



LEADERSHIP WEBCAST SERIES

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Honeywell

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COMMERCIALIZING SUSTAINABLE TECHNOLOGIES

IMPROVING ENVIRONMENTAL AND SOCIAL OUTCOMES FOR CUSTOMERS

Commercializing Sustainable Technologies

- **Honeywell** has been developing and commercializing sustainable technologies for decades across our entire portfolio
 - Providing customers with adaptable and efficient solutions to meet their safety, energy, and environmental needs
 - ~50% of Honeywell new product introduction (NPI) R&D investments are directed towards products that improve environmental and social outcomes for customers
- **Performance Materials and Technologies (PMT)** has deep expertise in chemical engineering, materials science, digitization, and automation and control technologies, which uniquely positions PMT to address the sustainability needs of our customers

Creating Growth Opportunities in HPS and UOP

	SAM	Market CAGR
Renewable Energy Storage and Controls	\$3B	~30%
Renewable Fuels	\$1B	~15%
Advanced Plastics Recycling*	\$1B	~30%
Carbon Capture and Hydrogen Economy	\$3B	~50%
Industrial Autonomous Operations	\$1B	~20%
Total	\$9B	~35%

PMT sales in sustainable technologies are expected to grow **above** the market

Sources: internal HON estimates; SAM: serviceable addressable market; *Represents 2025 market size and 2025 - 2030 CAGR

\$1B+ Potential Sales Growth Over the Next Few Years

RENEWABLE ENERGY STORAGE AND CONTROLS

\$3B

SAM

~30%

Market CAGR



Market Opportunity

- \$1.3T of investment will be required over the next 5 years to build 1 TW of renewable energy generation, as global wind and solar capacity is expected to outpace coal and gas
- Consistent, reliable, and economical renewable energy at scale requires:
 - Advanced **controls and automation**, including remote and autonomous operations, to lower energy costs by efficiently managing operations and energy supply / demand fluctuations
 - Intelligent **energy storage systems** to address variability in wind and solar energy generation

Creating Superior Renewable Energy Economics

Honeywell Solution

- **Controls and automation:** SaaS-based energy control solution that charges / discharges BESS units based on energy demand, intermittent supply, and grid pricing; also enables remote and autonomous operation of energy storage assets
- **Energy storage:** Honeywell process controls and automation integrate with energy storage systems to provide a complete customer solution; currently developing a breakthrough, next generation, grid-scale energy storage technology
- **Economic benefits:** Commercial, industrial, and utility customers benefit from an energy storage solution with fully-integrated controls and automation, generating:
 - Greater grid stability and lower use of peaker power plants
 - 10% - 70% reduction in electricity costs and ~60% reduction in carbon footprint, compared to prior to implementing Honeywell's solutions

Why We're Positioned to Win

- Long legacy of providing cutting-edge control systems for complex process industries and distributed energy networks
- Provide end-to-end energy performance solutions that lower electricity costs and offer improved grid stability
- Novel battery design leverages Honeywell UOP membrane technology and material science expertise to deliver safer, lower levelized cost of storage (LCOS) for 4+ hour applications

TW: Terawatt; SaaS: Software as a Service; BESS: Battery energy storage system; Sources: internal HON estimates, IHS Markit (1 TW), IHS Markit (\$1.3T)

Breakthrough Storage and Controls Accelerating Renewable Energy Adoption

RENEWABLE FUELS

\$1B
SAM
~15%
Market CAGR



Market Opportunity

- Growing need for cleaner burning fuels, stringent environmental mandates, and profitable regulatory incentives for refineries will drive demand for 4B incremental gallons per year of renewable fuel capacity (diesel and jet) by 2025, over 3x current volumes
- Producing renewable fuels at this pace requires:
 - Cost-effective **conversion of waste feedstocks into advanced biofuels**
 - **Repurposing existing, underutilized refineries** to efficiently produce renewable fuels

GHG: Greenhouse gas; Sources: internal HON estimates

Addressing Growing Demand for Renewable Fuels

Honeywell Solution

- **Renewable fuel production:** Honeywell UOP's Ecofining™ technology converts waste vegetable oils, animal fats, and biocrops into drop-in renewable diesel and renewable jet fuel
- **Repurpose existing refineries:** Ecofining technology is easily adaptable, using existing hydroprocessing assets to convert a mix of renewable feeds to finished fuels
- **Benefits:** Ecofining solutions enable refineries and airlines to reduce GHG emissions and meet compliance requirements with lower capital outlays
 - Refinery conversions require 50% to 70% less capital investment than similar-capacity greenfield projects
 - Depending on the feedstock used, diesel from the Ecofining process can reduce GHG emissions by 60% - 80% on a total lifecycle basis, compared to petroleum-based diesel

Why We're Positioned to Win

Honeywell UOP's Ecofining technology:

- Comprises the largest installed capacity of renewable jet and diesel fuel production, with 4x current capacity in development
- Processes the widest range of feedstocks, allowing the use of lowest-cost and lowest-carbon intensity feedstocks
- Results in market-leading yields, producing high margins for refining customers due to efficient catalysts and advanced process design

Reducing GHG Emissions with Drop-In Renewable Fuels

ADVANCED PLASTICS RECYCLING

\$1B
SAM
~30%
Market CAGR



Market Opportunity

- Increased social and economic pressure to manage plastic waste is driving a need for advanced plastics recycling
- 275M tons of plastic waste are produced annually and up to \$120B disappears from the economy every year through the disposal of single-use plastics
- Advanced recycling to address plastic waste must:
 - Be economically viable to scale
 - Process a wide variety of difficult-to-recycle plastics
 - Create plastics circularity

Sources: internal HON estimates, [Morgan Stanley](#), [Our World in Data](#); *Represents 2025 market size and 2025 - 2030 CAGR

Driving Plastics Circularity

Honeywell Solution

- **Economically viable to scale:** Plastics recycling is economically viable using UOP technologies capable of converting waste plastics to a recycled polymer oil that:
 - Replaces crude oil with a sustainable, next-generation drop-in feed for the production of petrochemicals and plastics
 - Produces a new profit stream for waste management companies by assigning an economic value to waste plastics
- **Accommodates a broad range of difficult to recycle plastics** and reduces them to the molecules from which they were made

Why We're Positioned to Win

- Led the development of petrochemical technologies for the past 70 years
- Our contaminant treatment delivers a technically superior offering to the petrochemical and plastics market
- Developed a unique technology with the critical ability to handle a wide variation of plastic waste streams to make a consistent drop-in feed
- Honeywell's technology can triple the portion of global plastics that are recyclable in the future

Honeywell Technology Can Increase the Recyclability of Plastics by 3x

CARBON CAPTURE AND HYDROGEN ECONOMY

\$3B

SAM

~50%

Market CAGR



Market Opportunity

- Hydrogen is a super-versatile, low-carbon energy resource; hydrogen demand is projected to grow 10x to ~560M tons by mid-century
- Hydrogen can play a pivotal role in next generation energy networks
 - **Blue H₂**, made from cheap and plentiful natural gas, is the near-term, abundant supply of low-carbon hydrogen; the CO₂ by-product requires capture and underground sequestration to prevent global warming
 - **Green H₂**, made from water and electricity with no CO₂ emissions, is a mid-to-long-term solution that requires further innovation and scale

CO₂: Carbon Dioxide; H₂: Hydrogen; Sources: internal HON estimates, [Hydrogen Council](#); *Results calculated based on design capacity of delivered technology using multiple UOP solutions: Separex™ Membrane Systems, Amine Guard™ FS Process, SeparALL™ Process.

Developing Next Generation Clean Energy

Honeywell Solution

- **Carbon capture:** UOP provides process and separation technologies with the capacity to capture and sequester up to 33M+ tons of CO₂ per year*
- **Blue H₂ production:** UOP technologies in acid gas removal and purification enable Blue H₂ production from natural gas with >90% CO₂ emissions reduction, compared to conventional “gray hydrogen” which does not include carbon capture
- **Green H₂ production:** UOP is developing electrolyzer technologies to produce Green H₂ from water using renewable power
- **H₂ transmission and distribution:** HPS offers a full suite of technologies for injecting H₂ into transmission lines and distributing H₂ to residential and industrial customers using existing natural gas networks
- **H₂ consumption:** HPS designs and manufactures the complete H₂ combustion system, including fuel train supplies and burner management systems, and SaaS-based solutions that optimize process systems

Why We're Positioned to Win

- Blue H₂ technologies provide the lowest cost per ton
- UOP is a leader in H₂ purification technologies with 1,100+ installations
- HPS has 30 years of experience providing H₂ transmission technologies to pipeline customers and provides end-to-end solutions for H₂ transmission, distribution, and consumption

Creating Lowest Cost Path to Clean Hydrogen

INDUSTRIAL AUTONOMOUS OPERATIONS

\$1B
SAM
~20%
Market CAGR



Market Opportunity

- New technologies in battery storage, hydrogen, solar, and wind can operate in a fully autonomous way, using the latest digitization and controls technologies
- Increased energy efficiency is required to meet growing industrial sustainability initiatives; existing industrial operations must increase efficiency by **converting from manual to automated to autonomous processes**

A Leader in Industrial Automation

Honeywell Solution

- **Honeywell's software-based automation and controls portfolio** enables extensive automation of manual processes, optimal control of industrial processes, predictive view into plant operations, and consolidation of expertise in remote control centers, resulting in efficient operations that produce increased output at better quality with lower energy consumption
- **Driving next generation of efficiency, safety, and reliability in customer processes** by leveraging Honeywell's experience transitioning to autonomous processes that can eliminate 25% - 100% of manual processes
- **Controlling thousands of devices at complex industrial plants** and distributed assets to enable safe, reliable, and efficient operations
- Honeywell automation and controls solutions serve wide range of industries, including life sciences, food and beverage, sustainable technologies, battery manufacturing, oil and gas, paper and pulp, metal and mining

Why We're Positioned to Win

- Deep domain expertise in process automation and experience transitioning to remote and autonomous operations
- Honeywell software solutions enable optimal intelligent, resilient, and autonomous operations for customers through capabilities in controls, plant models, optimization, and predictive health

Driving Energy Efficiency Through Autonomous Operations

Honeywell



UJJWAL KUMAR

PRESIDENT OF HONEYWELL PROCESS SOLUTIONS

Ujjwal Kumar is the President of Honeywell Process Solutions (HPS), a strategic business unit of Honeywell's Performance Materials and Technologies segment. HPS is a global leader in industrial automation and digitization, smart devices, remote and autonomous operations and outcome-based services.

Kumar previously served as Vice President and General Manager of Honeywell's Projects and Automation Solutions business, and as Vice President and General Manager of Honeywell's Process Measurement and Control business from 2017 - 2020. He joined Honeywell in 2016 as Vice President of Global Sales for Honeywell Process Solutions.

Kumar brings to the role an established track record of driving growth on a global scale through new software-enabled service models, product portfolio transformation, globalization, and partnerships.

Prior to Honeywell, Kumar held leadership roles at General Electric, General Motors and ITT Corporation, and has extensive experience in diverse industries including oil and gas, power generation, life sciences, chemicals, metals and mining, aviation, automotive, and food and beverage. Ujjwal holds a Master of Business Administration from the University of Michigan's Ross School of Business at Ann Arbor, a Master of Science in Mechanical Engineering from the University of Maryland at College Park, and a Bachelor of Science in Mechanical Engineering from the Indian Institute of Technology at Mumbai.



BEN OWENS

VICE PRESIDENT AND GENERAL MANAGER OF HONEYWELL SUSTAINABLE TECHNOLOGY SOLUTIONS

Ben Owens is the Vice President and General Manager of Honeywell's Sustainable Technology Solutions (STS) business. The STS business is focused on developing offerings that address today's environmental, economic and social challenges through the development of innovations that meet the growing demand for sustainable technologies. Honeywell's solutions are paving the way for a lower carbon economy through processes and technologies that can efficiently recycle plastic waste, significantly improve energy storage and convert renewable feedstocks into cleaner-burning fuels.

Ben has been with Honeywell for 13 years and prior to his current role was the Vice President and General Manager of Honeywell UOP's Gas Processing business. In this role, Ben led the Gas Processing business to deliver offerings that ranged from pre-engineered modular units to highly integrated - multiple technologies units. These technologies enabled contaminant removal and natural gas liquids recovery to help maximize the value of gas streams.

Prior to this role, Ben was the Vice President and Chief Commercial Officer for Honeywell's Performance Materials and Technologies strategic business group. In this role, he led the Honeywell Operating System focused on Strategy Development, New Product Development, Enterprise Information Management, Digital Marketing and Commercial Excellence. During his Honeywell career, Ben has held roles in Business Management, Strategic Marketing, Product Marketing and Operations Management.

Ben served as an Infantry officer in the United States Army and is a graduate of the United States Army Ranger School, its premier leadership school. Ben served overseas, leading American and foreign soldiers in combat operations, and was awarded the Bronze Star for meritorious service during Operation Iraqi Freedom.

Ben holds a Mechanical Engineering degree from the United States Military Academy, West Point and a Master's in Business Administration from the University of Texas at Austin. He is an Eagle Scout and volunteers with the Boy Scouts program that focusing on building character and citizenship.