Regions located in desert areas, like Middle East and North Africa (MENA) face a number of challenges: according to the World Bank, the MENA region is home to some 6% of the world population, but has only access to less than 2% of the world’s potable water.

Energy-intensive seawater desalination processes need to be applied to ensure meeting the demand. However, this region is highly dependent on fossil fuels: more than 80% of the energy required is generated from oil, gas and coal.

Last, but not least, the region has an unsolved waste disposal problem: According to the GIZ, German Association for International Collaboration, more than 50 million tons of residual waste are produced per year in MENA from which close to 95% are openly landfilled without any pre-treatment. This disposal method has not only negative health and environmental impacts, but also keeps the performance potential of municipal solid waste (MSW) unused.

MSW contains valuable, largely CO2-neutral energy. The Integrated Waste-to-Water Process (IWWP) allows recovering and using this energy to power the energy-intensive water desalination.

300 tons of MSW have the potential to generate enough energy to provide potable water for 100,000 people. This secures a sustainable, less fossil fuel depended, potable water supply for local citizens.

The Integrated Waste-to-Water Process uses municipal solid waste to fuel seawater desalination plants.

The concept is especially developed for applications in desert areas.
Fostering modern waste management

The IWWP helps to establish a modern waste management system enabling a reliable and ecologically-friendly disposal of waste amounts generated.

If the waste is thermally treated, its volumes can be reduced by more than 90% thus reducing the need for landfill capacities. And emissions produced are significantly below even the most stringent environmental standards.

The IWWP combines proven Waste-to-Energy (WtE) with Multiple Effect Distillation (MED) seawater desalination technology to feature the efficient cogeneration principle.

The WtE process generates superheated steam driving a back-pressure turbine which produces electrical energy used to cover the total power demand of both the WtE and desalination facility.

Steam from the back end of the turbine is supplied to the downstream seawater desalination plant and is used to heat the seawater in the MED process.

Vaporised seawater condensates and can be supplied as potable water. Steam from the turbine condensates during the heat transfer to the MED and is fed back to the incineration process as feed water.

The IWWP is a concept that is designed to make maximum use of available, climate-friendly resources while meeting urgent challenges of desert areas.