



**CASE 07-M-0548 - EPS PROCEEDING**

**EARTHKIND ENERGY RESPONSE TO THE**  
**STAFF PRELIMINARY PROPOSAL**

**General Comments**

EarthKind Energy is pleased to provide these comments on the Staff Preliminary Proposal. First and foremost, the Staff should be commended for the comprehensive report. This excellent effort will play a critical role in the progress of this proceeding.

The Staff Proposal identifies a series of programs that can be fast tracked, with solar thermal technologies identified in several. Our comments identify the details on how solar thermal technologies can be effectively included in fast tracks of existing programs.

Two key needs must be addressed: (1) increasing the awareness of market participants and (2) the level of incentives. Solar thermal can only provide a significant contribution to these when there is a communication component. These programs need to communicate information about the technology including costs and benefits to the market participants.

The similarity of solar thermal to PV suggests a comparable promotion of Solar Thermal to jump start the market. NYSERDA has for the last several years had conducted a very successful program to provide incentives to promote the installation of PV technology. Solar thermal hot water systems produce energy in the form of heated water. The production profile and benefits for electric hot water systems are very similar to PV, as solar hot water reduces peak load and saves energy year round. Solar thermal has the added benefits of raising no safety concerns on the utility's distribution network. There are 900,000 NYS residents who currently use electricity

to heat their hot water, plus 615,000 residents who still use electricity for space heating<sup>1</sup>. Solar thermal hot water and solar thermal space heating systems can be employed with any fuel. Natural gas customers that utilize solar thermal reduce natural gas load in peak usage periods, as well as lowering gas energy use year round. There are 4.4 million NYS residences that utilize natural gas to heat their hot water(refer to footnote 1).

In developing an incentive program, the greater cost effectiveness of solar thermal should be taken into account. The incentives can be set much lower, say at 1/3 to 1/4 the incentive currently provided PV (\$1.00 - \$1.50 per thermal equivalent watt<sup>2</sup>). We would recommend that this initial incentive be put in place for 2008 and 2009, but could decline over time, say by 15% per year, and eliminated in 2014. This 7 year program with decreasing incentives would provide the correct market signals to move end users to early action.

EarthKind Energy is willing to work with NYSEERDA and others to resolve the administrative issues that must be addressed to include a PV type solar thermal incentive on a fast track basis. This includes predicting performance<sup>3</sup>, qualifying installers<sup>4</sup> and verification of performance<sup>5</sup>.

answers to the Judge's October 1<sup>st</sup> generic questions:

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<sup>1</sup> U.S. 2000 Census

<sup>2</sup> Similar to PV, Solar Thermal produces a predictable amount of energy based on meteorological and site conditions. The incentive would be based on the comparable kw hour out put solar thermal to a PV system. For example, a 2 flat panel collector solar thermal system produces approximately the same energy as a 3 kW PV system.

<sup>3</sup> Predicting Performance: Since collectors are tested and certified by the SRCC (Solar Research Center Corporation), performance is very predictable for installations across the state. RetScreen International provides an unbiased analytical tool that was developed by the US Dept of Energy and others, and is supported by Resources Canada to enable analysis of Renewal Energy Technologies. Utilizing SRCC OG 100 certification data, along with metrological data for locations across New York State, in RetScreen provides verifiable projections of performance that can be used to calculate incentives. RetScreen provides verifiable projections of performance that can be used to calculate incentives.

<sup>4</sup> EarthKind Energy believes that the best way to implement the Solar Thermal market in the state is to require it to be installed by local contractors who gain certification and warranty rights by manufacturers with SRCC rated equipment. (The SRCC rating is a recognized procedure that is a prerequisite for Solar Thermal federal tax credits).

<sup>5</sup> NYSEERDA will need to verify that the contractors have installed the products and verify the performance used to establish the incentives. We are recommending that a pilot program for web-based monitoring be established that could track performance relative to the RET Screen analysis.

- whether, and to what extent, such program is presently oversubscribed;*

While each program may or may not be oversubscribed, solar thermal technologies have not been promoted effectively in any existing program and requires commitment and funding
- demonstrated effectiveness of such program;*

Each program has been effective, and each solar thermal technology shows positive benefits for all customers. A TRC analysis is provide after the program comments.
- incremental benefits expected from such program if funding levels were increased in the near term;*

There will be both direct energy benefits from incorporating solar thermal technologies in each program, as well as significant long-term economic and environmental benefits from establishing a viable, self-sustaining solar thermal market in New York State.
- cost of putting such program on fast track;*

We propose a focused, statewide solar thermal initiative that would have modest impacts on the administration of each program. TRC analysis were performed for solar thermal technologies; in each case, the benefit is greater than one. The cost of implementing the program will depend on the level of incentive and the number of participants.
- sources of funds that can be accessed on a fast track basis, including accelerated use of uncommitted SBC funds, and methods of cost recovery;*

We propose that uncommitted SBC funds be used to “kick-start” the program.
- administrative barriers, if any, to prompt expansion of such program, including process steps that would be necessary to secure and establish funding.*

The main administrative barrier is the lack of understanding about the cost-effectiveness of solar thermal technologies throughout state agencies, the trades, and

end users. The public information component of these programs will need to address overcoming this barrier.

## **FAST TRACK PROGRAMS IDENTIFIED BY STAFF**

### **Residential Energy Efficiency Programs**

#### **1) New Building Construction-Single and Multi-family Housing (p 38)**

This program is an excellent example of a fast track program where solar thermal can provide significant long term benefits. NYSERDA should be encouraged to involve stakeholders such as the technology providers in developing the program details. It is important that the program provide public awareness to the technology and its benefits. There is a concern that the current Energy Star designation does not provide a strong message to consumers about the benefits of more advanced energy efficiency components that provide superior performance. We recommend that NYSERDA establish various grades of Energy Star homes, say “Energy Star Plus” or “Energy Star Supreme”. These designations would require the inclusion of superior measures including measures such as solar hot water. This will enable the differentiation for quality builders and superior buildings. This can be implemented in 2008 with negligible costs.

#### **4) Home Performance with ENERGY STAR® (electric and gas) (p 43)**

In addition to promoting solar thermal as part of the home performance initiatives with Energy Star contractors, it should be completely integrated within the program. Contractors need to be properly trained on available technologies and incentives such as solar thermal, and all support activities should include these technologies.

For example, even though solar hot water has qualified as a NYSERDA BPI measure for years, the first solar hot water system to be included in the program only occurred when promoted by a new EarthKind Energy dealer. The BPI contractor then had difficulty getting the customer approved by the NYSERDA low interest loan program because solar thermal was not listed on the data entry options.

The Staff's analysis of the "Home Performance with Energy Star Expansion" identifies "Direct Program Operator Costs / Participant" of \$2,800, with "Participant Costs per participant" of \$3,407, creating savings of 1,057 kwhs and 465 therms. A standard 2 collector solar thermal installation for a family of four would generate comparable benefits of over 3,300 kwhs per year in electric savings.

**5) Residential Retrofit Program (mostly gas) (p 45)**

Solar thermal hot water systems should be a part of these residential retrofit home performance programs. There are over 4.4 million residences that heat their water with natural gas. With the incentives discussed above, a proper promotion will result in significant conversions.

**6) Residential Efficient Appliances and Equipment Purchases Program (gas)**

This program includes more efficient hot water heaters. Solar thermal hot water heaters are measures worthy of promotion along with these other technologies. Plumbing contractors need to be trained to up-sell these technologies, as these contractors often only sell on first cost (and not life time operations cost) and do not see their customers as having environmental concerns that would be factored into a purchasing decision. Since NYSERDA incentives are proposed, these plumbing contractors will also need to be certified as discussed above.

**7) New York City Apartment Building Energy Efficiency Program Design (electric and gas) (p 49)**

Solar thermal technologies to produce hot water and heat are both applicable to apartment buildings. PLANYC2030 data shows that 51% of energy use in New York City is for heat and hot water. Programs incorporating these technologies can be accomplished through targeting the building owners. It generally reduces their cost of operation, which provides an advantage over programs that are targeted toward renters.

Perforated/transpired plate collectors on the side of the building can be used to heat air entering the building for common areas and central heating systems. The US DOE has described this technology as: "*The transpired solar collector is the most reliable, best performing, and lowest cost solar heating system for commercial and industrial buildings available on the market today*". Clearly this is a technology that should also be provided incentives to reduce energy

consumption in apartment buildings. As discussed above, an incentive should be based on energy produced at 1/3 to 1/4 the incentive provided PV. The calculation method can be similar to the process used for solar hot water – RetScreen - employing system performance and local meteorological data.

Solar hot water is suited for use in apartment buildings. Due to the high and predictable usage, Solar hot water provides consistent paybacks with stable occupancy. As a result, in addition to traditional installation practices; there are opportunities to finance these projects based on the energy produced from the system.

### **1. New Commercial Buildings –“Whole Building Design” (electric and gas) (p 51)**

NYSERDA whole building design approach can be improved to provide greater efficiency improvements through the promotion of solar thermal technologies. These technologies complement the other technologies that are employed in this program. Solar thermal technologies including transpired plate for heating and solar thermal hot water systems should be included as part of a “High Performance New Building”

### **2. Small Business Direct Installation Program (electric and gas) (p 53)**

Solar thermal hot water would be an excellent addition to this program. There are many businesses that use hot water throughout the day, for example, car washes, laundries, restaurants, hotel/motels etc. The publicity and public awareness associated with this program needs to focus on having small businesses become aware of - and take advantage - of this technology.

### **4) Commercial Building Retro-commissioning (electric & gas) (p 55)**

Solar thermal technologies to produce hot water and heat are excellent technologies for commercial buildings. NYC data shows that 51% of energy use in the city is for heat and hot water. These technologies generally reduce their cost of operation. Retrofit projects that include more than one activity are excellent opportunities to achieve lower installed costs compared to installing individual technologies.

Perforated/transpired plate collectors on the side of the building can be used to heat air entering the building for common areas and central heating systems. If the building being retrofitted includes

projects to repair siding, improve ventilation, increase insulation etc, costs can be reduced and greater paybacks achieved.

As discussed above, an incentive should be based on energy produced at 1/3 to 1/4 the incentive provided PV. The calculation method can be similar to the process used for solar hot water - RetScreen employing system performance and local meteorological data.

Solar hot water is suited for use in commercial buildings. Due to the high and predictable usage, hot water provides consistent paybacks with stable occupancy. As a result, in addition to traditional installation practices; there are opportunities to finance these projects based on the energy produced from the system.

### **5. Commercial Target Sectors**

Targeting specific target sectors is an excellent strategy to follow. Depending on the sectors targeted Solar Thermal can play a significant role. Solar Thermal heating technologies are appropriate to the sample identified target sectors

Solar hot water has excellent economics with businesses that use hot water through out the day. Schools, hospitals, hotels, nursing homes all fall into this category. Solar space heating technologies also apply and should be promoted for consideration.

### **7. Flex Tech Including Process Improvements (electric and gas)**

This program should incorporate Solar Thermal technologies. Providers must be trained to understand the technologies and the circumstances where they would be cost effective. This will enable additional emphasis for solar thermal in this program.

### **C. Cross-cutting programs (p 61)**

The Solar Thermal market in Germany was boosted by strong awareness raising campaigns, R&D funds and above all the Marktanzreizprogramm (MAP), a financial incentive plan that has been running since 1999. For several years, Germany alone has made up half of the solar thermal market in Europe. On the whole, compared with financial incentives operated in most

other countries, the MAP has been a remarkably long-term and relatively stable support mechanism.

In 2006, Germany installed over 140,000 solar thermal systems with a total market of \$1.6 Billion in sales employing more than 18,000 people. The 6,300 MWs of installed solar thermal capacity is greater than that of 3 Indian Point nuclear power plants and reduced energy consumption by 4.3 million MWhs per year

However, the market development in Germany has been characterized by some significant ups and downs, with notable deeps in 2002 and in first half of 2007 (last update: August 2007). Most analysts believe that an important factor in this market instability, at least in 2002, was the frequent uncertainty of the MAP: its dependence on the federal budget makes it vulnerable to political instability. This experience points to the need to establish a clear time table for the incentives, such as the proposed 7 year declining incentive structure.

New regulations came into force in Spain last year that require solar thermal technology to be installed in new buildings and whenever major renovation work is carried out. This meant that the surface area of newly installed collectors nearly doubled in 2006 compared to the previous year. By 2010, the surface area of collectors installed in Spain is expected to total five million square meters, leading to fewer (66 million gallons) of heating oil being used, and reducing environmental impact by around 550,000 tons of CO<sub>2</sub> compared with conventional hot water systems.<sup>6</sup>

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<sup>6</sup> Please see “European Best Practice Regulations for Solar Thermal” for a complete description of European experience and their recommendations which has been distributed to the parties.

## BENEFIT / COST TESTS

EarthKind Energy ran the Benefit / Cost Tests for solar hot water and solar space heat technologies for both residential and commercial applications. The analysis assumed that solar thermal could be included within the current program administrative costs. The Total Cost included the installed cost of the system. Any incentives used to promote adoption of the technology would reduce the consumer's portion of the cost but would not reduce the Total Cost. The TRC analysis considered the Federal Tax Credit but not any state tax credit.

The results are as follows:

	SOLAR HOT WATER		SOLAR SPACE HEAT	
	RESIDENTIAL	COMMERCIAL	RESIDENTIAL	COMMERCIAL <i>(Per Square Foot)</i>
<b>Total Cost:</b>	\$ 7,000	\$ 56,000	\$ 1,800	\$ 30.00
Energy Output (kwh):	3,300	37,800	600	59 (~2 therms)
<b>ANNUAL SAVINGS</b>				
Electric @ 15.8 c / kwh:	\$ 521.40	\$ 5,972.40	\$ 94.80	\$ 9.32
Natural Gas	\$ 312.84	\$ 3,583.44	\$ 56.88	\$ 5.59
<b>25 Year Life Savings (No Rate Increase)</b>				
Electric	\$ 13,035	\$ 149,310	\$ 2,370	\$ 233
Gas	\$ 7,821	\$ 89,586	\$ 1,422	\$ 140
<b>Benefit/Cost Ratio (unadjusted for Rate Increases or Net Present Value)</b>				
Electric	2.61	3.81	1.88	11.10
Gas	1.56	2.29	1.13	6.66

Under this scenario, everything measure meets the test TRC test by being greater than 1.

Utilizing a commodity escalation of 7% with a discount factor of 2.9 percent, the TRC analysis is as follows:

	SOLAR HOT WATER		SOLAR SPACE HEAT	
	RESIDENTIAL	COMMERCIAL	RESIDENTIAL	COMMERCIAL <i>(Per Square Foot)</i>
<b>25 Year Net Present Value BENEFITS @ 2.9% Discount Rate with 7% Annual Rate Increase</b>				
Electric	\$ 20,828	\$ 208,285	\$ 4,166	\$ 410
Gas	\$ 12,497	\$ 124,971	\$ 2,499	\$ 246
<b>BENEFIT / COST with NPV @ 2.9% Discount Rate &amp; 7% Annual Rate Increases)</b>				
Electric	4.17	5.31	3.31	19.51
Gas	2.50	3.19	1.98	11.70

There may be an incentive to include these measures in targeted programs – especially low income residential – as they provide economic justice benefits.