Research

Clinton's Solar Plan Would Raise Subsidies by $62 Billion

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Summary

- Achieving Secretary Clinton's campaign promise of 140 GW of solar power would raise subsidy costs between $27.5 and $62 billion for existing subsidies alone.
- Since existing subsidies have not achieved this projected level of growth, further incentives are needed to mobilize capital, and would likely come in the form of Secretary Clinton's $60 billion Clean Energy Challenge.
- An energy policy that is primarily focused on government preference of solar power would come at the expense of other clean energy sources, making it doubtful the environmental benefits will be realized as advertised.

Introduction

Secretary Clinton has made a bold promise to install "half a billion" new solar panels in her first term, increase total solar power capacity to 140 Gigawatts (GW), extend renewable energy subsidies, and create new incentives for renewable energy investment. Such a policy will be un-abashedly pro-solar, even if it comes at the expense of other clean energy sources. On the topic of expense, promising to both extend subsidies and reach 140 GW of solar power has the potential to increase subsidy costs between $27.5 and $62 billion. This amount alone does not even address the enormous gap between her goal, and the projected demand for solar. The end result of such a policy will be massive government spending that does not succeed in efficiently achieving energy or environmental policy goals.

Calculating Costs

It is possible to calculate the costs of Secretary Clinton's energy policy by taking her promise to extend existing subsidies and then applying that to the costs of reaching her 140 GW of solar goal. The subsidy in question is the Business Energy Investment Tax Credit (ITC). This tax credit allows investors in solar power to claim 30 percent of their investment costs as a tax credit. If the tax credit exceeds the payer's liability for that year, then it is carried over to future years. As a budget item, the tax credit is effectively a cash rebate. This means that the tax credit of the ITC will have to be paid for either from other taxes now, or by incurring more debt to pay for it with future tax revenue.

In terms of capacity, 140 GW might seem like a lot (and it is), but it's not actually an important number. The value to measure is the difference between that 140 GW goal, and what projected solar capacity will be at the end of 2020. The Energy Information Administration (EIA) catalogues all of this information in their Annual Energy Outlook, and predicts that there will be a solar power capacity of 56.65 GW in 2020 (note we assume that Clinton's reference to solar panels means a focus on photovoltaic solar), which leaves a 83.35 GW gap that Secretary Clinton's policy needs to close.

This estimated 83.35 GW of solar can be applied to the EIA's capital cost estimates of solar. Their latest estimate is $2,480 per kW of capacity, which is $2.48 per watt. Applying this to the difference, yields a capital cost of $207 billion, all of which will be eligible to claim an Investment Tax Credit. Applying the 30 percent tax credit to the capital cost leaves the subsidized portion, which is $62 billion (about $500 per taxpayer).

Secretary Clinton's Solar Goal (2020):	140 GW
EIA's Projected Solar Capacity (2020):	56.65 GW
Increased Capacity Needed for Hillary's Goal:	83.35 GW
Capital Costs for Solar ($/Watt):	$2.48
Total Capital Investment Required (billions):	$206.7
Tax Credit (billions):	**$62**

To put this in perspective, the average annual tax credit of the ITC from 2012-2016 was $1.5 billion. Spreading out this new tax liability over four years would raise the subsidy's cost by more than tenfold. Note that this $62 billion is *in addition* to current law energy subsidies (read the American Action Forum's explanation of energy subsidies here), including the costs of the ITC to subsidize baseline solar growth.

The cost of Secretary Clinton's solar plan hinges on capital costs. The EIA's $2.48 per watt cost is higher than some recent estimates, since capital costs have been falling. However, even with the National Renewable Energy Laboratory's (NREL) most recent utility scale solar prices ($2.13 per watt), the tax credit would still reach $53.2 billion.

Recent capital costs are preferable to projected costs for estimating the ITC's burden, since solar utility projects have long lead times. However, even applying the NREL's optimistic $1.10 per watt price for 2020 (projected solar prices have been consistently lower than actual reported costs), as well as assumed that all 83 GW could be installed at that price, the subsidy cost would still be $27.5 billion. Installing 83 GW of capacity in a single year would be highly improbable though, meaning a $53.2 to $62 billion estimate is a more plausible range. A $27.5 billion ITC cost is unrealistically optimistic, but also represents the absolute lowest that the ITC could cost with these policies.

Furthermore, the $53.2 to $62 billion range is still low, since it assumes the deployment of cheaper utility scale solar, rather than the more expensive residential solar. Secretary Clinton's official policy has hinted that some (or all) of this 140 GW capacity would come from residential solar, which is $4.49 per watt (4-6 kW median price). If the full capacity increase came from residential solar, the residential version of the ITC would still subsidize 30 percent, raising the cost to $112 billion.

The $27.5 to $62 billion estimates are actually conservative though, for two reasons. Firstly, it assumes that prices will either be steady or decline. However, artificially increasing the demand for solar threefold would necessitate a considerable increase in production. This would have an upward effect on prices, which would increase the capital costs, and consequently the costs of the ITC as well.

Secondly, if existing subsidies (the source of the $27.5 to $62 billion estimate) are sufficient incentive to achieve 140 GW of solar, that would already be the projected capacity for 2020 (not 25 GW). This means that even *further* incentive must be provided in order to induce solar power growth. Secretary Clinton has outlined a $60 billion "Clean Energy Challenge" which would presumably achieve this by funding X-Prizes, competitive grants, infrastructure, and more. This $60 billion estimate supposedly includes the ITC, but the costs of the ITC alone are likely to exceed that amount.

Any government funded incentives to drive consumption to necessary levels to achieve 140 GW of solar capacity would be in *addition* to the ITC, meaning that Clinton's $60 billion estimate is likely too low, and a $27.5 to $62 billion estimate represents only a *portion* of the total incentives that would be needed for 140 GW of solar power. Bearing in mind that 30 percent of solar power capital costs are already subsidized, there is a serious question of just how much incentive is needed to mobilize capital for funding the other 70 percent needed for 140 GW capacity.

Solar Power is Not the Only Clean Energy Source

Solar power is not a commodity, the electricity it generates is. The demand for electricity will not rise proportionally to radical increases in solar capacity. The likely effect of such a heavily pro-solar plan is that subsidized solar will push out sources that are less or unsubsidized. This means that not only would fossil fuels lose market share, clean energy sources like hydroelectricity, wind, and nuclear power would as well.

Exacerbating this is the fact that solar power is an inherently intermittent source of energy. Its capacity factor is about 25 percent, meaning that it only generates its electricity capacity 25 percent of the time. Other energy sources have much higher capacity factors, so power plants pushed out of the market by subsidized solar cannot be entirely replaced with solar power. More likely they would be partially replaced by solar, and partially replaced by natural gas. In instances where the retired energy source was clean (such as nuclear power), the effect will be to actually *increase* pollution (a phenomenon California is already grappling with).

Considering that 140 GW of solar capacity would only provide about 7-8 percent of our total electricity needs, there should be some serious scrutiny of how well spent the money would be in achieving long term clean energy goals under an increasingly constrained budget.

Conclusion

In essence, Secretary Clinton's solar plan is to increase spending in order to push solar power to an artificially inflated level of market competitiveness. From either an energy or environmental policy, this makes little sense. This is not a plan that addresses core problems in either of those policies, neither in the near term or the long term. A more refined approach would be to focus on policy objectives, such as creating equitable treatment for *all* clean energy sources.

Secretary Clinton's policy does include some good ideas that are focused on innovation and expanding advanced energy research, but rather than being the core of her policy they are merely an afterthought. In its current form, this plan would be poor stewardship of both the environment and the treasury.