SCG

Behavioral Program

Implementation Plan

November 2, 2021

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Program Budget and Savings Information

1. Program and/or Sub-Program Name
Performance-Based Next Gen HERs for All

2. Sub-Program ID number
3824

3. Sub-Program Budget Table

Program Budget by Cost Category

	PY1	PY2	PY3	Total	% of Total Budget
Administration	$0	$0	$0	$0	0%
Marketing	$0	$0	$0	$0	0%
Direct Implementation - Non-Incentive	$ 495,338	$ 495,338	$ 495,338	$ 1,486,014	75%
Direct Implementation - – Non-Incentive (P4P)	$0 - $181,623	$0 - $181,623	$0 - $181,623	$0 - $544,869	25%
Total Budget	$511,338 - $676,961	$511,338 - $676,961	$511,338 - $676,961	$1,534,014 - $2,030,883	100%

4. Sub-program Net Impacts Table

The Performance-Based Next Gen HERs for All will initially be available to the following treatment customers.

Wave	Treatment Customers (November 2021, estimated)
Wave 3	13,675
Wave 6	24,865
Wave 8	42,325
Wave 9	89,935
Wave 11	73,108
Wave 12	328,138
Wave 14	65,745
Wave 15	22,659

Total	660,451	

Program Goals

First Year Annualized Deliverable	PY1	PY2	PY3	Total
Gross Therm Savings	2,147,163	2,338,666	2,408,123	6,893,952
Net Therm Savings	2,147,163	2,338,666	2,408,123	6,893,952
Projected Total System Benefit	2,061,679	2,172,999	2,175,168	6,409,846
Assumed Program Launch Date	November 2021			
Program TRC	3.47	Program PAC		3.47

5. Sub-Program Cost Effectiveness (TRC)
3.47

6. Sub-Program Cost Effectiveness (PAC)
3.47

7. Type of Sub-Program Implementer (Core, Third Party, or Partnership)
Third Party

8. Market Sector (including multi-family, low income, etc)
Single Family

9. Sub-program Type (Non-resource, Resource Acquisition, Market Transformation)
Behavioral

10. Intervention Strategies (Upstream, Downstream, Midstream, Direct Install, Non-Resource, Finance, etc)
Downstream

Program Implementation Plan Narrative

1. Program Description

SCG is running a behavioral energy efficiency program, which offers behavior intervention strategies to residential participants with the goal of achieving short-term energy and budget savings that can persist and produce long-term behavior change and energy savings. This is achieved by fostering participant engagement, ensuring participant satisfaction and providing energy education and upgrades through regular and participant-specific touch points in the form of digital Home Energy Reports (HERs) and a web-based education portal through the lazy-login feature.

Behavioral programs are required to employ comparative energy usage and disclosure, ex post measurement, and experimental design. In the residential sector, randomly selected customers receive their usage feedback via paper and email reports leveraging their usage data. This program includes the use of normative or comparative information, personalized communication in relation to the customers' energy usage, and any other demographic factors.

Program rationale & objectives

In Decision ("D.") 10-04-027 Southern California Gas Company (SoCalGas) Advanced Meter Project was authorized and required to establish a system to track attributed costs and projected savings from conservation. The decision sets a goal of reducing residential gas consumption by 1%. Based on this decision, SoCalGas developed a yearly heating season behavioral conservation campaign pilot demonstrating how to best meet the one percent energy savings goal associated with the Advanced Meter roll out and tracking the resulting conservation savings. In 2016-2017, after three years of implementing test and learn strategies, SoCalGas identified high performing behavioral conservation program design options.

SoCalGas Customer Programs and Assistance requested an additional $10 million dollars budget specifically for the residential sector, and largely to be utilized in behavioral programs to achieve a 1.8 million therm savings. The request was approved and in 2017-2018, the behavioral conservation campaign officially transitioned from the Advanced Meter Project to SoCalGas Customer Programs and Assistance. Various high performing experimental design strategies developed by the Advanced Meter Project were utilized. In winter 2017-2018, an aggregate therm savings of 3 million was realized by SoCalGas Customer Programs and Assistance.

SoCalGas Behavioral Outreach Program has historically focused on the top two quartiles of natural gas consumption (i.e. high-usage customers). The Implementer Alerts program which started in December 2019, on the other hand, included customers in the second quartile (average consumers) with digital-only treatment. This approach allowed SCG to realize cost-effective energy savings for this cohort. Implementer's next-generation HER program pursues this approach to go beyond the typical high-usage treatment groups and tap into new opportunities for gas savings by also including average usage customers with a small mix of high usage customers.

Program Goals

The program will market the Performance-Based Next Gen HERs for All to approximately 660,451 customers (Customer Segments served in this portion of the behavioral program: Residential Behavioral

Treatment Waves 3, 6, 8, 9, 11, 12, 14 and 15). Contractor will coordinate with SCG to promote other Energy Efficiency Programs (Company or Third Parties under Contract with Company), where applicable. Upon program launch, Contractor may refer and/or forward customer inquiries pertaining to services provided by other programs to SCG.

SCG will provide a downstream program that selects eligible customers and assigns them to a treatment group to receive HERs at regular intervals to encourage energy- and money-saving behavioral changes or to act as a control group for the study. The program's treatment group will receive a series of HERs as well as access to a web portal where they can learn about additional savings potential.

Customers will be enrolled into the program in compliance with the measurement and verification (M&V) plan filed with the California Public Utilities Commission (CPUC). The program will monitor participant eligibility on an ongoing basis, removing participants who no longer wish to participate or otherwise become ineligible to participate.

The SCG Behavioral Program goals are to:

- Establish a cost-effective residential behavioral program to educate participants on their energy consumption behavior and motivate them to save energy and money over the short- and long-term
- Validate participant savings using Randomized Control Trial (RCT) to measure savings

2. Program Delivery and Customer Service

Contractor will perform the following activities on behalf of the Program:

Communication Channels	Cadence/Frequency
Digital HER	2-3 emails per billing cycle, for assigned Residential Behavioral treatment waves (See Section 3.4): ● A monthly summary with an itemized energy bill ● A similar home comparison sent midway ● A dynamic energy efficiency alert that is triggered based on customer behavior
Web portal	A utility-branded, mobile-responsive web portal that contains a broad set of features to serve customer needs: ● Home Profile Survey ● Preferences Page

Participants will receive digital HERs as well as a host of additional access to resources and recommendations for energy saving solutions. The following table details each component of the participant experience and associated benefits.

Program Components and Benefits

Component	Description	Benefits
Similar Home Comparison	Performed at whole-home level for similar homes	Drive energy savings through social benchmarking
Appliance Itemization	Energy Bill Itemization for customers.	Customers can see where their energy dollars go
Personalized Recommendations	Highly personalized recommendations' engine driven by energy itemization, home profile, ease of use, savings impact, season, type and ownership of home.	Drive energy savings by empowering customers with curated set of actionable recommendations with highest savings impact; Drive interest and adoption of targeted offers

The SCG Behavioral Program is designed to drive energy awareness and consumption reduction through a behavioral program design. Program objectives will be achieved by providing digital home energy reports that address barriers to action for residential customers through modeling energy use at the home level and providing reports that call out end uses, costs, and personalized recommendations for improvements.

In addition to delivery methods designed specifically to address participants' needs through a cost-effective and personalized approach, SCG will provide customer service. Customer satisfaction through interactions that are timely and that provide meaningful information with actionable recommendations is the cornerstone of the Behavioral Program. Participants will have access to modernized digital programs like the web portal and digital HER that have benefits beyond measurable behavioral energy efficiency (EE); they can also contribute to an increase in customer satisfaction and an improved customer experience. Participants will also have access to customer service representatives from SCG via phone at applicable times.

3. Program Design and Best Practices

SCG's Program will use an RCT methodology to compare participants in the program to a control group's consumption and savings over time. The RCT approach complies with behavioral program evaluation best practices and CPUC requirements.

This method is used in conjunction by first selecting non-participants randomly from within the intended treatment population, using stratification to ensure equivalency between the two groups and then by

calculating consumption for both participants and non-participants. Then, the difference of differences will be calculated between the two groups to arrive at adjusted gross savings.

Using an RCT design will allow for two things: prevent capturing and paying for naturally occurring efficiency by comparing the treatment and control groups, and prevent selection bias in participant enrollment toward participants who have the highest propensity to save energy even without a behavioral intervention. Moreover, this approach allows specific participant tracking across different programs to avoid double counting of savings.

As described by Nexant in their past evaluations of the Residential Behavioral Program, the impacts on natural gas consumption are estimated using a lagged dependent variable model in which annual or seasonal energy consumption for treatment and control group customers was estimated using consumption data from the pre-treatment period and post- treatment period. The analysis database includes individual monthly therms consumption data for each customer in the control and treatment group. The regression specification is below, followed by definitions for each term in the Table.

Equation: Lagged Dependent Variable Model Specification

$$therms_{it} = a + b_t + c_t \cdot treatment_i + d \cdot pretreatment\_therms_{it} + e_t \cdot pretreatment\_therms_i + \varepsilon_{it}$$

Table: Lagged Dependent Variable Model Definitions

Variable	Definition
$therms_{it}$	Customer i's usage in month t.
a	The estimated constant for energy consumption (average for all customers in all periods).
b_t	The estimated coefficient for the month and year indicator variable.
c_t	The estimated coefficient for the month and year indicator variable for treatment customers. This is the treatment effect for the particular month t.
$treatment_i$	The treatment indicator variable for customer i. Equal to 1 for treatment customers and 0 otherwise.
d	The estimated coefficient for pretreatment consumption.
$pretreatment\_therms_{it}$	Pretreatment usage for customer i for month t. Pretreatment consumption for a particular month in the post treatment period refers to the same calendar month in the pretreatment period.
e_t	The estimated coefficient on pretreatment consumption for a

	particular month t.
ε_{it}	The error term.

This specification applies to all waves, with some indicator variables set to zero for some waves. In other words, the particular months included in the model vary by wave. In each case, the estimation included one year of pre-treatment and one year of post-treatment natural gas consumption data for each customer. Standard errors were estimated allowing for arbitrary correlation among errors within each customer's data.

The impacts for the Behavioral Outreach Program are estimated separately for each wave (i.e., a unique regression equation was used for each wave). Season-specific savings are also estimated. In order to maintain comparability between treatment and control groups, opt-outs (that is, customers assigned to treatment groups that requested to be removed from receiving the reports) are retained in the treatment groups throughout the course of the entire year. Two reasons underlie this decision. First, because the experiment uses an opt-out delivery design (in which households in the treatment receive the reports without requesting them), households that subsequently opt out of receiving the reports received at least one report before they dropped out. So, strictly speaking, they were treated. Second, it is impossible to remove parties in the control group who would have opted out, because their identity is unknown. Removing opt-outs only from the treatment group without doing so for the control group would compromise the internal validity of the savings estimates. HERs are assumed not to affect the rate at which customers close their accounts due to moving or other reasons; this appears to be true since the attrition rate between treatment and control groups are virtually identical. Treatment and control customers who move out during the year are retained in each sample until their accounts close. This means that the population of interest grows smaller for both the control and treatment groups as time progresses.

Participant Group

Participants for this program are chosen consistent with CPUC direction for downstream behavioral programs. SCG's Residential Behavioral Program adopts an existing conditions baseline with the following requirements to provide ample historical consumption data:

- Eligible projects must have at least 12 months of baseline energy consumption data in the form of hourly gas consumption. The baseline period selected involves the 12 months immediately before the implementation of EE measures (Baseline Period Dates)

To be eligible for SCG's Behavioral Program, SCG will screen and continuously monitor program participants for the following:

- Project site must be located in the SCG service area
- Property must be a single family structure with a single meter for each fuel
- Customer must have 12 months of consecutive consumption data for the same account
- Mixed-used sites are eligible if residential space represents at least 50% of conditioned space and have received gas distribution service from SCG

● Customer must have never opted out to receive communications i.e. HERs, CARE/Low-Income Programs

Control Group

For behavior-based interventions, a control group will be used for determining savings impacts. SCG will consider CPUC guidance provided in the Large Population Level Energy Efficiency Program Design Method Checklist[1] in designing the control group.

Scope for Behavioral Program

This table illustrates the specifications of the Home Energy Report program,

Program Specifications

Area	Scope
No. of Participants	Implementer will generate digital HERs for approximately 660,451 treatment group participants. An additional control group will be compared with the treatment group. Control group participants are representative when randomly selected within the same zip codes as treatment participants at a proportional distribution
Report Frequency (digital)	2-3 emails per billing cycle, for assigned Residential Behavioral treatment waves ● A monthly summary with an itemized energy bill ● A similar home comparison sent midway ● A dynamic energy efficiency alert that is triggered based on customer behavior
Customer Selection	SCG's program-eligible participants will be used to build a treatment group; Program participants will be chosen in compliance with the M&V Plan and approved CPUC requirements
Report content	HERs can include the following content: ● Appliance cost itemization ● Education and outreach about complementary programs ● Similar home energy consumption comparison ● Personalized energy- and cost-saving recommendations

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[1] California Public Utilities Commission Rolling Portfolio Guidance Website: https://www.cpuc.ca.gov/general.aspx?id=6442456320

Channel and Delivery	Reports will be emailed to program participants using the email address registered with SCG; The digital report will carry the SCG logo for identification and brand recognition of the program and agency providing the program
Channel and Delivery (additional resources for digital option)	Consumption summary sent early (e.g., Day 6) in a billing cycle, summarizing what happened in the previous billing cycle, including bill amounts, itemization, and recommendations at whole house and appliance category level; Similar Home Comparison will be sent around Day 12; EnergyEfficiency Alerts can be are triggered once a month based on customer behavior; Seasonal Alerts will be sent biannually
Unsubscribing	Program participants will be able to unsubscribe from receiving HERs through the program's website and by contacting SCG's contact center; SCG will provide support directly to participants and will unsubscribe participants using the web portal or support ticket

Digital HER

Customers identified for this program have an email address on file with SCG and are enrolled in the digital HER program option.

Participants will receive alerts and notifications that are timed to users' billing cycle. These digital touch points will be optimized for relevancy and timing to best suit the participant by providing a clear next best action for the participant, increasing the likelihood of the participant adopting the energy-saving tip or signing up for a promoted program. This facilitates a more interactive and engaging relationship with the participant, leading to higher satisfaction and program participation.

The following table describes the types of alerts and notifications customers will receive under the digital HER program option.

Alert Type	Description
Monthly Summary	Sent early (e.g., day 6) in a billing cycle, summarizing usage from the previous cycle, including itemization of spending and relevant saving recommendations, as well as program/product offers that align with a customer's given usage profile.
Self Comparison	Sent midway (e.g., day 12) into the billing cycle, displaying usage as compared to past behavior & consumption and relevant saving tips, as well as program/product offers
Energy Efficiency Alert	Additional eHER touchpoints that can be included in the overall eHER journey. Each notification includes a single highly personalized Efficiency interaction, generated by Implementer's Next Best Interaction engine

Behavioral Program participants will also have access to a suite of online solutions through a digital platform, which will provide a home profile survey for customers and a preferences page.

The Behavioral Program focuses on data analysis to itemize energy bills and generate recommendations that target behavioral change and motivate participants to save energy. The primary market barrier for the residential customer sector is lack of information or awareness about end use and how their behavior impacts their energy usage. Proactive delivery of this information to participants via HERs is intended to address this gap, while testing various methods of education delivery, and serve as a cost-effective way to achieve savings. This and other barriers addressed by the Behavioral Program are listed below.

Market Barriers and Solutions

Barrier	Solution
Difficulty providing personalized end use data and recommendations	Regular digital reports that include energy consumption and saving potential
Lack of information/awareness of end use consumption	Energy disaggregation tool identifies key energy consumers in the home
Lack of understanding of comparative performance over time	HER compares participant's consumption to past consumption
Personalized assessments are expensive and time-consuming	Program tools allow home energy use disaggregation digitally, eliminating the need for and cost of an in-home assessment

SCG will also use a state-of-the-art energy consumption analysis tool to provide participant education and incentive to make energy saving changes in their homes. By using only meter based energy consumption data (no in-home devices or any additional hardware) the Behavioral Program software will detect the presence and estimate the energy usage of several different appliance categories including heating, water heating, cooking, and laundry. The adoption of this tool can not only increase energy savings, but can also drive targeted demand response programs and achieve more efficient grid optimization. It enables the personalized experience that consumers have come to expect.

There are many established data points and reports in the industry that document the efficacy of behavioral programs. Links to three industry reports are included for reference.

1. *Behavior Change Programs: Status and Impact*, Reuven Sussman and Maxine Chikumbo; October 2016 *https://aceee.org/sites/default/files/publications/researchreports/b1601.pdf*
2. *Overview of Residential Energy Feedback and Behavior-based Energy Efficiency*, Prepared by E3 for the Customer Information and Behavior Working Group of the State and Local Energy Efficiency Action Network; February 2011 *https://www4.eere.energy.gov/seeaction/system/files/documents/participantinformation_behavioral_status_summary.pdf*

3. *Implementing EPA's Clean Power Plan: A Menu of Options* , Chapter 13. Pursue Behavioral Efficiency Programs *http://www.4cleanair.org/sites/default/files/Documents/Chapter_13.pdf*

4. Innovation *(If applicable and for programs designed and implemented by a third party): Describe how the program is innovative and will increase the uptake of cost-effective energy efficiency and minimizes lost opportunities for promoting other demand side energy reduction efforts by advancing a technology, marketing strategy, or delivery approach in a manner different from previous efforts. See Appendix D for the update innovation definition and requirements.*

This program brings a diverse range of solution design innovations to SoCalGas' Residential Behavioral Program:

- Patented true disaggregation: Using only energy usage data, without any hardware beyond the meter, Implementer's Artificial Intelligence (AI) platform generates detailed information for different appliance categories. We enrich this with weather data, premise data, demographic data, and digital interaction data to develop the world's most accurate and actionable consumer energy insights. These AI-driven insights include detailed appliance attributes and usage characteristics, appliances' fuel types, digital engagement behaviors, and a multitude of customer attributes that our platform identifies, all derived from actual customer behavior;
- Hyper-personalization: Implementer's platform continuously identifies the optimal energy insights and recommended actions for each customer at a given point in time, delivering combinations of unique insights and actions that we call "next best interactions" (NBIs). A string of NBIs, delivered over time through the customer's preferred channels, is what we refer to as a hyper-personalized customer journey;
- Lazy login web: Implementer's digital engagement includes personalized mobile-responsive web pages accessible with a single click (lazy log-in) from the emails;
- Launchpad: Implementer's state-of-the-art SaaS platform allows every feature to be managed as a platform component and to be easily configured as per the utility's requirements.

Additional business model innovations for SCG's Behavioral Program:

- Cost-effectiveness: Implementer's proposed program is projected to deliver savings at $0.32 per therm, with a portion of the total program cost based on measured therm savings - ensuring cost-effectiveness will be maintained in all circumstances. Our reliance on a Pay-for-Performance model provides a lower-risk option for SoCalGas;
- Scalability and flexibility: Our digital-first approach guarantees the possibility to easily scale the program to reach all eligible customers;
- Inclusivity and adaptability: Implementer's hyper-personalization means our solution is tailored to each customer's unique needs and challenges, including Hard To Reach customers and Disadvantaged Communities.

5. Metrics: Provide metrics that will be used to track program progress.

In general, the KPI ratings will be based on a 0 – 4 scale:

0 – Unsatisfactory   1 – Below expectations

2 – Meeting Expectations   4 – Greatly exceeding expectation

3 – Exceeding Expectations

Table –Key Performance Indicators

KPI	SoCalGas Metric	Description	Scoring	Continuous Monitoring Mechanisms
Performance: Goal Accomplishment (net therm savings)	S1: Energy Savings	Percentage of net monthly energy savings achieved vs forecasted	0: < or equal to 70% 1: >70 – 90% 2: >90 – 110% 3: >110 – 130% 4: >130%	Monthly Reports
Performance: Digital HERs Open Rate	N/A	Percentage of customers that open digital HERs.	0: < or equal to 30% 1: >30 - 35% 2: >35 - 40% 3: >40 - 50% 4: >50%	Monthly Reports
Service Delivery: Digital HERs	N/A	Percentage of emails that receive "Like Votes" vs "Dislike Votes"	0: < or equal to 50% 1: >50 - 60% 2: >60 - 70% 3: >70 - 80% 4: >80%	Monthly Reports
Service Delivery: Opt-Out Rate	N/A	Percentage of treatment customers who opt not to receive digital HERs .	0: >20% 1: 15% - 20% 2: 10% - 15% 3: 5% - 10% 4: <5%	Monthly Reports

Supporting Documents (attach in PDF format)

1. Program Manuals and Program Rules

The Behavioral Program does not have a manual because it does not require eligibility to participate or to claim savings. See Program design excerpts.

2. Program Logic Model

| Activity	Description	Output
Program Design		
Customer Selection	Select potential list of target customers based on pre-defined criteria that will meet of exceed savings goals	Eligible customer accounts
Setup Treatment and Control	Randomized assignment to treatment and control	Final list of treatment and control customers
Program Pre Launch		
Product Configuration	Configuration of the different components of the solution	Final product configurations
Quality Assurance (QA) of Solution	Test functionality of product to ensure it behaves as expected	Solution ready for launch
Launch readiness	Setup solution in production; ensure readiness of both implementer and SCG stakeholders to support the solution after go live	Solution ready to be launched to SCG's customers

Program Performance Assessment		
Go Live	Launch program	Customers start receiving email alerts every month
Savings Measurement	Calculate the EE savings on a monthly basis post launch using post-program regression model.	EE Savings (per household and aggregated) are available
Review Savings	Review savings numbers and compare with forecasts. If required, take remediation actions to mitigate savings gaps	Enhanced treatment groups / revised forecasts
P4P	Pay the implementer for the recognized EE savings	Payment received

3. Process Flow Chart

The diagram outlines the process flow for the program. Participants will be selected at the beginning based on the Qualification Screening & Monitoring criteria and will then be treated with home energy reports. Savings will be measured on a monthly basis.
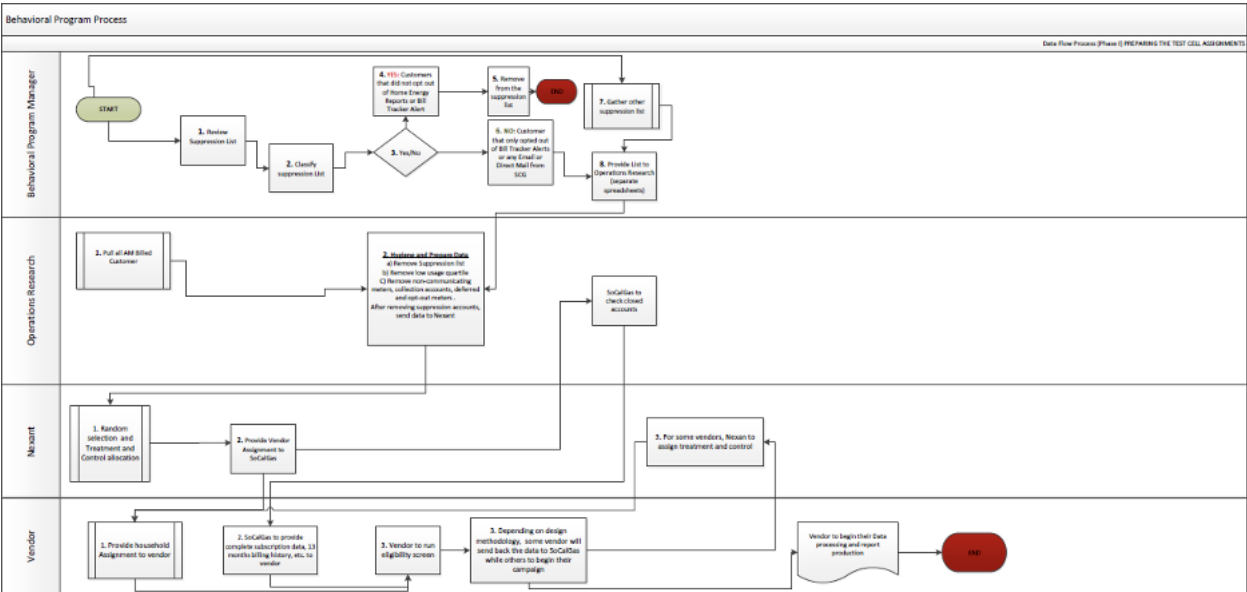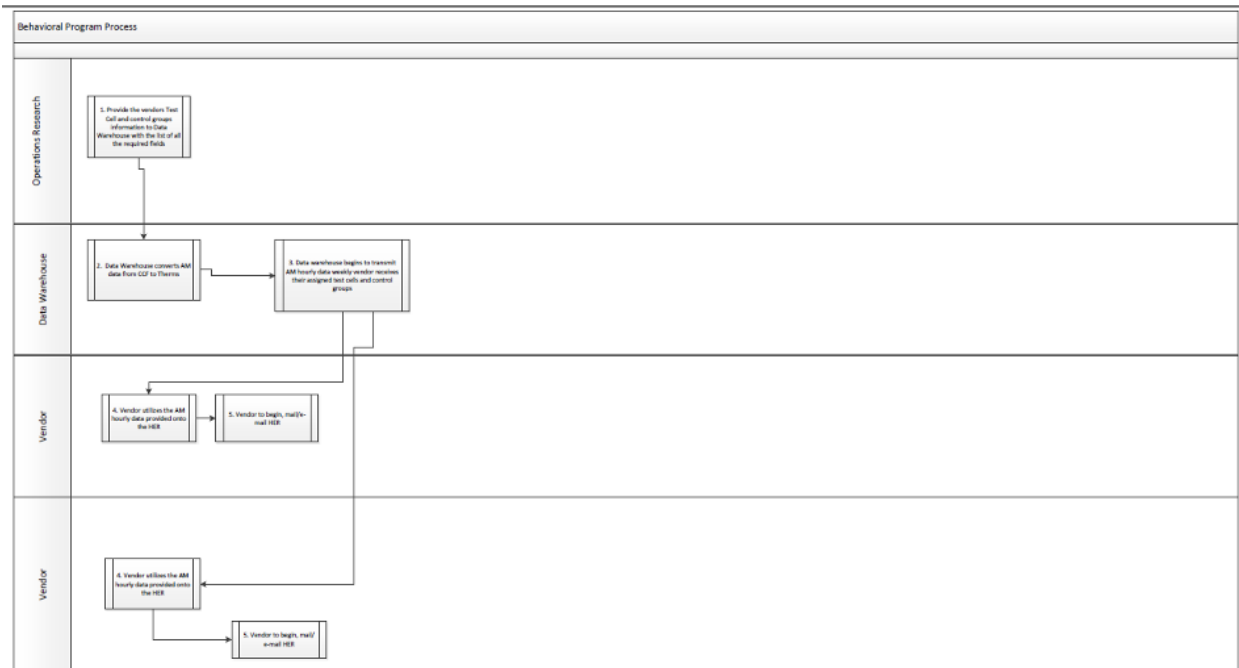
4. Incentive Tables, Workpapers, Software Tools

The following table outlines the software components used for this program.

#	Component	Description
1	Data Analytics Platform	The data analytics platform leverages the consumption and billing metadata to develop key data elements such as appliance itemization, similar home comparison and personalized recommendations used for the reports
2	Email Alerts Engine	This module is responsible for delivering the email alerts
3	Web Engine	This module is responsible for hosting all the web pages relevant to the program including the participant facing portal, the preferences portal as well as the utility console

5. Quantitative Program Targets

The table below provides the number of participants to whom home energy reports will be delivered as well as the targeted gas savings for the group.

The Performance-Based Next Gen HERs for All will initially be available to the following treatment customers.

Wave	Treatment Customers (November 2021, estimated)
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Assumed Program Launch Date	November 2021			
Program TRC	3.47	Program PAC		3.47

6. Diagram of Program

There is no sub- program associated with the Behavioral Program.

7. Evaluation, Measurement and Verification (EM&V)

See program design section for a description of the EM&V methodology used by the independent evaluator Nexant.