



Improving Customer Satisfaction and Solar Rooftop Value with Energy Monitoring Systems

By Farah Saeed, Research Director
Frost & Sullivan in Collaboration with Sense

Commoditization of the Solar Industry.....3

One Bad Customer Experience Can Derail Future Sales.....4

Making Data at the Center of Your Value Proposition.....4

Supporting Energy Conservation Goals through EMS.....5

EXECUTIVE SUMMARY

- Strategic-minded solar installers are integrating IoT enabled energy monitoring systems (EMS) into their offerings in order to:
 - reduce the cost of acquiring customers (CAC), and
 - grow market share as part of their value proposition.
- Providers are taking a consultative approach to broader home energy management through the assistance of EMS.
- Early adopters of this approach are experiencing higher customer satisfaction and reduced risk of defection post solar installation.
- Solar customers with access to detailed consumption data through an EMS are reducing electricity bills as low as to zero in solar friendly states.

INTRODUCTION

Research by Frost & Sullivan indicates that strategic-minded solar installers have found an effective way to reduce the cost of acquiring customers (CAC), improve customer satisfaction, and grow market share by integrating IoT-enabled energy management systems (EMS) as part of their value proposition.

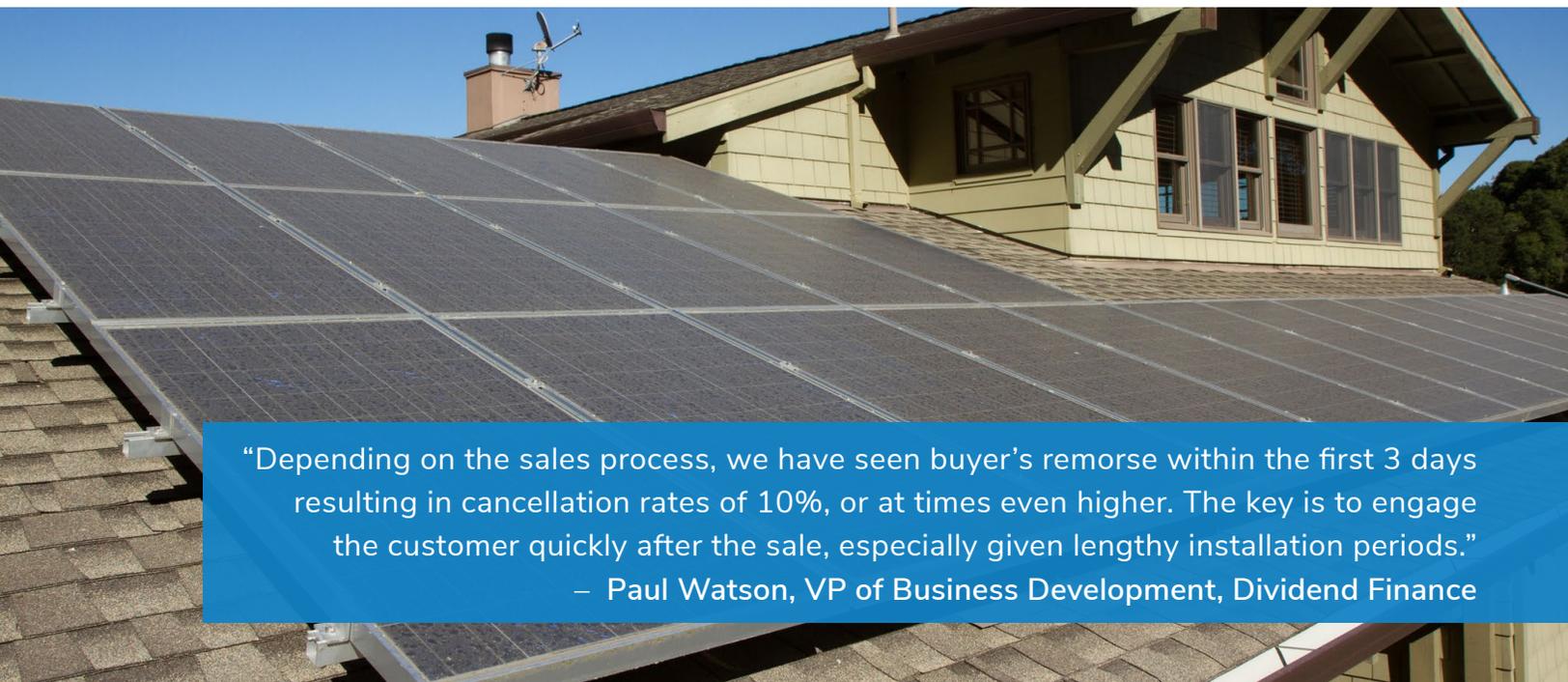
Today, it is increasingly common for photovoltaic (PV) systems to feature a mobile app that tracks solar production and has a notification system to alerts customers about malfunctions. This form of digitalization has helped solar installers and manufacturers alike differentiate themselves and provide value-added services. The industry itself is recognizing that customer service can be further improved by coordinating energy supply and demand at a given site, which can be achieved through an Internet of Things (IoT)-enabled EMS.

To analyze this trend, Frost & Sullivan interviewed solar rooftop panel installers and customers to determine current market challenges, the primary motives for choosing solar, and how value-added EMS can enhance customer satisfaction. This paper includes three customer case studies that will provide an in-depth perspective on the future role of solar installers.

COMMODITIZATION OF THE SOLAR INDUSTRY

Frost & Sullivan found that the US market for residential rooftop solar doubled from just 5 million MWh in 2014 to 10 million MWh in 2016. Research found two primary motives for switching to distributed energy resources, which include rooftop solar installations: frustration with rising utility bills and a long-term goal to reduce carbon footprints.

Due to a flourishing solar market, the industry has entered the commoditization stage as PV system prices decline, dropping 10% between 2015 and 2018. This trend is expected to continue because of the economies of scale and lower silicon prices. Despite declining prices, cost of acquisition (CAC) remains high, squeezing profitability for most solar installers.



“Depending on the sales process, we have seen buyer’s remorse within the first 3 days resulting in cancellation rates of 10%, or at times even higher. The key is to engage the customer quickly after the sale, especially given lengthy installation periods.”

– Paul Watson, VP of Business Development, Dividend Finance

ONE BAD CUSTOMER EXPERIENCE CAN DERAIL FUTURE SALES

The decision to install solar can be intimidating for most customers—in part, this is due to a limited understanding of financing options, payback periods, net metering opportunities, utility rates, and installation procedures. As such, prospective customers commonly seek recommendations from family, neighbors, and friends. Research indicates that 50% of all residential solar sales come from referrals, and a bad customer experience has the potential to derail multiple sales opportunities for an installer. Common issues that lead to a bad experience include a lengthy sales process and installation period, the wait for permits, and—for some—a surprisingly minuscule change in the monthly utility bill.



MAKING DATA AT THE CENTER OF YOUR VALUE PROPOSITION

Solar installers no longer consider themselves merely equipment providers—in fact, more are positioning themselves as energy management service companies and long-term energy conservation partners that help customers become cost savvy and green aware as their load requirements change. This load change could occur due to the addition of an electric vehicle, energy storage, or appliance upgrade. Solar is also considered to be a seasonal industry. Good Faith Energy, a solar installation company in Texas, has seen its business flourish in part due to a growing and diversified product offering.

Its CEO, Mohammed Abdalla, states, “You can no longer be viable strictly as a solar company. I think we will see businesses disappear within the next couple of years as solar prices continue to plummet. We have made data collection at the center of our value proposition. An energy monitoring system is going to give you granular level data on all of your appliances and granular level production data on solar for every panel in the system and every appliance in the home and true empowerment and cutting the middle man out, which is the utility, of course.”



We have made data collection at the center of our value proposition.”

– CEO Mohammed Abdalla, Good Faith

HelioPower has been in business since 2001 and it has since witnessed its business transform. The company’s President, Brad Schmehl, stated, “The main reason customers are looking into solar is strictly to save money versus what they are paying. Yes, they do complain about the [utility] rates going up. Our system includes the ability to monitor your solar not only through the inverter but also through an energy management unit to show how much power you are actually consuming and from which source [appliance]. It can get down the device level. This is usually a game changer because not everyone is offering this piece.”

SUPPORTING ENERGY CONSERVATION GOALS THROUGH EMS

Research indicates that consumers commonly consider solar because they are interested in reducing their carbon footprint. They may have already taken other steps to achieve this goal, such as enrolling in their utility’s green energy program or switching to an electric vehicle. Social influence has a strong impact in the decision-making process: one respondent had a parent who worked for the Solar Research Institute and felt almost an obligation to make the switch to green power, even though at the time a rooftop solar installation was not feasible as a renter. Upon becoming a homeowner, the respondent quickly installed solar panels.



Regardless of the motive, there is no denying that decision making and the sales process in general is fairly lengthy and further complicated by a long installation period. It can take between 60 and 90 days to finally close a project. During this period, it is not uncommon that customers lose interest. According to industry sources, cancellations can be as high as 20%. Furthermore, because of differences in state taxes and net metering incentives, a customer may not experience immediate or dramatic savings.

An EMS takes the lifestyle of the occupant into account, and it disaggregates electricity usage data at the device level and in real time to give customers detailed information about their electricity usage. These insights can then inform decisions to make improvements, such as replacing energy-inefficient appliances.

The following use cases illustrate how three customers optimized their rooftop solar installations with an EMS.

Customer 1: Tara Spencer, Oklahoma

Spencer was interested in solar for some time before finally determining that it had reached an affordable price point for her. While she did have concerns about how her utility was measuring her usage and the fact that Oklahoma does not buy back solar credit, these were not major factors in her decision to switch to solar power. Solar provider EnviroSolar's consultation included some load calculations and estimates of how much she would save based on her usage. As part of the contract, EnviroSolar equipped her home with a Sense monitor two months prior to the solar installation. "That [EMS] was a big selling point for me because I am very analytical ... and I like knowing where I am wasting energy," she said. Based on the initial consultation, she replaced all of her lighting with LEDs.

 **EMS was a big selling point for me...and I like knowing where I am wasting energy”
- Tara Spencer, solar home owner**

She has since seen savings ranging between 30% and 50%. She also experienced the added benefits of receiving notifications when her appliances malfunction or operate inefficiently. Last year, her heat pump was not working and it switched to emergency heating, which cost significantly more to operate. "I think the highest bill that I had since my solar panels [got installed] was because my heat pump malfunctioned and my capacitor went out," she said. "However, because of my Sense device, I noticed it within a day and had it fixed two days later." She said that the pump's replacement part cost only \$60— a fraction of what it would have cost her had she let her emergency heater run longer. Spencer considers the ability to monitor and receive alerts in a timely fashion to be an immediate return on her investment.

Customer 2: Heather Somaini, California

Somaini wanted to install solar for a long time to reduce her carbon footprint, but she held back because of the high cost associated with the configuration needed for her curved Spanish tile roof. When prices dropped, she decided to make the switch. "I just knew that if I could produce all my house and car electricity with these [solar] panels on my roof, that seemed to make a lot of sense to me because there were zero emissions," she said. "This means I am not using any power that is driven by anything that could be detrimental to the environment. And it feels good to be able to create my own electricity."

A friend who already tried an EMS at his home told her he loved the ability to track electricity usage. Upon receiving his recommendation, she installed a Sense monitor two months prior to getting solar panels. Once the solar rooftop system was installed, she added this component to the monitoring system. “It gives you so much information and allows you to make decisions that would be important to know,” Somaini said. “Overall, this is a great tool to reduce my utility footprint.” Upon installing Sense, the homeowner replaced all her bulbs with LED recessed lighting.

“ It gives you so much information and allows you to make decisions that would be important to know” – Heather Somaini, solar home owner

Since the rooftop solar installation, Somaini has been able to save \$100 a month, which was essentially her entire electricity bill. “I like not having an electric bill anymore,” she said. She anticipates a return on investment in 7 to 8 years.

She enjoys showing others the features of the Sense app. “The app is just really cool. It provides information. I love showing it to people when my big solar ball is this gigantic yellow compared to what my house is using in electricity,” Somaini said. “It is just a really fascinating visual representation that I am making all that [solar power] and I am only using this small amount, and people are like, ‘wow.’ I think when you are excited about something like creating electricity with solar panels, you want other people to think that this is awesome too.”



Customer 3: David Henderson, California

Henderson’s father worked for a solar research institute, which influenced his support of green energy. “I have always been concerned about the climate, environmental issues, and renewable energy,” he said. He was paying a premium bill rate to access green energy from his utility while he was a renter. Upon

becoming a homeowner, he installed solar on his house but did not realize an immediate financial benefit. “The first couple of bills showed almost zero change in my bill. It showed how much energy was created, and we were being billed for almost the same [amount],” he said. He checked with his solar provider and electricity utility company, and both determined that everything was working as it was supposed to after making several house calls. So, after much frustration, he decided to conduct an energy audit himself. He came across Sense through a Web search and had the device installed independently. Soon after, he discovered the main problem was his household electricity usage habits and appliances. “I was able to go around and identify the culprit: a chandelier that was using a 10-watt bulb in each socket.” In addition to replacing his light bulbs with LEDs, he replaced his pool pump with an energy-efficient model. This happened almost 7 months after the solar installation, which is equivalent to 3 billing cycles for Los Angeles Department of Water and Power (LADWP).

Henderson is pleased with his EMS system. “It was so easy: the data that it gives, instant information. Every person should have this,” he said. “A smart meter is the same locked box and you don’t see the data. People in general do not have a desire to be wasteful but they don’t have the tools to draw out the dollars and cents. [With Sense] you find these little things, such as a little space power heater that might not have shown up otherwise.”

“ People in general do not have a desire to be wasteful but they don’t have the tools to draw out the dollars and cents.” – Dave Henderson, solar home owner

Given the broad customer interest in conserving energy, customers can gain valuable insight into their consumption patterns through EMS and it helps them prioritize home upgrades to achieve the maximum and desired results for conserving electricity. By bringing data to the center of the solar installation project, installers will be able to reduce the cost of acquiring customers and broaden their services beyond solar panels. In turn, this will create new revenue streams for the installer. By installing EMS a month or two prior to installing solar panels, the installer can reduce the risk of customer concerns that could lead to cancellations during the sales process and complaints post-sales. This will help ensure a positive customer experience and encourage positive customer references.

This paper is sponsored by Sense:

Sense gives consumers engaging, real-time analytics on energy consumption in their homes right on their mobile devices. Its mission is to make all homes intelligent through its “fitness tracker for the home,” helping consumers save money and live safer with more energy-efficient households. Founded in 2013 by pioneers in speech recognition, Sense uses machine learning technology to provide real-time insights on device behavior, even for those devices that are not “smart.”

Customers rely on Sense for a wide range of uses including monitoring their home appliances, determining whether they left appliances running, and identifying major energy drains in their home so they can substantially reduce their energy costs. Sense is headquartered in Cambridge, Mass. To make sense of your energy, visit: <https://sense.com>.

SILICON VALLEY | 3211 Scott Blvd, Santa Clara, CA 95054

Tel +1 650.475.4500 | Fax +1 650.475.1571

SAN ANTONIO | 7550 West Interstate 10, Suite 400, San Antonio, Texas 78229-5616

Tel +1 210.348.1000 | Fax +1 210.348.1003

LONDON | Floor 3 - Building 5, Chiswick Business Park, 566 Chiswick High Road, London W4 5YF

TEL +44 (0)20 8996 8500 | FAX +44 (0)20 8994 1389

Frost & Sullivan, the Growth Partnership Company, works in collaboration with clients to leverage visionary innovation that addresses the global challenges and related growth opportunities that will make or break today's market participants. For more than 50 years, we have been developing growth strategies for the Global 1000, emerging businesses, the public sector and the investment community. Is your organization prepared for the next profound wave of industry convergence, disruptive technologies, increasing competitive intensity, Mega Trends, breakthrough best practices, changing customer dynamics and emerging economies?

For information regarding permission, write:

Frost & Sullivan: 3211 Scott Blvd, Santa Clara CA, 95054