

Waste heat to power through Organic Rankine Cycle in Iranian O&G industry



According to the U.S. Energy Information Administration, the electricity sector in Iran is characterized by an increasing domestic demand not evenly supported by the development of adequate infrastructure. This lack, together with the high dependence on fossil fuels, makes the entire electricity generation sector quite fragile and recently led to an increase of electricity prices. Such conditions represent an alert for energy-intensive industries, including the Oil & Gas one. In this framework, it is clear that a more sustainable and responsible use of energy within the industrial processes could be a prompt and effective way to address these issues. At the same time, being able to use a waste resource is a business opportunity to achieve mid-term strategic targets, such as:

- to enhance energy efficiency of the Oil & Gas production processes, reducing budget for electricity;
- to decrease the dependency on the grid and/or on fuel supply;
- to strengthen the “green” image of fossil fuels.

There are various methods to improve energy efficiency. Within the O&G sector, some of the most promising opportunities can leverage Organic Rankine Cycle (ORC) technology, a thermodynamic cycle that uses a high-molecular-mass fluid as working fluid allowing converting residual heat into useful power. Indeed, this technology is able to receive heat at high-to-low temperature and to convert it into electricity with high efficiency. The overall ORC-based heat recovery system is water-free, completely automatic,

with simple start-stop procedures and quiet running, and it guarantees high availability and flexibility while maintaining long lifetime (> 20 years), minimum O&M requirements and costs. Such characteristics make the ORC perfectly suitable to exploit the waste heat sources that are present in all O&G fields, namely the flare gas in the upstream, the exhaust gas of the open cycle gas turbines that operate in the midstream

and the medium-to-low temperature streams that are typical of the refineries in the downstream.

One of the main international players in heat recovery projects, with a field-proven experience also in the O&G industry, is Turboden. Its leadership in ORC technology is confirmed by its 300 ORC plants operating worldwide and other 50 under construction.

