Workshop Discussion: NEM Successor Examples

September 20th, 2017
Agenda

- **Context for Net Energy Metering (NEM)**
- **Update on State Actions on NEM**
  - California
  - Hawaii
  - Colorado
  - Arizona
- **Discussion**
  - Common features, what commissions are adopting
States with some form of NEM

Net Metering
www.dsireusa.org / July 2017

KEY
- State-developed mandatory rules for certain utilities (38 states + DC + 3 territories)
- No statewide mandatory rules, but some utilities allow net metering (2 states)
- Statewide distributed generation compensation rules other than net metering (7 states + 1 territory)

U.S. Territories:
- AS
- PR
- VI
- GU

38 States + DC, AS, USVI, & PR have mandatory Net Metering rules
The Crux of the Debate on NEM

Estimating the impact on non-participating customers

Cost-Benefit Calculation

Total Program Costs

Bill without NEM DG

Bill Savings with NEM DG

Bill with NEM DG

Program Costs

Bill Savings with NEM DG

Total Avoided Costs

Net cost (benefit) of NEM

Avoided Energy Costs

Avoided Costs of Losses

Avoided Capacity Costs

Avoided Transmission Costs

Avoided Distribution Costs

Avoided A/S Reserve Costs

Avoided Cost of Renewable Purchases

Bill Savings

*Not drawn to scale

Total Avoided Costs
A “smart” multi-part dynamic retail rate or tariff is one pricing solution that also serves to create a virtual retail market.

- Existing rates and tariffs do not effectively encourage dispatchable or high value DERs nor do they allow for efficient recovery of utility costs.
- A multi-part dynamic rate or tariff can work in tandem with other utility or state programs and it can also accommodate various public policy and regulatory goals.
- This design offers utilities the opportunity to create virtual retail markets based on rates and tariffs rather than entirely new distribution level markets.

### Part 1: Embedded Costs
- **Customer Charge**
  - $/customer? Other?

### Part 2: Embedded Costs
- **Network/Grid Access Charge**
  - $/kW, $/kWh? Other?

### Part 3: Marginal Costs
- **Value-Based Charge/Payment**
  - $/kW, $/kWh? Other?
In the future there will be many more types of customers with diverse needs around utility products and services.

Historic utility generation, transmission, distribution, and “other” products/services

- ‘G’: Procurement, Scheduling, Energy, Losses, Capacity, Reserves, Reliability, etc.
- ‘T’: Losses, Bulk/Sub-Transmission Capacity, Reliability, etc.
- ‘D’: Losses, Distribution Capacity, Customer, Billing, Reliability, etc.
- ‘O’: Public Policy Goals, Settlements, etc.

Full Requirements Customers
Relatively homogeneous and similar to today’s traditional bundled customers requiring the same type of full requirements service, power quality, and universal access.

Partial Requirements Customers (DERs, etc.)
Diverse in grid use and profiles that may be served by functional unbundling of utility services through multi-part rates, specific programs, and interconnection standards.

Enhanced Services Customers
Customers that value reliability or other enhanced utility products/services.
Proposed Full Value Tariff is a Three-Part Rate

Revenue Neutrality is Assumed for FVT Formulation

1) Customer Charge
- Collects customer related embedded costs and expenses

2) Network Subscription Charge
- Collects embedded costs and invariant costs of the grid based on the customer’s use of the grid
- Mechanism for area-differentiation and revenue neutrality

3) Dynamic Price
- Collects forward looking marginal or avoidable costs of load
- Area and time specific
- Can include externalities linked to energy use (CO₂ emissions, criteria emissions, etc.)

Residential & Small Commercial (Mass Market)
- $/customer-month
- $/proxy-kW based on 12-month rolling max monthly kWh
- $/kWh by hour provided day-ahead, differs by area

Large Commercial & Industrial (Demand Metered)
- $/customer-month
- $/kW of max monthly demand or contract demand
- $/kWh by hour provided day-ahead, differs by area
SURVEY OF STATE ACTIONS ON NEM
**Beyond NEM: California**

- As of July 2017, all IOUs have switched to the current NEM tariff
- Default TOU tariff is impending

### NEM 2.0

- Full retail credit for energy exports
- Interconnection fee ($75-$145)
- Mandatory TOU rates
- Non-bypassable charges for public services (per kWh)
  - Based on “netted out” quantity of energy consumed per metered interval (hour for residential, 15 min otherwise)
- To be reviewed in 2019

### Time-of-Use (TOU)

- Varies by time of day, day of week, and season
- Required for all commercial, industrial, agricultural customers
- Currently optional for residential customers, but becomes mandatory for all in 2018
San Diego Gas and Electric’s proposed TOU periods:

Effective Dec 1, 2017 (pending final approval from the CPUC)

**Proposed Seasons:**
Summer: Jun 1 – Oct 31
Winter: Nov 1 – May 31

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<thead>
<tr>
<th>Period</th>
<th>Time</th>
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<tbody>
<tr>
<td>On-Peak</td>
<td>3pm - 9pm (daily)</td>
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<tr>
<td>Off-Peak</td>
<td>All other times</td>
</tr>
<tr>
<td>Super Off-Peak (weekends and holidays)</td>
<td>12am - 2pm</td>
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<tr>
<td>Super Off-Peak (weekdays)</td>
<td>12am - 6am</td>
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SDG&E Peak Period Currently 11am to 6pm Weekdays, May through October.
‘Glide path’ for NEM transition

California residential example

2015 & 2016
Reduce severity of the inclining block tiers

NEM 2.0
Moderate customer charge
No longer pays public purpose for exports

2018
Time-of-use rates are required for customers with self-generation

2019
NEM 3.0 slated for consideration, no signal yet on additional reforms

Today
Beyond NEM: Hawaii

- NEM was closed to new entrants in 2015
- Phase 1 (Solar rate redesign): New customers and existing customers seeking to increase system capacity must choose from two plans:
  
  **A. Customer Self-Supply**
  - Intended only for solar PV
  - Exports are not allowed
  - Customers not compensated for export
  - $25 + green infrastructure fee minimum monthly charge (residential customers)

  **B. Customer Grid-Supply**
  - Billed at retail rate for grid consumed energy
  - Compensated at PUC-approved rates for exports
  - Credit in excess of billed amount is forfeited at end of billing cycle
  - $25 + green infrastructure fee minimum monthly charge (residential customers)
  - Limited program capacity

- Phase 2 (Solar rate redesign): Currently in development
Beyond NEM: Colorado

- PUC rejected Xcel Energy’s request to lower NEM compensation in 2015
- In 2016, Xcel Energy successfully settled 3 proceedings: its 2016 rate case, the 2017-2019 Renewable Energy compliance plan, & the Solar*Connect Program
- 26 signatories in settlement, including the PUC, solar, consumer and environmental groups

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<tr>
<th>Key Aspects of Dispute</th>
<th>Settlement</th>
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<tr>
<td>Xcel proposed new tiered monthly fixed charge for residential and small commercial customers, based on energy consumption over last 12 month period</td>
<td>Withdrew fixed charge proposal</td>
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<td>Fixed charge to cover expenditures associated with grid use</td>
<td>Initiated trial TOU pricing models, with the understanding of an eventual move to a default TOU rate</td>
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<td>New rate structure expected to increase bills majority of customer</td>
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Settlement

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PUC rejected Xcel Energy’s request to lower NEM compensation in 2015

Energy + Environmental Economics
Beyond NEM: Arizona

- Arizona Public Service’s successful rate case settlement in 2017 moved forward value-based solar rate design in the state
- Concluded a multi-year investigation of the cost and value of solar
- APS will not another request rate review until 2019

Key Aspects of Dispute

- Proposed significant decrease in export rates, which would be based on wholesale rates
- Introduced mandatory fixed demand charge for all customers
- Offset rate would also be substantially decreased
- Opposed by solar interests

Settlement

- Demand charge no longer mandatory (pilot)
- Customers choose either demand-based rates or TOU rate plans
- Existing NEM grandfathered for 20 years
- Export and offset rates from NEM, but higher than original proposed rates
- Export rates to be determined by avoided cost methodology that forecasts value and costs of DG to grid
DISCUSSION
Discussion of Different Features

- Increase customer charge or minimum monthly bill
  - E.g. California, Hawaii have moderately increased theirs
  - Need to be careful about small customer impact

- Demand-charge to collect more embedded cost
  - New paradigm for many small customers, bill complaints

- Different value for exports to the grid
  - California NEM 2.0, Hawaii post-NEM (grid-supply)
  - Increases financial incentive for storage systems

- Time-of-use tariffs
  - California, Arizona

- Grandfathering
  - Seems universal, Nevada had bad outcome without it
THANK YOU!

Contact Information
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The study directly builds upon the REV Track 2 Department of Public Service Staff white paper


The study presents a number of choices and options

The study examines the creation of a conceptual, but implementable full value tariff (FVT) with illustrative rate levels based on sound economic principles to achieve the following goals:

- To more accurately compensate customer and third party contributions to managing the grid
- To collect utility embedded costs equitably and efficiently
- To increase competition for distribution services
- To lower customer costs through more efficient use of the distribution system