

CESA Webinar

# NREL Solar Permitting Tools: An Introduction to SolarAPP+ and TRACE Tool

May 19, 2021

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# CleanEnergy States Alliance



GOVERNOR'S  
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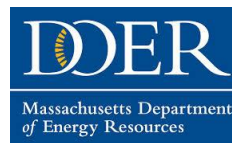
Maryland  
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Department of Commerce  
Innovation is in our nature.



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# Webinar Speakers



**Jeff Cook**

Renewable Energy Policy and  
Market Analyst, National  
Renewable Energy Laboratory



**Nate Hausman**

Project Director, Clean Energy  
States Alliance (moderator)





# NREL Solar Permitting Tools: An Introduction to SolarAPP+ and TRACE Tool

Jeffrey J. Cook PhD

# Webinar Agenda

- Overview of Research and Development Agenda
- Overview and Demonstration of NREL's Solar TRACE tool
- Introduction to NREL's SolarAPP+
- Summary of SolarAPP+ Pilots
- Demonstration of SolarAPP+ Compliance Checks



# National Renewable Energy Laboratory (NREL)

1,800

**Employees,**  
plus more than  
**400**

early-career researchers  
and visiting scientists



**World-class**

facilities, renowned  
technology experts

nearly  
**750**

**Partnerships**

with industry,  
academia, and  
government



**Campus**

operates as a  
living laboratory

**\$872M**  
annually

**National  
economic  
impact**



# NREL Research Analysis

## Analysis

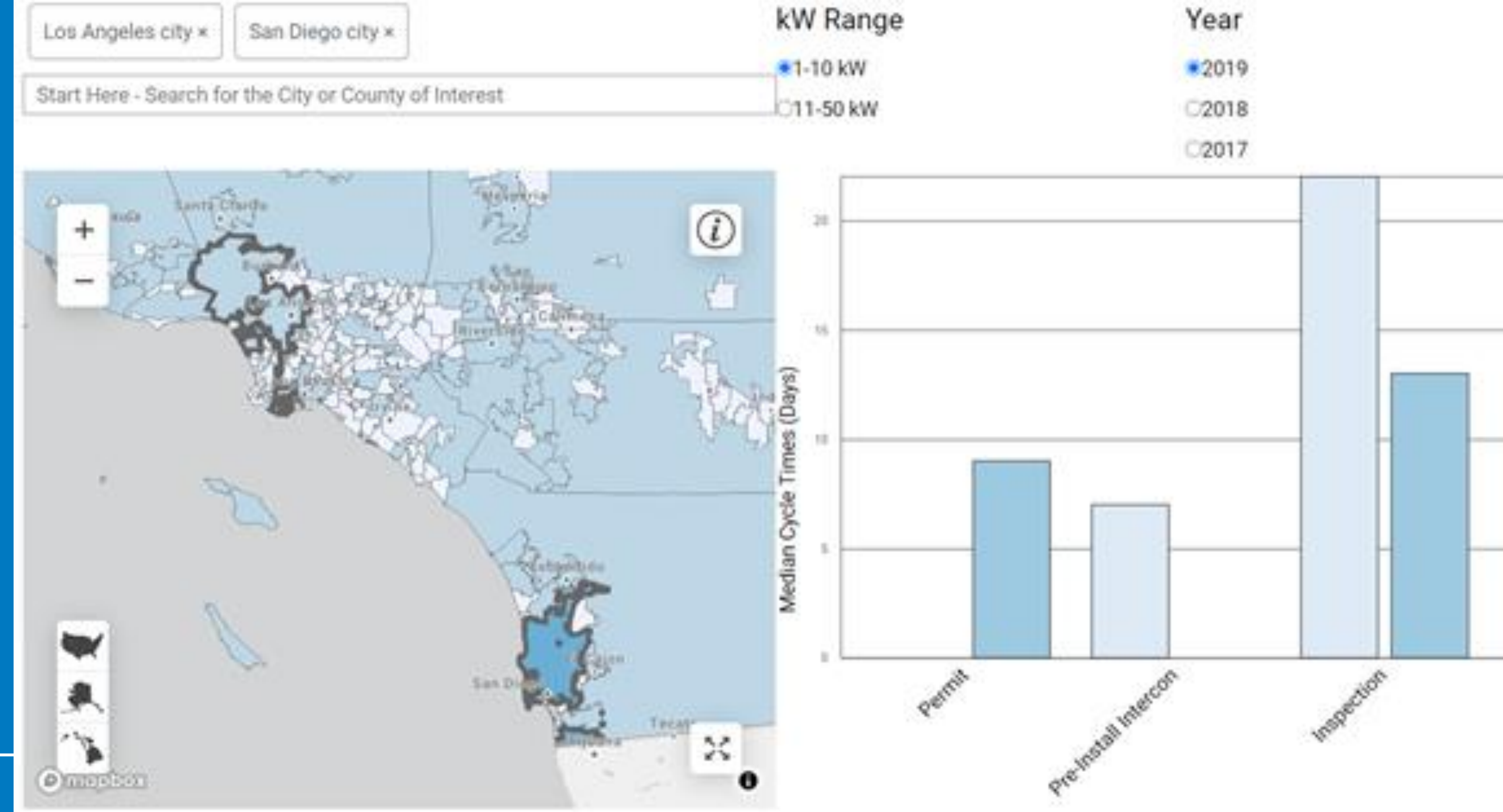
- Identify PII-related process requirements, cycle times, and cancellations across all municipalities.
- Demonstrate how PII-related process requirements correlate with delay and cancellations.
- Increase transparency into PII practices nationwide.

## Software

- Build Solar Automated Permit Processing Platform (SolarAPP+ Platform).



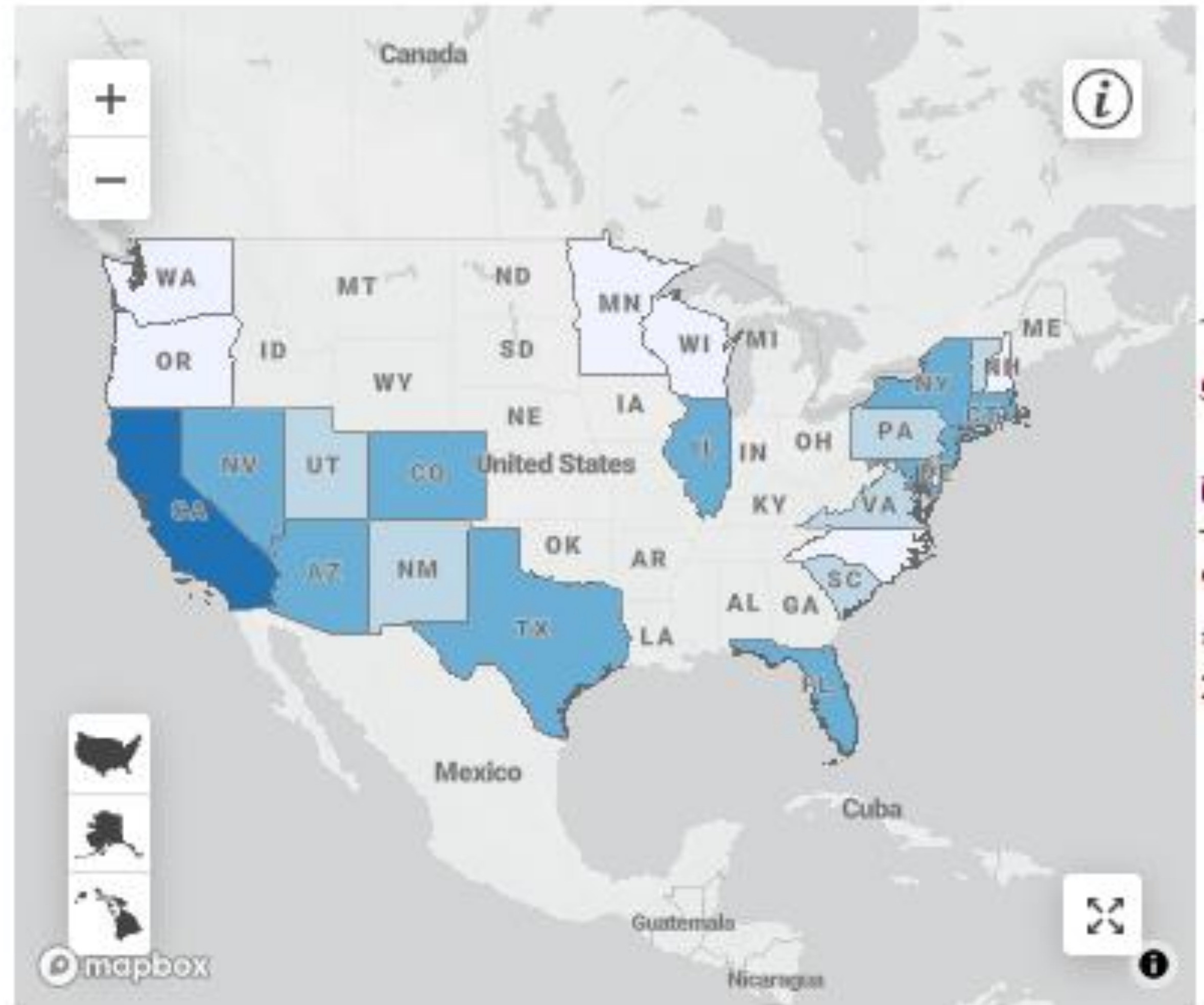
# Demonstration of Solar TRACE



<https://solarapp.nrel.gov/solarTRACE>

# Solar TRACE background

- Data: 200,000 residential rooftop PV systems (2017 – 2019)
- Source: installer partners
- Cycle times for ~740 AHJs and ~100 utilities are included in the dataset
- **Please reach out to NREL to add more data to the database for 2020 and beyond!**





# Live Demonstration of Solar TRACE

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<https://solarapp.nrel.gov/solarTRACE>

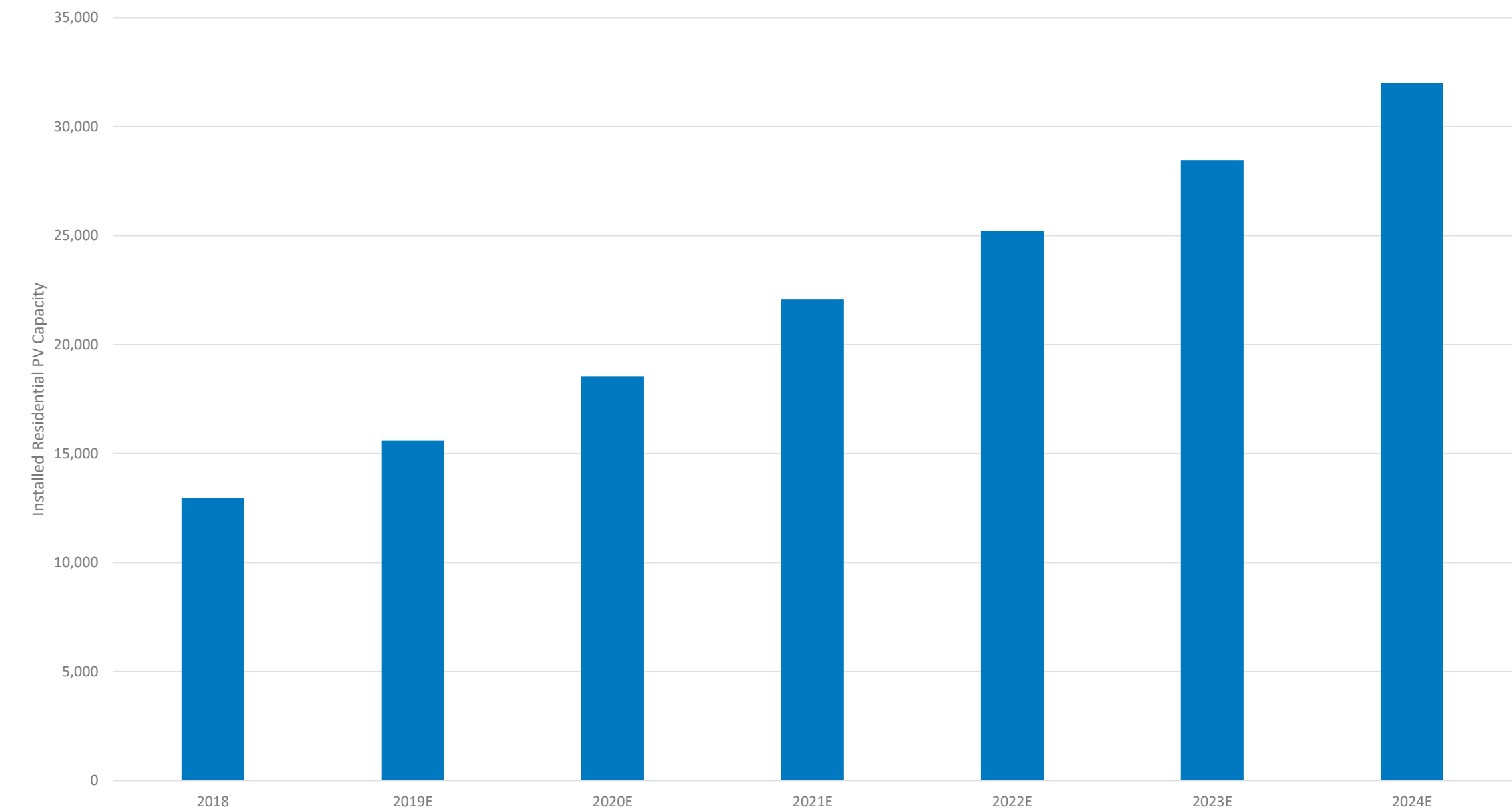
# SolarAPP+ Update

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# Why are we developing the SolarAPP+?

- Residential PV markets are expanding
- AHJs must permit and inspect these systems with limited resources
- Many PV systems have similar designs
  - ~75% of solar systems have one inverter and one or two solar arrays.



**Estimated PV Growth (2018 – 2024)**

*Source: U.S. Solar Market Insight Q4 2019*

# How is Industry Growth Impacting your Community?

- . What percentage of total permit application volume does rooftop solar represent?
- . Are there consistent issues with rooftop solar permits or inspections?
- Would you agree that ~75% of solar permits are standard, more cookie cutter projects?



# Benefits of SolarAPP+

- Automated online permitting can:
  - Reduce resource constraints on AHJ personnel
    - Block incomplete, non-compliant applications
- Allow your staff to focus on tougher projects/tech
- Enable economic development
- Support AHJ clean energy and environmental goals





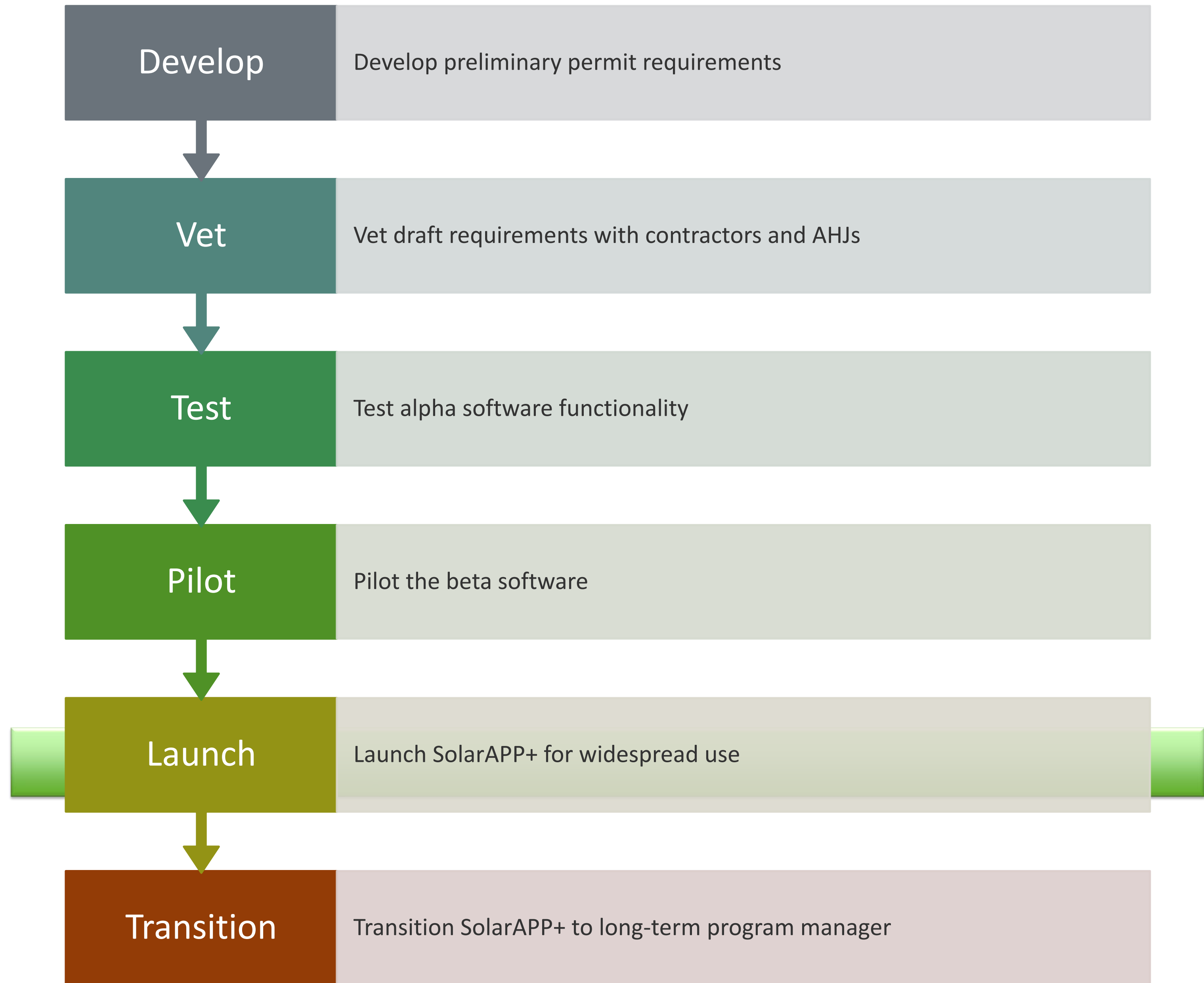


# What will SolarAPP+ Do?

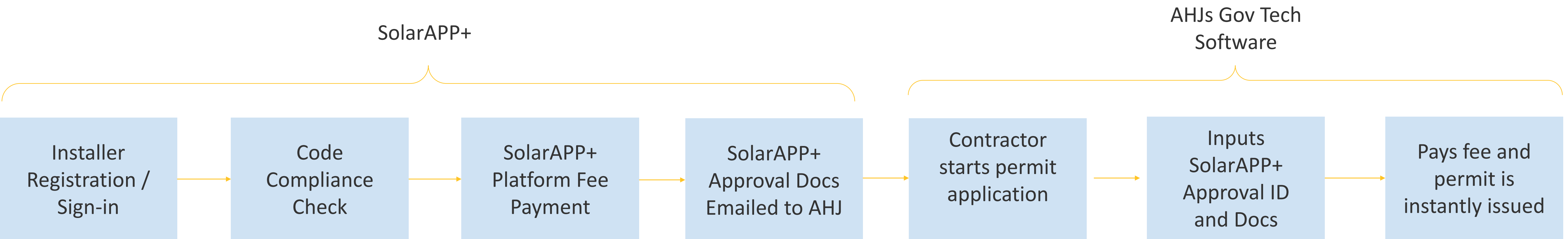
- Provide a flexible, web-based PV-permitting tool for residential systems at no-cost to AHJs.
- Evaluate applications for safety and code compliance.
  - Enable standardization of permitting processes.
- Deliver automated, instant plan review and permit approval
- Provide a clear inspection checklist to streamline inspection processes
- Integrate with existing software platform(s)
- Incorporate energy storage and expand to other market segments.



# SolarAPP+ Project Timeline and Milestones



# Software Implementation Package 1: Automated Plan Review



## •AHJ Requirements

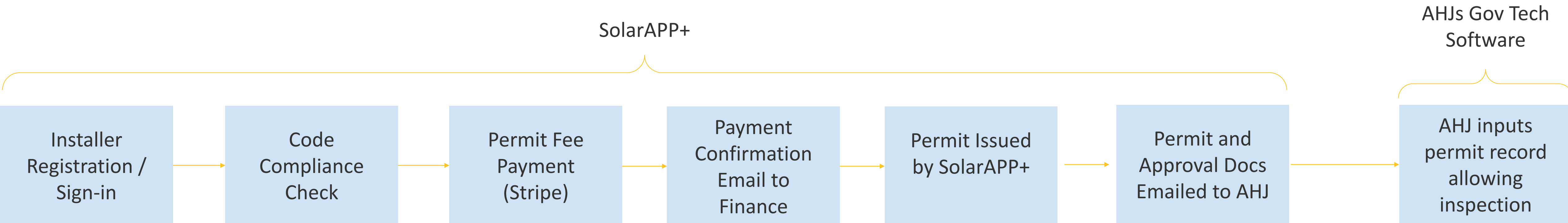
- AHJ repurposes instant permit process for solar.
- AHJ adds new input for SolarAPP Approval ID
- AHJ accepts via email or uploaded approval document.
  - (IF DESIRED as part of record)
- AHJ maintains permit process for ineligible solar projects.

## • Included in SolarAPP+

- Automated plan review for code compliant systems
- Ability to adopt newer model codes.



# Software Implementation Package 2: Standalone Permitting System



## • AHJ Requirements

- AHJ creates a new Stripe account tied to their bank account
- AHJ manually uploads record of SolarAPP+'s issued permit received from email to enable inspection scheduling
- AHJ maintains permit process for ineligible solar projects

## • Included in SolarAPP+

- Automated plan review for code compliant systems
- AHJ fee collection through Stripe
- Permit and inspection job card issued immediately
- Ability to adopt newer model codes.

# Piloting Update and Process

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# Phase 1 Participating Pilot AHJs

- Three Authorities Having Jurisdiction (AHJs) participated in Phase 1 of the SolarAPP+ pilot, which began in December 2020:
  - Pima County, AZ
  - Pleasant Hill, CA
  - Tucson, AZ

## Historical Residential Solar Permit Submittals by AHJ (2016-2020)

|               | 2016 | 2017 | 2018 | 2019 | 2020 | Annual Average |
|---------------|------|------|------|------|------|----------------|
| Pima Co.      | 1801 | 1633 | 1740 | 1408 | 1682 | 1653           |
| Pleasant Hill | 220  | 195  | 197  | 286  | 180  | 216            |
| Tucson        | 1883 | 1627 | 1812 | 1285 | 1534 | 1628           |



# AHJ Characteristics

| AHJ           | State | Pilot Phase | Population | 2020 Permit Volume | Permit Software | Permit Fee | Plan Check Staff | Avg. Permit Review (days) (2016 – 20) | Avg. Inspection Timeline (days) (2016 – 2020) | SolarAPP Integration Pathway |
|---------------|-------|-------------|------------|--------------------|-----------------|------------|------------------|---------------------------------------|---|------------------------------|
| Pima County   | AZ    | Phase 1     | 1,068,730  | 1682               | Accela, ACA     | \$94       | 3                | 8                                     | 35  | Version 1                    |
| Pleasant Hill | CA    | Phase 1     | 34,739     | 180                | Accela          | \$235      | 1                | 2                                     | 33  | Version 2                    |
| Tucson        | AZ    | Phase 1     | 982,000    | 1534               | EnerGov         | \$99       | 2                | 11                                    | 39  | Version 1                    |

Phase 1  
Contractor  
Participants

| AHJ               | Participating Contractors   |
|-------------------|---|
| Pima County, AZ   | Solar Store, Technicians for Sustainability, Tesla, Titan Solar, Solar Solutions Arizona, Sunbright Solar Arizona, Custom Solar and Leisure, and Net Zero Solar |
| Pleasant Hill, CA | Freedom Forever, SunPower, SunRun, and Tesla  |
| Tuscon, AZ        | Solar Store, Technicians for Sustainability, Tesla, Titan Solar, Solar Solutions Arizona, Sunbright Solar Arizona, Custom Solar and Leisure, and Net Zero Solar |

# SolarAPP+ Pilot Projects

- During the pilot, contractors submitted a control group of eligible SolarAPP+ projects through the traditional permit review process and a test group through SolarAPP+.
- AHJ, SolarAPP+, and contractors participated in weekly pilot meetings.

**Residential Solar Permit Submittals during SolarAPP+ Pilot  
(As of 4/14/21)**

|               | SolarAPP+ | Traditional |
|---------------|-----------|-------------|
| Pima Co.      | 43        | 25          |
| Pleasant Hill | 16        | 9           |
| Tucson        | 47        | 15          |

**DRAFT RESULTS: DO NOT SHARE OR DISTRIBUTE**



# SolarAPP+ Demonstration

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## SolarAPP Outreach Materials

- Website:
  - <https://solarapp.nrel.gov/>
- Kickoff webinar:
  - <https://www.youtube.com/watch?v=plIKb165xYI>
- Demonstration webinar:
  - <https://www.youtube.com/watch?v=wMDZYo7wf4I&t=1869s>
- Piloting webinar:
  - <https://youtu.be/iaocESF9Ilg>.
- SolarAPP Benefits Memo:
  - <https://www.thesolarfoundation.org/wp-content/uploads/2020/07/SolarAPP-Benefits-OnePager.pdf>

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

## Questions and Thank You!

For more information contact:

[solarapp@nrel.gov](mailto:solarapp@nrel.gov)

To sign-up for piloting:

<https://www.surveymonkey.com/r/SolarAPPInterest>.

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**www.nrel.gov**





# Upcoming Webinar

**How Low- and Moderate-Income Solar Programs are Evaluated:  
Trends and Best Practices**

*Thursday, May 20, 1-2pm ET*

**Evaluating the Financial Performance of Connecticut's Low- and  
Moderate-Income Solar Lease Program**

*Wednesday, May 26, 1-2pm ET*

Read more and register at: [www.cesa.org/webinars](http://www.cesa.org/webinars)



# Thank you for attending our webinar

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