



Energy+Environmental Economics

+ Rate design for achieving  
policy objectives

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**Energy & Environmental Economics (E3)**



# Agenda

## + Rate design objectives

- Enabling desired policy outcomes consistent with fundamental rate design principles

## + Examples of rate design to achieve policy goals

- BC Hydro inclining block structure
- NY smart home pilot/Full value tariff
- Rate design for electric vehicles (SDG&E)
- Using rates to implement Title 24 Community Solar Option

## + Importance of getting rate design right

- SGIP program evaluation
- NY NEM transition tariff



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# RATE DESIGN OBJECTIVES



## + Guiding Principles per Prof. Bonbright

- Customer acceptability
- Efficiency
- Fairness
- Sufficiency

**+ Rates can be designed consistent with these principles to meet policy objectives**



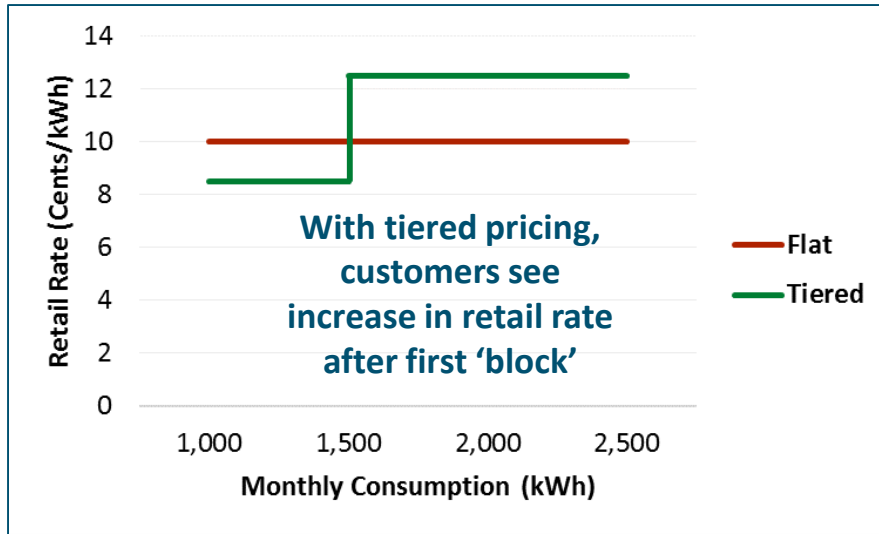
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# **E3 INSIGHTS THROUGH RATE DESIGN WORK**

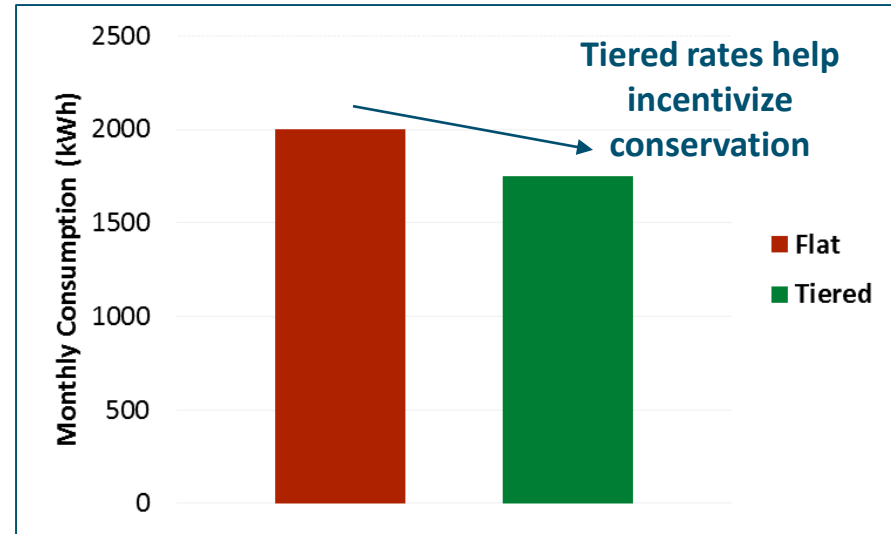


# Inclining block structures to encourage conservation

## Flat versus Tiered Rates



## Monthly Consumption with Flat and Tiered Rates



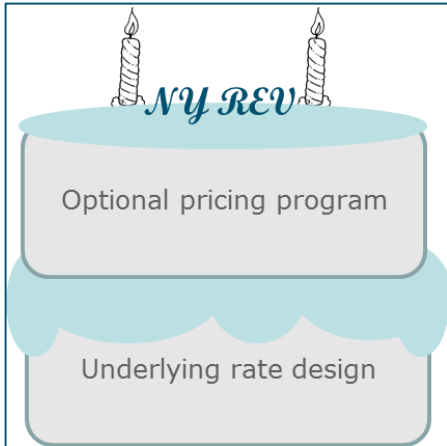
- + E3 has worked with clients to determine rate structures and design that will help enable conservation among rate classes
  - Inclining block tiered rates are effective in giving customers signals for conservation
- + Inclining block tiered rates can also make DSM more cost-effective by reducing payback periods on investments

**Tiered rate structures for customers can help boost the cost-effectiveness of CCA DSM programs**

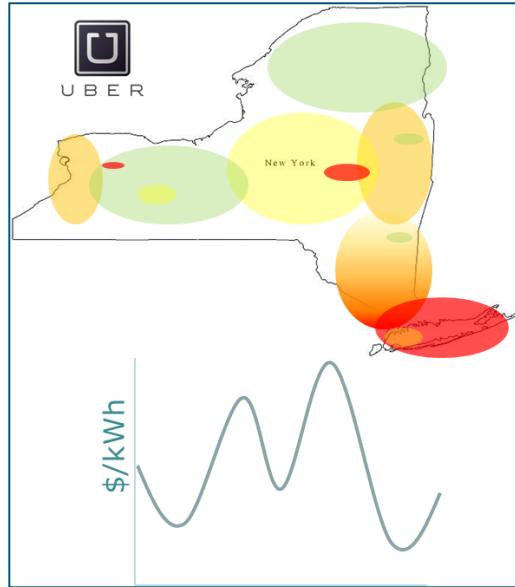


# Full Value Tariff to incentivize an efficient mix of Distributed Resources

## 'Layer Cake' Pricing



## 'Uber' Pricing



## 'Subscription' Pricing

How Can Platform Owners/Operators Charge for Access?

| <br><b>Subscription charge based on customer size</b> | <b>Sized Based Residential Charge (Peak or Usage?)</b> | <b>1 kW / 3,500 kWh?</b> | <b>5 kW / 17,500 kWh?</b> |
|---|--|--------------------------|---------------------------|
|   | Customer Charge (Modeled Current Rates)                |                          | \$20/month + ¢/kWh rate   |
| Subscription Service (NEW)                            |  | \$25/mo + Surge          | \$236/mo + Surge          |

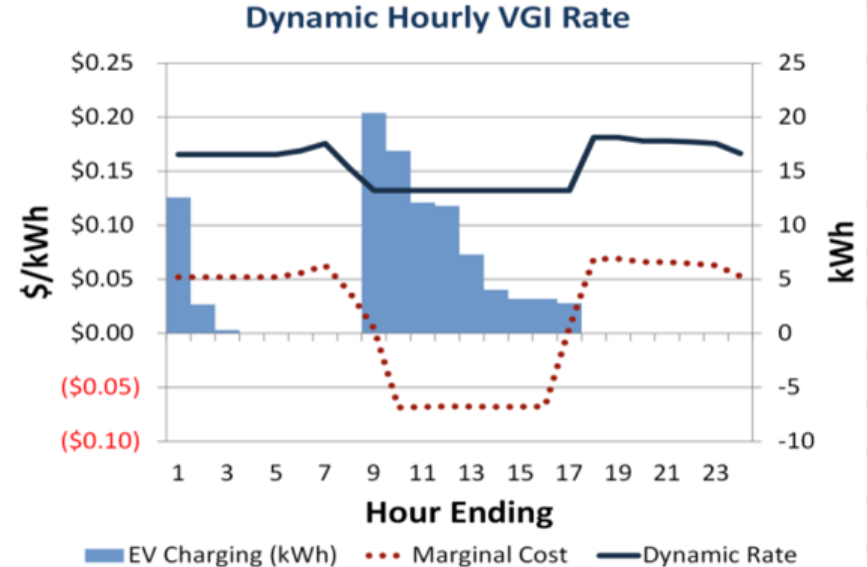
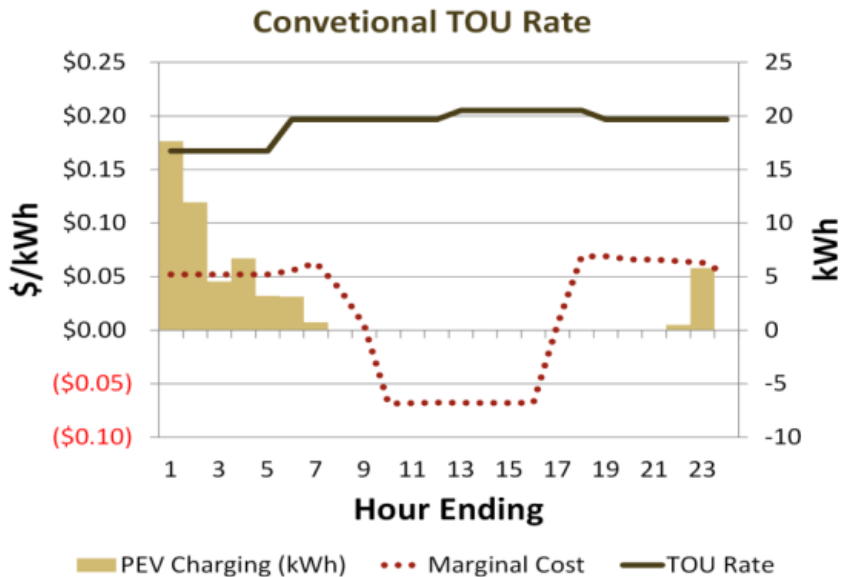
### + E3 worked for developing the 'Full Value Tariff' as a part of the NY REV initiative

- Rate design options try to balance: Policy Objectives, Rate Impacts, Market Impacts, Recovery of Embedded Costs, Accurate Signals of System Conditions to Customers

**CCAs can use rate design to ensure that policy objectives are met while ensuring cost recovery and minimizing disruption to customers**



# Dynamic rate structure to promote beneficial transportation electrification



## + SDG&E Dynamic Vehicle Grid Integration Rate

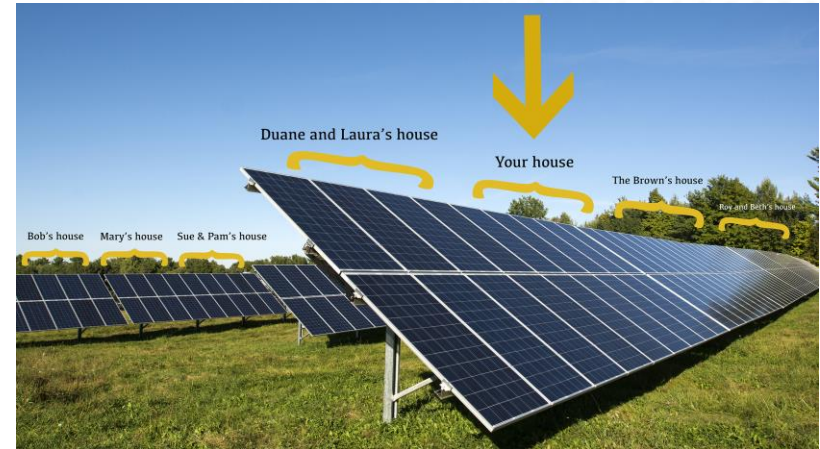
- Goal: shift EV charging to peak solar generation hours and relieve local grid congestion, and share grid benefits with EV drivers
  - Hourly component based upon CAISO day ahead prices,
  - Local component reflects grid conditions in **WHAT GEOGRAPHIC UNIT**
- Currently being piloted San Diego area at 350 workplaces and MUDs

**Opportunity for CCAs to accommodate PV while promoting EV adoption**





# Title 24's new Community Solar Option can be implemented via rates



- + **California Energy Commission Title 24 Solar Rooftop mandate has an alternative compliance pathway for community solar**
- + **CCA could propose their community solar program to the CEC to become qualified under Title 24 rules if it meets certain criteria:**
  - Criteria designed to achieve equivalence to rooftop solar (permanent, non-transferrable, additional, solar)
- + **E3 supported T24 at the CEC and has identified a few ways for CCAs to implement community solar**

**CCAs could make their community solar projects qualify through rates**



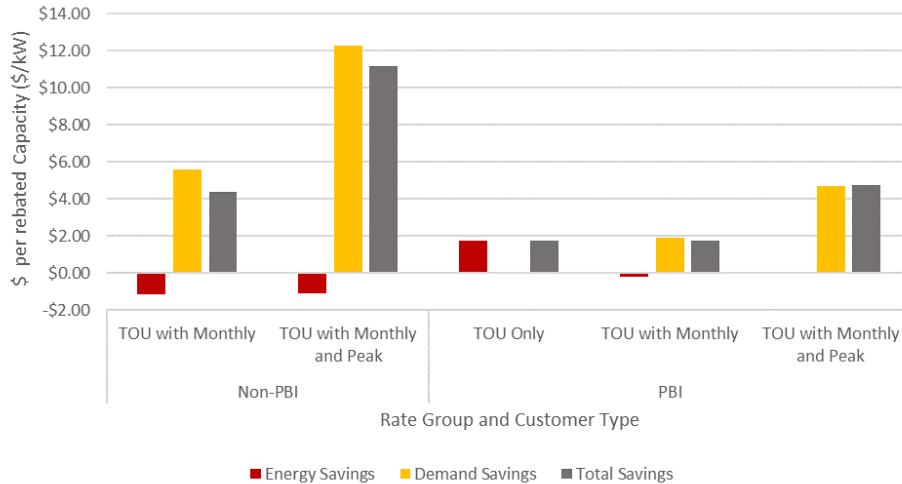
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# IMPORTANCE OF APPROPRIATE RATE DESIGN

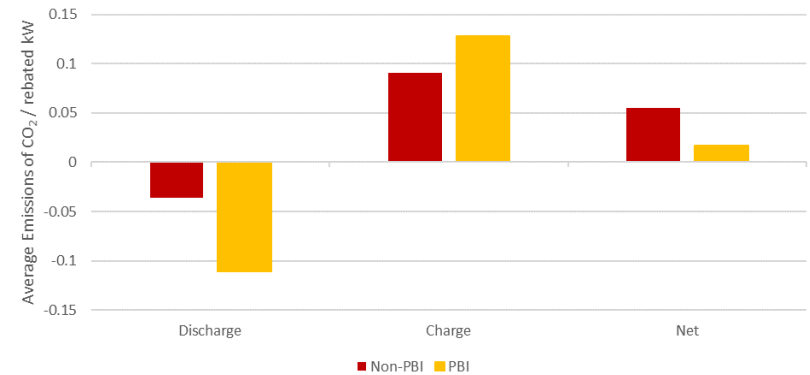


# Poor rate design can lead to outcomes that are not societally optimal

## Customer Bill Savings by Rate Group and PBI/Non PBI



## Average Non-Residential CO2 Emissions Per SGIP Rebated Capacity

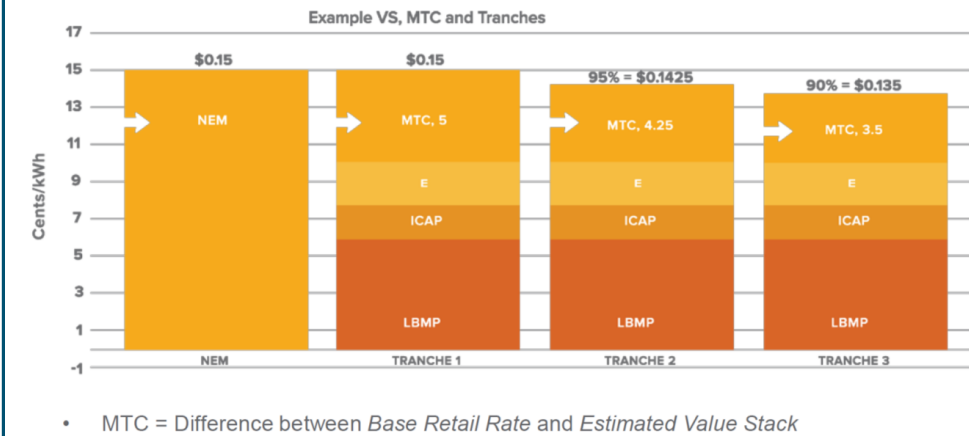


- + **CPUC's SGIP program encourages adoption of Advanced Energy Storage**
- + **Customers realize bill savings, but GHGs mostly increase**
- + **TOU pricing provides inadequate signal to optimize storage dispatch against grid costs**



# NY NEM Transition Tariff for Community Solar (CDG)

## CDG Tranche Design



## Too Complicated?

*"The methodology is so complicated that consumers will never understand it, putting an end to [community solar] adoption by the mass market, and the inability to predict the value with any certainty will keep the investment community from wanting anything to do with financing projects,"* Robb Jetty, founder of Renovus Solar.

- + **As part of the Reforming the Energy Vision Initiative New York State is transitioning away from conventional NEM**
- + **NYPSC set Phase One Value of Distributed Energy (VDER) compensation regime and set timeline for the transition**
- + **CDG providers receive compensation based upon a "Value Stack"**
  - Mass market component of CDG projects get fixed, declining MTC
  - Uncommitted portion and C&I customers exposed to more variable elements (capacity and



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# Thank You

Nancy Ryan  
Kiran Chawla  
Sandy Hull