




How critical are rates to the health of distribution companies and what is the best mechanism for utilities to recover their fixed costs from customers who elect to install solar?

 Dr. Mani Vadari

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Meet the Author:

An IEEE Fellow, electricity industry visionary, and leader, Dr. Mani Vadari delivers strategic services to a global set of utilities, vendors, and service providers seeking deep subject matter expertise in setting the business and technical direction to develop the next-generation electric/energy system. As a Business Architect, Dr. Vadari has been delivering solutions focusing on Transmission/ Distribution/ generation operations, Energy markets, and Smart Grid for over 35 years. In addition, he is an Adjunct Professor at Washington State University and an Affiliate Professor at the University of Washington. He has published two popular books, "[Smart Grid Redefined: Transformation of the Electric Utility](#)" and "[Electric System Operations – Evolving to the Modern Grid, 2nd Edition](#)", in addition to over a hundred industry papers, articles, and blogs. His books are serving as textbooks at several universities in the US and around the world

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When utility customers install solar on their rooftops, two main issues need to be resolved.

- The utility will need to install some kind of net metering at that residence so that it can track how much power was delivered back to the grid. Then, based on the tariff, the utility may need to pay the customer to cover the power delivered to the grid.
- The customer will also start consuming less from the utility leading to a reduction in utility revenues.

There are also benefits to the utility from these installations – the rate of load increase is reduced, resulting in an increased opportunity for the utility to delay system expansions.

Now, why are these things important to assess?

Under normal circumstances, if nothing is done in response, the utility will see a reduction in revenues from the customers who have installed solar on their rooftops. This is a problem because there are some fixed costs for a utility necessary to support the infrastructure that has been put in place. Per the regulatory compact, the utility expects to recover these costs from its customer base and this is normally done through the rates that it charges them for the energy consumed. When customers add solar to their rooftops, the amount of revenue they pay to their utility declines. The component of fixed costs that these customers had been paying must then be covered by others – who in turn will see their costs go up.

This can become a problem as more and more customers install solar on their rooftops – leading to fewer customers paying for the utility fixed costs and paying more and more.

Now, this is a problem – what is the solution?

One plausible solution is to decouple the rates into (at least) two major components: (1) connection charge and (2) consumption charge. How would this work?

- **Connection Charge:** The customer could pay a connection charge just to stay connected to the distribution grid. This charge could have multiple components:
- **Normal distribution connection charge:** This would be the customer's component of staying connected to the utility distribution system which are the fixed costs.
- **Solar connection charge:** Some utilities are also looking at charging the customer a nominal charge for connecting solar to the grid to ensure that other utility systems such as protection and field crew safety aspects are taken into consideration.
- **Grid disconnect charge:** Even if a customer wants to completely disconnect from the grid, they may need to pay for a portion of the distribution grid infrastructure that could be computed to cover the tariff calculations.

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Consumption Charge: This is just the energy charge paid by the customer for the energy consumed. This is a component of the charge that would go down if the customer consumes less or goes up if they consume more.

Here also, if there is a tariff for reimbursing the customer if they send energy back into the grid, then they will be paid a different rate for the energy sent back into the grid assuming if a more sophisticated form of net metering is available.

What is holding us back?

This is not a technical discussion – more of a regulatory discussion. Some states are encouraging their customers to install more distributed renewables on the grid and want to make it easier for them and reduce the burden on them. Once one or more states define the right path to covering utility fixed costs, we believe that the issue will be resolved.