

NYISO 2025-2029 ICAP Demand Curve Reset (DCR)

Annual Updating of ICAP Demand Curve Parameters

ICAP Working Group

August 22, 2024

Agenda

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Reminder: Annual Updating of Gross Cost of New Entry (CONE)

- As specified in the tariff, gross CONE values from the first year of each DCR are escalated annually for each of the three remaining years of the reset period by a state-wide escalation factor representing the cost-weighted average of inflation indices for four major components of Engineering, Procurement, and Construction (EPC) costs: generating equipment (turbines/batteries), labor, materials, and other/balance-of-costs:

2024-2025 Gross CONE

	2021-2022 Gross CONE (\$/kW-year) ³	2024-2025 Escalation Factor ¹	2024-2025 Gross CONE (\$/kW-year)	2023-2024 Gross CONE (\$/kW-year) ²
NYCA	\$114.75	15.89%	\$132.98	\$128.65
G-J	\$149.78	16.66%	\$174.72	\$169.07
NYC	\$196.41		\$229.11	\$221.70
LI	\$159.77		\$186.37	\$180.34

Composite Escalation Factor for NYCA

		Construction Labor Cost	Materials Cost	Gas and Steam Turbine Cost	GDP Deflator
Base Year	[A]	107,893	253	239	104.6
Escalation Year	[B]	112,634	351	263	121.8
Growth Rate	[B]/[A]-1	4.39%	38.44%	10.30%	16.40%
Weights (By Technology)		24%	19%	32%	25%
Escalation Factor:	$24\% \times 4.39\% + 19\% \times 38.44\% + 32\% \times 10.30\% + 25\% \times 16.40\% =$ 15.89%				

Composite Escalation Factor for G-J, NYC, LI

		Construction Labor Cost	Materials Cost	Gas and Steam Turbine Cost	GDP Deflator
Base Year	[A]	107,893	253	239	104.6
Escalation Year	[B]	112,634	351	263	121.8
Growth Rate	[B]/[A]-1	4.39%	38.44%	10.30%	16.40%
Weights (By Technology)		27%	23%	26%	24%
Escalation Factor:	$27\% \times 4.39\% + 23\% \times 38.44\% + 26\% \times 10.30\% + 24\% \times 16.40\% =$ 16.66%				

Source: "Annual Update for 2024-2025 ICAP Demand Curves," November 17th 2023 ICAPWG Meeting

Comparison of EPC Costs

- Concerns have been raised about differences between the escalated 2021-2025 DCR EPC costs and 2025-2029 DCR EPC costs for the 2025-2026 Capability Year
 - Based on use of a 1x0 GE 7HA.02 unit (i.e., the peaking plant technology for the 2021-2025 DCR), escalated 2021-2025 DCR EPC costs generally underestimate 2025-2029 DCR EPC costs for the 2025-2026 Capability Year.
 - Based on a 4-hour battery energy storage system (BESS), escalated 2021-2025 DCR EPC costs generally overestimate 2025-2029 EPC costs for the 2025-2026 Capability Year.
- Such comparisons do not control for all differences in underlying project design and scope between the 2021-2025 and 2025-2029 DCRs, which could lead to differences in costs that are unrelated to the annual adjustment methodology for gross CONE. Relevant changes in project design and scope include:
 - Dual fuel, selective catalytic reduction (SCR) emissions controls, and oxidation catalyst for the simple cycle gas turbine (SCGT) evaluated in all locations
 - Purpose-built enclosure for BESS equipment
 - Additional fire protection for BESS in Load Zone J
 - Initial BESS overbuild to account for capacity degradation
- AG acknowledges, however, that a portion of the differences likely results from the use of industry-wide indices that may not fully capture changes in prices for highly specialized equipment, labor, and materials relevant to utility-scale SCGT and BESS installations, including:
 - Skilled labor shortages
 - Equipment pricing and lead times
 - Commodity and material pricing for electrical, piping and concrete
 - Permitting schedules

Comparison of Gross CONE

- Gross CONE is an annualized value reflective of the total costs required to build a peaking plant technology option, including the levelized fixed charge, insurance rates, and fixed operations and maintenance (O&M). This value reflects the impact of changes in EPC costs, owner costs, allowance for funds used during construction (AFUDC), after-tax weighted average cost of capital, and amortization period.
- As such, differences in gross CONE values from the 2021-2025 DCR to the 2025-2029 DCR reflect changes that are unrelated to simply capturing inflationary impacts on cost components over time.
- Using the 1x0 GE 7HA.02, escalated 2021-2025 DCR gross CONE values are lower than 2025-2029 DCR gross CONE values for the 2025-2026 Capability Year, while escalated 2021-2025 DCR gross CONE values for a 4-hour BESS are higher than the 2025-2029 DCR gross CONE values for the 2025-2026 Capability Year.
- Differences between the 2021-2025 DCR and 2025-2029 DCR gross CONE values reflect differences in project scope and design, EPC costs, and other changes in input assumptions and policies that are unrelated to the annual adjustment methodology for gross CONE including:
 - Updated financing assumptions, including updated cost of debt, cost of equity, and modified accelerated cost recovery system (MACRS) schedules
 - Change in battery amortization period from 15 years to 20 years
 - Change in SCGT amortization period from 17 years to 13 years
 - Federal investment tax credit for BESS technologies

Final Recommendations for Annual Updating of Gross CONE

- AG does not recommend any changes to the annual updating process methodology for gross CONE:
 - Annual updates are not designed to replicate a full demand curve reset. The DCRs provide for the consideration of policy changes and market factors specific to a particular technology option and can result in changes in gross CONE that are unrelated to simply capturing inflationary changes in costs over time.
 - AG has not identified an alternative source(s) for indices that offer more specific information on costs related to new SCGT or BESS units.
 - As noted below, AG is recommending a change to one of its preliminary recommended indices sourced from the U.S. Bureau of Labor Statistics (BLS)
 - Several factors (e.g., changes in amortization period and other financial parameter assumptions, policies and tax incentives/abatements, and design basis assumptions) that cause differences between gross CONE values between the 2021-2025 and 2025-2029 DCRs are unrelated to accuracy of indices in tracking changes in costs over time.
 - It is unclear going forward whether the use of the current methodology may result in gross CONE values higher or lower than the analogous values from a full demand curve reset.
 - AG's analysis focused solely on the 2021-2025 DCR compared to analogous values from the 2025-2029 DCR and did not assess the relative performance of the composite escalation factor methodology over the 2017-2021 reset period in comparison to analogous values from the 2021-2025 DCR
- To better isolate factors impacting costs for lithium-ion batteries, AG recommends the use of a BLS energy storage producer price index (PPI) that excludes lead acid batteries (WPU11790105) as the index for assessing changes in battery equipment cost component for BESS.
- Other potential changes appear to have limited impact on the accuracy of annual updates (and would not conform with existing tariff requirements), including:
 - Annual updating of EPC cost category weights
 - Inclusion of new indices to track new categories of EPC costs on a more granular basis than the current four component categorization (e.g. Electric Power and Specialty Transformer Manufacturing)

Proposed Composite Escalation Rate Indices and Component Weights, by Technology (2025-2026 Capability Year Growth Rates)

Cost Component	Index	Interval	Calculation of Index Value	Annual Growth Rate	Component Weight, by Technology								
					7HA.03, 25 ppm, Dual Fuel and SCR	7HA.03, 25 ppm, Gas Only and SCR	7HA.02 25ppm, Dual Fuel and SCR	7HA.02 15ppm, Dual Fuel and No SCR	7HA.02 15ppm, Gas Only and No SCR	2-Hour BESS	4-Hour BESS	6-Hour BESS	8-Hour BESS
Construction Labor Cost	BLS Quarterly Census of Employment and Wages, New York - Statewide, NAICS 2371 Utility System Construction, Private, All Establishment Sizes, Average Annual Pay	Annually	Most recent annual value	2.35%	21%	17%	28%	20%	18%	15%	13%	13%	13%
MaterialsCost	BLS Producer Price Index for Commodities, Not Seasonally Adjusted, Intermediate Demand by Commodity Type (ID6), Materialsand Componentsfor Construction (12)	Monthly	Average of finalized February, March, April values	1.29%	14%	13%	15%	17%	16%	11%	9%	8%	7%
Gas and Steam Turbine Cost	BLS Producer Price Index for Commodities, Not Seasonally Adjusted, Machinery and Equipment (11), Turbinesand Turbine Generator Sets (97)	Monthly	Average of finalized February, March, April values	4.72%	31%	35%	22%	25%	26%	-	-	-	-
Storage Battery Costs	BLS Producer Price Index for Commodities, Not Seasonally Adjusted, Machinery and Equipment (11), Storage Batteries(Excluding Lead Acid), Including Partsfor All Storage Batteries (790105)	Monthly	Average of finalized February, March, April values	0.18%	-	Updated Recommendation				62%	65%	66%	67%
GDP Deflator	Bureau of Economic Analysis: Gross Domestic Product Implicit Price Deflator, Index 2009 = 100, Seasonally Adjusted	Quarterly	Most recent Q2 value	2.59%	34%	35%	35%	38%	40%	12%	13%	13%	13%
Total					100%	100%	100%	100%	100%	100%	100%	100%	100%

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Appendix

Additional Information on Recommended Inflation Indices

- This appendix provides additional information on AG's recommended inflation indices.
- North American Industry Classification System (NAICS) industry definitions are provided for the following indices:
 - Proposed labor component index: Construction labor cost: NAICS 2371 (Utility System Construction)
 - Proposed turbine component index: Gas and steam turbine cost: NAICS 333611 (Turbine and Turbine Generator Set Units)
 - Proposed battery component index: Storage battery costs: NAICS 335910 (Battery Manufacturing)
- BLS PPI for Materials and Components for Construction (i.e., the proposed materials component index) is an intermediate demand index tracking price changes for goods, services, and construction products sold to businesses. This appendix provides the commodities and weights underlying the recommended BLS indices (WPUID6121 and WPUID6122).
- The U.S. Bureau of Economic Analysis (BEA) gross domestic product implicit price deflator, or "GDP deflator" (i.e., the proposed balance-of-costs/other component index), measures changes in the prices of all goods and services produced in the United States, including those exported to other countries. Prices of imports are excluded.

Construction Labor Cost - Utility System Construction (NAICS 2371)

- Construction labor costs reflects average annual pay for utility system construction in New York across all establishment sizes
- Utility system construction comprises of NAICS 237110, NAICS 237120, and NAICS 237130:
 - NAICS 237110 - Water and Sewer Line and Related Structures Construction
 - NAICS 237120 - Oil and Gas Pipeline and Related Structures Construction
 - NAICS 237130 - Power and Communication Line and Related Structures Construction

Illustrative Examples of Industries Covered by NAICS 2371

- Alternative energy (e.g., geothermal, ocean wave, solar, wind) structure construction
- Power line stringing
- Cellular phone tower construction
- Radio transmitting tower construction
- Co-generation plant construction
- Satellite receiving station construction
- Communication tower construction
- Nuclear power plant construction
- Telephone line stringing
- Electric light and power plant (except hydroelectric) construction
- Transformer station and substation, electric power, construction
- Electric power transmission line and tower construction
- Underground cable (e.g., fiber optic, electricity, telephone, cable television) laying
- Distribution line, gas and oil, construction
- Oil refinery construction
- Gas main construction
- Petrochemical plant construction
- Gathering line, gas and oil field, construction
- Natural gas pipeline construction
- Pumping station, gas and oil transmission, construction
- Storage tank, natural gas or oil, tank farm or field, construction
- Natural gas processing plant construction
- Distribution line, sewer and water, construction
- Sewer main, pipe and connection, construction
- Fire hydrant installation
- Storm sewer construction
- Irrigation systems construction
- Water main and line construction
- Sewage disposal plant construction
- Water treatment plant construction
- Pumping station, water and sewer system, construction
- Water system storage tank and tower construction
- Reservoir construction
- Water well drilling, digging, boring, or sinking (except water intake wells in oil and gas fields)

BLS WPU117901/NAICS 335910 - Battery Manufacturing

- This industry comprises establishments primarily engaged in manufacturing primary and storage batteries.

- **Illustrative Examples:**

- Disposable flashlight batteries manufacturing
- Dry cells, primary (e.g., AAA, AA, C, D, 9V), manufacturing
- Lead acid storage batteries manufacturing
- Lithium batteries manufacturing
- Rechargeable nickel-cadmium (NICAD) batteries manufacturing
- Watch batteries manufacturing

Industries Covered by NAICS 335910

- Alkaline cell primary batteries manufacturing
- Alkaline cell storage batteries (i.e., nickel-cadmium, nickel-iron, silver oxide-zinc) manufacturing
- Alkaline manganese primary batteries manufacturing
- Automobile storage batteries manufacturing
- Batteries, primary, dry or wet, manufacturing
- Batteries, rechargeable, manufacturing
- Batteries, storage, manufacturing
- Button cells, primary batteries, manufacturing
- Disposable flashlight batteries manufacturing
- Dry cell primary batteries, single and multiple cell, manufacturing
- Dry cells, primary (e.g., AAA, AA, C, D, 9V), manufacturing
- Flashlight batteries, disposable, manufacturing
- Lead acid storage batteries manufacturing
- Lithium batteries manufacturing
- Marine storage batteries manufacturing
- Mercuric oxide batteries manufacturing
- Nickel-cadmium storage batteries manufacturing
- Primary batteries manufacturing
- Rechargeable battery packs made from purchased battery cells and housings
- Rechargeable nickel-cadmium (NICAD) batteries manufacturing
- Storage batteries manufacturing
- Transistor radio batteries manufacturing
- Watch batteries manufacturing
- Zinc carbon batteries manufacturing

Source: <https://www.naics.com/naics-code-description/?code=335910&v=2022>

BLS WPUID612/NAICS 333611 - Turbine and Turbine Generator Set Units Manufacturing

- This U.S. industry comprises establishments primarily engaged in manufacturing turbines (except aircraft); and complete turbine generator set units, such as steam, hydraulic, gas, and wind.

Industries Covered by NAICS 333611

- Gas turbine generator set units manufacturing
- Gas turbines (except aircraft) manufacturing
- Generator sets, turbine (e.g., gas, hydraulic, steam), manufacturing
- Governors, steam, manufacturing
- Hydraulic turbine generator set units manufacturing
- Hydraulic turbines manufacturing
- Motor generator sets, turbo generators, manufacturing
- Steam turbine generator set units manufacturing
- Steam turbines manufacturing
- Turbine generator set units manufacturing
- Turbines (except aircraft) manufacturing
- Water turbines manufacturing
- Wind powered turbine generator sets manufacturing
- Wind turbines (i.e., windmill) manufacturing
- Windmills, electric power, generation-type, manufacturing

Source: <https://www.naics.com/naics-code-description/?code=333611&v=2022>

BLS WPUID6121 - Materials for Construction

BLS ID	Commodity	Weight	BLS ID	Commodity	Weight
38303	Industrial and other fabricated products	0.008	102403	Secondary copper, alloyed and unalloyed	0
61302	Inorganic chemicals, other than alkalis and chlorine	0.028	102501	Aluminum mill shapes	-
62101	Architectural coatings	0.078	102502	Copper and brass mill shapes	0.004
62103	Special purpose coatings, incl. marine, industrial & construction coatings	0.03	102603	Nonferrous wire and cable	0.11
62301	Allied and miscellaneous paint products	0.011	105201	Vitreous plumbing fixtures, china lavatories, & flush tanks, incl. plumbing accessories	0.008
67904	Adhesives and sealants	0.033	108801	Ferrous wire rope, cable, forms and strand	0.029
67909	Other miscellaneous chemical products	0.009	108807	Ferrous wire cloth, other woven wire products	0.002
81105	Softwood cut stock and dimension	0.015	108812	Steel nails, staples, tacks, spikes and brads	0.006
81106	Softwood lumber, not edge worked	0.105	108905	Other metal products	0.002
81107	Softwood lumber, made from purchased lumber	0.017	122101	Wood office furniture and store fixtures	0.033
81203	Hardwood cut stock and dimension	0.023	122204	Nonwood partitions and fixtures	0.01
81204	Hardwood flooring	0.027	123101	Carpet and rugs	0.008
81205	Hardwood lumber, not edge worked	0.039	131108	Flat glass (float, sheet, and plate process)	0.011
81206	Hardwood lumber, made from purchased lumber	0.015	132201	Cement, hydraulic	0.038
82101	General millwork	0.481	133301	Ready-mix concrete	0.873
82201	Prefabricated structural members	0.339	133401	Precast concrete products	0.294
83103	Softwood veneer and plywood	0.069	133501	Prestressed concrete products	0.059
83501	Hardwood veneer and plywood	0.053	134201	Building or common brick	0.024
84903	Wood ties, siding, shingles, and shakes, and contract sawing of logs owned by others	0.004	134202	Glazed brick and other brick (paving, floor, and sewer)	0
84904	Sawn wood fence stock, wood lath, and contract resawing and planing	0.009	134401	Clay floor and wall tile, glazed and unglazed (including quarry tile and ceramic mosaic tile)	0.023
84909	All other miscellaneous wood products	0.032	134501	Structural clay products, n.e.c.	0.003
85105	Logs, bolts, timber, pulpwood and wood chips	0.02	135201	Clay refractories	0.014
86101	Prefabricated wood buildings and components	0.108	135301	Nonclay refractories (excluding dead-burned magnesia)	0.005
87101	Treated wood	0.189	136101	Prepared asphalt and tar roofing and siding products	0.337
87102	Contract wood preservation	0.008	136201	Roofing asphalts, pitches, coatings, and cement	0.065
92201	Particleboard and fiberboard	0.12	137101	Gypsum products	0.072
92202	Hardboard products	0.003	139201	Mineral wool for thermal and acoustical envelope insulation	0.102
101705	Steel wire	0	139401	Paving mixtures and blocks	0.38
101706	Steel pipe and tube	0.037	139501	Cut stone and stone products	0.071
101707	Cold rolled steel sheet and strip	0.008	139902	Clay and stone mining and quarrying	0.001
101708	Cold finished steel bars and bar shapes	0.007	139903	All other nonmetallic mineral products	0.064
102201	Primary nonferrous metals	0.001			

BLS WPUID6122 - Components for Construction

BLS ID	Commodity	Weight	BLS ID	Commodity	Weight
71306	Miscellaneous rubber products, n.e.c.	0.022	114107	Parts and attachments for air and gas compressors and vacuum pumps	0.002
72106	Plastics construction products	1.439	114108	Industrial spraying equipment	0.002
72205	Unsupported plastics film, sheet, and other shapes	0.059	114113	Domestic water systems	0.01
72901	Other plastics products	0.029	114115	Air and gas compressors and vacuum pumps	0.009
101502	Pressure and soil pipe and fittings, cast iron	0.001	114119	Other pumps, including parts and attachments	0.025
101504	Other gray and ductile iron castings	0.004	114201	Elevators and moving stairways	0.089
101505	Standard and pearlitic malleable iron castings	0	114202	Parts and attachments for elevators and moving stairs (sold separately)	0.007
101506	Steel investment castings	0.002	114302	Fluid power valves	0.009
101507	Carbon steel castings, except investment	0.001	114701	Fan, blower, air purification equipment	0.023
101508	High alloy steel castings, excluding investment	0.001	114802	Unitary air-conditioners, except air source heat pumps	0.249
101509	Other alloy steel castings, except investment	0.001	114806	All other miscellaneous refrigeration and air-conditioning equipment	0.045
104101	Builders' hardware	0.018	114807	Heat transfer equipment, including heat pumps	0.099
104105	Other miscellaneous hardware	0.003	114809	Parts and accessories for air conditioning and heat transfer equipment	0.035
105402	Plumbing fixtures, fittings, and trim	0.103	114902	Metal valves, except fluid power	0.024
105601	Enameled iron and metal sanitary ware	0.015	114903	Metal pipe fittings, flanges, and unions	0.008
106101	Steam and hot water equipment	0.013	117101	Current-carrying wiring devices	0.147
106201	Furnaces and heaters, including parts	0.041	117102	Noncurrent-carrying wiring devices	0.128
106301	Other heating equipment, non-electric, including parts	0.028	117522	Switchgear and switchboard apparatus	0.072
106401	Domestic heating stoves	0.005	117603	Other communications and related equipment, including broadcast and wireless	0.037
106601	Domestic water heaters	0.038	117605	Electronic systems and equipment, n.e.c.	0.014
107102	Metal doors and frames (except storm)	0.244	117606	Search, detection, navigation & guidance systems and equipment	0.012
107103	Metal windows (except storm sash)	0.065	117929	Miscellaneous electrical industrial apparatus	0.012
107104	Metal molding and trim and store fronts	0.029	117939	All other electrical equipment and components, except industrial	0
107105	Metal combination screen, storm sash, and storm doors	0.018	118105	Automatic environmental controls for monitoring residential, commercial, and appliance use	0.038
107107	Metal window and door screens (except combination screens) and metal weather strip	0.025	118501	Aeronautical, nautical, and navigational instruments	0.003
107201	Metal tanks	0.06	119505	Machine shop products	0.039
107301	Sheet metal products	0.657	122301	Public building furniture	0.001
107405	Fabricated structural metal	0.705	122401	Commercial furniture and fixtures, n.e.c.	0
107407	Custom roll form products	0.003	123201	Resilient floor coverings	0.02
107408	Ornamental and architectural metal work	0.231	124104	Other major household appliances including room air-conditioners	0.006
107411	Fabricated metal pipe, tube, and fittings	0.109	124301	Household vacuum cleaners and other floor care machines (including parts and attachments)	0.003
107501	Heat exchangers and steam condensers	0.026	124404	Small electric household appliances, including fans	0.01
107601	Fabricated steel plate	0.131	126501	Mirrors (decorated and undecorated), made from purchased glass	0.003
107901	Prefabricated metal building systems (excl. farm service bldgs, residential bldgs, and parts)	0.181	131107	Specialty glass	0.013
107902	Farm service buildings and other prefabricated and portable buildings, steel and aluminum	0.035	131301	Pressed and blown glassware	0.004
107903	Panels, parts, and sections for prefabricated buildings, steel and aluminum	0.024	133111	Structural concrete block	0.035
108302	Residential electric lighting fixtures, except portable	0.015	133121	Decorative concrete block	0.025
108303	Commercial, institutional and industrial electric lighting fixtures	0.1	133131	Concrete brick	0.017
108305	Other lighting equipment	0.063	133141	Concrete pavers	0.042
108904	Wire springs	0.008	133201	Concrete pipe	0.046
108905	Other metal products	0.053	139801	Gaskets and gasketing material	0.001
108907	Metal stampings n.e.c.	0.004	139802	Packing and sealing	0.001
114102	Industrial pumps, except hydraulic fluid power pumps	0.036	159A04	Signs and advertising displays	0.021