

# POTOMAC RIVER GENERATING STATION

EPC WORKSESSION

FEBRUARY 27, 2023



 **Hilco**<sup>TM</sup>  
Redevelopment Partners

 WIRE GILL

**Gensler**

HANDEL  
ARCHITECTS

 SCB

**OJB**

 christopher  
consultants  
IMEG

BALA

 MKA  
Madsen, Knippers & Associates, Inc.  
Construction Consultants & Engineers  
With Engineering, Science & Technology

**GOROVE SLADE**  
Transportation Planners and Engineers

**CLARK**  
CONSTRUCTION

**ARUP**

 Michael Blades & Associates  
Elevator and Escalator Consulting

 LERCH BATES  
Building Experts

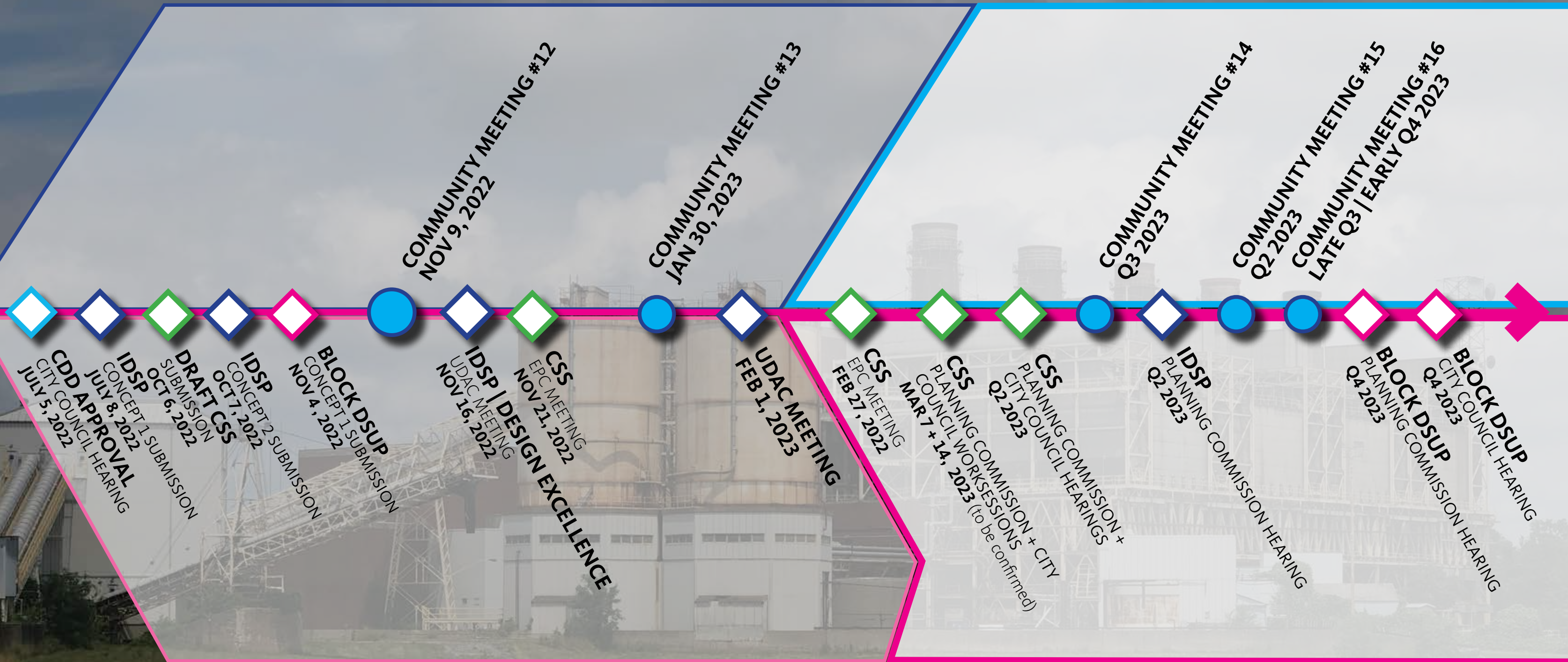
 vhb

 Capitol Airspace Group

 moffatt & nichol

# SCHEDULE & PROCESS

# STEPS FORWARD



# TODAY'S MEETING

**1. CONTEXT**

**2. CDD CONDITIONS & ROADMAP FOR TARGETS**

**3. COORDINATED SUSTAINABILITY STRATEGY (CSS)**

**4. REPORTING**

**5. FINANCIAL CONSIDERATIONS + POTENTIAL INCENTIVES**

**NEXT STEPS**

# ALEXANDRIA CONTEXT



## Alexandria Green Building Policy

Alexandria's Green Building Policy (GBP) identifies the minimum green building practices for all new development in Alexandria that requires a Development Site Plan (DSP) or Development Special Use Permit (DSUP) and were submitted to City Council on or after March 2nd, 2020. The Project will follow the GBP compliance option of LEED certification as the third-party rating system accepted under this policy. The PRGS redevelopment will pursue LEED for Neighborhood Development and LEED for Building Design + Construction Silver, at a minimum. The current version of the GBP at the time of writing the CSS is included in the Appendix.



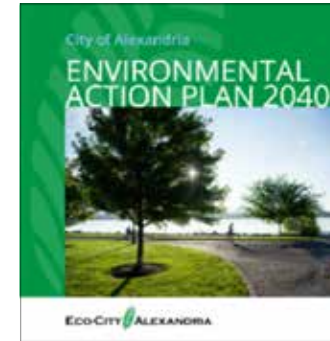
## Old Town North Small Area Plan

The Old Town North Small Area Plan (OTNSAP) was adopted in 2017 after a robust planning and community engagement process. The OTNSAP presents community goals for the redevelopment of the former PRGS site into a mixed-use district to act as an economic anchor that incorporates local arts and innovative sustainability targets. It outlines Eco-District sustainability strategies under four categories:

- Water Quality
- Energy & Green Building
- Design, Land Use and Transportation
- Performance Measures

The OTNSAP envisions four specific measures for the former power plant site to serve as a model for sustainability:

- Achieve LEED ND Silver
- Develop a Sustainability Master Plan (Coordinated Sustainability Strategy)
- Strive for carbon neutrality targets
- Explore the use of district energy on the site

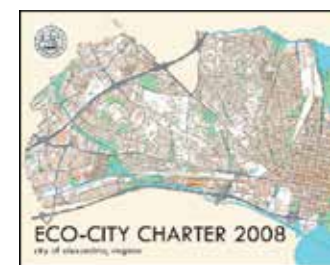


## Climate Emergency Acknowledgment

In October 2019, the Alexandria City Council adopted a resolution declaring climate emergency. This declaration acknowledged the grave threat that climate change poses to everyone in Alexandria and in the world. This resolution emphasizes the City Council's commitment to climate change action.

## City of Alexandria Environmental Action Plan 2040

Alexandria's Environmental Action Plan (EAP) 2040 adopted in 2019 as an update to the original EAP 2030 with expanded recommendations and commitments. It is a strategic guide that builds on the principles of the City's Eco-City Charter and identifies 19 goals with targets for short-term, mid-term, and long-term actions within the policy's ten guiding topics. The EAP 2040 commits to updating the document every five years.



## Eco-City Charter

Alexandria's Eco-City Charter was adopted by City Council in 2008 to define the City's commitment to ecological, economic, and social sustainability. The Charter outlines 11 guiding principles that reflect goals established in Alexandria's 2015 Strategic Plan and form the basis for the City's Environmental Action Plan 2040.

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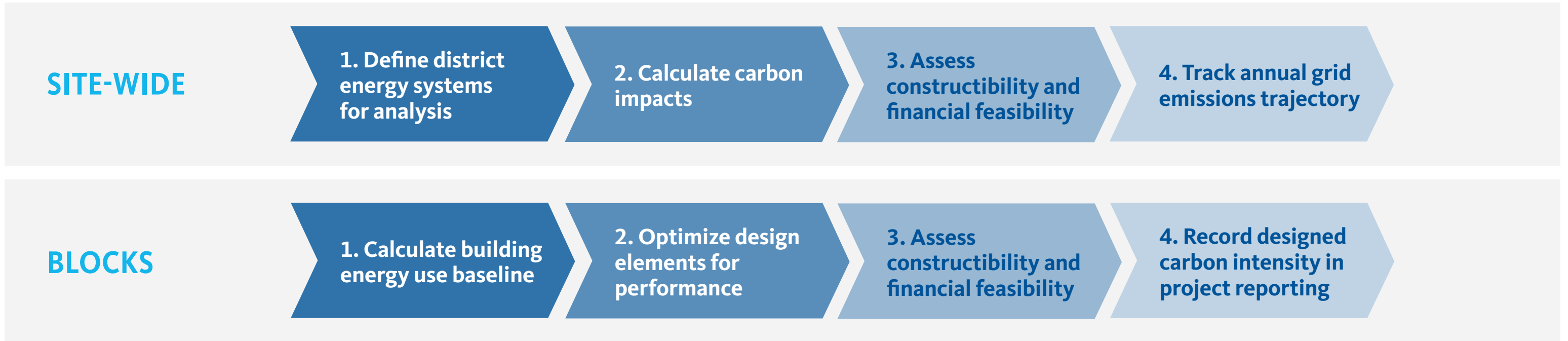
# CDD SUSTAINABILITY CONDITIONS

Several of the CDD conditions relate to the Project’s sustainability targets and ambitions.

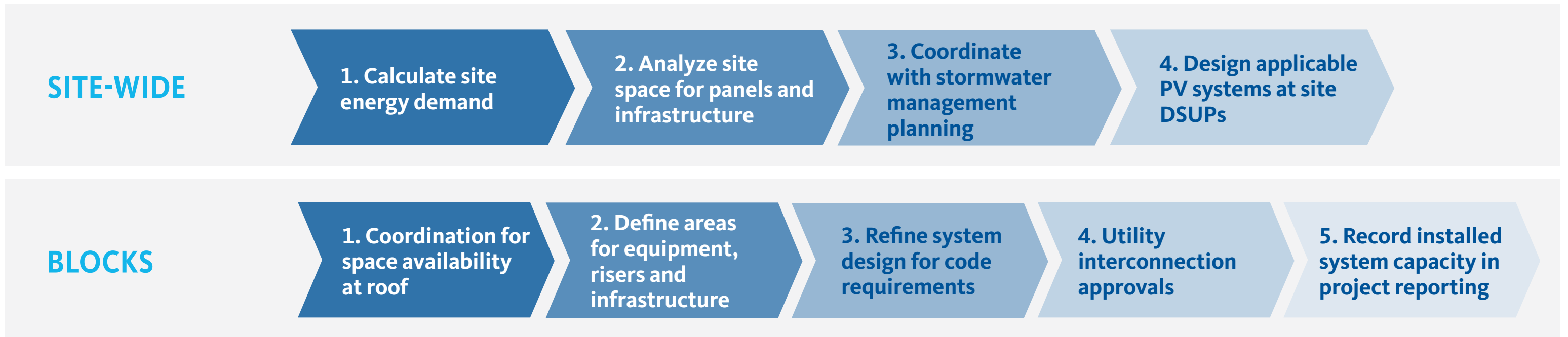
CONDITION	TOPIC	SUMMARY
<b>CONDITION 139</b>	CARBON NEUTRALITY	Site and buildings shall seek to achieve carbon neutrality through 5 targets: building operational carbon reduction, on-site renewable energy generation, building embodied carbon reduction, electric systems, and off-site renewables.
<b>CONDITION 143</b>	GREEN BUILDING	Comply with the Alexandria GBP in effect at time of DSUP submission.
<b>CONDITION 144</b>	COORDINATED SUSTAINABILITY STRATEGY	Develop a CSS prior to 2nd concept Infrastructure Development Site Plan.
<b>CONDITION 145</b>	COORDINATED SUSTAINABILITY STRATEGY	Outline strategies for site and building targets including energy and carbon planning, indoor environmental quality, site, public realm/streetscapes, water use management, waste management, resilience, and reporting.
<b>CONDITION 149</b>	ELECTRIFICATION	Demonstration compliance with electrification implementation as outlined in the EAP 2040 targets, goals and actions.
<b>CONDITION 150</b>	ELECTRIFICATION	Off-street parking shall provide EV charging consistent with City policies at time of DSUP submission.
<b>CONDITION 151</b>	ON-SITE ENERGY GENERATION	Newly constructed buildings shall be utilized to provide on-site energy to the extent feasible.
<b>CONDITION 152</b>	CONSTRUCTION WASTE	Provide regional construction recycling and reuse guidance with each final site plan.
<b>CONDITION 153</b>	REPORTING	Site-wide sustainability performance shall aggregate individual building data annually as buildings are constructed.
<b>CONDITION 154</b>	REPORTING	Public benchmarking through Energy Star Portfolio Manager results for each new building shall be submitted.

# ROADMAP FOR CDD SUSTAINABILITY TARGETS

## Target 1 – Operational Carbon Reduction

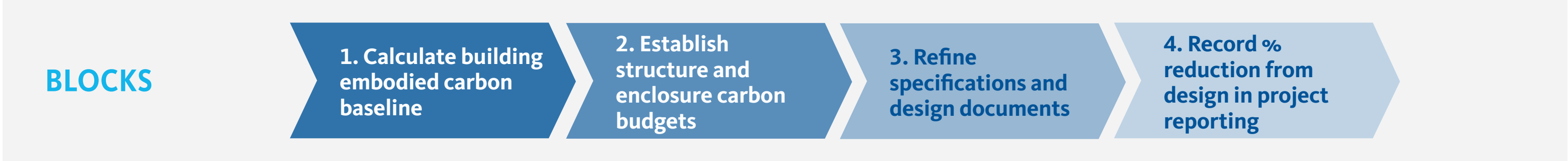


## Target 2 – 3% on-site Renewable Energy Generation

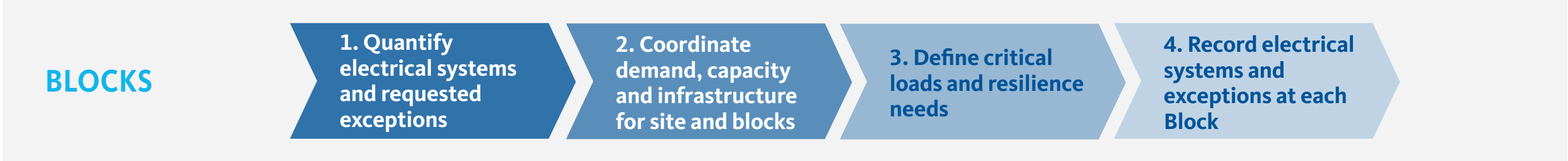


# ROADMAP FOR CDD SUSTAINABILITY TARGETS

## Target 3 – 10% Embodied Carbon Reduction



## Target 4 – All-electric Buildings



## Target 5 – Off-site Renewables





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# COORDINATED SUSTAINABILITY STRATEGY (CSS)

## FIVE CATEGORIES

**SITE**



- Site Sustainability Strategies
- Open Space
- Native and Adaptive Planting for Ecosystem Support
- Circulation and Transportation
- Stormwater Management and Green Infrastructure
- Zero Emission Vehicle Infrastructure

**ENERGY & CARBON**



- Energy & Carbon Reduction Strategies
- On-Site Renewables
- Embodied Carbon
- System Electrification
- Offsite Renewables
- Commissioning and Efficient Operations

**WATER**



- Water Conservation Strategies
- Potable Water Demand Reduction
- Indoor Water Use Efficiency
- Water Storage and Reuse

**HUMAN HEALTH**



- Material and Waste Reduction
- Healthy Materials
- Responsible Sourcing
- Waste Management

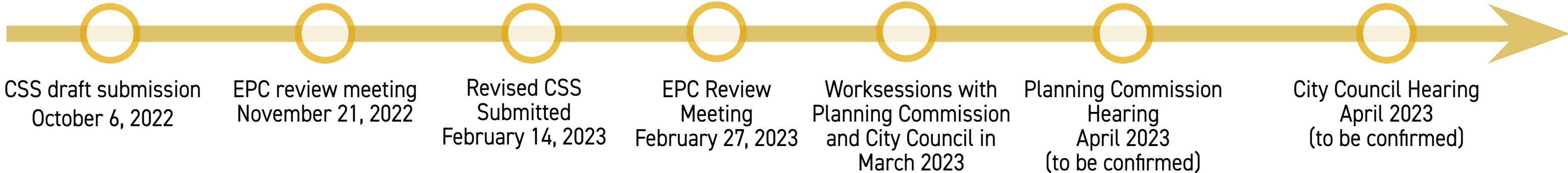
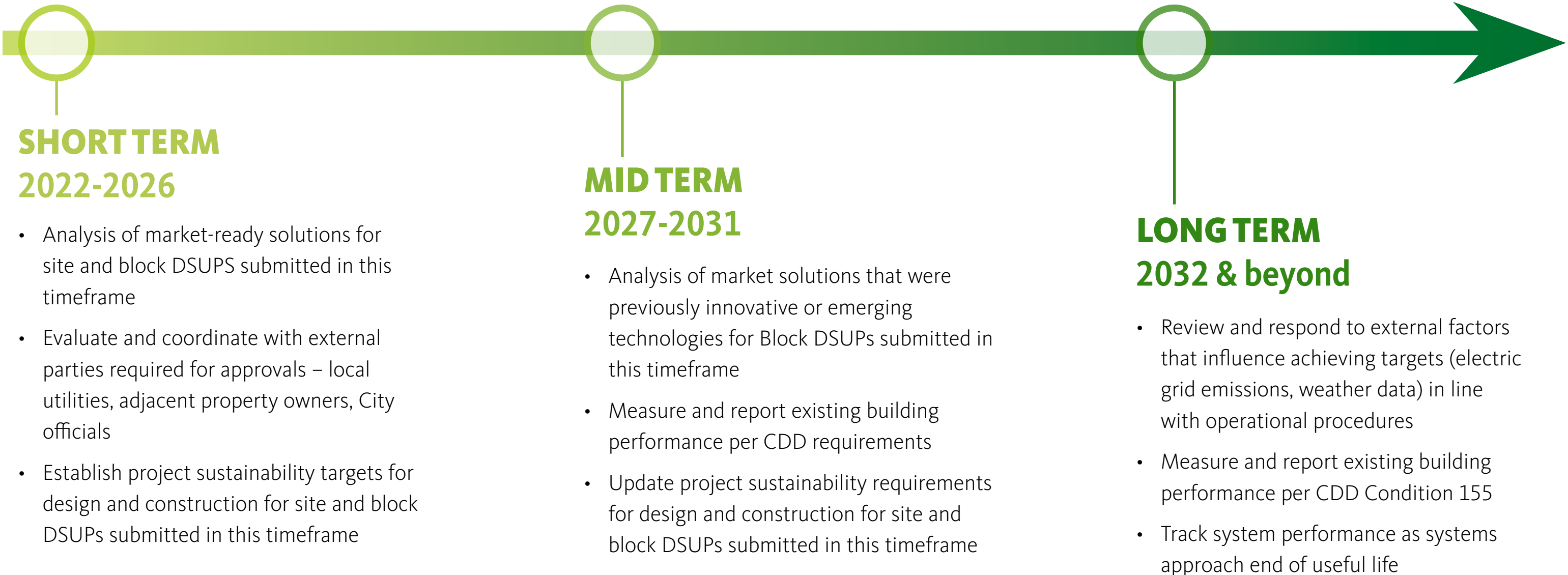
**CLIMATE RESILIENCE**



- Climate Resilience Strategies
- Heat Island Effect and Tree Canopy
- Adaptation for Extreme Weather Events
- Future-proofing and Flexibility for Infrastructure Demands

# CSS PLANNING TIMEFRAMES

## CSS PLANS ACROSS THREE TIMEFRAMES



# SITE

## OPEN SPACE + BIODIVERSITY

NATIVE PLANTING  
FOR ECOSYSTEM SUPPORT

CREATED OR IMPROVED  
**14 ACRES**  
ON SITE + ADJACENT PROPERTIES

**OPEN SPACE**

**20% GENUS  
DIVERSITY**  
IN TREE PLANTING

## GREEN INFRASTRUCTURE

ROOFTOP STORMWATER RETENTION

STORMWATER  
MANAGEMENT

EXTREME  
WEATHER  
ADAPTATION

NATURE-BASED  
SITE  
SOLUTIONS

**GREEN  
INFRASTRUCTURE**

**610 MT**  
CO<sub>2</sub> SEQUESTERED FROM  
VEGETATION

**25%**  
INTENSIVE GREEN ROOF AREA  
BY BLOCK

**BIORETENTION  
PLANTERS**

**2 ACRES**  
GREEN ROOF AND BIORETENTION  
SYSTEMS SITE-WIDE

## CIRCULATION + TRANSPORTATION

**4 DASH BUS STOPS**  
WITH SHELTERS

**2 BIKESHARE STATIONS**

**2% EV CHARGERS**  
OFF-STREET PARKING

**TRANSPORTATION**

ACTIVE & PASSIVE OPEN SPACES  
FOR PEDESTRIAN USES

# SITE TARGETS



## OPEN SPACE & BIODIVERSITY

**SITE-WIDE**

**5 acres on-site open space**

**SITE-WIDE**

**20% genus diversity in tree planting\***

**BLOCK**

**Quantify on-site sequestered carbon from plantings\***



## GREEN INFRASTRUCTURE

**SITE-WIDE**

**20% genus diversity in tree planting\***

**BLOCK**

**Quantify on-site sequestered carbon from plantings\***



## CIRCULATION & TRANSPORTATION

**SITE-WIDE**

**4 DASH bus stops with shelters**

**SITE-WIDE**

**2 Bikeshare stations**

**BLOCK**

**2% off-street parking spaces with EV charging\***

*\* voluntary commitment*

# ENERGY & CARBON

## ENERGY EFFICIENCY STRATEGIES

## SYSTEM ELECTRIFICATION

## COMMISSIONING & EFFICIENT OPERATIONS



**3%**  
ON-SITE PV

**25%**  
REDUCTION

**ALL ELECTRIC**  
BUILDING DHW/HVAC SYSTEMS

**ENERGY STAR**  
APPLIANCES & EQUIPMENT

**HIGH PERFORMANCE**

**MASSING & ENVELOPE**

**DENSITY**  
RESULTS IN A LOWER CARBON  
FOOTPRINT PER CAPITA

**HIGH PERFORMANCE**  
BUILDING ENVELOPES

**REDUCED**  
WINDOW TO WALL RATIO

**METERING**  
FOR ENERGY USE TRANSPARENCY

**COMMISSIONING**  
OF SYSTEMS

**DISTRICT & ENERGY**  
**RECOVERY SYSTEM**  
EVALUATION

**SYSTEM OPTIMIZATION**



# ENERGY & CARON TARGETS



**OPERATIONAL  
CARBON**

**BLOCK**

**100% electric HVAC & DHW systems**

**BLOCK**

**2021 IECC EUI**



**RENEWABLES**

**SITE-WIDE**

**3% on-site renewable energy generation**



**EMBODIED  
CARBON**

**SITE-WIDE**

**Measure additional horizontal  
concrete embodied carbon reduction\***

**BLOCK**

**10% building embodied carbon reduction**

*\* voluntary commitment*

# ENERGY DEFINITIONS MATTER

NET-POSITIVE ZERO ENERGY  
SITE NZE ZEPI  
ZNE SOURCE NET-ZERO ZERO-CARBON  
EMERGING ZNC  
EUI ULTRA-LOW  
VERIFIED CARBON



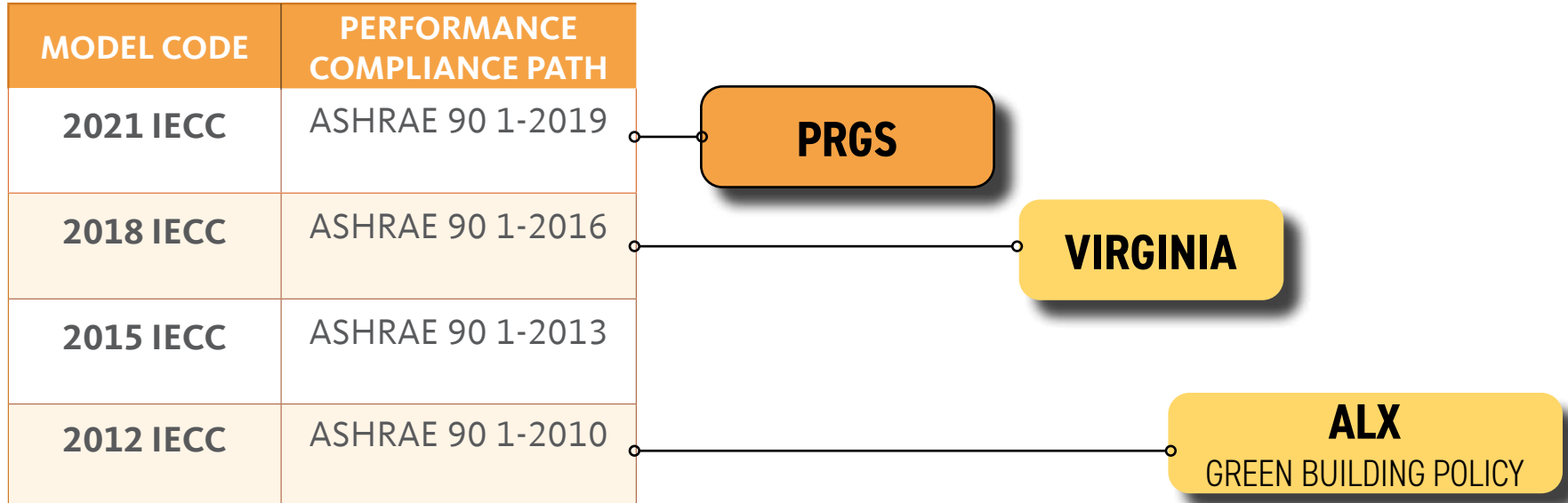
# APPLICABLE ENERGY CODES

## Current Commercial Energy Code for Virginia

- 2018 IECC and ASHRAE 90.1-2016 with amendments
  - Adopted 07/01/2021

## PRGS Energy Code Baseline

- CDD Condition #139a compliance pathway: IECC 2021 to be used for maximum EUI in block design
  - Performance energy modeling with ASHRAE 90.1-2019
- Following to ASHRAE 90.1-2019 (from current 2016 standard) is calculated to reduce statewide CO2 emissions by 8.4 MMT
  - Source: [Cost Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for Virginia](#)



# ENERGY USE INTENSITY (EUI) CONSIDERATIONS

## Energy Use Intensity (EUI)

is the calculation of a building's annual energy use

### Design EUI

uses modeling projections

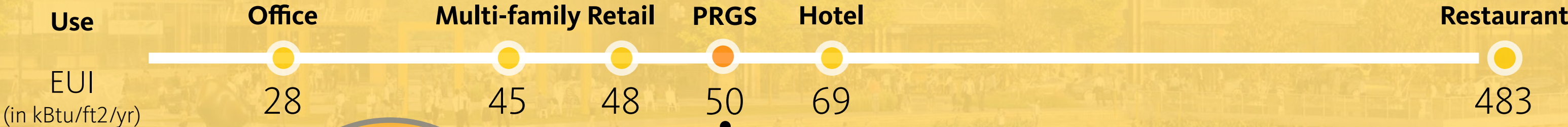
### Operational EUI

uses measured utility data

PRGS EUI analysis **HAS INCLUDED** Restaurant and Retail EUI in initial calculations

## Different types of building programs have different EUIs

\* EUI baselines from 2021 IECC



PRGS EUI analysis **HAS NOT INCLUDED** on-site renewables in initial calculations

**Current Program of 80% Residential and 20% Commercial** Results in a 50.6 Maximum Project Baseline for Compliance

**Source Energy** includes total raw fuel required to operate a building, including production, delivery and transmission losses

**Site Energy** is the amount of fuel required to operate a building from the utility meter

# EUI COMPONENTS

## COMPONENTS THAT IMPACT AN ENERGY MODEL

1. HVAC
2. AIR SEALING
3. FENESTRATION
4. INSULATION
5. WATER HEATING
6. DUCTS
7. VENTILATION
8. LIGHTING

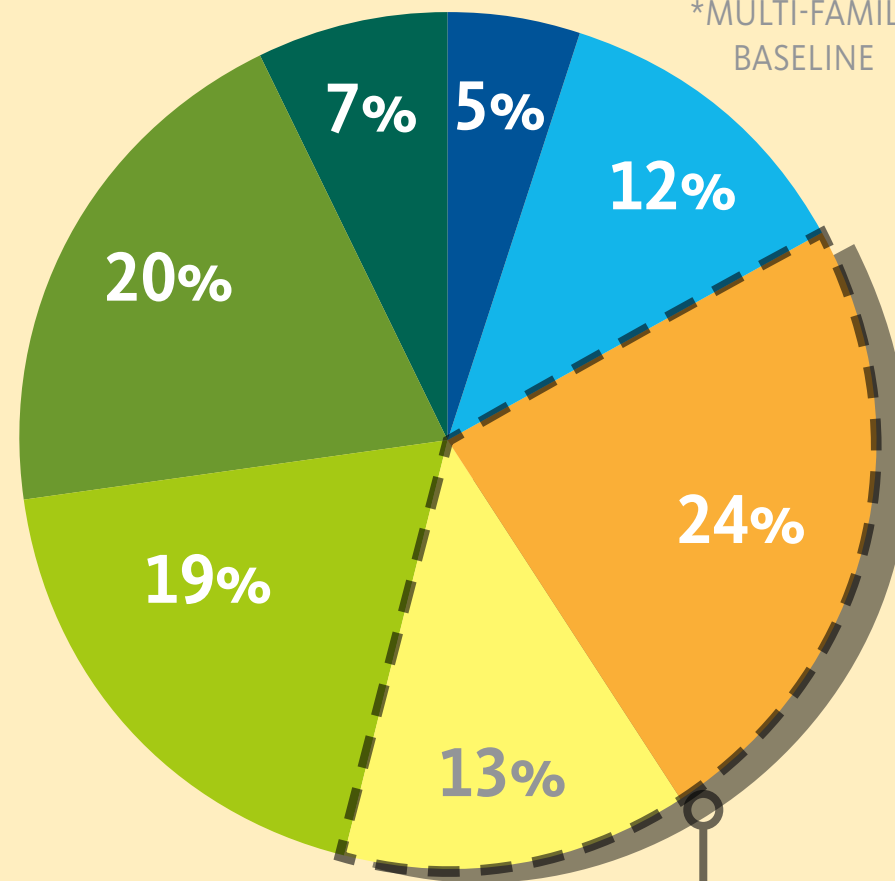
## COMPONENTS THAT DO NOT IMPACT AN ENERGY MODEL

- A. PLUG LOADS
- B. LIFE-SAFETY EQUIPMENT (ELEVATORS)
- C. OPERATIONAL SCHEDULES

### IECC 2021

BASELINE DESIGN\*  
EUI 45

\*MULTI-FAMILY  
BASELINE

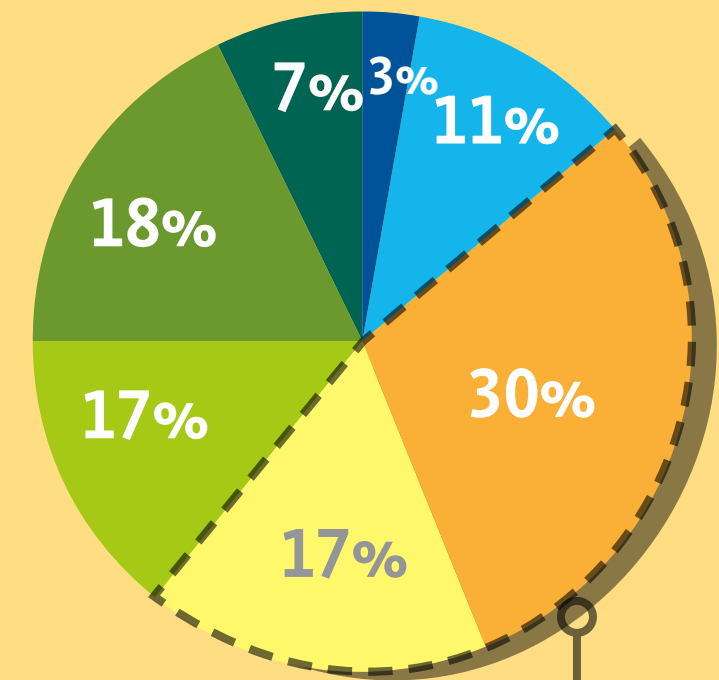


**37%** from Plug & Process Loads

### PRGS CURRENT DESIGN

OPTIMIZED DESIGN\*\*  
EUI 35

\*\*BASED ON  
BENCHMARKING



BECOMES A LARGER PERCENTAGE OF OVERALL BUILDING ENERGY USE

**47%** from Plug & Process Loads

■ Pumps & Fans  
■ Lighting

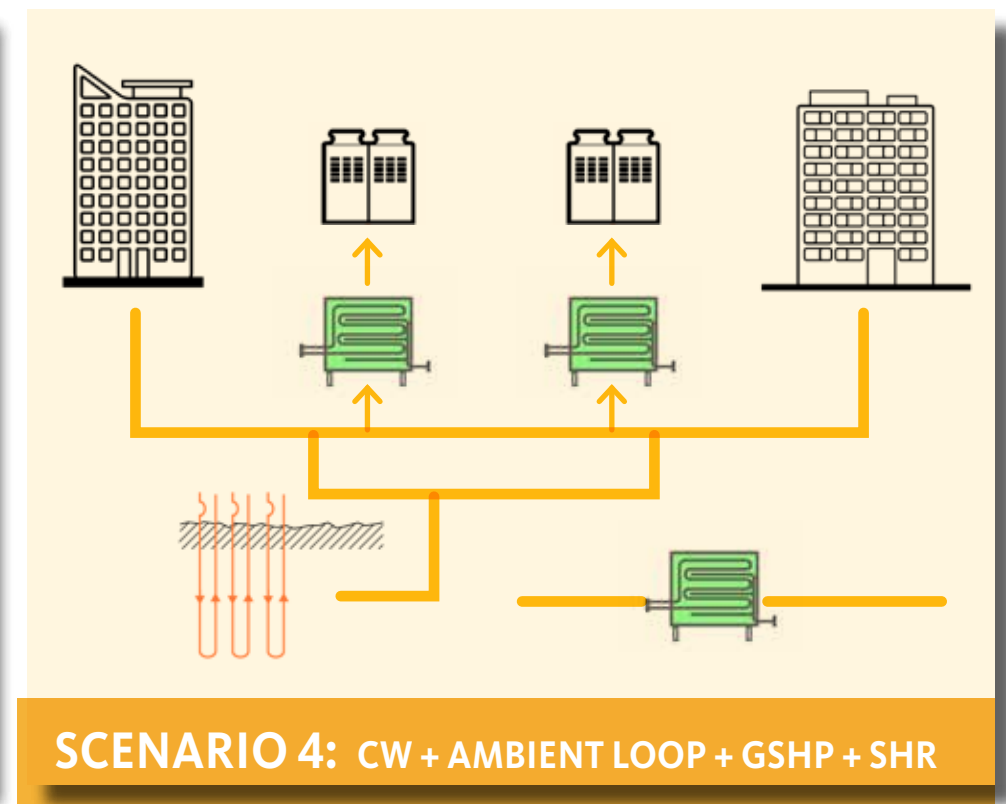
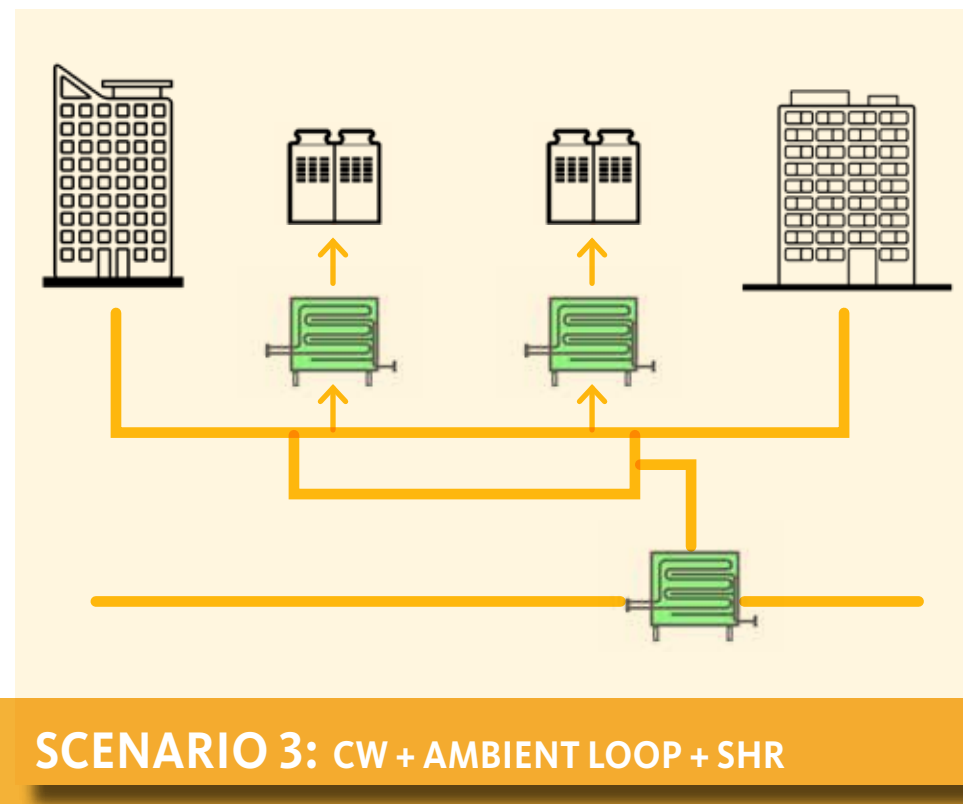
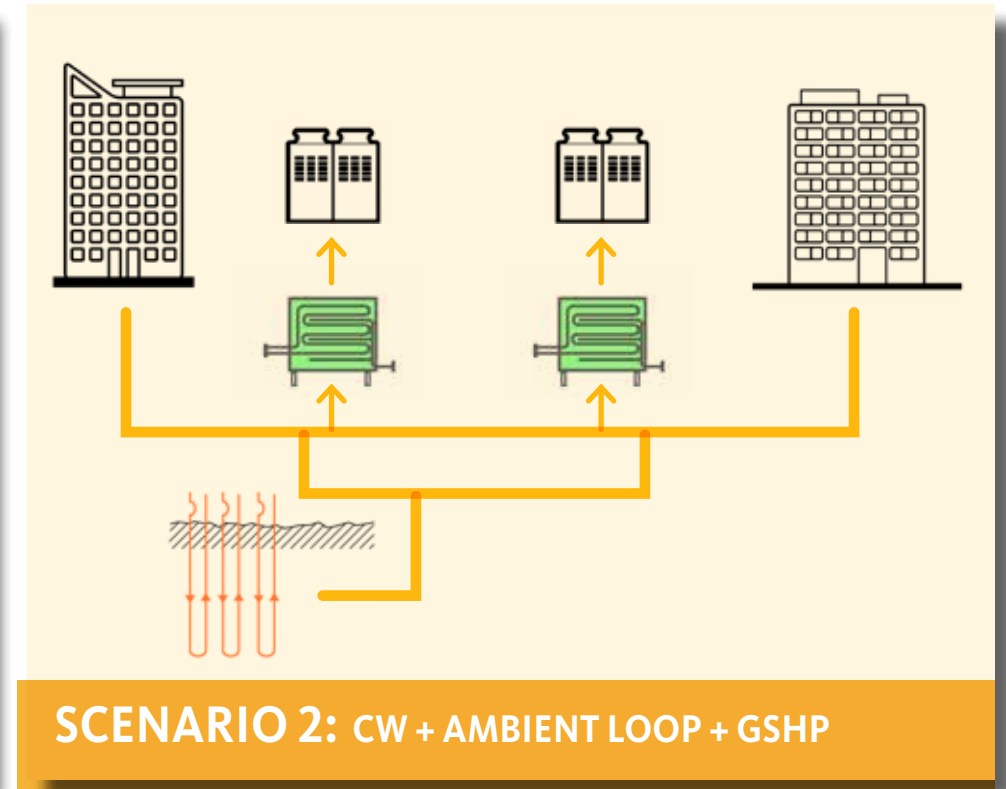
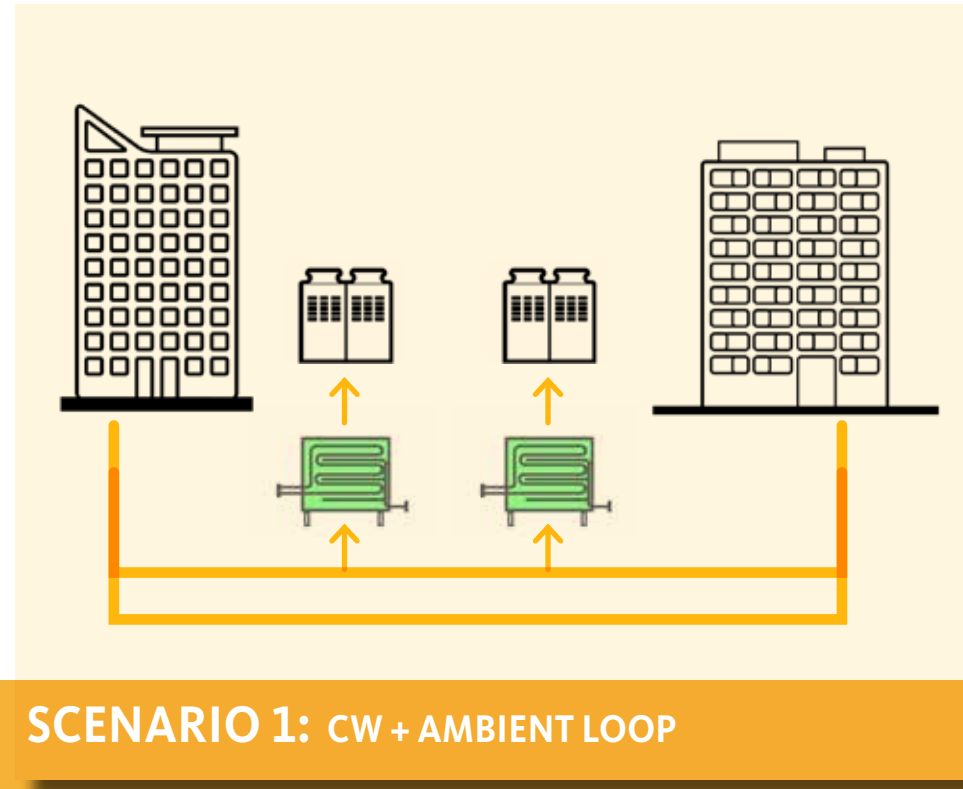
■ Plug Loads  
■ Process Equipment

■ Space Heating  
■ Water Heating

■ Space Cooling

# DISTRICT ENERGY FEASIBILITY ANALYSIS

- The District Energy Feasibility Analysis evaluated 4 scenarios
- An ambient loop connects the heating and cooling loads between buildings
- Other technologies are then able to be added to the ambient loop to increase the energy recovery potential from groundsource heat pumps and/or sewer heat recovery



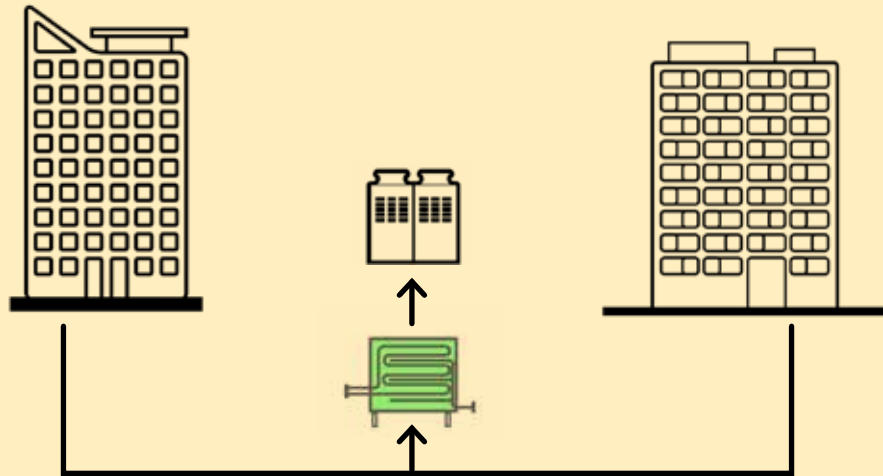
CW = Condenser Water  
GSHP = Ground Source Heat Pump  
SHR = Sewer Heat Recovery

# DISTRICT ENERGY FEASIBILITY STUDY

## AMBIENT LOOP SYSTEMS

### AMBIENT LOOP

configuration of piping to enable thermal energy exchange between buildings to recover excess waste heat and utilize for other buildings heating demands



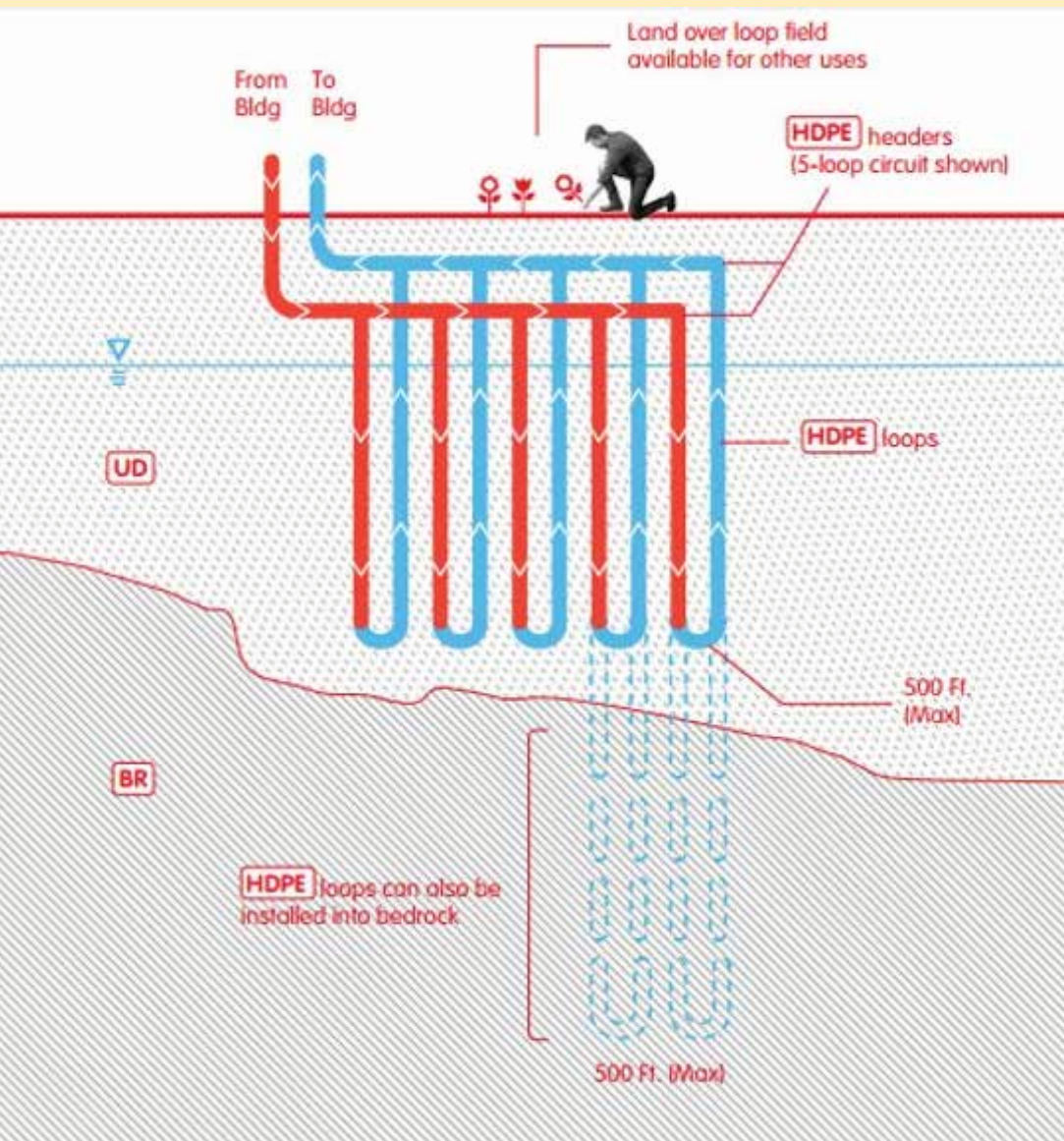
- Energy reduction from building level system efficiencies and enhanced envelope will reduce the overall demand first, which reduces the amount of energy recovery able to be shared between buildings
- Additional operational energy is required from pumping to move the heat from one building to another
- Embodied carbon impacts are increased from the piping and concrete encasement for the ambient loop connecting all buildings

# DISTRICT ENERGY FEASIBILITY STUDY

## GEOHERMAL HEAT EXCHANGE

### GEOHERMAL HEAT EXCHANGE

closed loops connected to a network of boreholes to reject or extract heat from the ground



- The PRGS site has **limited area for geothermal** heat exchange because of existing site utilities, planned roads and utilities, Resource Protection Areas, and underground parking.
- Available area is limited to the western edge of the site (area shown in green)
- Embodied carbon intensity from borehole drilling would be additive to the impact of the initial ambient loop

### LEGEND

- Available Area for Geothermal Wells
- Resource Protection Area
- Underground Parking Garage
- Site Utilities for PEPCO Substation and PRGS Redevelopment
- Areas Outside of PRGS Property Lines: PEPCO Substation, Norfolk Southern
- Road or Planned Utility Conflicts



# DISTRICT ENERGY FEASIBILITY STUDY

## SEWER HEAT RECOVERY

### SEWER HEAT RECOVERY

thermal energy recovered from building wastewater reused to heat the ambient loop



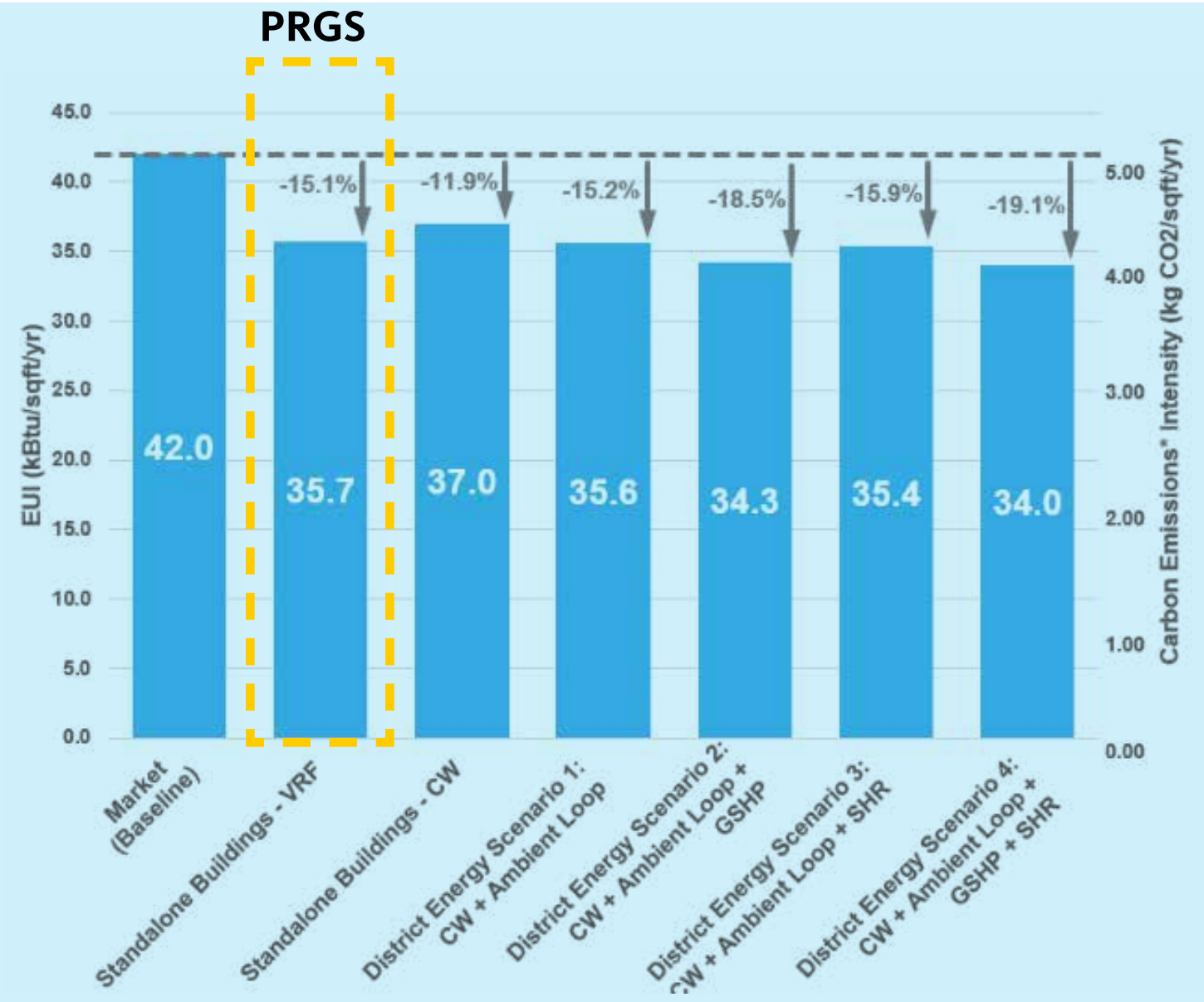
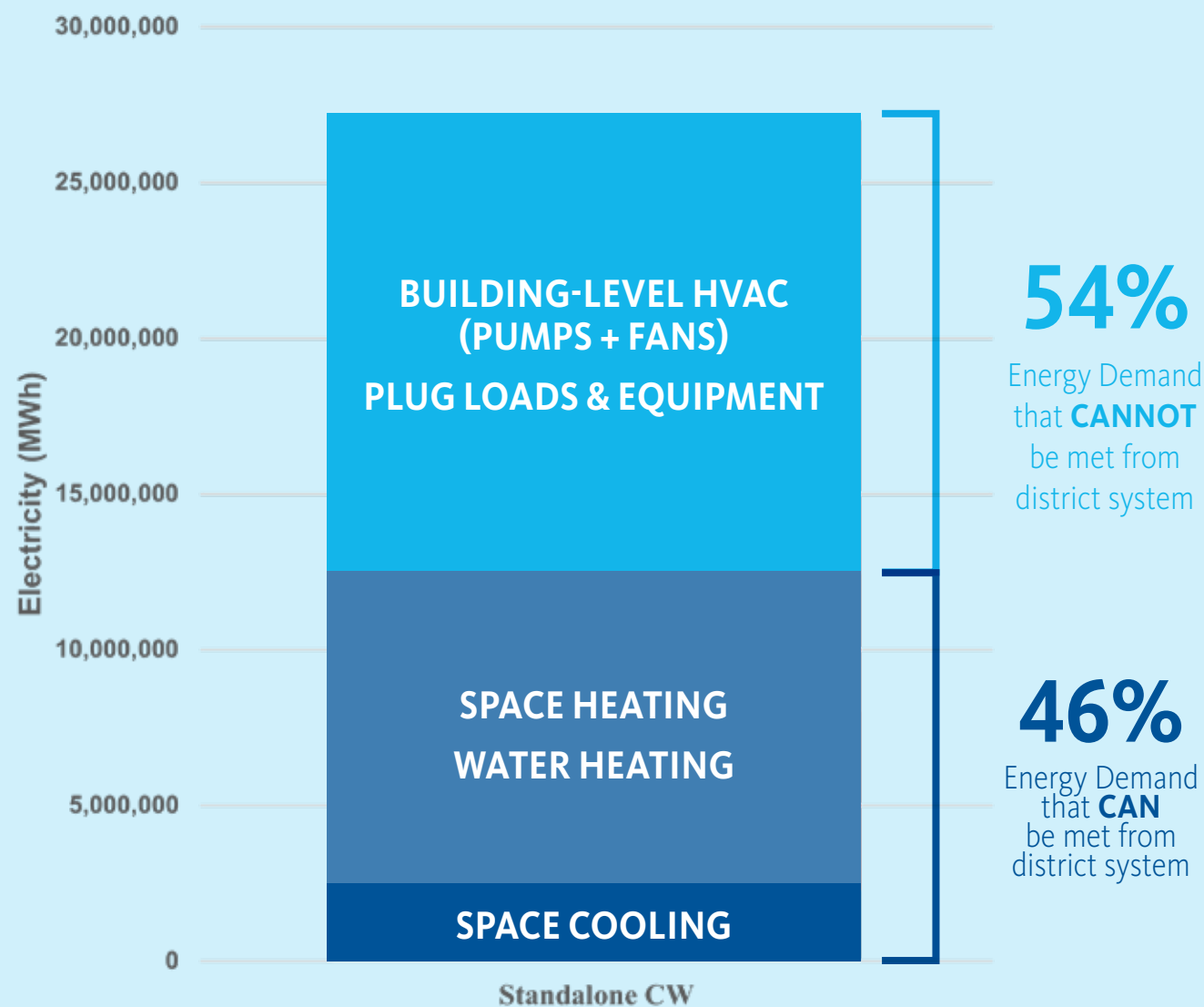
- The PRGS analysis was based upon a fully developed site-- the **overall capacity is diminished** during the initial phases
- The system is assumed to be utilized for heating during winter months and cooling during summer
- During months between summer and winter system can be used either as a net heating or cooling provider
- High residential programming is beneficial to these calculations, if the programming changes it may reduce the amount of energy recovery from this system

# DISTRICT ENERGY FEASIBILITY STUDY

## TECHNICAL FEASIBILITY

- Less than half of energy demand can be met from district system
- Standalone building options are capable of recovering a significant amount of waste heat and waste cooling with reduced complexity and lower whole life-cycle carbon impacts
- District energy systems will increase embodied carbon from additional infrastructure

• **District energy systems provide no or marginal EUI reduction**





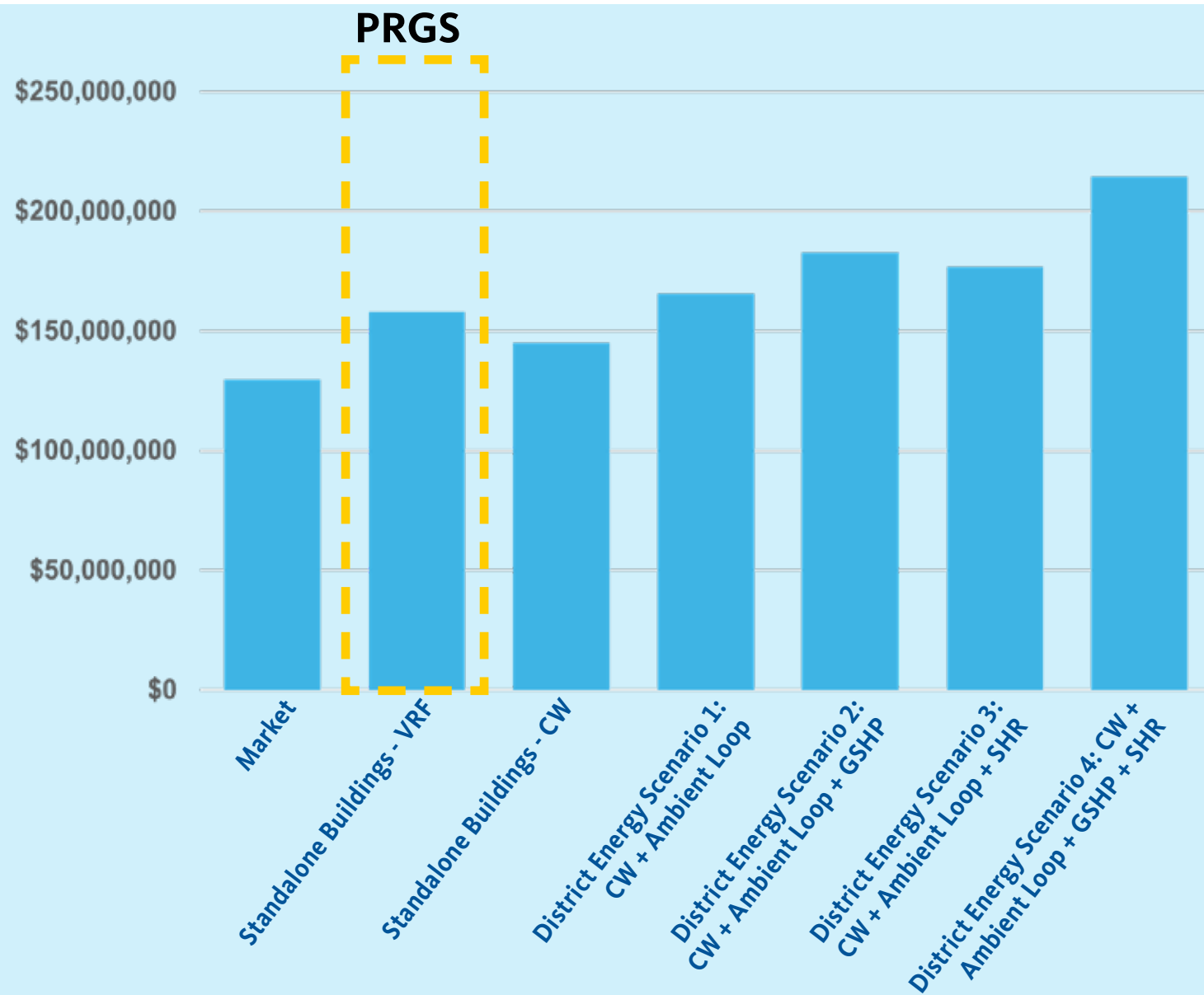
# DISTRICT ENERGY FEASIBILITY ANALYSIS

## FINANCIAL FEASIBILITY

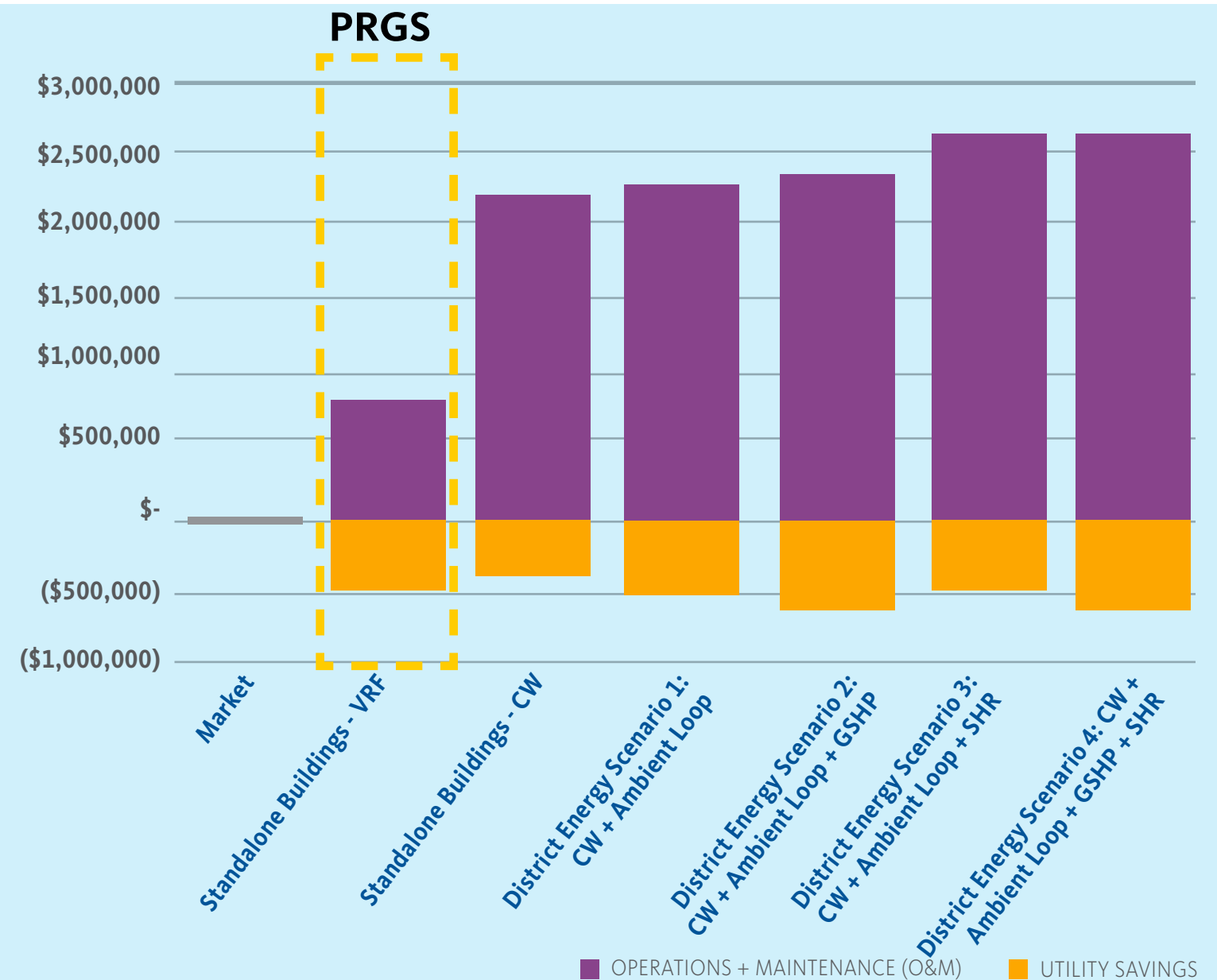
- None of the District Energy Study options modeled have commercially reasonable payback period
- Additional phased development costs are not accounted for in this study

- Increased annual operations and maintenance costs outweigh utility savings
- Significantly increases operations and maintenance requirements during occupancy

### INITIAL COST



### OPERATIONAL COST VS. UTILITY SAVINGS



# OTHER DISTRICT SYSTEMS EVALUATED



## RIVERWATER COOLING

Shallow river depth is prohibitive for calculating any energy recovery from this option.



## ANAEROBIC DIGESTION

Anaerobic digestion is not feasible due to minimal available feedstock in site proximity, space limitations and operational management demands.

# RENEWABLES

## ROOF MOUNT PV



- Market ready solution
- High performance ratio of capacity to output (optimal placement to best utilize panels)
- Lowest install cost

## VERTICAL MOUNT PV



- Custom installation required
- Low to moderate performance ratio of capacity to output (reduced sun access throughout day)
- Highest install cost

## SITE STRUCTURE PV



- Minimal site areas without shading from buildings available
- Low to moderate performance ratio of capacity to output (due to shading)
- Structures may be eligible for rebate incentives

## GREEN ROOF + PV



- Permitting pathway would need defined to ensure spacing or separation requirements would produce reasonable amount of energy
- High performance ratio of capacity to output

# BLOCK ROOFTOP PV ESTIMATES

## Panel Orientation Analysis

- 4 panel orientation explored to understand panel efficiency
- Horizontal panels should be prioritized, followed by: vertical south-facing and southwest facing, if financially feasible
- Vertical west-facing panels should not be considered due to lower efficiency, longer payback, customized mounting systems and prioritization of responsible use of raw materials used in PV panels.

ROOF PV TOTAL AREA		LAYOUT	SYSTEM SIZE (kW)	ANNUAL ENERGY (MWh/yr)	OUTPUT EFFICIENCY (MWh/yr)
BLOCK	AREA (SF)				
A	-	Horizontal Rooftop	459	623	1400
B	7,000				
C	8,870				
D	3,000	Additional Capacity	TBD	277	TBD
E	8,850				
F	10,600				

**Rooftop PV Contribution: 623 MWh/year** (~2% site energy)

- Additional capacity will be refined as block and site design continues



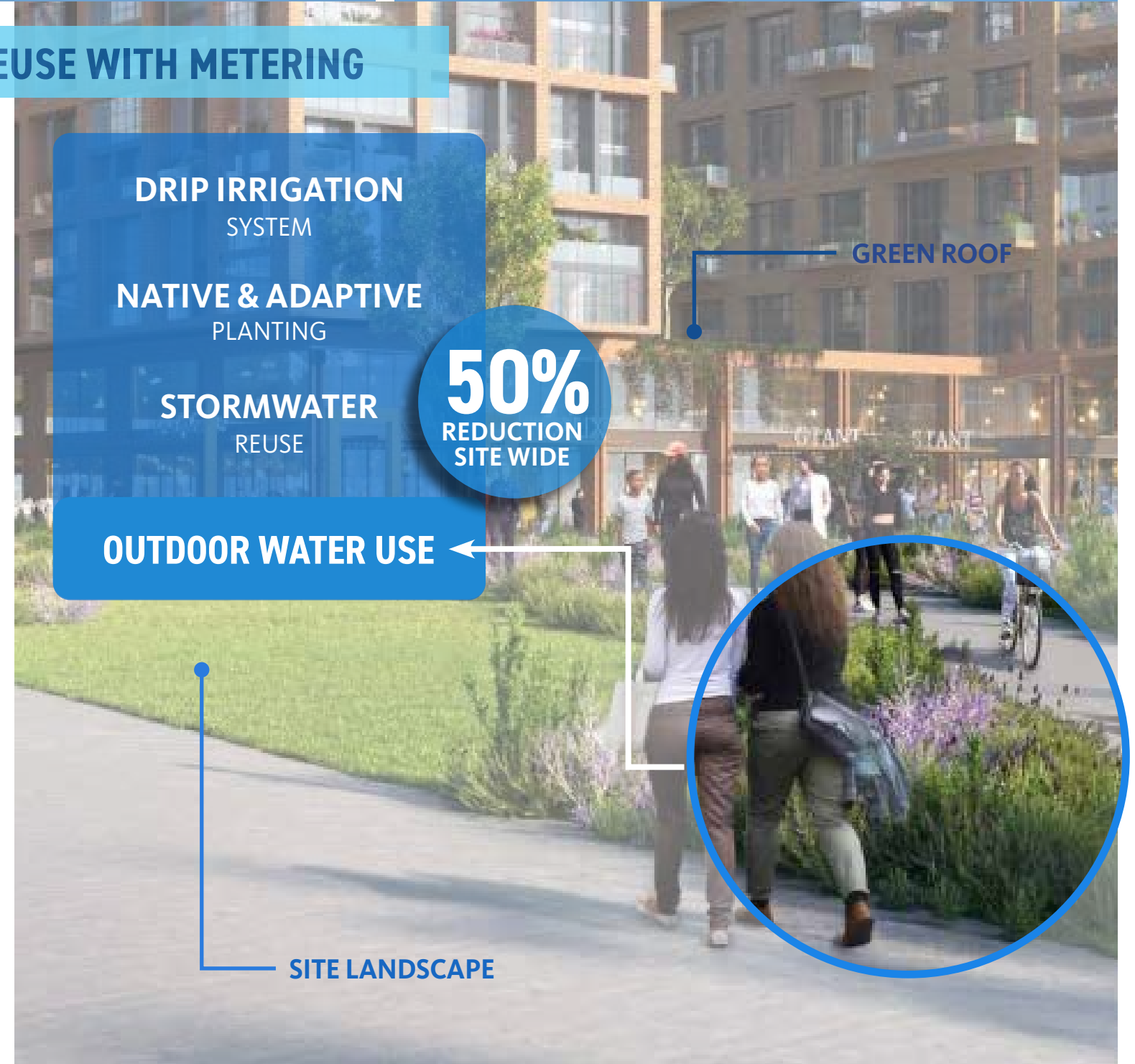
# WATER

## INDOOR WATER USE REDUCTION

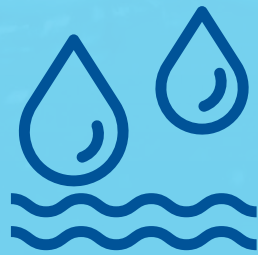
## OUTDOOR WATER USE REDUCTION

## STORAGE AND REUSE

### QUANTIFY WATER REUSE WITH METERING



# WATER TARGETS



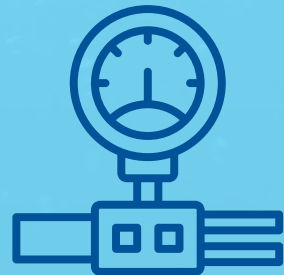
**POTABLE WATER DEMAND**

**SITE-WIDE**

**50% outdoor water use reduction**

**BLOCK**

**40% indoor water use reduction**



**STORAGE & REUSE**

**BLOCK**

**Quantify water reuse with meters \***

*\* voluntary commitment*

# HUMAN HEALTH

## OCCUPANT COMFORT

## INDOOR ENVIRONMENTAL QUALITY

## RESPONSIBLE MATERIALS

## WASTE MANAGEMENT



### USER EXPERIENCE

**THERMAL CONTROLS & SMART THERMOSTATS**

**ACOUSTICAL DESIGN**  
OPTIMIZED AT ENVELOPE

**OUTDOOR COMFORT**  
SHADING IN SUMMER & ACCESS TO SUNLIGHT IN WINTER

### HEALTHY SPACES

**INDOOR AND CONSTRUCTION AIR QUALITY MANAGEMENT PLANS**

**REDUCED MATERIAL OFF-GASSING**

**DAYLIGHT**  
ACCESS & CONTROL

### MATERIAL TRANSPARENCY

**ENVIRONMENTAL PRODUCT DECLARATIONS & MATERIAL INGREDIENT REPORTS**

**LOW-EMITTING MATERIALS**

### WASTE MANAGEMENT PLAN

**ALL CONSTRUCTION PHASES & OPERATIONS**  
WITH WASTE MANAGEMENT PLANS

**COMPOSTING**  
OPERATIONAL COLLECTIONS

# HUMAN HEALTH TARGETS



## MATERIAL SOURCING

BLOCK

Material sourcing tracking\*

BLOCK

Low-emitting material tracking



## INDOOR ENVIRONMENTAL QUALITY

BLOCK

Construction Indoor Air Quality Plans

BLOCK

100% occupant thermal control (multi-family buildings)\*



## WASTE MANAGEMENT

SITE-WIDE

Ongoing operational waste management planning\*

BLOCK

75% construction waste diversion from new construction\*

\* voluntary commitment



# CLIMATE & RESILIENCE

## ADAPTATION FOR EXTREME WEATHER

## INFRASTRUCTURE HARDENING



HIGH REFLECTANCE MATERIALS  
TREE CANOPY  
SHADING STRUCTURE  
VEGETATED ROOFS

**HEAT ISLAND REDUCTION**



**100% BUILDING SYSTEMS**  
DESIGNED FOR FUTURE CLIMATE PROJECTIONS

**FUTURE-PROOFING**  
SYSTEM SELECTION  
**FLEXIBLE CAPACITY**  
FOR FUTURE DEMANDS

**INFRASTRUCTURE**

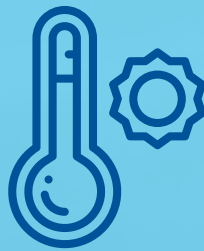
# RESILIENCE TARGETS



**EXTREME  
PRECIPITATION**

**SITE-WIDE**

Ongoing **monitoring and maintenance of green infrastructure** during operations to ensure storm event capacity\*



**EXTREME HEAT**

**SITE-WIDE**

**100% tree-lined blocks** at intervals of 50 ft spacing or less (where not restricted by easements, curb cuts, or other necessary streetscape elements, etc.)



**INFRASTRUCTURE  
HARDENING**

**BLOCK**

**100% building systems designed for future climate projections\***

**BLOCK**

Ongoing **monitoring of systems** during operations **after extreme weather events\***

*\* voluntary commitment*

# TODAY'S MEETING

**1. CONTEXT**

**2. CDD CONDITIONS & ROADMAP FOR TARGETS**

**3. COORDINATED SUSTAINABILITY STRATEGY (CSS)**

**4. REPORTING**

**5. FINANCIAL CONSIDERATIONS + POTENTIAL INCENTIVES**

**NEXT STEPS**

# SITE-LEVEL TRACKING

DESIGNED PERFORMANCE - SITE			
KEY TARGETS		DSUP SUBMISSION	CERTIFICATE OF OCCUPANCY
Stormwater Management phosphorus reduction		XX%	XX%
LEED ND Points		# Tracking	#Submitted/Award Level
CSS TARGETS			
Open Space and Biodiversity	5 acres on-site open space	XX acres	XX acres
	20% genus diversity in tree planting*	XX%	XX%
Green Infrastructure	2 acres green roof & bioretention systems*	XX%	XX%
Circulation & Transportation	4 DASH bu stops with shelters	YES/NO	YES/NO
	2 Bikeshare stations	YES/NO	YES/NO
Renewables	2% on-site renewable energy generation	XX kWh, XX%	XX kWh, XX%
Embodied Carbon	Measure additional horizontal concrete embodied carbon reduction*	XX%	XX%
Portable Water Demand	50% outdoor water reuse reduction	XX%	XX%
Water Storage & Reuse	Quantify water reuse with meters*	YES/NO	YES/NO
Waste Management	Ongoing operational waste management planning*	XX%	XX%
Extreme Precipitation	Ongoing monitoring green infrastructure during operations for storm event capacity*	YES/NO	YES/NO
Extreme Heat	100% tree-lined blocks at intervals of 50 ft spacing or less	YES/NO	YES/NO

DESIGNED PERFORMANCE - SITE		
	DSUP SUBMISSION	CERTIFICATE OF OCCUPANCY
INNOVATIVE & EMERGING TECHNOLOGY NOTES		
Site	[note any solutions/systems]	[note any solutions/systems]
Energy & Carbon	[note any solutions/systems]	[note any solutions/systems]
Water	[note any solutions/systems]	[note any solutions/systems]
Human Health	[note any solutions/systems]	[note any solutions/systems]
Resilience	[note any solutions/systems]	[note any solutions/systems]
EXTERNAL FACTORS		
SRVC Electric Grid Emissions	lbs / kWh	lbs / kWh
Electric Utility Price - Residential	\$ / kWh	\$ / kWh
Electric Utility Price - Commercial	\$ / kWh	\$ / kWh

# SITE-LEVEL TRACKING

OPERATIONAL PERFORMANCE - SITE					
KEY TARGETS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 4
Whole-site EUI Performance	kBtu/ft <sup>2</sup>	kBtu/ft <sup>2</sup>	kBtu/ft <sup>2</sup>	kBtu/ft <sup>2</sup>	kBtu/ft <sup>2</sup>
On-site Renewable Energy Production	X%	X%	X%	X%	X%
Whole-Site Operational Carbon Emissions	kg CO2e/m <sup>2</sup>	kg CO2e/m <sup>2</sup>	kg CO2e/m <sup>2</sup>	kg CO2e/m <sup>2</sup>	kg CO2e/m <sup>2</sup>
Water Reuse	kgal / year	kgal / year	kgal / year	kgal / year	kgal / year
EXTERNAL FACTORS					
SRVC Electric Grid Emissions	lbs / kWh	lbs / kWh	lbs / kWh	lbs / kWh	lbs / kWh
Electric Utility Price -Residential	\$ / kWh	\$ / kWh	\$ / kWh	\$ / kWh	\$ / kWh
\$ / kWh	\$ / kWh	\$ / kWh	\$ / kWh	\$ / kWh	\$ / kWh

# BLOCK-LEVEL TRACKING

DESIGNED PERFORMANCE - BLOCKS			
KEY TARGETS		BUILDING PERMIT	CERTIFICATE OF OCCUPANCY
EUI Performance		Baseline: XX KBtu/ft <sup>2</sup> Design: XX KBtu/ft <sup>2</sup>	Baseline: XX KBtu/ft <sup>2</sup> Design: XX KBtu/ft <sup>2</sup>
System design changes during construction		N/A	[note any combustion based systems]
Annual Operational Carbon Emissions		XX kg CO <sub>2</sub> e/m <sup>2</sup>	XX kg CO <sub>2</sub> e/m <sup>2</sup>
Electrification Exceptions		[note any combustion based systems]	[note any combustion based systems]
LEED Points		# Tracking	# Submitted/Award Level
CSS TARGETS			
Open Space and Biodiversity	Quantify on-site sequestered carbon from plantings	XX kg CO <sub>2</sub> e/m <sup>2</sup>	XX kg CO <sub>2</sub> e/m <sup>2</sup>
Green Infrastructure	25% of green roof area is intensive with at least 6 species*	XX%	XX%
Circulation & Transportation	3% off-street parking spaces with EV charging	XX%	XX%
Operational Carbon	100% electric HVAC & DHW systems	YES/NO	YES/NO
	2021 IECC EUI Targets	XX KBtu/ft <sup>2</sup>	XX KBtu/ft <sup>2</sup>
Embodied Carbon	10% building embodies carbon reduction	XX%	XX%
Portable Water Demand	40% indoor water use reduction	XX%	XX%
Water Storage & Reuse	Quantify water reuse with meters*	YES/NO	YES/NO
Material Sourcing	Material sourcing tracking*	YES/NO	YES/NO
	Low-emitting material tracking	# categories tracked	# categories tracked

DESIGNED PERFORMANCE - BLOCKS			
		BUILDING PERMIT	CERTIFICATE OF OCCUPANCY
Indoor Environmental Quality	Construction indoor Air Quality Plans*	YES/NO	YES/NO
	100% occupant thermal control (multi-family buildings)*	YES/NO	YES/NO
Waste Management	75% construction waste diversion from new construction	XX%	XX%
Infrastructure Hardening	100% building systems designed for future climate projections*	YES/NO	YES/NO
	Ongoing monitoring of operational systems after extreme weather events*	YES/NO	YES/NO
INNOVATIVE & EMERGING TECHNOLOGY NOTES			
Site		[note any solutions/systems]	[note any solutions/systems]
Energy & Carbon		[note any solutions/systems]	[note any solutions/systems]
Water		[note any solutions/systems]	[note any solutions/systems]
Human Health		[note any solutions/systems]	[note any solutions/systems]
Resilience		[note any solutions/systems]	[note any solutions/systems]
EXTERNAL FACTORS			
SRVC Electric Grid Emissions		lbs / kWh	lbs / kWh
Electric Utility Price - Residential		\$ / kWh	\$ / kWh
Electric Utility Price - Commercial		\$ / kWh	\$ / kWh

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**NEXT STEPS**

# FINANCIAL CONSIDERATIONS + POTENTIAL INCENTIVES



## Investment Tax Credit (ITC) - Renewables

Awaiting IRS details on wage requirements, understood to be applicable to construction of renewable energy system only

Emerging domestic manufacturing markets



## Inflation Recovery Act (IRA) – 179D & 45L

Awaiting IRS details on wage requirements, understood to be applicable to construction of entire building



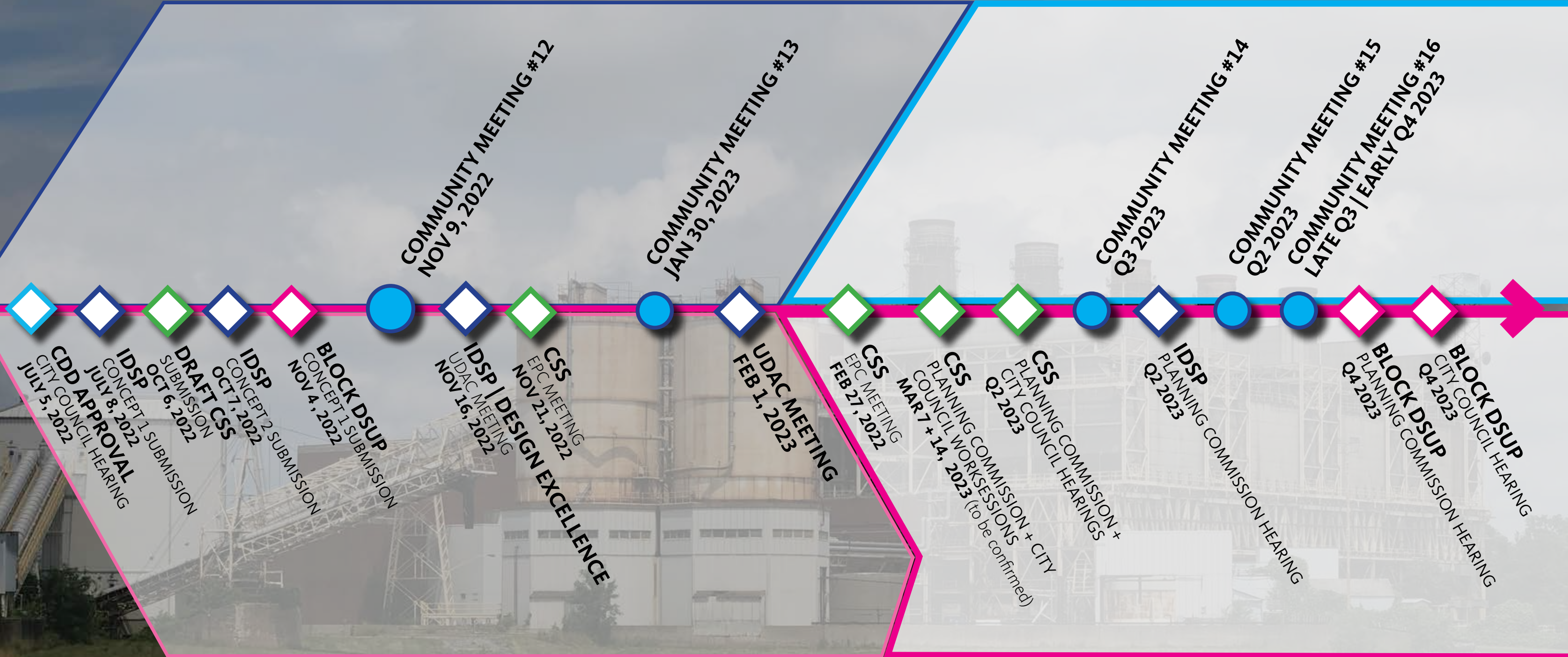
## Off-site Renewables

Volatile pricing market  
PJM interconnection delays and increasing costs



# SCHEDULE & PROCESS

# STEPS FORWARD



**KEY**

 IDSP	 DSUP	 CDD APPROVAL
 CSS	 COMMUNITY MEETINGS	

# THANK YOU

POTOMAC RIVER GENERATING STATION  
REDEVELOPMENT



WEBSITES:

[HRPALX.COM](http://HRPALX.COM)

[ALEXANDRIAVA.GOV/PLANNING/INFO](http://ALEXANDRIAVA.GOV/PLANNING/INFO)