

Final Report: Building Pathways to Solar Access in Northeast Houston

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Summary

Between September 2022 and September 2024, Solar United Neighbors and community partners in Northeast Houston worked with twenty households to deploy rooftop solar installations on twenty single-family homes. The Hive Foundation for Climate and Gender Justice funded this pilot project as part of their grantmaking priorities for Texas. The project's purpose was threefold: to make direct investments in an energy-burdened community, to identify barriers to rooftop solar access and adoption, and to uncover opportunities to improve and scale access to solar in Texas. After installation, interviews were conducted with all project participants to gather feedback. This report describes the process of developing and deploying the project, including barriers partners encountered along the way and suggestions for improvement; it summarizes themes from interviews, policy, and regulatory barriers, recommendations for overcoming obstacles, and opportunities presented by the 2022 Inflation Reduction Act.

Introduction

In September 2022, nonprofit Solar United Neighbors (SUN) received funding from the Hive Fund for Climate and Gender Justice to install twenty 5 kW solar arrays in Northeast Houston over two years. SUN combined grant funds with incentives from the Hard to Reach energy efficiency program at CenterPoint, the Transmission and Distribution Utility (TDU) for much of the Houston metro area. This incentive was part of CenterPoint's suite of energy efficiency programs designed to mitigate peak load through reduction strategies, such as home energy efficiency upgrades and distributed generation. CenterPoint's Hard to Reach Program is specifically for households at or below 200% of Federal Poverty Guidelines.¹ The purpose of the project was to get solar on rooftops within a community that experiences high energy burdens that would not otherwise be able to access solar, thereby directly investing in the community, socializing the concept of solar, and learning collectively about how to make solar more accessible.

As a project-based organization dedicated to building a clean and equitable energy system with rooftop solar at the cornerstone, SUN is committed to learning by doing. One of the organization's primary organizing tactics is solar co-ops or bulk purchasing programs. Solar co-ops are proven effective at educating people about renewable energy, helping them go solar, and empowering them as advocates for a clean and equitable energy future. Since 2007, we have helped more than 9,700 people go solar and avoid over 2.3 billion pounds of carbon emissions. By giving people a direct stake in the success of clean energy policies and uplifting lived experiences with rooftop solar, we created a network of passionate, dedicated, and informed individuals who can help push for clean energy legislation. To date, SUN has facilitated thirty-three Solar Equity Pilots. These pilot projects aim to improve access to solar energy among low- to moderate-income (LMI) households. SUN takes big ideas and implements them by starting with small pilot projects to learn about local considerations, identify barriers, and create pathways for expansion.

While the cost of solar in the US has dropped approximately 49% since 2010,² it remains out of reach for many LMI households.³ This barrier is partly due to how solar is sold and state and federal policies that drive solar adoption. The literature also suggests that the level of education, income, homeownership status, and language preference are all factors that influence solar adoption.⁴ Even though rooftop solar has the potential to save families thousands of dollars over the lifetime of the system, upfront costs and lack of access to credit pose significant barriers. For example, a solar system generating approximately 12,000 kWh of

¹ "2022 Hard-to-Reach Standard Offer Program | CenterPoint Energy," June, 2022.

https://visionelements.programprocessing.com/framework/CenterPointTX/612022143851.2022_HTR_Manual.pdf.

² "Solar Energy Research Data | SEIA," Accessed August 12, 2023.

<https://www.seia.org/solar-industry-research-data>.

³ Galen L Barbose, Sydney Forrester, Eric O'Shaughnessy, et al. "Residential Solar-Adopter Income and Demographic Trends: 2022 Update | Electricity Markets and Policy Group." February 2022.

<https://emp.lbl.gov/publications/residential-solar-adopter-income-0>.

⁴ *ibid*, Naim Darghouth, Eric O'Shaughnessy, Sydney Forrester, et al, 2022. "Characterizing Local Rooftop Solar Adoption Inequity in the US." *Environmental Research Letters* 17 (3): 034028.

<https://doi.org/10.1088/1748-9326/ac4fdc>.

electricity per year (average consumption for a single-family home in Texas) would cost about \$24,000 before tax credits, assuming an 8 kW system priced at \$3 per watt. The majority of solar sales are financed,⁵ often through national solar financial institutions that come with origination fees and require a credit score of 650 or greater.⁶ With a financed system, families make a loan payment that may replace the amount they would otherwise spend on a utility bill; however, there will always be a utility bill of varying amounts for grid-tied systems. While solar bulk purchase programs like SUN's solar co-ops have the potential to reach middle and moderate-income families by bringing down overall costs, without funds to further offset costs and/or inclusive financing mechanisms, low-income households are unlikely to get solar, meaning that families who most need relief from high utility bills are also cut out of the clean energy transition.

Context: Texas Electricity Market & Considerations for Northeast Houston

In Texas, the state's unbundled electricity market further complicates the value proposition of solar. The Texas electricity market, governed by the Electricity Reliability Council of Texas (ERCOT), may be broadly divided into three separate entities: 1. the generators, 2. the poles and wires utilities, 3. the companies that sell customers electricity.⁷ In the retail electricity market, Retail Electricity Providers (REPs) sell plans to consumers. In municipally owned utilities and Rural Electric Cooperatives, the poles and wires, and sales interface are owned by the local utility, though not necessarily all of the generation. Most Texans get electricity in the retail electricity market and therefore must choose a REP to sell them electricity for their home. Only a handful of REPs offer solar buyback plans that credit solar customers on their electric bill for the excess solar generation that solar customers contribute to the grid.⁸ What's more, without a statewide net metering policy, the value of the excess generation is subject to change year over year and, in some cases, month over month—at the discretion of the REP and their contract terms. Buyback plans mimicking net metering disappeared after winter storm Uri and are unlikely to come back. This price volatility makes for a murky payback rate on a solar system representing a 25-year investment, which further disincentivizes middle, moderate, and low-income households from switching to solar.

The gap between the need for clean energy solutions and access to rooftop solar is particularly large in Northeast Houston. This part of the Houston metro area is majority Black and Latino and has borne the brunt of climate-related impacts due to poor drainage infrastructure, poor housing stock, and consistent divestment from disaster relief funding. People in Northeast Houston also experience a high energy burden, meaning that residents

⁵Gaston, Zoë. "Will Rising Interest Rates Curb the Dominance of the US Residential Solar Loan Market?" Wood Mackenzie. October 26, 2022.
<https://www.woodmac.com/news/opinion/will-rising-interest-rates-curb-the-dominance-of-the-us-residential-solar-loan-market/>.

⁶ Sirull, Ellen. 2022. "Can You Go Solar with Low Credit?" *EnergySage Blog*, November.
<https://news.energysage.com/going-solar-with-low-credit/>.

⁷ <https://www.electricchoice.com/blog/guide-texas-electricity-deregulation/>

⁸ "Texas Solar Buyback Plans - Texas Power Guide." 2023. Texas Power Guide. August 2023.
<https://www.texaspowerguide.com/solar-buyback-plans-texas/>.

have to divert more of their relative income to pay for energy than other parts of the city and country. In fact, households in Northeast Houston spend upwards of 7% of their income to pay energy bills, while the median US household spends 3% on these expenses.⁹ Northeast Houston is also a nexus of community organizing, where residents and grassroots coalitions have been banding together to fight for local policies that improve living conditions and infrastructure resiliency.

Methods: Partners, Participants, Installer, and Processes

For the purpose of this pilot project, SUN initially chose to work with two local Community Benefit Organizations (CBOs) anchored in Northeast Houston: West Street Recovery (WSR) and Launch Point CDC. Considering SUN had never worked in this region of Houston, local partnerships were critical for project success and provided deep knowledge of the area and strong relationships with participants. By partnering with organizations that have long-term investments in the community's flourishing, we were able to quickly develop and deploy a program that would have otherwise taken years of trust-building to execute. SUN provided technical expertise and overall program and solar installer management. The local CBOs provided strategic guidance based on local knowledge in the first year. In both years, WSR recruited participants and, along with SUN, did the bulk of one-on-one "customer support;" this included collecting paperwork for permitting, interconnection, and other digital documents that were hard for participants to access, fill out, and understand.

For Year One, all participants were members of the Northeast Action Collective (NAC), a coalition that WSR participates in, and many had lived in their homes for decades. Additional communication barriers arose for several participants. Three out of the 10 participants were visually impaired, and one participant only fluently spoke Spanish. Additionally, we served a participant who was over 80 years old. All participants were willing to move forward with the project despite personal constraints. While we had anticipated needing a waiting list of people interested in the program, everyone who initially signed up ended up getting solar, perhaps because they had a high level of trust in the partner organizations and commitment to the process.

For Year Two, initially all participants were again members of the NAC, selected in collaboration with NAC members and WSR. One homeowner who was very handy, working on renovating his home over time using his electrical skills, declined to participate after the initial site visit by the installer. It was possibly due to the proposed location of the panels not being where the homeowner envisioned. WSR then heard about a solar homeowner whose flooded home had been demolished by the city, and replaced by a new home. Her solar array was put in storage and for months she had to pay her solar loan without any savings to offset the loan payment. The reinstallation of this homeowner's system and generator was added to the list of homes outfitted with solar through the grant. It is noteworthy that this homeowner was not part of NAC. It became clear mid-way through the process that she did not understand or trust how SUN and WSR were working with the installer to provide the reinstallation at no cost. The

⁹ "Energy Burdens in Houston | American Council for an Energy-Efficient Economy," September, 2020. https://www.aceee.org/sites/default/files/pdfs/aceee-01_energy_burden_-_houston.pdf

partners worked towards building a relationship with her to ensure we could help navigate this process with her.

Project partners aimed to keep the sign-up process as simple as possible and developed a communication and qualification plan ahead of the Year One project launch. Signing up for the project entailed expressing interest to WSR and providing contact information, name, and address. All participants were at or below 200% of Federal Poverty Guidelines and were income-qualified by Centerpoint Energy. Preference was given to homes that recently had their roofs replaced, and most participants had undergone disaster repair with WSR. SUN staff would then call participants and verify they understood what would happen: that this was a grant-funded opportunity to receive a free, 5.2 kW solar array on their home and that it was possible that not everyone who wanted the free solar would ultimately be eligible to receive an array. SUN staff explained the basics of how rooftop solar works, and that a solar installer would perform a site visit to verify their roof was suitable. After the call, names were released to an installer to start the process of permitting, design, site surveys, and installation. We provided ongoing support throughout the process.

Halfway through Year One, SUN initiated a pilot Impact SREC program to lower the system cost by selling the solar renewable energy credits (SREC). In the ERCOT territory, there isn't a market for SRECs except for this pilot. As a result, SUN conducted additional one-on-one communication with each homeowner and WSR to explain SRECs and generate trust and support around selling their credits for ten years. Nine of the ten homeowners agreed, each receiving around \$1,100.

The process for Year Two was improved with a combination celebration of the first ten homes and a workshop for the next ten homeowners to which the installer was invited. Potential solar homeowners could hear from those who already had their systems installed, the savings generated, and begin to trust in the process. SUN asked participants to provide a recent copy of their electric bill and sign their SUN Agreement, the Installer Contract, and the CenterPoint self-attestation by the end of the evening. SUN provided dinner and WSR provided live translation during the meeting. A SUN volunteer with solar and batteries shared tips and tricks for living with batteries.

Before launching Year Two, WSR explored the possibility of owning the systems for the first 5+ years to take advantage of the new "Direct Pay" option. This allows a non-profit to benefit from the 30% Federal credit (the process is detailed in Appendix 1). Although SUN was helping a non-profit in Minnesota in this process, it was still too early to have templates ready to use. In addition, a few Year One participants felt they could use the 30% Federal Income Tax Credit, especially as they could spread it out over several years. A write-up of the Minnesota project is available [here](#).

In Year Two, the Impact REC pilot changed to providing the installer rather than the homeowner the funds if the homeowner agreed to sell the credits. Communication about the process was improved by having the installer and Year One homeowners attest during the first celebration to the benefit of having the proceeds from the SRECs extend the grant work in NE Houston. All ten Year Two homeowners are on track to selling their SRECS, allowing WSR to expand the work they are doing in NE Houston.

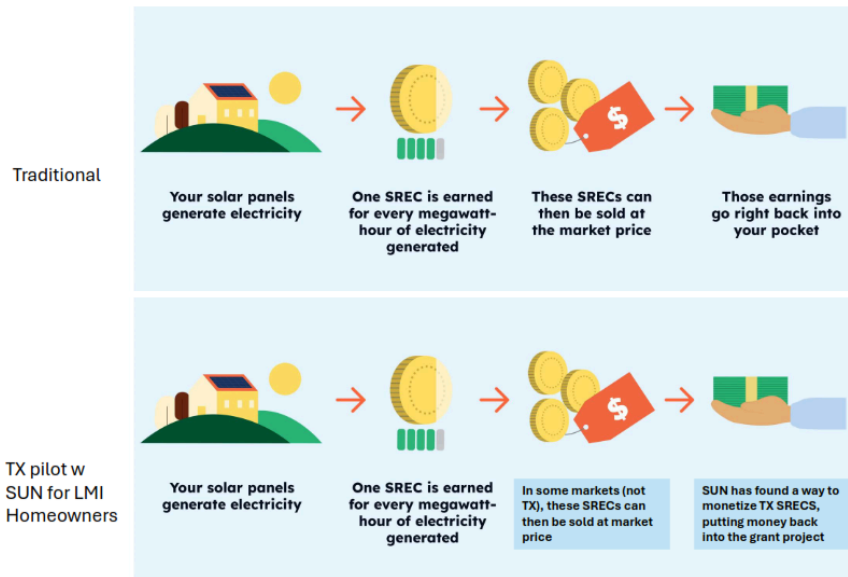


Figure 1: Special SREC Opportunity for LMI Pilot in Texas

The installer for the project was selected through a competitive bidding process. In Year One, we wrapped this pilot project into the end of a bulk-buy program for solar panels that SUN was running in Houston. Through the standard solar co-op process, a group of homeowners expresses interest in purchasing a rooftop solar system along with others in their city or county. SUN convenes a competitive bidding process for the group, and the members select the company to provide the installations. SUN approached the solar installation company that a Houston-area solar co-op had chosen to ask if the company would be willing to serve this group of 10 participants in Northeast Houston. SUN asked if the company would be willing to provide installations with extended warranties and maintenance support, and if so, what would be the charge for doing so. The Year One installer serving this project, Icon Power, agreed to do the installations at no extra cost.

In Year Two, in lieu of a Solar Co-op, SUN partnered with iChoosr for the Solar Switch group purchasing campaign. In this model, iChoosr conducts a reverse bid auction, selects the installers, and manages the installation process. SUN requested iChoosr ask if the selected installers would be interested in serving this group. Additional funds were allowed to cover the extended warranties and extra maintenance support. Sunshine Renewable Solutions agreed to handle the final ten installations.

While rooftop solar systems are usually sized to offset a percentage of a home's energy use over a year, SUN used a standard system size of around 5 kW for participants to control for costs and avoid overproduction. Solar is priced per watt, and to set an installation budget, we needed to know roughly how much 20 systems would cost long before participants were selected. Furthermore, because Texas does not have a state-wide net metering policy, homes that produce more energy than they consume do not provide any additional economic benefit to the families; this is especially true for solar homeowners who purchase their systems. Many households participating in this project had homes under 1,700 square feet, and the homeowners were generally careful about their energy use. Depending on the home's square

footage, energy efficiency, and family size, the arrays offset between 28-64% of each home's energy use per year, with a median offset of around \$650.

Because infrastructure resiliency is a priority for Northeast Houston residents, all solar systems were installed to be "battery-ready," and seven homes received donated batteries. "Battery-ready" means that the inverters used in the system are compatible with a battery and would not need to be retrofitted should a battery be added in the future. Due to recurrent flooding issues in Northeast Houston, the batteries were lifted above the manufacturer's minimum installation requirements to prevent water damage.

The participants who received solar and storage had already volunteered to be resiliency Hub Homes within the community that serve as heating or cooling and charging centers in the event of a grid outage. In Year Two, SUN was offered donated panels, which were used on four of the future "Hub Homes", allowing these homes to have slightly larger array sizes (3.475 - 3.84 kW). The savings of the donated panels covered the additional installation cost for the larger system. In addition, some of the unspent contingency funds from Year One were used to add a battery to a Year One home.

The installation process each year took approximately seven months to complete, and most of that time was spent in different permitting processes. Each participant had to sign upwards of five different documents from the installer, City of Houston, and CenterPoint, and all had to be submitted electronically. The actual solar installation is generally completed in less than a day. If the home has a battery, installation is generally completed in less than two days.

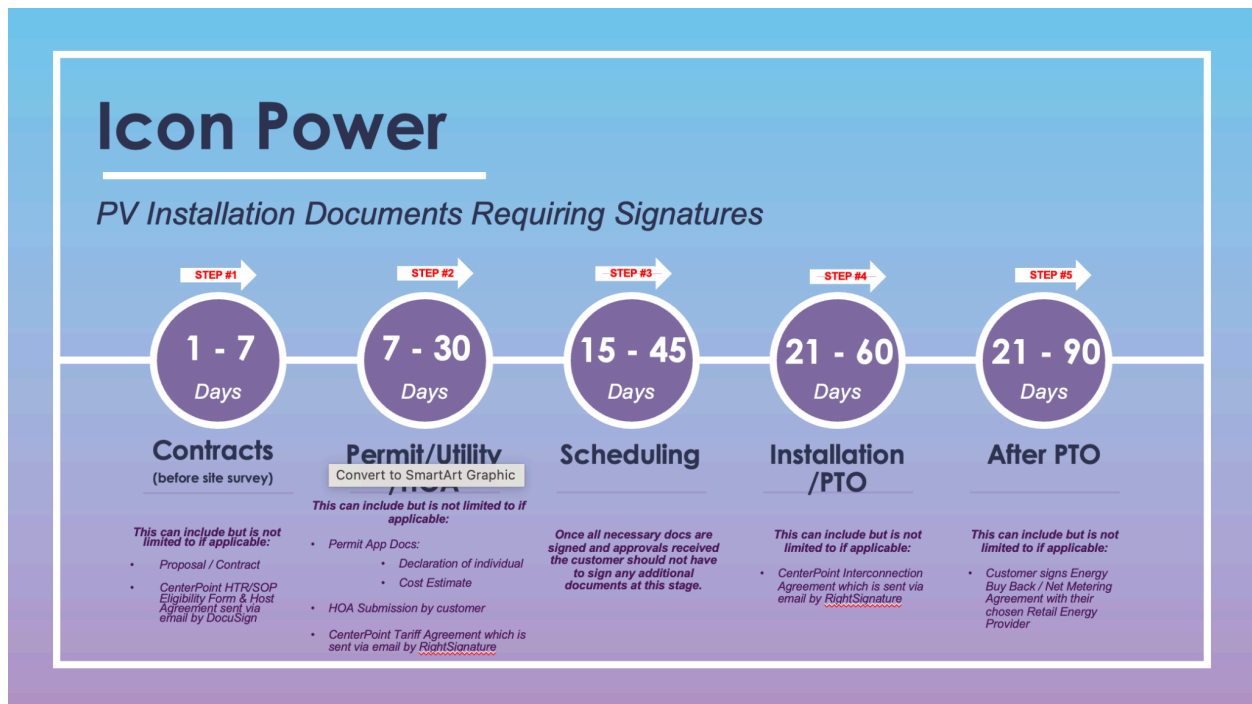


Figure 2: Icon Power's Document Timeline for the Project, provided by the company.

After installation, SUN worked with participants to switch electric plans if appropriate to maximize solar savings. SUN collected utility bill information from participants and requested a

report from Texas Power Guide to map the home's energy consumption patterns against all available REPs in the market. A sample analysis is attached in Appendix 2.

SUN collected participant feedback by developing a set of questions, along with partners, to ask during semi-structured interviews at least 30 days after each system received permission to operate from the utility (began generating electricity). A SUN representative conducted each interview, mostly in person between June and July 2023 and again in October 2024. Each interview lasted half an hour to an hour, depending on whether or not additional support was needed to verify utility bills, check on system production, test a battery, etc.

Findings:

Several themes emerged from the interviews with participants. See Appendix 3 for sample questions. In Year One, seven out of ten participants cited the paperwork (forms, emails, or permitting) as the most challenging part of getting solar. We also heard this from our partners at WSR, who had to help each participant fill out the forms. The amount of paperwork coupled with the digital format proved challenging and required much more staff support and time than anticipated. In Year Two, after holding the Celebration and paper signing event, only three participants felt the paperwork was daunting,

In Year One, half of the participants mentioned environmental reasons as either a motivating factor in their desire to participate in the program or the best part of getting solar. In Year Two, while environmental reasons factored in, more focus was on saving money and resilience for those with batteries.

Of the eight people in Year One with homeowners insurance, most had to find a new plan that didn't charge them significantly more for adding solar. In Year Two, of the eight people with homeowners insurance, most had not yet informed the company about the addition of the panels. One company refused initially to insure the panels because the homeowner mentioned she got them for free. Two homeowners were concerned about escalating insurance costs due to recent storm events. WSR is researching group insurance plans for their hub homeowners.

Fifteen out of twenty participants indicated that they would be willing to take out a low-interest, short-term loan for a solar system if it were cash flow positive in year one. There was concern about those on fixed incomes being unable to afford the loan.

While the incentive money offered by CenterPoint allowed the grant to be stretched further and established clear parameters for income qualification, it also added more forms and checkpoints to an already paperwork-heavy process. Participants had to submit an eligibility form to the solar installer, who then filed the paperwork with CenterPoint. Eligibility was determined by either self-attestation combined with a screen grab of address in a HUD census tract or proof of enrollment in another program such as WIC, food stamps, CHIP,

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"I haven't been able to depend on the grid. The lights were always going out. As a person with asthma, I need to be able to breathe. I need power."

or another program requiring income verification, outlined in the Hard to Reach program manual.¹⁰

From SUN and partner perspectives, the contingency fund proved to be essential. While most houses had roofs in good condition due to previous reroofing or repair work, six homes needed to be reroofed before adding solar. One home had a tree leaning towards the house that had to be removed for safety and shading issues. Additionally, one of the homes had a permitting fee from years ago that had never been paid by the contractor who had done the work, which meant that new electrical permits could not be pulled for solar until the old fee was paid. The older nature of the housing stock, coupled with frequent exposure to hurricane conditions in an under-resourced community, means that many of the homes in Northeast Houston are only suitable for solar with significant investment in repair.

Lifting the six batteries above minimum manufacturer installation specifications added a small amount of additional costs to the battery projects. Still, project partners deemed it necessary to improve infrastructure resiliency. Tesla Powerwalls may be mounted either on a wall or on the ground.¹¹ While the batteries should be able to take on some water and still function, many homes involved in this project experienced two to four feet of flooding during Hurricane Harvey in 2017. We asked that all batteries be installed two or more feet off the ground to improve infrastructure resiliency.

Houston's fire code requires three feet of clearance for pathways to the roof ridge as well as setbacks from the roof ridge, which consequently reduces available roof space for a solar array.¹² Due to this code requirement, several homes were installed with a stranded panel on a less-than-optimal orientation rather than being installed with the bulk of the panels. Breaking up an array in this manner adds cost to the installation and reduces performance. The code requirement generally reduces the amount of roof area available for solar. This is particularly detrimental for under-resourced communities that typically have less roof area.

As SUN has anticipated, the retail electricity market added a layer of complexity to the project. Since most REPs have hefty termination fees for those who cancel their plan before the contract period ends, SUN has been working with each participant to track individual electricity plan expiration and renewal dates. SUN is also working with [Texas Power Guide](#) (TPG) to run reports for each participant a few weeks before the renewal date to see which plan would help maximize their savings. Each situation is unique, and the plans change frequently. Even with this added support, one participant accidentally authorized his REP to switch him to a different "solar" plan that was not as beneficial as his old one, which had a very low import rate but didn't credit him for excess generation. Several Year One participants felt pressured by their REP to renew months before their renewal date. One participant, not understanding the TPG analysis and options, chose to switch to a plan another NAC member was on, which was not optimal for them. Tracking electricity plan prices, renewal dates, and consumption patterns is cumbersome, and the lack of fair and consistent buyback plans poses a significant barrier to

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https://visionelements.programprocessing.com/framework/CenterPointTX/612022143851.2022_HTR_Manual.pdf

¹¹

https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall%20AC_Datasheet_en_northamerica.pdf

¹² <https://www.houstonpermittingcenter.org/media/6111/download?inline>

equitable solar access. The good news is that since the 5 kW systems are generally undersized compared to usage, savings are realized from the first month without switching plans. Participants are encouraged to use energy while the sun shines unless they are on a free nights plan.

With Hive Fund support, SUN, alongside the Texas Solar Energy Society (TXSES), was able to commission DUNSKY Energy to write the “Value of Solar: Texas” report, providing an in-depth analysis of the shared benefits of residential rooftop solar within ERCOT over the next 25 years. The need for this report was identified as one of our main priorities for Year Two of this program. The key findings included:

- Solar energy substantially benefits Texas’s grid, determining that the overall solar energy value in ERCOT in 2025 will be about \$0.27/kWh.
 - * About 75% of the total value (\$0.15/kWh) is realized in the generation, transmission, and distribution system, which includes avoided energy costs. The remaining 25% (\$0.12/kWh) is realized through air pollutant and emission reduction benefits, including reducing greenhouse gas pollution.
- Current REP export rates range from \$0.03/kWh to \$0.19/kWh. This range is due to utilities’ varying ways of evaluating solar’s grid benefits, and often, they do not include solar’s additional benefits to the wholesale market. These export credits may not accurately reflect solar’s full value.
- Beyond the quantified value of solar energy above, distributed solar energy provides significant job and local economic benefits and improvements in poverty alleviation and energy equity.

This report is a critical piece for establishing fair credit for solar in Texas, which will also make it easier for low- to moderate-income families to go solar. We have shared it with Commissioners at the Public Utilities Commission of Texas (PUCT). We are using the findings to push the PUCT to take action and open a rulemaking process on fair credit rates for solar owners. We hope this results in substantial changes for Texans receiving fair credit for their solar energy.

Challenges Encountered

Unfortunately, the three batteries we installed in the Hub Homes during Year One encountered issues during the Derecho in May 2024. One battery failed to provide backup power, which the installer suspected was caused by a power surge on the grid. The other two batteries provided power until discharged but could not return online when the sun came out the next day. The installer had to use a generator supplied by WSR to charge up one of the batteries enough to return it online. The installer blamed the failures on not having the most current software updates. They contacted Tesla, who said, “We think that when the power went out, it didn’t just go out once. It came in and out several times in the span of a few seconds, which may have confused the system’s internal logic. Coupled with the low battery, the system was not doing what it was supposed to.”

While some technical issues are beyond our control, SUN created “Battery Steps” (Appendix 4) for both the installer and the homeowners to avoid these situations going forward.

Fortunately, each battery operated properly during the next power outage from Hurricane Beryl, which left more than 2.3 million customers in the dark for days after Beryl swept the Houston area. This small failure highlights the importance of pilot projects. While it was unfortunate that these systems failed, since there were only three, we could amend the situation relatively quickly. We can now institute better battery education for future rounds to prevent this from happening in the future.

Suggestions and next steps

While the Inflation Reduction Act (IRA), which passed in August 2022, set the stage for new rules to be written, processes to be developed, and investments to be made, practical guidelines for implementation are still being developed. The IRA presents several new opportunities for improving access to solar, including elective pay for non-profit institutions and renewed and enhanced tax benefits for solar, while also making \$27 billion available for direct investment in greenhouse gas reduction strategies.¹³ The IRA renewed the federal tax credit for solar at 30% until 2032, and the IRS has recently come out with guidance about how non-profit institutions can take this tax credit in direct payment or “elective pay.”¹⁴ This development helps reduce solar costs for institutions like churches, school districts, rural electric cooperatives, and community benefit organizations. Moreover, the EPA has funding opportunities for states to apply for federal funding to invest in solar locally. SUN and WSR are subrecipients of a Texas Solar For All (SFA) grant received by Harris County to expand the Hub Home pilot in other areas of Harris County. The local organizing, lived experiences, and project deployment built in Northeast Houston for years are invaluable to spurring further action through opportunities made available at the federal level. Projects such as this one collectively build neural pathways, muscle memory, and community insight to adapt and scale up.

SUN has created templates for non-profits and elective pay based on a pilot in Minnesota. We continue to explore avenues for a community partner to own the arrays and take the elective pay to reduce the system costs and potentially open future projects to more participants. Since so many participants expressed an appetite for a loan—assuming it was cash-flow positive and without a strict credit score requirement, we have also had several conversations with Green Banks to explore a loan component. Ensuring cash-flow positivity is difficult without consistent buyback plans and amid rising interest rates, so while we could not iron out a financing option for Year Two of the pilot, SUN and partners are eager to explore inclusive financing options for future projects. Even though it would not be cash-flow positive, several participants expressed interest in a low-interest, short-term loan for adding a battery.

Finally, a few minor adjustments that had a significant impact include providing an overview of all documents that must be signed as part of both individual calls with participants and group information sessions and wrapping participants into an even more extensive group

¹³ Solar United Neighbors. “How the Inflation Reduction Act Helps You and Your Community Go Solar.” March 8, 2023.

<https://www.solarunitedneighbors.org/learn-the-issues/solar-incentives/how-the-inflation-reduction-act-helps-you-and-your-community-go-solar/>.

¹⁴ “Elective Pay Overview | IRS,” Accessed August 2023. <https://www.irs.gov/pub/irs-pdf/p5817.pdf>.

buy program (Solar Switch Houston) to secure competitive rates. SUN will use this knowledge as we help SFA coalition partners train their solar ambassadors to implement their programs successfully. Empowering the 20 solar homeowners to be trusted solar ambassadors in their community is an important step. SUN created this [Texas Solar 101](#) YouTube video, which can be listened to with Spanish subtitles.

While the IRA opens up several potential pathways to scaling solar access and adoption, regulatory barriers remain due to how electricity is sold to consumers and the need for more opportunities for public participation in rate-making processes. In the aftermath of winter storm Uri, REPs stopped offering buyback plans that mimic net metering due to rising TDU rates that REPs must pay for all their customers. Rooftop solar customers are providing a service to the grid by generating electricity near where it is consumed. Yet solar customers provide the lowest value to a REP. More market signals are needed to incentivize REPs to make more solar-friendly plans. Opportunities for changing the regulatory environment are slim. The PUC does not account for the value distributed generation brings to the grid in their rate-making processes, and each TDU has a separate Transmission and Distribution Cost Recovery rate case, which rarely has intervenors. While changing these parameters is an uphill battle, SUN is committed to continue tracking opportunities for engagement.

Recommendations for Future Projects:

- **Organizing in-person gatherings to have all participants fill out paperwork together.** This saved us a lot of time, and having a working meeting helped build trust and rapport early on in the project.
- **Providing very in-depth education for anyone receiving a battery system.** This will ensure they can effectively manage their energy loads to prevent battery failures.
- **Establishing a clear and protected pathway for residents to use elective pay.** Many low-income residents do not have a tax burden and cannot use the 30% investment tax credit. Creating a way for low-income solar owners to use elective pay for nonprofits will ensure everyone can use the 30% tax credit and will help more projects pencil out.
- **Accurately valuing solar export rates in the ERCOT market.** In line with the findings of our DUNSKY study, ensuring that ERCOT and REPs are providing fair pricing for solar export rates is critical to allowing low-income households to go solar. Having consistent and fair pricing for solar energy makes payback periods shorter and makes it a dependable investment in the long term.

In addition, we offer the following policy recommendations to improve solar access and scale-up adoption in the Houston metro area.

- **On-bill loan servicing (i.e., inclusive financing with consumer protections):** One opportunity for expanding access to solar would be in the form of very low-interest loans. Paying one bill for a solar system and a utility bill is more manageable than paying two bills and reduces the paperwork burden. With on-bill loan servicing, the utility collects payment from the customer and passes the payment on to a third-party lending provider.

- **Consider revisiting the minimum clearance required in Houston's Fire Code:** 1204.2.1.1 Pathways to ridge and 1204.2.1.2 Setbacks at ridge to be in line with current best practices in fire safety while maximizing available roof space for solar.

Appendix 1

WSR Elective Pay Scoping

Basic Idea:

Solar United Neighbors (SUN) has a grant to work with West Street Recovery (WSR) to provide 10 free ~5kW installations to Northeast Houston homeowners at or below 200% of the Federal Poverty Line. WSR expressed an interest in owning the systems for 5 years to monetize direct-pay provisions of the Inflation Reduction Act (IRA), thereby making the grant money stretch further.

What incentives could be available?

- 30% Investment Tax Credit, [Section 48](#)
- 10% “Energy Community”
- 10% Low-income community. By application and with a (generous) cap. “[DOE will review applications and make recommendations to the IRS, which will allocate to up to 1.8 gigawatts \(GW\) of eligible solar and wind capacity per year.](#)” Application [here](#)
- By stacking these incentives, WSR could potentially get back 50% of system costs as a direct payment, though 40% may be more conservative since the low-income community adder comes with an additional application. WSR and SUN could potentially install solar on 20 homes instead of 10.

What would WSR need to do in order to claim the incentives?

See the detailed steps below, [Figure 1](#)

- The IRS has issued draft guidelines. Final rules should be coming out between now and the end of the year.
- Own solar systems for at least 5 years.
- Pre-register on the IRS website, indicating intention to claim elective pay.
- File forms when 2024 taxes are due.
- The IRS rules state that the ITC value + tax-exempt grants, specifically those for solar, can't be greater than the value of the system's installed cost. ([See Figure 2](#))

Additional forms required for installer

- None. Just make sure the agreement notes WSR as the owner and outlines the invoicing process.

Additional forms required for participants

- Addendum to the participant agreement acknowledging that WSR will own the array for the first 5 years. (SUN has an example from MN)

- End of lease, Fair market value agreement stating that WSR will transfer ownership to the homeowner at the end of 5 years and the system will have to be assessed at the “fair market value” (likely 0 dollars). (SUN has an example from MN)
- Lease agreement (SUN has an example from MN)

Additional forms required for WSR

- Additional MOU between SUN and WSR that describes the new relationship for a project where WSR would own the arrays and the tax incentives. (same as above)
- Lease agreement between WSR and homeowner. (Same as above)

Initial Risks

- IRS could reject elections because a grant for solar was used to pay for systems. We hope the final rules will exclude this requirement.
- Could mitigate some risk by only installing 10 homes and waiting on the other 10 until the IRS processes the direct payment. However...
- This could prevent the parties involved from demonstrating that the direct payment and the grant is less than the value of the systems. [See Figure 2](#)
- Invoicing process unclear - SUN is the grant recipient for solar system costs
- Assessing “fair market value” of systems after 5 years.
- In general, SUN is willing to test some of the new rules, knowing that organizations nationwide will also be engaging in tests.
- By taking this on, WSR is potentially opening their books to the IRS (if they determine a need to examine the program).
- As the owner of the systems, WSR would need to have a process for assisting participants with any maintenance/system issues during the 5-year period.

Appendix 2

Electric Plan Analysis for



M. Arellano
Houston, TX

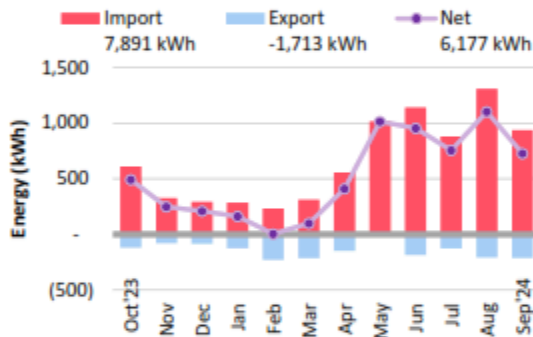
Meter: I349711572

Solar System Size: 5.2 kW
Battery Storage: None

Methodology

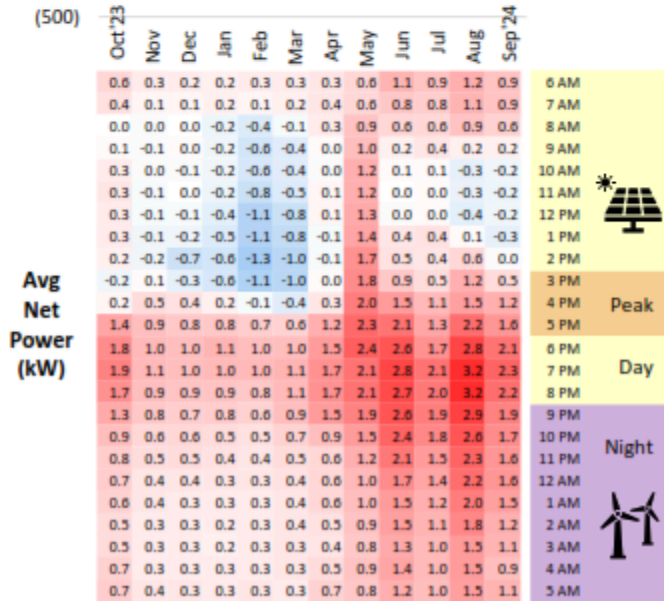
We gather 12 months of your usage, then analyze and rank the total energy plus delivery costs for hundreds of current electric plans.

Grid-Level Energy Usage



Your electric bill depends on how much grid energy you import (consume) versus export (supply), and when.

Some plans set prices and track usage annually; others every 15 minutes.



Tip: Minimizing peak-time usage reduces pollution and can save you money.

	Your Home (kWh)	Average Texas Home
--	-----------------	--------------------

Peak 800 << 2,645




Day 2,319 << 8,120

Night 3,059 4,907

Next: See how plans stack up for this usage. →

🛒 Electric Plan Comparison – Oct 2024

For your usage, here's how your annual bill compares for the cheapest plans versus others:

Retailer	Plan Name	Term (mo)	ETF	Base /mo	Import /kWh	Export /kWh	Other Details †	1st Year Net Bill
[Varies daily]	[Best fixed rate]	12	\$?		7.3¢ +TDU*		Lowest standard non-buyback rate.	\$1,047
 SOUTHERN FEDERAL ENERGY SERVICES	SoFed Solar Buy-Back	12	\$249	\$4.95	7.9¢ +TDU	RTW≤50¢	Buyback subj to chg.	\$1,126 ‡
 CHAMPION ENERGY SERVICES	Champ Saver	12	\$150		8.9¢ +TDU	RTW		\$1,144 ‡
 CHAMPION ENERGY SERVICES	Free Weekends	24	\$250		13.3¢ +TDU	RTW	0¢ energy Sat - Sun	\$1,151 ‡
 OhmConnect	Half Price Nights	12	\$150		11.3 5.6¢ +TDU		50% off 9p - 6a	\$1,191
 THINK ENERGY!	Think Shine	36	\$200	\$9.95*	8.5¢ +TDU*	4.0¢	Buyback subj to chg.	\$1,197
 just energy	Nights Free	12	\$175	\$4.95	25.3¢	3.0¢	Free 9p-7a. Buyback subj to chg. Net consumer.	\$1,202
 T E S L A	TE Fixed Plan	12			11.2 5.9¢ +TDU	5.0¢	Offpeak 12a-4a. Add savings for VPP/EV. Cash out every 12-mo.	\$1,211
 PULSE POWER	Free Energy Nights	12	\$20 /mo	\$4.95	16.4¢ +TDU		0¢ energy 8p - 6a	\$1,225
 CHARIOT ENERGY	Free Nights	12	\$15 /mo	\$9.95	11.4¢ +TDU		0¢ energy 11p-6a.	\$1,255

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* Not offsettable by energy export credits.

Also ranked: Frontier 'Frontier Sun 12' = \$1,286
Gexa 'Solar Export 12' = \$1,286
Octopus 'Octo 12 12' = \$1,315
Green Mtn 'RR Solar Credit 24' = \$1,326
...and 16 others

📝 Notes & Definitions

ETF: An Early Termination Fee for quitting your contract more than 14 days early (unless you move).

Base /mo: A monthly fee to cover administrative or other non-usage-based costs.

Import /kWh: The rate you pay for each kWh of electricity you consume from the grid.

Export /kWh: The credit you earn for each surplus kWh of electricity you supply to the grid.

† Unless noted, surplus credits roll over every month, never expire, and aren't redeemable for cash.

TDU: Your Transmission and Distribution Utility (Centerpoint) currently charges \$4.39/mo + 5.35 ¢/kWh.

‡ **RTW:** Real-Time Wholesale electric rates vary every 5 minutes and are NOT guaranteed, so 'Annual Bill' applies the trailing 12-month price history for reference only. [Click for more details.](#)

This report is brought to you by Solar United Neighbors and powered by Texas Power Guide.

Questions? Please contact txteam@solarunitedneighbors.org



Appendix 3

1. Semi-structured interview questions

A. Questions for participants:

What motivated you to get solar for your home?

What were your concerns (if any) about getting solar?

How was your experience working with the installer?

What lingering questions or concerns do you have now that your system has been installed and turned on?

What was the most challenging part about the process of getting solar?

What was the best part?

How could we make solar available to more people?

How could we improve our solar education and outreach?

Thinking about the neighborhood that you live in, what's your favorite part of your community, and what do you hope to see for your community 10 years from now?

Would you have considered taking out a ~\$5K low-interest, 10-year loan to get solar?

Do you have home insurance and if so how much did it increase in cost? How was the process of adding solar panels to your insurance?

B. Questions for partners

How do you think the pilot went overall?

What was the most significant success?

What was the biggest challenge or sticking point?

What opportunities do you see for process improvement?

What opportunities do you see for pilot expansion?

What are the biggest hurdles for program expansion?

What are the main issues that will exclude people from the program? For example, roof condition, shading, language, etc.

How much staff time did it take per person enrolled? Should this go up or down and if so how?

Appendix 4

NE Houston Solar Equity Battery Steps - HOMEOWNER

For Hub Homes installed with a 13 kWh Tesla battery:

Homeowner responsibilities:

1. Allow installer to assist with getting the Tesla app on the phone (remember password!)
2. Recommended Settings:
 1. Optional: Input current Retail Energy Provider. Update when REP is switched.

***** NOTE: Do not switch Retail Energy Providers without coordinating with SUN. *****

2. Powerwall: use up to **70%** for self-powered (higher percentage for more savings; Tesla will (or owner can) override in advance of a storm.
3. Advanced Option: Permission to Export - Yes
4. Grid Charging: Yes
5. Storm Watch enabled
6. Manage Access: allow third party access, making sure installer has access for possible SREC reporting

***** NOTE: Do not change settings on the Tesla app once the installer has helped set them**

3. Allow additional user so West Street Recovery has access
 1. In Tesla app go to Settings -> Manage Access -> 'Add Member' -> send text invitation to Becky @ 410-991-2908
 2. When Becky accepts it will show 'Becky Selle' becky@weststreetrecovery.org as a user
4. West Street Recovery:
 1. Battery Factory Updates - [need to understand this more].
5. Storm Preparation - General

As solar owners, it's important to prepare for hurricane season to ensure your system remains functional and safe. Solar systems automatically shut off when the grid goes down to protect utility workers who are working to restore power. However, since you have [paired your solar panels with battery storage](#), you can still have power during an

outage. Batteries store the electricity generated by your solar panels, keeping essential appliances running like lights, refrigerators, and medical equipment.

To prepare for a storm, make sure to:

1. Clear debris and trim back vegetation around your solar system if it is safe for you to do so. We recommend against climbing on your roof, so if you have concerns about maintaining the space around your solar system, please contact your installer.
2. Check your system monitoring software
3. Make sure you know how to read your battery's energy levels from your equipment on-site. You might not have internet access during or after the storm.
4. Keep your installer's contact info handy. If you have questions on your equipment or monitoring software, contact them ahead of time.

Remember, solar panels are built to withstand harsh weather, including hurricane-force winds. With proper preparation, and [battery storage](#), your solar system can help you stay powered during and after a storm.

6. Disaster Preparedness - battery checklist

1. In advance of potential power outage, override self-power if Tesla has not already done so, allowing the battery to charge to 100%. Go to "Settings" (Figure 1) -> Powerwall (Figure 2) -> Adjust % Backup Reserve (Figure 3)
2. When power goes out (you may not notice a loss of power in your home but your neighbors, streetlights, etc. may be without power), shut off all things that use electricity in your home that you don't need, for example non-essential window A/C units, fans, lights, local heaters, TV, etc. If possible, close off all non-essential living spaces.
3. Close curtains, change house temperature to 80 degrees or more summer, 50 degrees or less winter if safe for you, given your individual health needs.
4. Continue to monitor your battery level on the Tesla app on your phone. If you don't have internet or much cell service, connect the Powerwall via bluetooth: <https://www.tesla.com/support/energy/powerwall/mobile-app/connecting-powerwall-wi-fi>
5. At 20%, take warning; at 10% power down everything that uses electricity that you don't absolutely need.
6. It is safe to draw down to 10% battery level, although good to watch weather. Will the sun come out the next day to charge the battery back up?
7. Questions about your battery? Call your solar installer (Round 1: Icon Power 888-777-3736; Round 2: Sunshine Renewable Solutions 832-280-8828) or SUN Project Manager (Dori Wolfe 802-272-2328)

7. At least annually:

1. Review your electric bill to see when your plan is up for renewal and one month prior, request SUN to help determine the best plan

2. Test the battery back-up by shutting off your main circuit breaker panel to prove the battery is working.

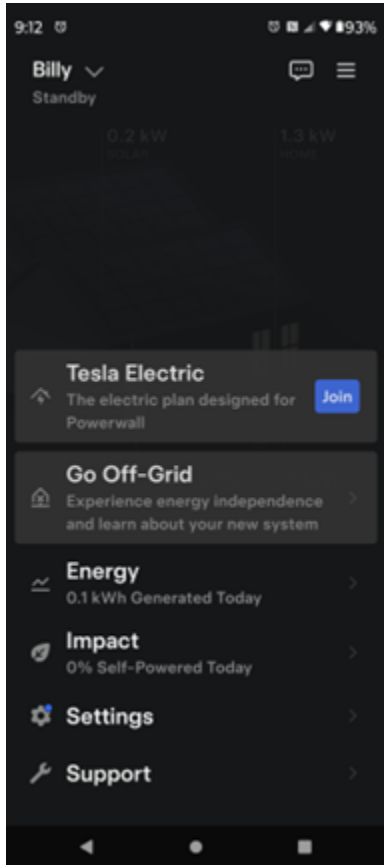


Figure 1

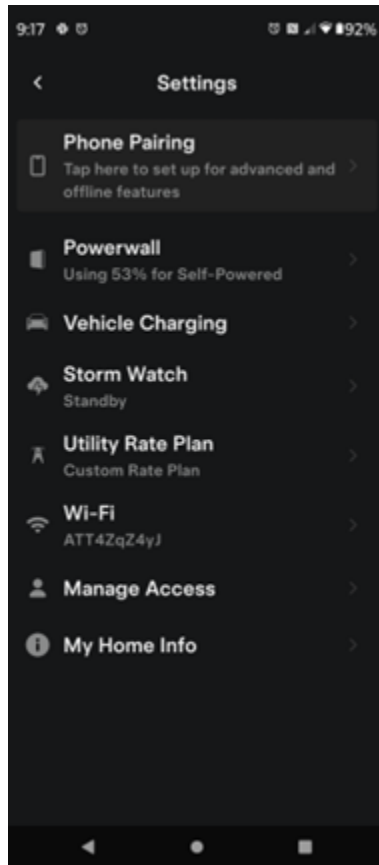


Figure 2

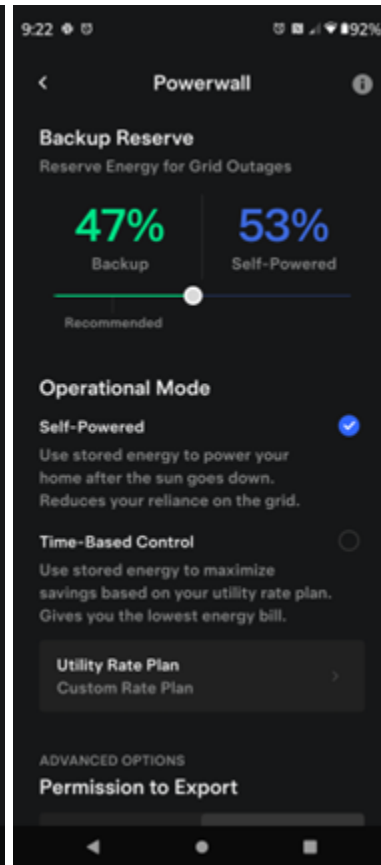


Figure 3