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UC Center Sacramento Policy Brief

Volume 01, Issue 11● February 16th, 2017

How Research on a UC Campus Made Solar Thermal Power Practical and Affordable World Wide

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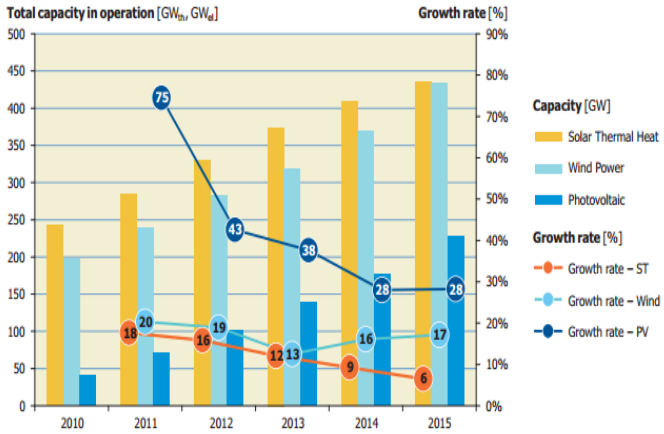
Professor Winston discusses ways in which policy in California can be used to promote the continued development and implementation of solar technology in the State. For example, he demonstrates that incentives for photovoltaics (converting light into electricity) worked well in California and can be applied to other solar-based solutions. Advances in technology should drive policy to incentivize homeowners and businesses to include solar thermal in their planning and budgets.

Solar thermal technology serves a wide range of applications, from domestic water heating to industrial heat processing. This innovative solar technology can be designed and developed into more efficient, more affordable, and easier to integrate systems.

Key Findings:

- ✦24 million square meters of solar thermal collectors operated in the U.S. in 2014, corresponding to 17,000 thermal megawatts of operating power and 11,000 Gigawatts of energy saving. This power collection reduced 3.8 million tons of CO_2 emission per year, which is equivalent to 1.2 million tons of oil, or 400,000 homes' energy use for one year.
- ✦Solar thermal is one of the most significant renewable energy sources globally. However this is largely overlooked in California, for historical reasons and the existence of very robust natural gas infrastructure. There is a strong incentive to promote solar thermal technologies because the current natural gas infrastructure is under stress.
- ✦Risk of natural gas leakage adds an urgency to energy source issues. One such leakage, at Aliso Canyon, lasted four months and emitted 100,000 tons of methane, which is 200 times the greenhouse gas potential compared to CO_2.

Global Solar Thermal Heat, Wind Power, and Photovoltaic Capacity in Operation and Market Growth Rates. 2010-2015



Sources: *AEE INTEC, Global Wind Energy Council (GWEC), European PV Industry Association (EPIA), REN21 – Global Reports 2011-2015.*

Implications for Policy

Economically speaking, a solar thermal collector's payback time is typically 3-6 years, compared to the typical 8-10 years (under incentive) of the photovoltaic (PV) system. A state based incentive program to promote solar thermal collection, similar to the one used to encourage PV home use, will have huge benefits to consumers and the environment.

Dr. Winston is Director of the University of California Advanced Solar Technologies Institute (UC Solar), a system-wide research collaboration