



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.

Moving closer to a hydrogen economy thanks to the CH2F launch

The launch of the Community Hydrogen Forum (CH2F) took place at Dublin City University on October 21, 2019. Over two days in Dublin, the latest GenComm partner meeting was also held.

The forum aims to establish a reliable, go-to source of information for all community stakeholders in the hydrogen and fuel cell space and is a key deliverable of GenComm. The forum will disseminate the latest news on real hydrogen projects, in the North West Europe region, including GenComm's renewable energy to hydrogen pilot plants.

The forum will inform communities on how hydrogen can enable growth, attract R&D investment and stimulate new cutting-edge industries, all while reducing reliance on imported and polluting fossil fuels. It will also provide information on hydrogen technology deployment and best practice, as communities strive to implement strategies to develop regional hydrogen hubs.

Among the stakeholders who will be invited to participate in the CH2F are local, regional and national authorities, energy agencies, community development groups, energy cooperatives, electricity and gas grid operators, electricity generators, large energy users and educational institutions.

The forum will also be the home of the Decision Support Tool (DST) – a web-based resource to assist industry, policy makers, investors and other interested stakeholders in assessing the commercial opportunity of hydrogen technologies which can enable sector coupling between renewable power and zero carbon transport needs across North West Europe. This is a first-of-a-kind assessment tool, designed to encourage wider understanding in the sector.

GenComm Programme Manager Paul Mc Cormack marked the launch of the CH2F, saying: "This will be a momentous day for the use of Hydrogen both here in Ireland and across Europe. The CH2F will be a resource for communities, industry and government who want to explore the use of hydrogen in the energy transition.

"By joining everyone benefits. The Community Hydrogen Forum helps move us towards a hydrogen economy and a new cleaner

energy system for all of Europe across many applications including energy storage, transport and power generation."

Ian Williamson, President of the European Hydrogen Association, said "The community hydrogen forum is designed to increase engagement with hydrogen. It will help to create a market pull for the new, clean technologies which we have developed in the last 20 years. No matter what the scale, now everyone can understand how to get involved in helping shape a sustainable hydrogen future for themselves."

Chair of the Community Hydrogen Forum, Dr Rory Monaghan from the NUI Galway Ryan Institute and School of Engineering and the MaREI Centre for Marine and Renewable Energy, said: "The energy sector has woken up to the potential of hydrogen to reduce emissions and fossil fuel use in power generation, transport, homes and businesses. It can play a truly transformative role in Europe's energy system and economy. The next step is to inform policymakers of the benefits of hydrogen and demonstrate to communities how hydrogen can re-energise regional development. This is the role of the CH2F."



Pictured at the CH2F launch in DCU are from left, Paul Mc Cormack, GenComm, Dr Rory Monaghan, NUIG, , Chair of the CH2F, Dr James Carton, DCU, Dr Wulf Clemens, IZES and Tubagus Aryandi Gunawan, NUIG

ENSICAEN partner meeting to highlight how methanation can reduce CO2 emissions

The eleventh GenComm partner meeting will be held at ENSICAEN in Caen, France in December 2019.

The École nationale supérieure d'ingénieurs de Caen & Centre de Recherche (ENSICAEN), which translates as National Graduate School of Engineering & Research Center, is one of the main French "grandes écoles", whose main purpose is to form chemical, electrical, and computer science engineers. The engineering school is located in the city of Caen in Normandy.

At the December event, Associate Professor Dr. Federico Azzolina-Jury, representing ENSICAEN, will present his main results obtained in the framework of GENCOMM on the methanation sub-route: Firstly, the manufacture of a remarkable stable catalyst based on alumina using nickel as an active phase will be described by Federico. A scientific article has been published (Federico Azzolina-Jury, "Novel boehmite transformation into γ -alumina and preparation of efficient nickel base alumina porous extrudates for plasma-assisted CO₂ methanation", Journal of Industrial and Engineering Chemistry 71 (2019) 410-424) and several conferences have been given on this subject around the globe.

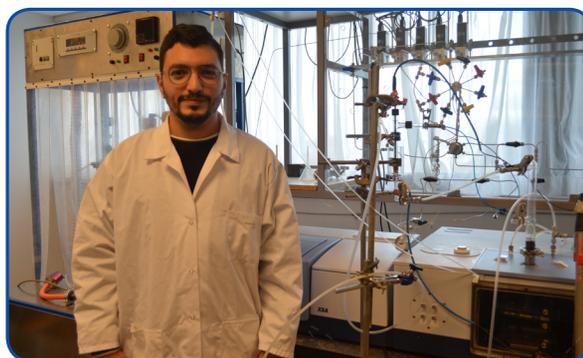
Second, the catalytic activity of this catalyst on the CO₂ methanation reaction in a methanation pilot in collaboration with INSA Rouen will also be addressed. Another scientific article has been published on this subject (B. Alrafi, I. Polaert, A. Ledoux, F. Azzolina-Jury, "Remarkably stable and efficient Ni and Ni-Co catalysts for CO₂ methanation", Catalysis Today Article in the press, March 2019).

Finally, the use of novel technologies for CO₂ methanation currently being carried out in ENSICAEN will be presented. For this December meeting, several key figures from industry and the academic sector have been invited to speak about H₂ production using different industrial processes.

This meeting is a great opportunity to introduce the main results and work of this North West Europe Interreg project to local authorities, colleagues, local students and GenComm partners. Moreover, the GenComm partners work will show to the local public, the feasibility of the implementation of renewable hydrogen technologies through the three GenComm pilot plants located in Northern Ireland, Scotland and Germany.

The methanation sub route of this project is a valuable technology for reducing CO₂ emissions into the atmosphere and for producing methane. ENSICAEN has been working on the heart of this methanation process with the synthesis, preparation, characterization and shaping of an efficient catalyst. The catalyst should allow performing the methanation reaction with a relatively high activity (CO₂ conversion and methane yield) without being deactivated. ENSICAEN has succeeded in preparing such a catalyst bringing new perspectives for the conception of an efficient industrial methanation process.

Dr Federico Azzolina-Jury, ENSICAEN



Dr Federico Azzolina-Jury, ENSICAEN

IZES presentation, empowering students for H2 learning pathway

As part of the communication and dissemination activities of the GenComm project Dr. Bodo Groß from the German GenComm partner IZES gGmbH visited St Malachy's School in Belfast on Tuesday 15th October and on Friday 18th Dr. Groß visited the Abbey Grammar School in Newry to present to students from the Abbey, Our lady's Grammar School and St Paul's Secondary School.

Spreading the green message, Dr Groß presentation centred on alternative mobility concepts and low emission alternative fuels for the future. Dr Groß said: "The main reason why we are working in this field is that we have to reduce CO₂ emissions in the transport sector rapidly."

Dr Groß explained that when comparing the three sectors electricity, heat and transport in terms of their share of renewable energy in total demand, the transport sector is the most undeveloped. Electricity as well as Hydrogen produced with renewable energy present two opportunities to reach this goal within the next two decades by using battery (BEV) or fuel cell electric vehicles (FCEV). A third opportunity could be synthetic fuels such as RME or HVO. As a conclusion Dr. Groß pointed out, that with the case of BEV the amount of new registered cars in recent year's increases rapidly.

On the one hand, this is due to the well developed infrastructure today, especially the increasing number of charging stations, and on the other hand to the increasing number of different models in different vehicle segments. In the case of fuel cell electric vehicles (FCEV) at present, only a few cars are available in Europe. Most of the new registered FCEV are coming from Korea or Japan. In both cases, the core technology (battery and fuel cells) comes from outside Europe, as well as from Korea and Japan.

The Head of CEIAG (Careers, Education, Information, Advice and Guidance) at Abbey CBS, Annelise Reynolds, said: "The opportunity to hear from industry and research partners is the link between class based and work related learning which allows students to realise what is available to them in education and the wider world for their careers."

GenComm Project Manager Paul McCormack who attended the presentation said: "The biggest barrier to driving transitions to the emerging low carbon economy is skills shortages. As we scale up the use of low carbon technologies especially in mobility, it requires people with the right set of skills to adapt them."

The presentations by Dr Groß highlighted emerging technologies and provided information for the students to make informed choices in their future studies and careers."

Green jobs help reduce negative environmental impact, ultimately leading to environmentally, economically and socially sustainable enterprises and economies. Green jobs also contribute to the reduction of energy consumption and use of raw materials, reduction of greenhouse gas emissions, minimisation of waste and pollution and protection of ecosystems.

Green skills are those skills needed to adapt products, services and processes to climate change and the related environmental requirements and regulations. They will be needed by all sectors especially in the transport sector as it transitions from fossil fuels to battery electric vehicles (BEV) and fuel cell electric vehicles (FCEV) and at all levels in the workforce.

Dr Bodo Groß, IZES gGmbH



Pictured at the Abbey School from left, Paul Mc Cormack, GenComm, Sean Sloan, Principal, Abbey Grammar School, Newry, Martina Bradley, science teacher, St Pauls High School, Bessbrook, Thomas Hackett, Head of technology, Our Lady's Grammar School, Newry and Dr Bodo Groß, IZES.

Invest NI feasibility studies can help companies become greener

Invest NI can now help you investigate new innovative energy technologies for your business.

Sam Knox, Invest NI, Business Development Executive and GenComm Steering Committee member points out the importance of the new energy surveys on offer, saying: "Hydrogen produces zero CO2 when combustion takes place and it has the potential to play an increasing role in the decarbonisation of our energy supply to help achieve the zero carbon target of 2050.

"Similar to natural gas, hydrogen can be used for heating, industrial processes, power generation, energy storage and transport but we will need to take into account many factors such as; what technologies are available and suitable for your business, the training of personnel, planning consents, health and safety requirements and the economic business case for the application of the various technologies.

"To accelerate the potential application of such new innovative energy technologies, Invest NI are offering client companies fully funded technology feasibility studies by independent consultants to help provide a basic understanding of what will be needed to develop commercial projects for businesses that support the journey to a zero carbon economy."

Invest NI also provide consultancy support to help businesses be more energy and resource efficient by identifying cost savings under the following themes:

- Resource Efficiency and Waste Management Systems,
- Efficient Technology and Processing Systems,
- Renewable Energy Systems,
- Energy Management and Efficiency,
- Investigation of New Technologies,
- Packaging Solutions,
- Standards, Accreditation and Systems,
- Transport and Logistics Efficiency,
- Sustainable Business Collaborations.

Expressions from interested businesses should be sent for the attention of Sam Knox by 15 December at ere@investni.com and the surveys will be allocated on a first come first served basis.

**Sam Knox
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Sam Knox is a Business Development Executive in the Energy and Resource Efficiency Team at Invest Northern Ireland. He is an Energy Engineer with over 30 years' experience in the sector and has delivered new business opportunities in the technology areas of energy efficiency, bio-energy, offshore wind, water and waste water. He is presently responsible for the development of opportunities associated with smart grid including energy storage and intelligent energy systems and is a GenComm Steering Group member.

Sam Knox, Invest NI, Business Development Executive



Pictured at the Ch2F launch event are from left Paul Mc Cormack, Gencomm, Eva Clymans, Interreg North West Europe Project Officer and Sam Knox, Invest NI.



Green light for hydrogen vehicles

Paul Mc Cormack, GenComm Programme Manager, recently welcomed the launch of the Hydrogen Mobility Ireland report 'A Hydrogen Roadmap for Irish Transport 2020-2030-Hydrogen Mobility Ireland.'

The report from the relatively new industry group is a big move in demonstrating how hydrogen can help in the decarbonisation of the Irish transport fleet. The report presented in Dublin to Richard Bruton, TD, Minister For Communications, Climate Action and Environment gives the green light to hydrogen vehicles including 30 buses, 50 cars and 10 trucks being on Irish roads by 2023.

GenComm are a key member of Hydrogen Mobility Ireland.

GenComm Programme Manager, and Hydrogen Ireland member Paul Mc Cormack, said: "The GenComm project welcomes the launch of the Hydrogen Mobility Strategy for Ireland. Decarbonising transport fuels and the electricity supply are prime requirements under the Paris agreement. As Ireland plans and develops a successful energy transition away from fossil fuels and towards the widespread use of secure renewable energy supply it will require the exploitation and implementation of existing and new technologies with industry stakeholders/ customers having commercial confidence in them. This strategy forms the building blocks of this confidence required by the market and illustrates how Hydrogen can be part of the future green energy mix for Ireland."

Mr Mc Cormack foresees the hydrogen vehicles in Ireland as being a vital part of the move towards growing a hydrogen economy. GenComm itself will technically and financially validate renewable H₂, and develop a Decision Support Tool (DST) to enable stakeholders and communities to transition to renewable hydrogen.

Hydrogen fuel cell vehicles consume hydrogen as a fuel to produce electrical power for the vehicle, with water vapour the only by-product. Hydrogen Mobility Ireland have set forward the business case and rationale for both the private sector and Government to support the provision of hydrogen fuel cell vehicles.

The report presented to the Irish government finds that:

- Ireland should follow the lead of countries like China, US and Japan who have committed to each having in the region of one million hydrogen fuel cell vehicles by 2030
- The Government should apply similar incentives to hydrogen fuel cell vehicles as they do to battery electric vehicles currently
- Hydrogen vehicles will be cost-competitive with conventional fuel vehicles by mid next decade.

Buses, vans and taxis could be deployed as the catalyst for market establishment

- Recommends building clusters of refuelling stations to give early adopters confidence
- A first deployment project involving two hydrogen production sources and three refuelling stations are presented. This can be done at a cost of €34M, and will require €14m of funding from Government
- By 2030, a network of 76 stations would ensure that 50% of the population of the island would live in a town with a Hydrogen Refuelling Station as well as providing adequate coverage of major roads, while a network of 27 electrolyzers collocated with renewable generators (mostly wind farms) would supply the hydrogen fuel
- In a positive adoption scenario this will lead to a national fuel cell fleet of 2,000 HGVs, 880 bus/coaches, 6,800 vans and 29,000 cars by 2030
- Hydrogen could abate 300,000 tonnes CO₂ annually (2% of transport emissions) with the potential for this to significantly increase in the 2030s. The cost of this abatement would be between €75-100/tonne

The full report is available at the following link:
<http://www.element-energy.co.uk/wordpress/wp-content/uploads/2019/10/20190930-Hydrogen-Mobility-Ireland-Final-External-Report.pdf>



Pictured at the Hydrogen Mobility Ireland strategy paper launch are Hydrogen Ireland members from left, Dr James Carton, Dublin City University, Co Founder of Hydrogen Ireland, David Strain, Department For Infrastructure, (NI), Paul Mc Cormack, GenComm Programme Manager, and Mark Welsh, Energy Services Manager, Energia.



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