Central Hudson Gas & Electric
Smart Home Rate

Demonstration Project Proposal

In response to Case 14-M-0101
Order Adopting a Ratemaking and Utility Revenue Model Policy Framework

February 1, 2017

Contents

Background

Within the Reforming the Energy Vision ("REV") proceeding,[1] the Commission issued the Order Adopting a Ratemaking and Utility Revenue Model Policy Framework, Issued and Effective May 19, 2016. ("May 19th 2016 Order")[2] The May 19th 2016 Order defines the objectives of the Smart Home Rate ("SHR") in the context of this proceeding:

"An SHR combines time-variable rates with the full value LMP+D compensation that is being developed in Case 15-E-0751. In other words, it combines highly granular time-based rates with location-and-time-based compensation for DER, in a manner that is managed automatically to optimize value for the customer and the system. The ideal SHR participant will combine generation (such as PV), electric vehicle charging, storage, and load management (such as a smart thermostat) with an inverter that allows two-way power flows and reads voltage and other system characteristics. The SHR participant should be able to offer load shifting, peak reduction, voltage and other ancillary support, and automatic response on a time interval specified by the utility."

Additionally, the May 19th, 2016 Order introduces the following key considerations for development:

1. SHR should be offered to "prosumers[3]" on an opt-in basis to "…advance the adoption of sophisticated home energy management technologies."

2. Current bundled rate constructs insulate most types of electric consumers from the real-time variance of energy markets and demands on grid infrastructure. A SHR "would unbundle price signals to incentivize different types of DER and energy management responses."

3. "…there are substantial risks & uncertainties associated with an SHR that may inhibit investment by customers and third party developers." To overcome these challenges, "…SHR at this time should be offered on a demonstration basis by utilities, with a hold-harmless provision that assures participating customers that their investments will not be stranded by superseding developments."

4. Concentrated deployment and adoption would be preferable. "…the network values of SHRs may not be achieved by sporadic early-adoption across a wide geographic range, as opposed to a geographically concentrated approach that will maximize both the networked value and the demonstration value of the SHR." As such, "…the ideal setting for such an approach would likely be new development in a high-growth area…"

5. "Each utility should collaborate with NYSERDA and with third-party developers to identify one or more SHR demonstration projects."

Per the May 19th, 2016 Order, "None of these considerations are intended to be binding on the development of an SHR. They are intended to explain why a demonstration approach at this time is preferable to a requirement that SHRs be developed for territory-wide adoption."

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[1] Case 14-M-0101, Reforming the Energy Vision, Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015).
[2] Case 14-M-0101, Reforming the Energy Vision, Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (issued May 19, 2016).
[3] In this context, Central Hudson takes "prosumer" to be defined as "proactive consumer of electricity and electricity-related products and services"

Central Hudson Gas & Electric Corporation (“Central Hudson” or “The Company”) has used these objectives and considerations as guidelines for development of the Smart Home Rate Demonstration Project detailed within this document.

Project Overview

Problem Statement

Bundled residential electric rates do not provide incentives for residential customers to alter the timing of their usage in a manner that relieves system constraints, reduces need for new large scale generation, or allows for the deferral of future utility capital distribution & transmission infrastructure investments.

Central Hudson's residential electric rates are determined based on an average delivery and supply rate for each unit of energy consumed within a monthly billing period. Energy & wholesale capacity prices may vary greatly based on the hour of the day, however, generally increase during peak usage periods. Because residential customers are insulated from these market price signals, usage patterns are not optimized with respect to the actual costs of electric service.

Solution

Central Hudson is proposing a rate structure where residential customers within a specific geographic area will have the opportunity to enroll in a new time-of-use electric rate, and receive technology from Central Hudson to automatically reduce usage during peak pricing periods. Central Hudson expects to install a smart Wi-Fi thermostat on qualifying air conditioner systems at no cost. The thermostat will be equipped with software that automatically optimizes the customer's usage based on time sensitive price signals that correspond to system peak usage periods. The technology will incorporate customer preferences, and refine the savings algorithm over time as temperature and runtime data are collected from the home.

Addressing Key Considerations from the May 19th, 2016 Order

1. **Offered on an opt-in basis:** The Smart Home Rate will be voluntary and offered on an opt-in basis. The Smart Home Rate is expected to be coupled with a smart Wi-Fi enabled thermostat to ensure that participants utilize at least one applicable technology type.
2. **Unbundled price signal:** A new Time-Of-Use rate will be utilized within the Smart Home Rate demonstration project, as detailed later within this document.
3. **Hold-harmless provision:** A hold-harmless provision is not required in Central Hudson's Smart Home Rate Demonstration for the following reasons:
    a. The Smart Home Rate demonstration is based on a Time-Of-Use rate that will be a permanent offering.
    b. Both the Time-Of-Use rate and Smart Home Rate are voluntary for customers.
    c. Enabling technology will be provided free of charge, reducing the risk of stranded customer investments due to obsolescence or modification of the rate.
    d. The Smart Home Rate demonstration proposes to test specific hypotheses about customers' behavioral responses to peak and off-peak price signals. A hold-harmless provision within the program would diminish the robustness of the experiment by minimizing the disincentive to use energy during prescribed peak periods.
4. **Concentrated deployment:** The proposed demonstration will be limited to a specific geographic area which overlaps a potential new Non-Wires Alternative ("NWA"), enabling synergies between the two projects to be explored.

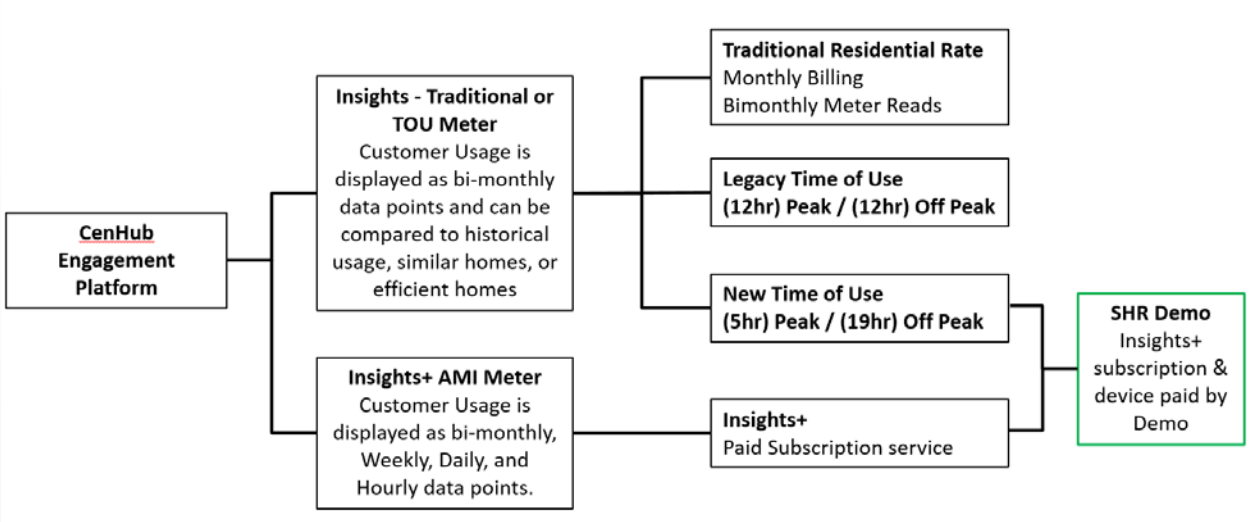
5. **Collaboration:** Central Hudson's Smart Home Rate Demonstration will be developed collaboratively:
    a. Comverge will be developing a new thermostat optimization algorithm to complement the Smart Home Rate design.
    b. Central Hudson will collaborate with New York State Energy Research and Development Authority ("NYSERDA") and New York State Department of Public Service Staff ("Staff") to develop the demonstration following this proposal. The Time-Of-Use rate design requirements will need to be complete at least 5 months prior to the "go-live" date to allow sufficient time for the information technology buildout.
    c. Central Hudson and Simple Energy are developing enhancements to the CenHub Insights platform concurrently with the development of this demonstration. The Insights pages will be rebranded as Insights+ for customers that opt-in to either a paid subscription or the Smart Home Rate offering. Insights+ will provide the customer with a graphical display of hourly usage data and visually differentiate peak and off-peak usage. Smart Home Rate customers will have access to Insights+ at no additional charge.
    d. Central Hudson will continue to look for other potential technologies and partners throughout the development and implementation of the Smart Home Rate demonstration.

Value for Customers

Central Hudson introduced a series of enhancements to its web and mobile residential customer experience in April 2016 called CenHub. For registered online customers, CenHub offers self service capabilities such as online bill pay, the ability to report an outage, and CenHub Insights. CenHub Insights allows customers to view usage information graphically by displaying metered usage data and receive tips and rewards for being energy efficient. Central Hudson will leverage the existing CenHub brand and customer engagement platform to bring additional value to customers.

Figure 1 illustrates how the Smart Home Rate will be integrated within the CenHub platform and utilize the Insights+ functionality.

Figure 1: Integration Flowchart



The Insights pages will be rebranded as Insights+ for customers that opt-in to either a paid subscription or the Smart Home Rate offering. Insights+ will provide the customer with a graphical display of hourly usage data and visually differentiate peak and off-peak usage. Smart Home Rate customers will have access to Insights+ at no additional charge. Insights+ will offer monthly, weekly and daily views of energy usage so customers can drill down into the hourly profiles of their energy usage. This is necessary for customers to understand and manage their energy use during on and off peak times. Insights+ will provide customer friendly visual cues that demonstrate where load can be shifted from on-peak to off-peak or curtailed to reduce the customer's energy bill. The branding creates a consistent experience and creates a pathway for Smart Home Rate customers to participate in other CenHub offers, such as the CenHub store.

Customers participating in the Smart Home Rate Demonstration project will receive the following benefits:

- **Energy-saving technology:** Customers will be provided with a free Wi-Fi enabled "smart" thermostat to control their central air conditioning system remotely from a smart phone or other connected device. Thermostats will be installed at no cost to the customer.

- **Free Enrollment in Insights+:** Smart Home Rate participants will be given access to CenHub Insights+ at no cost, which provides direct access to their interval metering data. Insights+ enrollment has a value of approximately $59.88 per year. Central Hudson proposes that the $4.99 fee for insights+ would be covered by the SHR funding.

- **Energy Cost Savings:** The Smart Home Rate will create economic value to participants, who can reduce their energy costs through participation, engagement, and automation. Non-participating customers may also realize economic benefits through rate moderation resulting from better system efficiency if Central Hudson is able to defer or avoid future load-growth related capital infrastructure. Select customers will also receive educational tips & prompts to suggest behavioral changes which would further optimize usage during peak & off-peak periods, potentially resulting in greater energy cost savings.

- **Additional Technology:** Prior to development of the final implementation plan, other technologies and customer engagement tools will be evaluated for potential inclusion in the Smart Home Rate demonstration, such as load disaggregation.

Hypotheses

Through this REV demonstration project, Central Hudson is looking to test the following hypotheses as well as their ability to make positive contributions toward the REV and New York State Energy goals:

1. Customers within the Smart Home Rate demonstration will reduce their energy use during peak periods.
    a. Usage during the prescribed peak hours will be reduced in comparison to customers on a Central Hudson's traditional residential rates.
    b. Usage during the prescribed peak hours will be reduced in comparison to customers using a Central Hudson Time-Of-Use rate alone.

2. The kW reduction achieved through the Smart Home Rate will be compared to the reduction achieved through events in the Targeted Demand Response Program to determine which solution is more cost effective. Load reductions per Smart Home Rate participant during the highest 10

annual load hours will be compared to the demand response reductions achieved during cycling events.

3. Adoption of the Smart Home Rate will be greater than the standard time-of-use rate due to the inclusion of enabling technology (free Wi-Fi thermostat & associated software).

4. The average kW reduction resulting from the Smart Home Rate will be greater for customers who are coached through tips and prompts, compared to a select group of Smart Home Rate customers who are not provided with tips and prompts.

Financial/Pricing Model overview

The project budget is still being assessed at this time. Central Hudson expects to realize cost efficiencies through its pre-existing partnership with Comverge and its network of device installation technicians through the Targeted Demand Response program.

The overall cost of this demonstration project will be detailed within the forthcoming implementation plan, which will be filed following collaboration with NYSERDA and Staff, and completion of the demonstration project design. At this time, however, Central Hudson expects the costs of the demonstration project to include the following elements:

- Incremental costs associated with the development of the new Time-Of-Use rate offering
- Free thermostat and installation for approximately 500 participants
- Administration costs, including marketing and recruitment efforts targeted at approximately 10,000 customers
- Insights+ meter hardware, installation and on-going communication fees

Market Demographics

Central Hudson has selected an area in the vicinity of Newburgh, NY for this targeted demonstration. There are currently 10,000 residential customers within this area. The area has been selected due to overlap with the Coldenham NWA area, which introduces the potential for synergies with the Smart Home Rate demonstration project.

According to Central Hudson's Energy Management Survey, conducted in 2013, 32% of residential customers throughout the service territory utilize central air conditioning for home cooling. In the absence of more refined locational data, this will be assumed to reflect the Smart Home Rate Demonstration area.

Marketing & Awareness Campaign

Central Hudson will commission a targeted marketing campaign to recruit customers within the Smart Home Rate demonstration area. The following methods are being evaluated and will likely be utilized:

Website:

- An educational web page and series of FAQs will inform customers of the available Time-Of-Use rate structure, and the financial benefits of participating. The page will also detail the thermostat offer and enhanced functionality available to Smart Home Rate participants. This page will be hosted by Central Hudson or by Comverge and will be branded as part of Central Hudson's CenHub family of offers.
- Smart Home Rate "teaser" advertisements will be presented on the CenHub My Account pages of eligible customers encouraging them to enroll.

Direct Mail: Introductory letters, detailed program brochures, frequently asked questions, and offer rules will be sent to eligible customers via direct mail packages.

Email Marketing: The Smart Home Rate will be announced and marketed to eligible Central Hudson customers via company e-newsletters and the CenHub email marketing channel.

Outbound Calling: Central Hudson may utilize an outbound call campaign to educate and enroll customers throughout the demonstration area.

Events: Home shows, and other local events may be utilized to reach additional customers.

Social Media: the use of social media to engage customers will be evaluated as part of the overall marketing strategy.

Time of Use Rate Structure

Background

Residential time-of-use ("TOU") service was first provided under Service Classification ("S.C.") No. 6 in 1982, with service supplied under rates which "bundled" commodity and delivery together. The rate structure consisted of a monthly customer charge and on-peak and off-peak volumetric (kWh) charges, with the differential in the volumetric charges established to reflect the differential in commodity. This bundled rate structure remained in place until February 1, 2001 when commodity supply was unbundled from delivery service in response to the sale of the Company's fossil generating stations. At that time, the on- and off-peak price differentiation was maintained in the volumetric base delivery charge and was not extended to the commodity charge. Effective July 1, 2007 the commodity rate applicable to S.C. No. 6 customers was separated into on- and off-peak rates in compliance with the order in Case 05-E-0934[4] to reflect the differential of procuring commodity during on- and off-peak periods. By approval of Department of Public Service Staff's memorandum in Case 11-E-0583[5], the Commission approved the Company's proposal to maintain the on- and off-peak delivery rate differential approved for Rate Year 2 (12 months ending June 30, 2012) rather than eliminate the differential as approved for Rate Year 3 (12 months ending June 30, 2013) in Case 09-E-0588.[6] This delivery rate differential continues in effect.

Current Rate Structure

The Company's current TOU offering continues to be comprised of a monthly customer charge and on-peak and off-peak volumetric (kWh) charges, with an on-peak to off-peak delivery rate differential of 3:1. Supply charges for full service TOU customers continue to be time differentiated as well, with TOU supply rates expressed as a percentage of the standard residential (S.C. No. 1) supply rate based on an analyses of historical NYISO Zone G Day Ahead Market Prices and load research data. TOU customers can select from among three twelve hour time periods for their weekday, on-peak usage (all weekend days and six major holidays per year are considered off-peak). The on-peak and off-peak rates are the same for all three time periods.

Potential Rate Structure

The Company believes that TOU pricing brings customers into the market, allowing them to affect it by their decisions and providing them with greater control over their electricity bills. Further, to maximize such benefit Central Hudson believes that TOU rates need to recognize commodity market and delivery system attributes, while providing customer flexibility. The Company has analyzed both system load and residential load and has determined that while there is a strong correlation of residential load to system

[4] Case 05-E-0934, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Central Hudson Gas & Electric Corporation for Electric Service, Order Establishing Rate Plan (issued July 24, 2006).
[5] Case 11-E-0583, Tariff Filing by Central Hudson Gas and Electric Corporation to Establish Residential Time-of-Use Rates, Memorandum (filed January 19, 2012).
[6] Case 09-E-0588, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Central Hudson Gas & Electric Corporation for Electric Service, Order Establishing Rate Plan (issued June 18, 2010).

load across hours and months, and the summer daily load shape of residential load indicates potential for shifting of load to reduce peak period load, the expansive twelve hour on-peak period under the current TOU rate structure does not provide a clear signal with respect to the hours when load shifting is needed from a delivery system perspective and does not provide TOU customers with the necessary flexibility for effectively shifting load. Further, the delivery rate differential, which has been static for many years and actually reflects the truncation of a phase out, may not be truly representative of system cost causation. As a result, the Company is considering the following potential revised TOU rate structure, which could be operable within the constraints of the current billing system capability:

- One, five hour on-peak period of 2 pm to 7 pm on weekdays;
- All remaining hours considered off-peak, including weekends and six holidays;
- On- and off-peak delivery rate differential established as the 10 year net present value of system wide avoided transmission and distribution ("T&D") costs, most recently determined as $14.55/kW-year[7];
- On- and off-peak supply rates continued to be expressed as a percentage of the standard residential supply rate based on an analyses of historical NYISO Zone G Day Ahead Market Prices and load research data, reflecting the revised on- and off-peak period hours; and,
- Capacity costs concentrated in the on-peak supply rates effective in June, July and August, requiring customers to take service under the revised TOU rate for at least twelve months.

Reducing the number of hours in the on-peak period, while maintaining alignment with the system peak will ensure that customers are afforded the opportunity, in terms of more off-peak hours, to adjust their consumption patterns to assist in reducing system peak load. Utilizing the marginal avoided T&D cost to establish the on- and off-peak delivery rate differential recognizes that the Company is attempting to affect consumption behavior in order to defer or avoid future investment, and also necessarily recognizes that the customers taking service on the system today may not be the same customers for which the current system was built. Continuing the practice of time differentiated supply pricing, albeit with the modifications noted above, will also align costs and usage, providing an additional price signal for customers to utilize in affecting the market through their consumption choices. Concentrating capacity costs into the on-peak period of the three months in which a New York Control Area ("NYCA") peak is likely to occur provides an improved price signal to assist customers in managing their consumption during the periods in which a NYCA peak will likely be reached and thus utilized to determine prospective capacity obligations.

[7] Case 16-M-0411, In the Matter of Distributed System Implementation Plans, Central Hudson Initial Distributed System Implementation Plan ("Initial DSIP"),(filed June 30, 2016).

Non-Wires Alternative Synergy

Central Hudson believes there is an opportunity to leverage a planned Non-Wires Alternative to maximize the impact of the Smart Home Rate Demonstration. The NWA location represents a relatively high growth area compared to the rest of Central Hudson's service area, where the Smart Home Rate could potentially address specific system needs that exist.

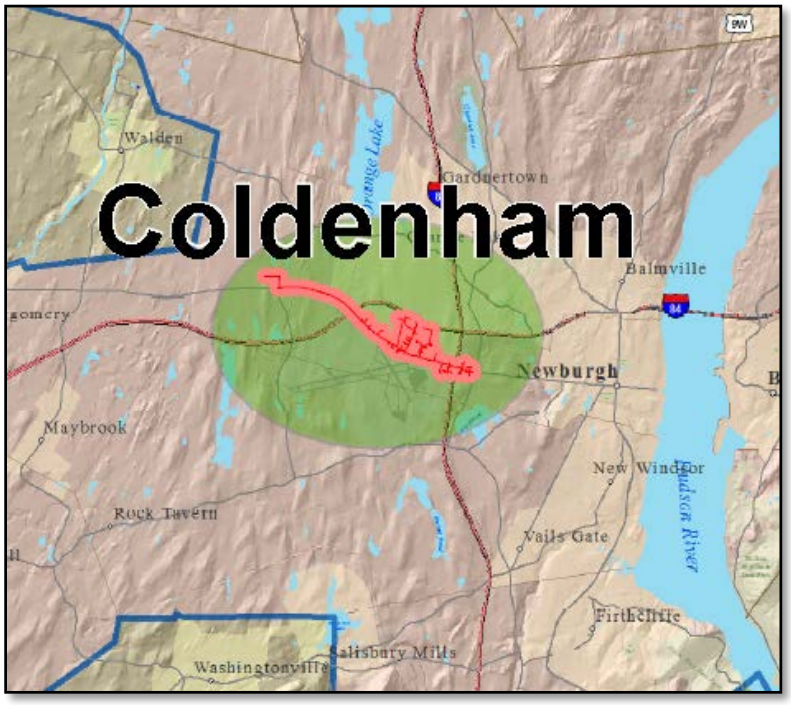
Description of Need

Central Hudson has identified the Coldenham area as a location which a DER solution or solutions have a high potential to serve as a viable non-wires alternative to a traditional infrastructure investment, based on the NWA suitability criteria included within the Initial DSIP. Significant electric load growth has recently occurred along State Route 17K in the Town of Newburgh west of State Route 300 due to development in the commercial & industrial sectors. This area's electricity needs are fed from the Coldenham Substation, located near the intersection of State Route 17K and State Route 747.

Within the Coldenham substation, the 4027 circuit is forecast to have a near-term design constraint, which requires an infrastructure investment within the next 3 years. The 4027 circuit has a normal design capacity of 6.0MVA. Based on the queue of outstanding service interconnections, the circuit is forecast to reach an operational load of 5.9MVA by 2017, with slow but steady growth thereafter. To accommodate continued load growth, additional capacity must be acquired through new infrastructure or a non-wires alternative.

The NWA project must provide capacity directly to the 4027 circuit in order to ensure specific deferral value. The portion of the 4027 circuit feeding the area of need serves between 180 and 190 customers along Route 17K, west of Route 300. The load served by the 4027 circuit is predominantly within the commercial & industrial sectors. Central Hudson plans to develop, assess, and file for approval of this NWA by the end of 2017.

Figure 3: Coldenham/4027 NWA Location



DER Solution

The geographically small NWA area may limit the capacity which can be obtained through certain types of DERs. As such Central Hudson is exploring an approach of stacking multiple DERs, whereby multiple technology types are combined to meet the capacity need. DER types under consideration include the following

1. Energy Efficiency: Targeted incremental energy efficiency measures which are capable of producing energy reductions that are coincident with the localized system needs. Enhanced incentives would be used to drive higher adoption rates than are found throughout the service territory as a whole.

2. Demand Response: Capacity achieved through dispatchable curtailment of large commercial & industrial loads, similar to the existing Commercial System Relief (CSRP) program. Incentives would reflect the localized avoided transmission & distribution infrastructure value.

3. Energy Storage: A variety of dispatchable storage applications are being considered, including both distributed behind-the-meter applications and centralized larger scale storage. Storage utilized as a solution within the NWA may also have the potential to facilitate participation in the Smart Home Rate.

4. Distributed Generation: Distributed behind-the-meter photovoltaic generation or other generating sources. This may be used in combination with dispatchable storage to ensure coincidence with localized peaks.

5. Smart Home Rate: The Smart Home Rate will be designed to shift energy consumption to off-peak hours where the energy cost, capacity cost, and system constraints are lower. The SHR demonstration location will include the Coldenham NWA area so that participation which occurs within the Coldenham NWA area will make a contribution to the NWA load reduction. The associated deferral value will help to support the larger test area.

Central Hudson expects to solicit third party interest in potential NWA solutions through an RFP within the first quarter of 2017. Central Hudson plans to file a detailed NWA plan for the Coldenham project in The Company's Rate Case in the summer of 2017.

Demonstration Design

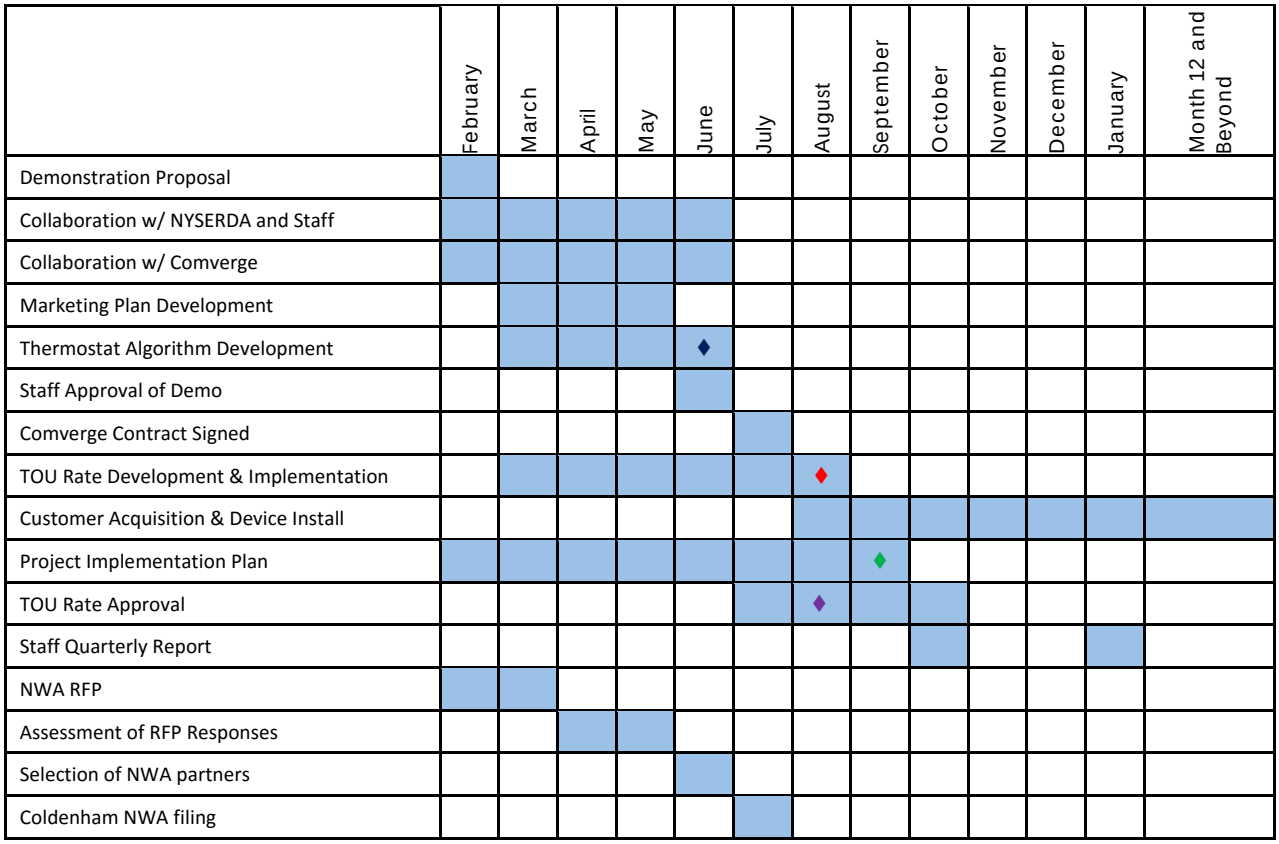
A) Timeline

Figure 2 below represents the preliminary project timeline for development and implementation of the Smart Home Rate demonstration. As discussed below, the timeline includes many interdependent steps where delay of one step may cause a delay in the entirety of the project. Due to potential synergies between the two programs, a preliminary timeline for the potential Coldenham NWA has been included within Figure 2.

Key Deliverables:

- Development of the Time-Of-Use rate: (♦) The demonstration project schedule assumes the design of the new Time-Of-Use rate structure will be finalized before March 1st, in collaboration with Staff. A four month rate buildout period is anticipated by Central Hudson's IT department, followed by a 45 day comment period after the Time-Of-Use rate design filing required by the May 19th 2016 Order. Central Hudson's IT department will be occupied by other scheduled projects during the month of July, which makes it optimal to have this buildout completed by the end of June. Delays in the development in the Time-Of-Use rate will delay the "go-live" of the Smart Home Demonstration
- Smart Home Rate demonstration implementation plan: (♦) Central Hudson anticipates filing the implementation plan and receiving Staff approval prior to the end of the second quarter of 2017.
- Time-Of-Use rate approval: (♦) Central Hudson anticipates receiving approval of the Time-Of-Use within August or prior.
- Development of Comverge algorithm & thermostat program design: (♦) Central Hudson anticipates that collaboration with Comverge will result in a new thermostat program which will be the basis of the Smart Home Demonstration project tests. Design of the thermostat program is expected to be finalized prior to the end of June 2017.

Figure 2: Timeline



B) Hypotheses

Table 1: Test Statements

Test Statement	Hypothesis
1. Customers within the Smart Home Rate program may reduce their energy usage during peak periods if they: • Utilize enabling technology which facilitates automatic shifting of usage.	• If Central Hudson offers a Smart Home Rate with enabling technology to facilitate automatic load shifting, as well as actionable information to help customers further optimize usage, o Usage during the prescribed peak hours will be reduced in comparison to customers on Central Hudson's traditional residential rates. o Usage during the prescribed peak hours will be reduced in comparison to customers using a Central Hudson Time-Of-Use rate alone.
2. Average kW reductions per customer realized through the Smart Home Rate	• The kW reduction achieved through the Smart Home Rate will be compared to that

will be compared to the direct load control (AC cycling) utilized within the Targeted Demand Response Program.	achieved through events in the Targeted Demand Response Program to determine which solution is more cost effective. Load reductions per Smart Home Rate participant during the highest 10 annual load hours will be compared to the demand response reductions achieved during cycling events.
3. The Smart Home Rate may have different adoption rates than the standard time-of-use rate.	• Adoption of the Smart Home Rate will be greater than the standard time-of-use rate due to the inclusion of enabling technology (free Wi-Fi thermostat & associated software).
4. The kW reductions achieved through the Smart Home Rate may be impacted by the inclusion of tips & prompts provided to the customer.	• The average kW reduction resulting from the Smart Home Rate will be greater for customers who are coached through tips and prompts, compared to a select group of Smart Home Rate customers who are not provided with tips and prompts.

Table 2: Test Population

Test Population Description	Selection Method	Current Population Size
Traditional Consumers: • Pre-existing interval metered homes. Meters have been installed for the purposes of load research will be used to represent the residential population.	• Locations anywhere in the service territory with usage patterns and demographic data that indicate central air conditioning is present will be used.	TBD
Customers on the pre-existing TOU Rate: • All residential customers receiving service via the time-of-use rate as developed prior to 2/1/17	• Locations anywhere in the service territory with usage patterns and demographic data that indicate central air conditioning is present will be used.	TBD

Customers on the new TOU Rate (traditional marketing) • A portion of residential customers receiving service under new time-of-use rate as proposed within this document, stratified geographically.		TBD
Customers on the new TOU Rate (with enhanced marketing, comparable to Smart Home Rate Program) • A portion of residential customers who enroll new time-of-use rate as proposed within this document, stratified geographically.		TBD
SHR Demonstration Group • All customers on the new TOU rate who also receive enabling thermostat technology & associated engagement methods.	• All customers in this group must have central air conditioning • All customers within this group will be included in the test population	TBD

Checkpoints

Checkpoints will be filed within the demonstration project implementation plan, developed through collaboration with Staff and NYSERDA. Sample milestones and targets have been included below for consideration and to facilitate discussion.

Table 3: Checkpoints

Checkpoint	Year 1 Measurement * 12 months from approval	Year 2 Measurement	Year 3 Measurement
Smart Home Rate budget capital expenditures	$X	$X	$X
Smart Home Rate vs traditional residential customer peak usage reduction	+ X% (TBD)	+ X% (TBD)	+ X% (TBD)
Smart Home Rate vs legacy TOU residential customer peak usage reduction	+ X% (TBD)	+ X% (TBD)	+ X% (TBD)
Smart Home Rate vs new TOU residential customer peak usage reduction	+ X% (TBD)	+ X% (TBD)	+ X% (TBD)
New TOU vs legacy TOU peak usage reduction	+ X% (TBD)	+ X% (TBD)	+ X% (TBD)
Smart Home Rate vs TDM peak usage reduction	- X% (TBD)	- X% (TBD)	- X% (TBD)
Smart Home Rate Adoption Rate	X% (TBD)	X% (TBD)	X% (TBD)
TOU – Traditional Marketing Adoption Rate	X% (TBD)	X% (TBD)	X% (TBD)
TOU – Enhanced Marketing Adoption Rate	X% (TBD)	X% (TBD)	X% (TBD)
Smart Home Rate w/ tips and prompts vs Smart Home Rate w/o tips and prompts peak usage reduction	+ X% (TBD)	+ X% (TBD)	+ X% (TBD)

Project Structure & Governance

The following section details the makeup of the project team, with associated roles and responsibilities, and program governance. Central Hudson has created a new division, Energy Transformation and Solutions to more closely collaborate and deliver energy saving tools and programs to customers. In addition, Central Hudson is partnering with Comverge to deliver on this project.

A) Project Team

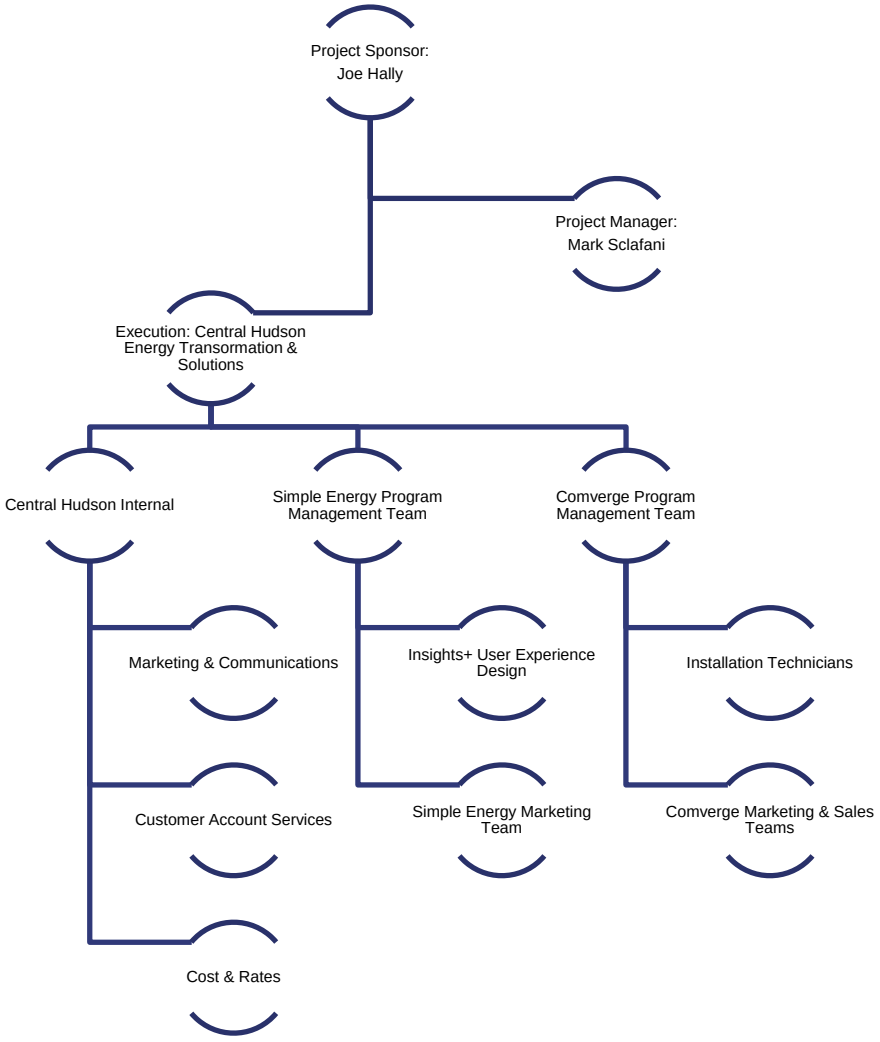
Each team member and their associated organization bring a specific skillset to the project as detailed in Table 4.

Table 4: Skillset Matrix

Central Hudson	Comverge
• Program Administration • Project Management • Customer Relationship Maintenance and Outreach • Rate Making • Energy Efficiency Programs • Business Development	• Device procurement • Installation • Software Support • Customer Acquisition

In light of the skillset requirements, the project will be staffed as follows:

Figure 2: Team Members



B) Governance

Central Hudson will contract with Comverge to provide operational, marketing, and technical support for the Smart Home Rate demonstration. Central Hudson will track progress, alignment to project objectives and performance in comparison to original hypotheses throughout the life of the project. Central Hudson will receive various weekly operational status reports from Comverge. Marketing and sales reviews will be performed monthly, or as often as needed.

Conclusion

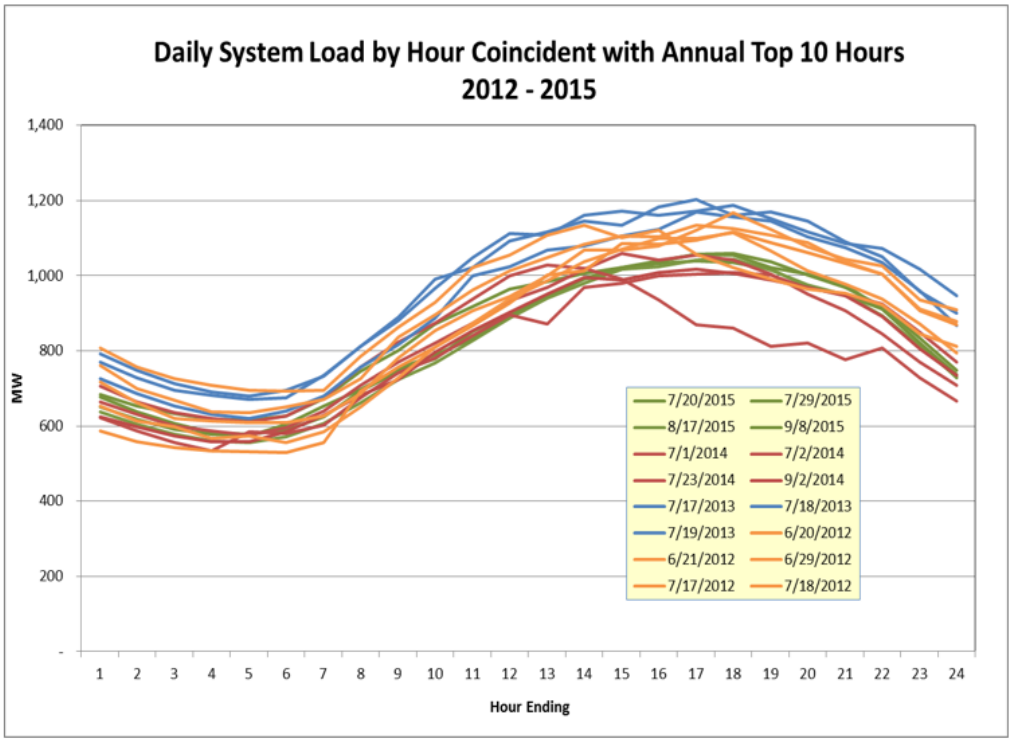
In accordance with the May 19th, 2016 Order, Central Hudson has proposed a Smart Home Rate Demonstration Project which is comprised of the following primary elements:

- A new residential Time-Of-Use rate, designed to create price signals which incentivize off-peak consumption. The price differential includes commodity and distribution capacity values. The distribution values are based on marginal avoided transmission and distribution infrastructure costs. These capacity costs are applied to prescribed daily peak hours from 2PM to 7PM, in June, July & August. All other hours in the year will be considered off-peak.
- Enabling technology which facilitates optimization of the Time-Of-Use rate through automation. Central Hudson will provide Wi-Fi enabled thermostats, installed at no cost to the customer, which include software designed to minimize consumption during the prescribed peak hours, while accounting for customers comfort preferences and cooling performance of the home.
- Engagement through tips & prompts which coach customers on how to better optimize both air conditioning and non-air conditioning loads within the home.

Through this demonstration, Central Hudson hopes to learn to what degree each of these elements will impact residential consumption during peak and off-peak hours. The demonstration will initially be rolled out to a specific geographical test area. The demonstration results from this test area will be used to perform a cost benefit analysis, indicating the extent to which the Smart Home Rate should be expanded to the rest of Central Hudson's service territory or utilized within a future Non-Wires Alternative.

Appendix A: Time-Of-Use Rate Analysis

RESIDENTIAL TOU RATE REDESIGN – System Potential

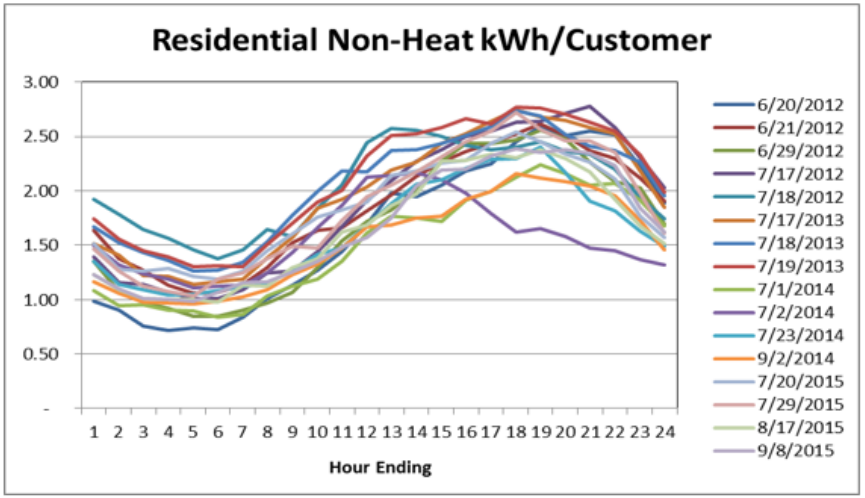


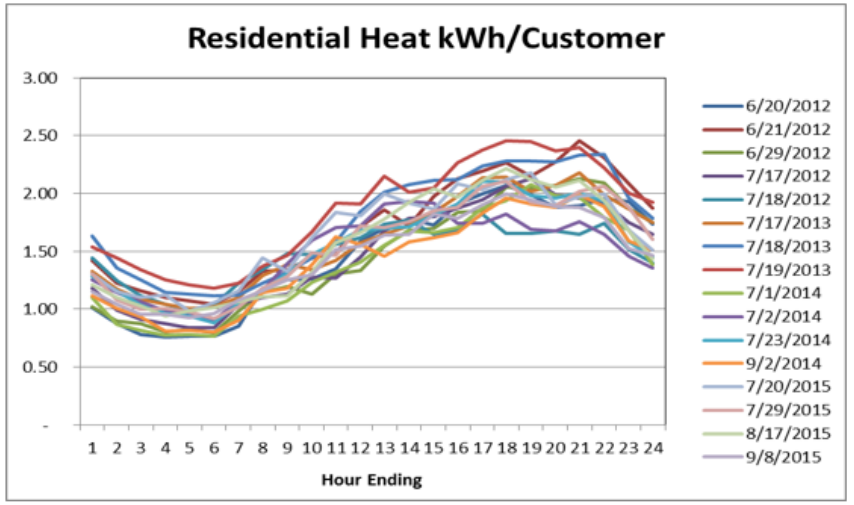
Ratio of Daily Max to Daily Min			
	Min MW	Max MW	Ratio
6/20/2012	529	1,117	2.11
6/21/2012	635	1,134	1.79
6/29/2012	557	1,114	2.00
7/17/2012	608	1,168	1.92
7/18/2012	693	1,134	1.64
7/17/2013	621	1,169	1.88
7/18/2013	671	1,202	1.79
7/19/2013	679	1,187	1.75
7/1/2014	533	1,009	1.89
7/2/2014	612	1,029	1.68
7/23/2014	577	1,060	1.84
9/2/2014	559	1,018	1.82
7/20/2015	615	1,040	1.69
7/29/2015	578	1,059	1.83
8/17/2015	555	1,045	1.88
9/8/2015	573	1,058	1.85

Potential:

- Ratio of daily max MW to daily min MW of approximately 1.85:1.00 indicates potential for shifting of load on a system basis.

RESIDENTIAL TOU RATE REDESIGN – Residential Potential





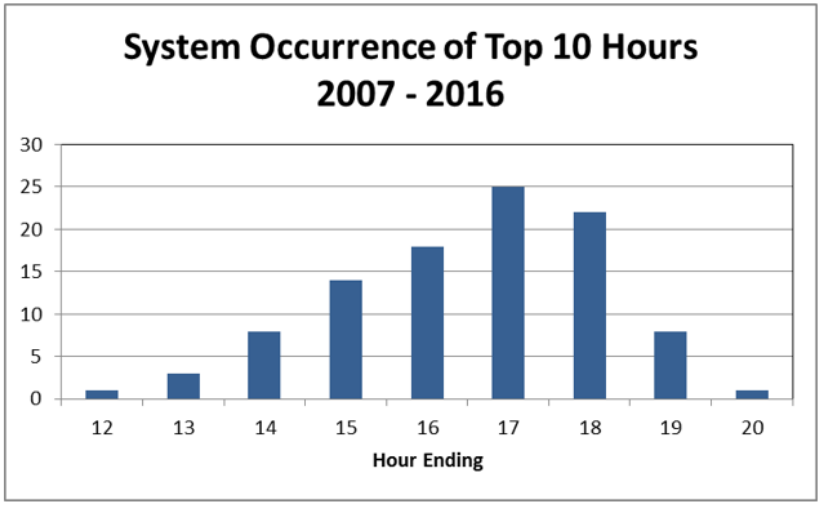
Ratio of Daily Max to Daily Min			
	Min MW	Max MW	Ratio
6/20/2012	0.71	2.59	3.64
6/21/2012	1.06	2.61	2.46
6/29/2012	0.85	2.56	3.02
7/17/2012	1.01	2.78	2.76
7/18/2012	1.38	2.57	1.87
7/17/2013	1.14	2.75	2.41
7/18/2013	1.26	2.74	2.17
7/19/2013	1.30	2.77	2.12
7/1/2014	0.84	2.24	2.67
7/2/2014	1.11	2.17	1.96
7/23/2014	1.05	2.40	2.30
9/2/2014	0.96	2.16	2.24
7/20/2015	1.19	2.54	2.14
7/29/2015	1.03	2.72	2.63
8/17/2015	0.98	2.38	2.44
9/8/2015	0.99	2.39	2.42

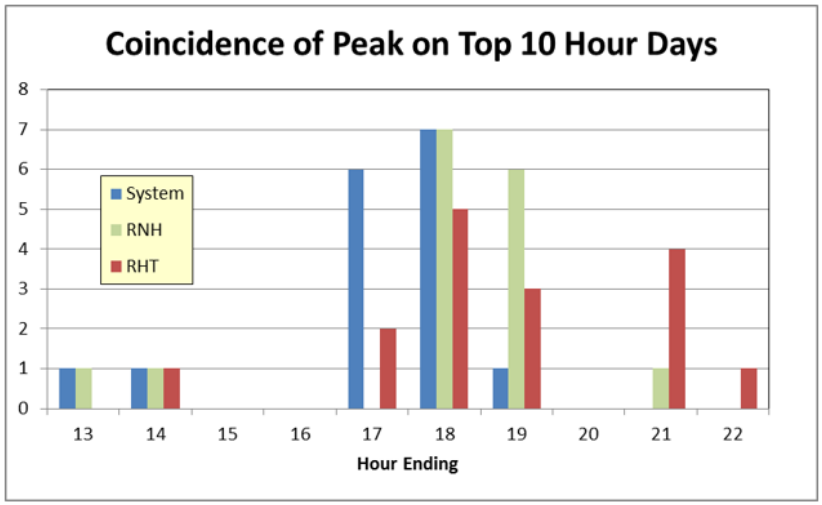
Potential:

- Ratio of daily max MW to daily min MW of approximately 2.40:1.00 indicates potential for shifting of load within the residential class.

Ratio of Daily Max to Daily Min			
	Min MW	Max MW	Ratio
6/20/2012	0.76	2.07	2.72
6/21/2012	1.05	2.46	2.35
6/29/2012	0.80	2.13	2.67
7/17/2012	0.84	2.13	2.53
7/18/2012	0.99	1.82	1.84
7/17/2013	1.01	2.18	2.17
7/18/2013	1.12	2.34	2.10
7/19/2013	1.18	2.46	2.08
7/1/2014	0.77	2.08	2.70
7/2/2014	0.90	1.93	2.14
7/23/2014	0.89	2.11	2.38
9/2/2014	0.80	1.99	2.49
7/20/2015	0.99	2.18	2.21
7/29/2015	0.92	2.11	2.30
8/17/2015	0.95	2.22	2.35
9/8/2015	0.92	1.99	2.16

RESIDENTIAL TOU RATE REDESIGN – Coincidence of Peak

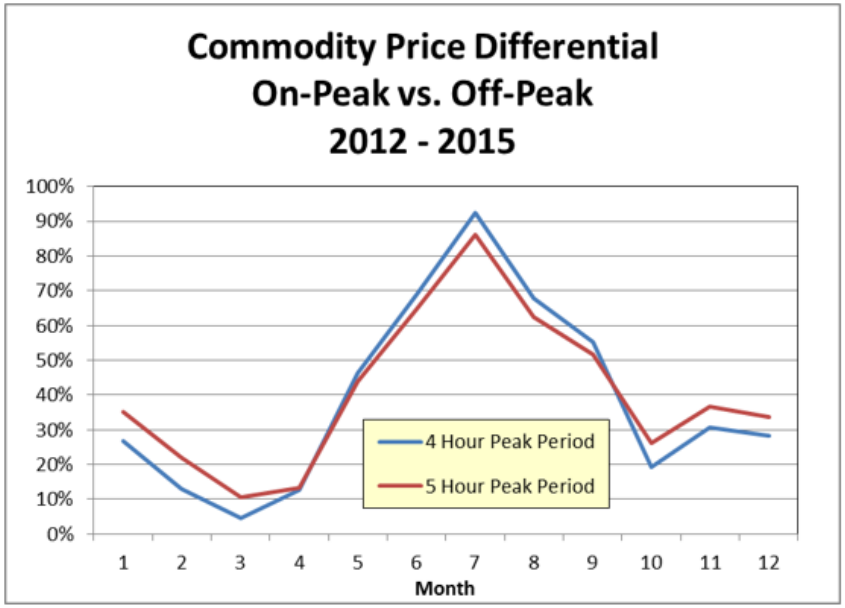


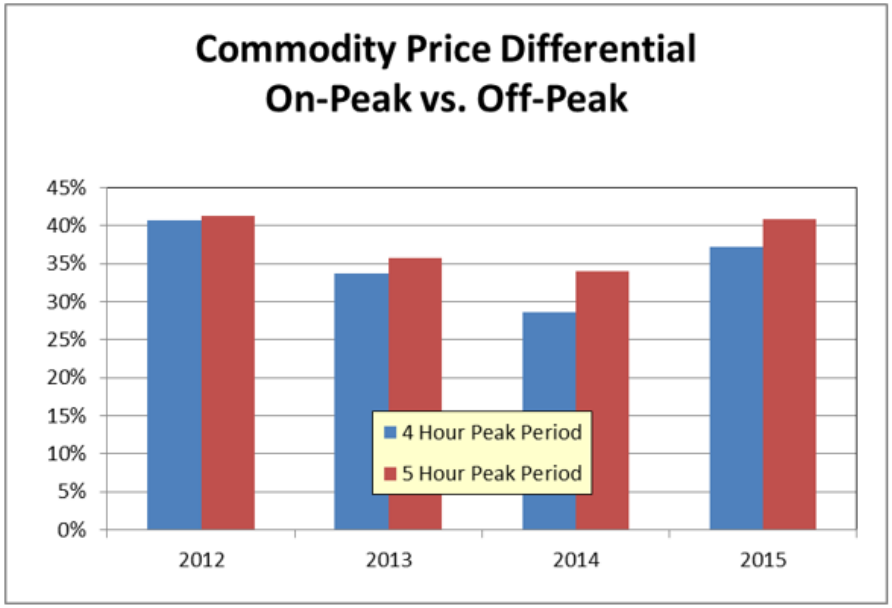


Coincidence:

- System load generally peaks between Hour Ending 15 and Hour Ending 18.
- Residential load peaks slightly later.

RESIDENTIAL TOU RATE REDESIGN – Commodity Differential





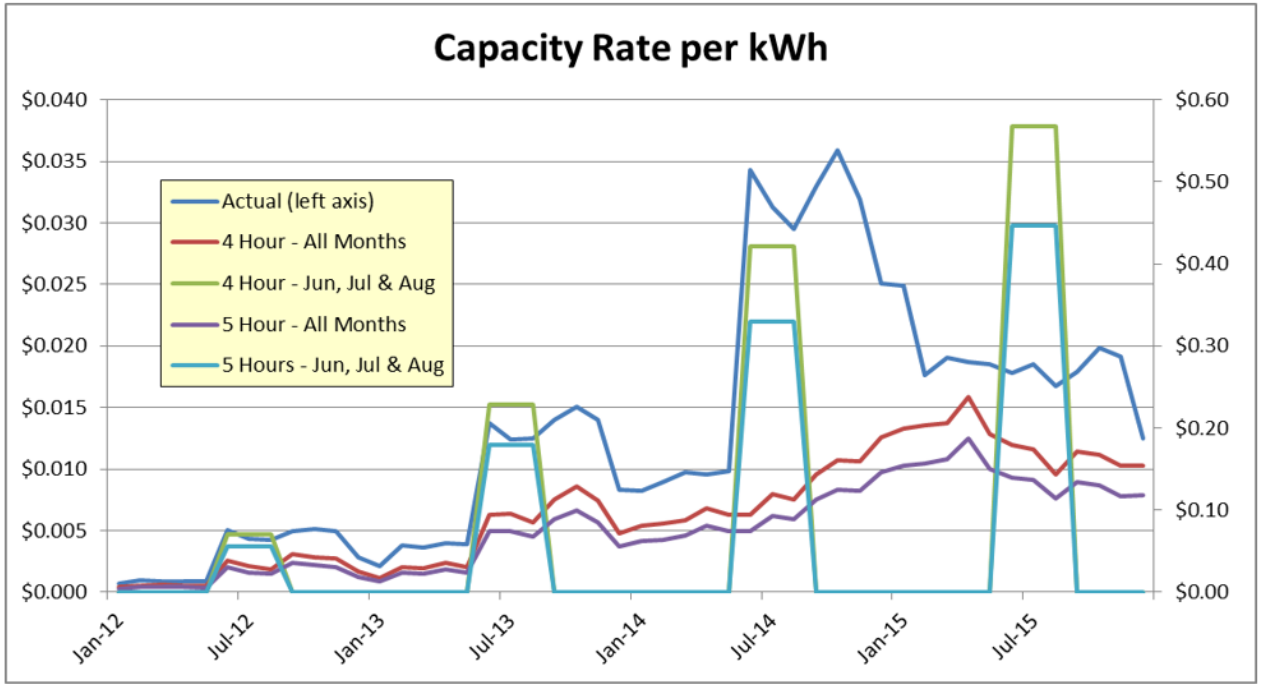
Assumptions:

- NYISO Zone G hourly Day-Ahead Market Price.
- On-Peak occurs on weekdays excluding six NERC holidays: 4 Hour Peak Period is 2 pm to 6 pm; 5 Hour Peak Period is 2 pm to 7 pm.
- Off-Peak is all remaining hours.
- Results are not load-weighted.

Commodity Differential:

- Both Peak Period alternatives provide significant pricing opportunities, particularly during the summer months.
- While the 5 Hour Peak Period exhibits a slightly smaller range in the on-peak to off-peak differential, it provides more opportunity in terms of peak period pricing.

RESIDENTIAL TOU RATE REDESIGN – Capacity (non-heat)



Potential:

- Capacity costs are recovered on a per kWh basis over all kWh billed.
- Capacity costs can be concentrated into the peak period and into specific months to provide more incentive for customers to shift electricity consumption.