

THE CARBON CAPTURE TECHNOLOGY OF TODAY FOR A BETTER TOMORROW

Help Meet Carbon-Neutral Goals with Honeywell



Honeywell
UOP

A PATH TO CARBON NEUTRALITY STARTS TODAY

With a global focus on combatting climate change, industry leaders are aggressively seeking technology solutions that limit greenhouse gas emissions.

This is especially critical for carbon-intensive industrial markets such as power, steel, cement, refining, petrochemicals, hydrogen and natural gas processing where reducing environmental impact has been difficult.

There are many avenues a company can take to meet sustainability goals – and a drive towards carbon neutrality is gaining prominence as a key driver of meeting commitments. While many companies are taking the first steps towards carbon neutrality with more energy-efficient machinery and processes, technology supporting these initiatives is continuously evolving and improving, and companies need to keep up.

CARBON CAPTURE TECHNOLOGIES AND THEIR ROLE IN SUSTAINABLE OPERATIONS

Deciding what sustainability initiatives to implement to start your company's journey towards more environmentally-friendly processes can be daunting. From making commitments to plant a certain number of trees to implementing energy-efficient processes, there are multiple pathways leading towards towards more carbon-neutral operations, some of which can be integrated immediately, but others require longer-term planning.

Carbon capture, utilization and storage (CCUS) is a key technology for reducing greenhouse gas emissions. According to the International Energy Agency, carbon capture capacity must increase more than 20 times to enable capture of 840 million metric tons per year of CO₂ by 2030 to meet global emission goals.¹

Incorporating carbon capture technologies into production is an effective path industrial companies can take to reduce their environmental impact and prevent harmful emissions from entering the atmosphere. But carbon capture is a broad and complex field, requiring in-depth knowledge of both the technology and industry to effectively execute.

CHALLENGES FOR INDUSTRY LEADERS:

- National and corporate net-zero policy ambitions
- Legal, regulatory, and financial frameworks are progressing
- Large scale projects remain a significant hurdle due to energy requirements
- Full ecosystem that embodies all elements of carbon capture to support fast-moving projects

1. IEA Report Extract: CCUS in the transition to net-zero emissions (<https://www.iea.org/reports/ccus-in-clean-energy-transitions/ccus-in-the-transition-to-net-zero-emissions>)

YOUR EXPERIENCED PROVIDER OF CARBON CAPTURE SOLUTIONS

At Honeywell, we're uniquely qualified to support industrial sectors with implementing carbon capture technology into their operations. With more than 70 years of experience in carbon capture, we have the knowledge to help you progress your journey to carbon neutrality.

We offer a proven suite of solvent, membrane, adsorbent and cryogenics technologies with industry-leading capture of CO₂ emissions. Honeywell CO₂ solutions are already capturing 15 million metric tons of CO₂ worldwide every year with additional installed capacity ready to do more.²

SIGNIFICANT TRACK RECORD IN CARBON CAPTURE WITH VAST TECHNOLOGY PORTFOLIO

Honeywell has a vast portfolio of carbon capture technologies that help support industrial industry leaders to move towards a lower carbon footprint. Our team of experts can work with you to determine the best solution to meet your CO₂ emission goals.

CHEMICAL SOLVENTS

AmineGuard™ Process

Solvent for high-concentration, MEA-based systems

AmineGuard™ FS Process

Family of specialty solvents for diverse industrial applications

Benfield ACT-1

Inorganic solvent for highly oxidative streams

PHYSICAL SOLVENTS

Selexol™ Process

Physical solvent for high pressure streams and gasification

ADSORBENTS

Polybed™ Pressure Swing Adsorption (PSA) System

Optimized adsorbents and cycles for CO₂ rejection

CRYOGENICS & MEMBRANES

Separex™ Membrane Systems

High, partial-pressure CO₂ capture for industrial applications

Ortloff CO₂ Fractionation

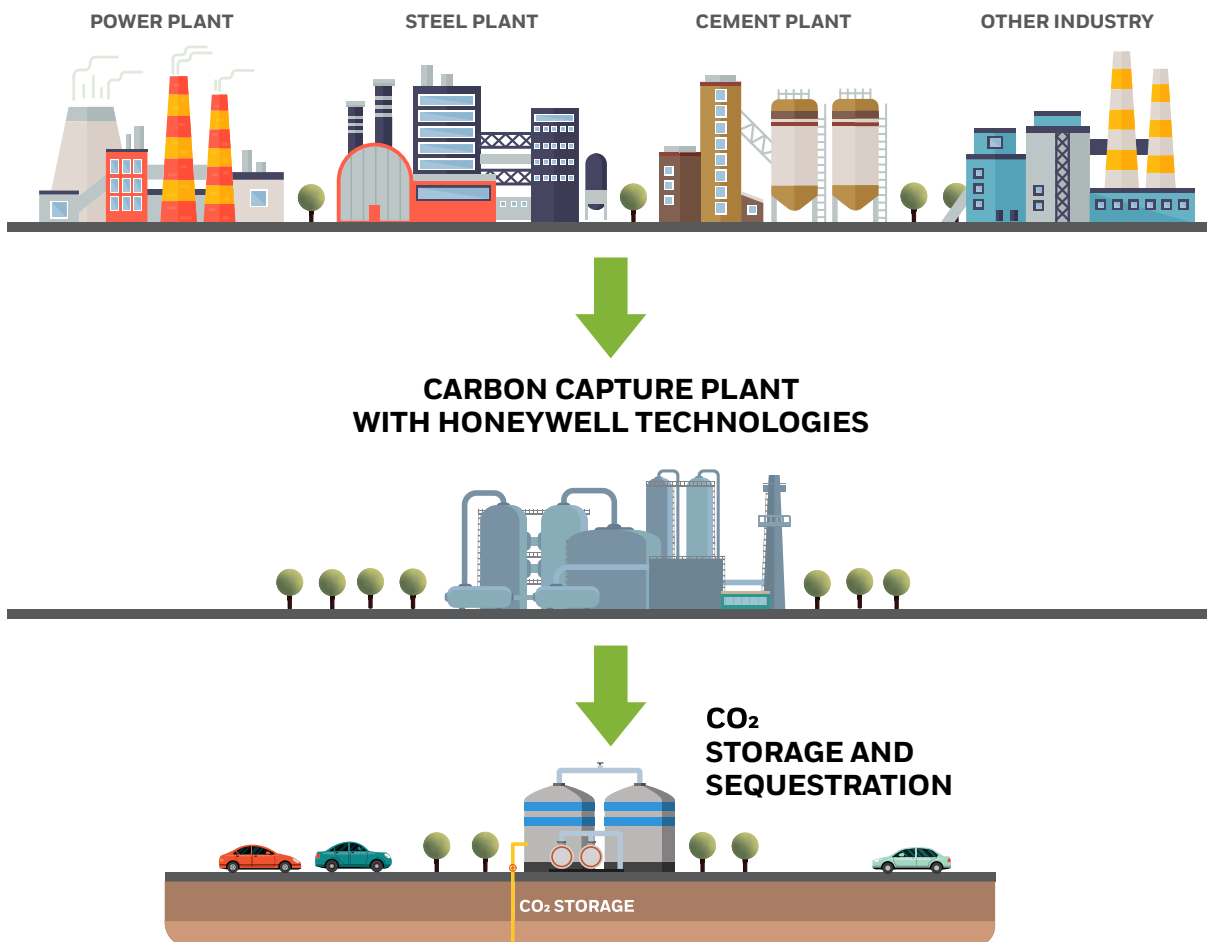
Captures CO₂ and also provides it as a high-purity liquid product

² Includes capacity of deployed Honeywell technology (membranes, chemical and physical solvents) in installed projects enabling CO₂ capture from gas streams, of which 15 million tons of the captured CO₂ is being utilized for enhanced oil recovery annually.

REDUCE CO₂ EMISSIONS IN HARD-TO-ABATE INDUSTRIES

At Honeywell, our CO₂ solutions can help make an impact within a wide range of industrial market segments where decarbonization has been a proven challenge, such as:

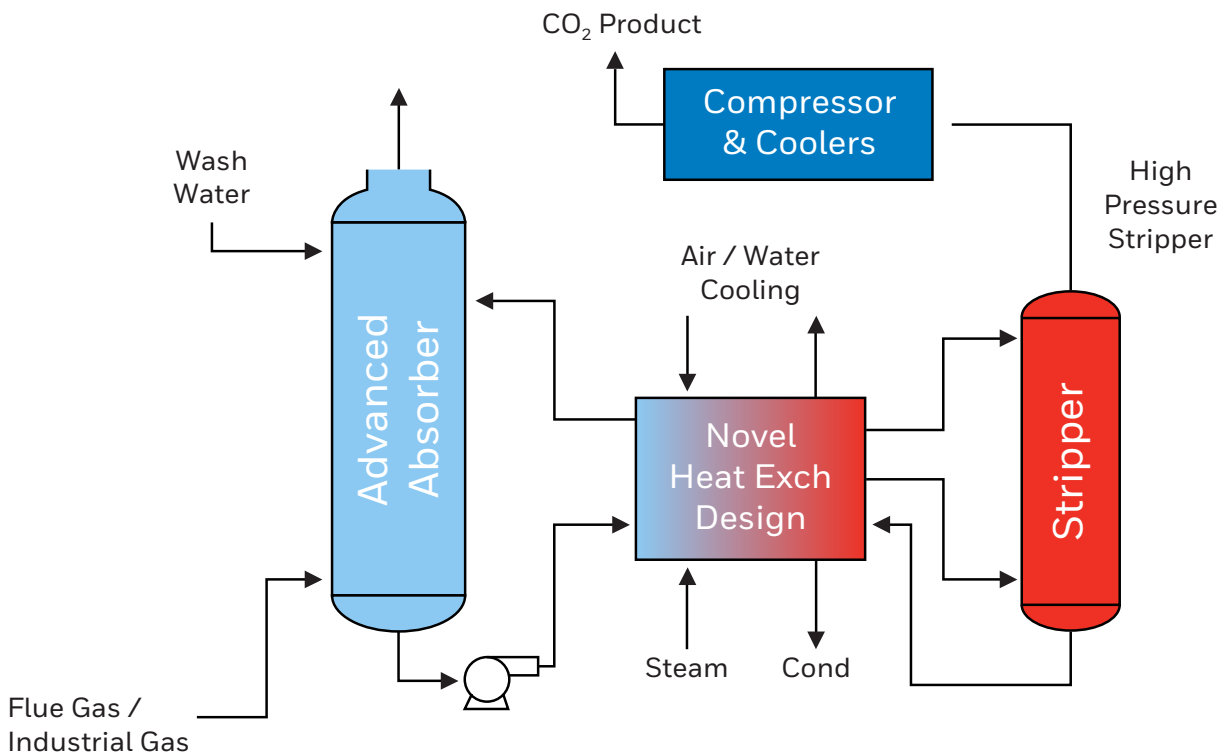
- Power
- Steel
- Cement
- Refining
- Petrochemical
- Hydrogen Plant
- Natural Gas Processing



POST-COMBUSTION ADVANCED SOLVENT TECHNOLOGY UNLOCKS POTENTIAL

In collaboration with the University of Texas, Honeywell is proud to offer a new advanced solvent technology to lower CO₂ emissions generated from combustion flue gases in hard-to-abate industries, such as power, steel, cement, refining, petrochemical and other industrial plants.

Utilizing an advanced solvent, this point source CO₂ removal technology enables CO₂ to be captured at a lower cost through greater efficiency using smaller equipment. This creates viable project economics today as countries across the globe progress to meet their sustainability targets.³ It can be retrofitted within existing plants or included as part of a new installation.



3. Lower cost of CO₂ capture based on comparing estimated capital and operating costs of this solution against other conventional amine solvents in same applications. CO₂ pricing considers current policies of \$50/ton tax credit (USA per IRS Section 45Q for permanent storage) and \$60/ton (UK and Europe – approximate averages from August 2021 through country/regional Emission Trading Systems and as reported by IHS Markit).

A CARBON NEUTRAL FUTURE STARTS TODAY

Meeting future sustainability goals requires action now. Honeywell has the expertise and carbon capture technology portfolio available at scale today to help you on your journey to carbon neutrality.

WE'RE READY NOW. JOIN US TODAY.



For more information

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THE
FUTURE
IS
WHAT
WE
MAKE IT

Honeywell