REV Demonstration Project Implementation Plan

Clean Virtual Power Plant

Date: December 11, 2015

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Executive Summary

This document is the Project Implementation Plan for Con Edison's Clean Virtual Power Plant (VPP) Reforming the Energy Vision (REV) Demonstration Project (Project). It sets forth the demonstration design, roles and responsibilities, work plan and budget, and reporting plan.

The Project outline, dated July 1, 2015, was assessed by the Department of Public Service (DPS) Staff (Staff) to be in compliance with the Ordering Clause 4 of the Commission's Order Adopting Regulatory Policy Framework and Implementation Plan, issued and effective February 26, 2015. This document provides the implementation plan for the approved Project outline. It is a living document and may be updated during Project execution due to new discoveries. Test hypotheses, population, and scenarios, while based on market analysis and estimation, may change over the course of the demonstration, requiring updates to the scope, schedules, and costs of the Project.

Con Edison, in partnership with SunPower, will execute the Project. It is designed to examine how stored Distributed Energy Resources (DERs) can be aggregated and leveraged to enable:

- Customer resiliency capability during periods of power outages
- Maximization of DERs as assets for transmission and distribution systems
- Reduction in costly future transmission and distribution capital investments

The Project will be executed in three phases:

Phase 0:	Project Planning
Phase 1:	Installation of Residential Solar and integrated Energy Storage Systems
Phase 2**:**	Demonstrate system control through Con Edison's control center applications
Phase 3:	Test market Participation and Rate Design

Pairing energy storage with solar has the potential to provide answers to critical questions for the future development of a robust Distributed Service Platform (DSP) with integrated DERs. Upon completion of the Project, Con Edison, in partnership with SunPower, will be able to use knowledge gained from the Project to help answer some of these questions, including:

- What is the Market potential for residential storage, factoring in resiliency and dispatch payment value, in particular:
  - Customers' willingness to pay for backup power from their solar systems
  - Opportunities for monetizing aggregated stored dispatchable energy as a Clean VPP into competitive markets (e.g., capacity, energy, reserves, regulation, demand response, etc.)
- What rate design changes will incentivize customers to optimize load profiles, which will provide distribution level benefits

As this Project goes into implementation, the key REV Demonstration principles examined are:

- Identifying a market solution to a utility-identified problem
- Creating a competitive and open market for grid services
- Deploying advanced distribution systems
- Informing pricing and rate design
- Delineating the economic value split among stakeholders
- Capitalizing on the opportunity to work with residential customers

Section 1: Demonstration Design

The Project is a three-phased demonstration. The phases are incremental and may occur in parallel or overlap. This section will detail the hypotheses being evaluated, the populations targeted, and the scenarios being evaluated. Checkpoints, detailed in Section 1D, will be utilized to monitor and inform progress. Throughout the phases and scenarios, the benefits of aggregated DERs will be continuously evaluated in order to inform future rate design and the development of a future DSP, specifically: a) measuring the value customers place on battery backup; b) testing the ability to dispatch several hundred DERs either independently or as a singular "virtual" unit; c) assessing the ability to manage a customer's load profile autonomously to optimize savings against more sophisticated rate designs; and d) estimating the potential value streams from existing markets (capacity, energy, reserves, regulation, DR) or future distribution-level markets.

Phase 0 will encompass implementation plan development and finalization of the partnership with SunPower. Phase 0 will conclude with plan approval by Staff and contract finalization between Con Edison and SunPower.

In Phase 1, SunPower, as an energy services provider (ESP), will market integrated solar and energy storage systems through the value proposition of resiliency services. SunPower will target single-family residential homeowners within Con Edison's territory. Phase 1 will be complete when SunPower delivers 1.8 MW of storage inverter power capacity to customers. Phase 1 will test customers' willingness to pay for resiliency and the knowledge created during the phase will inform ESPs on future dispatch payments required in addition to earned resiliency payment to enable Clean VPPs. In line with the future concept that an ESP will earn resiliency payments to offset the cost of battery and required dispatch payment requirements, SunPower will retain all resiliency payments during this Project. Contractual arrangements will be designed capture the value of the resiliency payments to lower the Project's cost. Con Edison will not earn revenue on the resiliency payments.

Phase 2 will focus on establishing the communication and control platform between Con Edison and SunPower necessary to operate the integrated energy storage systems, either independently or in aggregate, and evaluate their performance under a variety of different scenarios.

In Phase 3, Con Edison will investigate and test methods for optimizing dispatch. There is currently no existing process to do so. Con Edison will also evaluate the various existing market opportunities to monetize the wholesale market benefits of the VPP (i.e., capacity, energy, demand response, reserves, and frequency regulation) as well as identifying future opportunities to capture value that evolve over time through the Track Two process. In addition, alternative residential rate design use cases (e.g., demand, TOU) and dispatch options will be explored to examine optimal utilization of the solar and storage system for each use case.

A) Test Statements

The Project is designed to demonstrate the benefits of aggregating residential solar and storage systems for energy users/consumers, ESPs, utilities, and transmission and distribution systems. While the goal is to provide customers with additional options for backup power and to inform future DSP functionality and rate design, various hypotheses (listed in Table 1-A-1) will be tested, analyzed, and reported on to determine how best to achieve the Project's goals. The hypotheses are based on estimates and analysis and are expected to be proved-out by Project completion.

Hypotheses 1a and 1b will focus on determining the market for battery storage tied to solar photovoltaic (PV) systems, testing both the level of customer interest and the monthly lease fee price point. The growth of installed solar PV in Con Edison's territory indicates customer interest in alternative sources of energy. Recent severe weather events have heightened customers' interest in resiliency. Con Edison and SunPower hypothesize that a sub-set of customers will desire resiliency capability tied to their solar systems but will not need to use the capability frequently, creating a potential for a market in aggregating the unused storage capacity. Most solar PV systems do not provide power during grid outages and resiliency tied to battery storage can add significant cost to a solar PV system. This Project will examine if customers are interested in gaining resiliency during grid outages through monthly payments to an ESP.

Hypothesis 2a will focus on assessing if battery storage of solar can be aggregated and dispatched as a VPP in accordance with the dispatch requirements of a competitive wholesale market, current or future. Concurrent with the expansion of solar PV in Con Edison's territory and the increasing potential for aggregating stored capacity, there is a growing understanding that storage capacity has value in the competitive markets as well as to parties engaged in transforming the marketplace. Con Edison will coordinate with the New York Independent System Operator (NYISO) to evaluate rules and/or protocols for participation of the VPP in the existing wholesale market. This Project does not propose to actually participate in a competitive market, but rather demonstrate the capability to participate.

Finally, Hypothesis 3a will assess if the benefits prove out, whether there will be potential added cost savings for participating customers and ESPs. Taking into account customer resiliency payments and the potential revenue from dispatch payments in a competitive market, analysis will be able to predict when a third-party market will become viable as the cost of storage systems decline.

Table 1-A-1: Implementation Hypothesis

Test Statement	Hypothesis
We believe… residential customers installing new PV systems are willing to pay an extra monthly fee to have access to the solar energy during a grid outage.	**If…** customers want to use their solar energy during a grid outage at a low cost to them, **Then…**they will be willing to have a battery storage system installed on their property that is integrated with their solar system and controlled by a third party when the grid is online. (1a) **Then…** they will be willing to pay a low monthly resiliency payment for full access to the battery during a grid outage. **Then…** a price point that is most effective in the marketplace can be identified. (1b)
We believe… residential batteries, aggregated to work as a reliable, dispatchable energy resource, can provide grid benefits that can be monetized in a market.	**If…** battery storage of solar can be aggregated for dispatch reliably and effectively as a Clean VPP, **Then…**firm dispatchability captured by a VPP can be aggregated and sold in the wholesale market or DSP. (2a)
We believe… residential resiliency payments coupled with dispatchability payments from the market, along with the declining capital costs of battery systems, will lead to a market that incentivizes third-party participation.	**If…** we know what residential customers are willing to pay for added resiliency and the VPP can successfully participate in a market at a known price per kWh, **Then…** we will be able to project when a viable third-party market can be established as the cost of battery systems declines. (3a)

B) Test Population

The Project test populations (see Table 1-B-1) vary in Phases 1 and 3. In Phases 0 and 2, there will be no test populations due to the focused nature of the Phases. Phase 0 is a planning phase, and Phase 2 will focus on demonstrating the ability to dispatch the capacity reliably via electronic communication.

Phase 1 – Installation of Residential Systems will focus on single-family residential homeowners residing within Con Edison's service territory. SunPower will use proprietary customer selection methods to maximize participation rates and solar PV and battery installations within this Phase to meet the overall goal. In addition, SunPower, at the conclusion of Phase 1, will provide Con Edison with a project-learning report that will inform decisions on targeting future populations.

Phase 3 – Market Participation will be split into two key activities: 1) evaluating options for dispatching the deployed assets as a Clean VPP to inform future DSP development and 2) conducting rate design use cases to inform transformational rate design. (All rate design use cases will be done via shadow billing, so that there will be no impact on participating customers' utility bills). During the evaluation of rate design use cases, Con Edison will create multiple test populations with varying characteristics in order to evaluate optimum benefits and determine useful customer incentives. The test populations for Phase 3 will be drawn from the Phase 1 participants who installed a solar PV system with integrated storage capability. The test populations and control groups will be determined as Phase 3 begins, once the locations

and size of the population within Con Edison's service zones, and impacts of dispatching stored capacity are known and test scenarios accounting for demographics can be developed. Con Edison will update this Project implementation plan and utilize the quarterly reporting structure (see Section 4A) to update and coordinate with Staff as the Phase 3 test population is refined.

Table 1-B-1: Test Population

Project Phase	Test Population Description	Selection Method
Phase 1: Installation of Residential Solar plus Energy Storage Systems	Single-family residential customers within Con Edison's service territory	• SunPower will use customer segmentation analytics to tailor a targeted marketing and sales approach
Phase 2: **Demonstrate system control through Con Edison's control center applications**	Active customer participants from Phase 1	• Evaluate system integration; ability to aggregate and dispatch capacity as a whole and in varying population groups to be matched to Phase 3 test populations
Phase 3: Market Participation and Rate Design	Active customer participants from Phase 1	• Customers will be divided into test populations based on shadow-billing cases designed to assess and test alternative rate designs • Update on test population breakouts will be provided to the DPS as Phase 3 begins and the customer population is known

C) Test Scenarios

The Project implementation will evaluate multiple test scenarios (see Table 1-C-1) across Phases 1–3. Each Phase will address unique REV demonstration principles.

Phase 1 scenarios will focus on customers' willingness to pay for access to energy storage systems integrated with their solar PV for resiliency during a grid outage. SunPower will develop marketing and sales scenarios based on a Con Edison resiliency program customer offer consisting of two components: i) a monthly resiliency fee price and ii) a defined services subscription term. The scenarios are designed to be dynamic and allow for full exploration of resiliency value for customers.

Phase 2 will consist of a single scenario whereby Con Edison's distribution control centers in coordination with the SunPower and SunVerge control platforms test the ability to safely, reliably, and effectively dispatch aggregated storage capacity.

Phase 3 will have two distinct scenarios—evaluating the potential for Clean VPP participation in competitive markets and rate design analysis. Evaluating Clean VPP participation in competitive

markets will consist of assessing the potential for both: a) bidding the Clean VPP into the established wholesale markets and b) developing and participating in a distribution-level DSP market. Since the DSP is not an established market platform, Con Edison will continually evaluate the latter test scenario potential during the planning for Phase 3 and during Phase 3 execution, reporting changes/updates to scenarios as part of the quarterly reporting process. In the second scenario, Rate Design Analysis, Con Edison, in coordination with SunPower, will develop shadow-billing rate design scenarios targeted at actively participating customers identified in Phase 1, as described in Section 1B. The size of the test populations participating in the rate design use cases will vary based on the profiles of the customers participating in this Project. Once Phase 1 is complete, Con Edison can use the knowledge obtained to design specific scenarios examining the potential for innovative new rate designs. The rate designs and tariffs to be considered include demand, time of use, and demand response, and will be informed by the ongoing work in Track 2. As the test scenarios are developed, Con Edison will provide updates to Staff as part of its quarterly reports and incorporate changes into this living document.

Table 1-C-1: Test Scenarios

Scenario	Description
Examine residential market for energy storage integrated with Solar PV (Phase 1)	Evaluate a residential customer's interest in and willingness to pay for resiliency in order to inform potential for ESPs to participate in a DSP to supplement dispatchability payments from the VPP, making storage economically viable sooner. • SunPower will develop a resiliency marketing and sales offer consisting of: i) a monthly resiliency fee price ii) a defined services subscription term • Evaluate and modify the scenario to adjust for the effectiveness of price and term combinations.
Clean VPP in the Competitive Markets (Phase 3)	Evaluate the ability to bid Clean VPP into energy markets. • Dispatch the Clean VPP to identify the potential value of participating in various competitive markets (e.g., capacity, energy, reserves, regulation, demand response. **and/or** Dispatch the Clean VPP to identify its potential value as a monetized DSP resource.
Rate Design Analysis (Phase 3)	• Evaluate new rate designs.

D) Checkpoints

This Project is a new and innovative demonstration that will be managed by Con Edison in partnership with SunPower. Con Edison and SunPower will establish a Project management team and governance structure (see Section 2B) to review and monitor the Project. Key checkpoints, listed in Table 1-D-1, will highlight milestones for the governance structure to evaluate Project execution and the need for implementation strategy adjustments. While each checkpoint has key metrics tied to it, checkpoints that do not meet expected targets will undergo further analysis to ascertain impacts on the Project and identify root causes. Through the quarterly reports submission, as detailed in Section 4 below, the implementation team will detail checkpoint status, applicable remedies, and strategy modifications. At times, due to the dynamic nature of the demonstration and the intent to test varying hypotheses (see Table 1-A-1), checkpoint targets may occur earlier or later within phases and checkpoint criteria may adjust up or down based on customer and market partner reactions to the marketplace and operational risk. Operational risk can include changing economic dynamics and the outcomes of REV proceedings.

Table 1-D-1: Checkpoints

Checkpoint	Description
Residential Design and Installation (Phase 1)	**Measure:** Installed and commissioned inverter storage capacity with varying resiliency payment scenarios to find optimum marketplace price point **When** Phase 1 Midpoint Phase 1 Completion **How:** SunPower will provide a monthly commissioning report confidentially to Con Edison **Expected Target:** 1.8MW of installed inverter power at Phase 1 completion **Impact**: Phase 2 delayed; may demonstrate hypotheses 1a and 1b do not hold true **Solutions/Strategies in case results are below expectations**: SunPower will continually evaluate progress and adjust for the effectiveness of price and term combinations to meet target.

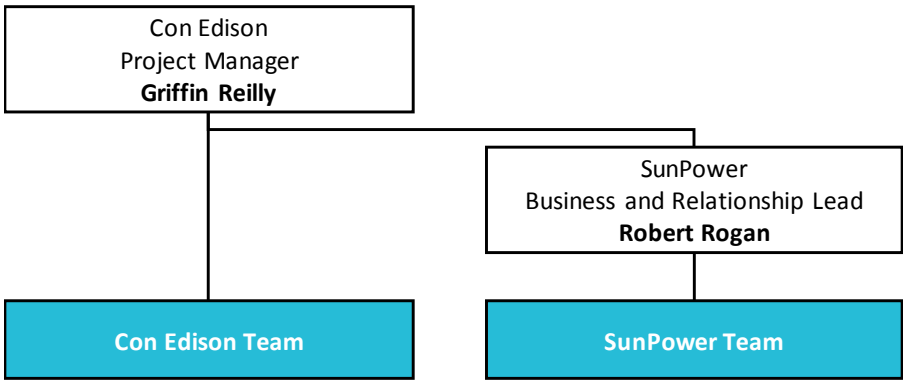
Checkpoint	Description
Demonstrate system control through Con Edison's control center applications **(Phase 2)**	**Measure:** Ability to dispatch the Clean VPP directly from Con Edison's Distribution Control Centers in a cyber secure, safe and reliable manner. **When:** Phase 1 End; Phase 2 Midpoint; Phase 2 End **How:** System Integration and Dispatch performance metrics **Expected Target:** Phase 1 End: SunPower demonstrates aggregation and dispatchability of storage capacity Phase 2 Midpoint: Con Edison demonstrates reliable control of the system with appropriate cybersecurity protocols in place). Phase 2 End: Con Edison demonstrates ability to control and dispatch VPP from Distribution Control Centers. **Impact**: An unreliable, sub-performing dispatch of aggregated stored capacity will disprove hypothesis 3a and negatively impact hypothesis 2a. **Solutions/Strategies in case results are below expectations**: In-line with root-cause analysis, actions may include systems upgrades at added cost, modified systems integration, and/or process review.
Market Participation and Rate Design (Phase 3)	**Measure:** Ability to dispatch Clean VPP aligned with market rules **When:** Phase 3: After one quarter, each quarter until project end **How**: System Integration and Dispatch performance metrics **Expected Result: Either** • Ability to dispatch Clean VPP in accordance with various competitive market participation requirements (i.e., capacity, energy, reserves, regulation, demand response, etc.) **or** • Ability to bid into a DSP **Impact**: An inability to demonstrate revenue potential during this demonstration will disprove hypothesis 3a. **Solutions/Strategies in case results are below expectations**: The Con Edison and SunPower Project management teams and system experts will assess and analyze revenue generation efforts, determine root cause, and take effective action to resolve and inform the Commission on resolution potential or roadblocks to DSP.

Section 2: Project Structure and Governance

A) Project Team

The Project is a partnership between Con Edison and SunPower. Each partner will provide key skillsets and be responsible for certain Project functions in order to execute a successful demonstration project. Con Edison will maintain overall responsibility for Project execution; SunPower is a key contributing partner. The high-level Project team makeup and alignment are depicted in Figure 2-A-1.

Figure 2-A-1: Team Leadership/Organization



Con Edison will facilitate interaction through its existing commercial customers and apply skillsets of its team (Table 2-A-1) aligned with its roles and knowledgebase as a utility, to the Project. Con Edison's Project manager will have overall responsibility for the success of the Project and will plan, coordinate, and manage activities for the scope and duration of the demonstration.

Table 2-A-1: Utility and Partner Skillsets

Con Edison Team Key Skillsets	SunPower Team Key Skillsets
• Program Management • Marketing • Distributed Resources • Information Resources (IR) • Customer Outreach and Community Engagement • Legal • Customer Support	• Sales and Marketing • Project Management • Channel Operations • Engineering • Solar Technology • Storage Technology • Project Finance • Contracting/Financing • Storage Operations and Maintenance • Customer Service

SunPower designs and installs solar PV in both residential and commercial settings. It has a long history of partnering with utilities in expanding DER awareness and introducing DERs into the grid. SunPower will provide its skills and knowledge in solar PV and energy storage, matching its product to the market and ability to engage customers. SunPower's Business and Relationship Lead will have overall responsibility to coordinate and align its efforts within this implementation plan and coordinate with third parties, including Sunverge, an expert in energy storage.

B) Project Staffing

Con Edison has created a REV demonstration program team within its Distributed Resource Integration and Planning department dedicated to identifying, developing, and implementing new projects related to REV. From this team, a Project manager has been identified to lead the Project. In addition, Con Edison will provide the necessary internal and external resources in key areas (e.g., marketing, information resources, legal, procurement, and engineering) to augment and support demonstration activities and objectives. Con Edison's team members are listed in Table 2-B-1 along with their functional areas and current duty titles.

Table 2-B-1: Con Edison's Project Team

Team Member	Title	Functional Area
Griffin Reilly*	Project Manager, Clean VPP	REV Project Management
Jamie Brennan	Director, Demonstration Projects	Project Governance
Chris Raup	Program Manager, Demonstration Projects	Project Oversight (REV Demonstration Program)
Andy Bishun	Manager, DRI Project Management Office	Project Controls
*Project Leader		

* As part of one of the largest residential utility providers in the country, Con Edison's Project team has access to more than 13,000 employees, representing a full complement of skills necessary to run the day-to-day operations of the Company. Additional Project team members will be identified and recruited as necessary during the course of Project execution.

SunPower is a committed partner for the Project. SunPower's Director of Business Development will lead SunPower's management and integration of SunPower's activities into the overall Project scope and plan. In addition, SunPower and its partner, Sunverge, will provide the Company with functional expertise (e.g., product marketing, operations and maintenance, and engineering and design) to execute demonstration tasks and activities. Table 2-B-2 is a list of key individuals from SunPower and its battery storage partner, Sunverge, who, along with their respective teams, will support this demonstration.

Table 2-B-2: SunPower's Project Team

Team Member	Title	Functional Area
Robert Rogan*	Director, Business Development, SunPower	Business and Relationship (Clean VPP)
Yi Wang	Principal Associate, Business Development, Smart Energy, SunPower	Business and Relationship (Clean VPP)
Steve Wolford	VP Product, Sunverge Energy, Inc.	Storage Product Engineering
Dave Hebert	Director of Business Development East, Sunverge Energy, Inc.	Storage Project Management (Clean VPP)
* Team Leader		

C) Roles and Responsibilities

The Project team has developed a work plan (Table 3-A-1) with specific tasks and activities aligned to the Project timeline and overall success. The breakdown of roles and responsibilities is provided in this section.

Phase 0 – Demonstration Planning

The initial stages of the demonstration will be focused on obtaining implementation approval from Staff and finalizing the agreements between Con Edison and SunPower.

Table 2-C-1: Phase 0 – Roles and Responsibilities

Lead Responsibilities	Con Edison	SunPower
Partnership Agreement		
Con Edison will enter into an agreement with SunPower to delineate roles and responsibilities with respect to the Clean VPP REV Demonstration execution.	X	
Homeowner Contract Development		
SunPower will develop the homeowner contract with respect to installing storage capacity and resiliency payments.		X
Con Edison will support SunPower's contract development efforts.	X	

Phase 1 – Installation of Residential Systems

SunPower will be responsible for installing and commissioning 1.8MW of total storage inverter capacity at the residences of participating customers. It will also be responsible for customer engagement, sales, and marketing. Phase 1 will be complete upon SunPower's demonstrated control of the deployed assets, both individually and in aggregate.

Table 2-C-2: Phase 1 – Roles and Responsibilities

Lead Responsibilities	Con Edison	SunPower
Customer Engagement		
SunPower will work with its channel partners to tailor a sales approach using a set of analytical tools to create a customized solar plus storage proposal.		X
Con Edison will provide marketing support to SunPower's customer engagement efforts.	X	
Supply Chain Management		
SunPower will conduct supply chain planning to meet the Project's execution timeline.		X
Installation and Commission		
SunPower through its channel partners will deliver 1.8MW of inverter storage capability to Con Edison at the completion of Phase 1.		X
Engineering and Design		
SunPower and its partner Sunverge will lead the solar PV and storage engineering design and ensure the capability to establish a link to storage capacity and demonstrate dispatchability.		X

Phase 2 – Demonstrate system control through Con Edison's control center applications

In Phase 2, Con Edison will link its distribution control centers with Sunverge's control platform and demonstrate the ability to dispatch the deployed assets, individually or collectively as a VPP.

Table 2-C-3: Phase 2 – Roles and Responsibilities

Lead Responsibilities	Con Edison	SunPower
Cybersecurity		
Con Edison will define the requirements.	X	
SunPower will ensure systems adhere to Con Edison's requirements.		X
System Engineering		
Con Edison will lead the integration of the distribution control centers to SunPower's and Sunverge's operation systems.	X	
SunPower will design and build protocol translators for interfacing between the control systems.		X
Dispatch Testing		
SunPower is responsible for interoperability with storage batteries.		X
Con Edison is responsible for integrating with SunPower and executing testing to demonstrate system reliability.	X	

Phase 3 – Market Participation and Rate Design
In Phase 3, Con Edison will continue evaluating system and dispatch reliability of Clean VPP, explore market options best suited for Clean VPP participation, and test alternative residential rate designs through various use cases.

Table 2-C-4: Phase 3 – Roles and Responsibilities

Lead Responsibilities	Con Edison	SunPower
Residential Rate Use Case Development Testing		
Con Edison will lead the development, design, and analysis of rate design, execution, and testing.	X	
SunPower will support efforts and facilitate battery dispatch, data collection, and analysis.		X
Market Participation		
Con Edison will lead exploration of opportunities for Clean VPP participation in existing and future competitive markets.	X	
SunPower will support efforts relating to battery dispatch.		X

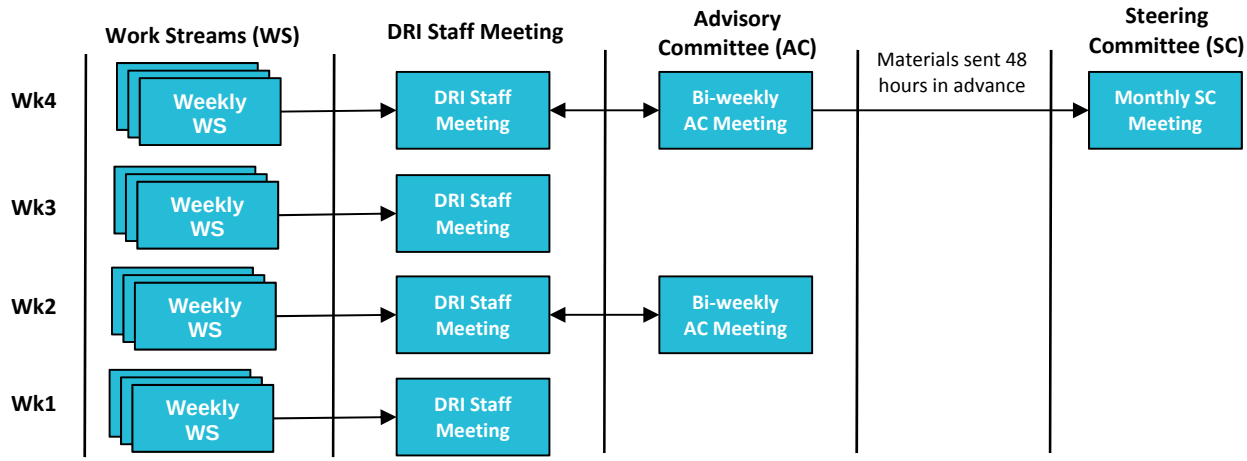
D) Governance

Con Edison will have overall responsibility for execution of the Project. It has put in place a governance structure detailed in the section below. The governance structure will encompass the Project management team, detailed in Sections 2A and 2B and depicted in Figure 2-A-1. The management team will have day-to-day execution responsibility for managing the Project, coordinating tasks and activities, and conducting overall Project management. The team will continuously coordinate activities throughout the Project. Team meetings will be held in-person, via conference calls, WebEx, or other communication means. The Project team will be responsible for coordination and execution of quarterly reports.

Utility Governance Structure

The Con Edison governance structure will consist of its dedicated Demonstration Projects department with REV initiative oversight, a cross-functional advisory committee, and a senior executive leadership steering committee. The governance structure will ensure senior leadership is fully engaged, appropriate internal stakeholders are engaged, and outcomes and Project executions are tracked. Con Edison will manage the process as depicted in Figure 2-D-1.

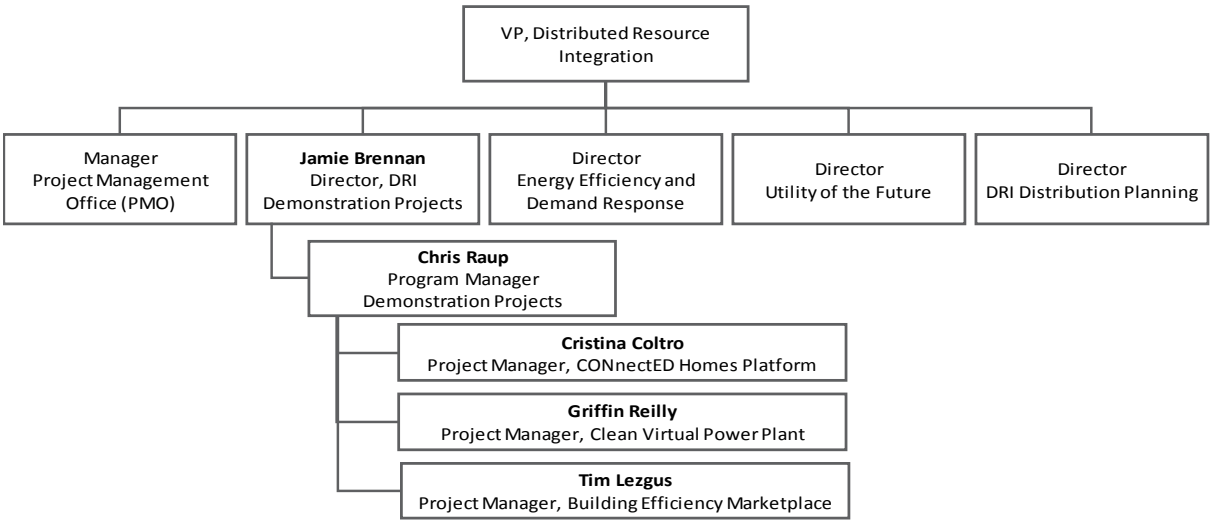
Figure 2-D-1: Con Edison's REV Demonstration Governance Process



Work Streams (WS)	**Purpose:** To discuss status and document issues and actions of individual WS • PMO leads will review status reports with WS leads through collaboration or face to face as needed • Issues/actions requiring escalation will be identified and documented • Outcomes will inform DRI Staff of progress/issues
DRI Staff Meeting	**Purpose:** To consolidate and formalize WS input, prepare for presentation to AC and SC, and debrief AC/SC meetings • Led by VP (DRI) and includes PMO department manager and WS leads, as invited • Serves as "glue" that connects the WS with AC and SC
Advisory Committee (AC)	**Purpose:** To review consolidated list of WS issues, provide guidance/resources as needed, and prepare material for SC review • Facilitated and led by VP (DRI), includes all AC members • Agenda will include status updates from each WS, discussion on issues for resolution, and review of SC presentation materials (as appropriate)
Steering Committee (SC)	**Purpose:** To provide project status and present issues and deliverables for SC decision/approval • Facilitated and led by VP (DRI) • Strategic/policy decisions will be made • Meeting materials will include completed analysis, implications of analysis, specific decision/approval request, sign-off by all reviewers on request, and documentation of dissenting opinions (as applicable)

The Project manager is under the Director, Demonstration Projects, who reports to Con Edison's Vice President (VP) for Distributed Resource Integration (DRI). The DRI organization (Figure 2-D-2), formed in May 2015, is a proactive response to the evolving energy distribution markets in New York. This new department is deemed critical by Con Edison to address customers' needs, move forward on REV, and adapt to the changing energy environment. DRI integrates infrastructure planning, innovative technical options, energy efficiency, and creative solutions to ensure continued reliability while serving customers in the future. All the elements of Con Edison's REV initiatives report to the VP of DRI—the Utility of the Future and Energy Efficiency/Demand Response, Resource Planning, Distributed Generation, and Demonstration Project teams.

Figure 2-D-2: Con Edison's Distributed Resource Integration and Planning Department



The VP of DRI will hold weekly staff meetings to review the progress of each REV-related work stream in order to provide oversight and resolve critical issues as they arise. All teams with REV-related initiatives, including each demonstration Project team, will provide weekly updates, highlighting progress made and escalating issues that require support from the organization, to address resource needs, changes in scope, or externalities that might impact the Project.

The Advisory Committee is made up of leaders from Con Edison's functional areas—Information Resources, Corporate Accounting, Corporate Strategy, Corporate Communications, Engineering and Planning, Energy Policy and Regulatory Affairs, Government Relations, and Customer Operations. These areas will be impacted by, or will need to provide resources to support, REV initiatives. This committee will provide guidance and input on strategic priorities, policy, and decisions; review REV project schedules and deliverables to ensure alignment of business unit priorities; secure resources to support REV work streams; resolve cross-functional issues with peers; serve as a champion for REV priorities within the respective business unit; and make decisions as delegated by the Steering Committee.

The Steering Committee consists of key members from Con Edison's senior executive leadership team. The role of the Steering Committee is to set strategic priorities for Con Edison with respect to REV, make critical policy and strategic decisions, set the standard for REV-related deliverables, and approve overall resourcing of the effort. Con Edison's senior leaders will have full visibility on REV demonstrations.

Partner Governance Structure

SunPower, as a partner to Con Edison, will enter into a contractual arrangement with Con Edison to provide services to execute the Project. The Director, Business Development, for SunPower is SunPower's Project team lead. The governance structure follows SunPower's internal project management oversight model.

Section 3: Work Plan and Budget

A) Project Plan

Con Edison in partnership with SunPower will implement the Project in three phases. Within each Phase are associated tasks and activities, which will be tracked and managed by the Project management team and reported on to the Commission and Staff. Table 3-A-1 details the phases, tasks, associated activity, and first level of sub-activity. The implementation plan's work plan and budget are part of this living document. Start and end periods of each task and activity may occur earlier or later in the schedule due to various inputs and risks which include, but are not limited to, customer feedback, customer participation, and systems integration. The key milestones for this Project align with the completion of each phase, meeting the checkpoints within the stage and demonstrating Phase success. Milestones are noted in red in Table 3-A-1 and defined within the definition table, Table 3-A-1. Con Edison, together with SunPower, will monitor progress and milestones through various checkpoints, as discussed in Section 1, Demonstration Design and will report to the Commission quarterly. Reporting will conform with the Commission's direction and with Section 4-A of this document, Reporting Expectations.

The budget estimates provided in Table 3-A-1 represent calculated estimates over the course of the Project and are not adjusted for inflation. Changing budget estimates will be reflected in the quarterly reports to the Commission.

Table 3-A-1: Work Plan

Activity No.	Activity Description	Lead	2015		2016				2017				2018			
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.0	**Phase 0 - Demonstration Planning**															
1.1	**Project Management**	**Con Edison/Sunpower**														
1.1.1	Obtain Commission Approval	Con Edison														
1.1.2	Finalize Contracts	Con Edison														
1.1.2.1	Refine Scope of Work	Sunpower														
1.1.2.2	Draft Partnership Contract	Con Edison														
1.1.2.3	Draft Homeowner Contract	Sunpower														
2.0	**Phase1 - Installation of Solar plus Battery Storage**															
2.1	**Project Management**	**Con Edison**														
2.2	**Customer Engagement**	Sunpower														
2.2.1	Marketing	Sunpower														
2.2.2	Sales	Sunpower														
2.2.3	Customer Acquisition	Sunpower				#										
2.2	**Financing**	**Sunpower**														
2.2.1	Arrangement for coupling storage to solar financings	Sunpower														
2.2.1.1	**Supply Chain**	Sunpower														
2.2.1.2	Supply chain planning	Sunpower														
2.2.1.3	**Design and Installation**	Sunpower														
2.2.1.4	Engineering and design, including standard critical load	Sunpower														
2.2.3	Solar PV and storage systems installations and commissioning	Sunpower								#						
2.3	**VPP Capacity Demonstration**	**Sunpower**								&						
2.4	**Solar PV and Storage Operations and Maintenance (O&M)**	**Sunpower**														
3.0	**Phase 2 - Demonstrate system control through Con Edison's control center applications**															
3.1	**Project Management**	**Con Edison**														
3.1.1	Evaluate Project Rollout	Con Edison														
3.2	**Storage Control Demonstration**	Con Edison/Sunpower										&				
3.2.1	Upgrade Con Edison's SCADA system	Con Edison														
3.2.2	Set VPP control parameters	Con Edison/Sunpower														
3.2.3	Establish SCADA Link	Con Edison														
3.2.4	Test Dispatch/System Integration	Con Edison/Sunpower														
3.2.5	Assess Risks	Con Edison														
3.3	**Solar PV and storage O&M**	**Sunpower**														
4.0	**Phase 3 - Market Participation and Rate Design**															
4.1	**Project Management**	**Con Edison**														
4.2	**Market Engagement**	**Con Edison**														
4.2.1	Market Analysis	Con Edison														
4.2.1.1	(Option A) Assess Ability to Dispatch into Competitive												%	%	%	%
4.2.1.2	(Option B) Assess Ability to Dispatch into a DSP												+	+	+	+
4.2.1.2.1	Demonstrate DSP Participation Requirements															
4.2.1.2.2	Dispatch In-line with a DSP Program															
4.3	**Rate Design Test**	**Con Edison/Sunpower**														
4.3.1	Use Case Development	Con Edison														
4.3.2	Test Population Development	Con Edison														
4.3.3	Use Case Test Conducted	Con Edison/Sunpower														
4.3.4	Rate Design Analysis	Con Edison														
4.4	**Solar PV and Storage O&M**	**Sunpower**														

MILESTONES

Phase 0: Partnership contract between Con Edison and SunPower complete
Phase 1: SunPower demonstrates aggregation of 1.8MW inverter storage capacity
Phase 2: Con Edison is able to dispatch aggregated Clean VPP
Phase 3: Successfully bid Clean VPP into a competitive market
Complete rate design analysis

CHECKPOINTS:

- Customers purchasing solar PV with storage capacity
& - SunPower and Con Edison system integration
% - Able to dispatch clean VPP IAW market participation requirements
=+ - Able to dispatch clean VPP IAW to DSP

B) Project Budget

Con Edison's Project manager will be responsible for managing and tracking the Project's costs and overall budget. The quarterly report to the Commission will provide budget updates and align with the work plan in Section 3A. SunPower will provide updates to the Project manager for inclusion in the quarterly report.

Project implementation costs will include the energy storage systems, balance of system components, installation and associated operations and maintenance services, fees for development and implementation of the program, operation and maintenance of the VPP, and integration of the VPP into Con Edison's communication and control systems.

This demonstration will examine two main revenue stream potentials. While there is no expectation of actual revenue collection during the demonstration, data will be collected and analyzed to model revenue potential to inform future rate design and the design of the DSP. Changes in Project scope, outcomes of the REV proceedings, and implications of Track Two order or subsequent Commission's orders may impact revenue estimations. At that time, Con Edison will provide an update to this Project Implementation Plan in its the quarterly report updates to the Commission.

Con Edison has petition for permission to recover its costs for this Project through the Monthly Adjustment Clause (MAC) until Project costs can be included in a rate filing; this petition is pending PSC approval. Any revenues from third-party service providers, lenders, and customers that participate in the Project will be credited to ratepayers, although no such revenues are currently anticipated.

Table 3-B-1: Clean VPP Budget

	2015	2016	2017	2018
Expected Cash-Out:	$0.50M	$9.57M	$3.38M	$0.77M
Expected Cash-In:	$0	$0	$0	$0

Section 4: Reporting Structure

A) Reporting Expectations

Quarterly reports will be provided to the Commission during the Project. The reports will provide an update on implementation progress according to the work plan and budget, detailing deviations, and noting task and activity progress. In addition, each quarterly report will capture, to the extent available, key project information, such as in-service dates, incremental costs incurred, operating results, rate design use case results, and market learnings as well as other observed project benefits. The quarterly report template will be as follows:

Figure 4-A-1: Quarterly Report Outline

1.0 Executive Summary
2.0 Demonstration Highlights
- 2.1 Since Previous Quarter
  - 2.1.1 Major Tasks Completion
  - 2.1.2 Activities Overview
  - 2.1.3 Sub-Activities Overview
- 2.2 Next Quarter Forecast
  - 2.2.1 Checkpoints/Milestone Progress
  - 2.2.2 Planned Activities
  - 2.2.3 Expected Changes
- 2.3 Issues

3.0 Work Plan and Budget Review
- 3.1 Phase Review
  - 3.1.1 Activity 1.0
    - Progress Assessment
    - Issues
    - 3.1.1.1 Sub-Activity 1.2
      - Progress Assessment
      - Issues
    - 3.1.1.2 Sub-Activity 1.3
- 3.2 Work Plan

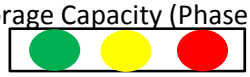
Table 3.2.A – Updated Work Plan
Table 3.2.B – Updated Budget

4.0 Conclusion
- 4.1 Lessons Learned
- 4.2 Recommendations

The quarterly report will focus on the phase(s) occurring within the previous quarter or scheduled to occur within the next two quarters, providing a focus on current progress while providing Staff insight into the near future. The governance structure and program management team will maintain oversight over all Project progress and include in Section 2.3, any impacts on the implementation execution that may extend beyond the report's timeline.

Checkpoint, milestone, and activity progress will provide detailed status information to inform the Commission of implementation progress and highlight issues, such as changes in scope, incremental cost, or shifts in the timeline. A stoplight chart will be used to detail progress for activities in the quarterly reports. Con Edison will provide narrative information to support the progress report. SunPower-related data will be provided confidentially to Staff.

Figure 4-A-2: Checkpoint/Milestone/Activity Progress Example

Checkpoint: Installed and commissioned inverter storage capacity
Target: 1.8MW Inverter Storage Capacity (Phase 1 completion)
Progress Status: 

Budget Impact: (Yes/On-Target/No Impact)
Incremental Cost Incurred: $XXXX incurred due to expanded marketing campaign to increase partner awareness and engagement

Previous Quarter Updates:

Future Quarter Impacts:

The Project management team will maintain frequent contact with Staff to review the quarterly report and respond to follow-up questions.