
Comments on the Renewable Energy Transmission Initiative (RETI) Phase 1A DRAFT Report

First Solar, Inc. (NASDAQ: FSLR) is the world's largest manufacturer of thin film photovoltaic solar modules. Since our founding in 1999, we have successfully commercialized our proprietary thin film manufacturing process that allows us today to convert a sheet of glass into a functional solar module in less than 2.5 hours while providing significantly lower module production costs compared to traditional crystalline silicon based PV technologies. We have current annual manufacturing capacity over 300 MW, and will have manufacturing capacity of over 1 GW by the end of 2009. While rapidly scaling manufacturing, First Solar has made significant reductions in module production costs from \$2.94/W in 2004 to \$1.12/W for the 4th quarter of 2007. First Solar is a market leader in utility-scale PV systems and has forward contracted for delivery of over 3.2 GW of modules during 2008-2012. First Solar is based in Phoenix, Arizona and has manufacturing operations in Ohio, Germany, and Malaysia.

1. Use of Thin-Film PV as the Representative Photovoltaic Technology

First Solar respectfully requests that the RETI Phase IA Report be modified to include thin-film PV as a solar photovoltaic technology and that such technology be used either in addition to or as the representative photovoltaic technology.

The Renewable Energy Transmission Initiative (RETI) is designed to identify and quantify the renewable resources that can provide cost-effective energy to meet the California RPS requirements. As such, First Solar believes that thin-film PV should be either used in addition to or as the representative photovoltaic technology as it is rapidly becoming the technology of choice for large PV systems due primarily to its lower installed costs. A recent report by the German government indicates that over 60% of the 2007 free-field market in Germany used thin-film technology. A recent Solar Buzz report indicates slightly lower numbers and that of the large PV projects installed in Germany in 2007, over 40% used thin-film technology and well over 90% of the thin-film projects used First Solar technology. This same report indicates production growth rates of over 120% for thin-film modules while crystalline experienced growth rates of 50% during 2007. Based on this report, First Solar experienced a production growth rate of 240% in 2007, representing just under a 50% share of all thin film production and became the fifth largest PV manufacturer in the world.¹ First Solar has forward contracted for delivery of over 3.2 GW of modules during 2008-2012 and will have annual manufacturing capacity of over 1 GW by the end of 2009.

2. Cost and Performance Characteristics of Thin-Film PV

First Solar respectfully disagrees with Black & Veatch's assertion that all photovoltaic technologies should have similar cost of energy characteristics (Renewable Energy Transmission Initiative Phase 1A Draft Report, Section 5.5.6, pg. 5-27). Thin-film modules such as those produced by First Solar, use about 1% of the semiconductor material of crystalline modules. Furthermore, First Solar's manufacturing process uses high-throughput production lines that complete all manufacturing steps, from semiconductor deposition to final assembly and testing, in an automated, continuous process which significantly reduces production costs. First Solar also uses a systematic replication process to build new production lines which has enables us to rapidly expand production capacity to meet product demand.

As a result, First Solar module manufacturing costs reached \$1.12/W in the 4th quarter of 2007, a reduction of over 60% since 2004. A recent presentation by Lazard indicates expected levelized cost of energy of \$90/MWh for First Solar thin-film technology based on total project cost of \$2.75/W and fixed O&M of \$25.00/kw-yr,

¹ MarketBuzz™ 2008, Annual World Photovoltaic Market, March 2008

Comments on the Renewable Energy Transmission Initiative (RETI) Phase 1A DRAFT Report

representing a significant difference between the assumptions for PV included in Table 5-7 of the RETI Draft report (pg. 5-28).²

Other indications that the cost assumptions in the RETI draft report are overstated for PV technology include:

- Southern California Edison's recent announcement of its plans to install 250 MW of distributed 1-2 MW photovoltaic project in California at an estimated installed cost of \$3.50/W dc (2008\$). SCE has indicated that program cost parameters were based on confidential market surveys.
- Southern California Edison's Advice Letter seeking CPUC approval of a contract with FSE Blythe Solar 1 for a 7.5-21 MW project. As no supplemental energy payments (SEPs) were requested and the Advise Letter process was used, it is reasonable to assume the contract is for power delivered at or below the California market price referent (MPR).

Based on this information, First Solar respectfully requests that the capital and operation costs for utility-scale thin-film photovoltaics be modified to reflect the above information.

3. New Plant Capacity (MW) and Geographic Location

The draft report recognizes the immense potential of solar PV within the state of California. However, First Solar recommends that the report consider PV both within and outside the state of California. With the cost changes recommended above for PV, PV will become a much more competitive resource both inside and outside of California. Furthermore, the study assumes a plant size of 20 MW for PV. However, PV is modular and scalable so it should be considered in California and as a minimum in those areas identified for further consideration of solar thermal technology.

4. Methodology, Financing Assumptions and Risk

Black and Veatch assumes that the cost of equity is the same for all technologies which fails to take into account the differences in risk for various technologies. Although First Solar understands the simplicity of such an approach, nowhere in Black & Veatch's proposed methodology are the differences in risk associated with the various technologies taken into account. We respectfully request that Black & Veatch includes either differences in financing costs to address differences in risk for various technologies or another alternative methodology. Furthermore, First Solar recommends using a cost of equity (Table 4-1, pg. 4-3) of 10% rather than 15%, as it is more in line with current market realities.

Larger, more complex projects, especially those dependent on new transmission siting, permitting and construction, face longer development timelines. These longer development timelines bring with them greater uncertainty related to a host of issues including changes in commodity and capital costs. The longer the development cycle, the greater the uncertainty regarding these issues and their ultimate impact on cancelled projects, consumer rates or a "dash to gas" where utilities are forced to aggressively build new gas fired generation in order to meet reliability needs arising from plant cancellations. Other appropriate risks to consider are those associated with technological feasibility, constrained supply-chains, and exchange rate risk.

² Lazard Frères & Co. Presentation to EXNET 21st Annual Utility M&A Symposium, January 2008

Comments on the Renewable Energy Transmission Initiative (RETI) Phase 1A DRAFT Report

California utilities have seen significant contract breakage related to their renewable energy contracting activity, no doubt a result of many of the aforementioned risks. Over the past several years, many contracts have been executed with companies based on unrealistic and unsubstantiated project cost estimates or non-commercially proven technologies. As one might predict, many of these contracts have resulted in upwardly renegotiated contract prices, missed development timelines or outright non-performance. In an area of generally rising costs related to utility plant infrastructure, these contract and performance failures hurt consumers who later are saddled with higher cost options. These represent additional reasons to address the differences in project risks in the proposed methodology.

5. Costs and Performance Characteristics for Solar Thermal Technologies

First Solar supports the assumption that CSP and other thermal cycle plants' capital costs, O&M costs and operating envelopes assume dry cooling, particularly when CREZ zones are identified in desert areas.

Concerns about long-term water availability and consumption patterns are real and growing in importance in the U.S. west. As indicated on page 3-12 of the draft report, BLM applications for over 45,000 MW have been received in California. The vast majority of these identified sites are in arid and semi arid areas where near term water availability is often challenged, let alone 20 year commitments.

As a result, the base trough plant design, capital cost, energy production, and capacity contribution should be based on dry cooling, sized to address the summer season 12 p.m. to 6 p.m. ambient air temperature and humidity characteristics associated with each CREZ.

Several very recent studies and reports present widely different capital, O&M and levelized MWh costs associated with solar trough plants. We respectfully suggest a rationalization take place between these studies to understand how and why these levelized cost differences exist.

In addition to the RETI Phase 1A Draft Report, two other reports have recently been delivered in the industry: (1) The multi-client Arizona Renewable Energy Assessment, September 2007, and (2) the multi-client EPRI CSP Feasibility Study, a summary of which was presented to the New Mexico Public Regulatory Commission on March 20, 2008.

Examples of these differences include but are not limited to:

	Wet/dry Cooling	Rated Capacity	Molten Salt Storage	Capital Cost (2011 Start)	O&M (\$/Kw-yr)	Levelized Costs (\$/MWh)	Dollars Used
RETI Draft	Dry	200MW	No	\$3600-4200/Kw based on site	\$66 fixed, no variable	137-176	N/A
AZ RE Assessment	Wet	100 MW	Yes	\$4200/Kw	\$55	161-176	2007
EPRI CSP Feasibility	Dry	125 MW	No	Not included in summary	Not included in summary	170-185	1/1/2011

Comments on the Renewable Energy Transmission Initiative (RETI) Phase 1A DRAFT Report

Certainly specific solar resource assumptions, ownership assumptions and financing variables all will of course have an impact on levelized costs. That said, these studies, delivered within a very few months of each other, drive at least one significant question:

If dry cooled trough plants cost more to construct per MW of capacity as a result of required design changes, typically have higher operating costs and demonstrate significant performance degradation when operating in the desert where 100 - 115 degree F plus summer temperatures are coincident with peak demand hours, all other things equal, why wouldn't they show significantly higher levelized costs and a lower peak season capacity contribution than similarly rated wet cooled trough plants?

Gaining an understanding across these studies surrounding the design, cost and operating assumptions used would presumably help policy makers make better informed decisions on behalf of consumers.