



PRESENTED BY
ECOSYSTEM

CHP Trifecta

INNOVATION, RESILIENCY, & FINANCIAL
WINDFALLS





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Adelphi University

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Project Development Lead
Ecosystem Energy Services

Campus Needs

DESIRED OUTCOMES

- ▶ Asset renewal
- ▶ Resiliency
- ▶ Financial prudence
- ▶ Continued leadership in sustainability



Adelphi Fast Facts

FOUNDED **1896**
MOVED TO LONG ISLAND 1928

8 SCHOOLS

8,000 UNDERGRADS

70 ACRES

6,500 FTEs

1,200,000 FT²

400,000 FT²
ADDED SINCE 2001

3 LEED-CERTIFIED
BUILDING

Adelphi Fast Facts

- ▶ 100% Green REC purchase every year since 2008. Current purchase exceeds 2.0 MWH.
- ▶ Member of EPA Green Power Partnership.
- ▶ The first geothermal system on a Long Island college campus when Res Hall A opened in 2003.
- ▶ The largest geothermal system in the northeast (Sports PAC) at the time it was installed.
- ▶ Extensive recycling programs.
- ▶ On-site electric vehicle charging stations

50 kW solar array on Swirbul Library



Project Description



SCIENCE BUILDING

- ▶ CAV to VAV
- ▶ New exhaust fans with atmospheric disbursement



WOODRUFF HALL

- ▶ New near-condensing boilers
- ▶ 2 MW cogeneration system

40%

ENERGY BILL REDUCTION

\$2.5M

INCENTIVES

\$1.6M

ANNUAL SAVINGS

\$13.5M

INVESTMENT



ecosystem

Financials

BOILER ROOM PROJECT FUNDS SCIENCE BUILDING UPGRADES

An innovative financing solution that guaranteed savings in excess of loan repayments by \$400,000 per year with a budget-neutral operating lease.

	ESCO contract	Decoupled project
Set-up	Complex and costly	Transparent and inexpensive
Risk	University	Ecosystem
Cost of capital	~ 7.5%	~ 3.75%
Payment term	15 years fixed	Tied to project ROI
Utility incentives	ESCO keeps	University keeps
Excess savings	ESCO keeps all measured savings	University benefits from all measured savings

Adelphi University
Energy Project Financing Analysis

Assumptions	
Project Cost Financed	\$ 13,500,000.00
Energy Savings Growth Rate	3%
Maintenance Cost Growth Rate	3%
Conservative Savings Modeling Discount	100%

Energy Savings Analysis			
Year	Projected Annual Energy Savings	Budgeted Maintenance Costs	Conservative Adjustment
1	\$ 1,600,000.00	\$ 400,000.00	\$ 1,200,000.00
2	\$ 1,648,000.00	\$ 412,000.00	\$ 1,236,000.00
3	\$ 1,697,440.00	\$ 424,360.00	\$ 1,273,080.00
4	\$ 1,748,363.20	\$ 437,090.80	\$ 1,311,272.40
5	\$ 1,800,814.10	\$ 450,203.52	\$ 1,350,610.57
6	\$ 1,854,838.52	\$ 463,709.63	\$ 1,391,128.89
7	\$ 1,910,483.67	\$ 477,620.92	\$ 1,432,862.76
8	\$ 1,967,798.18	\$ 491,949.55	\$ 1,475,848.64
9	\$ 2,026,832.13	\$ 506,708.03	\$ 1,520,124.10
10	\$ 2,087,637.09	\$ 521,909.27	\$ 1,565,727.82
11	\$ 2,150,266.21	\$ 537,566.55	\$ 1,612,699.66
12	\$ 2,214,774.19	\$ 553,693.55	\$ 1,661,080.64
13	\$ 2,281,217.42	\$ 570,304.35	\$ 1,710,913.06
14	\$ 2,349,653.94	\$ 587,413.49	\$ 1,762,240.46
15	\$ 2,420,143.56	\$ 605,035.89	\$ 1,815,107.67
16	\$ 2,492,747.87	\$ 623,186.97	\$ 1,869,560.90
17	\$ 2,567,530.30	\$ 641,882.58	\$ 1,925,647.73
18	\$ 2,644,556.21	\$ 661,139.05	\$ 1,983,417.16
19	\$ 2,723,892.90	\$ 680,973.22	\$ 2,042,919.67
20	\$ 2,805,609.68	\$ 701,402.42	\$ 2,104,207.26
21	\$ 2,889,777.98	\$ 722,444.49	\$ 2,167,333.48
22	\$ 2,976,471.31	\$ 744,117.83	\$ 2,232,353.49
23	\$ 3,065,765.45	\$ 766,441.36	\$ 2,299,324.09
24	\$ 3,157,738.42	\$ 789,434.60	\$ 2,368,303.81
25	\$ 3,252,470.57	\$ 813,117.64	\$ 2,439,352.93
			\$ 41,311,764.26

Lease Summary							
Scenerio #1 - FMV Buyout		Quarterly Lease Payments		Scenerio #2 - Finance FMV Buyout		Quarterly Lease Payments	
\$	(1,200,000.00)	\$	(300,000.00)	\$	(1,200,000.00)	\$	(300,000.00)
\$	(1,236,000.00)	\$	(309,000.00)	\$	(1,236,000.00)	\$	(309,000.00)
\$	(1,273,080.00)	\$	(318,270.00)	\$	(1,273,080.00)	\$	(318,270.00)
\$	(1,311,272.40)	\$	(327,818.10)	\$	(1,311,272.40)	\$	(327,818.10)
\$	(1,350,610.57)	\$	(337,652.64)	\$	(1,350,610.57)	\$	(337,652.64)
\$	(1,391,128.89)	\$	(347,782.22)	\$	(1,391,128.89)	\$	(347,782.22)
\$	(1,432,862.76)	\$	(358,215.69)	\$	(1,432,862.76)	\$	(358,215.69)
\$	(1,475,848.64)	\$	(368,962.16)	\$	(1,475,848.64)	\$	(368,962.16)
\$	(1,520,124.10)	\$	(380,031.02)	\$	(1,520,124.10)	\$	(380,031.02)
\$	(1,565,727.82)	\$	(391,431.96)	\$	(1,565,727.82)	\$	(391,431.96)
\$	(3,281,415.18)	\$	(3,281,415.18)	\$	(1,612,699.68)	\$	(403,174.91)
				\$	(1,661,080.64)	\$	(415,270.16)
				\$	(142,576.09)	\$	(142,576.09)
Payback Period				12.083			

FAEF Lease Option	
Excess Realized Savings	
Adjusted Savings Less Lease Payment	
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	1,568,336.98
\$	1,762,240.46
\$	1,815,107.67
\$	1,869,560.90
\$	1,925,647.73
\$	1,983,417.16
\$	2,042,919.67
\$	2,104,207.26
\$	2,167,333.48
\$	2,232,353.49
\$	2,299,324.09
\$	2,368,303.81
\$	2,439,352.93
\$	26,578,105.62







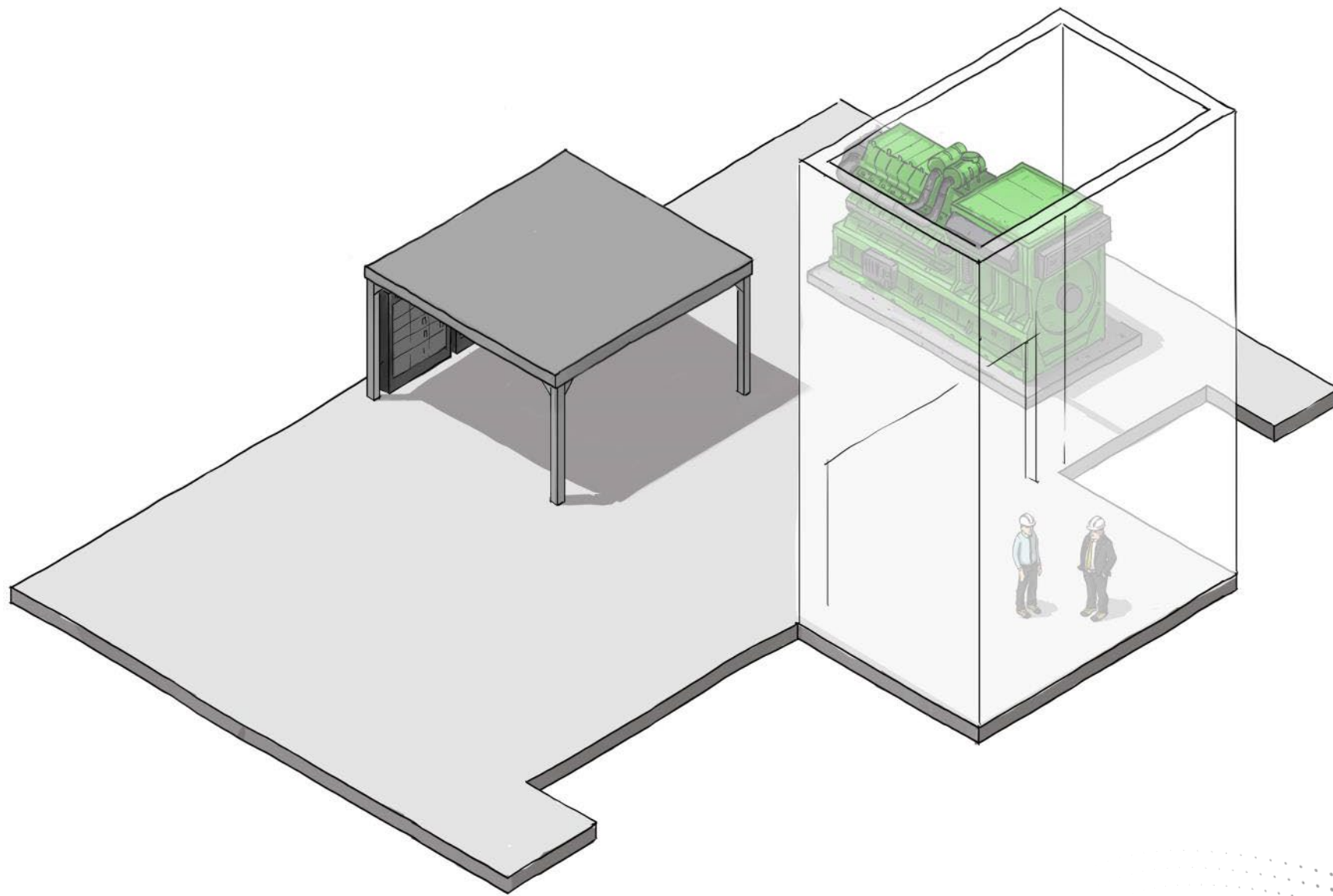
Woodruff Hall

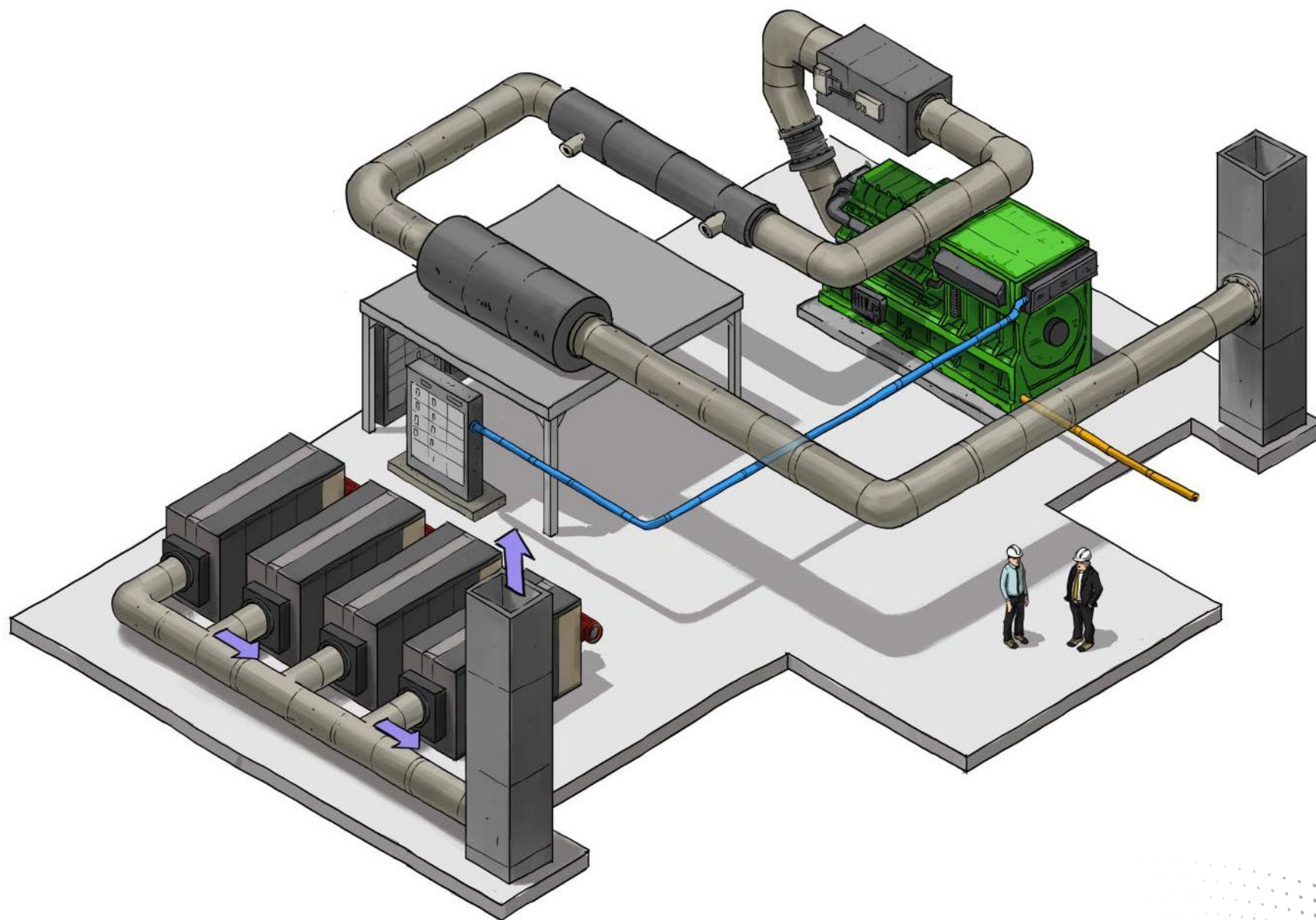
CHP PLANT & BOILER CHALLENGES

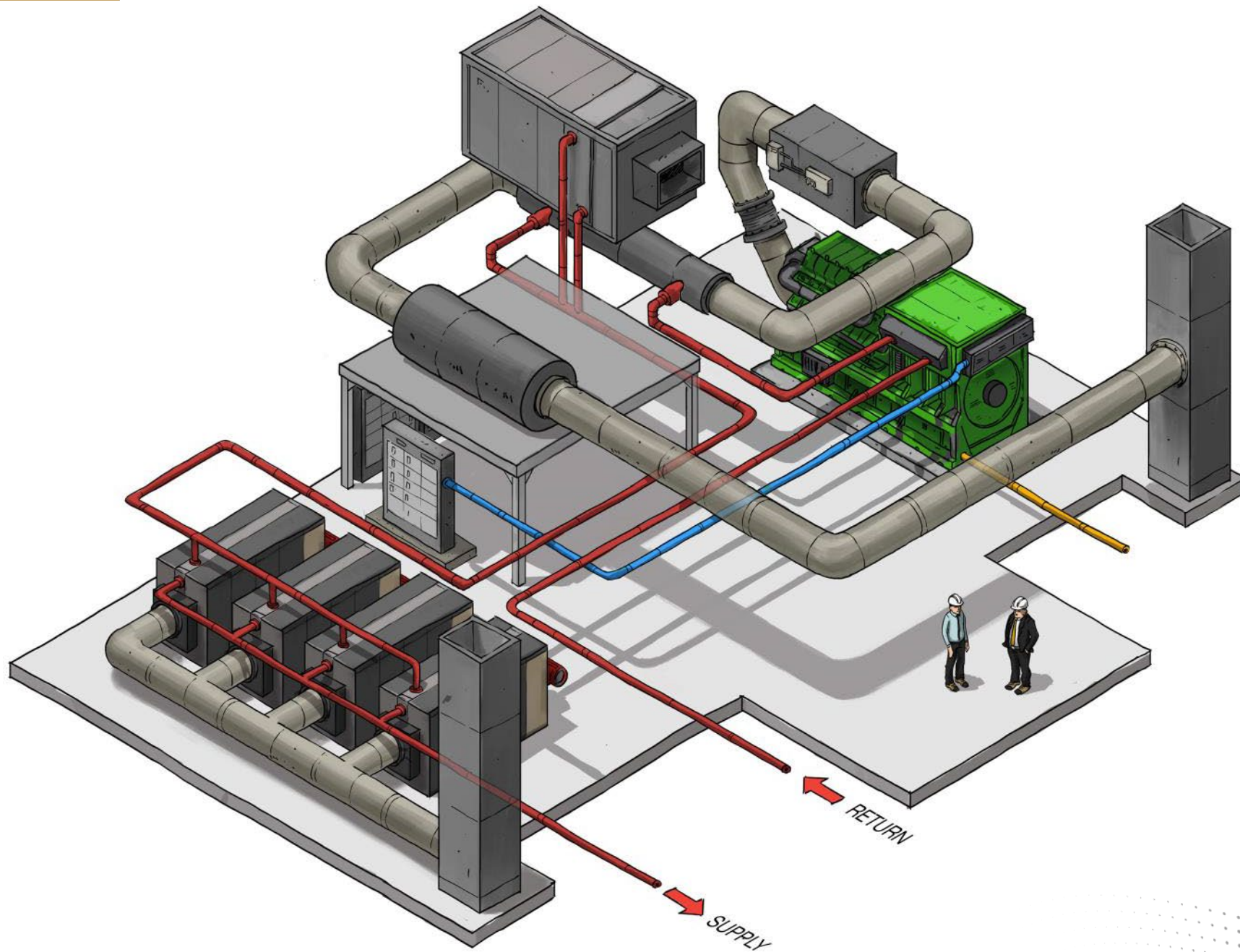
- ▶ Access and available space for new equipment
- ▶ Installation without disruption of services
- ▶ Electrical interconnection
- ▶ Implementation schedule

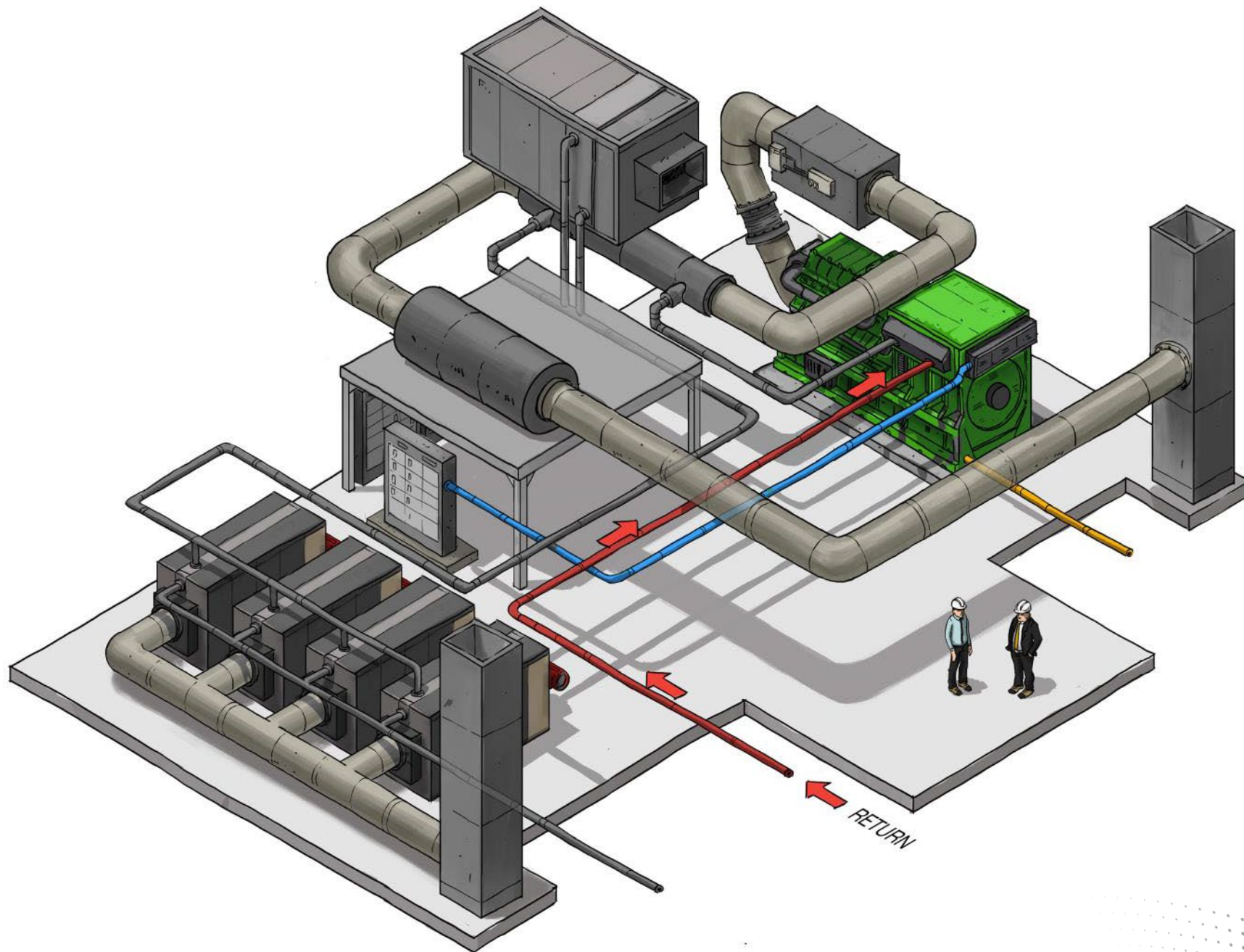
Before











An Evolving Technology

Gradual Decarbonization of the Electrical Grid

	Short-term	Medium-to-long term
Potential CHP operation strategies	<ul style="list-style-type: none">▶ Baseload operation▶ Emergency mode	<ul style="list-style-type: none">▶ Demand management▶ Combination with heat pumps▶ Low-/zero-carbon fuels (biofuels, hydrogen)/carbon sequestration
Benefits	<ul style="list-style-type: none">▶ Cleaner electricity▶ Energy cost savings▶ Increased resiliency	<ul style="list-style-type: none">▶ Demand savings▶ Alternate decarbonization solutions

The background is a solid yellow color. Overlaid on this are several wavy, horizontal lines that create a sense of motion. These lines are composed of small white dots, which are more densely packed in some areas and more sparse in others, creating a gradient effect. The lines curve upwards from the bottom left towards the top right, with a slight dip in the middle.

Questions?

Thank you!



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