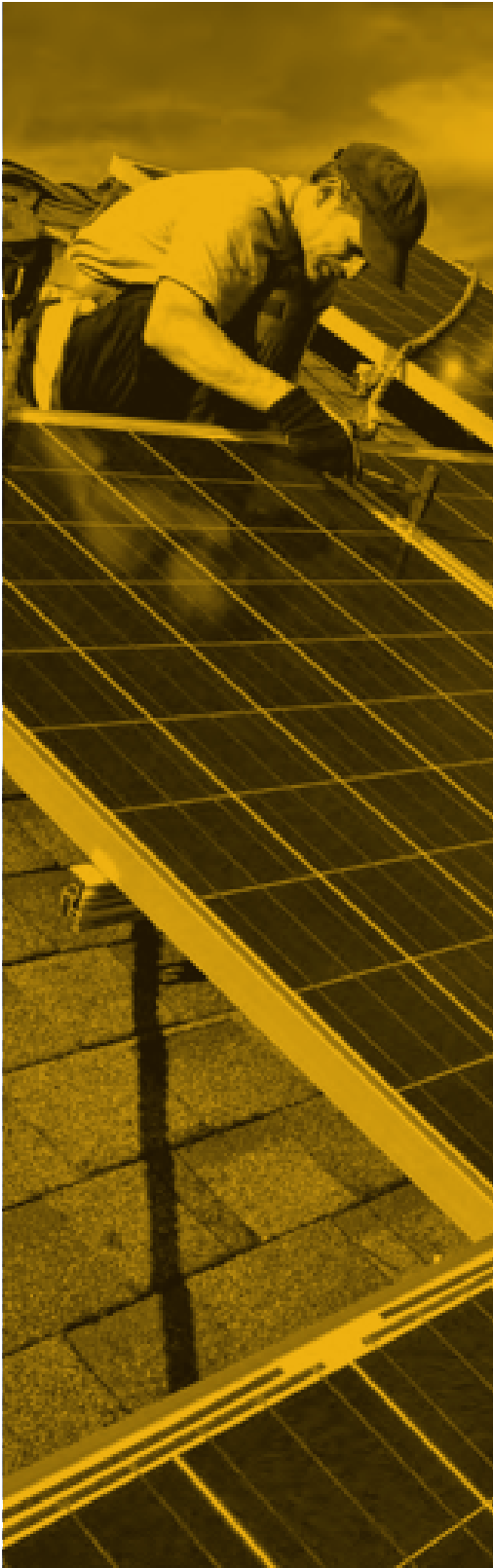


# Economic and Fiscal Impact Analysis of Residential Solar Permitting Reform

EXECUTIVE SUMMARY · JULY 2011



# Executive Summary

AECOM evaluated the economic and fiscal implications of a streamlined local government permitting system for installing solar photovoltaic (PV) systems on residences in California between 2012 and 2020. This summary provides an overview of the following key findings:

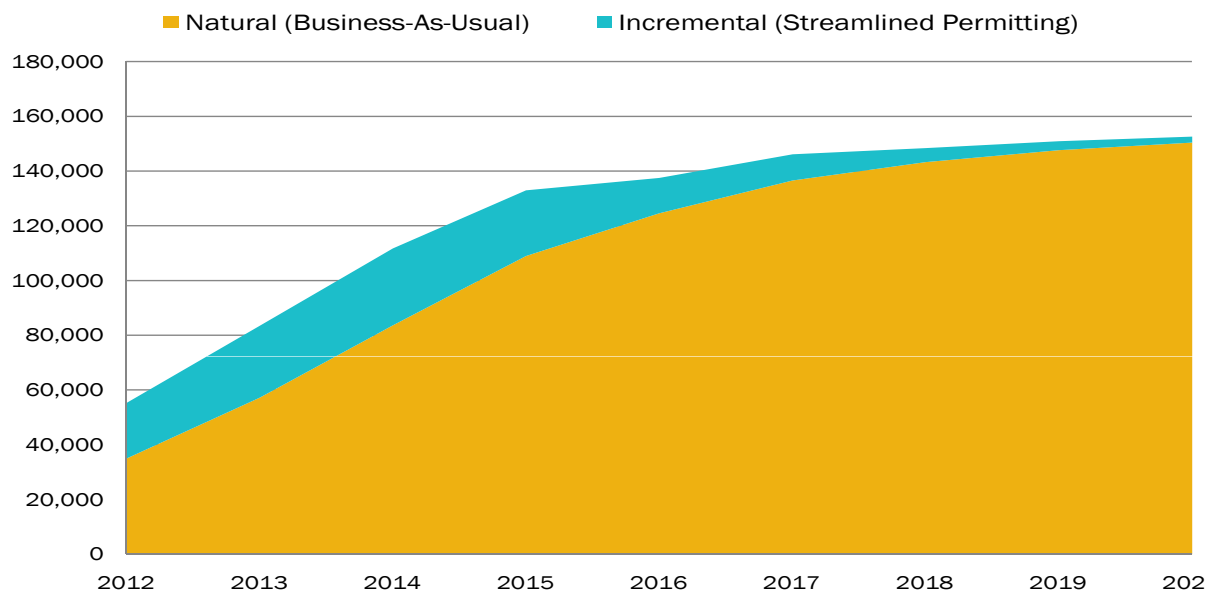
- Under the proposed streamlined permitting regime, California homeowners are projected to install an additional 132,000 systems, a 13 percent increase relative to market projections based on current permitting practices.
- AECOM's analysis estimates that the incremental growth and the additional savings that result from permitting reform would contribute nearly \$5.1 billion to the California economy between 2012 and 2020. AECOM's modeling indicates that approximately 3,900 full-time jobs would be generated by this economic contribution.
- In addition, the state of California, and its cities and counties would gain an estimated \$270 million in revenues from increases in sales tax, property tax, and payroll tax. All economic and fiscal impact calculations will be represented as net impacts in real 2011 dollars, for all years from 2012 to 2020.

## Projected Increase in Residential Solar Installations

As a basis for the fiscal and economic impact analysis that will follow, residential solar installation projections were developed for 2012 through 2020. For the purposes of this analysis, two categories of residential solar installations were considered: natural growth (business-as-usual) - homeowners for whom purchasing a solar PV system is cost effective in the current permitting regime, and incremental growth (expedited permitting) - homeowners for whom the purchase of a solar PV system would become cost effective under the new streamlined permitting regime.

Under the current permitting regime, the total projected natural growth exceeds 1,000,000 installations by 2020. The reduction in permitting costs that a streamlined permitting regime would generate decreases average solar system installation costs by approximately \$0.38 per watt thereby increasing their economic feasibility for many homeowners. Under the proposed streamlined permitting regime, California homeowners are projected to install an additional 132,000 systems, a 13 percent increase (see Figure 1). This increase in solar installations is derived through a reduction in the soft costs (i.e., administrative, permitting, inspection costs, etc.) associated with residential solar installation. This, in turn, enables more

**Figure 1: BAU vs. Streamlined Permitting Regime Solar Installation Projections**



homeowners to justify a solar installation due to a net savings in their electricity costs. It should also be noted that despite the reduction in permitting costs that a streamlined system would represent, these changes are meant to simplify and standardize processes in ways that uphold current safety standards. Recognizing the importance of permitting reform, the U.S. Department of Energy (DOE) launched a \$12.5 million “Rooftop Solar Challenge” in June 2011 to provide a funding opportunity for regional and local teams interested in simplifying and standardizing solar PV permitting processes.

## Residential Solar Permitting + Potential Savings from Streamlining

The current government permitting process in California is uneven across jurisdictions and can be a lengthy and costly process. Government permitting for residential solar installation accounts for approximately five to 20 percent of total installation cost (depending on the size and complexity of the solar installation), or approximately \$2,500 per solar installation. If local jurisdictions put into place a streamlined and uniform permitting system, total permitting costs are estimated to decrease by approximately 76 percent, to approximately \$600 per solar installation.

## Economic Impact

### BASELINE ECONOMIC IMPACT OF THE RESIDENTIAL SOLAR INDUSTRY

Economic impact can be described as the sum of economic activity within a defined geographic region resulting from an initial change in the economy, in this case a permitting reform change that induces growth in residential solar installations. This initial change spurs a series of subsequent activities as a result of interconnected economic relationships. Economic impact is typically defined in terms of output, earnings, and employment. First, an economic impact analysis of the natural growth in the market was performed in order to estimate the overall contribution that solar permitting reform would make to the residential solar market. This analysis was used as a benchmark to estimate the improvement that streamlined solar permitting reform would achieve. The positive economic impacts associated with residential solar include purchases of local materials and labor, household energy savings which flows to other local expenditures, systems purchases, and the indirect and induced economic impacts from the increased direct economic output. The total economic contributions of the residential solar industry to the

Table 1: Summary of Total Economic Impacts for Natural Solar Systems, 2012-2020

Economic Impact	Total CA
Average New Jobs in a Given Year	21,780
Total Output (\$million)	\$28,590
Annualized Output (\$million)	\$3,177

Table 2: Summary of Total Economic Impacts for Incremental vs. Natural Solar Systems, 2012-2020

Economic Impact	Incremental	Natural	Total	% Change
Average New Jobs in a Given Year	3,860	21,780	25,640	18%
Total Output (\$million)	\$5,138	\$28,590	\$33,728	18%
Annualized Output (\$million)	\$571	\$3,177	\$3,748	18%

California economy between 2012 and 2020 is estimated at nearly \$28.6 billion, with approximately 22,000 full-time jobs generated through growth in the industry (see Table 1).

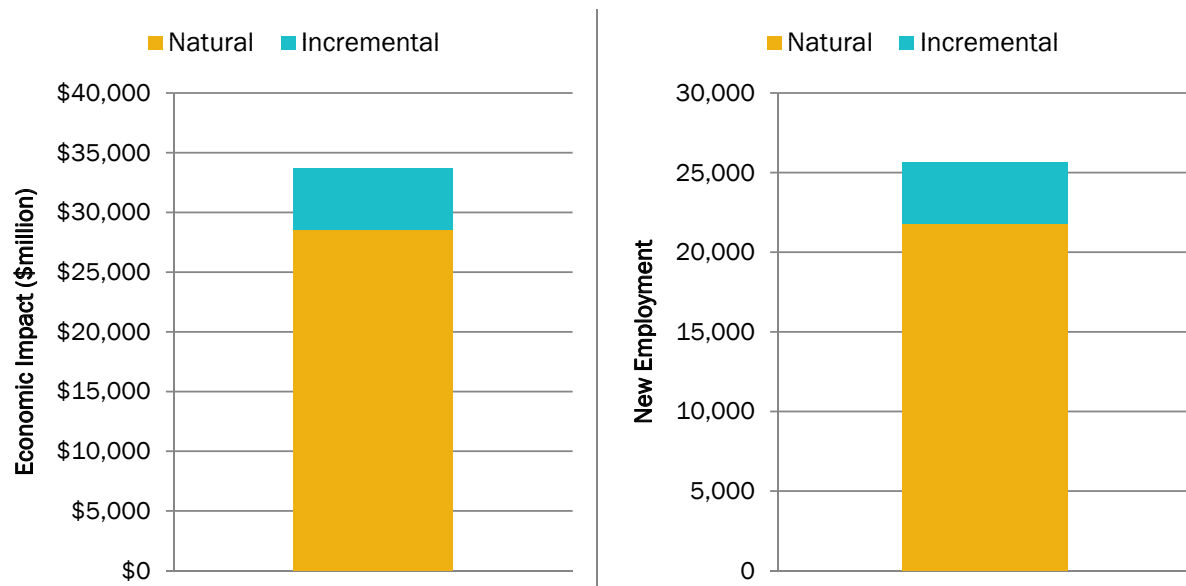
### TOTAL ECONOMIC AND EMPLOYMENT IMPACT OF SOLAR PERMITTING REFORM

The increase in 132,000 additional solar systems from a streamlined permitting system creates positive economic impacts to California, as well as its cities and counties. Overall, full implementation of a streamlined residential solar permitting system in California would generate an additional positive economic impact of approximately \$5.1 billion from 2012 to 2020 in California. As a result, the baseline economic impact increases 18 percent, raising the total economic impact to \$33.7 billion (see Table 2).

The additional economic output requires additional labor. The streamlining of solar permitting results in approximately 3,900 additional permanent jobs in California between 2012 and 2020 (averaged number of new jobs in any given year). These jobs are not necessarily “solar” jobs, but rather are directly and indirectly related to activity within the residential solar industry and the economy as a whole. Direct jobs may include jobs related to the manufacture of solar panels and equipment or the installation and maintenance of the panels themselves. Indirect jobs are distributed throughout the economy and are generated through increased economic activity related to the policy change.

Thus, solar permitting reform would generate an increase of approximately 18 percent in new jobs, with a corresponding improvement of approximately 18 percent in the overall economic impact associated with the residential solar industry (see Figure 2).

**Figure 2: The Increase in the Economic Impact and Employment of the Residential Solar Industry Generated from Solar Permitting Reform, 2012-2020**



## Fiscal Impact

### BASELINE FISCAL IMPACT OF THE RESIDENTIAL SOLAR INDUSTRY

The state of California, and its cities and counties stand to gain state and municipal revenues primarily from increased sales tax, property tax, and payroll tax (state only)<sup>1</sup>. A fiscal impact analysis of the natural growth in the residential solar market was performed to estimate the overall contribution of solar permitting reform to the fiscal revenues (state government, local government, and school districts). This analysis was used as a benchmark to estimate the improvement that streamlined solar permitting reform

<sup>1</sup> Note that there are other smaller state, county, and city revenues not estimated in this study which would also contribute to local and state general funds. These include property transfer tax, transient occupancy tax revenue, car rental tax revenue, in-lieu of vehicle license fee revenue, tobacco and alcohol revenues, and others.

would achieve. It should be recognized that this analysis represents a conservative estimation of fiscal impacts because the period of analysis (nine years) corresponds to less than half of the expected lifespan for a solar system (25 years). Were the analysis to extend beyond 2020, additional fiscal impacts would be captured, especially those related to property tax (as property tax increases are realized at the point of sale, and more homes would be projected to sell over the additional 16 years).

The total fiscal contributions of the residential solar industry under the current permitting regime to the California state government between 2012 and 2020 is estimated at nearly \$1.4 billion (\$1,350 per system), with over \$226 million (\$220 per system) of fiscal impact for local jurisdictions (cities and counties), and \$37 million (\$30 per system) to school districts throughout the state (see Table 3).

**Table 3: Summary of Total Fiscal Impacts for Natural Solar Systems, 2012-2020**

Fiscal Impacts	Total CA
Sales Tax - State (\$million)	\$1,034
Sales Tax - City & County (\$million)	\$207
Property Tax - School Districts (\$million)	\$37
Property Tax - City & County (\$million)	\$19
Payroll Tax (\$million)	\$325
<b>Totals</b>	
Total Inc. Special Districts (\$million)	\$1,358
School Districts (\$million)	\$37
City and County Governments (\$million)	\$226

### THE FISCAL IMPACT OF SOLAR PERMITTING REFORM

In total, the state would gain approximately \$211 million in additional revenues from a streamlined solar permitting system, while local jurisdictions (cities and counties) and school districts would receive over \$36 million and \$20 million respectively (see Table 4). Thus, solar permitting reform would generate approximately a 16 percent increase in combined sales and payroll tax revenues to the state government and a 16 percent in combined sales and property tax revenues to local governments. School districts would receive a considerable 53 percent increase in property tax revenues (see Figure 3). These fiscal benefits amount to nearly \$270 million of additional revenues to state and local governments, as well as school districts around the state.

### SALES TAX

Sales tax gains are realized at the point of sale of the solar system and the purchase of local materials, as well as indirectly as household energy savings are converted to discretionary spending in the general economy. Discretionary spending is primarily captured locally as households spend more on local restaurants, services, and retailers, though it is recognized that some percentage of discretionary income may not be used for expenditures but rather for savings or debt repayment. The total sales tax impact of the residential solar industry under the current regime is estimated to be \$1,034 million to the state and \$207 million to local jurisdictions. Solar permitting reform would increase these sale tax revenues by approximately \$155 million to the state and \$31 million to local jurisdictions from 2012 to 2020. This represents a 15 percent increase in the sales tax revenues flowing to both the state and local jurisdictions.

The increase in sales tax revenue would continue throughout the functional life of the solar system, as discretionary income is deployed in the local economy beyond the 2012 to 2020 evaluation years.

**Table 4: Summary of Total Fiscal Impacts for Incremental vs. Natural Solar Systems, 2012-2020**

Fiscal Impacts	Incremental	Natural	Total	% Change
Sales Tax - State (\$million)	\$155	\$1,034	\$1,188	15%
Sales Tax - City & County (\$million)	\$31	\$207	\$238	15%
Property Tax - School Districts (\$million)	\$20	\$37	\$57	53%
Property Tax - City & County (\$million)	\$5	\$19	\$24	28%
Payroll Tax (\$million)	\$56	\$325	\$381	17%
<b>Totals</b>				
Total Inc. Special Districts (\$million)	\$211	\$1,358	\$1,570	16%
School Districts (\$million)	\$20	\$37	\$57	53%
City and County Governments (\$million)	\$36	\$226	\$262	16%

## PROPERTY TAX

The gain in property values is realized to government revenues over time as properties are sold, the sale price reflecting a premium associated with the solar system<sup>2</sup>. The total property tax impact of the residential solar industry under the current regime is estimated to be \$37 million to school districts across the state and \$19 million to local jurisdictions. The gain in property values associated with the increased number of solar installations under the streamlined permitting regime would result in approximately \$25 million in property tax, with \$20 million flowing to school districts around the state, and \$5 million flowing to local jurisdictions. These gains in property tax revenues represent a 28 percent gain to local jurisdictions and a 53 percent increase to school districts. However, the potential gains in property taxes would not be fully realized during the period of this analysis (2012-2020). As more homes with solar systems are sold<sup>3</sup>, their home sale premiums will be realized which then boosts school district and local jurisdiction fiscal revenue.

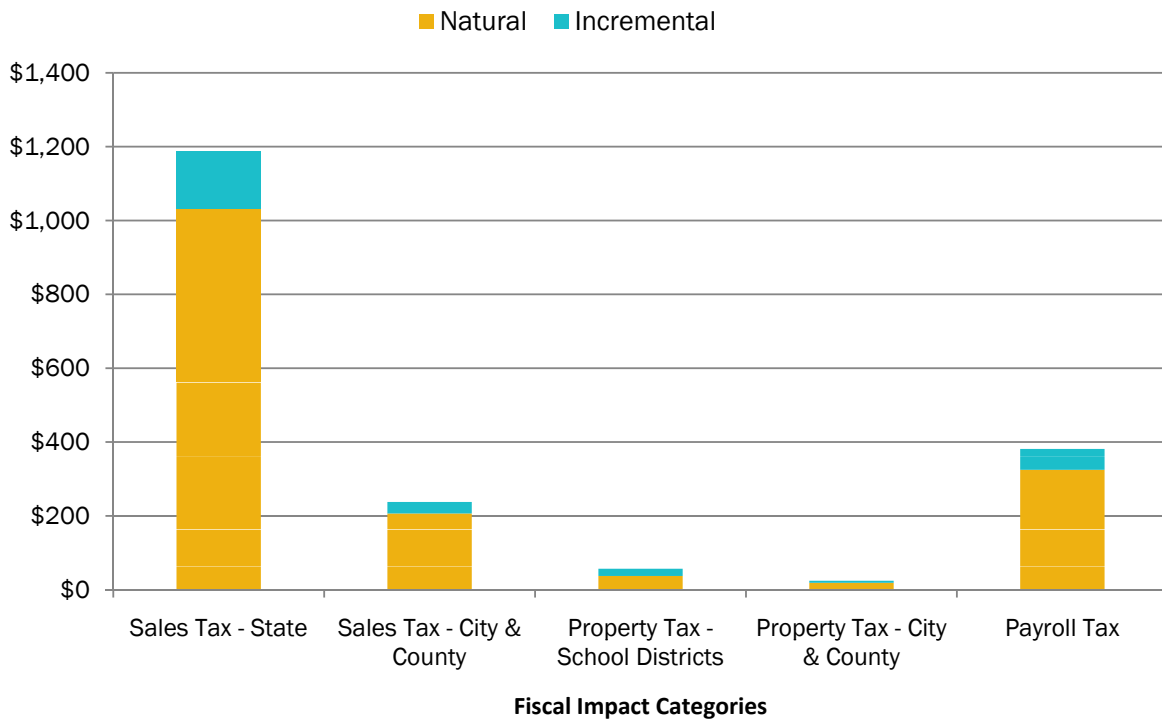
## PAYROLL TAX

Finally, the state will also receive additional payroll tax as a result of the increased economic output and employment associated with solar permitting reform. The total payroll tax impact of the residential solar industry under the current regime is estimated to be \$325 million, which would flow directly to the state. The state stands to gain approximately \$56 million in additional payroll tax revenue. This represents an increase of approximately 17 percent compared to the fiscal impacts of the current permitting regime.

<sup>2</sup> A recent hedonic pricing study conducted by the Lawrence Berkeley National Laboratory demonstrated a 3.6 percent (\$5.50 per watt) average increase in sale value for homes that have a solar system.

<sup>3</sup> Residential rooftop solar systems are exempt from the property taxes as an additional improved value. However, their value would be included in the total assessed value at point of sale to the extent that the systems provide a premium to the total home sale value.

Figure 3: The Increase in the Fiscal Impact of the Residential Solar Industry Generated from Solar Permitting Reform



## Conclusions

With economic impacts in excess of \$5 billion and fiscal impacts of nearly \$270 million cumulative across the state level, solar permitting reform represents a compelling opportunity to stimulate economic activity and generate fiscal revenue. These potential economic and fiscal impacts should be taken into consideration as jurisdictions consider reforming solar permitting processes to help encourage additional adoption of residential solar systems. DOE has already funded and developed the resources to quickly and efficiently implement a better process, such as the Expedited Permit Process by Solar ABCs and the Solar America Communities program. These initiatives at the federal level can be leveraged by governments at the local level to make this policy reform effectively.

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