The Finance of Renewables

**Q1: What is the PPA rate per kWh that SCTY should offer in order for the customer to save $10,000 over the next 20 years (undiscounted)?**

$0.10.

For System size: 6 kilowatts, the average annual electricity use required for a household is Installation Size 6 kW \* 1400 kWh/kW=8400 kWh. As the annual saving is $10,000 /20 = $500. Per kWh, the customer should save $0.06. Compared with the net metering rate which is 0.16 kWh, the PPA rate per kWh should be $0.10.

**Q2: How much of a “buy-in” payment can SCTY demand from the tax equity investor so that the latter receives an 8.5% IRR?**

$14,280.00.

According to the excel sheet, in year 0, the TE investment buy in should be ($14,280.00) to achieve an 8.5% IRR.

**Q3: What IRR can SolarCity expect from the transaction?**

10.0%

According to the excel sheet, with Proceeds from TE Investment Buy-In is ($14,280.00). Net Cash Flow for SolarCity is ($4,860.0), which gives a 10.0% IRR.

**Q4: How are the three parties (customer, tax equity investor, and SolarCity) affected when the ITC drops from 30% to 10% in 2017 (assuming the tax equity investors still require 8.5% IRR)?**

For customers, customer cash flow will not be affected, which is still $16,102 in total.

For investors, the “buy-in” payment can be reduced from $14,280 to $8,880.

For SolarCity, the IRR drops dramatically from 10.0% to 1.2%.

**Q5: By how much would SolarCity have to lower its installation cost to achieve the same IRR as the base case (Q1-Q3) with a 10% ITC assuming that the fair market value of the installation remains constant at $4.5 per watt?**

SolarCity would have to lower its installation cost by 40%, which is 0.9 $/W.

When the SCTY Installation Costs is $1.4 per Watt, the IRR for SCTY is 10%, with Full Cost of System drops from ($19,140.0) to ($13,739.0).

**Q6: How will the three parties (customer, tax equity investor, and SolarCity) be affected if the fair market value of the installation were to be assessed at $3.50 rather than $4.50 per watt in the base case with 30% ITC (Q1-Q3)?**

For customers, customer cash flow will not be affected, which is still $16,102 in total.

For tax equity investors, the “buy-in” payment can be reduced from 14,280 to $11,110.

For SolarCity, the IRR drops dramatically from 10.0% to 3.7%.

Hint: Use the numerical example (under Q1-Q6) to help you answer the next two qualitative questions.

**Q7: Explain how SolarCity (SCTY)’s partnership with tax equity investors combined with the partnership flip model allows it to take advantage of the subsidies offered for solar installations.**

1. The partnership flip model lets them take advantage of tax credits and other state solar incentives.
2. The ITC of 30% helps the company to achieve a high IRR.
3. With the partnership flip model, SCTY can offer a low SCTY PPA rate to attract customers.
4. With a "buy-in" payment, SCTY can demand from the tax equity investor for TE Investment Buy-In, along with the investment cash flow itself, the company can cover the full cost of the system.

**Q8: Highlight the threats to the business model and profitability of SolarCity. Feel free to list other sources of risk as well (please list (online) references if any).**

1. The ITC drops from 30% to 10% will dramatically decrease the profitability of SolarCity.
2. SolarCity highly relies on its projected low installation cost to achieve profitability. That is to say the profitability count on the future with lower solar installations costs.
3. If the fair market value of the installation drops, SolarCity will lose its price advantage thus IRR is very low and profitability can not be ensured.
4. If electricity prices from the utility decrease, the PPA could have customers over-paying for solar in the future.
5. The real efficiency of the solar panel can be varied due to the technology itself as well as the weather. For instance, there is an environmental risk, if there are too many cloudy days, the solar panel cannot generate enough electricity to meet the household demand and the customer must require more electricity from the utility.