

Integrating renewable for energy security



Paul McCormack at the GenComm launch with keynote speaker and energy expert Michel Junker.

How can we provide energy security at constant efficiency and reduced cost through greater integration of renewable energy in our energy matrix?

The challenge faced by Europe, and Ireland especially, is how to increase the share of intermittent renewable energy supply to meet demand in North-West Europe. This is especially challenging when our electricity grid is at maximum capacity and where expanding or increasing grid capacity will require major capital cost.

This lack of grid capacity is the biggest limiting factor in increasing the utility and community scale renewable energy supply in Ireland both north and south. Rural and isolated communities face unique energy issues related to efficiency, reliability and sustainability. This is commonly due to dependency on external and fossil fuel energy supply, low electricity grid capacity and limited or no connection to wider grids. As a result, these communities have higher than average carbon emissions and are more vulnerable to fluctuating fuel prices.

Renewable energy sources continue to increase their share of installed capacity worldwide. Their integration, in conjunction with increased energy efficiency and other low-carbon technologies, constitutes the best opportunity to achieve energy sustainability. They also constitute the best option to avert the risks that conventional non-renewable sources pose to health, geopolitics, the economy and the environment. In accordance with their commitment to the Paris Agreement of 2015, 175 parties have created national renewable energy action plans (NREAPs). Each NREAP aims to develop mixed energy systems that rely

on a variety of renewable energy sources and energy carriers. These plans involve increasing renewable energy penetration targets for the electricity, heating and cooling and transport sectors. These three sectors alone account for 20 per cent, 40 per cent and 40 per cent respectively of total end-use energy demand. And to shift from a hydrocarbon-based economy to a renewable one, there is a need for clean sustainable energy carriers. Energy carriers have now been identified as the key enabling solution that allow renewable sources to supply different forms of energy demand across these sectors, and thus strengthen their technical and economic viability.

Hydrogen is one of these carriers that has attracted much support from across many countries across the globe. In fact, it has the potential to become one of the main energy carriers of the future as it can be easily produced using renewable energy, stored using commercially available technologies and used throughout the entire energy system. The use of hydrogen as an energy carrier however, has been hindered by specific challenges that need to be addressed.

The Interreg North West Europe funded project GenComm led by Belfast Met is seeking to address the barriers preventing the greater integration of renewables into our energy matrix and to navigate a new energy pathway to energy security. GenComm (GENerating energy secure COMMunities) is a Smart Hydrogen-Integrated renewable energy, generation and storage project designed

to develop a new model for exploiting generated electricity from renewable sources to provide energy security for remote communities. Every community in the NWE region (whether or not remote) consumes the big three: power, heat and transportation fuel. The GenComm project through three renewable energy pilot schemes, each producing hydrogen from a renewable source – anaerobic digestion, solar and wind will demonstrate how hydrogen as an energy carrier can be the new energy pathway and overcome the current obstacles blocking greater utilisation of renewable energy in our energy consumption matrix.

The GenComm team are seeking to achieve successful energy transition to renewables in North West Europe by demonstrating the full commercial opportunity for renewable energy through renewable energy sector coupling by utilising SMART H2 (Hydrogen produced from renewable energy sources) as an energy carrier to achieve this goal.

The team are working to resolve grid constrained, renewable energy deployment issues, greening the energy infrastructure, creating and demonstrating the appropriate environments and setup required to utilise the excess renewable energy, transforming and storing it as a Hydrogen Gas and then using this as an energy carrier for multiple uses within the energy demand spectrum. This work will demonstrate how Ireland can benefit from energy security at constant efficiencies and reduced costs by greater integration of renewable energy in our energy matrix.

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