ACHIEVING ENERGY EFFICIENCY IN YOUR FACILITIES

Manufacturers Alliance Webinar

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OBJECTIVES

1. Understand how to more effectively manage the environmental impact of your buildings

2. Discuss how to scale improvements from one building to your entire portfolios

3. Learn how to overcome potential financial restraints through unique project funding options

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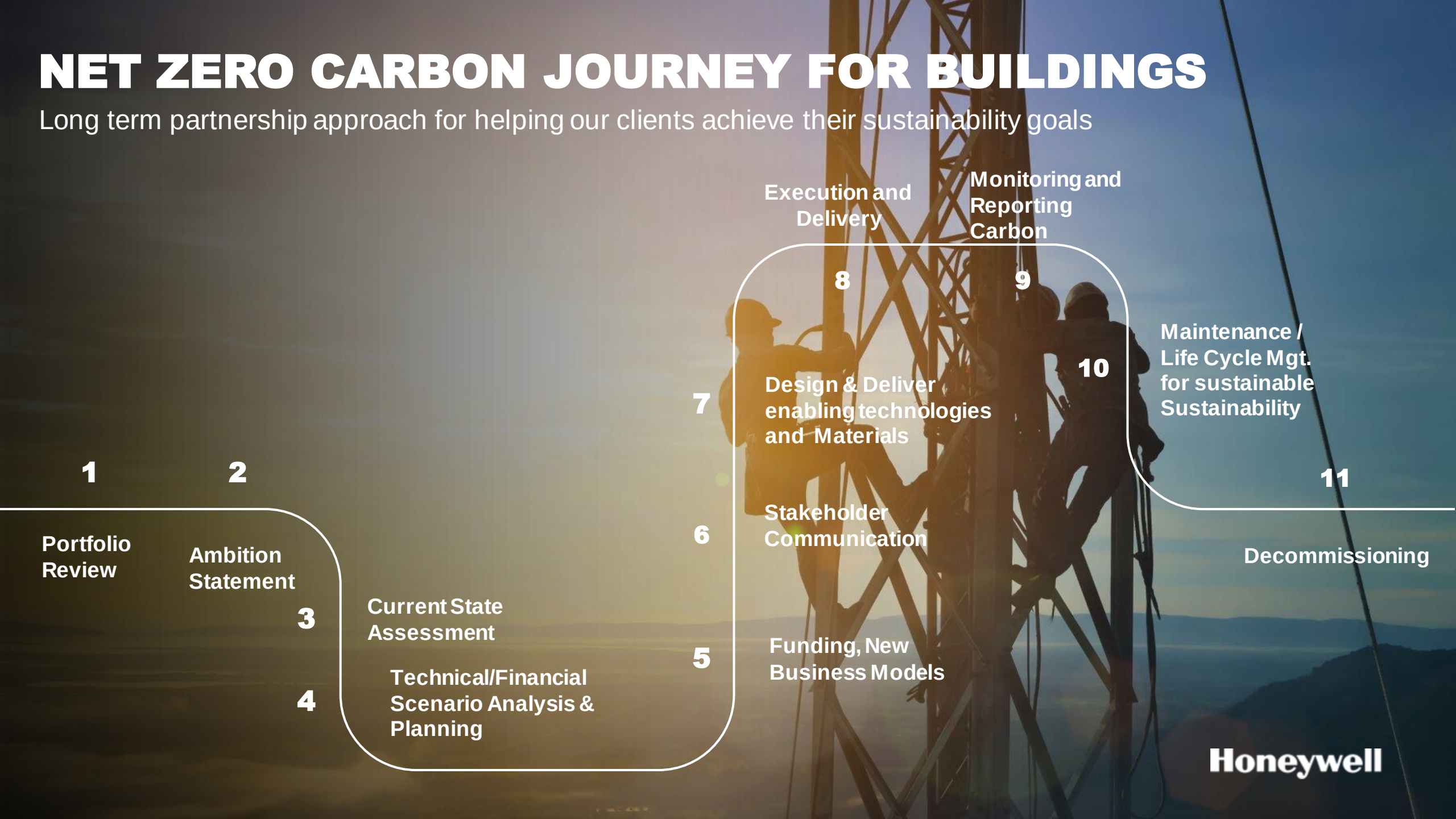
NET ZERO CARBON JOURNEY FOR BUILDINGS

Long term partnership approach for helping our clients achieve their sustainability goals



1 Portfolio Review

2 Ambition Statement

3 Current State Assessment

4 Technical/Financial Scenario Analysis & Planning

5 Funding, New Business Models

6 Stakeholder Communication

7 Design & Deliver enabling technologies and Materials

8 Execution and Delivery

9 Monitoring and Reporting Carbon

10 Maintenance / Life Cycle Mgt. for sustainable Sustainability

11 Decommissioning

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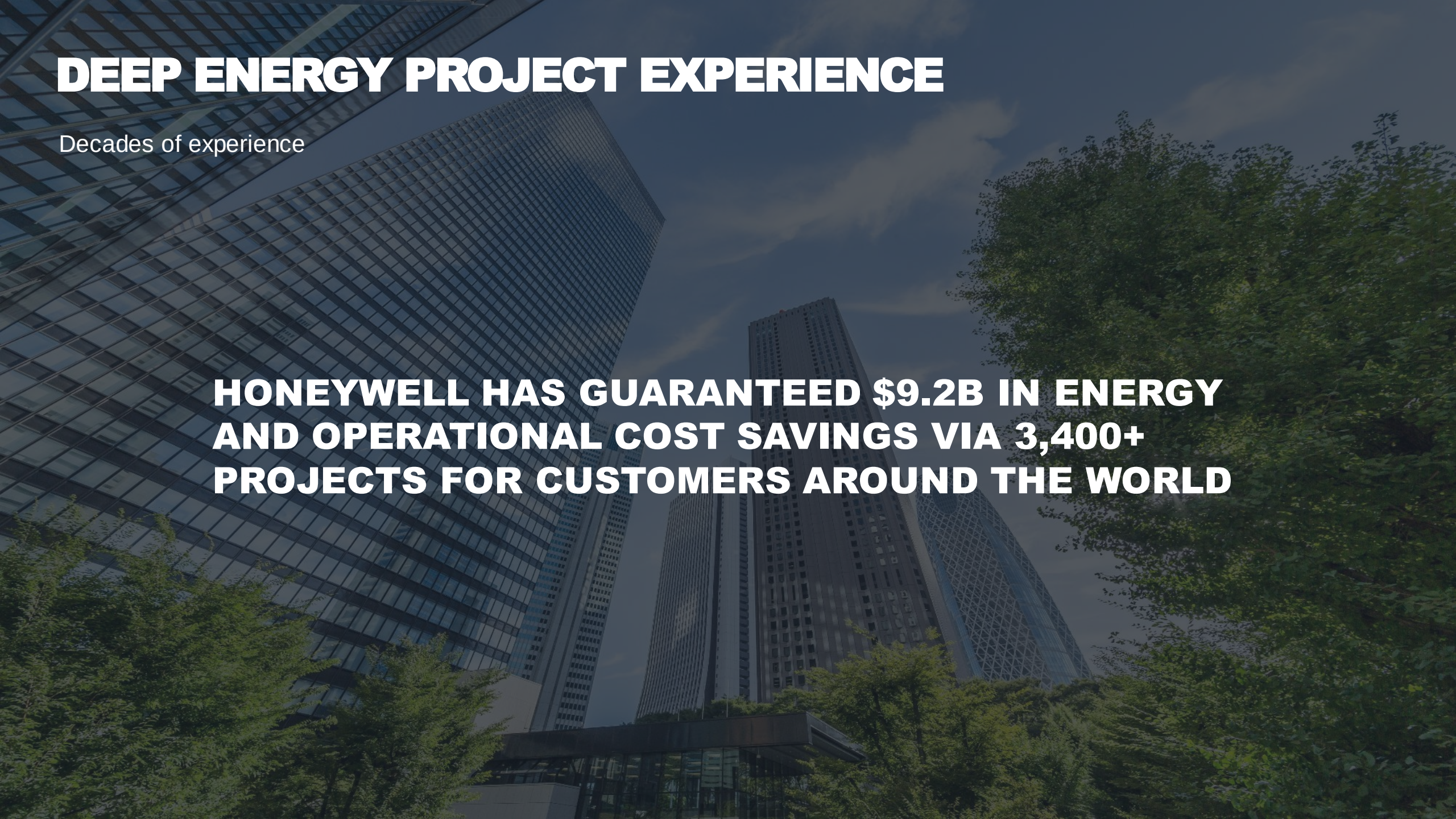
DEEP ENERGY PROJECT EXPERIENCE

Decades of experience



HONEYWELL HAS GUARANTEED $9.2B IN ENERGY AND OPERATIONAL COST SAVINGS VIA 3,400+ PROJECTS FOR CUSTOMERS AROUND THE WORLD

MEGA TRENDS IN SUSTAINABILITY

1 | CARBON IMPACT OF BUILDINGS

Current building energy use is threatening the roadmap to achieve UN goals, putting greater emphasis on **energy and carbon reduction**

2 | ELECTRIFICIATION OF EVERYTHING

From the switch to electrified power sources to the greater adoption of EVs, buildings need to **reduce emissions and manage operational resilience**

3 | NEW REGULATIONS AND COMMITMENTS

Countries and companies are committing to sustainability goals and unprecedented funding creating a greater need for **reporting compliance**.

4 | UNPRECENDENTED CLIMATE EVENTS

Climate-fueled disasters cost $165B in the United States in 2022, increasing the need for communities to **update infrastructure and create resilience**.

37%

of energy and process-related CO2 emissions globally were generated by buildings and construction in 2021[1]

34%

of energy demand globally were generated by buildings and construction in 2021[1]

140

countries covering 90% of emissions have carbon reduction goals[2]

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Sources:
1. United Nations Environment Programme (UNEP), 2022 Global Status Report for Buildings and Construction, Nov 09, 2022 [Accessed Feb 9, 2023]
2. Climate Action Tracker, CAT net zero target evaluations, Nov 2022 [Accessed Feb 9, 2023]

SUSTAINABILITY GOALS AND THE CURRENT ENVIRONMENT

MAKING YOUR COMMITMENT MATTER

BEYOND DATA, INSIGHTS
How can I convert data to actionable insights?

PRIORITIES
What's next after completing low complexity projects that show good ROI?

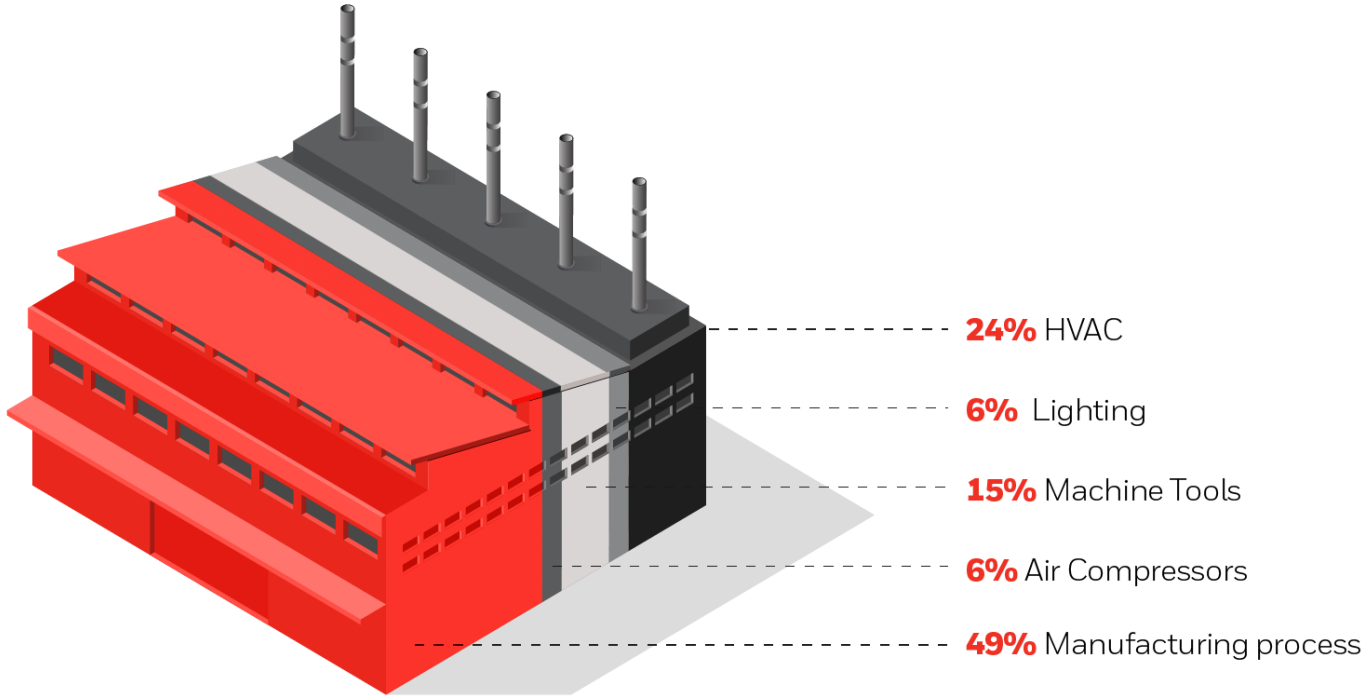
OPERATIONAL IMPACT
How do I reduce the environmental impact of my building portfolio without disrupting my organization's operations?

AGILITY & SCALABILITY
How can I easily scale improvements from an asset, building, or portfolio-level to demonstrate impact on my sustainability goals?

ACCRETIVE ENERGY EFFICIENCY
STEP 1: UNDERSTAND YOUR ASSETS

ASSETS | CONTROL | OPTIMIZATION

WHAT MIX OF ASSET UPGRADES WOULD MAXIMIZE THE ENERGY EFFICIENCY OF YOUR PORTFOLIO?



Source: Energy Star, Advanced Energy Uses 50001 Ready to Help Manufacturing Plant Achieve ISO 50001 Certification, Sept 15, 2019, Accessed September 21 2023

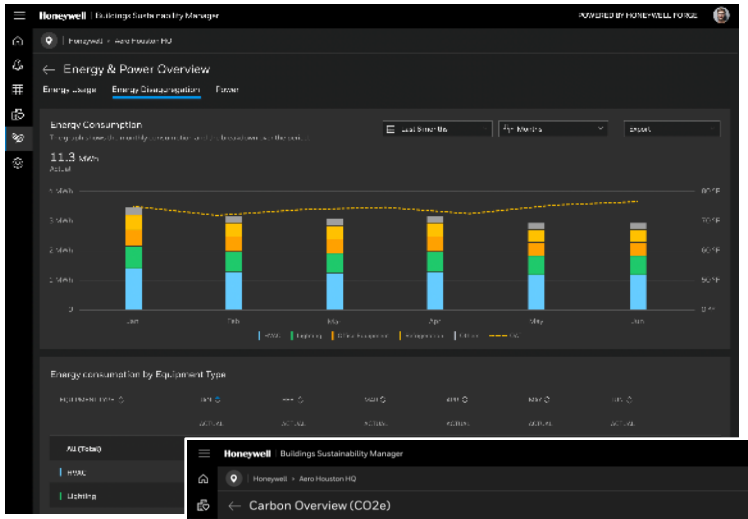
UNDERSTAND YOUR ASSETS TO PRIORITIZE ACTIONS

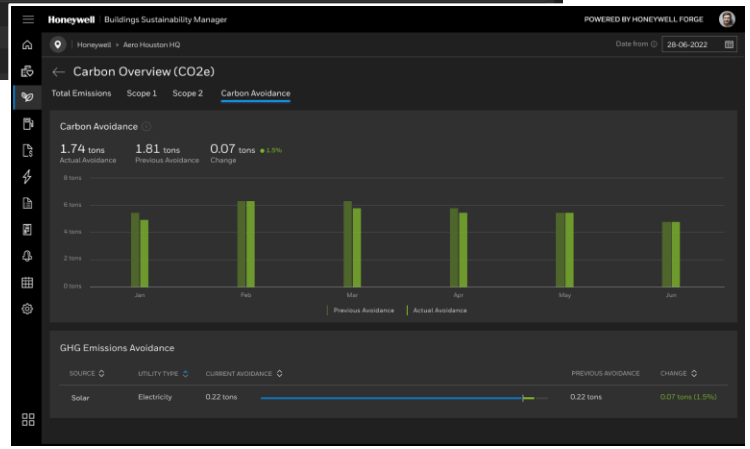
Snap-on
CT Sensors

Meter

IOT Utility Meters
- Electrical
- Gas
- Water

Energy and power overview





Carbon (CO_2e) overview

- **BEYOND SUB-METERING, NEW SOLUTIONS MAKE ENERGY DISAGGREGATION ACHIEVABLE**
- **DETAILED INSIGHTS DOWN TO THE ASSET LEVEL FOR PRIORITIZED ACTIONS**
- **COMPREHENSIVE INSIGHTS ON CARBON AVOIDANCE**

SAMPLE TECHNOLOGY TO MAXIMIZE ROI

COMPRESSED AIR

Save energy, reduce maintenance, decreased downtime through ensuring compressed air systems are accurately sized and maintained for optimal performance, to increase production throughput and improve product quality.

BMS

BMS allows control and optimization of equipment cycles, with algorithms focused on energy efficiency.[3]

Electrification

Analyze and implement the electrification of assets to reduce carbon footprint. Electric heat pumps can be 2.0-4.5x more efficient than gas furnaces.

SOLAR

Adopting solar can lower electricity bills by 20-30%, enable a lower carbon footprint, and support site electrification.[3]

BATTERY ENERGY STORAGE SYSTEM

Investing in energy storage can reduce operational costs, enhance resilience and lower your carbon footprint[5]

Sources:
1. Department of Energy: Improving Compressed Air System Performance Jun 2023 [Accessed Sept 21,2024]
2. McKinsey and Company: Building decarbonization: How electric heat pumps could help reduce emissions today and going forward [Accessed Sept 21, 2023]
3. energy.gov.au is a Department of Climate Change, Energy, the Environment and Water website: Building management systems Jun 2023 [Accessed Sept 21,2023]
4. Solar Energy Industries Association®: https://www.seia.org/sites/default/files/2018-01/Solar-Commercial-Real-Estate-SEIA-SolarKal_Jan2018-Final.pdf, Jan 2018 [Accessed Jun 15, 2023]
5. Energy Storage Association: https://energystorage.org/why-energy-storage/benefits/, Sep 2020 [Accessed Jun 15, 2023]

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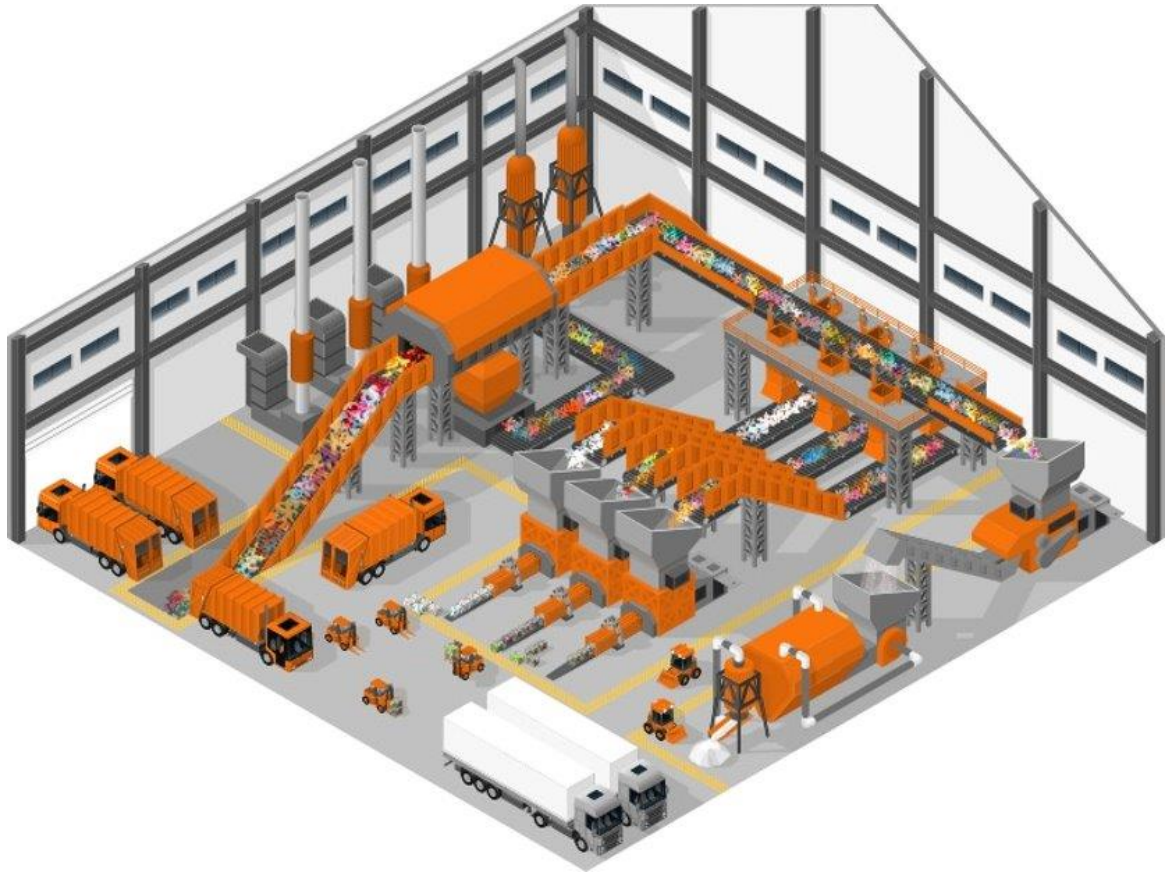
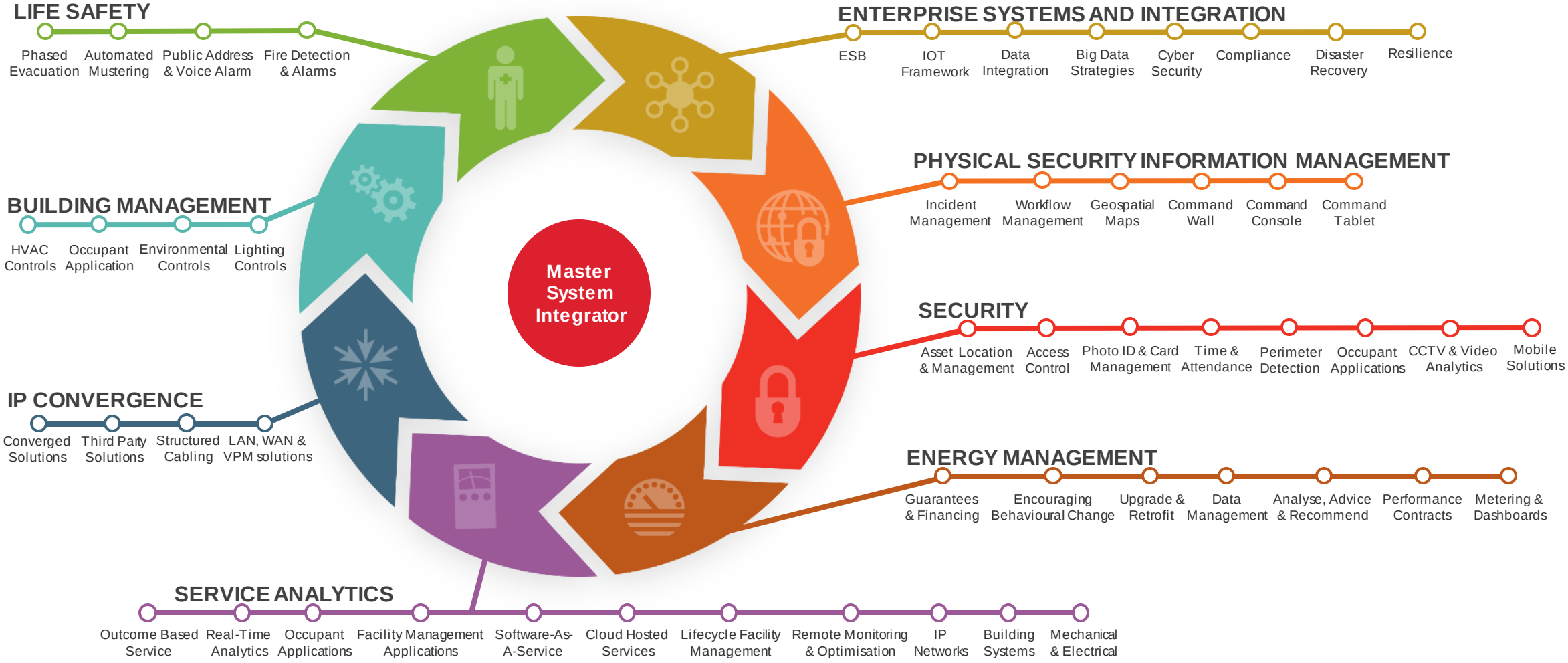
ACCRETIVE ENERGY EFFICIENCY
STEP 2: MONITOR & CONTROL AT SCALE

ASSETS | CONTROL | OPTIMIZATION

HOW DO YOU MONITOR & CONTROL YOUR BUILDING TO MAINTAIN CRITICAL INFRASTRUCTURE?



BREADTH OF DOMAIN EXPERTISE
MULTIPLE WAYS WE CAN HELP YOU



SMART SUSTAINABLE CONTROLS

Automation, integration and recommendations aligned with your operational dynamics

REMOTE MONITORING & CONTROL	INTUITIVE INSIGHTS	AUTOMATED SCHEDULING	INTEGRATION & CONTROL OF ASSETS	SUSTAINABILITY REPORTING
Operate your portfolio with greater convenience, consistency and responsiveness	Visualize real-time details as well as trends about comfort, energy, alarms, and KPIs.	Easily view and edit schedules, alarms, and setpoints by list, site, zone, or equipment level, for optimal control of your building.	Open protocols to interoperate with your existing ecosystem.	Simplify carbon, energy and utility reporting across your portfolio for greater productivity and consistency.
Faster response to reduce operational abnormalities.	Benchmark EUI across portfolio and prioritize improvements	Lighting controls to help enable further energy savings	Connected Power to reduce energy use and limit power draws from plug loads	Automated processes for Scope 1, Scope 2 and energy consumption

Your needs Honeywell capabilities

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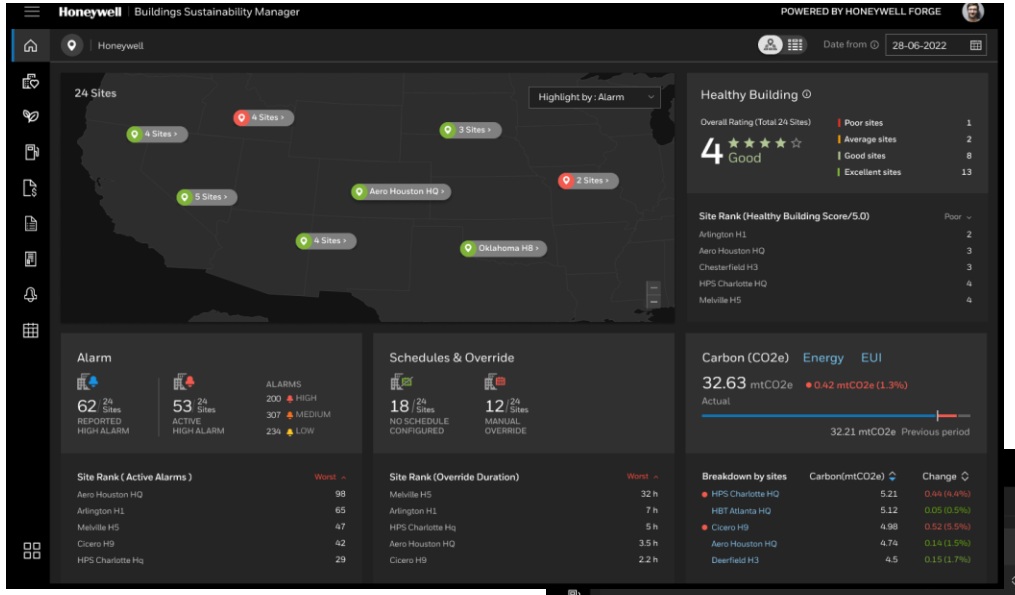
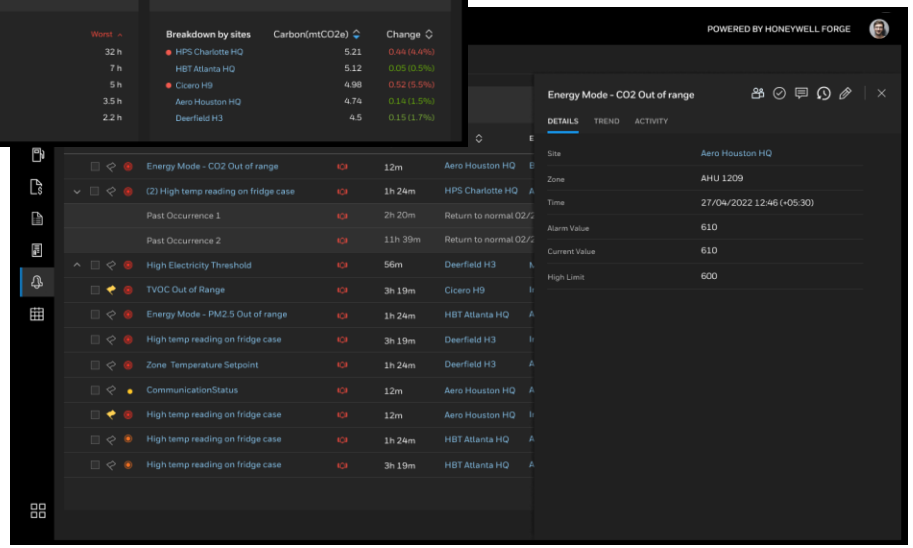
OPTIMAL CONTROL OF YOUR ASSETS



Portfolio to site to asset



Alarms and control

EASE OF CONTROL ACROSS A SINGLE SITE TO PORTFOLIO FOR OPERATIONAL EFFICIENCY AND SUSTAINABILITY IMPACT

VISUALIZE KPIs TO COMPARE PERFORMANCE ACROSS PORTFOLIO FOR ABILITY TO ACT

ALERTS AND ALARMS TO PROMOTE ISSUES TO FRONT-OF-MIND

HONEYWELL FORGE SUSTAINABILITY+ FOR BUILDINGS

An autonomous controls platform with a suite of applications that helps manage the environmental impact of buildings without compromising operational outcomes.

CARBON AND ENERGY MANAGEMENT

- Understand a building's energy
- Leverage smart meters, sensors and utility data
- Take corrective action
- Improve IAQ
- Use ML/AI algorithms
- Optimize energy intensive assets

POWER AND DEMAND MANAGEMENT

- Optimize electricity costs
- Deliver a complete microgrid
- Feature ML and AI automation
- Add EV into your building ecosystem
- Create resilience and preserve uptime

ACCRETIVE ENERGY EFFICIENCY
STEP 3: CONTINUOUS AND AUTONOMOUS OPTIMIZATION

ASSETS > CONTROL > OPTIMIZATION

HOW DO YOU OPTIMIZE ENERGY USE AND CARBON REDUCTION EFFORTS WHILE MAINTAINING AN OPTIMAL BUILDING EXPERIENCE?

SUSTAINABLE AND HUMAN CENTRIC ENVIRONMENTS

CONTINUOUS COMMISSIONING OF ASSETS

SIMPLICITY OF OPERATION AND OUTCOME

CONTINUOUS AND AUTONOMOUS OPTIMIZATION

Optimizing building performance using multiple variables

MULTI-PARAMETER INPUTS

Use multivariate analysis models of heating and cooling demand by processing various data, including weather, zone set points, humidity, indoor temperature, occupancy, historic BMS data and electricity prices.

AI/ML CLOSED–LOOP APPROACH

Optimize building performance with AI/ML by enabling two-way communication with the BMS, calculating optimal set points automatically for each asset in a building or portfolio, and adapting in real-time for continuous improvement.

HOLISTIC SYSTEM PERFORMANCE

Enable holistic HVAC system management to save energy and maintain comfort levels by focusing on key set points like air temperatures, flow rates, chilled water, hot water, ventilation and zone-level operations.

FLEXIBILITY IN OPERATION

Leverage four distinct modes to support optimal facility operations:

- Balanced mode
- Comfort mode
- Energy mode
- Dynamic mode

FOCUS ON CRITICAL ASSETS

Deploy continuous upgrades to cover a broader range of assets and HVAC configurations, such as systems with water source heat pumps (WSHP), condenser water loop optimization.

OPTIMIZE PERFORMANCE AUTONOMOUSLY

Multi-parameter optimization

USES MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

Analyzes historical and current multivariable data and uses closed loop to autonomously adjust systems to meet desired operational parameters

CREATES AN OPTIMAL INDOOR ENVIRONMENT

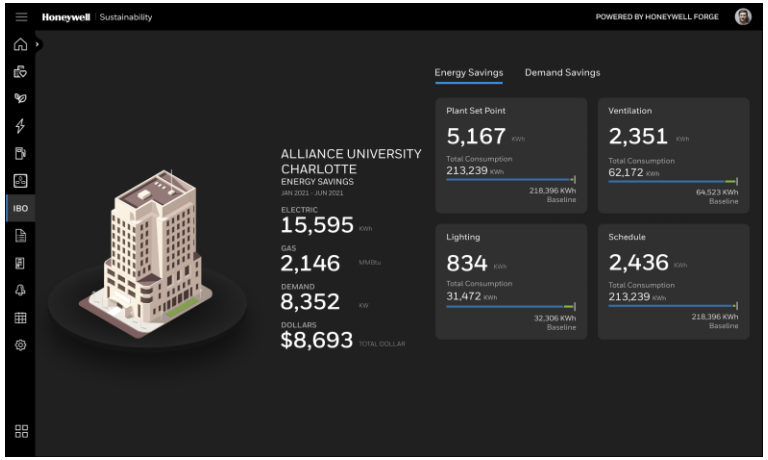
Enhances indoor air quality while optimizing energy efficiency for human-centric building operations

REDUCES NEED FOR MANUAL INTERVENTION

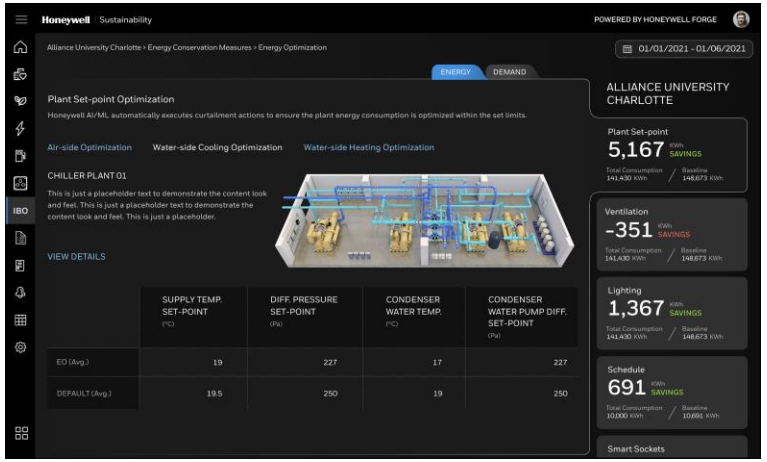
Enables facility teams to focus on other demands

OPTIMIZES ENERGY-INTENSIVE ASSETS

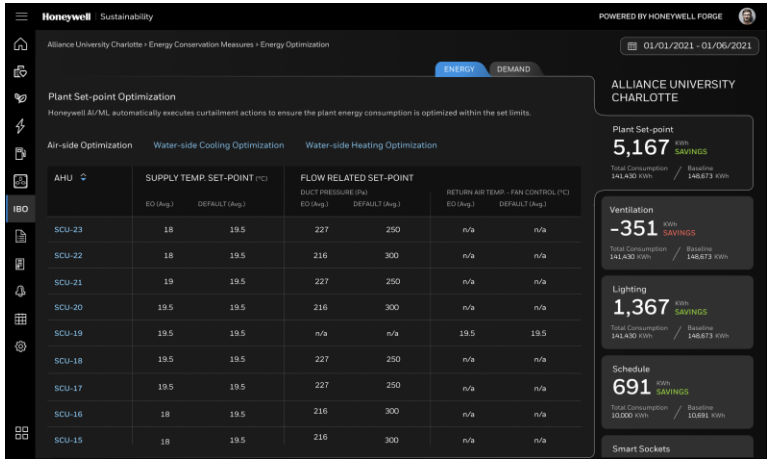
To reduce energy consumption, and optimizes asset performance for extended asset lifecycle



Visualization of optimization



Set point optimization



Water source heat pump optimization

WHAT BARRIERS ARE HOLDING YOU BACK?

Top five barriers to achieving sustainability goals[1]

1. Economic or geopolitical issues
2. Pandemic-related issues
3. Budget and resources
4. Political, regulations, compliance
5. Staffing and talent availability

Source: Honeywell, Environmental Sustainability Index Q2 2023, Jan 2023 [Accessed June 12, 2023]

HONEYWELL CAN HELP REMOVE BARRIERS WITH

FUNDING MECHANISMS THAT REQUIRE LITTLE-TO-NO UPFRONT CAPITAL

FINANCIAL CONSTRAINTS

CAPEX UNAVAILABILITY

Can I get more out of my existing infrastructure?

OPEX SAVINGS

How can I achieve OpEx savings without compromising current and future operations?

AGING FACILITIES

How should I finance improvement to be scalable across my organization's infrastructure?

COST OF RESOURCE CHURN

How can technology help me retain my team and manage a multi-generational workforce?

FUNDING MODEL COMPARISON

	Traditional				
	Internal Funding	**Equipment Lease**	**Energy Service Performance Contracting (ESPC)** [1]	**'Energy Service Agreement' (ESA)**	**Property Assessed Clean Energy (PACE)** [1]
Description	**Direct equipment purchase from OEM or contractor**	**Traditional lease financing for ECM equipment**	**On-balance sheet debt related to ESCO savings guarantee, (federal and MUSH markets)**	**Service contract with third-party capital to build, finance and maintain ECMs**	**Debt funding via voluntary property tax assessment and property lien**
Considerations					
No Upfront Cost	✗	✓	✓	✓	✓
No Balance Sheet Impact	✗	✗	✗	✓	?
Performance-Based	✗	✗	✓	✓	✗
Ongoing O&M	✗	?	✓	✓	✗
Ongoing M&V	✗	?	✓	✓	✗
Ability to Scale	✗	✗	✗	✓	✗
Investor Considerations					
Source of Repayment	**n/a**	Operating income	Operating income	**Service contract**	**Property taxes**
Typical Term	**n/a**	5 – 10 years	Up to 20 years	**5 – 15 years**	**Up to 20 years**
Collateral / Security	**n/a**	Equipment; UCC1 Statement	**Senior Secured**	**Equipment; UCC1 Statement**	**Tax lien**

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Honeywell EaaS Removes Barriers to Scale

EaaS is an enterprise-wide platform to achieve energy & sustainability goals

Traditional Customer Challenges…	…That Honeywell EaaS Solves	
Limited (Or No) Budget & Cycle Alignment with Project Objectives	 **Project Capital**	» Provides EaaS on global scale to match customer footprint » No upfront capital required, long-term financial planning tool » Manages and maximizes rebates and tax incentives
Resources and Technology Expertise to Scale Projects	 **Resources & Scale**	» No Deployment Burden or Risk » No Administrative burden & reduced procurement cycles » Ongoing Warranty and Maintenance w/ Performance Outcomes
Lack of Asset-Level Data Makes ESG Reporting Inconsistent and Unreliable	 **Measurement & Reporting Data**	» Energy consumption & ESG reporting » Meter based performance transparency » Asset performance monitoring and project identification

DBOOM CASE STUDY

Airbus | Mobile, AL
$600M, Corporate Capital Investment | Central Plant DBOOM + 10-year O&M agreement
Contractor: Brasfield and Gorrie

THE CHALLENGE

- Create a central utility plant with a state-of-the-art BAS System
- Design build and operate necessary infrastructure for A320 assembly and painting facility
- Implement energy saving equipment that will kick off the first Airbus manufacturing operation in USA
- Assembling up to 8 A320 planes per month at final capacity

THE SOLUTION

- LEED Gold Central Energy Plant facility that supplies utilities campus wide
- 4 chillers, 4 cooling towers, 4 boilers and 4 air compressors that are N + 1 for total redundancy
- Power distribution, compressed air, hot water, potable water, chilled water & fire water (2-450k Gallon Tanks)
- Winner of the prestigious Airbus Preferred Supplier Award in 2015

KEY TECHNOLOGIES		
EBI Systems with BACnet	Honeywell Forge System Optimization	N+1 Redundant Central Energy Plant
OUTCOMES		
Tracks CUP Performance	DBOOM Delivery	LEED Gold Achievement

GLOBAL PHARMACEUTICALS COMPANY

R&D, Manufacturing, and Offices across 20 countries | EaaS Enabled

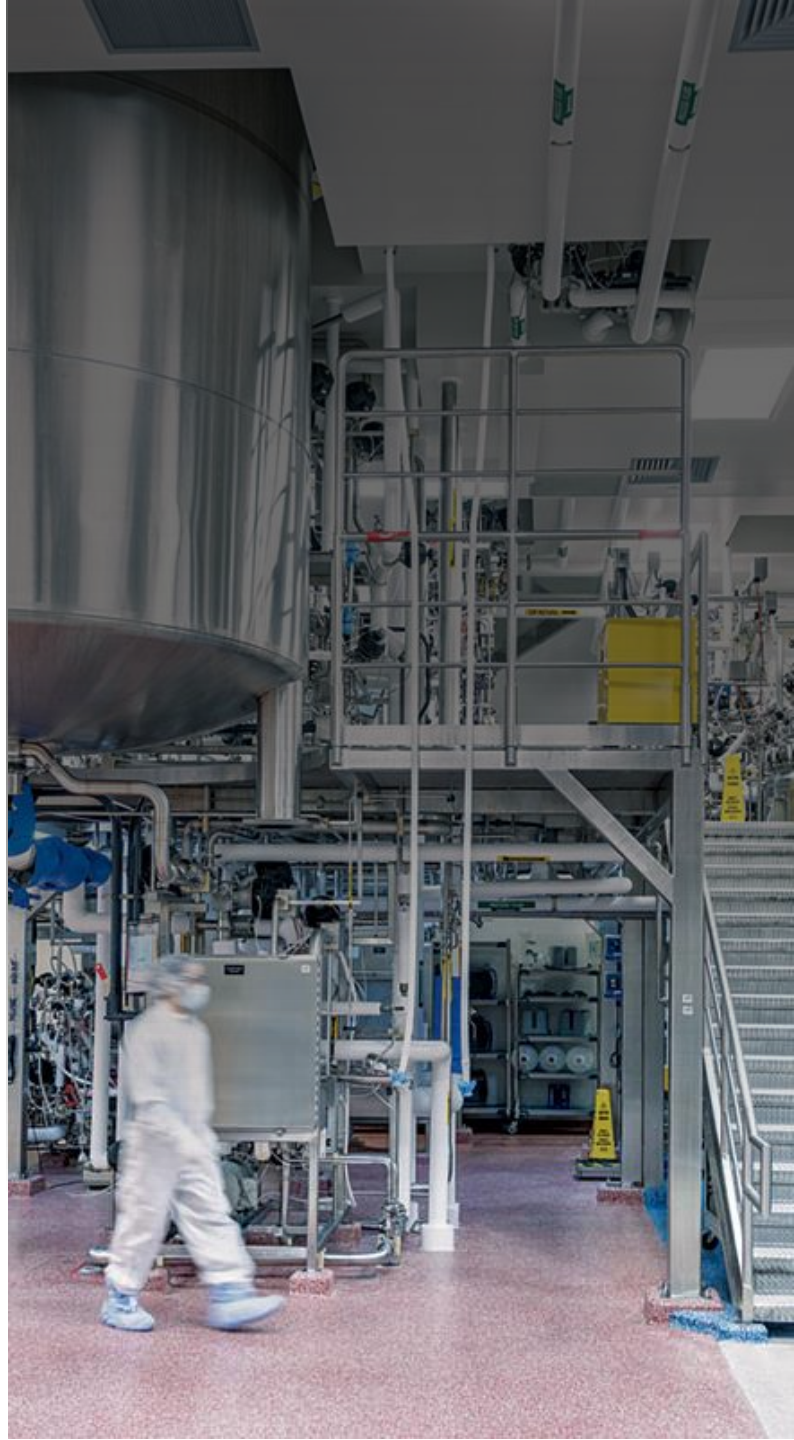
THE CHALLENGE

Global Pharmaceuticals Company committed to Science Based Targets initiative and established ambitious targets in line with the Paris Climate Agreement with limited capital availability.

THE SOLUTION

- Honeywell developed a Global EaaS framework and alignment of financiers and project implantation to match client footprint.
- Honeywell has aligned with clients Global PMO to perform portfolio level EUI analysis, standardize processes, prioritize locations and technologies for deployment at scale.
- Honeywell teams are simultaneously deploying across North America, Europe, and APAC.

KEY TECHNOLOGIES		
Decentralize heating for buildings	Heat recovery of flue gases	Optimization of controls
OUTCOMES		
Centralized programmatic global strategy	Accelerated project delivery	Alleviate CapEx burdens



MAJOR PROVISIONS IN IRA for Manufacturers

$51B	Production Tax Credits for Electricity Produced from Renewable Sources
$50.9B	Investment Tax Credits for Qualified Clean Energy Projects
$30B	Solar panel, wind turbine, battery, and critical minerals processing manufacturing tax credits
$22B	New EV manufacturing and existing vehicle facility retooling loans; to make more EVs
$9.5B	Defense Production Act funding for heat pumps and critical minerals processing and additional Federal procurement of American-made clean technologies
$9B	Advanced Industrial Facilities Deployment Program, to reduce emissions from industrial manufacturing

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Source: Decarbonization Channel, Breaking Down Clean Energy Funding in the Inflation Reduction Act, February 2023, [Accessed August 15, 2023]

IRA | RELEVANT PROVISIONS

Guidance/Provision	Summary	Timeline/ Status
Advanced Energy Project Credit	Extension and Expansion of the Advanced Energy Project Credit. Allocates **$10 billion to projects that** (1) re-equip, expand, or establish an industrial or manufacturing facility for the production or recycling of a range of renewable energy and energy efficiency equipment, carbon capture equipment, and advanced vehicles; (2) **re-equip an industrial or manufacturing facility with equipment designed to reduce greenhouse gas emissions by at least 20 percent;** or (3) re-equip, expand, or establish an industrial facility for the processing, refining, or recycling of critical materials. The law requires the Secretary of the Treasury to set aside 40 percent of the qualified investments for projects in energy communities where a coal mine or coal-fired electric generating unit has closed.	The credit is available when the application and certification process begins and ends when credits are fully allocated.
Energy Investment Tax Credit (ITC)	Taxpayers may claim an ITC (section 48) equal to a percentage of their investments in clean-energy property. **Applicable energy projects include solar, wind, fuel cell, microgrid, battery, and waste energy recovery systems, among others**. The credit is 6% of the basis of the energy property, and it is increased to 30% if the project has an output of less than 1 MW or meets certain labor requirements. Taxpayers can claim additional bonus credits for adhering to specified domestic-content requirements or placing their projects in noted low-income or historically-fossil-fuel-reliant communities. In 2025, the credit will switch to a "tech-neutral" version under section 48E, requiring applicable projects to have net-zero lifecycle emissions to qualify.	Period of Availability: To remain available through September 30, 2026.
Energy-Efficient Commercial Buildings Deduction	**Taxpayers are eligible for a tax deduction under section 179D for commercial, tax-exempt organizations, and government building retrofits that are part of a plan to reduce the annual energy costs of certain systems by at least 25%** Eligible systems include interior lighting; heating, cooling, ventilation, and hot water processes; or the building envelope. The deduction has a base value of between $0.50 and $1.00 multiplied by the square footage of the building, depending on the demonstrated energy savings. Additionally, the value of the deduction is multiplied by five if the taxpayer adheres to certain labor requirements. To qualify for the deduction, building owners must use the current ASHRAE 90.1 baseline standards to reflect energy savings.	

Honeywell is not engaged in providing legal, tax or financial advice. Accordingly, before making any final decisions you should consider obtaining additional information and advice from your accountant or other financial advisers who are fully aware of your specific circumstances.

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HONEYWELL IS READY NOW TO HELP DRIVE YOUR TRANSFORMATION

I. UNMATCHED PERSPECTIVE & EXPERIENCE

Deep and decades-long industrial expertise and experience across dozens of vertical markets.

II. UNIQUE DEPTH & BREADTH

Large installed-base and diverse solutions across nearly every aspect of sustainability, designed for the needs and scale of industry.

III. PROVEN SOLUTIONS

Tested and used in our own facilities-drop-in solutions ready to drive impact and help industry reach commitments faster.

IV. INVESTED WITH YOU

The bulk of our R&D investment is committed to ESG-focused solutions. We also plan to be carbon-neutral in our facilities and operations by 2035.

V. THE PEOPLE TO TAKE YOU ON THE JOURNEY

Honeywell's team of #futureshaper innovators are creating solutions every day for a more sustainable tomorrow.

A promise to our customers, anywhere in their journey.

WRAP UP

1. Understand how to more effectively manage the environmental impact of your buildings

2. Discuss how to scale improvements from one building to your entire portfolios

3. Learn how to overcome potential financial restraints through unique project funding options

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THANK YOU

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