

Boulder's Pathway to Sustainability Lies in Being Bolder

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ABSTRACT

The City of Boulder and the County of Boulder have been leaders in the movement towards sustainable community development for the past 50 years. Each has implemented various initiatives to guide their respective communities towards their environmental, energy, and economic development goals. Some highlights from the energy sector alone include, a robust portfolio of energy efficiency programs, EnergySmart, developed at the county level, a full inventory of the city's solar resources, and progressive legislation at the city level, SmartRegs, that provides a new baseline energy efficiency requirement for all rental properties through a combination of changes to the housing and rental licensing codes.

The challenge for both entities was to develop these initiatives in a way that did not put programs at odds with one another or cannibalize resources and/or popular support. Early on it was difficult, especially as the populations began to grow at an accelerated rate. In 2010, as the SmartRegs and Energy Smart programs were being launched, there was a conscious effort to establish a platform that allowed the programs to be integrated as much as possible and rolled out seamlessly to constituents regardless of regulatory body.

The platform for EnergySmart is built on three key components; a single entry point of access to the program's resources (one-on-one energy advising, contractor selection assistance, financial incentives, and energy efficiency or renewable energy information), demonstrated expertise - facilitated through a consistent on-call staff of subject matter experts, and a standard of exemplary customer service. The EnergySmart platform was so successful that the city quickly leveraged it as the outreach and implementation arm of SmartRegs, followed by the county's adoption of the advisor based platform for flood recovery and wildfire mitigation efforts.

This paper will explore not only the past successes of the EnergySmart platform, but also the future plans for more integrated city-county initiatives and the key role that the platform will play.

Introduction

There is much talk of "big data" entering the regulated utility space, and in some respects it already has. Generally speaking, big data refers to extremely large data sets that can be mined for trends. In the energy efficiency space, general areas of focus center on project lead generation, and workflow management to improve rebate processing times and streamline program participation. We focus on speed of throughput as a metric of success because it tends to mean less hassle for participants. Similarly, leveraging insights gleaned from large data sets; consumption by utility account, or GIS data layers, is to reduce opportunity costs and leverage those economies of scale to go deeper into the market to achieve greater savings. The vast majority of the programs CLEAResult runs leverage the full suite of our data and analytics

capabilities. Yet the majority of savings targets hover around 1-2% in annual savings; in some cases, it can even be lower than that, so where is the disconnect?

What we are finding is that big data can quantify and qualify opportunities very well, but when it comes to actually completing energy efficiency projects, big data has its limitations. The issue is that with all of the insight and opportunity we can derive from our sophisticated analytics, getting projects done still comes down to human interaction. Data can take us right up to the customers' doorstep, but attempting full market transformation, one building at a time, by dumping a bunch of analysis at the customers' feet only goes so far.

The EnergySmart platform helped the City of Boulder and Boulder County programs get away from the one building at a time approach and create a culture around energy efficiency within the market. To do that, it redirects the focus away from the building, and puts it on the customer. When combined with the analytics platforms already employed, it creates a comprehensive delivery approach that allows the program to take advantage of opportunities that have traditionally been too hard to access through a traditional building-focused model.

Thus far, the program has been so successful in building the culture around efficiency that the city and county are now looking at opportunities to leverage the model to achieve other sustainability and/or community goals.

Overview of Boulder and Boulder County's Sustainability Initiatives

Boulder County – EnergySmart

Boulder County has numerous community sustainability initiatives. One of the major initiatives that Boulder County has undertaken to combat climate change and support local economic development is the Sustainable Energy Plan (SEP). The main goals for the plan are to achieve the following by 2020;

- reduce overall emissions 3.6 million metric tons, which translates to an 11% reduction below 1990 levels
- total annual energy cost savings of \$445 million

One of the main drivers of success for the plan is the EnergySmart program.

EnergySmart helps homes and businesses throughout Boulder County become more comfortable and energy efficient. Within the EnergySmart program, there are expert Energy Advisors that can answer questions and help customers prioritize projects, connect with qualified contractors, find and apply for incentives and low-cost financing, and generally help make energy upgrades easier for participants.

The goal for EnergySmart is to stimulate local economic growth, increase energy efficiency investment within Boulder County and advance the local, regional and state's energy independence through energy upgrades. The program is a collaborative partnership between Boulder County and its municipalities (including the City of Boulder) and local energy utilities (including Xcel Energy and Platte River Power Authority). It is funded by Boulder County, the City of Boulder Climate Action Plan (CAP) tax and the City of Longmont. Residential services are administered by CLEAResult.

EnergySmart was launched in 2011 and initially funded by a \$25 million grant from the U.S. Department of Energy's Better Buildings Program. The grant was shared with the City and County of Denver, and Garfield County. The grant goals for Boulder County were to engage at least 10,000 homes and 3,000 businesses in energy efficiency projects in the three and a half year period ending in the middle of 2013, when the grant expired. These goals were successfully

achieved. Figure 1 displays the cumulative participation by businesses and residents that have continued to participate in the program, despite the loss of federally supported funding.

Of the original grant funds, \$7.1 million was set aside for a loan-loss reserve (Boulder Co and Denver) to support \$35 million in financing for home and business energy improvements. Post grant, EnergySmart has continued using local funding to expand its services beyond energy efficiency to also include renewable energy, water conservation, waste diversion, and wild fire mitigation support. Figure 1 shows the cumulative program progress towards goal from 2011 to Q1 2016.



Figure 1 - Boulder County's EnergySmart Progress, 2015. Source: Boulder County's EnergySmart Program website.

City of Boulder – SmartRegs

The SmartRegs (energy efficiency requirements for licensed rental properties) effort started in the summer 2009 with the goal of enhancing the energy efficiency and increasing tenant comfort in Boulder's approximately 20,000 licensed rental properties. The city's Planning, Housing & Sustainability and Public Works departments examined code changes needed to update the technical provisions of the Housing Code and Rental Housing Inspection and Licensing Program. The focus of the effort centered on potential code requirements that would further community sustainability objectives, most prominently energy efficiency.

In tandem, the Boulder City Council Meeting on the Climate Action Plan (CAP) identified strategies needed to reduce greenhouse gas (GHG) emissions to meet CAP objectives. One of the primary strategies identified was reducing energy use in buildings. Roughly 55%¹ of the city's GHG emissions come from electricity use in buildings. From 2007 through the first quarter of 2009, numerous energy efficiency projects were implemented for residential and commercial buildings in new construction, remodels and additions.

Addressing energy efficiency in existing licensed rental housing had become the focus of the council across multiple departments. The SmartRegs focus emerged because roughly half of the residential building stock in Boulder is rental properties. Changes to the rental housing and inspection program, including energy efficiency requirements, were developed. The development of a Commercial Energy Conservation Ordinance (CECO) was also analyzed. However, because Boulder already had a business process in place for licensing rental properties, this was the first policy adopted for the existing building stock. SmartRegs was adopted by Boulder City Council on Sept. 21, 2010 and began implementation in 2011.

¹ "2012 Community Greenhouse Gas Inventory Results." Accessed 6/20/2016.
<https://bouldercolorado.gov/climate/boulders-community-greenhouse-gas-inventory>

To receive or renew a rental license, required every 4 years, property owners must achieve compliance with the new energy-efficiency standard by Dec. 31, 2018. The eight-year implementation period allows rental property owners to achieve voluntary compliance over time. Properties not in compliance on Jan 1, 2019 will not be able to renew rental licenses until they pass a compliance inspection. During the first three years of this period (2011-2013), local, state, and federal funding was—and some of these funding sources continue to be—available to property owners to decrease the cost of installing the energy efficiency upgrades needed to achieve compliance. Property owners may also utilize the incentives offered by the EnergySmart program and the Energy Advisors to facilitate compliance. Rental property owners can achieve SmartRegs compliance through two pathways:

- The Performance Path requires that the property achieve a Home Energy Rating System (HERS) score of 120 or less, as measured through a test performed by a Residential Energy Services Network (RESNET)-certified rater.
- The Prescriptive Path requires property owners to achieve a score of 100 (or more) points on the SmartRegs checklist (created by the City) and achieve two mandatory water-conservation points.

Property owners must hire a Class “G” inspector (new license class created by the City) perform a baseline inspection and any follow-up inspections needed to verify compliance. Property owners can access Energy Advisor support and incentives to help them comply with the SmartRegs Prescriptive Path. EnergySmart offers the same services to rental property owners that they provide to owner-occupied residences, which includes dedicated Energy Advisors who assist property owners to:

- Understand the SmartRegs process;
- Schedule inspectors;
- Develop a compliance strategy based on baseline inspection results;
- Identify incentives;
- Track compliance documents; and
- Contact contractors for bids.

As of the end of Q1, 2016 (the latest period for which evaluated data is available), the program has gotten approximately 50% of rental units into compliance, and is on track to have over 12,000 total units compliant by the end of 2016, 60% of the December 31, 2018 Compliance Deadline goal of 20,000 properties.

Collaboration between the Two Local Governments

Boulder County and the City of Boulder have been likely collaborating since their incorporation as legal entities. For sustainability, joint citizen groups have been engaging with city and county officials since the late 1950’s to pass Blue Line laws that limit water service to development above a certain elevation. With this history of collaboration, it seems a natural progression to now leverage the EnergySmart platform to facilitate both jurisdiction’s energy and sustainability goals.

Energy Advisors can shuttle participants into the most appropriate channel to facilitate their particular projects; whether that is towards available city funds, the county-level loan program, or through utility rebate programs like EnergySmart.

The Energy Advising Model

Overview

Energy Advising is a high-touch, customer-centric, data-driven model for energy efficiency program design and implementation. The Energy Advisors combine building science technical knowledge, sales and customer service skills to provide a friendly, helpful, expert resource to customers during their energy upgrade journey or journeys (high customer re-engagement because of initial customer satisfaction with the service is a source of program pride). Through phone-based energy advising, CLEAResult provides individualized and ongoing assistance to property owners with relevant programs, energy efficiency benefits, contractor selection, assessment report and bid review, financing options, upgrade project support, and customer service to both the City of Boulder and Boulder County. The emphasis with customers is to provide a “one-stop-shop” that will provide a turn-key solution for any needs they might have. There is also a heavy emphasis on meeting the customer “where they are at,” both literally bringing the expertise to the customers door whenever necessary, and also figuratively making sure that the customer addresses the things that are relevant to them at the time. Opportunities beyond what the customer is comfortable undertaking at the time are addressed in the future.

CLEAResult also provides individualized and ongoing assistance to trade allies with;

- program onboarding and requirements,
- lead generation, sales,
- identifying customer concerns and areas for trade ally improvement,
- providing resources to increase trade ally success.

Programs featuring the Energy Advisor platform utilize comprehensive data management to track a wide variety of program parameters both for goal attainment as well as opportunity assessment. This creates a streamlined experience for customers and trade allies, while providing deep insight into program performance that allows for robust reporting and on-going continuous improvement.

The programs also drive deeper energy savings over time utilizing information gathered about customers and their properties, which maximizes marketing budgets and reduces customer acquisition costs. The platform is built with the understanding that patience is a key component for programs. Homeowners often need time to prioritize efficient projects with other cost concerns in their lives and can’t always act within the constraints of energy efficiency program

budget cycles. Figure 2 shows the results of how data is integrated with customer experience.

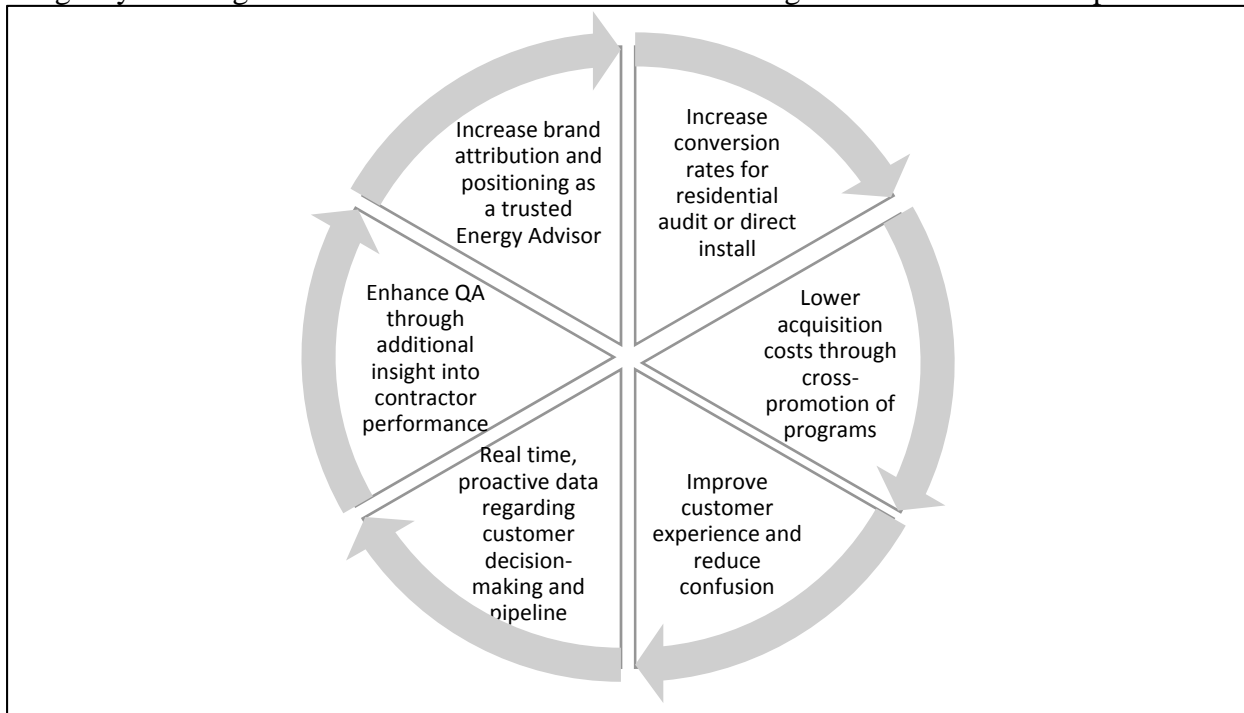


Figure 2 - Value proposition of the Energy Advisor Model, 2015. Source: CLEAResult Progress Report

Customer-Centric-People First Approach

The Energy Advisor programs in both the Boulder and Boulder County utilize the People First, Buildings Second™ approach to program implementation, following six core best practices to deliver a world-class customer experience while maximizing program results, as seen in Figure 3. The components of program design are considered from the perspective of its impact on the experience of the customers and other key stakeholders such as trade allies. Energy Advisors utilize behavior-based sales skills to help drive energy upgrade projects to completion, and simultaneously support customers as a neutral third party and advise them based on customers' priorities and interests.

People First, Buildings Second™
Six best practices

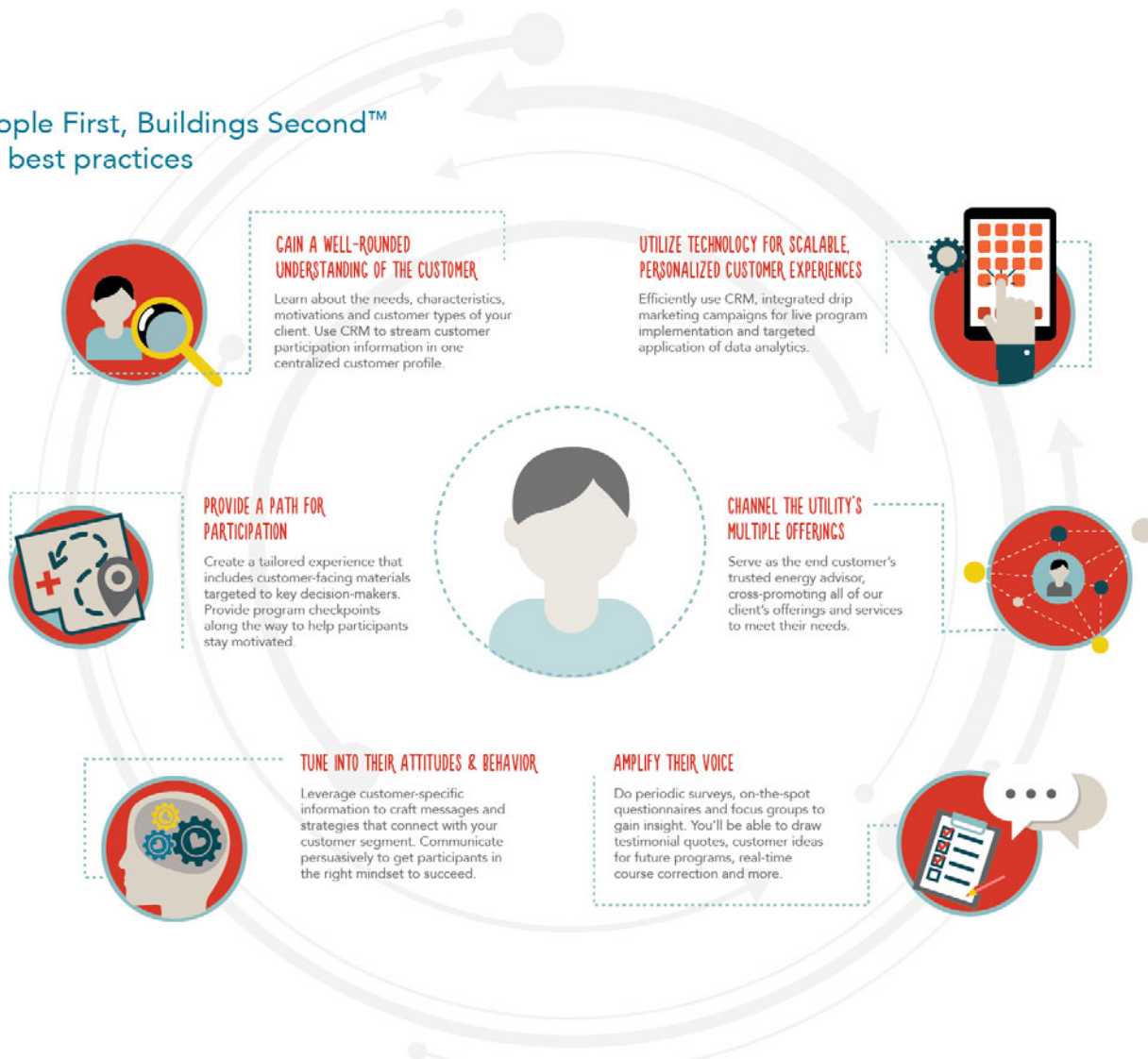


Figure 3 - People First, Buildings Second Best Practice Guide

Building Science Technical Knowledge

Energy Advisors have a baseline level of building science technical knowledge and continue to expand that knowledge over time as program needs evolve. For residential programs, Energy Advisors hold a Building Performance Institute (BPI) Building Science Principles certificate, BPI Building Analyst Certification, or similar certification. They will also participate in the CLEAResult Energy Advisor for Homes training curriculum, and demonstrate a strong understanding of the “House as a System” approach to energy efficiency. For commercial programs, Energy Advisors hold certifications and/or complete trainings relevant to the building types they serve and the scope of their role. This started with getting HERS raters certified through Residential Energy Services Network (RESNET). While it has gone on to include professional engineers with building modeling, and IPMVP protocols training to provide assistance with custom and commercial scale projects, the focus of this paper is on the Residential segment, and Rental properties in particular.

Data Tracked in the Energy Advisor Programs

Energy Advisor programs must be able to collect, track, and utilize real-time data on a wide variety of parameters to help manage the relationship with the participant. This includes having the ability to track and effectively report on data that identifies;

- qualitative customer goals and priorities,
- qualitative barriers to participation,
- qualitative investment concerns, as well as quantitative thresholds regarding project scopes
- qualitative feedback regarding all aspects of participation in the program

Data that helps guide evaluation and measuring the impact for stakeholders is also tracked through a client relationship management platform. This includes;

- program participation status,
- lead source,
- planned improvements and/or improvements in which the customer expressed interest,
- assessment and/or estimate tracking and reporting

For reporting progress and continually improving the process of programs, customer participation rates over defined periods of time, program conversion rates, contractor feedback and performance tracking, and number of activities related to each customer and/or contractor are tracked.

Trade Ally Coordination

Energy Advisor programs are successful in part due to the Advisors' ability to assist customers with selecting a trade ally (contractor) for their project. This effort also involves the Advisor helping the customer, review estimates and bids and provide feedback, schedule work, and communicate effectively throughout the project. Developing and maintaining strong relationships and partnerships with the trade allies is a key component required to implement a successful Energy Advisor program. The program is also selective in managing the pool of eligible contractors to ensure that the level of quality and customer satisfaction remains high.

Consistent, Relevant, and Personalized Follow-Up

To drive deeper energy savings over time and increase additional program participation, it is imperative that Energy Advisors maintain a consistent, professional, and personalized line of communication with the customer throughout their entire upgrade project, and beyond. The Advisor is key in managing, or helping manage, the project for the customer so that no aspect of the process is overwhelming to the participant. This includes follow-up and assistance with program requirements, selecting a trade ally, reviewing energy assessment reports and/or estimates, scheduling, finalizing a scope of work. It also includes dealing with rebate applications, financing, and any other post-project program requirements (e.g. coordinating QC, oversight of rebate application status, etc.).

Long-term Follow-Up

Utilizing customer-centric data regarding customer decision-making and project pipelines, Energy Advisor programs will provide proactive and long-term follow-up based on the customers' profiles to encourage additional upgrades and drive additional program participation. This includes follow-up regarding previously planned but not completed upgrades, customer priorities, new program offerings or changes, and other complementary programs that may meet the customers' needs.

Deploying the Energy Advisor Model

Data is not Enough

In the world of utility programming, the landscape is getting more complicated. New technologies are entering the market in all parts of the energy supply chain. Utilities are contemplating diversified business models. As a result, teams are relying more and more on data to derive insight and make energy management decision.

In the energy efficiency space, relying on a building by building approach to acquire energy savings is going to become a more difficult proposition as time goes on. Baseline technologies are getting more efficient, eroding measure savings from one side, while customer awareness is increasing net savings effects and eroding savings from the other side. And with the exception of currently underserved and hard to reach markets, many programs are starting to experience cost effectiveness issues related to market saturation. Beyond that, utilities are facing a changing business landscape. There are cost concerns around traditional supply side resources, distributed generation is becoming more common and forcing an overhaul of the grid network, and utilities are looking for new services they can sell to their customers.

Success in a Comprehensive Platform that Marries Data and Engagement

Boulder County and the City of Boulder have a platform that marries data and engagement. Based on evaluation results, the EnergySmart program has nearly a 70% conversion rate for owner occupied homes that use an Energy Advisor. Conversion is defined as a customer who engages with the program and follows through the process all the way to completing a project that realizes energy savings. This is extremely high compared to other residential assessment programs that rely on a building-centric deployment strategy, such as Home Performance with ENERGY STAR, which has an average conversion rate across CLEAResult's programs of around 18%.

The platform has been successful because it has combined a single point-source of information approach, with expert advising, and excellent customer service. The combination has led to a very high level of satisfaction and trust in the consumer. One telling statistic is that of all the different ways for customers to find their way to the EnergySmart program, including a web site and traditional marketing collateral, the most common method is word of mouth through family, friends, and co-workers. And, over 90% of participants said they would definitely recommend the program to others.

The Future of the Energy Advising Model

Boulder County and the City of Boulder have numerous other initiatives they plan to roll out through the EnergySmart platform. Some are not even related to energy, but the program has garnered such trust and respect in the community, that they have continued to expand its scope of services. There are numerous anecdotes from the program team about customers calling with non-energy related questions. Boulder County has already replicated the model for wild fire mitigation efforts.

There is also a widely publicized effort underway to create a City of Boulder municipal utility as part of the overall strategy to have more control over its energy supply; helping to meet climate and sustainability goals. Energy efficiency will grow from a means to meet sustainability goals, to also become a tangible component of the municipal utility's resource mix. The EnergySmart platform will become even more crucial as a result.

Conclusion

The marriage of data and customer engagement in the energy efficiency space is happening in Boulder, and Boulder County, and in other municipalities like Austin, TX, where Austin Energy has started running a similar program. The Energy Advisor platform, has established itself as a key source of information and support for property owners looking to comply with city regulations, as well as program participants in the EnergySmart program, and in many cases those two turn out to be one in the same. There are new applications as well. The county has a wildfire mitigation platform based on the Energy Advisor model and is still in the process of rolling it out. And although no official stats were kept, there are also numerous anecdotal stories from the Energy Advisor staff regarding customer calls in the aftermath of a flood event in 2013. Flood mitigation is covered by a separate municipal department, but the awareness of and trust in the Energy Advisor service within the community was so high that people called them first. While there are no official plans to further integrate other city or county services, the vision that Boulder and Boulder County have demonstrated in leveraging the Energy Advisor platform thus far is truly a novel and exciting approach.

Acknowledgements

The authors of this paper would like to thank all the following people for their guidance and assistance in the development and review of this work (in alphabetical order): Kevin Carlucci, Kiel Dolence, Laura Hutchings, Katy Wolf and Samantha Youngblood.

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