The Contractors Guide to the Smart Home

Northeast Energy Efficiency Partnerships (NEEP), December 2017

Introduction

The hype around the concept of a "smart home" has been growing for years, but most homeowners have only recently started incorporating smart products into their homes. While these products and devices may seem gimmicky—with their smartphone-based app interfaces and goofy names[1]—many of them can actually be complementary to existing home performance, HVAC, or even solar portfolios. Smart home products may provide a tangible perspective into the often-unseen work done to improve a home's performance by providing insight and/or control of energy-using elements. This could become the "cherry on the sundae" for contractors looking to ensure satisfied, repeat, and referral-ready customers. In some cases, the products may even help contractors do their job better.

Smart home technologies

It won't make sense for contractors to incorporate all smart home products into their work, just as not every house is appropriate for a given smart home technology. A high-cost, low-visibility product such as a smart dishwasher, while providing some benefit to consumers and the grid, may not be a compelling upsell for contractors. Many smart devices and systems, however, can provide value to contractors; these technologies are listed in order of potential benefit and ease of incorporation into existing efforts. NEEP maintains a list of smart home products online which provides more details.[2]

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[1] Some examples are: Foobot, ecobee, Tado, Smappee. More listed on http://neep.org/initiatives/high-efficiency-products/home-energy-management-systems

[2] http://neep.org/initiatives/high-efficiency-products/home-energy-management-systems

Technology	Why consider it?	Approximate range of prices (product only)
Smart thermostats	Potential energy savings, especially for products that are ENERGY STAR certified.[3] Energy related leave-behind. Visually appealing reminder of home performance work done. Rebates often available. Relatively easy installation. Training available.	$120-250, with several products on the ENERGY STAR list ~$170.
Health/ safety home monitors	Monitors such as Foodbot and Nest Protect can keep track of health and safety concerns such as indoor air quality, smoke, and carbon monoxide present a logical, smart leave-behind. No direct energy impacts. Relatively easy installation.	$100-200
Smart lighting	Low cost. High visual impact. Opportunity for upsell. Gateway product into the smart home. Relatively easy installation. Uncertain energy impacts beyond being an LED.	$12-70, large range of functionality and hardware
Smart home apps	Can be the lightest touch engagement to install a free app, especially if a home has smart meter data that can be connected to a third-party interface. Some utilities offer apps and may reward customer sign-up. Potentially helpful leave-behind. Low set-up needs. Likely low energy impacts, but could show energy savings from work performed, especially if app is installed before work is done. Can be a monitoring tool with associated monthly subscription fee.	$0-50/month
Smart water heating products	Potential for significant energy savings. Potential for utility rebates. May requires some electrical and plumbing expertise to install. Still emerging area, but likely to grow. There are third-party devices for older water heaters (Aquanta or Carina) or easier installation of CTA-2045 attachments to make it connected.	$70-300
Load monitoring hardware	Can provide greater detail into energy use in home with an opportunity for subscription/monitoring by contactor for emergency alert system. Requires some electrical expertise to install. Likely low energy impact, but could show energy savings from work performed, especially if installed before work is done.	$100-500, costs still coming down
Other smart home devices	The smart home can be fun. While unlikely to have energy impacts, products such as smart door locks and doorbells can have some benefit to allow workers on-site when the homeowner is not available. Other cameras, monitors, garage door openers, blinds, appliances, plugs, speakers, switches etc. could be of interest to customers who may be fearful to self-install. While unlikely to transform the business, these products may be something to consider adding to the portfolio of offerings.	Widely variable

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[3] https://data.energystar.gov/Active-Specifications/ENERGY-STAR-Certified-Smart-Thermostats/7p2p-wkbf

Bringing the smart home into your business

Many smart home products are relatively easy to install, especially if one has experience or training.[4] However, for the millions of homeowners with little patience or tech-savvy intuition, professional set-up for a modest fee could be the deciding factor in making a purchase. Products that involve direct interaction with a home's circuitry (such as a Sense or Whisker Labs load monitor) or water heater (such as Wally Home) may benefit from professional installation because of the added complexity. While these products may technically be considered "self-install," many homeowners may prefer to avoid the hassle or risk of mistake.

Some smart devices have contractor portals or functionalities that allow contractors to access device data to assist in diagnostics or predict potential problems. These products, such as a smart thermostat with HVAC diagnostics, a home automation platform like Building36, an HVAC sensor such as Emerson's Comfort Guard, or a smart indoor air quality monitor that sends an alert when there are concerns, have the potential to help improve contractor-customer relationships. Contractors can create opportunities for long-term revenue streams by charging a monthly fee for remote monitoring in addition to charging for the time to install or set up the device.

Monitoring apps such as Bidgely, Powerley, or ResiSpeak may be a low- or no-cost project add-on for contractors as they have no hardware to install, but may allow for significant added benefit of customer retention. At present, few contractors are including smart home products in their offerings, and those who are, are largely focused on smart thermostats.[5] This leaves a large opportunity for home performance professionals to incorporate other smart home offerings into their portfolios.

Programmatically, creating a Smart Energy Audit program could be a systematic way for many contractors to offer the same services across customers with their utility partners. This could mean an on-site visit to help with installation and set-up of hardware or software within the home, which would be most beneficial when coupled with any existing retrofit or direct install program. This could even include adding a smart energy home component to an existing audit program, which might include a walkthrough with the specific intention of identifying opportunities for smart products. These walkthroughs might look at things like home optimization based on load profile or identification of specific end uses like appliances or water heating units that could be replaced with an efficient and smart new product.

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[4] Some manufacturers, such as Nest and ecobee, offer installer certification: https://pro.nest.com/ and https://www.ecobee.com/contractors/

[5] NYSERDA Smart Thermostat Market Characterization, 2016, https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/Smart-Thermostat-Market-Charaterization-Report.pdf

With any smart home device, it is important to remember that interoperability and connection between products is important to customers. If a home has a smart speaker such as the Amazon Echo or Google Home, it is advantageous to ensure that those devices are connecting with all possible smart products in that home. This could be a relatively easy add-on service for contractors. For example, in a home walkthrough, contractors may notice that smart appliances, thermostats, or light bulbs are not actually connected with smart speakers or that the appropriate app has not been set up. While not every home is compatible with every smart home product, especially those with older wiring or connectivity challenges, maximizing interoperability of existing products is an easy value-add.

Smart data to find new customers?

Taking a different approach, several research efforts are looking into how data, either from a smart thermostat or a smart meter, may help identify homes that would be good candidates for home performance upgrades. While in the early stages of implementation, these efforts may help to target marketing, outreach, and potentially even incentive levels for home retrofit efforts, as well as provide a baseline for home performance projects.

Efficiency Vermont has been running smart thermostat and data analytics pilots for years, which led them to develop the Smart Thermostat Analytics Toolkit (STAT).[6] The STAT open-source set of tools pulls in several data sources, including weather, thermostat, smart meter (where applicable), and household information (when available), and runs an iterative analysis to, among other things, help identify homes that may be a good fit for further Efficiency Vermont home retrofit programs.

The Fraunhofer Center for Sustainable Energy Systems is leading another study in Massachusetts and it is similarly focused on using smart thermostat data to identify homes in need of efficiency measures and to improve the targeting and marketing of energy efficiency upgrades to specific homeowners.[7]

Finally, a more simplified approach to custom targeting homes for efficiency upgrades is under consideration. For utilities that run demand response programs, there is basic information on the homes that drop-out of an event or program because they cannot retain comfort when HVAC is turned off. Traditionally, those homes have been taken out of demand response programs and considered poor fits, while in fact, it's very likely that these homes are the leakiest of the bunch and the best fit for targeted home performance efforts.[8]

As these efforts demonstrate, additional data and analytics enabled by the smart home can help improve outcomes for home performance contractors. While the number of homes with smart

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[6] http://www.veic.org/resource-library/smart-thermostat-analytics-toolkit
[7] https://energy.gov/sites/prod/files/2017/04/f34/10_11150d_Roth_031517-1330.pdf
[8] http://homeenergy.org/show/article/id/2197

thermostats is relatively small, as various market drivers increase that number, the potential to use smart home data to identify homes in need of efficiency upgrades will grow.

Attracting a new workforce?

As is the case for many industries, the current workforce for home performance and other in-home contracting is aging. For years, businesses have been wrestling with how to attract new generations of talent, especially for work that can be physically demanding, such as home performance. Many employers have found that crawl spaces, basements, and roofs aren't as attractive or competitive for a new employee as the open office space of technology start-ups. This provides a challenge when attracting new entrants to the workforce.

Today's entry-level workers, more than previous generations, are concerned about climate change[9] and motivated to make a difference. This is a major factor when considering younger potential workers. As building codes improve, retrofitting the existing built environment becomes a bigger strategy to reduce energy use and help mitigate climate change. Furthermore, while the tech-savvy inclinations of younger workers may been seen by some as a drawback or character flaw, this is a benefit when it comes to the skills necessary to work in the smart home environment. Consider this an opportunity to re-frame a contractor's job, from "home performance contractor" to "smart home technician." While the core nature of the work may not change, re-thinking new job descriptions like this may attract younger workers who have an aptitude and interest for smart products, thus helping to diversify both the workforce and the contractor business offerings.

Conclusion

Smart home technologies offer tangible benefits to residential contractors. As the smart home interest continues to grow, with participants in longstanding programs like the Weatherization Assistance Program (WAP) starting to include smart thermostats into the suite of offerings, the onus to successfully integrate these offerings is on the contractor. Many purchasing decisions are made with a combination of logical need and unconscious desire,[10] and the residential efficiency world has observed over and over that customers do not often prioritize efficiency when making home improvements. HVAC is typically replaced at or near burn out, insulation is too often put off to improve the kitchen, and even an economically-convincing set of efficiency upgrades may not be enough to actually motivate customers to undertake those projects. Since smart home technology is typically lower cost and more interactive than other home efficiency improvements, there may be a natural fit to incorporate these products into business offerings. Additionally, when coupled with utility rebates

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[9] http://www.shaperssurvey2017.org/
[10] https://www.newscientist.com/article/dn16625-when-you-should-trust-your-gut/

or subscription-based monitoring, these technologies may start to become integral to a successful contractor business model.

Above all else, though, smart home technology penetration is on the rise.[11] Contractors who find themselves in the fortunate position of being in a customer home to offer advice and services should be prepared for the inevitable conversation turn towards smart devices. Planning for that future and cementing your position as a trusted partner for homeowners is just, well, smart.

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[11] https://www.cnbc.com/2017/01/04/why-2017-will-finally-be-the-year-of-the-smart-home-consumers-figure-it-out.html