Prepared Testimony of
Rick Gilliam
Vice President, Government Affairs, SunEdison

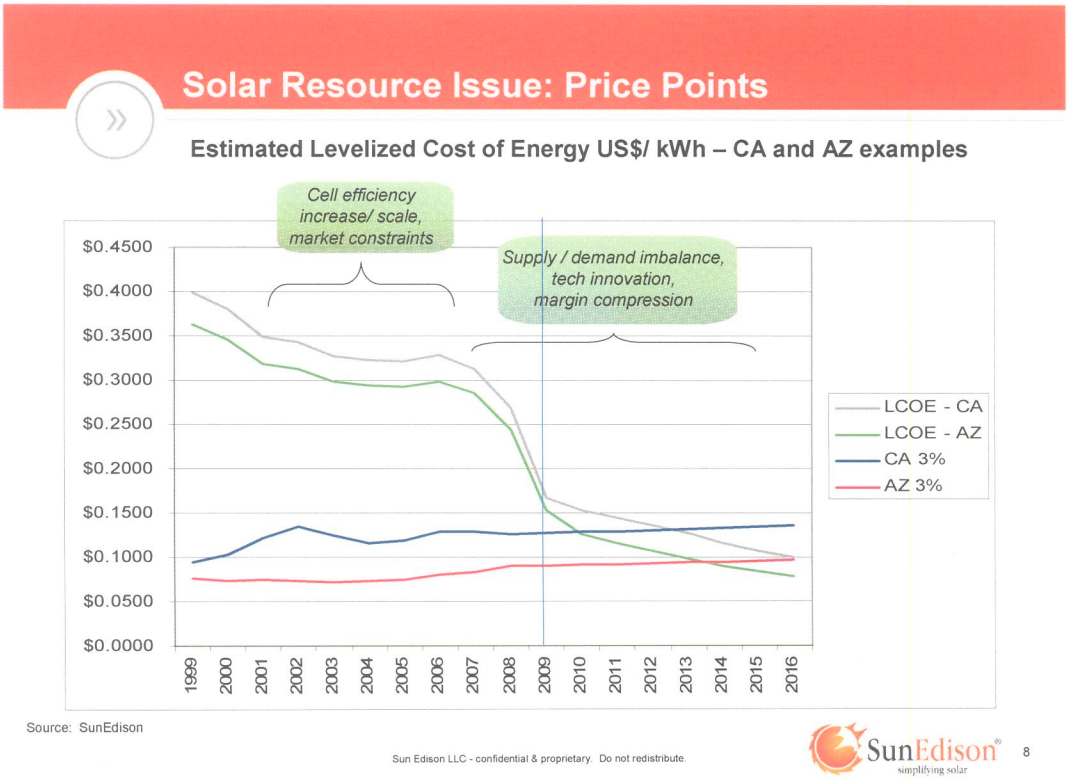
Before the Senate Business and Commerce Committee

Good morning. I come before you today to speak about the benefits and costs of alternative energy source, and in particular, solar energy resources.

SunEdison develops, builds, finances, owns and operates solar power plants across North America and around the world. We have financed and operate over 350 solar plants, built the first utility scale PV project in the US and in Canada, and are currently building Europe's largest utility scale project. Our parent Company, MEMC, is a leader in the manufacture of silicon wafers, a core building block for solar panels and projects. MEMC has two manufacturing facilities in Pasadena, Texas. Our mission is to drive the cost of solar energy down to comparability with other resources.

I would like to leave you today with the knowledge that solar is a real and viable long term electric resource option for Texas. Solar electric resources diversify the electric generation resource base, provide energy security and avoid emissions, but my testimony will focus on the associated direct costs and benefits.

Costs have declined dramatically, especially over the past 18 months



Source: SunEdison

SunEdison focuses on market segments ranging from large commercial up to utility scale projects generally not exceeding 20 MW. As the chart shows, the combination of additional supply, reduced demand, and reduced margins has helped to drive prices down recently. Interestingly, the end result is that the downward cost curve for solar has realigned present prices with the declining cost curve that solar had been tracking until the 2002-2007 time frame.[1]

Details of Solar Costs and Benefits

- Components of a solar installation: hardware and labor
  - Hardware costs are generally tied to the global market
    - Includes solar modules (panels) and inverters
    - Panel prices have experienced dramatic price declines to between $1.50 and $2.00 per Watt
  - Installation costs have been declining too
    - Related more to the local market: developer experience and a trained workforce
    - Emphasizes the need for a long term sustainable market
  - In more mature markets, installed price is roughly 2x panel costs per Watt
- Generally solar resources are developed by creating value through electricity generation and bridging the difference with economic support
  - Electricity costs generally increase over time, hence increasing value
    - Average Texas electricity rates in 2008 were 11¢
    - May have moderated somewhat due to recent shale gas entering market
  - Economic support (aka incentives) must be sufficient to make up remaining cost of development after consideration of electricity value
  - Provide bridge between electricity value and system cost
  - SunEdison's preferred incentive structure includes the following principles
    - Temporary
    - Performance-based
    - Declining
- Benefits to the grid
  - Direct and immediate savings related to each kWh of solar generation
    - Marginal fuel costs savings
    - Variable operating & maintenance cost savings
    - Reduced transmission and distribution losses

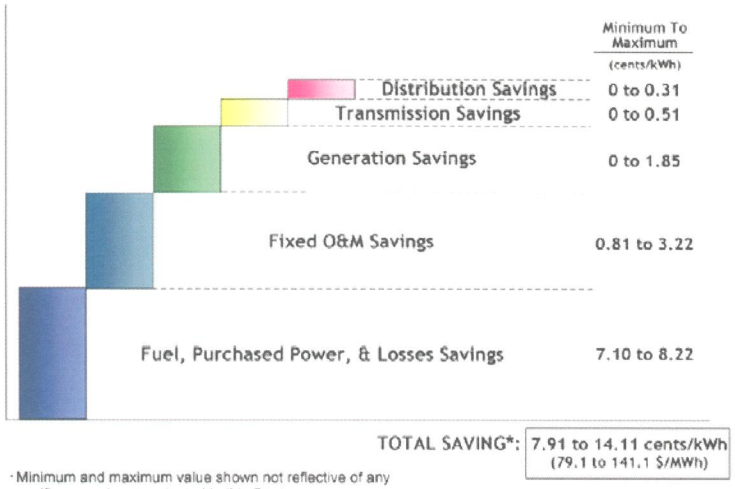
---

[1] It should be noted that the recent "Texas Clean Energy Economy" report performed by Billy Hamilton Consulting appears to use solar data that is out of date at best. For example, the NREL cost projections on page 8 were developed in 2002. The solar industry has achieved the NREL 2020 estimates effectively in 2012. More importantly, Table 5 on page 43 sets forth incredibly high $/MWh projections for 2016. These estimates are apparently from the U.S. Energy Information Administration.

- Solar PV also provides *capacity* value resulting in the ability to defer and avoid transmission, distribution, and generation investments.
  - Public Service Company of Colorado found an effective load carrying capability of 60-70%, depending on location, for solar PV in Colorado. This means that the utility can count on 60-70% of the installed PV capacity to meet its system peaks.
  - Arizona Public Service commissioned a study, performed by RW Beck, that found similar but slightly lower capacity values. However, the study projected the fixed costs deferred and avoided and summarized the benefits as follows.

Arizona Public Service: RW Beck Analysis

Solar DE Value Buildup



*Minimum and maximum value shown not reflective of any specific scenario as evaluated in this Study

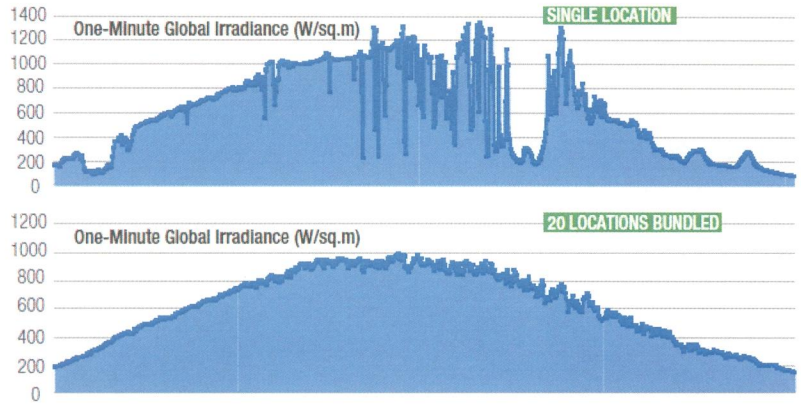
Source: www.aps.com/solar

The Intermittency Issue

- One concern we hear frequently relates to the intermittent nature of solar resources, and more particularly to the cloudy afternoons that many of us experience in the West. The following chart shows the effects of spreading the solar generating systems out over a 10m by 10m square. Clearly, dispersing the generation resources over even a reasonably area mitigates this type of intermittency concern.

Solar Resource Issues: Intermittency

FIG. 1 REGIONAL DISPERSION AND RELIABILITY



Comparing the solar irradiance at one location on a single partly cloudy day (top) to that of 20 locations dispersed over approximately 100 square miles illustrates how system-wide distribution greatly reduces variability in solar energy.

Source: Public Utilities Fortnightly, Feb 2009.

Solar Benefits Retail Electricity Customers and the Economy

- The benefits outlined above to the electric utility grid are ultimately passed on to the benefit of all retail electric customers
- In addition, solar generation located on a retail customer's premises provides an important energy hedge value to that customer
- Solar PV has the highest job creation potential per MW of any electric generation technology

What can Texas do?

- Promote the development of solar electric resources by providing a bridging incentive
- Very roughly, one GW can be developed over a five year time frame beginning in 2011 for a very modest cost – not much more than the cost of a postage stamp per month, not per day,[2] for a residential customer)

I want to thank the Committee for allowing me to speak before you today, and am happy to answer any questions you may have.

[2] The Hamilton report overstates the funding necessary to develop a robust solar program.