

**ONE GOAL**

**FIVE YEARS**

**FIFTEEN ACTIONS**

The Lloyd EcoDistrict aspires to be the  
most sustainable business district in North America.

-LLOYD ECODISTRICT VISION STATEMENT



# FOREWARD

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## **Our Vision**

The Lloyd EcoDistrict is a place where businesses, residents, government agencies and nonprofits all share a vision: to build the most sustainable living and working district in North America. This vision defines sustainability as starting with a strong, vibrant and growing local economy.

## **Energy Action Plan - The First Five Years**

The leaders of the Lloyd EcoDistrict understand the importance of combining economic, environmental and social considerations in new ways – ways that benefit everyone who share the district. This Energy Action Plan is an example of our commitment to find creative solutions regarding efficient energy consumption in order to meet our goal of “*no net increase*” in energy use by 2035. We have come together to bring the concept to life, with a clear vision and concrete plans. We are approaching our vision in five-year increments, as a reasonable development planning horizon, and a way to course correct should we need to make changes.

## **15 Actions**

To begin our first 5-year increment, we identified 15 energy related projects that will keep us on track to meet our goals. They are in the categories of new construction, existing buildings, renewables and catalytic actions. Over the next five years, we anticipate our energy investments to generate the following value for our EcoDistrict members:

## ***Return on Investment (ROI)***

Approximately \$16M in energy-related investments will be needed to implement the 15 proposed projects. The savings generated from this investment is estimated to result in an initial return on investment of 5.2%.

## ***Net Operating Income (NOI)***

Over \$800,000 in operating savings results in increased net operating income for building owners within the Lloyd EcoDistrict.

## ***Enhancing Asset Value***

Generating annual operating savings of over \$800,000 annually has the potential to increase building value by over \$11.8M assuming a cap rate of 6.75% (CBRE Survey, 2013).

## ***Job Creation***

\$16M in capital investment is projected to benefit over 78 local construction jobs and 12 permanent jobs in the Lloyd EcoDistrict.

## ***Risk Management & Resiliency***

Investing in energy efficiency generates proven results; moreover, investing in energy will buffer the Lloyd EcoDistrict buffer itself from uncertain shifts in future energy prices, local and national regulations, and environmental changes.

## ***Attracting Expertise and Capital***

Our innovative businesses models, at both the building and district infrastructure scale, will allow the Lloyd EcoDistrict to attract outside capital partners experienced in successfully implementing energy improvement projects.

## ***Public Policy Achievement***

The Lloyd EcoDistrict demonstrates clearly how public policies can be achieved at a neighborhood scale while delivering positive economic, environmental and social outcomes.

## ***Brand Differentiation***

Triple bottom line goals at a neighborhood scale benefit the entire district. This Energy Action Plan further defines our brand and differentiates the Lloyd District as an urban leader.

## ***Scale***

The defining characteristic of an EcoDistrict is scale. Though we certainly want to see energy efficiency projects happen in any form, we anticipate that we will be able to reach our EcoDistrict goals faster and at less expense by working as a community.

The Lloyd EcoDistrict Energy Action Plan is a dynamic document, meant to both guide and inspire the implementation of next generation strategies and business models. This first round of projects will generate tremendous economic value for the Lloyd EcoDistrict and continue to foster the environment of public and private collaboration required to realize the Lloyd EcoDistrict vision.

**LLOYD ECODISTRICT**

*Wade Lange, Board President*



# ACKNOWLEDGEMENTS

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The Lloyd EcoDistrict would like to thank the following individuals and organizations for their commitment and contribution in helping to develop this Plan.

## **Stakeholder Advisory Committee (SAC)**

Michael Armstrong, City of Portland Bureau of Planning and Sustainability  
Hank Ashforth, The Ashforth Company  
Lew Bowers, Portland Development Commission  
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# EXECUTIVE SUMMARY

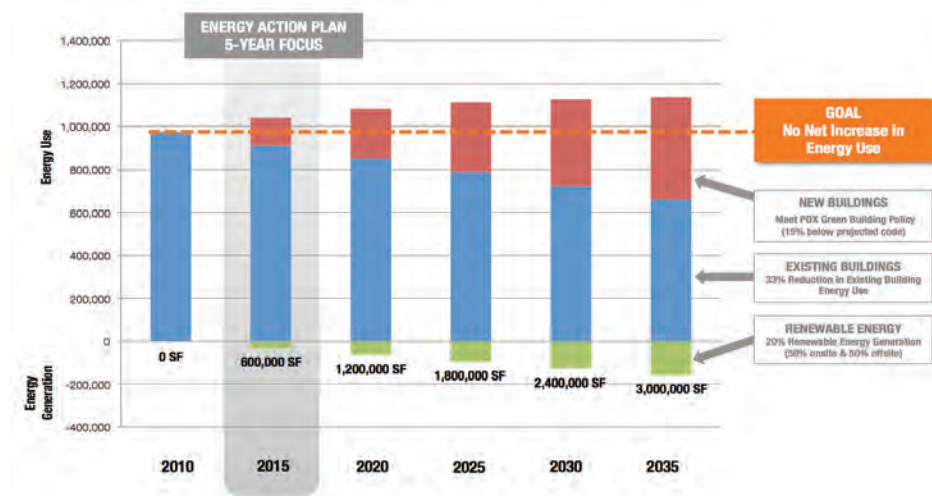
In 2012, the Lloyd EcoDistrict focused on the performance areas of transportation, water, energy and waste and established goals for the next 20 years of development and growth in the Lloyd EcoDistrict Roadmap. An ambitious energy goal of “no net increase” in energy use by 2035 based on 2010 energy use was set in the Roadmap.

**No Net Increase in Energy Use.**

- Lloyd EcoDistrict Energy Goal

Achieving this goal means that the Lloyd EcoDistrict, which currently consumes approximately 975,000 MMBtus of energy annually based on 11.5M SF of existing buildings, will not exceed current energy use even though an additional 22M SF of new building is planned over the next 25 years.

Exhibit A represents energy use growth over the next 25 years and demonstrates where the Lloyd EcoDistrict will focus efforts to achieve its “no net increase” goal. Reducing energy use through more efficient buildings combined with renewable energy generation are the key focus areas. All new buildings in the Lloyd EcoDistrict will align with the City of Portland’s Green Building Policy that targets new building energy efficiency at 15% below projected Oregon energy code.



**Exhibit A - Lloyd EcoDistrict Energy Goal and Focus Areas**

Existing buildings will be upgraded to reduce energy use by 33%. On-site and off-site renewable energy systems will generate energy equivalent to 20% of EcoDistrict energy use.

In 2013, a core group of Lloyd EcoDistrict property owners – representing approximately half of the existing buildings in the district (by area) – and City leaders came together to identify near-term energy projects to demonstrate progress toward achieving Lloyd’s “no net increase” energy goal. Over fifty (50) potential energy projects were identified across the EcoDistrict for consideration and, based on group consensus, the top fifteen (15) were

selected based on energy savings potential, business case, building owner interest and whether or not the project reinforced EcoDistrict-scale interests.

These fifteen first round projects comprise the Lloyd EcoDistrict Energy Action Plan and represent clear and implementable energy investments over the next 5-years to ensure progress toward the Lloyd EcoDistrict’s “no net increase” in energy use goal.

<b>New Building Energy Efficiency (NBEE)</b>	#1	<b>New Building Energy Use Intensity (EUI)</b>	<b>15% better than Oregon Code (Portland's Green Building Policy)</b>
<b>Existing Building Energy Efficiency (EBEE)</b>	#2	<b>Lloyd 700 Building Upgrade</b>	<b>30% Energy Reduction</b>
	#3	<b>Legacy Labs Upgrade</b>	<b>40% Energy Reduction</b>
	#4	<b>Oregon Convention Center Upgrade</b>	<b>13% Energy Reduction</b>
	#5	<b>East West College Upgrade</b>	<b>2% Energy Reduction</b>
	#6	<b>Calaroga Terrace Upgrade</b>	<b>14% Energy Reduction</b>
	#7	<b>Red Lion Inn Upgrade</b>	<b>30% Energy Reduction</b>
<b>Renewable Energy &amp; District Energy (RE/DE)</b>	#8	<b>Oregon Convention Center Solar PV</b>	<b>2MW Solar PV System</b>
	#9	<b>Additional Solar PV</b>	<b>50,000 SF Solar PV System</b>
	#10	<b>Convention Center / Convention Center Hotel</b>	<b>District Energy System with OCC</b>
<b>EcoDistrict Catalyzers</b>	#11	<b>Energy Efficiency Working Group</b>	<b>Continuous</b>
	#12	<b>Existing Building Energy Protocol</b>	<b>Continuous</b>
	#13	<b>Energy Monitoring &amp; Benchmarking</b>	<b>Continuous</b>
	#14	<b>Bulk Purchase Demonstration Pilot</b>	<b>LED Lighting</b>
	#15	<b>Preferred Solar Provider</b>	<b>3<sup>rd</sup> Party Provider Partnership</b>

**Exhibit B - Lloyd EcoDistrict Energy Action Plan**

Exhibit B summarizes all fifteen energy actions of the Lloyd EcoDistrict Energy Action Plan. Energy investments align with the focus areas originally identified in the Roadmap (ie, new buildings, existing buildings, renewable energy and district energy). Moreover, all fifteen actions align well with the EcoDistrict Framework that categorizes projects as building focused, infrastructure focused or management focused.

EcoDistrict “catalyzers” have also been identified to further accelerate energy efficiency efforts across the district. These catalyzers are a mix of demonstration pilot projects to provide “proof of concept” tests of EcoDistrict-scale project delivery and information sharing efforts between EcoDistrict members to provide education and knowledge as well as to monitor and track progress toward goals.

Successfully implementing the Lloyd EcoDistrict Energy Action Plan will require continued commitment by public, private, nonprofit and private 3rd party partners. For each action, each partner has a specific role to play and only together – under the management of the Lloyd EcoDistrict – will the Lloyd EcoDistrict’s ambitious “*no net increase*” energy goal be realized.

# 1. INTRODUCTION

## The Lloyd EcoDistrict Vision

Born from innovative district-scale efforts spanning the last two decades, the Lloyd District was the first district in North America to be recognized as an EcoDistrict. Today, the Lloyd EcoDistrict continues to advance its leadership position through its bold vision and a keen focus on leading by example.

**The Lloyd EcoDistrict  
aspires to be the most  
sustainable business  
district in North America.**

**- Lloyd EcoDistrict Vision Statement**

The leaders behind the Lloyd EcoDistrict understand the importance of combining economic, environmental and social considerations in new ways – ways that benefit everyone who shares the district. Moreover, they understand the importance that every project considered for implementation in the Lloyd EcoDistrict must possess a solid business case to ensure both project viability and ability to replicate.

## Lloyd EcoDistrict Roadmap

In 2012, the Lloyd EcoDistrict solidified this vision through the adoption of the Lloyd EcoDistrict Roadmap (Roadmap).

The Roadmap provides the Lloyd EcoDistrict clear goals and the strategies to achieve them as well as the investments and partnerships to make each strategy a reality.



The Roadmap is intended to guide Lloyd EcoDistrict project implementation efforts, with an emphasis on meeting ambitious goals in the areas of **return on investment, job growth, water, energy, materials management, habitat & ecosystem function, and access & mobility.**



One of the “Big Ideas” of the Roadmap was the concept of the “Efficient District.” As stated in the Roadmap, the Lloyd EcoDistrict will set the standard for resource conservation and efficiency (energy, water and materials management), minimizing the EcoDistrict’s impact on the environment while optimizing the use of existing public infrastructure investments and reducing private

development costs and utility related expenses for local businesses and residents.

Upon adoption of the Roadmap, Lloyd EcoDistrict leaders were determined to begin action immediately and identified energy as a key focus area.

## Lloyd EcoDistrict Energy Action Plan

Representing Lloyd’s first step to implementing the energy strategies identified in the Roadmap, the Lloyd EcoDistrict Energy Action Plan is comprehensive energy efficiency implementation plan focused on achieving EcoDistrict goals and building EcoDistrict value – all while stimulating local economic development in Lloyd EcoDistrict and the City of Portland.

Focused on the next five-years, the objective of the Lloyd EcoDistrict Energy Action Plan is to identify implementable actions to help achieve the “no net increase” energy goal of the Lloyd EcoDistrict by 2035. The district-scale energy assessment from the Roadmap was refined utilizing more detailed GIS data combined with actual building energy use data to provide a much more realistic understanding of existing energy use within the Lloyd EcoDistrict. Based on this information, and future energy use estimates, a five-year energy use baseline and subsequent energy use reduction goal was established.

To achieve the five-year energy use reduction goal, the following focus areas were identified as key areas of investment opportunity to help reduce energy use (see Exhibit C):

#### ***Existing Building Energy Efficiency***

By 2015, existing building energy use will account for 83% of Lloyd EcoDistrict energy use. As a result, existing buildings represent the most significant energy use reduction opportunity in the Lloyd EcoDistrict.

#### ***New Building Energy Efficiency***

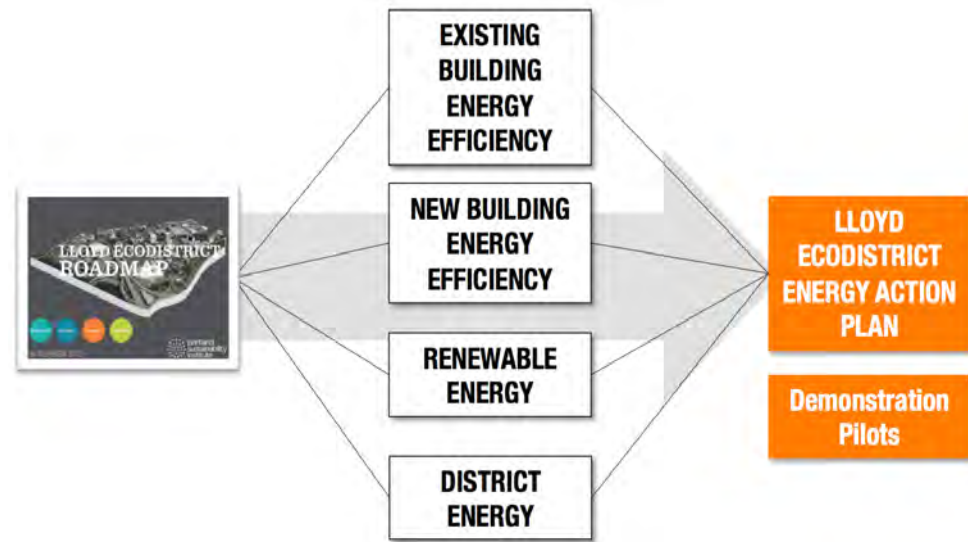
Over 4.1M SF of new development is anticipated in the Lloyd EcoDistrict over the next five years. Ensuring all new buildings in the EcoDistrict are energy efficient buildings will be an important focus for the Lloyd EcoDistrict.

#### ***Renewable Energy***

Energy efficiency alone will not be enough to achieve the Lloyd EcoDistrict's five-year energy goal. Energy generation from in-district and out-of-district renewable sources will be needed to offset building energy use.

#### ***District Energy***

District energy presents a unique opportunity to achieve building energy efficiency goals while potentially reducing capital requirements through the use of shared infrastructure. This shared infrastructure could be converted to use renewable fuel sources to also help achieve the renewable energy goal of the EcoDistrict.



**Exhibit C - Project Approach**

Clear and implementable projects have been identified for each focus area as part of this Plan. Moreover, programmatic efforts to foster continued district collaboration and “demonstration pilots” to test EcoDistrict-scale project delivery have been identified to catalyze efforts beyond Energy Action Plan projects.

#### **Stakeholder Advisory Committee**

To help shape the development of the Lloyd EcoDistrict Energy Action Plan, a group of 20

Lloyd public and private sector leaders – representing over 50% of existing buildings (by area) and all major new development in the Lloyd District – came together to share building performance data, discuss planned projects and develop new projects. The relationships formed out of their collaboration further reinforces the importance of district-scale leadership and organization to achieve the Lloyd EcoDistrict vision.

## 2. 5-YR GOAL & GOAL ACHIEVEMENT

### Existing and Future Energy Use

The basic energy assessment of the Lloyd EcoDistrict completed for the Roadmap was established - based on the land use, building area, existing utility data for the district and Portland-specific building development assumptions - and further refined based on significantly more detailed inputs into the Lloyd EcoDistrict energy model including:

#### Existing and Future Development

Approximately 213 buildings, comprised of 11.5M SF of building area, currently exist within the Lloyd EcoDistrict. Development is anticipated to increase by 22M SF according to the N/NE Quadrant Plan (BPS, 2012), approximately 4.4M SF every five years for the next 25 years.

#### Building Information (GIS)

For all the buildings in the EcoDistrict, detailed building information was obtained using PDC's GIS database including location, building area, building use, year built and ownership.

#### Portfolio Manager (SAC Buildings)

All project stakeholder advisory committee (SAC) members provided building information via Portfolio Manager including building area, building use, year built and energy use data.

#### Energy Use Intensity (EUI)

Actual and assumed (when actual not available) EUIs were identified for all 213 buildings in the Lloyd EcoDistrict. Energy use intensity (EUI)

was obtained for each SAC-member building through Portfolio Manager. These EUIs were used as proxy EUIs for similar buildings in the EcoDistrict. Where EUIs were not available based on actual energy data, US Department of Energy Commercial Building Energy Consumption Survey (CBECS) EUIs were utilized. Existing building EUIs were assumed to decrease 3% every 5-years based on assumed existing building redevelopment. Future building EUIs were assumed to align with Portland's Green Building Policy (15% below projected Oregon Energy code).

Exhibit D below shows a comparison between Roadmap energy use projections (blue line) and Energy Action Plan energy use projections (red line). Future energy use is approximately

30% less than that projected in the Roadmap due primarily to much lower future building EUIs resulting from more stringent projected energy codes.

### Lloyd EcoDistrict Energy Goal

To maintain alignment with the “no net increase” energy goal of the Lloyd EcoDistrict Roadmap the following goals must reduce energy use by 36% over the next 25-years (green line) and a 10% reduction over the next five years.

**5-yr Energy Goal:  
Reduce Energy Use  
by 10%**

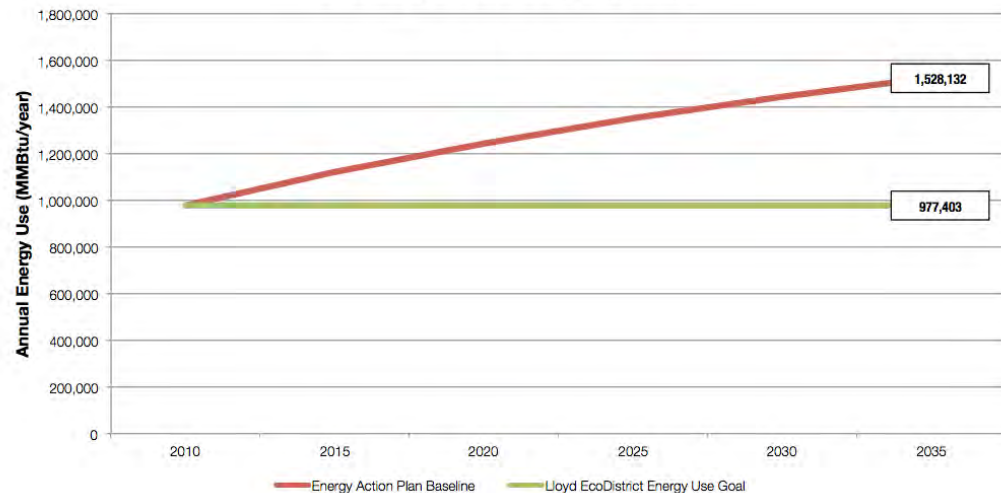


Exhibit D - Energy Use Projections

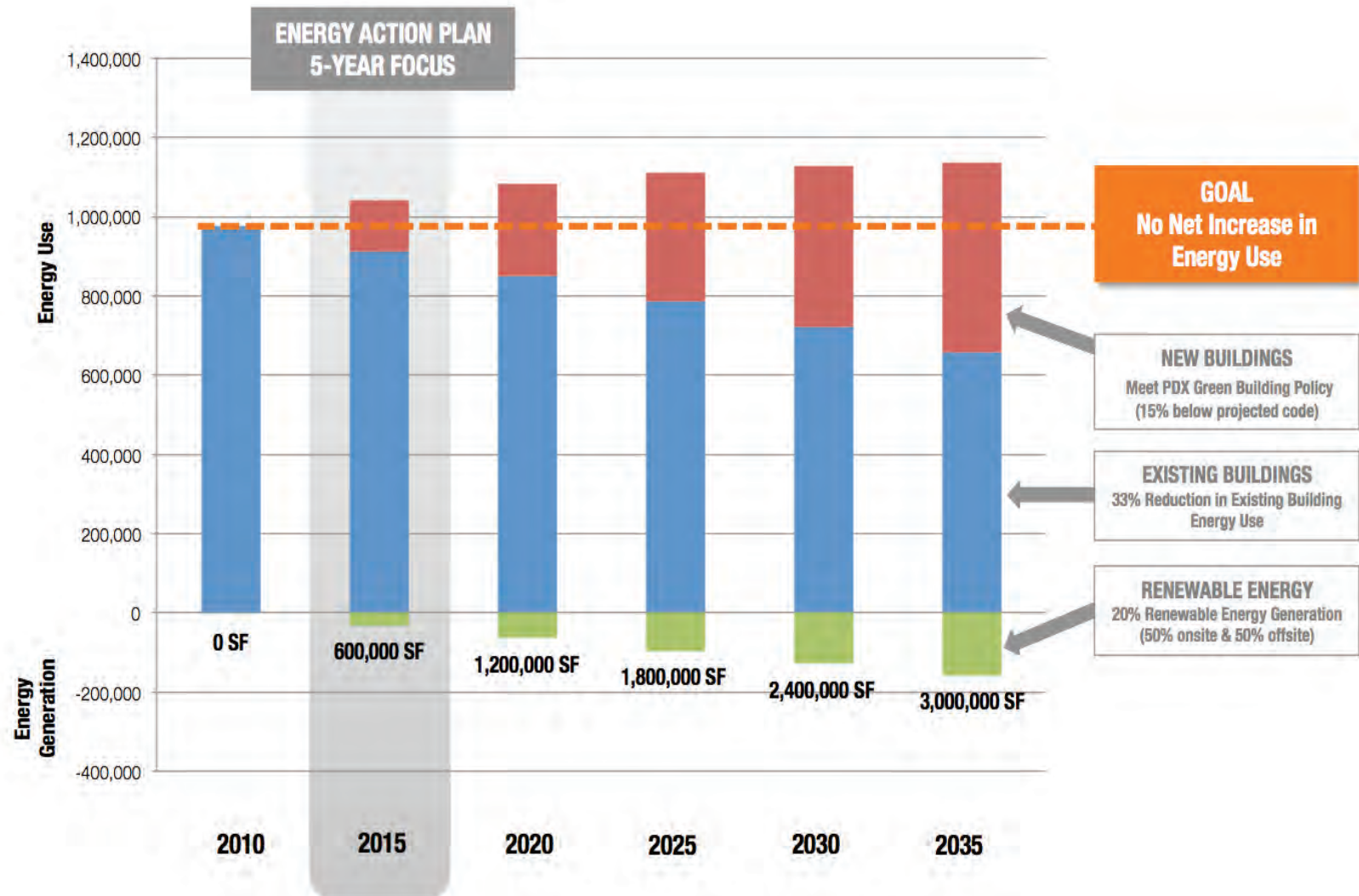


Exhibit E - Lloyd EcoDistrict Energy Goal and Focus Areas

## Energy Goal Achievement

To achieve its energy goal (see Exhibit E), the Lloyd EcoDistrict must focus on reducing energy use while increasing renewable and efficient energy generation. As identified in the Roadmap, the following four strategies will be utilized:

- New Building Energy Efficiency
- Existing Building Energy Efficiency
- Renewable Energy
- District Energy

New buildings from this point forward must align with Portland Green Building Policy (15% below projected code), existing building energy use must be reduced by 33%, and 20% of annual energy use must be met through renewable energy generation (50% in-district and 50% out of district).

### 5-yr Energy Goal Achievement:

The Lloyd EcoDistrict will achieve the following over the next five years:

#### NEW BUILDING ENERGY EFFICIENCY

All new building energy use will align with Portland Green Building Policy (ie, Office EUI = 35).

#### EXISTING BUILDING ENERGY EFFICIENCY

Existing building energy use will be reduced by 33%.

#### RENEWABLE ENERGY

300,000 SF of Solar PV will be installed.

BUILDINGS	INFRASTRUCTURE	MANAGEMENT
LLOYD 700 LEGACY RESEARCH INST. OCC EAST WEST COLLEGE CALAROGA TERRACE RED LION INN NEW BUILDING EUIs BULK PURCHASE DEMONSTRATION PILOT*	OCC SOLAR PV ADDITIONAL SOLAR PV PREFERRED SOLAR PV PROVIDER* OCC CONVENTION CENTER HOTEL DISTRICT ENERGY	ENERGY EFFICIENCY WORKING GROUP EXISTING BUILDING ENERGY PROTOCOL ENERGY MONITORING & BENCHMARKING *organize multi-building efforts.
BUILDING OWNERS	3 <sup>RD</sup> PARTY	ECODISTRICT

Exhibit F - Project Types & Delivery Partners

## Project Types

The EcoDistrict Framework identifies three categories of projects: buildings, infrastructure and demand management. As represented in Exhibit F on this page, all fifteen actions of the Energy Action Plan are consistent with this categorization.

### Building Efficiency Projects

Building projects are focused on reducing existing and future building energy use within the EcoDistrict. Specific building energy use reduction measures include: Envelope, HVAC, central plant, etc. All new building and existing building actions, including bulk purchasing, lie within this project type.

### Infrastructure Projects

Infrastructure projects provide utility related service within the EcoDistrict in the form of energy efficiency and/or energy generation. All solar PV actions are categorized as infrastructure because they generate energy. District energy provides energy efficiency and potentially energy generation.

### Management Projects

Management projects help to monitor and report EcoDistrict progress, build collaborative networks between EcoDistrict members, and help accelerate and scale building and infrastructure project delivery.

## Delivery Partners

As the Lloyd EcoDistrict Energy Action Plan is focused on action, project delivery is paramount. It was recognized that in order to achieve the goals of the EcoDistrict, the stakeholders identified four primary investment partnerships to deliver projects: public, private, public private partnerships, and private third parties. In the context of energy, the Lloyd EcoDistrict will utilize the following project delivery partners:

### *Public Agencies (Public)*

Conservation improvements to energy consuming elements within the public right-of-way such as LED street lights should be led by the public sector.

### *Building Owners (Private)*

Building owners are best suited to deliver building-scale projects. These projects include existing building retrofits, new building EUIs, and bulk purchasing.

### *3rd Party (Private 3rd Party)*

Building owners typically do not have the available capital, expertise and capacity to deliver infrastructure projects such as solar PV and district energy. Existing business models provided by private 3rd parties do and the Lloyd EcoDistrict will engage with them to implement infrastructure projects.

### *EcoDistrict (Public Private Partnership)*

The EcoDistrict provides the connection between private, 3rd party and public. It also

ensure progress toward goals and foster connection and collaboration between members. As a result, management related actions will be the responsibility of the Lloyd EcoDistrict to champion.

## EcoDistrict Catalyzers

Most of the projects identified in the Energy Action Plan (see Exhibit B) are single building focused and delivered by individual building owners. This approach is represented in Quadrant A of Exhibit G. An assumed value proposition of an EcoDistrict is the benefit of scale – an economy of scale to deliver projects at less cost if multiple building owners work together. To demonstrate this value, the Energy Action Plan includes actions that will test the potential benefit of project delivery through EcoDistrict-scale approaches including:

### *Multi-Building, Self-Perform (Quadrant B)*

Action #14 – Bulk Purchase Demonstration Pilot will develop and deliver a LED-lighting bulk purchase project for multiple buildings across the EcoDistrict. Participating building owners will work together to purchase LED products – and potentially installation – at a scale that provides a cost reduction not achievable if building owners procured as individuals.

### *Single-Building, 3rd Party (Quadrant D)*

For Action #8 – Oregon Convention Center Solar PV, OCC will look to engage with a private 3rd party solar provider to finance, install and operate a large solar PV system.

Through this approach, OCC will avoid the typical capital cost barrier of implementing solar PV.

### *Multi-Building, 3rd Party (Quadrant C)*

Action #15 expands on the OCC’s efforts for Action #8 to provide multiple buildings the opportunity to implement solar PV from a “preferred solar provider.” This approach seeks to test if more favorable 3rd party terms could be obtained for EcoDistrict members if they work together to generate scale.

These EcoDistrict “catalyst” efforts will be extremely important as the EcoDistrict looks for additional projects to complete beyond the efforts outlined in the Energy Action Plan.

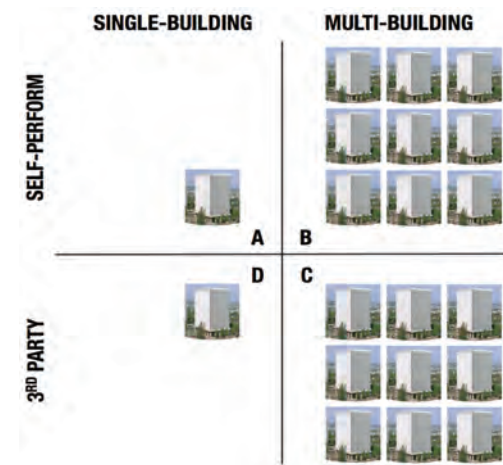


Exhibit G - Project Delivery Options

# 3. PROJECTS

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THESE ACTIONS WILL REDUCE ENERGY USE NOW...

**NEW BUILDING ENERGY EFFICIENCY**

**EXISTING BUILDING ENERGY EFFICIENCY**

**RENEWABLE ENERGY**

**DISTRICT ENERGY**

## ACTION #1

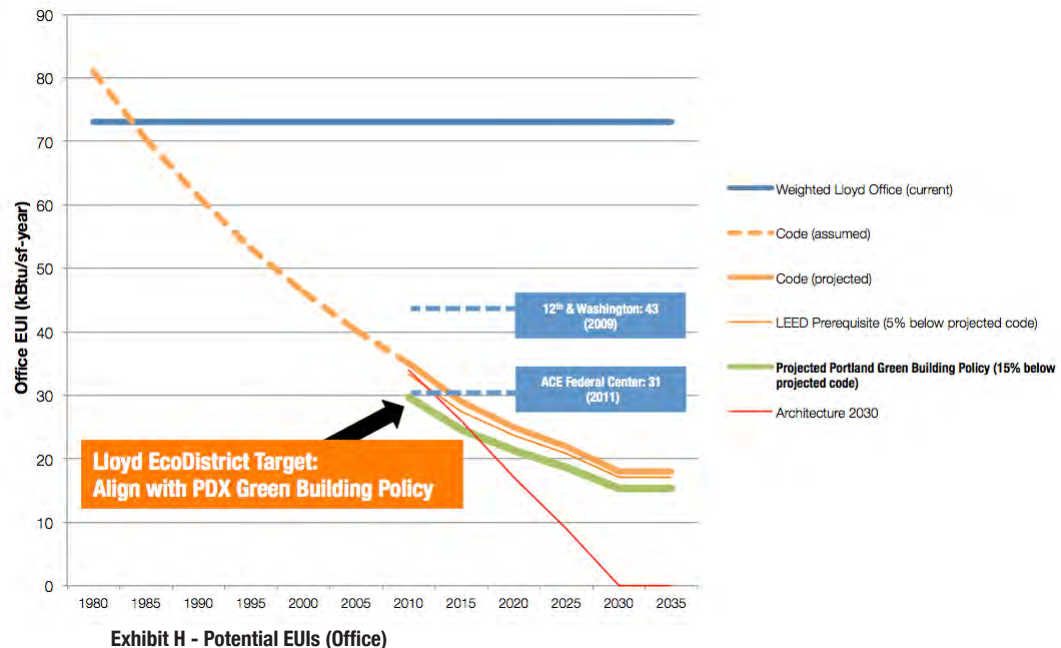
# NEW BUILDING EUI

To achieve Lloyd EcoDistrict Energy Action Plan goals, all new buildings must aggressively minimize energy use. Energy Use Intensity (EUI) is the most common measure of energy performance in buildings and will be used by the Lloyd EcoDistrict to guide building performance efforts. EUIs were estimated for all existing buildings in the Lloyd EcoDistrict. The average EUI for office buildings is 73 (blue line in Exhibit H).

### EUI Background and Context

A review of relevant green building standards, rating systems, best practices and emerging concepts revealed a downward EUI trend over the past 20-30 years (see Exhibit H). Building energy codes in the mid-1980s, when many of Lloyd's buildings were built, resulted in EUIs around 70-75. Enhancements in building energy codes between the 80's and 90's further pushed EUIs downward. Future building energy codes are projected to continue this downward trend.

Architecture 2030, which targets carbon neutral buildings by 2030 (based on progressive goals set by using target EUIs) is emerging as the most popular building energy performance "guideline." As such, building energy codes are beginning to align with Architecture 2030 which continues the downward trend of code. The City of Portland's current Green Building Policy is consistent with this downward trend and looks to push beyond it by establishing a goal of at least 15% below projected Oregon Energy code (green line in Exhibit H).



Achieving this level of EUI performance has already been achieved by buildings including the 12th and Washington building in Portland (EUI = 43) and the Army Corps of Engineers Federal Center in Seattle (EUI = 31).

### New Building EUI

The Lloyd EcoDistrict will meet or exceed the Portland Green Building Policy for all new buildings in the district. Achieving this level of building performance will help the Lloyd EcoDistrict achieve its "no net increase" in energy use goal.

#### LLOYD ECODISTRICT ACTION: Complete the following:

- 1. NEW BUILDING EUI**  
All new buildings will achieve EUIs in alignment with Portland Green Building Policy (anticipated to be set at 15% below projected Oregon energy code).

**RESPONSIBLE PARTY:** New Building Developers

**TIMEFRAME:** On-Going

# LLOYD 700 BUILDING

## ACTION #2

### 1 Understand Energy Use

Lloyd 700 has a Portfolio Manager account and has shared account information with the Lloyd EcoDistrict. See Project Summary for information.

### 2 Building Performance & Project Identification

In the midst of a major renovation, with a design that will integrate the tower's heating and cooling plant capabilities with the commercial occupancy needs of new, adjacent, mixed use residential towers, the Lloyd 700 project has benefited from detailed audit and analysis of energy efficiency opportunities.

### 3 Business Case Assessment

The project team's design and estimating work has been supplemented by the efforts of the Energy Building Renewal (EBR) Team of the Northwest Energy Efficiency Alliance (NEEA), who have proposed a set of integrated deep retrofit measures, supporting their proposal with business case analysis that assesses both energy savings and non-energy related benefits.

An "integrated measure package," proposed by NEEA, includes near-term plant renovation, encompassing boilers, chillers, and cooling towers; roof insulation; and replacement of single pane glass. In addition, tenant space

improvements, over time, will address distributed HVAC equipment upgrades and lighting. Upon full implementation of the measures, energy energy savings are expected to approach 40%.

Lloyd 700 management has been working with the Energy Trust of Oregon to assess incentive opportunities.

### 4 Leverage EcoDistrict Structure & Delivery

Not Applicable.

### 5 Project Implementation

Project elements requiring access to tenant spaces, for construction, will be implemented as those spaces become available. The initial, major projects, addressing the heating and cooling plant and the building envelope will be completed during the five-year planning horizon.

**note:**

Development of this action followed the recommended Existing Building Energy Protocol (see Action #12).



#### BUILDING INFO:

Building Type:	Office
Owner:	AAT
Energy Use:	21,979 MMBtu/year
Energy Cost:	\$486,959/year
EUI:	75 kBtu/SF-year

#### PROJECT SUMMARY:

SAVINGS:	COST:	ROI:
<b>30%</b>	<b>\$3M</b>	<b>5%</b>

NOTE: ROI not inclusive of available incentives.

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Finalize NEEA business case and select energy efficiency improvements.
2. Implement energy efficiency improvements.
3. Share results with Lloyd EcoDistrict Energy Efficiency Working Group.

RESPONSIBLE PARTY: AAT

TIMEFRAME: 2014-2016

## 1 Understand Energy Use

Legacy Research Institute has a Portfolio Manager account and has shared account information with the Lloyd EcoDistrict. See Project Summary for information.

## 2 Building Performance & Project Identification

The Legacy Research Institute site houses a number of energy intensive operations including a research center and a comprehensive clinical research laboratory. Occupancy and use of two-thirds of the existing building will change in the next few years and this change, alone, should lead to a substantial reduction in energy use (an assumption based upon the current building EUI). The chilled water plant was updated 7-8 years ago, replacement of supply air fans with fan wall units is scheduled to take place on a phased basis, over the next few years. As vacated spaces are renovated, 20-year old HVAC distribution will be replaced, lighting will be upgraded, and DDC controls will be installed.

## 3 Business Case Assessment

Legacy has adopted a strategic energy management approach, to extend their planning horizon and, to the extent possible, to anticipate and optimize energy performance opportunities. As part of this process, the EcoDistrict and Legacy will benefit if financial support can be provided to help offset the expense of the

detailed analysis required to allow full analysis, exploration and prioritization of efficiency measures. Lighting, in particular, is one area where energy analysis, beyond basic code compliance, has not generally been pursued. Yet, with the integrated impact of lighting choices upon HVAC system sizing and energy use, additional work to optimally design systems to deliver the required lighting levels, with the least energy use, would be a major benefit. Furthermore, this additional analysis, regarding the costs and benefits of measures to improve performance beyond code minimum requirements, will help energy performance projects compete for funding, within the health system capital budgeting process.

## 4 Leverage EcoDistrict Structure & Delivery

Legacy staff have expressed interest in exploring the potential benefits from Lloyd EcoDistrict-wide procurement of commodity items such as high performance air filters, lamps and ballasts.

## 5 Project Implementation

All projects under consideration by Legacy can be implemented and completed during the five-year time horizon.

**note:**

Development of this action followed the recommended Existing Building Energy Protocol (see Action #12).



### BUILDING INFO:

Building Type:	Healthcare Research & Clinical Laboratory
Owner:	Legacy Health
Energy Use:	54,332 MMBtu/year
Energy Cost:	\$649,035/year
EUI:	350 kBtu/SF-year

### PROJECT SUMMARY:

SAVINGS:	COST:	ROI:
<b>40%</b>	<b>\$3.9M</b>	<b>7%</b>

NOTE: ROI not inclusive of available incentives.

### LLOYD ECODISTRICT ACTION:

Complete the following:

1. PDC to help arrange DOS funding for business case assessment support.
2. Complete business case assessment to prioritize projects.
3. Implement projects.
4. Share results with Lloyd EcoDistrict Energy Efficiency Working Group.

RESPONSIBLE PARTY: Legacy Labs, PDC  
TIMEFRAME: 2015

# OREGON CONVENTION CENTER

## ACTION #4

### 1 Understand Energy Use

The Oregon Convention Center (OCC) has a Portfolio Manager account and has shared account information with the Lloyd EcoDistrict. See Project Summary for information.

### 2 Building Performance & Project Identification

OCC staff have adopted a strategic energy management approach and have prepared a five-year plan, covering identification, staged engineering analysis and design, and capital budgeting, for a number of energy performance projects.

### 3 Business Case Assessment

Energy projects identified within the plan, to take place between 2014 and 2018, include: a number of interior lighting projects, LED parking lot lighting, replacement of process loop piping, and analysis of opportunities to upgrade air handler fans to variable frequency drives, engineering to update and upgrade the central heating and cooling plant capabilities, and implementation of the central plant measures.

The detailed analysis identified in the plan, will estimate project energy savings and help to prioritize the projects. However, a rough order

of magnitude of savings, if all of the projects are implemented, should reduce overall facility energy use by 12-13%: 2-3% of overall energy use from the lighting projects and 10% savings from plant improvements (approximately 7% from heating improvements and 3% from cooling improvements).

OCC management works closely with the Energy Trust of Oregon to identify opportunities to receive incentives.

### 4 Leverage EcoDistrict Structure & Delivery

While the OCC has staff and consultant relationships fully able to manage the identified projects, their approach to strategic energy management will allow quick consideration of emerging Lloyd EcoDistrict capabilities and programs, such as procurement opportunities, that might lead to shifting prioritization of projects.

### 5 Project Implementation

The identified projects are all within the initial EcoDistrict five-year planning horizon.

**note:**

Development of this action followed the recommended Existing Building Energy Protocol (see Action #12).



#### BUILDING INFO:

Building Type:	Assembly
Owner:	OCC
Energy Use:	47,609 MMBtu/year
Energy Cost:	\$765,00/year
EUI:	55 kBtu/SF-year

#### PROJECT SUMMARY:

SAVINGS:	COST:	ROI:
13%	\$3.3M	2%

NOTE: ROI not inclusive of available incentives.

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Implement planned projects.
2. Share results with Lloyd EcoDistrict Energy Efficiency Working Group.

RESPONSIBLE PARTY: OCC, PDC  
TIMEFRAME: 2015

## ACTION #5

# EAST WEST COLLEGE

### 1 Understand Energy Use

East West College has a Portfolio Manager account and has shared account information with the Lloyd EcoDistrict. See Project Summary for information.

### 2 Building Performance & Project Identification

East West College has completed a Kilowatt Crackdown walk-through, identifying a series of operation and maintenance (O&M) measures and capital improvement energy-efficiency opportunities.

### 3 Business Case Assessment

Of the projects identified during the walk-through, a number of O&M measures have already been completed by College facilities/operations staff. The capital projects need additional analysis and design in order to carefully assess costs and benefits. A number of these projects are related to air quality and ventilation.

East West College should pursue one of two project development paths: either a traditional spec-bid approach, with a contract engineer completing the analysis and developing a design and specifications that can be competitively bid; or, work directly with a design-build

firm able to take the project all the way from analysis through construction. (A hybrid of these two approaches is also possible, with the initial analysis and conceptual design performed by a consulting engineer, with the final design and implementation by a design-build firm.)

Introductions were made to firms who could support College intentions, with either implementation path.

### 4 Leverage EcoDistrict Structure & Delivery

If the Lloyd EcoDistrict were to develop relationships with engineering and design/build firms and pre qualify them to provide services within the EcoDistrict, it would simplify the procurement process for building owners who are not regularly active in the design and design-build communities.

### 5 Project Implementation

Project elements requiring access to tenant spaces, for construction, will be implemented as those spaces become available. The initial, major projects, addressing the heating and cooling plant and the building envelope will be completed during the five-year planning horizon.

**note:**

Development of this action followed the recommended Existing Building Energy Protocol (see Action #12).



#### BUILDING INFO:

Building Type:	Higher Education
Owner:	East West College
Energy Use:	2,637 MMBtu/year
Energy Cost:	\$48,628/year
EUI:	50 kBtu/SF-year

#### PROJECT SUMMARY:

SAVINGS:	COST:	ROI:
32%	\$418k	2%

NOTE: ROI not inclusive of available incentives.

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Determine project development pathway.
2. Work with PDC to arrange DOS funding for energy assessment if consultant used.
3. Implement projects.
4. Share results with Lloyd EcoDistrict Energy Efficiency Working Group.

RESPONSIBLE PARTY: East West College, PDC

TIMEFRAME: 2014-215

# CALAROGA TERRACE

## ACTION #6

### 1 Understand Energy Use

Calaroga Terrace has a Portfolio Manager account and has shared account information with the Lloyd EcoDistrict. See Project Summary for information.

### 2 Building Performance & Project Identification

Calaroga Terrace has completed an energy study, funded by the Energy Trust of Oregon, identifying a number of project opportunities.

### 3 Business Case Assessment

The highest priority project opportunity, targeted by Calaroga Terrace, involves a significant upgrade to perimeter HVAC fan coils, involving three-way valve replacement, improved fan control, and installation of digital thermostats. Project costs have been fully priced (including cost savings from Calaroga Terrace staff performing the labor) and will be close to \$300,000. Projected annual energy savings are 208,411 kWh and 23,220 therms, for a total of 3,033 MMBTU, or 14% of the typical building energy use. The annual energy expense savings has been estimated as \$34,130.

### 4 Leverage EcoDistrict Structure & Delivery

Project development tasks for the HVAC fan coil/thermostat project have been completed to the point that structure and delivery options have been selected. Calaroga Terrace has the capability to fully manage this project.

### 5 Project Implementation

The initial project can easily be completed during the current five-year EcoDistrict planning horizon. Additional projects, including replacing/updating the space heating boilers with condensing boilers, are under consideration. Calaroga Terrace management will also evaluate the benefits of a rooftop photovoltaics installation at the time of roof replacement.

**note:**

Development of this action followed the recommended Existing Building Energy Protocol (see Action #12).



#### BUILDING INFO:

Building Type:	Multi-Family Housing
Owner:	Pacific Securities
Energy Use:	21,634 MMBtu/year
Energy Cost:	Not provided.
EUI:	68 kBtu/SF-year

#### PROJECT SUMMARY:

SAVINGS:	COST:	ROI:
14%	\$300k	11%

NOTE: ROI not inclusive of available incentives.

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Work with PDC to finalize funding.
2. Implement projects.
3. Share results with Lloyd EcoDistrict Energy Efficiency Working Group.

RESPONSIBLE PARTY: Calaroga Terrace, PDC

TIMEFRAME: 2014

## ACTION #7

# RED LION INN

### 1 Understand Energy Use

Red Lion energy use data has not been shared with the Lloyd EcoDistrict.

### 2 Building Performance & Project Identification

The hotel will be undertaking a major renovation, with new glazing and an enhanced building envelope, updated HVAC systems and controls, and new lighting. Major energy efficiency improvements can be expected, compared to the basecase performance of current operations.

### 3 Business Case Assessment

Decisions regarding energy performance will take place within the context of the overall design and operating needs and the project development budget. With a major renovation of this scale the project will qualify for incentives from the Energy Trust of Oregon new construction program, using current code as the performance baseline.

### 4 Leverage EcoDistrict Structure & Delivery

This project will be moving quickly and it is likely that the most critical decisions will be made and implemented before Lloyd EcoDistrict programs emerge that could influence prioritization.

### 5 Project Implementation

The renovation of the hotel and the accompanying energy performance upgrades will be completed during the five-year planning horizon.

**note:**

Development of this action followed the recommended Existing Building Energy Protocol (see Action #12).



#### BUILDING INFO:

Building Type:	Hotel
Owner:	Grand Ventures Hotel, LLC
Energy Use:	14,000MMBtu/year*
Energy Cost:	\$222,000/year*
EUI:	130 kBtu/SF-year*
	*estimated

#### PROJECT SUMMARY:

SAVINGS:	COST:	ROI:
40-50%	\$680k	6%

NOTE: ROI not inclusive of available incentives.

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Red Lion to complete energy model and performance assessment during spring 2014.
2. Red Lion to meet with PDC and Lloyd EcoDistrict to review assessment results.
3. Should additional funding be needed to further reduce energy use, PDC is available for support.

RESPONSIBLE PARTY: Red Lion, PDC  
TIMEFRAME: 2014

# OCC SOLAR PV

## ACTION #8

### Energy Generation Potential

In 2007, the Energy Trust of Oregon evaluated the solar PV potential for the south roof of the Oregon Convention Center and identified approximately 1.1MW of solar PV generation potential.

#### SOUTH ROOF SOLAR PV CONCEPT:



#### NORTH ROOF SOLAR PV CONCEPT:



In 2012, an assessment of the north roof identified approximately 1.27MW of solar PV generation potential. Combined, OCC has the potential to install 2MW of solar PV which is the maximum currently allowed by the Oregon Public Utilities Commission.

OCC is looking to re-roof the entire north roof in 2014, creating a good opportunity to install solar PV with re-roofing efforts.

### Business Case Assessment

Solar PV costs have come down substantially since the first ETO solar PV evaluation in 2007. Costs identified in the ETO report were approximately \$8.50 per watt where costs identified per recent market outreach were around \$3.50 per watt given current incentives.

At \$3.50 per watt, the cost of the 1.27MW north roof solar PV system would be approximately \$4.45M. A system of this scale would generate approximately 15% of OCC annual electricity demand, equivalent to \$100,000 in annual electricity savings at current rates.

### Project Delivery

OCC currently does not have the capital budget to invest in solar PV. As a result, OCC is looking to evaluate potential third party solar PV partnerships to implement the project. OCC is open to numerous deal structures such as a power purchase agreement (PPA) or long-term lease so long as it does not require OCC capital and the rate paid for solar PV is reasonable as compared with current and future electricity rates.

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. OCC will potentially issue an RFP for third party solar PV providers in early 2014 to evaluate potential third party providers and deal structures. Should OCC come to an agreement with a potential third party provider, they will integrate solar PV installation with their re-roofing project later in 2014. Moreover, OCC may consider addition solar PV installation, up to the 2MW PUC maximum.
2. The Lloyd EcoDistrict will continue to support OCC solar PV efforts. Moreover, it should encourage OCC to share the results of its RFP efforts and decision making with others in the Lloyd EcoDistrict. Should OCC find agreement with a third party, that agreement could also be used elsewhere in the Lloyd EcoDistrict.

RESPONSIBLE PARTY: OCC

TIMEFRAME: 2014

## ACTION #9

# ADDITIONAL SOLAR PV

### Energy Generation Potential

In 2011, the National Renewable Energy Lab (NREL) conducted a solar PV assessment for the Lloyd EcoDistrict identifying approximately 6.1 MW of solar PV generation potential over 1,032,052 SF of existing useable solar area.

The Lloyd EcoDistrict will need 600,000 SF of solar PV to meet its five-year renewable energy goal – 50% on-site (300,000 SF) and 50% off-site (300,000 SF). Exhibit I shows enough potential large rooftop solar PV projects, including OCC, to achieve the 100% five-year Lloyd EcoDistrict renewable energy goal. Should OCC install its maximum of 2MW, representing about 250,000 SF of installed solar PV (see Action #8), only 50,000 SF of additional solar PV will be needed to achieve the five-year on-site goal of 300,000 SF.

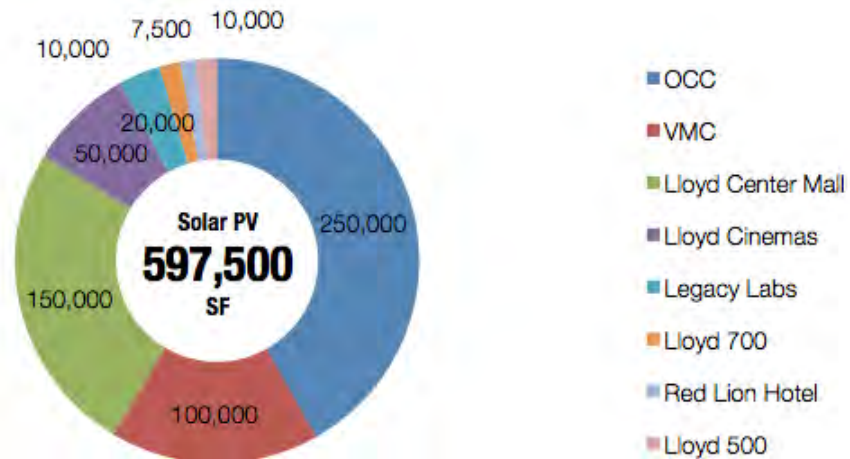


Exhibit I - Additional Solar PV Opportunities

### Business Case Assessment

Given the current installed cost of solar PV and available incentives, building owners will pay a premium over current electricity rates to generate renewable energy through solar PV. Recent solar PV rates for large project disclosed by PGE were around \$0.21 (2012) and \$0.18 (2013). These rates are more than double current electricity rates of PacifiCorp (\$0.075). Even though the installed cost of solar PV has come down substantially over the last five years (\$8.50 per watt in 2007 and \$3.50 per watt in 2012), capital cost will continue to be a

barrier for Lloyd EcoDistrict property owners considering self-performing solar PV. 300,000 SF to 600,000 SF of solar PV will cost approximately \$10.5M to \$21M respectively.

Third party business models exist however to lessen this gap, providing solar PV at an affordable rate by reducing installed cost by supply chain control and maximizing available incentives including accelerated depreciation.

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. The Lloyd EcoDistrict will work with the eight property owners shown in Exhibit I, at a minimum, to ensure enough solar PV is installed to meet its renewable energy goal. Solar PV implementation via a third party provider like OCC is evaluating should be considered (see Action #8 and Action #12).

RESPONSIBLE PARTY: Lloyd EcoDistrict

TIMEFRAME: 2014-2015

# OCC / CONVENTION CENTER HOTEL DISTRICT ENERGY

## ACTION #10

The City of Portland's 2009 Climate Action Plan recognizes the advantages of district energy and establishes the goal of producing "ten percent of the total energy used within the City/Multnomah County from on-site renewable sources and clean district energy systems" by 2030.

### District Energy Opportunity

The central plant serving the Oregon Convention Center (OCC) is nearing the end of its functional life-cycle and will need to be replaced during the next 2-3 years. The 600-room Convention Center Hotel will require new boilers and chillers to provide energy service when constructed over the next 2-3 years. Both facilities are located directly across the street from each other and, due to their respective timelines and central plant needs, represent a potential opportunity to implement district energy to benefit both projects to potentially reduce energy and save money.

### Business Case Assessment

Successful implementation of district energy generally follows two pathways: business-to-business (B2B) or public policy (ie, carbon emissions reduction policy). The opportunity between OCC and the Convention Center Hotel represents the B2B pathway where both buildings require central plant capital investments during a timeframe where a shared system implemented between the two could reduce and/or eliminate the overall

### CONVENTION CENTER HOTEL SITE:



could reduce and/or eliminate the overall capital required by each party to provide energy service via a third party district energy provider.

Similar examples of successful district energy system implementation via the B2B pathway include The Brewery Blocks including recent expansion to the new, LEED Platinum 12th & Washington Building (district cooling) and The Round in Beaverton (district heating and cooling). Both projects benefited from the capital and O&M benefits provided by district energy.

Because district energy systems require installation of major long-term infrastructure in the form of central energy plants and piping infrastructure (often located within the public right-of-way), some form of public involvement is often necessary. This could be in the form of direct public investments or through policies to help reduce investment risk and internalize public benefits in private decision making.

OCC and the Convention Center Hotel are just beginning discussions of the potential financial benefits – in addition to performance benefits – of implementing district energy to serve both facilities. Preliminary district energy feasibility, including the assessment of potential benefits to each building and potential additional buildings, will be conducted by both parties in early 2014.

### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Although not directly involved in district energy feasibility at OCC and the Convention Center Hotel, the Lloyd EcoDistrict should continue to be supportive of district energy as it benefits a number of Energy Action Plan objectives including return on investment (ROI), attracting outside expertise and capital, brand differentiation and scale.

RESPONSIBLE PARTY: Lloyd EcoDistrict

TIMEFRAME: 2014-2016

# 4. CATALYSTS

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THESE ACTIONS WILL ACCELERATE FUTURE ENERGY INVESTMENT...

**KNOWLEDGE SHARING**

**MONITORING & BENCHMARKING**

**DEMONSTRATION PILOTS**

## ACTION #11

# ENERGY EFFICIENCY WORKING GROUP

### Roles and Responsibilities

SAC-member engagement proved invaluable in helping to develop the Lloyd EcoDistrict Energy Action Plan. Transitioning from project planning to project implementation will require a similar group to ensure success. A new advisory group, the Lloyd EcoDistrict Energy Efficiency Working Group, will be created to fill this need.

The primary objective of the Energy Efficiency Working Group is to ensure successful implementation of the Lloyd EcoDistrict Energy Action Plan.

### Structure and Membership

The Lloyd EcoDistrict Energy Efficiency Working Group should serve as a working group of the Lloyd EcoDistrict Board (see Exhibit J). Membership should include:

#### *Energy Action Plan Project Partners*

All property owners involved with Energy Action Plan projects. Number = 10.

#### *Lloyd EcoDistrict Board Members*

Two Board members should be involved to maintain Board direction. Number = 2.

#### *Public Partners*

Public partners including PDC, BPS, Metro PacificPower and ETO should be represented. Number = 5.

#### *Industry Partners*

Private and non-profit partners experienced with project delivery and/or program development should be included. Number = 4.

Group membership should be around 20. Final Working Group membership should be decided by the Lloyd EcoDistrict Board.

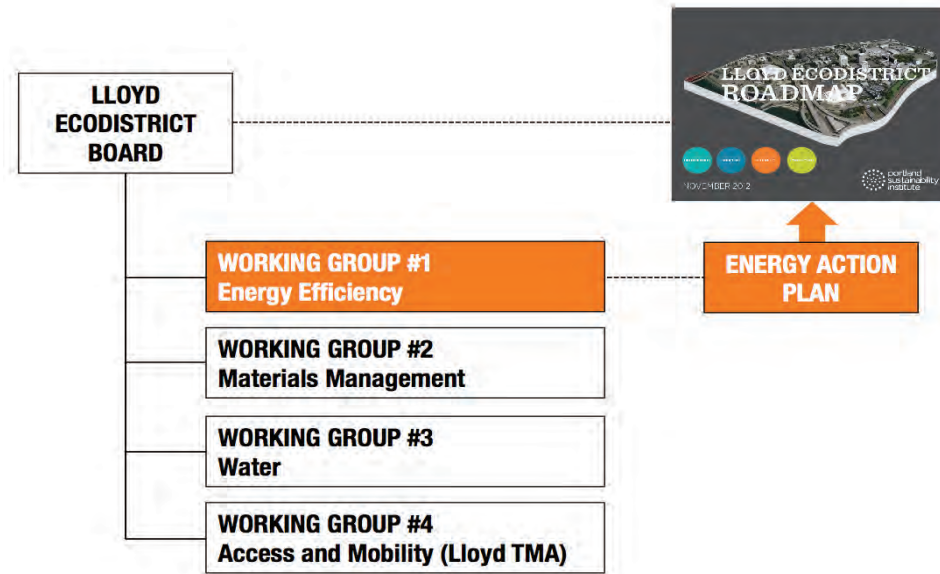


Exhibit J - Energy Efficiency Working Group

#### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Organize and launch Energy Efficiency Working Group

RESPONSIBLE PARTY: Lloyd EcoDistrict

TIMEFRAME: 2014

# EXISTING BUILDING ENERGY PROTOCOL

## ACTION #12

Building on the stakeholders' engagement in both the Lloyd EcoDistrict Roadmap and this effort, the EcoDistrict will use the following protocol to support existing building energy reduction efforts:

### 1 Understand Energy Use

Understand your building's annual energy use is the first step to mastering energy performance and controlling energy budget. Gather a minimum of 12 months of utility bills for all fuels and all meters (three years, is even better, with monthly averages helping to smooth non-representative differences related to weather and occupancy). Set up an Energy Star Portfolio Manager account to facilitate ongoing tracking and access Portfolio Manager resources, to benchmark your building's performance against similar buildings.

### 2 Building Performance & Project Identification

After developing an understanding of your building's relative annual energy performance, have a skilled engineer or contractor walk the building, during daytime operating hours and during night conditions. These two looks will provide an opportunity to see how systems are performing during regular operating hours and if systems and equipment are shutting down, as scheduled, during non-occupied hours.

This walk through should also identify for conditions such as uncontrolled infiltration (air leakage), from the building envelope, improperly controlled HVAC dampers, and elevator shafts. Evaluate the remaining life and energy performance of equipment and systems.

### 3 Business Case Assessment

When considering energy-efficiency projects, look at the life cycle performance of each proposed measure, within the context of projects that you know will need attention in upcoming years (e.g. end-of-life replacement of major pieces of equipment). If your building does not submeter major energy using systems (lighting, heating, cooling, ventilation, etc.) many engineers and contractors will be able to perform short-term metering to provide insight into exactly how and where your building is using the most energy, knowledge that will help prioritize energy efficiency measure opportunities. (The Energy Trust often has incentive dollars available for investigations with this level of detail.) Metering, as a basis for project evaluation is often referred to as the basis for an "investment-grade audit". Try to prioritize and accelerate and implement lower-cost measures, such as O&M improvements and envelope sealing, before more expensive measures. This strategy may provide opportunities to reduce loads on heating and cooling equipment, by increasing the performance of envelope and lighting systems, before replacing HVAC systems (allowing smaller capacity HVAC selection, as a result of the lower loads).

### 4 Leverage EcoDistrict Structure & Delivery

Continue to explore opportunities for bulk purchasing or market leverage across EcoDistrict projects. Learn from other Lloyd EcoDistrict owners/managers, which engineers and contractors have provided exceptional service. Learn from colleagues about currently competitive market pricing.

### 5 Project Implementation

Project elements requiring access to tenant spaces, for construction, will be implemented as those spaces become available. The initial, major projects, addressing the heating and cooling plant and the building envelope will be completed during the five-year planning horizon.

#### LLOYD ECODISTRICT ACTION: Complete the following:

1. Working Group to review, revise and finalize Existing Building Energy Protocol
2. Lloyd EcoDistrict to use Protocol as a guide for engagement as more existing buildings are involved in EcoDistrict efforts.

RESPONSIBLE PARTY: Lloyd EcoDistrict  
TIMEFRAME: 2014

## ACTION #13

# ENERGY BENCHMARKING & MONITORING

Understanding energy use is foundational to identifying smart energy efficiency investments. Actual building energy use data is key.

### Assumed vs. Actual Energy Use

For the Lloyd EcoDistrict Roadmap, district-scale energy use was estimated based on GIS-based building information and assumed building energy performance resulting in an annual energy use estimate of 981,800 MMBtu/year. This estimate was further revised based on more detailed GIS-based building information and CBECs EUI data, resulting in an annual energy use estimate of 977,403. Both estimates are fairly comparable.

Energy use data was collected for 24 buildings utilizing Portfolio Manager to generate actual EUIs. Actual and estimated EUIs were then compared to each other (see Exhibit K) resulting in significant variation between values – and annual energy use varied greatly between the two estimates. As a result, actual energy use data should be used when identifying energy efficiency projects at the building-scale.

### Energy Benchmarking & Monitoring

To support continued energy efficiency improvements, the Lloyd EcoDistrict will support efforts to benchmark and monitor energy use at both the building-scale and district-scale. Building-scale benchmarking will be important to helping building owners understand how their facilities are performing

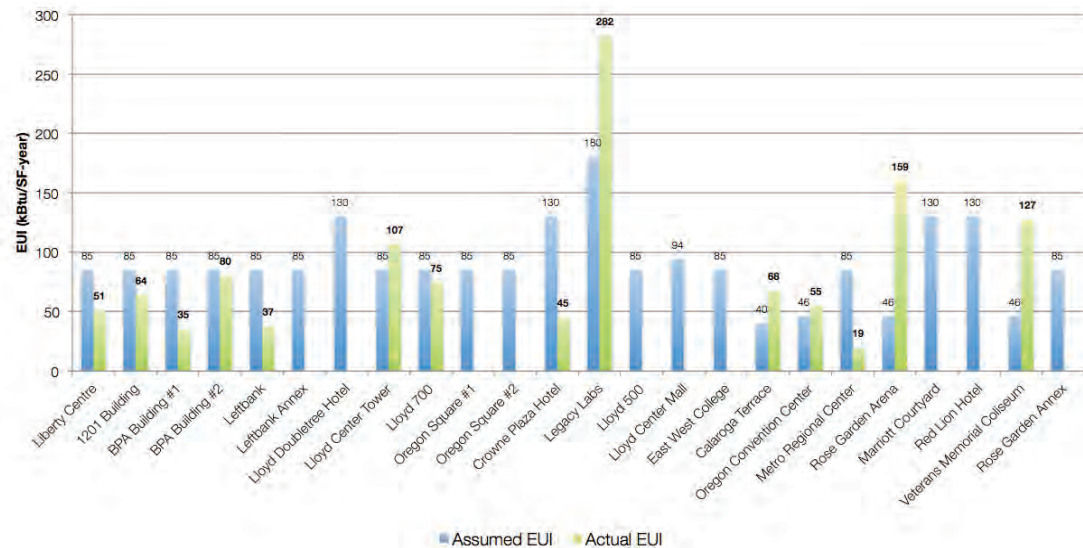


Exhibit K - Comparison of Assumed and Actual EUIs (SAC Buildings)

compared to other similar facilities and understand potential energy efficiency projects to help reduce energy use. Moreover, district-scale benchmarking will be useful to track progress toward Lloyd EcoDistrict goals as well as compared performance to other EcoDistricts or neighborhoods.

Portfolio Manager will serve as the primary tool to monitor building energy use within the district. New and existing building owners participating in Lloyd EcoDistrict efforts will update Portfolio Manager accounts annually.

### LLOYD ECODISTRICT ACTION:

Complete the following:

1. EcoDistrict building owners to use Portfolio Manager and provide annual updates.
2. Lloyd EcoDistrict to maintain Portfolio Manager master account to monitor and summarize building energy use.
3. EcoDistrict to report on annual energy use to progress toward energy goals annually.

RESPONSIBLE PARTY: Lloyd EcoDistrict  
TIMEFRAME: 2014

# BULK PURCHASE DEMONSTRATION PILOT

## ACTION #14

Successful implementation of this project will demonstrate the potential value of Lloyd EcoDistrict building owners working together to reduce project cost through collaborative project delivery as represented in Quadrant B in Exhibit L (ie, multi-building, self-perform).

### Project Opportunity

A number of existing building owners in the Lloyd EcoDistrict are planning, or have expressed interest in, retrofitting existing parking lighting with high-efficiency LED-lighting to reduce energy costs. Specific interested buildings include:

- Oregon Convention Center
- Veterans Memorial Coliseum
- Rose Garden Arena
- Legacy Research Institute
- Kaiser Permanente
- Lloyd Center Tower
- Lloyd Center Mall

Since the lighting requirements across most of parking areas associated with these buildings will be similar, there is the potential to negotiate a price reduction for LED-lighting equipment purchased in mass (ie, “bulk purchase”). This approach is similar to a number of government programs such as the GSA’s Blanket Purchasing Agreements (BPAs) where multiple government facilities may purchase equipment and materials at pre-negotiated rate schedules minimizing purchasing cost and time. Moreover, further cost reduction and

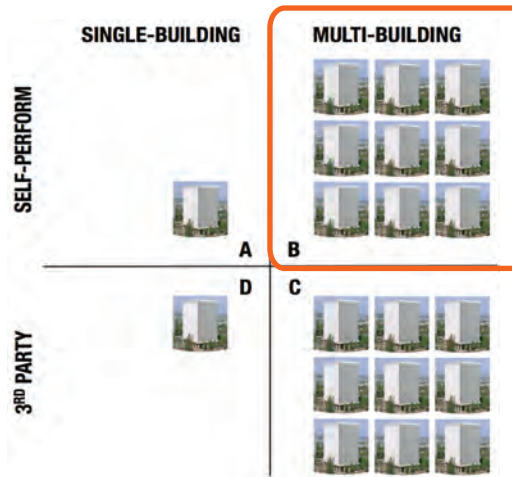


Exhibit L - Project Delivery Options

delivery ease may be realized through bulk implementation where multiple project owners work with a single contractor to deliver LED-lighting retrofits.

### Business Case Assessment

Preliminary evaluations of LED-lighting retrofits have estimated project payback in less than 2-3 years. As a result, buildings like OCC, VMC and the Rose Garden are already budgeting for LED-lighting retrofits in their capital improvement plans. This demonstration pilot will explore if LED-lighting price reductions can be realized through bulk purchasing and/or overall project cost reduction realized through bulk delivery.

### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Finalize Interested Buildings & Similar Lighting Needs
2. Develop Joint Purchase Strategy/Joint Delivery Strategy
3. Issue RFP for Joint Purchase/Joint Delivery Partner & Select Partner
4. Implement LED-lighting retrofits
5. Verify Value Proposition (ie, price, ease of delivery, etc.)

RESPONSIBLE PARTY: Lloyd EcoDistrict

TIMEFRAME: 2014

## ACTION #15

# PREFERRED SOLAR PROVIDER

Similar to Action #14, this project will demonstrate the potential value of Lloyd EcoDistrict building owners working together to reduce project cost through collaborative project delivery. However this project represents a multi-building, 3rd party effort (ie, Quadrant D in Exhibit M).

### Project Opportunity

Action #8 – OCC Solar PV and Action #9 – Additional Solar PV both identify the use of a 3rd party provider to implement solar PV. Based on that direction, the Lloyd EcoDistrict could help to establish a strategic relationship with a “preferred solar provider” to provide a uniform deal structure and delivery package to Lloyd EcoDistrict members buildings.

Over 600,000 SF of solar PV potential has been identified in the Lloyd EcoDistrict including the following buildings:

- Oregon Convention Center
- Veterans Memorial Coliseum
- Lloyd Center Mall
- Lloyd Cinemas
- Legacy Research Institute
- Lloyd 700
- Red Lion Inn
- Lloyd 500

The “preferred solar provider” would provide all management, finance, construction and operations for turn-key solar PV implementation.

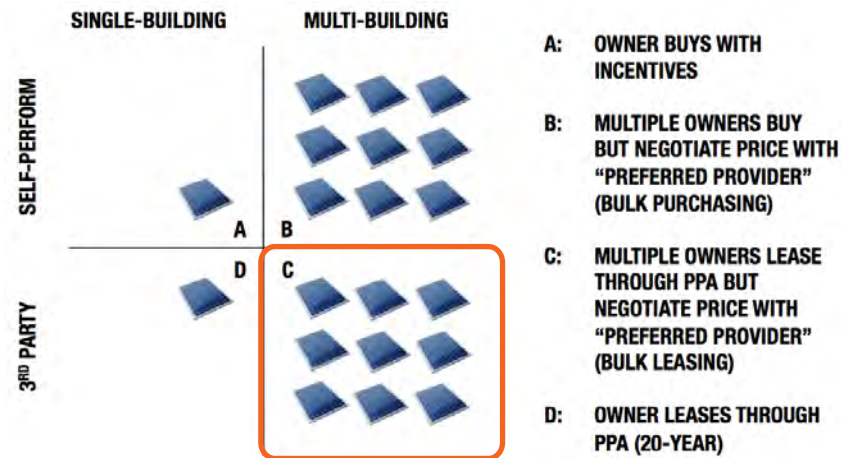


Exhibit M - Project Delivery Options

A Lloyd EcoDistrict-specific solar PV agreement would be created to simplify contracting and provide reliability and certainty for all parties involved.

### Business Case Assessment

The potential value of the “preferred solar provider” would be to reduce product and installation cost through the use of a single provider while improving financing terms. Market outreach indicated that multi-building, self-perform (Quadrant B) could reduce solar PV cost from \$3.50 per watt to less than \$3.00. Utilizing 3rd party delivery could reduce overall costs even more. The results of Action #8 – OCC Solar PV should be reviewed as a guide.

### LLOYD ECODISTRICT ACTION:

Complete the following:

1. Finalize Interested Buildings & Solar Potential
2. Discuss Potential Solar PV Purchase Agreement Terms
3. Issue RFP for Joint Solar PV Purchase Agreement & Select Partner
4. Implement Solar PV projects
5. Verify Value Proposition (ie, price, ease of delivery, etc.)

RESPONSIBLE PARTY: Lloyd EcoDistrict

TIMEFRAME: 2014

**ONE GOAL**

**FIVE YEARS**

**FIFTEEN ACTIONS**

