

Utility Perspective: Compliance Market for Renewable Energy in California

Jomo Thorne
Manager, Renewable and Clean Energy Strategy

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1. About PG&E
2. California's Renewable Portfolio Standard (RPS)
3. Product and Geographic Restrictions
4. Renewable Market Dynamics In California



Pacific Gas and Electric Company (PG&E)



Company Facts

- Fortune 200 company located in San Francisco, CA
- \$14M in operating revenues in 2010
- 20,000 employees

Energy Supply

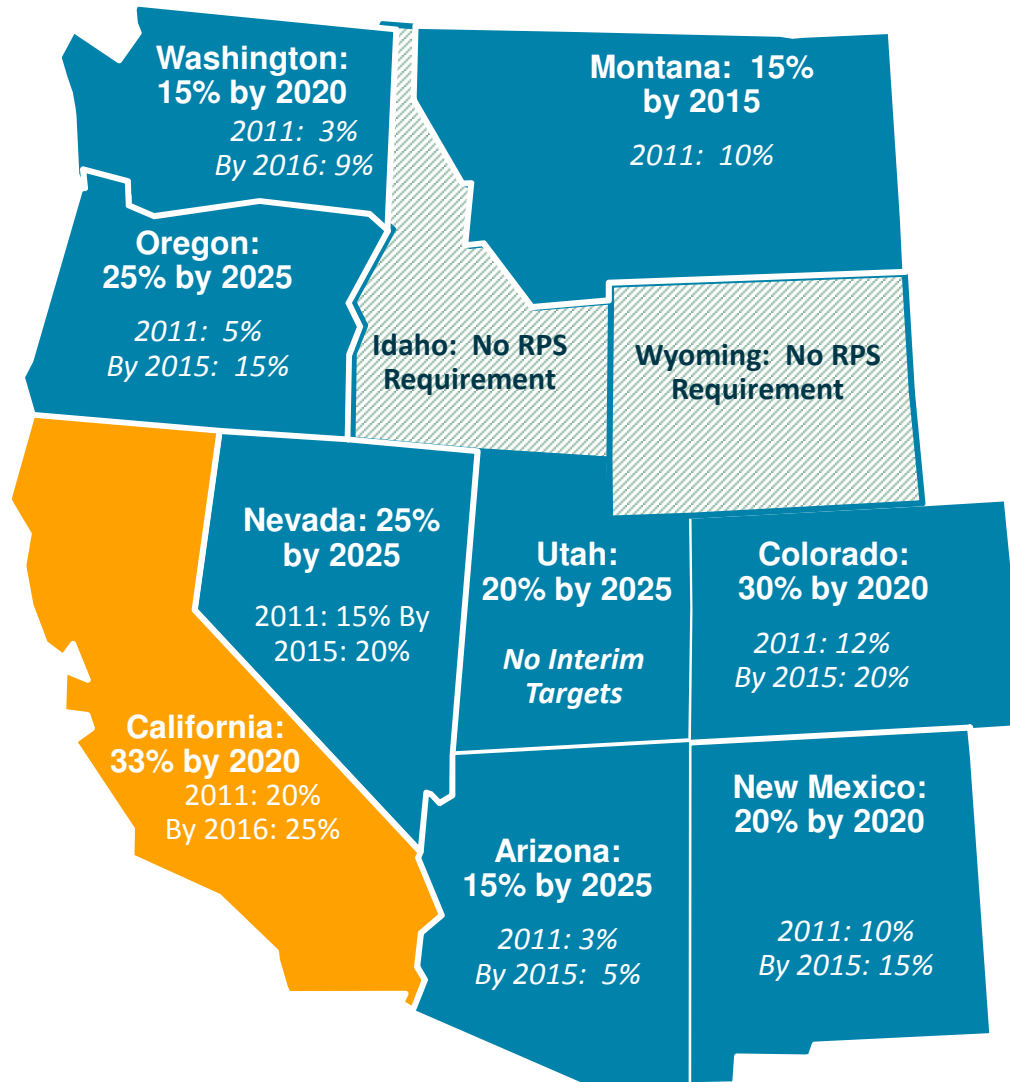
- Services to 15M people:
 - 5.2M Electric accounts
 - 4.3M Natural Gas accounts
- Peak electricity demand: 20,000 MW
- Over 50% of PG&E's electric supply comes from non-greenhouse gas emitting facilities

Service Territory

- 70,000 sq. miles with diverse topography
- 160,000 circuit miles of electric transmission and distribution lines
- 49,000 miles of natural gas transmission and distribution pipelines



California Has Most Aggressive RPS Mandate In the Nation



Source: DSIREUSA.org



Executed RPS Contracts

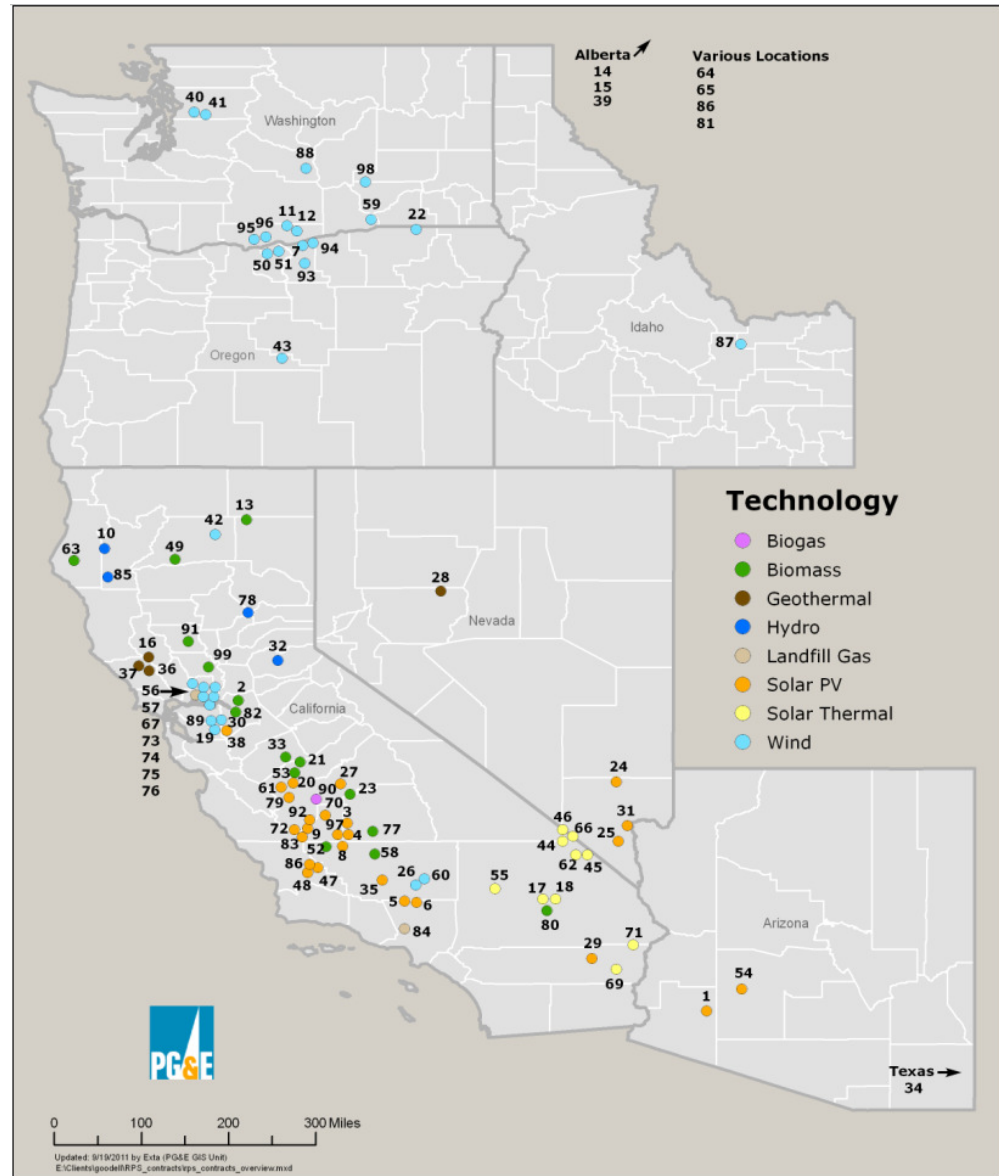
114 RPS contracts totaling over 9,900 MWs, since the program began in 2002^(1,2)

Technology	#	Min MWs
Geothermal	9	662
Wind	38	3,636
Bioenergy ³	20	254
Solar PV	26	2,536
Solar Thermal	14	2,735
Small Hydro	6	80
Wave	1	2
Total	114	9,904

¹Table does not include small (less than 1.5 MW) renewable generator PPAs and 5 amended post-2002 QF contracts (QF contracts total MW = 56 MW)

²Table includes terminated/expired/rejected contracts which are excluded in the map

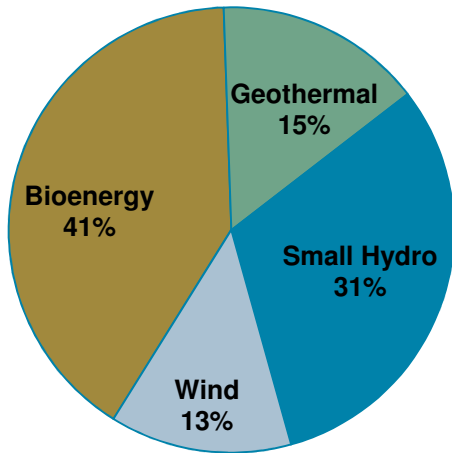
³Bioenergy includes biomass, biogas and landfill gas





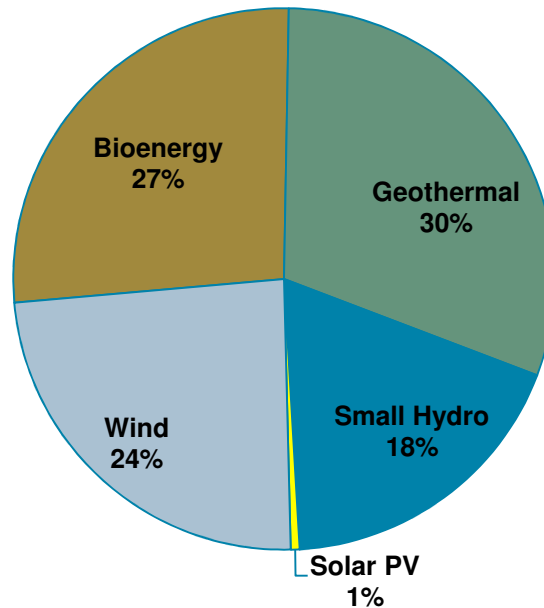
PG&E's Renewable Portfolio: Past, Present, and Future

2002 Actual
10.6% of total bundled retail sales



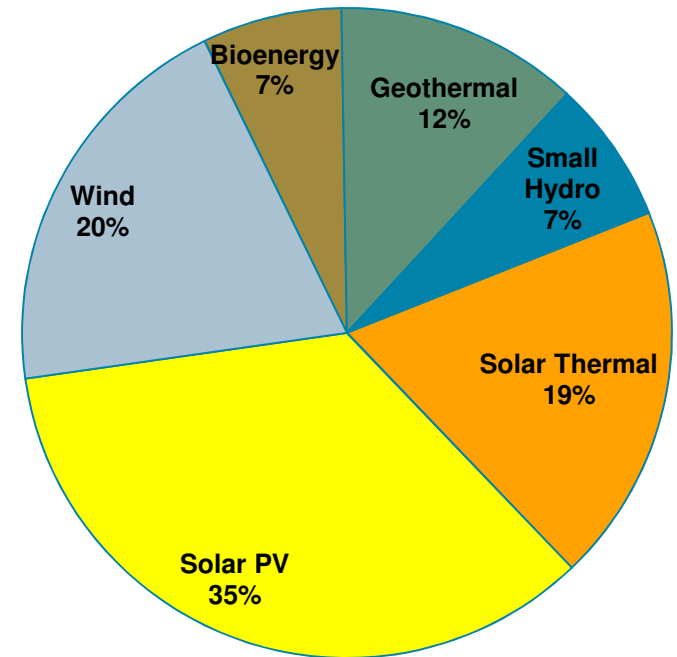
Total RPS-Eligible Procurement
7,504 GWh

2010 Actual
15.9% of total bundled retail sales



Total RPS-Eligible Procurement
12,339 GWh

2020 Projected
33% of total bundled retail sales



Projected RPS-Eligible Procurement
~27,000 GWh

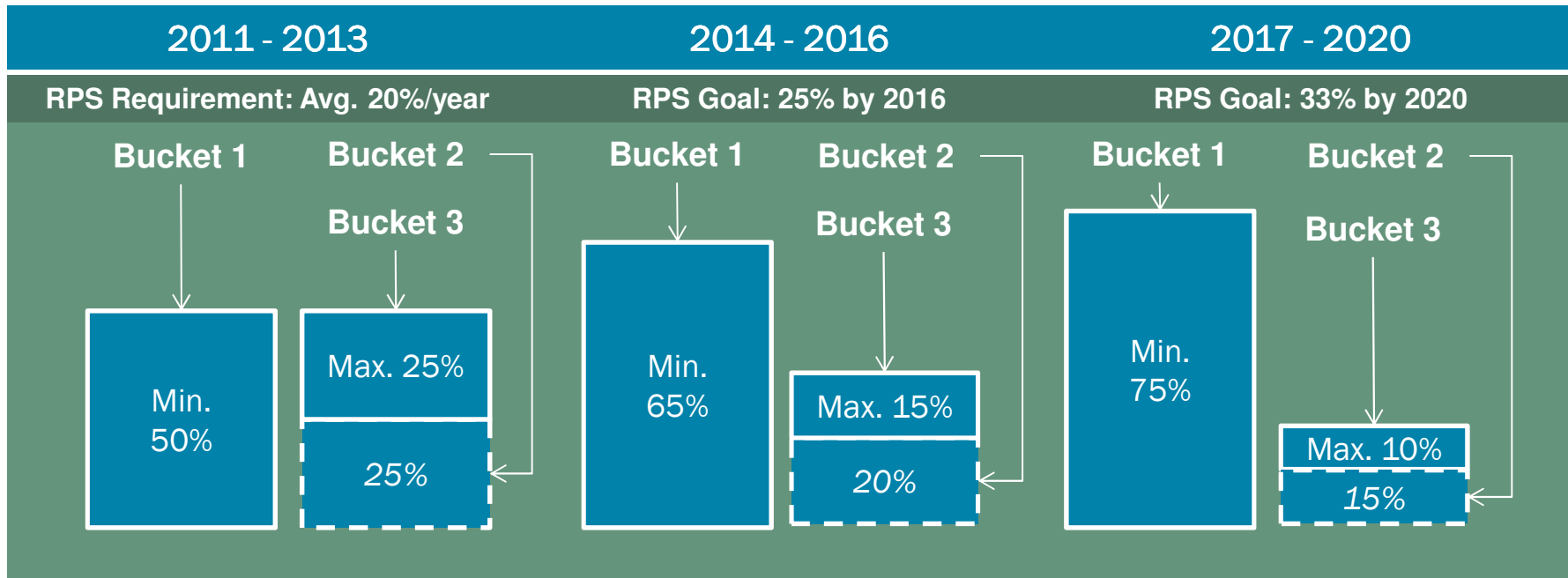
Source: PG&E's 2002 Corporate Environmental Report and PG&E's August 2011 RPS Compliance Report

Note: 2020 deliveries are based on current and projected future contractual commitments. Future unfilled need is assumed to be filled with deliveries from a generic mix of technologies.



Product and Geographic Restrictions

Restrictions on procurement by product category vary over the three compliance periods, with Bucket 3 being the most restrictive compliance category.



- BUCKET 1** Majority of deliveries from incremental (post June 2010) contracts must be directly connected to, dynamically transferred into, or scheduled on an hourly basis without substitute energy into, a California Balancing Authority.
- BUCKET 2** Remaining incremental deliveries may come entirely from firming & shaping (F/S) contracts, or
- BUCKET 3** A mixture of F/S and other resources ineligible for Bucket 1 or Bucket 2, including unbundled RECs.



California Market Is Driven by US Dynamics

Key drivers in '11 & 12

Key drivers '13 & beyond



RPS Market

- Increase in viable RPS projects under development
- Diminishing demand for RPS volumes among CA IOUs.

- Gradual increase CA IOU demand as RPS requirements phase in across WECC
- Potential CA RPS increase to 40%?



Solar PV

- Global supply ramp up and less EU demand have dramatically reduced CA system prices
- Strong incentives (cash grants & loan guarantees) driving development of record size PV projects in CA

- Suppliers with strong technology, scale, & ability to innovate rapidly survive global PV reorganization & consolidation
- Will tax equity by the next big bottleneck for large scale PV projects?



Wind

- '12 positioned to be the largest build year in US history as developers race to activate projects before PTC extension
- Anxiety that political gridlock lasts through '12 election

- Regardless of PTC outcome, IPPs and OEMs realign build expectations as US becomes a lower growth market
- Will PTC be extended?



Questions?

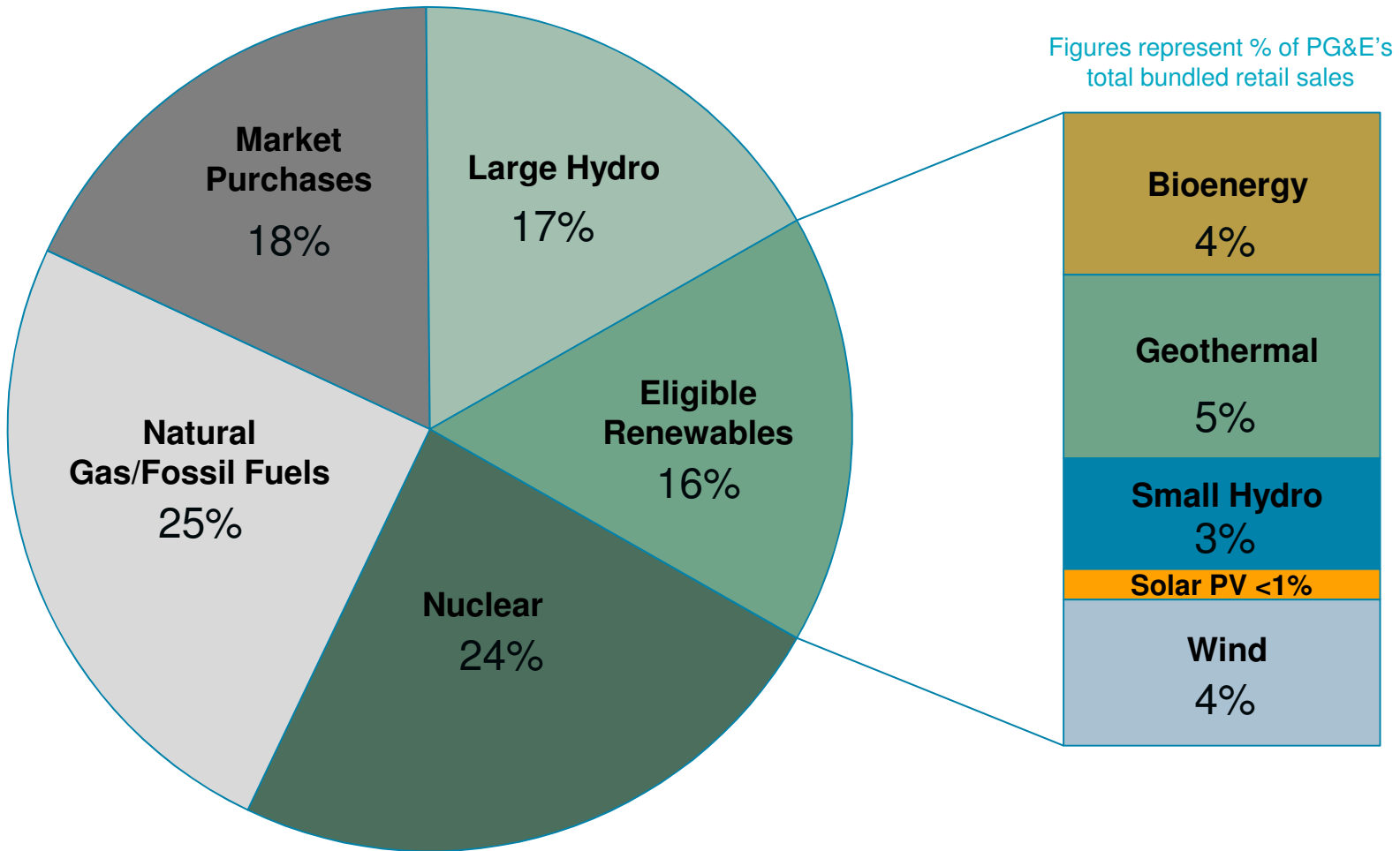
Jomo Thorne
j2t7@pge.com



Appendix



PG&E's 2010 Electric Generation Portfolio Mix







"Unspecified Sources" is non-auditable electricity purchased from the market and generally reflects energy mix of the Western United States

Sources: <http://www.pge.com/about/environment/pge/cleanenergy/> and P&GE's August 2011 Compliance Report

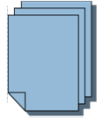


Potential RPS Program Challenges

	Utilities	Developers
 Project Permitting	Customer costs increase Compliance with RPS targets less certain	Delays increase project costs
 Transmission	Need to develop new transmission not solely for reliability	Project viability uncertainty Uncertain allocation of upgrade costs
 Economic Downturn	Projects may fail due to lack of financing May see price amendment requests	Reduced availability of project financing and tax equity investment DOE loan guarantee program concluded
 Renewable Integration	Customer costs increase as utilities need increased operating flexibility	Project costs can increase as integration charges are imposed



Mitigating the Challenges of Developing Renewables



Project Permitting Delays

- Modified form PPA to include extension provisions for guaranteed milestones (e.g. construction start and COD) so as to meet the evolving challenges of securing permitting and transmission



Limited Transmission

- When reasonable, amended contract pricing/terms for projects experiencing cost increases and delays



Financing

- Structured credit and collateral provisions to support the financing of projects



Renewable Integration

- Monitor integration issues outside of California, and engage CAISO and key stakeholders to collaborate in determination of integration needs



Eligible Renewable Energy Technologies



Wind



Solar Thermal



Photovoltaic



Biomass



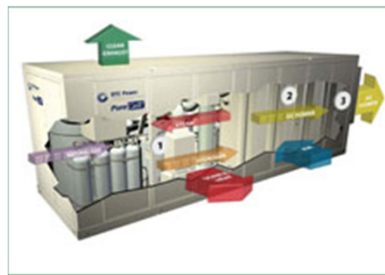
Small Hydro
Less than 30 MW



Geothermal



Bioenergy



Fuel Cell**
Using renewable fuels



Ocean Power**

*Eligible Resources do not include fossil-fueled cogeneration, gasified coal, large hydro, or municipal waste combustion

** No utility scale PPA offered, emerging technologies