DER Capacity

Introduction to Demand Efficiency

OpenEAC Alliance Meeting

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Today's Agenda

01 Introduction to Demand Efficiency

From energy efficiency to demand efficiency. Why kW matters more than kWh in the era of load growth.

~20 min

02 DER Capacity Methodology

Physical vs. system capacity. Two baselines for two types of resources. Why hourly data is required.

~20 min

03 Measuring DER Capacity

Approaches by resource type. The role of M&V and the system of record. Open questions.

~15 min

01

Introduction to Demand Efficiency

From energy efficiency to DER capacity

The Grid's Problem Is Capacity, Not Just Energy

Every additional kWh

served through existing infrastructure

saves money

Spreads fixed costs over more throughput

Every additional kW

of new capacity we must build

costs money

Higher fixed costs even if throughput stays flat

Load growth from data centers, EVs, and electrification is a capacity problem. The question is whether we build new supply-side infrastructure or tap demand-side resources.

Energy Efficiency ≠ Demand Efficiency

Energy efficiency assumes all savings are created equal. A kWh saved at noon and a kWh saved at 6pm are treated the same.

But if the grid peaks at 6pm, the savings at 6pm are worth far more.

Energy Efficiency

- All kWh savings valued equally
Annual or deemed reporting
May target wrong hours
Could increase costs if off-peak

Demand Efficiency

- Savings valued by grid impact
Hourly, real-world measurement
Targets peak demand hours
Reduces need for new capacity

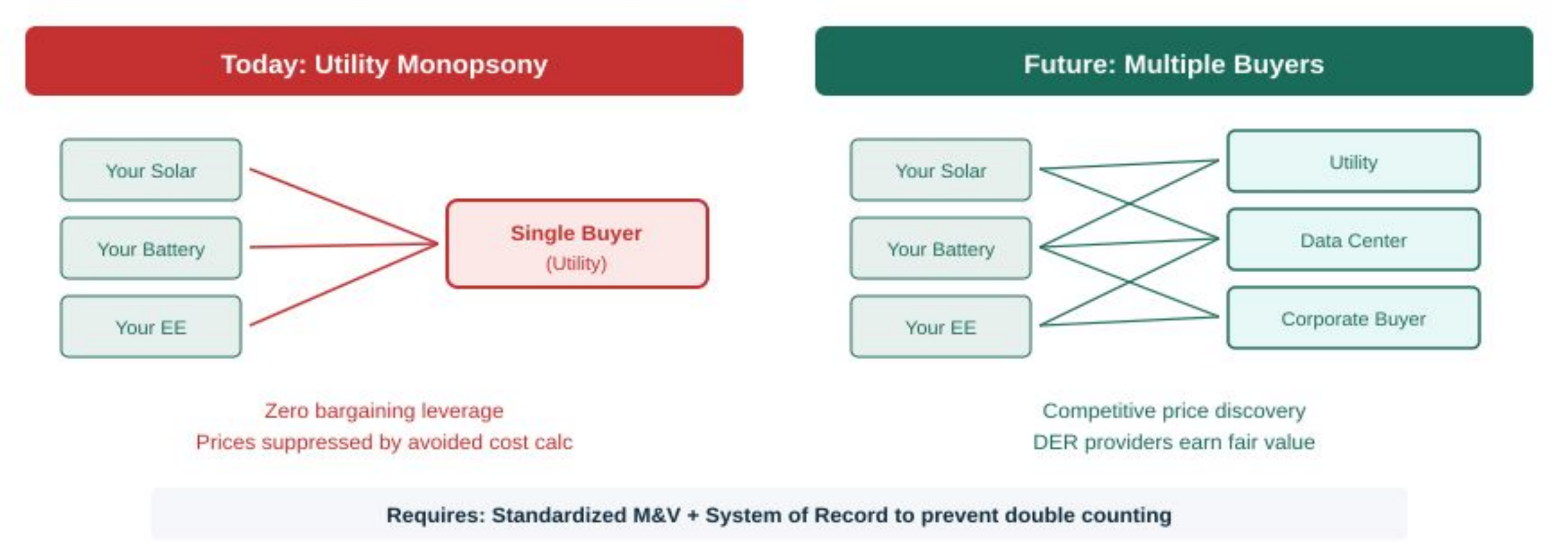
Ad Hoc Group / Alliance to Save Energy (Jan 2026): demand-side resources are the cheapest, fastest, most available solution for capacity challenges.

The Water Pipe Analogy

How to think about the economics of grid capacity

Why DER Markets Need Multiple Buyers

The monopsony problem and the case for open markets



Data centers need to BYOC (Bring Your Own Capacity). Let them become buyers in demand-side energy markets alongside utilities.

What Emerging DER Markets Require

Standardized M&V

Consistent, transparent methodologies applied across all DER types. No bespoke engineering exercises.

Hourly Granularity

Capacity value depends on timing. Annual or deemed reporting is insufficient for demand efficiency.

System of Record

Unique serial numbers for each watt-hour transacted. Prevents the same capacity from being sold to multiple buyers.

Automated & Scalable

On-demand M&V, not months-long engineering audits. The chicken-and-egg problem is solved by automation.

02

How to Think About DER Capacity

Physical capacity, system capacity, and the measurement gap

Physical Capacity vs. System Capacity

The gap between what a device can do and what the grid can count on

Physical Capacity		System Capacity (Peak Value)
Solar Array: 7 kW nameplate Device rating under standard conditions		**Solar: 0.4 - 3.9 kW (5-55% ELCC)** Varies by season, peak timing, cloud cover
Battery: 11.5 kW / 13.5 kWh Nameplate power and energy rating	→	**Battery: 10.4 kW (90% ELCC)** Dispatchable, high confidence at peak
EE Retrofit: 3 kW peak reduction Measured change to building load shape		**EE Retrofit: 2.1 kW (70% ELCC)** Persistent but weather-dependent

The gap between physical and system capacity is the core measurement challenge.

Supply-side ELCC is standard practice. Demand-side methodology is where OpenEAC can lead.

Peak Capacity Contribution by Resource

Resource	Summer Peak	Winter Peak	Baseline Type
Battery Storage	~90%	~90%	Short-term (event)
Demand Response	~92% (PJM)	~92% (PJM)	Short-term (event)
EE / Building Shell	~40-70%	~70-85%	Long-term (counterfactual)
Heat Pumps	~40%	~85%	Both
Rooftop Solar	~55%	~5%	N/A (generation)

Key insight: A "10 MW portfolio" of mixed DERs might deliver only 5-6 MW of peak-coincident system capacity. The gap between physical and system capacity varies by resource, season, and grid context.

Two Baselines for Two Types of Capacity

Short-Term Baseline (Event-Based)	Long-Term Baseline (Counterfactual)
Question: "If I send a signal, what shows up?"	**Question:** "How much load is simply not there?"
Resources: Batteries, DR, flexible loads	Resources: EE, weatherization, electrification
Method: Compare load during event vs. predicted	Method: Compare current load shape vs. pre-retrofit
Result: Dispatchable kW, high confidence	Result: Persistent kW reduction, weather-correlated
PJM ELCC: DR at 92%	**Typical ELCC: EE at ~70%**

Both produce a kW number during peak hours.

Both can be verified against meter data.

The difference is the counterfactual methodology, not the output.

A heat pump with weatherization uses both baselines: the long-term baseline shows the building uses 30% less during cold snaps; the short-term baseline shows 2 kW of additional curtailment when dispatched.

Why Hourly Granularity Is Non-Negotiable

Deemed Measures

Estimated savings based on equipment specs and assumptions about usage. No verification against actual performance. Cannot determine coincidence with system peak.

Non-starter

Annual Reporting

Total energy saved over a year, reported once. Masks the temporal distribution of savings. A program could save energy only at 2am and look great on paper.

Insufficient

Hourly M&V

Real-world meter data, weather-normalized, calculated hour by hour. Shows exactly when savings occurred and whether they coincided with peak. The only viable approach for capacity claims.

Required

03

Measuring DER Capacity

Preliminary approaches and open questions

Demand Efficiency Measurements

Coincident Peak Contribution

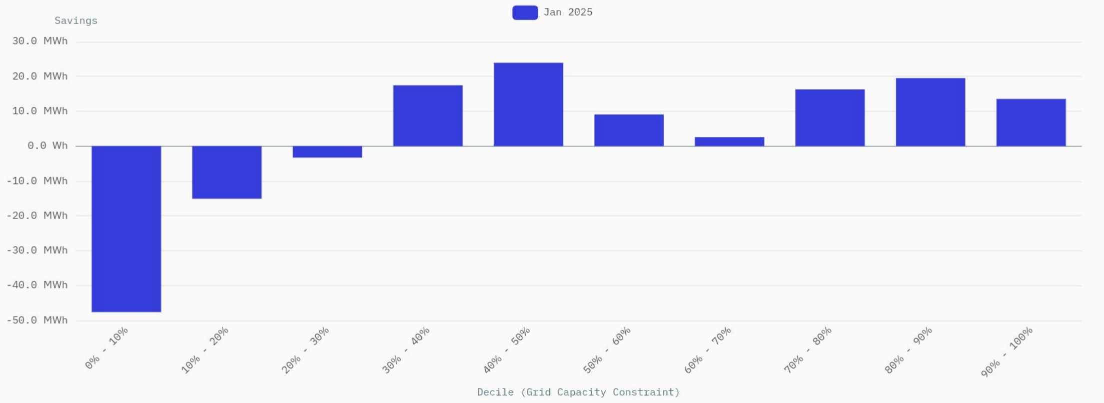
How much savings took place during stressed hours?

Effective Load-Carrying Capability (ELCC)

How generally reliable is this Asset/Portfolio of Assets for helping grid stress?

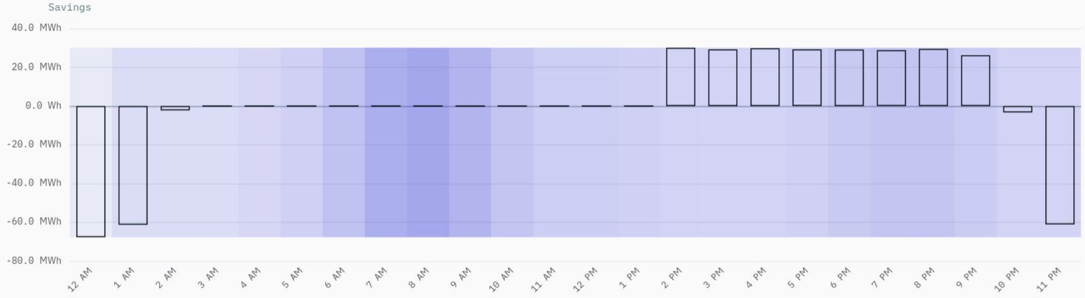
Draft of Demand Response Efficiency Methodology

Coincident Peak Contribution



Savings by Hour of Day Compared to Top Decile

Background shade: Frequency of time in top decile



Month	Installed Capacity	Median CF	Total Saved	Top Decile Saved	% in Top Decile	Median CF (Top)
Jan 2025	1.1 MW	0.0019	36.4 MWh	13.5 MWh	37.3%	0.0021

Open Questions for the Alliance

Seasonal Tracking

Should summer and winter capacity be tracked separately? Many resources have dramatically different contributions across seasons.

ELCC Assumptions

Should OpenEAC recommend specific ELCC values by resource type, or remain methodology-agnostic and let market participants apply their own?

Portfolio Accreditation

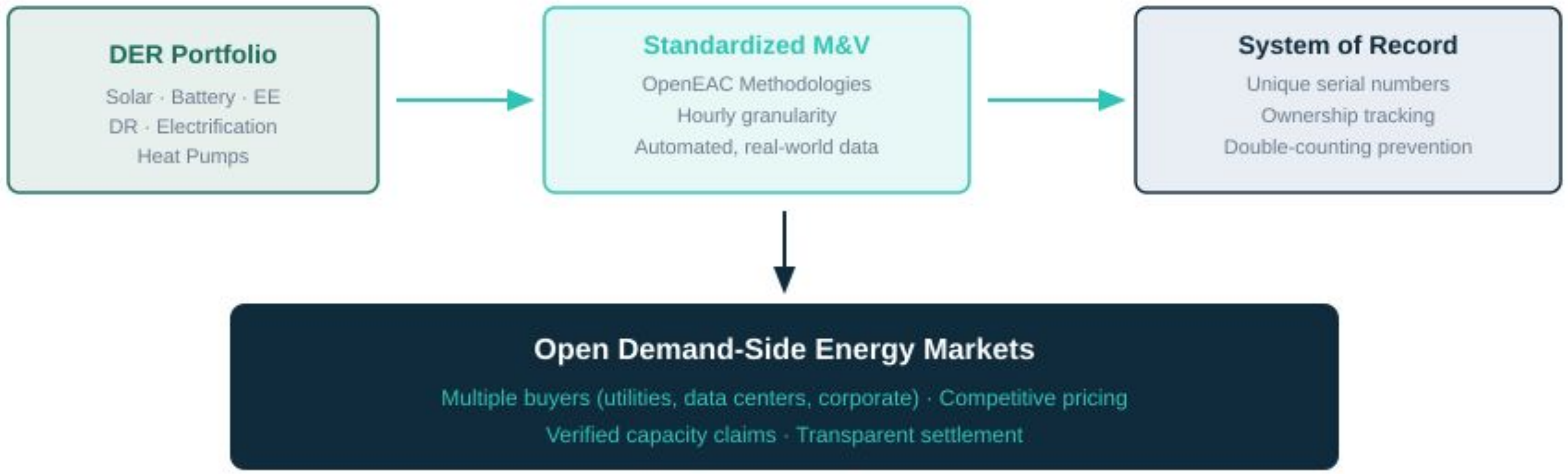
Is it sufficient to sum individual ELCC-adjusted capacities, or do interaction effects between resources in a portfolio need to be modeled?

DER Capacity Certificate

Should OpenEAC develop a standard "DER Capacity Certificate" specification, distinct from or complementary to the existing EAC framework?

The Settlement Layer for DER Capacity

From measurement to markets



Example: A battery dispatches daily. Buyer A needs capacity twice a year. Buyer B needs it twice a month. Buyer C needs it twice a week. The system of record tracks which hours are committed to which buyer.

The New Efficiency

Demand efficiency maximizes the kWh served by the grid while minimizing the kW of new capacity that needs to be built.

DER capacity is not the same as DER nameplate. The measurement gap between physical and system capacity is the core challenge, and it's where OpenEAC can establish the standard.

Open demand-side energy markets need standardized M&V, hourly granularity, and a system of record. The alliance can define this infrastructure.