of biofuel production presents an excellent opportunity for states to enact policies that promote solar thermal technologies. Cellulosic ethanol processes may benefit from solar thermal even more than corn ethanol processes when the lignin stream is of a quality that makes it more valuable as a feedstock than as a fuel used to provide process heat.

Solar thermal also provides an emission-free heat source that could generate income or avoid costs associated with creating "off-sets" in non-attainment areas, providing emissions credits for carbon, NOx, or acid rain trading, or providing renewable energy credits that can be used to meet state renewable portfolio standards, or may otherwise be of value to companies trying to meet corporate energy or environmental goals.

Solar thermal systems offer reliable energy over their life times that will be cheaper than natural gas at expected prices. In the United States, solar thermal technologies have not been employed in the industrial sector, mainly because, 1) natural gas has been cheap over the last two decades; and 2) industrial energy managers find it difficult to get capital projects approved that have simple paybacks longer than 12 to 18 months. Rising energy prices and requirements to reduce emissions to the environment have changed this dynamic and the ethanol and biodiesel industries need to be brought up to speed on the contributions that solar technologies can make to the bottom line.

Solar thermal system applications include:

- Boiler make-up water heating
- Boiler combustion air heating
- Process water or process air heating, e.g., for distillation or drying
- Air heating for ventilation
- Backup generator heating to reduce the need for resistance heating

These systems are currently eligible for a 30% federal investment tax credit and accelerated 5 year depreciation. Several states also provide incentives, a 35% tax credit in North Carolina and 25% in Massachusetts are two examples.

Capital Sun Group is seeking partners who would like to demonstrate the use of solar thermal in the process of ethanol or other processes. If you are interested, please contact Judy Kosovich at (202) 257-9556 or judy.kosovich@gmail.com.

6503 81st Street • Cabin John, Maryland 20818-1204 • 301-229-0671

What Solar Thermal Needs from CAPITAL SUN GROUP The brightest ideas under the sun Law Makers and Regulators

Power companies should be able to offset their emissions using any solar energy application that displaces combustion of fossil fuel to earn Renewable Energy Credits, not just solar electric systems. The air does not care how the emissions were generated or avoided. Fuel use for heat accounts for about 70% of U.S. industrial energy use, and the industrial sector uses 37% of the nation's energy. Huge emissions reductions are possible if companies have flexibility. Further, solar thermal solutions have many crossover benefits, including increased local employment and tax bases, increased reliability and shorter lead times than centrally based power or fossil fuel delivery systems

The clean air benefits of solar thermal technologies should be recognized in EPA guidance, state implementation plans, clean air models, and various emission trading systems. When feasible, this recognition should include time-of-day benefits that peak when burdens on air quality are the greatest. Although time-of-day recognition cannot easily be incorporated in trading systems, some of the value of solar energy systems can be captured and rewarded in the modeling that supports state implementation plans. Another form of encouragement would be pollution prevention exemptions to new source review requirements.

The proven benefits of solar thermal technologies should be demonstrated in a great variety of settings to encourage more companies to use flat plate or evacuated tube technologies and state-of-the-art parabolic troughs. Promoting cost-shared projects with industry would be helpful, but removing regulatory and programmatic barriers that disadvantage solar thermal technologies will go a long way to expanding the range of industry's contributions to energy and clean air goals. Solar thermal technologies can also generate electricity for utility applications with lower capital costs and shorter payback times than photovoltaic systems. Further, solar thermal systems can increase the efficiency of various processes used in electricity generation, thereby reducing operating costs of fossil energy systems.
Additional academic, industrial, and state partners are being sought. Capital Sun has also begun to work with Mondial Energy, a fund dedicated to financing solar thermal energy systems to take advantage of greenhouse gas reduction and other incentives. Together, Capital Sun and Mondial can offer biofuel producers solar thermal utilities, projects that deliver energy through a meter on a ten-year contract.

Capital Sun Group provides feasibility studies, policy analysis, designs and installations. (http://www.capitalsungroup.com)

For Further Information Please Contact
Judy Kosovich 202 257-9556, judykosovich@hotmail.com