

## Redefining Renewable for America's Clean Energy Future

Traditionally, renewable energy has been limited in its definition to naturally occurring resources of emission-free electricity. As the global leader in manufacturing, the U.S. produces 22 percent of the world's manufactured products, employing nearly 12 million workers. Making these goods requires constant industrial process, creating continuously occurring waste heat. By capturing this abundant resource, American industry can enhance energy efficiency *and* generate the same product as traditional renewables— emission-free electricity.

### Producing Emission-Free Electricity

Waste heat recovery is the process of capturing heat generated through industrial applications, with the intent to productively use the byproduct – waste heat. Several uses exist for that heat that would help reduce energy costs for industrial users, including Waste Heat to Power (WH2P) – the process of capturing industrial waste heat for emission-free power generation. A WH2P system works by capturing waste heat at the source and converting it into electricity through heat transfer. No combustion. No emissions. Across America today, a vast amount of waste heat is being generated and lost. Oil and gas plants, compressor stations along pipelines, landfill gas engines, and all energy intensive industries generate massive quantities of industrial waste heat.

#### Industries with Significant Waste Heat Potential

<u>Industry</u>	<u>US Jobs</u>
Steel	159,000
Cement	140,950
Paper	111,030

*\*Bureau of Labor Statistics*

WH2P isn't new, yet it is often overlooked. In fact, steam turbine technology is more than 100 years old and has been utilized for WH2P systems since the 1970's. Waste heat temperature and project size can limit applications using steam – according to a 2008 DOE report, more than 90% of America's waste heat is generated at lower temperatures than steam turbines can economically capture<sup>1</sup>. The Organic Rankine Cycle, however, a newer technology developed and proven in the geothermal and solar thermal industry, is capable of capturing waste heat at lower temperatures from smaller scale projects. Thermo-electrics, high pressure CO2 and other technologies are also being developed and readied for commercial deployment. Through the application of these technologies, industrial waste heat is no longer just a byproduct – it is source for emission-free electricity, just like traditional renewables.

### Waste Heat Compared to Other Renewable Sources

While all waste heat recovery provides an opportunity to enhance efficiency, WH2P creates entirely new emission-free electricity. Without incentives equal to other types of emission-free electricity, industrial WH2P continues to be overlooked and underdeveloped. Government and regulatory influence for all other forms of emission-free electricity has diverted investments in WH2P to those that receive subsidies such as wind and solar. Since the 2006 inclusion of solar power in the U.S. tax code, the industry has grown by 800%.<sup>2</sup> Given equal economic incentives, industrial waste heat could provide enough emission-free electricity to power 10 million American homes, provide thousands of new American jobs and support critical US manufacturing industries.

#### National Support for WH2P

A recent poll conducted by FTI Consulting found that an overwhelming majority (70%) of Americans support a proposal to provide tax credits for installing waste heat capture technology.

### America's Responsible Energy Future

As the world works to identify energy options that are both economical and environmentally sound, it is imperative to provide the opportunity for all viable solutions to thrive. Waste Heat to Power generation will provide the energy equivalence of over 60,000,000 barrels of oil annually. We cannot continue to ignore this ready, proven resource that supports American jobs, key industries, and the environment.

Because industrial waste heat competes in the open market with 'traditional renewables' and offers the same product—zero-emission electricity— WH2P should be offered the same tax treatment. Securing a 30% investment tax credit and/or the full production tax credit for ALL zero-emission generation would level the playing field and expand the market for this valuable resource. As Congress and states legislatures debate our energy future, industrial waste heat's qualities as an emission-free electricity producer must be realized. Heat is power. Let's capture it.

<sup>1</sup> U.S. Department of Energy. (2008). *Waste Heat Recovery: Technology and Opportunities in U.S. Industry* (BCS Incorporated). Retrieved from [http://www1.eere.energy.gov/manufacturing/intensiveprocesses/pdfs/waste\\_heat\\_recovery.pdf](http://www1.eere.energy.gov/manufacturing/intensiveprocesses/pdfs/waste_heat_recovery.pdf), pg 54.

<sup>2</sup> Solar Energy Industries Association: [http://www.seia.org/cs/solar\\_policies/solar\\_tax\\_policy](http://www.seia.org/cs/solar_policies/solar_tax_policy)