



NORTH AMERICA RENEWABLE POWER ADVISORY

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Waste Heat Recovery Gains Attention in the US

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INDUSTRY DEVELOPMENT

On 19 November 2010, Nevada, US-based utility NV Energy announced the completion of a 7.5 MW waste heat recovery (WHR) power project in Goodsprings, Nevada, 30 miles south of Las Vegas. Power is generated from waste heat given off by compressors serving the Kern River natural gas pipeline owned and operated by Kern River Gas Transmission Company, a subsidiary of MidAmerican Energy. Nevada-based Ormat Technologies provided the organic rankine cycle (ORC) power generation equipment and all engineering, procurement, and construction (EPC) services for the Goodsprings project. NV Energy will own the plant, paying a host fee to Kern River Gas for use of the exhaust waste heat. Ormat will operate the facility for the first three years, with NV Energy taking over operation after this time.

NV Energy is the primary electric utility in Nevada, serving 2.4 million customers across Nevada and northern California. NV Energy is required to meet Nevada's Renewable Portfolio Standard (RPS) of 25% renewable power by 2025. Nevada allows WHR to qualify under the RPS.

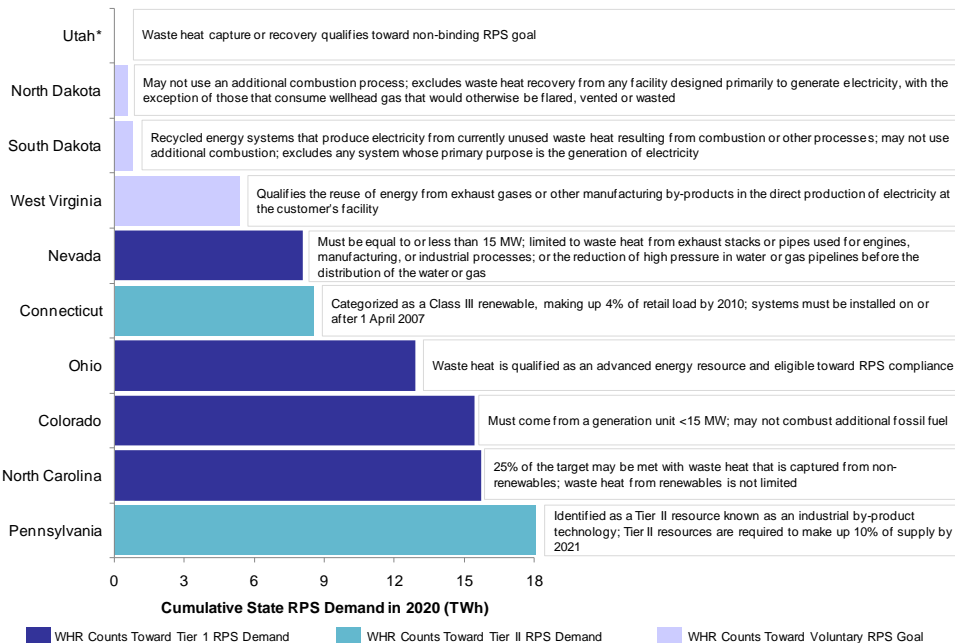
EER INSIGHTS

NV Energy diversifies RPS portfolio with cost-competitive WHR. The US\$22 million Goodsprings project is a cost-competitive option for NV Energy to meet Nevada's RPS target, which is the second-highest standard in the western US behind California. The Goodsprings WHR project—able to operate as baseload power with a utilization factor exceeding 95%—is estimated to produce power below US\$80/MWh in the absence of subsidies. Following the success of Goodsprings, NV Energy is exploring additional WHR opportunities, identifying 30 MW to 50 MW of potential at natural gas compressor stations. Further growth is possible at Nevada mining sites, as NV Energy diversifies its RPS compliance strategy in the absence of significant in-state wind resources.

WHR gaining policy support as emphasis shifts toward energy efficiency. WHR is capturing increased attention as US energy policy continues a shift toward support for energy efficiency. The US federal government is considering legislation in both the House (HR 4144) and Senate (S. 1639) that would include WHR systems under the 10% combined heat and power (CHP) investment tax credit. In addition, nine of 35 US states now allow WHR to qualify toward RPS compliance. Of these RPS states, Nevada, Pennsylvania, North Carolina, and Ohio offer the most attractive potential, considering their industrial bases, and/or limited wind resources.

Ormat leads WHR supply market, with growing attention from major industrials. With increased policy support, equipment suppliers are stepping up to capture the US WHR market opportunity as part of their low-carbon growth strategies. It is estimated that 1 GW to 2.5 GW of untapped WHR potential remains at natural gas compressor sites, and 4.5 GW to 6.5 GW exists at industrial sites. The most attractive industrial potential is associated with fuel refineries and steel and glass manufacturing. Over 200 MW of WHR is estimated to be installed in the US. Ormat Technologies is the US market leader, having supplied 100 MW of WHR systems, primarily 5 MW to 10 MW plants at natural gas compressor stations. Signaling the growing interest in scaling WHR, on 1 October 2010, GE acquired Calnetix Power Solutions, a WHR systems provider, with a growing focus on industrial WHR projects. In 2009, United Technologies Corporation acquired Italian ORC manufacturer Turboden and Siemens acquired a stake in Transparent Energy Systems.

Waste Heat Recovery and RPS Policies in the US



Note: *Utah's non-binding RPS does not become effective until 2025 and lacks interim targets. An additional four states (Hawaii, Michigan, Massachusetts, and Washington) allow WHR to qualify toward RPS mandates as combined heat and power
Source: DSIRE, IHS Emerging Energy Research