Interreg
North-West Europe
GenComm
European Regional Development Fund

H_2GO NEWS

September 2021

GenComm Princeton Bound

I joined the GenComm project after completing my master's degree in energy engineering at the Technical University of Berlin in 2017. A collaboration of 10 partners in GenComm aims to technically and financially validate the value chain of renewable hydrogen. I always had the interest in clean and sustainable fuel. Therefore, to be part of GenComm is a true honour and excitement for me.

From one meeting to another, I have learned how a regional European project has effectively managed to achieve the project's goals. The expertise of each partner helped me to validate the techno-economic parameters for the modelling work. GenComm also provided me with plenty of opportunities to describe the progress of our work to the public. It facilitated in sharpening my skills in time management and communication. Additionally, GenComm bridged and connected me with the crucial stakeholders in the energy transition. It added another milestone to my valuable work experience.

One of the essential goals of GenComm is a Decision Support Tool (DST) of the Community Hydrogen Forum (CH_2F). The DST was completed and delivered by the National University of Ireland Galway (NUIG) as a deliverable of the long term effects. The DST aimed to assist in evaluating how hydrogen technologies can be deployed for hydrogen-fuelled buses in major cities across Northwest Europe. Furthermore, through the CH_2F, the DST can now be utilised by two other EU-funded hydrogen projects, SEAFUEL and HUGE. In addition, of course, more energy communities and stakeholders are expected to benefit from established GenComm' forums and tools in the future. Currently, NUIG develops the Enabling Support Tool (EST) as the next generation of DST.

I will be joining the Energy Systems Analysis Group at Princeton University's Andlinger centre for Energy and the Environment as a postdoctoral research associate in October 2021. The research will be on Net-Zero America (NZA) studies. Some regions in the US have plenty of biomass resources. The biomass can be converted through various types of bioenergy conversion plus carbon capture storage to produce bio-hydrogen. The experiences I have gained during my study at NUIG and work at GenComm will be beneficial to accomplish this research.

Therefore, I would like to express my gratitude to our project coordinator, Paul McCormack, and my supervisor, Dr Rory Monaghan, for the tremendous support and help in my career and study. Finally, I want to extend my thankfulness to all the family members of the GenComm project. It has been a true pleasure to work with all of you.

Gunawan Tubagus
NUIG

Bus Éireann Hydrogen Fuel Cell Bus Deployment

Monday July 19th 2021 was a pivotal day on Ireland's path towards transforming our national public transport system for future generations. The first step in the transition, from conventional fossil-based diesel power to a future zero tail pipe emissions fleet, was heralded by the introduction of the first three zero emissions double deck buses in the Republic of Ireland.

Whilst most similar first zero emissions launches to date in other countries across Europe have involved Battery Electric buses, this launch was somewhat different, in that not only are the buses based on electric drive technology, they are Fuel Cell electric buses, employing hydrogen as the primary fuel.

The three FCEV buses, funded by Ireland's National Transport Authority, were designed and assembled by Wright Bus, in Ballymena. The 11.5m StreetdeckH$_2$ is a first generation hydrogen fuel cell bus, borne from a rejuvenated Wright Bus, following Jo Bamfords incredible foresight and strategic investment in the company in 2019.

The origins of this pilot deployment go back to the establishment of Hydrogen Mobility Ireland in early 2019, to develop a structured and informed roadmap for hydrogen as a transport fuel in Ireland. With a broad membership of industry members from across the transport and energy sectors and input from policy stakeholders from the Republic of Ireland and Northern Ireland, the publication of HMI's **'Hydrogen Roadmap for Irish Transport, 2020-2030'**, in October 2019, led to the National Transport Authority's decision to invest in three FCEV double deck buses, to validate the technology ahead of further potential larger scale deployment.

Whilst the current range of Battery Electric technology meets the cumulative mileage requirements of many urban routes, Hydrogen Fuel Cell technology provides a complimentary zero emissions solution for longer distance outer urban commuter, regional and inter-city services.

Stephen Kent, CEO, Bus Éireann, **Eamonn Ryan,** Minister for Transport and **Anne Graham,** CEO National Transport Authority

Ray Connolly, Bus Éireann, explains fuel cell technology to dignitaries.

Bus Éireann is Ireland's national public transport company, providing public transport services in the main urban cities of Cork, Limerick, Galway and Waterford, many regional town services, long distance Expressway inter-city routes and national school transport services.

One of Ireland largest heavy commercial vehicle fleets, we operate a wide range of bus and coach vehicle types designed for the broad scope of services provided, with a fleet of over 1,000 vehicles. In transitioning to a full zero emissions fleet, hydrogen fuel and fuel cell vehicle technology is a hugely important solution in that journey, particularly in its potential to accelerate that transition on longer distance routes.

Hence, deploying the three buses on our outer urban commuter routes from satellite towns in the Greater Dublin Area into Dublin city centre, allows us to test the performance and reliability of the technology in a range of operating conditions -from slow stop-start urban driving to outer urban and higher speed motorway running.

This pilot deployment will provide us with significant insight into the operational characteristics of the technology, including an assessment of fuel consumption in different operating environments, effects of temperature and pressure across seasonal variations and direct comparisons with conventional diesel bus performance. It also allows us to assess fuelling attributes ahead of wider full scale fuelling station deployment, passenger and driver adoption of the technology and to work with vehicle manufacturers on developing and enhancing second generation products.

Prior to entering service, Minister for Transport Eamonn Ryan said *"Reducing carbon emissions from transport is critical to reaching our climate goals and will also improve air quality for all."*

"Other technologies such as battery-electric, are very well suited to bus services in urban areas, but on longer commuter and inter-urban routes, hydrogen fuel cell technology is an innovative zero pipe emission alternative to diesel."

"I'm especially pleased that the Wrightbus Streetdeck, which is the first such bus in the world, is assembled in Northern Ireland and that Bus Eireann are piloting these buses on their commuter route between Dublin to Ratoath."

Stephen Kent, Chief Executive Officer, Bus Éireann commented that *"Bus Éireann is committed to the transition to a zero emission fleet and to our sustainability targets which include growing passenger journeys and offering a compelling alternative to private car travel."*

"Given the very varied routes, locations and terrains Bus Éireann serves across 82 million kilometres a year, it has become evident that no single technology is the answer."

"We are especially excited about the range offered by zero tail-pipe emission hydrogen vehicles, and also the passenger benefits of silent, smooth travel that delivers a notably different and much improved bus journey experience."

"Combined with the environmental benefits, I am confident that this improved experience will help to convert more people to bus travel."

"While the focus is often on the vehicle, the deployment of each new technology requires huge back-of-house changes for our skilled engineers and craft workers, at our 17 depots and in our supply chain."

"We are grateful for the support and investment of Minister Ryan, the Department of Transport, the National Transport Authority and collaboration with all partners as we begin to implement fundamental changes in our operations. We are delighted to get Ireland's first hydrogen fuelled buses on the road and into public service next week."

Anne Graham, NTA Chief Executive Officer said
"As these new hydrogen buses go into operation with Bus Éireann, we are setting out on a journey towards a zero emission public transport fleet."

"Procuring these three buses and putting them into service gives us an opportunity to pilot hydrogen-fuel-cell technology in daily public transport operations in Ireland and to assess the part it can play in the long term transition to a zero emission bus fleet."

While the initial pilot deployment phase will continue until the end of 2022, initial performance indicators from the three buses have been extremely encouraging. While loadings remain constrained by Covid impacts, initial consumption figures are well within our original expectations. Driver and passenger feedback has also been wholly positive.

The three buses recently reached their first milestone, in collectively operating 10,000 kms, contributing to a reduction of over 8.5 tonnes of CO_2 compared to conventional diesel buses, within their first month of operation.

That is an incredibly encouraging result in such a short period of time and provides an early indication of how Hydrogen fuel and Fuel Cell technology can play a significant and complimentary role in decarbonising road, rail and marine transport on a much larger and faster scale.

As much of the highly valuable and ongoing academic research carried out by Irish academics indicates, hydrogen has a much larger potential role in decarbonising the islands industrial and domestic sectors.

Ray Connolly, Senior Technical Manager, Engineering-Bus Éireann, **Caoimhe Donnelly,** Chief sustainability Officer, CIE and **Dr James Carton,** Dublin City University

With the abundant wind and water resources we have readily available around our coastline, it is extremely encouraging to see the genesis of some hugely significant hydrogen based projects which will bring scale and traction to hydrogen production, distribution and accessibility to the wider population.

Ray Connolly
Senior Technical Manager Engineering – Bus Éireann

Two Different Technologies Towards an Emission-free Transport Sector

As the climate continues to change and greenhouse gas (GHG) emissions keep increasing, global warming effects become ubiquitous, pressing the need for more effective actions and further implementation of green energy technology.

Photo:
BEV (Hyundai ionic) versus FCEV (Toyota Mirai)

In this regard, the transport sector continues to be highly relevant to GHG emissions and consequently to GHG reduction opportunities. It has been turned into a global arena where both new and legacy automakers attempt to take the lead of the new paradigm shift towards clean mobility. One thing is certain: the predominant days of Internal Combustion Engine Vehicles (ICEVs) are soon to be over and the arising technologies of Battery Electric Vehicles (BEVs) and Fuel Cell Electric Vehicles (FCEVs) are poised to replace them. This in turn exacerbates the need for further research and development of such areas.

OBSTACLES

Both BEVs and FCEVs need to overcome numerous hurdles in the close to mid-term future to allow for a seamless technology transition. The first of them is infrastructure. Hydrogen refuelling stations (HRS) suffer from the classical egg and chicken problem. Investors don't want to develop HRSs when there are not enough vehicles to make a profit, and consumers don't want to buy FCEVs because there are not enough HRS and finally, car manufacturers are not interested in producing FCEVs because there is not enough interest from the consumers.

The situation is more promising for BEVs due to the increase of public interest in electromobility conjoined with stricter government measures that aim to phase out ICEVs. The charging infrastructure for BEVs has been growing across the European Union but most of the growth has been restricted to a handful of countries (see Figure 2).

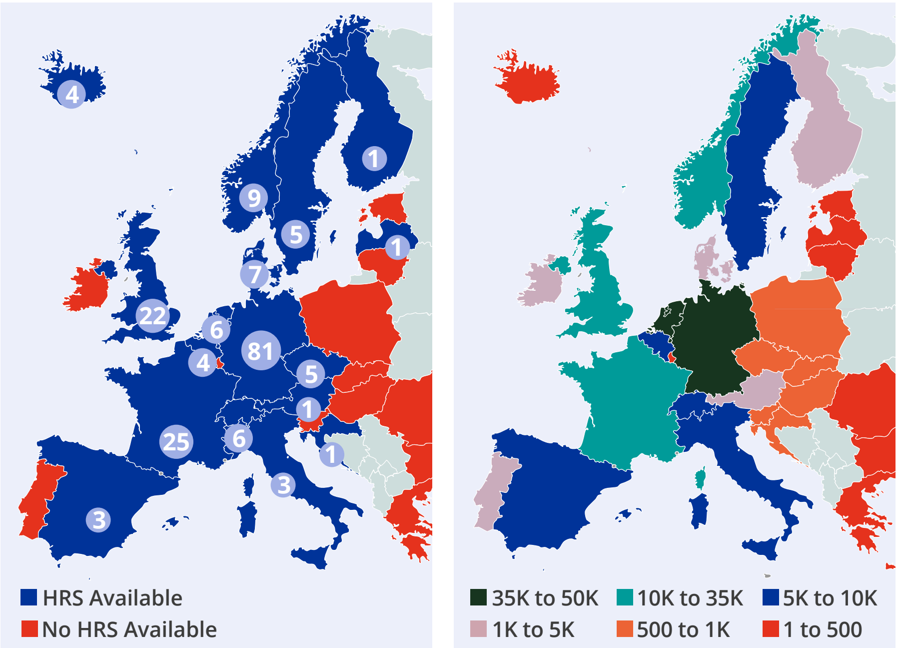
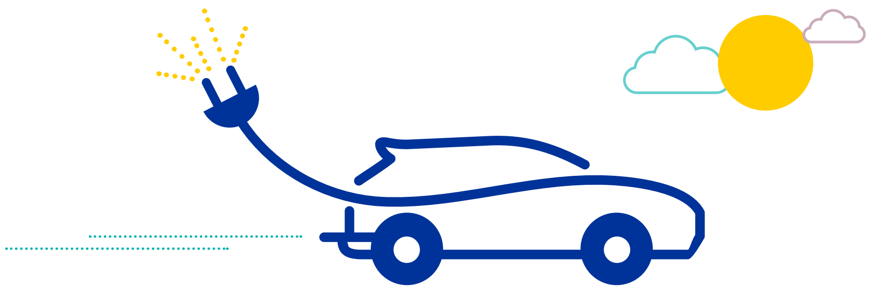


Figure 1:
Total amount of HRS for the European Union (end of 2019) (Left). Data from International Energy Agency and Amount of charging stations across the European Union (Right). Data from the European Alternative Fuels Observatory.

Another big problem is related to the establishment of circular economies around both technologies. Lithium-ion batteries use significant amounts of Lithium and Cobalt which are scarce and expensive resources. The case of cobalt is especially critical because it is also region-dependent with 70% of the worldwide extraction coming from the Democratic Republic of the Congo. Furthermore, there is a lack of standards for manufacturing and recycling of the batteries; each manufacturer uses its own shape, components and design for the batteries, adding additional layers of difficulty to the disassembly and separation of the components at the moment of recycling.

On the other hand, fuel cells use Platinum for the catalyst layer, although in quantities considerably smaller (10-20 grams) compared to the amount of Lithium and Cobalt used in a battery (up to 75% of the total battery composition). Platinum is also scarce and region-dependent, with most of the current proven reserves located in South Africa.

Last but not least, Platinum mining is a high energy consuming process requiring energy levels between two and three orders of magnitude higher per kilogram when compared to mining other metals like Aluminium or Nickel just to name a few.



ADVANTAGES AND APPEAL

Both BEVs and FCEVs are intrinsically clean, producing no GHG; however, this only holds true if the battery's source of energy as well as the energy used to produce the remaining parts of the vehicle, all come from renewable energy sources.

In the case of FCEVs, Hydrogen is used to power the vehicle, which is advantageous due to its low weight. The weight of the fuel is negligible compared to the overall weight of the vehicle, this is especially important for the case of big vehicles like lorries or trains. This aspect of FCEVs is more attractive compared to BEVs which would have the constant weight of the battery to consider and this weight increases the pollution from road to tyre contact and brakes to tyre contact (as the tyres take the brunt of the weight).

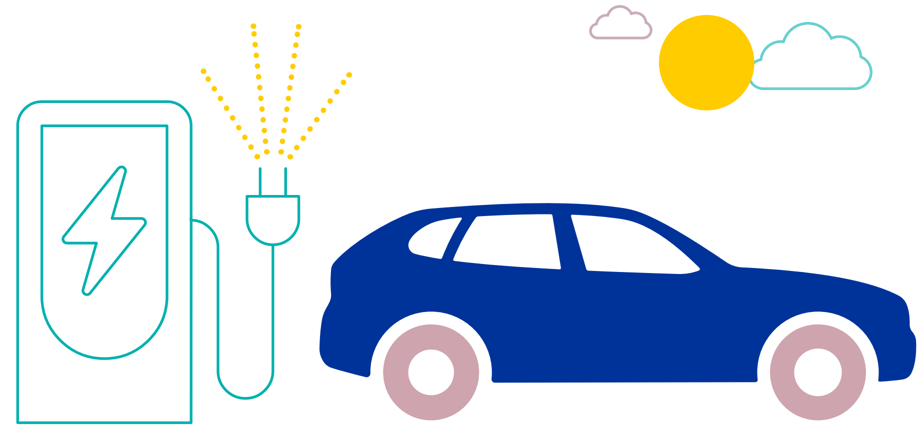
Lastly, FCEVs have a similar refuelling time as ICEVs and their powertrain efficiency sits around 60% (twice as much as the maximum efficiency of an ICEV powertrain). The efficiency comparison between BEVs and FCEVs is, however, more up for debate. All energy conversion will have an intrinsic loss; thus, as BEVs have fewer conversions than FCEVs, they are more efficient when using renewable energy sources. Just how much more efficient they are is up for debate due to the varying involved technologies related to energy generation, storing and transmission. Again, the calculation of efficiencies becomes more complex when non-renewable energy sources are considered.

Both technologies however, are still far behind in numbers compared to the ICEVs (See Figure 2). Their environmental advantages need to be paired up with economies of scale for their production and better refuelling and service infrastructure. This will reduce prices and the consumers will feel more confident to change their old ICEVs for a cleaner BEV or FCEV.

CONCLUSIONS

It is important to note that ICEVs do not necessarily need to be eliminated but merely reduced, creating space, investment, and thus infrastructure for BEVs and FCEVs. Green sources of energy and the independence from scarce and expensive materials must be emphasized in the push for the increased production and use of BEVs and FCEVs.

Additionally, the use of Hydrogen is not limited to the transport sector and it is hoped that its use expands beyond transportation means, thus increasing the desire and motivation to expand green energy efforts into other sectors; through this, more research can occur. Ultimately, little to no progress will be made if green energy is not a unified effort. Climate change is not restricted by borders and only together can winning this fight for a better, cleaner world be made more of a reality.



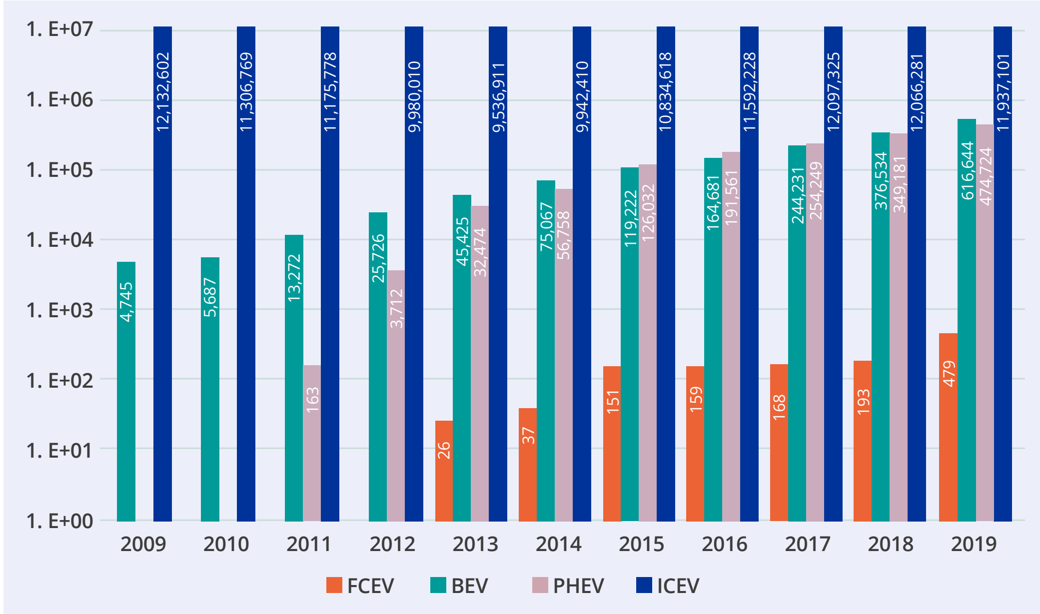


Figure 2:
Total of FCEVs, BEVs, Plug-in Hybrid electric vehicles (PHEVs) and ICEVs new registrations in the EU-28. Information from the European Alternative Fuels Observatory for the FCEVs, BEVs and PHEVs and from the European Automobile Manufacturers' Association for the ICEVs. Edited by IZES.

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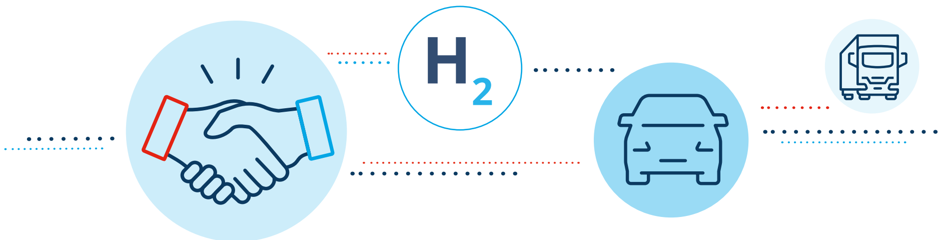
UNIVERSITY OF LUXEMBOURG

New GenComm Partner From Luxembourg

Prof. Dr. Stefan Maas and his team, composed of Dr. Steffen Bechtel and Branca Delmonte, from the Department of Engineering at the Faculty of Science, Technology, and Medicine (FSTM) of the University of Luxembourg have joined the GENCOMM Project in July 2021.

The team aims to amplify its applied research in the field of hydrogen and will work closely with the new chair in **"Energy Process Engineering"** that will start operating in 2022. While the Ministry of Energy is currently developing Luxembourg's hydrogen strategy, following **the EU "Green Deal"**, Professor Maas' team is combining its long experience in the field of energy efficiency with close cooperation with national and international partners both from the private and public sector to contribute to this discussion. As part of this effort, the University has launched the **"H2 Think-Tank"**, where key national stakeholders come together and meet regularly to discuss solution strategies and develop projects.

In the second phase of the GenComm project the new partner, the University of Luxemburg will deliver planning and scheduling for early stage green H_2 adaption in mobility applications.



Branca Delmonte said:

"I have a degree in environmental engineering and a master's degree in environmental geotechnics. After more than 10 years of working experience at university as well as in industry, mainly with oil waste management projects in my home country Brazil, in 2019, I started a master's degree in energy efficiency and economics at the University of Luxembourg, which will be completed now in September 2021. Since December 2020 I've been working with Professor Maas at ENERGE Project and will be officially joining GENCOMM as a PhD candidate in October 2021."

Dr Steffen Bechtel said:

"I obtained a master degree in "Energy Management and Energy Technologies" at the University of Applied Sciences in Ansbach (Germany) in 2017. I then rejoined the University of Luxembourg (where I already completed a Bachelor in Engineering in 2014) as a PhD Student and Project Manager in the INTERREG project "PTH4GR²ID". In the end of 2020 I successfully defended my thesis that dealt with the subject of flexible control strategies for heat-pumps. Now I work as a Postdoctoral Researcher and I mainly engage with setting up a research group dealing with hydrogen, as the debate has intensified in Luxembourg over the last 1-2 years."

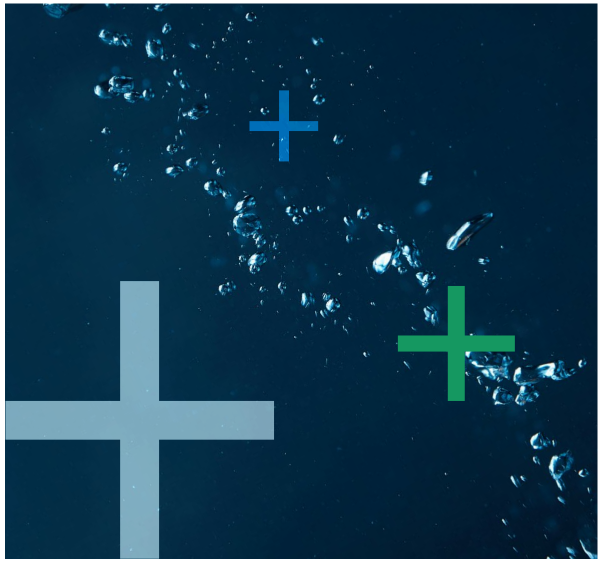
GenComm H_2GO

GenComm is moving into the next phase of the project development and delivery. Having successfully secured additional funding from Interreg North West Europe under the Capitalisation Call, the project has embarked on a €2M GenComm+ phase from July 2021 until August 2023.

As Europe strives to tackle the climate crisis and reduce $C0_2$ emissions, we are in the middle of a H_2 energy revolution - a position where all of Europe must be informed, assisted and enabled to continue the transition from fossil fuels to a net zero $C0_2$ destination. Hydrogen is no longer an 'if and why', it is now 'when and how,' and GenComm is helping develop this European Hydrogen Highway.

Through the creation of a techno-economic model, the decision support tool (DST), GenComm has helped change the energy landscape of Europe, working with partners and authorities to technically and financially optimise the commercialisation of renewable hydrogen. As the EU green energy revolution continues, authorities and agencies need continued information and key data analytics outputs to support and encourage confidence in their green energy planning. Thus, a dynamic and collaborative decision support tool involving regional stakeholders is one aspect of a regional empowerment strategy for communities to play an active role in energy transition.

Building upon the excellent work achieved to date, GenComm+ will develop the Enabling Support Tool (EST), a user-friendly online tool that can be used for proactive planning of green Hydrogen-based public transport. The EST will inform, empower and enable policy makers, authorities and transport bodies to get the optimal solution for a given green H_2 demand based on existing local structures.
The tool will first be used in the pilot regions of Northern Ireland/Ireland, Saarland, and Luxembourg and in medium term in the entire NWE area.
The EST will inform and assist regions to develop their own Green H_2 public transport roadmaps, identifying, developing and creating individual opportunities and conditions across the whole value chain for Green H_2. It will also assist policy makers, authorities and transport bodies to address the challenges of concomitant development of their own demand-driven and economic H_2 market and effectively boosting and decarbonising regional economies.



Essentially, the EST is a quantification tool that will enable all the EU transport sector to decarbonise. Initially focussed on public transport, it will also open opportunities to other hard to decarbonise mobility sectors: trucks and trains. Regional clustering of demand will facilitate larger supply hubs co-located with either industrial H_2 applications or other value chain enhancing opportunities i.e. sale of co-produced oxygen.

The EST will also enable other regions to overcome the inertia of renewable-powered electricity grids. The ability to integrate electrolysers as stabilisation components in the grids will lead to overcoming the growing problems, as decarbonisation is expected to lead to at least a doubling of electricity demand as both the transport and heat sector will be electrified. Due to the expected large industrial demand for green H_2, the EST will also promote the formation of larger clusters for H_2 production to enable the partner regions to consider other commercial development opportunities. The EST will be the basis for strategies in NWE for increasing decarbonisation by demonstrating the opportunities for multiple uses of Green H_2 through technical and economic qualification and quantification.

Key GenComm partners Belfast Met, Energia, HyEnergy, IZES and NUIG are joined in this capitalisation work package by new partner the University of Luxembourg.

Building on the success of the GreenH$_2$ mobility in NI Energia will deploy enhanced H_2 optimisation routes and technologies for further expansion of H_2 mobility deployment. IZES will develop H_2 accessibility optimisation for green mobility development in Saarland. Fulfilling the third segment, the University of Luxembourg will deliver planning and scheduling for early-stage green H_2 adaption. HyEnergy are the H_2 specialists who will provide the technical and commercial focus and integration of the three EST phases ensuring comprehensive cross fertilisation, deployment and replicability within the target regions and dissemination across other NWE regions.

NUIG will build and deliver the EST gathering, compiling, analysing and modelling the data, producing the enterprise resource planning from key data analysis. Project lead partner Belfast Met will provide management, operations and communications support ensuring continual dissemination across all Associate Partners, stakeholders and the NWE region.

By Paul Mc Cormack, GenComm

TEDx Talk in Galway by GenComm partner

Dr Rory Monaghan, from GenComm partner NUIG will give a TEDx talk in Galway on November 11, 2021. The event will be live in the Town Hall Theatre in Galway. Rory's idea for the talk is based on the premise, Green hydrogen can be a West of Ireland solution to a global problem.

With green hydrogen the West of Ireland can have hydrogen production throughout the West at onshore and offshore wind farms, ports and airports. Hydrogen powered truck and bus fleets will silently improve air quality. You can inject H_2 into the gas grid in Mayo, (symbolically replacing the Corrib natural (Fossil) gas field with green H_2 from irish wind) and in Galway for export around Ireland.

A redeveloped Galway port could serve as a Hydrogen Hub, bringing offshore wind energy ashore, using hydrogen to balance the grid, fuelling city bus truck and train fleets, (Trains could transport Galway H_2 around the country).

The availability of constant green electricity and H_2 stimulates innovative green industries and can attract new clean tech employers to the West. It would be possible to make the West the worlds top green tourism destination and to green the Wild Atlantic Way.

Rory acknowledges there is potential to deliver many times more wind, wave and ocean current energy than Ireland could ever use. But we would need a massively expanded power grid.

THE EVENT WILL BE LIVE ON 11 NOVEMBER IN GALWAY AND BROADCAST ONLINE.

Details at www.tedxgalway.com

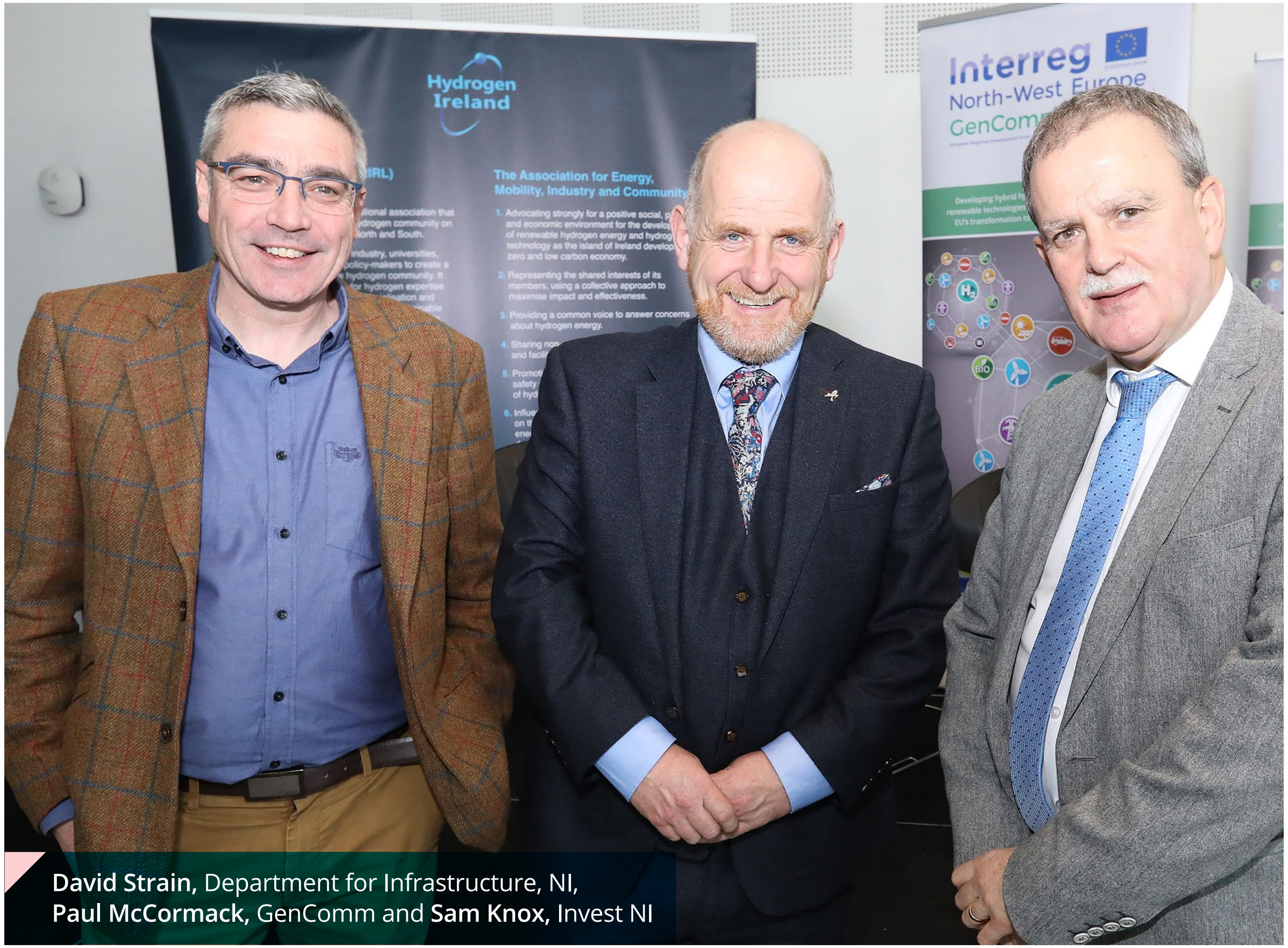
People Centred Clean Energy Transition

INTRODUCTION

As the world seeks to address climate and biodiversity challenges and move to clean energy solutions for example, these will deliver impacts within the workplace.

Positive impacts will result in new jobs and opportunities being created within the emerging green economy, but negative impacts will deliver shocks to traditional fossil fuel based industries where jobs will be lost. Net job creation resulting from the shift to clean energy will be positive, but there has to be an honest recognition that impacts on workers and communities will be uneven.

The challenge for all is to ensure this transition to a green economy remains people centred and 'just', so that no community or workers are 'left behind' or is left burdening an unfair share of the costs of this transition.



David Strain, Department for Infrastructure, NI,
Paul McCormack, GenComm and **Sam Knox,** Invest NI

TRANSITION SHOCKS

Navigating the pathway to net-zero emissions as part of the new green economy will open significant economic opportunities that will create millions of new jobs in the green technologies and nature based solutions of the future low carbon, regenerative economy.

However this transition will deliver shocks both positive and negative. Many of the new job opportunities will require workers to make technical, geographical and skills adjustments in order to bridge the transfer. Indeed, many traditionally so called 'dirty' jobs will be lost and workers need to be assisted to make this step into the new green economy, and ideally be able to use some of their skill set, learned and applied in the dirty energy sector for example, in the clean energy revolution.

Clean energy transitions around the world will have impacts, both large and small, on the lives of billions of people. Some sectors will grow significantly, others will inevitably decline resulting in job losses and the need for supported employment change, early retirement and retraining and relocation.

This transition challenge must be proactively addressed, and coordinated by government, in order to ensure the transition to a low-carbon future benefits all our workers and that none are left stranded because of this new direction of travel in our new energy pathway.

PEOPLE CENTRED

It is very important that as we listen to the headlines and the talk of targets, climate challenges, green technologies and environmental policies that we remain focussed on what lies at the centre of this change – people. People drive change, and if we are to successfully transition to a new green global economy we must ensure that people are at the centre of all we discuss, develop and deliver.

Governments, policy makers and industry must work in cohesion to ensure that the move to clean energy is fair and equitable. Upskilling, retraining and skills enhancement programmes will be critical to help dislocated workers find new employment, and to enable the industries of the new green economy to find qualified employees and deliver the low carbon technologies and solutions required for us to reach net zero by 2050.

A key part of the 'just transition' (part of the preamble of the Paris 2015 Climate Agreement), as accepted by governments around the world in the 'Silesia Declaration' agreed at COP24 in 2018, is the importance of including workers, communities and people in plans for a just transition.

This is the 'social dialogue' dimension of the just transition, important for both ensuring the legitimacy of any just transition plan, and also for allowing such co-creating processes to generate solutions based on local knowledge to be integrated into planning and design. And a good example of why this social dialogue and co-creation is important can be seen in relation to the backlash that greeted President Macron's government in France when it imposed a tax on diesel as part of their climate policies.

This led to the 'gillets jaunes' or 'yellow vests' movement which was outraged by both the lack of citizen participation in this carbon ax decision but also that this carbon tax disproportionately and therefore unfairly impacted on working class people. This is what happens when we have an 'unjust transition' – lack of support from the people.

JOBS GROWTH

The transition towards net-zero emissions will lead to an overall increase in the energy sector jobs of approximately 9 million globally. The IEA's Net-Zero Emissions report states that by 2050, an estimated 14 million new jobs are generated in energy supply by 2030 with fossil fuel production losing 5 million positions over the same period.

In addition, clean energy industries such as efficiency, automotive and construction are predicted to require a further 16 million workers. This means a total of more than 30 million jobs could be created in the green economy by 2030.

These will be mainly new jobs created as a direct result of the green transition, delivering technology convergence of information technologies with production engineering, advanced manufacturing, creating new innovative techniques, products and solutions.

This transition and convergence will fundamentally transform industry to become a smart manufacturing ecosystem and also include new roles for existing workers in construction, in the manufacturing of emissions-reducing products like BEVs and in innovative technologies such as hydrogen. This is nothing short of a new industrial revolution.

PIVOTING SKILLS

However because of the transitions and the geographical impacts of new green technologies new jobs will not always be in the same places or sectors where employment will be lost.

Countries, communities and industries that are heavily dependent on fossil energy production, especially coal will see the highest level of job losses giving rise to significant impact on local economies and communities. These impacts and losses can be mitigated through appropriate long-term planning coordinated by the state and national and local levels, and careful navigation of the energy transition route. Reskilling and retraining will ensure that many dislocated workers will find quality employment work in related sectors.

Many workers in traditional energy industries have experience pertinent to drive the transition to clean energy solutions. Offshore oil and gas workers, for example, have the skills foundations required for offshore wind, hydrogen production and low-carbon gas transport.

The energy technology solutions required to reach net zero by 2050 will involve specific geographical and technical deployment. Planning and energy opportunity navigation will ensure that geographical areas and communities that are adversely impacted by the decline of local industries should be specifically targeted for support.

Government assistance including research and development initiatives, education, skills training must be linked to decision-making criteria focused on achieving equity and inclusion, delivering high quality and well compensated jobs and still delivering clean energy solutions.

CONCLUSION

As we tackle the climate crisis and deliver a cleaner, better, brighter future we must make our transition beyond a carbon-based and climate destabilising unsustainable economic-energy model a citizen centred transition.

Transitioning to net zero will mean disruption, and that there will be costs and losers as well as winners and long term benefits, but planning the route, navigating with care, delivering commensurate benefits from the opportunities will help avoid negative social impact on our journey. As the old saying has it: 'If you fail to plan, you are planning to fail'.

Transitioning to net zero and developing a green economy presents an opportunity for economies to grow post the COVID-19 pandemic, to reinvent themselves and to develop specialised high value economies. To 'build back better' we need to 'build back green'. However the change required will be powered by a just transition, one where quality, well paid and secure work for people is the vital link in the chain for consistent, substantive progress in decarbonising our energy systems and the wider economy.

Making sure the energy world benefits all people can help advance human and economic development goals, especially in emerging and developing economies, and is critical for increasing public acceptance and support of energy transitions. A just transition has the capacity to communicate, mobilise and enthuse our communities and citizens, so that we embark on the energy transition as if we are living and working in the early days of a better society.

John Barry
Professor of Green Political Economy & Co-Director of the Centre for Sustainability, Equality and Climate Action (SECA) Co-Chair Belfast Climate Commission

Paul McCormack
Gencomm Programme Manager

Interreg North-West Europe
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For more information

on the GenComm Project and our work in the green hydrogen arena contact

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Engage in the hydrogen evolution and join the CH2F

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