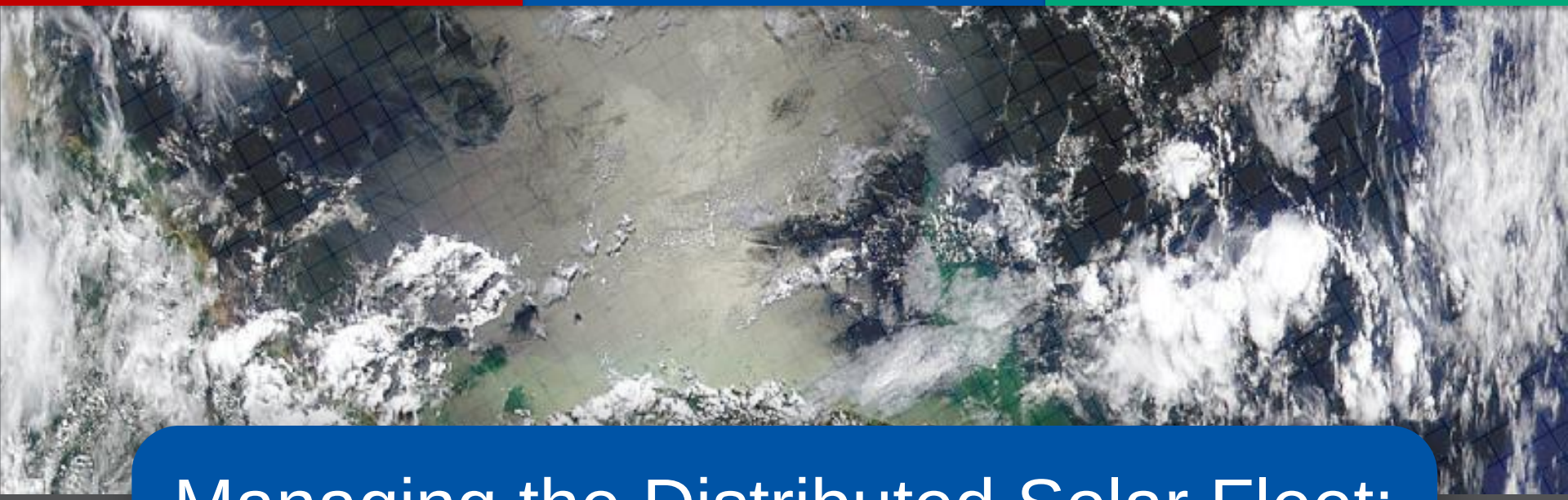

Managing the Distributed Solar Fleet: From Interconnection to Fleet Operations

Clean Power Research®

Solar Power International 2013

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v040313

Today's Presenters

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solar electric power association

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Today's Discussion

- Challenges of Managing Distributed Solar
- Administration
- Customer Engagement
- Grid Integration
- Q&A

This material is based upon work supported by the U.S. Department of Energy under Award Numbers DE-EE0006329 and DE-EE0006408.

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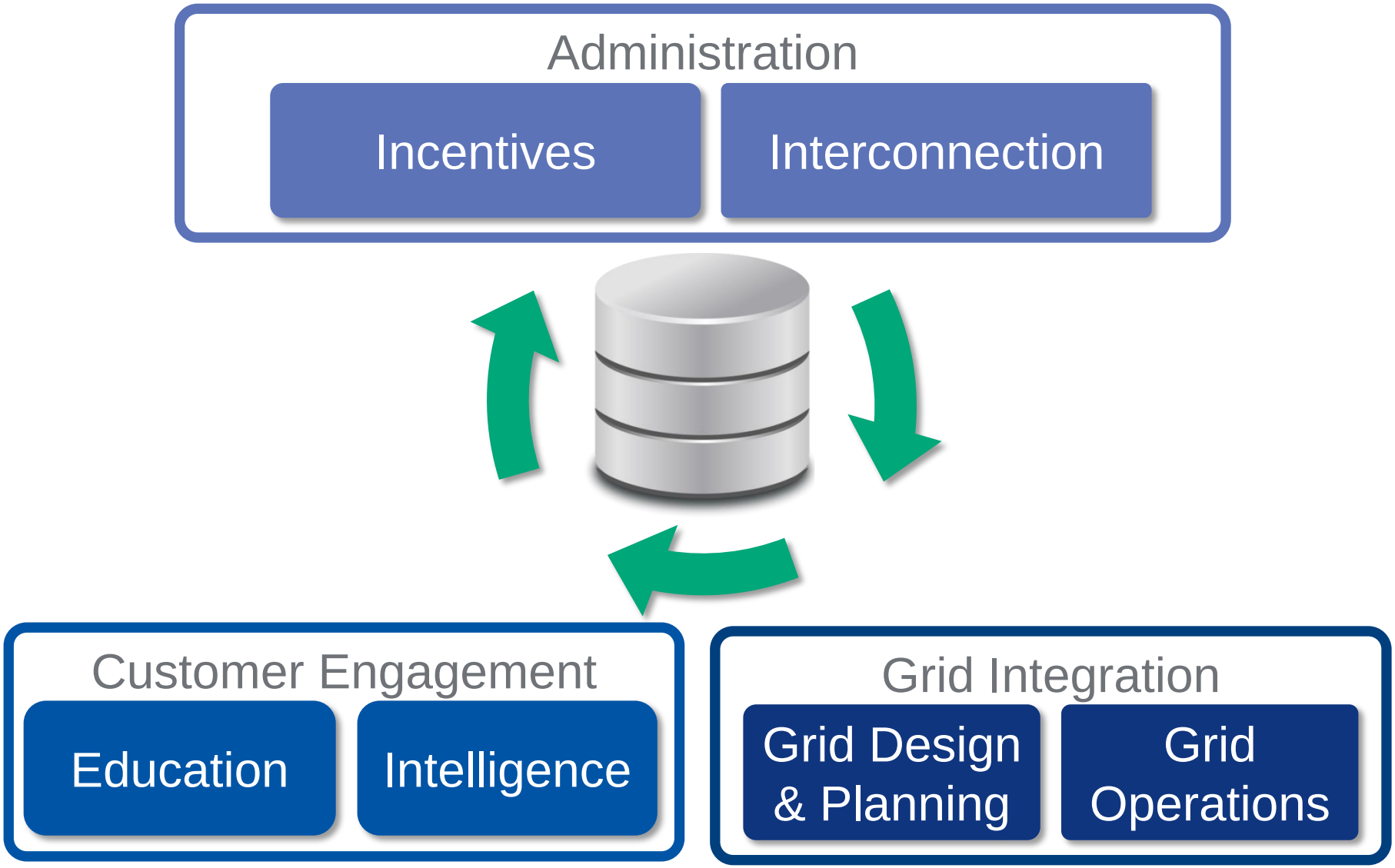
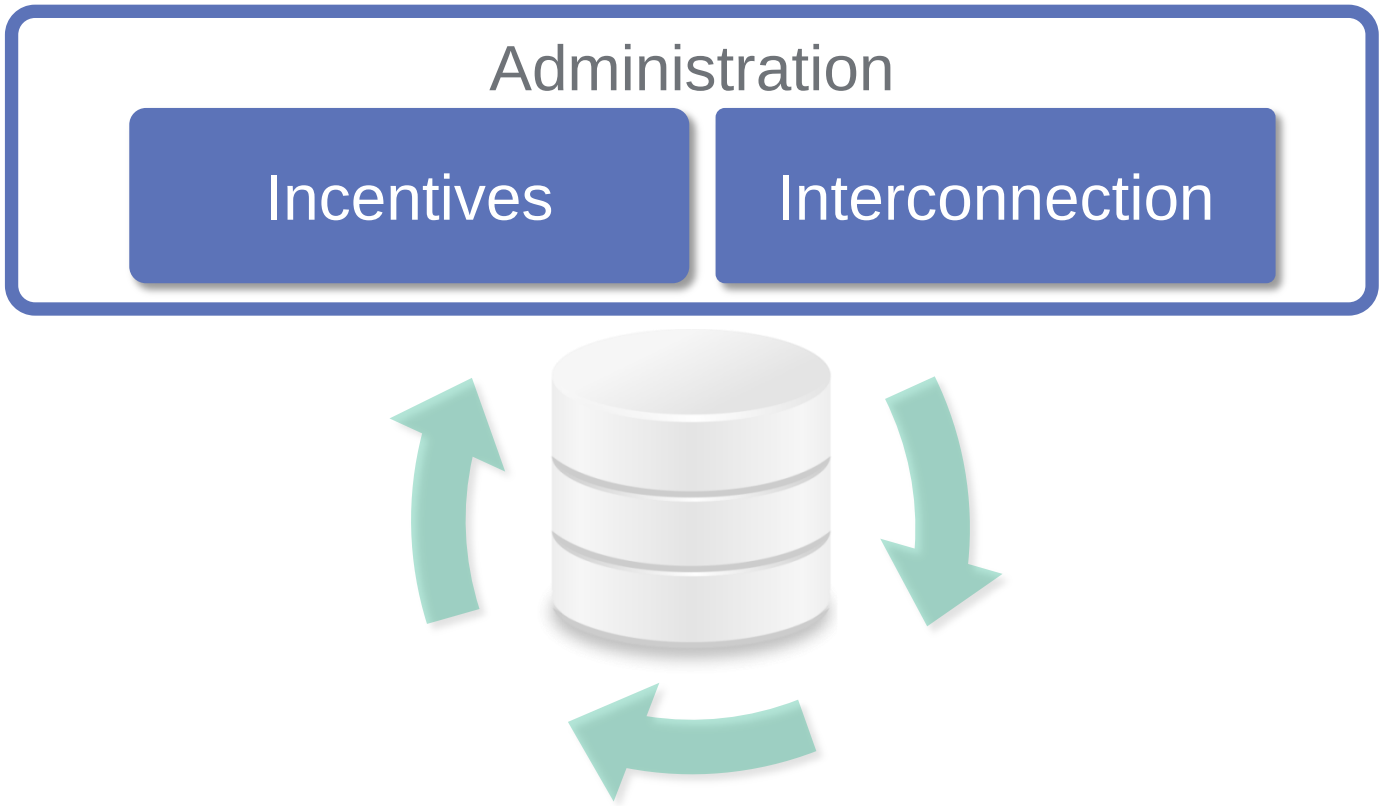
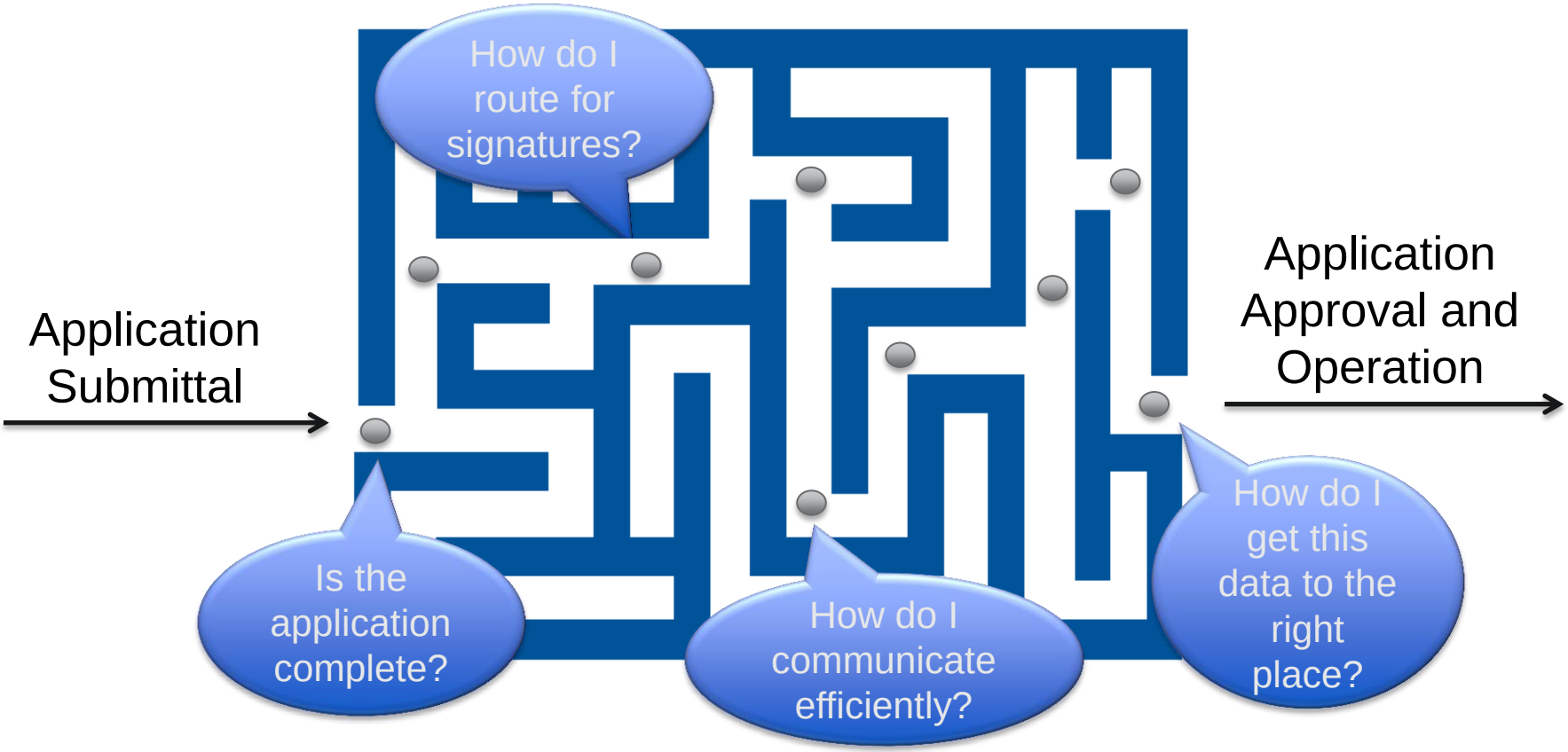
Utility Management of Distributed Solar



Onboarding Distributed PV



Interconnection Challenges



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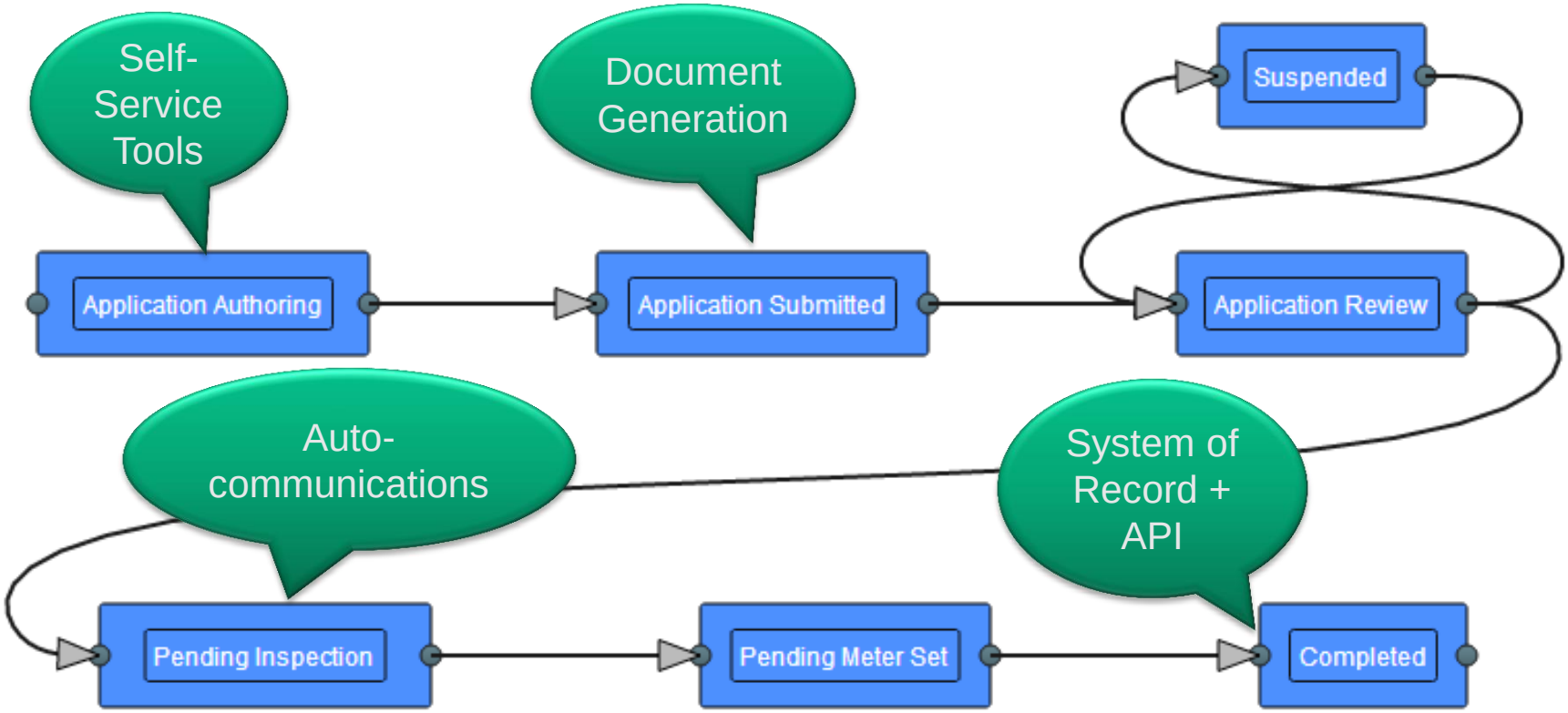
A Clearer Path Forward



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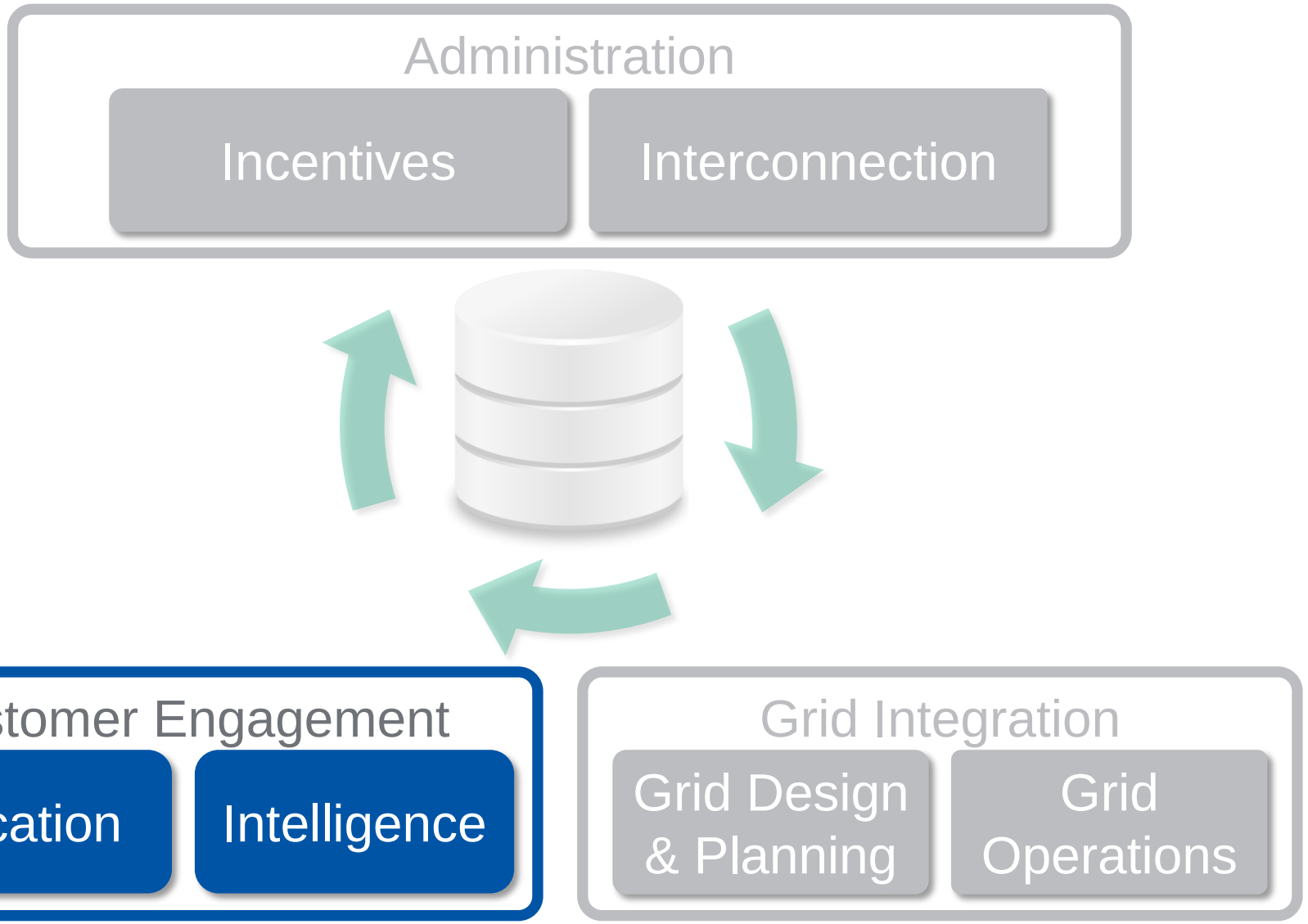
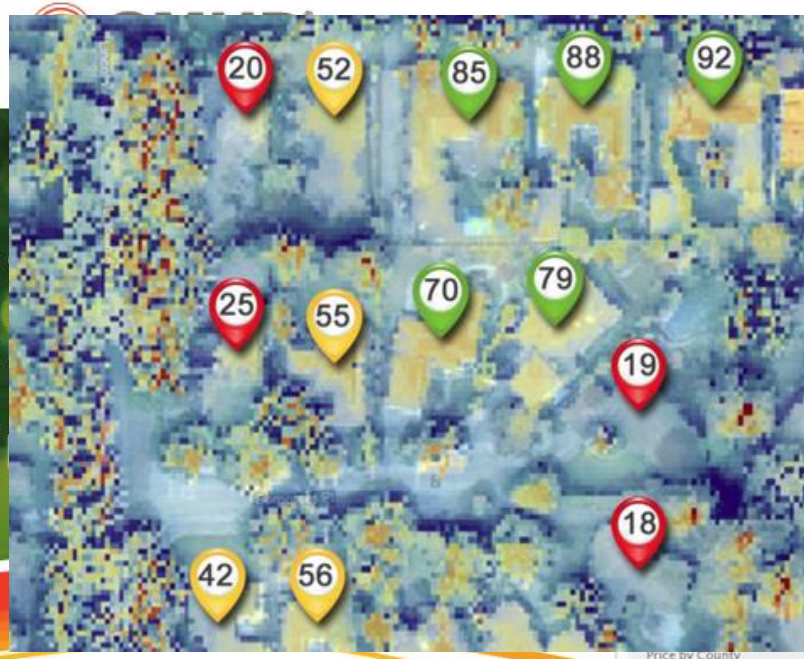
PowerClerk Interconnect Demo

Helping Customers Make Smart Decisions



Customer Engagement

Rooftop Analysis



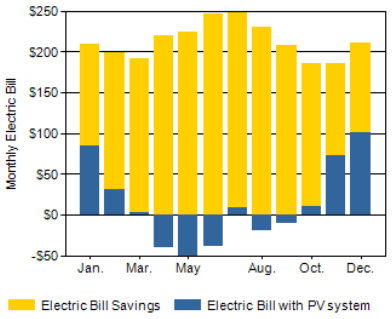
Detailed Economics

System Summary

Net system cost after all incentives:	$10,466
PV system electricity production:	9,455 kWh/year
Electricity production supplied by system:	100%
Carbon dioxide emission reduction:	8,581 lbs per year
Internal rate of return:	28%
Net present value:	$37,842
Years to payback:	4.9

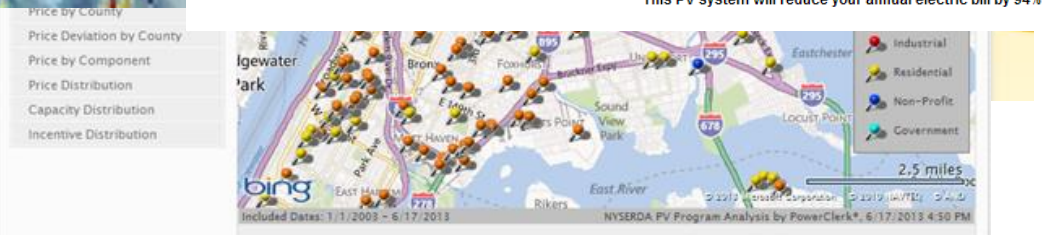
SELECT...	NET COST YEAR 1	MONTHLY ELECTRIC BILL	DAILY PV PRODUCTION	DAILY ELECTRICITY USE	MONTHLY PV OUTPUT
	NET CASH FLOW	CUM NET CASH FLOW	CUM DISC CASH FLOW	NET CASH FLOW DETAIL	POLLUTION PREVENTION

Monthly Electric Bill



	Without PV system	With PV system	Bill Savings
January	$209	$84	$125
February	$199	$31	$168
March	$191	$3	$188
April	$180	$-40	$220
May	$174	$-50	$224
June	$208	$-39	$247
July	$249	$8	$241
August	$210	$-20	$230
September	$198	$-10	$208
October	$186	$10	$176
November	$185	$72	$113
December	$211	$101	$110
TOTAL	$2,400	$150	$2,250

This PV system will reduce your annual electric bill by 94%



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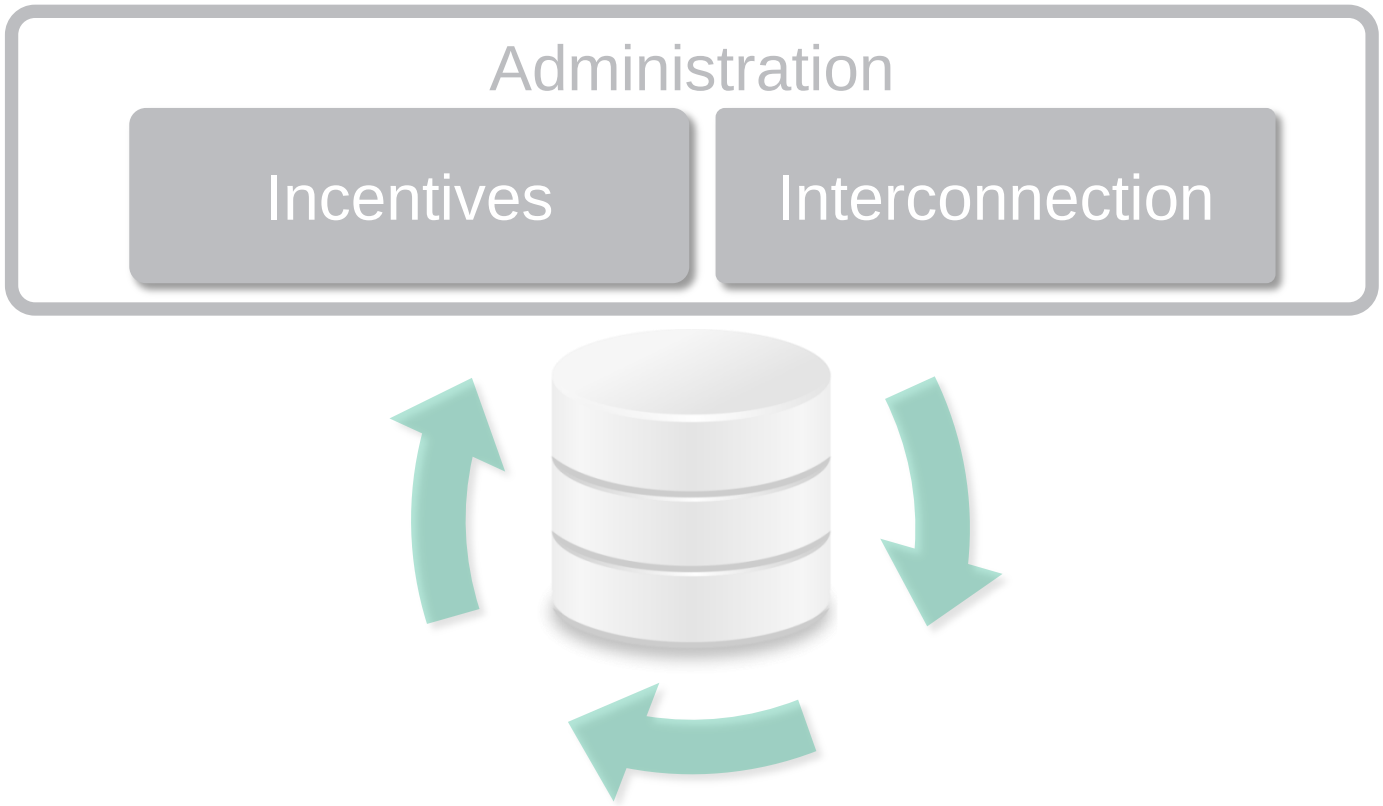
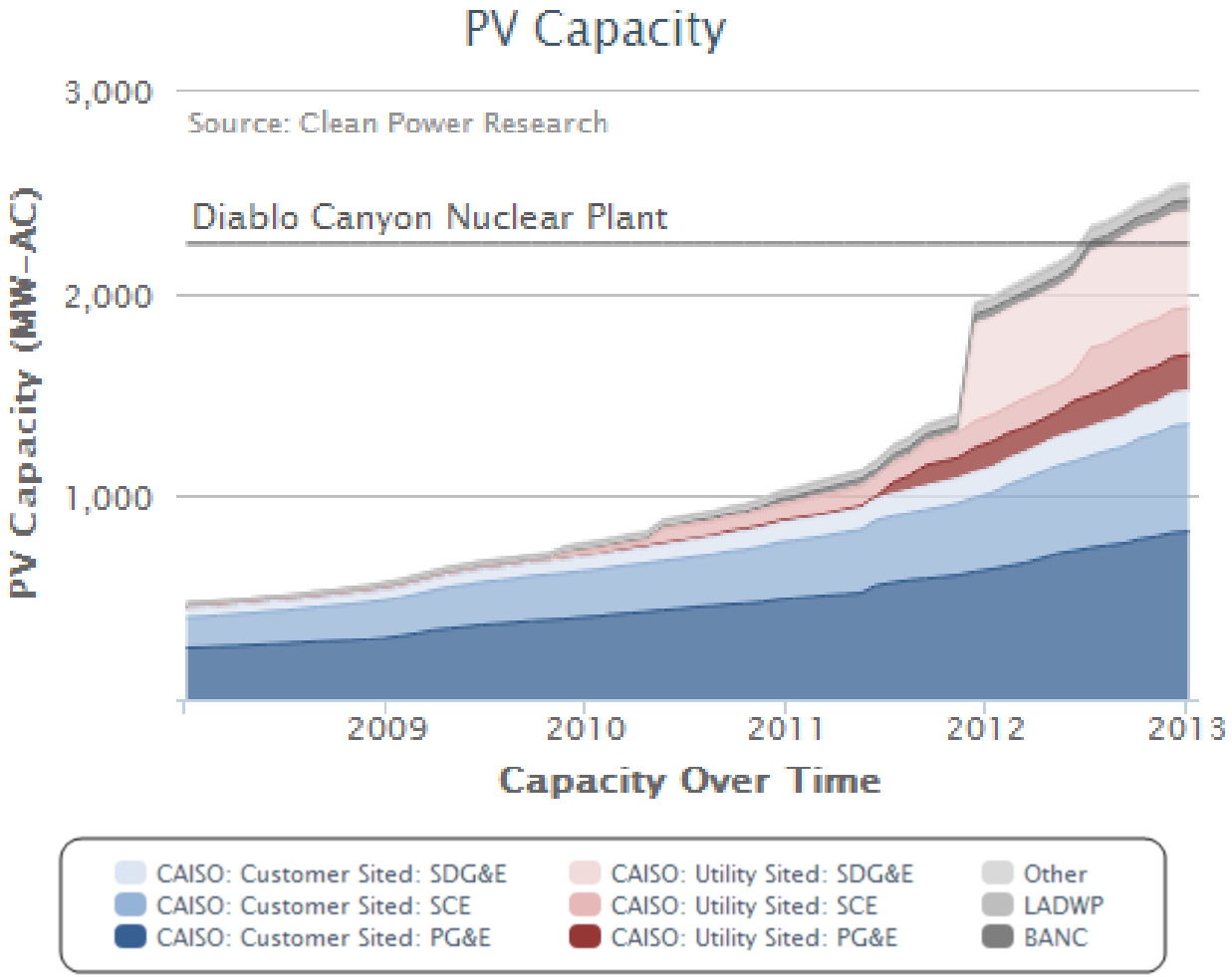
Integrating Grid-Connected PV

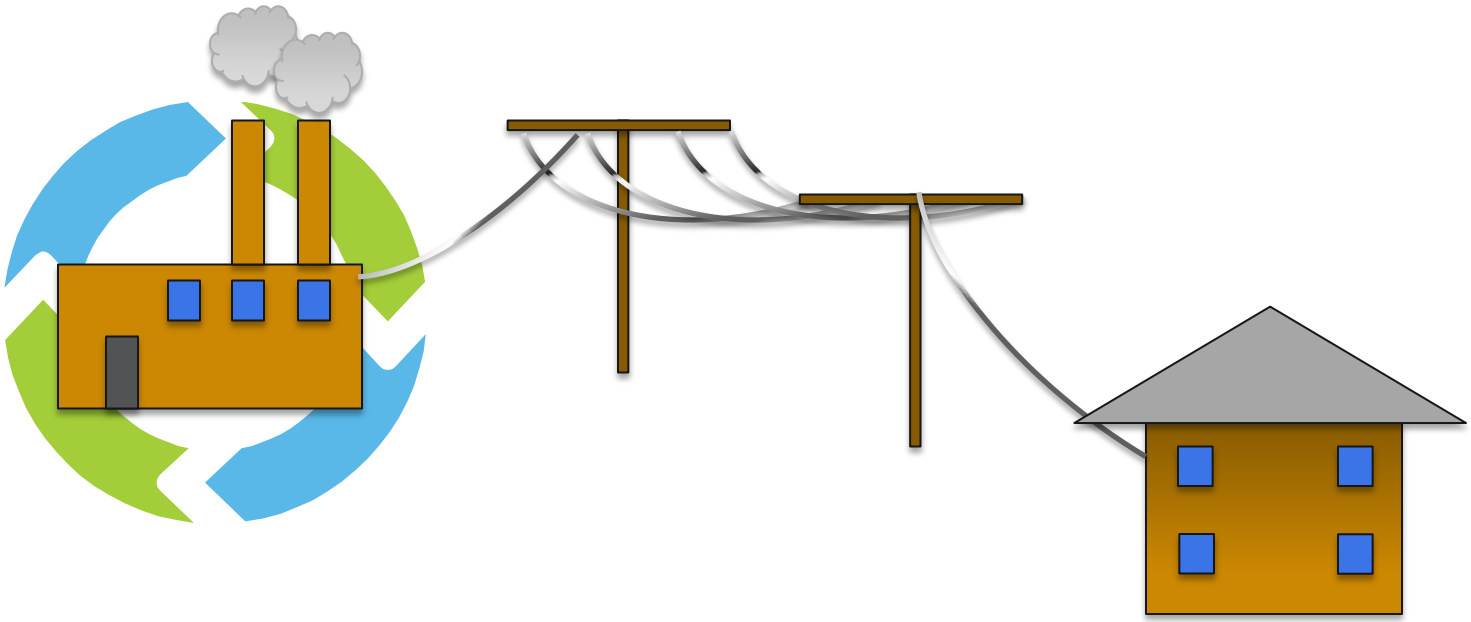


The PV Challenge: **Capacity is Growing (*and fast*)!**



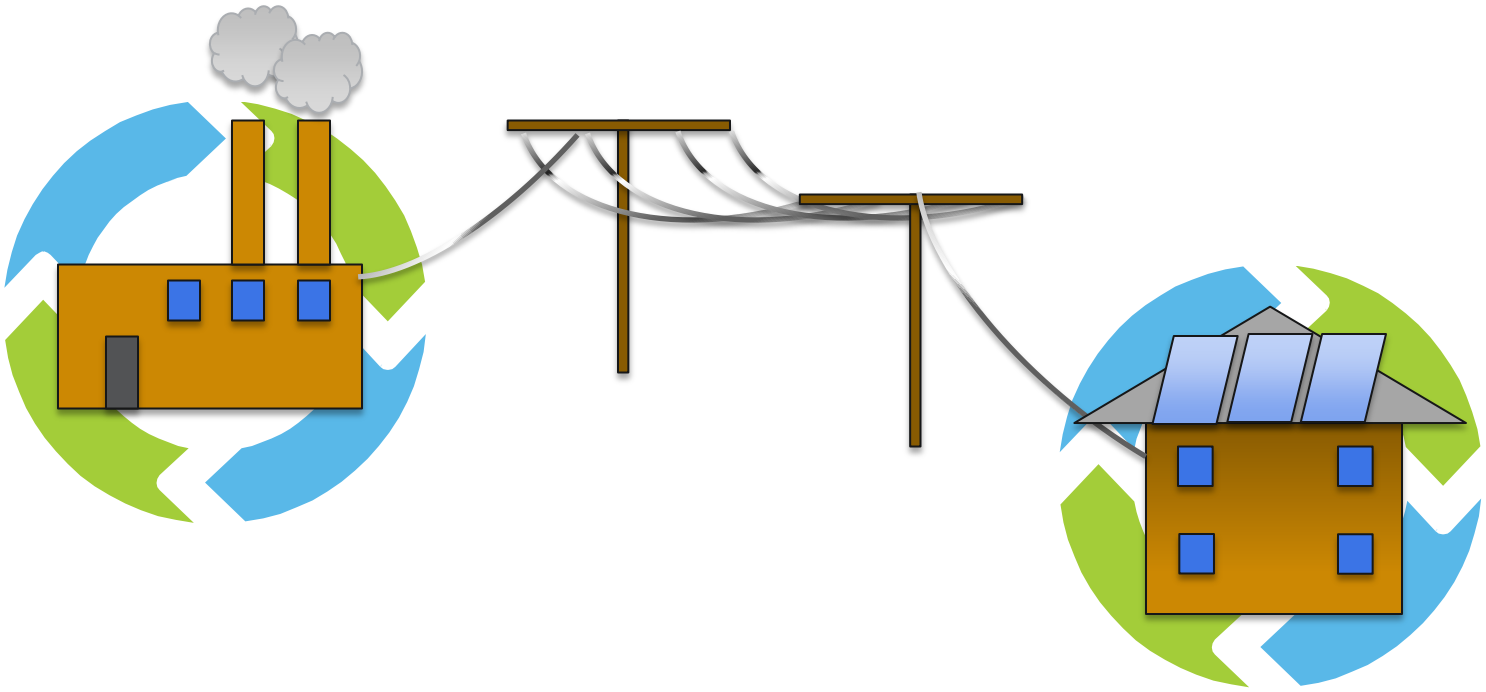
Note: Utility-sited systems include intertie systems in NV and AZ

The PV Challenge: **Plan and Forecast**



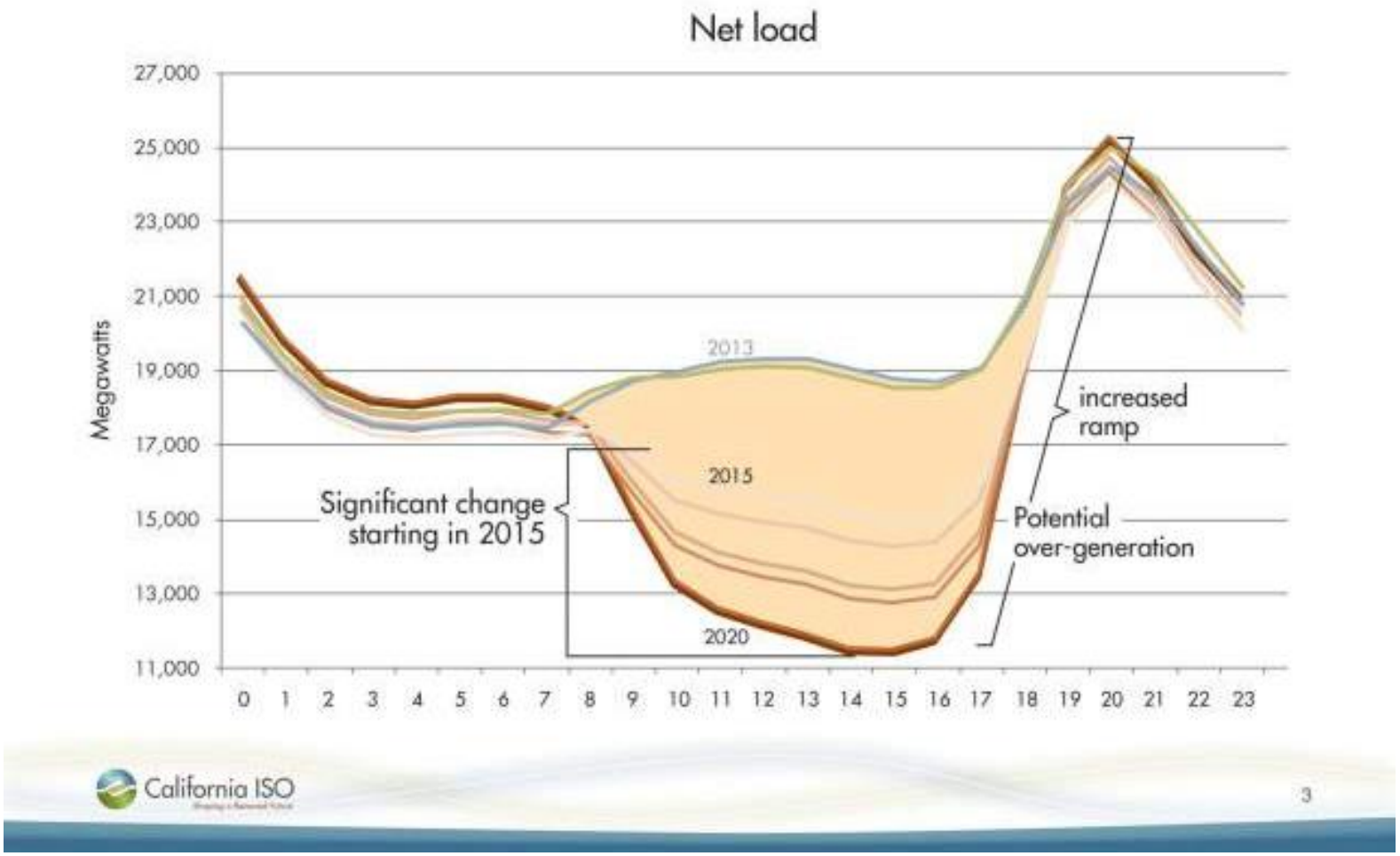
Load *was* separated from generation

The PV Challenge: **Plan and Forecast**



Now, generation is *co-located* with load

The PV Challenge: **The Duck**



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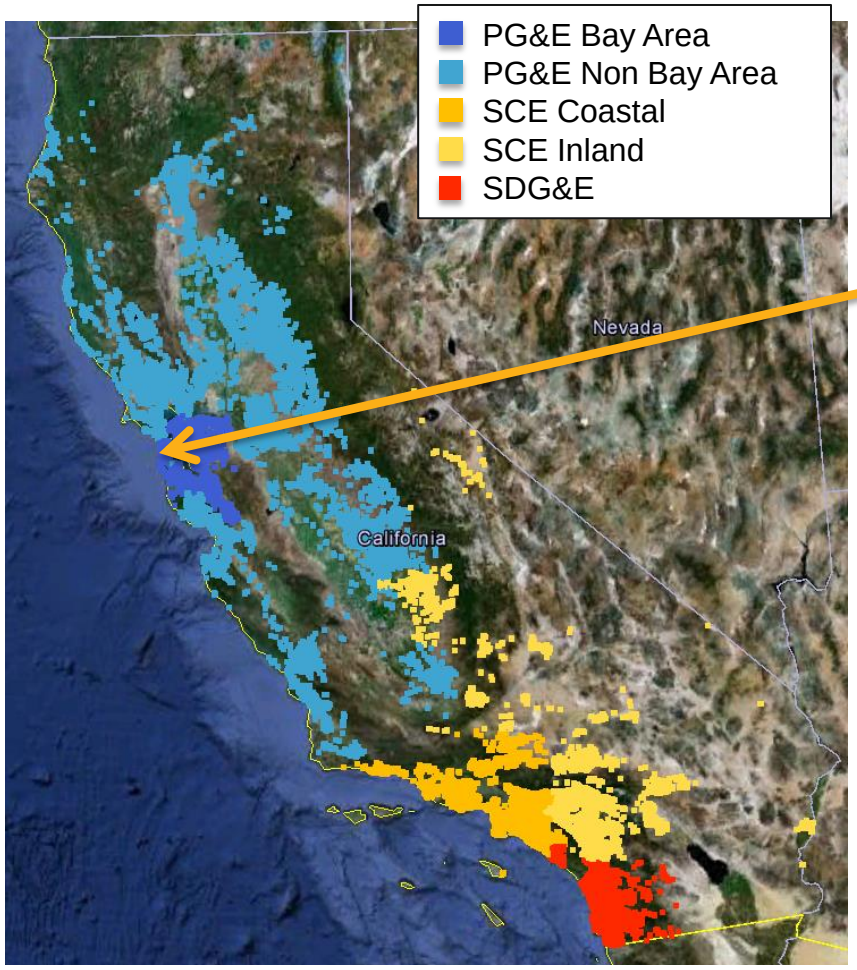
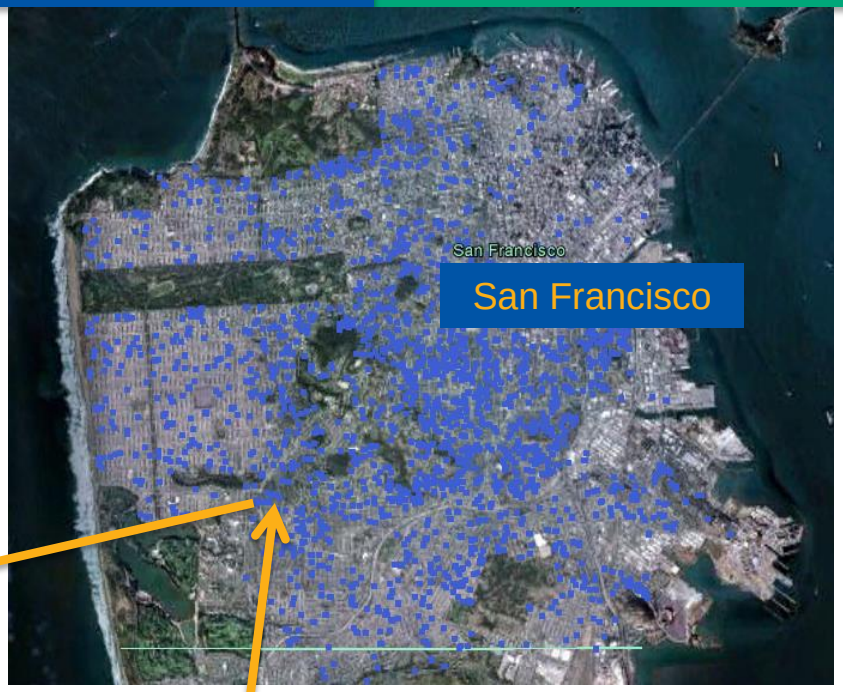
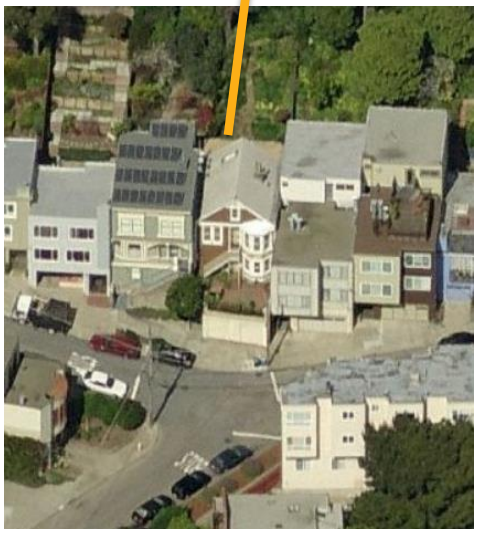
Step 1: Identifying the Generators

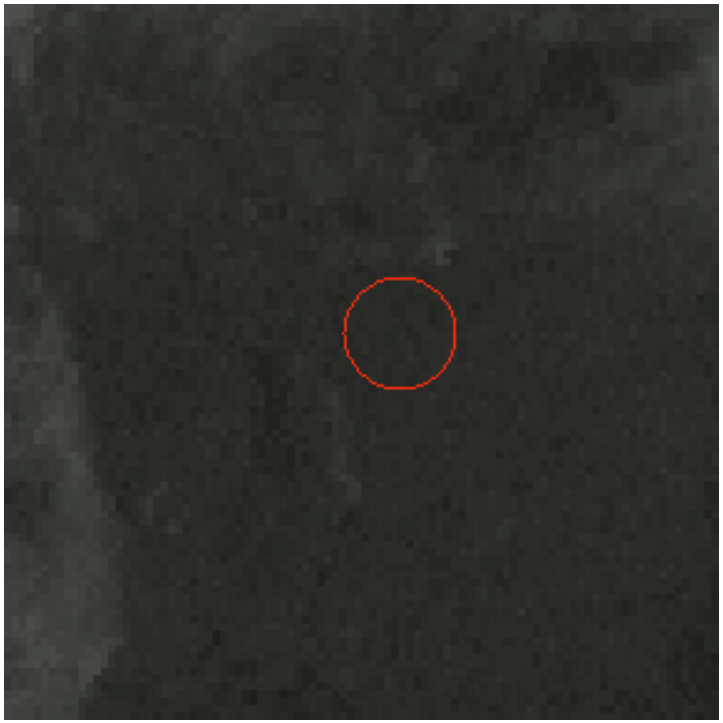


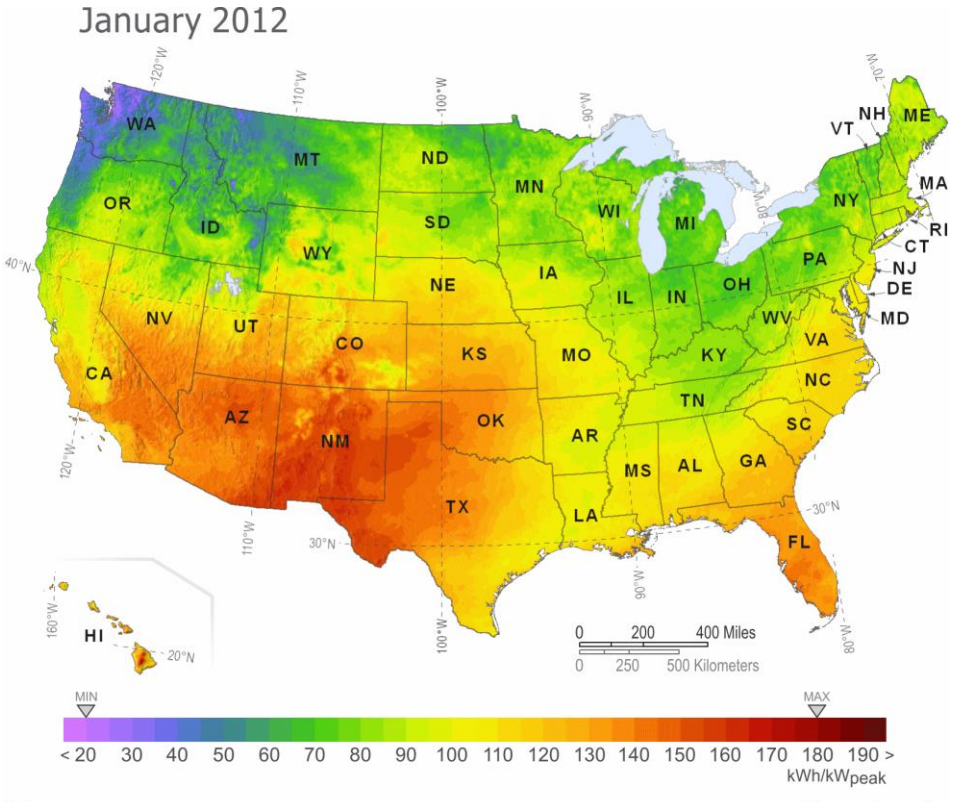




- 4.49 kW-AC
- SunPower Inverter (SPR-5000X, 240V)
- 27 Modules (SunPower 210 W, SPR-210-WHT)
- 37.76281º N, 122.44313º W
- Commissioned April 2008

Step 2: Forecasting Generation

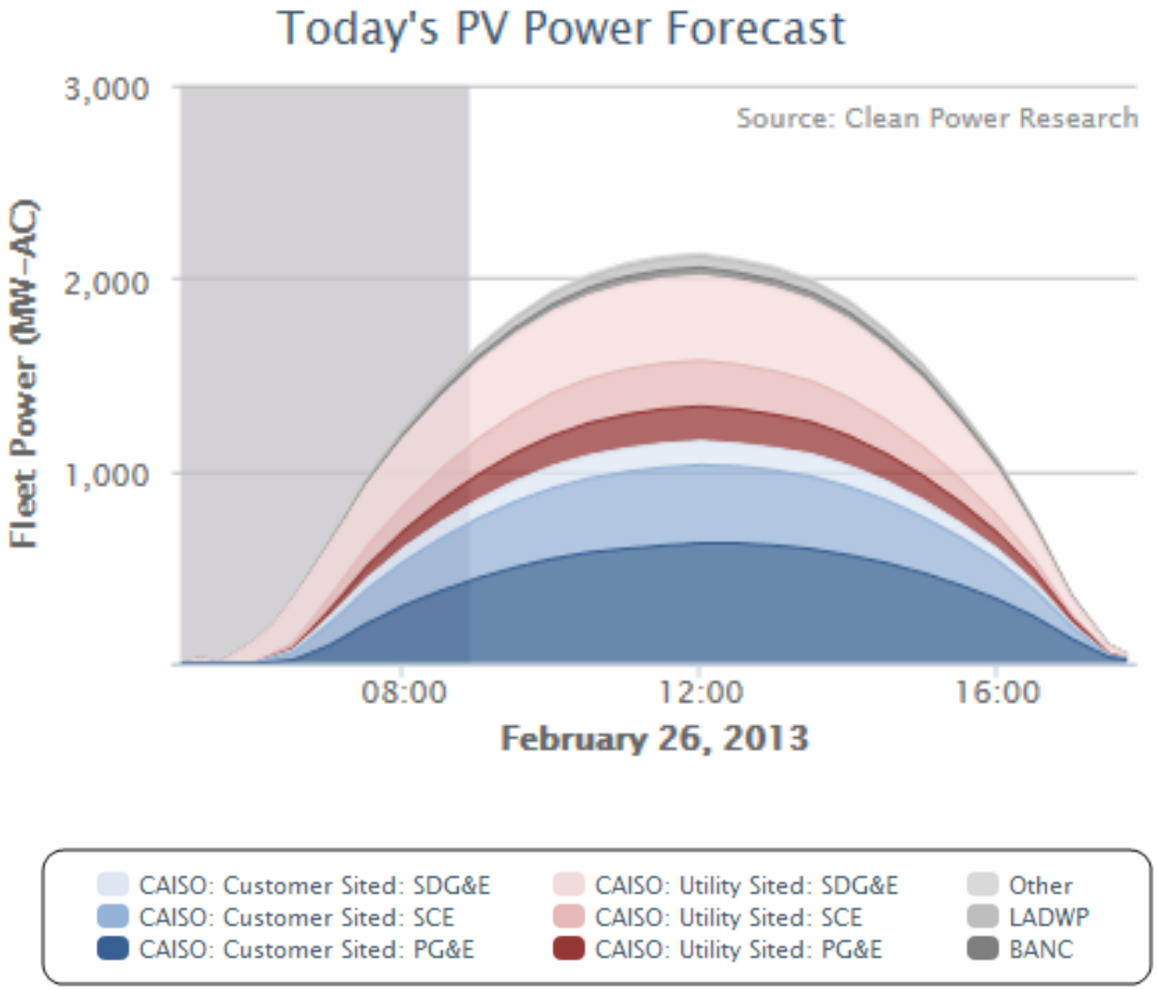




Short Term

Long Term

Step 3: Aggregating Forecasts



Note: Utility Sited systems include intertie systems in NV and AZ

Step 4: Systems Integration

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SolarAnywhere FleetView Demo

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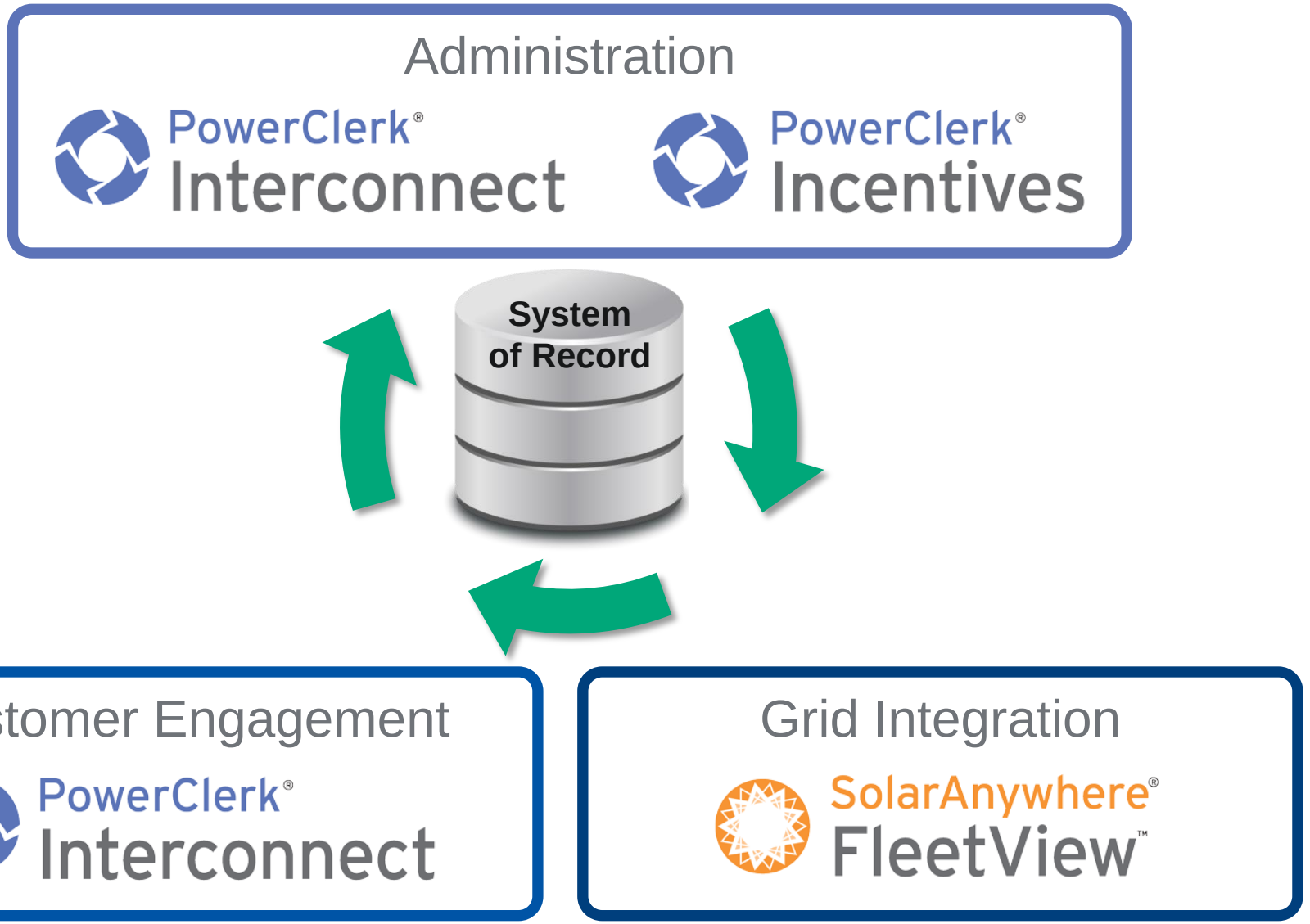
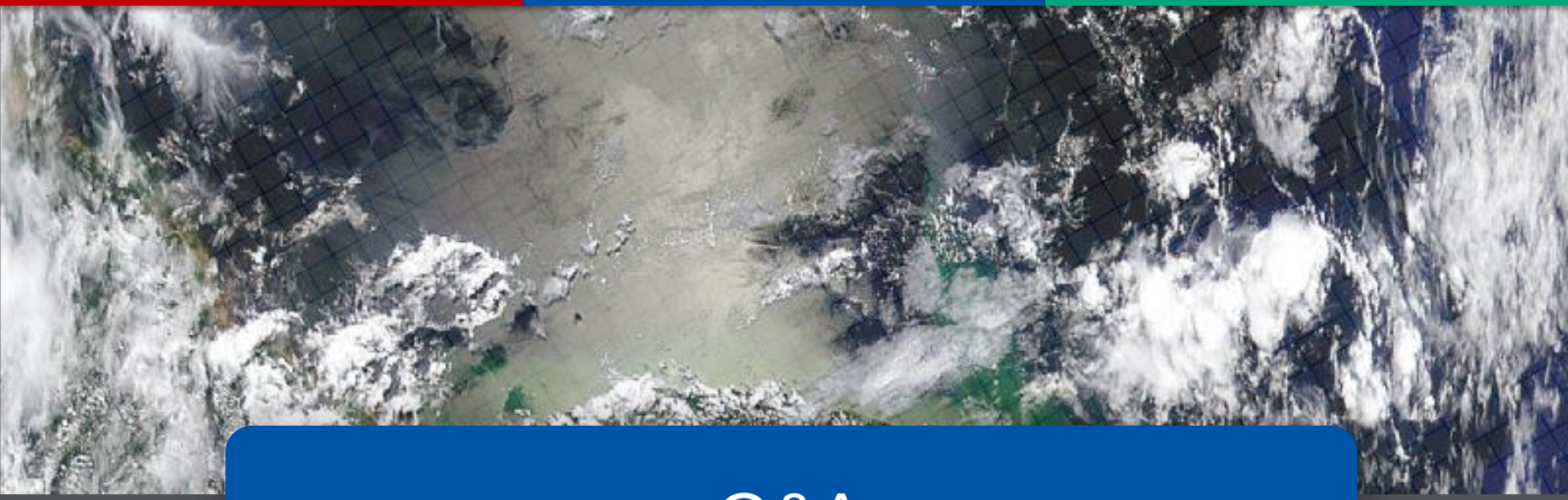
Utility Management of Distributed Solar





Q&A

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