

## San Francisco Environment (SFE) Case Study: OEI Tools Deployment for SF Energy Ordinance (Benchmarking and Audits)

### *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<sup>1</sup> 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 San Francisco Environment (SFE) 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*

SKEE 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 SFE benchmarking program by decreasing program costs and improving operations by reducing costs of handling data for

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<sup>1</sup> San Francisco Environment runs benchmarking and EE programs. This case study covers the benchmarking program.

The objective of this OEP pilot was to demonstrate efficiencies in collecting, storing, verifying and reporting data in SFE’s Benchmarking ordinance program.

- The OEP effort was conducted in 2018 and focused on data transfer between Energy Star Portfolio Manager, the Standard Energy Efficiency Data (SEED) Platform and Salesforce.
- Future plans include linking Building Energy Asset Score to SEED and Salesforce.



This pilot project aimed to simplify data transfer between Energy Star Portfolio Manager, SEED and Salesforce to lower the cost of implementing San Francisco’s Building Energy Benchmarking Ordinance.

San Francisco Environment runs several programs related to energy efficiency and green house gas mitigation. These programs require interacting with building owners and involve large amounts of building energy data and building characteristics data. While the building data that SFE collects might be used in a number of their programs the focus of this pilot is the Benchmarking Ordinance that San Francisco adopted in 2011. In support of this ordinance, SFE currently maintains a “covered buildings” list of ~1600 buildings.

SFE adopted its Benchmarking Ordinance before there were tools available specifically designed to collect, verify and report the types of data required. Early experiments with the original SEED database and other the Building Energy for Cities application were not successful. For a while, SFE relied on Excel spreadsheets (3) to manage the information required. Recent improvements in SEED, coupled with the OEP data management package, have allowed SFE to greatly streamline the administration of the ordinance.

SFE sees great promise in the combination of EPA/DOE tools and the Salesforce CRM. They believe that the hard work that they’ve done in the past couple years will allow other cities to pick up a suite of tools that will greatly ease the administrative and reporting burdens of implementing benchmarking programs. But perhaps more importantly, they see the promise of using standard energy models in their energy efficiency programs to enhance the identification of candidates for energy projects. Ultimately this system will become a critical part of their overall program to reduce GHG emissions.

## Assessment of the Pilot

### Methodology

SKEE conducted an interview with Ammon Reagan, Building Energy Analyst, to assess the SFE pilot application of the OEP. The interview followed detailed interview guides. The guide used to conduct the final interview addressed the following topics:

- What barriers the OEP and related federal tools helped each pilot overcome
- What difficulties each pilot had implementing the OEP and related federal tools
- What benefits OEP and related federal tools offered compared to the conventional approach to implement each pilot program
- What lessons can be learned from each pilot to help improve the OEP and support adoption of federal tools, such as the program's best applications and usefulness (including those for small buildings)
- Other potential OEP applications

### Implementation of OEP

SFE began implementation of the Existing Commercial Buildings Energy Performance Ordinance in 2011<sup>2</sup>. For several years, SFE used Excel spreadsheets, Microsoft Access, Microsoft CRM, ZOHO<sup>3</sup>, Building Energy for Cities<sup>4</sup> as the data tools supporting the program. For the past three years, Ammon Reagan has been in charge of managing the implementation of the program, including maintaining the data and tools. Ammon and others at SFE participated in early SEED user calls to stay current with recent developments. They had tried to implement SEED years ago but found the software unreliable and hard to use.

At the same time, SFE increased reliance on applications built on Salesforce to support the administrative functions of contacting and exchanging data with building owners. SFE experimented with their own Salesforce package to upload data from SEED into a Salesforce application that would allow them to maintain a list of covered buildings and communicate with building owners.

When PSD proposed an OEI solution that would include all of the data required for the benchmarking ordinance, SFE agreed to be a pilot participant. PSD created a "managed package"<sup>5</sup> that allowed SFE to streamline the benchmarking reporting process using Energy Star Portfolio Manager, SEED and Salesforce. The process starts with the building owner submitting data into Portfolio Manager. SFE takes the data from Portfolio Manager and uses SEED to verify fields and store all the data. A subset of the

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<sup>2</sup> <https://sfenvironment.org/news/press-release/san-franciscos-benchmarking-ordinance-requiring-commercial-buildings-to-disclose-energy-data-shows-major-reduction-in-energy-use>

<sup>3</sup> <https://www.zoho.com>

<sup>4</sup> Building Energy for Cities was an early third-party SEED application

<sup>5</sup> [https://help.salesforce.com/articleView?id=sharing\\_apps.htm&type=5](https://help.salesforce.com/articleView?id=sharing_apps.htm&type=5)

SEED database is moved to Salesforce for benchmarking compliance and reporting functions. All of the structured data is available for future use cases.



As part of the Existing Commercial Buildings Energy Ordinance, SFE also runs an energy efficiency audit program<sup>6</sup>. Buildings over 10,000 square feet must have a comprehensive energy audit (ASHRAE Level 1). Buildings over 50,000 square feet must have an ASHRAE Level 2 audit.<sup>7</sup>

SFE began using DOE's Building Energy Asset Score (Asset Score) earlier this year to collect assessor audit data. SFE currently saves the output from Asset Score in PDF format and uploads this information to Salesforce. SFE intends to develop a data link between Asset Score and SEED, much like the current Portfolio Manager link.

Program privacy policies require that only limited audit data is shared. Hence, benchmark and audit data are currently stored separately. But Portfolio Manager building characteristics data would be validated with Asset Score data.

Regarding skills required to implement the OEI solution, Ammon feels that the new system is straightforward and will not require extensive training. Previous versions of SEED were not as user friendly. When SEED was combined with custom data transfer tools the result was a data system that was difficult to teach to new users. Indeed, many cities have implemented custom solutions to implement benchmarking programs. There is no standard. Some cities (Boulder) have invested in Salesforce applications for the entire process, but this is cost prohibitive. A potential outcome of this OEI pilot is a system of tools that any entity can adopt quickly and use with limited previous experience or training. SFE participates in the C40 Building Energy Network, the EPA Energy Star Update Meetings and other industry events. These might be productive venues to share SFE's experience in the future.

As mentioned earlier, San Francisco was the first major city in the US to adopt a benchmarking ordinance. As there were no existing solutions to support the data and administration needs of this program, SFE benefited from the support of the DOE National Labs in creating the OEI solution.

<sup>6</sup> <https://sfenvironment.org/energy/energy-efficiency/commercial-and-multifamily-properties/existing-commercial-buildings-energy-performance-ordinance/energy-efficiency-audits>

<sup>7</sup> [https://sfenvironment.org/sites/default/files/fliers/files/sfe\\_gb\\_ecb\\_cea\\_guidelines.pdf](https://sfenvironment.org/sites/default/files/fliers/files/sfe_gb_ecb_cea_guidelines.pdf)

SFE anticipates two primary future uses for the OEP. Building energy and audit data will be used to target the best candidates for SFE's energy efficiency incentive programs. SFE sees an opportunity to upload Asset Score audit data into Salesforce to assist in this effort. Furthermore, the EnergyPlus models that support the Asset Score can be used in custom program submittal and subsequent Measurement and Verification. While the California Public Utilities Commission Energy Division does not currently include EnergyPlus in the approved custom tool archive, Energy Division staff have expressed an interest in learning more about the SFE/ OEI program and how these tools can assist the CPUC in their mission.

- Further definition of the requirements for an open OEI schema to support a managed package for program reporting in Salesforce, Mule connectivity to this package, including load shapes.
- Evaluation of the use of OpenStudio to support ECM calculation methodology descriptions for Technical Reference Manuals. (need more info on where this ended up and if OpenStudio models and methods were directly referenced in the IL TRM.)

## Effectiveness assessment

Barriers overcome –

- Existing tools and software were not robust. Data transfer created many errors.
- OEI, through improved functionality in SEED and the PSD managed package allowed SFE to greatly reduce data processing time and reduce errors.
- The ability to utilize a world class CRM (Salesforce) greatly enhanced SFE's ability to deploy and administer the EBCEEO.
- The resulting OEP will be simple to transfer to other cities/entities with benchmarking programs.

## Assessment of pilot's strengths and weaknesses based on interviews with pilot participants

### Outcomes

- SFE has successfully linked Energy Star Portfolio Manager to SEED and Salesforce.
- SFE is using DOE tools to support all of the administrative activities related to its Building Energy Benchmarking Ordinance.
- The recent improvement in SEED and the PSD Salesforce managed package allowed SFE to reduce the time and money required to administer SFE's Benchmarking Ordinance.
- SFE is considering how to assist other cities in complying with municipal and state benchmarking ordinances.
- SFE is planning on using the audit data and modeling capabilities in Asset Score to identify candidates for its energy efficiency programs.

- SFE will be meeting with the California Public Utilities Commission in early 2019 to demonstrate their process and discuss using DOE tools in CPUC programs.

## ***Overall conclusions, recommendations***

### **Conclusions**

Several developments in software came together at the same time to allow SFE utilize the OEP effectively. Ongoing investments in SEED, coupled with the PSD managed package in Salesforce allowed SFE to develop a simple, cost-effective and scalable solution to current benchmarking programs. Better yet, this solution shows promise to allow SFE to incorporate Asset Score data and models to implement energy efficiency incentive programs and other efforts to meet climate goals.

Based on SFE's experience with one Bay Area city, this package should be easy to implement in other cities with a limited learning curve and low implementation cost.

### **Recommendations**

- Get the word out!