Net Metering for Class I Renewable Energy Systems Stakeholder meeting

November 19, 2024

Welcome

This is the public stakeholder meeting for

Docket No. QO24090723

In the Matter of

Net Metering for Class I Renewable Energy Systems

This meeting will focus on a jurisdictional review of net energy metering reforms and introduce upcoming stakeholder proceedings and opportunities for comment.

Disclaimer

This presentation is provided for informational purposes only and should not be taken to represent the views of the New Jersey Board of Public Utilities, its Commissioners, or the State of New Jersey. Please be aware that any information presented is subject to change if there are changes to New Jersey statutes, rules, or policies.

All viewers are responsible for ensuring that they rely only on current legal authority regarding the matters covered in the presentation.

Webinar Instruction Page

All attendees will be automatically muted.

Questions? Please use the Q&A function in Zoom.

We will address clarifying questions at the end of the presentation. These will be collected as FAQ and posted on our website as relevant. Nine registered attendees have requested to speak. Please keep comments brief due to time constraints. Board Staff will accept written comment, and there will be further opportunities for stakeholder engagement.

The Chat function in Zoom is not available for this meeting.

This meeting is being recorded. A copy of the recording and slides will be made available on the BPU website:
https://www.nj.gov/bpu/newsroom/public/

BPU New Jersey's cleanenergy program™

Written Stakeholder Comment Guidelines

Board Staff will accept written comments to inform this process. Please note that this is an introductory meeting and there will be additional opportunities to comment on these proceedings.

Please submit comments directly to Docket No. QO24090723, using the “Post Comments” button on the Board’s Public Document Search tool.

Comments are considered “public documents” for purposes of the State’s Open Public Records Act and any confidential information should be submitted in accordance with the procedures set forth in N.J.A.C. 14:1-12.3.

Written comments may also be submitted to:

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Agenda

1. Introduction
2. Overview of Common NEM Successor Mechanisms
3. Deep Dives on NEM Reforms in Selected Jurisdictions
4. Conclusion
5. Q&A

Jurisdictional Review of Net Energy Metering Reforms

WORKSHOP #1 OF STAKEHOLDER PROCESS TO UPDATE NEW JERSEY'S NET ENERGY METERING POLICIES

PRESENTED BY

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NOVEMBER 19, 2024

Brattle

Introduction

Purpose of NEM Successor Policy Development Workshops

- **NEM History**
  - 1999: Net metering introduced (Electric Discount and Energy Competition Act)
  - 2008: SB 2936 adds options for customers to be compensated at the real-time PJM price or based on a bilateral agreement with retailer; allows BPU to limit NEM to 2.5% of peak demand
  - 2010: System size cap of 2 MW is lifted
  - 2014: NEM capacity threshold raised to 2.9% of total annual kWh sold by energy suppliers
  - 2018: AB 3723 authorizes the BPU to limit NEM to 5.8% of the total annual kWh sold
  - EY2024: NEM generating capacity in the state exceeded 5.8% of total kWh sales
- **NEM statistics**
  - 197,000 residential installations
    - 1,700 MW
  - 9,500 non-residential installation
    - 2,305 MW
  - Estimated annual generation of 4,600 GWh

Purpose of NEM Successor Policy Development Workshops

- **Motivations for considering NEM successor policy in NJ**
  - Provide certainty on compensation going forward, since the 5.8% milestone was exceeded during Energy Year 2024
  - Encourage economic efficiency and fair allocation of costs and benefits
  - Align of DER compensation with achievement of climate goals
  - Integrate with grid modernization, energy storage, and demand-response technologies
  - Continue to support a strong solar industry in the state
  - Promote energy equity and access for disadvantaged communities

Project Team

NJ BPU	Brattle	Mondre
Sawyer Morgan Research Scientist, Division of Clean Energy *BPU Project Manager*	**Ryan Hledik** Principal | Portland, OR *Project Director*	**Judith Mondre** President | Philadelphia, PA *Mondre Project Manager*
Paul Heitmann Division of Clean Energy	**Akhilesh Ramakrishnan** Managing Associate | Toronto, ON *Project Manager*	**Steven Miller** VP Engineering | Philadelphia, PA *Technical Advisor*
Peter Taunov Office of the Economist	**Kailin Graham** Research Associate | Boston, MA *Research and Modeling Lead*	

Plan and Schedule

Task		Timeline
1	**Develop stakeholder knowledge base on NEM reform** • Brattle to conduct jurisdictional survey of NEM policies • Present findings at **Stakeholder Workshop #1**	November 19, 2024
2	**Gather stakeholder proposals on NEM successor policy** • Conduct **Technical Conference** for stakeholders to present proposals • Brattle to summarize and compare proposals	Technical Conference on January 21, 2025
3	**Develop up to three sets of policy options** • Brattle and BPU Staff to develop policy options • Present options at **Stakeholder Workshop #2** and gather feedback	April 2025
4	**Publish straw proposal as draft report**	June 2025
5	**Publish final report and recommendations**	November 2025
6	**Potential regulatory/legislative actions**	Early 2026

Scope of Stakeholder Process and Final Report

- Facilitate stakeholder workshops to share information and gather proposals
- Evaluate various possible NEM successor compensation mechanism designs
- Recommend design elements such as customer eligibility rules, market transition mechanisms, grandfathering period, etc.
- Model potential bill impacts of shortlisted policies
- Collect and incorporate stakeholder feedback in development of final policy recommendations

Overview of Common NEM Successor Mechanisms

Types of Compensation Mechanisms

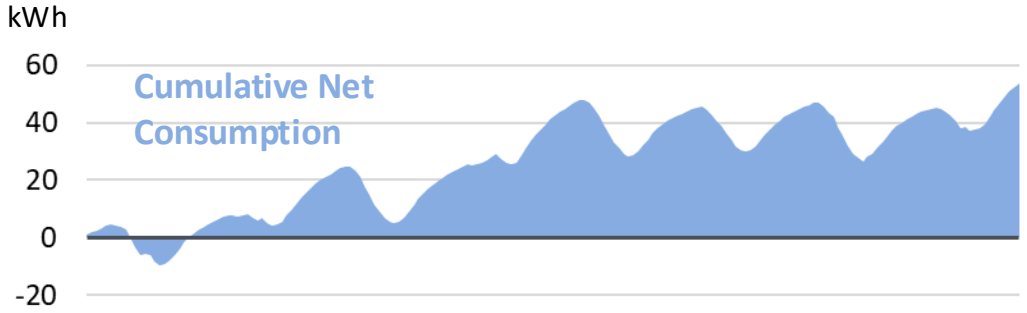
Most jurisdictions have implemented or proposed one of three common compensation mechanisms for NEM customers

Compensation Mechanisms	Description	Metering Requirements
Traditional NEM (NEM 1.0)	• Customer generation offsets consumption; excess generation is credited to account at the retail volumetric rate • Excess credits are typically carried over for some prescribed period (often 1 year) before being forfeited or cashed out at a pre-determined rate	Can be implemented with legacy utility meters as excess generation simply "rolls back" the meter
Net Billing	• Exports are compensated at a different rate than the volumetric charge • Some jurisdictions also impose "non-bypassable" charges (components of the rate that cannot be avoided)	Requires a smart meter with dual channel capability (for imports and exports)
Buy All – Sell All	• Customers pay for their gross consumption (i.e. their load before netting out any solar generation even if it is consumed on-site) at the retail rate • Customers are compensated for all generation at a predetermined sell rate	Requires the solar array to be separately metered

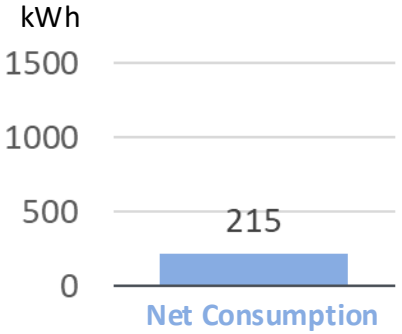
Illustrative Application of the Compensation Mechanisms

Net Metering

Metered Quantities (illustrative week)



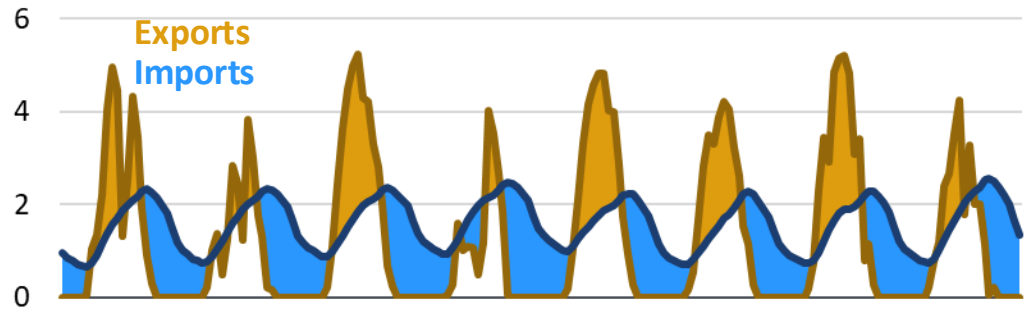
Monthly Billing Determinants

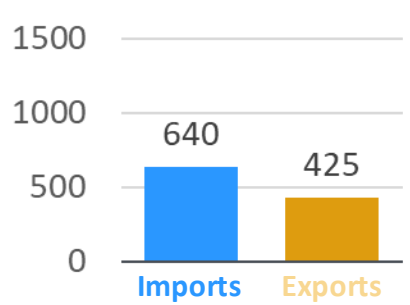


Rates and Bills

Billing Determinant	Quantity (kWh)	Rate ($/kWh)	Bill ($)
Net Consumption	215	$0.24	$52
Total Bill			**$52**

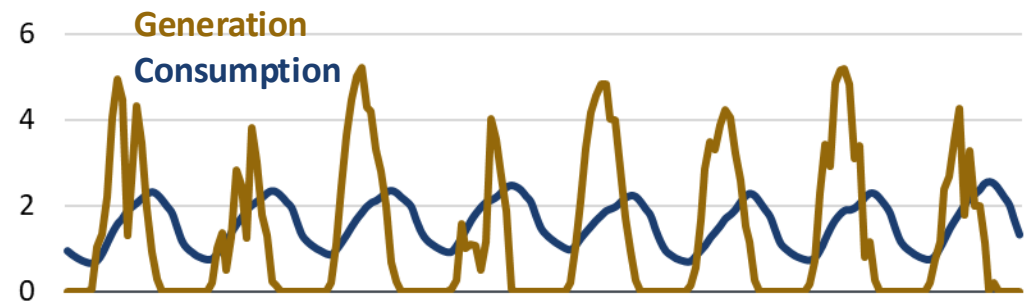
Net Billing

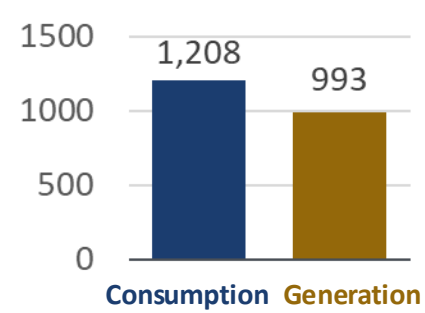




Billing Determinant	Quantity (kWh)	Rate ($/kWh)	Bill ($)
Imports	640	$0.24	$154
Exports	425	-$0.14	-$60
Total Bill			**$94**

Buy All Sell All





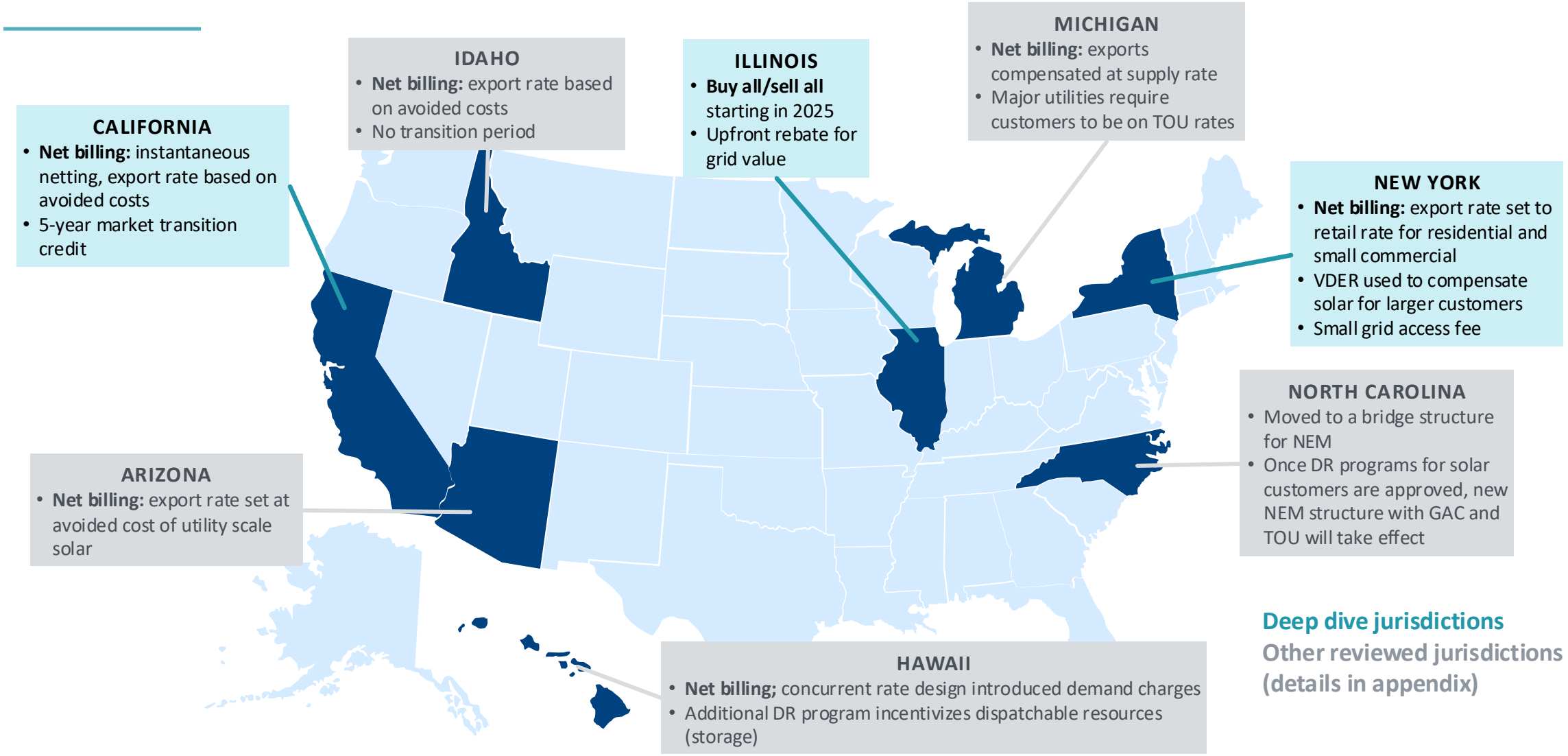
Billing Determinant	Quantity (kWh)	Rate ($/kWh)	Bill ($)
Consumption	1208	$0.24	$290
Generation	993	-$0.14	-$139
Total Bill			**$151**

Other Key Elements Affecting Compensation

NEM Design Element	Notes
Netting Interval	• In the net billing mechanism, netting can be done at different time intervals • Shorter netting intervals (hourly, daily) result in higher calculated imports over a billing cycle, meaning solar customers face higher bills • Monthly netting is simpler but does not capture that customers are net consumers and net exporters at different times within the month
Credit Retention	• Excess NEM credits (over the customer's minimum allowed bill) may be carried over to offset future monthly bills • Many jurisdictions allow credits to be carried for 12 months at which time they are either forfeited; compensated at a pre-determined rate, or transferred to a low-income customer program
Grid Access Fee	• Some jurisdictions assess a fee from NEM customers to reflect the costs they impose on the transmission and distribution system • Fee may be a fixed monthly fee or a per-kW installed solar fee
Grid Services Payment	• Some jurisdictions pay NEM customers additional compensation to for grid services they provide (e.g., avoided transmission and distribution upgrades)
Market Transition Adder	• To make the change to compensation more gradual, some jurisdictions provide a temporary additional incentive that is phased out over the first few years after the successor mechanism takes effect
Parallel Redesign of Retail Rate Structures	• Many jurisdictions are making rate design modifications in parallel to NEM reform as part of the overall change to compensation for NEM customers • Common changes include TOU rates or increased fixed charges

Deep Dives on NEM Reforms in Selected Jurisdictions

Map of Reviewed States



CALIFORNIA
- **Net billing:** instantaneous netting, export rate based on avoided costs
- 5-year market transition credit

IDAHO
- **Net billing:** export rate based on avoided costs
- No transition period

ILLINOIS
- **Buy all/sell all** starting in 2025
- Upfront rebate for grid value

MICHIGAN
- **Net billing:** exports compensated at supply rate
- Major utilities require customers to be on TOU rates

NEW YORK
- **Net billing:** export rate set to retail rate for residential and small commercial
- VDER used to compensate solar for larger customers
- Small grid access fee

NORTH CAROLINA
- Moved to a bridge structure for NEM
- Once DR programs for solar customers are approved, new NEM structure with GAC and TOU will take effect

ARIZONA
- **Net billing:** export rate set at avoided cost of utility scale solar

HAWAII
- **Net billing;** concurrent rate design introduced demand charges
- Additional DR program incentivizes dispatchable resources (storage)

Deep dive jurisdictions
Other reviewed jurisdictions (details in appendix)

California: Key Features of the Net Billing Tariff (NBT)

Summary

- Effective April 2023
- Net billing structure
- Customers are required to be on TOU rate
- Systems can be sized to produce up to 150% of annual usage

Rates

- **Imports:** TOU rate with high differentiation between peak and off-peak periods
- **Exports:** Rate varies hourly and is set based on the value stack of avoided costs (energy, T&D capacity, etc.)
- **Netting Interval:** Instantaneous
- **Non-bypassable charges:** Fixed charge and several charges related to public purpose programs, wildfire hardening, etc.

Transition Features

Rate Lock-in Period: New NBT customers can have their export rates locked in for 9 years from install

Market Transition Credit:

- Adder to export rate, set such that payback period would be 9 years for a typical customer
- Adder follows glidepath to zero in 5 years

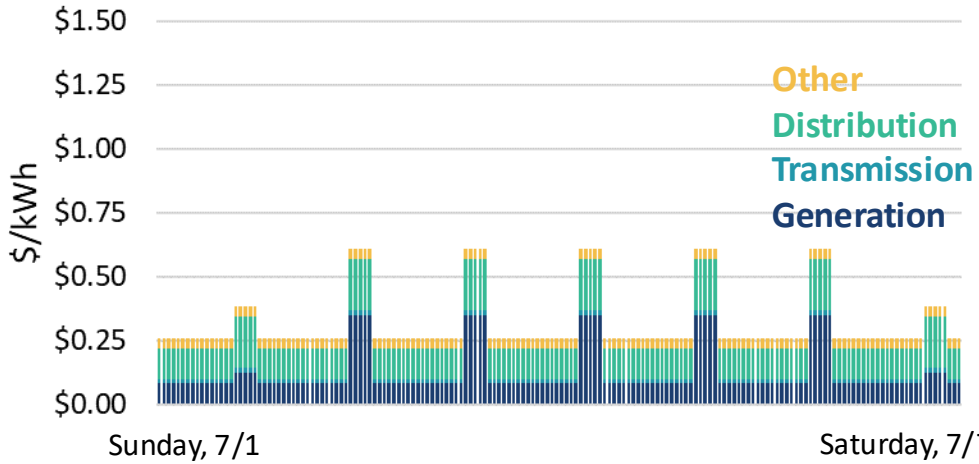
Grandfathering: Existing NEM customers allowed to remain on their old rate for 20 years

California: NBT Import and Export Rates

Imports

- Net billing customers are required to be on the "TOU D-PRIME" rate
- It consists of a fixed daily charge ($0.52/day for SCE) and time-varying import rates (shown below)
- Rates vary by TOU window, weekend vs. weekday, and summer vs. winter

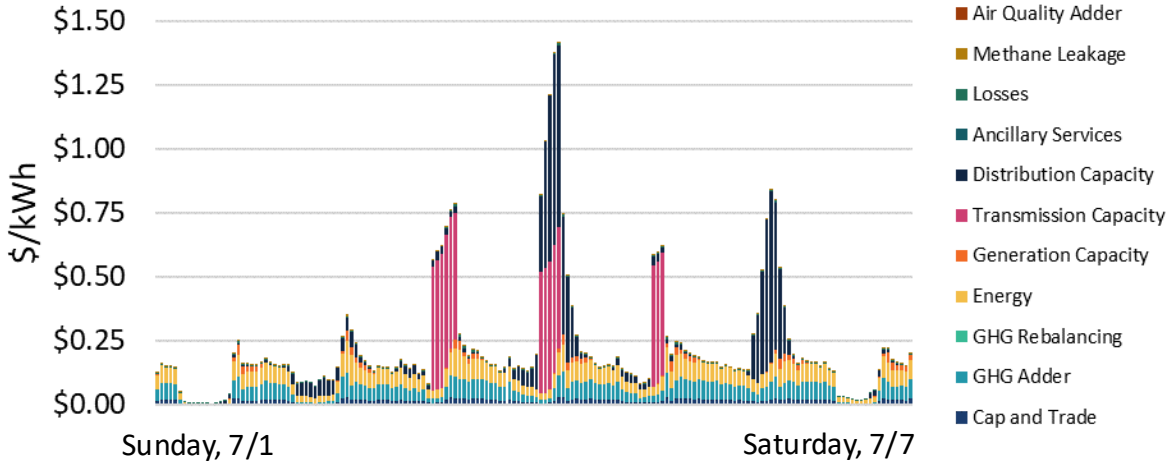
SCE Import Rates (Mandatory "TOU D-PRIME")



Exports

- Rates vary hourly and are based on forecasted avoided costs from the Avoided Cost Calculator
- Export compensation rates are locked in for the first 9 years after install based on the ACC version in effect on the install date
- The ACC uses several inputs to calculate avoided costs:
  - Generation costs modeled in IRP proceeding
  - T&D costs from Distribution Resource Plan proceeding

SCE Export Rates (from Avoided Cost Calculator)



New York: Key Features of Updated DER Tariffs

Summary

- Mass market customers (residential < 25 kW and non-residential < 750 kW) are allowed to remain on a tariff that is very similar to traditional NEM (called "Phase One NEM")
  - New customers since Jan. 2022 must pay the "Customer Benefit Contribution (CBC)" – a $/kW surcharge on DER capacity
- A net billing tariff (called "Value Stack tariff") became available July 2017; any customer with system size < 2,000 kW can opt in

Rates (under Value Stack tariff)

- **Imports:** Based on the customer's rate schedule
- **Exports:** Rate varies hourly and is set based on the value stack of avoided costs (energy, T&D capacity, etc.)
- **Netting Interval:** Hourly
- **Customer Benefit Contribution:** Value Stack customers pay a lower CBC than Phase One NEM customers

Transition Features

Continuation of NEM: Phase One NEM is a continuation of legacy NEM for mass market customers

Market Transition Credit: Additional credits for large projects under Value Stack tariff. Credits phase out as more capacity is installed.

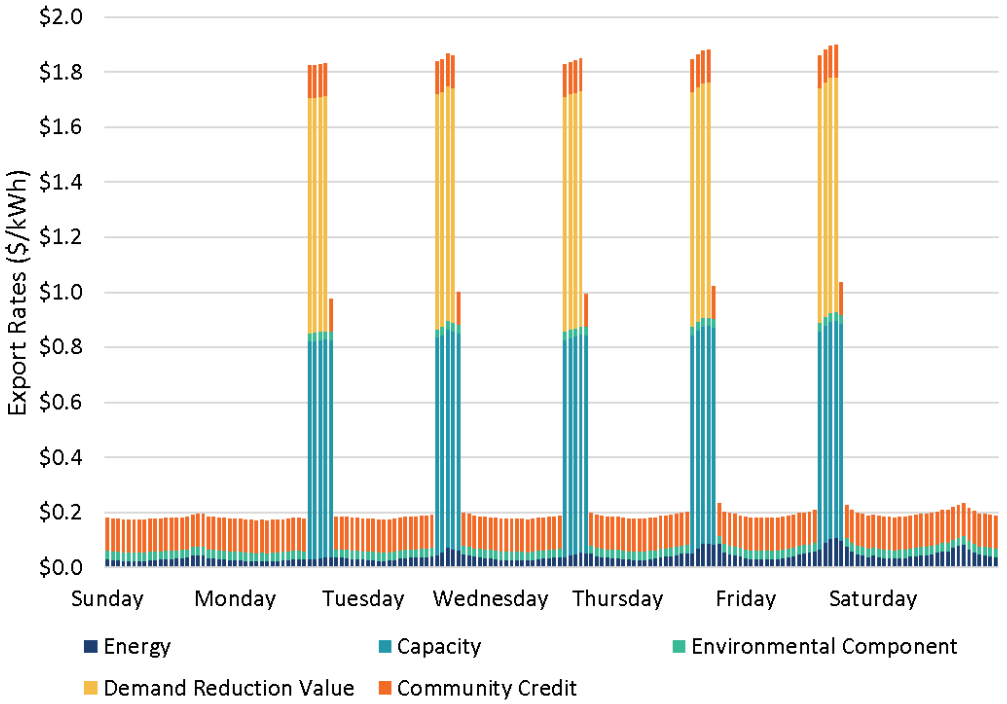
Grandfathering: Existing NEM customers allowed to remain on their old rate for 20 years

New York: Value Stack Export Rates

Value Stack tariff export rates vary hourly and are the sum of:

- **Energy:** Direct pass-through of hourly day-ahead market rates
- **Capacity:** Customers can select one of three options
  1. Flat $/kWh rate based on modeled hours of solar production
  2. Higher $/kWh rate only available 2-6pm on weekdays June 24th – August 31st
  3. $/kW rate for exports during NYCA peak hours
- **Distribution:**
  - **Demand Reduction Value:** A lower average value of distribution deferral paid regardless of location
  - **Locational System Relief Value:** A higher value paid only to projects in locations with distribution system capacity constraints
- **Other:** Additional minor components for environmental value, etc.
- The Value Stack tariff requires several inputs:
  - Prices from NYISO
  - Marginal costs of T&D upgrades estimated by each utility
  - Distribution grid locations projected to have near-term constraints

ConEd Export Rates (Phase 2 VDER Tariff)



Note: Figure shows a representative week in July

Illinois: Key Features of Updated DER Tariffs

Summary

- Clean Energy Jobs Act (CEJA) of 2021 directs that the NEM successor tariff take effect for new systems in 2025
- CEJA is unique in that it specifies the design of the rate, so there is no additional room for regulatory interpretation
- CEJA also requires that an upfront DG rebate be provided to new customers once the new tariff is effective

Rates

CEJA does not explicitly set up a buy-all-sell-all structure. Instead, it directs that:

Energy, capacity, and transmission be billed on *net* consumption, meaning solar generation is compensated for these components

Delivery charges and riders be billed on *gross* consumption, meaning solar generation does not offset this component of the bill, even when consumed onsite

i.e., it sets up a structure where:

Buy Rate = Energy + Capacity + Transmission + Delivery + Riders

Sell Rate = Energy + Capacity + Transmission

Transition Features

Distributed Generation Rebate: Upfront payment for distribution grid value of DERs

Grandfathering: Existing NEM customers remain on their rate for the lifetime of their system

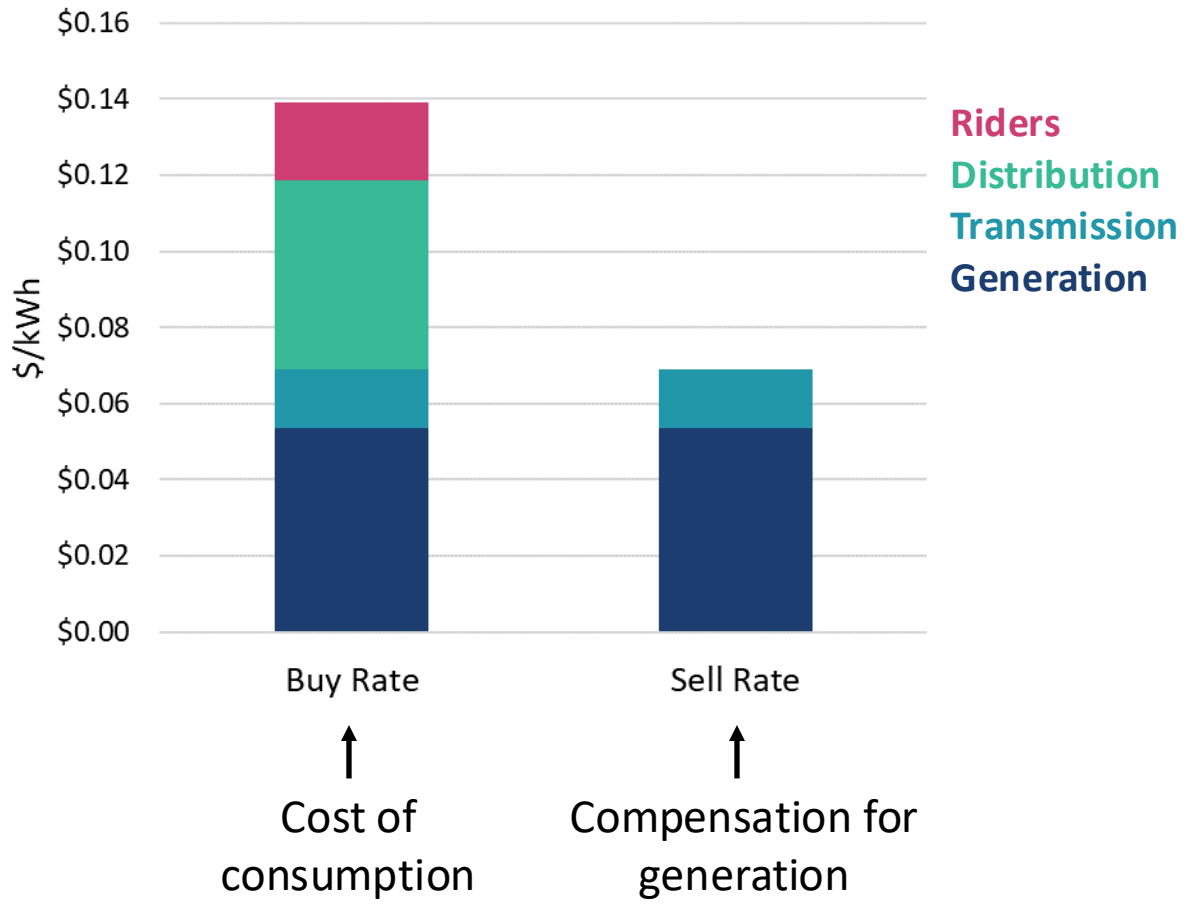
Renewable Energy Credit (REC) Procurement: IL procures RECs from customers upfront at relatively high, administratively set prices

Illinois: Buy All - Sell All Structure

There will be several changes when the NEM successor tariff goes into effect.

- Compensation for solar generation will drop to the new sell rate.
- New customers will receive the Distributed Generation Rebate, an upfront $/kW payment intended to reflect the locational value of grid services provided by the DER.
  - CEJA requires the rebate to be at least $300/kW
  - DERs can be stacked, i.e., 5 kW solar + 5 kW storage receives compensation for 10 kW
  - Customer is required to install a smart inverter; this inverter is what enables buy-all-sell-all as it can meter solar output
  - Utilities are allowed to treat the rebates as regulatory assets and earn a return on them

Illustrative Buy and Sell Rates
(based on ComEd's Basic Electric Service rate)



Avoided Cost Components Included in Export/Sell Rates

Setting compensation for exports based on avoided costs is a common theme across NEM successor mechanisms. However, there is a wide range in what different jurisdictions consider to be "avoided costs".

- The matrix below shows the parts of the "value stack" that exports are compensated for in each state
- Even in states that include similar components, methods of compensating for them vary widely. E.g., NY's VDER tariff compensates for energy by passing on wholesale market prices, while CA's tariff uses historical energy prices.

Matrix of Avoided Cost Components Included in Export/Sell Rates

Avoided cost component	CA	NY	IL*	AZ	HI^	ID	MI	NC
Energy	■	■	■	■	■	■	■	■
Capacity	■	■	■		■	■		
Ancillary services	■				■			
Transmission	■	■	■	■		■		
Distribution	■	■		■		■		
Line losses	■			■		■		
Environmental/GHG costs	■	■						

* IL compensates for DER distribution grid services through the Distributed Generation Rebate. It compensates for environmental value through REC procurements.
^ HI compensates for energy through Smart DER tariff, and capacity and ancillary services through the BYOD program

Additional International Insights

- Many countries offer **long-term contracts** that operate analogously to net billing or buy-or sell-all mechanisms
  - General movement towards **net billing with instantaneous netting** – Germany's policy moved from buy-all sell-all to net billing over time (although they recently added a new buy-all sell-all option)
  - Fixed contracts "bake in" grandfathering, usually for 10-20 years after initial system purchase
- **Export rates have decreased over time** across the board, either by design or from decreasing value of rooftop solar. As in the US, a wide range of methods are used to determine export rates
  - **Germany's** highly influential 2000s "feed-in tariff" policy was designed to reduce over time
  - **Australian states** revise export rates annually based on avoided costs
  - **The UK** mandates that retailers offer an export tariff but relies on retail competition to set prevailing rates
  - Despite decreasing export rates and relatively high rooftop PV penetration levels, many jurisdictions continue to see high rates of adoption despite (and in part due to) differences in permitting environments
- There is a trend toward **integration of TOU export rates and DER programs**
  - Regulators in Victoria, Australia require retailers to offer two TOU export tariffs with defined hours and minimum rates
  - UK: Retailers such as Octopus Energy offer export rates that track day-ahead wholesale prices, as well as block TOU rates that reward customers for allowing Octopus to operate a customer's home battery

Conclusion

Summary of Trends Observed Across Jurisdictions (1)

- **Most jurisdictions are moving to net billing**; however, there are broad variations in the design elements
- Jurisdictions with **net billing structures generally compensate exports at avoided cost**
  - States use many different methodologies to calculate avoided costs, resulting in a wide range of export compensation rates
  - Methodologies include "value stack" approaches based on historical/forecast avoided costs of generation, T&D, etc.; selecting specific components of the import rate to comprise the export rate; or setting a value based on avoided utility scale generation costs
- Several jurisdictions are **redesigning rates for all customers** in parallel with NEM reform
  - This allows implementation of more cost-reflective rates for all customers, including NEM customers, and limits cost-shifting to non-NEM customers
  - The new rates typically contain **higher fixed charges** and/or a **highly differentiated TOU** component
- Some jurisdictions are implementing a **suite of programs in parallel to NEM reform** to allow solar customers to provide grid services
  - These programs are similar to DR programs and **reward dispatchability and peak reduction**
  - They **incentivize the addition of storage**
  - They provide a new **potential revenue stream** to offset some of the reduction in compensation resulting from NEM reforms

Summary of Trends Observed Across Jurisdictions (2)

- The **netting interval** determines how imports and exports are measured
  - Several jurisdictions use **instantaneous netting**, which is the most accurate method
  - Some jurisdictions use **hourly or monthly netting,** which are seen as simpler to understand and lead to higher compensation relative to instantaneous
  - **Longer netting intervals are more beneficial for DG customers** as there is more scope for exports to offset imports (e.g., daily netting would allow generation during the day to offset imports at night, but hourly netting would not allow this)
- **Grid Access Fees** are not yet common in the current NEM landscape
  - GACs are contentious where they are introduced as they are seen as discriminatory
  - Some jurisdictions instead collect higher fixed charges to recover other costs from customer generators
- Several jurisdictions provide a **"glidepath" or "market transition" mechanism** to reduce shocks to the solar market
  - California provides an adder to the export rate such that payback periods for new customers do not exceed 9 years
  - Arizona does not allow the export rate to fall by more than 10% per year
  - Illinois will offer a $300/kW upfront rebate once the NEM successor rate goes into effect

Guidance for Stakeholder Proposals

The Technical Conference in January is for stakeholders to present proposals for a NEM successor policy in New Jersey. Presentations can include proposed designs for the following policy elements:

- Timeline
- Grandfathering period
- Eligible DER technologies
- System size limits
- Program enrollment cap
- Compensation mechanism
- Treatment of time-varying rates
- Netting interval
- Credit retention
- Grid services payment
- Grid access charges
- Non-bypassable charges

Shortly after this workshop, we will send a memo providing additional guidance on the format of stakeholder presentations and the key policy questions proposals should address.

Q&A

Appendix:
Jurisdictional Review of NEM Reforms

Summary of NEM Reforms in Surveyed Jurisdictions

No.	State	Summary
1	**Arizona**	Net billing with exports compensated at avoided cost of utility scale solar (assumes rooftop solar reduces need for utility scale solar)
2	**California**	Transitioning from full retail NEM to net billing with export rate based on avoided costs, with instantaneous netting; 5-year market transition credit
3	**Hawaii**	Net billing with concurrent rate design that institutes demand charges; additional DR program to incentivize dispatchable resources (storage)
4	**Illinois**	Buy all /sell all starting in 2025; i.e., solar generation not compensated for distribution charges even if consumed onsite.
5	**Michigan**	Net billing with exports compensated at supply rate. One of the utilities requires new DG customers to be on the time-of-use rate.
6	**New York**	Optional net billing value stack rate. Traditional NEM continues to be available for residential and small commercial, but with a grid access charge.
7	**North Carolina**	Moved to a bridge structure for NEM; once DR programs for solar customers are approved, new NEM structure with GAC and TOU will take effect
8	**Idaho**	Net billing as of 2024, with export rate based on avoided costs. No transition period, customers grandfathered for legacy systems installed before Dec 2019.
9	**International jurisdictions**	Germany & Australia: Net billing “feed-in tariffs” with instantaneous netting and various annually reviewed export rates. UK: net billing with instantaneous netting; innovative retailers (e.g. Octopus Energy) offer different time-varying export rates.

Glossary of Surveyed NEM Design Elements

Design Element	Description
Trigger for NEM Reform	Legislative, regulatory, or other motivations that drove the decision to reform traditional NEM
Timeline	Effective date of NEM successor tariff
Grandfathering	Whether and how long existing NEM customers are allowed to remain on the old NEM structure
Technologies	Technologies eligible for net metering programs vary by jurisdiction. Some states or utilities limit qualifying technology to renewables, while others allow all customer-owned generators
System Size Limits	Some jurisdictions set system capacity limits to regulate the size of individual net-metered installations. Capacity limits can be defined either in terms of installed capacity or as a percentage of the customer's annual consumption
Program Enrollment Cap	Some states have caps limiting the total amount of installed net metered generating capacity
Compensation Mechanism	Type of mechanism (traditional NEM, net billing, etc.)
Treatment of Time-Varying Rates	Whether NEM customers are allowed to be on time-varying rates and how that affects NEM compensation
Netting Interval	The frequency of netting (hourly, instantaneous, etc.), applicable only to the net billing mechanism
Credit Retention	Treatment of excess credit payments if the customer has net excess generation in a month
Grid Services Payment	Any separate payment intended to compensate DER customers for distribution grid services
Grid Access Fee	Any payment charged only to DER customers, generally intended to reduce the scale of cost shift to non-DER customer
Non-bypassable Charges	Charges that must be paid every month and cannot be offset even if the customer has net excess generation

Arizona – Summary of Net Billing Mechanism

	Net Billing Program
Trigger for NEM Reform	December 2016 decision from ACC to replace net metering with net billing
Timeline	Effective as of 2017
Grandfathering	Customers on previous net metering program keep former program rules for 20 years after initial enrollment
Technologies	Solar, wind, hydroelectric, geothermal, biomass, biogas, combined heat and power, or fuel cell technologies
System Size Limits	Systems must be sized to not exceed 125% of customer's total connected load
Program Enrollment Cap	N/A
Compensation Mechanism	**Net billing** – exports compensated at the avoided cost rate of procuring utility-scale solar. Customers keep their export rates for 10 years, and export rates for new enrollments are updated annually (capped at 10% decrease).
Treatment of Time-Varying Rates	Net billing export rates are not time-varying, even if customer is on a time-of-use retail plan. APS requires net billing customers to participate in one of its TOU rates.
Netting Interval	Instantaneous
Credit Retention	Monthly net excess generation is carried forward indefinitely; utility pays customer for remaining credits at the end of the annual period if the credit amounts exceed the following balances: Arizona Public Service: $25 ; Tucson Electric Power: $10 ; UNS Electric: $10
Grid Services Payment	N/A
Grid Access Fee	N/A
Non-bypassable Charges	Only kWh portion of customer bill is eligible for credit

Source: DSIRE (dsireusa.org)
E000024471.pdf (azcc.gov)
APS Net Metering Bill FAQs | APS Solar Fees | Sunrun
ACC Votes to Do Away With Solar Grid Access Fee

Arizona – Key Policy Issues

- **Export compensation mechanism:** Export rate set using "Resource Comparison Proxy (RCP)" framework, which seeks to determine the avoided cost of procuring utility-scale solar
  - Set at rolling average of PPA prices for utility-scale solar projects put into service in the last 5 years
  - Includes adders for avoided T&D costs and line losses
  - Customers keep their export rate for 10 years
  - Export rates are recalculated annually for new customers – maximum annual decrease of 10%
    - Since program inception, export rates have decreased by maximum of 10% each year
- **Grid access fee:** Arizona Public Service (APS) required a $0.93/kW-DC grid access fee is required for APS customers with solar, but the ACC ordered this fee be eliminated in late 2021
- **Time-varying rates:** APS requires solar customers to be on one of two time-of-use rates with on- and off-peak rates (peak hours: 4-7pm on weekdays). One of these rates includes a demand charge for the highest hour of usage during on-peak hours.
  - Exports from net billing customers are not compensated differently between on- and off-peak hours
- **Grandfathering:** Initial net metering customers permitted to remain on net metering rates for 20 years following initial enrollment

Source: DSIRE (dsireusa.org)
E000024471.pdf (azcc.gov)
APS Net Metering Bill FAQs | APS Solar Fees | Sunrun
ACC Votes to Do Away With Solar Grid Access Fee
Your Journey to Adding Rooftop Solar | APS
ACC Decision No. 75859

California – Summary of New Compensation Mechanism

	Latest NEM Program
Trigger for NEM Reform	CPUC Order Instituting Rulemaking to Revisit Net Energy Metering Tariffs (Aug 27, 2020)
Timeline	In effect as of April 2023
Grandfathering	Customers stay on current NEM rate until 20 years after their initial installation date
Technologies	Solar, wind, fuel cell, biogas, biomass, digester gas, geothermal, hydroelectric, landfill gas, municipal solid waste, ocean thermal, wave solar thermal, tidal current
System Size Limits	System size (annual generation) cannot exceed 150% of electricity usage in previous 12 months – justification needed once size exceeds 100% of historical usage
Program Enrollment Cap	N/A
Compensation Mechanism	• Net billing: imports at TOU rate with high price differentiation; exports at hourly avoided cost from avoided cost calculator (ACC) • ACC Plus Glide Path Adder: customers switching to net billing from NEM 2.0 to receive a credit, which follows a glidepath down to zero in 5 years. The credit will be an adder to the export rate
Treatment of Time-Varying Rates	NEM 3.0 is based on avoided cost rates; the exact rate varies depending on the hour/day/month customers export energy to the grid. Customer generators are required to take service under a TOU rate
Netting Interval	Instantaneous netting for all classes applicable to all charges
Credit Retention	Credits roll over for 1 year; excess at end of year compensated at energy-only rate
Grid Services Payment	N/A
Grid Access Fee	N/A
Non-bypassable Charges	Any fixed charge contained in customer generator's applicable rate, as well as four non-bypassable charges: public purpose program charge, nuclear decommissioning charge, competition transition charge, and the wildfire fund non-bypassable charge

Source: 500043682.PDF (ca.gov)
Net Billing-Residential-CA-2023 (seia.org)
2024 San Diego Gas & Electric (SDG&E) Net Metering | EnergySage
2024 Pacific Gas & Electric (PGE) Net Metering | EnergySage
2024 Southern California Edison (SCE) Net Metering | EnergySage
Understanding Your NEM Bill | San Diego Gas & Electric (sdge.com)

California – Key Policy Issues in Updated NEM 3.0 (1)

- **Grid participation charge**
  - Monthly charge proposed in 2021 decision dropped in face of criticism that it would act as a "tax on solar."
- **Adder with glidepath**
  - Adder approved to minimize shock to solar market, with 5-year glidepath deemed to balance market sustainability with significance of cost shift
    - Adder value determined as the additional compensation needed to achieve a payment period of 9 years in each utility area. Customers in SDG&E were ascertained to already have a payback period of less than 9 years, so no adder is available in that jurisdiction.
- **Program applicability**
  - NEM 3.0 only applies to customers who install rooftop solar after April 15th 2023 – all other customers stay on old NEM rate
- **Retail export compensation rate structure**
  - CPUC asserted that import rates do not reflect value of exports → approved export rate based on ACC to send accurate price signals and maximize value to all customers
    - Export rate to be set based on the hour of day for each month, averaged from the ACC's 8760 hourly values
- **Instantaneous netting (a.k.a. no netting)**
  - Imports and exports are measured on two separate channels of the meter
  - All imports measured on Channel 1 are compensated at the import rate, all exports measured on Channel 2 at the export rate
  - Different from hourly or monthly netting, where exports can offset imports from a different instant within the netting interval

Source: PROPOSED DECISION OF ALJ HYMES (Mailed 11/10/22), Rulemaking 20-08-020
NEM 3.0 in California: What homeowners need to know about Net Billing

California – Key Policy Issues in Updated NEM 3.0 (2)

- **Retail import rate structure**
  - Rate is a highly differentiated TOU rate available to all customers
- **Grid Benefits Charges and Non-Bypassable Charges**
  - No additional charges in NEM 3.0 order; determined that another proceeding to reform fixed charges would address this issue
    - CPUC asserted that NEM customers cause costs even when self-generating
- **Virtual Net Metering (VNEM)**
  - Adopted the same NEM 3.0 structure for VNEM (exports compensated at avoided cost), stating that the decision has already determined that NEM 2.0 (with similar export and import rates) did not meet the objective of aligning costs and benefits of DERs
    - VNEM customers are exempt from the requirement to enroll in the new, highly differentiated TOU rates but must enroll in existing TOU rates
- **Assembly Bill 2619**
  - In February 2024, a California State Assembly member introduced Assembly Bill 2619, which aims to repeal the NEM 3.0 legislation and create a new structure that is in line with California's clean energy goals
- **Provisions for low- or moderate-income customers**
  - All current and new recipients of the Solar On Multifamily Affordable Housing (SOMAH) and current recipients of the Multifamily Affordable Solar Housing (MASH) programs maintain their previous VNEM tariffs, which follow NEM 2.0

Source: Decision 22-12-056, Rulemaking 20-08-020, December 15, 2022

Hawaii – Summary of New NEM programs

	Smart Renewable Energy (a.k.a. Smart DER)	Bring Your Own Device (BYOD)
Trigger for NEM Reform	Within its ongoing DER program track, Hawaii Public Utilities Commission decided to "design and implement long-term DER programs that include both an export-only program and a more advanced program featuring compensation for energy exports and grid services" in Order No. 37066	
Timeline	Launched for enrollment April 2024	
Grandfathering	Customers enrolled on interim tariffs can remain on program for seven years after initial enrollment, but must switch to new tariffs afterwards	
Technologies	Solar, wind, biomass, hydro, or hybrid system	Any tech able to provide the required grid services, non-renewables are excluded
System Size Limits	N/A	
Program Enrollment Cap	N/A	Varies by territory within HI; total is 107 MW
Compensation Mechanism	• Non-Export Option: Allows customers to connect to the grid through a streamlined process that does not allow for compensation for exporting energy • Export Option: Allows customers to connect to the grid and receive time-varying compensation for exporting energy (net billing).	• Customers with dispatchable generation enroll in one of three riders with varying levels of utility control and obligations to provide power. • Fixed incentive of $100/kW is paid upfront. Monthly incentive of $5-10/kW of commitment capacity, based on performance during BYOD events. May also earn credits at Smart DER evening peak rate for controlled energy exports during BYOD events.
Treatment of Time-Varying Rates	Customers who opt-in to the Export Option receive time-varying compensation for exporting energy, according to an evening peak period and a daytime period	N/A, compensation is based on customer response to utility-determined events
Netting Interval	Instantaneous netting (export rider rates vary across overnight, daytime, and evening peak windows)	N/A
Credit Retention	Export credits to be classified as grid service or non-grid service • **Grid service credits** – For exports during utility grid service program events (important export periods); no expiration • **Non-grid service credits** – All other exports; forfeited every 12 months	Excess generation occurring in response to utility events will roll forward on a monthly basis. Annual cash-out per customer is limited to 300 kWh
Grid Services Payment	Incorporated into export credits	Reflected in compensation mechanism
Grid Access Fee	Grid Access Charge (GAC): Currently defined as a $/month charge but set to eventually transition to a $/kW charge based on individual customer metered demand after sufficient AMI metering is installed	
Non-bypassable Charges	Fixed monthly customer charge to recover only metering and billing costs, plus GAC. Total monthly bill cannot go below a minimum bill amount (encompassing customer charge and GAC) plus "applicable surcharges" until GAC is computed on a per customer basis, at which point minimum charge will be phased out.	

Source: Welcome to Net Energy Metering (hawaiianelectric.com)
2019-0323_40418.DER.DPS Phase 3 Order.12.04.2023.pdf - Google Drive
Smart Renewable Energy Export | Hawaiian Electric
Customer Grid-Supply | Hawaiian Electric
Customer Grid-Supply Plus | Hawaiian Electric
How to read your Smart Renewable Energy Export bill | Hawaiian Electric

Hawaii – Key Policy Issues (1)

Hawaii addressed NEM reform and rate design concurrently in the same proceeding. The new "three-part rate design" consists of the following components:

- **Customer charge:** Fixed monthly charge to recover only metering and billing costs
- **Grid access charge (GAC):** Monthly $/kW charge to recover cost of customer's connect to the grid, will be based on each customer's own kW demand once AMI is fully deployed
- **TOU Energy Charge:** 3 period schedule to recover energy costs and all other costs not included in the GAC or customer charges
  - 1:3:2 price ratio for day, overnight, and evening respectively
    - Daytime: 9am – 5pm
    - Evening: 5pm – 9pm
    - Overnight: 9pm – 9am
  - All customers on NEM 3.0 tariffs must be enrolled in the TOU rates; TOU structure applies to both imports and exports, but rate levels will differ
- Minimum charge will remain in place for the time being. GAC and customer charges will count towards the minimum charge. When AMI is fully deployed and the GAC is calculated on a customer basis, the minimum charge will be phased out.

NEM Reform: Introduced "Smart DER" and "Bring Your Own Device" programs to replace legacy net billing and scheduled dispatch programs, respectively.

- NEM 1.0 customers are not impacted
- All interim programs will be closed to new customers upon activation of new DER tariffs. Customers enrolled on interim tariffs can remain on program for seven years after initial enrollment, but must switch to new tariffs afterwards.

Hawaii – Key Policy Issues (2)

Smart DER ("Basic Program")

- **Net billing** – replaces previous net billing programs; export rates utilize the newly designed 3-Period TOU rate structure
- All customers participating in the new NEM program must have AMI and be enrolled in TOU rates
  - The Smart DER tariff will consist of two riders, the "export rider" and the "non-export rider". The non-export rider will be a streamlined option for customers who do not want to export DG to the grid
- Export credits classified as "grid-service" or "non-grid service." Grid service credits roll over indefinitely and can be cashed out; non-grid service credits roll over during a 12-month period after which they are forfeited.

Bring your own device (BYOD – "Advanced Program")

- The BYOD tariff offers additional compensation options for grid services independent of Smart DER participation
- The program is resource agnostic and open to any renewable resource capable to providing the required services (storage and demand response are the most likely resources to be used)
- Consists of 3 tariffs (below) and provides upfront ($/kW) and monthly ($/kW) compensation, a 10-year commitment is required
  - BYOD level 1 – flexible dispatch where specified kW-level committed for 2 hours of dispatch during on-period
  - BYOD level 2 – emergency dispatch where customer allows utility to control dispatch of committed capacity (kW) for a predetermined number of events each year (maximum of 156 events/year)
  - BYOD level 3 – system grid services with two options, capacity load reduction (dispatch committed capacity for 2-4 hours) and capacity load build (charge committed capacity for 2-4 hours)
- **LMI Adder**: maximum upfront compensation doubled for LMI participants ($1,000 vs $500)

Idaho – Summary of New Net Billing Methodology

	Net Billing Program
Trigger for NEM Reform	PUC Order 34046 (2018) required Idaho Power to conduct a study into on-site generation in terms of rates, rate design, and compensation. PUC Order 36048 authorized a shift from net metering to net billing in Dec 2023.
Timeline	Came into effect on January 1, 2024
Grandfathering	Updated net billing rates apply to those who purchased solar panels after December 2019
Technologies	Solar thermal electric, solar photovoltaics, biomass, hydroelectric, fuel cells using non-renewable fuels, wind (small), hydroelectric (small), fuel cells using renewable fuels
System Size Limits	25 kW for residential and small C&I, largest of 100 kW or 100% of demand for large C&I (energy storage devices do not count towards limit)
Program Enrollment Cap	N/A
Compensation Mechanism	**Net billing:** "Export Credit Rate" (ECR) set based on avoided-cost methodology. On-peak and off-peak ECRs during summer months (June-Sep), lower ECR in non-summer months.
Treatment of Time-Varying Rates	No requirement to be on TOU rate; customers on TOU rates are billed at TOU rate for net consumption but are compensated for exports at ECR
Netting Interval	Instantaneous
Credit Retention	Carried forward indefinitely. Credits can be transferred between accounts
Grid Services Payment	N/A
Grid Access Fee	N/A
Non-bypassable Charges	Unclear

Source: DSIRE – Net Metering – Idaho
Idaho PUC – Order 36048
Idaho Power – Customer Generation – Frequently Asked Questions

Idaho – Key Policy Issues

- **Export Credit Rate determination:** Based on avoided cost methodology that considers the following:
  - **Avoided energy:** Determined using 12 months of export-weighted market prices from Energy Imbalance Market
  - **Avoided generation capacity:** 5-year rolling average of Effective Load Carrying Capability and levelized capacity costs from 2023 IRP
    - Accounts for line losses
  - **Avoided transmission and distribution capacity:** Considered value of deferring T&D investments through reducing peak demand with exports (using 2021 export data) for 20 years of historical T&D projects
  - **Avoided line losses**
  - ECR varies by season, with summer months (June – September) having different on- and off-peak rates (3-11pm, Mon-Sat)
  - ECR to be updated annually starting April 1, 2025
- **Grandfathering:** "Legacy status" granted to systems installed before December 2019. Legacy systems continue to receive net energy metering credits
  - Terminates December 2045
- **Parallel rate increases:** Fixed charge for all residential customers increased from $5 to $10/month in 2024, and to $15 in 2025

Source: DSIRE – Net Metering – Idaho
Idaho PUC – Order 36048
Idaho Power – Customer Generation – Frequently Asked Questions

Illinois – Summary of New Compensation Mechanism

	Latest NEM Program (Not yet in effect)
Trigger for NEM Reform	Future Energy Jobs Act of 2016 set a cap on NEM, after which a successor must be designed; Clean Energy Jobs Act of 2021 eliminated the cap and directed that a successor tariff take effect Jan. 2025
Timeline	Takes effect January 1, 2025
Grandfathering	Existing NEM customers remain on NEM till the end of their system's lifetime
Technologies	Solar, wind, dedicated crops, food processing waste, fuel cells, hydroelectric
System Size Limits	N/A
Program Enrollment Cap	N/A
Compensation Mechanism	• 1:1 kWh or monetary credit on supply charges only (kWh equivalent values for energy + capacity + transmission), applied to net consumption. The customer can choose between the 1:1 kWh or monetary credit at the time they apply for NEM. • Delivery charges, taxes, and fees are all charged to the customer based on gross consumption
Treatment of Time-Varying Rates	If customer is on TOU rate, net metering credits will reflect the TOU rate. ComEd and Ameren customers can still participate with their utility's real-time pricing programs.
Netting Interval	Monthly if customer is on default rate; hourly if on TOU or real time pricing rates
Credit Retention	12 months – excess credits expire after
Grid Services Payment	When new NEM program takes effect, new customers will receive a rebate of at least $300/kW for grid services provided by their generator. There is an ongoing proceeding to set the value of this rebate.
Non-bypassable Charges	Customer remains responsible for gross amount of delivery services charges, supply-related charges, and all taxes and fees related to such charges

Source: Illinois General Assembly - Illinois Compiled Statutes (ilga.gov)

Illinois – Key Policy Issues Addressed in NEM Revision

- **Array Size Limit**
  - The bill removed the NEM tariff's size limit of 2 MW
- **NEM 1.0 program sunset**
  - Changed from 5% of peak threshold to firm date; this extended NEM 1.0 as some utilities were close to the 5% threshold
- **Distributed Generation (DG) Rebate**
  - Comes into effect when NEM 1.0 sunsets (or if a customer opts into the rebate instead of NEM 1.0)
  - Provides a one-time rebate based on the installed capacity of DG (value currently set at $250/kW and may not be revised lower)
  - Storage eligible for separate compensation, i.e., a system with 5 kW solar + 5 kW storage would receive compensation for 10 kW
  - Intended to compensate for grid services including avoided or deferred distribution capacity costs, resilience and reliability benefits, avoided or deferred distribution operation and maintenance costs, distribution voltage and power quality benefits, and line loss reductions
  - **Requires the customer to install a smart inverter; this inverter is what enables buy-all-sell-all as it can meter solar output**
  - Utilities are allowed to treat the rebates as regulatory assets and earn a return on them
- **Other additions made by the bill**
  - Co-located storage added to eligible technologies
  - Allowed oversizing of systems to meet modeled future load from EVs and heating electrification

Source: IL Public Act 102-0662

Michigan – Summary of New Compensation Mechanism

	Distributed Generation Program
Trigger for NEM Reform	Public Acts 341 and 342 (2016) directed MPSC to replace existing net metering with a new "Distributed Generation Program." Public Act 235 (2023) increased size of program and updated system size limits.
Timeline	MSPC approved Distributed Generation (DG) Program in April 2018. DTE Energy's DG Program went into effect May 2019; Consumers Energy's DG Program went into effect Jan 2021. DG Program limits updated in Feb 2024.
Grandfathering	Customers who installed solar before April 2018 can stay on existing net metering rates for 10 years after initial enrollment
Technologies	Renewables: Biomass, solar & solar thermal energy, wind, kinetic energy of moving water (waves, tidal, currents & traditional hydro), geothermal, thermal energy from heat pump, solid waste, municipal waste and food waste. Other: Methane digester
System Size Limits	110% of customer's electricity usage over the prior 12 months (previously 100% or 20 kW, whichever was smaller)
Program Enrollment Cap	10% of utility's average in-state peak load for the past 5 years (previously 1%): • At least 50% of the cap must be for project 20 kW or smaller • No more than 50% of the cap can be for project between 20 kW and 550 kW
Compensation Mechanism	**Net Billing:** "Inflow/Outflow" mechanism, where net power drawn from and injected to the grid is measured and outflow credits are awarded based on net outflow and a credit rate based on power supply component of retail rate
Treatment of Time-Varying Rates	Michigan utilities offer different summer and winter rates, and within-day peak vs. off-peak rates (mostly during summer months). Program recipients are billed at different inflow/outflow rates that follow time-varying rates.
Netting Interval	Instantaneous
Credit Retention	Credits carried forward indefinitely
Grid Services Payment	N/A
Grid Access Fee	N/A
Non-bypassable Charges	Outflow credit is only applied to power supply charges – customer must still pay distribution charges and customer service charges

Source: Solar net metering in Michigan: what homeowners need to know
What to know about DTE's net metering replacement in Michigan
Report on the MPSC Staff Study to Develop a Cost of Service-Based Distributed Generation Program Tariff
DTE Energy – Distributed Generation FAQs
Michigan Public Act 235 – 2023
DTE Tariff (Rider No 18) – 2023
Consumer Energy (C11) - 2023
Michigan's new clean energy package is historic for the country, not just the Midwest
New 'Power for All' Bills to Help Michiganders Harness More Solar Energy
MPSC – Distributed Generation Program Implementation

Michigan – Key Policy Issues

- **Net billing:** "Inflow-Outflow" mechanism compensates customers for power in excess of what they consume on-site
  - Requires two-way smart metering
  - Outflow compensated in form of a credit on power supply charges (energy + transmission); credit rate is set at the energy portion of the power supply charge (i.e. doesn't include transmission, distribution or other charges)
- **Grandfathering:** Existing NEM customers keep their rates until 10 years after initial enrollment
- **Non-bypassable charges:** Outflow credit cannot be applied to distribution charge or customer service charge
- **Time-varying rates:** Consumers Energy and DTE Energy (90% of MI customers) rolled out time-varying rates as their base tariffs in 2021 and 2023, respectively
  - Summer and winter rates, with within-day peak/off-peak pricing during summer months
  - Inflow and outflow rates reflect differences in retail rates across time periods
- **Enrollment cap:** Increased from 1% of utility in-state average peak load to 10% in late 2023
- **House Bill 4839:** Michigan legislature is considering bill that would require MPSC to establish rules for new programs for Virtual Power Plants to provide distribution system benefits
  - Potential for greater compensation to be offered to low-to-moderate income households
  - Has been referred to House Committee on Energy, Communications and Technology
- **House Bill 4840:** House considering bill that would introduce further up-front rebates for rooftop solar and behind-the-meter storage, which would be **doubled for low-to-moderate income households**

New York – Summary of New Compensation Mechanisms

	Phase 1 NEM	Phase 2 VDER Value Stack
Trigger for NEM Reform	Reforming the Energy Vision (REV) initiative to enable a distributed, transactive, integrated energy system	Phase 1: More accurate valuation and compensation of DERs Phase 2: Refinements to Phase 1 mechanism
Timeline	Starting January 1st, 2022 new customers can choose between "Phase 1 NEM" and the VDER Value stack	"Phase 2 Value Stack" is the current rate and is effective starting July 27th, 2018
Grandfathering	Existing NEM customers were grandfathered into their NEM rate (without the CBC) for 20 years.	
Technologies	Solar PV, wind, hydro, farm waste generation, fuel cells, some CHP	
System Size Limits	Residential: < 25 kW Non-residential: < 750 kW	Residential: < 25 kW Non-residential: < 2,000 kW
Program Enrollment Cap	N/A	N/A
Compensation Mechanism	Traditional net metering	Net billing, with exports compensated based on an avoided cost value stack, which includes: location-based marginal pricing; capacity; environmental value; distribution deferral value.
Treatment of Time-Varying Rates	Net metering credits reflect the time of use rate	Imports are priced based on the customer's retail rate, which may be a time-varying rate. The rate does not affect exports.
Netting Interval	Monthly	Hourly
Credit Retention	Credits carry over month-to-month and year-to-year	Credits roll over till end of the 20-year net metering term (any leftover credits expire without payment)
Grid Services Payment	N/A	
Grid Access Fee	Customers installing after January 1, 2022 pay a monthly "Customer Benefit Contribution (CBC)" charge per kW of installed capacity. The rate varies by utility and type of DER.	Lower CBC compared to Phase 1 NEM.
Non-bypassable Charges	Customer charge and any surcharges	

Source: the Value Stack - Value of Distributed Energy Resources – NYSERDA; NYPSC Case 15-E-0751

New York – Key Policy Issues

- **Transition for mass market customers:** Net billing structure is primarily targeted at larger customers and customers with storage systems. "Phase 1 NEM" allows mass market solar customers to continue on a traditional NEM structure.
- **Grid Access Fee:** "Customer Benefit Contribution" serves as the grid access fee, intended to reduce the cost shift by imposing a monthly $/kW charge on DER customers.
- **Distribution Deferral Value:**
  - The Value Stack tariff compensated for distribution value through two components: Demand Reduction Value (DRV) and Locational System Relief Value (LSRV)
    - DRV: Applies across a utility service territory and represent an average value of load reduction
    - LSRV: Additional value available only for customers served by specific substations that are at risk of near-term overload
  - In the Phase 2 Value Stack tariff, DRV and LSRV were revised so that DRV applies throughout the summer, and LSRV applies to utility call windows
  - DRV and LSRV structures were subject to a lot of discussion and revisions
  - Solar industry/project developers suggested that allocating value to the top 10 peak hours (the original Phase 1 Value Stack structure) made it too difficult to predict compensation
  - Staff recommended revising DRV to widen peak window and retiring LSRV to be replaced by demand response/non-wire alternative programs
  - However, the PSC decided to continue both components, with some refinements to increase predictability of compensation
  - Methodologies for utility marginal cost of service studies used to determine the DRV and LSRV are the subject of a new proceeding

North Carolina – Summary of New NEM programs

	Net Metering Bridge (Rider NMB)	Residential Solar Choice (Rider RSC)
Trigger for NEM Reform	2021 bill requiring revision of NEM rates	
Timeline	Effective October 2023 for residential customers	Effective October 2023 for residential customers on Time of Use or Critical Peak Pricing (CPP) rates
Grandfathering	Customers who installed solar before July 1 2023 will be grandfathered into Rider NMB on January 1 2027	
Technologies	Solar electric; wind-powered; biomass-fueled; waste heat; or hydro-powered generating system	
System Size Limits	Nameplate capacity must not exceed max monthly demand, or ≤ 20 kW, whichever is less	
Program Enrollment Cap	Closed to new participants after 01/2027; grandfathered participants retain service for up to 15 years, then transfer to Rider RSC. Annual Capacity Limits (DEC + DEP): 2023 – 15.4 MW; 2024 – 67.8 MW; 2025 – 74.6 MW; 2026 – 82.2 MW	N/A
Compensation Mechanism	Excess generation compensated at Net Excess Energy Credit rate. **No requirement to be on a TOU rate.**	Excess generation compensated at Net Excess Energy Credit rate. **Customers required to take service under a TOU with CPP rate schedule.**
Treatment of Time-Varying Rates	Net electricity will be calculated for each TOU period. After offsetting usage in the same TOU period, any remaining excess energy will be applied to lower TOU periods in descending order by price. Any excess generation after this allocation credited at the Net Excess Energy Rate Critical peak hours are considered a separate TOU pricing period for the purpose of netting	
Netting Interval	Monthly, or by TOU period for customers on TOU rates	Netting within each TOU pricing period
Credit Retention	N/A	
Grid Services Payment	None for solar, but pilot program for solar + storage (see following slides)	
Grid Access Fee	Based on the Customer's Nameplate Capacity (in kW DC for solar, kW AC for non-solar). $0 for systems <15kW. For systems >15 kW, $1.50/kW-month in DEP and $2.05/kW-month in DEP	
Non-bypassable Charges	"Monthly Non-Bypassable Charge based on nameplate capacity of system"	Monthly Non-Bypassable Charge and Grid Access Fee

Source: ncridernmb.pdf (duke-energy.com)
ncriderrsc.pdf (duke-energy.com)
Net Metering | NC Public Staff
DSIRE – Net Metering – North Carolina
Agreement Reached Among the Companies and Various Stakeholders Docket No. E-100, Sub 180
NC Shared Solar - Duke Energy (duke-energy.com)

North Carolina – Key Policy Issues

- **Residential Solar Choice NEM rate (Rider RSC):** In early 2022, Duke Energy proposed to transition NEM to rates that better reflect the cost of serving NEM customers. Several new components:
  - **Monthly minimum bills:** Intended to ensure recovery of distribution costs, which are largely fixed; proposed at $22 for Duke Energy Carolinas and $28 for Duke Energy Progress
  - **Grid access fee**: Applicable only to systems >15 kW; intended to recover distribution demand costs
  - **Non-bypassable charges:** To recover demand side management, energy efficiency, storm, and cyber security costs; structures as a per kW charge calculated based on the amount of kWh bypassed per kW of solar
  - **TOU Energy Charges:** Monthly netting of imports and exports within each TOU period. **Net imports** are billed at the applicable TOU rate and **net exports** are compensated at the end of the month at the annualized avoided energy cost rate
  - In May of 2022 Duke and solar advocates reached an agreement to delay mandatory TOU until 2026, giving parties more time to plan business models and incentive details
- **Bridge Rate (Rider NMB):** Pushback from solar developers in response to the proposed mandatory TOU rates led to the development of a new "Bridge Rate"
  - Traditional NEM no longer available to new customers; bridge rate available till 2026, after which Rider RSC will be the only option
  - Provides a more gradual transition – GAC and mandatory TOU are not part of the bridge rate
  - Bridge rate contains 3 key differences compared to traditional NEM:
    - **Lower export compensation:** Net exports compensated at avoided energy cost rate (netting interval is monthly)
    - Imposes a **minimum bill. Low-income customers are exempted** (homes built specifically for low-income and vulnerable customers; LIHEAP recipients; CIP recipients)
    - Includes **non-bypassable charges**
  - Limited option with annual MW caps and early termination stipulations

Source: Rooftop solar companies enter fray over North Carolina net metering proposal

Residential Solar + Storage Program – PowerPair

- On January 11, 2024, NC Utilities Commission approved "PowerPair" **pilot program for residential solar and storage**
  - First authorized as part of 2023 NEM order, however design was not finalized
- Start date: May 2024
- Enrolment cap: 30,000 kW (~6,000 homes). Must participate for at least ten years.
- Eligibility: Customers installing new solar + storage systems. Not available to existing solar customers adding storage.
- Two components: one-time rebate and monthly battery control incentive
  - **One-time solar and storage rebates**: Total upfront rebate up to **$9,000**
    - $0.36/W for solar, up to $3,600 (10 kW). $400/kWh for battery storage, up to $5,400 (13.5 kWh)
  - **Monthly battery control incentive:** customers can elect to allow utility to discharge their battery between 30 and 36 times per year in exchange for a net monthly incentive of $4.61/kW ($6.40/kW incentive * 70.9% capability factor).
    - Must participate in NEM Bridge rate
    - Applied to customers' monthly bill, additional credits roll over to following month

Source: Solar + Battery Incentives | Duke Energy
PowerPair Program Approved by NC Utilities Commission

Compensation mechanisms in international jurisdictions

Jurisdiction	Feature	Context	Program description
Germany	Feed-in tariffs (FiT)	• **Feed-in tariff (FiT)**: long-term contract (often ~20 years) of guaranteed $/kWh compensation for energy injected into grid. Can apply to net generation (analogous to net billing) or gross generation (analogous to buy-all sell-all). • Germany introduced national government-set FiT in 2000 as part of broader renewable energy policy framework. Highly successful – became model for FiT policies in different jurisdictions.	• Initially, FiT rates were greater than retail rate, applied to gross generation, and designed to reduce over time. Eventually, FiT was revised to be applied to net generation. • In 2022, added second FiT so that customers who export all generation are compensated at a higher rate than versus customers who export surplus generation (i.e. buy-all sell-all vs net billing). Aimed at incentivizing full rooftop utilization of PV instead of scaling PV systems to consumption levels.
Australia – Victoria	Time-varying solar net feed-in tariff	• World's highest rooftop PV penetration (1 in 3 rooftops). • Net FiTs: **Net billing** with instantaneous netting. Net exports are compensated at predetermined FiT rate, locked in for fixed term. • State regulators annually set minimum FiT that retailers must offer to new customers based on solar-weighted average wholesale electricity prices, avoided T&D losses, and avoided social cost of carbon. • FiT rates have dropped dramatically from rates of 60 c/kWh to 2.1-8.4 c/kWh	Victoria offers three FiT options to retailers: a flat FiT and two time-varying FiTs. • Flat: 3.3 c/kWh • TOU 1: Day (7am-3pm & 9pm-10pm, 2.8c/kWh), early evening (3pm-9pm, 7c/kWh), and overnight (10pm-7am, 7.6c/kWh) rates • TOU 2: Off-peak (10am-2pm, 2.1c/kWh), peak (4pm-9pm, 8.4c/kWh), and shoulder rates (9pm-10am & 2pm-4pm, 4.1c/kWh) Aims to incentivize later-in-day solar generation (e.g. west-facing panels instead of north-facing) and home battery storage.
UK – Octopus Energy	Customizable TOU import and export rates for solar and solar + storage	• In 2020 UK Gov replaced FiT with "Smart Energy Guarantee": retailers must offer an export tariff, retail competition sets prevailing rates. • Octopus Energy: UK retailer offering innovative "smart rates," including block TOU rates and rates that entirely pass through the real-time wholesale price of energy.	All programs are net billing with instantaneous netting. Customers can combine different import and export tariff designs: • "Agile" rates set half-hourly to match day-ahead wholesale rates (export rates compensated only for energy portion of wholesale price) • Block TOU rates, with option to allow Octopus to operate battery charging/discharging schedule to minimize costs • Flat export rates

Source: Minimum feed-in tariff | Essential Services Commission
Smart Export Guarantee Explained
Octopus Energy – Export Tariffs
Germany raises feed-in tariffs for solar up to 750 kW
Photovoltaic distributed generation – An international review on diffusion, support policies, and electricity sector regulatory adaptation