POTOMAC RIVER GENERATING STATION

PLANNING COMMISSION + CITY COUNCIL WORKSESSIONS

March 7 + 14, 2023

Hilco™ Redevelopment Partners

WIRE GILL LLP · Gensler · HANDEL ARCHITECTS · SCB · OJB · christopher consultants IMEG · BALA · MKA Madsen, Kneppers & Associates, Inc. Construction Consultants & Engineers · GOROVE SLADE Transportation Planners and Engineers · CLARK CONSTRUCTION · ARUP · Michael Blades & Associates Elevator and Escalator Consulting · LERCH BATES · 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:

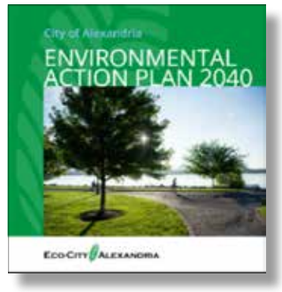
- Water Quality
- Energy & Green Building
- Design, Land Use and Transportation
- Performance Measures

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

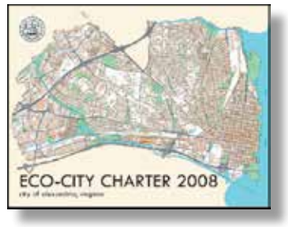
Climate Emergency Acknowledgment

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.

TODAY'S MEETING

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NEXT STEPS

CDD SUSTAINABILITY CONDITIONS

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

CONDITION	TOPIC	SUMMARY
CONDITION 139	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.
CONDITION 143	GREEN BUILDING	Comply with the Alexandria GBP in effect at time of DSUP submission.
CONDITION 144	COORDINATED SUSTAINABILITY STRATEGY	Develop a CSS prior to 2nd concept Infrastructure Development Site Plan.
CONDITION 145	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.
CONDITION 149	ELECTRIFICATION	Demonstration compliance with electrification implementation as outlined in the EAP 2040 targets, goals and actions.
CONDITION 150	ELECTRIFICATION	Off-street parking shall provide EV charging consistent with City policies at time of DSUP submission.
CONDITION 151	ON-SITE ENERGY GENERATION	Newly constructed buildings shall be utilized to provide on-site energy to the extent feasible.
CONDITION 152	CONSTRUCTION WASTE	Provide regional construction recycling and reuse guidance with each final site plan.
CONDITION 153	REPORTING	Site-wide sustainability performance shall aggregate individual building data annually as buildings are constructed.
CONDITION 154	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

SITE-WIDE

1. Define district energy systems for analysis
2. Calculate carbon impacts
3. Assess constructibility and financial feasibility
4. Track annual grid emissions trajectory

BLOCKS

1. Calculate building energy use baseline
2. Optimize design elements for performance
3. Assess constructibility and financial feasibility
4. Record designed carbon intensity in project reporting

Target 2 – 3% On-Site Renewable Energy Generation

SITE-WIDE

1. Calculate site energy demand
2. Analyze site space for panels and infrastructure
3. Coordinate with stormwater management planning
4. Design applicable PV systems at site DSUPs

BLOCKS

1. Coordination for space availability at roof
2. Define areas for equipment, risers and infrastructure
3. Refine system design for code requirements
4. Utility interconnection approvals
5. Record installed system capacity in project reporting

ROADMAP FOR CDD SUSTAINABILITY TARGETS

Target 3 – 10% Embodied Carbon Reduction

BLOCKS

1. Calculate building embodied carbon baseline
2. Establish structure and enclosure carbon budgets
3. Refine specifications and design documents
4. Record % reduction from design in project reporting

Target 4 – All-Electric Buildings

BLOCKS

1. Quantify electrical systems and requested exceptions
2. Coordinate demand, capacity and infrastructure for site and blocks
3. Define critical loads and resilience needs
4. Record electrical systems and exceptions at each Block

Target 5 – Off-site Renewables

1. Define the off-site capacity target
2. Establish procurement quality criteria
3. Price off-site renewables within 1 year of occupancy
4. Review contract terms prior to expiration or renewal

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NEXT STEPS

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**

SHORT TERM
2022-2026

- Analysis of market-ready solutions for site and block DSUPS submitted in this timeframe
- Evaluate and coordinate with external parties required for approvals – local utilities, adjacent property owners, City officials
- Establish project sustainability targets for design and construction for site and block DSUPs submitted in this timeframe

MID TERM
2027-2031

- Analysis of market solutions that were previously innovative or emerging technologies for Block DSUPs submitted in this timeframe
- Measure and report existing building performance per CDD requirements
- Update project sustainability requirements for design and construction for site and block DSUPs submitted in this timeframe

LONG TERM
2032 & beyond

- Review and respond to external factors that influence achieving targets (electric grid emissions, weather data) in line with operational procedures
- Measure and report existing building performance per CDD Condition 155
- Track system performance as systems approach end of useful life

CSS draft submission
October 6, 2022

EPC review meeting
November 21, 2022

Revised CSS Submitted
February 14, 2023

EPC Review Meeting
February 27, 2023

Worksessions with Planning Commission and City Council in March 2023

Planning Commission Hearing
May 2023

City Council Hearing
May 2023

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

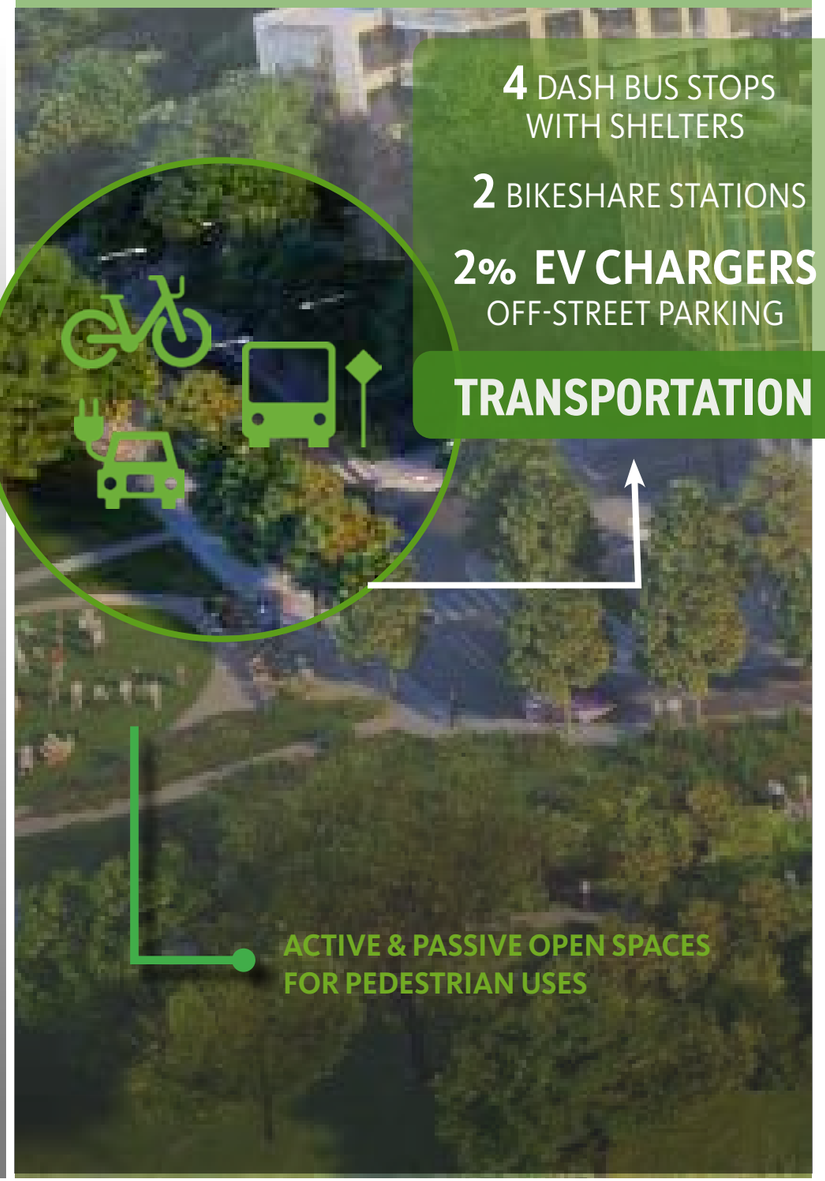
610 MT
CO_2 SEQUESTERED FROM VEGETATION

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

ENERGY & CARBON 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 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

MODEL CODE	PERFORMANCE COMPLIANCE PATH
2021 IECC	ASHRAE 90 1-2019
2018 IECC	ASHRAE 90 1-2016
2015 IECC	ASHRAE 90 1-2013
2012 IECC	ASHRAE 90 1-2010

PRGS

VIRGINIA

ALX
GREEN BUILDING POLICY

ENERGY USE INTENSITY (EUI) CONSIDERATIONS

Energy Use Intensity (EUI)

is the calculation of a building's annual energy use

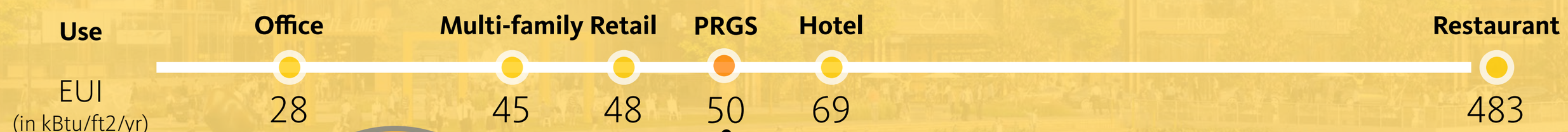
Design EUI
uses modeling projections

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
Which is above current requirements



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

MULTI-FAMILY 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

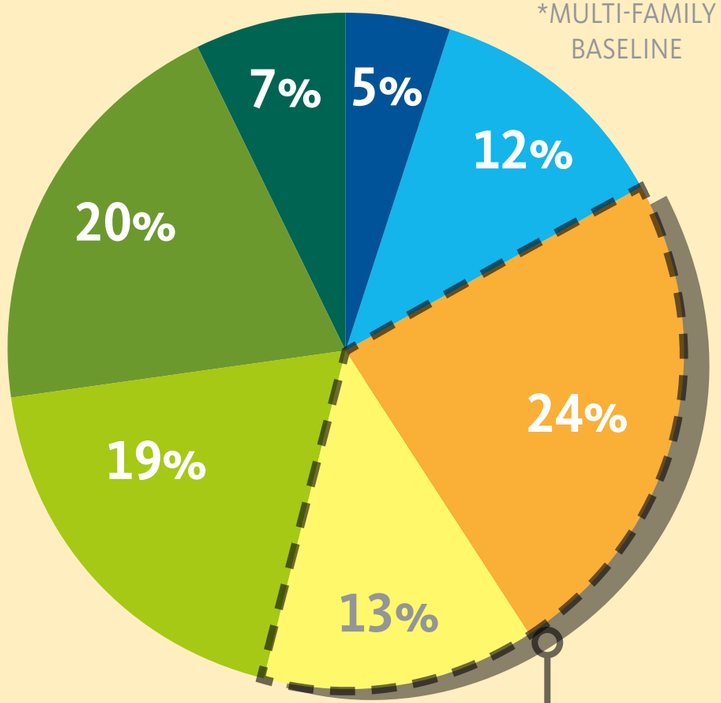
B. LIFE-SAFETY EQUIPMENT (ELEVATORS)

C. OPERATIONAL SCHEDULES

RESIDENTIAL IECC 2021 RESIDENTIAL EUI

BASELINE DESIGN*
EUI 45

*MULTI-FAMILY BASELINE

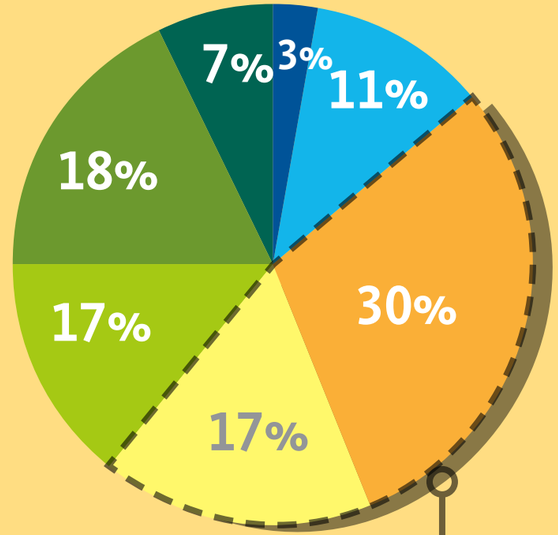


37% from Plug & Process Loads

PRGS CURRENT DESIGN RESIDENTIAL EUI

OPTIMIZED DESIGN**
EUI 35

**BASED ON BENCHMARKING



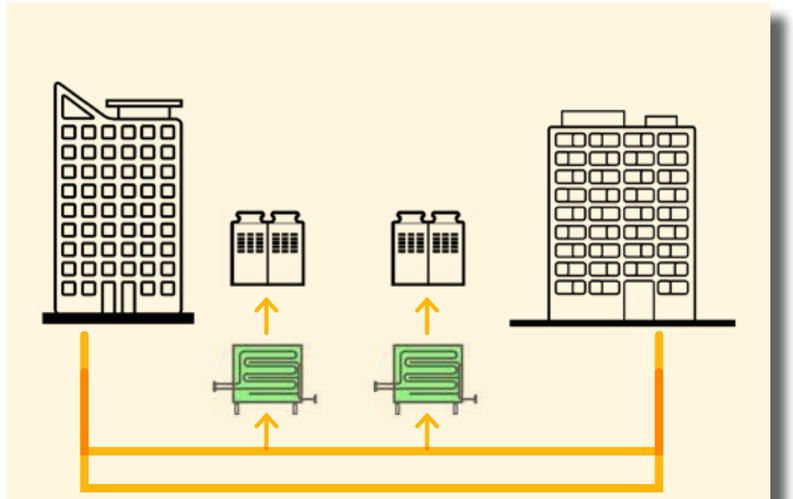
BECOMES A LARGER PERCENTAGE OF OVERALL BUILDING ENERGY USE

47% from Plug & Process Loads

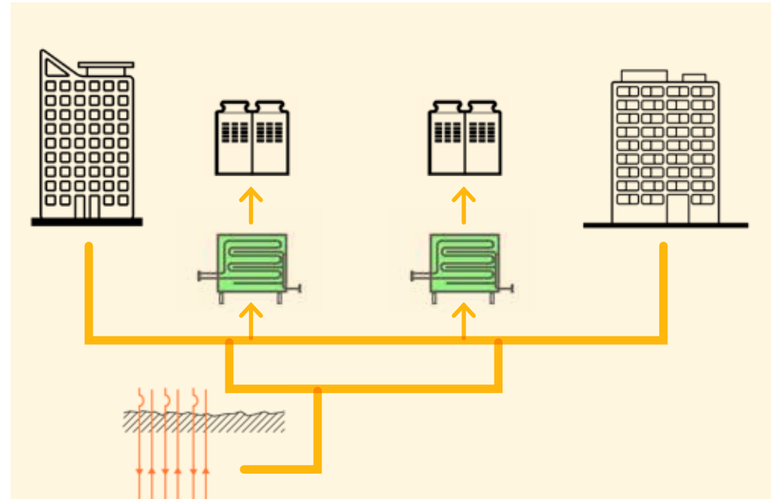
- Pumps & Fans
- Lighting
- Plug Loads
- Process Equipment
- Space Heating
- Water Heating
- Space Cooling

DISTRICT ENERGY FEASIBILITY ANALYSIS

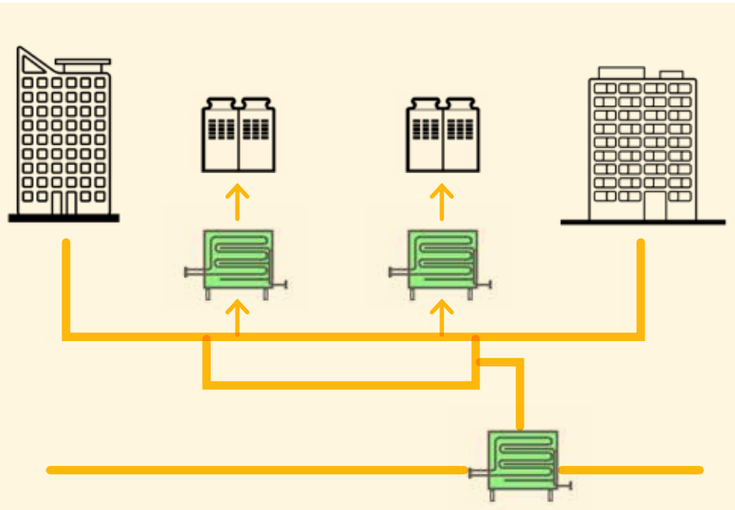
- The District Energy Feasibility Analysis evaluated 4 scenarios
- An ambient loop connects the heating and cooling loads between buildings
- Other technologies are then able to be added to the ambient loop to increase the energy recovery potential from groundsource heat pumps and/or sewer heat recovery



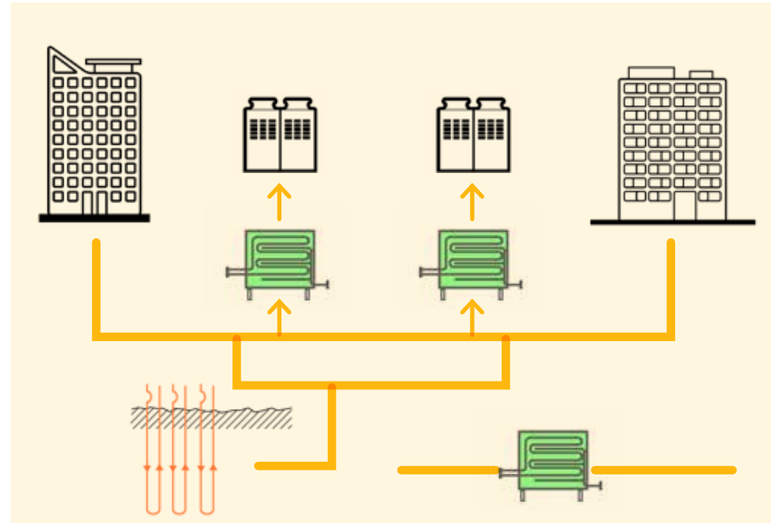
SCENARIO 1: CW + AMBIENT LOOP



SCENARIO 2: CW + AMBIENT LOOP + GSHP



SCENARIO 3: CW + AMBIENT LOOP + SHR



SCENARIO 4: CW + AMBIENT LOOP + GSHP + SHR

CW = Condenser Water

GSHP = Ground Source Heat Pump

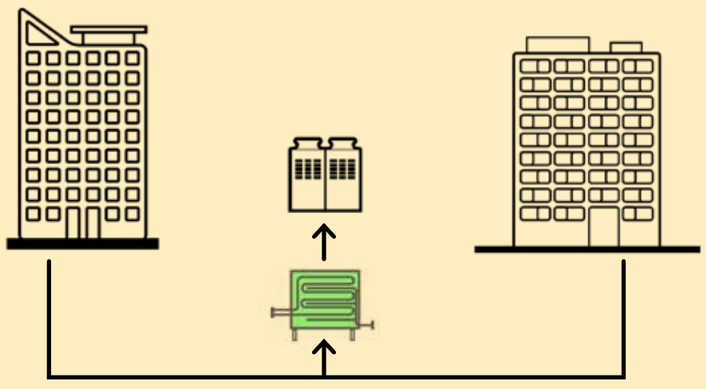
SHR = Sewer Heat Recovery

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



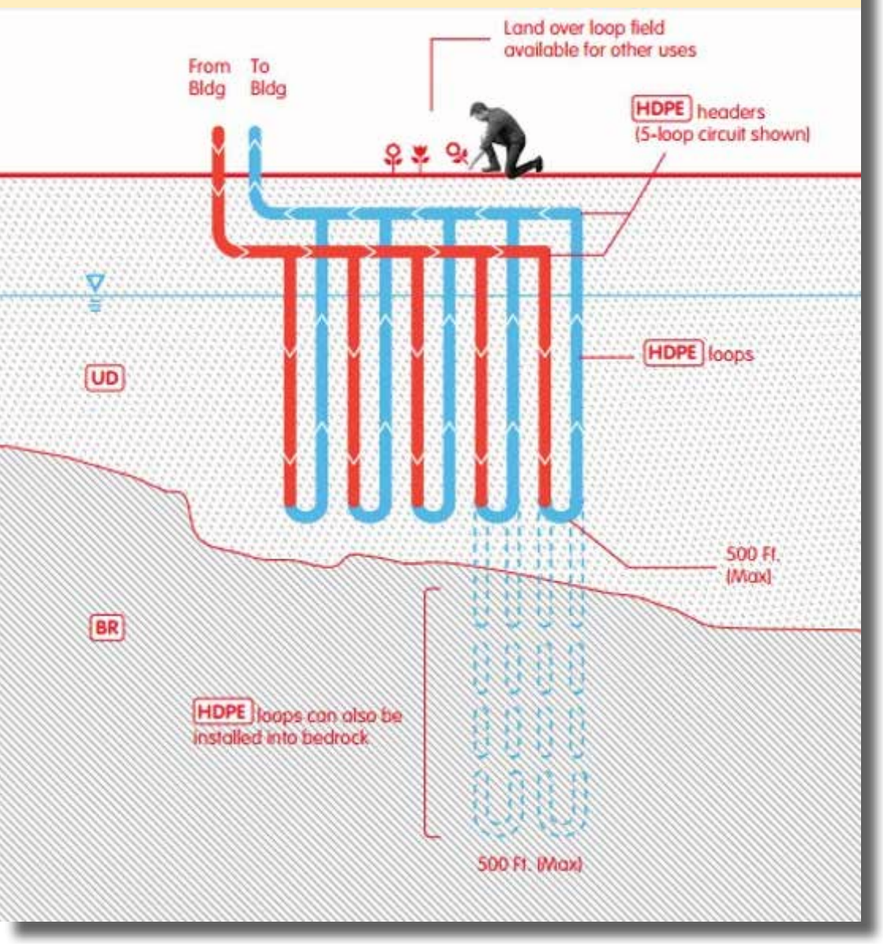
- Energy reduction from building level system efficiencies and enhanced envelope will reduce the overall demand first, which reduces the amount of energy recovery able to be shared between buildings
- Additional operational energy is required from pumping to move the heat from one building to another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

DISTRICT ENERGY FEASIBILITY STUDY

GEOTHERMAL HEAT EXCHANGE

GEOTHERMAL 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

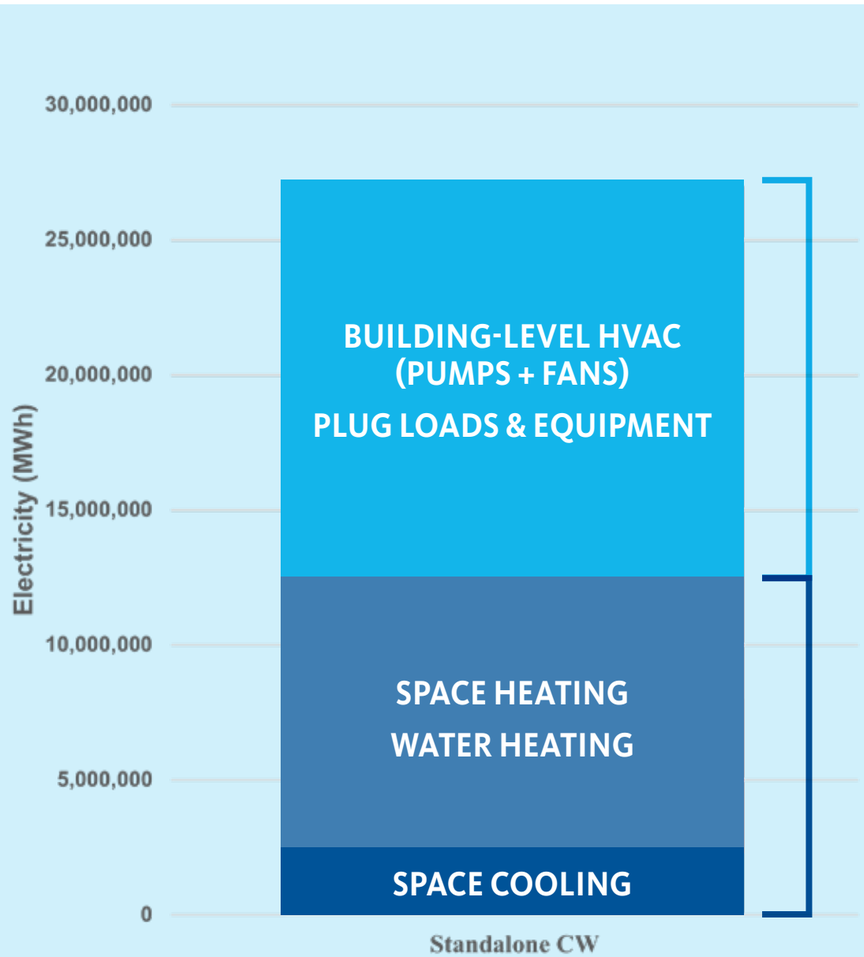
- The PRGS analysis was based upon a fully developed site-- the **overall capacity is diminished** during the initial phases
- The system is assumed to be utilized for heating during winter months and cooling during summer
- During months between summer and winter system can be used either as a net heating 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

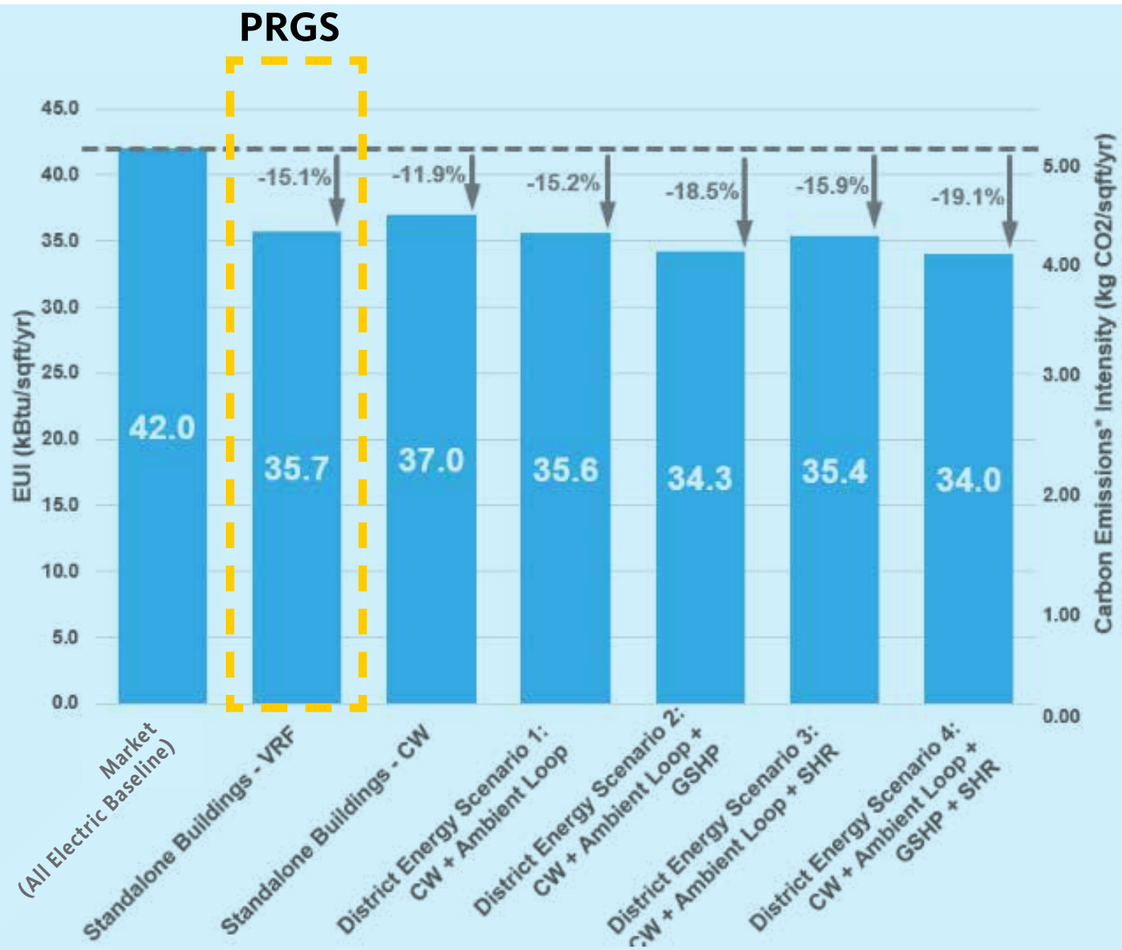
DISTRICT ENERGY FEASIBILITY STUDY

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**



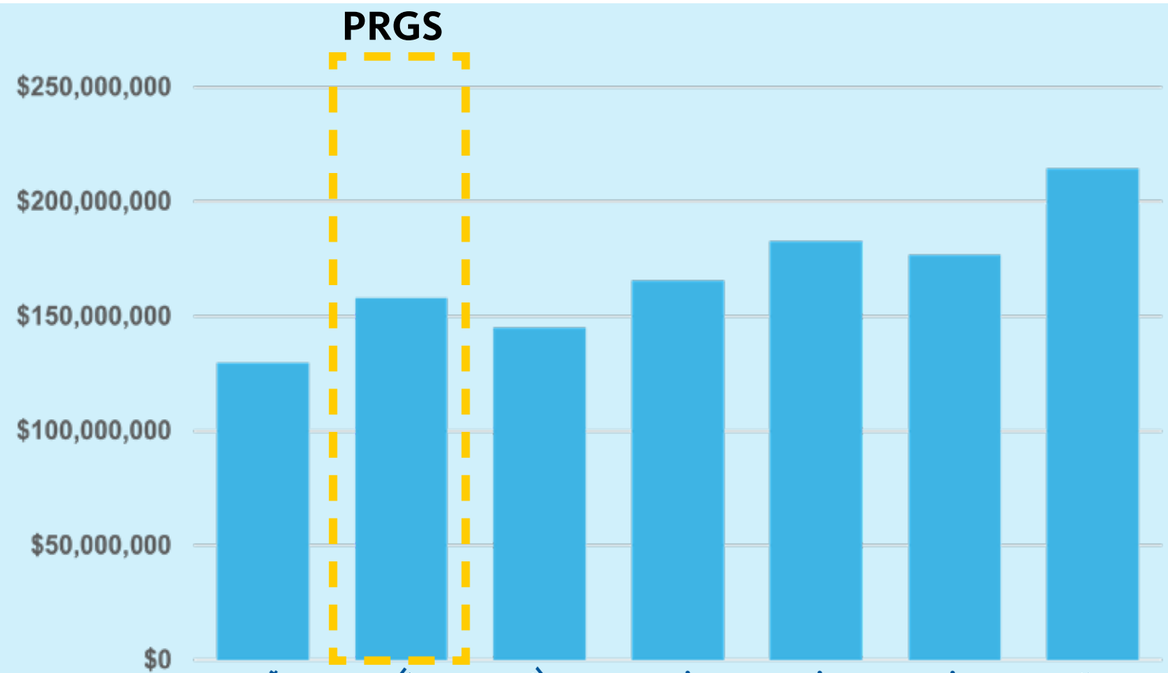


DISTRICT ENERGY FEASIBILITY ANALYSIS

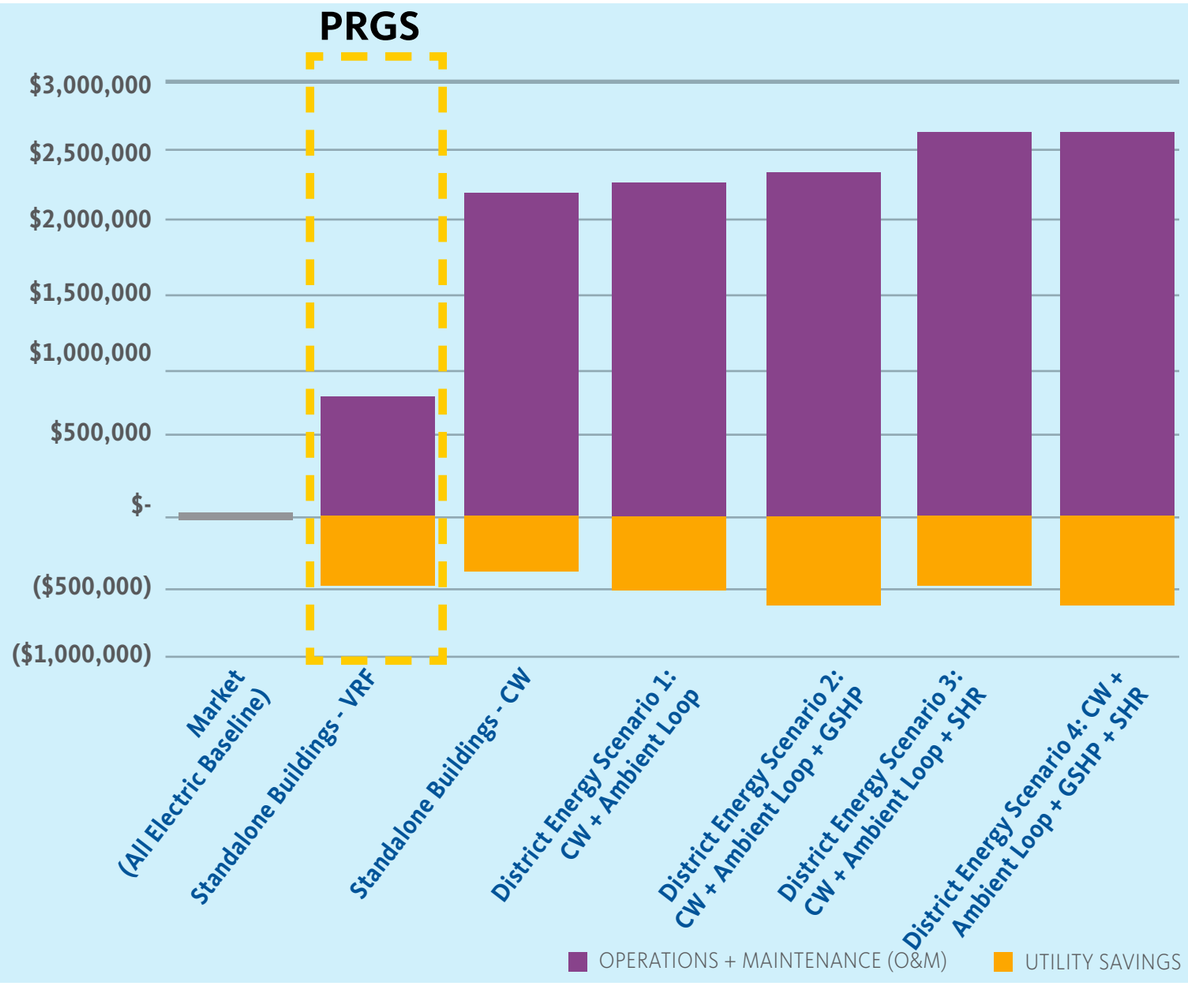
FINANCIAL FEASIBILITY

- 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	
BLOCK	AREA (SF)
A	-
B	7,000
C	8,870
D	3,000
E	8,850
F	10,600

LAYOUT	SYSTEM SIZE (kW)	ANNUAL ENERGY (MWh/yr)	OUTPUT EFFICIENCY (MWh/yr)
Horizontal Rooftop	459	623	1400
Additional Capacity	TBD	277	TBD

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

EFFICIENT BUILDING FIXTURES & EQUIPMENT

ULTRA LOW FLOW
FIXTURES

STORMWATER & CONDENSATE
STORAGE

WATER REUSE

40%
REDUCTION BY BLOCK

INDOOR WATER USE

DRIP IRRIGATION
SYSTEM

NATIVE & ADAPTIVE
PLANTING

STORMWATER
REUSE

50%
REDUCTION SITE WIDE

OUTDOOR WATER USE

GREEN ROOF

SITE LANDSCAPE

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

USER EXPERIENCE

THERMAL CONTROLS & SMART THERMOSTATS

ACOUSTICAL DESIGN
OPTIMIZED AT ENVELOPE

OUTDOOR COMFORT
SHADING IN SUMMER & ACCESS TO SUNLIGHT IN WINTER

INDOOR ENVIRONMENTAL QUALITY

HEALTHY SPACES

INDOOR AND CONSTRUCTION AIR QUALITY MANAGEMENT PLANS

REDUCED MATERIAL OFF-GASSING

DAYLIGHT
ACCESS & CONTROL

RESPONSIBLE MATERIALS

MATERIAL TRANSPARENCY

ENVIRONMENTAL PRODUCT DECLARATIONS & MATERIAL INGREDIENT REPORTS

LOW-EMITTING MATERIALS

WASTE MANAGEMENT

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

HIGH REFLECTANCE
MATERIALS

TREE CANOPY

SHADING STRUCTURE

VEGETATED ROOFS

HEAT ISLAND REDUCTION

INFRASTRUCTURE HARDENING

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

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6. 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 5**
Whole-site EUI Performance	kBtu/ft^2	kBtu/ft^2	kBtu/ft^2	kBtu/ft^2	kBtu/ft^2
On-site Renewable Energy Production	X%	X%	X%	X%	X%
Whole=Site Operational Carbon Emissions	kg CO2e/m^2	kg CO2e/m^2	kg CO2e/m^2	kg CO2e/m^2	kg CO2e/m^2
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^2 Design: XX KBtu/ft^2	Baseline: XX KBtu/ft^2 Design: XX KBtu/ft^2
System design changes during construction		N/A	[note any combustion based systems]
Annual Operational Carbon Emissions		XX kg CO2e/m^2	XX kg CO2e/m^2
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 CO2e/m^2	XX kg CO2e/m^2
Green Infrastructure	25% of green roof area is intensive with at least 6 species*	XX%	XX%
Circulation & Transportation	2% 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^2	XX KBtu/ft^2
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 meeters*	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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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

CDD APPROVAL
CITY COUNCIL HEARING
JULY 5, 2022

IDSP
CONCEPT 1 SUBMISSION
JULY 8, 2022

DRAFT CSS
SUBMISSION
OCT 6, 2022

IDSP
CONCEPT 2 SUBMISSION
OCT 7, 2022

BLOCK DSUP
CONCEPT 1 SUBMISSION
NOV 4, 2022

COMMUNITY MEETING #12
NOV 9, 2022

IDSP | DESIGN EXCELLENCE
UDAC MEETING
NOV 16, 2022

CSS
EPC MEETING
NOV 21, 2022

UDAC MEETING
FEB 1, 2023

CSS
EPC MEETING
FEB 27, 2022

COMMUNITY MEETING #13
JAN 30, 2023

CSS
PLANNING COMMISSION + CITY COUNCIL WORKSESSIONS
MAR 7 + 14, 2023

CSS
PLANNING COMMISSION + CITY COUNCIL HEARINGS
Q2 2023

COMMUNITY MEETING #14
Q3 2023

IDSP
PLANNING COMMISSION HEARING
Q2 2023

COMMUNITY MEETING #15
Q2 2023

BLOCK DSUP
PLANNING COMMISSION HEARING
Q4 2023

COMMUNITY MEETING #16
LATE Q3 | EARLY Q4 2023

BLOCK DSUP
CITY COUNCIL HEARING
Q4 2023

KEY

- IDSP
- DSUP
- CDD APPROVAL
- CSS
- COMMUNITY MEETINGS

THANK YOU

POTOMAC RIVER GENERATING STATION
REDEVELOPMENT

WEBSITES:

HRPALX.COM
ALEXANDRIAVA.GOV/PLANNING/INFO

APPENDIX

PASSIVE HOUSE REFERENCES

HILLCREST RESIDENCES

PITTSBURGH, PA

Senior Affordable Housing

Architect: RDL Architects, Inc

Developer: The Community Builders

Size: 68,000 sf, 66 units

Status: Constructed

PARK AVENUE GREEN

BRONX, NY

Mixed-use affordable

Architect: Curtis+Ginsberg

Developer: Omni

Size: 164,000 sf, 154 units

Status: Constructed

SENDERO VERDE

HARLEM, NY

Mixed-income housing and community uses

Architect: Handel Architects

Developer: Jonathan Rose Companies, L+M Development Partners and Acacia Network

Size: 750,000 sf, 709 units

Status: Constructed (phase 1), Under Construction (phase 2)

PASSIVE HOUSE REFERENCES

425 GRAND CONCOURSE

BRONX, NY

Mixed-use: affordable housing, community and retail

Architect: Dattner Architects

Developer: Trinity Financial, MBD Community Housing Corporation

Size: 300,000 sf, 277 units

Status: Constructed

HILLANDALE GATEWAY CENTER

SILVER SPRING, MD

Mixed-use, affordable and market housing

includes below- and above-grade parking

Architect: Torti Gallas Architects

Developer: Montgomery County Housing Opportunities Commission and The Duffie Companies

Size: 10 stories, 463,000 sf, 496 units

Construction Cost: Unknown

Status: Design

THE HOUSE, CORNELL TECH CENTER

NEW YORK, NY

Dormitory

Architect: Handel Architects

Developer: Cornell University

Size: 26 stories, 271,000 sf

Construction Cost: $150 million

Status: Constructed

PASSIVE HOUSE REFERENCES

SECOND AND DELAWARE

KANSAS CITY, MO

Multi-family residential

Architect: Jeffrey M. White

Developer: Arnold Development Group

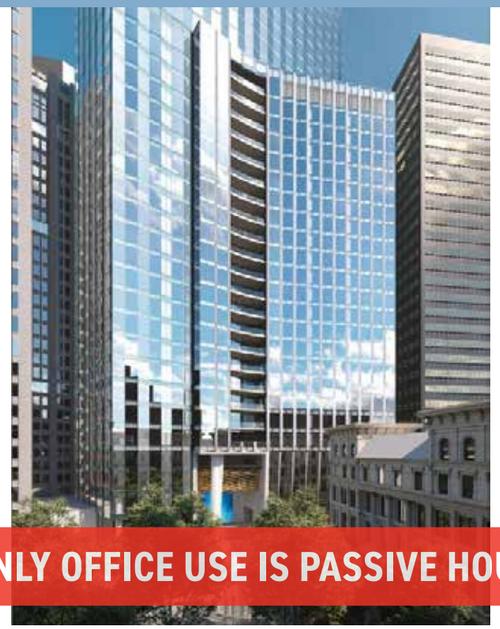
Size: 6 stories, 330,000 sf, 276 units, all concrete above ground parking structure

Status: Constructed

WINTHROP CENTER

BOSTON, MA

Office and condo building



Architect: Handel Architects

Developer: Millennium Partners

Size: 53 stories, 1,900,000 sf, 400 units

Construction Cost: $1,300,000,000

Status: Under Construction

OASIS

LONG ISLAND CITY, NY

Office building with retail

Architect: Archimaera

Developer: JNY Capital

Size: 425,000 sf

Status: Constructed

PASSIVE HOUSE APPLICABILITY

Multi-family Typology

- Commonly applied for student, senior and affordable housing due to simplicity of units
- Typically have centralized laundry facilities (lower plug loads and simplified dryer ventilation design)
- Very low window-to-wall ratio (<30%)

2ND + DELAWARE, KANSAS CITY, MO

AFFORDABLE HOUSING, FAR ROCKAWAY, NY

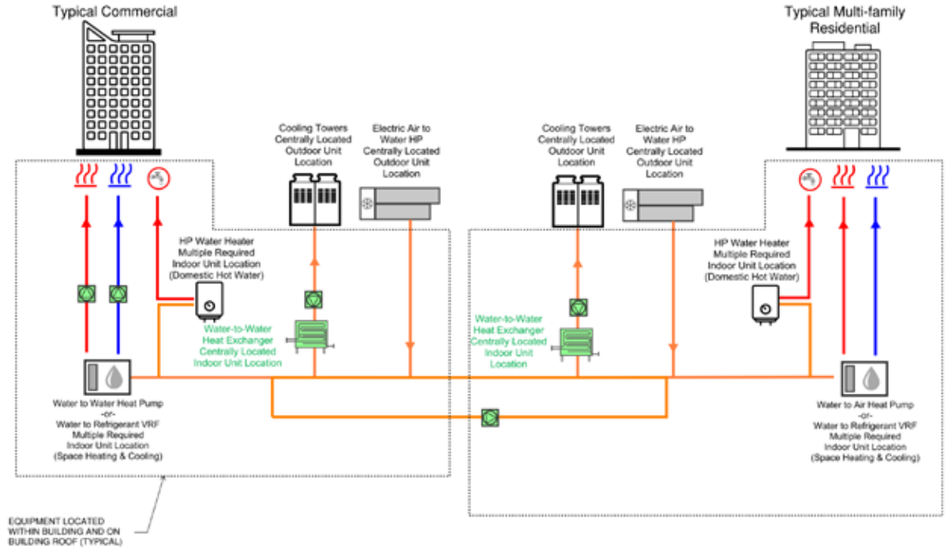
Local Context

- Lack of experienced contractors and tradespeople in the DMV market
- Source EUI values higher than NYC comparisons

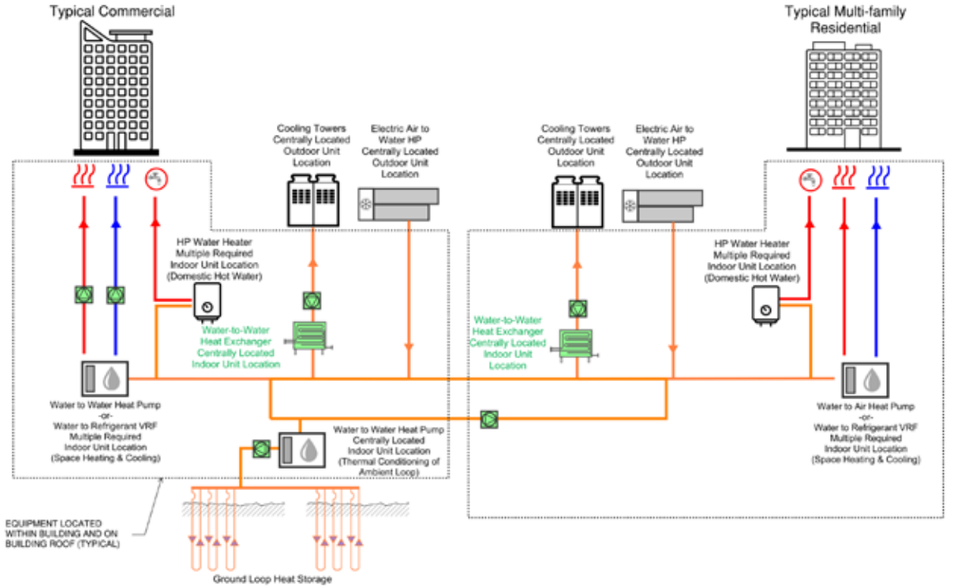
REPORTING REQUIREMENTS

TARGET	SITE-LEVEL REPORTING	BLOCK-LEVEL REPORTING
CONDITION #139 TARGET 1 OPERATIONAL CARBON	LEED ND SCORECARD	Block DSUP Submissions
CONDITION #139 TARGET 2 ON-SITE RENEWABLES	INFRASTRUCTURE DSP / OPEN SPACE DSUP SUBMISSIONS	Block DSUP Submissions
CONDITION #139 TARGET 3 EMBODIED CARBON	LEED ND SCORECARD	Block DSUP Submissions
CONDITION #139 TARGET 4 ELECTRIFICATION	N/A	Block DSUP Submissions
CONDITION #139 TARGET 5 OFF-SITE RENEWABLES	N/A	TBD
CONDITION #142 LEED ND CERTIFICATION	FINAL SITE PLAN	N/A
CONDITION #143 GBP COMPLIANCE	N/A	Block DSUP Submissions
CONDITION #146 CSS CONSISTENCY	N/A	Block DSUP Submissions
CONDITION #17 DRAFT SUSTAINABILITY SCORECARDS	FINAL SITE PLAN	N/A
CONDITION #148 SUSTAINABILITY SCORECARDS	N/A	Block DSUP Submissions & within 1 year of Certificate of Occupancy
CONDITION #150 EV CHARGERS	N/A	Block DSUP Submissions
CONDITION #153 AGGREGATE PERFORMANCE DATA	ANNUAL SITE OPERATION PERFORMANCE REPORT(S)	Annual Building Operation Reports (starting 12 months after first building occupied) for 5 years
CONDITION #154 & 155 ENERGY BENCHMARKING	REPORTING	Public benchmarking through Energy Star Portfolio Manager results for each new building shall be submitted.
CONDITION #154 & 155 ENERGY BENCHMARKING	N/A	Annual ENERGY STAR Portfolio Manager reporting & Sustainability scorecard tracking (starting with first building to have full Jan-Dec utility reporting) for 5 years

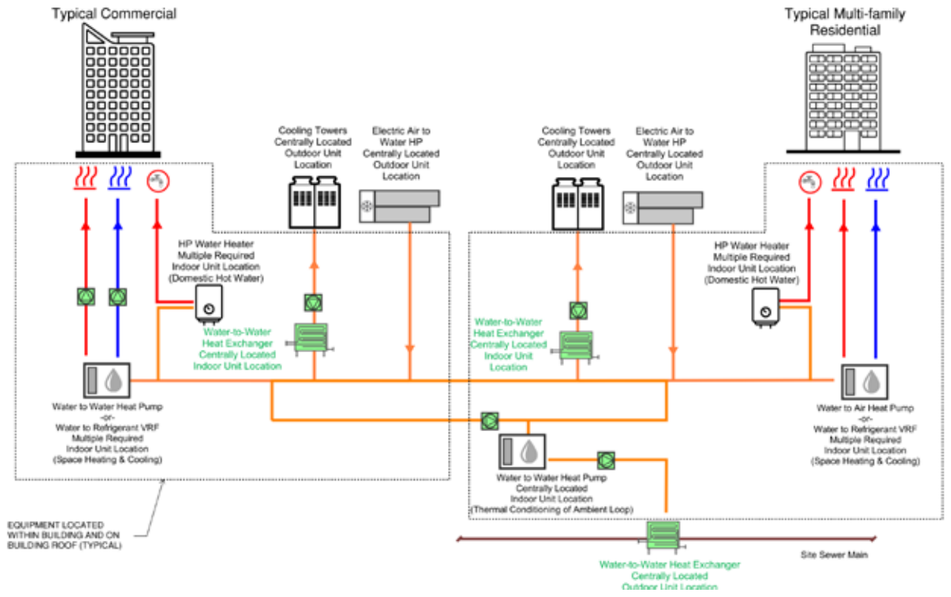
DISTRICT ENERGY FEASIBILITY ANALYSIS



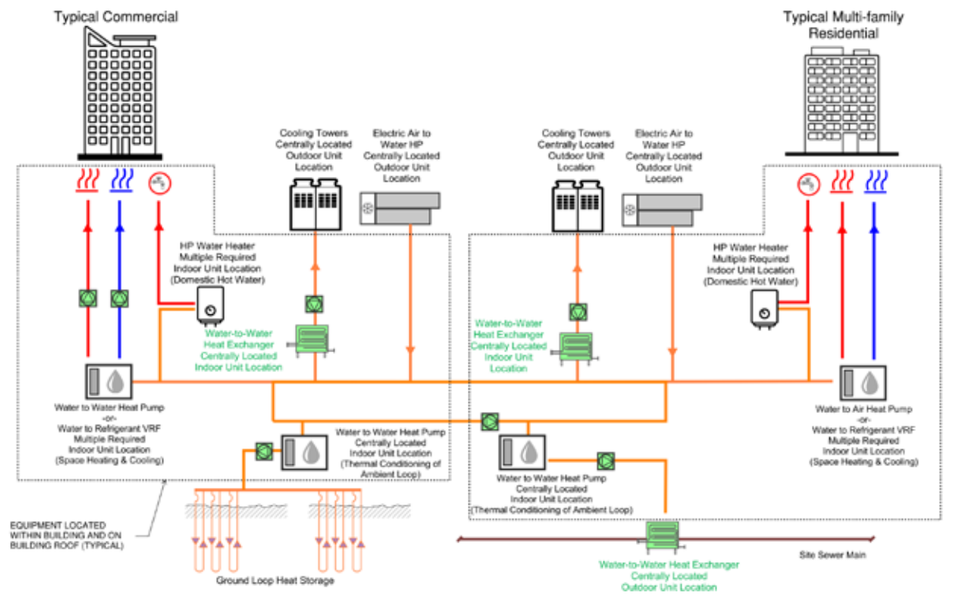
SCENARIO 1: CW+ AMBIENT LOOP



SCENARIO 2: CW + AMBIENT LOOP + GROUNDSOURCE HEAT



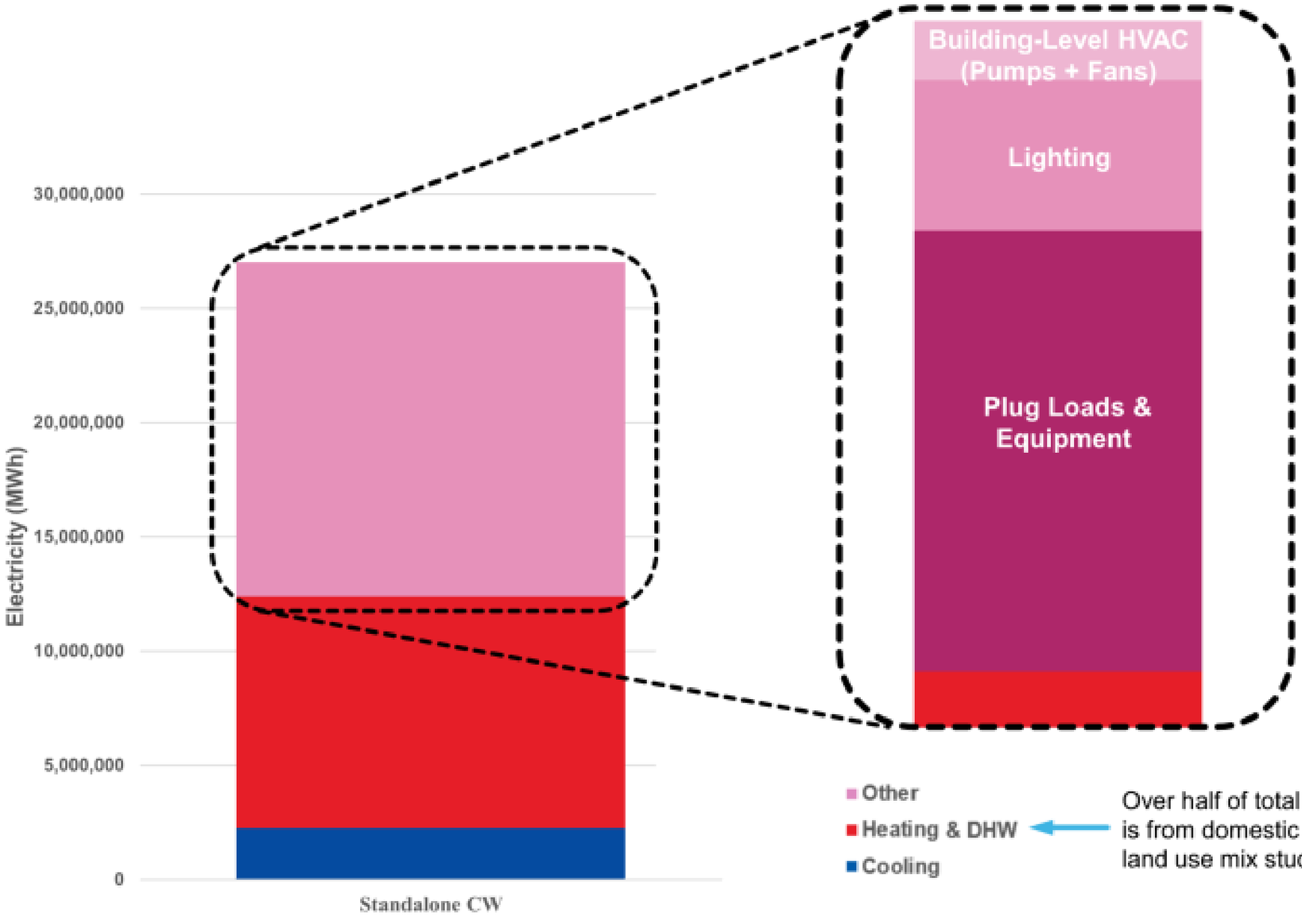
SCENARIO 3: CW + AMBIENT LOOP + SEWER HEAT



SCENARIO 4: CW + AMBIENT LOOP + GROUNDSOURCE HEAT PUMP + SEWER HEAT

DISTRICT ENERGY FEASIBILITY ANALYSIS

TOTAL BUILDING ELECTRICITY USE



54%

of building electricity use is attributed to plug loads, lighting, and pumps and fans. These load are driven by building program and remain consistent amongst the various scenarios.

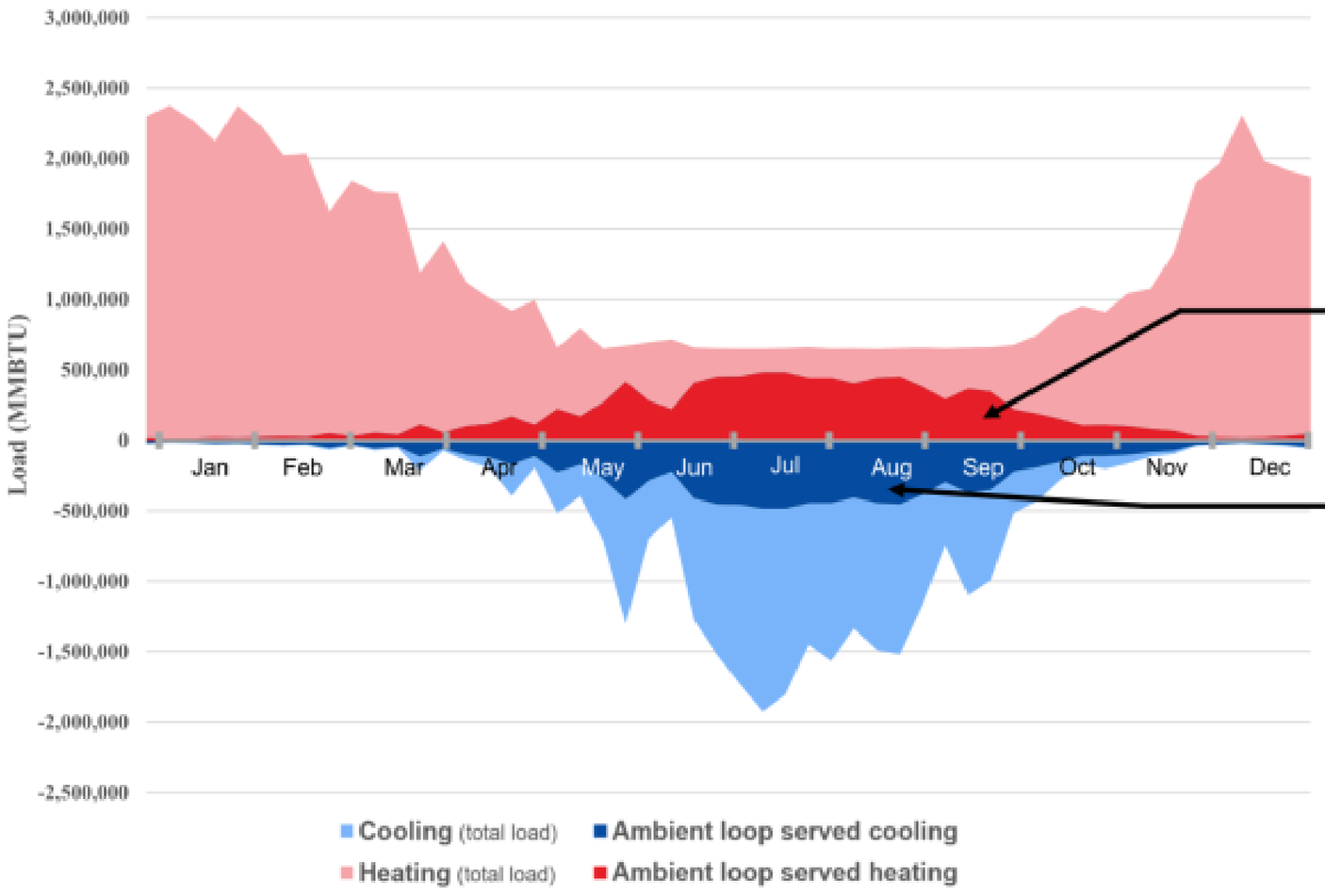
As district systems can only serve building heating and cooling loads,

less than half *of building energy end uses could benefit from a district system.*

Over half of total heating demand (51%) is from domestic hot water (DHW) in the land use mix studied for this analysis

DISTRICT ENERGY FEASIBILITY ANALYSIS

SCENARIO 1: CW + AMBIENT LOOP



Ambient loop: 14%

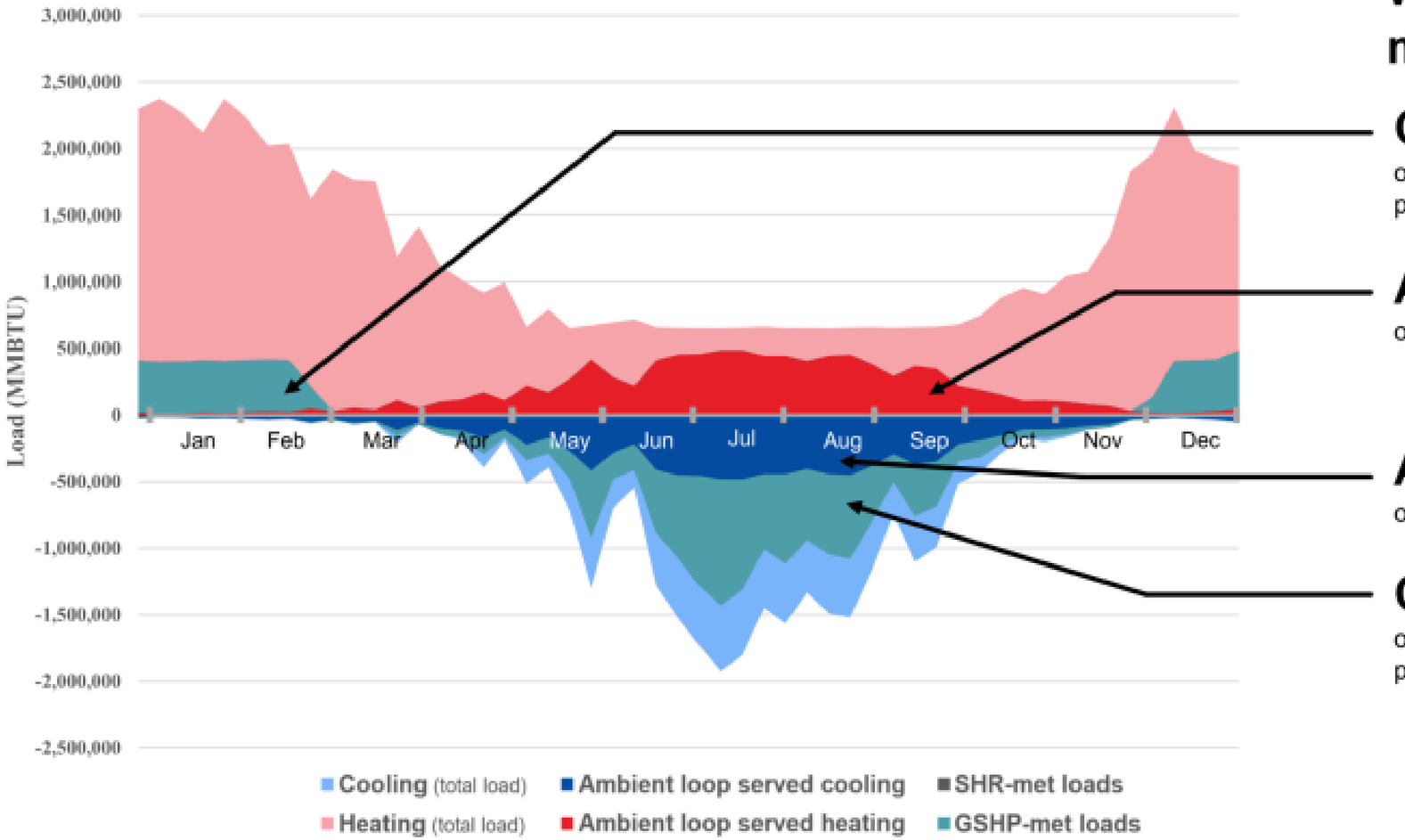
of heating loads served by the ambient loop via a district energy system

Ambient loop: 35%

of cooling loads served by the ambient loop via a district energy system

DISTRICT ENERGY FEASIBILITY ANALYSIS

SCENARIO 2: CW + AMBIENT LOOP + GROUND SOURCE HEAT PUMP



GSHP wells installed in Open Area of site coupled with Ambient Loop could meet:

GSHP: 8%
of heating loads served by ground source heat pumps (GSHP)

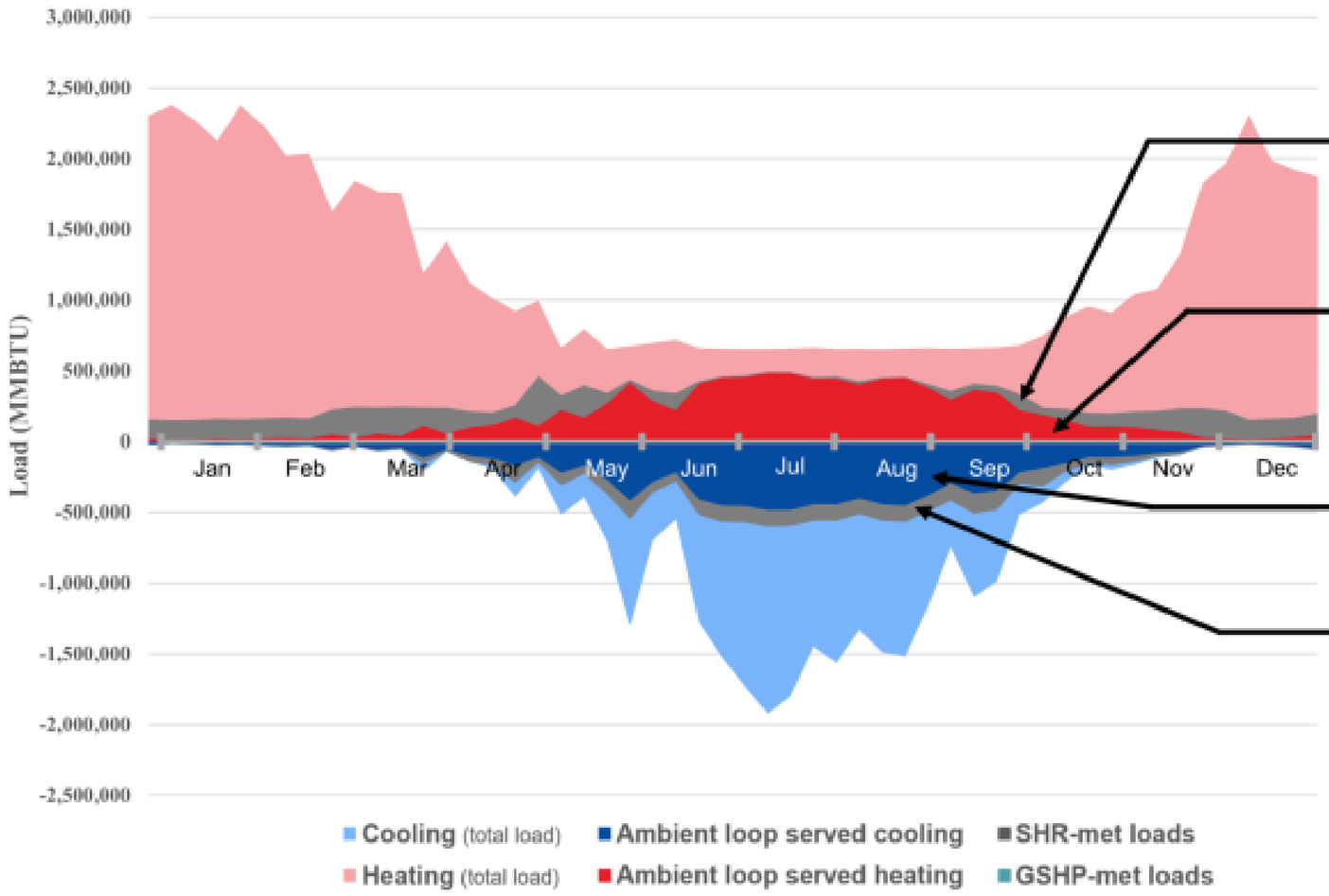
Ambient loop: 14%
of heating loads served by the ambient loop

Ambient loop: 35%
of cooling loads served by the ambient loop

GSHP: 37%
of cooling loads served by ground source heat pumps (GSHP)

DISTRICT ENERGY FEASIBILITY ANALYSIS

SCENARIO 3: CW + AMBIENT LOOP + SEWER HEAT RECOVERY



SHR coupled with Ambient Loop could meet:

SHR: 9%
of heating loads served by sewer heat recovery (SHR)

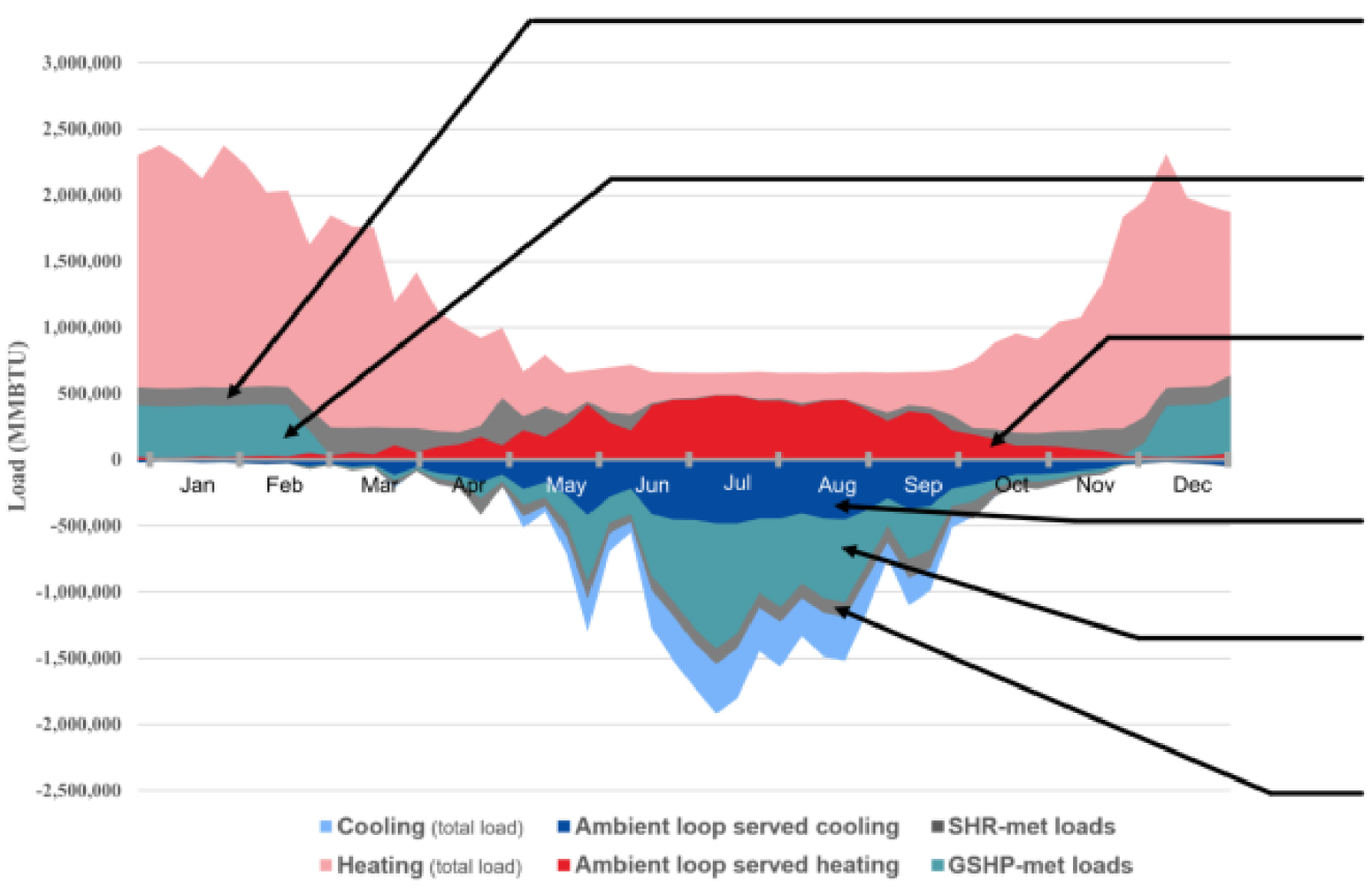
Ambient loop: 14%
of heating loads served by the ambient loop

Ambient loop: 35%
of cooling loads served by the ambient loop

SHR: 1%
of cooling loads served by sewer heat recovery (SHR)

DISTRICT ENERGY FEASIBILITY ANALYSIS

SCENARIO 4: CW + AMBIENT LOOP + GSHP + SEWER HEAT RECOVERY



GSHP and SHR coupled with Ambient Loop could meet:

SHR: 9%
of heating loads served by sewer heat recovery (SHR)

GSHP: 8%
of heating loads served by ground source heat pumps (GSHP)

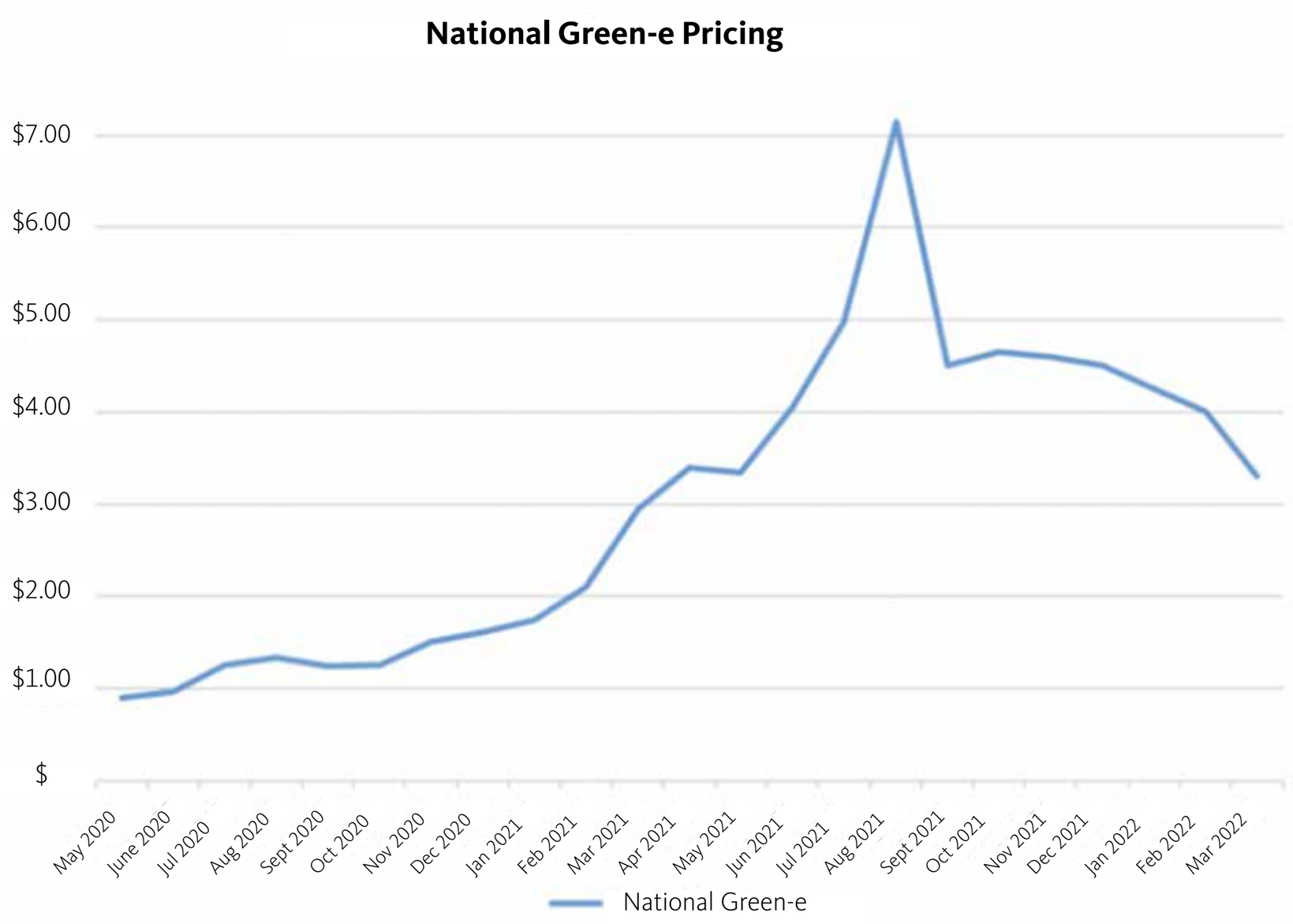
Ambient loop: 14%
of heating loads served by the ambient loop

Ambient loop: 35%
of cooling loads served by the ambient loop

GSHP: 37%
of cooling loads served by ground source heat pumps (GSHP)

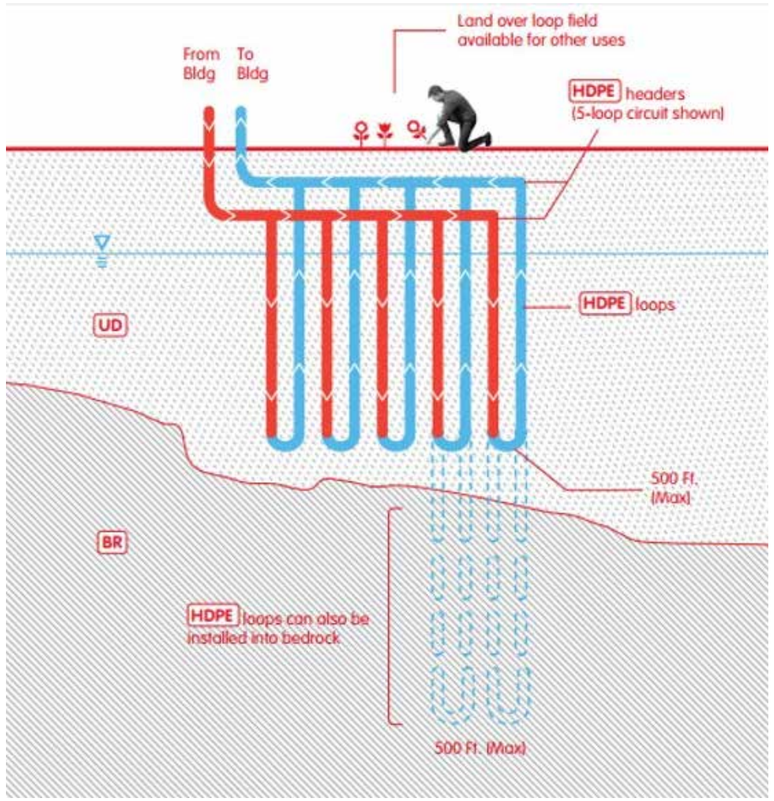
SHR: 1%
of cooling loads served by sewer heat recovery (SHR)

NATIONAL RENEWABLE ENERGY CREDITS (RECS)PRICING

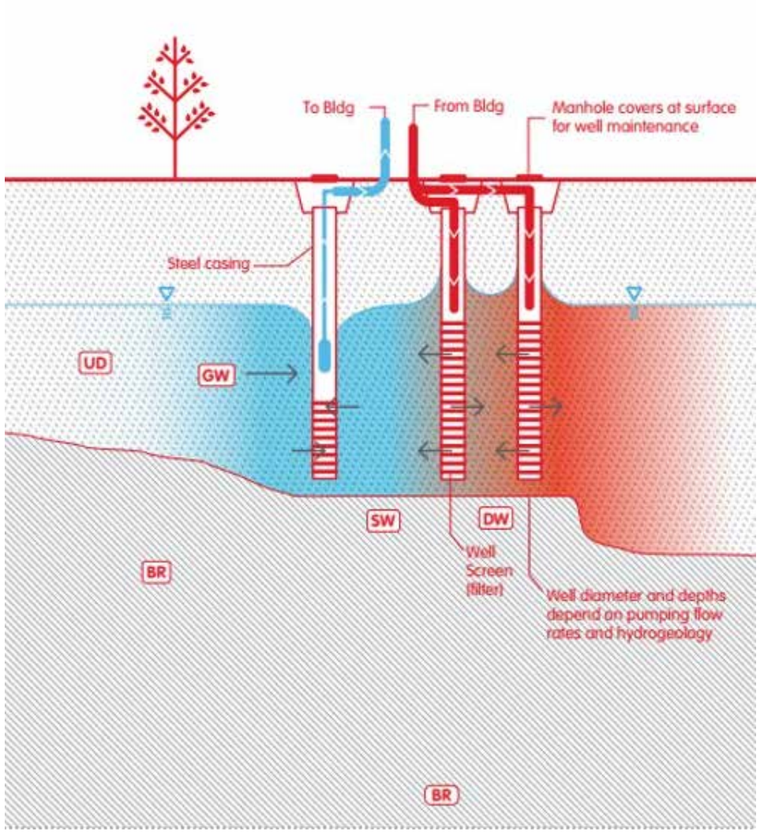


GEOTHERMAL

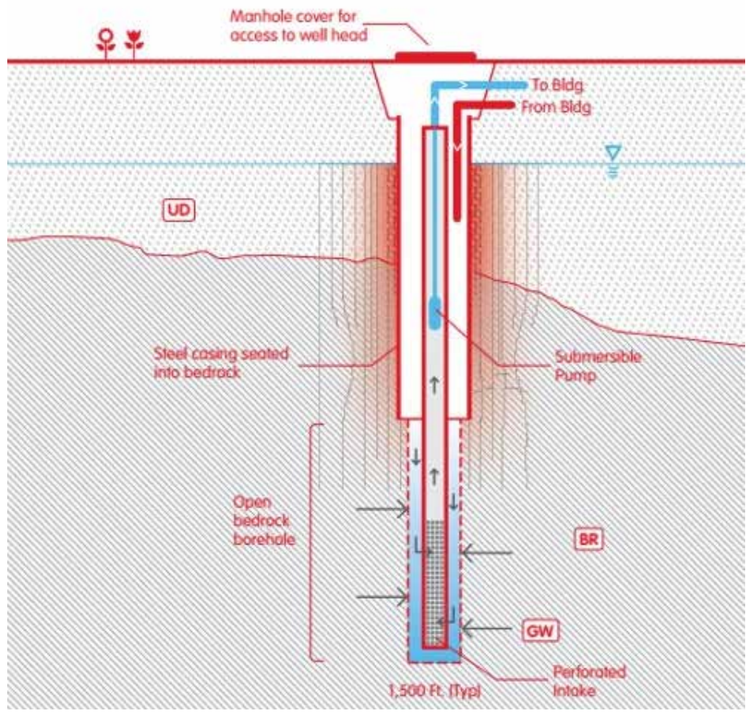
Closed Loop



Open Loop



Standing Column Well



Source: Geothermal Heat Pump Systems Manual, NYC Department of Design and Construction