

# Sheffield bioenergy experts collaborate with Egyptian partners to produce drinking water

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Seawater in Egypt could be turned into drinking water using biomass energy as a source of heat in a new collaborative project from academics at the University of Sheffield UK and Port Said University in Egypt.

The unique two year project will see academics from the world-leading Energy 2050 Institute partner with Egyptian experts to develop a [system](#) that could provide fresh and safe water to poor and rural communities.

Egypt's growing population and scarcity of water resources means that freshwater supplies are becoming increasingly stressed.

Desalination technologies, which produce drinkable water from seawater, offer an alternative source of water but at a high [energy](#) cost. Renewable solar energy has been used extensively in these technologies but is not consistent due to not enough sunlight on cloudy days and at night.

A hybrid system using biogas and solar is an entirely new technology with only a handful of studies being attempted so far. There are several options for the integration of the hybrid energy system and the desalination process and the process will explore both thermal and electrically based freshwater production systems.

The collaborative team will investigate whether biogas produced from biological matter - such as cattle manure - could be used as a feasible backup to solar. At the same time, the team will find the optimum way

of integrating the two technologies to maximise fresh water production.

The project will involve a survey of biogas resources in Egypt, a model-based design and optimisation of the hybrid desalination system and will investigate the operational strategies to ensure cost-effective and reliable [drinking water](#) supply to rural communities.

The team hope that the hybridisation of biogas and solar energy sources will lead to more reliable and flexible energy production but also will be cheaper than using a single renewable energy [technology](#) alone, given that both biomass and [solar energy](#) are in abundance in Egypt.

Dr Mark Walker, Research Associate at Energy 2050, said: "The first part of the project will see us look at how to maximise fresh water production at the lowest cost. We'll also be investigating how different wastes can help us to produce the most energy to supply the system.

"Our project could provide continuous production of fresh [water](#) to rural areas, at a low cost and smaller carbon footprint than current technologies."

A pilot demonstration system will be built in Egypt and will be monitored by the joint UK/Egyptian team to assess its performance. The team hope to install integrated desalination systems in poor and [rural communities](#) of Egypt like Sinai, Nile-Delta and Upper Egypt.

Dr Mohamed Hammam, Assistant Professor at Port Said University, said: "This project is important from many perspectives. Beside the technological and economical benefits, it allows researchers from two institutes with famous experience in the field of renewable energy and combustion to work closely together."

Provided by University of Sheffield

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