
AUROS
GROUP
BUILDING
PERFORMANCE.
CONNECTED.

RESILIENCE

Where do we start?

RESILIENCE

The best solutions solve multiple problems

Resilience

ENVELOPE FIRST
PASSIVE OVER ACTIVE
SITE OVER SOURCE

NATURAL ORDER OF SUSTAINABILITY

- Passive First
- Active Second
- Renewables Last

The path to integration and alignment

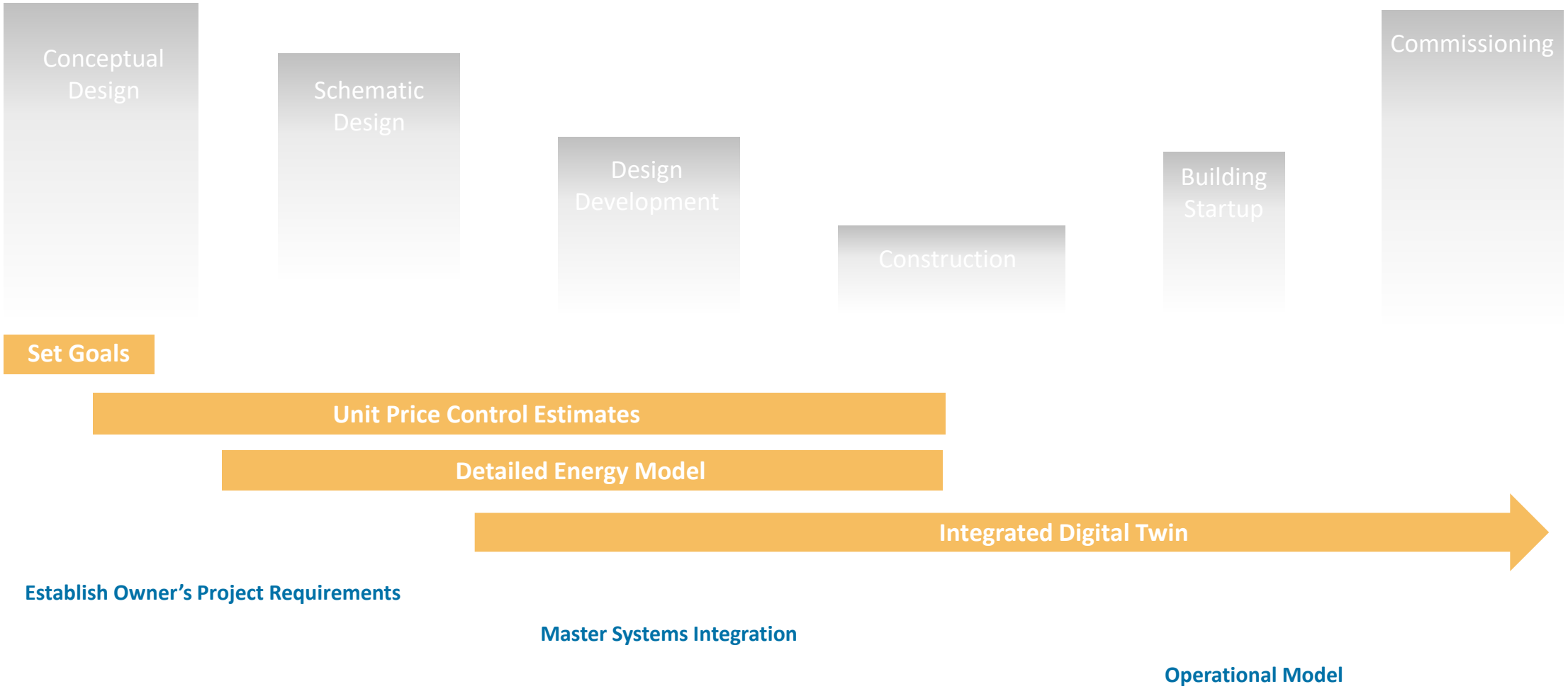
SET GOALS

CREATE SIMULATIONS

MEASURE PERFORMANCE

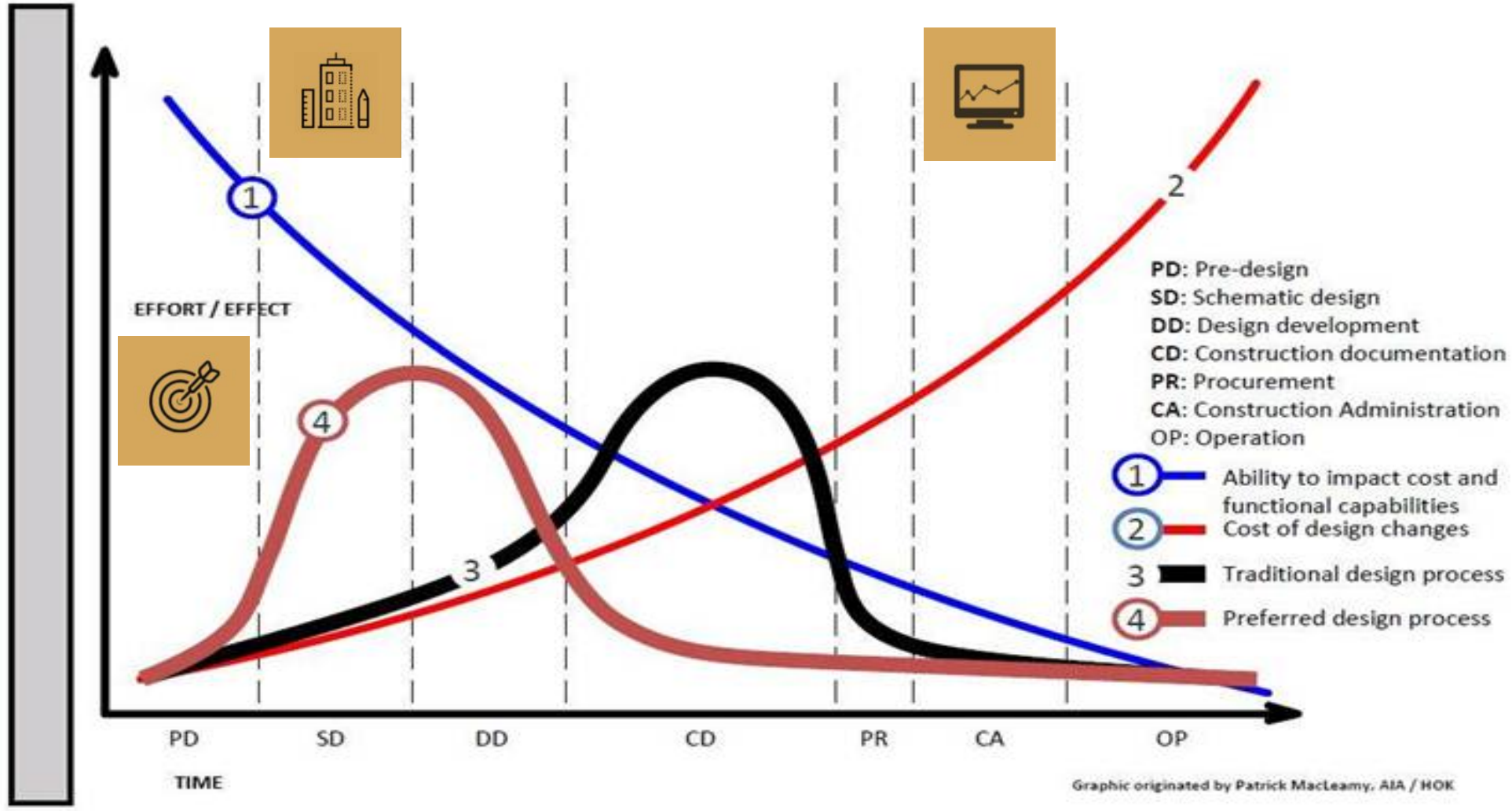
RESILIENCE

Strategies during project delivery



RESILIENCE

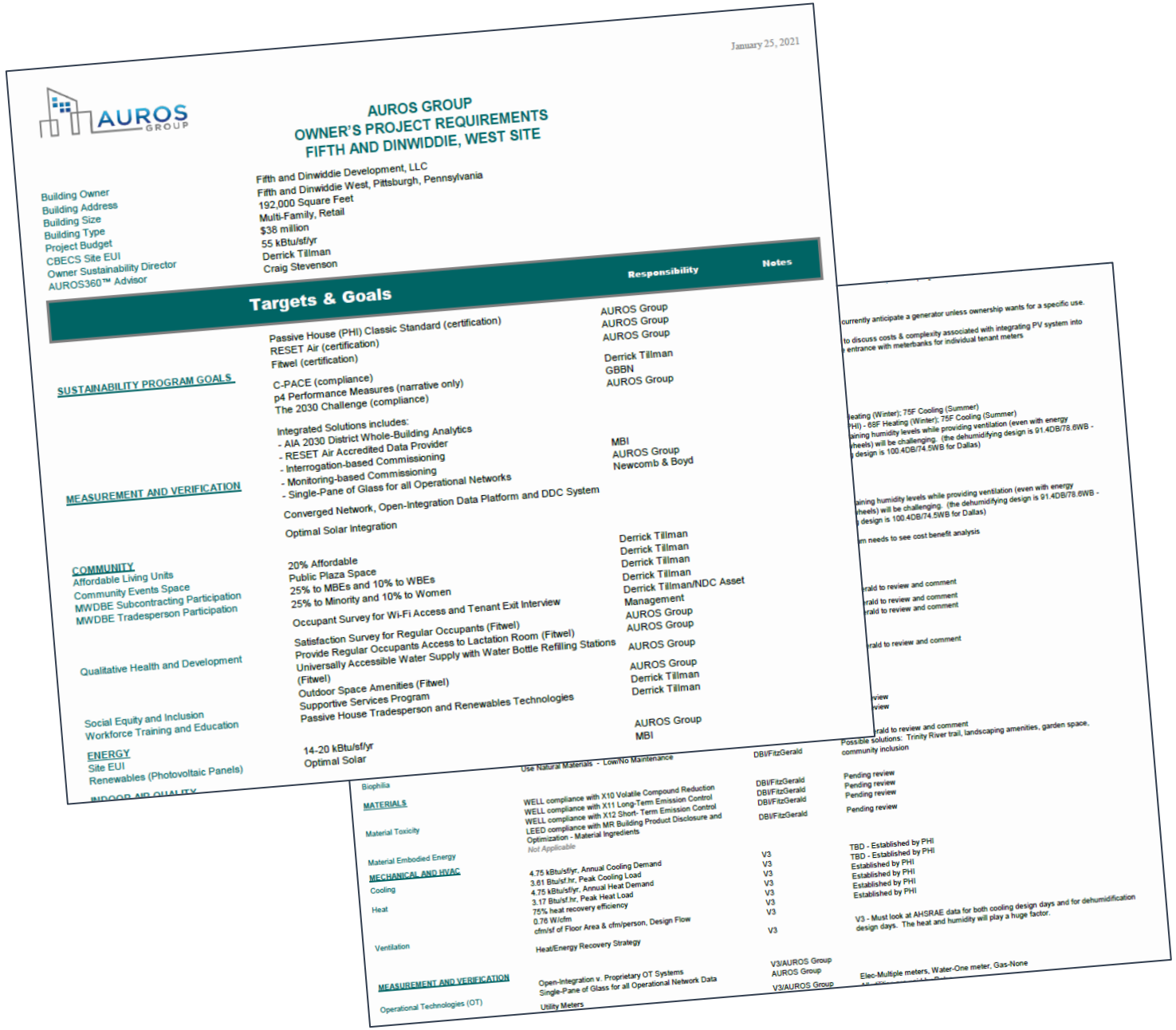
Strategies to reach goals



Owner's Project Requirements

ESTABLISH TARGET VALUES

- Carbon
- Zero Energy
- Indoor Air Quality
- Social Equity
- Data Control & Transparency



January 25, 2021

AUROS GROUP

AUROS GROUP
OWNER'S PROJECT REQUIREMENTS
FIFTH AND DINWIDDIE, WEST SITE

Building Owner	Fifth and Dinwiddie Development, LLC
Building Address	Fifth and Dinwiddie West, Pittsburgh, Pennsylvania
Building Size	192,000 Square Feet
Building Type	Multi-Family, Retail
Project Budget	$38 million
CBECS Site EUI	55 kBtu/sf/yr
Owner Sustainability Director	Derrick Tillman
AUROS360™ Advisor	Craig Stevenson

Targets & Goals		Responsibility	Notes
SUSTAINABILITY PROGRAM GOALS	Passive House (PHI) Classic Standard (certification)	AUROS Group	
	RESET Air (certification)	AUROS Group	
	Fitwel (certification)	AUROS Group	
	C-PACE (compliance)	Derrick Tillman	
	p4 Performance Measures (narrative only)	GBBN	
	The 2030 Challenge (compliance)	AUROS Group	
MEASUREMENT AND VERIFICATION	Integrated Solutions includes: - AIA 2030 District Whole-Building Analytics - RESET Air Accredited Data Provider - Interrogation-based Commissioning - Monitoring-based Commissioning - Single-Pane of Glass for all Operational Networks	MBI AUROS Group Newcomb & Boyd	
	Converged Network, Open-Integration Data Platform and DDC System		
	Optimal Solar Integration		
COMMUNITY Affordable Living Units	20% Affordable	Derrick Tillman	
Community Events Space	Public Plaza Space	Derrick Tillman	
MWDBE Subcontracting Participation	25% to MBEs and 10% to WBEs	Derrick Tillman	
MWDBE Tradesperson Participation	25% to Minority and 10% to Women	Derrick Tillman	
Qualitative Health and Development	Occupant Survey for Wi-Fi Access and Tenant Exit Interview	Derrick Tillman/NDC Asset Management	
	Satisfaction Survey for Regular Occupants (Fitwel)	AUROS Group	
	Provide Regular Occupants Access to Lactation Room (Fitwel)	AUROS Group	
	Universally Accessible Water Supply with Water Bottle Refilling Stations (Fitwel)	AUROS Group	
	Outdoor Space Amenities (Fitwel)	AUROS Group	
Social Equity and Inclusion	Supportive Services Program	Derrick Tillman	
Workforce Training and Education	Passive House Tradesperson and Renewables Technologies	Derrick Tillman	
ENERGY Site EUI	14-20 kBtu/sf/yr	AUROS Group	
Renewables (Photovoltaic Panels)	Optimal Solar	MBI	
INDOOR AIR QUALITY			

currently anticipate a generator unless ownership wants for a specific use.

to discuss costs & complexity associated with integrating PV system into
e entrance with meterbanks for individual tenant meters

eating (Winter); 75F Cooling (Summer)
'HI) - 68F Heating (Winter); 75F Cooling (Summer)
aining humidity levels while providing ventilation (even with energy
heels) will be challenging. (the dehumidifying design is 91.4DB/78.6WB -
design is 100.4DB/74.5WB for Dallas)

aining humidity levels while providing ventilation (even with energy
heels) will be challenging. (the dehumidifying design is 91.4DB/78.6WB -
design is 100.4DB/74.5WB for Dallas)

m needs to see cost benefit analysis

rald to review and comment
rald to review and comment
rald to review and comment

rald to review and comment

view
view

rald to review and comment

Biophilia	Use Natural Materials - Low/No Maintenance	DBI/FitzGerald	Possible solutions: Trinity River trail, landscaping amenities, garden space, community inclusion
MATERIALS	WELL compliance with X10 Volatile Compound Reduction	DBI/FitzGerald	Pending review
	WELL compliance with X11 Long-Term Emission Control	DBI/FitzGerald	Pending review
	WELL compliance with X12 Short- Term Emission Control	DBI/FitzGerald	Pending review
Material Toxicity	LEED compliance with MR Building Product Disclosure and Optimization - Material Ingredients	DBI/FitzGerald	Pending review
Material Embodied Energy	*Not Applicable*		
MECHANICAL AND HVAC		V3	TBD - Established by PHI
Cooling	4.75 kBtu/sf/yr, Annual Cooling Demand	V3	TBD - Established by PHI
	3.61 Btu/sf.hr, Peak Cooling Load	V3	Established by PHI
Heat	4.75 kBtu/sf/yr, Annual Heat Demand	V3	Established by PHI
	3.17 Btu/sf.hr, Peak Heat Load	V3	Established by PHI
	75% heat recovery efficiency	V3	Established by PHI
Ventilation	0.76 W/cfm cfm/sf of Floor Area & cfm/person, Design Flow	V3	V3 - Must look at AHSRAE data for both cooling design days and for dehumidification design days. The heat and humidity will play a huge factor.
	Heat/Energy Recovery Strategy		
MEASUREMENT AND VERIFICATION		V3/AUROS Group	
Operational Technologies (OT)	Open-Integration v. Proprietary OT Systems	AUROS Group	
	Single-Pane of Glass for all Operational Network Data	V3/AUROS Group	
	Utility Meters		Elec-Multiple meters, Water-One meter, Gas-None

Owner's Project Requirements

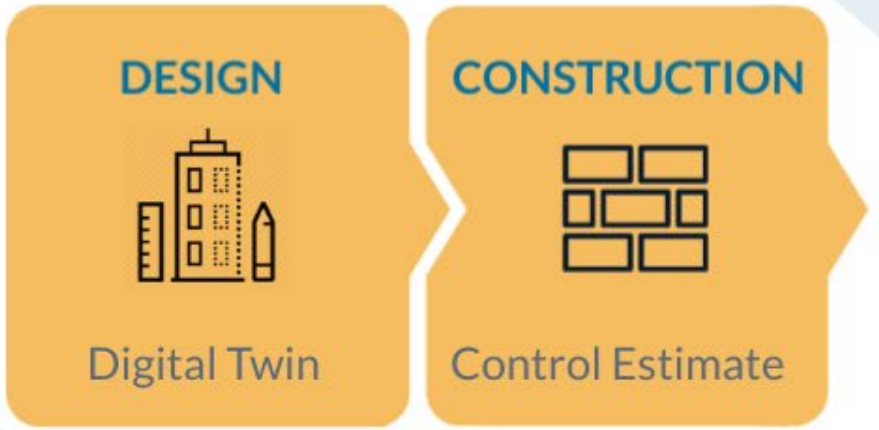
TARGET VALUES
(excerpt)

KEY PERFORMANCE INDICATORS	METRICS
SUSTAINABILITY CERTIFICATION PROGRAM GOALS `	Evidence-based goals *[Select your programs]*
ENERGY	
Site Energy Use Intensity (EUI)	14 kBtu/sf/yr
Gas v. Electrification Balance	
Renewables	Offset annual energy consumption to Zero Energy
Building Envelope Infiltration	0.05 cfm/gross sf shell @50Pa
INDOOR AIR QUALITY	
Particulate Matter 2.5 (PM2.5)	< 12 µg/m3
Total Volatile Organic Compound (TVOC)	< 0.4 mg/m3 (< 400 µg/m3)
Carbon Dioxide (CO2)	< 600 ppm
Temperature	Monitored
Humidity	Monitored
Carbon Monoxide (CO)	< 9 ppm
Ozone (O3)	< 51 ppb
Particulate Matter 10 (PM10)	< 50 µg/m3
Radon	< 0.148 Bq/L [4 pCi/L] in the lowest occupied level
Ventilation Rate:	PH Compliance

Simulations

TECHNOLOGY
REDUCES RISK

Continuous modeling meets continuous estimating.

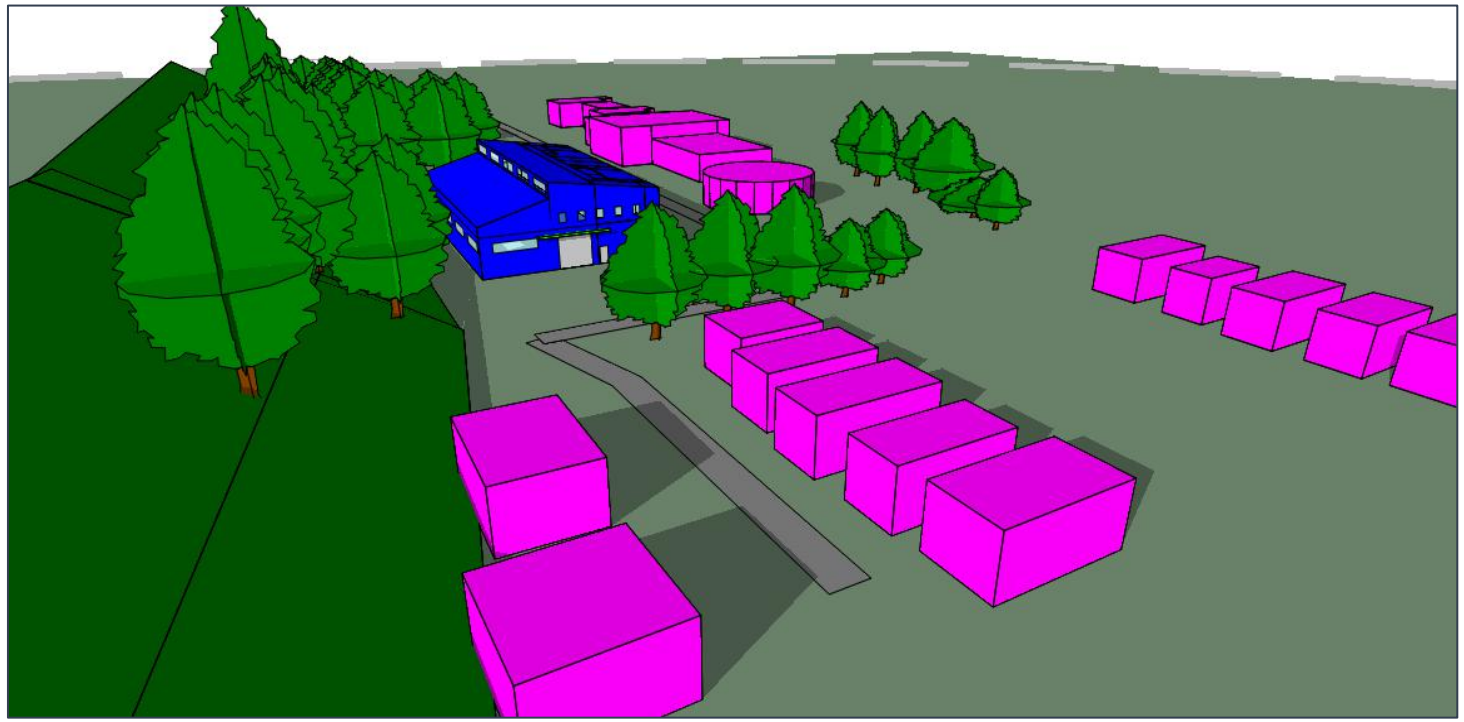


Simulations

MUNICIPAL
WAREHOUSE

DESIGN

Digital Twin

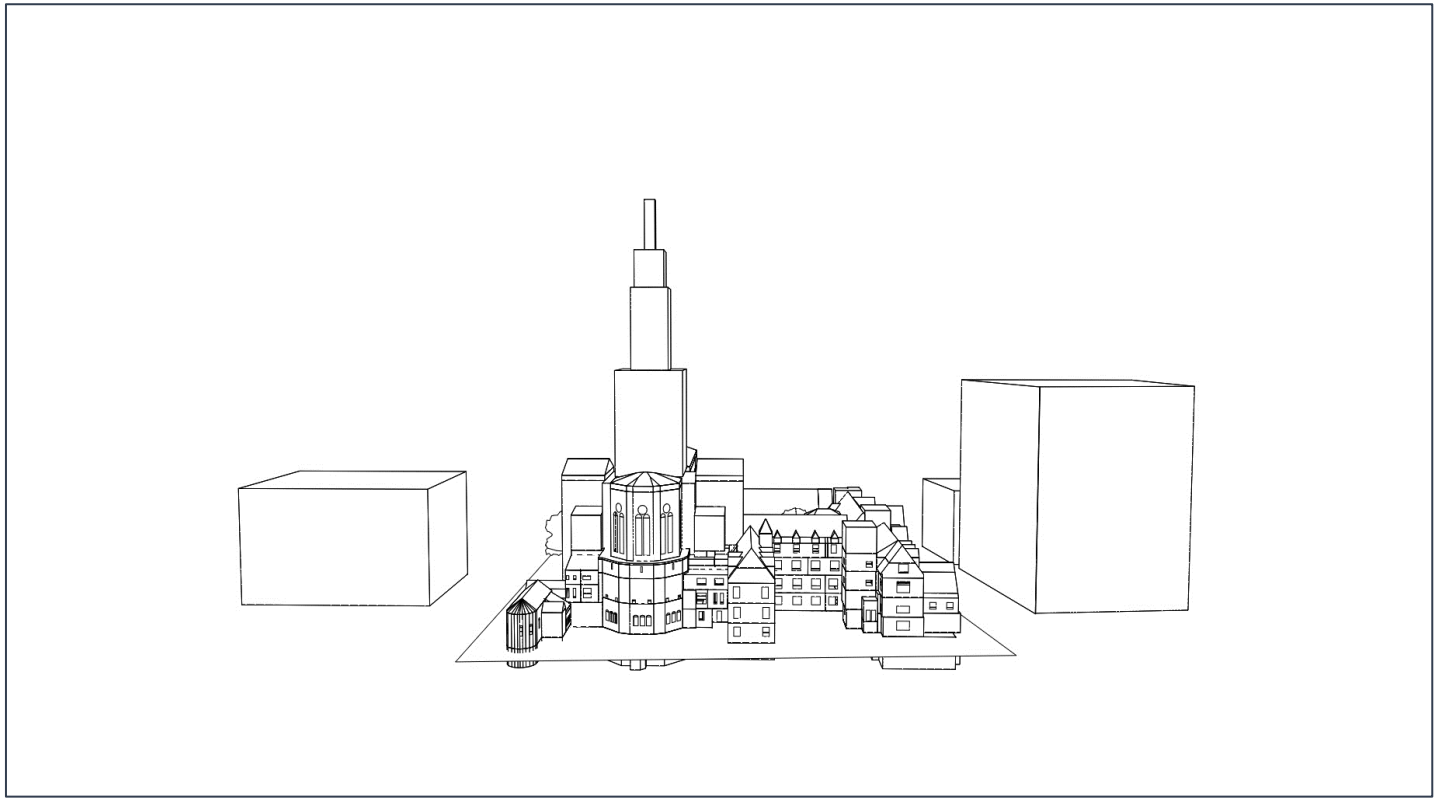


Simulations

CATHEDRAL

DESIGN

Digital Twin

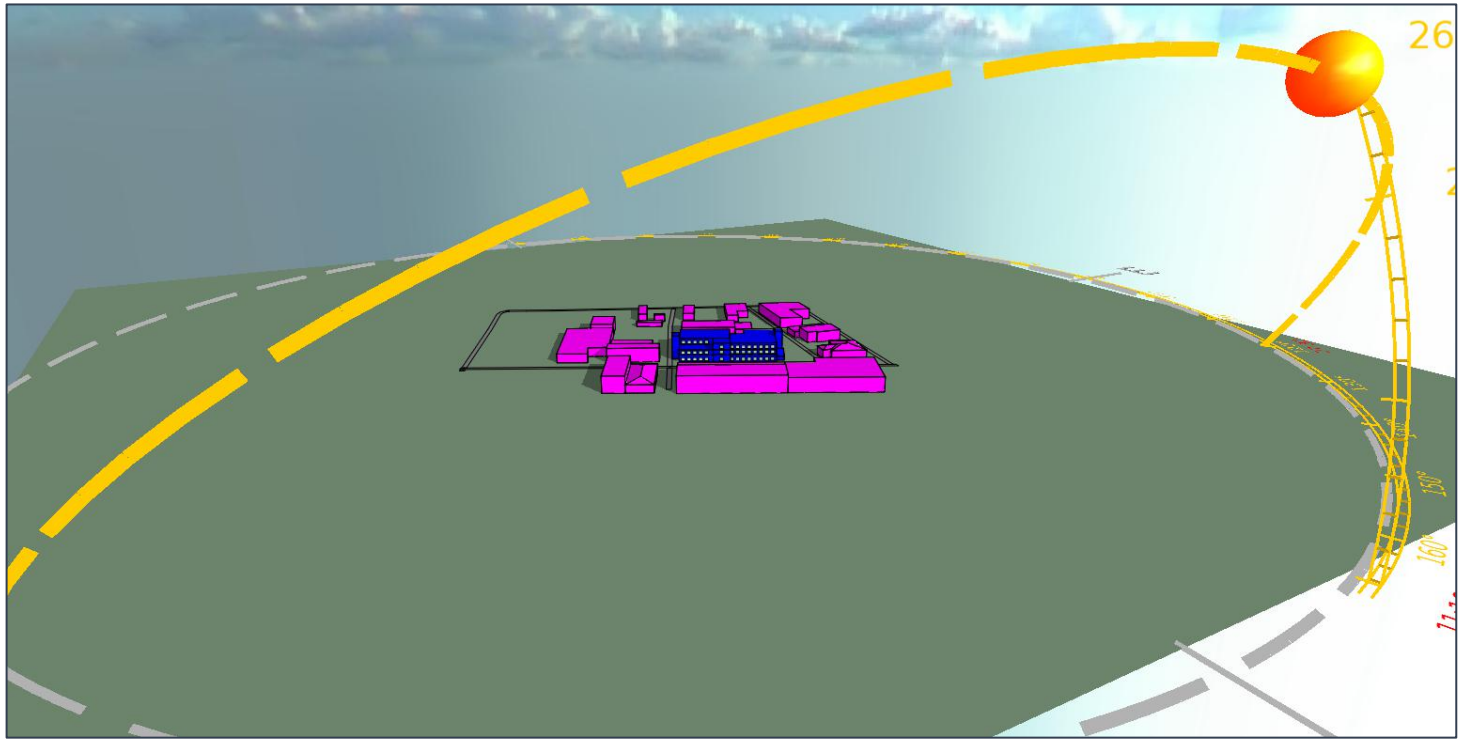


Simulations

HIGH SCHOOL

DESIGN

Digital Twin



Simulations

MIXED USE:
MULTI-FAMILY
RETAIL
COMMERCIAL

DESIGN

Digital Twin

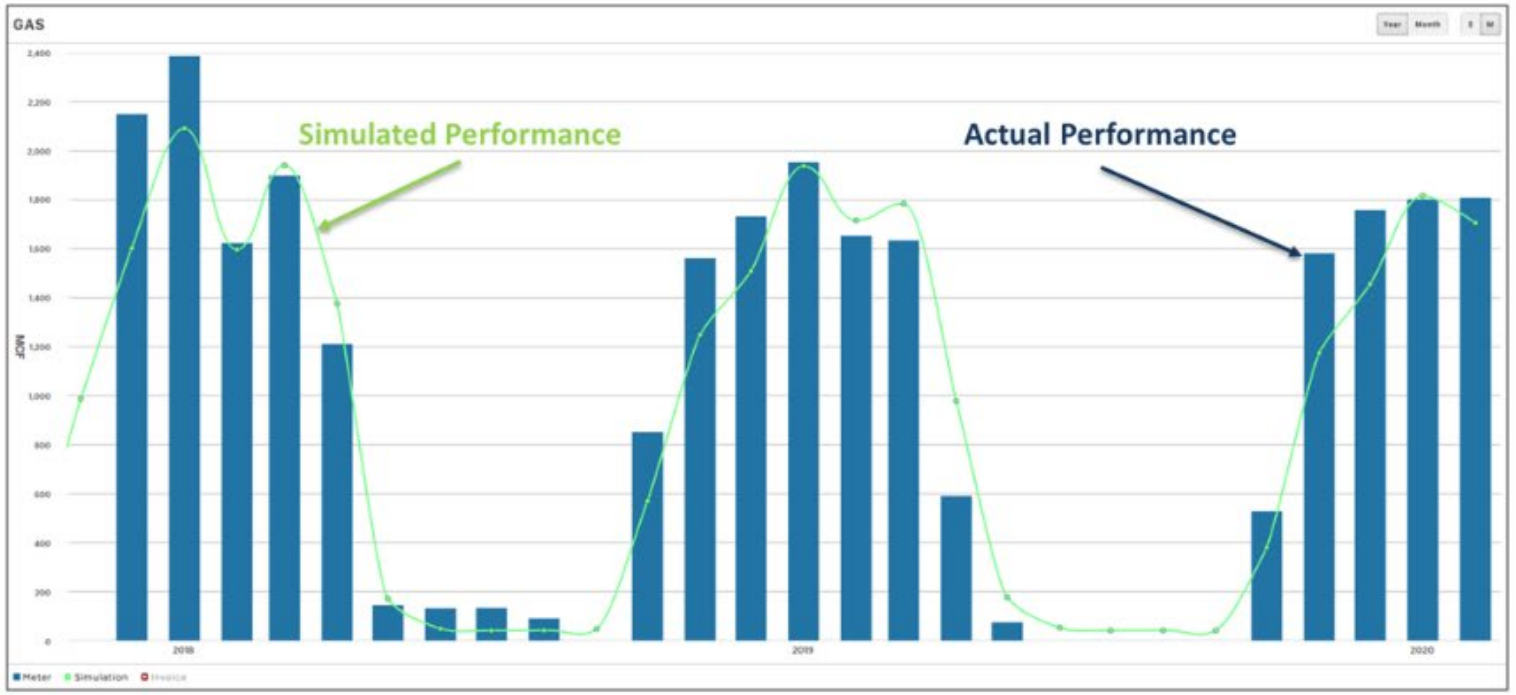
Performance

THE PROOF

Performance

THE PROOF

INTEGRATED DIGITAL TWIN



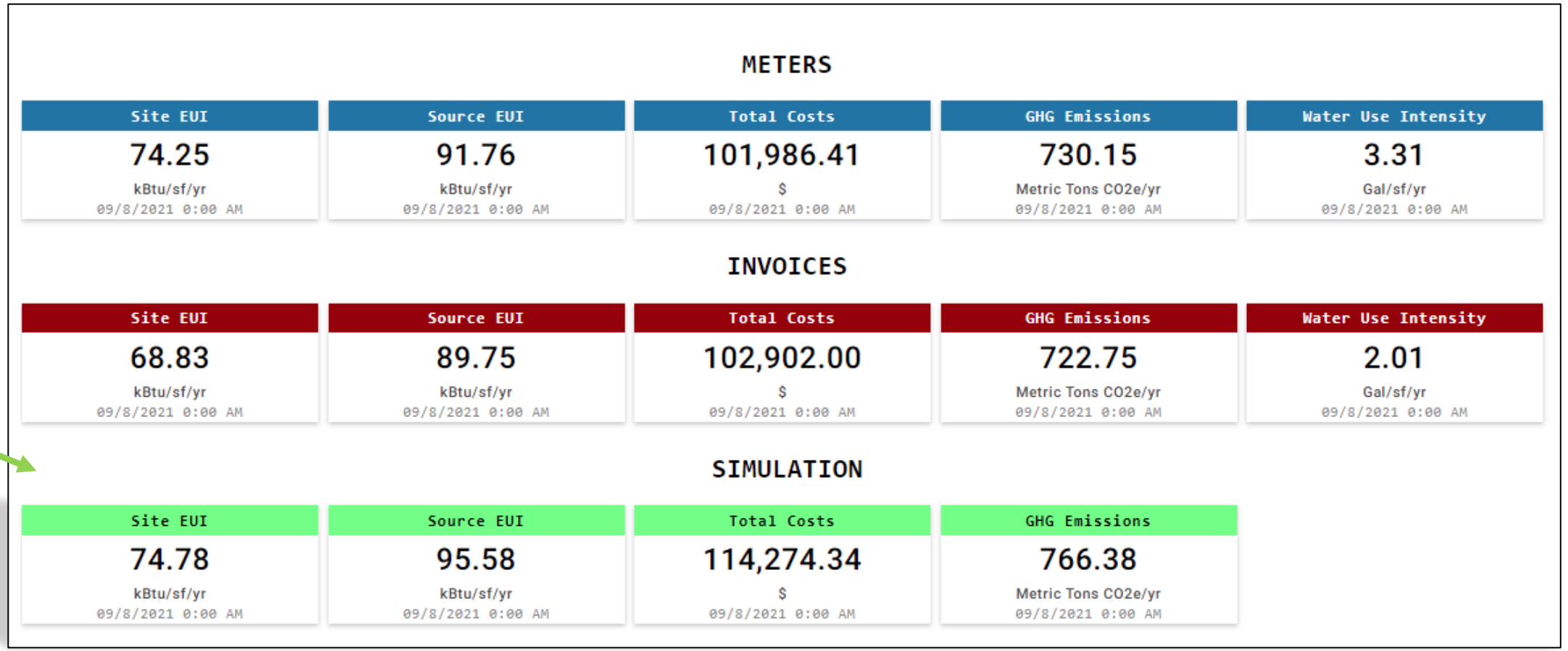
BUILD USE CASES TO CONNECT BUILDING GOALS TO BUILDING PERFORMANCE

PERFORMANCE

How building owners know they got what they paid for

Actual Performance

Simulated Performance



METERS

Site EUI	Source EUI	Total Costs	GHG Emissions	Water Use Intensity
74.25	91.76	101,986.41	730.15	3.31
kBtu/sf/yr	kBtu/sf/yr	$	Metric Tons CO2e/yr	Gal/sf/yr
09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM

INVOICES

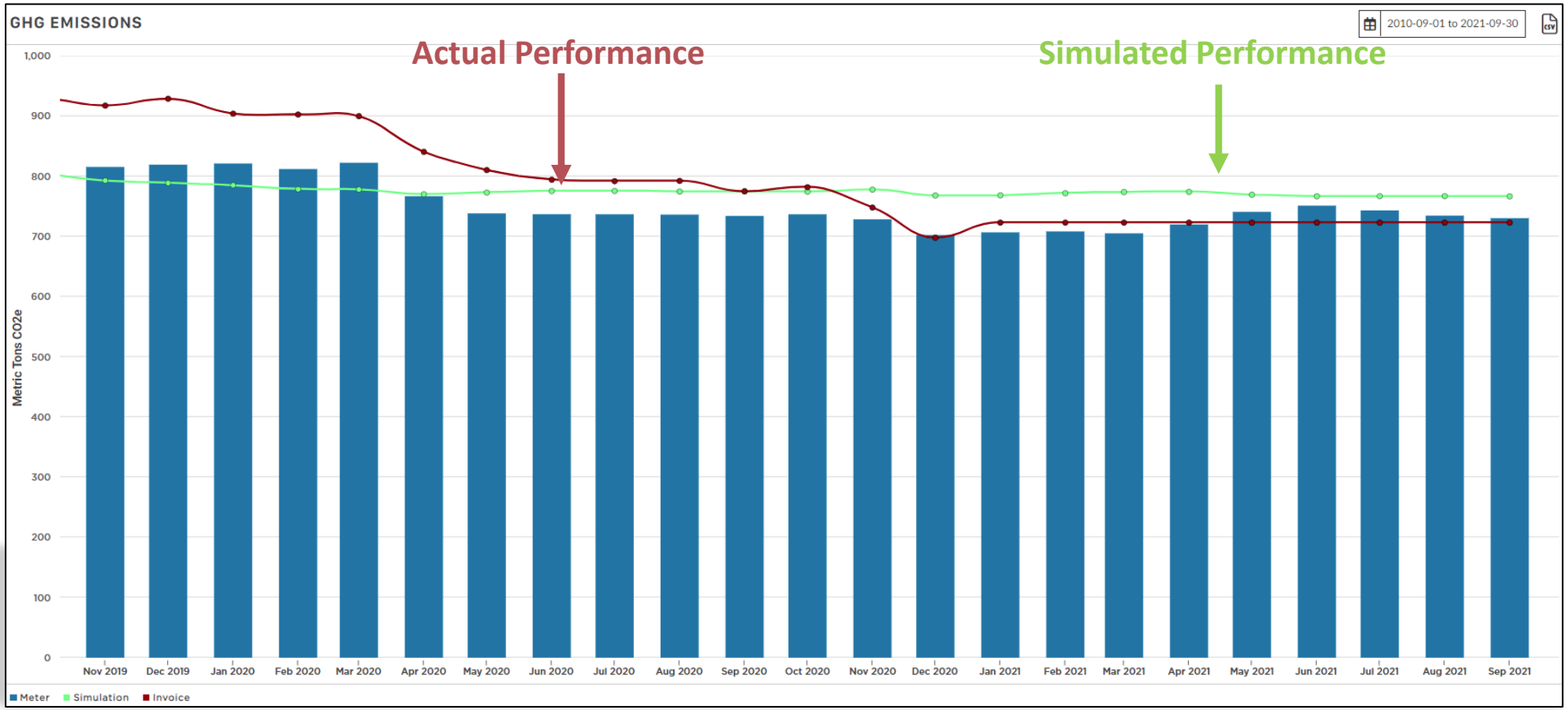
Site EUI	Source EUI	Total Costs	GHG Emissions	Water Use Intensity
68.83	89.75	102,902.00	722.75	2.01
kBtu/sf/yr	kBtu/sf/yr	$	Metric Tons CO2e/yr	Gal/sf/yr
09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM

SIMULATION

Site EUI	Source EUI	Total Costs	GHG Emissions
74.78	95.58	114,274.34	766.38
kBtu/sf/yr	kBtu/sf/yr	$	Metric Tons CO2e/yr
09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM	09/8/2021 0:00 AM

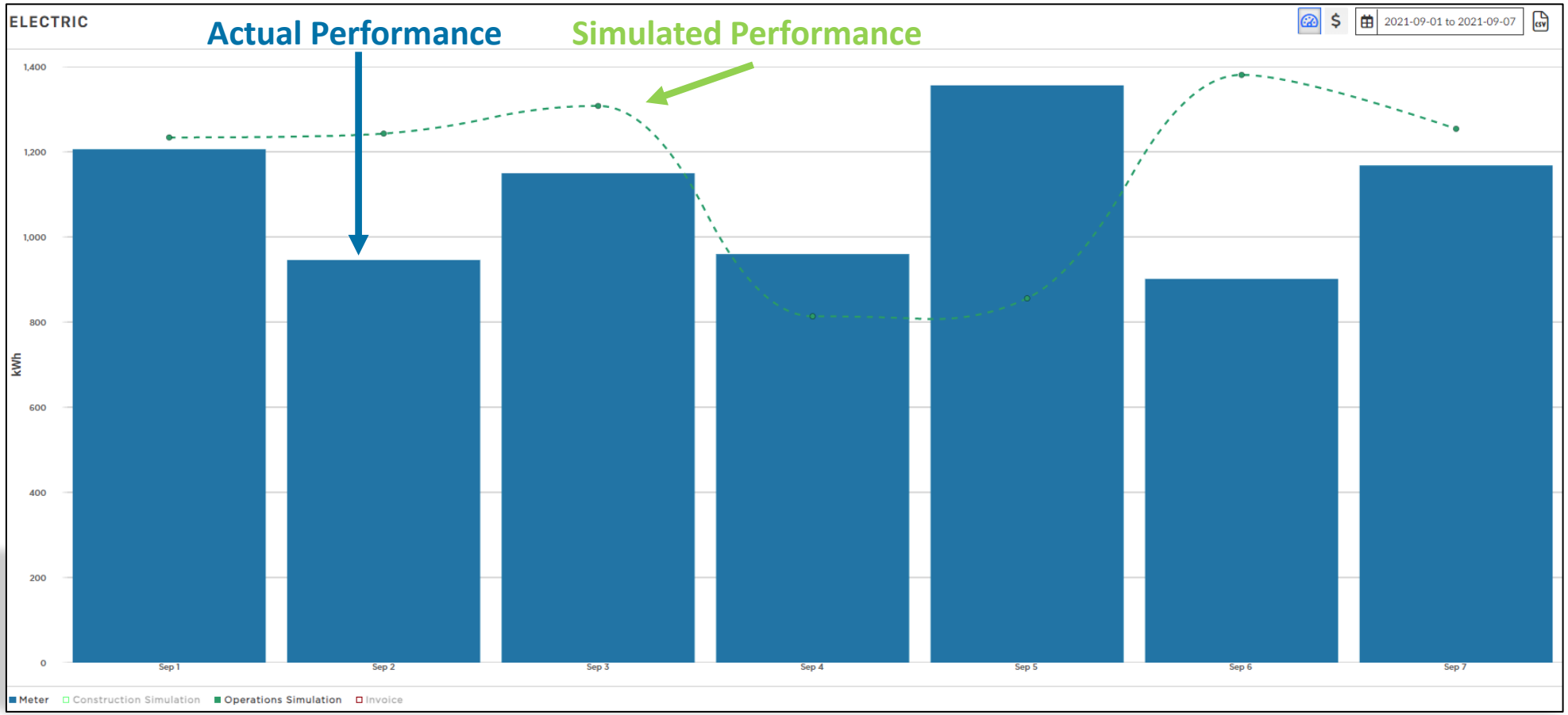
PERFORMANCE

How building owners know they got what they paid for



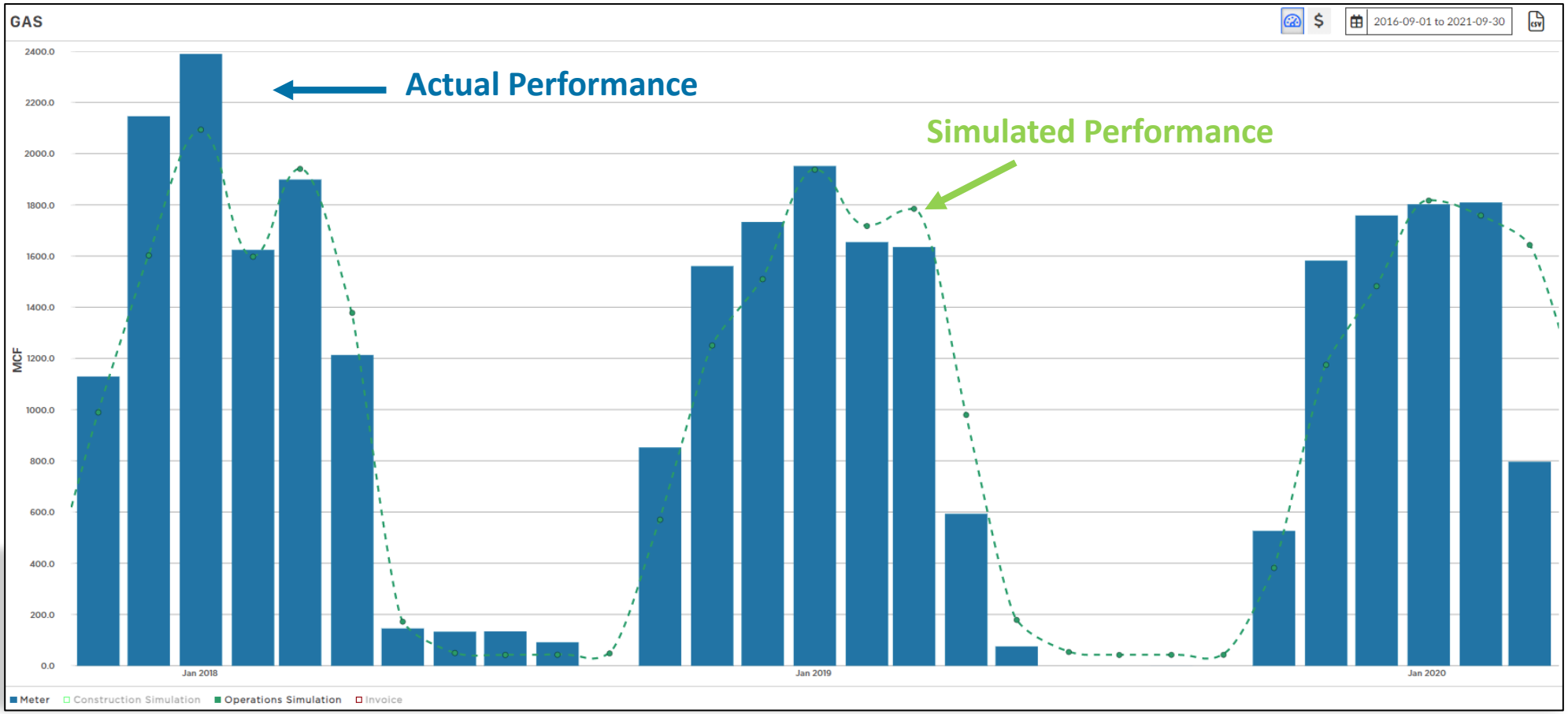
PERFORMANCE

How building owners know they got what they paid for



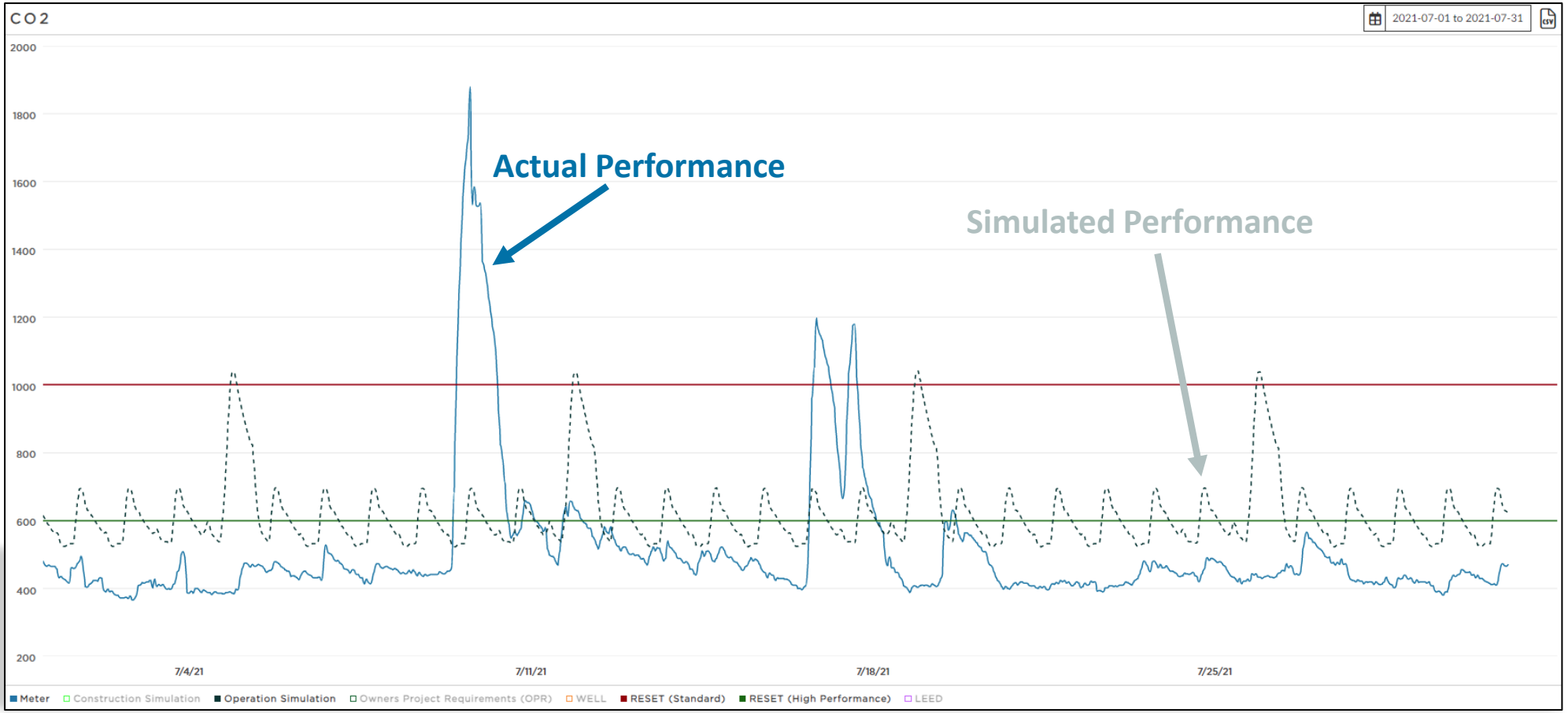
PERFORMANCE

How building owners know they got what they paid for



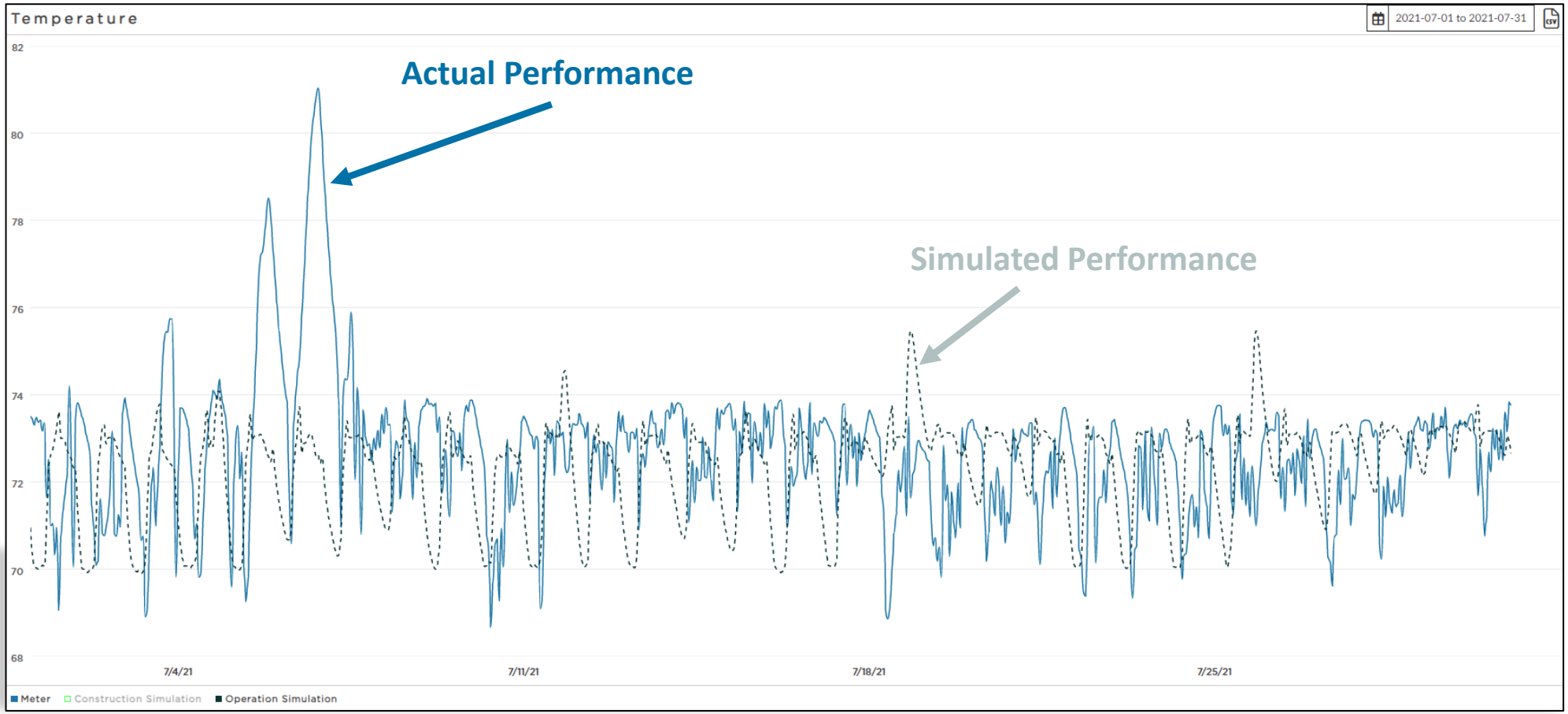
PERFORMANCE

How building owners know they got what they paid for



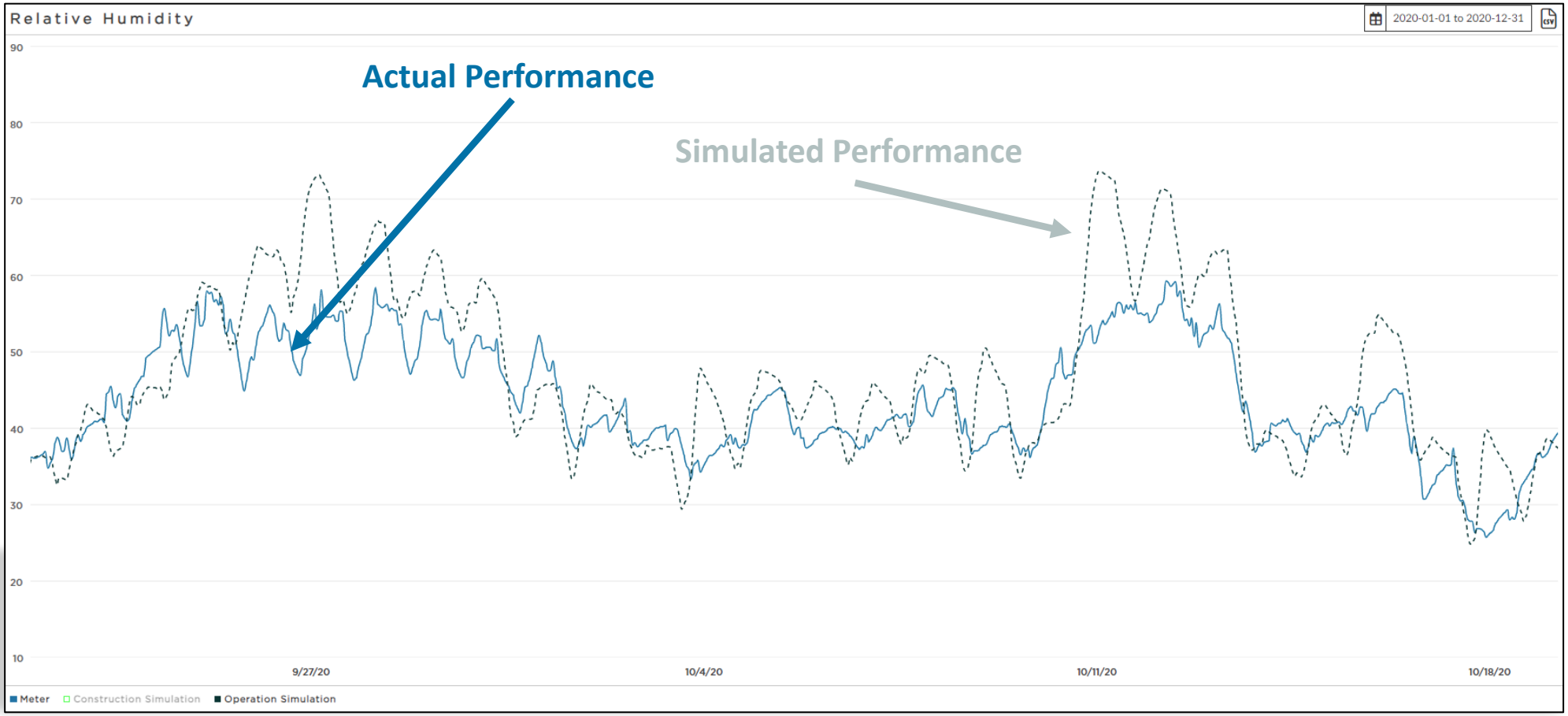
PERFORMANCE

How building owners know they got what they paid for



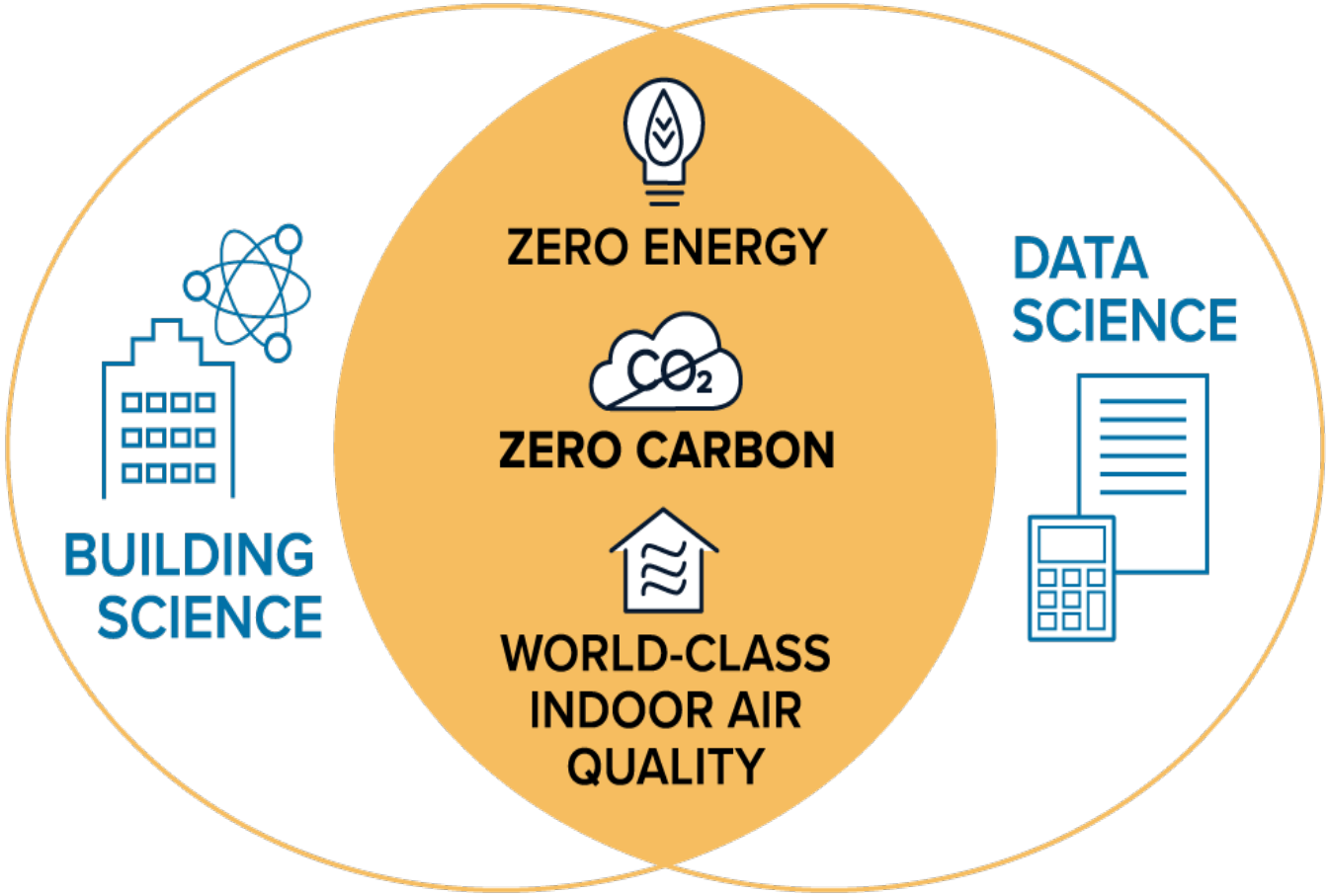
PERFORMANCE

How building owners know they got what they paid for



Resilience

BUILDING SCIENCE
MEETS
DATA SCIENCE



Q & A

CONTACT:

Craig Stevenson

412-506-6777

craig.stevenson@aurosgroup.com