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Order 13 Average Participant Cost Test (PCT) Report

Submitted in Docket No. 26-08-05

energy storage SOLUTIONS

August 1, 2026



Introduction

- PURA's December 17, 2024 Final Decision in Docket No. 25-08-05, included the following Order 13:
  - *Reference Decision, Nov. 29, 2023, Docket No. 23-08-05, Order No. 24, p. 62: No later than August 1, 2024, and annually thereafter until the ESS Program stops accepting new enrollments, CGB shall file as compliance in the applicable annual review proceeding (i.e., in 2024, Docket No. 24-08-05) the average participant cost test (PCT) broken out by customer type, project size category, and Program developer for both residential and commercial customer projects, utilizing all information available to CGB, including Performance Incentive Fee data, to ensure an accurate accounting of the PCT. The PCT shall also specifically be conducted from the perspective of the host customer; to the extent that this necessitates a change from the methodology that has historically been applied, CGB shall submit PCT values calculated using both the historical methodology and the customer focused methodology.*
  - In the following slides, Customized Energy Solutions (CES) provides its interpretation of the Order, a description of the methodology used to respond, and results

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Interpreting the Order (1)

"…all information available to CGB "

- Used the following evaluated data (also incorporated in the Year 6 annual EM&V report and Benefit Cost Analysis (BCA) model filed in response to Order 3):
  - For projects with approved applications (including those that are operational and those under development):
    - Project characteristics (kW, kWh, Electric Distribution Company [EDC], paired with PV or standalone, etc.)
    - Upfront or enrollment incentives either paid or expected to be paid
    - Reported total installed cost of the battery energy storage system (BESS)
  - For operational projects: performance incentives paid to date

"…all information available to CGB, <u>including Performance Incentive Fee data</u>"

- Interpreted "Performance Incentive Fee" to mean charges levied by entities that enable participation in active dispatch events, realized as a reduction in active dispatch incentives paid to the customer
- CES is aware of two Original Equipment Manufacturers (OEMs) levying this type of fee:
  - FranklinWH – 10% fee, assumed to be effective start of Summer 2025 for certain customers
  - Tesla – 20% fee, effective start of Winter 2024/2025
- There are likely other entities charging similar fees through bespoke contracts that CES is not aware of (especially on the C&I side)

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Interpreting the Order (2)

"...from the perspective of the host customer"

- The PCT, as calculated, is intended to represent the perspective of the host customer
- There are a number of factors that are challenging to accurately account for in the modeling, and are therefore not specifically addressed in PCT modeling:
  - **Customer-specific resiliency value**
    - The model accounts for resiliency value by including an estimate of the avoided cost for a comparable fossil-based generator (for projects with a 2026 COD, the value is $433 per installed kW of battery capacity)
    - The value customers place on lost load ranges dramatically, as does the ability of the installed BESS to provide reliable backup power
  - **Financial impact of third-party ownership (TPO)**
    - TPO structures are highly varied; accurately modeling the impact of third-party ownership on the host customer economics may not be practical
    - Data available on prevalence of third-party ownership for residential systems indicates that while there has been very limited third-party ownership to date, there is likely to be a significant increase in third party-ownership, likely driven by the elimination of the Section 25D tax credit (see slide 11)
  - **Demand charge management benefit for Commercial & Industrial (C&I) customers**
    - Demand charge savings potential is highly site-specific (generally, lower load factor yields greater demand charge savings potential)
    - C&I telemetry data does not include site load, which would be necessary to evaluate realized demand charge savings
    - Current design of rates with demand charges may make demand charge management challenging (e.g., levying some demand charges based on highest demand in both current and preceding billing periods)
  - **Summary:** the PCT already is calculated from the perspective of the host customer; no modifications made to default approach to PCT used in the BCA

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Description of Results

- As noted, the BCA already incorporates evaluated data (e.g., system enrollment, performance, project cost data, paid incentives, etc.) for projects that are deployed
- Provided in subsequent slides are results covering two sets of projects:
  - **Evaluated projects:** those projects for which an Energy Storage Solutions (ESS) application has been approved
  - **Projected projects**: operational projects and projects expected to participate in the future, about which no specific information is available
- For both sets, *the vast majority of benefits is tied to projected performance, not evaluated performance*

	Set of Projects	Description	Data Available
Evaluated projects	Approved projects	Projects with approved ESS upfront or enrollment incentive applications, but that have not yet begun operating	Project configuration (size, EDC, etc.), cost, upfront incentive amount, etc.
	Operational projects	Projects enrolled and actively participating in ESS	Data above as well as telemetry and incentive information through Winter 2025/2026; future operations projected
All projects	Future projects	Projects projected to participate in the future; no project-specific information currently available; costs, etc. based on projections	None – all projected. Total of 72 MW installed through 2027

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Primary Impacts Included in PCT

Category	Benefit/Cost Stream	PCT
Participant Bill Savings	Participant Bill Savings	Benefit
Incentives	Program Upfront and Performance Incentives	Benefit
	Performance Incentive Aggregator Fee	Cost
	Upfront incentive clawbacks	Cost
ESS Technology Costs	Participant Incremental DER Costs	Cost
Avoided Backup Generator	Net Avoided Backup Generator	Benefit

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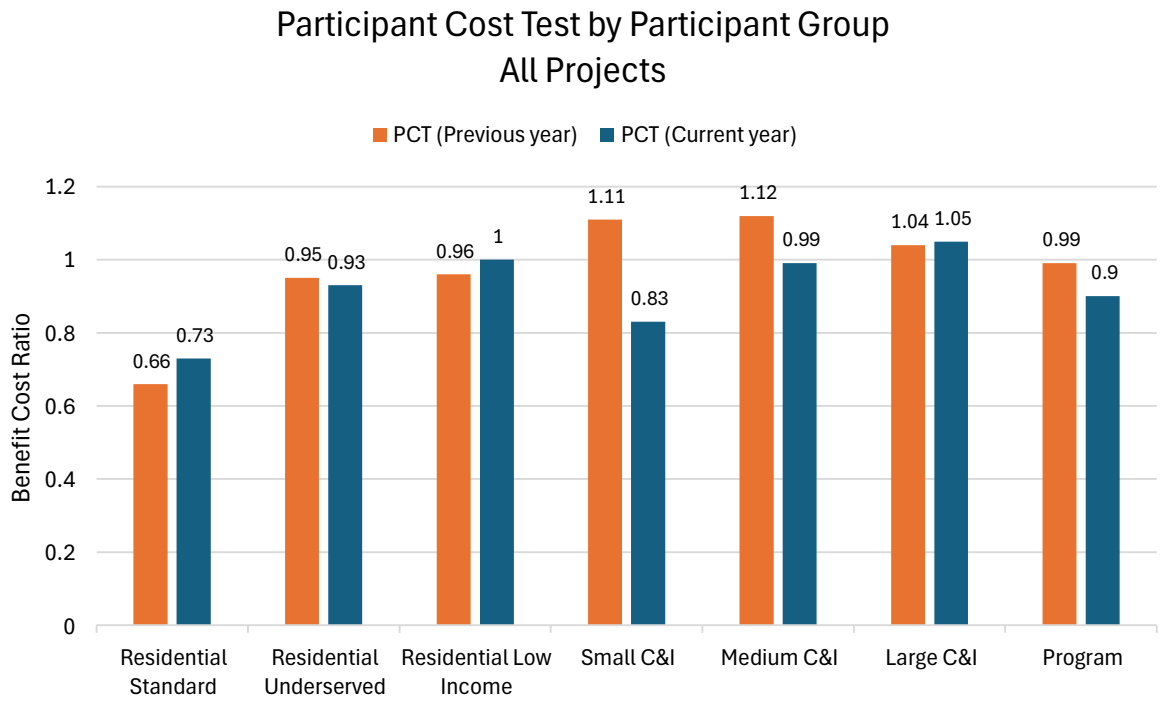
Results – All Projects

- PCT ratios by participant group for **all** projects are presented in the graph to the right
- These align with the values reflected in the Order 3 filing (the BCA model and the annual report)
- The overall program achieves a PCT of 0.90, a slight decline from the previous year's value of 1.00. This decline is primarily driven by lower PCT values for the Small and Medium C&I segments compared to the previous year
- Within the residential category, the underserved and low-income segments achieve PCT values in the 0.9–1.0 range. The standard residential segment remains lower at 0.73, although this represents a notable improvement over the previous year's 0.66
- For future projects, the assumption about the ability of residential resources to take advantage of the Section 48E tax credit (the commercial tax credit, which would require third-party ownership) has been revised since last year, building in an assumption that an increasing share of projects will be able to take advantage of 48E over time (see slide 13 for more detail)



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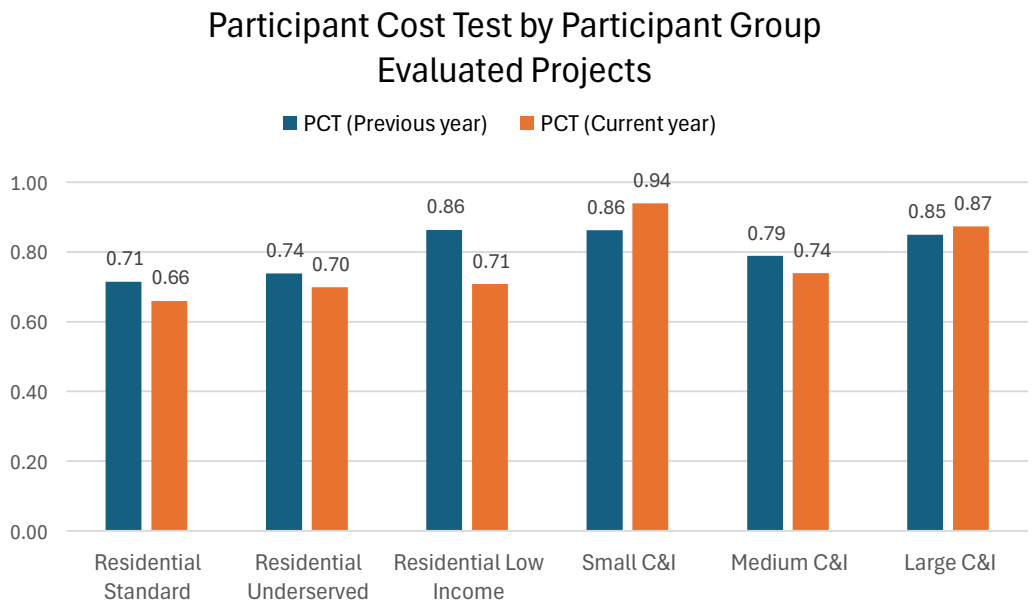
Results – Evaluated Projects

- The PCT for **Evaluated** Projects, by participant group, is provided to the right (as described on slide 5, “Evaluated Projects” and only includes projects for which an ESS application has been received and approved, including both operational and not yet operational projects)
- Notes for all Evaluated Project data:
  - Projects lacking enrollment information such as, Eligible Contractor, OEM, cost, incentive, or technical details (battery energy/capacity) were excluded from the PCT analysis, since these fields are required inputs to the calculation.
  - For evaluated projects, residential projects that have not yet become operational are assumed to come online 12 months after Application Approval date; for C&I projects, assumed to be 30 months. Hence, C&I projects which are expected to be operational in 2028 are not considered for evaluation
  - Limited data points may make drawing conclusions from these tables challenging — for example, other C&I segments are represented by only a handful of projects due to the low levels of deployment.



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Results – Evaluated Projects – by Manufacturer

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PCT by Eligible OEM – Evaluated Projects

	PCT							Other Characteristics			
Manufacturer	Residential Standard	Residential Underserved	Residential Low Income	Small C&I	Medium C&I	Large C&I	Weighted Average PCT	# of Systems	Total kW	Avg. $/kWh	Avg. Duration
Cadenza	0.59					0.50	0.56	3	34	$1,175	5.2
Enphase	0.60	0.67	0.78				0.62	178	1854	$1,569	1.8
Fortress Power	0.63	0.64					0.63	22	375	$1,164	2.4
FranklinWH	0.64	0.71	0.76				0.66	460	7865	$1,297	1.9
Generac	0.60	0.60	0.69				0.62	188	1507	$1,563	2.2
SolarEdge	0.50	0.64					0.52	14	178	$1,901	2.0
SunPower	0.58	0.53	0.51				0.56	91	808	$2,003	2.2
Tesla	0.75	0.89	0.72	1.06	0.90	1.02	0.82	155	83804	$925	1.9
HomeGrid	0.63	0.86					0.65	11	118	$1,616	2.2
EndurEnergy	0.58						0.58	9	114	$1,273	2.2
ELM				0.67	0.69		0.68	7	3625	$993	4.9
Socomec						0.79	0.79	2	500	$784	2.2
Fortress	0.73						0.73	1	24	$1,225	1.8
StackRack	0.76	0.72					0.75	3	33	$1,054	2.2
Narada					0.65	0.64	0.65	11	22000	$1,013	2.8
Yotta				0.71	0.52		0.59	5	632	$4,272	1.0
Pylon	0.55						0.55	3	36	$1,058	3.0
Panasonic	0.62						0.62	1	15	$925	2.6
PointGuard	0.55	0.93					0.68	3	57	$1,342	1.2
American						1.04	1.04	1	3980	$458	3.6
Sigenergy	0.67	0.63					0.65	2	23	$902	3.4
EG4	1.09						1.09	1	16	$382	3.0

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Results – Evaluated Projects – by Installer

PCT by Eligible Contractor – Residential Evaluated Projects

	PCT				Other Characteristics			
	Residential Standard	Residential Underserved	Residential Low Income	Weighted Average	# of Systems	Total kW	Avg. $/kWh	Avg. Duration
Aegis Solar Energy	0.61	0.62		0.61	23	270	$1,510	2.1
Apex Electrical Contractors LLC	0.58	0.62		0.59	4	60	$1,361	1.5
BigEnergy USA LLC	0.59			0.59	1	23	$1,149	1.8
Cadenza Innovation, Inc.	0.72			0.72	1	7	$682	5.9
CES Danbury LLC DBA Ross Solar Group	0.72	0.67		0.71	20	209	$1,114	2.0
Connecticut Solar Power LLC	0.54	0.36		0.50	8	153	$1,540	2.3
Crocker Consulting Inc DBA Omega Energy	0.84			0.84	1	15	$1,050	1.3
Earth Smart Solar	0.66	0.68	0.69	0.66	75	1163	$1,334	1.9
Earthlight Technologies, LLC	0.63	0.72	0.78	0.67	321	5430	$1,240	2.0
Eastern CT Solar LLC	0.62	0.74	0.74	0.66	28	412	$1,385	1.7
EcoSmart Home Services	0.69	0.70		0.69	17	243	$1,298	1.8
EcoSolar Installations, LLC	0.69			0.69	10	127	$1,229	1.7
Efficient Lighting Consultants, Inc. (ELC)	0.85			0.85	4	48	$1,040	1.7
Evergreen Energy. LLC	0.65			0.65	3	60	$956	2.1
Green Power Energy, LLC	0.49	0.57		0.51	67	742	$2,122	1.9
Griffin Electrical Contractors Inc.		0.87		0.87	1	12	$1,035	2.6
Harvest Power LLC	0.74			0.74	1	12	$1,333	1.2
Helio Solar LLC	0.61	0.65		0.62	29	384	$1,277	2.1
Infinity Solar Systems	0.75			0.75	18	231	$1,116	1.8
Insight Solar	0.60			0.60	1	15	$1,308	2.6
Ion Solar Pros	0.57	0.74		0.60	21	248	$1,417	1.4
Newport Electric Construction Corp.		0.87	0.84	0.85	2	40	$1,108	1.5

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Results – Evaluated Projects – by Installer (cont'd)

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PCT by Eligible Contractor – Residential Evaluated Projects

	PCT				Other Characteristics			
	Residential Standard	Residential Underserved	Residential Low Income	Weighted Average	# of Systems	Total kW	Avg. $/kWh	Avg. Duration
NuWatt Energy	0.64	0.71		0.66	7	90	$1,265	1.5
Ovanova	1.22			1.22	1	9	$534	2.1
Porticade Construction LLC, DBA Action Solar	0.43			0.43	1	15	$3,351	1.3
Powur PBC	0.58			0.58	3	31	$1,509	2.0
PurePoint Energy LLC	0.55			0.55	3	60	$1,342	3.3
SAVKAT, Inc.	0.54	0.54	0.51	0.54	72	708	$2,091	2.1
Shedd Technologies LLC		0.88		0.88	2	28	$1,070	1.9
Shoreline Solar LLC	0.66	0.57		0.65	8	103	$1,363	1.2
Sol Power LLC	0.68			0.68	1	12	$938	2.3
Son Energy Systems	0.46			0.46	4	47	$2,539	1.6
Summer Hill Solar	0.63	0.62		0.63	9	120	$1,363	1.9
SunBug Solar			0.87	0.87	1	9	$979	2.0
Sunlight Solar Energy, Inc.	0.60			0.60	6	52	$1,345	2.7
Sunrise Solar Consulting LLC	0.23			0.23	1	11	$5,030	0.9
Sunrite Solar LLC		0.95		0.95	1	23	$963	1.2
Sunrun Installation Services Inc.	0.77	1.12		0.94	8	100	$1,088	1.5
SunTegra Energy LLC	0.52			0.52	2	23	$1,424	2.1
Synergy Electrical Contracting LLC	0.55			0.55	3	42	$1,762	1.8
Synergy Smart Homes	0.60	0.60		0.60	10	99	$1,531	2.0
TotalEnergies Distributed Generation USA, LLC	0.71			0.71	1	14	$1,250	1.9
Venture Home Solar, LLC	0.71	0.84	0.81	0.74	75	980	$1,098	1.7
West Electric LLC	0.71	0.63		0.70	31	611	$1,012	1.9
Trinity Solar LLC	0.62	0.94	0.65	0.79	4	71	$1,070	2.0
Posigen, CT	0.58	0.61	0.65	0.62	159	1208	$1,417	2.4

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Results – Evaluated Projects – by Installer

PCT by Eligible Contractor – C&I Evaluated Projects

	PCT				Other Characteristics			
Installer	Small C&I	Medium C&I	Large C&I	Weighted Average	# of Systems	Total kW	Avg. $/kWh	Avg. Duration
Cadenza Innovation, Inc.			0.50	0.50	1	7	$1,031	5.9
Earthlight Technologies, LLC	0.67			0.67	4	625	$1,012	5.3
HQCA Energy Solutions, LLC			0.79	0.79	2	500	$784	2.2
RWE Clean Energy, LLC	1.06	0.89	0.95	0.99	7	6139	$501	4.0
Scale Microgrid Solutions LLC		0.88	0.87	0.87	13	57909	$715	2.1
CPower		0.95	1.21	1.15	6	16810	$479	2.1
Waldron Engineering & Construction, Inc.			0.80	0.80	1	979	$954	3.9
Honeywell International, Inc.		0.66	0.64	0.65	14	25000	$999	2.9
Daisy Solutions, LLC	0.71	0.52		0.59	5	632	$4,272	1.0
Kinsley Group, Inc.			1.04	1.04	1	3980	$458	3.6

- Of the 72 C&I projects initially in scope, 54 are evaluated, as projects expected to become operational from 2028 onward are excluded as the current BCA model is designed for projects with commercial operation dates by the end of 2027

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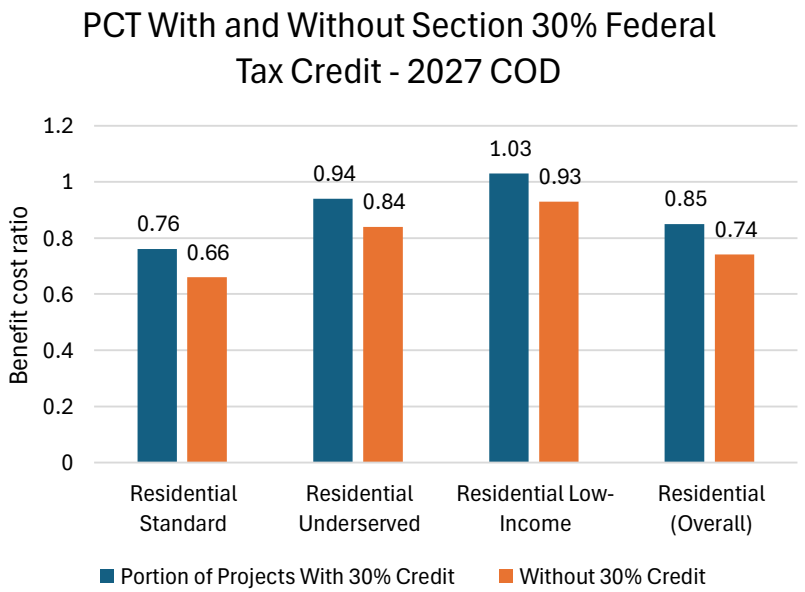
Impact of Elimination of Section 25D – Residential Tax Credit

- The One Big Beautiful Bill Act eliminated the Section 25D Residential Clean Energy Credit (30%) for residential solar and storage systems, requiring systems to be in service by December 31st, 2025, to qualify
- In practice, residential storage systems under a third-party ownership (TPO) model may still be able to qualify for the Section 48E tax credit (30%) and be able to take advantage of the available 100% bonus depreciation
- The BCA model has been updated to assume 20% of residential projects use the tax credit in 2026, steadily increasing to 40% in 2027 and 60% in 2028; last year, the model assumed no residential projects took credit of Section 48E
- Part of the value of the credit and bonus depreciation would be retained by the third-party owner (i.e., the customer would not realize the full 30% value by going through a third party); CES currently lacks sufficient information to accurately estimate this impact
- The figure to the right demonstrates the PCT for residential projects receiving no tax credit vs. a portion of projects receiving the 30% tax as outlined in the bullets above
- It highlights how critical enabling TPO models for residential storage will be, as well as the need for more information on how TPO models affect host customer economics
- C&I and Residential (TPO) storage systems may still be able to quality for adders such as the Low-Income Bonus, Energy Community Bonus, and Domestic Content Bonus



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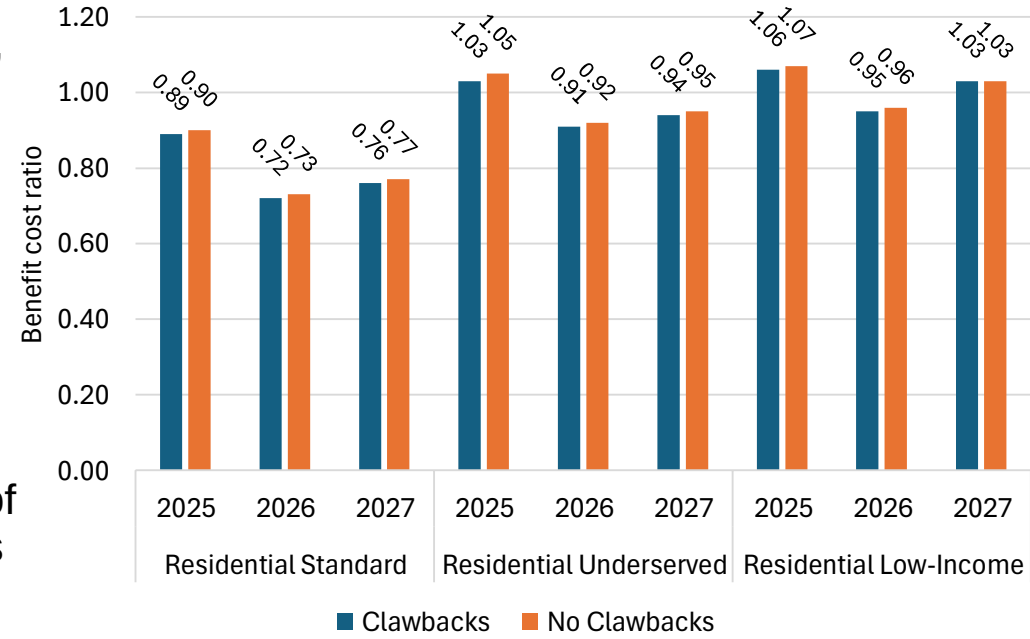
Impact of Clawbacks on PCT

- Starting in 2026, the BCA model assumes that, of the systems that are subject to clawbacks (i.e., received an upfront incentive under the Legacy construct), 40% have some amount of clawback applied, linearly tapering to 25% by 2029
- For those systems that have a clawback applied (governed by percentages noted in bullet above), the percent of total amount clawed back is assumed to be 25% in 2026, ramping down to 15% by 2029, and remaining at that level of the remainder of the analysis period
- Discussion
  - PCT is calculated discounted cash flow, which reduces the impact of the clawbacks, as earlier years (i.e., when the upfront incentive was received) are weighted more heavily than subsequent years; this reduced impact is not likely to translate to how clawbacks are perceived by project host
  - The difference in PCT with and without clawbacks aren't very noticeable going forward, can be attributed to newer projects shifting to Construct 5 moving forward and the projects performing considerably better when compared to early years of the ESS program

Residential PCT with and Without Clawbacks
By Install Year and Participant Group
(All Projects)



Note – the table above includes all projects (Legacy and Construct 5). Because of this, the COD 2025 projects (which excludes Construct 5 projects, to which clawbacks do not apply) illustrates the direct impact of applying (or not applying) clawback assumptions, while the other CODs show the diluted impact, including Construct 5 projects, to which clawbacks would not be applied. Clawback assumptions are discussed in bullets to the left.

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Discussion

- Drivers of the wide range of PCTs (including many substantially below 1.0) may include:
  - Different demand charge management opportunity
  - Varying resiliency opportunities, and customer value for resiliency
  - Other drivers of energy storage adoption, for example, Environmental, Social, Governance ("ESG") commitments
  - Varying project costs, some of which may be attributable to inconsistency or errors in how applicants calculate and enter project costs
- Program costs vary widely, though, it should be noted that $/kWh is a useful, but imperfect metric for storage costs; it is most accurate when the duration of the projects being evaluated are the same or very similar
- PCT is a useful indicator of host customer economics, but is not a full project financial model and cannot fully capture the diverse set of projects eligible to participate in the ESS program
- It will be critical for CES and the Program Administrators to monitor the adoption of the third-party ownership model for residential systems and to assess how third-party ownership affects the economics from the perspective of the host customer

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