

University Research for a Better Ireland

Energy

Developing Clean Energy



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Ireland's energy future is at risk. With heavy dependence on imported fossil fuels, dwindling domestic gas production, and increasing geopolitical instability, we face growing energy anxiety. Our researchers deliver groundbreaking research, with, and for industry and communities, and are key to unlocking Ireland's vast alternative energy potential, reducing our dependence on foreign energy, and securing a cleaner, resilient future.

Building our Off-shore Energy Industry

Ireland aims to source up to 80% of its electricity from renewable sources by 2030. Several offshore Irish wind farms are at advanced planning and development stages. Ireland needs up to 500 offshore wind turbines, depending on the type of technology we use.

University College Cork Engineer, Dr. Jimmy Murphy, is paving a path forward to ensure we can reach our goal. His team is pioneering test beds to produce the most cost efficient infrastructure, globally, that can also thrive in the harshest marine environment.

Energy Storage Solutions

Ireland's renewable energy future hinges on a key challenge—effective wind and solar energy storage. Chemist, Prof. Kevin Ryan at **University of Limerick** is tackling this head-on, advancing the safety, and cost efficiency of battery storage. His innovations are crucial for powering homes, businesses, and electric vehicles into the future, ensuring that the energy we generate can be safely stored and readily released when needed. Kevin's breakthrough work empowers Ireland's use of home-grown renewables and strengthens energy security.

Harnessing the Power of Solar Energy

Solar energy promises a cleaner, cheaper future for all residents, industry, and off grid households. But the technology that enables changing sunlight to energy, photovoltaics (PV), needs to become more efficient to ensure access for all. Achieving this requires cost-effective manufacturing, and smarter material use. Dr Sithara Pavithran Sreenilayam, **Dublin City University**, and colleagues are revolutionising solar technology creating efficient, recyclable, and affordable alternatives - reducing waste, cutting CO2 emissions, and making clean energy a real alternative.

Fuelling Public Transport with Green Hydrogen

Ireland and island communities across Europe have an energy system highly dependent on fossil fuel imports. Led by Dr. Pau Farràs, **University of Galway**, researchers have created public transport vehicles fuelled by hydrogen generated from seawater and sunlight. Collaborating with researchers across Europe, the team has created a new hydrogen plant; a refuelling station for public transport vehicles; and successfully modified battery powered electric vehicles to run on hydrogen. This effort has made Ireland a centre of excellence in hydrogen technologies, and led to our first EU-funded hydrogen valley based in Galway Port.

