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# Smart Energy, Smarter Infrastructure

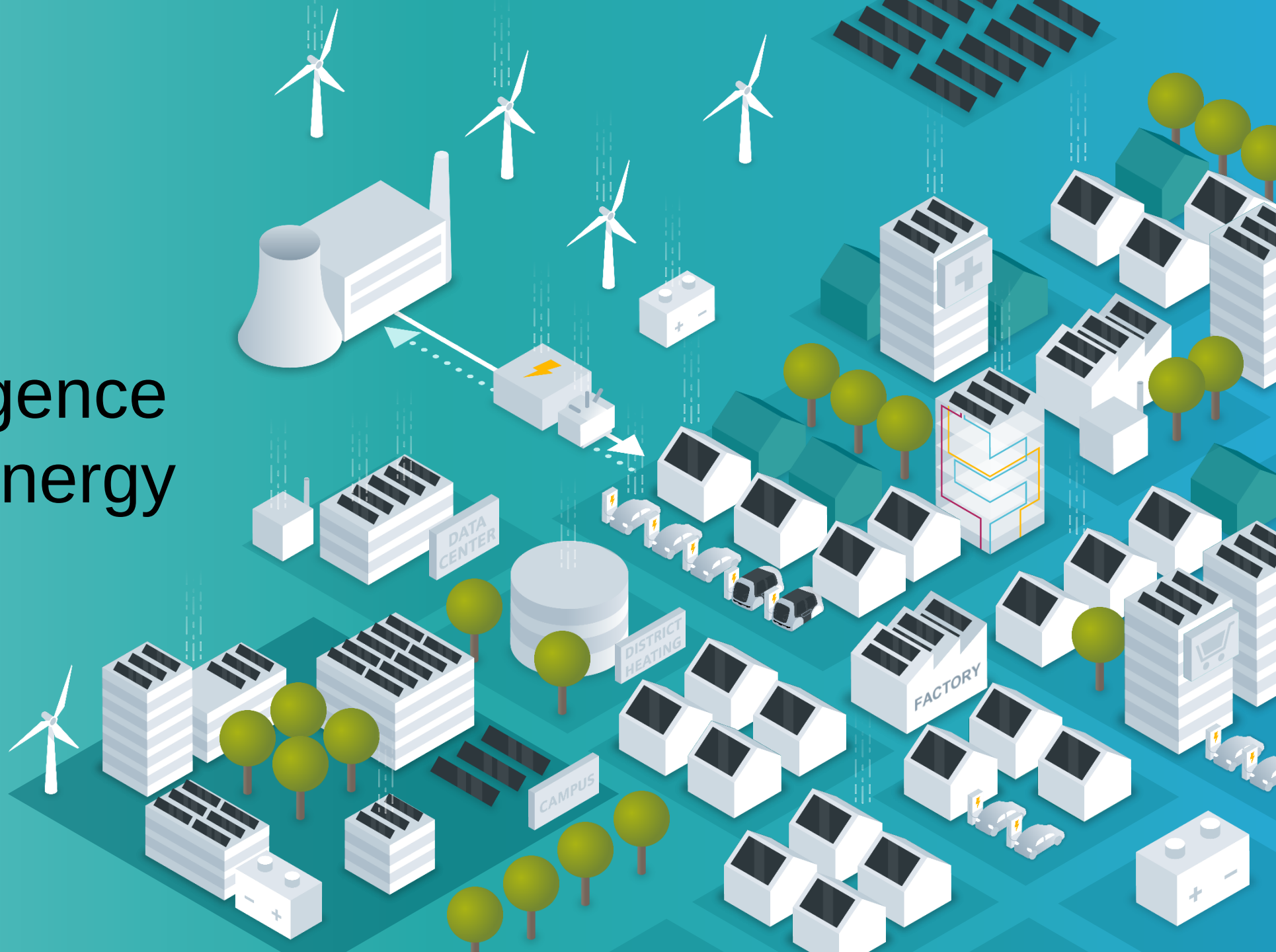
Lidija Sekaric, PhD
Siemens

IDEA 2019, June 2019


Theory
Practice

A Smart Community applies technology and policy solutions that enable holistic integration of public assets for the sake of making great places for *people to live and work*.

# The emergence of a new energy system



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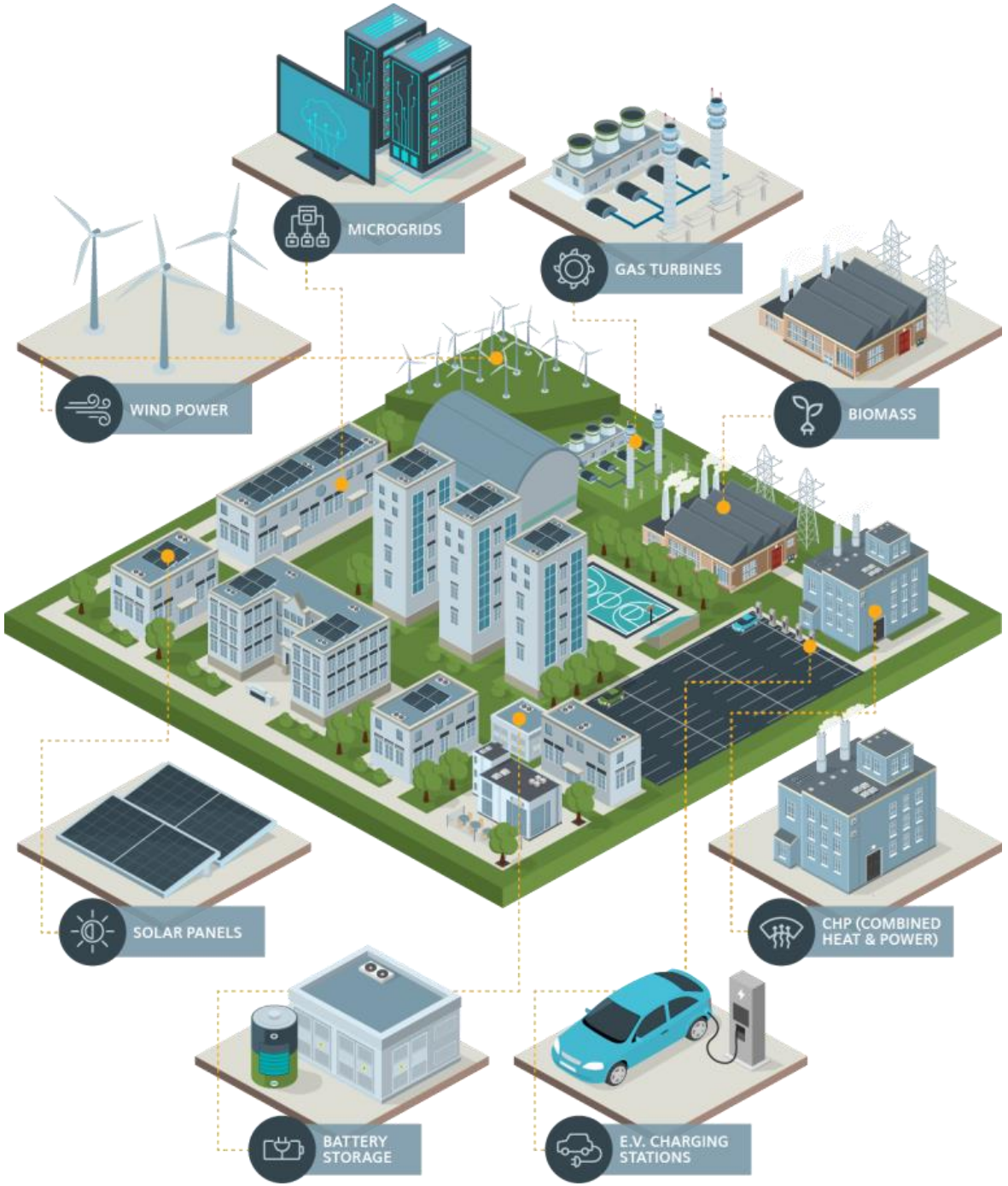

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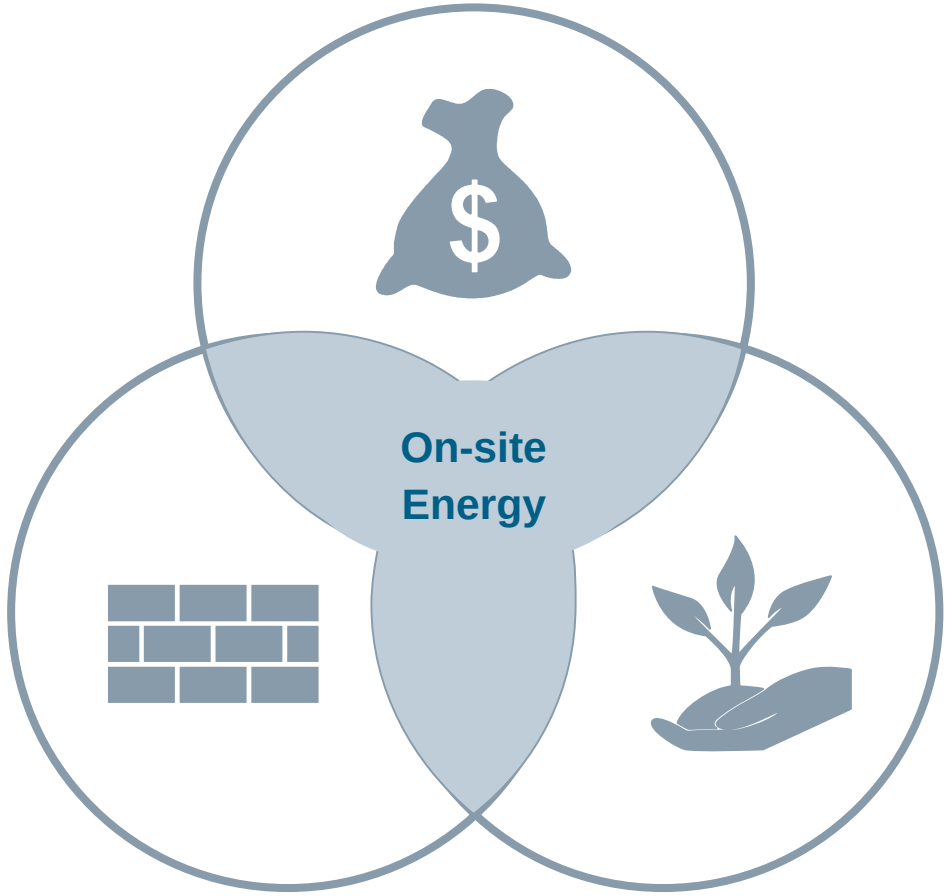
Savings




Resilience

Sustainability

# Blue Lake Rancheria low-carbon microgrid

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THE GREAT TRIBAL SEAL OF THE BLUE LAKE RANCHERIA

## 7 days

Duration of available on-site power
independent from the utility

# Holland co-generation plant

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holland
michigan

## 115 MW

New power generated
via CHP plant

## Largest Snowmelt System in North America

Revitalizes Downtown Economy

# City of Thousand Oaks wastewater treatment plant

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## 100% Energy Self-Sufficient

All of the energy needs are generated on-site

## $400k annual bill savings

## Berkshire Medical Center microgrid

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Berkshire Medical Center

# Planned power resilience

Microgrid with co-generation provides resilience for City of Pittsfield’s critical infrastructure

# Brooklyn microgrid: Neighbors Helping Neighbors

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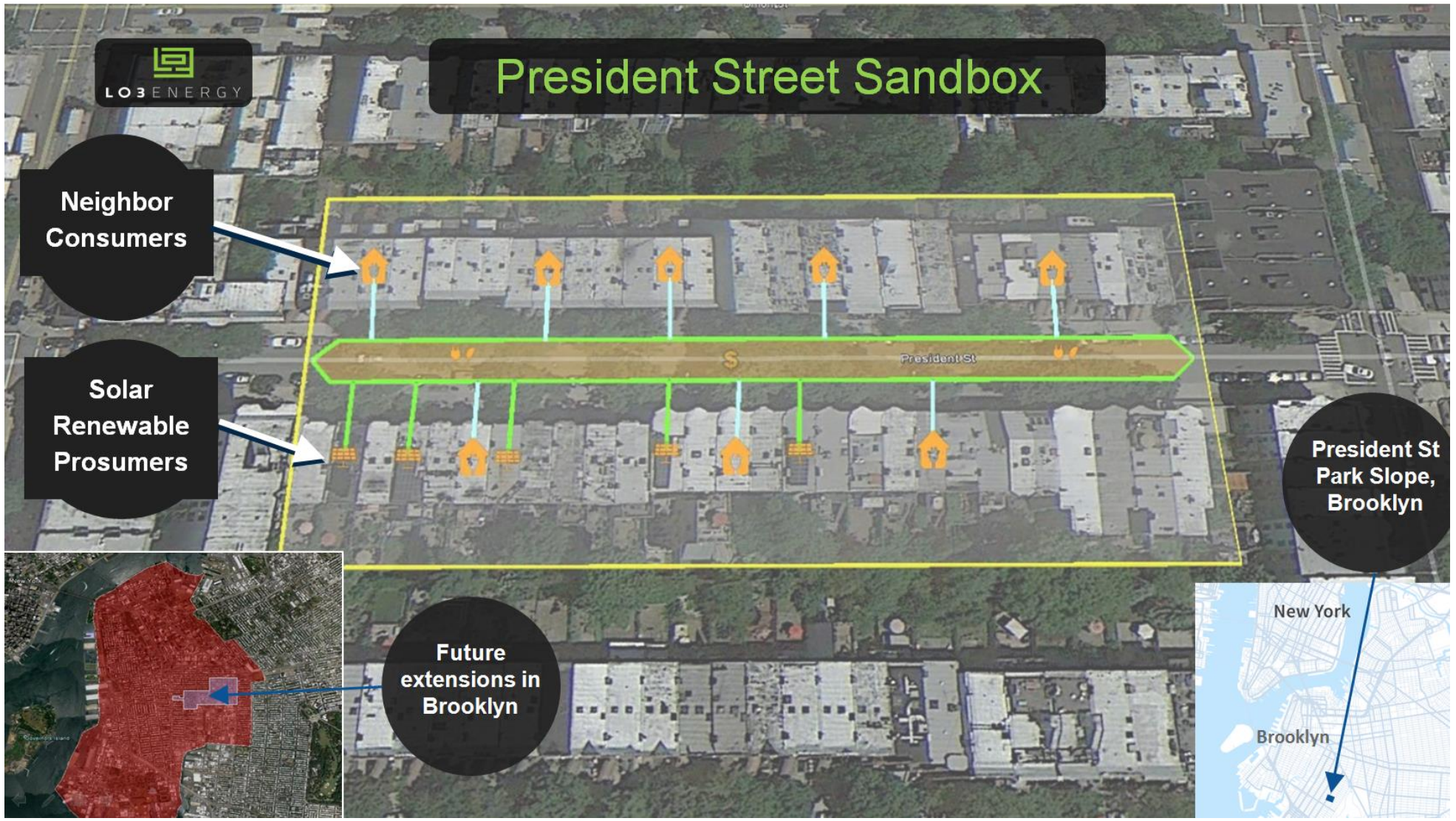
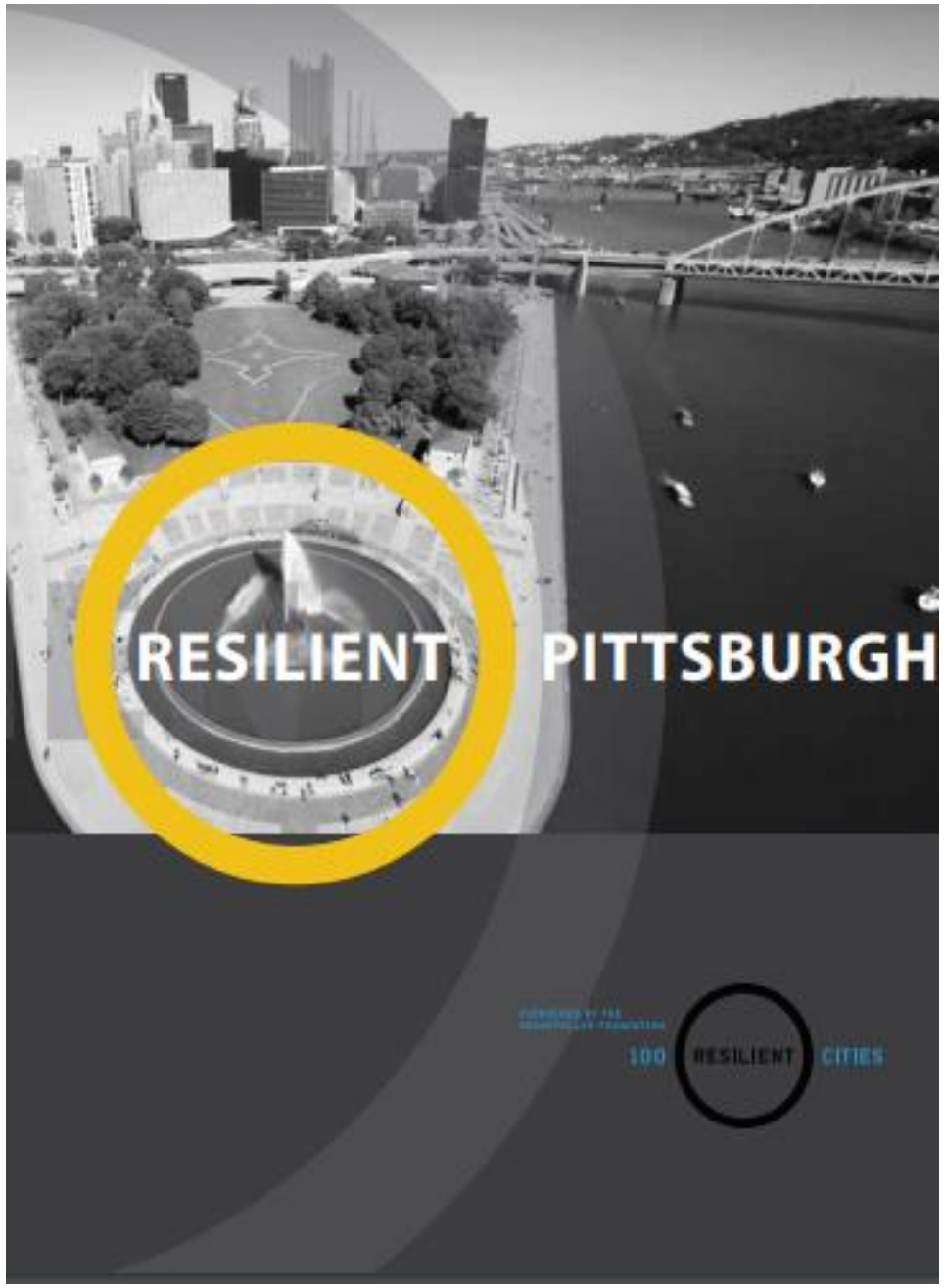



Street Parking
eBus Depot
Gas Stations and Truck Stops
Public and Private Garages
Residential and Apartment Buildings
Business and Retail
Highway Transit Charging


Theory
Practice

# Achieving climate and resilience goals through integrated planning in Pittsburgh

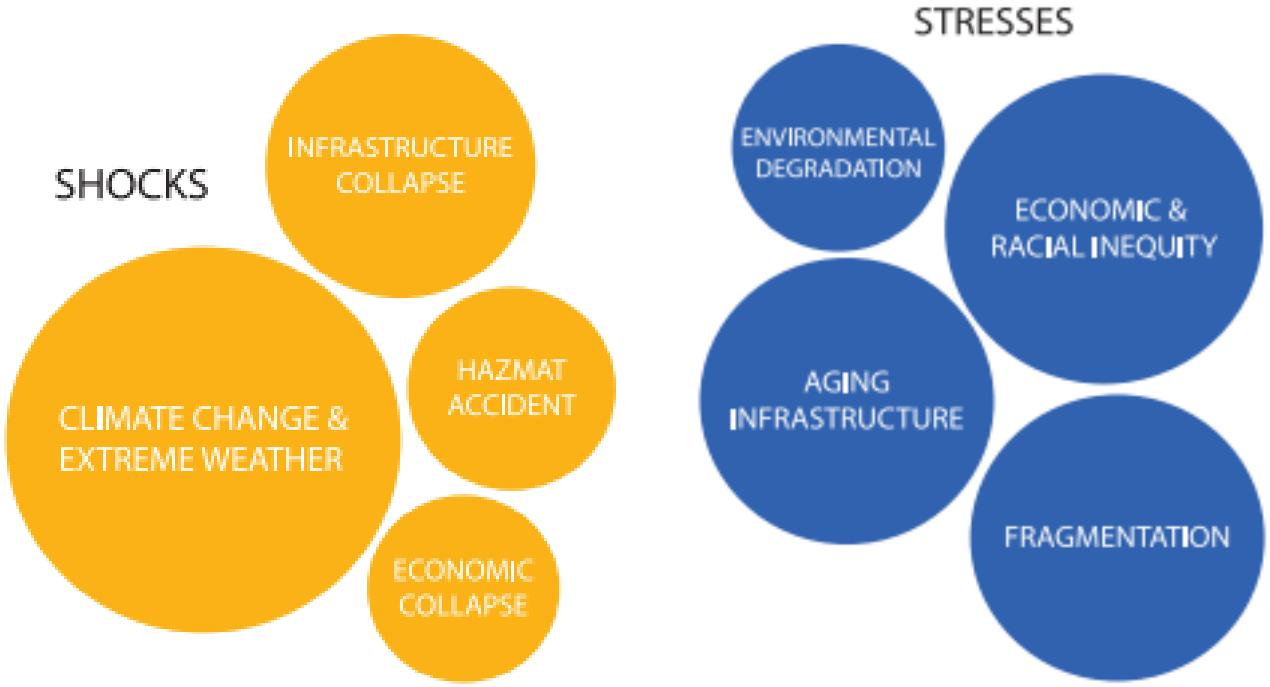
ONEPGH
RESILIENT PITTSBURGH




# Preliminary Resilience Assessment

The Sustainability and Resilience Division conducted extensive community outreach, engaging more than 1,000 Pittsburghers in roundtables, deliberative forums, working groups, resilience fairs and steering committees to develop ONEPGH.

## Pittsburgh's Shocks and Stresses Profile



# American Cities Climate Challenge

ONEPGH RESILIENT PITTSBURGH

## Objective

Emissions reduction targets

↓50%
by 2030

100%
clean electricity

## Strategies

**LOWER ENERGY CONSUMPTION**

by improving renewable financing options and energy efficiency codes

**REDUCE EMISSIONS FROM TRANSPORTATION**

by improving public transit and pedestrian conditions

## Goals

- Implement and prioritize district energy systems
- Electric vehicle charging in municipally owned parking lots
- Community solar projects or other local renewable energy initiatives at scale
- New financing programs for energy efficiency, renewables, and infrastructure
- Benchmarking, audit, and retro-commissioning (RCx) policies for existing buildings
- Incentives and demonstration projects for building decarbonization with a focus on City facilities
- Electrify city fleets and buses
- Improve access to charging infrastructure and encourage private EV ownership
- Implement high priority segments in the walking and bicycling network

# Department of City Planning

ONEPGH
RESILIENT PITTSBURGH

## Citywide Plans

Citywide Green First (2016)

OnePGH Resilience Plan (2017)

Climate Action Plan (2018)

EcoInnovation District Plan (2018)

Comprehensive Plan (2020)

## District Scale Performance

**EcoDistrict Protocol**

**Zoning and Performance Bonus**

**Building Performance Review**

**Infrastructure Integration**

# EcoInnovation District

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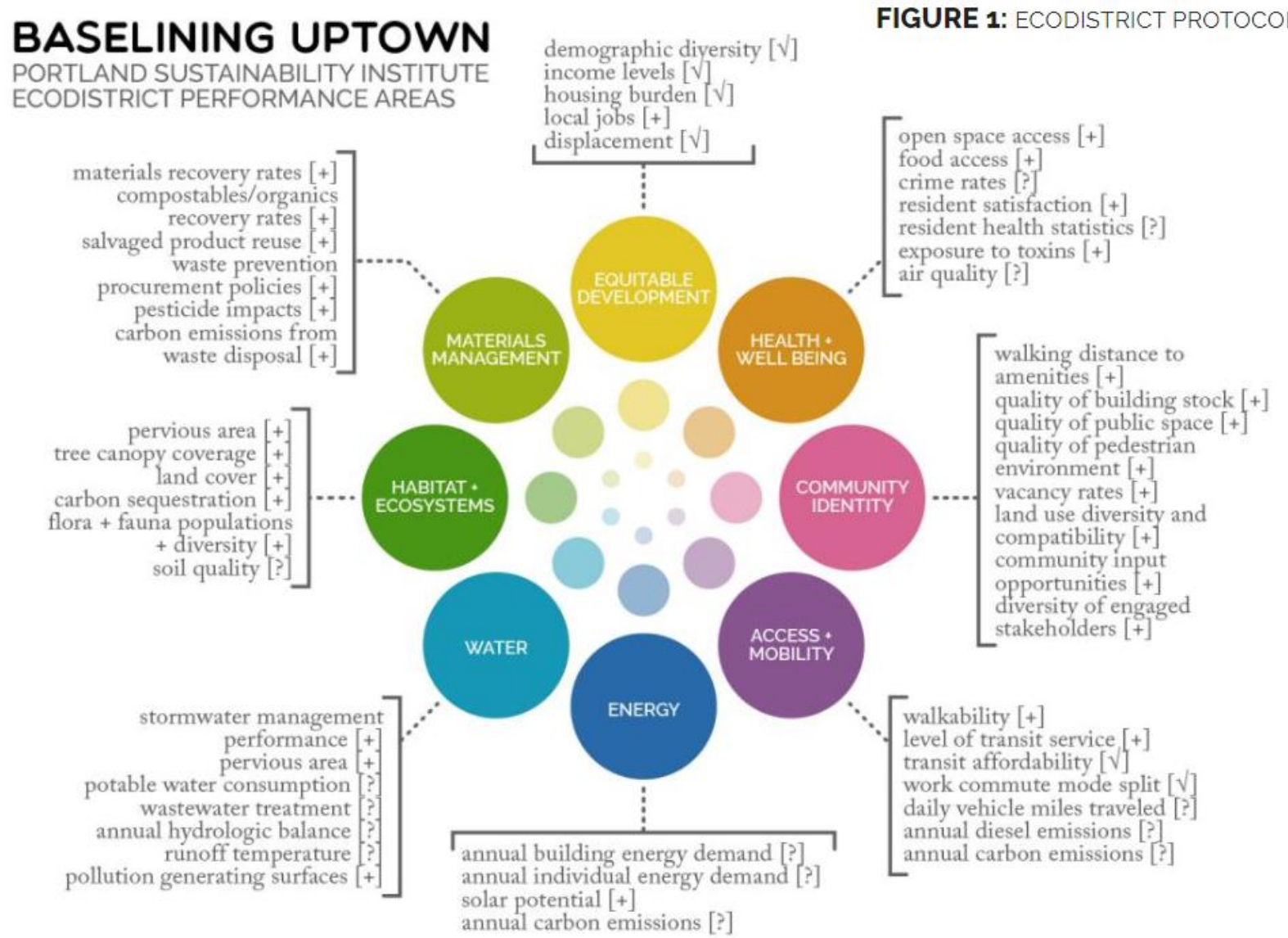

# District Energy and Micro-Grids

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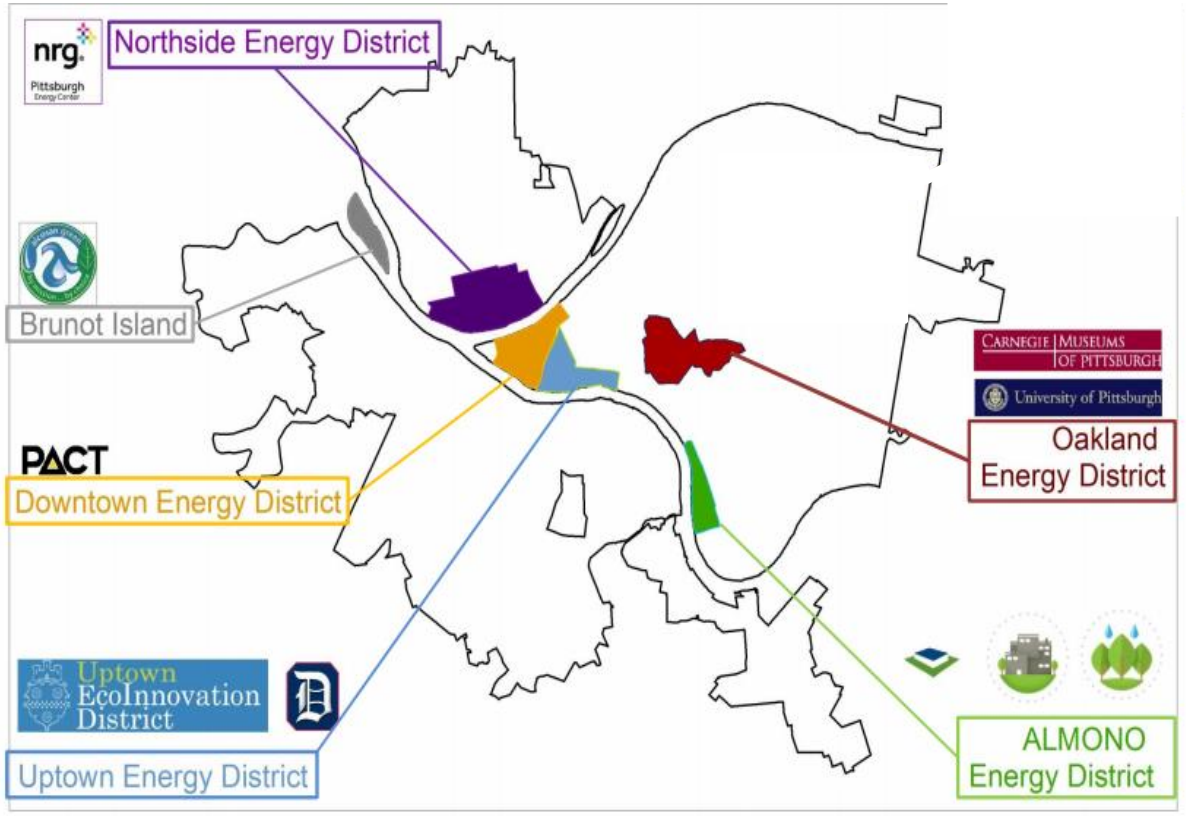
**Existing District Energy Systems**

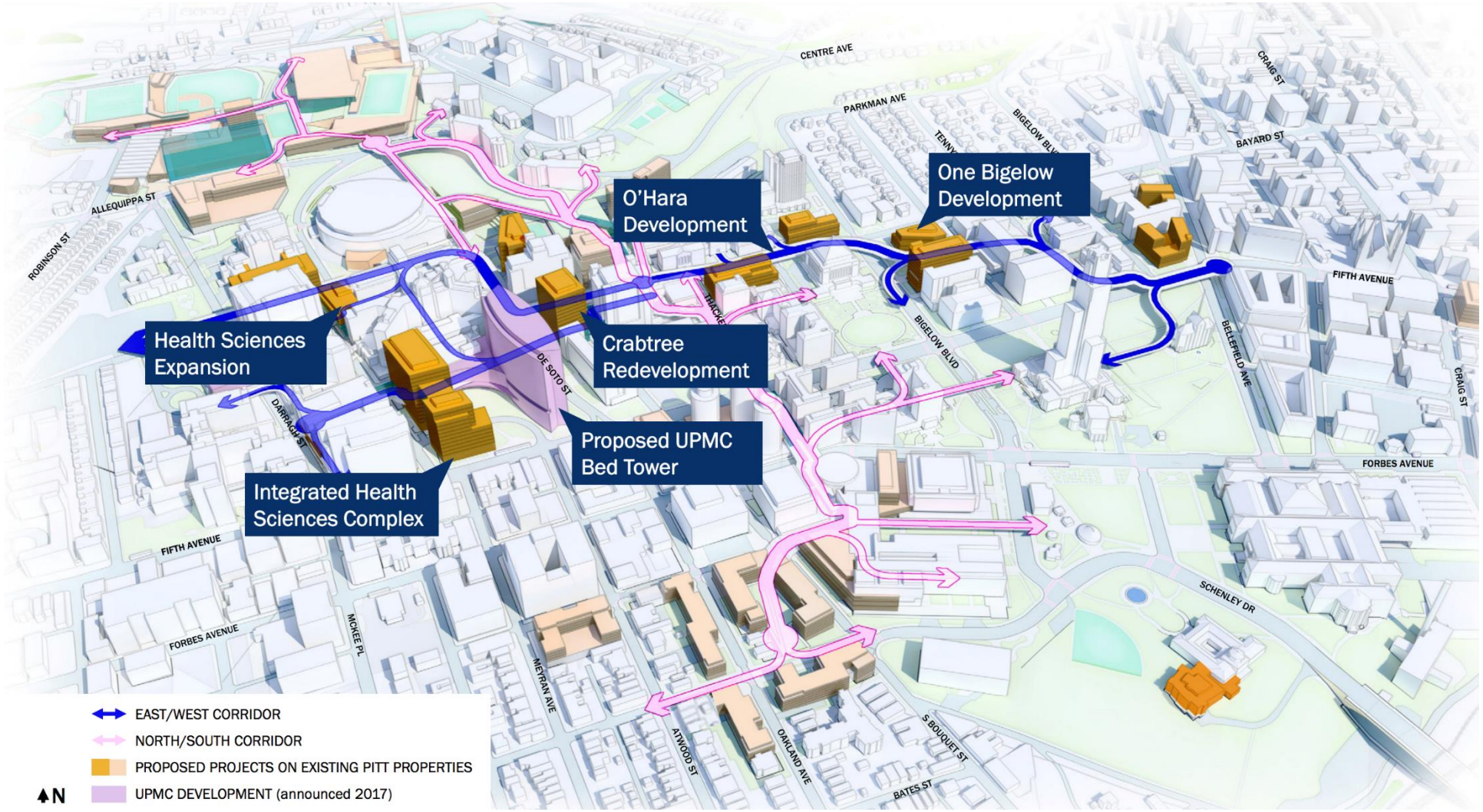
- PACT
- Northside
- Uptown
- Bellefield

**Potential New District Energy Plans**

- 2nd Avenue
- 62nd Street
- SCI Site



# Master Plans and Institutional Master Plans




Source: University of Pittsburgh, 2018

# Implementation: Buildings

## New Land Use Regulations

- Uptown Public Realm (including GBA guidance)
- Riverfront Zoning

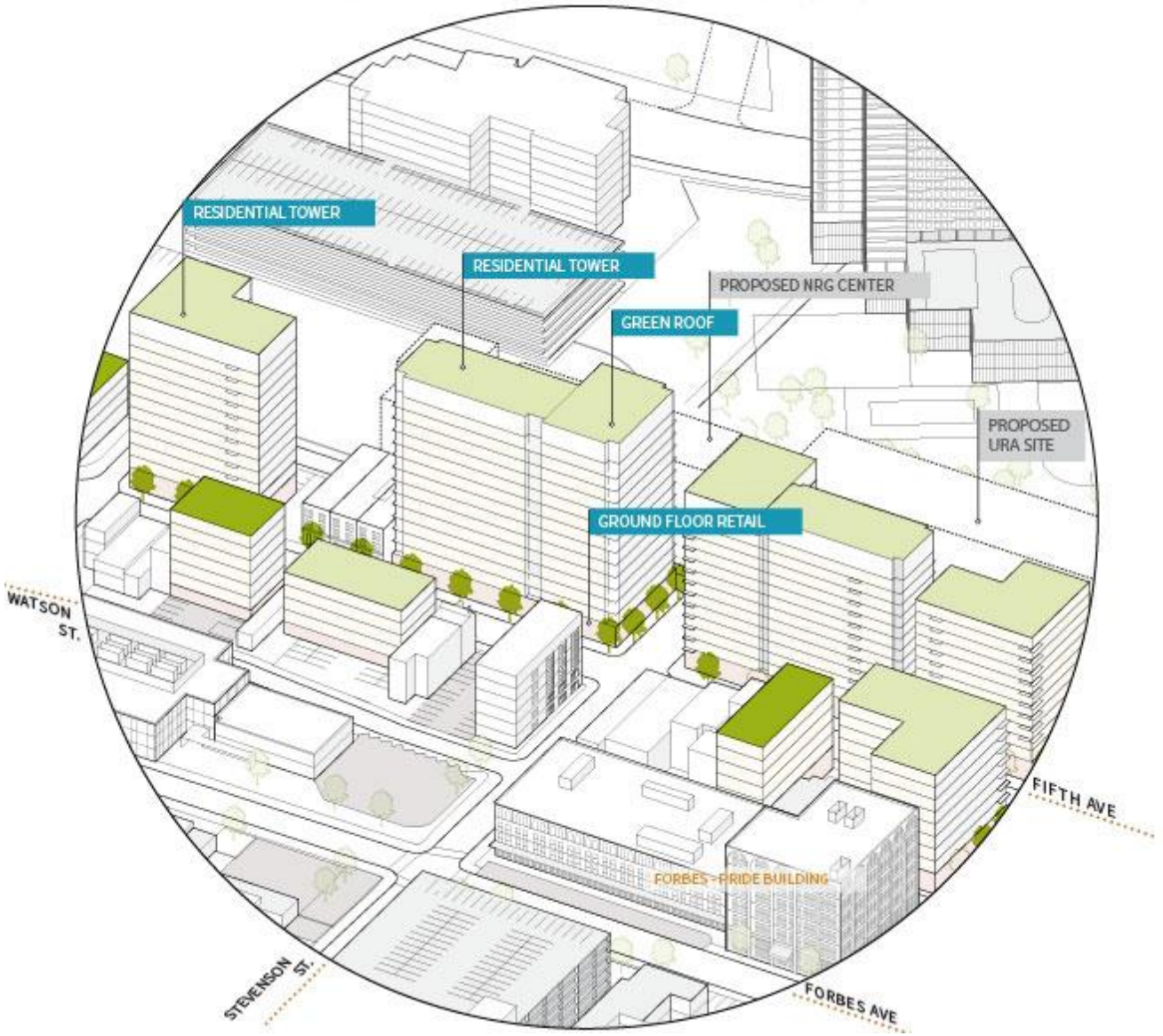
## New Incentives

- Performance Points System

## Collaboration / Consultation

- Performance Reviews
- Master Plans

# Performance Points System




1. Energy efficiency
2. Energy generation
3. Green infrastructure
4. Affordable housing
5. Building reuse

# Building Performance Reviews

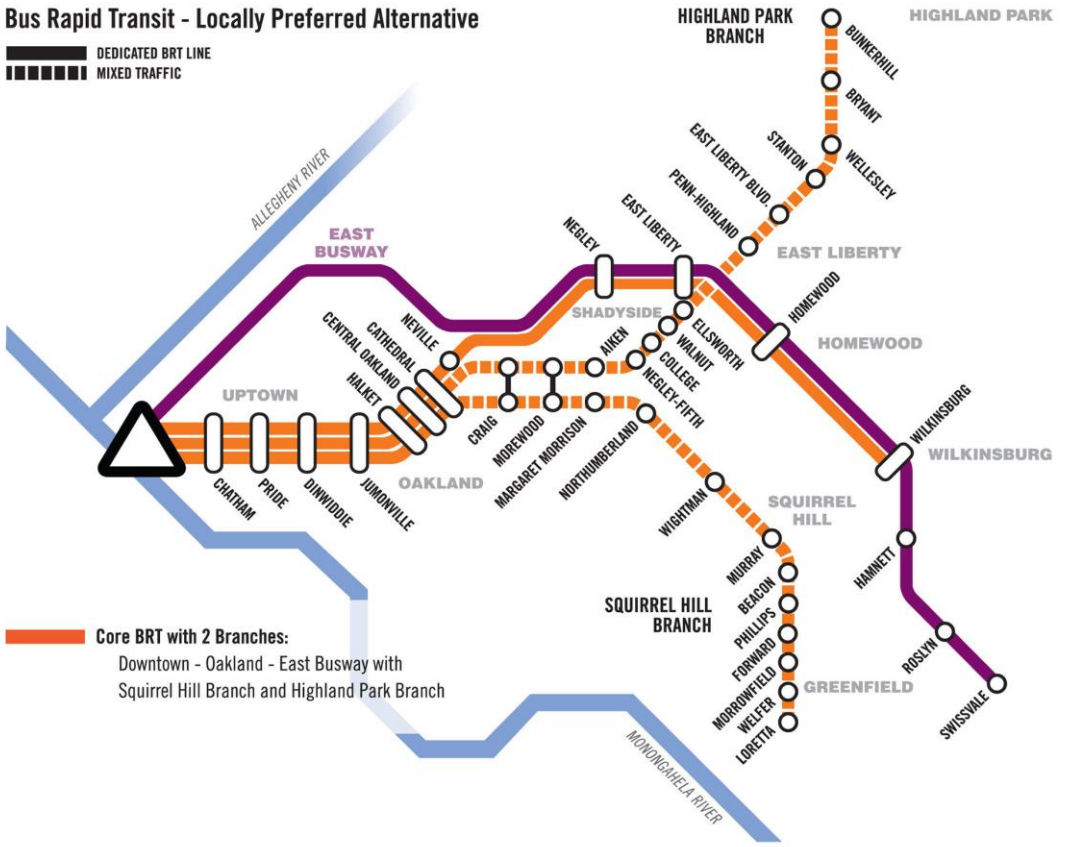
Source: UPMC Vision Rehabilitation Hospital Hospital, 2018

# Vehicle Electrification

Bus Rapid Transit

City fleet conversion
Expanded charging infrastructure

Integration of renewables with electric vehicles



# Thank you!


**Lidija Sekaric, PhD**

**Director of Strategy & Marketing, Distributed Energy Systems**

Siemens Smart Infrastructure

lidija.sekaric@siemens.com

**Grant Ervin**

**Chief Resilience Officer**

City of Pittsburgh

grant.ervin@pittsburghpa.gov