

AVEVA PI WORLD



Merging Building Science and Data Science using the PI System

Presented By: Derrick Tillman and Craig Stevenson

AVEVA



Derrick Tillman

President & CEO

- Bridging the Gap Development, LLC
- Dtillman@btgdevelopment.net



Craig Stevenson

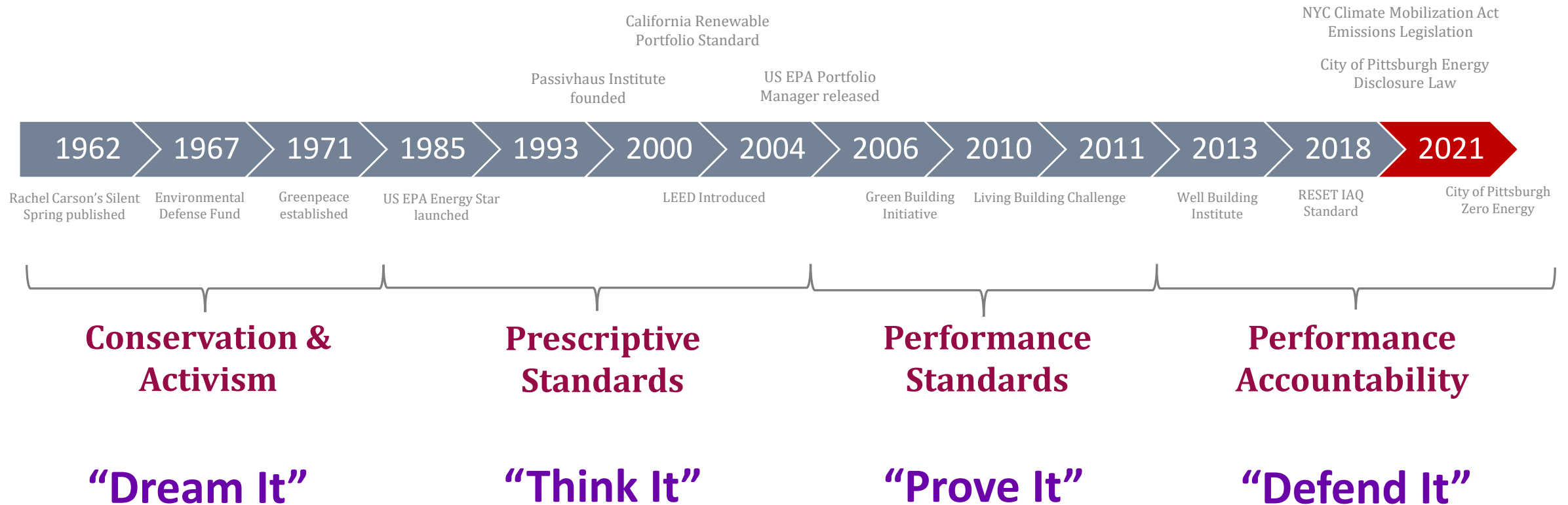
President

- AUROS Group
- Craig.Stevenson@aurosgroup.com



History of Sustainability

Owners, Developers and Funders are looking for proof.



Proof of results that matter

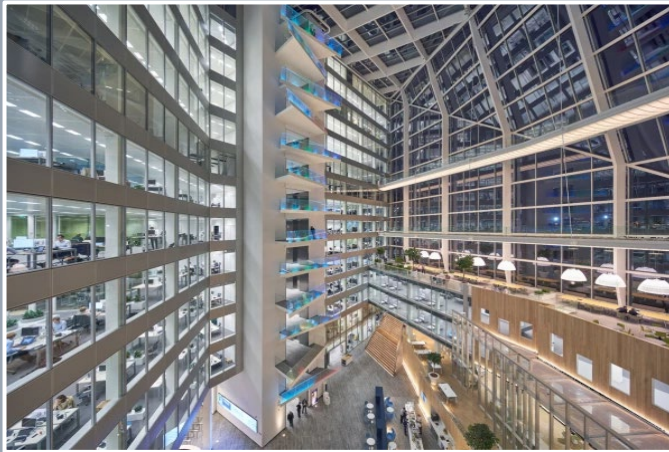


This is what matters most to me

Smart Buildings $\neq$ High-Performance Buildings

Smart Buildings

Connected IoT, transparent, digital, whole-building analytics



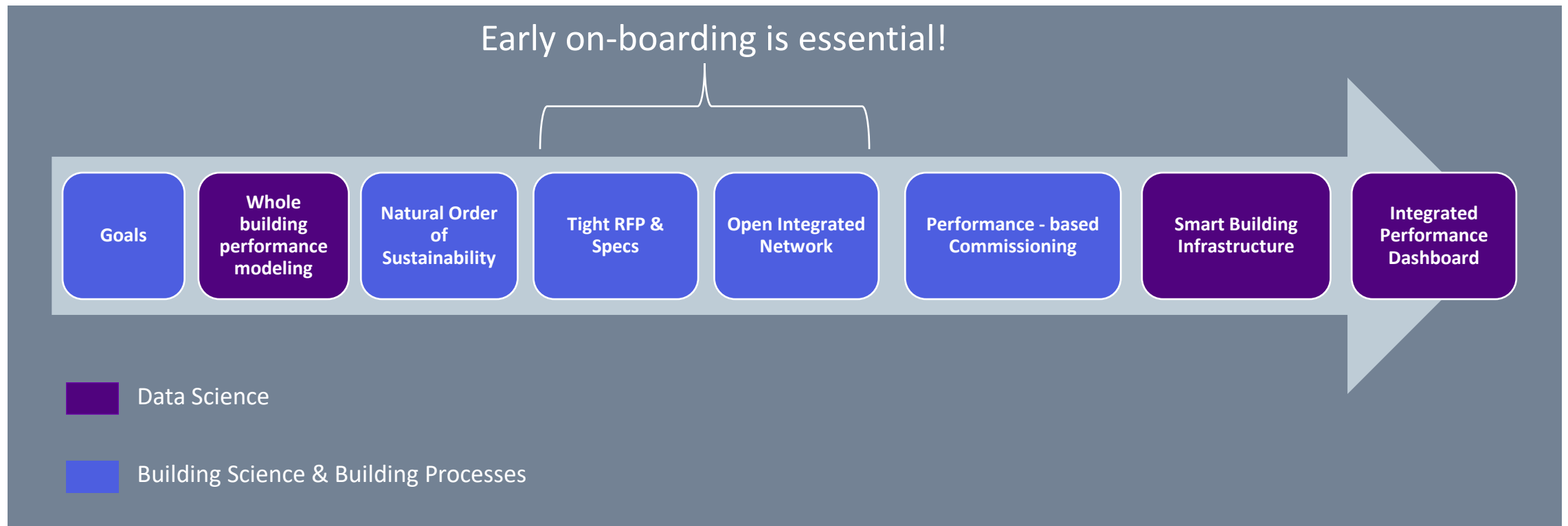
High-Performance Buildings

Low energy consumption, high indoor environmental quality

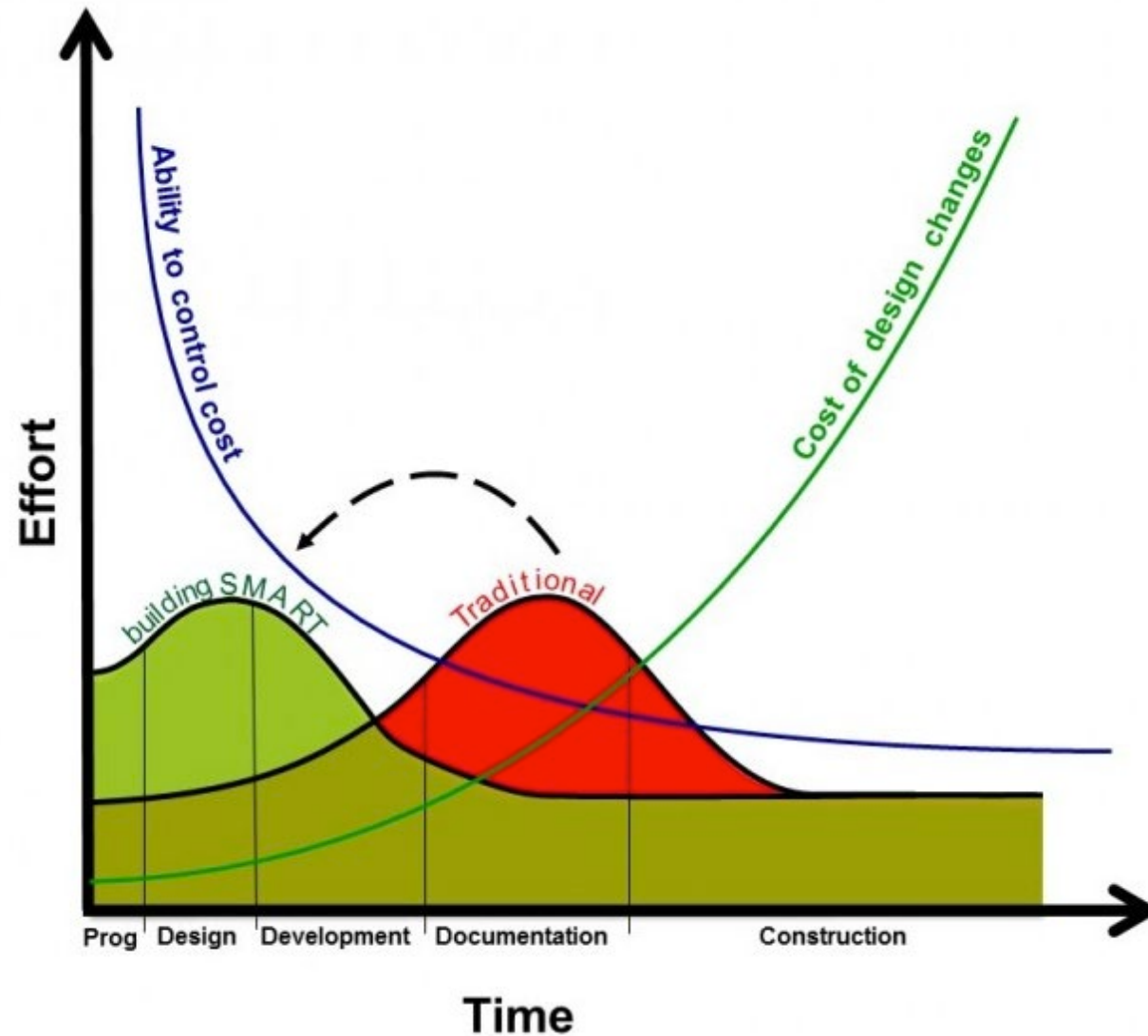


Cornell Tech—Courtesy of Handel Architecture & Steven Winter Associates

To integrate building science and data science



But it shouldn't cost more to get it



Fifth & Dinwiddie

Pittsburgh, Pennsylvania



MULTI-USE, COMMERCIAL BUILDING



171-UNIT MULTIFAMILY W/ RETAIL

**Passive House
Certification
(PHI)**

**Fitwel
Certification**

**RESET Air
Certification**

**Smart Building
Infrastructure**

**Offsite
Construction**

AVEVA

Owner's Project Requirements



Building Performance Categories

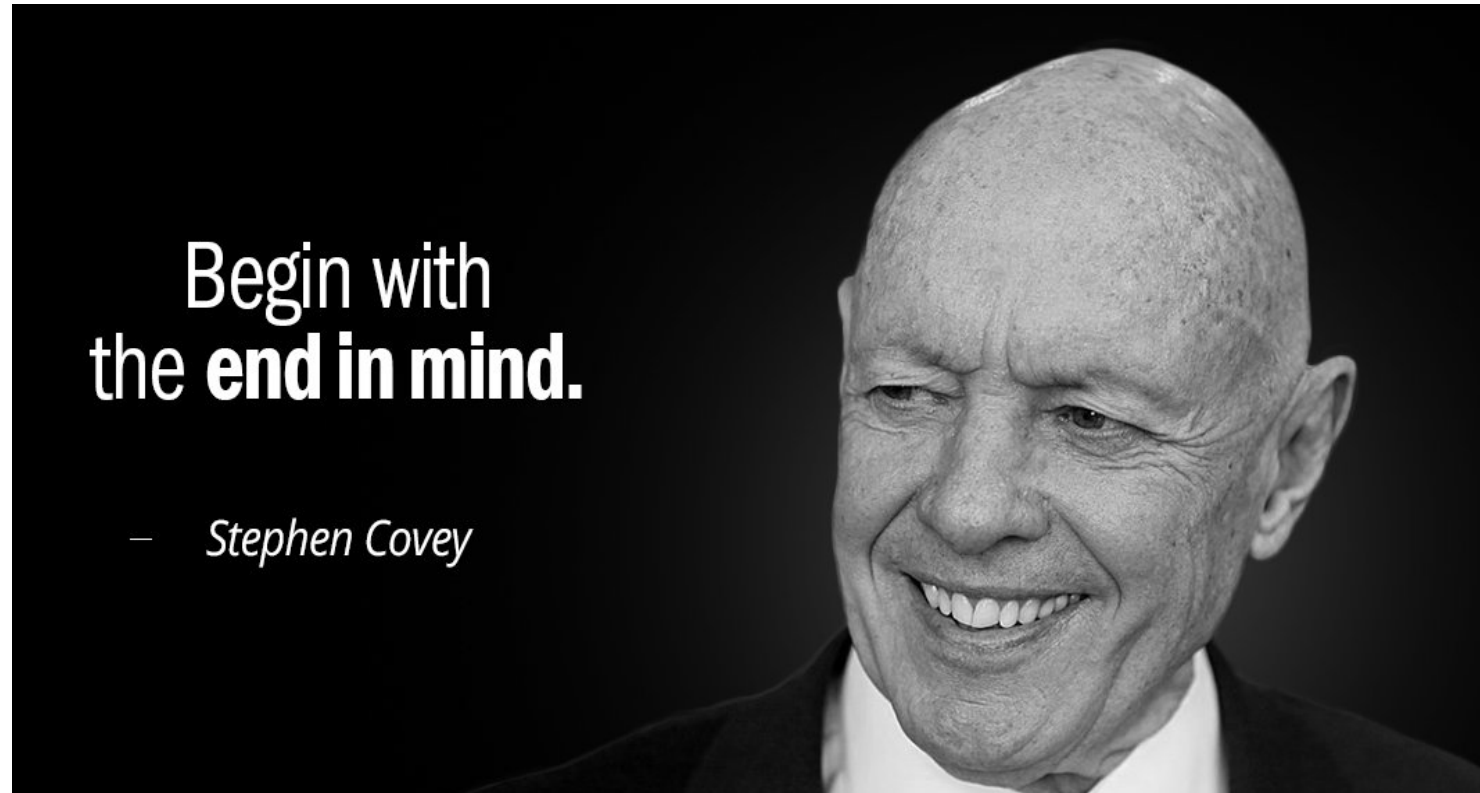
- Sustainability Program Goals
- Measurement & Verification
- Community
- Energy
- Indoor Air Quality
- Indoor Environmental Quality
- Landscaping
- Materials
- Operations & Maintenance
- Waste
- Water
- Transportation

Any building can be high-performing

A building's potential is found by merging the digital and real worlds.

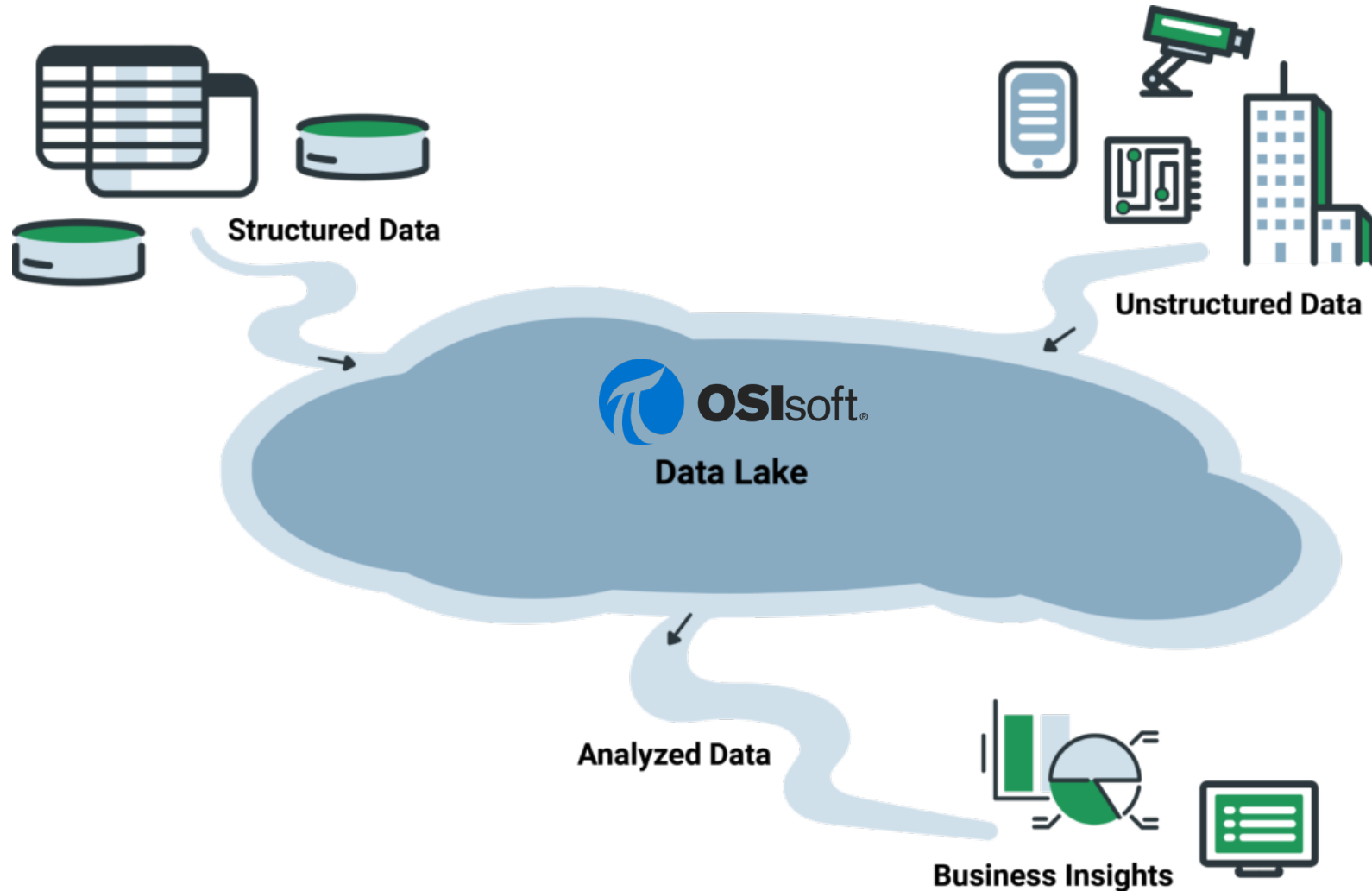


How do we reach evidence-based performance?



OSIsoft PI System is the Missing Link

The “proof” lies in liberating a building’s performance data

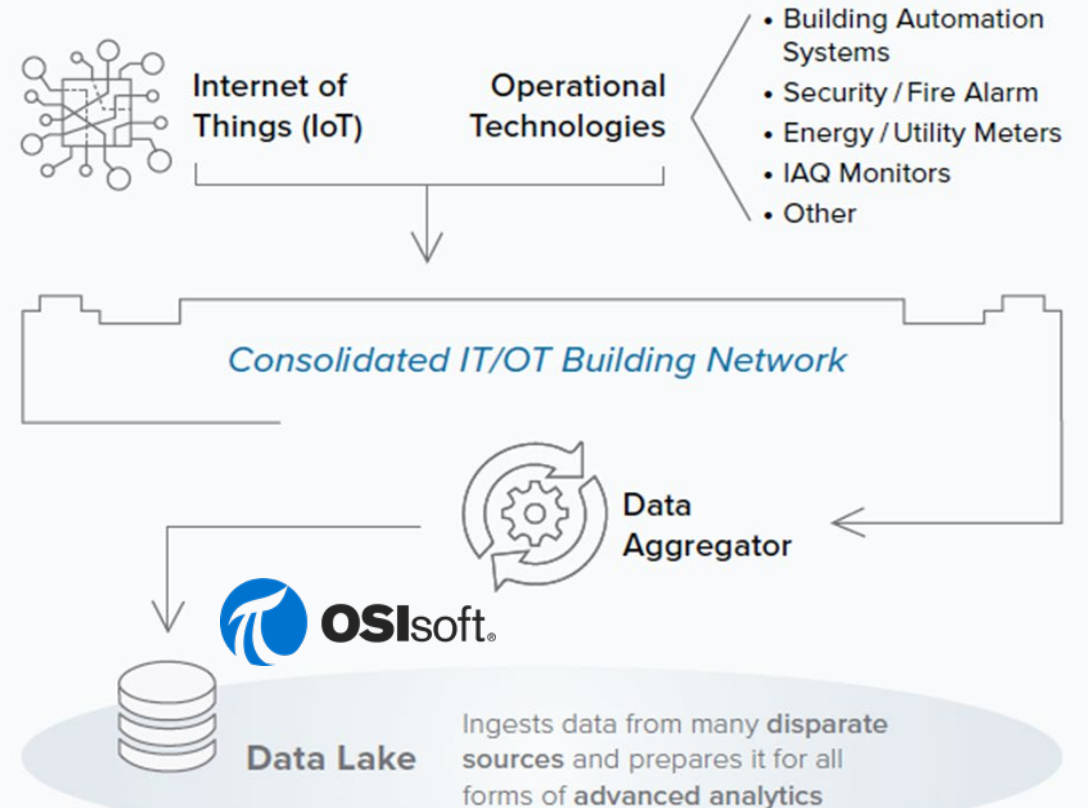


Funders require proof

Proof requires
liberation of all data

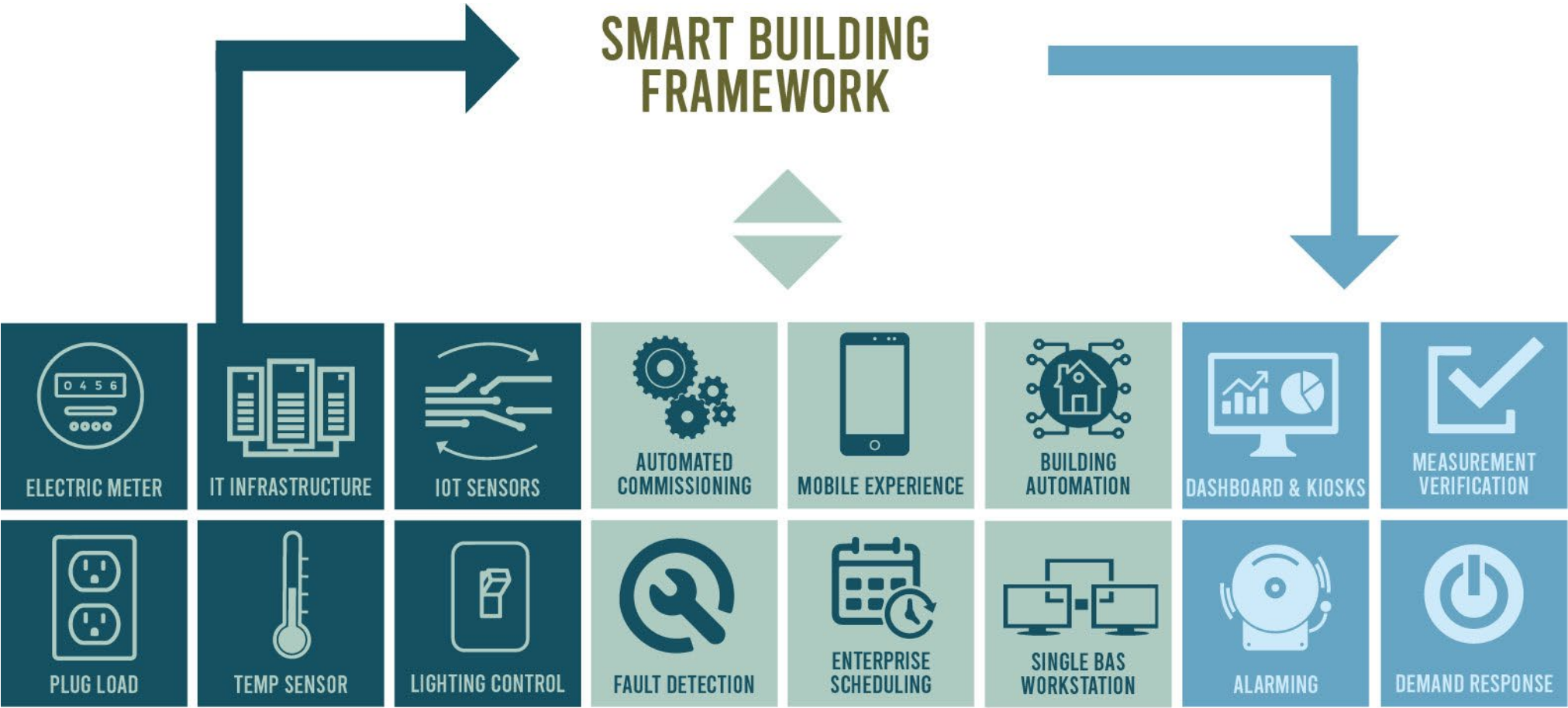
LIBERATING YOUR BUILDING DATA

Gain control over building performance data



Now you own your data

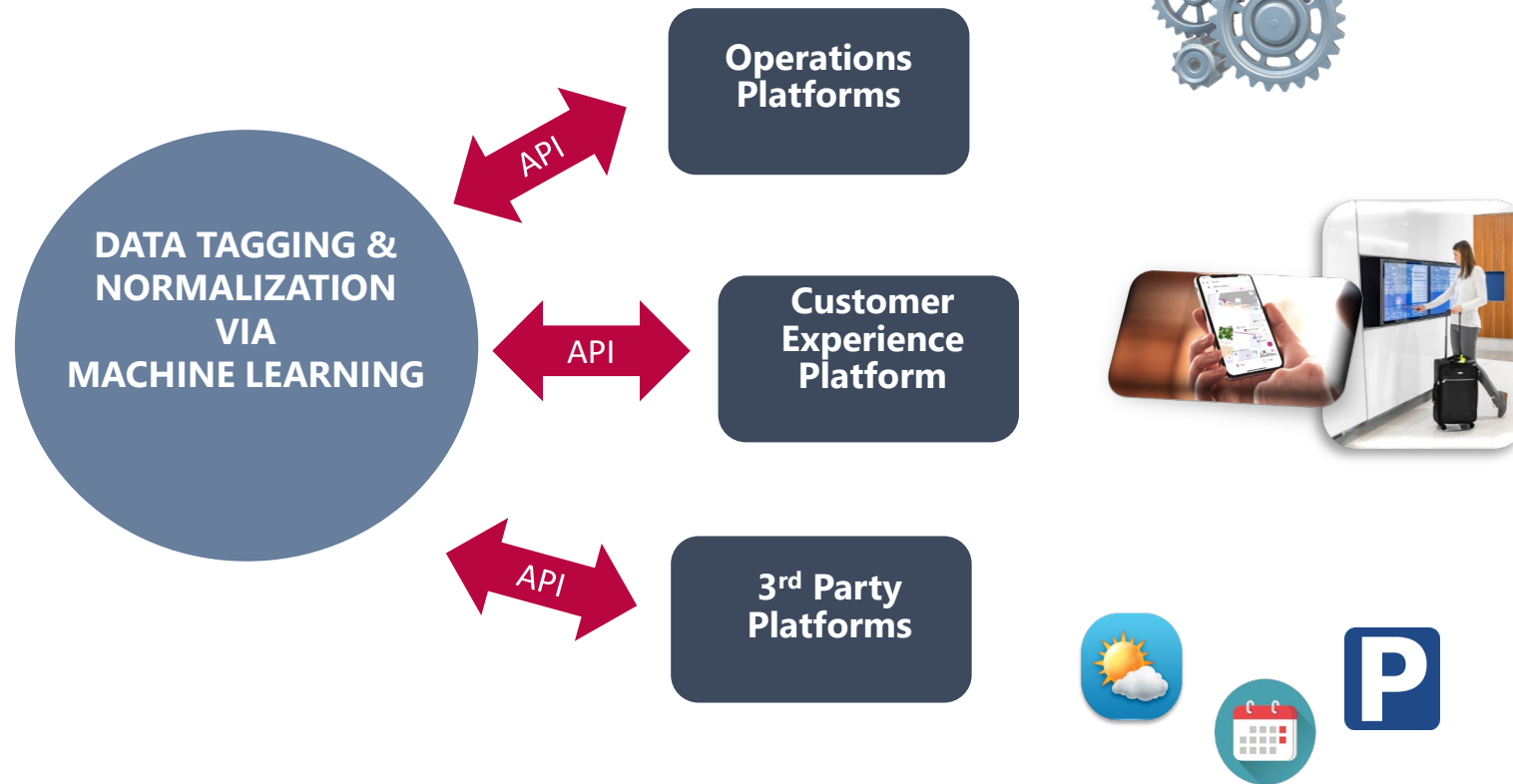
Smart Building Framework



Source: Newcomb & Boyd

Building Systems

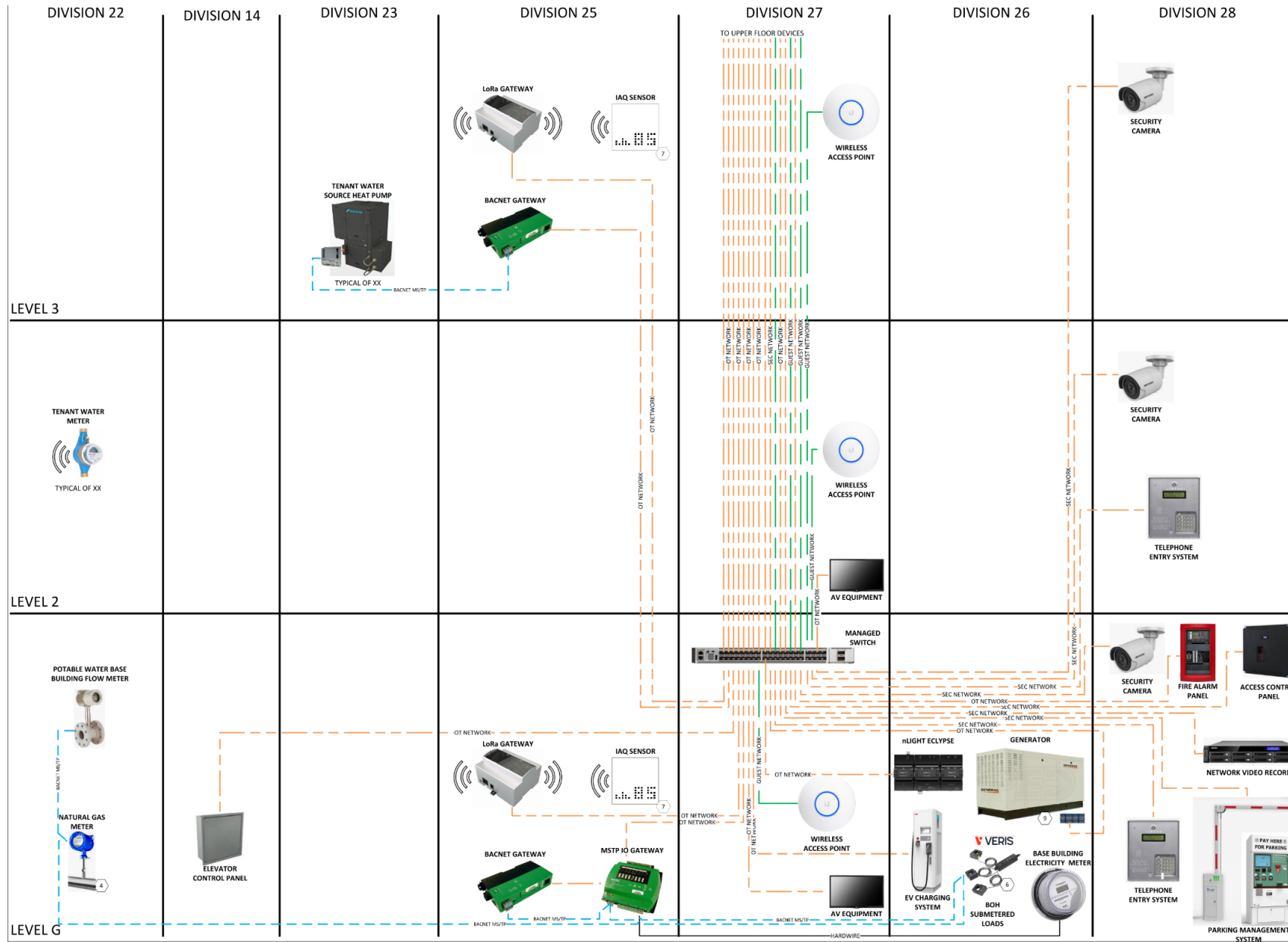
Operational Technology Networks



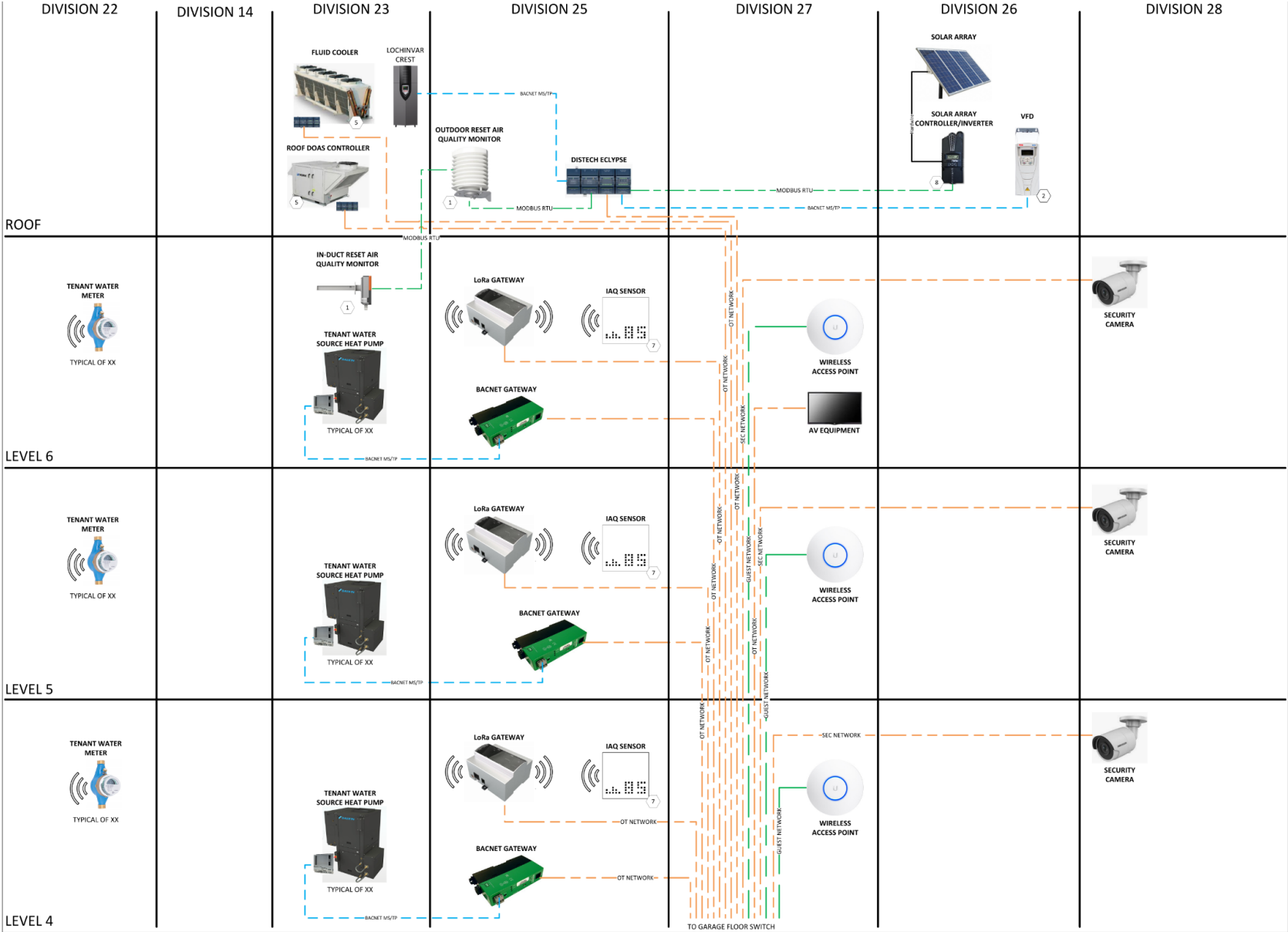
Source: Newcomb & Boyd

- ❑ ICT Platform
- ❑ Controllers
- ❑ Sensors
- ❑ Actuators
- ❑ Surveillance
- ❑ Elevators
- ❑ Lighting

Operational Technology Networks



Operational Technology Networks



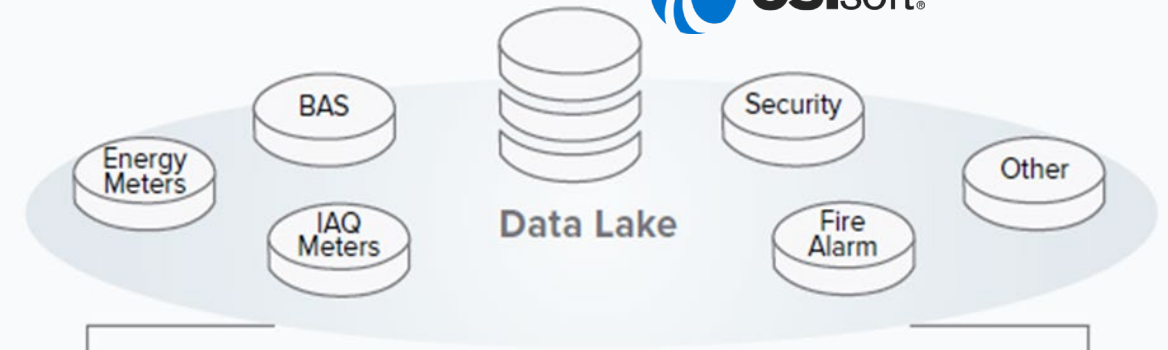
Source: Newcomb & Boyd

The Missing Link

Once liberated, data needs to be unified to deliver outcomes

THE MISSING LINK

A data lake brings disparate data into a common data platform



The biggest problems with proprietary operational technology systems (new and legacy):



Historical
data
retention

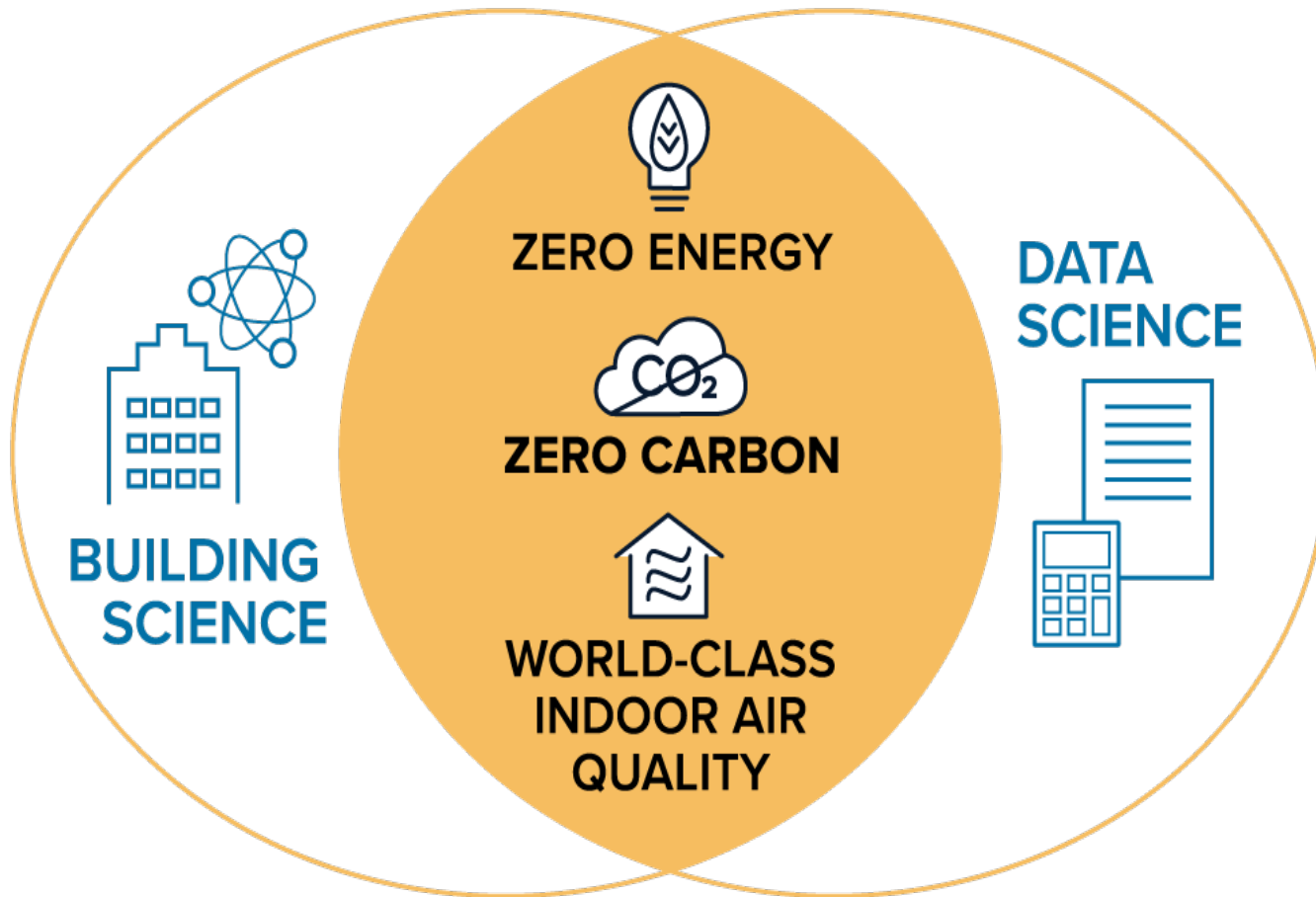


Speed of
real-time
data retrieval



Contemporary
cyber-security
expectations

No Regrets Moves



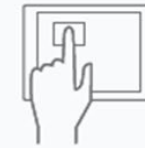
- Use Owners Project Requirements to set metrics-based goals
- Demand open-integrated operational technologies
- The easiest use cases to prove performance are energy consumption and indoor air quality (target these first)

Control and direct your data

With data control and transparency, the options are limitless

CONTROL & DIRECT YOUR DATA!

Effective data management enables automated delivery of data to destinations based on priorities



Active Building Performance Management

- Data Transparency
- Owner Control



Automated Data Transfer

- Internal & External Stakeholders



Simulation as a Superpower

- Integrated Building Simulation using Physics-based Sustainability Modeling



Only with control over data is it possible to **prioritize investments based on expected costs and benefits**



Simulation is our Superpower

This is how building owners know they got what they paid for

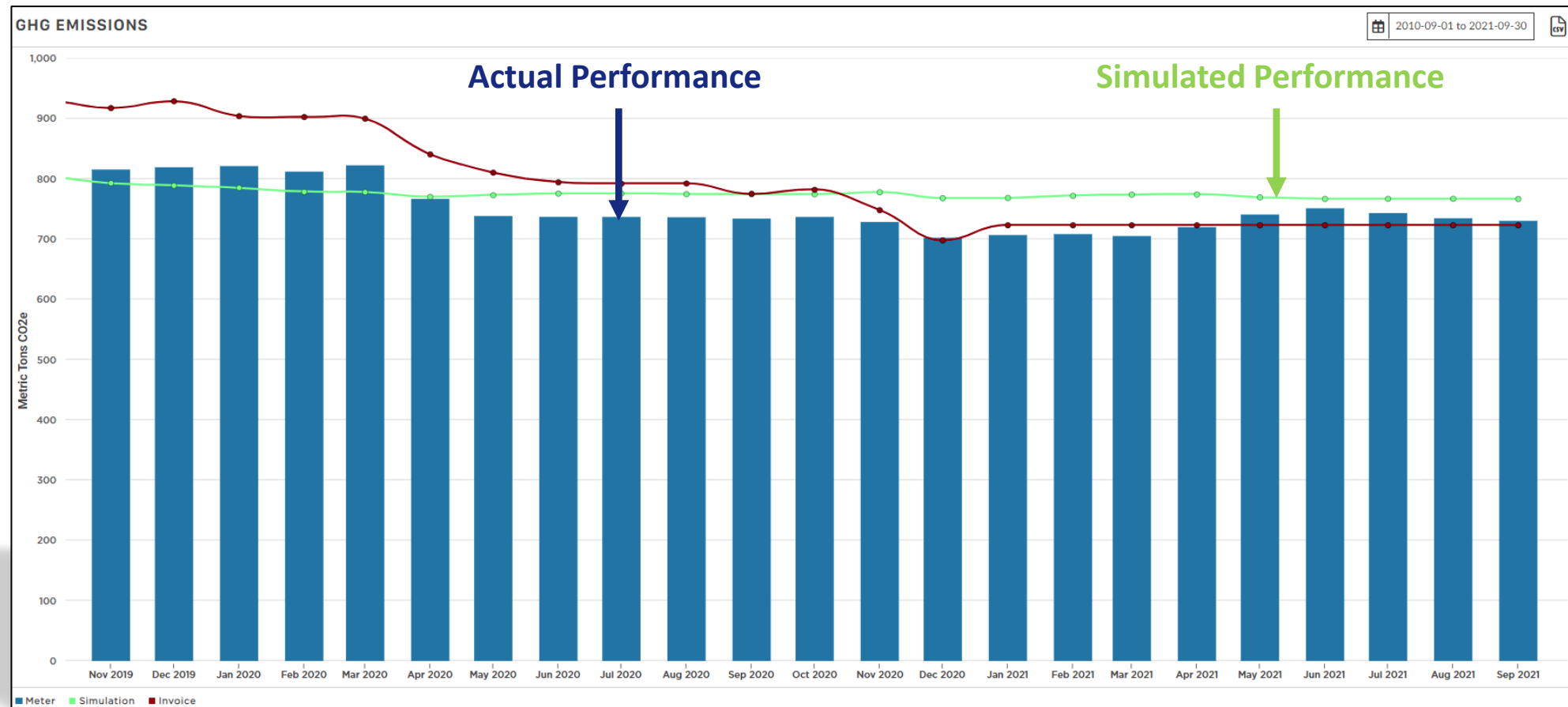
METERS				
Site EUI 74.25 kBtu/sf/yr 09/8/2021 0:00 AM	Source EUI 91.76 kBtu/sf/yr 09/8/2021 0:00 AM	Total Costs 101,986.41 \$ 09/8/2021 0:00 AM	GHG Emissions 730.15 Metric Tons CO2e/yr 09/8/2021 0:00 AM	Water Use Intensity 3.31 Gal/sf/yr 09/8/2021 0:00 AM
INVOICES				
Site EUI 68.83 kBtu/sf/yr 09/8/2021 0:00 AM	Source EUI 89.75 kBtu/sf/yr 09/8/2021 0:00 AM	Total Costs 102,902.00 \$ 09/8/2021 0:00 AM	GHG Emissions 722.75 Metric Tons CO2e/yr 09/8/2021 0:00 AM	Water Use Intensity 2.01 Gal/sf/yr 09/8/2021 0:00 AM
SIMULATION				
Site EUI 74.78 kBtu/sf/yr 09/8/2021 0:00 AM	Source EUI 95.58 kBtu/sf/yr 09/8/2021 0:00 AM	Total Costs 114,274.34 \$ 09/8/2021 0:00 AM	GHG Emissions 766.38 Metric Tons CO2e/yr 09/8/2021 0:00 AM	

Actual Performance

Simulated Performance

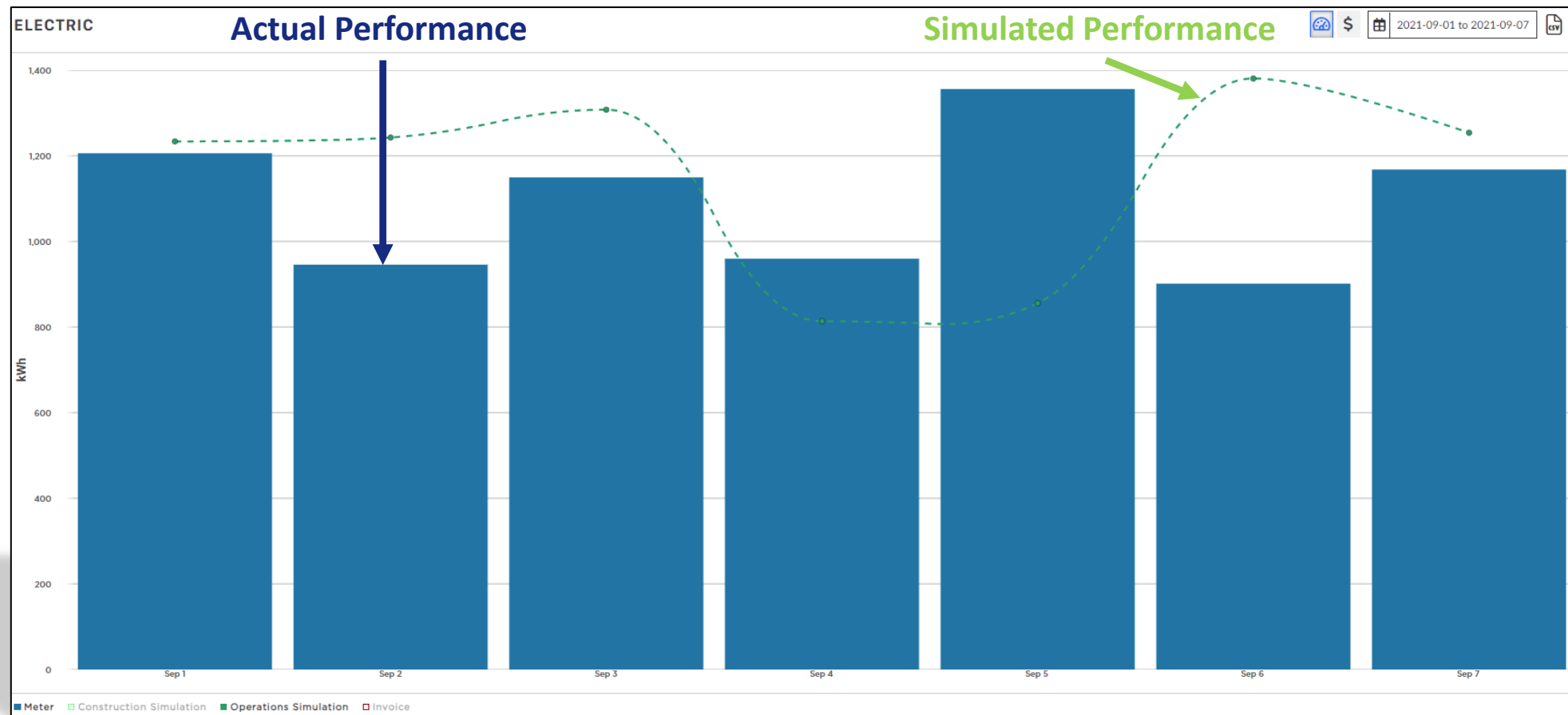
Simulation is our Superpower

This is how building owners know they got what they paid for



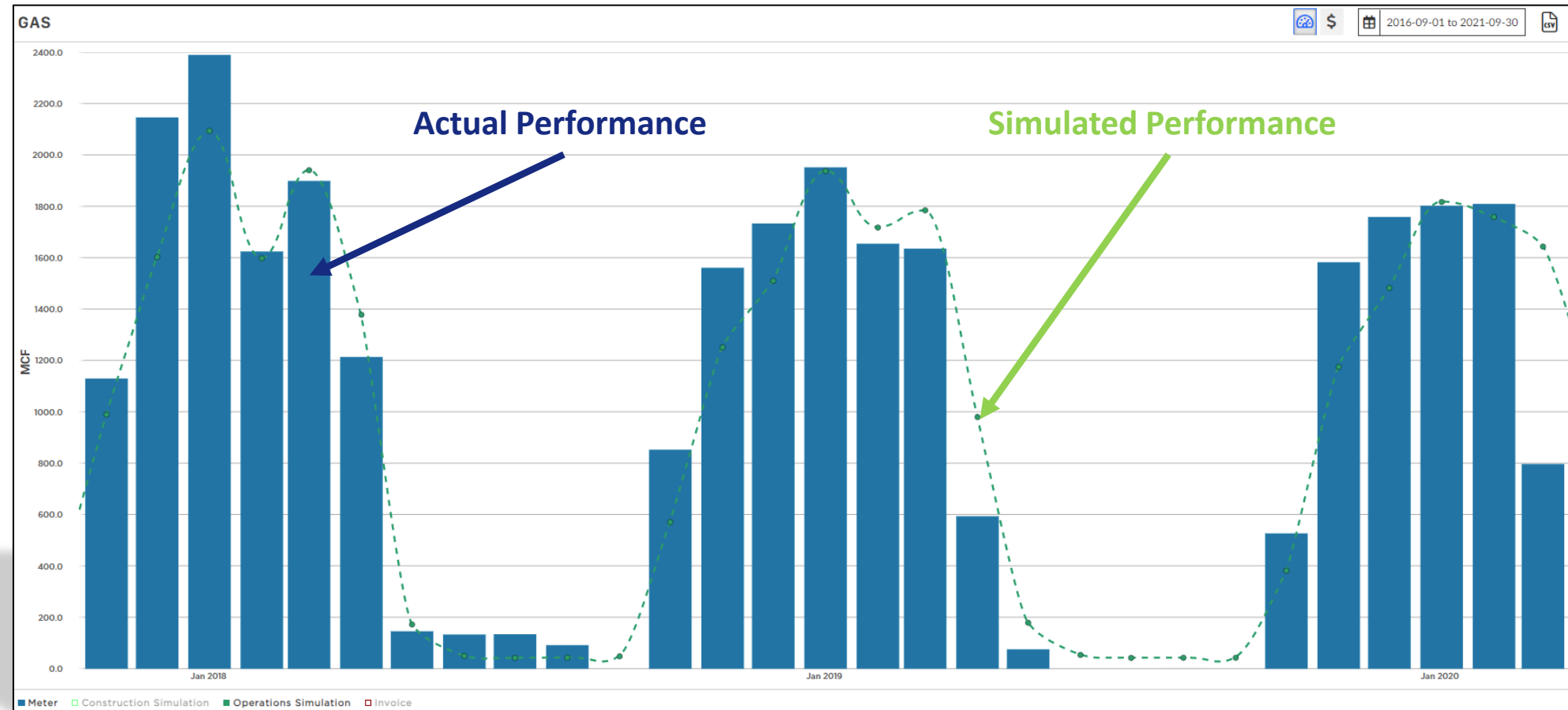
Simulation is our Superpower

This is how building owners know they got what they paid for



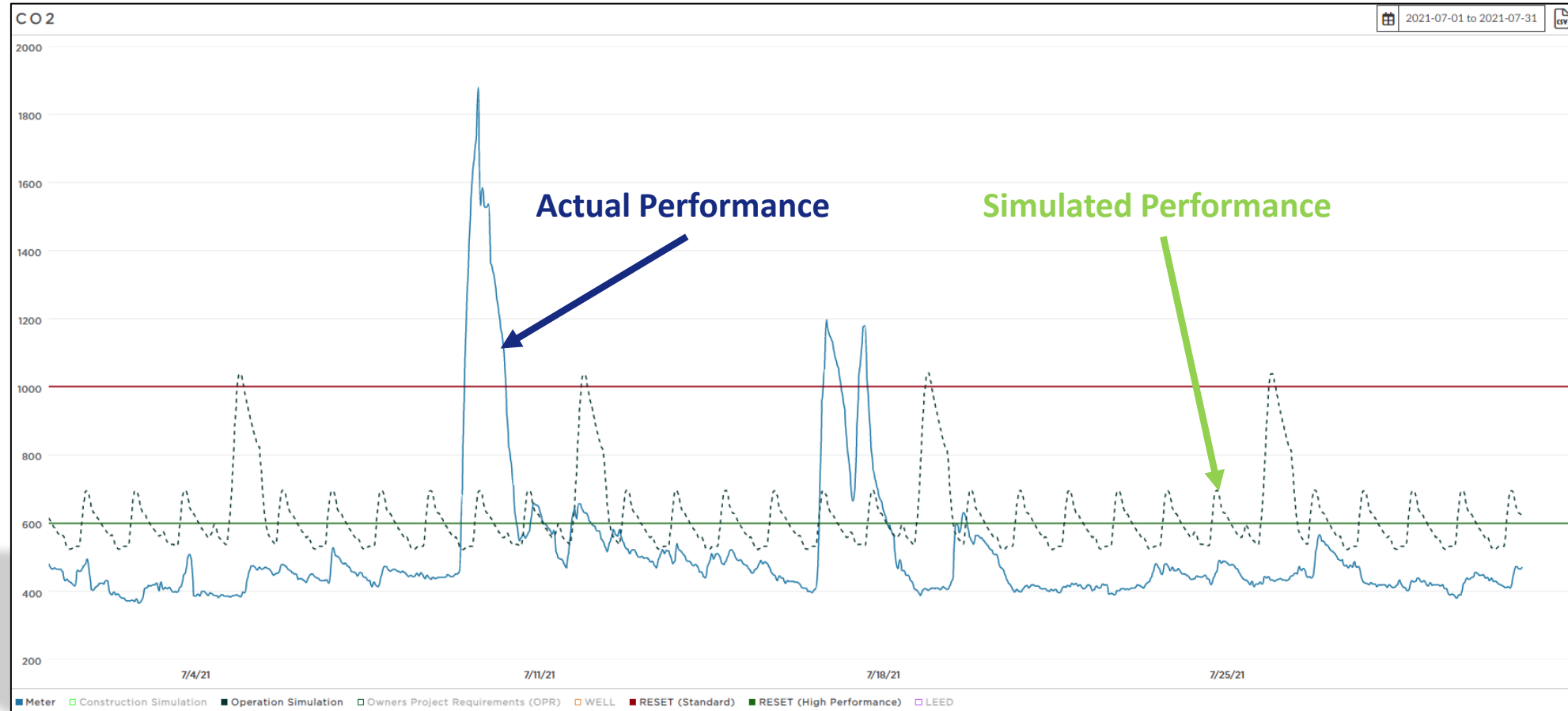
Simulation is our Superpower

This is how building owners know they got what they paid for



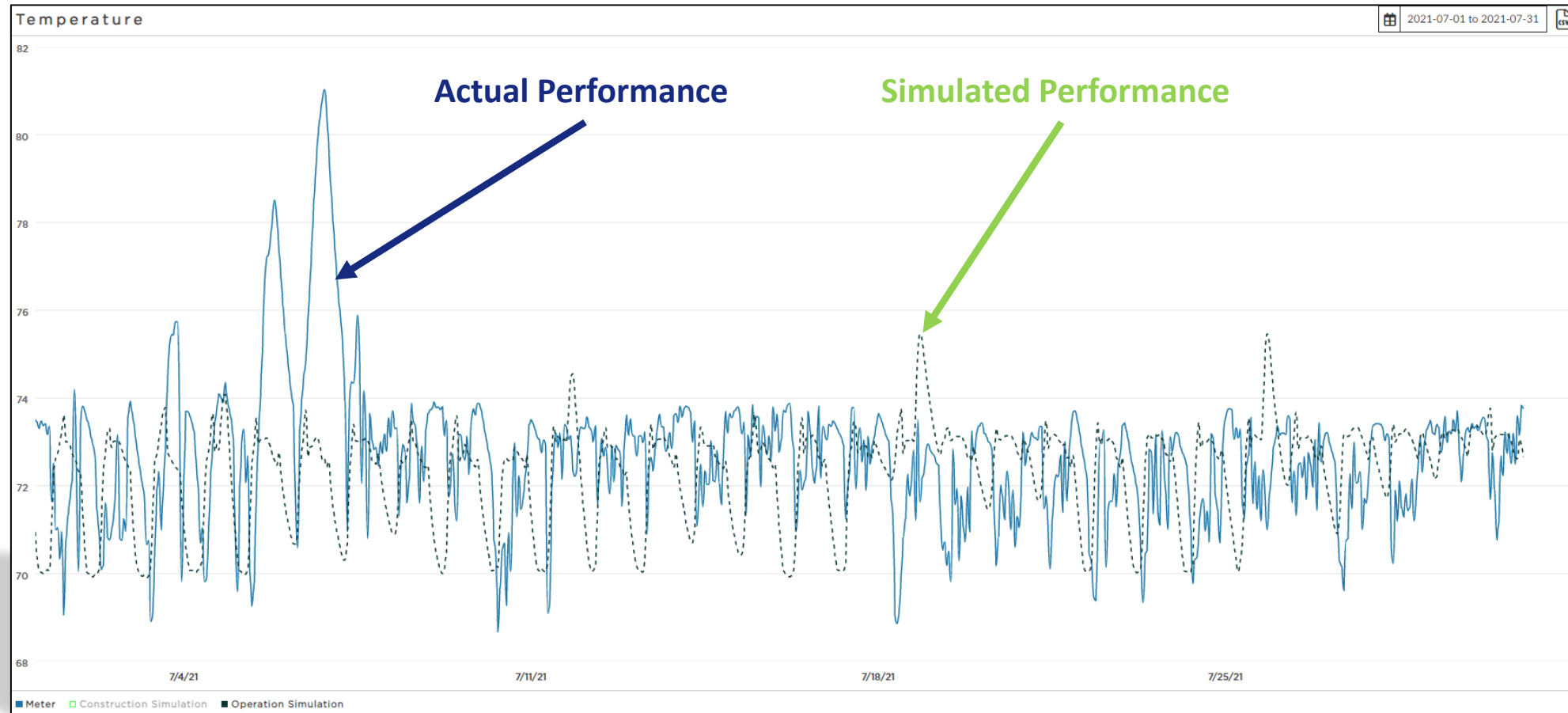
Simulation is our Superpower

This is how building owners know they got what they paid for



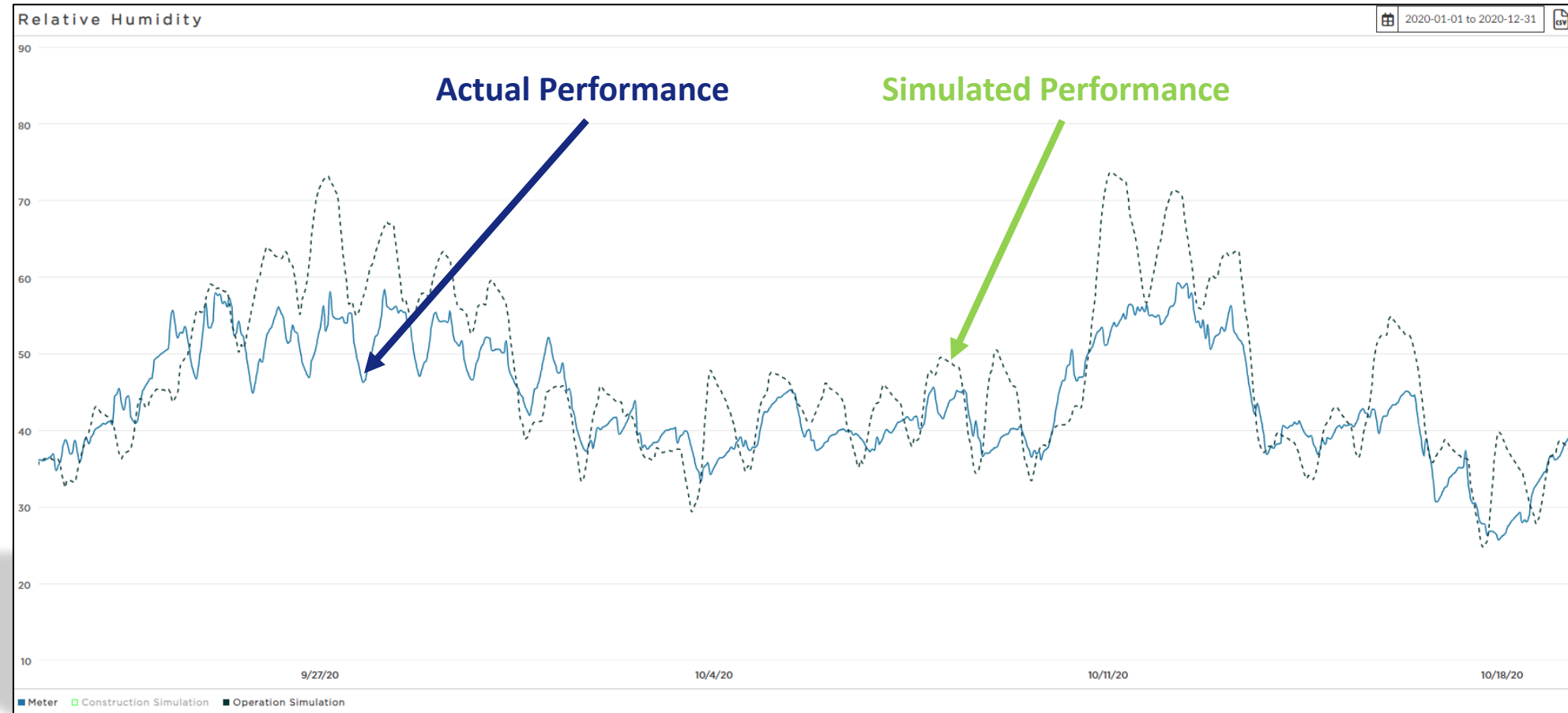
Simulation is our Superpower

This is how building owners know they got what they paid for



Simulation is our Superpower

This is how building owners know they got what they paid for





Derrick Tillman

President & CEO

- Bridging the Gap Development, LLC
- Dtillman@btgdevelopment.net



Thank You!



Craig Stevenson

President

- AUROS Group
- Craig.Stevenson@aurosgroup.com



AVEVA