



## Overview of the GenComm project

The €9.39 million GenComm project funded by Interreg North West Europe aims to address the energy sustainability challenges of NWE, by technically and commercially validating renewable hydrogen technologies. The project will develop three pilot plants, in Northern Ireland (wind power), Scotland (bioenergy) and Germany (solar power), linking the three main renewable sources, Solar Power, Wind Power and Bioenergy, with energy storage and the main forms of demand - heat, power and transportation fuels. Based on the pilot plants, technical and financial models will be developed, with the overall aim of developing a Decision Support Tool (DST). This DST will then provide a roadmap for communities to transition to renewable, hydrogen-based energy.

## GenComm launches 'Hydrogen Ireland' at City Hall Belfast

Carbon reduction and renewable hydrogen were top of the agenda at Belfast's City Hall on 12 March, with the launch of 'Hydrogen Ireland', Ireland's new national hydrogen association. Launched as part of GenComm's Open Meeting, the new association is a welcome development for all those involved in developing the renewable hydrogen sector. Hosted by GenComm partner Energia, energy stakeholders from across Europe gathered for the launch, and to hear the latest developments on the GenComm project.

The Lord Mayor of Belfast, Councillor Deirdre Hargey, was present to welcome attendees to the City Hall, and showed her support for the GenComm project and its long-term aim to provide a clean sustainable energy solution for Northern Ireland communities: "The work being carried out by GenComm into discovering more sustainable and environmentally friendly forms of energy is fantastic. We need to be more aware of the impact we're having on our environment and work collectively to improve the world we live in for future generations."

Ruut Louwers, Programme Director at Interreg North West Europe, commented: "It gives me great pleasure to be present at the launch of Hydrogen Ireland here in Belfast! This is one of the main outcomes of GENCOMM, which is demonstrating an innovative combination of successful solutions that can achieve higher impacts on the communities of North-West Europe. INTERREG NWE decided to finance this initiative as it demonstrates a smart way to tackle storage, which represents one of the main challenges hindering the development of renewables and the reduction of GHG emissions in the EU. With five countries involved in the partnership, the project is also a solid example of the added-value of transnational cooperation and cohesion between Member States."

The GenComm meeting also coincided with the recent publication of an EU Survey on the EU's 28 progress towards their 2020 renewable energy targets. With Sweden coming out top with more

[www.hydrogenireland.org](http://www.hydrogenireland.org)

than half (54.5%) of its energy coming from renewable sources and exceeding its target, the UK remains short of its national target, with 10.2% of its energy coming from renewable sources. Northern Ireland expects to reach its ambitious 40% renewable 'electricity' target one year ahead of schedule, however it increased its overall greenhouse emissions in 2016, and its transport emissions are 29% higher than in 1990. Projects like GenComm are therefore vitally important in the drive to meet climate change targets, and to seeing much needed improvements to transport emissions.



**Front from left:** David Barnett, WrightBus; Cathal Boylan MLA; Lord Mayor of Belfast, Councillor Deirdre Hargey; Paul McCormack, GenComm Project Manager, Belfast Met; David Strain, Department of Infrastructure; Sam Knox, Invest Northern Ireland;  
**Back from left:** Clare McKeown, Belfast City Council; Damian Duffy, Belfast Met; Mark Welsh, Energia – pictured beside Wrightbus's hydrogen-fuelled bus.

## Wrightbus hydrogen double decker buses to help tackle London's toxic air

Twenty Wrightbus built zero emission hydrogen buses will arrive in London next year. The world's first hydrogen double decker buses will be introduced on three London bus routes next year. On May 10, 2019 'Transport For London' (TfL) ordered 20 of the green buses, which produce no pollution from their exhausts, as part of its drive to make London transport zero emission. The environment friendly vehicles will be introduced on routes 245, 7 and N7 with people travelling to Wembley Stadium, or from West London to the West End.

TfL is investing £12 million in the new buses and the fuelling infrastructure. Wrightbus will manufacture the buses. TfL is leading procurement within the 'Joint Initiative for hydrogen vehicles across Europe', (JIVE) project.

Sadiq Khan, Mayor of London, said: "We all have a role to play in cleaning up London's toxic air and I've always said that TfL should lead from the front. Following the launch of the world first Ultra Low Emission Zone last month I'm delighted that TfL has today signed a contract to bring 20 state of the art, zero emission hydrogen buses to London's streets. We are investing a record £85 million in cleaning up our bus fleet, and I am proud that London now has the largest zero emission bus fleet in Europe."

Hydrogen buses can store more energy on board than equivalent buses, meaning they can be deployed on longer routes. They only need to be refuelled once a day for five minutes, making them much quicker to power up when compared with conventional battery electric buses.

David Barnett, Wrightbus' Business Development Director, welcomed the news saying "Wrightbus are delighted to be working with TfL to bring 20 zero emission double decks into service in London. The innovative configuration allows us to offer a zero emission double deck with much greater flexibility due to the increased range and short refuelling times."

"Wrightbus are continuing to work closely with other cities, and we expect that this order from TfL marks a tipping point for the fuel cell electric vehicle (FCEV). Wrightbus predict that the FCEV will become an integral part of the UK's solution for zero emission public transport"



Wrightbus' new hydrogen bus pictured at GenComms open meeting in Belfast, from left David Barnett, Wrightbus, Lord Mayor of Belfast, Councillor Deirdre Hargey, Ruut Louwers, Programme Director, Interreg North West Europe, Paul Mc Cormack, Belfast Met and Neil Morrow, Energia.

## GenComm partner BURN presents at the first SMARTCATS conference

In January 2019, the first conference about SMART energy Carriers and Technologies (SMARTCATS) took place in Naples. The objective of the SMARTCATS organisation was to share state-of-the-art knowledge and perspectives relating to the storage and release of energy using advanced combustion technology.

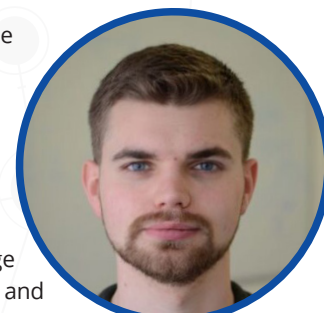
The goal of the event was to provide practical solutions for ensuring the security of energy supply. Researchers and industry concluded by the end of the conference, the emerging need for the integration of energy carriers to negate the intermittent effect of renewables on our electricity grid. BURN was present at this conference and showed its work on the topic of robustifying the hydrogen-based energy carrier (i.e. ammonia) production process to enable a low-cost solution for seasonal storage of hydrogen.

On the first day of the three-day conference, Kevin Verleysen, the new PhD researcher of the Department of Mechanical Engineering, showed his Gencomm contributions to the public. The topic of the work is

related to the optimisation of the ammonia synthesis process when operational uncertainties are influencing the performance. This robust optimisation is deemed necessary when considering the operational safety of the complete process when renewable energy needs to be captured and transformed on the spot into ammonia. Ammonia as an energy vector has an advantage over the other synthetic fuels, e.g., methanol and methane, because it can provide a pathway of CO<sub>2</sub>-free energy storage using the mature and commercialised Haber-Bosch process.

Research and industry confirmed during the conference the market potential and the wide range of applications for renewable ammonia, as a key enabler for seasonal hydrogen storage and maritime fuel. They concluded and recognised that ammonia is the cheapest, simplest and safest low-carbon alternative for this long-term storage of hydrogen due to the ease of distributing and transporting the hydrogen as a liquid fuel.

*Kevin Verleysen*



*Kevin Verleysen  
BURN, Brussels*



## The need for more advanced electrolyzers

Hydrogen is a near zero-carbon energy carrier. In decarbonising our planet, high temperature industrial processes and heavy freight have not identified convincing pathways to decarbonisation. Given its energy density coupled with safety challenges, can heavy freight and high temperature industrial processes facilitate the safe and initially near zero carbon application of hydrogen as it transforms to a zero-carbon option?

A recent report from Arup (A Future Hydrogen Economy, 2019) stated that hydrogen could play a role in decarbonising UK energy, but states that hydrogen use will need policy changes and commitments, provided there are enough demonstrators to validate the correct scenarios for its use. Consumer engagement will be an important element of this work as hydrogen has significant consumer perception issues to overcome. Network capacity will be an important aspect for distributing hydrogen, especially from updated gas distribution networks. However, there is a query over use of the gas transmission network for hydrogen.

Current research will also need to focus on electrolyser efficiency. Improvements in efficiency will facilitate both current projects that consider use of natural gas as a hydrogen source when combined with adjacent Carbon Capture and Storage (CCS). CCS has only 2 large scale operating projects in Norway based on redundant North

Sea oil production facilities. The UK is proposing 5 CCS plants and Ireland is proposing 1 plant – all from the mid 2020's onwards.

Therefore, this leaves renewable energy as the provider of excess electricity. Wind power in the UK has 30% availability and current electrolyser technology is of the order of 60% efficiency. The need for more advanced electrolyzers is therefore paramount. But the final challenge is electrolyser location. If the gas distribution network is suitable, this would require local distributed plants placed adjacent to the gas network. We are once again faced with moving large amounts of renewable electricity to points on the network where a demand will occur. The question has to be economic in bringing together a decarbonisation strategy that works for all.

*Neil Hewitt*



**Professor Neil Hewitt, University of Ulster, Professor of Energy**

## Hydrogen mobility in the federal state of Saarland

On 22 March 2019, the first Toyota Mirai in Saarland, Germany was registered by GenComm partner IZES gGmbH.

It is a hydrogen-powered fuel cell vehicle. The first hydrogen refuelling station in Saarland is to be built at the IZES gGmbH site in the InnovationCampus Saar by autumn of this year. It will be a non-public refuelling station. The planning for this is well advanced and the main components of the refuelling station have already arrived at the manufacturer and will be installed there in the next few weeks.

Dr. Bodo Groß, head of the Technical Innovations department at IZES gGmbH, said: "After setting up and extensively testing a regenerative charging station for battery electric vehicles in recent years, within the framework of the NWE funded project GenComm, we wanted to establish hydrogen mobility in Saarland as the next evolutionary stage of electrically powered vehicles". With the registration of the vehicle and the forthcoming commissioning of the refuelling station, the "hydrogen age" has now also begun in Saarland as an essential component of the future energy supply.

*Dr. Bodo Groß, IZES, Germany*



*from left to right: Dr. Bodo Groß (IZES, Germany), Dr. Michael Brand (Managing Director IZES gGmbH) and Jonas Haferkorn (Branch Manager Toyota Autowelt in Saarbrücken)*

# Valentia Island Hydrogen Feasibility Study Launch in Co Kerry, Ireland



From left to right: Caroline Daly - Valentia Island Community Energy Group, 7. Professor James Carton - Dublin City University, Elizabeth Johnson - Pure Energy Centre, Scotland, Colum O'Connell - Valentia Island Community Energy group, Duncan Stewart - Eco Eye television presenter, Dr. Rory Monaghan - NUI Galway / GenComm, Cormac Walsh - Energy Co-operatives Ireland, Lugh O'Braonáin - Energy Co-operatives Ireland

The Valentia Island Community Hydrogen event was held on the 27th of April 2019 in the Royal Hotel, in County Kerry, Republic of Ireland.

The Keynote address to the event was presented by Ireland's foremost environmental personality Duncan Stewart, and this resulted in over 100 local people being in attendance on the day. The first section of the day was the judging of Renewable Energy themed paintings from children out of the local Junior schools on the island by Duncan.

The local Valentia Energy group is soon to become a formal Energy Co-operative. Its Chairman Colum O'Connell introduced the community energy groups history to date and the potential Hydrogen future plans. Ms Elizabeth Johnson spoke of the real life application of Hydrogen from renewable energy. She told of her involvement in the highly successful community based Surf n Turf Hydrogen project in the Orkney Islands.

An extensive Q&A on the subject of locally produced and consumed Hydrogen followed with every query from the community being answered. The success of the day provided a fantastic platform to move onto sharing the fully completed Hydrogen Valentia Island Feasibility study report

with the local community in a couple of months time. The event was called 'How Valentia can enable Irish communities to make the energy transition'. This feasibility study into the local production and consumption of Hydrogen in a sustainable way on Valentia Island was previewed in the Irish Examiner newspaper.

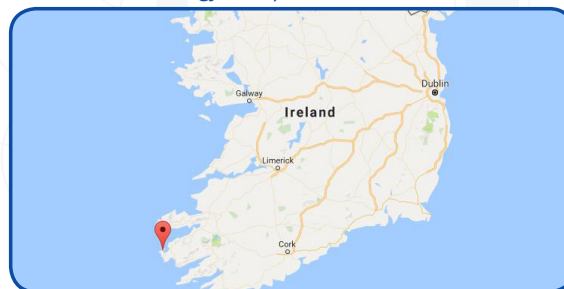
The newspaper reported how a Co Kerry island is aiming to produce clean energy which could be used to power public lighting and propel its ferry service, among other uses.

The project which is community-led is based on a successful venture which has been continuing and developing on Scotland's Orkney Islands since 2016.

Colum O'Connell, chairman of the Valentia Energy Group pointed out islanders would be able to pull up at hydrogen refuelling stations just as Orkney islanders currently do. Mr O'Connell said in the not-too-distant future Valentia could eventually be a powerhouse for storing and selling on the clean energy. He added that hydrogen is the up and coming 'transitional' energy technology as the world moves from carbon and fossil fuels. Harvested from water, using renewable energy methods, it can be stored as a gas in cylinders.

The Chief Executive of Energy Co-Ops Ireland, Cormac Walsh described the venture as exciting saying: "We are thrilled to be working with the team in Valentia. The production of hydrogen from renewable energy has the potential to enable Valentia to get to their goal of energy independence and a reduced carbon community."

Cormac Walsh, Energy Co-Operatives, Ireland



## We invite your feedback at our Open Meetings!

12 June 2019..... Aberdeen (Pure Energy Centre, Scotland)  
17 Oct 2019..... NUIG  
11 Dec 2019 ..... ENSICAEN (France)  
11 Mar 2020..... Belfast Met (Northern Ireland)



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