NJ TRIENNIUM 2 EVALUATION STUDIES LIST AND PLAN

STATE OF NEW JERSEY

Report Prepared by:
Statewide Evaluator ("SWE") team with input from
Evaluation, Measurement, & Verification Working Group ("EM&V WG")

As part of SWE Assignments for New Jersey Board of Public Utilities ("BPU")

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Revised Document
April 10, 2023

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Introduction

This document provides the Three-Year Triennium 2 Evaluation Studies List and Plan and represents an integral element of the Evaluation Framework surrounding State of New Jersey ("State") and utility company ("Utility") energy efficiency ("EE") programs and the associated evaluation, measurement, and verification ("EM&V") processes. This document, prepared by the Statewide Evaluator ("SWE") team, includes evaluation studies conducted at the State and the Utility level over the Triennium.

Purpose of this Plan

This document provides an organized list of the studies that will fulfill key evaluation needs. The studies will do the following:

- Provide the array of New Jersey-specific evaluation results necessary to support a current and defensible TRM;
- Provide recommendations, best practices, and other information to support continual improvements in the design, delivery, effectiveness, and cost-effectiveness of the portfolio of EE programs at the Utility and State levels;
- Provide evaluation results that support reliable estimates of performance for the measures, programs, and portfolio; and
- Guide development of and provide a benchmark for expected studies conducted over the triennium.

Development of the Plan

SWE developed the Evaluation Studies List and Plan in consultation with the EM&V Working Group ("EM&V WG"), including the following steps:

- SWE issued a request for evaluation study needs and ideas to the EM&V WG;
- SWE prepared an initial draft of the studies list based on input, best practices on study topics and cadence, guidelines, and priority near- and medium-term New Jersey topic areas;
- SWE solicited comments on the draft list and facilitated discussion at EM&V WG meetings;
- SWE prepared and distributed a revised Evaluation List and Plan, including budget estimates, for discussion by the EM&V WG; and
- SWE prepared and distributed a final Evaluation List and Plan to the EM&V WG.

The Evaluation Studies List will be updated annually based on changing priorities and new study and topic needs and in accordance with the Evaluation Framework. Details contained in the Evaluation Studies List and Plan may be updated more frequently based on new information and continuing discussions with Board Staff ("Staff") and the EM&V WG.

Introduction to the Triennium 2 Evaluation Studies List and Plan

Table 1 shows the list of the current 27 studies of interest. Many of these studies represent multiple studies of a single type, e.g., the "process evaluations of Utility programs," which includes evaluation of approximately 18 individual programs. Table 1 identifies the following:

- Evaluation study type
- Evaluation study name
- Evaluation study relative priority level
- Whether the study is conducted by the Utility or State (or both)
- Evaluation study budget, based on the following steps:
    - The number of programs or sectors that the study includes (e.g., process evaluations of all residential and commercial programs);
    - The number of times throughout the triennium that the study is expected to be repeated; and
    - The average amount a single study of this type is expected to cost.

    The product of the previous three bullets equals the total 3-year budget for the Evaluation study entry over the Triennium. Note that the calculation for the Utility process and impact evaluations have one more multiplier to obtain the final budget – that is, the number of Utilities evaluating the listed program. In most cases, the multiplier is each study conducted by each Utility, so the total is multiplied times 7.

- In the final two columns:
    - The percent of the total three-year Utility evaluation budget represented by the study entry; and
    - The same information for the State studies

    This allows a review of the shares represented by process vs. impact evaluation studies and other relative comparisons.

Note that the Evaluation Studies List and Plan does not include scopes of work. The requirements for scopes of work, including outputs, data collection, rigor, analysis methods, content, and other specifications are generally contained in the "Evaluation Guidelines" associated with the specific study type. When the study is ready to commence, the evaluator (State or Utility) prepares a tailored scope of work for that project, which the SWE then reviews for conformance with the Evaluation Guidelines.

General Results

The 27 studies and study groups in the Evaluation List (Table 1) cover the range of key studies needed for an integrated and sufficient plan and budget. The actual number of evaluation studies represented by this list and plan is considerably more than 27. Later tables show the relative shares of studies by sector and type. Note that the 28th project is not strictly considered an EE evaluation study. However, it does relate to and interact with some elements of the Evaluation processes, so the importance of the regularly updating Avoided Cost values and their inputs is noted, along with a reminder of the need for an adequate budget. Table 1 shows the following:

- The overall budget for the evaluation studies list is $91 million in total.
- Nearly 84% of this budget, representing the largest number of physical studies, comprises Utility evaluations of Utility programs, mostly impact and process evaluations and some net-to-gross analyses. The large number of evaluation studies derives from having 18 Utility-run programs at each of 7 Utilities. A few programs are delivered by electric distribution companies ("EDCs") only, but the bulk are coordinated programs run at each Utility.

- The remainder are State studies, which include a few process and impact evaluations (there are fewer State-run programs). However, the bulk of the topic-based studies are handled at the State level, as shown in the Table.

Codes used in Table 1:

- Codes for who conducts the study:
  - COMBO=Utilities conducting studies singly or in combination;
  - EST= Evaluation Statewide Team;
  - O=other selected / specialist consultant as needed;
  - R=Rutgers Center for Green Building (RCGB);
  - SWE=Statewide Evaluator;
  - U=Utility.
- Codes for Priority, in relative terms: VH=very high; H=high; MH=medium-high; M=medium
- Codes for Evaluation Study Types:
  - Baseline=Studies to provide baseline market or baseline conditions information
  - Decarb=studies related to building decarbonization issues;
  - Equity=studies related to equity, workforce, out outreach for programs not expected to directly lead to energy savings;
  - Impact=Impact evaluations that estimate the savings or other quantitative performance elements of programs;
  - NJCT=New Jersey Cost Test updates or research on its inputs / updates;
  - Process=Process evaluation, examining the design, delivery, and participant experience and program process improvements;
  - Topics=other studies that address specific evaluation topics;
  - TRM=NJ Technical Reference Manual updates or research on its inputs or updates.

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Table 1: Triennium 2 Evaluation Studies List and Budget with Study Note and Budget Assumptions (Total Three-Year Budget = $91.2 Million)

Row/ Study	Type	Evaluation Studies List	Priority	Who Conducts	Number of Programs / Sectors Needing Evaluation	Number of Times Study Repeats in 3-year term	Average Budget per Study ($ Thousands)	Total Calculated 3-Year Budget ($ Thousands)	Percent of Utility Evaluation Budget	Percent of State Evaluation Budget	Project Notes, Budget Assumptions
1	Process	Utility Process Evaluations, each program	VH	U/COMBO	17	1.25	$125	$18,594	24%		Utility Program Process Evaluations, each program (10 Residential, 1 Multifamily, 6 Commercial; half for EDC-only programs). Scopes assume NTG surveys and analysis may be embedded for some studies. Frequency in Tri2 is assumed to be at least 1 evaluation per 3 years for ongoing programs (Residential & C&I). However, there may need to be more frequent, smaller studies for new programs. The total budget is multiplied times 7 to provide the budget across all Utilities for utility process & impact evaluations. Substantial savings can be achieved if some evaluations are conducted jointly across multiple Utilities.
2	Process	State Process Evaluations, each program	VH	EST & R	6	1	$175	$1,050		8%	State Program Process Evaluations, each program (6 programs). Once every 3 years, each program.
3	Impact	Utility Impact Evaluations, each Residential and Multifamily program	VH	U/COMBO	11	1	$275	$21,175	27%		Utility Program Impact Evaluations, Non-Commercial, each program (10 Residential, 1 Multifamily; with "half-program" counted for EDC-only programs). Evaluations assume NTG surveys and analysis may be embedded for some studies. Frequency for all programs is assumed to be at least once per 3 years in Tri2. In the future, commercial frequencies may decrease in Tri3 if forward market sales verification rules allow it; however, the TRM needs reliable studies in near-term Tri2. The total budget calculation multiplies the budgets and frequencies times 7 Utilities. Substantial savings can be achieved if some evaluations are conducted jointly across multiple Utilities.

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4	Impact	Utility Impact Evaluations, each Commercial program	VH	U/COMBO	6	1	$850	$35,700	46%		Utility Program Impact Evaluations, Commercial, each program (6 commercial programs, with "half-program" counted for EDC-only programs). Evaluations assume NTG surveys and analysis may be embedded for some studies. Frequency for all programs is assumed to be at least once per 3 years in Tri2. In the future, commercial frequencies may decrease in Tri3 if forward market sales verification rules allow it; however, the TRM needs reliable studies in near-term Tri2. The total budget calculation multiplies the budgets and frequencies times 7 Utilities. Substantial savings can be achieved if some evaluations are conducted jointly across multiple Utilities.
5	Impact	State Program Impact Evaluations, Non-Commercial, each program	VH	EST	5	1	$300	$1,500		11%	State Program Impact Evaluations, Non-commercial, each program (5 Non-Commercial). Conducted once per 3 years for all programs in Tri2.
6	Impact	State Program Impact Evaluations, Commercial, each program	VH	EST	1	1	$950	$950		7%	State Program Impact Evaluations, Commercial, each program. Conducted once per 3 years for all programs in Tri2.
7	Topics	Emerging Issues and Pilot Studies	VH	EST	1	1	$1,250	$1,250		9%	Emerging Issues and Pilot studies, with specific issues to be determined in Evaluation Studies List updates. State total budget.
8	Potential	Goal-setting and Potential Studies	VH	EST	1	1	$625	$625		5%	Goal-setting and potential studies. Conducted once per triennium. Full studies, started early enough for robust review.
9	NJCT	Incremental Measure Cost ("IMC"), Phase 2	VH	EST	1	1	$600	$600		4%	Incremental Measure Cost, (IMC), Phase 2, including primary and related prioritized research. Detailed study is conducted in Tri2 and followed by large studies every other Triennium, with smaller updates between, partly through automated inflation factors and partly new research and literature reviews.
10	Decarb	Building Decarbonization and Greenhouse Gas ("GHG") / Framework, barriers to electrification, effects of gas measure incentives.	VH	EST	1	1	$575	$575		4%	Building Decarbonization, Greenhouse Gas ("GHG") Framework study/studies, including barriers to electrification, effects of gas measure incentives and other topics. One study on the topic is being conducted in Tri1, but this issue will continue to mature into Tri2. Additional studies are assumed to use phased approach on priority topics.

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11	TRM	Triennial Technical Reference Manual (“TRM”)	H	EST	1	1	$400	$400		3%	Triennial Technical Reference Manual (“TRM”). Combination of literature review, NJ research, primary inputs, and other sources, reviewing all entries in the TRM comprehensively. Conducted once every triennium to support development of 3-year planning needs.
12	TRM	TRM Annual Updates	H	EST	1	2	$150	$300		2%	TRM (Annual). Annual updates to update the Triennial TRM. This includes updates from multiple primary and secondary sources, including NJ impact, process, and other evaluations as they become available.
13	NTG	Net-to-Gross (“NTG”) (Comprehensive 3rd year)	H	EST & U	1	1	$400	$400		3%	Net-To-Gross (“NTG”) Study (comprehensive 3-year evaluation). Across all measures / end-uses / delivery channels, the study reviews and recommends NTG values from primary state work, NJ Utility numbers, review of studies, and TRMs elsewhere. Recommendations are integrated into the TRM.
14	NTG	NTG Annual Updates	H	EST & U	2	1	$275	$550		4%	NTG Annual Updates. Study conducts research on prioritized subsets of various prioritized programs in turn throughout each year to update the NTG values, which are integrated into the TRM.
15	Baseline	Residential Baseline/Residential Appliance Saturation Survey (“RASS”)	H	EST	1	1	$700	$700		5%	Residential Baseline/Residential Appliance Saturation Survey (“RASS”). Conducted once per triennium to support goals, potential, planning, market and baseline information needs. Depending on the completion date and amount of Utility data that are integrated into Tri1 RASS, this might be an update; more likely it will be a full study.
16	TRM	TRM Follow-up Studies on Priority Needs	H	EST	8	1	$90	$720		5%	Follow-up TRM Input Studies on Priority Needs. Multiple prioritized topics identified by Triennial TRM study & TRM Committee, gaps, NJ needs
17	Baseline	New Construction Baseline, and Code Compliance / Industry standard practice (“ISP”)	MH	EST	1	1	$575	$575		4%	New Construction Baseline and Code Compliance / Industry Standard Practice (“ISP”) study. This study of this important sector is conducted once per triennium, covering one or more sectors (e.g., residential, commercial, multifamily).
18	Baseline	ISP Studies on Prioritized sectors	MH	EST	2	1	$80	$160		1%	ISP studies, conducted on multiple prioritized programs or measures, and sectors. These studies are important to provide defensible baselines for measures / end uses in each sector.

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19	Decarb	State Building Decarb/Electrification Program Impacts	MH	EST	2	1	$300	$600		4%	State Building Decarbonization/Electrification Program Impacts Study. It is assumed that two main sectors will be studied during Tri2. The evaluations will require special evaluation methods related to the application of different metrics (CO2, etc.). The budget assumes one study per sector in Tri2.
20	Decarb	Utility Building Decarb/Electrification Program Impacts	MH	EST, O	7	1	$225	$1,575	2%		Utility Building Decarbonization/Electrification Program Impacts Studies. The budget computations assumed that all Utilities will undertake programs during Tri2.
21	Decarb	Heat Pump Pilot Project Evaluation	MH	EST, O	2	1	$350	$700			Heat Pump Pilot Project Evaluation. Pilot study is underway at Rockland Electric Company ("RECO"). The budget assumes an evaluation of that pilot will be conducted first. Other Utilities may adopt aspects of the pilot. The budget assumes that the evaluation of the pilots will then be conducted as a joint project, for a total of 2 evaluations in this triennium.
22	Equity	Statewide Equity Investigations (Residential & Commercial)	M	EST, R	1	1	$550	$550		4%	Statewide Equity Investigation / Studies. This investigation will incorporate work on approaches for hard-to-reach, vulnerable, or arrears customers, and the study will address non-participant equity analyses for the residential and commercial sectors. Savings may or may not be claimed for these initiatives, but they are considered EE-related and are included in this Evaluation List and Plan.
23	Equity	Education, Workforce Initiatives Evaluation	M	EST, R	1	1	$350	$350		3%	Education, Workforce Initiatives Evaluation. Savings may or may not be claimed but these efforts are considered under the EE umbrella. In addition, the Inflation Reduction Act will provide funds for these efforts, so to the extent that they are new or revised EE programs, this evaluation will be a priority. The budget assumes one statewide study will be conducted during Tri2.
24	NJCT	New Jersey Cost Test ("NJCT") Input Studies: Non-Energy Impacts / Non-Energy Benefits ("NEIs"/"NEBs") - Economic impacts and Other Prioritized Topics	M	EST, R, SWE	1	1	$300	$300		2%	Non-Energy Impacts / Non-Energy Benefits ("NEIs/NEBs") study of economic and jobs impacts of EE programs and other prioritized topics. The NEIs/NEBs studies are inputs to the NJCT updates. This topic was one specifically prioritized in the NJCT recommendations.

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25	NJCT	NJCT Input Studies: NEIs/NEBs – Health & Safety (Prioritized Topic)	M	EST, R	1	1	$300	$300		2%	NEIs/NEBs studies to be conducted on participant and/or societal health and safety impacts. The NEI /NEB studies are inputs to the NJCT updates. This topic was prioritized in NJCT Committee discussions.
26	NJCT	NJCT Input Studies: Prioritized Topics	M	EST, O	5	1	$150	$750		6%	Follow-up NJCT input studies to be conducted on topics prioritized by the NJCT Committee.
27	TRM	TRM input study: Estimated Useful Lifetimes ("EUL") / Measure Lifetimes and Remaining Useful Lifetimes ("RUL")	M	EST	3	1	$100	$300		2%	Measure Lifetimes, Estimated Useful Lifetime / Remaining Useful Lifetime studies to be conducted on priority sectors and measures. Existing values in the TRM are based on aged studies, and many lack RUL information needed for early replacement programs.
28	Avoided Cost	Avoided Cost - State and Utility efforts on this topic are not included in the EE Evaluation Studies List, but are assumed to be carried out with Generation Avoided Cost computations		EST, O	0	0	$0	$0		0%	Avoided Cost - State and Utility efforts. These studies are important, but are often considered outside the realm of the EE programs, as the computations are commonly conducted with generation projects. It is vital these studies be sufficiently funded, and it may be suitable to have participation by evaluation staff, partly to monitor inclusion of evaluation study results into the calculations and updated NJCT. Assumed to be part of the filings, but not part of EE evaluation.

2. Resulting Evaluation Studies Budget and Breakdown by Sector, Topics, and State/Utility

The tables below identify the following:

- The percent of budget by sector and by Utility vs. State budgets.
- The number of studies and their budgets by evaluation topic area, and the percent of total represented.
    - Budgets are about 40% residential and 50% commercial when State and Utility budgets are combined.
    - Regarding topic areas, process and impact studies are 87% of the budgets. Impact study results are key contributors to TRM updates, and the combined TRM-related studies represent about 70% of the budget.

Table 2 below shows the budget breakdown by sector and evaluation topics.

Table 2: Budgets by Type of Evaluation Study

Program Sectors	Percent of Total	Total ($ millions)	Utility ($ millions)	State ($ millions)
Total Evaluation List	100%	$91.2	$76.2	$15.1
Residential Studies	39%	$35.9	$32.1	$3.8
Commercial Studies	49%	$44.7	$43.4	$1.4
Cross-Sector Studies	8%	$6.9	$0.0	$6.9
New Construction	3%	$2.8	$0.7	$2.1
Other Studies	0%	$0.9	$0.0	$0.9
Evaluation Study Topics	**Percent of Total Budget**	**Budget ($ millions)**	**Utility ($ millions)**	**State ($ millions)**
Baseline	2%	$1.4		$1.4
Decarb	4%	$3.5		$3.5
Equity	1%	$0.9		$0.9
Impact	65%	$59.3	$57.4	$1.9
NJCT	2%	$2.0		$2.0
NTG	1%	$1.0		$1.0
Potential	1%	$0.6		$0.6
Process	22%	$19.6	$18.8	$0.8
Topics	1%	$1.3		$1.3
TRM	2%	$1.7		$1.7
Grand Total	100%	$91.2	$76.2	$15.1

Table 3 below shows estimates of the evaluation study budget allocation between State and Utility consultants.

Table 3: Estimated Budgets for Utility and State Evaluators

Evaluators	3 Year Budget
Utility Contractors (millions, 3-year)	$76.3
EST/ State (millions, 3-year)	$13.8
RGBC / State (millions, 3-year)	$1.2
Total	$91.2

The budget computations are based on assumptions about the approximate number of programs that the State and Utilities will run and evaluate – namely six State programs (including about one-third targeted to the C&I sector) and 18 Utility programs (including two run only by EDCs).

Although the Utilities' proposed and approved budgets will not be known for some time, based on a high-level review, the current estimated budgets are generally in line with industry standards relative to EE program budgets. Also note that the budget computations and resulting funding needs are directly sensitive to whether all evaluations are conducted independently or whether some evaluations are conducted jointly. Joint studies would result in economies of scale and larger sample sizes, which can be advantageous to the evaluations.