

Report Back:

Single family homes:

“Product Specs” in 6-10 years and beyond

June 1, 2011

Modified strawman for single family homes, 10% adoption in 6-10 years



HIGH Priority:

<u>Category</u>	<u>ARPA-E's proposed</u>	<u>Suggested Modifications</u>
System rating	5-10 kWe	1: 5-10 kWe 2: 1-10 kWe 3: 3-15 kWe (baseload to peak)
Electrical efficiency (@ ≥50% kW rating)	≥ 40%	1: ≥40-45% 2: ≥50% (not a high priority) 3: ≥50% peak efficiency (40% average) – highly debated
Part-load efficiency	≥ 75% of max efficiency	1: ≥32% (specify for 25, 50, 100% loads)
Cost	First cost: \$5k – 10k installed or \$1500/kW Or LCOE : \$0.17/kWh over 7 yrs	1: \$1500/kWe (varies with production) 2: <LCOE of \$0.12/kWh (most important metric) 3: << LCOE of \$0.17/kWh
Payback	2 – 3 yrs	1: Metric will fall out of other specs. 2: Part of cost 3: 2-6 yrs. Varies with business models.

Modified strawman for single family homes, 10% adoption in 6-10 years cont'd



MEDIUM Priority:

<u>Category</u>	<u>ARPA-E's proposed</u>	<u>Suggested Modifications</u>
Emissions	EPA, CARB tier	1: Coupled with efficiency 2: Very important @ full penetration (GHG emissions should be tied to TRL levels)
Unit volume @ price point	10,000	1: @ 10,000 units - \$3000/kWe. @ 1M units - \$1500/kWe
Fuel type	NG, propane, biogas, fuel-flexible	1: Biofuels could improve emissions 2: Benign fuels are better if cost competitive
Maintenance frequency	Once per year, maintenance <4 hr, \$200	All agreed.
Reliability	<1 unintentional outage per yr, <8 hrs 99.91%	2: If not grid tied, this is crucial. 3: <1x per 3yrs. <4hrs each time. More like appliance than the grid.
Lifetime	>60,000 hrs before major overhaul or replacement	1: Lifetime or operational life? 3: 7 yrs
Electrical output type AC/DC, frequency	AC = 60Hz, 120v DC option??	2: If grid tied, include cost of inverter. 240V AC. Should meet IEEE 1547 or equiv.

Modified strawman for single family homes, 10% adoption in 6-10 years cont'd



LOW Priority:

<u>Category</u>	<u>ARPA-E's proposed</u>	<u>Suggested Modifications</u>
Energy provided annually	20,000 kWh	

OTHER:

<u>Category</u>	<u>Rationale</u>
Noise level	Should be quiet, especially at night.
Start up time	Time to full capacity important if you are tied to grid.
Safety standards	Should be safe
Output temperature	Waste heat should be usable and valuable
Minimize metrics	Be technology agnostic and don't over specify the problem