Solarize Portland: Community Empowerment through Collective Purchasing

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ABSTRACT

Portland, Oregon's largest city, is considered to be one of the greenest cities in the country. Half of its power comes from renewable sources, it boasts the most LEED-certified buildings per capita in the nation, and it has the highest rate of bicycle commuting of any major U.S. city (ACS 2006). Despite this, only 38 residential solar electric systems were installed in 2008. San Francisco, a larger but similarly green city, saw 168 installations in the same year.

In 2009, Energy Trust of Oregon[1] collaborated with Southeast Uplift Neighborhood Coalition to create *Solarize Portland*—a community driven, group purchase initiative to help residents overcome the financial and logistical hurdles of going solar. The project effectively merged community activism and education, smart marketing, green job creation, and economies of scale to drive a high volume of participation. The effort was an unprecedented success, resulting in 120 new photovoltaic (PV) systems in six months—more than three times the number of systems installed in the city of Portland in 2008.

Introduction

In April 2009, Stephanie Stewart, a resident of the Mount Tabor neighborhood in Southeast Portland, decided she wanted to promote solar to her neighbors and, ideally, make the purchase and installation experience easier and more affordable. Stewart had investigated installing PV on her own home, but found the cost and the process overwhelming. She reached out to Southeast Uplift Neighborhood Coalition (SE Uplift)[2] for help. SE Uplift, in turn, enlisted Energy Trust's assistance to develop a community program that met Stewart and SE Uplift's goals.

Energy Trust is no stranger to the barriers homeowners encounter when they start down the path to solar. For years, Energy Trust has distributed information and hosted free public seminars to stimulate Oregonians' growing interest in solar. By 2007, homeowners were requesting over 1,000 information packets each year and monthly workshops were regularly seeing 100 attendees. But despite the marked increase in interest in solar, solar installations, as shown in Figure 1, were not rising at the same rate.

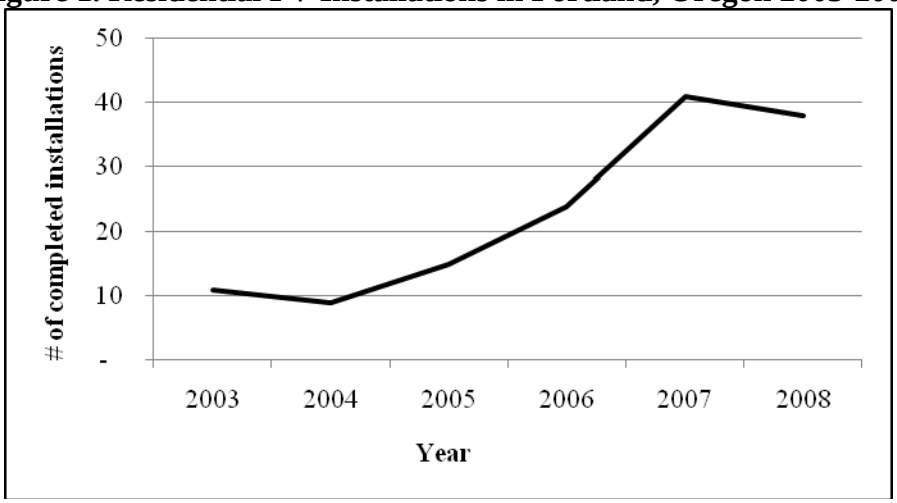
To understand what was keeping Oregonians from turning their solar interest into action, Energy Trust engaged SmartPower, a nonprofit marketing organization, to investigate the market barriers (Rosoff 2007; Rosoff & Sinclair 2009). The study identified several main obstacles for homeowners; high up-front cost and a wide range of prices quoted by contractors, a complex and stressful research, purchase and installation process, and a lengthy decision-making process that

[1] Energy Trust of Oregon is an independent nonprofit organization dedicated to helping Oregonians invest in and benefit from energy efficiency and clean, renewable energy. Energy Trust provides services and cash incentives to utility customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas.

[2] Southeast Uplift Neighborhood Coalition is an independent non-profit organization that facilitates citizen participation services and related activities for the neighborhood associations and citizens within their geographically defined area in Portland, Oregon.

tended to result in consumer inertia. The research also revealed that customers are motivated by the non-energy benefits of solar as much as the direct benefits of lower bills. These included setting a good example, reducing their carbon footprint, and making a contribution to society by "doing their part."

Figure 1. Residential PV Installations in Portland, Oregon 2003-2008



Source: Energy Trust of Oregon 2010

SE Uplift's desire for an easy and affordable community-based solar program was the perfect opportunity for Energy Trust to test a new approach to marketing solar. The project explored the following questions:

- Does neighborhood involvement increase the likelihood of an individual installing solar?
- If you relieve homeowners of the task of selecting a contractor, does it make them more likely to proceed and/or accelerate their purchasing decision?
- Does assurance of a good deal help people take action?
- Can a cluster of low-priced installations result in a lasting, downward price impact in a market?
- Do limited offers speed action?

Solarize Portland ultimately resulted in 120 new, residential solar installations in six months. The goal was to enroll 50 homeowners and achieve 25 installations through the effort. Due to its unique and successful melding of community engagement and education, smart marketing, green job creation, and economies of scale, the project generated 380% more installations than originally targeted.

Solarize Portland **Design and Scope**

Critical to the success of *Solarize Portland* was the partnership of Energy Trust, a statewide non-profit organization with deep solar expertise and market familiarity, with SE Uplift, a local non-profit experienced in engaging citizens and implementing community initiatives. The project design made the most of each organization's strengths and credibility with homeowners.

SE Uplift was founded in 1968 and is known and trusted throughout the neighborhoods of Southeast Portland. They specialize in relationship-building, community organizing and grassroots democracy.

Energy Trust was launched in 2002 and is considered a trusted, neutral, go-to source for information and resources to make clean energy projects happen (Rosoff 2007). The solar program is engaged in comprehensive market transformation. In addition to providing a buy-down incentive, the program is deeply involvement in all aspects of the market, from industry training to consumer education to establishing standards and codes (West et al. 2004).

In order to be successful, *Solarize Portland* needed to tackle all of the primary market barriers for homeowners: cost, discomfort with contractors and the sales process, unfamiliarity with solar technology, financial complexity, and inertia. Furthermore, the program needed to be simple to engage and enroll in. To this end, the project featured several key elements:

- Grassroots outreach and promotion by neighborhood volunteers
- Competitively selected contractor with set pricing tiers
- Educational workshops in the community to learn the details
- Free site assessments for all enrollees to determine suitability
- Incentives of $2.25/watt plus state and federal tax credits
- Limited-time enrollment period

As the plan for *Solarize Portland* developed, SE Uplift naturally assumed responsibility for outreach and community organizing, while Energy Trust lent its market expertise in developing the structure of the program, the contractor request for proposals (RFP) and educational program.

Outreach approach. Outreach was driven by SE Uplift and a corps of dedicated volunteers from its affiliated neighborhoods. To kick off the project SE Uplift solicited participation from the twenty neighborhoods it serves, seeking volunteers to spread the word about the project in their community.

Five neighborhoods responded with strong interest and produced a troupe of passionate volunteer representatives. These community leaders became the go-to group for citizen input on everything from the outreach and communication strategy to how the contractor RFP should be weighted. As a result, word of mouth, posters in local businesses, articles in community papers and newsletters, informational door hangers, announcements at community meetings, and distribution of flyers at events were all used to solicit participation. In addition, a project website was created at www.solarizeportland.org. This website, which was written and maintained by a neighborhood volunteer, became the central resource for information about the project as it progressed. Samples of these materials can be seen in Figure 2.

Ultimately, earned media garnered a great deal of attention for the effort. While the television, radio and print coverage was appreciated, it also posed challenges. Because the audience for these media outlets was much broader than the Southeast Portland area, interest flooded in from ineligible homeowners. In addition, much of the coverage came at the end of the enrollment period, after most of the educational workshops were completed. This left latecomers with fewer opportunities to about the project before the enrollment deadline.

Figure 2. Sample of Outreach Collateral Used to Promote *Solarize Portland*

Source: Energy Trust of Oregon 2010

Contractor selection and pricing. Choosing a contractor up-front was central to simplifying the process and making it affordable. With input from SE Uplift, Energy Trust wrote an RFP to solicit contractor bids. The same neighborhood representatives that shaped the outreach strategy for the project also directed Energy Trust and SE Uplift in the creation of the RFP. Their input ensured that the selection reflected what was important to the community. As a result, being a local or minority owned business, and sourcing local/sustainably manufactured equipment were given nearly equal weight with price.

The goal of the RFP was to select a single contractor who would serve all project enrollees with a single price. It was made clear that the number of participants was unknown. Respondents were asked to provide pricing, in $/watt, based on the volume of participation.

The RFP required that the contractor provide site assessments and system design proposals for each homeowner that enrolled. It was unknown what percentage of these site assessments would ultimately result in signed contracts.

For each home that moved forward with an installation, the contractor would be responsible for securing all required permits, completing and submitting Energy Trust incentive applications, and scheduling and passing all jurisdictional and Energy Trust inspections.[3] Each homeowner had to receive assistance in completing a net-metering agreement with their utility, as well as the Oregon Department of Energy Residential Energy Tax Credit application. The contractor also had to provide each homeowner appropriate documentation and guidance for applying for the federal energy tax credit.

Eleven contractors responded to the RFP, which was distributed through Energy Trust's network of trade ally contractors and the state solar trade association. After interviews with finalists, SE Uplift's selection committee chose Imagine Energy, an energy consulting and contracting company from Portland, Oregon. Imagine Energy's pricing tiers were as shown in Table 1. These pricing tiers were 20-24% less than the average price for Portland at the time, according to incentive applications received by Energy Trust in the second quarter of 2009.

Amazingly, enrollment in *Solarize Portland* was so fast it became apparent early on that the price would be the lowest tier, at \$6.80/watt$_{DC}$.

Table 1. Pricing Tiers for *Solarize Portland* Based on Total Participation

	25 kW	50 kW	75 kW	100 kW	150 kW
Installed price (\$/Watt$_{DC}$)	\$7.20/W	\$7.10/W	\$7.00/W	\$6.90/W	\$6.80/W

Source: Imagine Energy 2009

Educational program. To make it easy for homeowners to get up to speed, *Solarize Portland* offered a series of educational workshops. All interested neighbors were strongly encouraged to attend one of five introductory, one-hour seminars, held in each of the neighborhoods that were actively recruiting participants. These seminars explained how the project worked, the benefits of buying in bulk, how to participate and gave a brief introduction to solar.

After attending an introductory workshop, those who wanted additional, in-depth information were invited to attend any of several Q&A sessions, held once a week after business hours. These informal, open-format sessions covered different topic areas including; incentives, tax credits and financing, technical nuts and bolts, and net-metering.

All the workshops were very well attended, with 50-100 attendees at each introductory workshops, and over 100 attendees at the Q&A sessions. Presentations and supporting material was made available on the *Solarize Portland* website.

A self-guided tour of six solar homes in Southeast Portland was held just before the enrollment deadline, providing a final opportunity for homeowners to see solar in action. About 75 neighbors participated, and several anecdotally reported that talking to enthusiastic solar homeowners firsthand was what tipped the scales and convince them to install.

[3] Energy Trust publishes Solar Electric Installation Requirements that reflect industry best practices. All projects are required to comply with these requirements. The program inspects about 70% of completed projects to ensure compliance with these standards.

Site assessments. At every event and on the website, homeowners were provided with the opportunity to formally enroll in the project. Enrollment served two purposes, but was not a commitment to install. First, it assured them a spot in the project. Second, it initiated the next step in the process—a site assessment.

Site assessments are necessary to establish a site's suitability for solar. Furthermore, since size and cost are directly related, homeowners needed to know their options for system size, and corresponding system cost, before they could make a financial decision.

Solarize Portland offered enrollees two options for site assessments, depending on how ready they felt to proceed and how well they understood the financial ins-and-outs. If they were ready and knowledgeable, their information was sent directly to the contractor, who would schedule a comprehensive site visit that would result in a system design and installation contract to proceed. If they weren't quite ready or had additional questions and concerns, Energy Trust would provide a Solar Energy Review. These one-hour, informational walkthroughs answered basic homeowner questions about solar and helped them understand; their energy consumption, site suitability for solar, eligibility for incentives and tax credits, how solar would impact their bill, and other energy improvements they might consider. After receiving a Solar Energy Review, homeowners could choose to proceed with an installation and would be connected with the contractor for a full site assessment.

With some customers, it became apparent early on in the review that the home or customers were not a good match for solar. In these cases, the Energy Trust reviewers, who are all trained in performing energy efficiency audits, would refocus the assessment on energy efficiency opportunities in the home.

Energy Trust visited nearly 100 homes to provide Solar Energy Reviews for the project, and the contractor ultimately performed 245 full site assessments.

Incentives. No special incentives or grants were provided for the *Solarize Portland* project. All participants who enrolled by the deadline and chose to install systems as part of the effort were eligible to receive the residential Energy Trust incentives that were available at the time of enrollment, as well as state and federal tax credits. The Energy Trust incentive, $2.25/watt capped at $20,000, is an instant rebate that reduces the cost to the homeowner up-front. Energy Trust later reimburses the contractor for the amount of the incentive, after the project has passed inspection. Oregon has a state energy tax credit for solar, worth $3.00/watt and capped at $6,000. Projects were also eligible for the uncapped federal residential energy tax credit of 30% of project cost, less the Energy Trust incentive.[4]

During the second quarter of 2009, the average price of residential PV in Portland was $8.95/watt. Through the competitive, bulk pricing approach, the price for *Solarize Portland* installations was $6.80/watt. For an average sized, 2,800 watt installation, the out-of-pocket cost (post-incentive and tax credits) was $2,918 for *Solarize Portland* projects, versus the average $8,210 cost previously seen in Portland. A sample simple cost scenario for *Solarize Portland* is shown in Table 2.

[4] The IRS provided Energy Trust with a private letter ruling in 2007 indicating that incentives for ***residential*** energy efficiency and renewable energy improvements may be excluded from a participant's taxable income under section 136 of the Internal Revenue Code. Energy Trust's reading of the federal tax code is that generally, energy subsidies that are excluded from a participant's taxable income reduce the basis for a participant's federal energy tax credit.

Table 2. Pricing Example for a 2,800 watt Residential PV System with *Solarize Portland*[5]

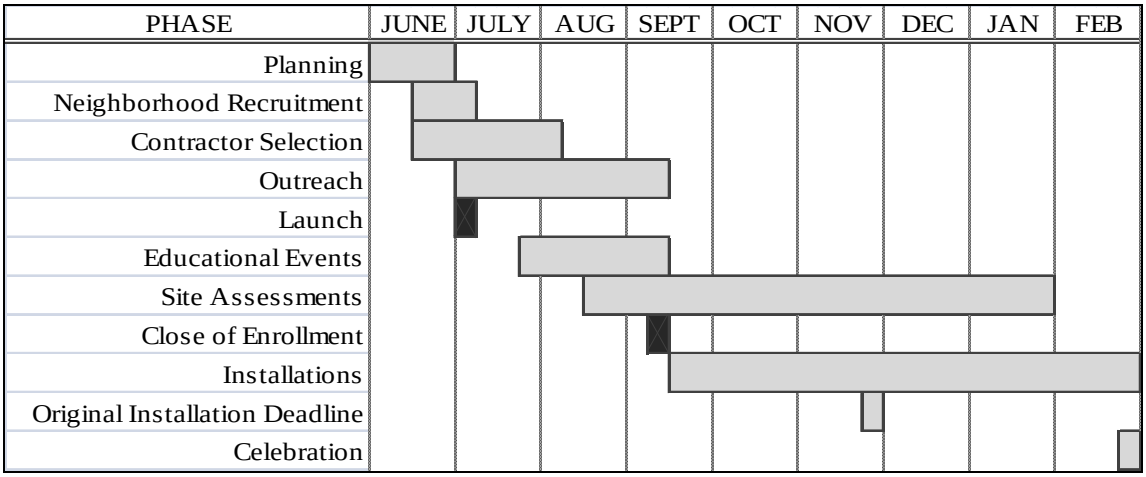
$19,040	Initial Price
-$6,300	Energy Trust incentive ($2.25/watt)
-$6,000	State tax credit ($3.00/watt capped at $6,000)
-$3,822	Federal tax credit (30% of $12,740)
$2,918	Final out of pocket cost

Source: Energy Trust of Oregon 2010

Enrollment period. Outreach for *Solarize Portland* began in early July, though the first workshop wasn't held until July 30. Enrollment closed on September 15, leaving an effective enrollment period of six weeks, a shown in Table 3. During the enrollment period, at least one event was held every week, which ensured that momentum remained high.

The combination of the enrollment deadline with the bulk-pricing created a highly effective limited-time offer. While enrollment was not a commitment to install, it did force interested homeowners to decide, by a particular date, whether they wanted to move forward with the process. Nearly 350 homes enrolled by the September 15 deadline.

Table 3. *Solarize Portland* Timeline



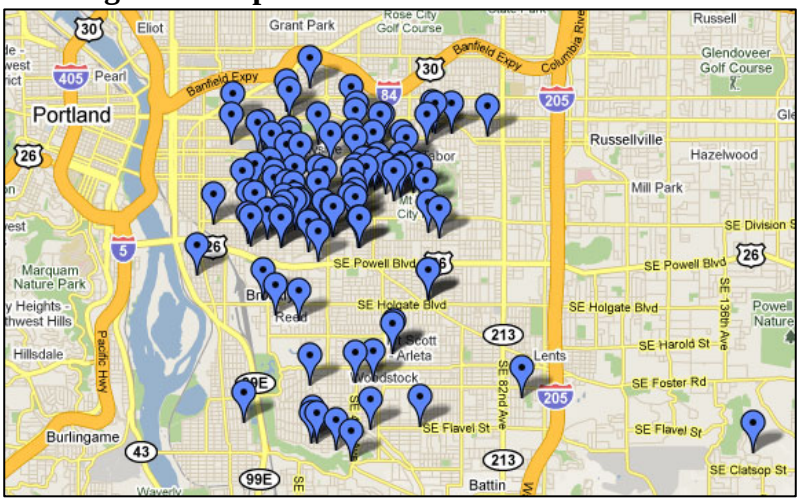
Source: Energy Trust of Oregon 2010

Results

Approximately 350 homes signed up for the project with some level of interest by the September 15 deadline. When installations concluded at the end of February, 120 Southeast Portland homes had fully participated by installing solar electric systems—more than triple the 38 installations completed on homes citywide in 2008. A distribution map of the installations can be seen in Figure 3.

[5] Pricing example is a simple financial assessment. It does not include interactive tax effects, O&M, or the NPV of tax credits.

Figure 3. Map of *Solarize Portland* Installations.

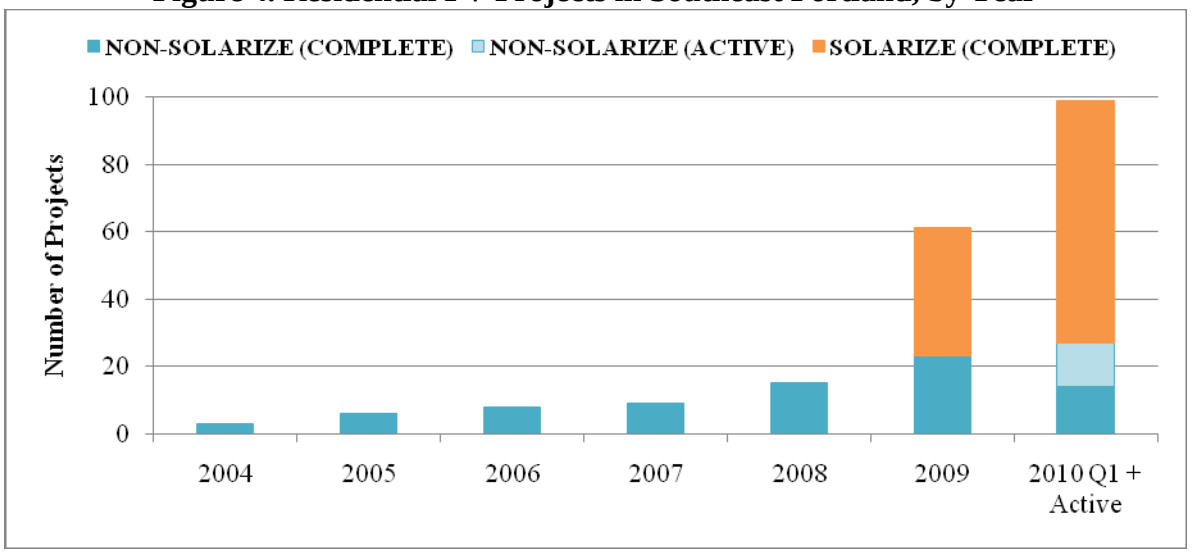


Source: Imagine Energy 2010

In Portland, non-*Solarize Portland* residential PV installations also increased. From September 2009 through March 2010, there were 78 non-*Solarize* systems completed, compared with only 20 during the same period the year before, a 290% increase. Non-Portland installations also increased during that timeframe, but not as substantially.[6]

In Southeast Portland specifically, non-*Solarize* installations between September and March increased 188%, from 9 in 2008/2009, to 26 in 2009/2010. Figure 4 shows the activity in Southeast Portland over time.

Figure 4. Residential PV Projects in Southeast Portland, by Year



Source: Energy Trust of Oregon 2010

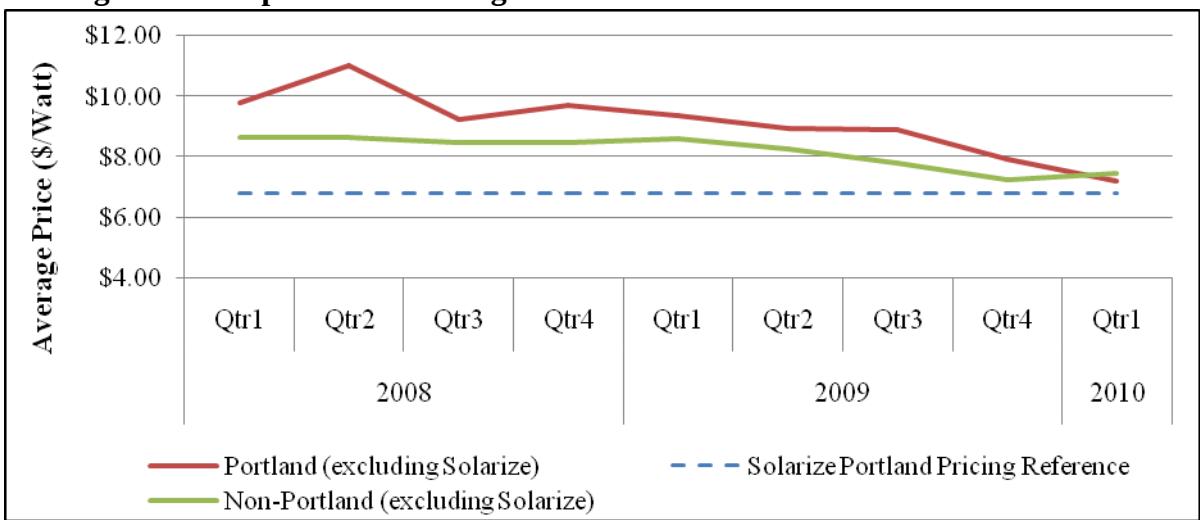
The 120 *Solarize Portland* installations added 347 kilowatts of new PV capacity to Portland, and will produce an estimated 326,000 kWh of electricity per year. This will prevent the emission of 190 tons of CO_2 annually, the equivalent of not driving 418,000 miles every

[6] Non-Portland residential PV installations went from 52 to 132 during this period, a 253% increase.

year.[7] The project also helped provide 18 professional wage jobs for site assessors, engineers, project managers, journeyman electricians and roofers.

The price received by participants in the project was $6.80/watt, 24% lower than the average price in Portland at the time the project launched. Since the launch of *Solarize Portland*, average installation prices in Portland have come down over 19%, or $1.73/watt. While prices declined statewide over the same period, non-Portland prices saw only a 5% decrease. As a result, Portland prices, which have typically been 10-20% higher than elsewhere in the Oregon, are now on par with the statewide average. The change in average price in Portland and throughout the state is shown in Figure 5.

Figure 5. Comparison of Average Price of Residential PV in & Out of Portland



Source: Energy Trust of Oregon 2010.

The decision-making and overall installation timeline for participants in the project was substantially less than a traditional installation. The market study Energy Trust performed in 2007 determined that most participants thought about installing solar for over two years before they actually did (Rosoff 2007). An earlier study showed that fully 70 percent of homeowners that installed PV considered it for five or more years installing (Energy Market Innovations. 2003). Homeowners for *Solarize Portland* received all of their decision-making information through workshops, the website or direct conversation with an expert during a site assessment. The information gathering phase was a few weeks to a few months for most participants. Homeowners were then given two weeks to sign a contract and move forward from the time they received a system design and bid.

Energy Trust performed nearly 100 Solar Energy Reviews as part of the site assessment offer through *Solarize Portland.* These assessments helped homeowners understand whether their home was solar appropriate and gave more information about the financial particulars of the project. They also identified ways that the homeowner could improve the energy efficiency of their home. Of the reviews performed for the project, over 10% resulted in solar installations. Preliminary analysis shows that recipients of the Solar Energy Review service may have opted to perform energy upgrades in addition to or in lieu of solar. The data indicates that as many as

[7] CO_2 equivalencies calculated using Energy Trust's equivalency calculator, which calculates CO_2 reductions for energy generation projects based on the energy mix of the utility that the project(s) serve.

84% of the *Solarize Portland* participants have also engaged in energy conservation by participating in a non-solar Energy Trust program.

A formal evaluation of *Solarize Portland* will be perform in May and June of 2010 to learn more about the customer experience with the project. The evaluation will gauge overall participant and contractor satisfaction with all elements of the project, what barriers the project helped homeowners overcome, what features most motivated participation, how participants paid for their systems, whether and for how long they had considered installing solar before the project, what changes they would suggest and, for those who enrolled but did not follow-through, identify the hurdles that prevented them from installing. The evaluation hopes to quantify how much the design elements of a pre-selected contractor, bulk-pricing, community connection and limited-time offer influenced their purchasing decision. Ultimately, the results will help inform future community-based efforts.

Conclusions

Solarize Portland explored the combination of community engagement with the hallmarks of a conventional sale (a lower-than-usual price and a limited-time offer) and a simple call to action.

The project appears to have applied downward price pressure to the historically inflated prices in Portland, bringing them in line with costs in the rest of the state. Buzz created by the effort may also have spurred additional activity in the area, with non-*Solarize* installations increasing over 350% during the project timeline—a surprising outcome considering the large portion of the potential market already engaged in the community project.

Further study is needed to understand the further-reaching impacts of this program. It's important to determine if *Solarize Portland* and similar projects negatively affect contractors who aren't participating in the program. While current data shows that non-*Solarize* installations have increased compared to previous years, there may be delayed market effects. An additional consideration is quality control. Energy Trust typically inspects about 70% of the PV projects it funds, with experienced contractors transitioning to less frequent, random inspections. Consistent with the *Solarize Portland* contractor's random inspection status, only 23% of the *Solarize Portland* installations were physically inspected by the program.

Regardless, if popularity is any measure of success, *Solarize Portland* is clearly a winning model. In six months the project enrolled 350 participants and installed 120 PV systems—more than three times the installations completed on homes citywide in 2008. The model is rapidly spreading to other neighborhoods in Portland and beyond. The City of Portland's Bureau of Planning and Sustainability is providing planning and logistical assistance to other neighborhoods to take *Solarize Portland* citywide. With to their support, *Solarize* projects are now underway in both Northeast and Southwest Portland. In April, *Solarize Northeast* topped enrollment at over 1,000 homes, and *Solarize Southwest* could exceed 600 enrollees. In response to continued demand, Southeast Portland is moving forward with phase two of the original initiative described in this paper. These three projects alone could result in over 600 *Solarize* installations for Portland in 2010. In addition, the City of Pendleton, a rural community in Northeastern Oregon, is organizing a similar effort for its residents. If they reach their goal of 100 installations, Pendleton will become the most "solarized" rural community in the United States.

According to Tim O'Neal, sustainability coordinator for SE Uplift, "This project has truly brought our community together, all moving toward one goal. From attending workshops to watching as neighbors went solar street by street — it's been great to see what we've been able to accomplish as a group."

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