kWh Analytics:
Quality Ratings for PV

DOE SunShot Grand Challenge

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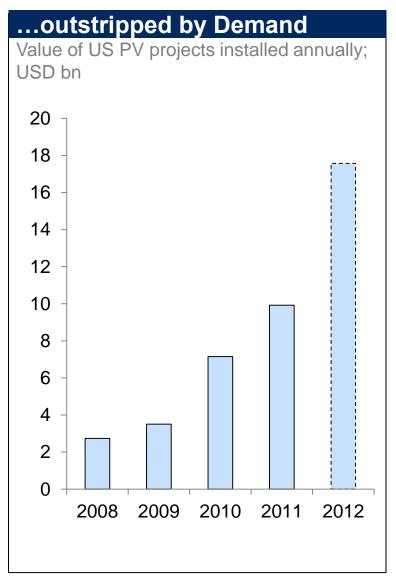June 2012

US solar adoption constrained by scarcity of capital

Supply of Capital for PV…

- Wells Fargo
- US Bank
- Union Bank
- Rabbobank
- Morgan Stanley
- JP Morgan
- Goldman Sachs
- NY Life
- MetLife
- John Hancock
- …

…outstripped by Demand

Value of US PV projects installed annually; USD bn

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Year	Value
2008	~2.7
2009	~3.5
2010	~7.1
2011	~9.9
2012	~17.6

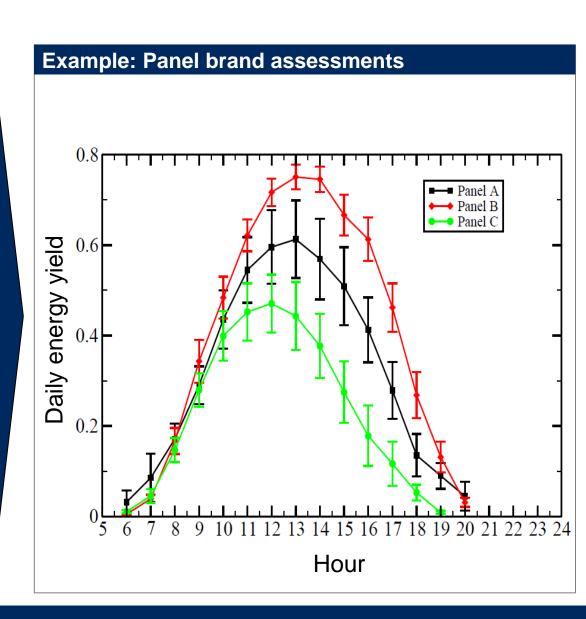# Identifying quality differences is the first step towards correct risk pricing

Data

- Thousands of PV systems across the US
- Aggregated and normalized data

Backend

- Cloud based storage (Amazon EC2+S3)
- Parallel computing architecture
- Scalable to millions of systems

Analytics

- Machine learning
- NoSQL Mapreduce query engine
- Confidence interval for every prediction

Example: Panel brand assessments

Transparent, independent ratings enable new capital to deploy in solar with less risk

		Panel	Inverter	EPC	O&M	Envi
Total score (Out of 100)	=	X (10 max)	+ X (15 max)	+ X (20 max)	+ X (25 max)	+ X (30 max)
"A" Quality		• Brand 1 • Brand 2 • Brand 3	• Brand 1 • Brand 2 • Brand 3	• Brand 1 • Brand 2 • Brand 3	• Brand 1 • Brand 2 • Brand 3	• Location 1 • Location 2 • Location 3
"B" Quality		• ""	• ""	• ""	• ""	• ""
"C" Quality		• ""	• ""	• ""	• ""	• ""

Ratings are valuable because of what they enable

Cost of Capital and Solar Demand are inversely related

By increasing the investment capital available for solar + enabling efficient securitization, ratings could reduce cost of capital by 2%, or **$.40/W** * 130GW = **$52bn**

Solar Demand

Cost of Capital

Assumptions: Reduction of debt interest rates from 7% to 5%, on $3/W at 60% leverage. McKinsey forecasts of 80-130GW PV installed in US between 2012 - 2020

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