

ONE GOAL

TWO YEARS LATER

FIVE ACTIONS COMPLETE

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INTRODUCTION

EXECUTIVE SUMMARY

Lloyd EcoDistrict has made substantial progress towards the district goal of **no net increase in energy use by 2035**.

Our biggest finding is that we have **reduced building energy use by 12.2%, nearly double our original five year goal. Together, we have also developed 250,000 square feet of solar photovoltaics, and constructed new buildings that use 30% less energy.**

Progress is made more quickly when goals are set and monitored, which is why the district has undertaken the massive endeavor of tracking energy use for **87% of buildings over 20,000 square feet.**

All of this hard work among so many committed stakeholders has produced excellent results towards meeting our energy goals. The district has emerged as a leader for energy efficiency within the region. **Energy Star scores are 13% higher in Lloyd District than in the overall city.** We still have more to do, but the district should celebrate this success and stay motivated to continue this positive momentum.

Background

In 2013, Lloyd EcoDistrict developed the Lloyd EcoDistrict Energy Action Plan working with district stakeholders representing approximately half of buildings in the district, as well as public partners. The Energy Action Plan is a 5-year plan that puts the district on track to reach its energy goals as outlined in the Lloyd EcoDistrict Roadmap.

Goal and Focus Areas

Lloyd EcoDistrict established the ambitious goal for **no net increase in energy use**, despite future development of the district being expected to double over the next 25 years.

To reach this goal, actions were developed around the following main focus areas:

- Existing buildings,
- New construction
- Renewable energy
- District energy
- EcoDistrict catalyzers.

Targets were set which address these focus areas:

- 33% reduction in existing building energy use
- 20% renewable energy generation
- New buildings designed 15% below projected code.

2016 Achievements



**12.2% Reduction
in Building Energy
Use**



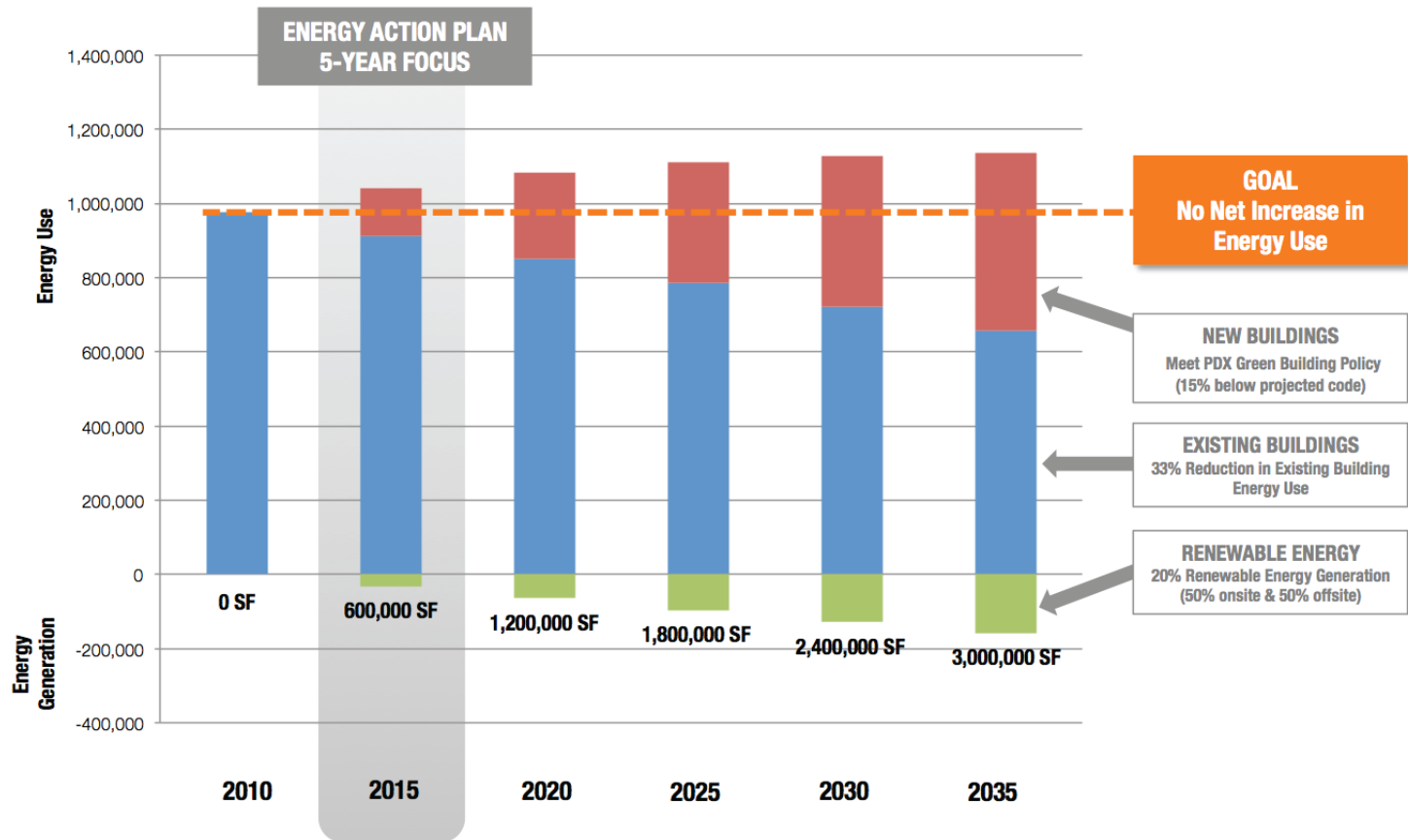
**250,000 square
feet of solar
photovoltaics**



**New Buildings
that use up to
30% less energy**

INTRODUCTION

Lloyd EcoDistrict Energy Goal and Focus Areas



ENERGY ACTIONS

Lloyd EcoDistrict Energy Action Plan Project Completion

| Focus Area | Action | Target | Status | Completion |
|-------------------------------------|-----------------------------------|-----------------------------|-------------|------------|
| Existing Building Energy Efficiency | HOTEL EASTLUND | 30% Energy Reduction | In Progress | 100% |
| | LLOYD 700 | 32% Energy Reduction | In Progress | 80% |
| | EAST WEST COLLEGE | 2% Energy Reduction | In Progress | 70% |
| | OCC | 13% Energy Reduction | In Progress | 40% |
| | LEGACY HEALTH | 40% Energy Reduction | In Progress | 30% |
| | CALAROGA TERRACE | 14% Energy Reduction | In Progress | 20% |
| New Building Energy Efficiency | NEW BUILDING EUI | 15% Better than Oregon Code | In Progress | 10% |
| Renewable Energy/District Energy | OCC SOLAR PV | 2MW Solar PV System | Achieved | 95% |
| | ADDITIONAL SOLAR PV | 50,000 SF Solar PV System | Not Started | 0% |
| | DISTRICT ENERGY | OCC/Convention Center Hotel | Not Started | 0% |
| EcoDistrict Catalyzers | ENERGY EFFICIENCY WORKING GROUP | Continuous | Ongoing | 100% |
| | ENERGY BENCHMARKING & MONITORING | Continuous | Ongoing | 80% |
| | BULK PURCHASE DEMONSTRATION PILOT | Continuous | Ongoing | 80% |
| | PREFERRED SOLAR PROVIDER | 3rd Party Partnership | Not Started | 5% |
| | EXISTING BUILDING ENERGY PROTOCOL | Continuous | Not Started | 0% |

This list shows the key actions identified in the Energy Action Plan. All fifteen actions outlined in the Energy Action Plan work together to make this five year goal possible.

Several key building owners set more rigorous targets to reduce their energy use based upon expected returns from

energy efficiency projects they planned to pursue over the next five years. Several catalyzer projects were also identified which would work to accelerate energy efficiency efforts, with Lloyd EcoDistrict organizational support.

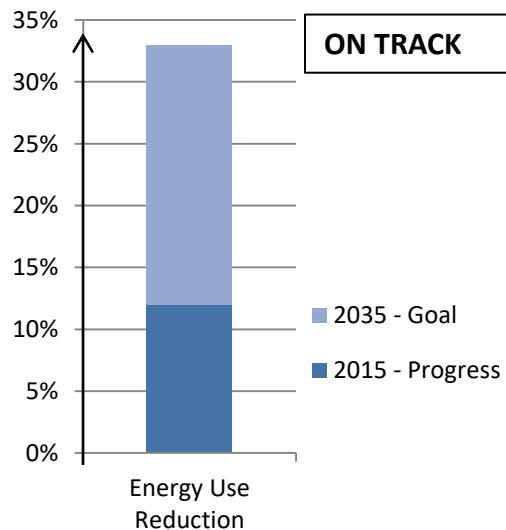
Since 2013, district stakeholders and Lloyd EcoDistrict have been making

consistent progress on these action plan projects. Each focus area has been active over the last two years, but existing building projects in particular have made strong progress. Three out of five EcoDistrict catalyzer actions have launched and 2017 is anticipated to be an active year for the remaining two actions.

2035 GOALS & CURRENT PROGRESS

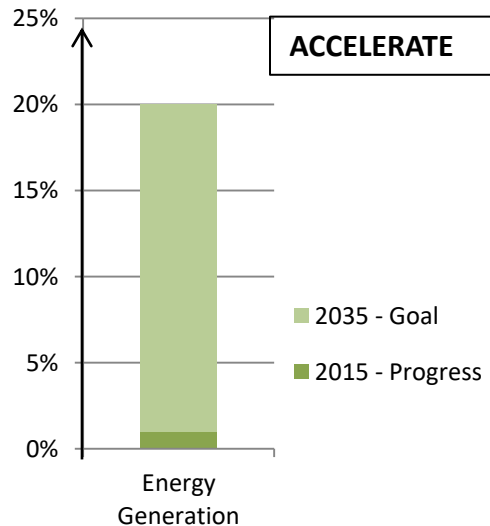
Existing Building Energy Use

Existing building energy use needs to be reduced by 33% by 2035 in order to meet the district's goal of no net increase in energy consumption. As of 2015, existing buildings have reduced their energy use by 12.2. This achievement is nearly halfway to our 2035 goal in only five years. The median Energy Use Intensity (EUI), the measure of energy use by unit of area, of buildings in the district has been reduced by 20%.



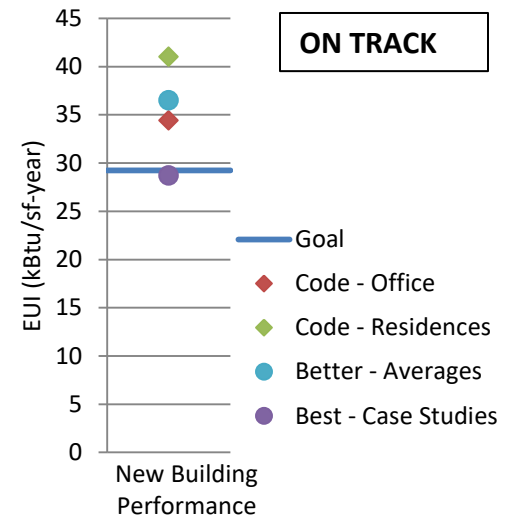
Renewable Energy Generation

Renewable energy efforts have so far been due to a single large project, and we are missing information about renewable energy credits. However, a community solar program is being developed for 2017 to help accelerate solar photovoltaic (PV) projects in the district.



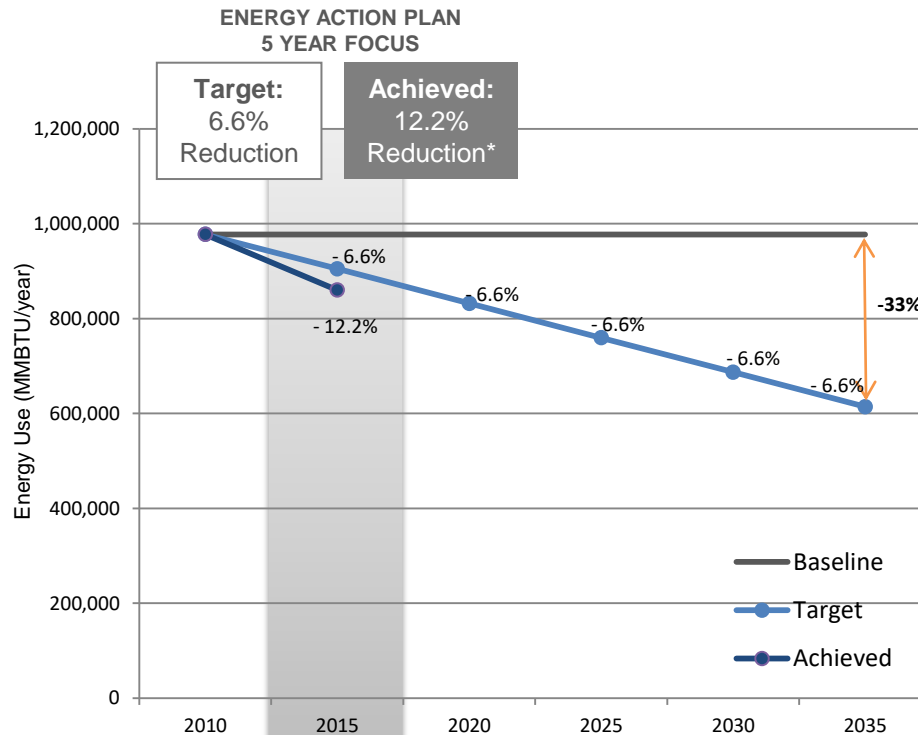
New Building Performance

While data is limited for new buildings it appears that several new buildings are surpassing the EUI goal. So far, there has been more residential construction in the district than any other type. Market research from NEEA shows averages for new residential construction in Oregon are performing 11% better than code. In the best case scenario, it is estimated that new buildings in the district may exceed the original goal by 5%.



EXISTING BUILDING GOAL & PROGRESS

Existing Building Energy Use



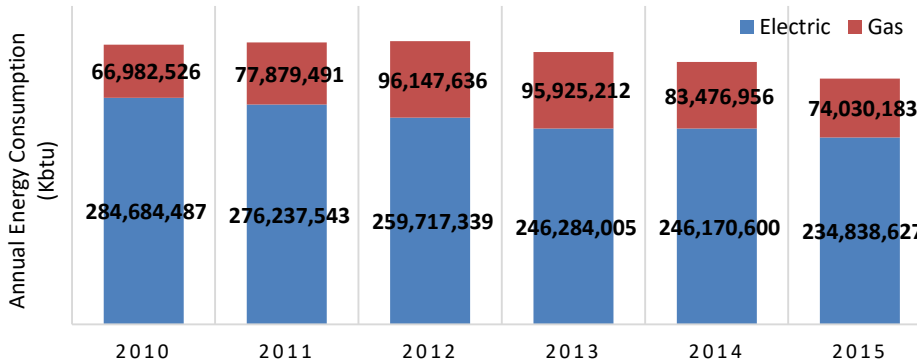
* Based on available building data set in Portfolio Manager, which represents 65.7% of district square footage. Further refinement of the data is needed in order to more accurately track progress.

In order to meet the 2035 goal for existing building energy efficiency, existing buildings will need to reduce energy use by 1.1 MMBtus. Tracking our progress towards this 25 year goal, existing building retrofits need to reduce energy use by approximately 6.6% every 5 years. Loosely extrapolating available existing building energy use data shows a **12.2% reduction has been achieved since 2010**, which is nearly double the goal set forth in the energy action plan. This is truly cause for celebration.

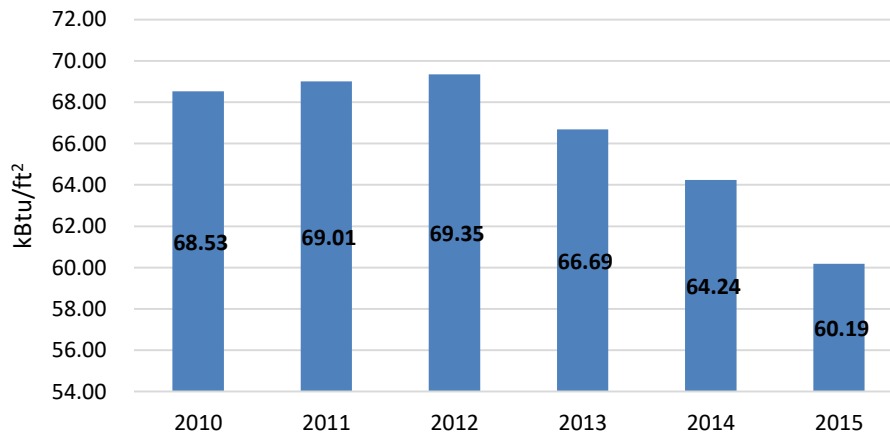
There is still more work to be done. The complete data for building energy use is not yet available district-wide, so it is possible that the buildings which are currently being tracked are high performers for energy efficiency. Additionally, as simple low cost measures to improve energy efficiency are completed, further reductions in energy use will likely be more challenging. Regardless, the key takeaway from the district's efforts to improve energy efficiency of existing buildings is that we surpassed our 2015 goal by 100% which is a resounding success.

DISTRICT-WIDE BUILDING ENERGY USE DATA

Total Energy Use, 2010-2015



EUI, 2010-2015



Energy Star Portfolio Manager 2015 Report

Energy Star Portfolio Manager is our primary means of tracking our success in energy efficiency as a district. This data is reported voluntarily by building staff. The 2015 report confirms that we are currently on track to exceed our goals, as demonstrated by the charts at left.

From the original cohort of 16 buildings with available historical data, total energy use has decreased since 2010 from 351,667 MMBtu to 308,869 MMBtu, a reduction of 12.2%. Energy use intensity (EUI) for this cohort of buildings has also decreased by 9.1 kBtu/sf.

Reference: Lloyd EcoDistrict Energy Star Portfolio Manager Summary 2015 Report, October 2016, Green Building Services

DISTRICT HIGHLIGHTS:

- **Overall Energy Use Reduced by 12.2%**
- **District Median EUI Reduced by 20%**

REGIONAL CONTEXT

While it is valuable to know how buildings in Lloyd EcoDistrict are performing relative to district-wide goals, it is also important to put those results in the context of regional building performance.

City of Portland Energy Reporting Policy

The City of Portland's Energy Reporting Policy went into effect in April of 2016 and the first report was published in October of 2016. The City of Portland helped keep Lloyd EcoDistrict informed about this policy and has supported our efforts to have strong compliance. As a district, we have been tracking energy use since 2010, which meant many buildings were easily able to comply with this requirement, and also made Lloyd EcoDistrict a leader that others in the City were looking towards as this new policy came into affect.

In the last four years, we have worked to help get more buildings tracking their data and to connect building managers in the district with resources and tools to help improve their energy performance. Therefore, we were

optimistic that Lloyd EcoDistrict would perform well. Our efforts were rewarded with strong energy performance as well as a high percentage complying with reporting requirements.

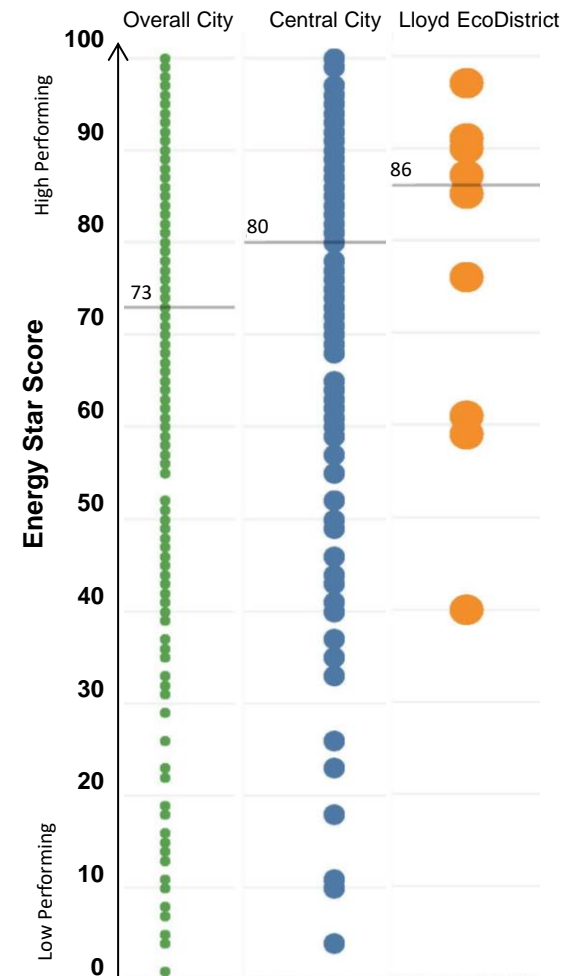
Regional Leadership

Energy Star scores buildings from 0 to 100 with 100 being best performing and 0 being low performing. Buildings in Lloyd EcoDistrict achieved 13% better energy star scores than the overall city median score and 6% better than central city median score. This shows how Lloyd EcoDistrict stakeholders are not only championing energy efficiency at their organizations and within the district, we are also emerging as energy efficiency leaders for the city as a whole.

Reference:

City of Portland 2015 Building Energy Performance Reporting Results, September 2016, City of Portland Bureau of Planning and Sustainability

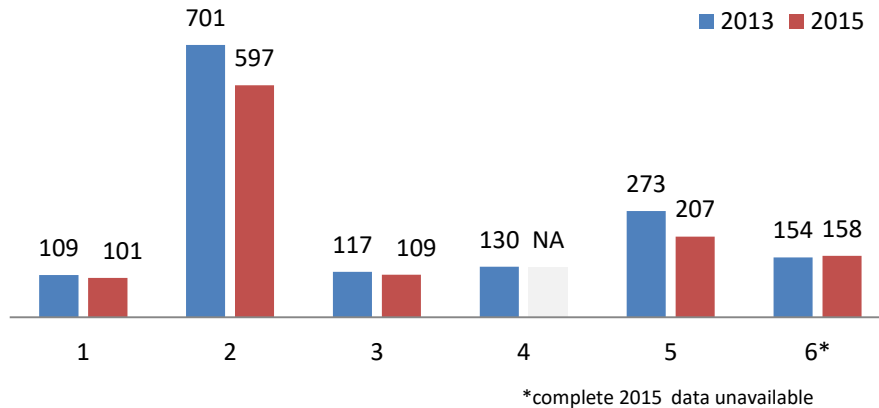
Median Energy Star Score



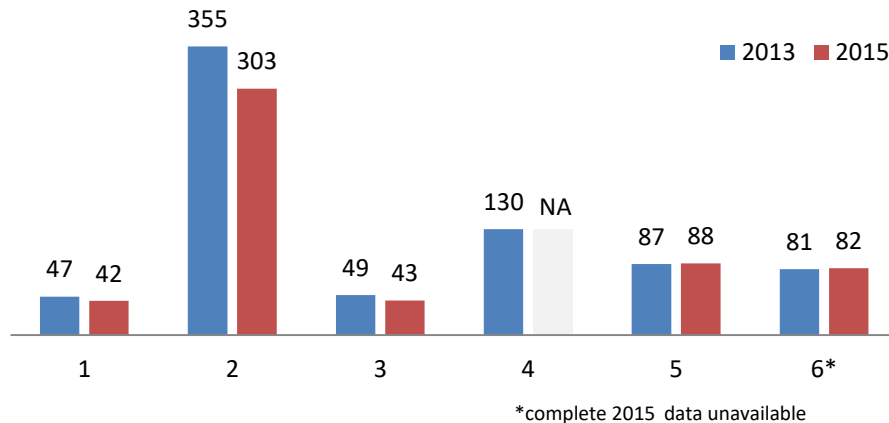
ACTION UPDATES

- EXISTING BUILDING ENERGY EFFICIENCY
- NEW BUILDING ENERGY EFFICIENCY
- RENEWABLE ENERGY
- DISTRICT ACTIONS

Source EUI (kbtu/sf)



Site EUI (kbtu/sf)



SUMMARY

6 buildings were identified as undergoing major energy efficiency projects within the 5-years of the energy action plan. Energy efficiency upgrades are still underway at many of these buildings, but currently completed projects have already improved energy use intensity by an average of 12%.

System assessment and energy audits were the first phase of energy efficiency work for many of these buildings. LED lighting upgrades were often implemented early on due to the low cost and high potential return on investment. Other low cost strategies such as sealing leakages and HVAC filter replacement were also early projects tackled by many in this group. The following case studies go into more detail about the energy efficiency work underway at these buildings.

DISTRICT HIGHLIGHTS:

- **Energy Use Intensity Reduced by 12%**

1 Overview & Goals

A series of deep energy retrofit projects have resulted in substantial cost savings for this office building. These updates have also added value, improving tenant acquisition and retention by 25% in the last few years. Building management is projecting that with recently completed projects, once 2016 data is assessed, Lloyd 700 will have met its energy use reduction goal of 30%.

2 Current Status

Lloyd 700 underwent an integrated property assessment through NEEA which identified several key projects for improving energy use: total replacement of heating and cooling plant with new boilers, chillers, hot water heater and cooling tower. The building also participated in Lloyd also participates in ETO's Strategic Energy Management (SEM) program. Through streamlined engineering and reduced loads, mechanical equipment was downsized resulting in a much more efficient heating and cooling system. A natural gas

PROGRESS TO DATE

hot water heater, and boilers has reduced heating costs by approximately 20% and reduced greenhouse gas emissions associated with energy use by approximately 30%. Sealing envelope penetrations, destination controls for the elevator, installing light-filtering shades on windows and lighting improvements have also helped reduce energy use for the building as a whole. The occupancy rate for the building has increased from 73% to 98% and rents have also increased, which management credits to the improved occupant comfort and modernization of the building.

3 Still to Come

Despite estimates indicating energy use reduction goals have been met, building management continues to pursue sensible energy saving upgrades. Next on the list for 2016 includes improving insulation and continuing sealing penetrations and installing shades, as well as additional upgrades to LED lighting and updated controls which is being completed on a floor-by-floor basis throughout tenant-occupied spaces.



BUILDING INFO:

2015

| | |
|-----------------------|-------------------|
| Building Type: | Office |
| Owner: | AAT |
| Baseline Energy Use: | 21,979 MMBtu/year |
| Current Energy Use: | 22,071 MMBtu/year |
| Baseline Energy Cost: | \$502,944 year |
| Current Energy Cost: | \$399,561 year |
| Baseline EUI: | 87 kBtu/Sf-year |
| Current EUI: | 88 kBtu/Sf-year |

PROJECT HIGHLIGHTS:

EUI improved by 24%

80%

EXISTING BUILDINGS

1 Overview & Goals

Legacy Health owns and operates two buildings on this site; one newly constructed building approximately 82,650 sq. ft. in size, and the original building of approximately 155,000 sq. ft. The original building housed Legacy Central Laboratory, the Legacy Research Institute and a state operated long-term psychiatric care hospital. Going forward, the original building will house the Legacy Research Institute and the Unity Center for Behavioral Health, a new collaboration between Adventist Health, Kaiser Permanente, Legacy Health and OHSU. Note that each of the use types is highly energy-intensive. Legacy Health originally established a 5 year energy savings goal of 40% for this site and during the design planning for the new lab building, an energy efficiency goal of 30% better than code was established.

2 Current Status

With the addition of the new building and more energy-efficient systems to support that additional square footage, as

PROGRESS TO DATE

well as the site's participation in the ETO Strategic Energy Management (SEM) program, a substantial reduction in energy use for the site has been achieved. As a result campus building energy use intensity has already dropped 15%. The weather normalized EUI for the site is now 280 kBtu/sq. ft. - a significant decrease from the baseline EUI of 350 kBtu/sq. ft. However this new EUI does not take into account the reduced energy use as a result of the Unity Behavioral Health space that is now under construction. Once construction is completed it will be possible to properly determine a new EUI for normal operations.

3 Still to Come

Legacy Health remains focused on continually improving energy efficiency at this site. Investments are continuing to be made in building infrastructure as new opportunities arise. Continued participation in the ETO SEM program will allow regular monitoring of energy use at the site and continued operations and maintenance improvements.

LEGACY HEALTH



BUILDING INFO:

2015

| | |
|-----------------------|---|
| Building Type: | Healthcare Research, Clinical Laboratory & Hospital |
| Owner: | Legacy Health, Unity |
| Baseline Energy Use: | 54,332 MMBtu/year |
| Current Energy Use: | 55,313 MMBtu/year |
| Baseline Energy Cost: | \$654,817 year |
| Current Energy Cost: | \$683,937 year |
| Baseline EUI: | 355 kBtu/Sf-year |
| Current EUI: | 303 kBtu/Sf-year |

PROJECT HIGHLIGHTS:

EUI improved by 15%

30%

1 Overview & Goals

Working closely with Energy Trust of Oregon and employing a strategic energy management approach, staff at this LEED Platinum convention center have been following a detailed and aggressive five-year plan to improve overall facility use. So far, with addition of renewable energy sourcing, the facility is now producing 33.8% less greenhouse gas emissions compared to the baseline in 2014.

2 Current Status

OCC management has been targeting five main phases of energy efficiency improvements:

- Stage 1 – Recommissioning
- Stage 2 – Lighting
- Stage 3 - Load Reductions
- Stage 4 - Fan Systems
- Stage 5 - Heating and Cooling Plant.

Ongoing commissioning studies have been helping OCC staff evaluate condition and timing of HVAC upgrades while using low-cost or no-cost improvement to fine-

tune the system and controls. Without these improvements and with record event booking, over the past two years, the cost of power for operating the facility would have been over one million dollars higher. Additionally, a massive solar array was installed that occupies the north roof. This project is described in more detail on page 18.

3 Still to Come

Lighting upgrades throughout the facility are currently underway for the ballrooms. The tower, loading dock and parking garage are planned for LED lighting upgrades as well. The timing of chiller and boiler replacements are currently being evaluated.



BUILDING INFO:

2015

| | |
|-----------------------|--------------------------|
| Building Type: | Event |
| Owner: | Oregon Convention Center |
| Baseline Energy Use: | 42,454 MMBtu/year |
| Current Energy Use: | 36,918 MMBtu/year |
| Baseline Energy Cost: | \$895,861 year |
| Current Energy Cost: | \$915,310 year |
| Baseline EUI: | 49 kBtu/Sf-year |
| Current EUI: | 43 kBtu/Sf-year |

PROJECT HIGHLIGHTS:

EUI improved by 7%

PROGRESS TO DATE

40%

1 Overview & Goals

East West College is an excellent example of how existing building stock can be retrofitted to meet modern energy efficiency standards. Built in 1919, through upgrades and careful operations the building has been able to achieve an impressive energy use intensity of 47.2 kBtu per square foot. East West College is a massage therapy school, therefore the health and comfort of those who use the building is an even greater priority because this aligns with the mission of the school. Lighting, thermal comfort, indoor air quality and noise considerations all feature highly in building operational considerations for East West college.

2 Current Status

Working with a consultant, an energy audit revealed several fixes and upgrades to improve the operation of the HVAC system and reduce electrical loads. Leakages in the envelope were identified and sealed in the roof and elevator

control room. The roof was painted white in order to reflect more heat. Filters were changed and a key ventilation fan was replaced. Since the building has adequate daylight at many times of the day, employees were given desk lamps in order to improve controllability of lighting for the individual and reduce the intensity of overhead lighting. Occupants have indicated that changes like this have improved comfort as well. Procedural changes such as reducing the number of lights left on in the evening and changing the hours in which lights are turned on, to reflect the reduced occupancy during non-school hours, also helped reduce electrical loads.

3 Still to Come

Upgrading the HVAC system is currently the highest priority for the building. Six poor-performing HVAC units have been replaced and six more are in the process of being replaced. Additionally, using Lloyd EcoDistrict's LED Advantage Member Program (LAMP), all exterior lighting has been upgraded to LEDs.



BUILDING INFO:

2015

| | |
|-----------------------|------------------|
| Building Type: | Office |
| Owner: | EW College |
| Baseline Energy Use: | 2,549 MMBtu/year |
| Current Energy Use: | 2,267 MMBtu/year |
| Baseline Energy Cost: | \$48,135 year |
| Current Energy Cost: | \$48,365 year |
| Baseline EUI: | 47 kBtu/Sf-year |
| Current EUI: | 42 kBtu/Sf-year |

PROJECT HIGHLIGHTS:

EUI improved by 7%

PROGRESS TO DATE

70%

EXISTING BUILDINGS

HOTEL EASTLUND

1 Overview & Goals

Back in 2014, the Hotel Eastlund was called the Red Lion Inn. This building was purchased by new owners and completely rehabilitated, with all systems replaced except the structure. This new hotel has been open since June 1st of 2015, so it is not yet clear what the effect on energy use has been with such a drastic change.

2 Current Status

The HVAC system of this new building is controlled by a central system. The single pane uninsulated curtain wall system was replaced with insulated double-pane glass. With so much glass in the building envelope, this alone will have a substantial impact on the building energy use. Variable frequency drive's were installed on the HVAC allowing the system to accommodate additional loading. A central control allows hotel management to turn off heating and cooling in unoccupied rooms and turn it back on when guests check in. LED lights

were used throughout the building. Auto shutoff sensors for lighting were installed in rooms and public areas and the overall light level was reduced in the design, which is logical given the high levels of daylight throughout the building.

3 Still to Come

Hotel Eastlund is new so energy use data is not fully available. It will be useful to assess how much the improvements reduced energy use and continue to monitor energy use over time in order to seek maximum operational efficiency. Since this building was not operational at the time of the Energy Action Plan, the baseline energy use was an estimated figure from an energy model provided by the design team. Therefore, it is recommended that once the first complete year of energy use has been tracked the baseline energy use be adjusted to reflect actual use.



BUILDING INFO:

2015

| | |
|-----------------------|-------------------|
| Building Type: | Office |
| Owner: | Hotel Eastlund |
| Baseline Energy Use: | 14,000 MMBtu/year |
| Current Energy Use: | Not Available |
| Baseline Energy Cost: | \$222,000 year |
| Current Energy Cost: | Not Available |
| Baseline EUI: | 130 kBtu/Sf-year |
| Current EUI: | Not Available |

PROJECT HIGHLIGHTS:

Estimated Savings 40%

PROGRESS TO DATE

100%

SUMMARY

Reducing new building energy efficiency alone is not enough to achieve the goal of no net increase in energy consumption. The square footage of the district is expected to double by 2035, therefore to meet our goals new construction coming into the district will need to perform 15% better than Oregon Energy code.

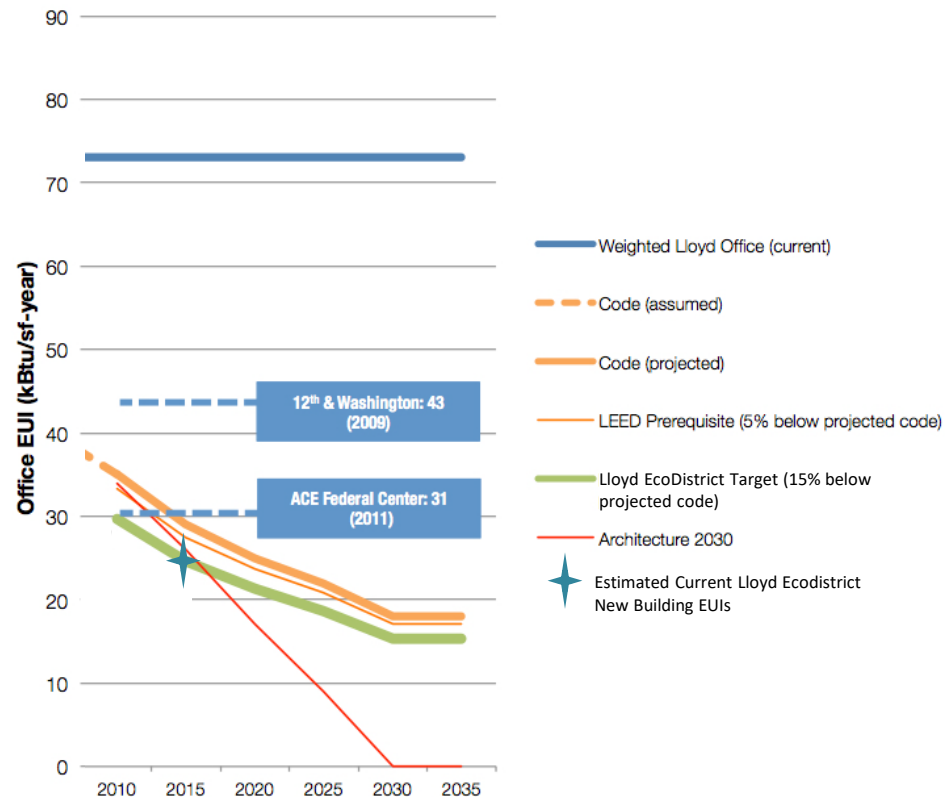
It should be noted that the analysis done to create this goal focused on the EUI of office space with a target of between 30 to 45 kBtu/sf/year, but many new properties in the district are residential. Market research from Northwest Energy Efficiency Alliance (NEEA) suggests new residential construction is likely to be achieving 11% better than code.

DISTRICT HIGHLIGHTS:

- **New Building EUI at least 11% better than Oregon Energy Code**

Reference: Oregon Residential Energy Code Compliance, April 9, 2014, Northwest Energy Efficiency Alliance

Potential EUIs (Office)



1 Overview & Goals

Informal interviews with managers and market research suggest several new buildings are performing close to or better than Lloyd EcoDistrict's goal of 15% below code.

2 Current Status

Over the last 3 years, there has been an influx of new multi-family residential units in the district. Since the district's new building energy use goals were predominantly based on office space, research is needed to determine what affect the increase in residences will have on total energy use for the district. However, a recent study by NEEA, shows newly constructed residences throughout Oregon are using 11% less energy than required for code compliance.

Hassalo on Eighth

This LEED platinum community houses 657 residences and has been designed to the highest performance standards. Annual energy use for these buildings is

projected to be 30% lower than Oregon energy code. A second phase of development is planned in an adjacent lot.

1400 NE Multnomah

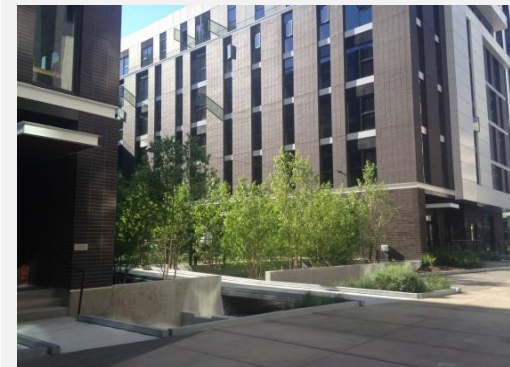
While energy modeling information was not available, this development has been utilizing best practices to energy efficiency. The project leads have been working with Lloyd EcoDistrict and Energy Trust of Oregon (ETO) to ensure an energy efficient design, including energy star fixtures and LED lighting. The building received design and land use approval and will open in late 2018.

3 Still to Come

More developments are coming into the district, including an affordable housing community. A new building guideline is needed so that developers are aware that their project is in an EcoDistrict and have guidance and direction to resources, such as ETO's path to net zero program, that will best help them to support EcoDistrict goals.

PROJECT HIGHLIGHTS:

- **Several New Multi-Family Residential Buildings**
- **Hassalo on Eighth is designed to consume 30% less energy than typical buildings of this type.**



PROGRESS TO DATE

80%

SOLAR PHOTOVOLTAICS (PV)



SUMMARY

In addition to improving building energy consumption, 20% of total energy use in the district will need to come from renewable sources. This will most likely take the form of solar PV and may include renewable energy credits, on-site solar production, or a community solar option. The solar array at OCC was an important first step for the district. Improving access to solar options is the next step to help smaller entities invest in this energy solution.

DISTRICT HIGHLIGHTS:

- **Only 50,000 SF of on-site solar needed**

PROGRESS TO DATE

1 Overview & Goals

Nearly 600,000 SF of solar PV will be needed to meet the district's five year renewable energy goal, with 300,000 SF identified for on-site generation.

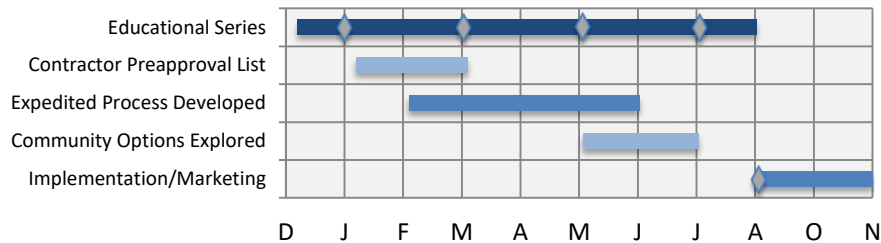
2 Current Status

Since OCC was able to install a 2.2 MW array, representing approximately 250,000 SF, the remaining on-site solar needed to meet Energy Action Plan goals is only 50,000 SF. With almost 750,000 SF of remaining usable solar area in the district, this goal is still achievable. Currently, Lloyd EcoDistrict is in the early phases of developing a campaign to improve the business climate for solar.

3 Still to Come

There are many models which could improve access to this technology. A well-vetted third party servicer could provide a uniform deal structure and delivery package, with built-in financing options. Alternatively, the district could provide a list of vetted providers and expedited processing. Another option would be a community solar model where members buy into a solar installation and receive either dividends or a bill credit on their electric bill. The rules for the latter are under development at the state level. Several large sites make community solar a reasonable option, and the potential to link battery storage to this solution could also improve the district's resiliency in the event of a disaster scenario.

Solar Options Campaign Outline



30%

RENEWABLE ENERGY

1 Overview & Goals

6,500 solar panels were installed on top of the north part of the Oregon Convention Center roof. What was initially designed as a 1.1 MW solar array system, was expanded to a 2.2 MW system. This was possible due to a partnership that allowed Pacific Power Blue Sky and ETO incentives to work together and improve the size of the system that could be financed through solar installer and supplier, Solar City. 2MW is the maximum possible size for net-metered solar array in Oregon. It is estimated that this PV system will supply approximately 25% of OCC's annual energy use, or approximately 9,230 MMBTU per year.

2 Current Status

Through a power purchase agreement, OCC was able to have the solar arrays installed at no upfront cost. This agreement extends through the full life of the roof, approximately 20 years. The project was timed following a roof

replacement in order to minimize maintenance complications.

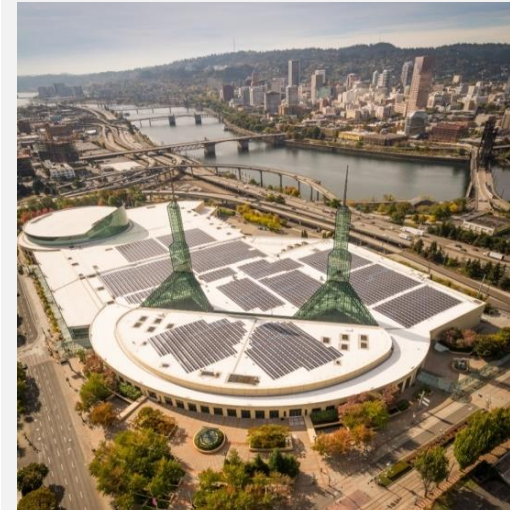
3 Still to Come

The solar array has been operational since early August of 2016. OCC staff is eager to track the production and peak usage of the system and hopes to share this data for public education. Several employees have been inspired by the success of this project to install solar in their homes.

OCC SOLAR PV

PROJECT HIGHLIGHTS:

- **2.2 MW array**
- **25% of building energy use**
- **1% of total energy use district-wide**



PROGRESS TO DATE

95%

DISTRICT ACTIONS

ENERGY BENCHMARKING

SUMMARY

In addition to targeting existing and new building energy use, and renewable energy, collaborative action plays a vital role in our success as an EcoDistrict. District-wide endeavors can act as a catalyst to accelerate energy efficiency efforts. The three most active district actions are the energy efficiency working group, energy benchmarking, and a bulk purchasing pilot for LEDs.

DISTRICT HIGHLIGHTS:

- **87% of buildings over 20,000 SF tracking and sharing energy use data**

1 Overview & Goals

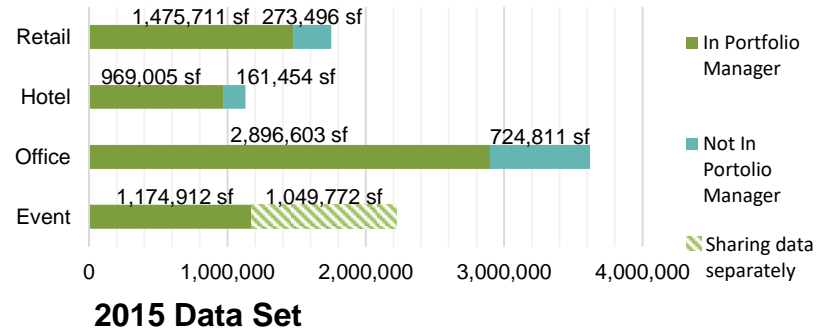
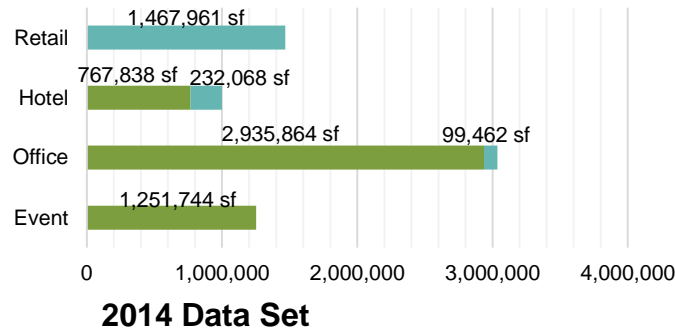
Tracking progress towards energy goals requires actual building data. Using Energy Star Portfolio Manager (ESPM), buildings in the district log their energy use, and share this data with Lloyd EcoDistrict. Data tracking began with a core group of 16 buildings. Leading up to City of Portland's energy reporting policy coming into affect in 2016, the EcoDistrict set a goal to track all buildings over 50,000SF. This would focus outreach efforts while capturing a large percentage of the district building square footage. Over time, the data tracking target has expanded to include all buildings over 20,000 SF and will eventually include multi-family residential properties as well.

2 Current Status

The current data set includes 65.7% of the total building area (11,529,831 sf) and 25 property owners. While this initial data is valuable, with only a portion of district square footage represented, a more complete data set is needed in order to verify total district baseline energy use.

3 Still to Come

As more buildings in the district begin to track and share their data, the baseline will need to be adjusted. Setting sector-specific targets for EUI, benchmarking and forecasting this progress are important next steps. Performing professional engineer verification would help ensure the accuracy of this data set.



ENERGY EFFICIENCY WORKING GROUP

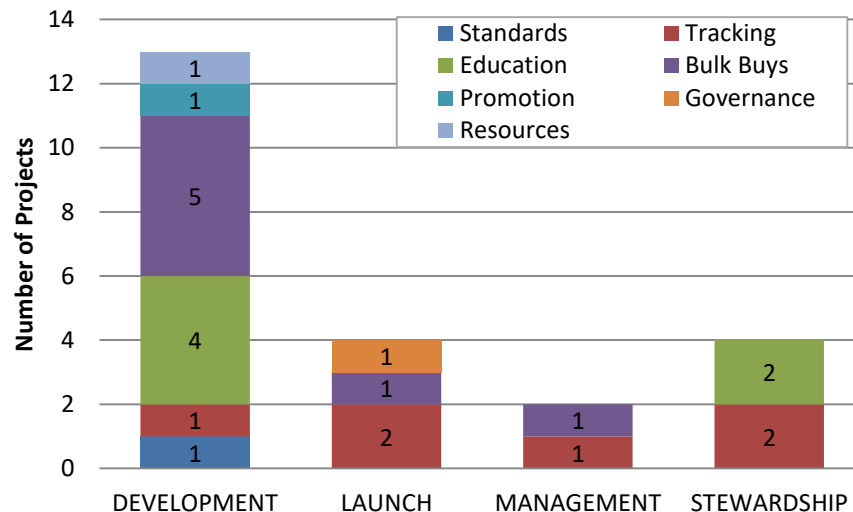
Purpose

The main purpose of the energy efficiency working group is to track progress and ensure implementation of energy efficiency projects in the district. The group serves an important educational function for knowledge-sharing among stakeholders, awareness of available tools and resources, and highlighting case studies from district leaders. The group also provides opportunities to collaborate and develop new energy efficiency projects.

Projects

Stakeholders in the working group are tracking their energy in Portfolio Manager. Sharing these results with the group helps show how buildings are performing within the district context and how energy goals are progressing. The group has also been kept aware of programs or services which can aide and enhance use of Portfolio Manager for energy monitoring, and has discussed ideas for further district support, such as professional engineer verification. The stakeholders are also informed of Lloyd EcoDistrict and partner programs which can support energy efficiency goals. Several additional bulk buy opportunities are being explored for possible future programs.

Energy Efficiency Working Group Projects



Membership

The group has grown to encompass 42 members, with a core group of approximately 7 who attend consistently. The membership of the group consists mostly of district stakeholders who work to accomplish energy efficiency projects in their buildings. Public partners, such as Energy Trust, City of Portland and Pacific

Power, attend to seek allied interests, support the work of the group and promote beneficial programs. Industry partners, including Green Building Services provide key technical and delivery support.

Another key strategy identified in the energy Action Plan was the concept of a bulk purchase to make energy reducing products more affordable and accessible. This would be one of the projects managed by Lloyd EcoDistrict. The idea for this pilot was to find a simple but meaningful project where we could test the concept of aggregating demand for energy efficiency products.

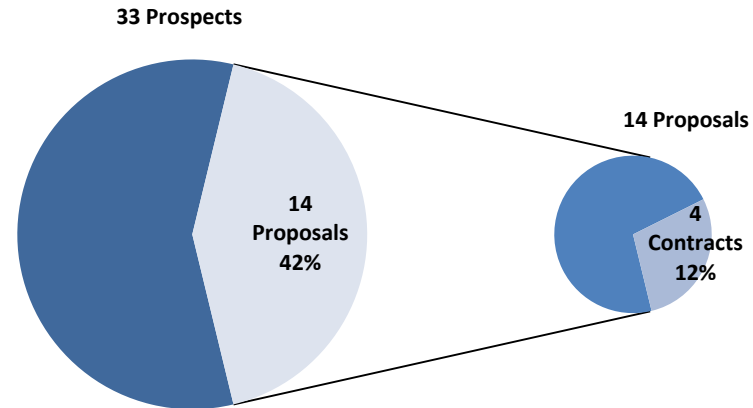
Many stakeholders in the district identified a desire to do LED retrofits, therefore this was a logical choice for the bulk purchase demonstration pilot. Lloyd EcoDistrict approached several lighting distributors on behalf of the group, and was able to negotiate a competitive pricing schedule and developed a streamlined process. Originally, the program would cover parking lot lighting only, but it now covers all interior and exterior LED lighting applications.

LED Advantage Member Program (LAMP)

This program was launched in February of 2016. By making it easier to purchase LEDs, LAMP helps to reduce the amount of energy that goes towards lighting. In addition, the program is structured to provide discounted pricing to stakeholders, provide a small fee to

Lloyd EcoDistrict to fund further work, and also donate funds to a nonprofit working to help the homeless population in Portland. In order to make the scope of the project work for the service provider, the program is available throughout Oregon, which is possible due to a strategic partnership with Building Owners and Managers (BOMA) Oregon. As of October 2016, several LED installations were complete and a pilot project with a facility for the City of Portland was underway.

LAMP Projects To-Date (2016)



Still to Come

Now that LAMP has been launched, Lloyd EcoDistrict will work to determine the next bulk purchase opportunity which would most benefit the district. Several ideas are being considered, ranging from smart power strips, to software energy management solutions. Lloyd EcoDistrict is consulting with the energy efficiency working group regarding which technologies would be most effective to support energy efficiency goals.

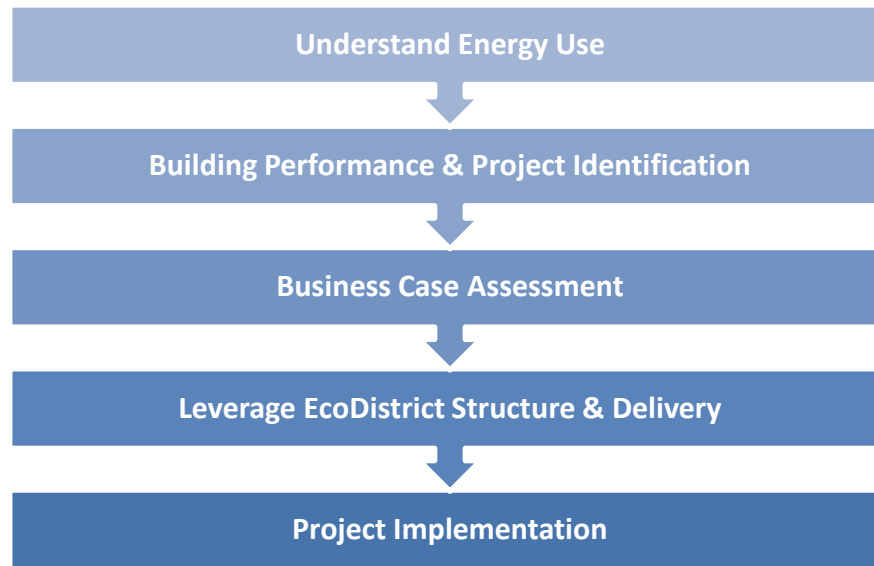
Existing Building Energy Protocol

An outline was created in the Energy Action Plan to provide district stakeholders clear steps to improve their existing building's energy use. However, this outline should be expanded to a brief stand-alone document which includes a comprehensive listing of resources, such as Energy Trust programs, which a building manager can utilize. Development of this document should occur in 2017.

District Energy

Back in 2014, there was a potential for district energy collaboration between OCC, Veterans Memorial Coliseum and Rose Quarter. While this project did not come to fruition, district energy still has merit as a clean and efficient energy production strategy. However, implementing district energy requires substantial capital investments. Due to this high cost burden, it is often only possible to pursue these systems with costs shared among multiple parties. It has proven challenging to get businesses to commit funds to shared investments.

Existing Building Energy Protocol Outline



Nonetheless, implementing such a system could make sense due to timing of major systems of several adjacent buildings. Additionally, in the future, public policy options or third party service providers could provide solutions to the current financial barriers to district energy systems.

Therefore, district energy should definitely still be considered in Lloyd EcoDistrict's long-range plan to reach our energy use goals.

CONCLUSIONS



CONCLUSIONS

The district should celebrate the substantial progress that has been made towards our district goal of **no net increase in energy use by 2035**. These first two years represent a big step in the right direction. Working together, the invested stakeholders in this district have **reduced building energy use by 12.2%**, developed **250,000 SF of solar PV**, and launched a **successful LED bulk-buying program**. Our success indicates that our efforts are on the right track to meeting our energy goals. Our work isn't done yet, we have a lot of important steps to take, but we should **be proud** of what we have accomplished and stay motivated as we **continue to pave the way** as energy efficiency leaders.

Acknowledgements

The Lloyd EcoDistrict is grateful for our board, committed stakeholders, and community partners each of whom are vital to the continued success of our work as a district towards our energy goals. In addition, we would like to give a special thanks to the following individuals and their organizations for contributing their expertise to the findings in this report.

Andria Jacobs, City of Portland Bureau of Planning and Sustainability
Vihn Mason, City of Portland Bureau of Planning and Sustainability
Kellee Jackson, Green Building Services
Wade Lange, American Assets Trust
Pat Lydon, Legacy Health
David Slawson, East West College
Cassidy Bolger, Portland Lloyd Center Community
Stephanie Shaffer, Hassalo on 8th
Matt Uchtman, Oregon Convention Center
Sheila Holden, Pacificorp
Rodrigo George, Bonneville Power Administration
Jim Collins, Quantum Energy

References

- City of Portland 2015 Building Energy Performance Reporting Results, September 2016, City of Portland Bureau of Planning and Sustainability
- Lloyd EcoDistrict Energy Star Portfolio Manager Summary 2015 Report, October 2016, Green Building Services
- Oregon Residential Energy Code Compliance, April 9, 2014, Northwest Energy Efficiency Alliance



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