The Energy Coalition (TEC) Case Study: Implementing the Open Efficiency Platform in Calfornia Energy Efficiency Programs

Introduction and Overview

The U.S. Department of Energy (DOE) funded Performance Systems Development of New York, LLC (PSD) to develop an integrated open source platform under the Open Efficiency Initiative (OEI), and to evaluate it through a series of whole-building energy efficiency program pilots.

The Open Efficiency Platform (OEP) aims to integrate a suite of DOE and U.S. Environmental Protection Agency (EPA) tools and to expand their use in energy efficiency programs. The OEI's overall goal is to increase the range and depth of energy savings available from commercial whole-building energy efficiency and programs[1] through reducing program administrative costs and better aligning program operations with private-sector market experience. Ultimately, OEI seeks to make regulated, commercial, whole-building energy efficiency programs easier to implement and more cost-effective for administrators, with simplified and automated processes for practitioners and building owners.

Demonstration of the OEP occurred through pilots conducted by energy-efficiency program administrators (PAs) who designed each pilot to use relevant components of the OEP. Each pilot was evaluated as a case study based on interviews with key stakeholders and a review of pilot data. This case study of the pilot conducted by The Energy Coalition (TEC) was prepared by SKEE.

The overall purpose of each case study was to evaluate the specific application of the OEP. As each project was a unique pilot and the number of pilots was limited, the case study approach was the most appropriate research methodology. For each pilot, the case study provided information on the issues OEP was implemented to address, how effective it was, what actions were least effective, lessons learned, and insights about other opportunities for applying OEP.

Pilot Description

The Energy Coalition worked with PSD as part of an effort to improve the performance of energy efficiency program operations using DOE and EPA tools. This pilot did not focus on a specific program. Instead, it was intended to leverage components of OEP in ways that would benefit the TEC by

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[1] The Energy Coalition operates as a program implementer for both IOU and Regional Energy Network Programs under the California Public Utilities Commission.

decreasing program costs and improving operations by reducing costs of handling data for program implementation and reporting.

The objective of this OEP pilot was to demonstrate efficiencies in collecting, storing, verifying and reporting data in TEC's program delivery and reporting process.

Assessment of the Pilot

Methodology

SKEE interviewed Marc Costa, Policy and Regulatory Manager at The Energy Coalition. Marc participated in the planning, execution and outreach for the OEP activities. He has served in his current role for the past three years out of seven total at TEC.

The Pilot

Background Information

The Energy Coalition (TEC) is a program implementer for both Investor Owned Utility (IOU) and Regional Energy Network (REN) Programs regulated by the California Public Utilities Commission. TEC has also provided regulatory support in the form of compliance filings. TEC's efficiency programs are typically focused on *public sector* facilities. TEC subcontracts out engineering services as needed. Currently their largest program contributes approximately 15 GWh/year of energy savings.

Existing Data Infrastructure

TEC has historically used a wide range of energy analysis and data management tools. They manage energy consumption data in Excel formats, energy audit data in Excel and eQUEST, incentive applications in Excel, MS word and PDF, and various reports in MS word, Excel, Google sheets, PDF and online application tools. Prior to the OEI project, this data was managed in Google drive and in Salesforce. TEC uses PSD's Compass reporting tool to create reports related to benchmarking and a Comparative Energy Analysis (CEA) that evaluates energy use and costs across a public agency. This analysis includes buildings, streetlights, pumps and water/wastewater. TEC also makes use of GIS tools from ESRI for reporting and project mapping/visualization.

The OEI suite of tools offered TEC an opportunity to enhance the TEC's entire work flow, from automated energy data collection through Green Button to screening buildings using ENERGY STAR Portfolio Manager and Asset Score. TEC also used OEI data interoperability tools such as BEDES, BuildingSync and SEED and the energy analysis capabilities of Open Studio.

Challenges Faced –

Regulatory

In its role as a program implementor for the regulated utilities (IOUs) in California, TEC implements programs that are counted towards the IOU goals (resource programs) and programs that are not counted in the current IOU goals (non-resource programs). Non-resource programs are allowed more flexibility in terms of tools and methods. TEC used this flexibility to apply OEP to its public buildings programs, an underdeveloped but promising source of energy efficiency savings.

For the past several years, the California Public Utility Commission Energy Division has developed energy efficiency calculation and reporting tools based on DOE 2.2/2.3 and eQUEST simulation software. The CPUC is now considering allowing EnergyPlus and OpenStudio based tools. Until this change occurs, the OEP demonstration in California will be limited to its application to non-resource programs.

If the CPUC were to allow OpenStudio/EnergyPlus, TEC could utilize features such as the automated workflows and "measures" from the Building Component Library to perform certain types of analysis and perform QA/QC.

Skills/Personnel

Implementing the OEP tool suite does require some special skills. And because the OEP tools are not widely used in CPUC programs to date, there is an additional challenge in finding people skilled in their use. For this reason, TEC typically subcontracts out the energy modeling. But once the tools and personnel are trained and the systems are in place, features such as OpenStudio measures for modeling retrofits or for QA/QC reports become powerful time-savings features..

Identifying Resources in the Engineering Community - Events

While implementing OEP, TEC participated in a variety of industry events such as, local USGBC events, ASHRAE events, DOE Better Building Challenge events and work groups to implement BEDES, SEED and various federal tools. While there is much to be shared in these events, TEC witnessed a continuing need for DOE to market their tools and raise awareness about the possibilities for enhanced program performance through integration packages such at OEP.

Industry-led planning efforts, such as Southern California Edison's 2016 energy tool road map, the ongoing Software Symposia and the California Technical Forum (CalTF), are useful in generating conversations about improved and integrated energy modeling analysis. But there is not yet the regulatory environment that allows full implementation of the good ideas generated in these events.

Partners

TEC partnered with other organizations to accomplish their goals. A small in-kind partnership with Performance Systems Development (PSD) grew into a larger teaming where TEC paid PSD to deploy OEI tools in their program workflows.

TEC used engineering subcontractors to participate in pilot programs that tied Portfolio Manager to Asset Score and to OpenStudio. This exposed the engineering community to the benefits of data standardization and federal tools, which TEC is now considering a best practice in future program implementation.

Multiple Use Models - Life Cycle Applications

A major challenge in the larger world of energy efficiency implementation is the fact that a single project may end up with multiple sources and repositories of building energy data. Often there have been multiple previous audits. The first cost of coordinating efforts usually outweighs the long-term benefits of reducing data collection and analysis costs.

Hence, there is a balance between exercising pragmatism to accomplish short term requirements when operating in the public sector versus developing an integrated and robust data ecosystem.

TEC envisions a future where energy modeling will be akin to a curated library of information that grows overtime in quantity and quality. Instead of multiple audits at buildings over years that could easily have been used and refined, a building model (and associated data) could be archived and updated as needed. OEP could play a big role in making this a reality.

Furthermore, with the advent of the Universal Building ID, it would be an ideal situation that every building in the TEC service area would have an energy model that would be periodically updated and enhanced over time. This would be beneficial to program design and targeting as well as policy development and strategic climate/energy planning. Finally, the need for distribution system analysis could benefit from streamlined access to updated building data.

How Did OEP Help?   Implementation Details and Issues -

TEC enjoys flexibility in how they implement the non-resource programs. TEC leveraged this flexibility to experiment with various combinations of OEI tools. They implemented the Portfolio Manager (PM), Asset Score and Salesforce connections in the OEP, and then added on Green Button connectivity and also adopted Compass as a report generator.

The TEC team has also implemented a connection between Portfolio Manager and Compass. They have generated dozens of deliverables for clients using this approach. They also have generated a handful of Asset Score to PM connections.

Lastly, they have completed a pilot with the full scope from Portfolio Manager, to Asset Score to OpenStudio to Compass. In each case the standardization inherent in the OEI tool suite allowed TEC to create solutions that go well beyond any current tool for identifying opportunities, implementing projects and reporting results.

Implementation is where the OEI excels.

Because TEC utilizes multiple engineers, each with their own audit tools and templates, they have long debated how to best streamline data collection and reporting. The OEI gives them the flexibility to collect multiple sources and formats of data from various parties, and then compile and streamline the data for program reporting and analysis. It also allows them to have a continuum between various stages of customer engagement and project delivery, including customer acquisition, baseline analysis, audit, incentive application and M&V.

One area that is particularly useful is streamlined file management. Instead of having data on a drive, it is intelligently digested and standardized for use in other phases of the program. Future applications will upload data into Salesforce from Compass This will provide valuable cost savings in data input and QA/QC. In the case of potential "resource" programs that allow OpenStudio, that component of the workflow will be valuable for savings documentation for regulatory purposes.

Evaluation

TEC's current public sector programs are evaluated by their client IOUs and subsequently by the CPUC. When they begin delivering "resource programs" the evaluation capabilities of the OEI will be advantageous. The opportunity to connect energy models in OpenStudio to ongoing consumption data from Green Button will be valuable for both simple and complex savings claims.

Challenges Applying the OEP

OEP was critical in helping TEC adopt a solution that required custom configuration, and to get company-wide as well as subcontractor buy-in that this system would be beneficial. Especially in California, with ever changing requirements and no approved use of OpenStudio as an analysis tool, it had been difficult to get cooperation on utilizing DOE tools. The actual use of the system was fairly detailed and complex to implement; however, TEC took on this challenge as a means of demonstrating their commitment to best-in-class engineering. The OEP is now configured to meet TEC's needs, which are similar to that of many other organizations across the state and around the country. Ultimately, it was easier for TEC to work through the challenges of developing OEP than to try and customize or adapt a platform that was built without consideration for the unique California rules and regulations.

Final Observations

The OEP work exposed TEC to a range of related initiatives at the federal level and connected them with peers around the country. TEC sees the OEP data ecosystem as the next generation of data management for energy programs – and believes it is 'future-proof.' Once up and running, OEP promises to improve the cost-effectiveness of program implementation. Opportunities for cooperation with other adopter will produce a networking effect, accelerating and enhancing the OEP for all parties.

Outcomes

- TEC has successfully integrated multiple OEP tools

- TEC has demonstrated the efficiencies that result from standardized data
- TEC has worked with partners to implement the OEP
- TEC has developed an integrated package that can prove useful for reporting to "resource" programs, should the CPUC change their modeling tool requirements

Overall conclusions, recommendations

Conclusions

Conducting energy efficiency programs within the California regulated environment can present unique challenges. TEC's public sector programs are defined as "non-resource" and hence, subject to different rules than "resource" programs. While the results of non-resource programs do not count towards the program administrator goals, these programs enjoy more flexibility in tools and approaches to recruiting and implementing projects. TEC used to flexibility to test out he OEI/OEP tools in ways that will prove useful to future programs throughout California and beyond. TEC successfully demonstrated that the integrated OEI tools provide benefits beyond simple data handling and reporting. Properly managed, energy data can greatly enhance program delivery through more efficient identification of opportunities and coordination of implementation.

Finally, while the current CPUC Energy Division policies prevent the use of program data reported using OpenStudio/EnergyPlus, ongoing adaptations to CPUC rules and regulations hold out the hope that these policies may be reviewed in the near future.

Recommendations

- Continue to work with CPUC Energy Division to identify opportunities to implement OEP in CPUC resource programs.
- Raise awareness of the benefits of OEP with other program administrators. IOUs, Regional Energy Networks (REN) and Community Choice Aggregators (CCA) could all benefit from implementing the OEP.
- CCAs or municipalities that implement benchmarking/audit programs in addition to energy retrofit program administration are particularly strong candidates for future cooperation.