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MADRI Working Group Meeting: Rate Design Alternatives for Customers

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Jim Torpey

Jim.Torpey@sunpower.com

Safe Harbor

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SunPower Corporation

Solar Technology and Energy Solutions Provider

RESIDENTIAL

COMMERCIAL

POWER PLANTS

- 2013 revenue $2.5 billion
- > 6,000 employees
- 2.5 GW solar PV deployed
- Strategic investment by Total SA: #11, F500
- Active in MADRI area since 2005

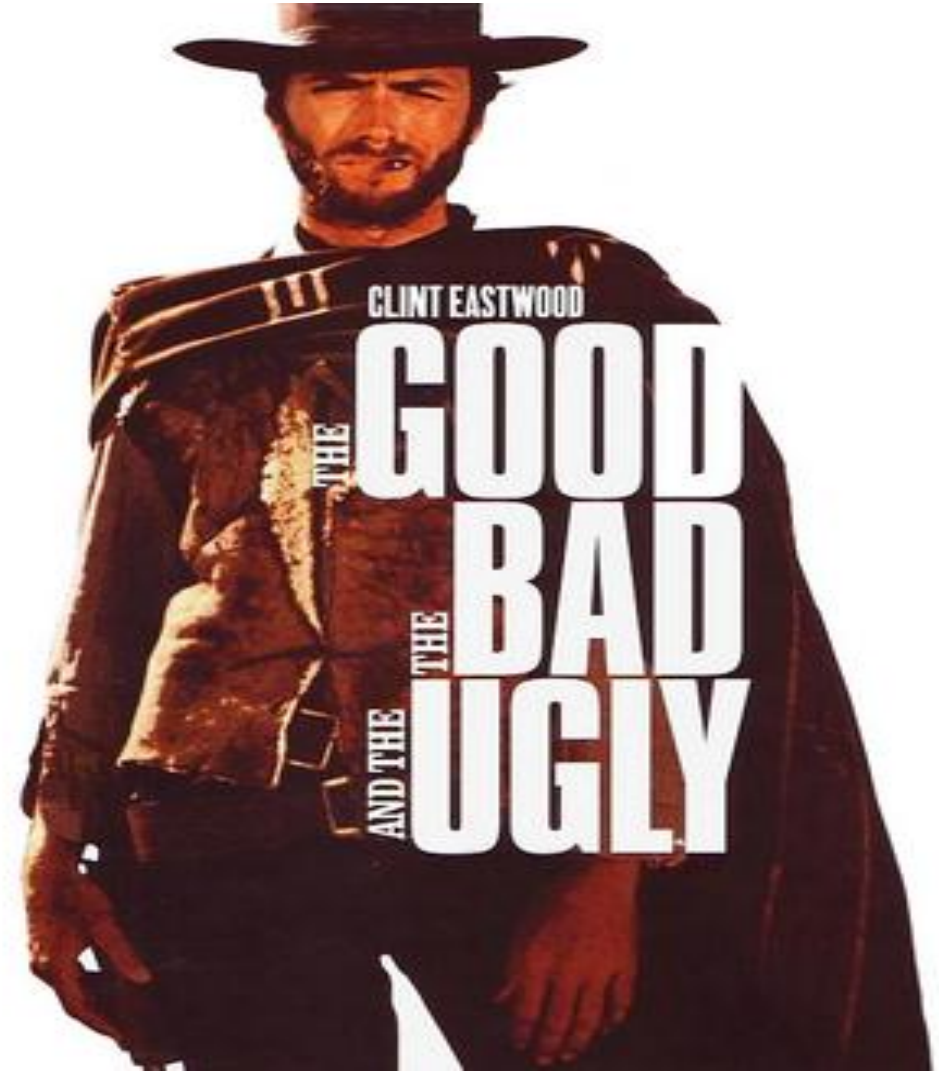
- Record breaking solar panel efficiency[1]
- >200 patents worldwide
- Global diversity: homes to power plants
- >1,800 dealer partners worldwide including approx. 35 in the Mid Atlantic region

[1] SunPower holds the world-record large Silicon panel efficiency (21.4%). Green, M. A., et. al. "Solar Cell Efficiency Tables (version 39)," Progress in Photovoltaics, 2013, vol. 21, p1-11.

Basic DER Rate Principles

- Customers have a right to use or not use electricity provided from the grid and on site devices
- Customers own all benefits of on site power unless they contract those rights to others
- Customers choosing to reduce their energy consumption should be treated on a non-discriminatory basis
- Although the value of exported power is hard to monetize today (requiring scale and technology), net metering is a reasonable proxy for the value while DG penetration is low (as shown in most non utility studies of solar value completed to date)

Rate Design in a High DER Penetration Scenario



“The Good, the Bad, and the Ugly”

- The Good: *Cost Recovery* – Ensure that everyone pays for a share of network infrastructure that they are relying on.
- The Bad: *Dual Rate Alternative* – Customers lose the right to use solar on their roof to serve their own loads and reduce purchased electricity. This approach will lead to significant increase in quasi rate cases.
- The Ugly: *Cost of Service Model* – Requires customer- and utility-specific information and infrastructure that is impractical today.

Developing the cost of service model may be the ultimate goal. How do we get there?

Turning The Ugly into the Good

1. Retain full retail credit for solar delivered to the grid until solar penetration exceeds a certain level (e.g. five percent). The Commission should then conduct a full cost/benefit analysis for behind-the-meter solar using local data.
2. If the costs of DG exceed the benefits, institute a minimum bill framework for all connected customers to ensure that everyone is paying a fair share of the costs of maintaining the grid.
3. Support utility/private developer pilot initiatives to build and analyze the costs and benefits of properly designed two way circuit(s) that integrate DER customer resources and a DG friendly grid infrastructure.

Advanced DER Rate Principles

- DG creates value at certain times and in certain places within the grid for non-DG customers – we need to figure out how to capture that value.
- In order to maximize value capture, utilities need to invest in circuit monitoring and change design standards for voltage regulation, trip/transfer settings, etc. The grid must become a two lane highway – no longer a one-way conduit from central generator to customer meter. Regulators should support this modernization of the grid with a well-designed multi year investment program.
- Since the value is complicated to calculate on an individual customer level, principles of rate making would support a calculation of average value that should be applied to every DG customer.
- Costs of operating the grid should be shared across all customers, including DER participants, but the ultimate goal of regulators should be to maximize societal benefit, not maintain the current utility throughput-based cost recovery model.
- Utility transparency must increase so fair rates can be established.

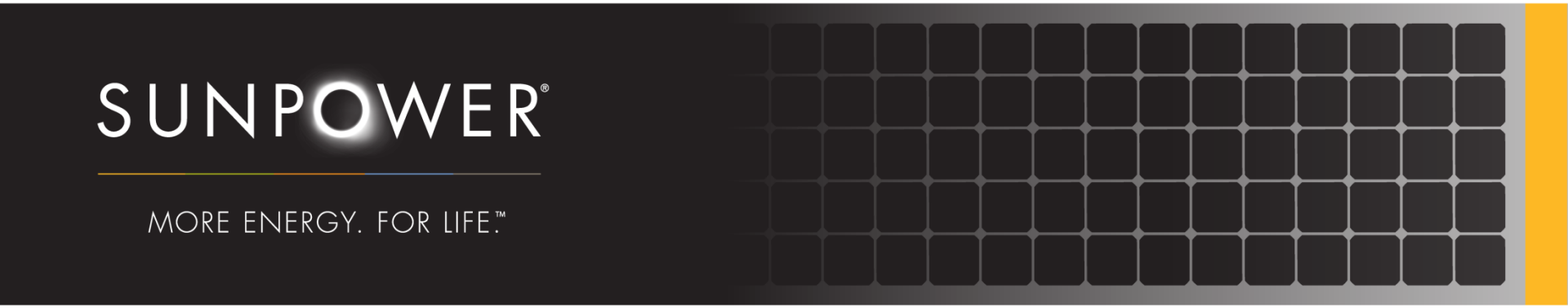
The new paradigm will be a grid where customers and the utility cooperate to maximize value creation at acceptable costs. The costs and benefits will be shared

Other Steps Toward a True Cost/Value Model for DG Rates

- Deploy TOU meters and establish TOU rates
- Allow DG aggregation to provide alternatives to grid expansion (open up the utility planning process; ID where DG can add value by reducing/eliminating constraints)
- Develop a residential solar load profile that can be bid by PJM suppliers in auctions such as NJ BGS
- Establish embedded generation distribution credits (*a la* the UK)
- Require utilities to pay customers for value delivered to the grid
- Require circuit-level hourly metering and communication

THANK YOU!

QUESTIONS / COMMENTS?



CONTACT: Jim Torpey
jim.torpey@sunpower.com