California Energy Commission

CONSULTANT REPORT

Leveraging Public / Private Partnerships to Accelerate Market Adoption

Lancaster Advanced Energy Community

Prepared for: **California Energy Commission**
Prepared by: **ZNE Alliance**

California Energy Commission

Edmund G. Brown Jr., Governor

October 2017 | CEC-EPC-015-069

California Energy Commission

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ABSTRACT

This paper examines the role of Public/Private Partnerships (PPP) in the context of an Advanced Energy Community seeking to accelerate achievement of Zero Net Energy goals. First, diverse PPP types are assessed from the perspective of value creation and value variability. Strategies for alignment of stakeholder incentives are examined to determine how maximum value and optimum program outcomes can be achieved. Diverse ownership structures are also assessed to determine how to strategically leverage clean energy and mobility assets to maximize revenue and minimize costs. Finally, best practices in information dissemination and consumer engagement are reviewed to equip program designers with the necessary tools for program success. All of the ideas illustrated by decision trees – processes that policy makers and program administrators can leverage in successful program design.

With robust design strategies, Public/Private Partnerships can leverage the best of what each sector has to offer. Public agencies bring knowledge of community needs and the ability to unite diverse stakeholder groups. Private partners bring efficient value propositions, technical knowledge and expertise, and the ability and resources to scale successful programs. Together, they can unlock value creating, scalable and smart programs.

Please use the following citation for this report:

Chipman Jane. ZNE Alliance, 2017. ***Leveraging Public/Private Partnerships to Accelerate Market Adoption.*** California Energy Commission. Publication Number: CEC-EPC-15-069.

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CHAPTER 1: Introduction

Partnerships between public agencies and private firms leverage the best of what each sector has to offer. Public agencies bring knowledge of communities' values and needs, as well as the ability to unite diverse stakeholder groups. Private partners contribute efficient value propositions, technical knowledge and expertise, and the ability and resources to scale successful programs. More and more, utilities and public agencies have looked to leverage the market efficiencies and technologies of private partners in program deployment.

Designing distributed energy resource (DER), Energy Efficiency (EE) or integrated demand side management (IDSM) programs that achieve meaningful scale and market uptake needs to be guided by the context and the specific objectives of the program in question. This paper sets out to define frameworks which allow program creators to capture optimal program outcomes through strategic public/private partnership design. By understanding how program design can best incentivize stakeholders in public private partnerships, program creators can deliver impressive results.

This paper seeks to identify best practices that will enable program designers to better match program outcomes with program structure. By ensuring that the potential for value creation in DER, EE, or IDSM programs is distributed appropriately to program participants, designers can ensure that stakeholders collaborate to optimize program outcomes. Additionally, by choosing an appropriate asset ownership structure, public/private partnerships can leverage additional savings.

Key Stakeholders Discussed

This report assesses public/private partnerships from the perspective of three key actors: public agencies, private partners, and end users. While not every program incorporates all three stakeholder groups, and some serve additional stakeholder types, this categorization provides a structure from which program designers can explore and compare programs. The three stakeholders are defined as follows:

- **Public agencies** include Community Choice Aggregations (CCAs), governments, utilities, air districts, etc. All of these organizations work with or under some sort of public mandate.
- **Private partners** are for-profit or not-for-profit organizations with the capabilities, equipment, and/or technical expertise to support public agency deployments of any kind.

- **End users** are the ultimate recipients of program interventions, such as electric utility customers or clients in public housing. Their level of participation can vary significantly.

While in practice, these three categories can blur and overlap, they serve an important role in creating a strategic framework.

Chapter 2 - Public Private Partnership Operating Models

This paper will explore three program operating models and how performance risk – as well as the opportunity to benefit from program outcomes – is distributed to stakeholders in each model. These models serve as archetypes – simplified structures through which key concepts can be examined. The programmatic models examined are incentives, enrollment, and shared value. This report also explores hybrid programs that combine archetypes. Through an examination of which stakeholders bear performance risk in each archetype, program designers can use program design to incentivize stakeholders to achieve optimal program outcomes. This section concludes with guidance for how program designers can use the framework to select an optimal operating model to achieve program outcomes.

Examination of Value Creation Opportunities

A critical element of this report's analytical framework is the examination of performance risk, the ongoing opportunity for marginal value creation. This concept is akin to the financial definition of risk or volatility, which entails an examination of the potential for upside as well as for downside in program outcomes.

For instance, in the case of an incentive program, a public agency may work with a private partner to provide an end user with a pre-defined incentive for DER installation. The engagement of both the public agency and the private partner typically ends after installation, as neither has any ongoing stake in the DER's performance. The end user reaps all the benefits if the DER performs better than expected. Likewise, if the DER performs worse than expected, only the end user is affected. In this case, all the performance risk resides with the end user, and the end user will therefore be incentivized to optimize DER performance.

Where performance risk is assigned to a particular stakeholder, the underlying strategic "theory of action" is that stakeholders will therefore be *incentivized* to proactively maximize value from the program intervention. If a stakeholder assumes most of the benefits (and risks) associated with an intervention, that stakeholder will be incentivized to do anything possible to maximize the intervention's performance.

Program engagement can take many forms depending on the stakeholder, project objectives and context. Some examples, categorized by stakeholder, are below:

- **Public agency:** Ensuring appropriate site selection; designing rates to incentivize program uptake; providing communication support to customers
- **Private partner:** Ensuring that DER installations are properly installed and receive proper maintenance; educating end users adequately

- **End user:** Regularly checking to ensure that the DER/EE measure is functioning as planned; operating the technology (e.g., a new HVAC system) efficiently

By selecting a program operating model that ensures that value volatility is distributed across stakeholders appropriately, program designers can ensure that stakeholders are incentivized to optimize program outcomes.

Overview of Program Archetypes

Understanding which stakeholders are incentivized for ongoing action is key to aligning incentives properly. The table below summarizes which stakeholders are incentivized by performance risk in each program archetype discussed in this chapter. While these program archetypes, as well as which program objectives they best serve, are discussed later in this chapter, this section serves to give a brief introduction to which stakeholders hold performance risk in each model.

Stakeholders Receiving Marginal Benefits by Operating Model

Key

✓ Impacted by variability in performance and incentivized to engage in ongoing operations

	End users	Private partners	Public agencies
Incentive	✓		
Enrollment		✓	✓
Shared Value	✓	✓	✓

Source: ZNE Alliance analysis, 2017

- **Incentive Programs**: In an incentive program, the end user bears all the performance risk, and thus receives marginal benefits or downsides of variable performance. Public agencies and private partners have a finite role, generally in provided the incentive to the end user, but rarely hold any ongoing performance risk.
- **Enrollment Programs:** An enrollment program serves as the inverse of the incentive program from a performance risk perspective. In enrollment programs, end users sign up for a fixed service for a fixed price. The public agency and/or private partner bears all of the performance risk.
- **Shared Value Programs:** Shared value models offer the most opportunity for performance risk and reward to be optimized and appropriately divided among stakeholders. Depending on the construction of the shared value model, marginal program benefits can be shared with multiple partners. As all parties are affected by program outcomes, all parties are incentivized to ensure program success.

It is important to note that these program archetypes are tools to be used in strategic program design. Most programs, in actuality, combine small parts of different program archetypes. However, examining program types through the lens of discrete archetypes allows for a clear discussion of incentivizing program-optimizing activities through strategic distribution of performance risk.

Publicly Provided Incentives

The first and most simple operating model to be explored is the incentive program model. Incentive programs sponsored by public agencies are perhaps the most ubiquitous of program types. In an incentive program, funds are provided by a public agency in order to shift the value proposition of a decision maker toward a preferred solution. Generally, incentive programs involve a finite engagement between stakeholders; an end user redeems an incentive, works with a public agency and/or a private partner to deploy the intervention, and then continues to maintain the intervention independently. The defining feature of incentive programs for the purposes of this report is the finite engagement of all parties except for the end user, who carries the bulk of the performance risk (and opportunity).

Benefits of Incentive Programs

Incentive programs are relatively easy to implement, as a public agency and/or private partner simply has to make funds available to end users. These are often deployed in partnership with a private partner to simplify the process for end users and maximize program outreach. While incentives can take the form of tax rebates, incentives upon purchase, or incentives provided through a partnership with a private partner, in each form, the provider has minimal avenues of engagement once the incentive is redeemed. This is the greatest strength of incentives – they can be extremely simple for a public agency to implement and are an excellent option when resources are constrained and the required ongoing engagement is limited to the end user.

Drawbacks of Incentive Programs

While incentive programs can be an easy and affordable mechanism, they limit the motivation for public agencies or private partners to positively impact outcomes *after* the initial device or program measure has been deployed. Once the end user redeems the incentive, the public agency and private partner generally have no ongoing role. All of the responsibility for optimization of program outcomes falls in the hands of the end user. While this is appropriate in instances where the end user is the only stakeholder with the ability to optimize program outcomes (as in the case of the Electric Vehicle purchase incentive program described below), this can have significant downsides as well.

For example, consider the case of a utility program designed to lower residential loads by providing incentives for refrigerator upgrades. If an end user redeems an incentive for an efficient refrigerator, the public agency benefits if the end user replaces the old, inefficient refrigerator with the new purchase. However, unless the agency requires pick-up of the old unit, the end user may choose to move the old refrigerator into the garage to expand their total capacity, thereby creating the opposite effect of what was intended. If the public agency's role ends with incentive redemption, the agency may lack the necessary power to enforce desired outcomes in programs which would otherwise benefit from ongoing public agency involvement.

Best Fit Programs for Incentives

Because of the simplicity of implementation, the incentive archetype is best for situations in which resources are constrained, and when there is little benefit from ongoing engagement from multiple stakeholders. As the end user retains primary control over program outcomes, a best fit program would be one that only *needed* end user engagement to ensure success. One example of an incentive program where design is aligned with program objectives is Sonoma Clean Power's (SCP) Drive Evergreen program.

Example: Drive Evergreen with Sonoma Clean Power

Sonoma Clean Power's Drive Evergreen Program		
Category	Incentive	
Description	SCP partnered with local dealerships to offer SCP customers a dual discount: a direct incentive for EV purchase from SCP and a discount on purchase price from the dealer	
End User *(EV buyer)*	Initial Role	Purchase car, redeem incentives
	Operational Responsibility	Driving habits, maintenance ensures vehicle efficiency and performance are maximized
Private Partner *(Car dealer)*	Initial Role	Offer vehicle discount
	Operational Responsibility	No ongoing role
Public Agency *(Sonoma Clean Power)*	Initial Role	Offer financial incentive
	Operational Responsibility	No ongoing role

Source: Sonomacleanpower.org, accessed 11/12/2017; ZNE Alliance Analysis

In this case, the incentives were provided by both the public agency, SCP, as well as the private partner, the dealerships. The Drive Evergreen Program provides a clear example of the simplicity of stakeholder motivations in incentive programs. Once the incentives have been redeemed and the vehicle purchased, the customer reaps the benefits, or downsides in variability of vehicle performance. If the vehicle gets significantly better or worse mileage per kWh or has longer or shorter range, only the end customer is affected. As there is nothing for either the public agency or the private partner to do to ensure the vehicle operates effectively once the end user takes possession of it, there is no need to incentivize them with performance risk.

Drive Evergreen Marketing Material

Source: https://sonomacleanpower.org/sonoma-clean-power-launches-ev-incentive-program/

The Drive Evergreen program also offers another component, a smart charger that creates value for end customers. However, this essentially functions separately from the vehicle rebate program and will be discussed in the Shared Value section on page 12.

Enrollment Programs

The second type of program explored is one in which an end user enrolls in a particular service rendered by the public agency, generally in concert with a private partner. In this scenario, the end user enrolls for a set cost in exchange for a defined (ongoing) service. In this design, as the end user receives a fixed service, the other parties involved – the public agencies and the private partners – receive any marginal value created from the program. Likewise, the private partner or public agency receives any marginal reward, rather than the end user.

Benefits of Enrollment Programs

From the perspective of performance risk, enrollment programs act as the inverse of the incentive program. As the end user has no responsibility for optimizing program outcomes, enrollment programs are most reliably effective when little ongoing engagement is required from the end user. As the responsibility for optimizing value creation is in the hands of the private partner and/or the public agency, in many cases the end user can remain uninformed or even completely "hands-off" without impacting program outcomes.

Downsides of Enrollment Programs

An inverse of the benefit, as end users pay a fixed price (which in some cases, can be just the effort of enrollment) for program participation and do not share in any of the marginal benefits, they have no incentive to optimize program outcomes.

Best Fit Programs for End-User Enrollment

Ideal programs for the low-customer engagement enrollment structure are ones in which the responsibility for any ongoing operations is controllable by the private partner or the public agency. This structure is also well suited for scenarios when ongoing operations are complex enough that the end customer is effectively discouraged or prevented from successful operating optimization and one of the other stakeholders must assume responsibility.

MCE "Local Sol" Offering Marketing Material

Source: https://www.mcecleanenergy.org/100-local-solar/

One example of this program design is local green tariffs like MCE's Local Sol program. To support the Local Sol option for end users, MCE partners with renewable developers to create local generation projects. To access this near-zero carbon electricity, MCE customers enroll in the "Local Sol" tariff, priced at a 14.2 cents per kWh, approximately twice the price of MCE's base rate. While MCE and the private partner (in this case a solar developer) manage the solar installation to ensure optimum operations, end users participate simply by enrolling and paying the fixed additional rate.

Example: MCE's Local Power Tariff

MCE's Local Sol Program	
Category	Enrollment
Description	MCE partners with local renewable developers by offering a feed-in tariff to purchase the electricity generated by prospective projects.

	The feed-in tariff is directly tied to the price of electricity charged to customers – 13.9 cents per kWh (plus a .04 cent administrative fee) who enroll in the premium Local Sol tariff. Projects that have been funded to date include a landfill gas-to-energy project at the Redwood Landfill, solar projects on rooftops at the airport, shopping plazas, and a solar installation on a brownfield at the Richmond Chevron Refinery (in process)	
End User *(Ratepayer)*	Role	Enroll in tariff
	Responsibility	No ongoing role after enrollment
Private Partner *(Solar developer)*	Role	Build and operate renewable project
	Responsibility	Opportunity to project recover costs through efficient operations
Public Agency *(MCE)*	Role	Market to and enroll customers, ensure pipeline of renewable projects aligns with customer demand, oversee renewable project development and operation
	Responsibility	Need to ensure that both customer and developer value propositions are satisfied

Source: https://www.mcecleanenergy.org/100-local-solar/, accessed 11/15/2017.

MCE's Local Sol program is an excellent example of an environmentally beneficial program that is most appropriate for the straight-forward enrollment program design. As end users, in this case, Local Sol tariff enrollees, are not in a position to impact the efficient performance of the solar developments, there is no need to reward them for marginal gains in efficiency. Instead, paying a flat rate per kWh for electricity is appropriate given the nature of their participation.

Shared Value Programs

The third operating model examined is the shared value model, in which all stakeholders share in a program's marginal benefits. As a result, all participants are incentivized to do what they can to optimize program outcomes. The shared value model can take many forms. In many cases, the technology supplier (often the private partner) accepts an ongoing stream of shared savings as payment for the technology installation instead of (or as a supplement to) upfront payment. This ensures that the private partner is only compensated (or primarily compensated) if the program is successful in creating value. Other stakeholders will also receive a portion of the savings, though these are generally proportionate to their upfront capital investment or share of ongoing operational risk. Instead of monetary savings, participants may bear performance risk through non-monetary benefits, such grid benefits or resiliency.

Benefits of Shared Value Programs

Any stakeholder that has a share of the value created by an intervention is incentivized to ensure that value creation is optimized. In programs that require engagement by all three stakeholder types to ensure optimal performance, a shared savings model with participation of all three types can ensure maximized value for all.

Additionally, by using shared value payments instead of upfront payment, many public agencies or end users can move ahead with implementing value-creating efficiency or DER installations with minimal requirements for upfront capital. As upfront capital can be a major barrier for end users seeking to finance efficiency projects, this design unlocks many opportunities.

Downsides of Shared Value Programs

Shared value programs are complicated to administer and to ensure appropriate distribution of value created. It is very important that clear contracts are in place that specify how value will be shared under various performance scenarios.

Additionally, in order for the value of savings to be monetized, there must be a pre-intervention baseline in place that all parties agree upon. While this sounds simple in practice, it can be fraught with challenges. One notable challenge is aligning on a methodology to incorporate the effort of non-program interventions which impact performance. For example, if energy storage is installed to mitigate demand charges, and the installer plans to be paid by an ongoing portion of demand charge savings, all parties must be clear on the implications of other efficiency measures (e.g. after the installation of a more efficient HVAC system).

Best Fit Programs for Shared Value Structure

The most appropriate programs for the shared value structure are those that require ongoing coordination with all parties for value to be maximized. Additionally, they are useful when upfront capital is an issue for end users. As long as the private partner can provide the upfront capital necessary with an expectation for shared savings prepayment, this system works. The example below highlights a capital-intensive application – energy storage – in which a no-money-down shared savings model has been implemented by means of the manufacturer's "Power Efficiency Agreement" program structure. In this case, the solution provider – Green Charge Networks (now owned by Engie, a large French utility) – has the deep pockets required to finance tens of millions of dollars of energy storage for installations that may have longer payback periods.

Example: Green Charge Networks

Green Charge Networks' Power Efficiency Agreement	
Category	Shared Value

Description	Green Charge Networks installs energy storage at a customer site and then manages ongoing maintenance and operations. In return, Green Charge Networks takes a portion of energy bill savings for a set period. These installations can be in partnership with the local utility (e.g., in the case of the energy storage installation at the Lancaster Museum of Art & History). However, utility participation is not necessary for the program.	
End User *(System host)*	Initial Role	Sign up with Green Charge Networks, potentially through a utility co-marketing arrangement
	Operational Responsibility	Collaborate with Green Charge Networks if necessary to ensure effective operations are maintained (in this case, site host role is minimal as storage operations are automated)
Private Partner *(Green Charge Networks)*	Initial Role	Install storage and solar
	Operational Responsibility	Optimize system once operating
Public Agency *(Local Utility)*	Initial Role	Optional: can partner to provide customer outreach support, potential other source of financing.
	Operational Responsibility	

Source: http://www.greencharge.net/business-government/savings/, Accessed 12/1/2017

In this case, Green Charge Network is able to access low-cost financing through its parent company, Engie, a multinational energy corporation with annual revenues of €66+B. This is an advantage that not every private partner has. In the event that a private partner is not able to provide upfront financing in a shared value structure, the public agency can explore financing options as well. As long as all parties are confident about the savings, and thus ongoing cashflow potential, additional financing options should be explored.

Another example of a shared value program is SCP's partnership with eMotorwerks, described below.

Example: eMotorwerks and Sonoma Clean Power

Sonoma Clean Power and eMotorwerks – Drive Evergreen Charge-up	
Category	Shared Value

Description	SCP provides EV owners with free eMotorwerks-compatible chargers (end users pays tax, shipping, and installation). End users then can participate in the GridSavvy program, where they receive points (redeemable for cash or services) based on whether they allow their charger to respond to grid signals to optimize charging time. For most users, the preponderance of charging occurs during overnight charging sessions, and users are able to define their own parameters for their cars' state-of-charge requirements by a specific time of day. The utility and eMotorwerks then control the customers' chargers to respond to demand response events and smooth out grid operations while honoring customer requirements for battery charge and vehicle readiness.	
End User *(Vehicle Owner Using Home Charging)*	Initial Role	Enroll in program, pay initial fees for installation.
	Operational Responsibility	Configure charger to respond to GridSavvy signals within customer-defined parameters, receive rewards on electricity bill based on participation
Private Partner *(EMotorwerks)*	Initial Role	Provide chargers to SCP customers
	Operational Responsibility	Maintain GridSavvy program, capture a percentage of savings (details not available due to confidentiality provisions)
Public Agency *(Sonoma Clean Power)*	Initial Role	Subsidize charger purchase by end user
	Operational Responsibility	Control chargers through GridSavvy program, provide end user rewards for program participation

Source: https://sonomacleanpower.org/wp-content/uploads/2017/12/Program-FAQs-12.21.pdf, Accessed 12/1/2017.

Hybrid Programs

Programs can combine various elements of the three program archetypes in innovative ways. This section will explore an example of this.

Example – Tesla & Green Mountain Power

Tesla & Green Mountain Power Residential Storage Program	
Category	Hybrid - Enrollment / Shared Value
Description	Customers choose to enroll and provide on-premise space for battery energy storage installations in response to joint marketing between Green Mountain Power (GMP) and Tesla. Batteries are

	primarily used for grid services by GMP, but any residual charge will be available for end customers in the case of grid outages. End Users receive the battery at a significant discount (one payment of $1,500, or $15 per month for a decade) as their access to it is secondary to its provision of GMP controlled grid services.	
End User *(Ratepayer)*	Initial Role	Pay onetime discounted price or ongoing subscription for access to battery for resiliency
	Operational Responsibility	No ongoing role after enrollment
Private Partner *(Tesla, storage provider and installer)*	Initial Role	Provide and install batteries; manage batteries with GridLogic software platform
	Operational Responsibility	Exact terms of partnership are unknown, but ensure optimum performance of batteries, likely with an ongoing share of revenue
Public Agency *(GMP)*	Initial Role	Partner with Tesla to subsidize batteries
	Operational Responsibility	Utilize batteries for grid services, oversee ongoing program operations

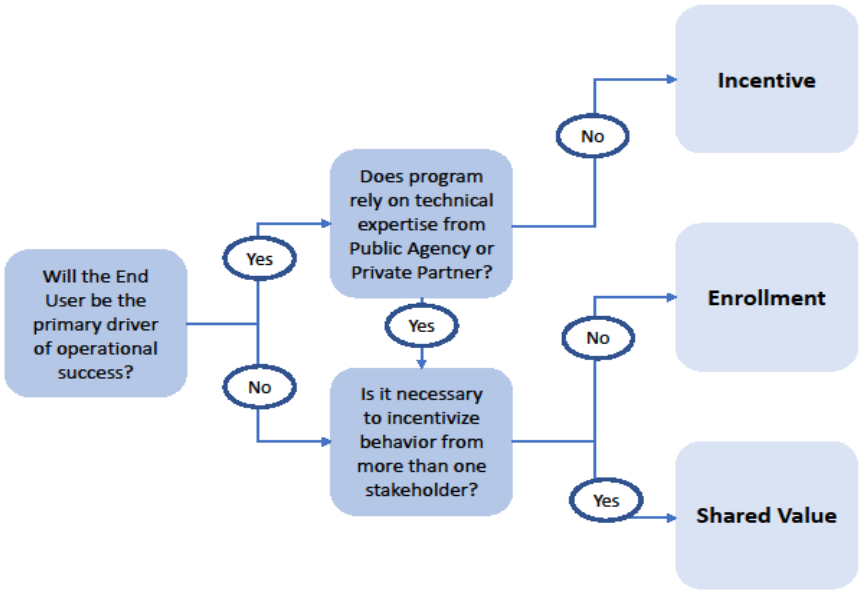
Source: https://www.greenmountainpower.com/press/gmp-launches-new-comprehensive-energy-home-solution-tesla-lower-costs-customers/, accessed 11/15/2017; https://www.greentechmedia.com/articles/read/tesla-and-green-mountain-power-get-your-behind-the-meter-battery-for-15-a-m#gs.4X7TQ2g, accessed 11/15/2017

The Tesla and GMP model combines the shared value and the enrollment model. From an end user perspective, the program follows the enrollment structure, as customers pay a fixed or ongoing flat fee and receive a fixed service (resiliency) in return. While details of the exact agreement between Tesla and GMP are not public, we know that GMP benefits from grid services (such as Frequency Response) delivered by the batteries, and it can be assumed that Tesla earns revenue from installation and ongoing operations. It is not known to what extent GMP also receives a share of enrollment revenue, or the level at which GMP may share a portion of the grid value created.

Aligning Program Needs with Operational Design

A wide variety of operational structures for public/private partnerships exist, and it is vital for program creators to ensure that operational design aligns with program objectives. The decision tree below gives some guidance on how program creators should arrive at the ideal operational structure.

Operational Structure Decision Tree



Source: ZNE Alliance Analysis, 2017.

Program designers must first determine responsibility for both initial program setup and program operations after the program measure has been implemented. If significant responsibility for measure optimization lies with the end user, and little technical expertise is needed after the program is implemented, then a simple up-front incentive structure works well. The example of SCP's Drive Evergreen vehicle incentive is an excellent illustration of this – once the end user receives the vehicle, the public agency and private partners have a minimal ongoing role.

However, if other partners hold operational responsibility, and in particular, if there is technical expertise required in any operational responsibility held, then program creators should explore the enrollment or the shared value structure. The choice between simpler end-user enrollment strategies with fixed outcomes for end users and ongoing optimization-focused shared value models should be determined by the initial analysis of stakeholder roles and value streams. If minimal end user engagement is required, the enrollment or hybrid enrollment/shared value structure can be used, in which the end user pays a fixed price to participate and value is shared between the private partner and the public agency based on performance. If engagement among all parties is required to achieve optimum program outcomes, then performance risk should be shared with all parties in the shared value structure.

Chapter 3 - Public Private Partnership Ownership Models

Determining asset ownership is another key decision point for designers of EE, DER, or IDSM programs. DER and device assets can make up the majority of the cost of programs, and maximizing the value from them is crucial to successful program implementation. This section explores several options to ensure program value is optimized.

Importance of Asset Ownership

By strategically planning asset ownership, program values can be maximized. There are three main components to consider when evaluating how to structure asset ownership in a program.

First, installations of DER and EE technology can be eligible for significant government support. The Federal Investment Tax Credit (ITC) can cover up to 30 percent of project costs. However, as it is provided as a credit against taxes, only tax-paying entities can monetize the technology. As such, if the ITC is to be captured, assets must be owned by a for-profit entity for enough time for the benefits to be monetized. There is a myriad of additional incentives for advanced energy technology, and a thorough review of the relevant incentives must be undertaken to maximize returns for all relevant stakeholders across the value chain.

The owner of an energy asset also bears the opportunity cost of that asset. For example, if a municipality sponsors an energy storage program and purchases the batteries outright, the capital that they have used to acquire those assets cannot earn interest or be used for other purposes. However, if the municipality leases the batteries from a private partner, that municipality only has to pay a relatively small monthly payment, and can utilize the capital elsewhere.

Finally, often one stakeholder will have a non-program goal that the program assets can fulfill. One example of this is energy storage for CCAs. In California, CCAs and other utilities are under a California Public Utilities Commission (CPUC) mandate to install sufficient energy storage to meet 1 percent of peak load.[1] Therefore, if a CCA is considering sponsoring an energy storage program, CCA stakeholders will want to consider an arrangement that leaves the CCA with the necessary control and governance of the storage asset to meet the CPUC mandate.

Summary of Asset Ownership for Stakeholders

Stakeholder	Benefits of Ownership	Downsides of Ownership

1 AB 2514

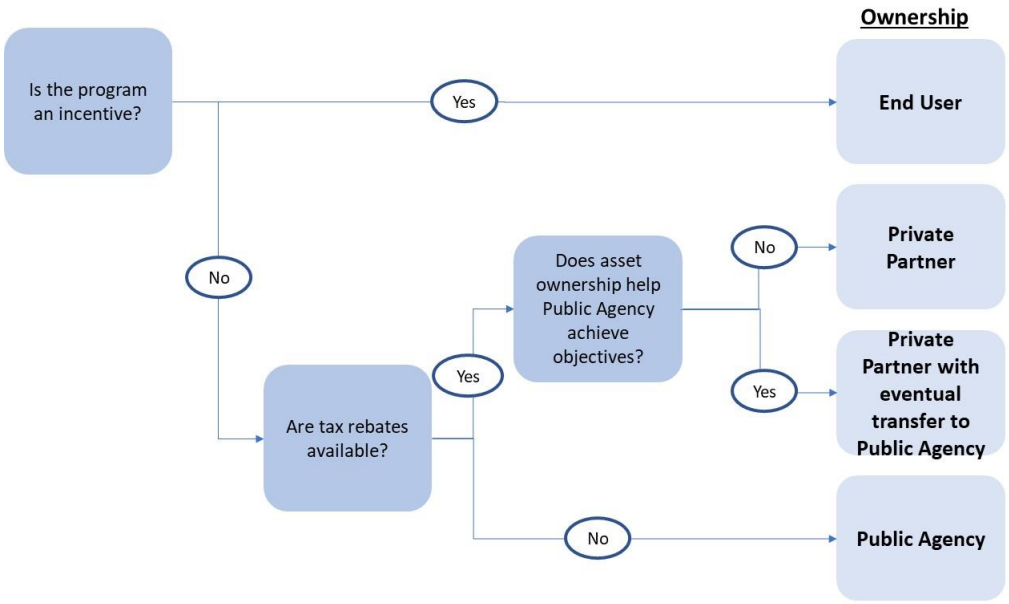
Public Agency	Can use assets to achieve regulatory goals	Cannot monetize tax credits
Private Partner	Can monetize tax benefits if for-profit	Assets cannot be used by public agency to achieve regulatory goals
End User	Can monetize tax benefits if pays tax	Assets cannot be used by public agency to achieve regulatory goals; capital constraints common.

Source: ZNE Alliance Analysis, 2017.

Aligning Program Needs with Operational Design

Aligning asset ownership structure with program objectives and context ensures that programs can be implemented as cost-effectively as possible. When evaluating different asset ownership structures, operational structure should be examined first. If a program includes an incentive for up-front deployment yet also requires customer responsiveness to optimize outcomes over time, then end user ownership is often the most appropriate asset structure. Where this is not possible (e.g., because the end user cannot provide sufficient capital to take ownership), a special program incentive to ensure ongoing user optimization may be appropriate. While incentives that take the form of an up-front price discount are typically associated with user ownership, upfront price discount incentives can also be applied to leasing scenarios as well (as is the case with most EV discounts). In these scenarios (typical of higher-cost assets such as EVs, solar arrays, or energy storage), ownership of the asset may initially rest with the lessor and then be transferred to the end user/lessee at the end of the lease term (depending on specific buyout provisions).

Ownership Structure Decision Tree



Source: ZNE Alliance Analysis, 2017.

The decision tree above illustrates how ownership and incentive design issues can best be approached. If a program follows the incentive 'archetype' discussed above, the it is easiest for the end users to own any assets, as they will be responsible for ongoing operations. If the program at stake is not a simple incentive model, one should then evaluate if there are any tax benefits available. If so, program designers should also evaluate whether asset ownership by the public agency can be structured to enable the agency to claim the incentive or to monetize it by special mechanisms. This option can be complex and burdensome, but is possible in some cases. If the public agency cannot claim the incentive directly or indirectly, the most straightforward path is to designate the private partner that can monetize the tax incentives to hold the assets. If there are benefits to asset ownership for the public agency, another option is for the private partner to hold the assets until the tax benefits are monetized, and then for the public agency to purchase them.

By strategically designing asset ownership in concert with operational structure, program creators can ensure that programs maximize benefit for all stakeholders.

Chapter 5 - Program Explored with Lancaster

By taking the areas of highest value creation from the DER Valuation model and layering them, the project team created a proposed DER Program to be implemented in partnership with LCE. The program, known as the Lancaster "Green District," positions LCE as a business partner with customers, creating value for both LCE, technology partners, and LCE's customers.

Program Overview

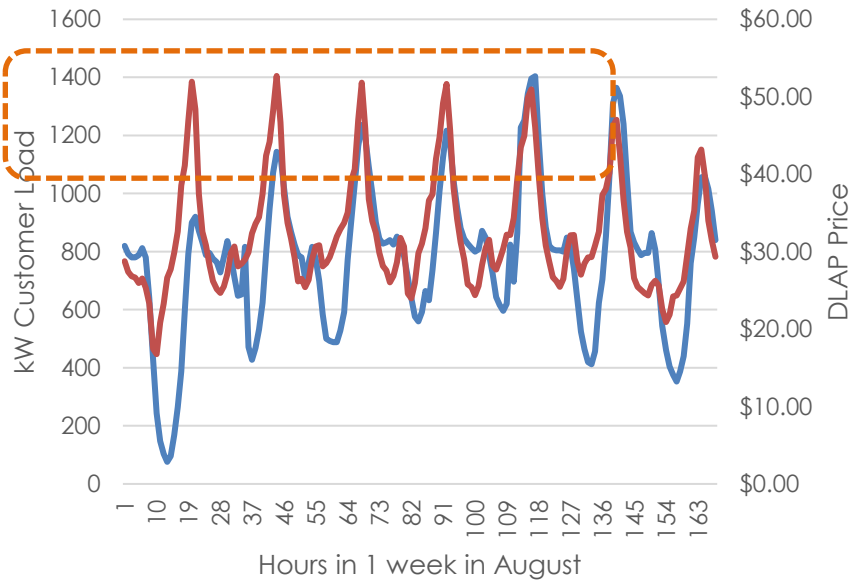
The program combines two elements, a building energy management system to reduce peaks and lower building load, and a solar and battery storage deployment. The technology deployments work in concert to reduce demand charges and manage loads.

Key Insight

Much excitement exists around building multiple value streams for battery storage. However, while multiple value streams are possible in certain contexts, in many situations they require having separate load allocated for each purpose. For instance, if a battery is to be used primarily for demand charge mitigation, it must have capacity allocated to manage demand charges on a daily basis. While the battery could potentially be used for frequency regulation during off-peak hours, it would not be able to concurrently provide reliable back-up power in the case of grid outages, as the outage could occur when the charge is depleted in the service of demand charge mitigation.

Given the complexity of utilizing the same resource to potentiate multiple value streams, the team reviewed many options. After assessing the load profiles of large users, the team found many customers with load peaks that coincided with system load peaks. By mitigating peak load for LCE customers, the batteries could be used to offset SCE demand charges on end users' bills, while also providing relief to LCE by reducing system load peaks during price spikes at the SubLAP (SLAP) level. These spikes often require LCE to procure high-cost electricity in the real-time market when they lack sufficient longer-term, lower-cost supply to meet the spike (i.e., are "under-procured"). The figure below demonstrates one such customer cost scenario.

DLAP Price Coincidence with Large User Load Peaks



Source: ZNE Alliance analysis, 2017.

By targeting customers with demand peaks that coincide with LCE system peaks at the SUB-lap level, value streams can be optimized for both LCE and the customer.

Operational Structure Design

The program will operate under the shared value structure – reflecting the operational reality that engagement by both LCE and relevant large customers is required to ensure value is optimized. Each stakeholder role is detailed in the table below:

Lancaster Choice Energy 'Green District' Program

LCE Green District Program		
Category	Shared Value	
Description	Customer eligibility is determined by the degree to which customer demand peaks overlap with LCE system peaks. If eligible customers choose to participate, the private partner installs storage and solar at end user facilities. Savings are shared between end users, LCE and the private partner. Assets are owned by the private partner until tax incentives are monetized, after which they are transferred to LCE to enable LCE to meet its energy storage goals and mandates.	
End User	Initial Role	Participate in eligibility analysis; allow private partner access to site for installation

(Large LCE customer)	Operational Responsibility	Ensure that no major changes to load occur that would damage value of installation, ensure that private partner has necessary access to manage DER operations
Private Partner *(Storage installer)*	Initial Role	Conduct eligibility analysis, determine value creation potential, install DERs
	Operational Responsibility	Maintain DERs, ensure that maximum value is being created from DER installation
Public Agency *(LCE)*	Initial Role	Work with private partner to conduct eligibility analysis, facilitate outreach and communication to private partner
	Operational Responsibility	Manage billing and shared savings credits

Asset Ownership

Program value will be enhanced by ensuring both solar PV and battery storage tax credits are fully monetized. Additionally, LCE is subject to the CPUC requirement to install enough energy storage to cover 1 percent of peak system load. By allowing the private partner to initially hold the assets and monetize the tax savings, and then subsequently transferring assets to LCE, the program allows the storage to be counted towards LCE's goals while still achieving the lowest cost possible.

Next Steps

Two efforts are under way concurrently to ensure successful rollout of the DER program. First, the project team is engaged with energy storage providers to identify an appropriate implementation partner. Ideal partners will have experience with major commercial and industrial installations and will be able to implement a shared savings approach. Additionally, private storage partners must be willing to engage in a long-term partnership with the city of Lancaster and LCE.

Second, the project team is continuing to analyze the load profiles of the largest 50 LCE customers to understand which would be the best candidates for the program. Once appropriate candidates have been identified, the project team, in concert with LCE, will begin outreach to these large users. The project team plans to have multiple signed contracts for storage by the conclusion of the project.

Conclusion

Many barriers exist to wide deployment of DERs and energy efficiency technologies. Some of these are not yet cost effective, and in the case of many, information about performance and potential savings is not readily accessible to end users. Partnerships between public and private entities can overcome many of these barriers to market uptake, particularly when they are designed to optimize stakeholder behavior.

When public/private partnerships are designed to ensure that any stakeholders that are able to positively impact program outcomes are incentivized to do so, programs can achieve optimal outcomes. Programs that provide proven results gain market traction and become scalable. Scalable energy efficiency and DER programs can enable California to meet its climate goals.