INDUSTRY ANALYSIS

If You Build It (and Market It) Well, They Will Come

*Design Options for Utility-Led Voluntary Renewable Energy Programs*
**Introduction**

The residential renewable energy market is primed for rapid growth as a confluence of market factors leads to increased choices for residential customers. Utilities in particular are eager to provide more choices and enhanced customer engagement. The challenge is how to navigate designing and delivering meaningful products to satisfy this growing customer demand.

61% of utilities expect that over the next five years, they will increase customer interactions related to green pricing programs.
Studies show renewable energy programs can increase customer satisfaction with their utilities. According to the J.D. Power 2017 Utility Products and Services StudySM, mere awareness of product and service options increases customer satisfaction. No wonder that utilities are increasingly focused on efforts to enhance and expand these program offerings. In fact, 61% of utilities expect that over the next five years, they will increase customer interactions related to green pricing programs, according to the Utility Dive’s 2016 State of the Electric Utility industry survey.

But which products and services do customers want to hear about? The inconvenient truth is “it depends” — customer segmentation is a critical first step. More than a decade of in-field market experience and a myriad of research efforts have convinced us at 3Degrees that a substantial portion of customers are committed to taking actions that support their desire to create change. The desired change could be more local jobs, saving resources for their grandkids, cleaner air, or other goals. When it comes to their utility, one logical way for engaged customers to create change is by supporting a transition to a renewable energy future. A variety of utility-led renewable energy products represent a direct option for meeting these customers’ goals.

To develop well-designed programs that align with customer desires for renewable energy, it is important to understand the benefits and risks faced by the customer and the utilities. In the next section, we evaluate insights from our field experience, industry reports, and our recent survey of 600 residential customers to identify the program attributes that are most desirable. Based on these insights, we assess three options for utility-led programs: green power programs, solar renewable energy certificate (REC) programs, and community solar. We compare and contrast these options from a customer perspective, and provide tips and tricks for successfully marketing each option.
Program Design: What do Engaged and Committed Customers Want?

Utilities face the classic product-development conundrum: developing the right program comes down to balancing competing product attributes. As so often happens, if you make one attribute more appealing to consumers, another becomes less so. And perhaps not surprisingly, there is no silver-bullet solution. Based on insights from our decade-plus experience in the field, industry reports, and our recent community solar research, we offer key findings to inform designing successful utility-led programs to satisfy customer demand.

SUMMARY OF KEY FINDINGS

- Flexibility and ease of access are fundamental
- Supporting renewable energy is a motivation for participation
- Simplicity of participation-level options increases participation
- Education is critical so customers understand what they are getting
**FINDING #1 Flexibility and Ease of Access**

Customers have been trained by online interactions to value flexibility and ease of access. Long term commitments (such as contracts) cancellation terms or fees, and upfront costs invoke a strong negative response from most residential customers. These program attributes can make acquisition of participants so challenging that the cost of the program increase as a result. In contrast, program flexibility, such as the ability to terminate a commitment at any time, is a perceived “freedom” and is valued as highly positive by customers, even if they don’t pursue this option (e.g. 3Degrees has 15 years of data showing steady year-over-year commitments from most customers — apart from those related to moving residences). Similarly, our recent community solar research confirmed that shortening and/or eliminating contract terms is the single biggest opportunity to increase market acceptance of a product. Interestingly, resistance to long-term contracts seems to be highest among those customers with the best credit rating.

Closely related to concern about contract length is concern over cancellation terms and fees. Eliminating termination fees has almost the same (positive) impact on customer interest as reducing the contract length from 20 years to 10 years. This makes sense — if a long-term contract is easy to terminate, it doesn’t really feel like a long-term contract.
FINDING #2 Truly Supporting Renewable Energy

RECs play a key role for involuntary renewable energy products. RECs are a legal instrument that allow a customer to claim consumption of renewable energy. When a customer voluntarily chooses to purchase renewable energy, retiring the appropriate number of RECs is the action that allows the customer to claim that commitment. Voluntary REC purchases represent one form of demand for renewable energy that can only be met with output from renewable energy facilities. Meeting this demand requires output from renewable energy projects and allows customers to reduce their carbon footprint.

RECs are created and tracked along with electricity production from all grid-connected renewable energy projects, and they are almost always monetized and claimed by someone. In all renewable energy products offered by utilities, the RECs should be conveyed to and claimed by the participating customers, and in cases where this isn’t possible, disclosures must be clear. If the customer does not get the RECs associated with the electricity provided, they are not purchasing renewable energy or reducing emissions. With certain utility-led community solar programs (as with some third-party rooftop solar products), customers do not receive the RECs. In these cases, utilities need to be careful with how they market the program so they do not mislead customers into thinking they are buying renewable energy.
1 REC Represents the Environmental Attributes of 1 MWh of Renewable Energy

- FOSSIL FUEL ENERGY GENERATOR (Natural Gas, Coal)
- RENEWABLE ENERGY GENERATOR

1 MWh

POWER POOL

CUSTOMER without REC purchase

CUSTOMER with REC purchase

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Our field experience and research validate that when engaged and committed customers participate in utility-led renewable energy programs, they really do expect to receive the environmental benefits, as opposed to learning that utilities or other entities are claiming the benefits to meet internal or mandated standards or otherwise monetizing them. Importantly, customers also value a connection to the project they are supporting. In the case of a community solar project, customers like the ability to track output from a project online, whether or not they actually do it.

Geographic proximity is a stated preference; 69% of respondents to a 3Degrees survey included “in your town” as one of their top two rankings for the desired location of a project. However, in the field, 3Degrees has found an important location/cost tradeoff distinction for customers. While customers generally state a preference to be connected to a specific project, they are also quite price sensitive. This too makes sense — customers’ willingness to pay for a hyper-local project has its limits. The most important thing is for a customer to feel connected to a project, which can be done through excellent product marketing rather than through a series of expensive local installations.

**FINDING #3 Simplicity of Options**

Research and real-world experience highlight the value of ensuring clear, simple, and easy-to-understand options. When customers are offered options to participate in programs at varying levels, it is critical that these options are perceived as providing meaningful choice. Too many options can actually confound customers and lower their likelihood to participate. At 3Degrees, our field experience has repeatedly affirmed two simple-to-understand options that resonate with customers: a 100% option based on their actual usage, and a block option that has a fixed cost every month. More or different options are simply not needed.
**FINDING #4**

*Education is Critical*

Our primary research confirmed that the more someone knows about renewable energy, the more important it is to them. Not surprising, though our research also showed that knowledge and exposure to this information varies greatly among residential customers. Industry research — including a recent research report conducted by Smart Electric Power Alliance (SEPA) and the Shelton Group — and our own on-the-ground experience reveal that even customers who may be aware of program options like community solar don't necessarily understand how these programs work. This is an opportunity because simply put, people are less likely to sign up for programs they don't understand.

While education can be time-consuming, it is time well spent. Consider this insight from the J.D. Power 2017 Utility Products and Services Study™ of 52,000 residential customers of 138 electric utilities throughout the United States:

"Satisfaction among electric residential customers who are aware of products and services offered by their local utility is 79 points higher [1,000 point scale] than among those customers who are unaware of such programs."

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*The more someone knows about renewable energy, the more important it is to them.*
Voluntary Program Models — Three Options

At 3Degrees, we have seen three effective program models for how utilities can channel customer preferences to design compelling renewable energy programs: REC-based green power programs, solar REC programs, and community solar/shared renewables. These program options represent the most common existing and emerging products today for residential customers — in increasing complexity — for utility-led renewable energy programs.
Voluntary Program Models — Overview

While all three program types may be used to serve both residential and commercial customers, this paper focuses on the residential customer segment. Here is an overview of how these programs work.

<table>
<thead>
<tr>
<th>HOW IT WORKS</th>
<th>REC-BASED GREEN POWER PROGRAM</th>
<th>SOLAR REC PROGRAM</th>
<th>COMMUNITY SOLAR (SHARED RENEWABLES)</th>
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<tbody>
<tr>
<td>+ Customers pay a fixed premium on their electricity bill for RECs from a variety of renewable resources. The projects supported can be local or national, and either highly appealing or more commoditized depending on utility and customer preference.</td>
<td>+ Customers pay a premium on their electricity bill for RECs from solar facilities.</td>
<td>Customers either:</td>
<td></td>
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<tr>
<td>+ Support green power projects and reduce personal carbon footprints because of ability to claim consumption of zero-emission resource and reduce footprint.</td>
<td>+ Typically, supports a single solar facility.</td>
<td>+ Pay to help construct a central renewable energy facility and receive a credit for selling the energy back to the utility, OR</td>
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<tr>
<td>+ Leveraged as a platform to launch new renewable energy program offerings such as grant funding for local renewables, or Solar REC or Shared Renewables programs.</td>
<td>+ If program RECs are retired, same benefit as green power program.</td>
<td>+ Customers pay for the energy produced by a centralized facility and receive a credit for the standard utility energy they did not consume.</td>
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<tr>
<td>+ Likely to continue existing alongside new product offerings.</td>
<td>+ Offered as precursor to community solar or when community solar is too complex or expensive.</td>
<td>+ Fixed price renewable energy or an actual or perceived hedge.</td>
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<td>+ If program RECs are retired, same benefit as traditional green power programs.</td>
<td>+ Investor-owned utilities (IOUs) are increasingly comfortable creating these products which had previously been largely the domain of munis and coops.</td>
<td>+ Reduced pricing as the cost of solar continues to decline.</td>
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REC-BASED GREEN POWER PROGRAM

REC-based green power programs have existed since the late nineties. Today, they are offered by utilities in 40 states serving 36 million customers. Through these programs, customers typically pay a small premium to cover some portion or all of their electricity use with RECs. Based on customer preferences, utilities may offer a selection of RECs in terms of technology (solar, wind), geography (in-state, local), and new build. These programs were first offered nearly 20 years ago and some believe they have outlived their usefulness. This view ignores opportunities to evolve basic REC products (as described below) and to leverage the thousands of engaged customers currently participating.

From a customer perspective, REC-based programs typically provide maximum flexibility (i.e. no minimum contract length, no termination fees, and various participation options). Participation level options may include either a usage matching (100%, 75%, 50%) and/or fixed kilowatt-hour (kWh) block choice. The cost of participation is reflected on existing utility bills and nothing else about the service provider or bill changes.

From a utility perspective, the implementation of REC-based green power programs is relatively easy, complements the traditional utility structure and minimizes potential risks. While these programs continue to receive interest from both existing and new participants, some engaged and committed customers have indicated a desire to do even more to support the development of new local projects. Utilities can implement novel procurement strategies that help drive new development of renewable energy generation.

These programs continue to receive interest from both existing and new participants.
One solution to enhance the impact of these programs is to set aside a portion of program funds dedicated to purchasing RECs and use these funds to support grants to new, local renewable project development. A second solution: sign one or more multi-year contracts with projects that meet a relatively small portion of total program demand. These contracts can be at a premium to market prices but blended with lower-priced RECs — when total program demand is large, this is possible. Risk of cost sharing with non-participants is extremely low, while participants are able to support new construction, as described in the case study below.

### CASE STUDY: BEST-IN-CLASS REC-BASED GREEN POWER PROGRAM

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<th>SOLUTION</th>
<th>BEST PRACTICES</th>
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| Pacific Power’s Blue Sky Program launched in 2000. Today, with sister utility Rocky Mountain Power, it is still consistently ranked as one of the top REC-based programs in the U.S. with over 115,000 residential and business participants across their combined six-state service area. | The utility was considering how to evolve their existing programs in order to keep them relevant to customers and to the wider renewable energy market given the desire for a connection to projects. | Pacific Power worked closely with 3Degrees to develop a REC procurement strategy that has, in a single year, driven the development of 51 megawatts (MWs) of additional renewable capacity in the state of Oregon. Not only does this approach directly impact the regional renewable energy landscape, it also creates a more tangible connection between program participants and the facilities they support — something that is often lacking in the traditional green power model. | + Identify projects that have not yet been financed  
+ Work with developers to determine the REC price needed to secure financing or get the project built  
+ Sign long-term REC contracts to guarantee income stream for multiple-year periods  
+ Connect participants with facilities through increased marketing access, like naming rights, photography and video during project construction, touring rights and more. |
SOLAR REC PROGRAM

In a recent Gallup poll, 79% of the Americans surveyed selected solar power as the technology that should receive more emphasis for producing domestic energy — more than any other generation option, including wind power. High levels of public support are part of the reason a number of utilities have launched solar REC programs, sometimes as a precursor to a community solar offering.

Solar REC programs are generally sold in small, 100–200 kWh blocks — often $5 or less each — and the RECs are from prominently sited solar projects. From a customer perspective, this makes the program affordable (and therefore accessible) to almost everyone who wants to support solar energy.

From a utility perspective, these programs are quite similar to traditional REC-based programs with the slight limitation that RECs can only be sourced from solar projects. As solar energy pricing has declined, this has become far less of an obstacle. Overall risk is low because there are generally backstops for unsold generation, whether they be an existing green power program that can absorb any unsold RECs, or approval from regulators to utilize unsold RECs to meet a Renewable Portfolio Standard. Solar REC programs also provide a direct measure of customer demand for solar products with a lower-investment and easier-to-design program than community solar.

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RECENT GALLUP POLL
In the last year, Puget Sound Energy and Portland General Electric both opted to move forward with solar REC programs while at the same time considering how Community Solar may work in the future through the context of each state’s legislation. Puget Sound Energy Product Development Manager Therese Miranda-Blackney explained:

“We know our customers care about solar and so we’re working to make that a reality for all customers, not just those who can put it on their own roofs. Since our Solar Choice program is a REC-based product, we’ve been able to move faster than we could otherwise to address customer interest. Having something in the market will allow us to learn a lot about the demand for this type of product, helping us to plan for future programs and additional customer options.”

### CASE STUDY: SOLAR CHOICE AS A BRIGHT PROGRAM OPTION

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| Since 2002, Puget Sound Energy has provided customers with options to support renewable power in the Pacific Northwest through their REC-based Green Power program that today supports a blend of wind, solar, biogas, geothermal and low-impact hydro from Washington, Oregon, or Idaho. For the average home, $10.00 a month is enough to match 100% of electricity usage. | Meeting strong customer demand for solar options in a timely manner. Efforts to launch a community solar program were stalled amid discussions related to reconciling program design with state solar incentives. | Launched in 2017, PSE’s Solar Choice enables customers to select 100% solar power generated in Washington and neighboring Idaho. This program is at a premium to the existing PSE Green Power option. **COST:** $5 per month for 150 kWh **TIME TO SELL OUT:** 6 months for the first 5,000 MWh. Program has now been doubled in size. | + Capture customer imagination by focusing on solar within a REC-based green power program  
+ Support local solar projects and connectivity with the product  
+ Leverage customer acquisition channels already in place with existing REC-based green power programs  
+ Upgrade online enrollment experience and tools |
COMMUNITY SOLAR / SHARED RENEWABLES

There has been tremendous industry hype and hope about the potential for community solar programs to provide greater access to the benefits of renewable energy for residential customers who may not be a good fit for rooftop solar. These programs fundamentally differ from REC-based programs. Community solar programs sell solar energy or an energy hedge to the customer. As utilities design more community solar programs, more customers can get the benefit of fixed-price solar energy, but it also means customers often pay the utilities’ full costs of providing solar energy.

From a customer perspective, buying solar energy sounds very appealing and offers the fixed-price or potential hedge benefits. Community solar also raises some familiar customer questions: Will I be receiving the actual solar energy? What happens if the sun doesn’t shine? Why is it not free (or at least less expensive) if the sun is free? These questions can be addressed through thoughtful customer outreach and education.

From a utility perspective, community solar programs raise a host of program-design questions that make launching a new program more complicated than REC-based programs, starting with how to value or price the energy generated from community solar systems and the energy displaced from the standard utility supply mix. Each utility arrives at this value differently and the answer directly impacts the end-price to customers and the resulting appeal of the product.

The answer is that it depends; a relatively small consulting engagement with a Community Solar expert can help answer many of these and lead to a much more successful, and often low-cost offering.

KEY DESIGN QUESTIONS

Other key program-design questions include:

+ How to treat RECs (i.e. is the customer buying renewable energy or is the REC used by the utility)?
+ What should the contract term (i.e. length of purchase commitment) be?
+ How to treat cancellation terms and fees?
+ Are there any locational benefits or opportunities to co-located storage facilities that can increase the value of a community solar project to the utility?
+ Should customers buy renewable energy at a cost-of-service model and if so, what do you credit them back? Or should they pay the cost of building the solar facility and sell the energy back to the utility? At what rate?
+ Should customers buy kWh blocks, a % of their usage, or the output of a panel?
BACKGROUND
In 2006, Rocky Mountain Power expanded the impact of its long-standing Blue Sky Renewable Energy program by introducing project funding awards. In that time, Blue Sky participants have helped more than 100 community-scale renewable energy across Utah.

CHALLENGE
Providing customers with access to the appropriately valued benefits of solar through a utility program option.

SOLUTION
Launched in 2016, Rocky Mountain Power customers in Utah can participate in the Subscriber Solar program, which is based on a larger project (20MW array) located in the heart of the southern Utah desert — one of the best solar resources in the country. The program is expected to benefit participants when the utility’s power price rises.

- Buy solar energy in 200 kWh blocks from a local solar plant
- Lock in your generation rate for up to 20 years
- No upfront or maintenance costs
- Termination fee will be required for leaving the program before three years
- Sold out program in 6 months

BEST PRACTICES
- Local project in area with excellent solar resource potential
- Customers receive both renewable power benefits and potential savings
- No upfront or maintenance costs
- Ease of leaving and short contract term (i.e. termination fee will only be required for leaving the program before three years)
- Subscriber Solar invited participants to “Sign their panel” in addition to being able to view and access generation stats

CASE STUDY: ROCKY MOUNTAIN POWER’S HIGH INSOLATION AND PARTICIPATION
### Overview of Utility-Led Programs for Residential Customers

<table>
<thead>
<tr>
<th>What Customers Want</th>
<th>Rec-Based Green Power Program</th>
<th>Solar REC Program</th>
<th>Community Solar (Shared Renewables)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility and Ease</td>
<td>Most flexible</td>
<td>Almost as flexible</td>
<td>Depends on program design, but likely somewhat less flexible</td>
</tr>
<tr>
<td>Support Renewable Energy</td>
<td>Yes. Support for new build is possible, but less likely.</td>
<td>Yes. Support for new build is likely.</td>
<td>Only if the REC is retired on customer's behalf. Support for new build is likely.</td>
</tr>
<tr>
<td>Simplicity of Participation Options</td>
<td>High</td>
<td>High</td>
<td>Depends on regulatory approval and program design</td>
</tr>
<tr>
<td>Understanding What They Receive</td>
<td>Education important</td>
<td>Education important</td>
<td>Variable production requires special consideration and education</td>
</tr>
</tbody>
</table>
Conclusion

Designing renewable energy programs that appeal to residential customers is an opportunity for utilities to increase customer engagement and satisfaction. Traditional green power programs, solar REC programs and community solar/shared renewables all bring their own unique benefits and risks to targeted customers and utilities. Thoughtful program design that is inclusive of targeted customer desires as well as utility goals is the first step toward a successful program.

About Us

At 3Degrees, we are passionate about addressing climate change. That's why we’ve built a business around offering comprehensive clean energy services that enable organizations and individuals to transition toward a low-carbon economy.

We have been working with utilities to design and implement some of the most successful voluntary renewable energy programs in the country since the early 2000s, including REC-based, solar REC, community solar/shared renewables, and green tariffs.