
URBAN SUSTAINABILITY
& PERSONAL ENERGY
MANAGEMENT

ECODISTRICTS
SUMMARY

In an EcoDistrict model:

- Resource flows are **scaled appropriately**.

- Energy and water sources are **localized**.

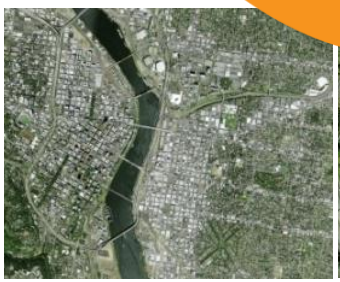
- Food, economics, cultural resources have strong **regional** components.

- Ideas and culture have **global** reach with strong local identity.

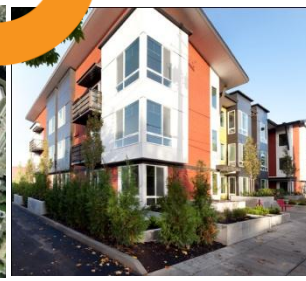

planet


bio-region

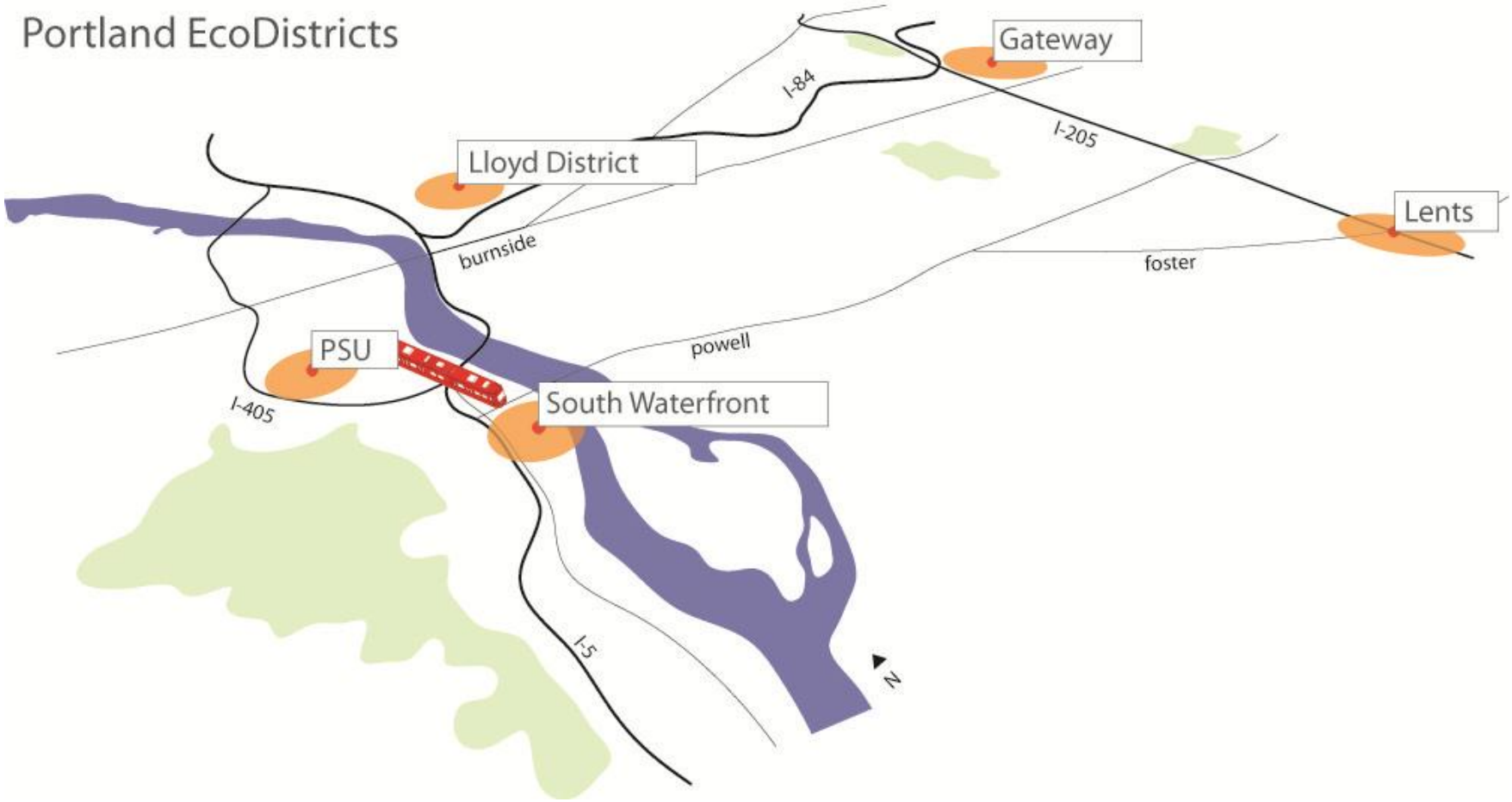

city region


city


neighborhood


home

ECODISTRICTS
PILOT DISTRICTS



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ECODISTRICTS
PSU PILOT

The PSU pilot EcoDistrict is envisioned to create a model that will guide future efforts in Portland and elsewhere, through a rich collaboration of the University, the City and other district residents and stakeholders.

University EcoDistrict Pilot Objectives:

1. establish a common basis for policy, investment, incentives, etc.
2. advance metrics, R&D agenda
3. create incentives for partnership & investment
4. facilitate multiple owner behavioral change

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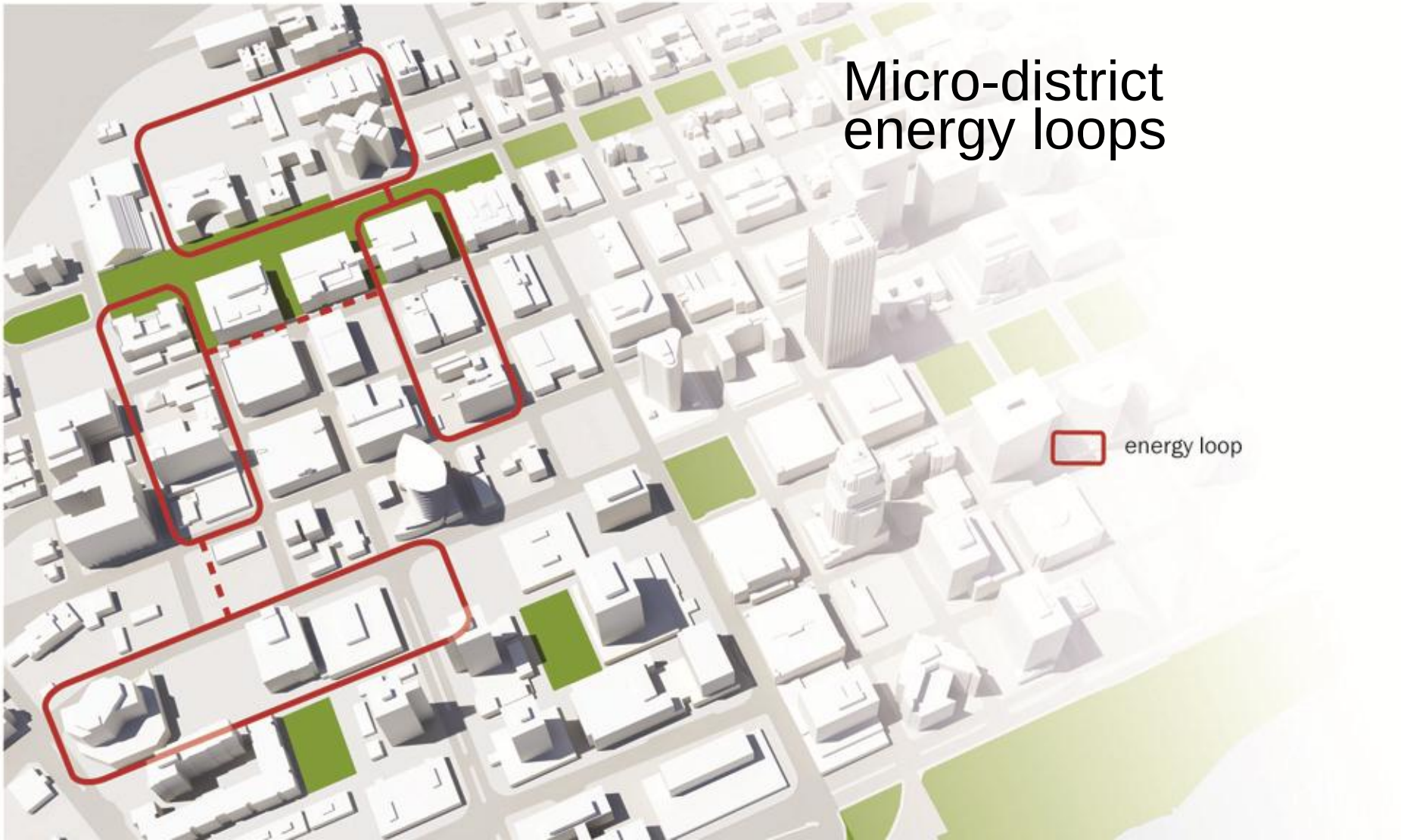
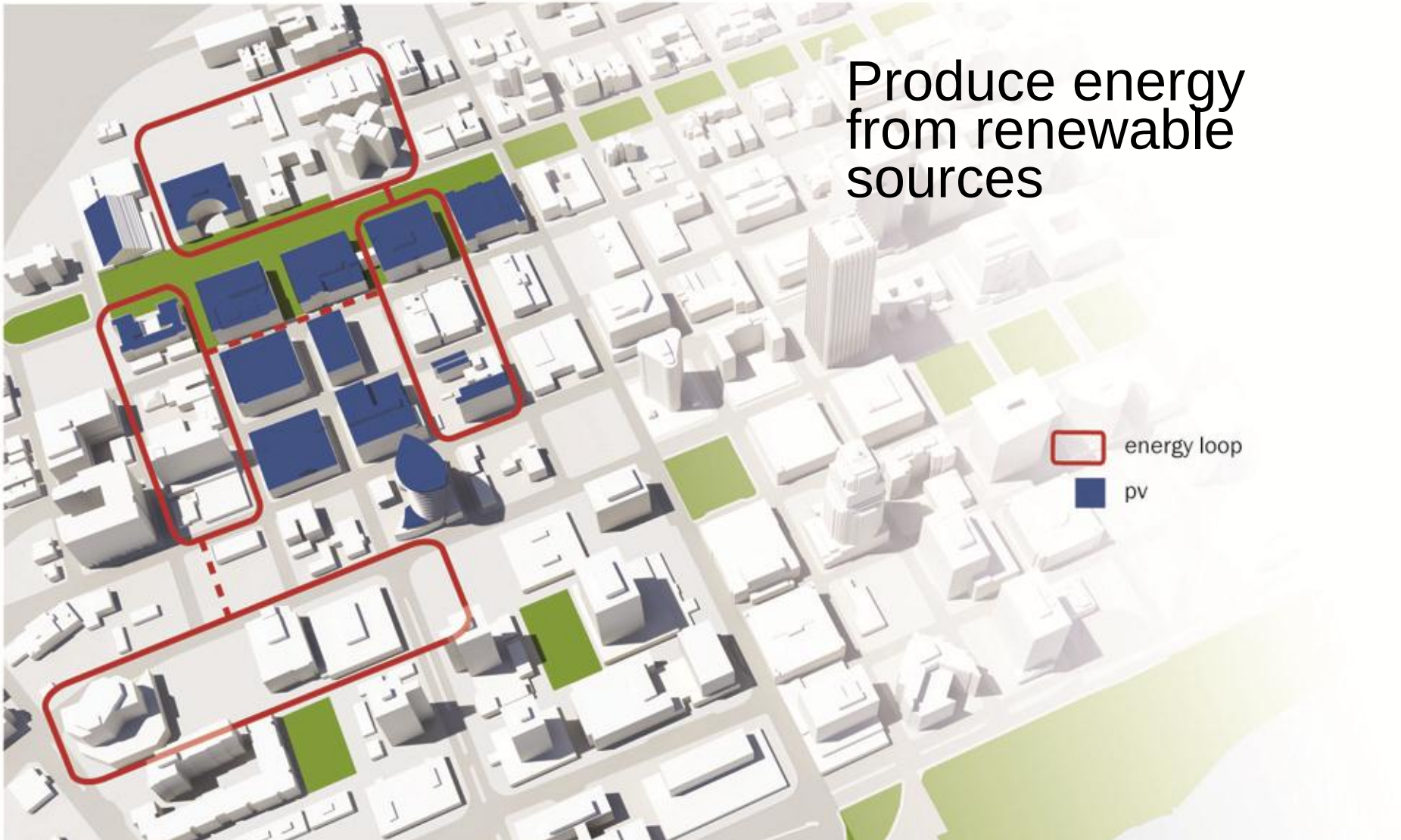
ECODISTRICTS
BASELINE CONDITIONS

ECODISTRICTS
DISTRICT ENERGY



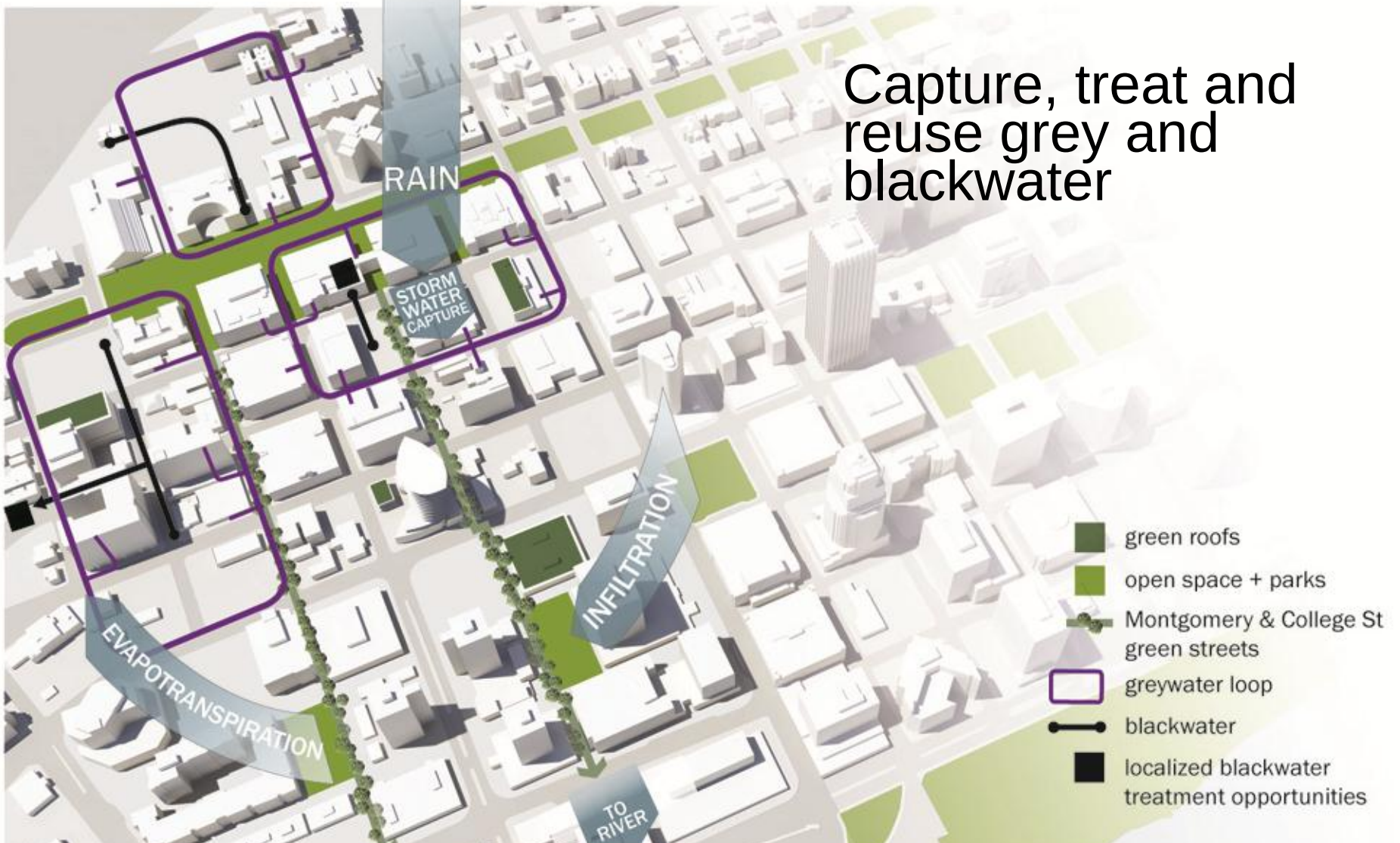
ECODISTRICTS
DISTRICT ENERGY



ECODISTRICTS
WATER MANAGEMENT

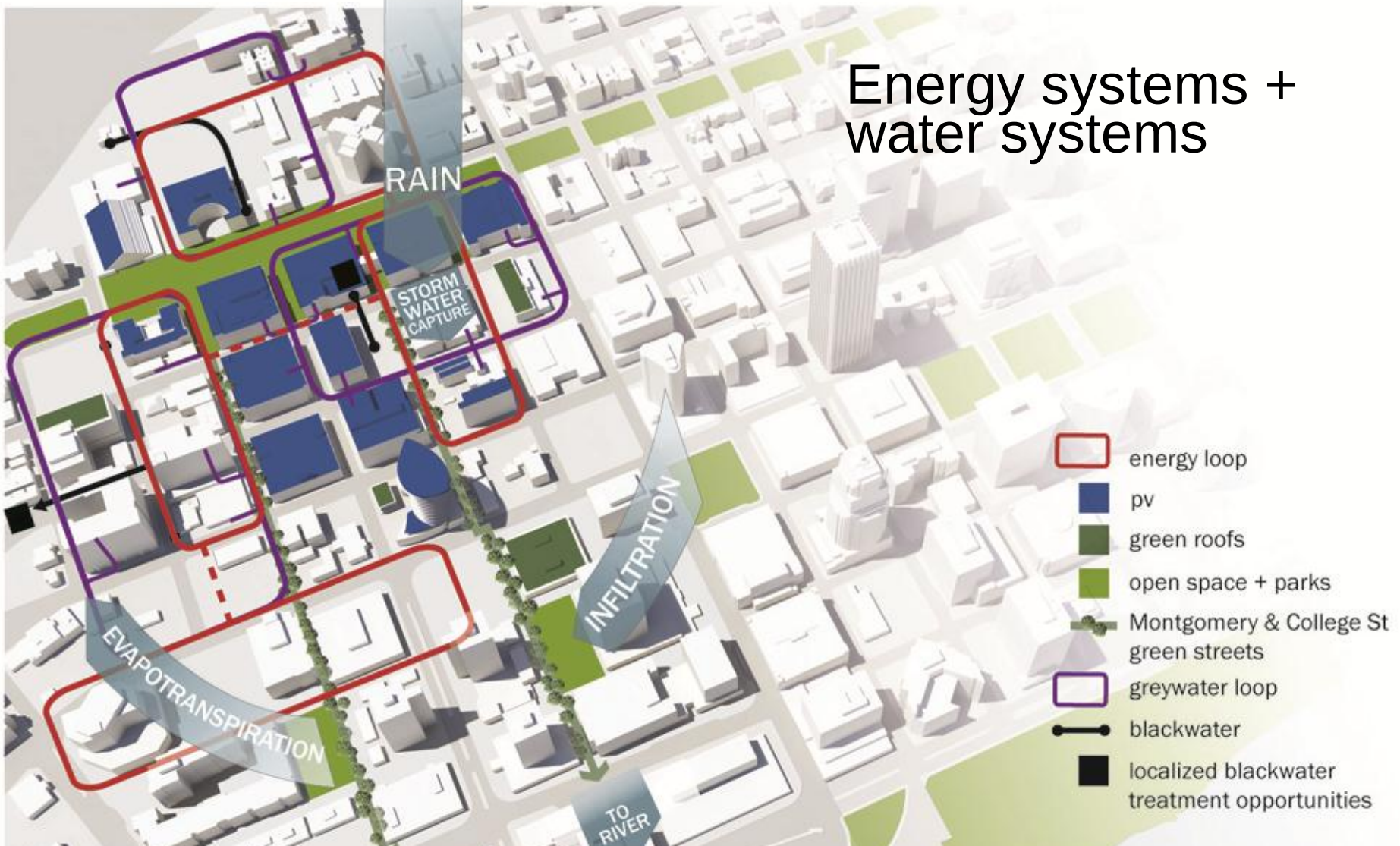
Manage stormwater where it falls

ECODISTRICTS
WATER BALANCE



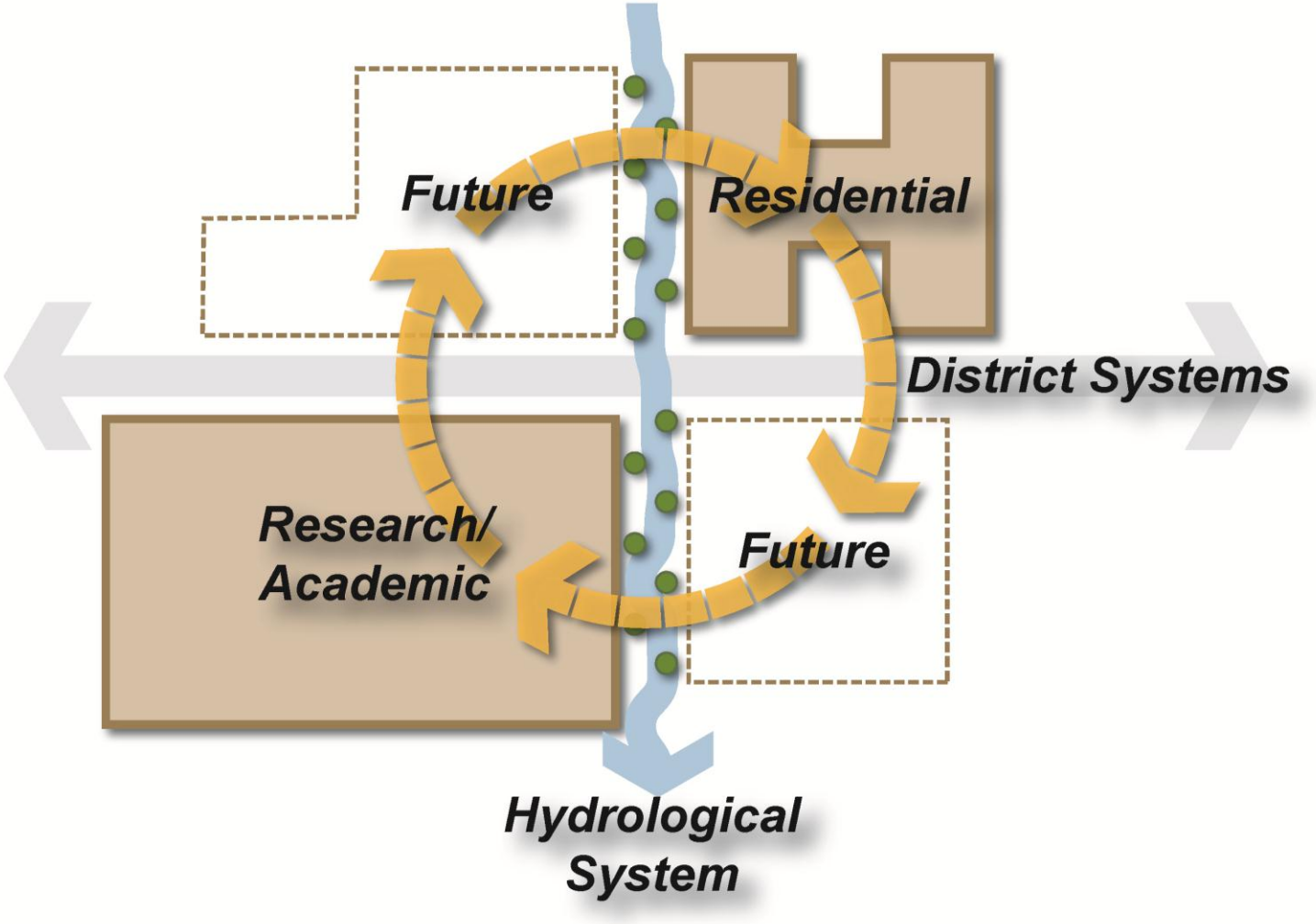
Capture, treat and reuse grey and blackwater

ECODISTRICTS
COMPOSITE SYSTEMS



ECODISTRICTS
COMPOSITE SYSTEMS

ECODISTRICTS
BENEFICIAL RELATIONSHIPS



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EDITH GREEN / WENDELL WYATT FEDERAL BUILDING

- 437,000 SF
- OFFICES
- 18 STORIES

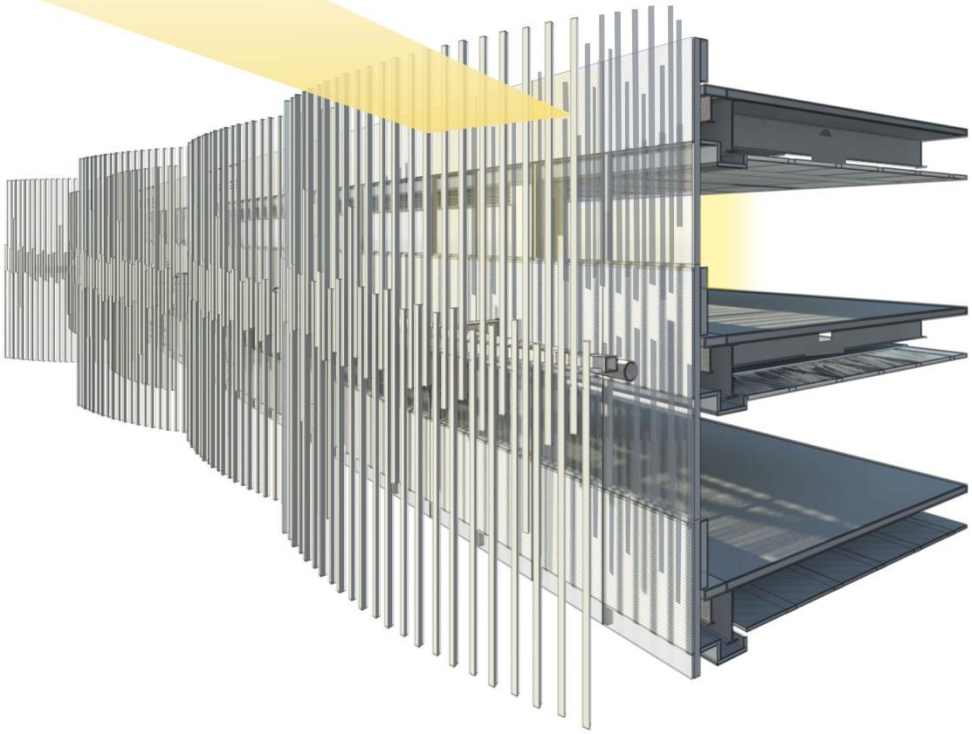
HIGH PERFORMANCE DESIGN

SHADING

West
Reeds provide 50% shading

South & East
Combination vertical + horizontal

North
No shading

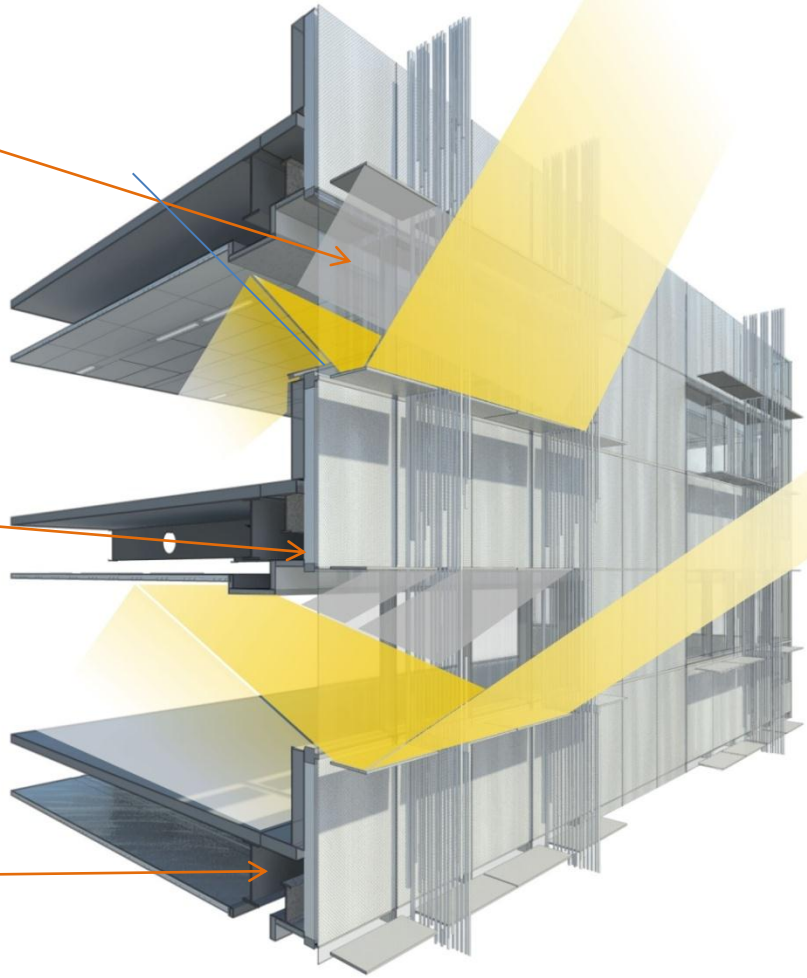


HIGH PERFORMANCE DESIGN

ENVELOPE & DAYLIGHTING

Summer mid-day sun (high angle)

Low glazing to wall ratio

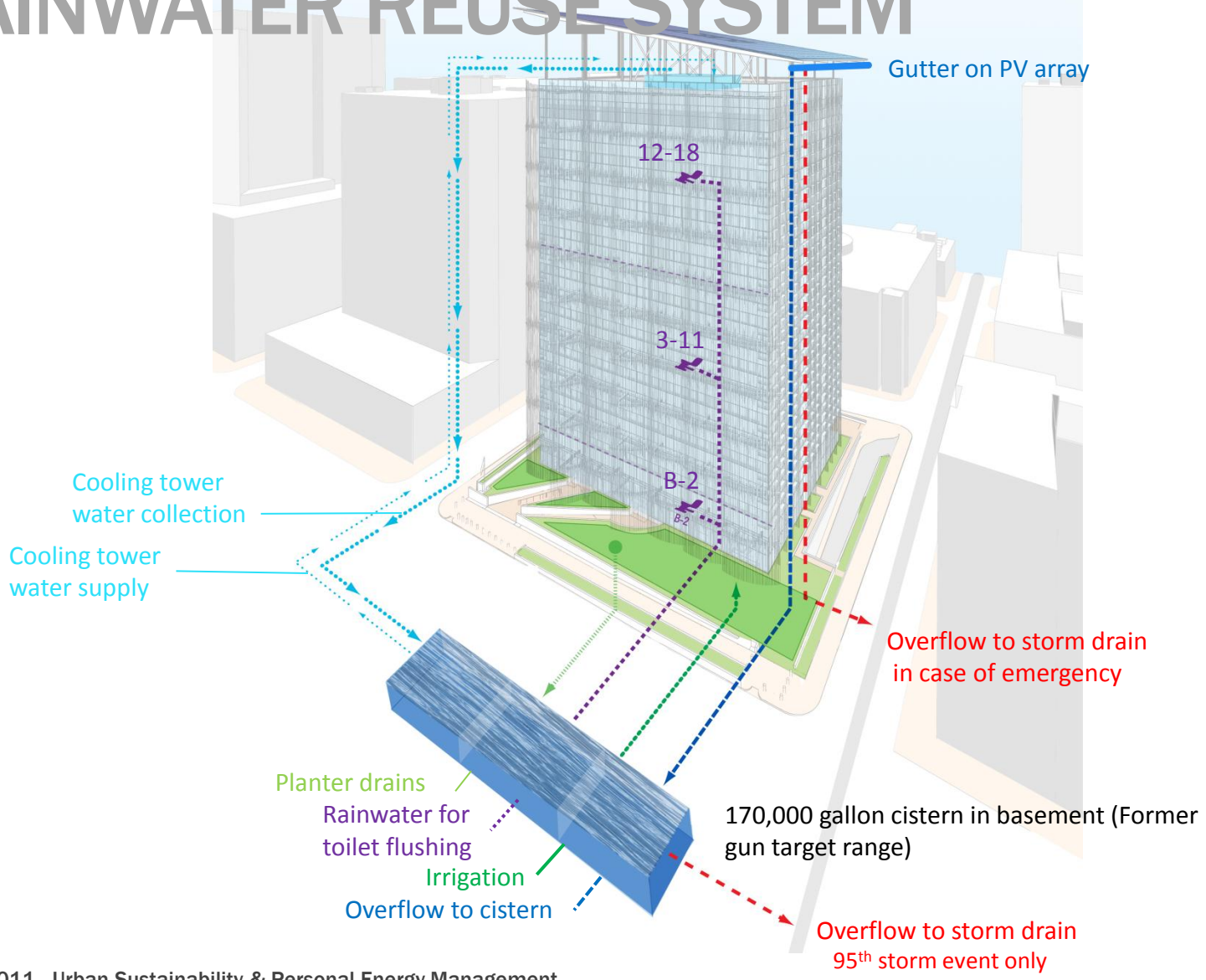


Low infiltration rate

Equinox morning sun (lower angle)

Super-insulated wall

WATER CONSERVATION
RAINWATER REUSE SYSTEM



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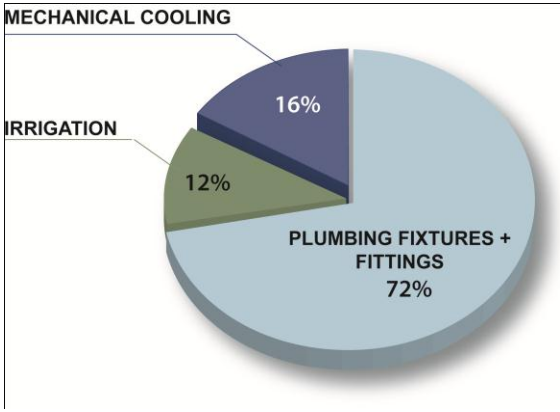
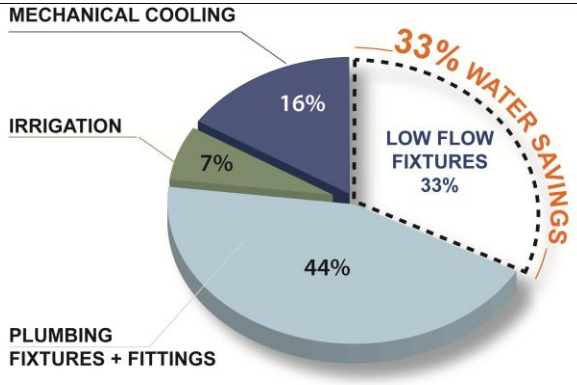
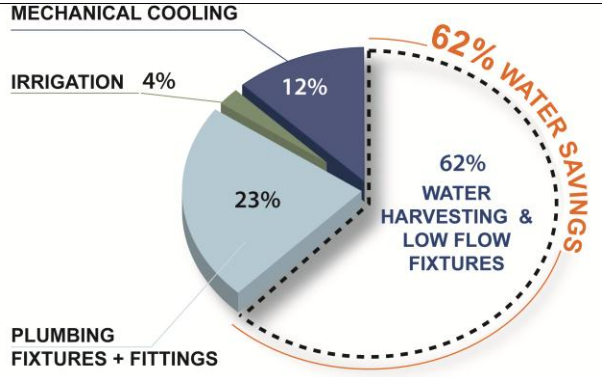
WATER CONSERVATION
SAVINGS







Water Usage Base Case

ARRA Goal = 20% Indoor Potable Water Reduction

50% Outdoor Potable Water Reduction

Low Flow Fixtures

Proposed Water Use Reduction

+Rainwater Collection

Proposed Water Use Reduction

* Graphic combines both Indoor and Outdoor potable use

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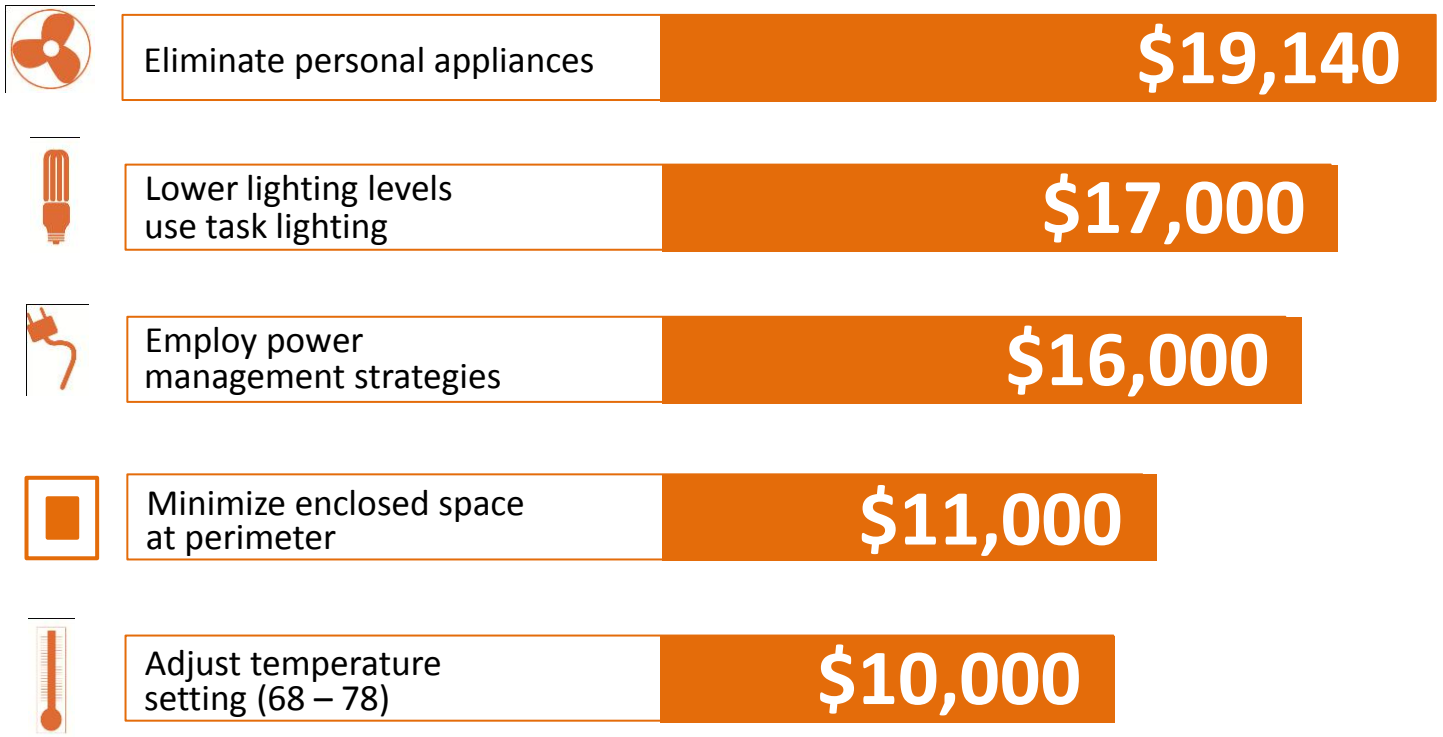
GREEN INITIATIVES
FOR THE WORKPLACE

TENANT LEASE STRATEGY

ANNUAL ENERGY COST SAVINGS ($/yr)



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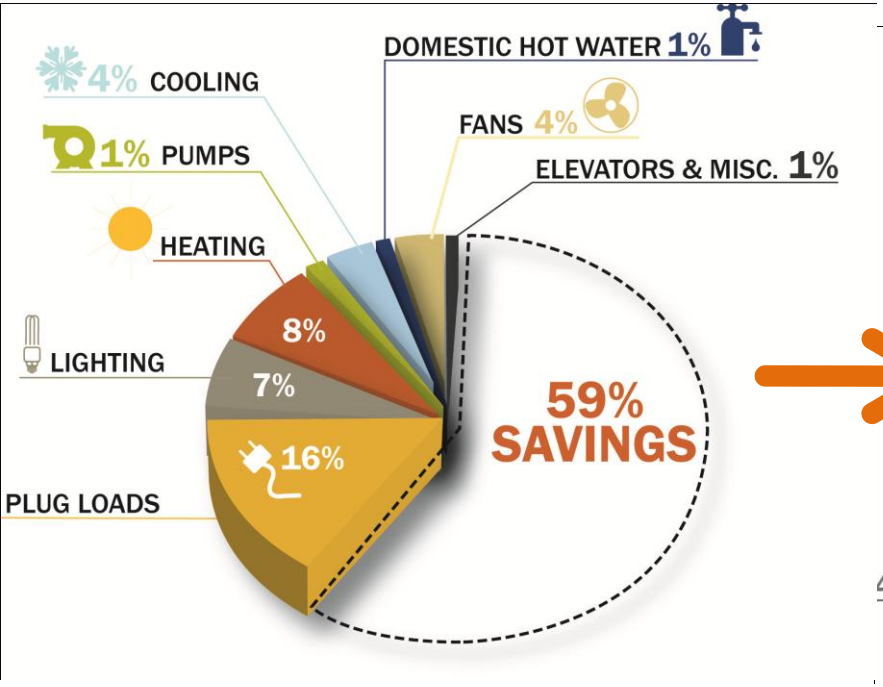
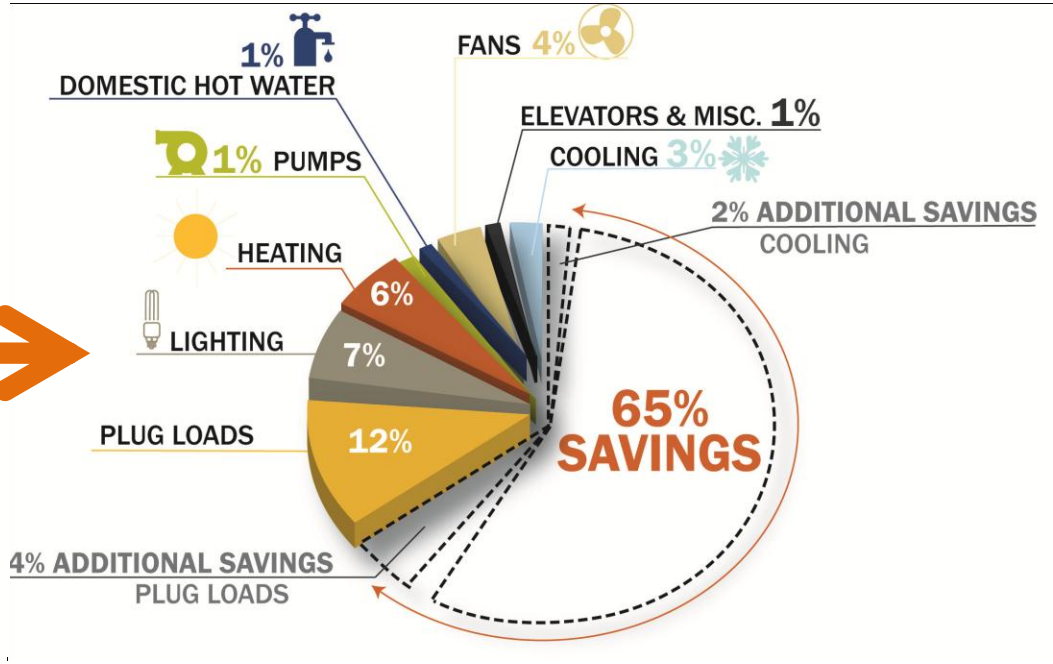
ENERGY USE
WITH TENANT ENGAGEMENT





POTENTIAL
ENERGY SAVINGS
Without Tenant ECMS

ENERGY SAVING GOAL
With Tenant ECMS

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INTEGRATED CENTRAL NERVOUS SYSTEM

Bldg communication structure

Lighting control

Electrical metering & monitoring

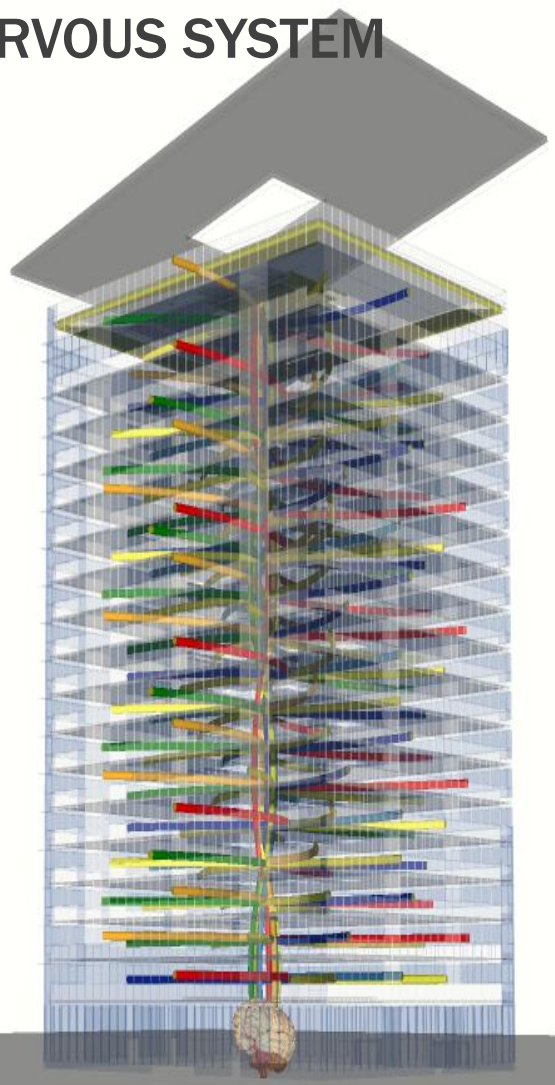
Building automation system

Access control and intrusion

Closed circuit television

Digital display and dashboard

...with room for expansion for s




OREGON SUSTAINABILITY CENTER

PROJECT MISSION

To create a world class center of excellence in sustainability that celebrates and nurtures the values and strengths of Oregon's leadership in climate change, land use planning, smart growth, green building, environmental stewardship, civic engagement and social justice.

LIVING BUILDING CHALLENGE

Performance Areas

- Net-Zero Energy
- Net-Zero Water
- Net-Zero Waste Water
- Non-toxic Materials

Overview

- 7 focus areas
- 20 requirements
- Projects must be operational 12 months

LIVING BUILDING CHALLENGE™ 2.0

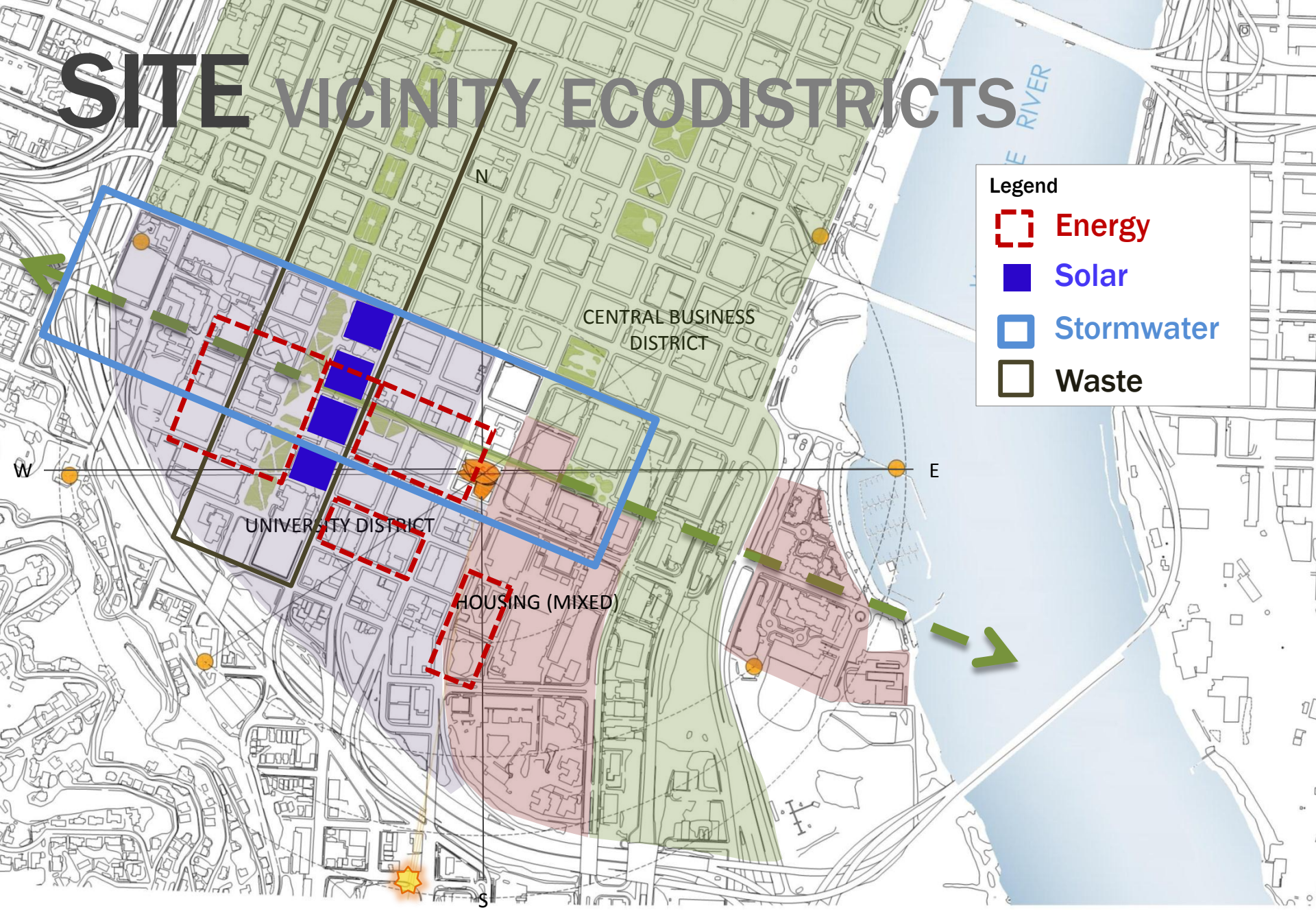
A VISIONARY PATH TO A RESTORATIVE FUTURE

www.ilbi.org

INTERNATIONAL LIVING BUILDING INSTITUTE™

"It's about what you do, not what you say you'll do"

SITE VICINITY ECODISTRICTS



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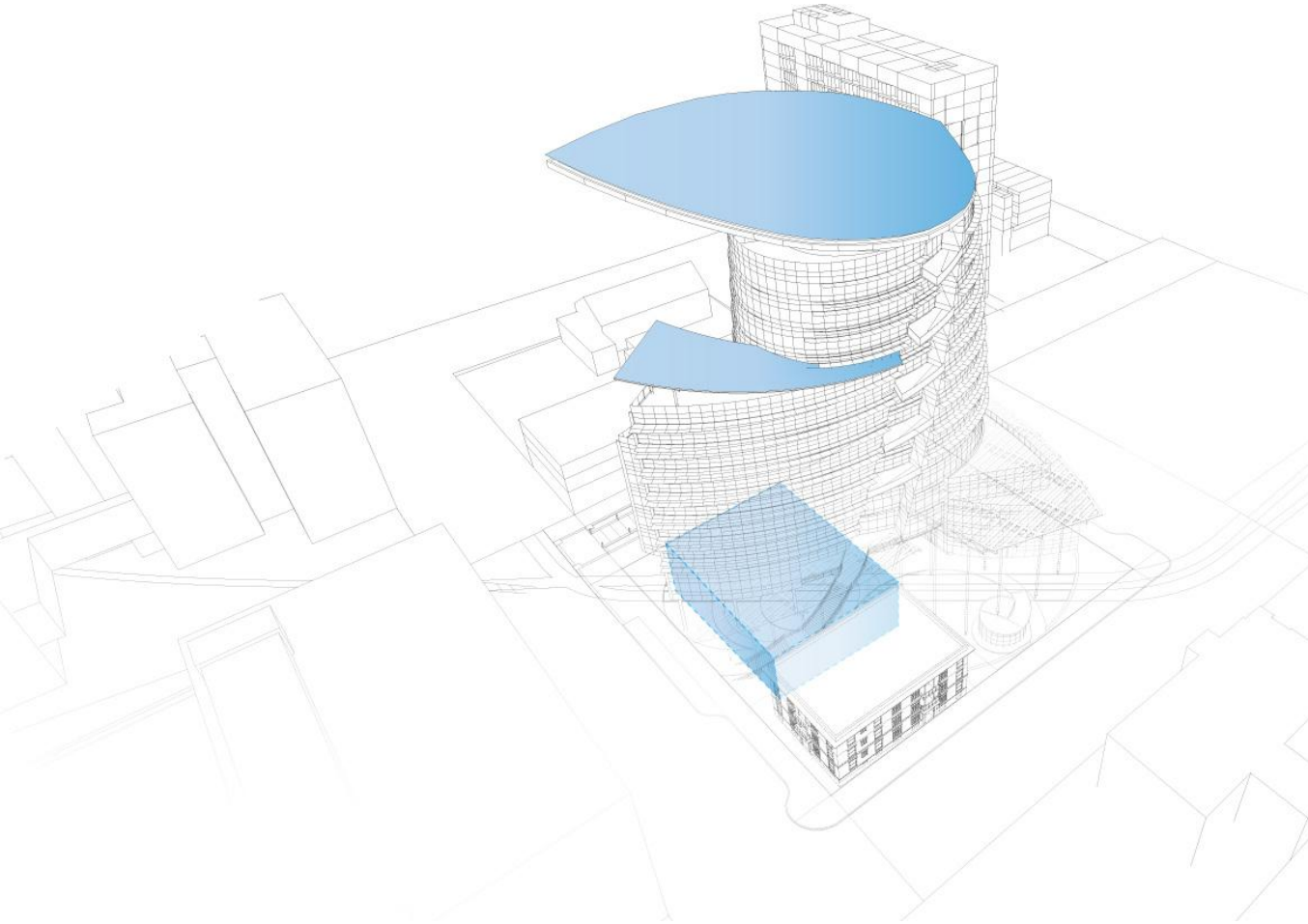
WATER
NET ZERO



HIGH ROOF TOP=

407,000 gallons

Average year

ROOFTOP + 10th floor =

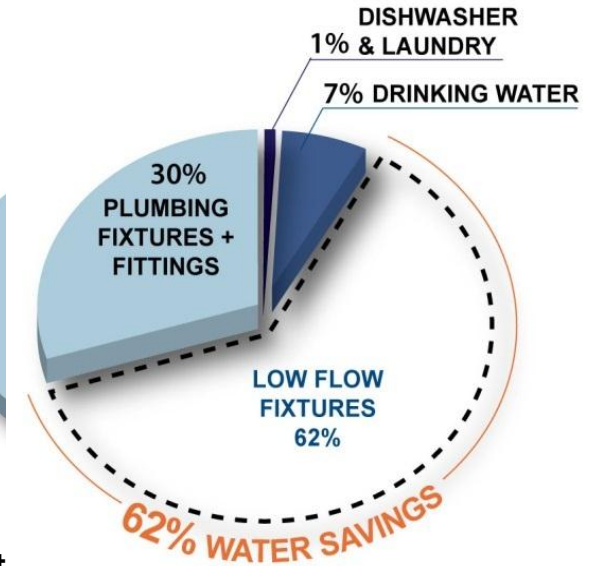
323,000 gallons

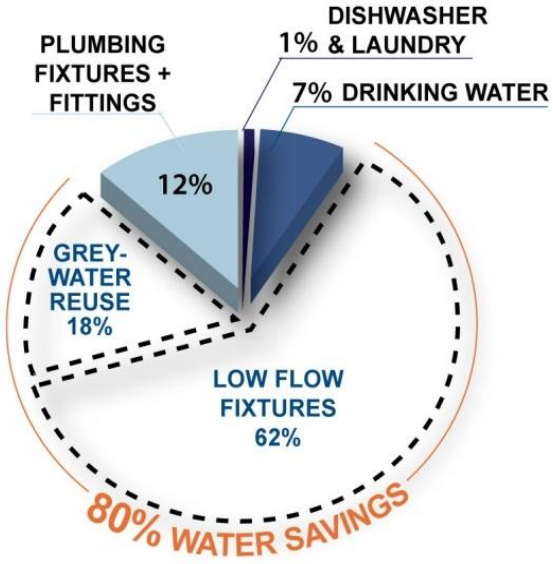
Dry year

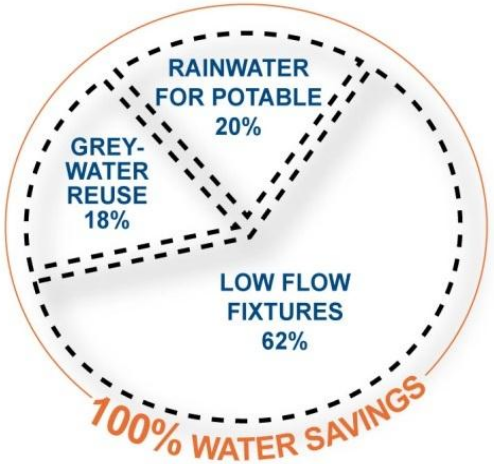
POTABLE WATER STORAGE=

200,000 gallons

WATER SAVINGS







Wat on

Low Flow Fixtures

Proposed Water Use Reduction

+ Greywater Recycling

Proposed Water Use Reduction

+ Rainwater Collection

Proposed Water Use Reduction

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SUSTAINABLE
WATER DISCHARGE

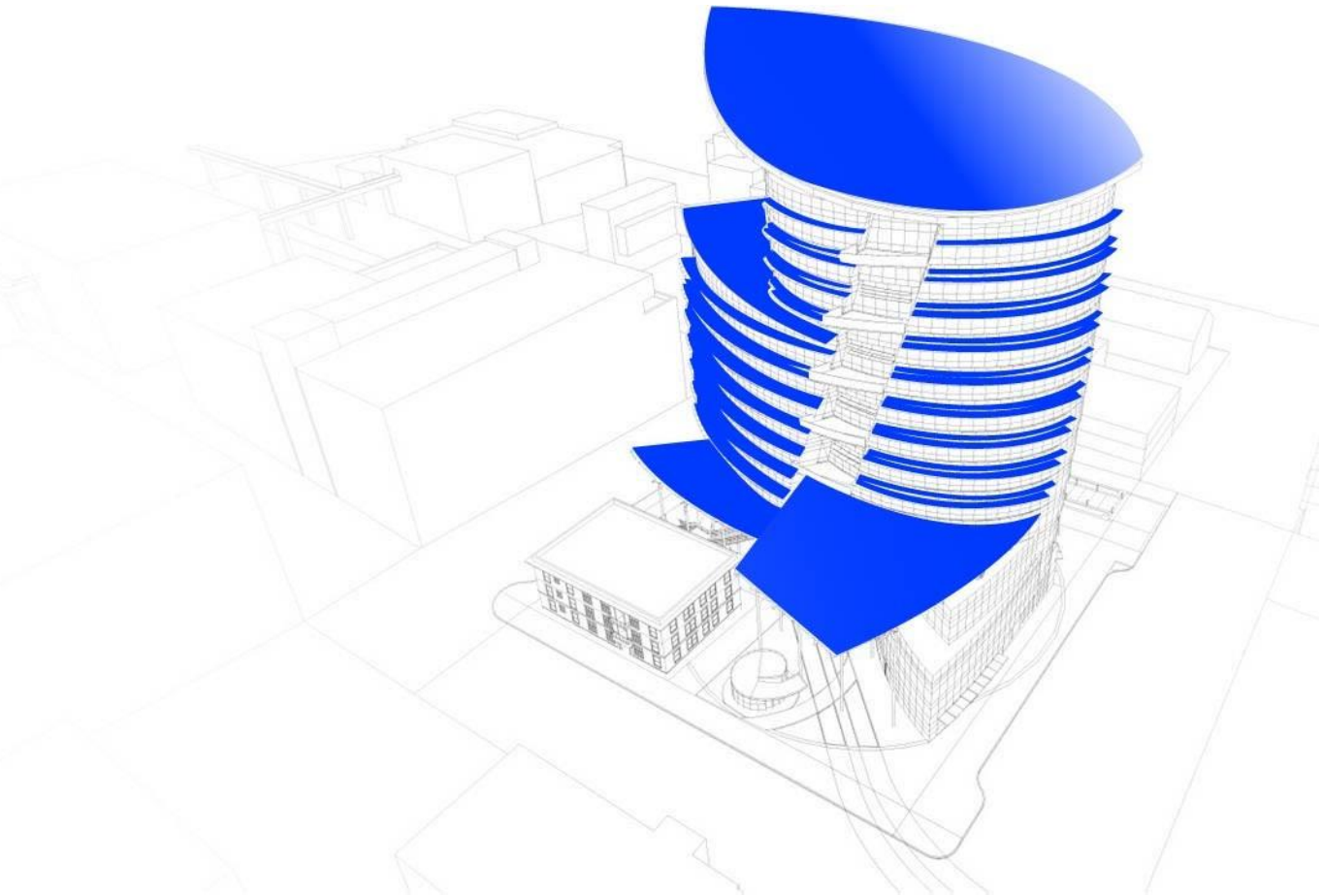
IRRIGATION:

ECO-ROOFS/PLANTERS

RECHARGE:

MONTGOMERY STREET ACQUIFER

ENERGY
RENEWABLES INTEGRATION



CANOPIES = 9,900 sf

21% of total energy

ROOFTOPS = 26,400 sf

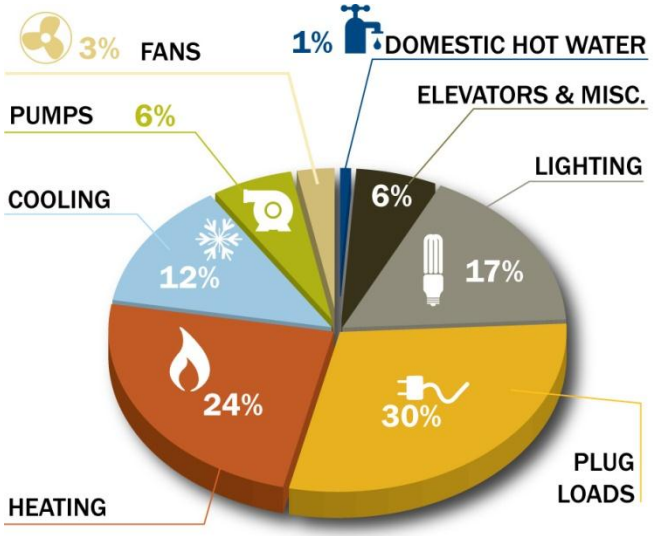
55% total of energy

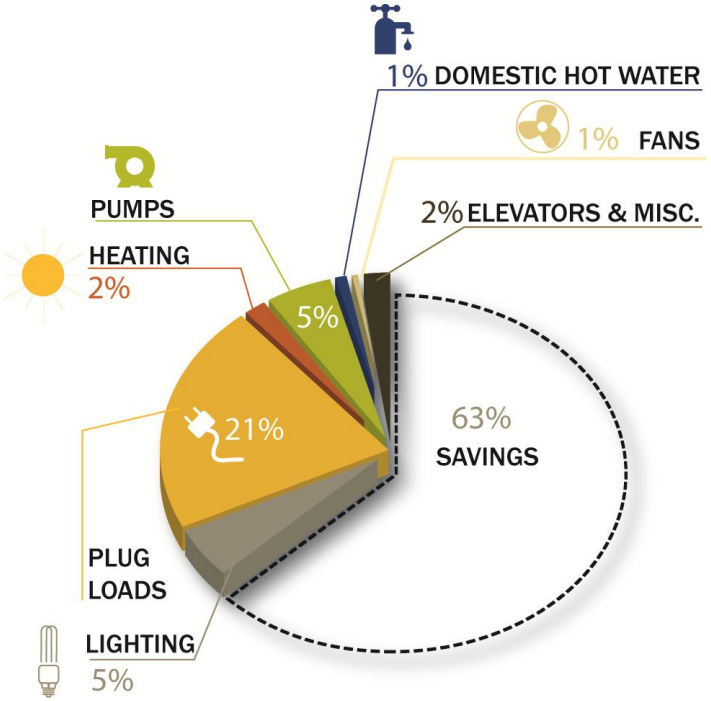
SUNSHADES = 12,325 sf

24% of total energy

TOTAL = 48,625 sf

ENERGY USE
BEFORE TENANT ENGAGEMENT





TYPICAL BUILDING ENERGY USAGE

POTENTIAL ENERGY SAVINGS Without Tenant ECMS

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HIGH PERFORMANCE
WORKPLACE

6 ENERGY SAVING STRATEGIES
STRATEGIES (cost savings in PV not required)

Adjust off-hours activities to occur during the business day ($89k)

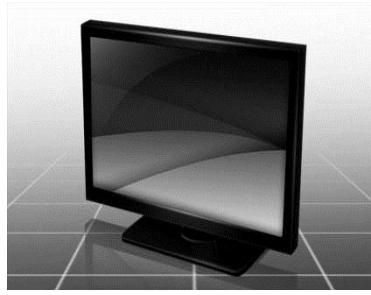
Minimize vertical transportation ($708k)

Slightly adjusted temperature expectations ($268k)

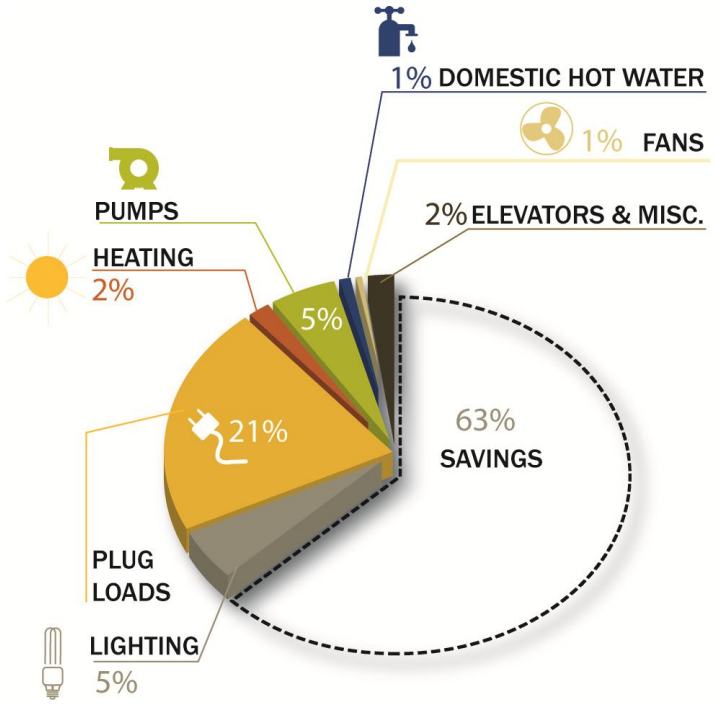
Minimize domestic hot water use ($447k)

Reduce use of printers & copiers ($178k)

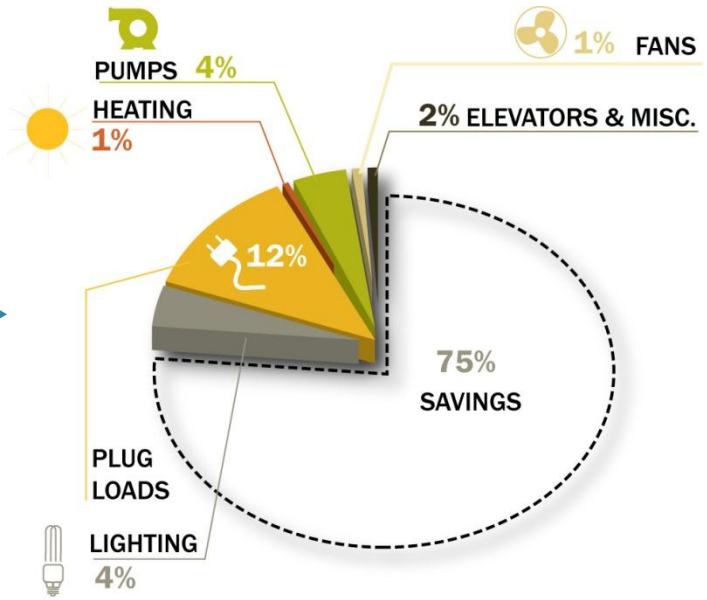
Alternative computing strategies ($5000k)



ENERGY DISTRIBUTION
with TENANT ENGAGEMENT



POTENTIAL
ENERGY SAVINGS
Without Tenant ECMS



ENERGY SAVING
GOAL

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THANK YOU!

QUESTIONS / MORE INFORMATION

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www.serapdx.com
Twitter@ClarkBrockman
SERA Architects

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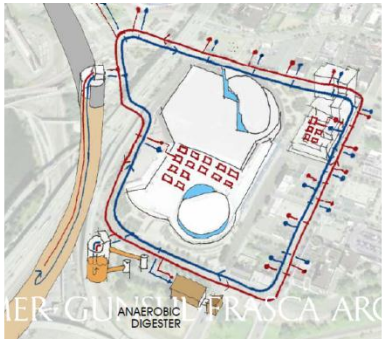
SUSTAINABLE BUILT ENVIRONMENT RESEARCH CONSORTIUM

BEHAVIOR | MATERIALS | FINANCE & PROCESS | ECODISTRICTS | RETROFITS



- knowledge
- feedback
- human factors

- conservation
- health

- financial instruments
- design process

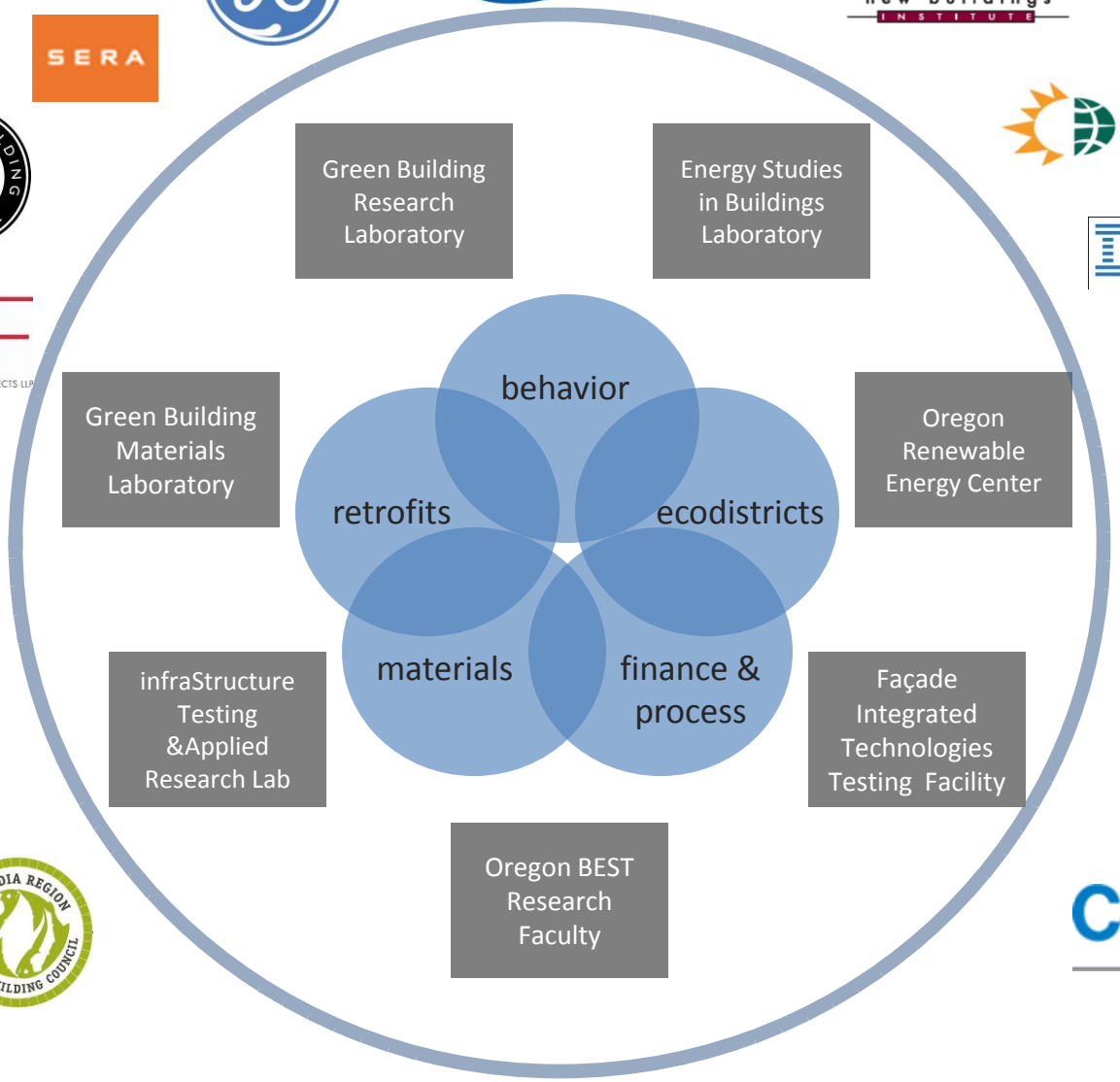
- policy innovation
- district systems

- schools
- high rises
- homes

RESEARCH • COLLABORATION • INNOVATION

Fueling Oregon's Green Economy.™

best™ Oregon Built Environment & Sustainable Technologies Center


Green Building Research Laboratory
Energy Studies in Buildings Laboratory
Green Building Materials Laboratory
Oregon Renewable Energy Center
behavior
retrofits
ecodistricts
materials
finance & process
infraStructure Testing &Applied Research Lab
Façade Integrated Technologies Testing Facility
Oregon BEST Research Faculty

BUILT ENVIRONMENT RESEARCH CONSORTIUM

Oregon University System
Faculty Researchers and
Laboratories

best™
Oregon Built Environment &
Sustainable Technologies Center

Manufacturers
Developers
Design and Construction
Partner NGOs
Utilities

behavior

retrofits

materials

eco
districts

finance &
process

Demonstration Projects – Product and Process Test Bed

Oregon Sustainability Center

& Future OUS and Private projects

Regional Exports

Regional
Intellectual
Capital

Jobs Creation

Attract and
Retain Students
and Faculty

CONSORTIUM
COMMERCIALIZATION TEST BED

- New products installed in new construction or existing buildings
- Oregon BEST researchers evaluate performance, assist manufacturers with proof-of-concept
- Co-branding Opportunities with developers

Oregon University System

Classrooms / Offices
Retail
Sports
Residential
Laboratory

Gerding Edlen

Commercial Office
Condominiums
Apartments
Retail
Institutional

Portland Development Commission

Mixed use
Multi-family residential
Retail
Commercial

OMSI

Museum
Campus Systems
Offices
Classrooms

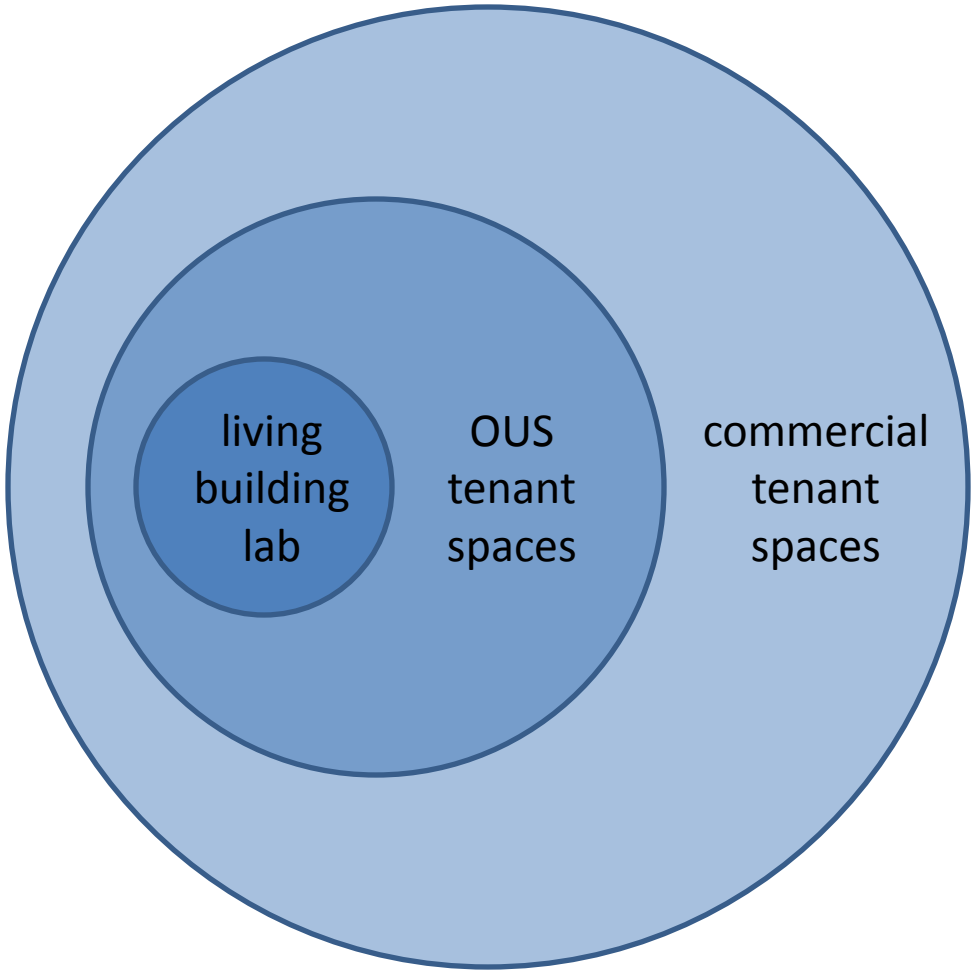
Earth Advantage

Residential
Small-scale commercial

OSC

Office
Classrooms
Retail
Conference

OSC RESEARCH AGENDA
LIVING LABORATORY



- Researcher-Occupied
- Highly Instrumented
- Highly Reconfigurable
- Building Performance Monitoring
- Material Performance Monitoring
- Occupant Surveys - Regular

- Faculty and Staff Occupants
- Highly Instrumented
- Building Performance Monitoring
- Material Performance Monitoring
- Occupant Surveys - Periodic

- Non-OUS Tenants
- Highly Instrumented
- Passive Performance Monitoring
- Occupant Surveys - Infrequent

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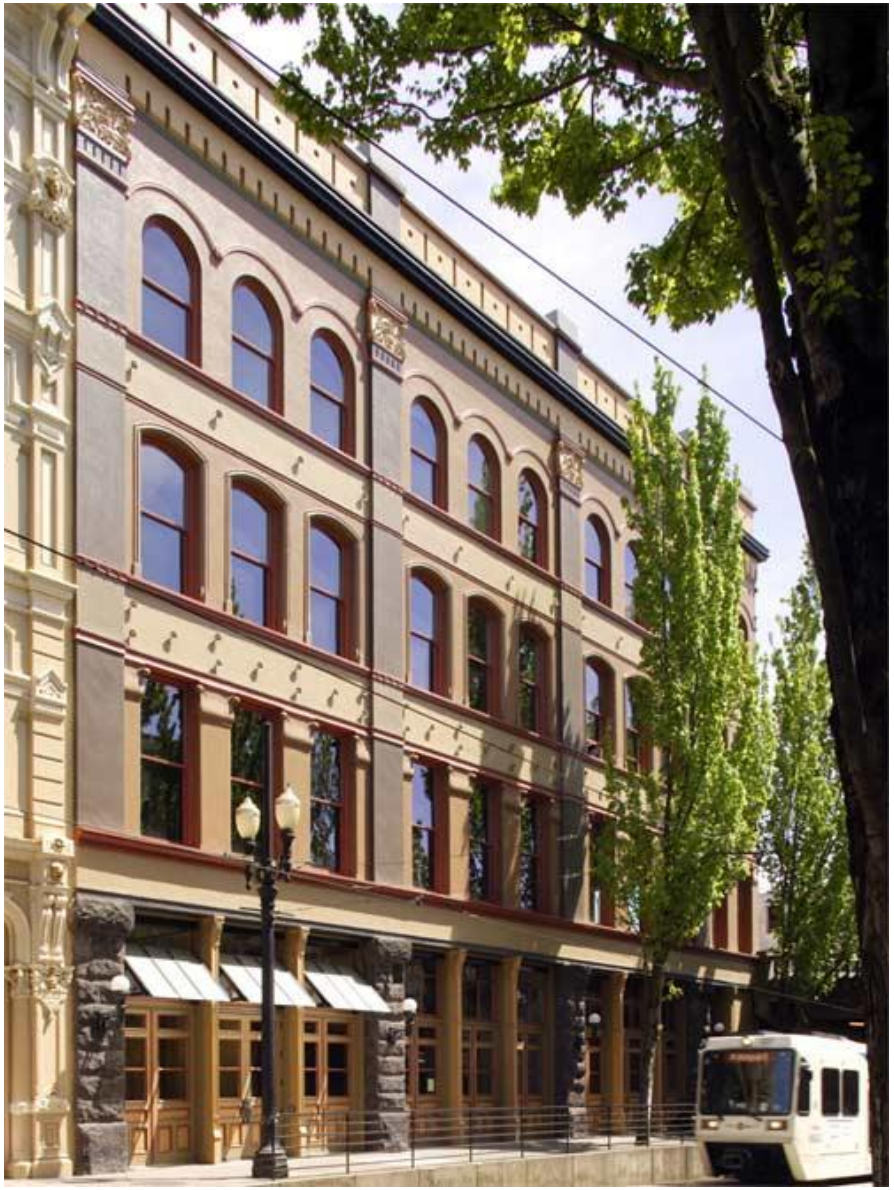

Consortium LAUNCH EVENT January 26th Portland

University of Oregon, Portland
White Stag Building