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A No-Cost Rooftop Solar Stimulus

How streamlining residential solar installations can jumpstart a green economic recovery

Acknowledgments

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Introduction

Like so many other industries, solar energy has been seriously impacted by the COVID-19 pandemic. Residential solar permit applications in the United States fell more than 40% since early February,[1] and the last two months have eliminated all the solar jobs created in the last five years.[2] These are thousands of middle- and high-wage jobs that workers across the U.S. and California need back.

As cities start to reopen and organize around recovery, California and the Bay Area should look to significantly expand the number of good solar jobs that can support families, combat climate change and make communities more resilient to natural disasters.

While there's little money in state and local budgets for new solar subsidies to support this job expansion, state and local governments can provide a no-cost solar stimulus by streamlining the stack of building and fire codes and permitting and inspection requirements that delay solar installations and drive up costs. "Soft costs" like these are notoriously high in the United States and in some cases can account for more than half the price[3] of getting small solar systems off the ground and onto roofs. In effect, local and state governments should treat installing rooftop solar panels more like getting a new HVAC system or washing machines (an appliance) and less like building a new foundation (a construction process).

Rooftop solar permitting and building inspection processes are intended to protect residents and promote safety, but they can complicate and delay solar installations, particularly for routine, small-scale residential systems. California has a well-established solar industry and has led on regulatory reforms, yet these costs can still add up to an additional $3,000 per installation.[4] By bringing down these costs to levels seen in countries like Germany — while still guaranteeing safety — California and the Bay Area can jumpstart a recovery built on a clean energy economy and high-potential jobs.

The Golden Solar State

The solar industry is now large enough to be a true driver for clean and equitable economic growth in California and the Bay Area. Before the recent job losses, the solar industry had grown impressively, adding over 100,000 jobs in the last decade and growing at four times the rate of the overall economy.[5] In 2018, the Federal Bureau of Labor Statistics predicted that solar installers would be the fastest growing job over the coming decade.[6]

California is particularly well positioned, too: The 2019 state building code update requires solar systems on new home construction,[7] creating a powerful connection between green jobs and solving California's acute housing shortage. The California Public Utilities Commission and publicly owned power utilities and distributors (known as community choice aggregators, or CCAs) across the state have provided strong rate-based incentives for customers to install rooftop solar and storage.

Delivering Rooftop Solar Today

In California, each rooftop solar system requires a building permit similar to what you'd need if you were building a new foundation for your home. Before granting a permit to construct the system, the local government takes a substantial fee (up to $450) to review applications to ensure the system meets building code requirements. The base building code is set by the State of California, but individual cities interpret the same building code sections differently, and some impose their own additional unique code requirements. The variability of codes — and their interpretation and enforcement among jurisdictions — means that, by some estimates, as many as 30% of applications come in incorrect or incomplete. This may help explain why the time from permit application to successful building inspection can vary by up to two months within a

1 https://pv-magazine-usa.com/2020/04/10/what-permitting-volume-tells-us-about-solar-deployment-during-the-pandemic/
2 https://www.greentechmedia.com/articles/read/coronavirus-wipes-out-solar-job-growth
3 https://www.energy.gov/sites/prod/files/2016/05/f32/SC%20Fact%20Sheet-508.pdf
4 https://www.nrel.gov/docs/fy17osti/68925.pdf
5 https://www.thesolarfoundation.org/national/
6 https://www.bls.gov/emp/tables/fastest-growing-occupations.htm
7 https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency

city.[8] Imagine buying a washing machine and not knowing when in the next two months it will be delivered and you can start using it. According to installers, this significant variability in the timing to issue a permit causes meaningful numbers of customer cancellations, driving up costs. This uncertainty also drives down customer satisfaction, increasing the cost of customer acquisition.

After a solar system is permitted and installed, it must be physically inspected. The onsite inspection is intended to ensure code compliance, including proper wiring methods, structural integrity of the building and fire safety measures. Some cities conduct multiple inspections over the course of construction and, in some cases, additional agencies like the fire district will conduct separate checks. As with the permitting process, there is variability between jurisdictions in department expertise, capacity and interpretation of building codes. Often a building inspection appointment can require a contractor to spend hours at the job site waiting for the inspector to arrive. The time it takes to schedule, wait for and complete inspections can often cause significant delays in starting up the rooftop solar system once it has been installed. In fact, despite California's well-established rooftop solar industry (and some legislative reforms, described below), average wait times between when a permit has been submitted and a successful building inspection have remained consistent at 45 to 50 days over the last decade.[1]

This regulatory process made sense when rooftop solar was still a new and untested product. However, there have now been over 1 million rooftop solar installations in California and many millions more around the world.[2] A recent study using data from Germany, which has over 1.7 million rooftop solar installations, found only 210 fires caused by rooftop solar systems.[3] While the cost of solar technology continues to fall, the burden of permitting has remained a persistent barrier to expansion across the state. This is despite the growth potential that the solar industry has already demonstrated in California and despite policies that encourage solar expansion.

Toward No-Cost Permitting

Streamlining the permitting and building inspection process for small solar systems would reduce the burden on building departments, help meet the state's renewable energy goals and spur local job creation, while still ensuring safety.

California has passed several pieces of legislation to partially manage costs and improve local government processes for rooftop solar systems. SB 1222 (Leno, 2012) capped permit fees at $500 per permit.[4] AB 2188 (Muratsuchi, 2014) required local governments to create a streamlined permitting process for small (under 10 kilowatt) rooftop solar systems[5]. As a result, local jurisdictions must allow applications to be filed online for rooftop solar systems, limit permit review timeframes and consolidate inspection visits.[6] Most recently, AB1414 (Friedman, 2017)[7] extended AB 2188 and further reduced the cap on permit fees.[8] The law has been successful for some cities: San Jose, for example, went far beyond the requirements in AB 2188 when it implemented its streamlining ordinance in 2015, putting in place a system that not only allowed for online permit submission, but also provided instant online permit approvals. As a result, San Jose saw a 600% increase in residential rooftop solar permits by the following year.[9]

Other jurisdictions, however, lack the resources and staff capacity to make significant progress or have only half-heartedly implemented the legislation. San Francisco, for instance, will allow for a permit application to be submitted online, but applicants must show up at the Building Inspection Department and stand in line to receive the permit itself.
Local governments across the Bay Area could pursue several significant steps to dramatically reduce the cost of small residential solar installations — and increase their uptake:

8 https://emp.lbl.gov/publications/patience-virtue-data-driven-analysis
9 https://emp.lbl.gov/publications/patience-virtue-data-driven-analysis
10 https://www.latimes.com/environment/story/2019-12-12/california-clean-energy-milestone-1-million-solar-roofs
11 https://www.energy.gov/sites/prod/files/2018/10/f56/PV%20Fire%20Safety%20Fire%20Guideline_Translation_V04%2020180614_FINAL.pdf
12 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB1222#:~:text=SB%201222%2C%20Leno
.,limit%20obstacles%20to%20their%20use.
13 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB2188
14 https://static1.squarespace.com/static/54c1a3f9e4b04884b35cfef6/t/5a7509ff24a69434ae0e3f4a/1517619712940/
CALSSA+Streamlined+Permitting+Fact+Sheet.pdf
15 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB1414
16 https://static1.squarespace.com/static/54c1a3f9e4b04884b35cfef6/t/5a75124e53450ac9090fbf73/1517621839970/
CALSSA+Solar+Permit+Fee+Cap+Fact+Sheet+2.1.18.pdf
17 https://insideclimatenews.org/news/29072016/california-fast-track-solar-permits-let-sun-shine-faster-cheaper-san-jose-los-angeles

1. **Standardize local building codes for rooftop solar across the Bay Area.**

Local jurisdictions should align their requirements to California's building, residential, fire and electrical codes and coordinate with each other to make enforcement consistent. This would significantly reduce the cost associated with the multitude of building codes, and would eliminate expensive additional requirements in some jurisdictions.

2. **Transition to fully online permitting, including application, fee payment and permit acquisition**.

Studies have shown that providing an online option while retaining some in-person permit applications does not meaningfully reduce permitting timelines. A fully online process, however, would significantly reduce the cost associated with having to travel to the local government office and wait in line as well as reducing government staff workloads. This change would also increase public health safety: A number of jurisdictions around the country have quickly moved to online processing during the pandemic.[18]

3. **Provide automated and instant approval for online applications.**

By creating online applications that ask standardized questions and filter for compliant answers, software can easily provide automated and instant approval for solar permits. This software would virtually eliminate the permitting cost born by local jurisdictions and cut permit application processing time to zero for most small residential systems. San Jose and San Louis Obispo already provide automated and instant approvals.

4. **Eliminate permit fees for rooftop solar systems.**

Permitting fees are used to subsidize the administrative cost of processing new solar projects. Ultimately, if jurisdictions improve their permitting and inspection processes with automated and instant online permitting, these fees will no longer be needed for the vast majority of rooftop solar installations.

5. **Allow for virtual building inspection**.

The pandemic has already prompted a number of cities to allow their building inspectors to perform virtual home visits.[19] Virtual inspections would allow building inspectors to inspect many more worksites a day and stay on schedule, reducing both the delay associated with scheduling a building inspection visit and the amount of time that contractors must wait on site for the building inspector to arrive.

Until recently, jurisdictions like San Jose had to build custom software solutions to take the modest steps outlined above. Over the past year, however, the National Renewable Energy Laboratory has partnered with solar companies and code enforcement officials to create SolarAPP, online and automatic solar permitting software that local jurisdictions across the U.S. can use for free.[20]

Like with a credit card application, the SolarAPP software asks a set of standardized questions of each permit applicant and only accepts applications with compliant answers. The SolarAPP software then provides an instant assessment of the system's compliance with state building codes and instantaneously approves or rejects the permit application. The SolarAPP software also allows for local customization options around snow, fire and earthquake safety requirements. Importantly for local governments, it can be used on its own or integrated with online permitting management software that some jurisdictions already use, and still allows local jurisdictions to collect permit fees.

SolarAPP also produces a standardized building inspection checklist that can integrate with any inspection process, including virtual inspections. SolarAPP's timeline has been accelerated during the pandemic and is now being implemented as a pilot with a select group of local governments.

Already there's evidence of significant time saving for local governments who are ahead of the curve and have eliminated permitting and inspection delays. As part of its COVID-19 response, San Luis Obisbo recently moved to fully online instant residential solar permitting. The city has reduced some projects' total installation time (from sale to permit approval to

18 https://solarindustrymag.com/coronavirus-could-change-the-future-of-solar-permitting
19 http://www.cityofnorthlasvegas.com/departments/ldcs/residential_video_inspection_program.php
20 https://www.thesolarfoundation.org/solarapp/

successful building inspection) to 12 hours, down from the average of more than 45 days. SolarAPP has the potential to accelerate these improvements across California and the United States.

Beyond Residential Solar Permitting

Ultimately, rooftop solar systems should transition to a model where they are treated more like installing a home appliance than undertaking a major home renovation. No permit — or permit fee — would be needed. As they are now, solar installers would be licensed and required to cover significant insurance coverage. Rather than inspecting each individual solar system, building inspectors would spot check an installer's overall work. If inspectors found any system to be out of compliance, they would be required to inspect the remainder of the installer's systems at the installer's cost, impose penalties and, if needed, eventually suspend and revoke the installer's license. In the future, solar building codes should be standardized across not just the Bay Area, but across the whole state and maybe even nationally. A very similar system is currently at work in Germany where, despite similar wages and equipment costs, a residential solar system can be installed at half the price as in California.[21]

Conclusion

COVID-19 makes clear the urgent need for a job recovery strategy that employs workers in jobs with high income potential and meets our environmental goals. Ultimately, local governments can create the conditions where installing rooftop solar systems is simple and automatic for homeowners, installers and regulators. In doing so, they can deliver a no-cost green recovery and put the region back to work.

21 https://www.greentechmedia.com/articles/read/how-to-halve-the-cost-of-residential-solar-in-the-us

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