

# ***Public Buildings Portfolio Management: Understanding Best Practices for Energy Efficiency Strategies and Supporting Technologies***

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## *Executive Summary*

This final report summarizes the engagements with three public building portfolios for the project entitled “Energy Efficiency Strategies and Technologies: Understanding Regional Best Practices,” funded by NEEA and the U.S. Department of Energy (DOE). The goal of this project was to support utility development of a process to engage K-12 school districts and municipalities in the adoption of scalable and effective data collection and analysis processes and tools in support of Strategic Energy Management (SEM) practices. The project focused on creating a portfolio-wide view of energy data per building, and identifying priority buildings for energy savings.. The project builds on previous work on public buildings portfolio management strategies and best practices, also funded by NEEA and DOE and conducted by Maalka, EcoEdge and the New Buildings Institute.<sup>1</sup>

Engagement with each entity started with entering building and energy use data into Portfolio Manager, which was then uploaded to the Maalka software platform. In the case of Pierce County, a third-party data transfer service was used to upload utility data directly to the Maalka platform. Nampa’s data was manually entered in Portfolio Manager, which was then uploaded to the Maalka platform. Pocatello had been benchmarking for 16 years in Portfolio Manager so their data could easily be uploaded to Maalka for greater visualization.

Once an entire portfolio of buildings was benchmarked, graphs were produced to help visualize energy use trends. These visualizations aided in prioritizing the buildings with the highest potential for saving energy. Those with the highest EUI and largest total energy use were initial top candidates. Pierce County identified that correctional facilities had the highest opportunity for savings, so deeper analysis was done on those types of buildings. Efforts with them built on benchmarking to include supporting the development of policies that foster energy efficiency: a Resource Conservation Management Policy and Standard Operating Procedures. They also explored the creation of a funding mechanism such as an energy revolving fund. Nampa learned of a new metric, EUI, and new software for tracking energy use that creates better visualizations for decision making and for creating friendly competitions between

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<sup>1</sup> Resources developed through previous work in public buildings portfolio management are available at <https://newbuildings.org/resource/public-buildings-portfolio-management/>.

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schools. Pocatello utilized the visualization to three similar schools to tell a clear story to decision makers about the value of an energy upgrade. They also implemented nine energy efficiency projects in 2019.

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## ***Introduction***

This final report summarizes the engagements with three public entities with the goal of supporting utility development of a process to engage K-12 school districts and municipalities in the adoption of scalable and effective data collection and analysis processes and tools in support of Strategic Energy Management (SEM) practices. The project focused on creating a portfolio-wide view of energy data per entity, and identifying priority buildings for energy savings.

This project began in April of 2019 and ended in December of 2019. Initial funding was provided by the Department of Energy (DOE) via the National Renewable Energy Lab (NREL). Additional funding was provided by NEEA. The project builds on previous work on public buildings portfolio management strategies and best practices, funded by NEEA and DOE and conducted by Maalka, EcoEdge and the New Buildings Institute.<sup>2</sup>

The team was led by Sharon Grant with Eco Edge and included technical support from John Teeter and Rimas Gulbinas with Maalka. Sharon served as the project manager for the project, which involved relationships with the utilities and entities, meeting coordination and facilitation, and reporting. John and Rimas collected and input data into Portfolio Manager software and the Maalka platform, performed data validation on all energy data and generated visualizations of energy performance.

The two primary portfolios engaged in this project were Pierce County, WA, in coordination with Tacoma Power; and Idaho's Nampa School District in coordination with Idaho Power. In addition, there was secondary engagement with Pocatello School District, which consisted of follow-up activities on a project initiated in the previous year. All three entities were involved in utility SEM cohorts; the project team was sensitive to align with utility efforts.

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<sup>2</sup> Resources developed through previous work in public buildings portfolio management are available at <https://newbuildings.org/resource/public-buildings-portfolio-management/>.

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## ***Overview of Engagements***

The level of engagement and specific actions varied between the three entities, but several key actions included: a regular cadence of meetings, a process for updating data regularly, and a prioritization process for evaluating all buildings across a portfolio.

For each building in the entities' portfolio, the project team provided a report that included total energy use, EUI (energy use index or kBtu/sq ft/year), and then correlated so the buildings that had high energy use and a high EUI were prioritized for more targeted analysis. In one engagement, the prioritization process involved multiple departments and achieved a higher level of communication and coordination between departments as well as brought a broader and shared understanding of the value of saving energy. In addition, in all three engagements, the entities had two or three buildings involved in a utility SEM cohort that focused on technical analysis to identify energy saving opportunities. This team was very conscious of complementing but not duplicating any efforts of the cohort. The primary objective was to establish portfolio-wide benchmarking to present a more holistic view of building energy use and enable data-driven decision making.

## ***Overview of Technologies***

Engagement with each entity started with entering building and energy use data into Portfolio Manager, which was then uploaded to the Maalka software platform.

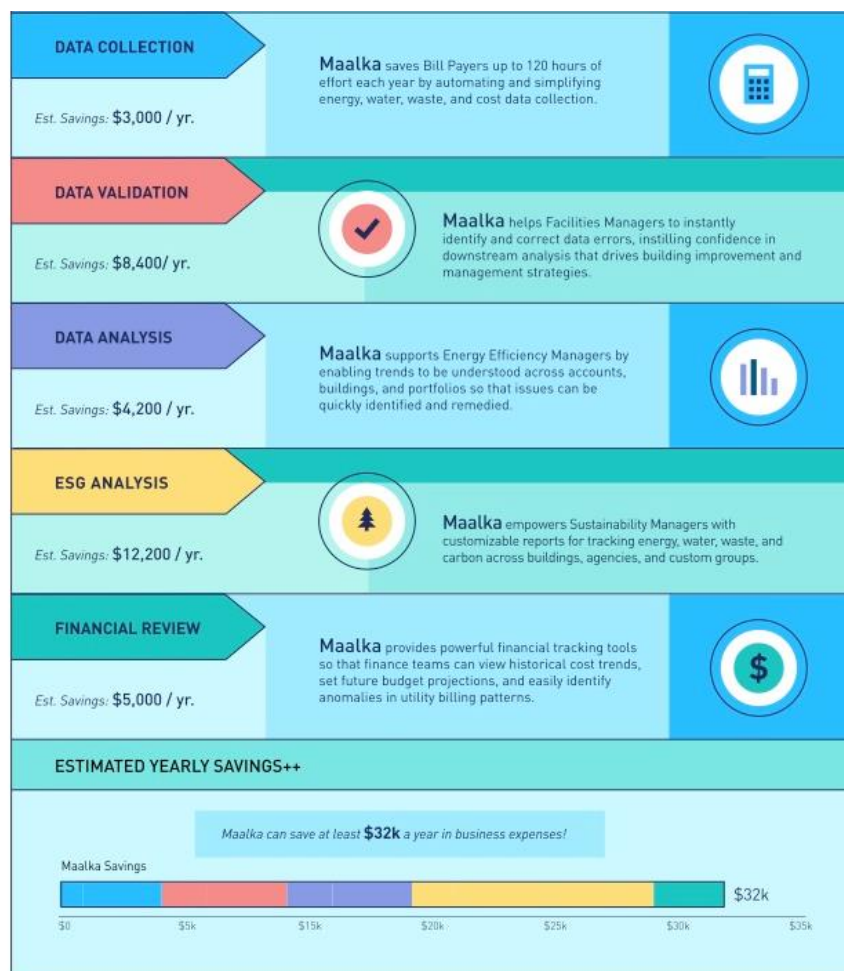
### ***Portfolio Manager***

Portfolio Manager is a free online tool that was developed by the EPA to measure and track energy and water consumption, as well as greenhouse gas emissions. It is the most used tool for capturing data and provides users with a standardized approach for benchmarking building energy performance. However, while the name 'Portfolio Manager' implies that the tool is designed to provide performance trends across portfolios, it is in fact mostly used for data collection and simple visualizations at the building level. To provide more value to users in the form of portfolio-scale benchmarking, visualizations, data validation, and reporting, the team utilized the Maalka platform, which is compatible with Portfolio Manager. Maalka was developed through industry-leading partnerships to provide an essential layer of

analysis for understanding energy, water, and emissions trends across entire building portfolios at various time resolutions (day/month/year).

## Maalka Platform

Maalka provides a platform for building portfolios that streamlines the process of collecting, validating, benchmarking, goal-setting, analyzing, and reporting energy, water, carbon, and cost trends over time. This enables teams to access data-driven insights for better decision-making that balances climate, performance, financial, and compliance considerations. Furthermore, Maalka provides the option of automating utility data exchange so that these entities can further reduce costs, time, and effort of manual data entry. The graphic below demonstrates the cost savings across different steps associated with an SEM program for a municipality:



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Maalka has been used to support SEM programs in over 10 municipalities. Specifically, in the pilots of this program, Maalka was leveraged to accomplish the following:

- 1) **Data Validation & Quality Control:** One of the most time consuming and error-prone processes of an Energy Efficiency and Benchmarking program is ensuring data quality and completeness. Maalka worked with the pilot clients to apply data validation rules that check against raw and normalized values. This includes checking for gaps and overlaps in entries, as well as jumps from month-to-month, year-to-year, and month-over-month-per-year. The data validation process applied to the client portfolios represents a directly transferable best practice that can be applied to other municipal and school portfolios to ensure consistency in data quality and completeness.
- 2) **Data Normalization & Reporting:** After passing the data validation phase, Maalka was applied to enable the clients to view trends over time and report on progress. Buildings were added into customized groupings (e.g. Pierce County Correctional Facilities) so that users could view specific trends by building type, size, location, etc. This allows users to track the performance of subsets of buildings very easily to help in EE prioritization. In addition, Maalka allows performance reports to be generated on-demand so that users can instantly share the progress of buildings over time with other users. The ability to instantly view site-, group-, and portfolio-level trends represents a best practice that can be applied to other portfolios so that data can be used to help inform portfolio-scale decision-making.
- 3) **Utility Data Automation:** Another highly time-consuming and error-prone process for portfolio managers is managing utility bills and the extraction of data for input into software for tracking. Maalka integrated a third-party utility data service provider, Urjanet, to enable Pierce County to continually and automatically track utility energy use data. Initially, 39 electricity and 69 water accounts were set up for automated utility data exchange into Maalka. Maalka is currently expanding the number of supported accounts as well as the utilities. This option represents another proven best practice that can be adopted by other utilities to offer clients a cost-effective method for tracking utility energy billing data that feeds downstream analysis and reporting.

In addition to the three best practices listed above, which can be adopted by individual municipal and school portfolios, Maalka can be leveraged to benchmark and track energy/water/carbon reduction across multiple municipalities and districts simultaneously. That enables utilities to simultaneously run



several EE and Benchmarking programs and to track on-demand the energy/water/carbon trends across the entire service territory, between participating portfolios, for different cross-sections of buildings (e.g. All K12 Schools vs. All Fire Stations), as well as individual buildings.

## Description of Engagements and Outcomes

### Pierce County

Engagement with Pierce County began in April of 2019 after they expressed interest in participating in mid-2018. They displayed high motivation to pursue this project and were actively engaged throughout.

Pierce County had two facilities involved in the Tacoma Power school cohort, so a focus area of this engagement was to establish portfolio-wide benchmarking for 70 properties, totaling 2,485,186 square feet of real estate. The team began by working with the County’s Resource Conservation Manager

(RCM) to collect energy and building data on every facility in the portfolio. This was entered into Portfolio Manager and Maalka, then data quality assurance quality control (QAQC) was performed using the Maalka software to ensure the data was clean. A master facility list was created, which is the foundation for any portfolio-wide benchmarking effort. The team generated energy performance results that showed the entire portfolio ranked by total energy use and Energy Use Intensity (EUI). These results were then used to conduct a prioritization workshop with the facilities and construction planning departments. Below is a table of total energy use vs EUI.

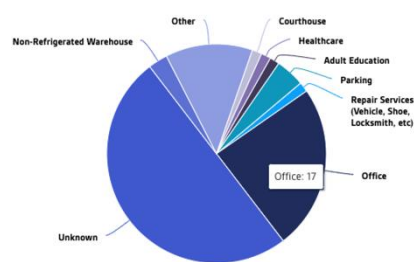


FIGURE 1: PIERCE COUNTY BUILDING TYPES

Below is a table of total energy use vs EUI.

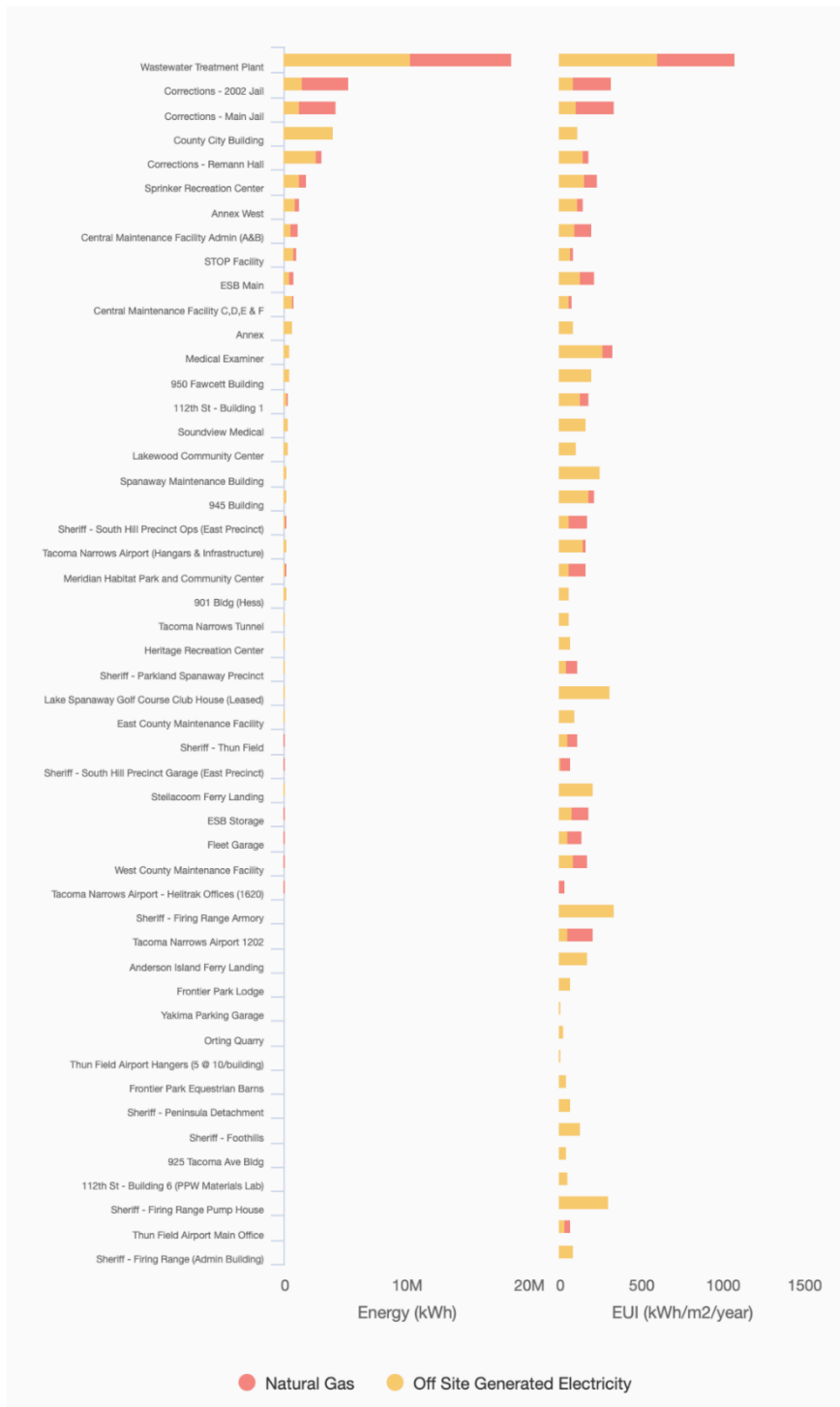


FIGURE 2: PIERCE COUNTY BUILDING ENERGY CONSUMPTION AND INTENSITY

The team then facilitated a prioritization workshop that included the RCM, facilities staff, new construction staff and utility representatives. The purpose of the workshop was to bring cross-departmental stakeholders to the table to review building energy performance and compare it to other strategic priorities to identify the highest priority buildings for immediate targeted analysis.

In the workshop, the strategic plan for building maintenance and upgrades was reviewed in the context of energy usage as reported by the Maalka tool. As a result of the workshop, Pierce County is now considering adding energy savings as one of the criteria in their strategic planning process, and Pierce County is now also aware of and preparing for the new Clean Buildings Act that will require buildings over 50,000 sq ft to meet EUI targets by 2026 or face penalties.

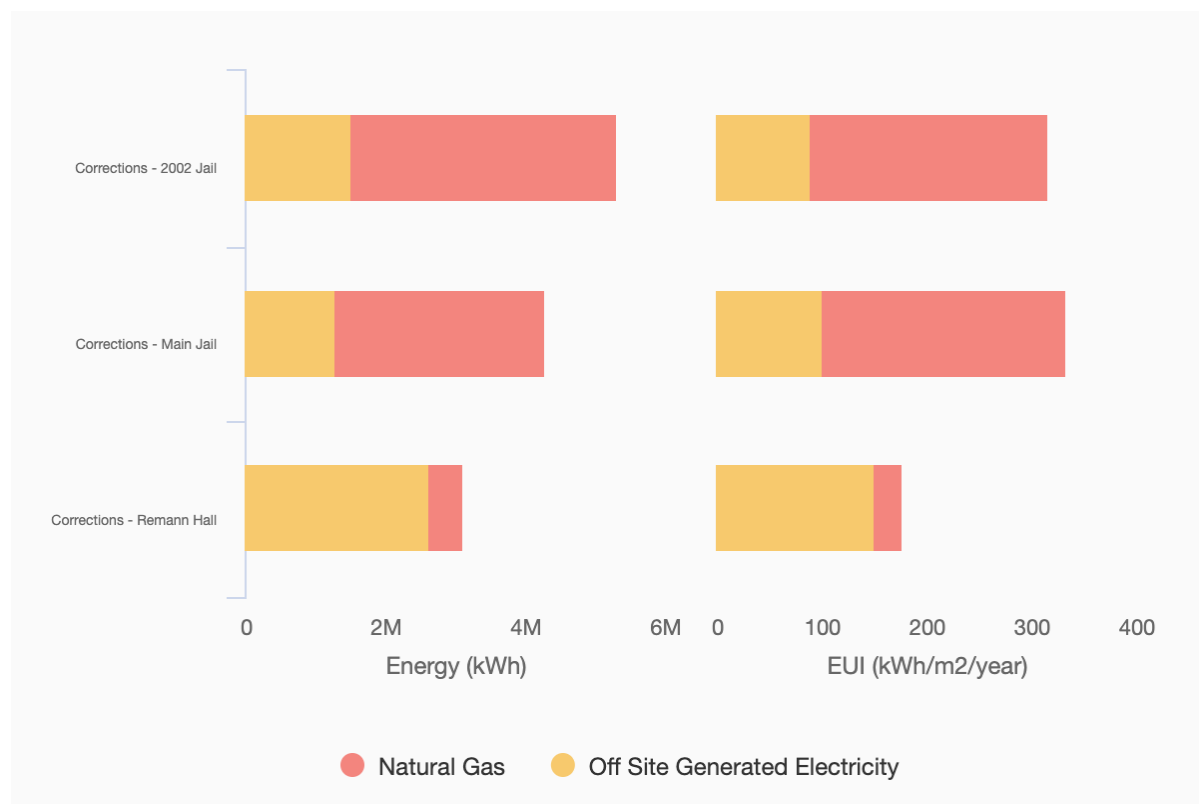
Below are the facilities that were identified as Priority Level I buildings, which represent the best candidates for energy efficiency improvements according to ranking criteria based on relevant intrinsic (e.g. building characteristics) and extrinsic (e.g. regulatory exposure) variables. Extrinsic variables are typically modified to reflect specific customer situations and needs such as regulatory exposure, pre-existing plans/mandates, and management structure. In the table below, the buildings with the most variables started to stand out and turned out to be correctional facilities.

**TABLE 1: BUILDING IMPROVEMENT PRIORITY RANKINGS**

Facility	High EUI	High Total Energy Use	Renovation Planned	Clean Bldg Act	Essential Service	Highly Visible	TPU CSEM
Main Jail		X		X	X		
2002 Jail		X		X	X		
City County Building		X		X	X	X	X
Sprinker		X	X	X		X	
Corrections		X		X	X		
Medical Examiner	X		X		X		
Spanaway GC	X						
Firing Range	X						
Spanaway Maintenance	X						

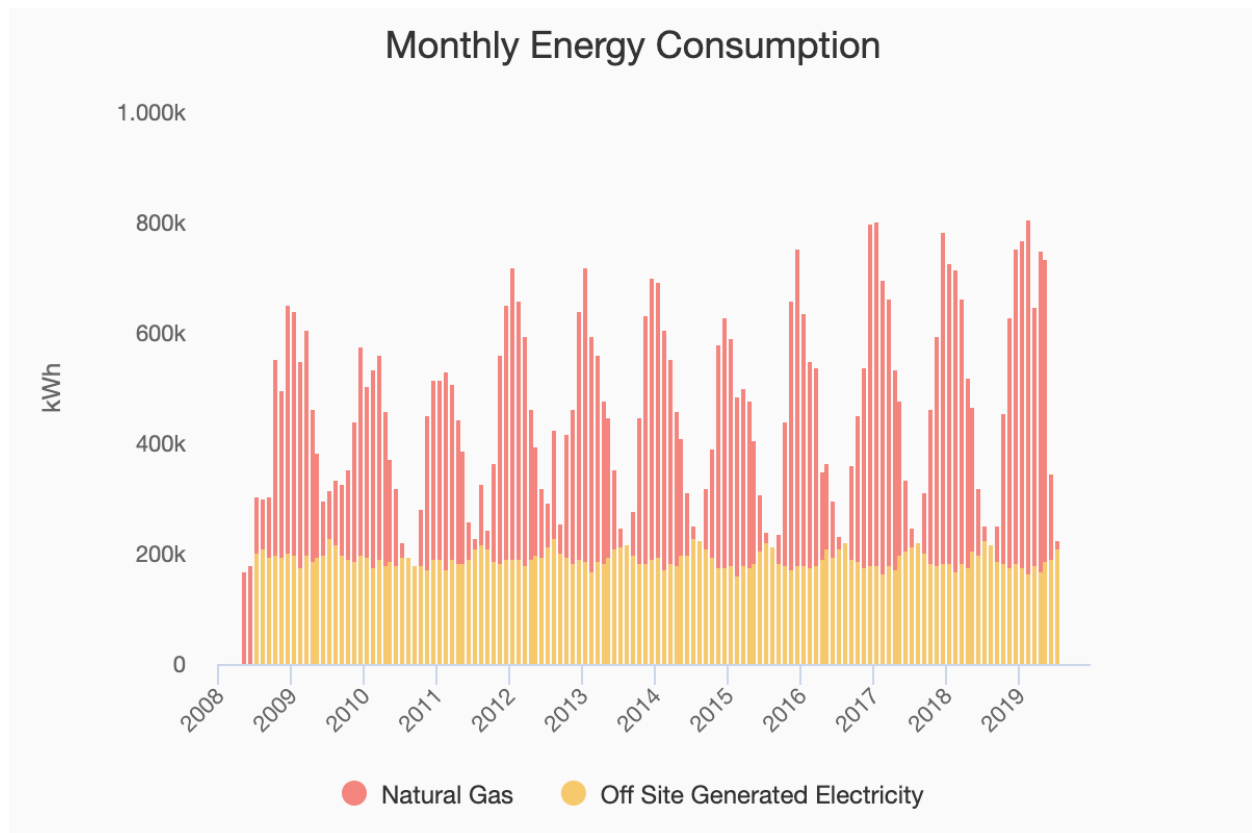
945 Building	X						
950 Fawcett	X						
Annex West			X	X			X

Buildings highlighted in yellow in Table 1 are correctional facilities. It was a group decision to focus efforts on researching correctional facilities as a priority. Below is a visualization of the energy use and EUI of three correctional facilities, zoomed in to provide a more detailed view.



**FIGURE 3: PIERCE COUNTY CORRECTIONAL FACILITIES ENERGY CONSUMPTION AND INTENSITY**

Out of the three correctional facilities, the Main Jail (Figure 3 – middle) showed the highest EUI. In addition, as seen in Figure 4, it showed increasing monthly energy use over time.



**FIGURE 4: PIERCE COUNTY MAIN JAIL MONTHLY ENERGY CONSUMPTION OVER TIME**

In response to the prioritization of correctional facilities, one of the monthly webinars focused on discussing how to engage the correctional facilities, such as the best point of contact and approach. In addition, the utility sourced some resources on best practices through E Source for saving energy in prisons and received several good case studies. The team summarized the best practices but realized a key variable: most research is on prisons, but Pierce County has jails not prisons, which is a different type of population.

As an outcome of the prioritization workshop, the RCM felt that funding energy conservation measures was a challenge that an energy revolving fund could address. Pierce County has an overwhelming amount of deferred maintenance that tends to take priority over energy efficiency. A presentation was given to the facilities department on the option of creating a revolving fund. A revolving fund is a process that reinvests a portion of the cost savings generated from energy efficiency and renewable energy projects in new projects designed to generate additional savings – thereby establishing a

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continuous funding feedback loop to drive energy efficiency over time. Although it does not appear likely that they will implement a revolving fund in the near term, the presentation fueled more in-depth discussion and collaboration on how to incorporate energy efficiency into projects.

As a result of the workshop, Pierce County identified three immediate next steps: (1) evaluate options for funding energy conservation measures, (2) develop a RCM policy, and (3) develop SOPs.

In addition to bringing together the Pierce County facilities, budget, and sustainability teams to discuss potential financing strategies, the team also engaged the county to develop an RCM policy to empower the RCM and help these teams integrate sustainability-oriented best practices into their purchasing and management processes. The Resource Conservation Management Policy (RCM Policy) directs the development and implementation of a Resource Conservation Management Plan (RCM Plan) and related procedures, all in furtherance of Pierce County's Strategic Objectives. The intent of the policy is to ensure that the planning, design, construction, maintenance and operation, and purchase of all County-owned assets is consistent with the latest high-performance building, sustainable purchasing, materials stewardship, and sustainable development practices. The RCM Policy, and corresponding plan, intend to continuously improve the productivity of consumable resources by managing the consumption and utilization of energy, water, fuel, materials, and greenhouse gases (GHG)<sup>3</sup> by the county and its employees.

Complementing the formation of the RCM Policy, the project team also helped develop a new set of standard operating procedures (SOPs) to provide guidance on saving energy in operations. The team sourced standard vs. best practice SOPs to foster a discussion during a webinar dedicated to this topic. The presentation was edited during the discussion to a final version that can be presented to maintenance staff for their input. The RCM is also piloting a policy on space heaters to initiate the idea of SOPs.

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<sup>3</sup> GHG equivalencies provide a concise way to measure the productivity of consumable resources by converting their consumption into CO<sub>2</sub> equivalents (CO<sub>2</sub>e). This unit translates abstract measurements into concrete terms using a single unit of measure.

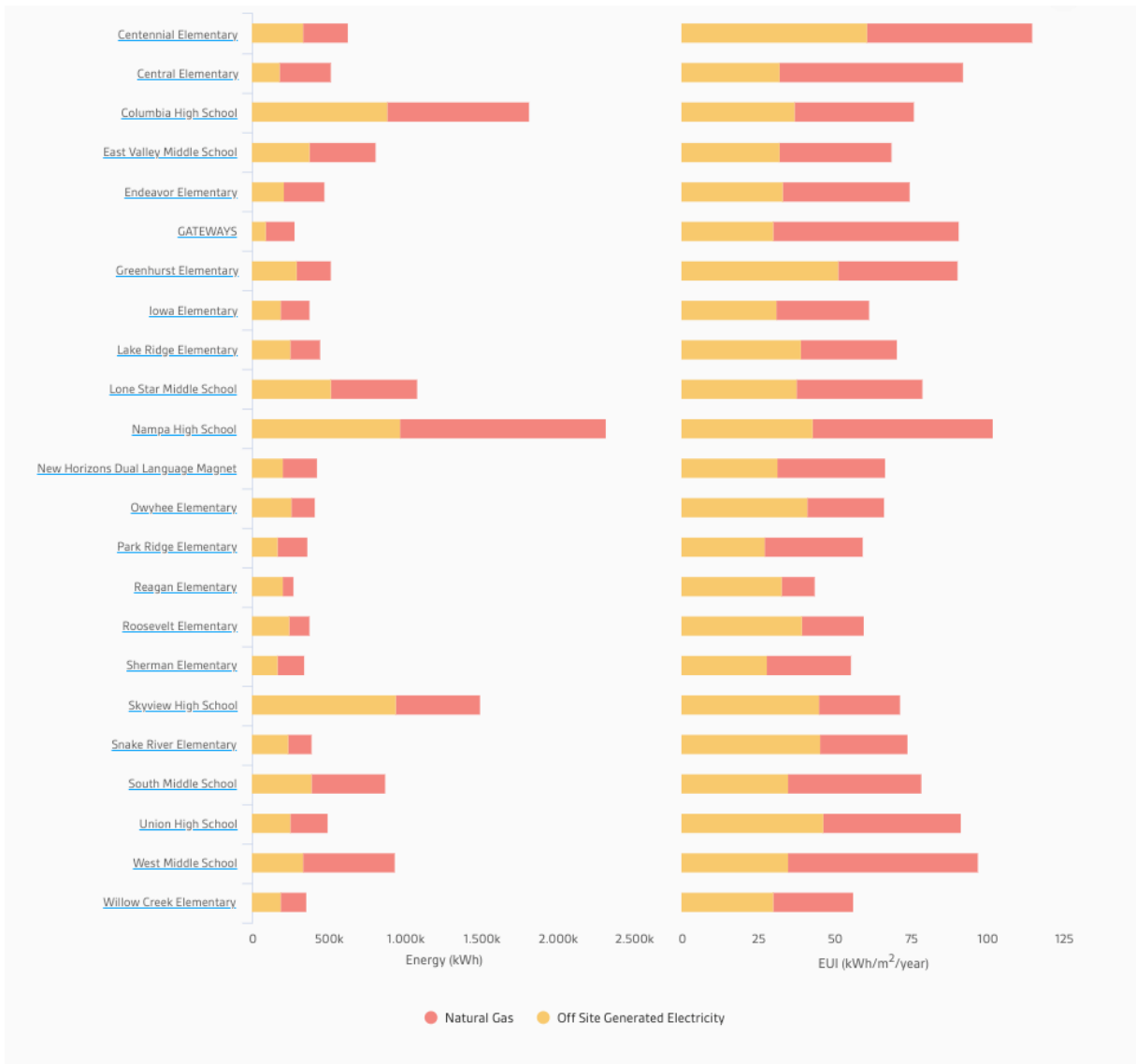
In addition to helping understand energy use trends across the portfolio and to providing support in developing a structured facility improvement plan and policy, the team developed new capacities to streamline data entry. One of the most time and cost-intensive processes identified early in the engagement was the collection and input of energy data for all the buildings across the portfolio. Each month, more than ~80 employee hours are required to manage bill collection and input data into the system. Furthermore, manual data entry introduces significant chances for data errors, as each building often includes multiple accounts and bills can be inconsistent in structure. In the past, Tacoma Power created an automated data transfer for the City of Tacoma, so efforts initially focused on trying to recreate this for Pierce County. However, this approach was inconsistent, limited (only supported one account per facility), and was never made operational. It was determined to shift to a third-party utility data provider, Urjanet, in order to reduce this burden on Pierce County. Urjanet is a specialized data exchange service that pushes utility energy use data to Maalka on a daily basis. Initially, 39 electricity and 69 water accounts were set up for automated utility data exchange into Maalka. Maalka is currently expanding the number of supported accounts as well as the utilities, so that the county can also benefit from automated data exchange for non-Tacoma Power accounts. Pierce County is currently assessing whether to continue the paid service in 2020.

### *Nampa School District*

After exploring several candidates with Idaho Power, Nampa School District was identified as a primary engagement entity in August of 2019. The focus of the work with them was to establish benchmarking in Portfolio Manager to better track performance compared to the spreadsheets currently being used. Data was collected, uploaded and went through Maalka's QAQC process. A primary goal of the district was to not add workload or duplicate efforts with the utility's K12 cohort. So, the task of entering data into Portfolio Manager was identified as a workload transfer, not addition, because staff were already entering data in a tool. The team held training sessions for several staff on Portfolio Manager. During the transition, the staff intends to enter data into both the spreadsheet and Portfolio Manager to compare the amount of time and effort required vs. the benefit of each process. They also intend to compare the process of entering data to an automated data transfer service such as Urjanet.

Another area of focus was to offer them a portfolio view of their entire stock of buildings rather than just looking at the few that were involved in the cohort. This more holistic view allows them to compare building energy performance based on total energy use and EUI (a new metric for the district) and

prioritize buildings for deeper analysis (see Figure 5). Through the cohort, they had focused on controls to capture savings. A result of this engagement was a master building list that was expanded to include energy data points.



**FIGURE 5: NAMPA BUILDING ENERGY CONSUMPTION AND INTENSITY**

The types of the buildings that stood out as opportunities for saving energy were high schools. In particular, Centennial High School, Nampa High School and West Middle School. A more detailed view



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of West Middle School, as an example, can be seen in Figure 6. One of these buildings would be a good candidate for deeper analysis such as the 75/25 incentive program that Idaho Power offers for constructing an energy model to identify the best upgrade opportunities. And, by grouping buildings and comparing just high schools, for example, a competition between high schools could be launched.

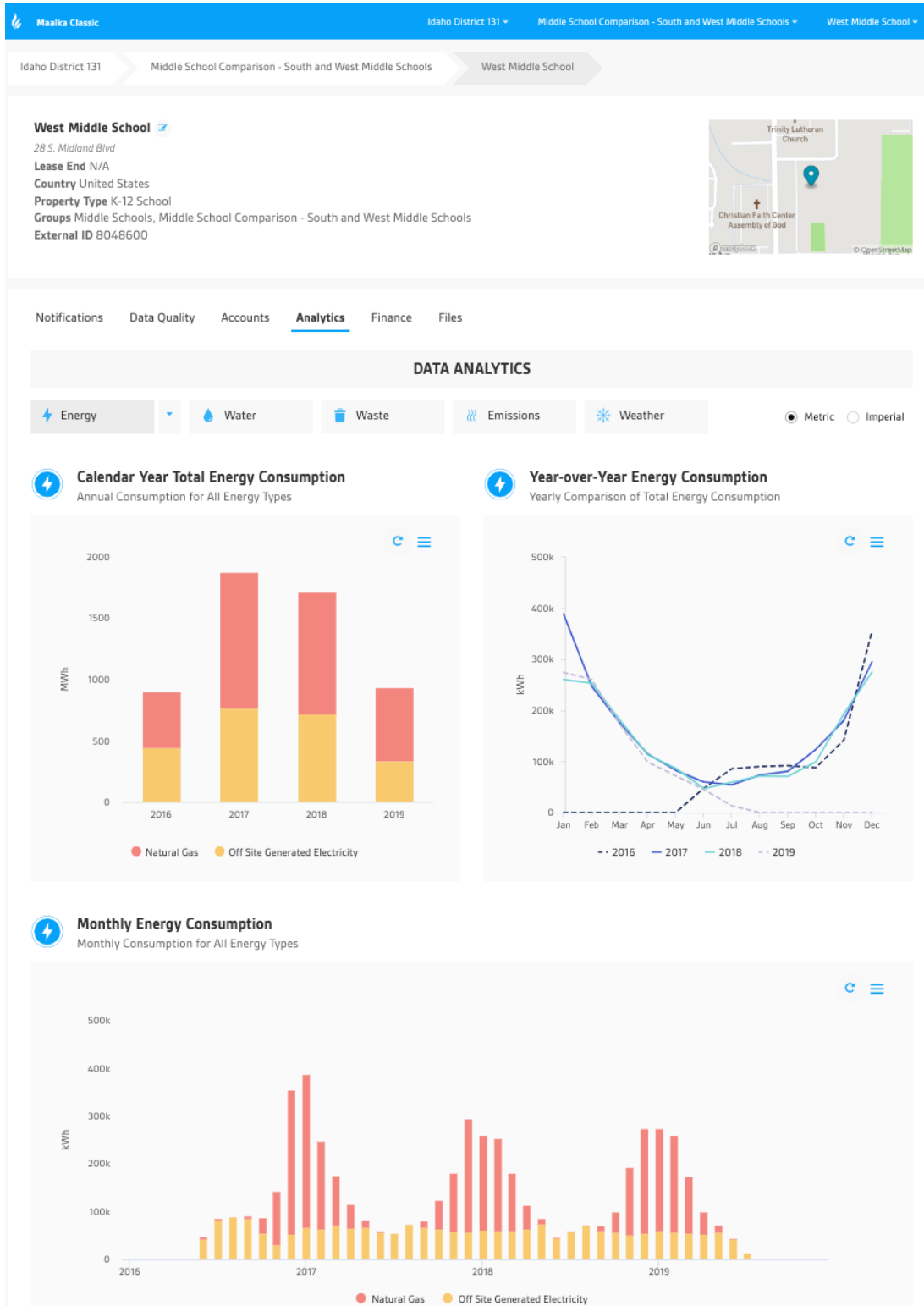


FIGURE 6: WEST MIDDLE SCHOOL ENERGY USE TRENDS

## Pocatello School District

For several months in 2018, Pocatello was a primary engagement entity that the team worked closely with to benchmark performance and visualize it through Maalka software through a previous project funded by DOE/NREL with additional support from NEEA. Pocatello has the only known Energy Manager for a school district in Idaho. He has been benchmarking buildings in Portfolio Manager for 16 years. The team created a video success story with Idaho Power that can be found at <https://www.youtube.com/watch?v=1BgtiXW83BE>. The team also worked with them to create a flyer for engaging staff in saving energy. Staff has since posted this flyer in classrooms to engage teachers and students.

Pocatello was identified as a secondary engagement entity in 2019 for the team to have limited follow-up with them to continue to track their performance. Below is a list of energy efficiency measures that have been implemented in 2019.

**TABLE 2: POCATELLO 2019 BUILDING IMPROVEMENT PROJECTS**

Project ID#	Year	Incentive	kWh Savings	Description	Meter Number	Project Cost
166229	2019	\$ 3,500.00	12,000	VFDs for CHS Gyms	19922609	\$ 7,000.00
IND 2367	2019	\$ 2,090.00	10,896	HHS A-Hall Lights	14656598	\$ 8,000.00
190252	2019	\$ 10,948.65	82,149	Green Acres Classroom Lighting	41144068	\$ 31,000.00
IND 2368	2019	\$ 4,940.71	32,938	HHS Gym Lights	14656598	\$ 15,000.00
	2019	\$ 1,520.00	4,850	HHS E-Building	14656598	\$ 5,280.00
190462	2019	\$ 3,150.00	38,520	Syringa HVAC	41042233	\$ 130,097.00
190460	2019	\$ 900.00	12,350	Lincoln HVAC	41144053	\$ 43,740.00
190459	2019	\$ 2,850.00	72,040	HHS HVAC Upgrades D	14656598	\$ 269,070.00
190461	2019	\$ 2,325.00	37,852	Irving HVAC Upgrades	36481363	\$ 103,510.00

During the 2019 engagement, Maalka processed updated energy trend visualizations. Below is the standard total energy use and EUI comparison.



**FIGURE 7: POCATELLO BUILDING ENERGY CONSUMPTION AND INTENSITY**

Viewing the entire portfolio again, staff requested a comparison of three buildings (see Figure 8). Ellis and Gate City have had HVAC upgrades and Jefferson has not. Staff found this to be a very effective visual to justify the value in also upgrading the HVAC at Jefferson.



FIGURE 8: POCATELLO THREE SCHOOL ENERGY CONSUMPTION AND INTENSITY

## Feedback from Entities

During the wrap-up meetings, the team asked each entity to provide their feedback about the impact of this project. The feedback is occasionally paraphrased but represents many of their exact words.

### Pierce County

The delay between Pierce County asking for assistance and the long contract process (started in October 2018 but not enacted until April 2019 due to the lengthy contracting process for DOE funding) was frustrating for Seth McKinney, the RCM, but he does appreciate that he was invited to listen to calls and meetings with the City of Tacoma to learn from those experiences before this contract officially started.

The TPU cohort approach (run by Stillwater Energy) has been more technical, and this project more strategic in nature. Together, these approaches are very effective.

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The strategic and global approach of this project is a necessary perspective that enables bigger picture efforts such as financing mechanisms, SOPs and policies. The converse to this is that the Facilities Department tends to have a more short-term approach.

With the current energy champion leaving for a position at Stillwater, a new champion will be needed to not lose the impact that has been achieved. Setting up a project around one person is too vulnerable. An example was shared of another local jurisdiction that decided to eliminate the sustainability position because “sustainability should be everywhere in all positions,” which resulted in sustainability efforts being lost. A person dedicated to energy or sustainability is important.

The perception may have been that the concept of a new financing mechanism failed but it helped the department learn what would work and led to SOPs and a project management manual, which have strong buy-in. These have the potential for significant organizational change if implemented.

A potential solution suggested was to hire an energy manager to focus on facility maintenance and energy saving opportunities from that perspective.

The regular cadence of calls (monthly) was very helpful to organize and focus thoughts and actions. Good probing questions were asked during the calls.

TPU appreciated that the team paid close attention to specific needs while still maintaining the perspective of a more global framework. The framework of SEM is good but it is important to have a skilled facilitator of the process that is adaptable and makes an effort to customize the approach to meet specific needs.

### *Nampa School District*

In the engagement with Nampa that began in August 2019 and ended in December 2019, staff were not familiar with some key concepts such as EUI as a metric or the Portfolio Manager benchmarking program. Peter Jurhs, the Executive Director of Operations, expressed appreciation for learning about these as well as saw great value in better visualization of energy performance. His specific feedback follows.

This project enabled NSD to identify a new metric to compare and evaluate building performance: EUI, which normalizes energy use.

Staff learned about new software that gives a big view and helps identify what is out of whack: Portfolio Manager and the Maalka tool.

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The process has helped staff to think about how to look at and talk about school energy use and show data to have discussions.

The only bill to *decrease* in the past few years has been the electric bill. Managing electricity use continues to be an opportunity and can bring long term value to the district.

Instead of making intuitive decisions, this process showed staff how to use real data to make decisions based on a portfolio view.

This project brought attention to buildings that are not student occupied.

Staff expressed that it was very important that NSD didn't have to do the lift to get Portfolio Manager going, and they will just maintain it.

Staff sees value in the tools shown. It helps to see trends to identify issues.

Staff sees this as way to leverage data to make decisions and talk to the board.

This project provides a holistic view, which enables prioritization of projects for impact.

### *Pocatello School District*

Engagement with Pocatello School District was with Brian Glenn, Energy Manager. The project team fully engaged with Pocatello in 2018 and conducted only "light assistance" to follow-up in 2019. His feedback captures overall impact for both engagements.

Staff expressed that it is all about optics to get buy-in so being able to *show* the data impact is more effective than telling. So, showing visualizations will help their annual presentation to the board.

Tools such as the flyer (developed in 2018) are good visuals to engage staff and have been posted in classrooms in 2019. There are still some faculty who buy-in to saving energy and some that don't.

This project raised the opportunity to engage students more and try "gamification." Possible next steps include a scoreboard in the lobby or a contest between 7<sup>th</sup> and 8<sup>th</sup> graders. Students could drive staff to engage more.

Pocatello currently has two schools in the Idaho Power cohort with limited participation: Century and Highland High Schools. Staff is running a program to let the school keep the \$0.025/kWh incentive if

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they reduce energy use. This project suggested the idea of also setting up a friendly competition between the schools.

There is more awareness as a result of this project of the energy water nexus, and staff would like to start entering water use early in 2020.

It is hard to predict the future, but staff appreciates that project meetings provided insight into how the future is changing, which is a more strategic approach.



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## ***Key Accomplishments and Findings***

Findings are categorized into four areas: 1) learnings about the process of engagement, 2) learnings about operations of collecting data and using the tool, 3) learnings about how data visualization can increase SEM/energy savings, and 4) utilization of Maalka platform.

### ***Process of Engagement***

The utility SEM cohort process tends to focus on only two to three buildings, while the approach of this project was to start with a more holistic view of the entire portfolio of buildings. Our portfolio approach involves a prioritization process that identifies the best candidates for the deeper technical analysis of the utility SEM cohort. The value of the prioritization process is in creating a bridge between departments such as facilities and increasing awareness of the value of incorporating energy efficiency measures in projects. It is important for the RCM/Energy Manager/Sustainability Manager to be at the table discussing future projects so that energy efficiency is considered. This process also brings attention to the buildings with the highest energy use and EUI, which saves time, money and energy by being able to focus resources on those buildings with the most savings potential. It also can point to a particular type of building, such as correctional facilities or high schools, where resources can be streamlined to identify best practices for that type of building and comparisons can be made that can lead to friendly competitions. Additional savings are likely to be gained by selecting projects based on data presented rather than the way they were selecting projects.

Because utilities are tending to offer their own SEM programs, it is important to have good communication with the utility and collaborate and align with their program rather than compete or duplicate efforts. This likely means starting the process with a structured approach but be prepared to be responsive to customer needs and utility preferences. Not every entity progresses at the same pace and has the same needs.

Another process learning is to have a regular cadence of meetings to monitor progress. Scheduling these at the start of the engagement helps everyone be efficient with time and plan ahead. It is even more efficient to outline the topics for each meeting ahead of time. It also helps to maintain

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motivation. And, having at least one or two in-person engagements (rather than all webinar or conference calls) helps to build a better relationship with the customer.

## ***Data Collection***

The operations of collecting data and using the tools can vary but tends to have some similarities. Portfolio Manager is the most used program for capturing data. It provides customers with a standardized program for benchmarking building energy performance across a portfolio of buildings. The Maalka program integrates with Portfolio Manager and provides a more robust ability to track and manage energy performance over time and visualize the results to report to stakeholders. Pierce County found the data entry process to be onerous and time consuming and decided to try the Urjanet service that uploads utility data daily to Maalka. Nampa is comparing options and evaluating whether continuing to enter data manually makes sense or if a service like Urjanet might be more efficient. Pocatello spends less than 10 hours per month entering data and feels this is manageable. Regardless, it is important to streamline data entry as much as possible. Ideally, local utilities could offer automated data transfer. This does not seem to be common in this region, so using a service like Urjanet can provide automated data entry.

## ***Data Visualization***

Learnings about how data visualization can save energy is exemplified by the comparison of three Pocatello schools shown in Figure 8. This provided a clear visual to present to decision makers to see across a portfolio easily and prioritize efforts as well as to justify the project. Showing that the two schools with HVAC upgrades had lower energy use compared to the one that did not, will help to convey an opportunity immediately and was more effective than simply talking about the potential. Identifying similar types of buildings that can be easily compared can be an effective way to have a visual track energy performance and generate friendly competition such as between two similar schools or jails.

## ***Maalka Platform***

In order to best leverage the Maalka Platform, utilities could follow the following simple workflow:

- 1) Identify multiple target municipal and/or school portfolios and main point of contact
- 2) Have each POC import a template into Maalka for initiating the portfolio
- 3) Have each POC add users, accounts, and building details to their respective portfolio

- 4) Have a utility program manager (or someone on this team) apply data validation rules based on the best practices identified in these pilots; validation rules will automatically generate rules for every building in every portfolio
- 5) Have a utility program manager (or someone on this team) set benchmarking goals and automatically generate progress reports for all buildings and portfolios
- 6) Have a utility program manager (or someone on this team) create custom groupings of buildings for which program-level analysis is of interest (e.g. All K12 Schools vs. All Fire Stations vs. All Buildings in a Target Region, etc.)
- 7) Report program-level progress to policymakers, prioritize building- and group-level EE improvements, and provide reports for individual buildings
- 8) Expand Programs for tracking RECs, DERs, and other metrics for the same buildings with the same (or different users)

## ***Recommendations for Next Steps***

Future steps with Pierce County could include integrating the Washington Clean Buildings Act EUI targets so they have real-time tracking for that too. Maalka plans to complete this by end of Q1 2020, with the new/improved 2030 reports on v2.0, so it can be utilized as a tool for this.

Future steps with Nampa School District will include continued support to implement using Portfolio Manager as a benchmarking tool and investigating an automated data transfer service such as Urjanet in comparison to current data entry efforts. Staff is targeting the school with the highest EUI, West High School, for more targeted analysis such as an energy model. Staff is also planning to try friendly competitions between schools to engage staff and potentially students.

Future steps with Pocatello School District will center around engaging staff and students more. For example, staff intends to set up a friendly competition between the two schools in the Idaho Power cohort: Century and Highland High Schools. They are also considering a competition between students such as 7<sup>th</sup> and 8<sup>th</sup> graders. Any additional visualizations that tell a good story to stakeholders is also appreciated.

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In their feedback, Idaho Power mentioned that they would like to see further funding for this project, so it is worth considering a project that could continue engagement with K12 schools and Idaho Power.

A general next step could be to offer a regional webinar on the value of benchmarking energy performance and best practices that is targeted towards cities, counties and school districts. Another recommendation is to conduct outreach with utilities to present how this project's portfolio approach and prioritization process is complementary to their cohort approach.