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New York
Statewide Residential Appliance Metering Study

October 2016

Table of Contents

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- Participating New York Program Administrators
- Benefits of this study
- Project Timeline
- Phase 1 Objectives
  - Phase 1 Highlights
- Phase 2 Objectives
- Enetics Device Information
- How it Works
- Sample Reports
- Upcoming Milestones
- Questions

Participating Program Administrators

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Program Administrators
Central Hudson
Con Edison
National Grid
NYSEG/RG&E
NYSERDA
Orange and Rockland
Other Stakeholders
NY ISO
DPS Staff

*PSEG/LI may be a future participant in Phase 2

Benefits of the study

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- Provide a year-one baseline and two additional years of residential usage patterns for annual and monthly energy consumption, seasonal peak demands, and hourly load profiles. Both premise-level usage and major appliance usage patterns would be available.
- Compare energy efficiency program participant and non-program participant energy usage at the whole-home and appliance level, to obtain impact evaluation data for both annual energy and seasonal peaks, and for future energy efficiency program design and planning.
- Determine the weather-sensitivity of residential appliances, with applications for long-term and real-time load forecasting, system planning and rate design.
- Update residential load profiles for smart grid investment, demand response programs and retail access purposes.
- Provide information for customer service inquires about typical appliance energy usage characteristics.

Source: *Benefits of a Residential End-Use Metering Project for New York*, New York Independent System Operator, March, 2013

Benefits of this study (cont'd)

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- The results of this study will also help future planning for:
  - Demand Response Programs
  - Energy Efficiency Programs
  - Reforming Energy Vision (REV)
  - Clean Energy Fund (CEF)

Phase 1 Objectives

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The overall objective of the Phase 1 pilot (located in National Grid and Con Edison territory) is to determine the feasibility, design and cost of a statewide load research study.

High Level Goals:

- Test the Enetics NILM device and plug-load device (intrusive) within single family and multi-family households
- Develop the sampling strategy for Phase 1 and the larger Phase 2 study
- Identify, document, manage and mitigate any foreseen and unforeseen issues
- Present Phase 1 findings to DPS Staff/CEAC with recommendations for implementation of Phase 2

Overall Timeline*

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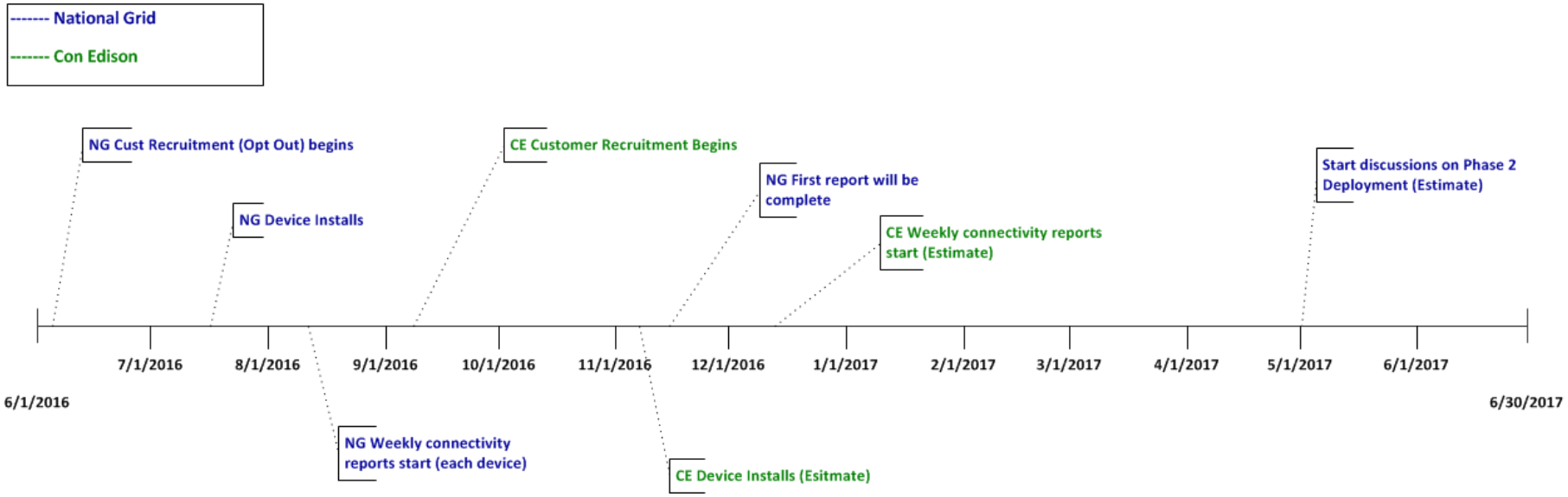

*Future dates are subject to change

Phase 1 Highlights

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- Installed 50 devices within National Grid Territory
  - 23 devices in Albany
  - 27 devices in Buffalo
- Customer recruitment and deployment went very well
- National Grid is testing the Enetics LD 1120 ongoing with hopes of approval in the next few months
- Customer recruitment has begun in Con Edison territory
- Con Edison device installs set to begin ~ November 2016

Phase 2 Objectives

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Overall Objectives of Phase 2 (Statewide Study):

- Premise-level and major household appliance usage patterns for residential customers throughout New York State.
- Determine weather-sensitivity of residential appliances, with applications for long-term and real-time load forecasting, system planning and rate design.
- Update residential load profiles for smart grid investment, demand response programs and retail access purposes.
- Provide information for customer service inquires about typical appliance energy usage characteristics.
- Provide support for future planning of energy efficiency programs and potential studies.

Non-Intrusive Meter Device Details

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- Installed on the outside of the home like an ordinary revenue meter, yet is able to measure individual appliance loads
- Records volts and amps in millisecond time-steps and can aggregate the data at intervals such as 1 minute, five-minute, fifteen-minute and hourly, as well as daily, weekly and monthly
- Individual appliance usage can be detected by pattern recognition algorithms based on instantaneous changes in voltage and current
- The meter can report both watts and vars, so that power quality and transient analyses may also be performed.

Source: *Benefits of a Residential End-Use Metering Project for New York*, New York Independent System Operator, March, 2013

Enetics LD-1100

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The Enetics LD-1100 non intrusive recorder connects to the revenue meter and will be one of the devices deployed for Phase 1 in National Grid's territory.

(PLEASE NOTE: This device has been approved by the NYS Public Service Commission)

Enetics LD-1203

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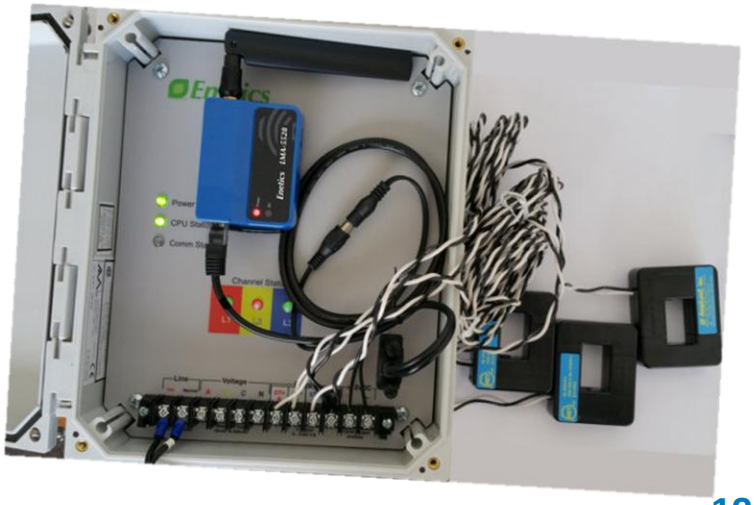
The Enetics LD-1203 is a stand alone load recorder that is not directly connected to the revenue meter, and will be the device deployed for Phase 1 in Con Edison's territory. This device is solely being tested to determine if these work with master metered buildings with underground revenue meters.

(PLEASE NOTE: This device does not require Commission approval which was confirmed by DPS Staff)



Enetics LD-1120

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The Enetics LD-1120 is a plug load recorder that will be placed within a customer's home, and will be one of the devices deployed for Phase 1 in National Grid's territory.

(PLEASE NOTE: This device has been petitioned by Enetics for approval by the NYS Public Service Commission. Currently, we can not deploy this device until it has been fully approved.)

How it Works

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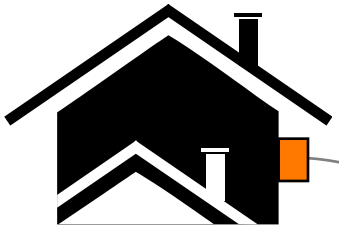
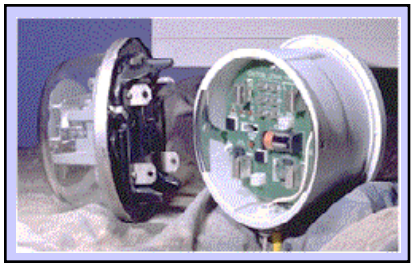
Field Recorder

- Collects energy samples from service entrance location

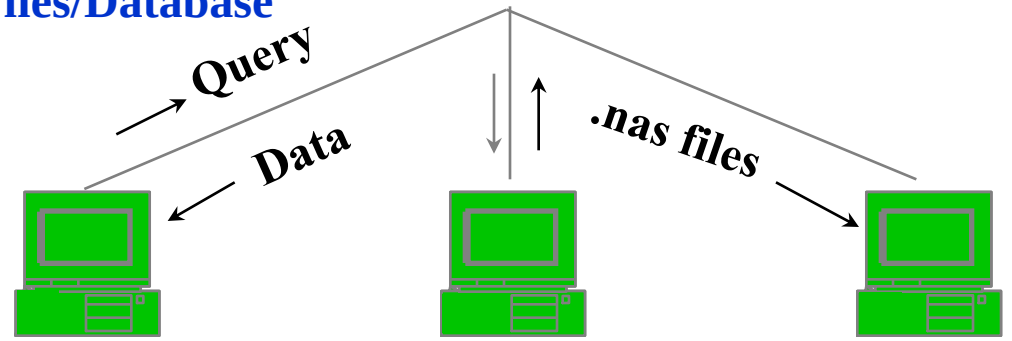


Premises



Master Station

- Manages recorders
- Processes data
- Files/Database



Analysis Stations

- Generates graphical and tabular reports
- Flexible time intervals & appliance selection

Sample Enetics Meter Load Profile

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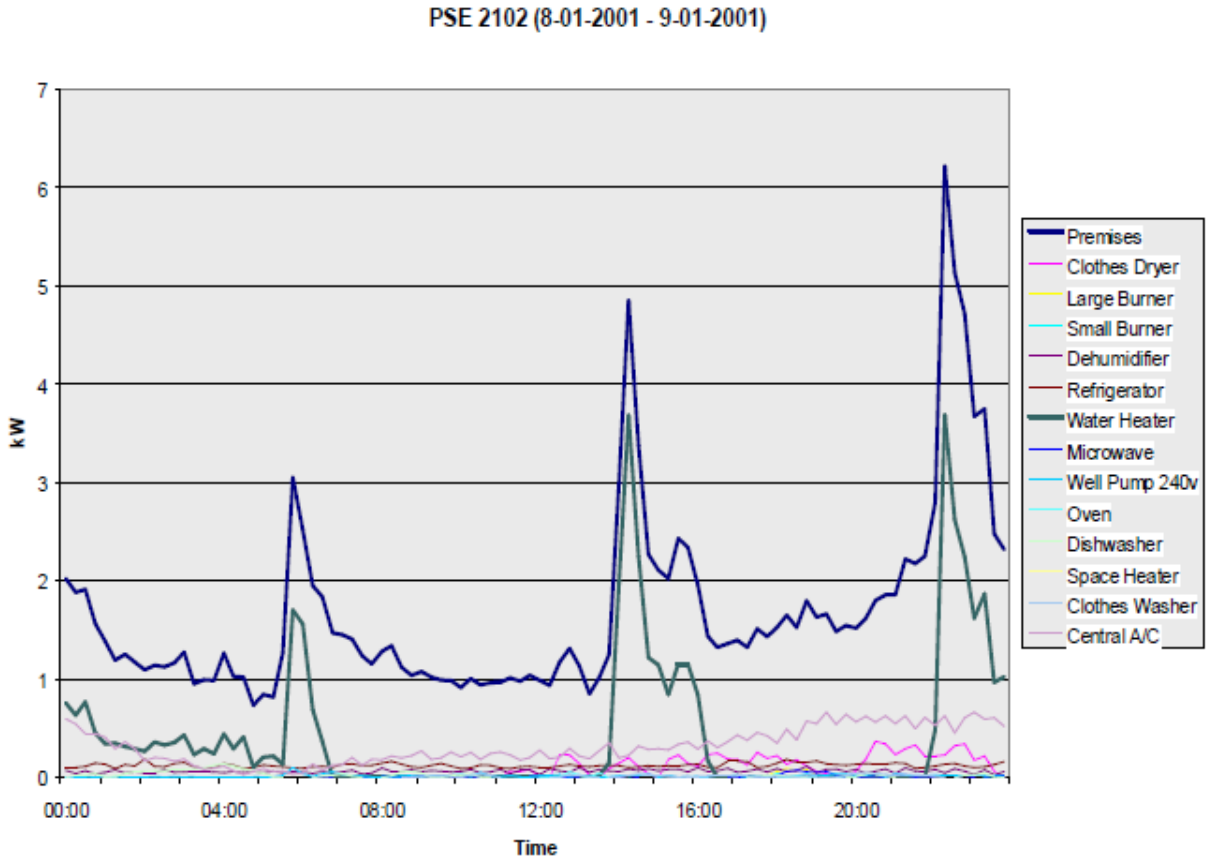

Figure 2 – Typical Load Profile From an Enetics Meter

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Sample Enetics– Monthly Usage Breakdown

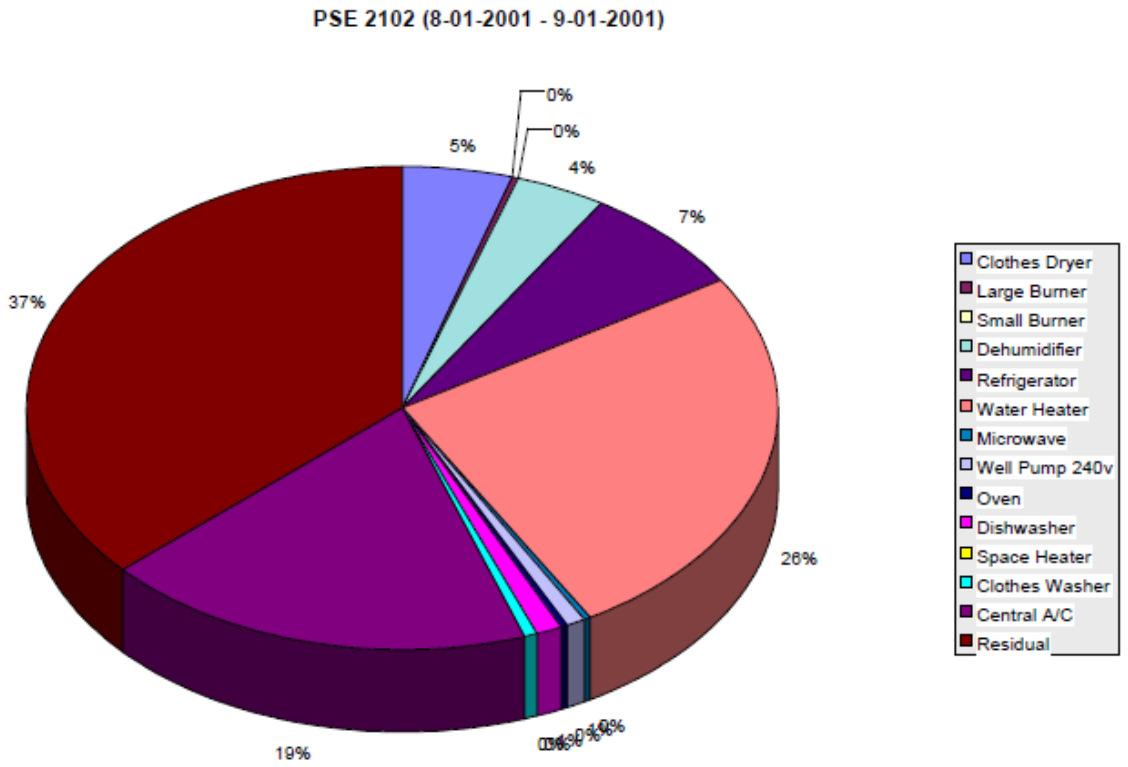

Figure 1 – Monthly Percent Usage for Specific Appliances

Upcoming Milestones

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These dates are estimates and may change through out the project.

- First Report from National Grid territory – ~mid November 2016
- Approval of LD-1220 – ~Q1 2017
- Con Edison device deployment – ~November 2016
- First Report from Con Edison territory – ~Q1 2017
- Phase 2 Kick Off Discussions – ~Q2 2017
- Phase 2 Deployment - ~Q1 2018
- Final Study Results - ~Q1 2020

Questions?

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