

Waste Heat to Power Fact Sheet

An overview of WHP's value as a carbon-free source of clean electricity.

WHP generates carbon-free, baseload power that improves grid stability and can be quickly deployed to meet energy transition goals.

What is WHP?

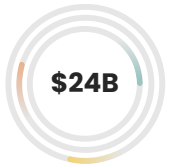
- Waste Heat to Power (WHP) is a valuable clean energy resource that converts wasted thermal energy or pressure into baseload, carbon-free electricity. WHP generates zero emissions and requires no fuel or combustion.

Why is WHP important?

- WHP reduces waste, improves efficiency, and vastly reduces the carbon intensity of industrial processes. WHP is a critically important tool to decarbonize the industrial sector and help the U.S. transition to a net-zero future.

American Market Opportunity & GHG Reduction Impact

Investment Opportunity



US Market Opportunity



GHG Reduction Opportunity



WHP Systems & Industrial Applications

- WHP systems convert, recover, or recycle otherwise wasted heat or pressure** from industrial processes to generate electricity or mechanical power. The electricity is used on-site or sold and delivered to the grid.
- WHP systems are made of component technologies**, including heat exchangers, thermal oil loops, turboexpanders, pumps, condensers, and cooling equipment, that have been commercially available for decades. Most systems utilize Rankine Cycles and Kalina Cycles to convert heat and pressure into power.
- WHP systems are stand-alone, bolt-on units**, independent of the industrial facility and process that creates waste heat or pressure. WHP systems are added onto existing industrial processes.
- WHP systems can be applied to any number of industrial processes** that create waste heat or pressure as a byproduct, including:

Natural Gas



Cement



Iron & Steel



Glass



Chemicals



Fertilizer

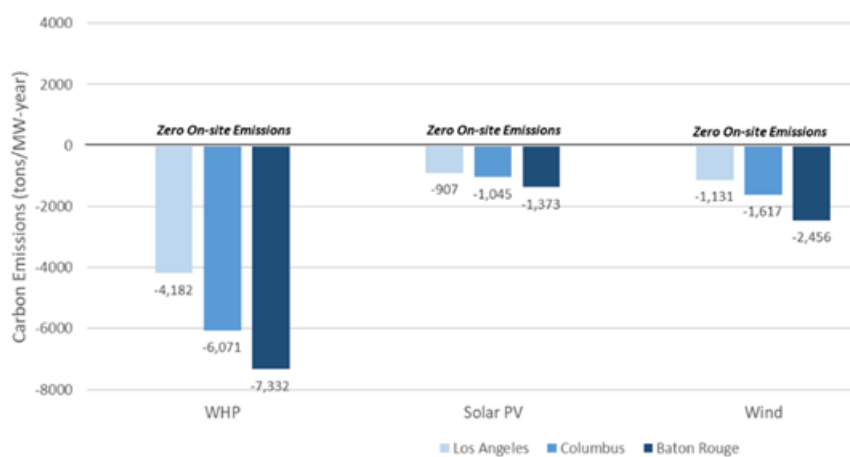


Biomass



Hydrogen





WHP Has Zero On-Site Emissions

Diagram illustrates annual carbon emissions impact by Technology per MW of generation capacity

Source: ICF International Inc.

WHP in Federal & State Policy

- **Under the Inflation Reduction Act, WHP or waste energy recovery property** receives a 30% investment tax credit (ITC) through the end of 2024. WHP is eligible to receive stackable bonus credits on top of the ITC, including:
 - an additional 10% for building in a designated Energy Community;
 - an additional 10% for complying with domestic content requirements
- **WHP is recognized and defined under the Consolidated Appropriations Act of 2021**
 - In general – the term **“waste energy recovery property”** means property that generates electricity solely from heat from buildings or equipment if the primary purpose of such building or equipment is not the generation of electricity. Limited to <50 MW system. (26 U.S.C. §48(c)(5))
- **WHP has been recognized under the Energy Independence and Security Act of 2007**
 - The term **‘recoverable waste energy’** means waste energy from which electricity or useful thermal energy may be recovered through modification of an existing facility or addition of a new facility; defines recoverable waste energy similarly to how it is understood in practice today – a waste fuel that is harnessed through technology added after the existing facility is commissioned.
- **WHP has been recognized in 32 states across the United States.** WHP qualifies for both voluntary and compliance markets depending on the state.



Benefits of Waste Heat to Power

WHP produces baseload clean electricity, which enhances grid stability and can replace carbon-emitting power sources like natural gas and coal. According to a 2021 study by ICF International, WHP can provide greater annual emissions reduction than a comparable capacity solar or wind system due to WHP’s ability to run 24/7.

WHP provides heavy industry with a reliable, near-term solution for decarbonization since the systems can be integrated into existing assets. The industrial sector accounts for 33% of the nation’s primary energy use and nearly 30% of greenhouse gas emissions, including indirect emissions from the sector’s electricity consumption.

By generating power on-site, WHP reduces grid reliance and demand while increasing energy cost savings. WHP can save U.S. industry an estimated \$3 billion annually.

In the U.S., WHP has the potential to generate 21 gigawatts of clean electricity and create hundreds of thousands of new jobs. The market potential for WHP continues to expand with the growth of American industry and the development of new WHP technologies.

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