AESC Review Note 2

Solar Initiatives in California

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Publication Date: 04-2020

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Introduction:

To accelerate the solar development, the California Million Solar Roof Initiatives was established in 2006. The state governor planned to install one million solar systems, with installed capacity of 3GW by 2018. The target of one million solar was met with installed capacity of 8.7 GW, which is almost three times the original capacity target. The literature discussed the progress, benefits and drawbacks of those innovative initiatives. It thus provides good implication for other cities formulating the solar energy transition.

1. California Million Solar Initiatives

The California Million Solar Roof Initiatives (the initiative) was established in 2006 by former governor, Arnold Schwarzenegger, authorised by Kevin Murray, Senator in the California State Senate which the state would provide a USD 3.3 billion incentives in total (rebate program) to help Californians to install one million solar energy systems on homes and business throughout the state by 2018, with a 3 GW installed capacity which enough to power one million homes (Misbrener, 2019). The funding ended in 2016, but the number of solar installation continued to grow. In December 2019, the target of one million solars was met with a capacity of 8.7 GW, which is almost three times the original capacity target, with no additional cost besides the original rebate program (Jacobson, 2020).

2. Progress of Solar Initiatives

The initiative consists of three installation program, 1) California Solar Initiative (CSI), an incentive program for the area served by investor-owned utilities; 2) a parallel program for the area served by publicly-owned utilities, and 3) The New Solar Home Partnership, which supports solar energy on new homes built within investor-owned utility territories (Del Chiaro, 2009). These three install programs have made a significant process in solar installed capacity. As of November 2014, 1,891 MW of solar has been installed under the initiative, which is 12 times as much solar PV capacity as the entire state had in 2006 (156 MW). It has also reduced the average cost per W of residential solar PV in California, from USD 9.68 per W in 2007 to USD 5.32 per W in 2014. The initiative has also helped low-income households to install solar PV system to reduce their burden on electricity charges (Farrell, 2005)

3. Benefits of Solar Initiatives

According to the County of Santa Clara, the initiative can bring 5 benefits to California, which are (County of Santa Clara, 2002):

(1) Reduce air pollution and emissions. For every MW of solar power instead in California, more than 300 pounds of smog-forming pollution is reduced
(2) The initiative can create the economies of scale needed to bring solar energy's cost down and become affordable to low-income families in California
(3) This initiative can reduce California's reliance on fossil fuels, such as natural gas, which were partially responsible for the 2000-2001 energy crisis
(4) This initiative can create a strong solar job market and keeping energy money within the California economy
(5) This initiative allows producing power in the place where it is consumed.

The establishment of the initiative has also gained attractions from scholars on accessing the effectiveness of providing subsidies on encouraging the use of renewable energy. (Hughes & Podolefsky, 2015)'s works ensure that the initiative has a significant effect on reducing the average cost of installation and increasing the solar installed capacity. (Schmidt-Costa et al., 2019)'s work further indicated that the initiative can also benefit California through technological innovations and increased service support

providers etc. even after the program ended. On the other hand, (Frey & Mojtahedi, 2018)'s research has shown that the initiative also helps non-residential sectors to adopt solar, and indicated that the adoption decision for one entity can be affected by the decisions in the surrounding area.

4. Criticisms of Solar Initiatives

However, the initiatives are also critiqued by mostly economist on their economic efficiency. (Bollinger & Gillingham, 2019)'s work stated that the initiative is economic inefficient due to its environmental externalities and learning spillovers (i.e. learning experiences from its competitors). (Tsvetanov, 2019)'s research posted further questions on whether similar programs should be established and stated that the rebate program to ratepayers necessitates a more extensive benefit-cost analysis of its different stages. Therefore, state government should pay attention to the opposite voices, balance the stakeholders' benefits and adapt changes on existing approaches.

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