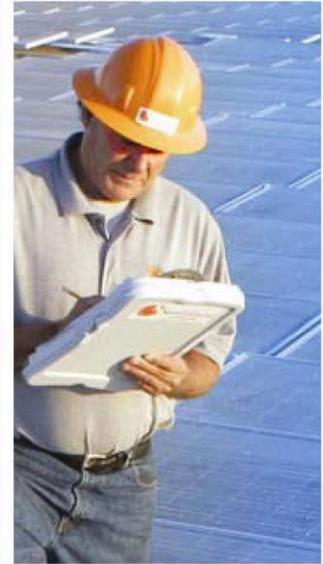




# SIMPLIFYING SOLAR



## **Markets and Trends: Solar Energy as a Service Understanding PPA's in Context**

Mark R. Culpepper - CTO  
July 28, 2009





## Introduction

Market Evolution

Market Outlook & Trends

Summary

# Introduction: SunEdison overview



## Pioneer in delivering Solar Energy as a Service (SEaaS)

- First to provide commercial turn key solar power plants
- No capital outlays with predictable energy 20 year terms
- No impact on existing services, no maintenance costs

## The largest solar energy service provider in North America

- 70 MW of 100% renewable capacity installed
- Over 130GWh of delivered energy
- Nearly 300 individual power plants under service

## Demonstrated track record with financial institutions

- Over \$500M in committed project-specific financing
- Experience financing in North America and Europe

## Diverse operational experience

- Beltsville, MD headquarters with over 300 employees globally
- Operations in North America and Europe

## High performance, transparent energy services

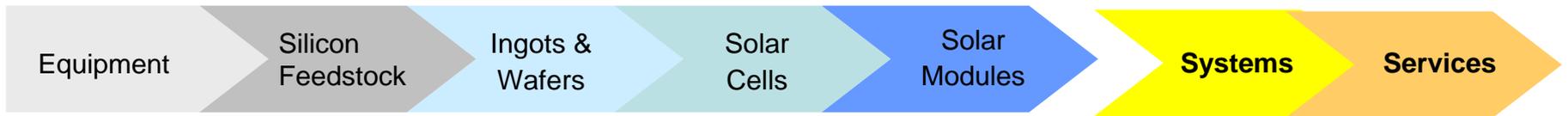
- Fleet-wide uptime in excess of 98%
- Fleet-wide delivered energy at 108% of underwritten investment



## Customer Alignment: The SEaaS Model – In Brief



**PPA providers...**



1. **...develop, build, finance, own and operate solar power plants in order to deliver solar services / sell commercial retail electricity at competitive retail prices...**
2. **...AND have an ownership stake in the plant, and thus plant performance. *If the plant doesn't perform, the PPA provider doesn't get paid.***



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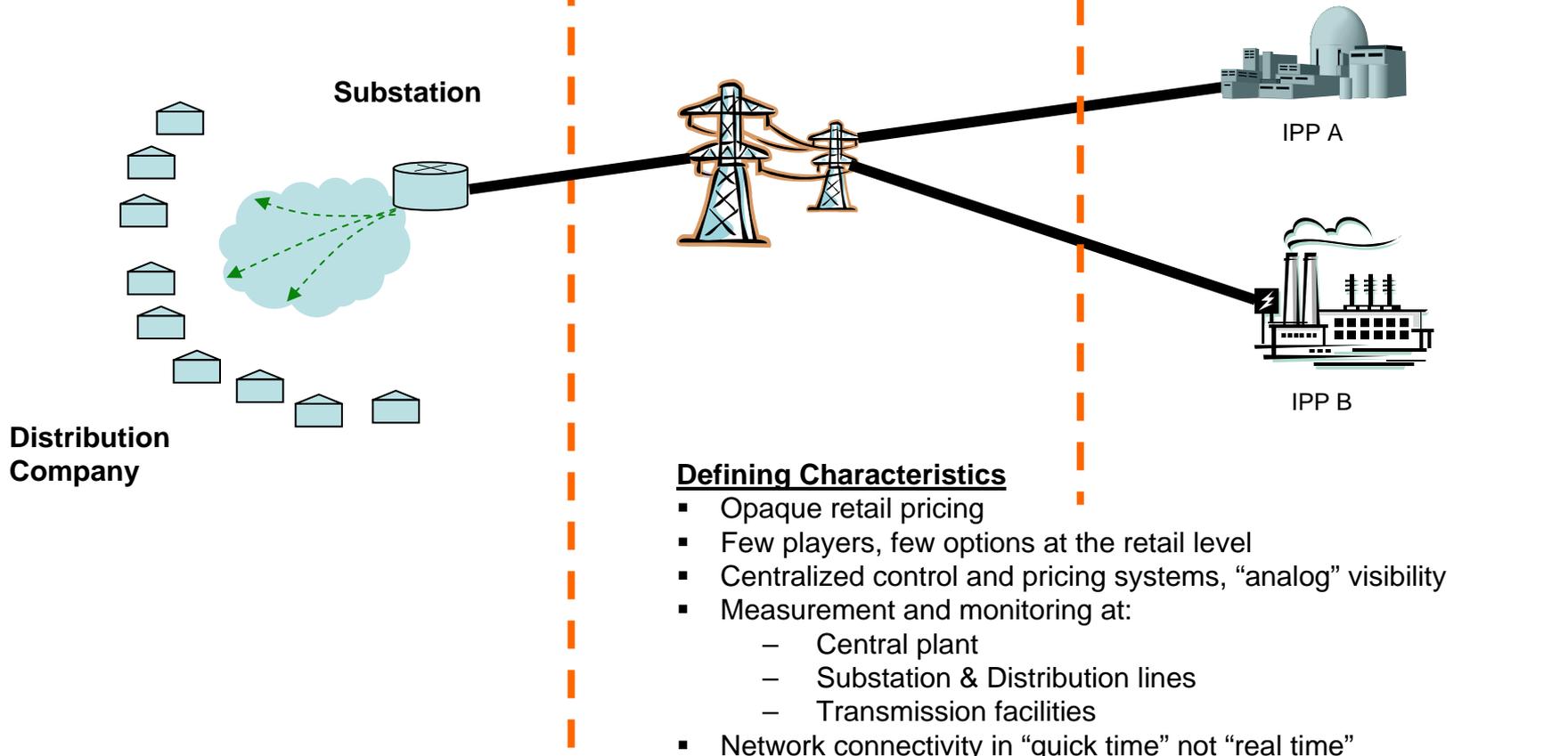
# Today's Grid: Largely Centralized, Fixed, and Mostly Predictable



Distribution

Transmission

Generation

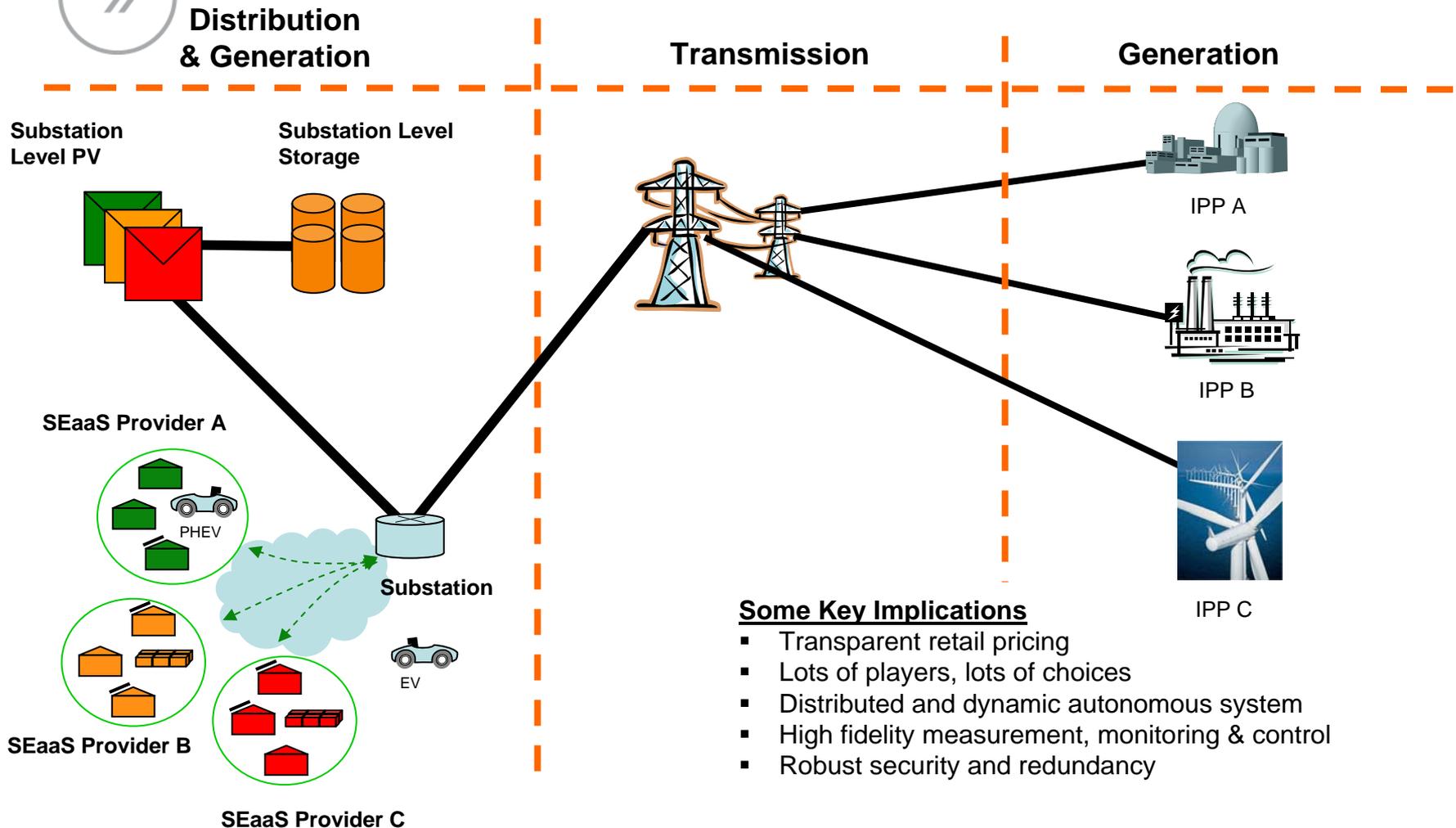


## Defining Characteristics

- Opaque retail pricing
- Few players, few options at the retail level
- Centralized control and pricing systems, “analog” visibility
- Measurement and monitoring at:
  - Central plant
  - Substation & Distribution lines
  - Transmission facilities
- Network connectivity in “quick time” not “real time”

**Challenge:** You pay whatever price the utility tells you

# Tomorrow's Grid: Regionalized, Dynamic, Redundant



## Some Key Implications

- Transparent retail pricing
- Lots of players, lots of choices
- Distributed and dynamic autonomous system
- High fidelity measurement, monitoring & control
- Robust security and redundancy

**Challenge:** How to pick the right provider?



## Evaluating SEaaS PPA Providers: Core Requirements

- Proven track-record of sustained energy delivery performance
- Technology Neutral panel supply with pricing flexibility
- Scalable EPC model for low cost implementations
- Access to diversified capital and structuring expertise
- Extensible services architecture with strong O&M capabilities

**Takeaway:** SEaaS PPA companies need all to succeed



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## Three key trends drive near-term solar market, accelerating progress to dynamic grid environments & price parity



1. Panel oversupply placing prices under extreme pressure
2. Rising commercial retail electricity rates increase long-term value of solar systems
3. Government regulations and incentives support the market evolution

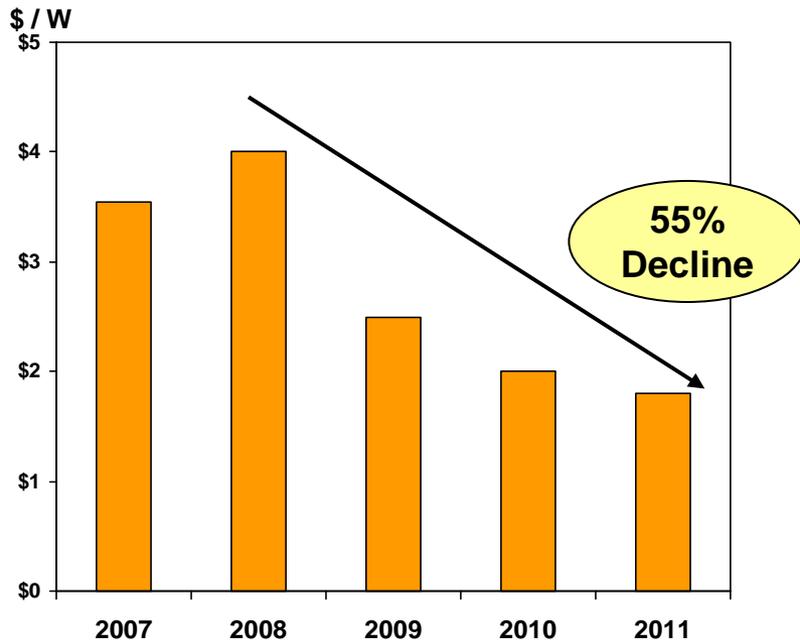


**The SEaaS Market is rapidly expanding – there will be multiple PPA players**

# 1. Panel oversupply placing prices under extreme pressure



## Panel Pricing, 2007 through 2011E



**Takeaway:** Providers leveraging trends will deliver greater savings

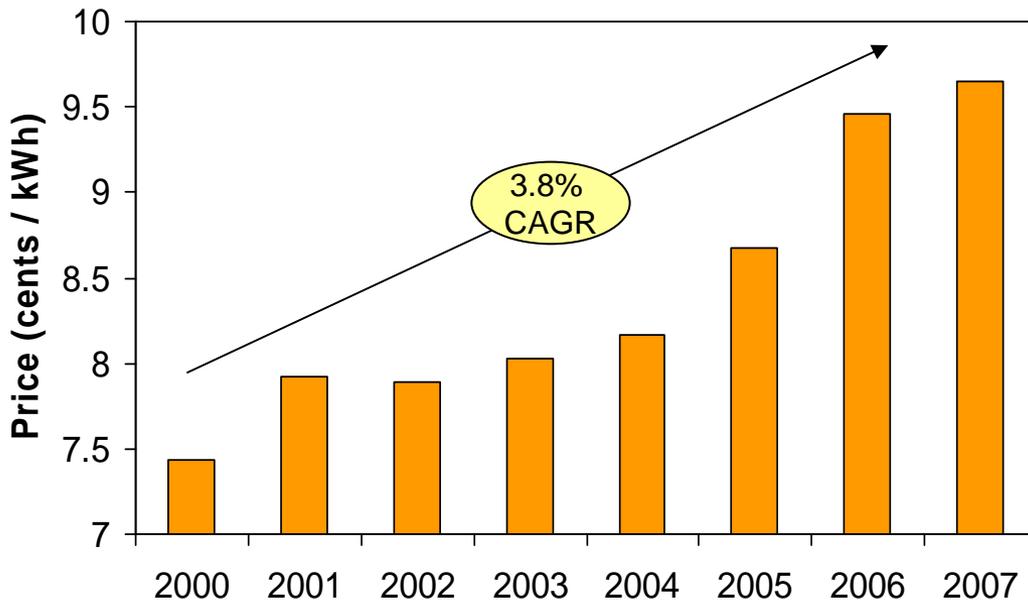
## Market Dynamics

- Panel manufacturers facing large inventories and overcapacity in 2009 and beyond
- Margins are being squeezed throughout the upstream value-chain
- More than 4x growth in Si supply between 2008 and 2010 (7GW to 32GW)
- Upstream companies forward integrating and squeezing pricing in mid-stream
- New technologies on horizon to compete with current market leaders

## 2. Rising commercial retail electricity rates improve economics of solar



U.S. commercial retail electricity prices



All indicators point to future increases in electricity prices, which will disproportionately impact the commercial sector:

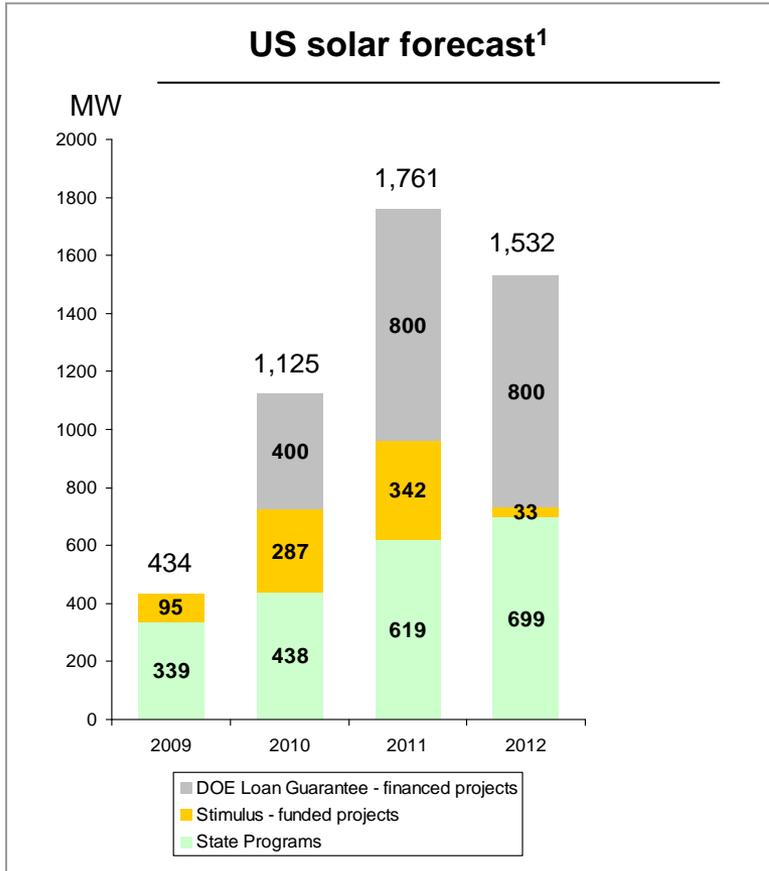
- Additional coal fired power plants increasingly difficult
- Outdated grid infrastructure, increasing cost of T&D
- Threat of national legislation / carbon price

**Takeaway:** Providers validating actual savings will gain share

### 3. Market trends, boosted by stimulus funding and RPS, support 5 GW installed from 2009-2012



**ESTIMATES**



- **State programs:** projects implemented with support of increased state level RPS programs
- **Stimulus-funded project:** Projects partially funded through Federal grant money
  - ~\$3.3 billion from State Energy Programs
  - \$5.5 billion from GSA
- **DOE loan guarantee-financed projects:** projects implemented with access to low cost debt financing through DOE loan guarantee program.

**Takeaway: High demand = find suppliers with proven service records**

1) Forecast does not include new states opening solar programs  
Source: SunEdison, DOE

# The dictate of service: Uptime, delivered energy, and customer savings



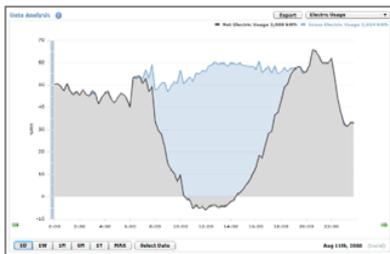
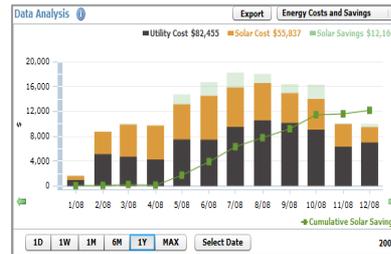
Transparent, high fidelity monitoring of on-site solar assets...

...with a robust services architecture...

*Asset distribution*

*Energy savings*

*Renewable Operations Center*



*15 minute interval data*

*Environmental offsets*

*Ticketing & Field Dispatch*

...drives greater uptime, more delivered energy and greater customer savings

**Takeaway:** Providers focused on uptime & service will grow faster



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# Summary: Market Outlook and Trends



## Pioneer in delivering Solar Energy as a Service (SEaaS)

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## North American retail electricity market

- From opaque pricing, to transparent market pricing
- Lots of evolving provider choices
- Selection criteria is critical

## Market Outlook & Trends

- Rapid expansion of industrial solar capacity
- Increasing electricity rates
- Strong government policies around renewable standards
- Plants require service to maximize savings

## SunEdison – 5 years as the market leader in solar services

- Fleet-wide uptime over 98%
- Fleet-wide delivered energy 108% of underwritten investment





## Contact Information

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