Innovative Sustainable Solutions to Optimize Plastic Waste Management

M. Marchionna
Saipem, Technology Innovation

Abstract

Embracing new models that create value and safeguard the environment by improving the management of resources, eliminating waste through better design, and maximizing the circulation of products is one of the pillars of our strategy towards a more and more extensive decarbonization. The development of innovative solutions to sustainably treat any kind of waste produced by urban, commercial, and industrial activities (Oil & Gas, Petrochemistry, including plastics recycling, Cement, Iron & Steel, Pulp and Paper, …) with their consequent valorization to energy and/or valuable products, is becoming an important asset.

Confining our interest to plastic recycling, disposal and recycle of plastic wastes are key topics for which a comprehensive solution needs to be found and developed soon. A potential new, important market is growing but many challenges need to be faced.

As a major international contractor, we have started the analysis, planning and implementation of plastic recycling projects, with the business vision that the industry is developing. As a result, the main challenges gradually emerging from the project works become clear and their analysis can help tuning the overall vision. Several and very diverse stakeholders are involved, and it is important to realize the contribution expected from every of them as well as the state of the art of this developing business with its different possible operating models. There is no “one-solution-fits-all” approach and there is a great need for players who can have a holistic, high-level vision to the problem while maintaining the capability to implement specific projects tailored to regional situations with unique operating and financial constraints.

In the above contest, we are developing different technology options, in order to develop different solutions to be flexibly deployed according to the specific situations. Among them we may mention: clean combustion, with CO_2 recycle to urea or methanol production, through ITEA’s ISOTHERM Pwr® “Flameless” Oxy-Combustion, gasification to produce syn-gas to be possibly converted to chemicals - Saipem has an agreement with a technology provider in order to co-develop a pressurized gasification technology to produce syn gas from waste - and pyrolysis with product recycle to the Steam Cracker; in this respect Saipem has entered into an agreement with Corepla (national plastic recovery consortium) and Quantafuel to jointly promote circular economy models for plastic waste, and to seek building chemical recycling plants throughout Italy.