Obligatory Thomas Jefferson or Rotunda photo …

2020-2030 GOALS

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(approved by the Board of Visitors, December 2019)

1. **Be carbon neutral by 2030 and fossil fuel-free by 2050**

2. Achieve the "30 by 30" goals by 2030 (relative to 2010 levels)
   - Reduce water use and reactive nitrogen losses by 30%
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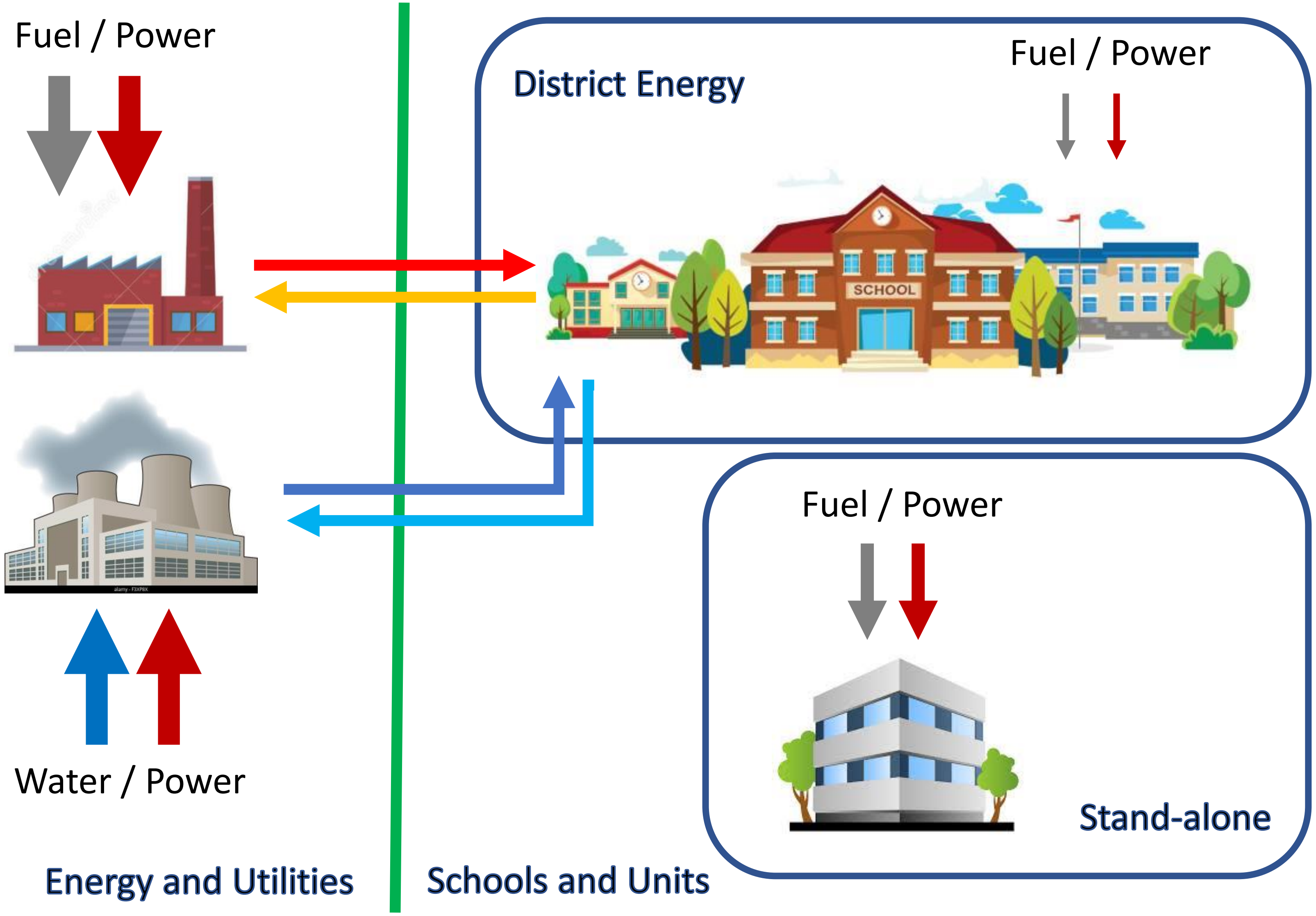
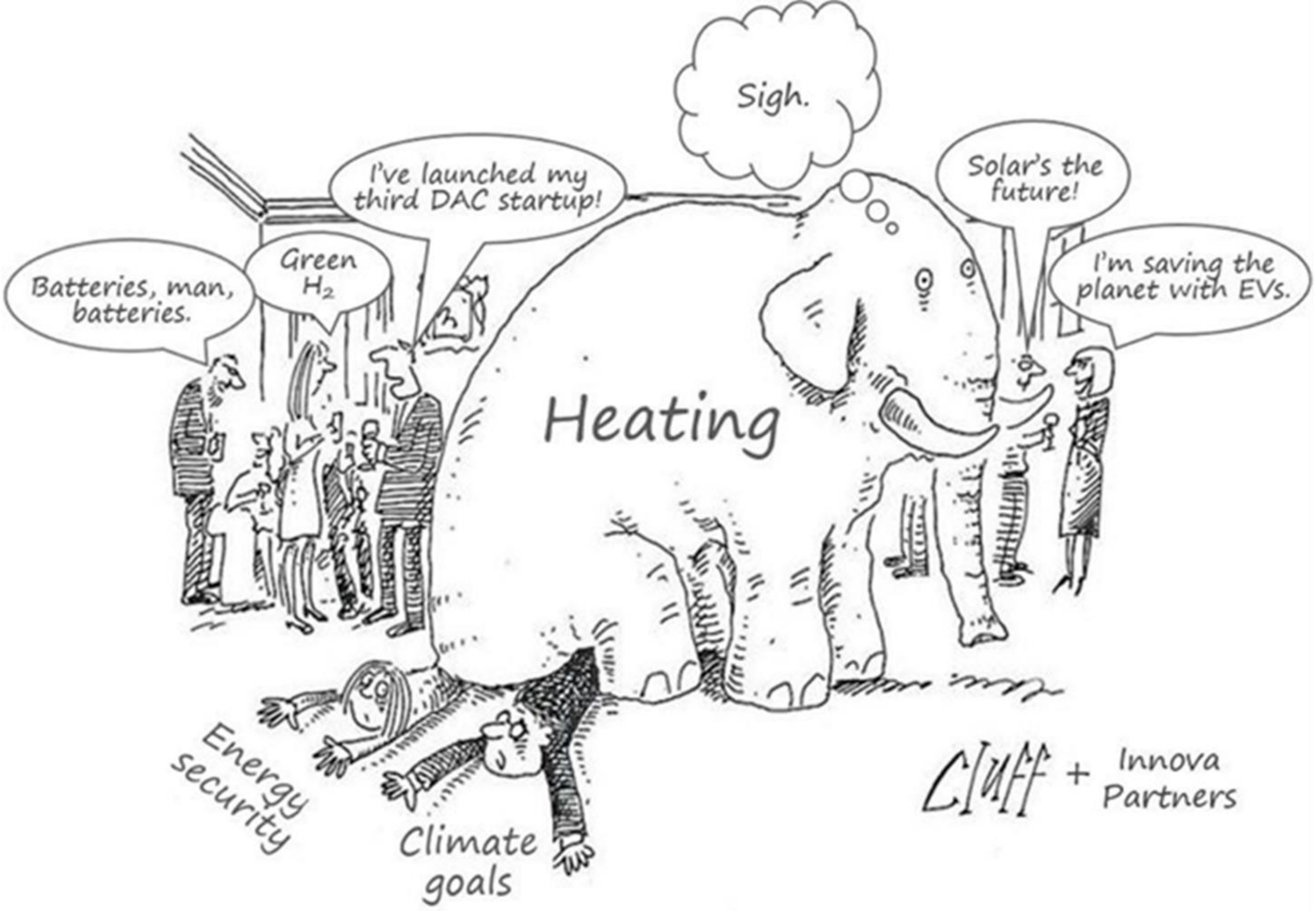
   to advance sustainable, equitable, and healthy places for all

4. Enhance sustainability-focused research and curriculum

Review of Carbon

- Scope 1 (fossil fuels)
  - Emissions produced on Grounds
  - Typically, combustion for heating or transportation
  - Offsets
- Scope 2 (power)
  - Emissions produced off Grounds based on consumption on Grounds
  - RECs
- Scope 3 (transportation)
  - Upstream emissions or embodied carbon
  - Offsets





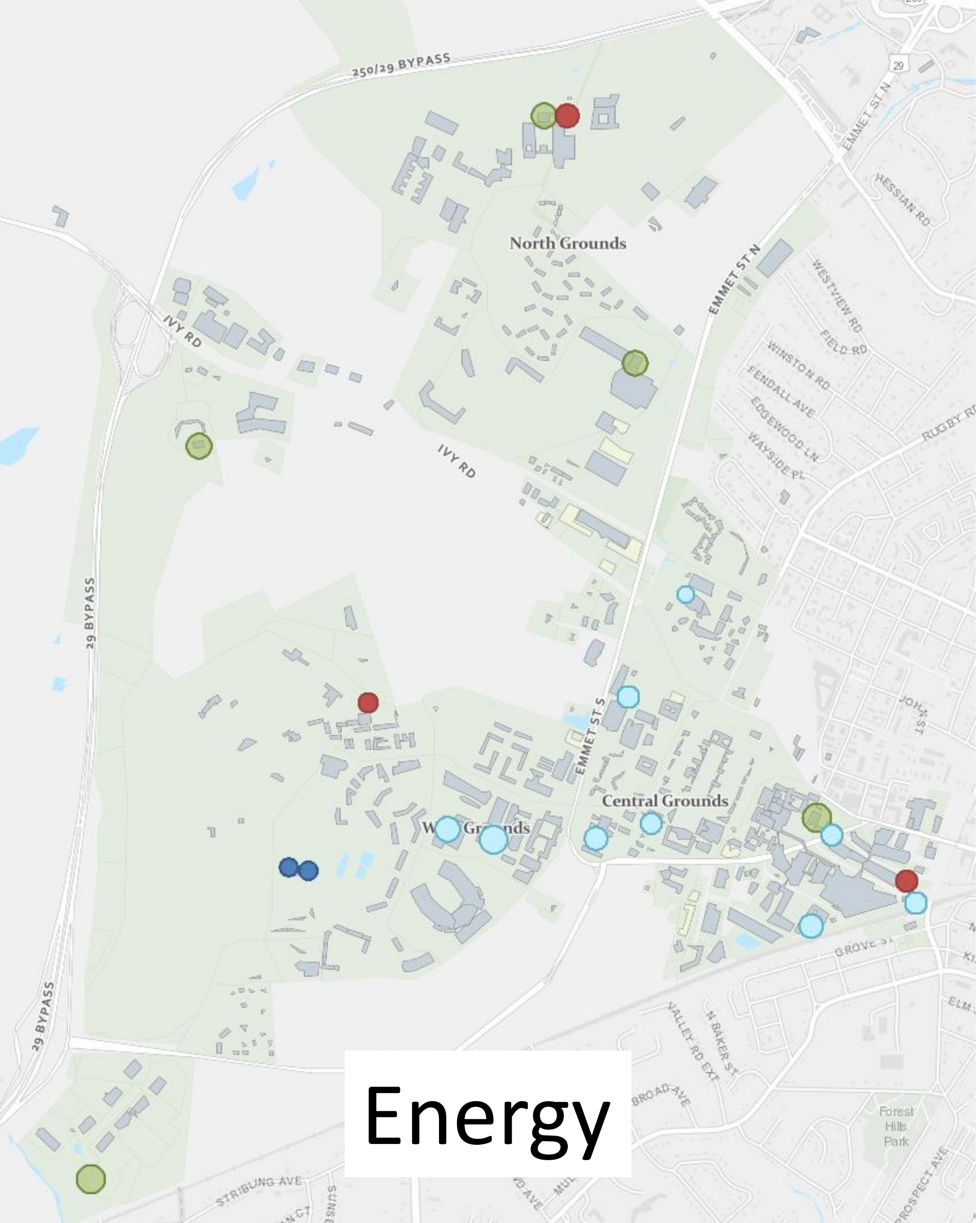
Cluff + Innova Partners

"HAVE YOU NOTICED IT, TOO?"

Energy

● CUPs (5)
- NGMP
- IM CUP
- Massie Plant
- Main Heat Plant
- Fontaine CEP
- 1,153,607 MMBTU

● Substations (3)
- Cavalier
- Alderman
- North Grounds
- 1,036,653 MMBTU
- 303,825,600 kWh



● Chiller Plants (9)
- East
- South
- North
- Bryan Hall
- Clark
- Newcomb
- Chemistry
- AFC
- Carrs Hill
- 976,268 MMBTU
- 6 hydraulic loops

● Domestic Water (1MM gpd use)
- 2 x 1.5MM gallon DW tanks
- Alderman Pump Station

Utilities

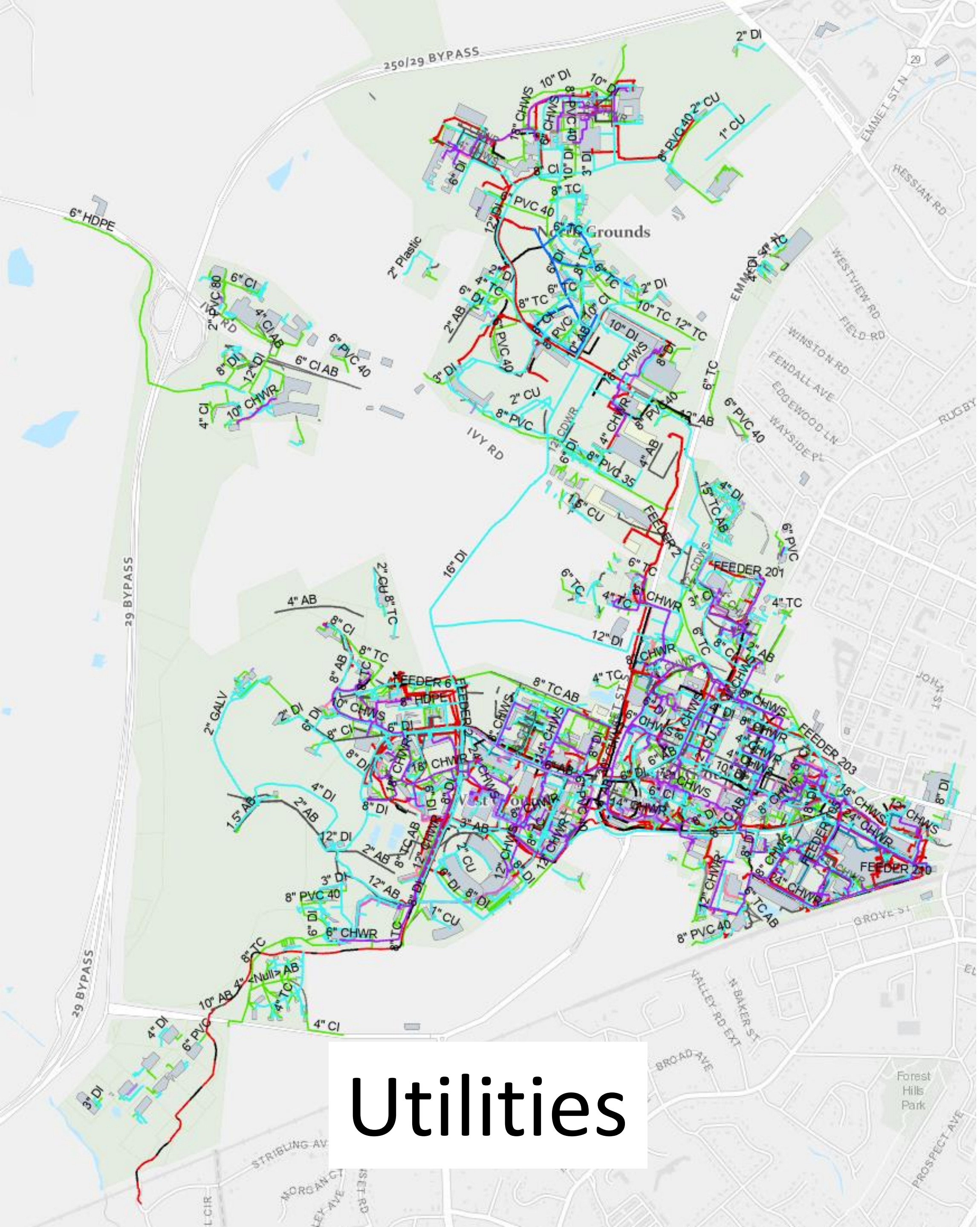
58
- Steam
- Hot Water
- Chilled Water

140
- Domestic Water
- Sanitary
- Storm

43
- Power

Miles of utility

247 miles total

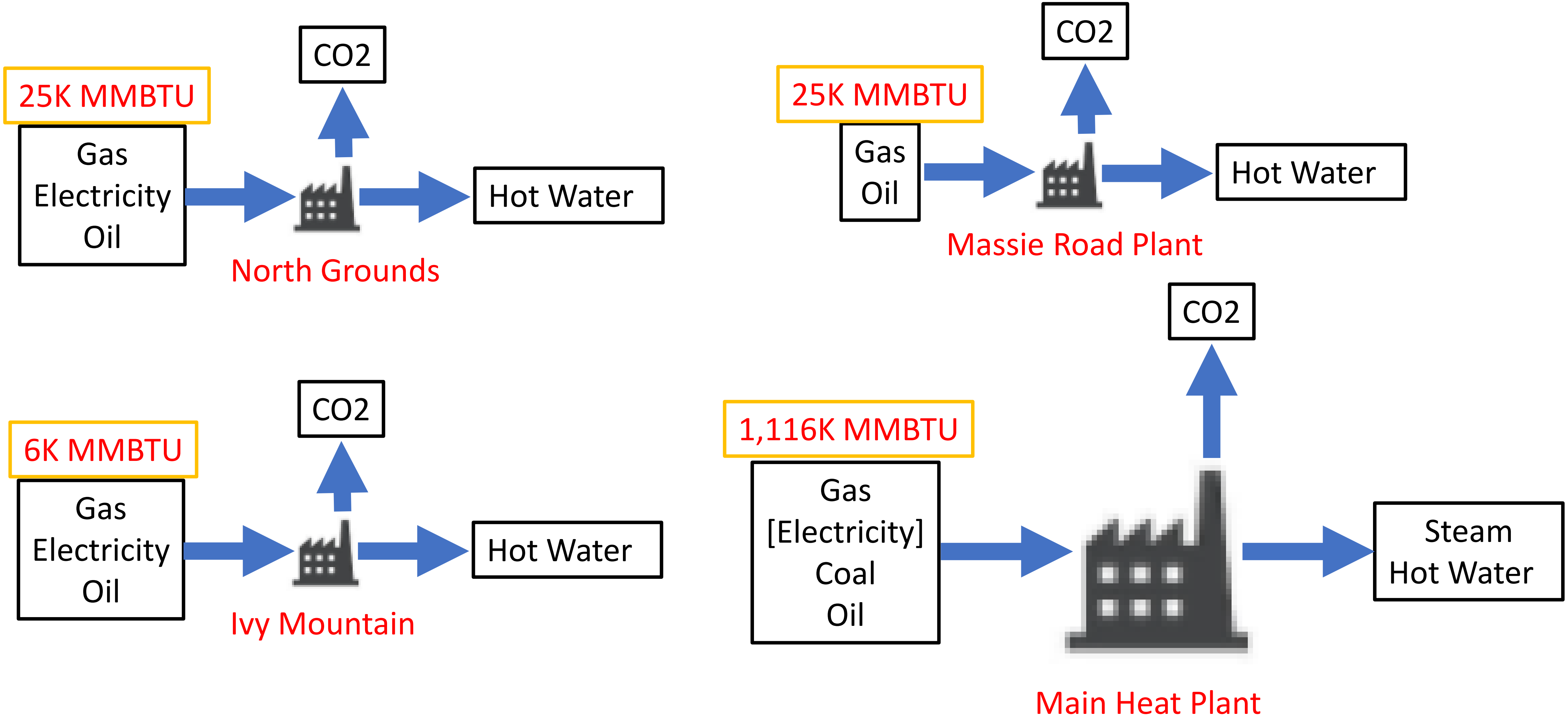


Utilities

Utility Structures

- Tunnels (6.3 miles)
- Box conduit
- Vaults (2,556)
- Duct Banks

How we make heat today … 1,172K MMBTUs



25K MMBTU

Gas
Electricity
Oil

CO2

Hot Water

North Grounds

25K MMBTU

Gas
Oil

CO2

Hot Water

Massie Road Plant

6K MMBTU

Gas
Electricity
Oil

CO2

Hot Water

Ivy Mountain

1,116K MMBTU

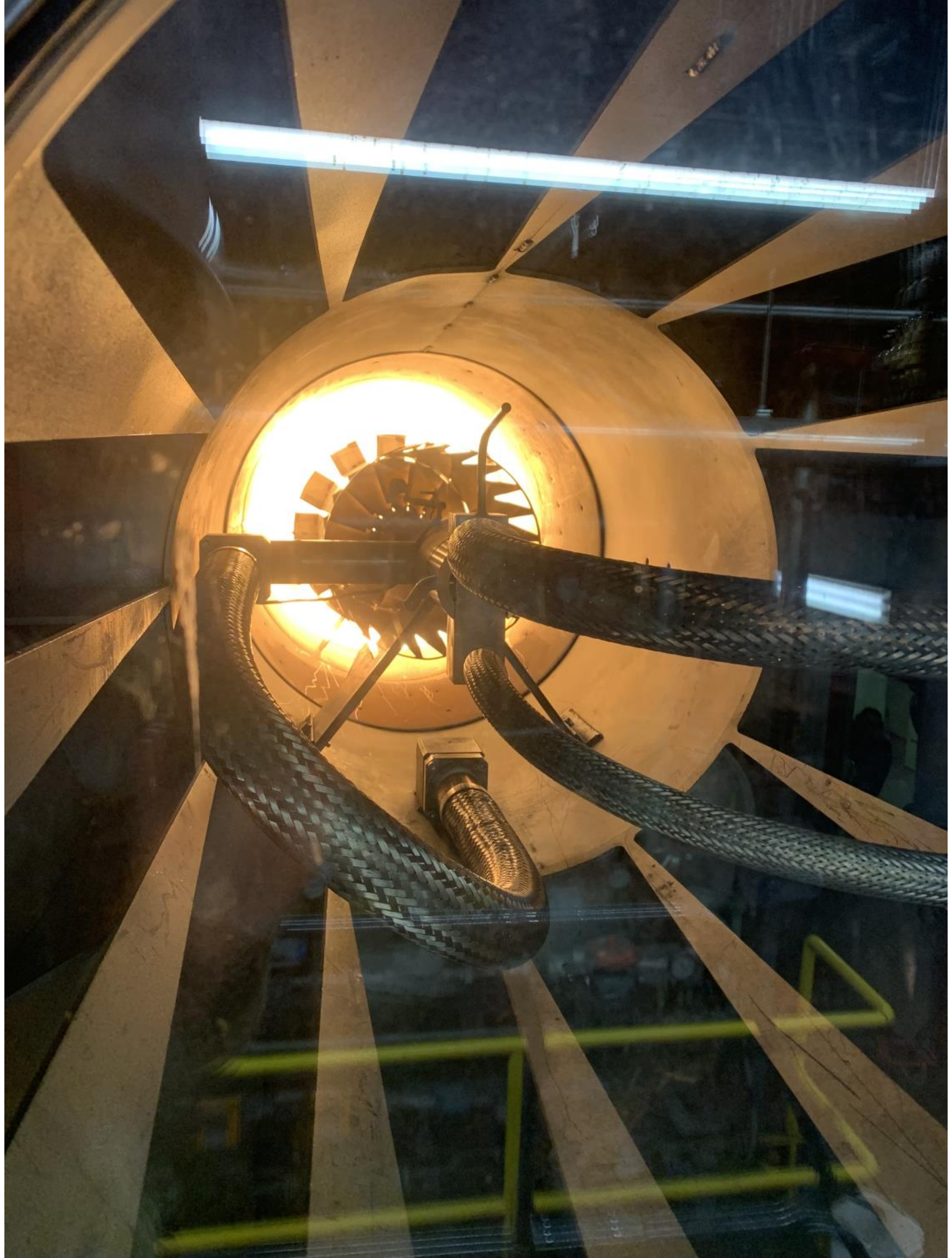
Gas
[Electricity]
Coal
Oil

CO2

Steam
Hot Water

Main Heat Plant


BRUT



North Grounds
140-180F hot water

Ivy Mountain
140F hot water

Massie Road
190F hot water
140F hot water

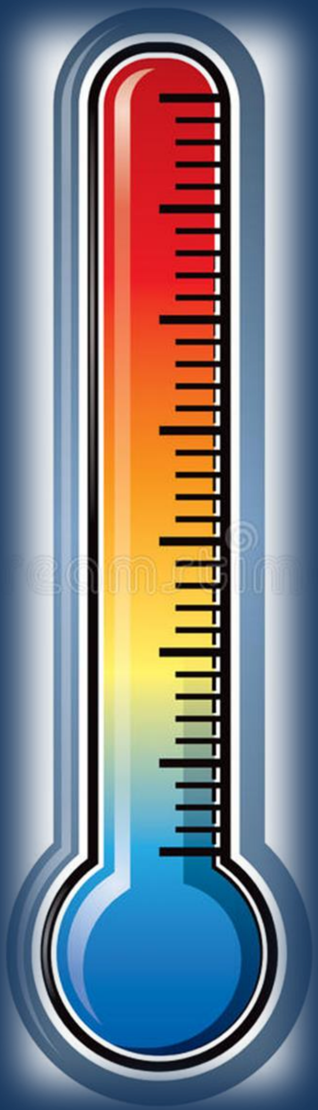
Main Heat Plant
380F steam
170F hot water

Fontaine
125F hot water

Heat Recovery Chillers and Heating Water Temperature

- Steam … none

- 170F … one
- 140F … several
- 125F … many



North Grounds
- 140-180F hot water

Ivy Mountain
- 140F hot water

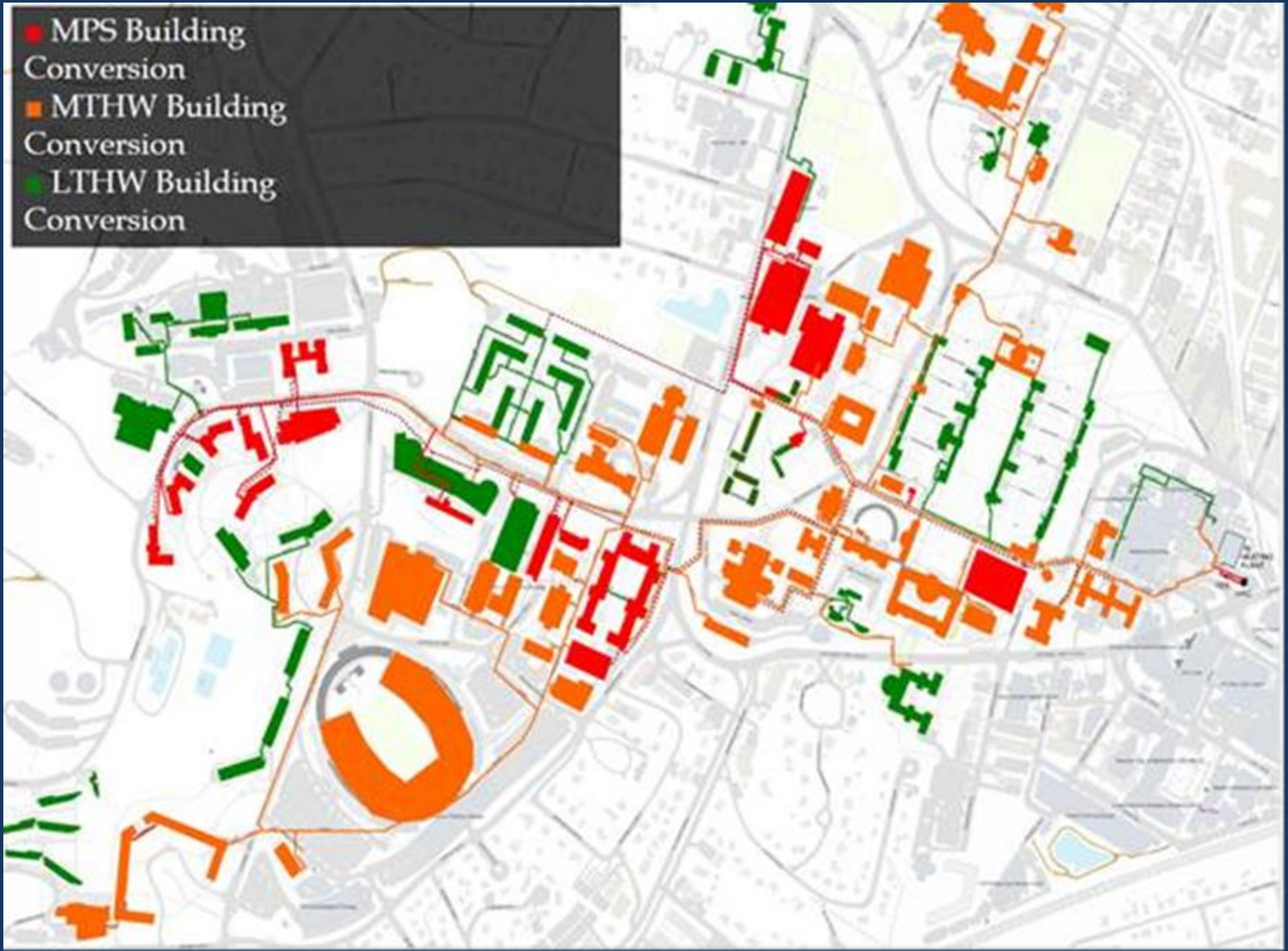
Massie Road
- 190F hot water
- 140F hot water

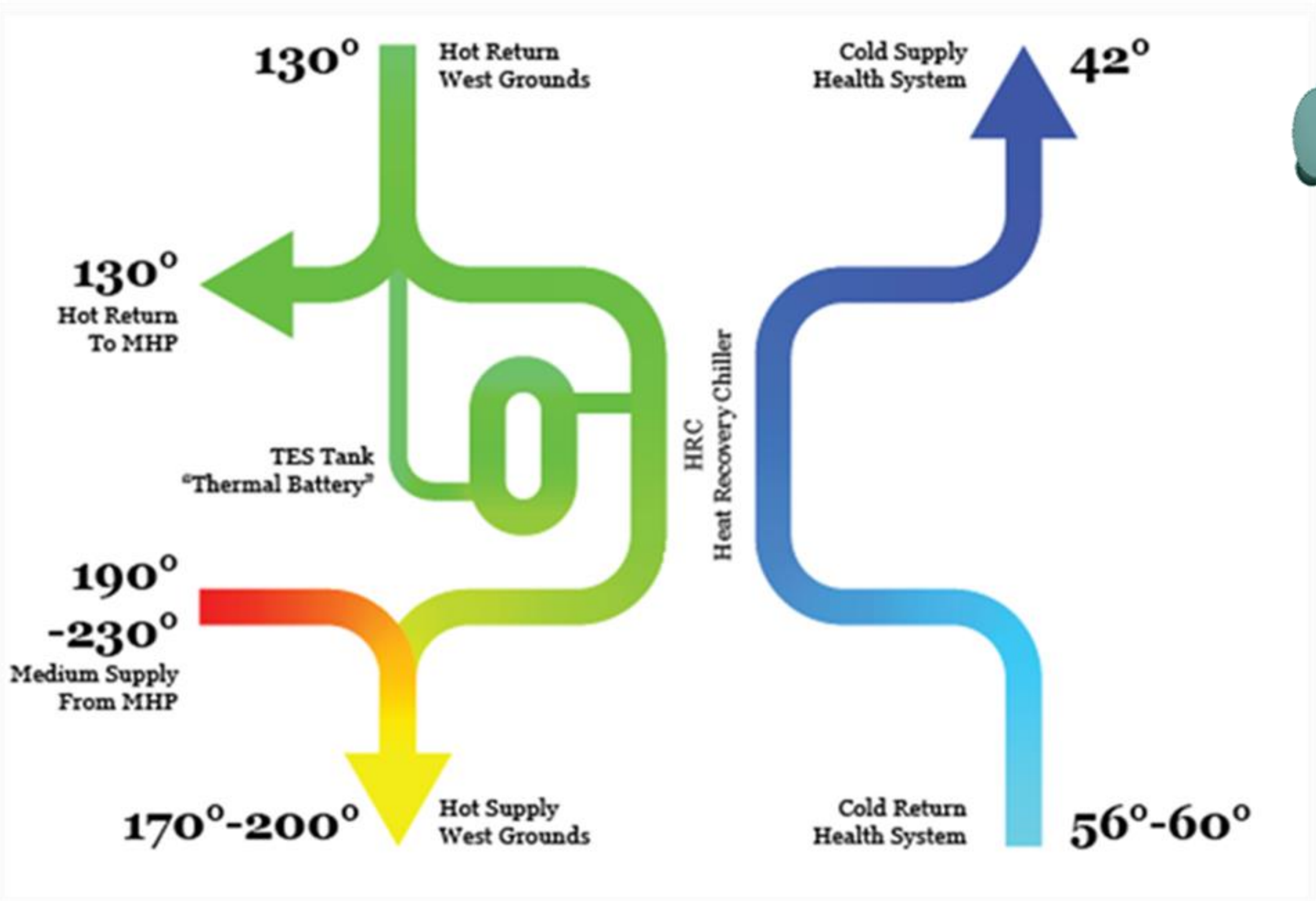
Main Heat Plant
- 380F steam
- 170F hot water

Fontaine
- 125F hot water

Current Steam and MTHW

Future Steam and HHW





130°
Hot Return
West Grounds

Cold Supply
Health System
42°

130°
Hot Return
To MHP

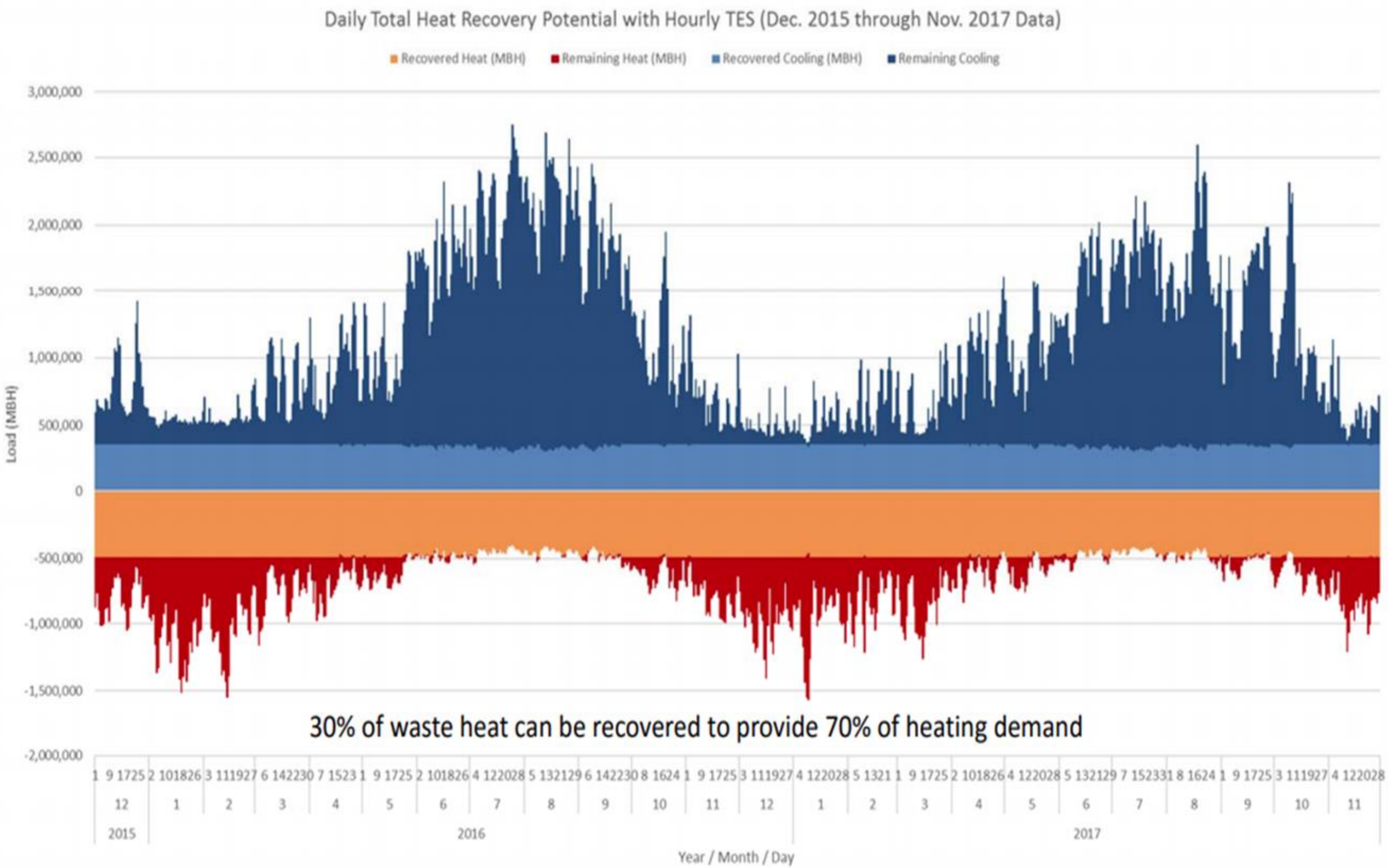
HRC
Heat Recovery Chiller

TES Tank
"Thermal Battery"

190°
-230°
Medium Supply
From MHP

170°-200°
Hot Supply
West Grounds

Cold Return
Health System
56°-60°



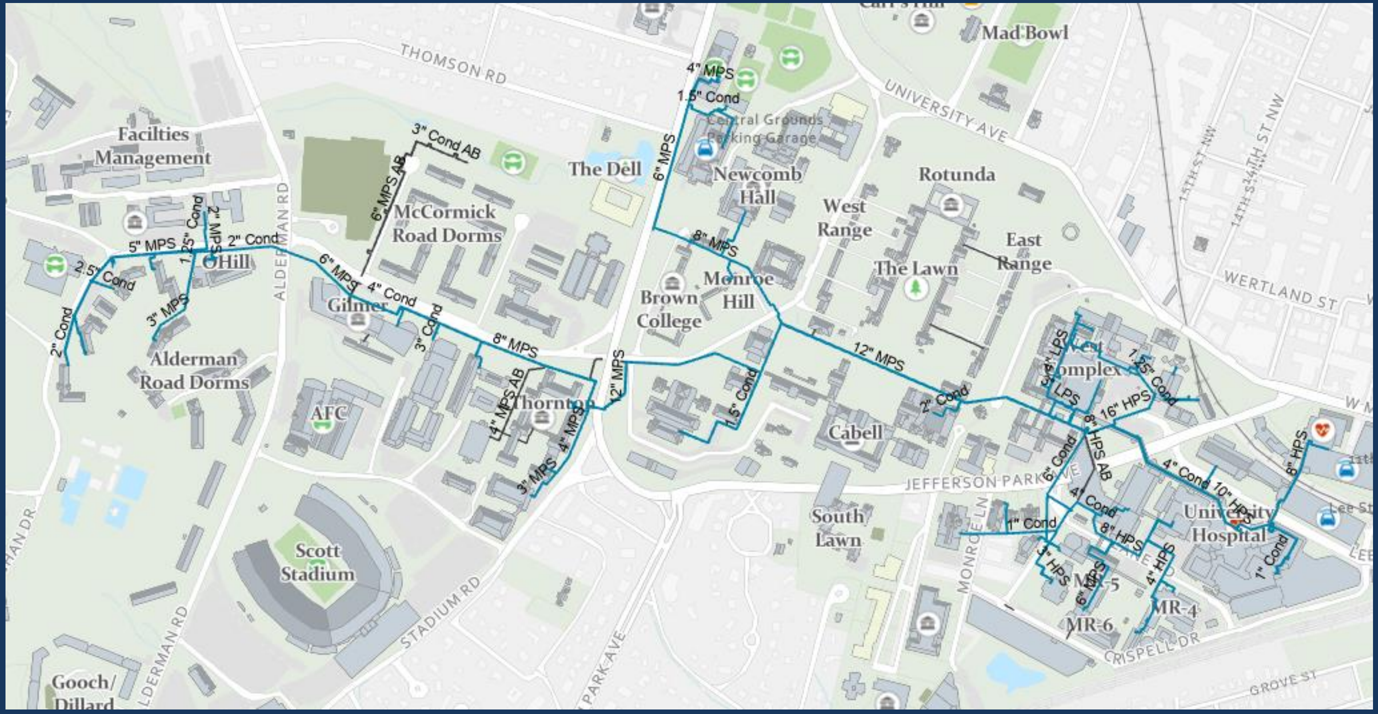
Daily Total Heat Recovery Potential with Hourly TES (Dec. 2015 through Nov. 2017 Data)

30% of waste heat can be recovered to provide 70% of heating demand

Realities of Steam Production

- Production
  - Combustion with Fossil Fuel
    - Lowest operating cost
    - No capital cost (moderate with coal conversion)
    - Low fuel risk
  - Combustion with Renewable
    - High operating cost
    - Significant capital cost
    - Moderate fuel risk
  - Electrode boiler
    - Highest operating cost
    - Extensive capital cost
    - Low fuel risk (must address firm fuel)
  - Fission
    - Currently in demonstration
    - TBD on operating cost/capital

- Geo-exchange cannot produce steam



- Use
  - Heating buildings
  - Surgical sterilization
  - Medical waste sterilization
  - Autoclaves
  - Humidification
  - Domestic water production

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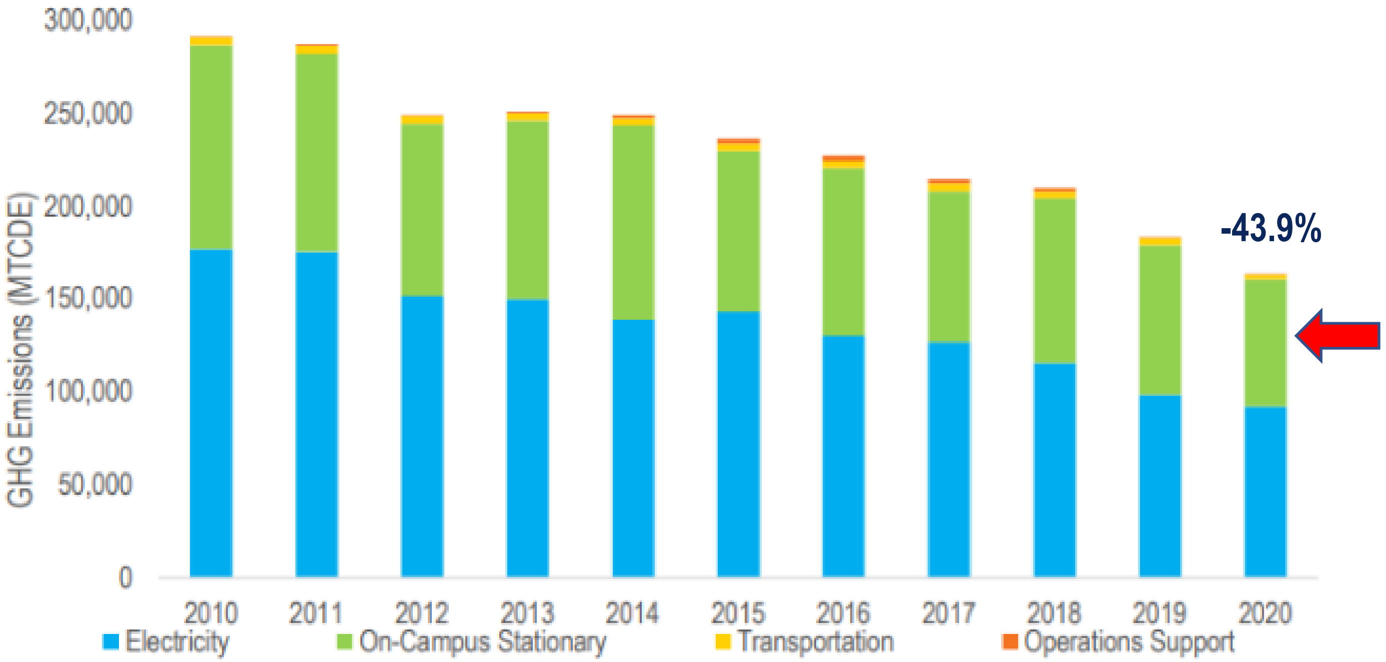
Climate Action Plan Strategies

Low Energy Buildings	Building Efficiency
Smart Labs Program	
Energy Efficiency Retrofits	
Smart Clinics Program	
Building Electrification	
Off-site Renewable Energy	Energy Supply: Strategic Thermal Energy Study
Thermal Energy Strategies: Heating Electrification Hot Water & Steam Optimization Chilled Water Optimization	
On-site Renewable Energy	
Electric Buses	Fleet
Electric Vehicles	
Fleet Optimization	
Combined Operations Strategies	Operations (e.g., fertilizer, refrigerants, behavior, training)
Virginia Clean Economy Act	Greener electric grid (100% carbon-free electricity by 2045)

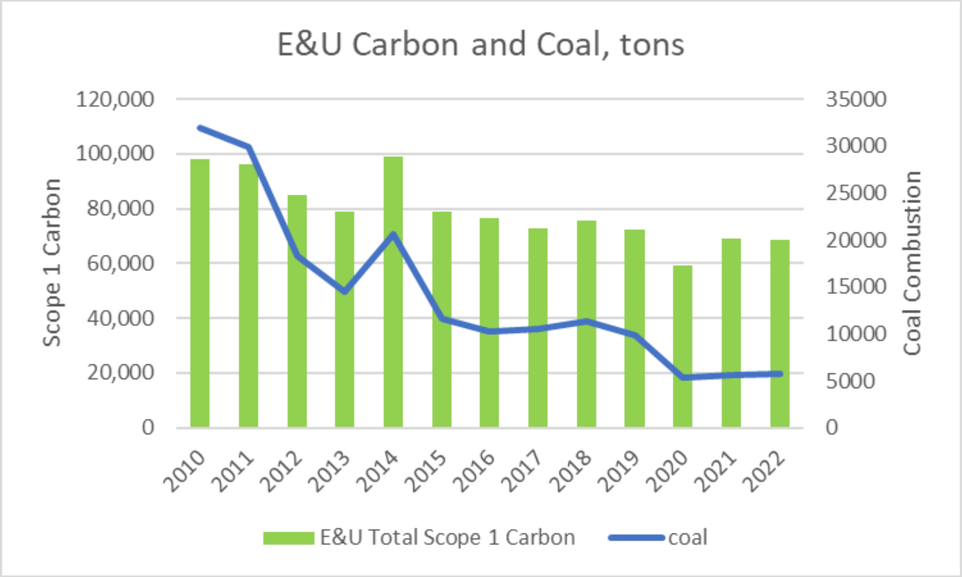
UVA’s Carbon Footprint: Neutrality by 2030 - Progress

UVA 2020 Carbon Footprint



- Goal: Reduce emissions to 0 by 2030.
- In CY2010, the baseline year, UVA's footprint was 291,123 MTCDE.
- As of CY2020, UVA decreased its footprint to 163,327 MTCDE (a 43.9% reduction).
- Since 2010, UVA’s population has increased 20.1% and square footage has increased 20.6%. Despite this, UVA has reduced its emissions per person and per square foot.

E&U Scope 1 Carbon Footprint Progress



- Primary driver
  - minimizing coal use
- Creates issues
  - Procurement
  - Operations

- Other drivers
  - Plant equipment renewal
  - Burner replacement
  - Replace fossil fuel with electricity
  - The weather

Scope of Strategic Thermal Energy Study (STES)

UVA Charlottesville

Primary focus is **Scope 1** emissions (combustion of FF on Grounds)
- Steam and hot water for heating and process loads
- 70K tons of Carbon, E&U
- 8K tons of Carbon, balance of UVA

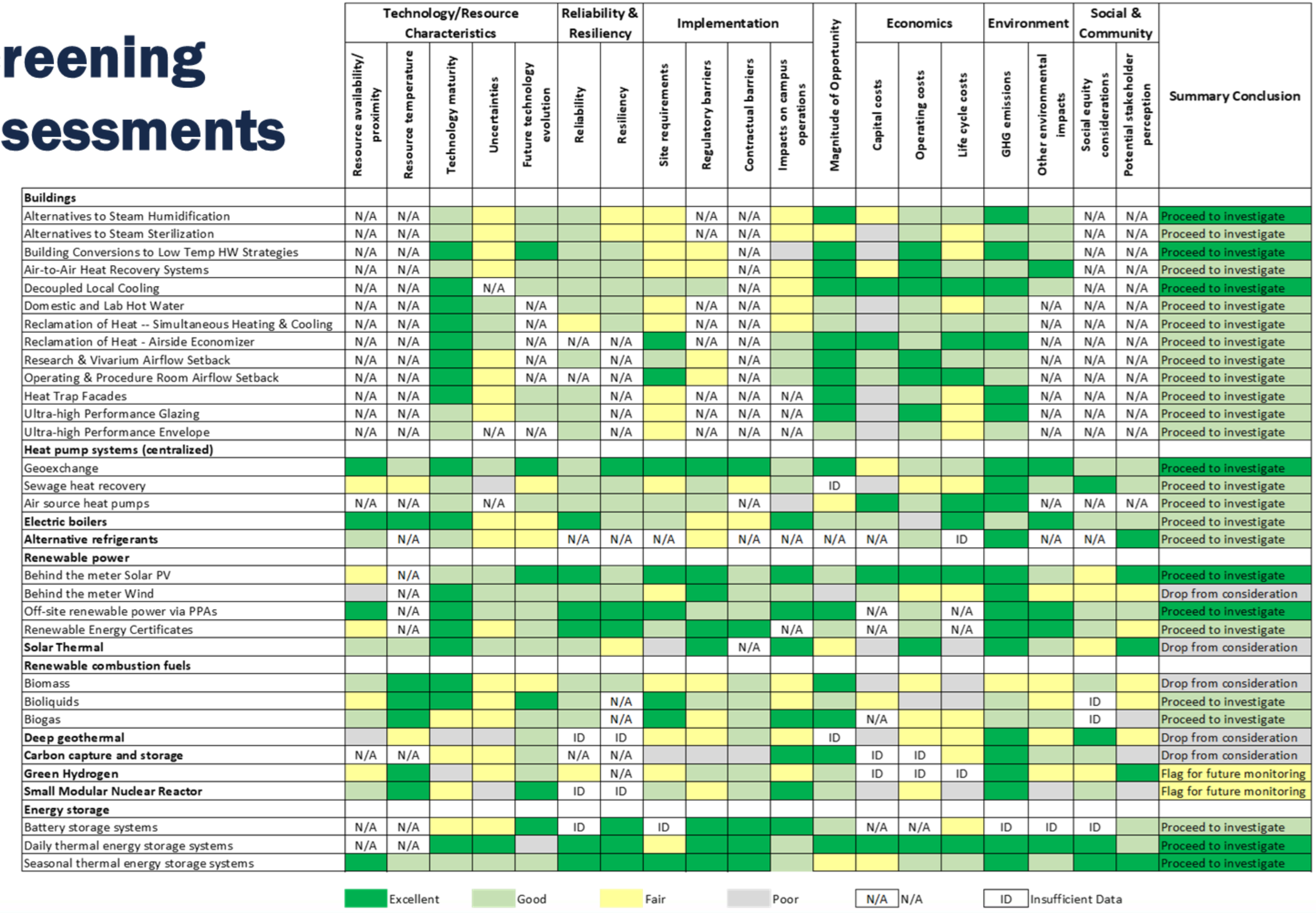
Electrification required including **Scope 2** emissions (electricity consumed on Grounds)
- Chilled water for cooling and building load (lights, plug, HVAC)
- 23K tons of Carbon, E&U
- 76K tons of Carbon, balance of UVA

Project growth and emission for buildings and from plants … all Scope 1 (and 2)

Recommend specific technologies, strategies, and projects for immediate and long-term implementation

High Level Screening Matrix

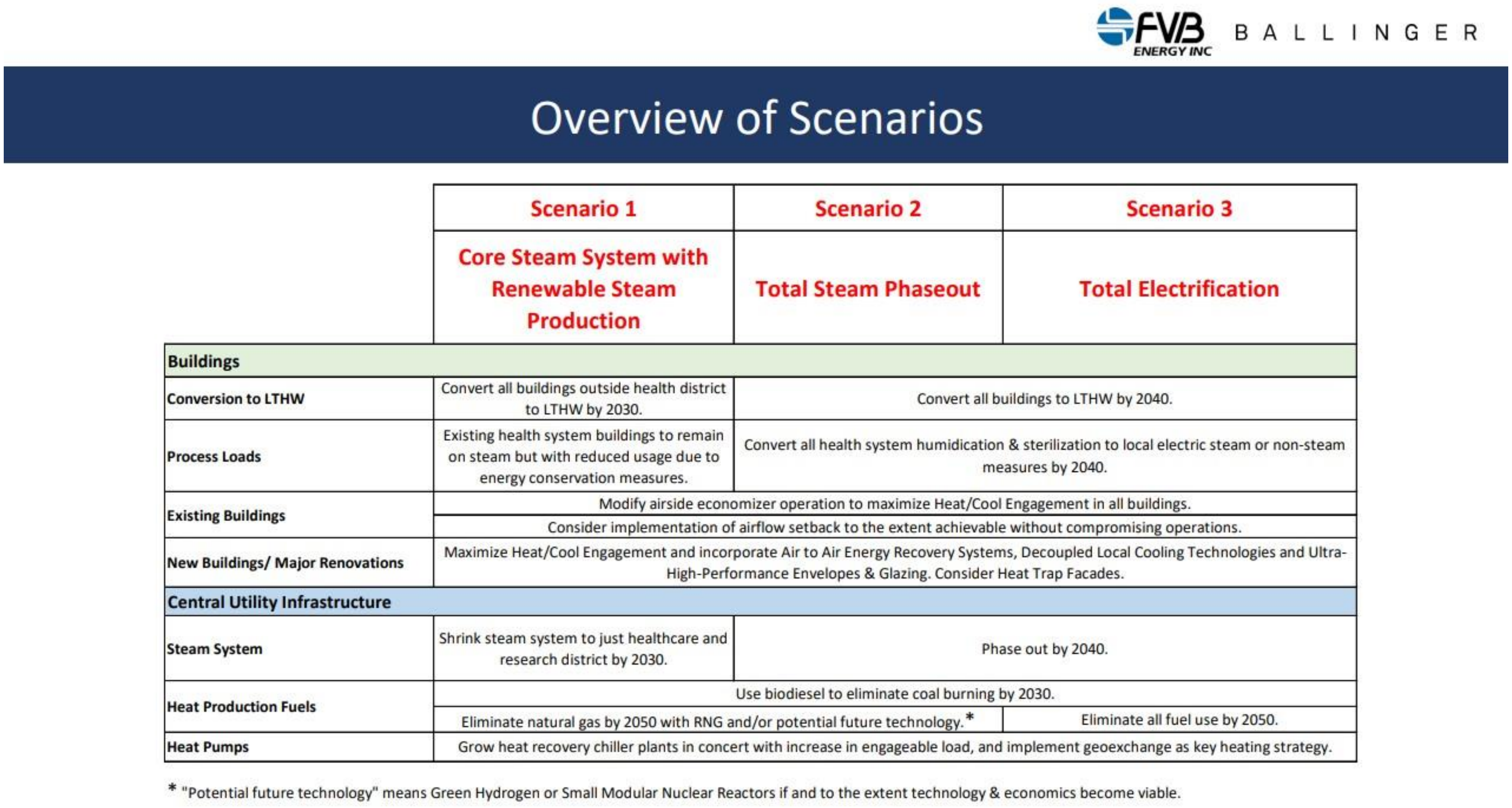
Screening Assessments



	Technology/Resource Characteristics					Reliability & Resiliency		Implementation				Magnitude of Opportunity	Economics			Environment		Social & Community		Summary Conclusion
	Resource availability/ proximity	Resource temperature	Technology maturity	Uncertainties	Future technology evolution	Reliability	Resiliency	Site requirements	Regulatory barriers	Contractual barriers	Impacts on campus operations		Capital costs	Operating costs	Life cycle costs	GHG emissions	Other environmental impacts	Social equity considerations	Potential stakeholder perception	
Buildings																				
Alternatives to Steam Humidification	N/A	N/A	🟢	🟨	🟢	🟢	🟨	🟨	N/A	N/A	🟨	🟩	🟨	🟢	🟢	🟩	🟢	N/A	N/A	🟩 Proceed to investigate
Alternatives to Steam Sterilization	N/A	N/A	🟢	🟨	🟢	🟢	🟨	🟨	N/A	N/A	🟨	🟨	⬜	🟢	🟨	🟢	🟢	N/A	N/A	🟢 Proceed to investigate
Building Conversions to Low Temp HW Strategies	N/A	N/A	🟩	🟨	🟩	🟢	🟢	🟨	🟨	N/A	⬜	🟩	⬜	🟩	🟨	🟩	🟢	N/A	N/A	🟩 Proceed to investigate
Air-to-Air Heat Recovery Systems	N/A	N/A	🟢	🟨	🟢	🟢	🟢	🟨	🟨	N/A	🟨	🟩	🟨	🟩	🟢	🟢	🟩	N/A	N/A	🟢 Proceed to investigate
Decoupled Local Cooling	N/A	N/A	🟩	N/A	🟢	🟢	🟢	🟢	🟢	N/A	🟨	🟩	🟩	🟩	🟩	🟩	🟢	N/A	N/A	🟩 Proceed to investigate
Domestic and Lab Hot Water	N/A	N/A	🟩	🟢	N/A	🟢	🟢	🟨	N/A	N/A	🟨	🟢	⬜	🟢	🟨	🟢	N/A	N/A	N/A	🟢 Proceed to investigate
Reclamation of Heat -- Simultaneous Heating & Cooling	N/A	N/A	🟩	🟢	N/A	🟨	🟢	🟨	N/A	N/A	🟨	🟢	⬜	🟢	🟢	🟢	N/A	N/A	N/A	🟢 Proceed to investigate
Reclamation of Heat - Airside Economizer	N/A	N/A	🟩	🟢	N/A	N/A	N/A	🟩	N/A	N/A	🟢	🟩	🟩	🟢	🟩	🟩	N/A	N/A	N/A	🟢 Proceed to investigate
Research & Vivarium Airflow Setback	N/A	N/A	🟩	🟨	N/A	🟢	N/A	🟢	🟨	N/A	🟢	🟩	🟢	🟩	🟢	🟢	N/A	N/A	N/A	🟢 Proceed to investigate
Operating & Procedure Room Airflow Setback	N/A	N/A	🟩	🟨	N/A	N/A	N/A	🟩	🟨	N/A	🟢	🟩	🟢	🟩	🟩	🟢	N/A	N/A	N/A	🟢 Proceed to investigate
Heat Trap Facades	N/A	N/A	🟩	🟨	🟢	🟢	N/A	🟨	N/A	N/A	N/A	🟩	⬜	🟢	🟨	🟩	N/A	N/A	N/A	🟢 Proceed to investigate
Ultra-high Performance Glazing	N/A	N/A	🟢	🟨	🟢	🟢	N/A	🟨	N/A	N/A	N/A	🟩	⬜	🟩	🟨	🟩	N/A	N/A	N/A	🟢 Proceed to investigate
Ultra-high Performance Envelope	N/A	N/A	🟢	N/A	N/A	🟢	N/A	🟨	N/A	N/A	N/A	🟢	⬜	🟢	🟨	🟢	N/A	N/A	N/A	🟢 Proceed to investigate
Heat pump systems (centralized)																				
Geoexchange	🟩	🟢	🟩	🟢	🟩	🟢	🟩	🟩	🟩	🟩	🟢	🟩	🟨	🟢	🟢	🟩	🟩	🟢	🟢	🟩 Proceed to investigate
Sewage heat recovery	🟨	🟨	🟢	⬜	🟨	🟢	🟢	🟨	🟢	🟨	🟢	ID	⬜	🟨	🟨	🟩	🟢	🟩	🟢	🟢 Proceed to investigate
Air source heat pumps	N/A	N/A	🟢	N/A	🟢	🟢	🟢	🟢	🟢	N/A	⬜	🟨	🟩	🟢	🟩	🟩	N/A	N/A	N/A	🟢 Proceed to investigate
Electric boilers	🟩	🟩	🟩	🟨	🟨	🟩	🟢	🟢	🟨	🟨	🟩	🟢	🟢	⬜	🟩	🟢	🟩	🟢	🟢	🟢 Proceed to investigate
Alternative refrigerants	🟢	N/A	🟢	🟨	🟨	N/A	N/A	N/A	🟨	N/A	N/A	N/A	N/A	🟢	ID	🟩	N/A	N/A	🟩	🟢 Proceed to investigate
Renewable power																				
Behind the meter Solar PV	🟨	N/A	🟢	🟢	🟩	🟩	🟢	🟩	🟩	🟢	🟩	🟢	🟩	🟩	🟩	🟩	🟢	🟨	🟩	🟩 Proceed to investigate
Behind the meter Wind	⬜	N/A	🟩	🟢	🟢	🟢	🟢	🟨	🟩	🟢	🟢	⬜	🟢	🟨	🟨	🟩	🟨	🟨	🟨	⬜ Drop from consideration
Off-site renewable power via PPAs	🟩	N/A	🟩	🟢	🟢	🟩	🟩	🟩	🟢	🟢	🟩	🟩	N/A	🟢	N/A	🟩	🟩	🟢	🟢	🟩 Proceed to investigate
Renewable Energy Certificates	🟨	N/A	🟩	🟨	🟢	🟩	🟩	🟢	🟩	🟩	N/A	🟢	N/A	🟢	N/A	🟩	🟩	🟢	🟨	🟢 Proceed to investigate
Solar Thermal	🟢	🟢	🟩	🟢	🟢	🟢	🟨	⬜	🟩	N/A	🟩	🟨	⬜	🟩	⬜	🟩	🟢	🟨	🟩	⬜ Drop from consideration
Renewable combustion fuels																				
Biomass	🟢	🟩	🟩	🟨	🟨	🟢	🟢	🟨	🟨	🟢	🟨	🟩	⬜	🟨	⬜	🟨	🟨	🟢	🟨	⬜ Drop from consideration
Bioliquids	🟨	🟩	🟩	🟨	🟩	🟢	N/A	🟩	🟢	🟢	🟨	🟢	🟨	⬜	⬜	🟢	🟨	ID	🟨	🟢 Proceed to investigate
Biogas	🟢	🟩	🟨	🟨	🟢	🟢	N/A	🟩	🟨	🟢	🟩	🟩	N/A	🟨	🟨	🟢	🟢	ID	⬜	🟢 Proceed to investigate
Deep geothermal	⬜	🟨	⬜	⬜	🟢	ID	ID	🟨	🟨	🟢	🟨	ID	⬜	🟨	🟨	🟩	🟨	🟩	🟨	⬜ Drop from consideration
Carbon capture and storage	N/A	N/A	🟨	🟨	🟢	N/A	N/A	⬜	⬜	⬜	🟩	🟩	ID	ID	🟨	🟩	🟢	🟢	⬜	⬜ Drop from consideration
Green Hydrogen	🟨	🟩	⬜	🟨	🟢	🟨	N/A	🟨	🟢	🟢	🟨	🟢	ID	ID	ID	🟩	🟨	🟨	🟩	🟨 Flag for future monitoring
Small Modular Nuclear Reactor	🟢	🟩	🟨	⬜	🟩	ID	ID	🟢	🟨	🟢	🟩	🟢	⬜	🟨	⬜	🟩	⬜	🟢	⬜	🟨 Flag for future monitoring
Energy storage																				
Battery storage systems	N/A	N/A	🟨	🟨	🟩	ID	🟩	ID	🟩	🟩	🟩	🟢	N/A	N/A	🟨	ID	ID	ID	🟢	🟢 Proceed to investigate
Daily thermal energy storage systems	N/A	N/A	🟩	🟩	⬜	🟩	🟩	🟨	🟩	🟩	🟢	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟢	🟩 Proceed to investigate
Seasonal thermal energy storage systems	🟩	🟢	🟢	🟢	🟢	🟩	🟩	🟩	🟩	🟩	🟢	🟨	🟨	🟢	🟢	🟩	🟢	🟩	🟩	🟩 Proceed to investigate

🟩 Excellent 🟢 Good 🟨 Fair ⬜ Poor N/A N/A ID Insufficient Data

STES Scenarios



FVB ENERGY INC BALLINGER

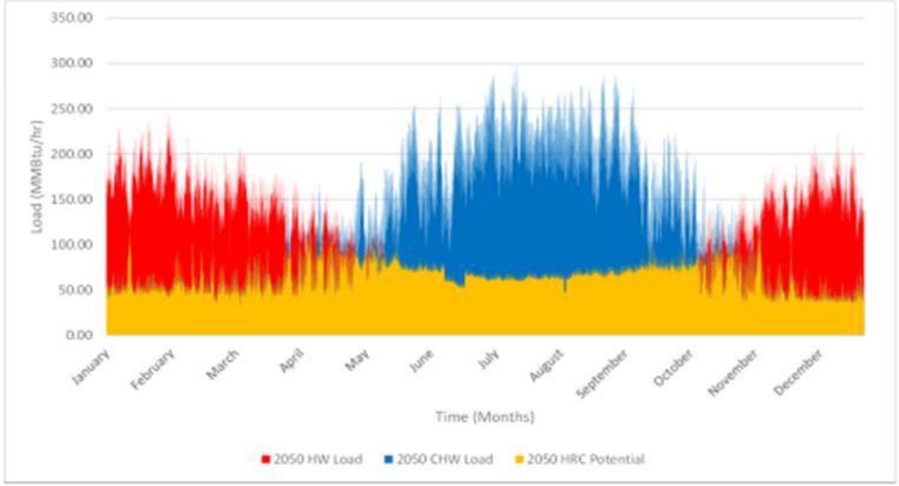
Overview of Scenarios

<table>
<tr><th></th><th>Scenario 1</th><th>Scenario 2</th><th>Scenario 3</th></tr>
<tr><th></th><th>Core Steam System with Renewable Steam Production</th><th>Total Steam Phaseout</th><th>Total Electrification</th></tr>
<tr><td colspan="4">Buildings</td></tr>
<tr><td>Conversion to LTHW</td><td>Convert all buildings outside health district to LTHW by 2030.</td><td colspan="2">Convert all buildings to LTHW by 2040.</td></tr>
<tr><td>Process Loads</td><td>Existing health system buildings to remain on steam but with reduced usage due to energy conservation measures.</td><td colspan="2">Convert all health system humidication & sterilization to local electric steam or non-steam measures by 2040.</td></tr>
<tr><td rowspan="2">Existing Buildings</td><td colspan="3">Modify airside economizer operation to maximize Heat/Cool Engagement in all buildings.</td></tr>
<tr><td colspan="3">Consider implementation of airflow setback to the extent achievable without compromising operations.</td></tr>
<tr><td>New Buildings/ Major Renovations</td><td colspan="3">Maximize Heat/Cool Engagement and incorporate Air to Air Energy Recovery Systems, Decoupled Local Cooling Technologies and Ultra-High-Performance Envelopes & Glazing. Consider Heat Trap Facades.</td></tr>
<tr><td colspan="4">Central Utility Infrastructure</td></tr>
<tr><td>Steam System</td><td>Shrink steam system to just healthcare and research district by 2030.</td><td colspan="2">Phase out by 2040.</td></tr>
<tr><td rowspan="2">Heat Production Fuels</td><td colspan="3">Use biodiesel to eliminate coal burning by 2030.</td></tr>
<tr><td colspan="2">Eliminate natural gas by 2050 with RNG and/or potential future technology.*</td><td>Eliminate all fuel use by 2050.</td></tr>
<tr><td>Heat Pumps</td><td colspan="3">Grow heat recovery chiller plants in concert with increase in engageable load, and implement geoexchange as key heating strategy.</td></tr>
</table>

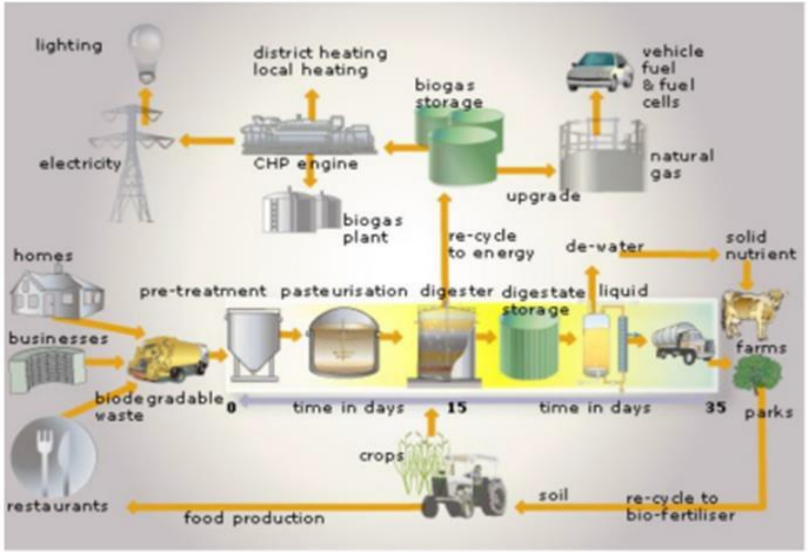
* "Potential future technology" means Green Hydrogen or Small Modular Nuclear Reactors if and to the extent technology & economics become viable.

Proven Technologies

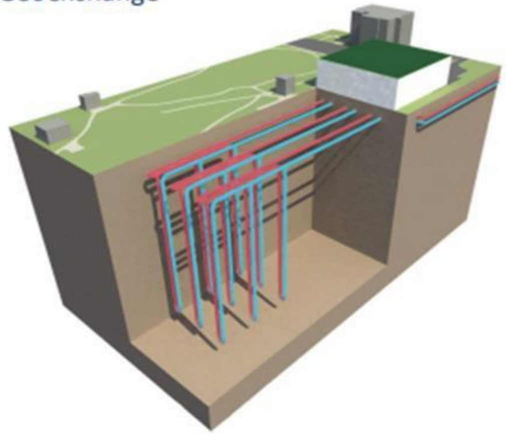
Heat Recovery Chillers



Renewable Natural Gas



Geoexchange

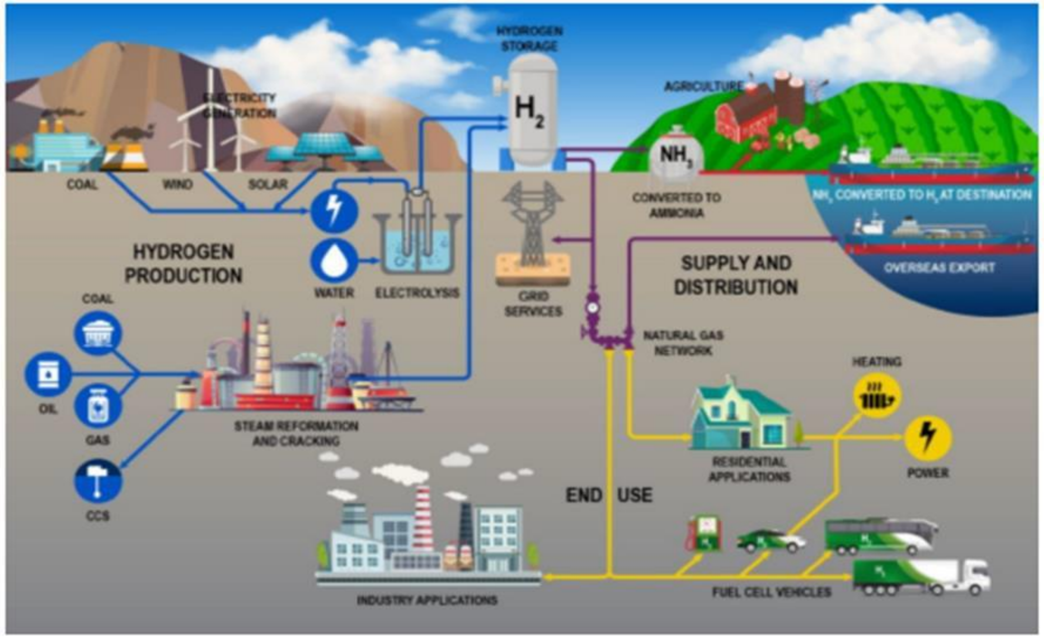


Thermal Energy Storage

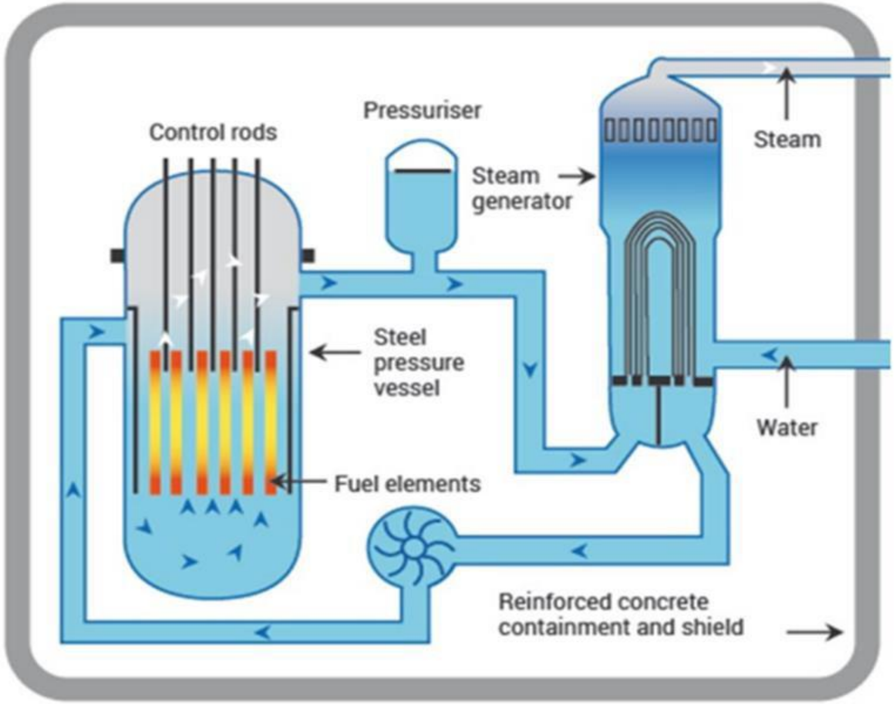
Raw Water Heat Recovery

Future Technologies

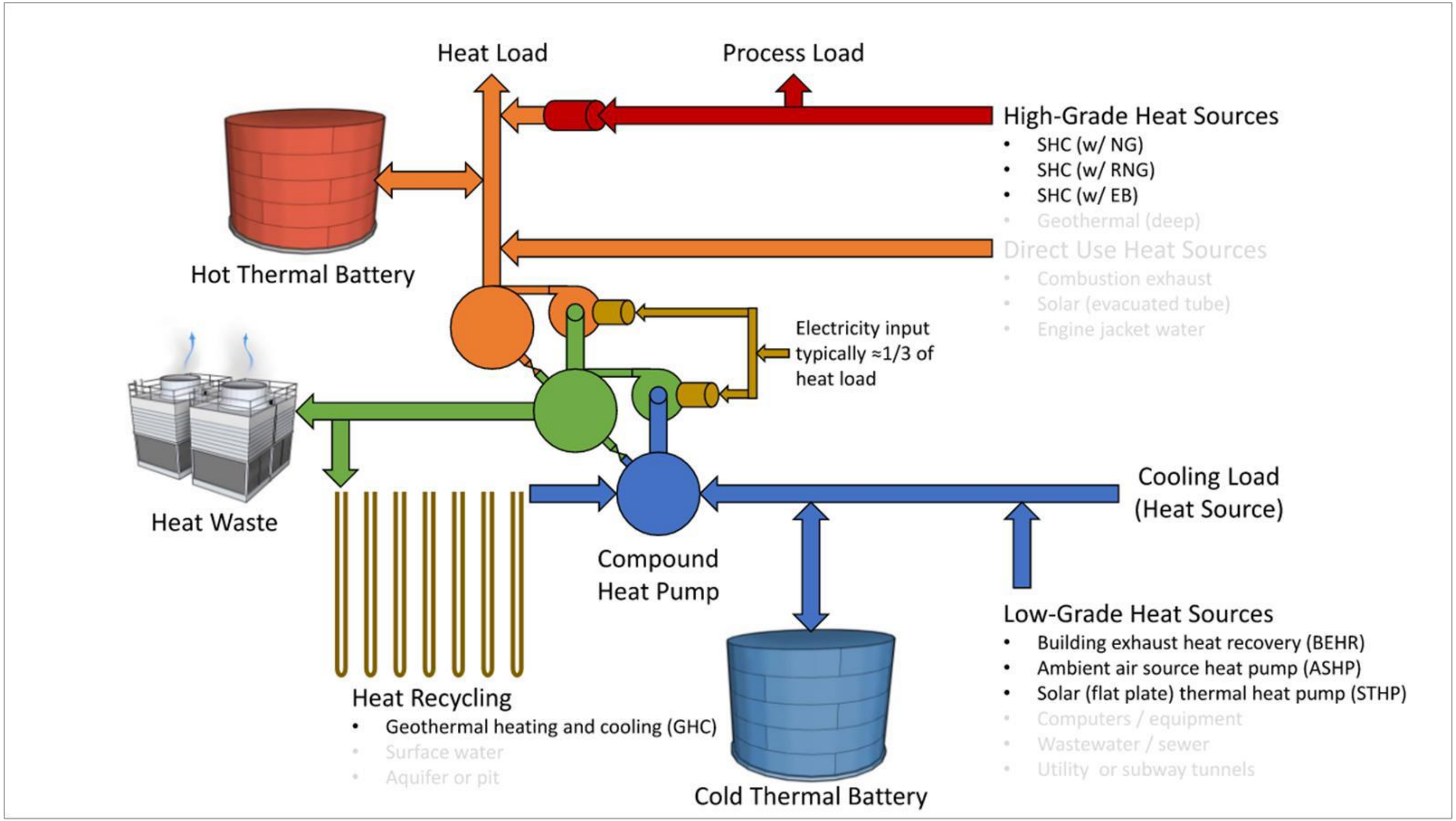
Green Hydrogen



Small Modular Nuclear Reactors



Preferred Thermal Utilities



Heat Load

Process Load

High-Grade Heat Sources

- SHC (w/ NG)
- SHC (w/ RNG)
- SHC (w/ EB)
- Geothermal (deep)

Hot Thermal Battery

Direct Use Heat Sources

- Combustion exhaust
- Solar (evacuated tube)
- Engine jacket water

Electricity input
typically ≈1/3 of
heat load

Heat Waste

Cooling Load
(Heat Source)

Compound
Heat Pump

Heat Recycling

- Geothermal heating and cooling (GHC)
- Surface water
- Aquifer or pit

Low-Grade Heat Sources

- Building exhaust heat recovery (BEHR)
- Ambient air source heat pump (ASHP)
- Solar (flat plate) thermal heat pump (STHP)
- Computers / equipment
- Wastewater / sewer
- Utility or subway tunnels

Cold Thermal Battery

UVA Thermal Energy Study (TES)

- Provides a ***long-term* Strategic Framework Plan** to achieve the fossil fuel free goal by 2050
  - Move from current heating infrastructure to electrification as new technologies develop

- Outlines a ***short-term* Fossil Fuel Action Plan** with specific strategies to reduce the use of fossil fuels
  - Install heat recovery chillers
  - Connect and expand thermal loops
  - Install geothermal
  - Eliminate use of coal
  - Expand solar
  - Track emerging Fossil Fuel Free technology that will produce steam

Studies – Academic Decarbonization

Before 2030 and 2050

Based on the recent engineering studies, the following projects have been recommended to help us achieve our sustainability goals, improve operation reliability/resiliency, and reduce operating cost:

- Fuel Conversion at the Main Heat Plant – Phase 1 (eliminate coal). $25M
- Replace Chemistry Chillers with heat recovery chillers. $20M
- Connect Academic and Massie thermal loops (heating/cooling) and add geothermal backbone between these two large Academic zones. Install additional heat recovery chillers and new geoexchange seasonal storage bore fields to support Academic and Massie heating/cooling demand. $97M
- Renew Massie Road plant with heat recovery chillers and geoexchange. $120M
- Future - Fuel Conversion at the Main Heat Plant – Phase 2 (eliminate combustion). $TBD

The first four projects would deliver carbon neutrality except for the fuel used at the main heat plant to make steam for the Medical Center. It was recommended to wait on future technology (modular/micro nuclear for example) that can produce steam without combustion for the second phase of the Main Heat Plant fuel conversion.

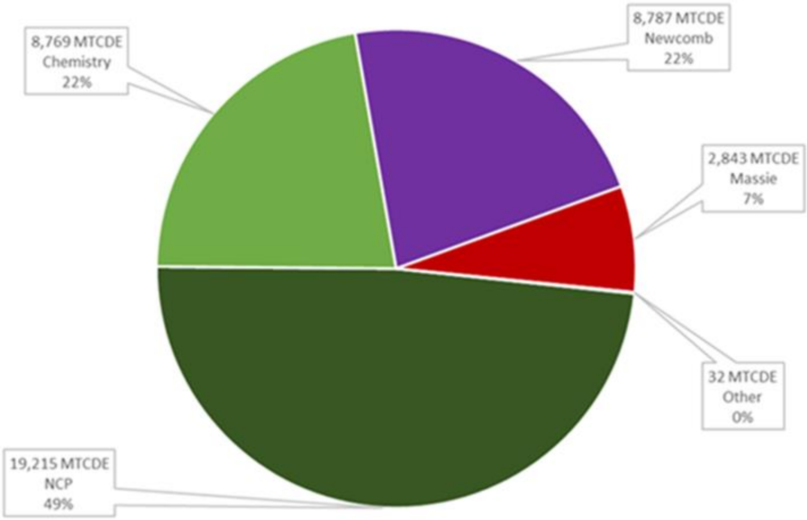
Proposed Thermal Utility Systems - Benefits

Preliminary modeling estimates when fully implemented

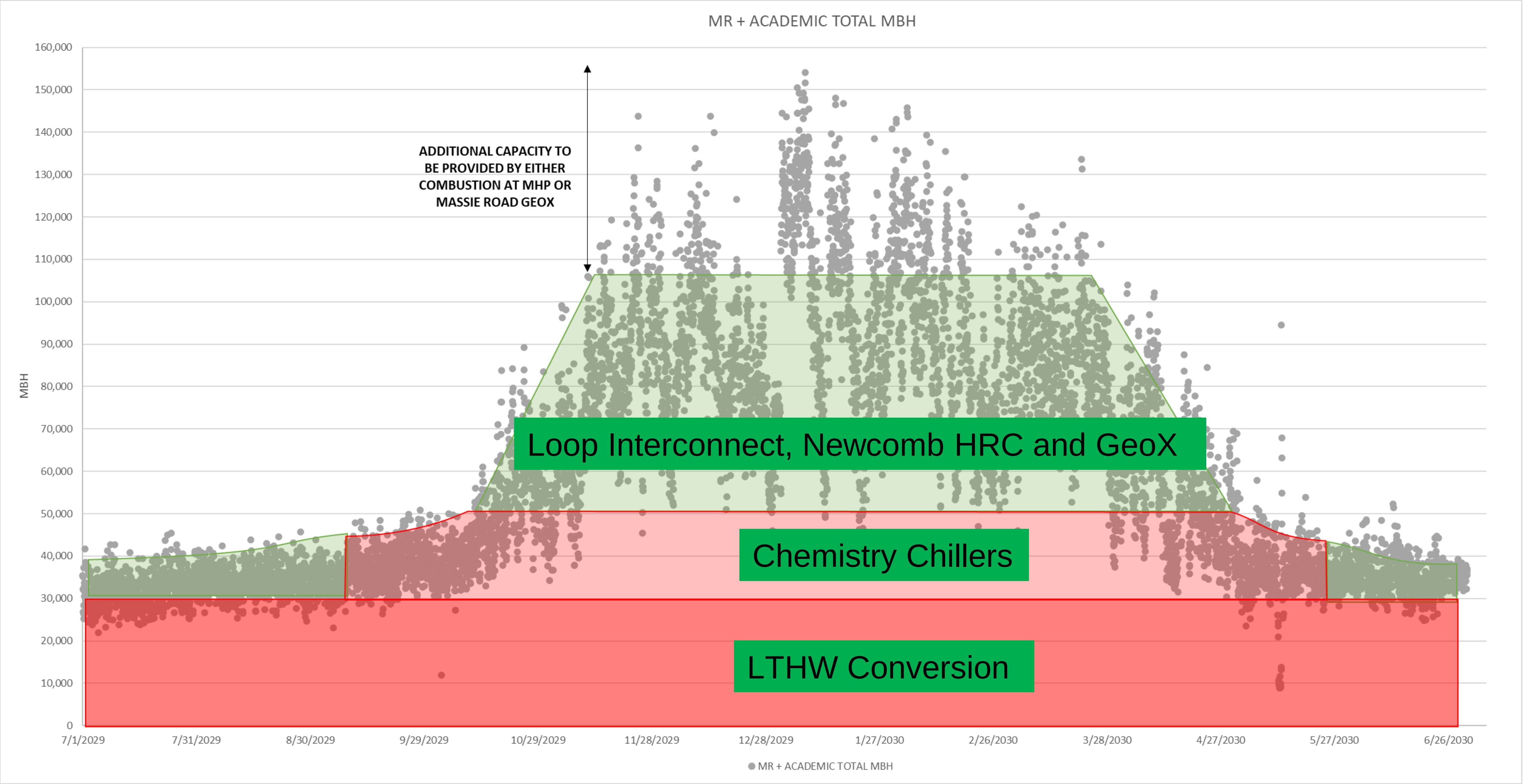
- $63M NPV (2028-2050) operational energy savings
- No new fossil fuel fired assets added, plus 700 million MBH reduction of fossil fueled production at MHP, MRCUP and NGCUP
- 37,000 metric tons per year reduction of carbon emissions
- 60,000,000 gallons per year savings of cooling tower make up water

Cooling systems (chillers, pumps, and cooling towers) can be removed from:

- Bryan Hall, Clark Hall, and Campbell Hall



Academic Heat Load and Decarb Projects



Facilities Management Recommended Path Forward

2023 through 2028

Fuel Conversion at the Main Heat Plant – Phase 1 (eliminate coal). $25M

- This project provides a significant reduction in Scope 1 GHG emissions (**11,089 tons**) and provides fuel security and resiliency to our most critical customer, the Medical Center.

Replace Chemistry Chillers with heat recovery chillers. $20M

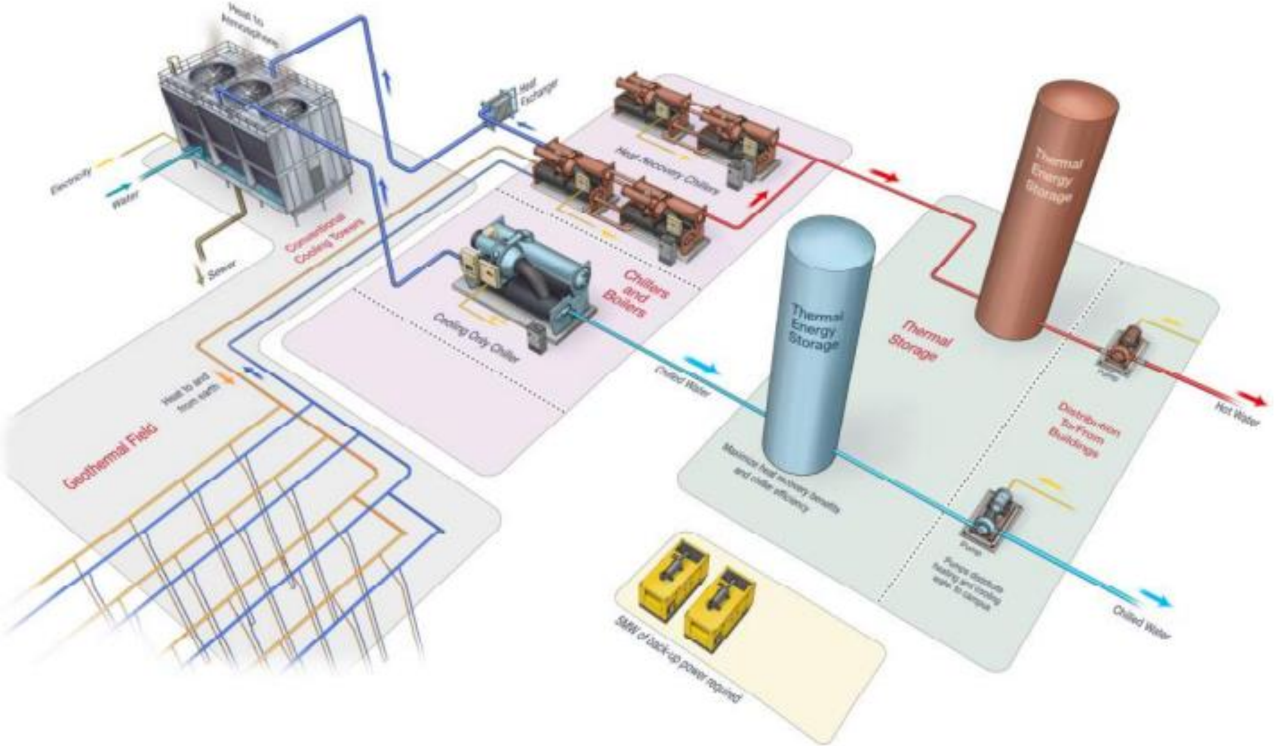
- This project replaces traditional chillers with heat recover chillers further reducing our Scope 1 GHG emissions (**4,316 tons**) and renews our chilled water capacity.

2029 Through 2033

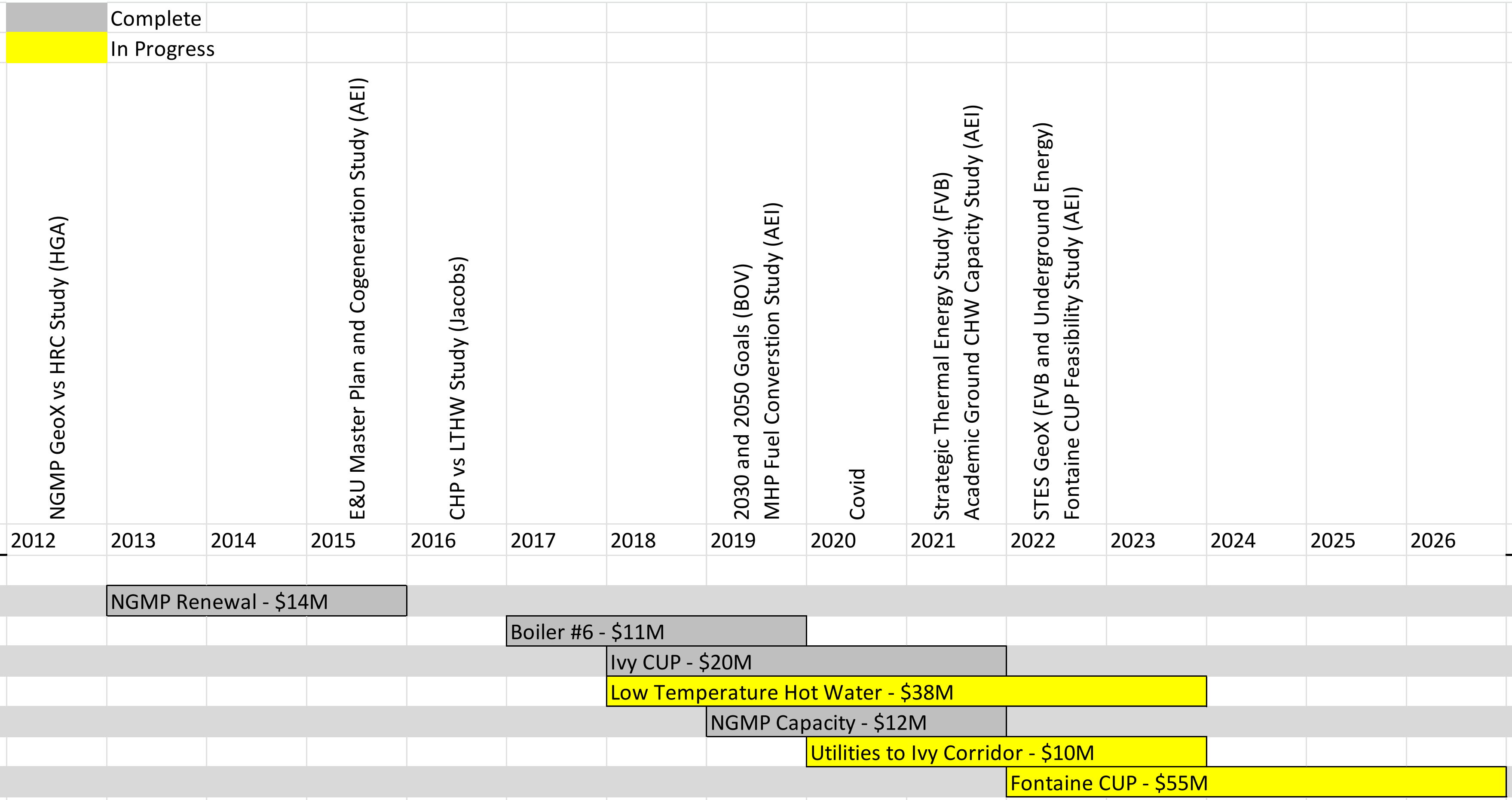
Connect Academic and Massie thermal loops (heating/cooling) and add geothermal backbone between these two large Academic zones. Install additional heat recovery chillers and new geoexchange seasonal storage bore fields to support Academic and Massie heating/cooling demand. $97M

- This project provides for another significant reduction in Scope 1 GHG emissions (**8,998 tons**), establishes geoexchange on Academic Grounds, and renews/expands our chilled water capacity to meet growing demand.

Zero Combustion Fontaine Plant



E&U Project History and Informing Studies



Technology					Outcome		
HRC	LTHW	GeoX	TBD		Decarb	Water	Cost
✓	✓			NGMP Renewal - $14M	✓	✓	✓
	✓			Boiler #6 - $11M	✓		
✓	✓			Ivy CUP - $20M	✓	✓	n/a
✓	✓			Low Temperature Hot Water - $38M	✓	✓	✓
✓				NGMP Capacity - $12M	✓	✓	
	✓			Utilities to Ivy Corridor - $10M			
✓	✓	✓		Fontaine CUP - $55M	✓	✓	n/a

HRC	Heat Recovery Chillers
LTHW	Low Temperature Hot Water
GeoX	GeoeXchange or closed-loop geothermal
TBD	To Be Developed
NGMP	North Grounds Mechanical Plant
CUP	Central Utility Plant

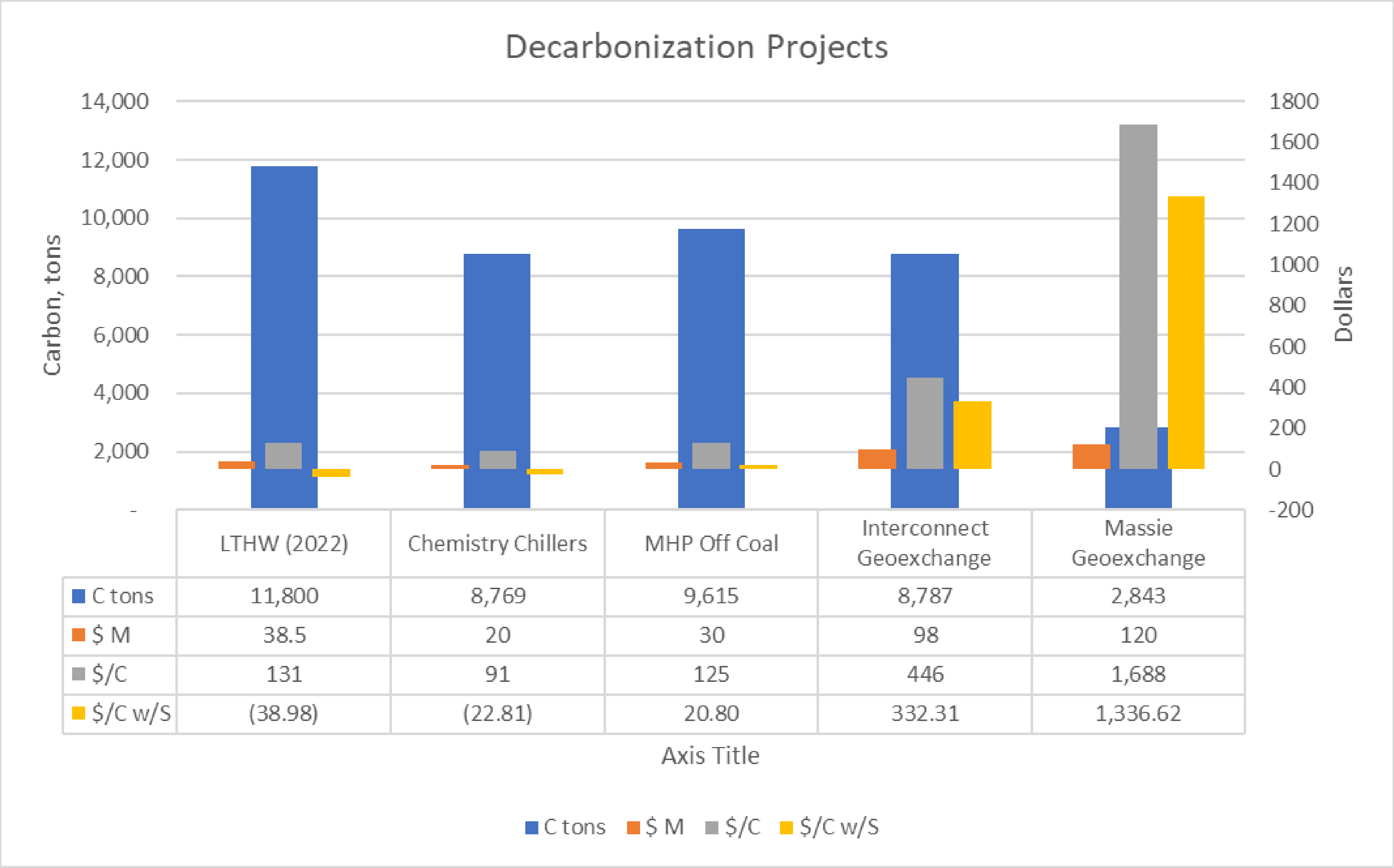
Ten Year Decarbonization Capital Project Plan

These three projects achieve Academic Grounds decarbonization and provide long-term fuel security/reliability for our critical steam customers (Medical Center Clinical and Research)

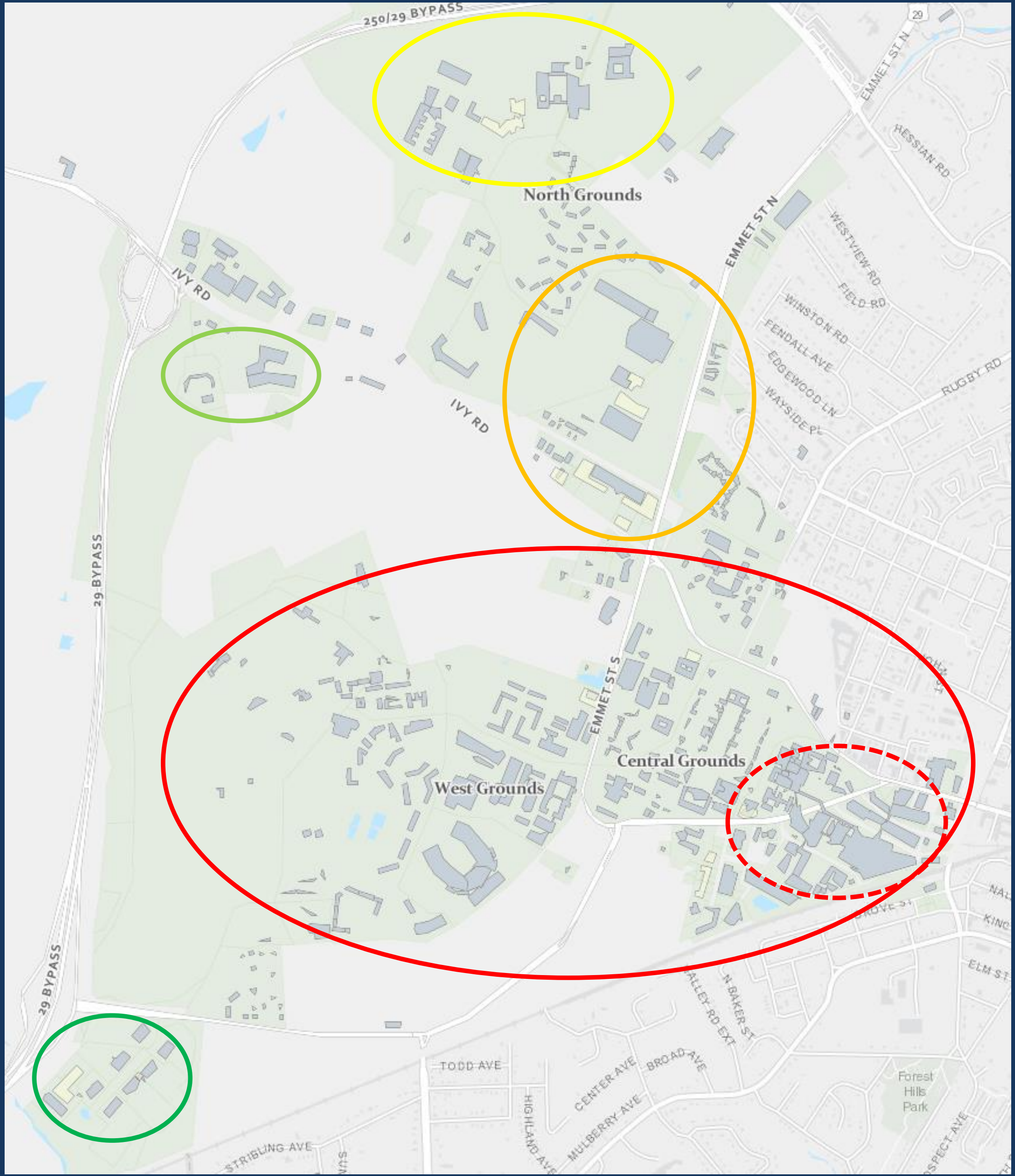
	Project Cost ($M)			$20		$25				$97									
	Scope 1 Carbon (tons)			4,316		11,089				8,998									
	$/ton			$185		$90				$431									
Technology				2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Outcome		
HRC	LTHW	GeoX	TBD														Decarb	Water	Cost
✓				Chemistry HRCs - $20M	🟩												✓	✓	✓
						MHP Fuel Conversion	🟩	🟩	🟩								✓		✓
✓		✓								Newcomb HRC, GeoX, Distribution	🟩	🟩	🟩	🟩			✓	✓	✓

MHP	Main Heat Plant
HRC	Heat Recovery Chillers
GeoX	GeoeXchange or closed-loop geothermal
TBD	To Be Developed
Distribution	Interconnect Academic and Massie thermal loops and add geoexchange loop

Relative Comparison of proposed projects



	LTHW (2022)	Chemistry Chillers	MHP Off Coal	Interconnect Geoexchange	Massie Geoexchange
🟦 C tons	11,800	8,769	9,615	8,787	2,843
🟧 $ M	38.5	20	30	98	120
◼ $/C	131	91	125	446	1,688
🟨 $/C w/S	(38.98)	(22.81)	20.80	332.31	1,336.62



Ivy Mountain

140F hot water

Geoexchange

Electric WHs

Fontaine

125F hot water

North Grounds

140-180F hot water

LTHW

Geoexchange

Electric WHs

Massie Road

190F hot water

140F hot water

LTHW

HRCs

Loop connect

Main Heat Plant

380F steam

170F hot water

HRC

LTHW

TBD

2022 Inflation Reduction Act (IRA)

The Federal Inflation Reduction Act of 2022 (IRA) is the most impactful energy and climate legislation in decades. It includes $369 billion for climate change and energy security initiatives. The major difference in this Act is that now governmental agencies can receive direct payments (versus tax liability credits) for installing or upgrading energy infrastructure that results in decarbonization.

This is a long-term Act. For example, the longest technology-specific credit is for geoexchange, this credit extends through 2034.

The most relevant credits for UVA are heat recovery chillers coupled with goexchange, thermal storage tanks, and solar PV systems.

The base level of credit is 6%. Additional credits are available for prevailing wage, apprentice participation, and domestic sourced materials. The upper end on credit potential is 40% of the applicable project basis.

2022 Inflation Reduction Act (IRA)

Projects potentially eligible for the ITC

- Fontaine CUP
  - $55M project
  - $10-30M credit potential
- Chemistry HRCs
  - $20M project
  - $0 credit potential (because they are not coupled with geoexchange
  - Exploring options to include some GeoX in this project
- Main Heat Plant Fuel Conversion
  - $25M project
  - Application process for up to $25M (no guarantee if grant will be awarded)
  - Concept Paper due 7/31 (Cost of $25K to KPMG)
  - Final application submission based on IRS feedback of Concept Paper
- Newcomb HRCs, GeoX, and Distribution
  - $97M project
  - TBD credit potential … will use Fontaine project as guide