





GenComm 8 Stage Project Crisis Management Plan

Co-ordinating an €9.4M international project with 10 partners spread all across Europe is difficult at the best of times. However, the current COVID-19 crisis suddenly brings a completely new challenge. Lockdowns have affected all of the project partner countries, with each having different policies on easing restrictions. Therefore, a current 10-week lockdown in GB could translate into a 14-week period when other affected EU countries are taken into account.

This impacts on everyday work as sub-contractors, suppliers, technical support etc. are closed and critically we are not receiving information and updates from them. It is difficult to plan and co-ordinate in a vacuum. For most, in this current situation, it is a case of makeshift and make-do but that does not mean doing nothing.

Doing nothing or the *'batten down the hatches'* mind-set and trying to ride out the storm is not an option. When managing an international project you can't wait until your hand is forced, being passive is not a strategic option, nor is it a project-deliverable option. In spite of

the difficulties arising from the COVID-19 restrictions, we remained proactive, scrambled virtual teams and digital activities together, and worked to anticipate obstacles before they appeared, or worked around them when the obstacles landed and also put in place a process to deal with many of the unknowns.

In order to maintain the good progress made by the project so far, we devised a 8-stage plan that not only ensures GenComm can remain open for business but also return quickly back to full working capacities, schedules and loads. The stages are designed specifically to provide guidance for each partner and also externally for all stakeholders.

The stages can be viewed as ways in which we can work around COVID-19 issues, if required by the partners to ensure continuity. In order to help prepare for the unknowns and maintain momentum during uncertainty we developed 3 options for each deliverable. This 'triple lock' approach ensured that we would not end up in a project hiatus or cul-de-sac and would have alternative workaround routes for the project to keep it going.

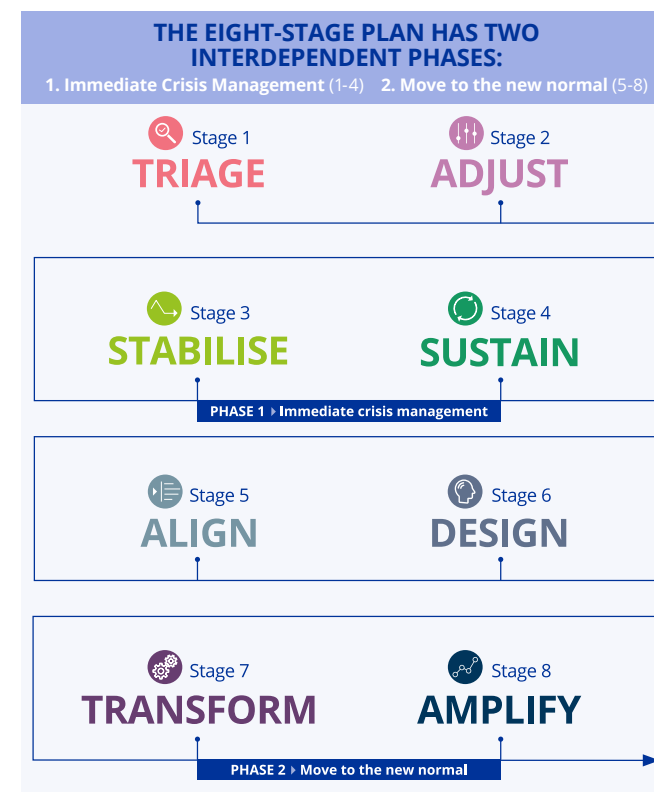


Figure:
GenComm 8 Stage Project Crisis Management Plan Model



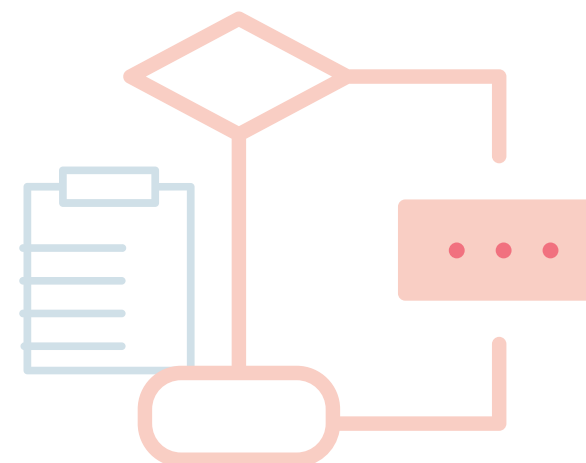
The outworking's of this plan is our 'mission critical' platform and details how we can continue to deliver on all project aims, objectives and outputs. We will also capture how we are continuing to employ innovation and digitalisation processes to explore capabilities, identify gaps, strengths and weaknesses and importantly identify potential differentiators to maximise the project deliverables for all.

In the initial weeks of the lock down period, the team carried out four critical analytical steps on the project - triage, adjust, stabilise and sustain. These first four stages are related to immediate crisis management, activating all Belfast Met and partner organization's resources to protect the business fundamentals and operate with enough capacity to fulfil only the highest-priority needs. Critical to the success of this phase was getting all the partners on board.

Looking back now those first 5 weeks of the pandemic induced social isolation, it was hectic, everything was up in the air, there was no direction. The key to success in this phase was communication and getting all the partners to focus. Partners were concerned about how the COVID-19 pandemic would shape their lives. Most were stuck by the uncertainty of the answer. Continual, open and transparent communication from the co-ordinator provided a certainty and was critical at getting all the partners onto the same page, focussed and agile. This helped move the project and partners from shut down 'inertia' position to where they started to look at alternatives, develop a makeshift, deliver a make do, importantly project movement.

Stages 5 to 8 establish a project bridge to our new normal. They run in parallel to stages 1 to 4 and build on the fundamentals of crisis management that have been established in these stages. The parallel path and overlap in the model is deliberate and reflects the need to have resources applied to internal and external in order to maintain the project. These 8 stages identify and capture the different sets of internal and external resources which are required to manage and explore different trajectories in a coordinated fashion.

As with all plans when it was initially drawn up, it was to capture "**what we need to do list.**" However as we have started implementing it has now moved into the '**what we have done**' in order to meet the requirements of each stage or in some cases '**what we did**' as a workaround and is now developing into '**what we need to do.**' In practice all looked great on paper until we started to get down to work and found that in order to get what we wanted and where we needed to be was anything but straightforward and indeed at times messy but not broken.





Stage 1: Triage the landscape

With the crisis imminent in Europe in early March, we triaged the project defining the critical baseline data and analysed this to enable maximum project operations. This step provided immediate project and partner wide visibility into any changes that were needed to maintain operations.

During this stage 1 process, partner company Energia, the Work Package lead on Investment 3 the wind to hydrogen pilot, immediately formed a Business Continuity Team which looked at all areas in the company. This included the hydrogen business as they have several live, high-profile projects and the objective of the team was to establish the status on each area of the project.

This confirmed the number of key contracts for their Work Package including; Electrolyser, Compressors, Storage Trailers, Project Management, Funding and Supply Agreements. The parties for each agreement were identified together with key contact details including the escalation process.

A brief description of these contracts was defined including, locations, deposits paid and status before the start of the crisis. A business risk analysis and impact summary matrix were developed showing Risk Impact, Probability and Mitigation covering each key contract together with a full finance risk summary. This Triage step helped management to direct any resources to the highest priorities and greatly helped in the development of Stage 2 of the Crisis Management Plan.



Stage 2: Adjusting to the new norms

Following stage one, we then looked to see what adjustments were critical to the project and how these could be implemented. In this stage of the plan we focused on core project principles, closed off all non-essentials, and implemented new project specific requirements.

Critically, we adjusted and moved to new communications structures and platforms internally and externally. With the EU Projects team in Belfast Met we have extensive experience and a track history of international collaboration and remote management. With all travel prohibited we moved all partner, management and technical support meetings online utilising a wide array of IT channels and support. Importantly the Belfast Met IT team and support had ensured that we were well equipped for the tasks and provided continual remote support. It was not an easy step to make especially with all working at home balancing family life with work and struggling with some IT connectivity being under par. In the absence of any working at home protocols, we utilised some short-term makeshift approaches including fluid working times, split meetings, evening meetings and capturing some input off line when problems occurred. >



➤ Achieving open transparent and comprehensive communication in the whole process is key to our continued successful monitoring, evaluation and management of the project and this is even more important during the lockdown. Remote video and audio links are crucial, we are after all a tactile group and it's nice to see and speak to partners regularly. Internally, we implemented thrice-weekly team meetings and updates; externally we increased the regularity of the team conference calls and added additional webinar support. Communication built confidence whilst reducing friction, fragility, and fear for all partners and stakeholders.

Again, we had to build in some workarounds, as it is not easy working at home when you have to balance home life and work life in one arena and young children making the odd appearance. Getting to a good home working place takes time and we built in allowances such as late meetings and after hour's deadlines to accommodate home life.

Another point is the further communication with the suppliers of the outstanding components of the two investment work packages. Here too, communication has been switched to video calls. After about two months, this "new" way of communication has now successfully proven itself.

External stakeholder engagement was also increased in order to provide information, updates and clarity including explanations; this step ensured continued confidence in the project. A further example of our adjustment can be highlighted in our new digital newsletter. Previously we would have produced a dual copy for electronic and standard circulation. Now we are redesigning the newsletter improving the digital layout and graphics to reach an online audience, to encourage more reader loyalty and utilising several social media campaigns per edition.

Our German partner IZES is in charge of work Package I2 - solar to hydrogen. During the adjustment phase, IZES have continued the theoretical work on the approval procedures as well as the paper work for the SWOT analysis regarding battery electric vehicles (BEV) and fuel cell electric vehicles (FCEV). The contact with the supplier of the hydrogen refuelling station was maintained and in some cases even intensified through the establishment of regular video calls, as there are still safety-related issues to be clarified, all of which are due to the requirements of the local approval authorities.

After the lockdown in Scotland, the resulting hardware related to the Hydrogen refuelling station work will be restarted shortly. However, due to the delay and the continuing travel restrictions in Europe, the September 2020 deadline for the final completion of the hydrogen refuelling station can no longer be met. According to current information, an extension of at least six months is necessary to bring work package I2 to a successful conclusion.

After a weather delay and a COVID 19 infection at the building company, which caused a construction stop of about 6 weeks, the work at the construction site of the hydrogen refuelling station has been continued since the second week of May. The completion of the work is thus ensured before delivery of the hydrogen refuelling station.

Communicating changes and the way partner organisations were affected and how the project overall was impacted was also key to ensuring the team functioned coherently. Any changes that we made were communicated internally and externally, with complete clarity, sharing our vision and providing explanations on the reasons for change were provided. Again, this continual process whilst very time consuming meant that we, the lead partner, were able to adjust and manage the project.



Stage 3: Building stabilisers

During the stabilising phase we continued with data gathering, information and iterative reviews on stages 1 and 2. These stabilisers or business applications stage allowed us to quickly leverage this data to extract insight, make data-driven decisions and take the best actions.

This continual process ensured we had the latest updates and data to support informed decision making, enabling short-term immediate and medium term operational planning. Stage 3 allowed us to develop a wider functioning governance model with shorter decision cycles capable of immediate response and to adjust baseline as and when necessary and importantly communicate this to the team and partners as part of our evolving strategy.

French partner INSA, and other work package leaders, carried out extensive data gathering internally and externally. Sometimes this couldn't be achieved so workarounds, closing gaps utilising educated guesswork helped bridge the gaps. This data was used to continually evaluate and inform proactive decision making, adjusting priorities where appropriate. The partners also used this information to continually evaluate stage 1 triage and

update as necessary. Processes were implemented across the project to convert data flow and access to short-term immediacy and medium term decisions. Wider more flexible governance models were developed with revised and adjusted baselines and this evolving strategy was communicated effectively.

Kieran McLaughlin from NI based partner TK Renewables states *'It certainly wasn't easy during this challenging period, gathering data from partners to facilitate the development of a Commercialisation Plan and SWOT Analysis for a hydrogen based economy. In the absence of core data, we were able to make iterative adjustments including sourcing secondary data references and utilise these. Persistence paid off and we were able ensure accurate and consistent compiled data flow.'*

Paul McCormack GenComm project co-ordinator stated *'The steps taken in this stage were proactive. We did not sit back and wait for things to happen and then react. We led from the front providing clarity amid the pandemic induced confusion. This adjusted rigour and discipline deployed within the lead partner team then fed across the project and was increasingly understood and utilised across the wider project team.'*



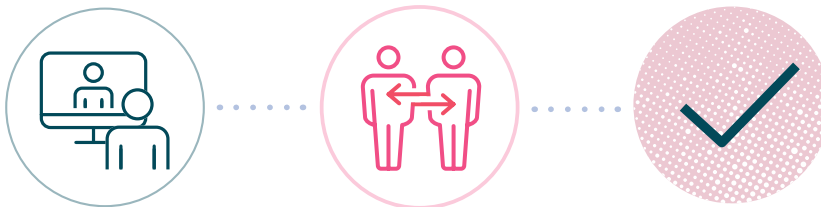


Stage 4: Sustaining the project beyond

This stage of the plan is a proof point of project organisation and external stakeholders especially Associate Partners, and the Community Hydrogen Forum. As we worked to sustain the project in collaboration with all partners we put in place a virtual support mechanism that was accessible to all and ensured that iterative adjustments based on data and remote working demands could be implemented seamlessly.

Sustaining the project was critical. The Met project team developed a comprehensive remote working strategy and plan that was used as the blueprint for the project. This plan included all activities, dates, deadlines, time allocation, options, teamed responsibilities, a comprehensive internal/external communications plan and financial management plan.

We are not at the end of stage four yet and in a current climate where all is still in a state of flux, this is an ongoing and iterative process. Commenting on this sustaining phase of the plan **Dr Rory Monaghan** from National University of Ireland Galway (NUIG) stated *'As a pan-European project, GenComm was in a good position to adopt video conference meetings and remote working. The main outputs of the project, the Community Hydrogen Forum and the Decision Support Tool are online. The team working to develop them, in Ireland and the UK, saw very little change to their daily routine. GenComm is especially equipped to sustain itself in the COVID-19 world.'*



Stages five to eight:

Move to the New Normal

Post COVID-19 crisis there will be no 'back to normal.' How will the COVID-19 pandemic shape our lives in years to come?

We are in uncharted waters and as such have no 'project pole star' to navigate by. Those anticipating a return to pre-pandemic normality may be shocked to find that many of the previous systems, structures, norms and jobs have disappeared and will not return. As we all look to adjust to an emerging new world, digitalisation is playing a bigger central part in our lives.

We are using the outputs and data from the first 4 stages of this crisis management plan to develop a new route for GenComm. In the absence of any clear external direction we are 'grasping the nettle firmly' and planning the cardinal points for our own GenComm sat nav. We are building certainty into the project from the bottom up with the partners delivering the reference points.

Stage 5: Alignment to the new working conditions

In times such as these it has to be recognised that external changes will impact and as a result will have project impact. We felt it was critical that the project pro-actively reacted to these impacts so as not to leave the project vulnerable. By being 'on the front foot' the entire team continually horizon scan for any impending changes and plan in advance of these in order to lessen impact.

Having completed stages 1 to 4 the project team were able to carry out internal realignment of functions commensurate with the new working environment and as a result deliver new options for all the project team and ensure that by staying proactive we never reached a stage where there were no options on the table.

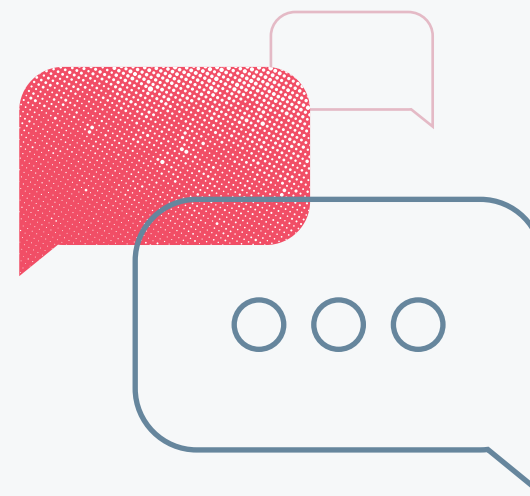
Just as others were being forced to take action to continue operating, so did GenComm. Project Co-ordinator **Paul McCormack** who stated, '*Ultimately we drove the alignment around technology-enabled solutions and opportunities. This allowed us to successfully align and develop strategic direction and hopefully differentiation.*' Stakeholders responded positively to these changes because it provided project wide clarity of intent and confidence.

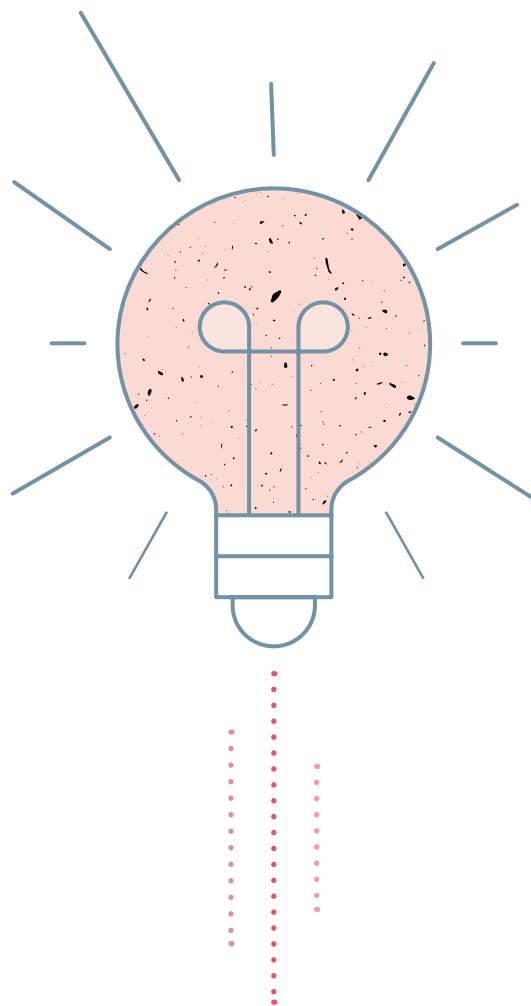
Regular internal and external communications, updating all stakeholders, ensuring all are informed and up to date have been implemented. This stage also recognises that temporary work changes need to be implemented, challenges and opportunities addressed and protocols designed and applied in order to sustain the project.

With the social distancing regulations in place first level control verifications and partner visits could not happen, however, we were able to rely on the foundations set in place in 2018 and enhance these with greater digitalisation of processes.

Peter Smyth the Financial Controller for the project in Belfast Met stated '*The array of reporting structures and mechanisms, initiated and embedded by Belfast Met at programme commencement, remain virtually unchanged during this current COVID climate. They are robust, still fit for purpose and operational across our collaborative network. The ongoing provision and flow of quality partnership financial data allows informed and effective decisions to be made.*

The decision making process, concerning best way forward, is greatly assisted by the effective communication strategy in place throughout the partnership and is furthermore reinforced by the invaluable support provided through closely forged links with SEUPB and the INTERREG NWE funding authority'. >





➤ With changes being developed all partners are working to build their individual, organisational and collaborative GenComm project plans and ensuring that these are an integrated fit as GenComm moves to the new normal.

Implementing the structures in this alignment stage, **Isabelle Polaert** from INSA stated, *'From 13th May 2020, INSA will re-open in planned, controlled phases. Work at home is compulsory for whoever can work at home. New timetables and deadlines will have to be devised; people will come back to work progressively from 20% to 33% of the workers until June 2020. Lab experiments will start again progressively with priority being given to PHD students who have experimental work to do, including GenComm PHD student (M. Quezada) and engineer (Y. Kouhili) are allowed to come back 2-3 days/week and work in the lab. Permanent GenComm workers will go on with work from home with planned regular internal and external meetings in place to ensure the project is still operating correctly.'*

Many of these changes may be temporary and last only as long as necessary and the temptation will be to slip back into old habits. However, some may, in time prove to be extremely useful in ensuring continuity and may end up being a permanent fixture in the project management toolkit; therefore, these are being kept under constant review.

Member Company HyEnergy aligned their work programme to accommodate and maximise the resultant options from the external changes. CEO **Ian Williamson** stated *'Having been through this process, I think we all recognise that returning to how things were before COVID would be welcome. However, in the face of adversity we had no options, we have learnt new skills and work practices which have ensured continuity. In some cases, these have delivered additional benefits be it in productivity via avoiding the daily commute or by increasing contact time with our families and loved ones. We will likely have a hybrid of old and new practices in a future post COVID world.'*



Stage 6:

Proactive and responsive design-led initiatives

In this stage, we reflected on project fundamentals. We did a full internal project examination to explore if we could redesign strategy to achieve the same outputs and explored the alternatives. We have designed in all the lessons learned during the first four stages and have created a project and team resilience to mitigate unknown future circumstances and developed a model to capitalise on opportunities.

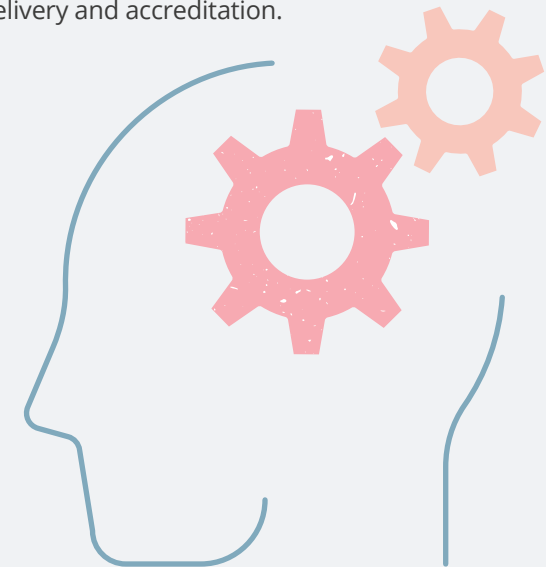
German partner IZES highlights how they are trying to circumnavigate obstacles and getting workarounds developed. The system assembly in the manufacturer's workshops can only be done with a greatly reduced team. Due to isolation regulations, only two fitters can work on the system at the same time. But in the case of still open, special, location-related safety-related questions that may arise during the hydrogen refuelling process, IZES individually and in collaboration have searched for alternative solutions within Germany and prepared and proposed concepts in advance.

Wulf Clements from IZES stated *'As travel restrictions still exist, concepts for the handling of the fabric acceptance test (FAT) via video and test-data-streaming are currently being considered. If a workable solution can be found, we hope that the delayed delivery of the system could be compensated at least partially, despite the great loss of time caused by the national shutdowns.'*

One of our key opportunities emerging from this stage is to get training and upskilling programmes developed for the H2 and Low Carbon engineers, technicians and electricians in order to sustain this development. This is critical as many employees are on 'furlough' at present on the current job retention scheme and this provides an intervention opportunity that we can utilise. As part of this process, we are seeking external support for this work and will carry out initial gaps, and needs analysis.

Part of our work to date in this field has highlighted the need for a 'blended' delivery to upskill those already in employment as their employer seeks to diversify. To this end, we aim to tailor all the material, support, delivery and implement a structured support/follow up process fully integrating a beyond blended mechanism.

In the post, COVID-19 crisis there will not be a return to pre-pandemic normality; many of the previous systems, structures and jobs have disappeared and will not return. It is therefore imperative that in order to help kick start the economy and to take full benefit from the emerging low carbon economy that all training tools developed will be future fit in design, content, delivery and accreditation.



Stage 7: Transform

Now with the project future design described at the high level, we have started to detail the steps, methodologies and processes necessary to make it happen. This plan includes key transformation steps, options that will help us move to the creation of an executable set activities/time-frame necessary to deliver the complete project.

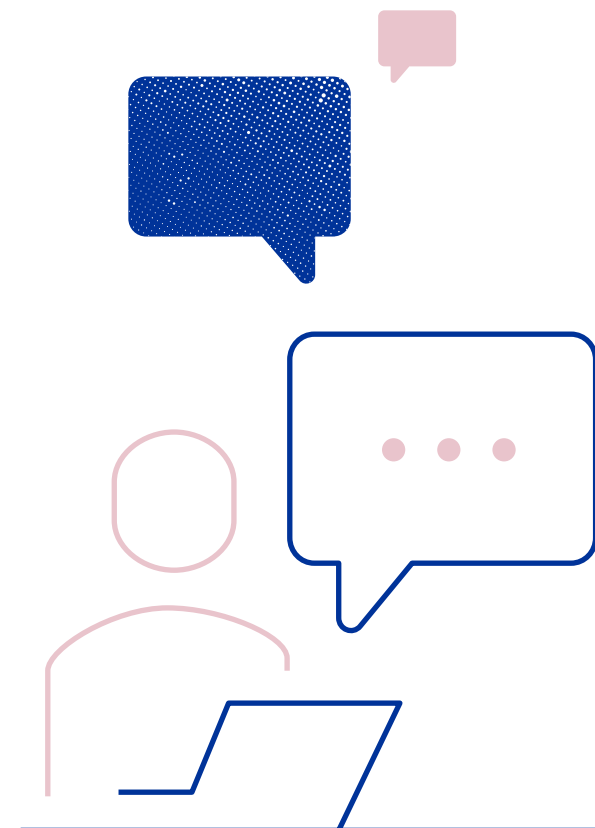
We will start implementing the model we have developed in the previous step to keep all team, Associate Partners, Community Hydrogen Forum (CH2F) etc. informed. As part of this process, we are also examining what key transformation partners and processes we will require to help create and deliver the series of activities required to make a successful transformation.

Stage 8: Amplify

By responding quickly and effectively to the crisis and being proactive, we will maintain our project agility, flexibility, and innovation. During this stage we need to manage all areas of the new plan effectively and monitor closely, ensuring milestones are achieved with all KPIs achieved with no additional resources or reserves.

In this stage, we will look to see if we can develop other areas, steps or technical tangents that are more exploratory to assist and maintain momentum. It is critical that we keep the innovation engine switched on to deliver optimisation from our in-built agility, resilience and ability to adapt.

Paul McCormack project co-ordinator stated *'This stage is proving vital in supporting and driving internal project innovation and especially delivering diverse project impacts. As we maintain agility with the partners, we can continually drive micro-level investigations of the challenges faced and maintain vigorous internal relationships.'*



Summary

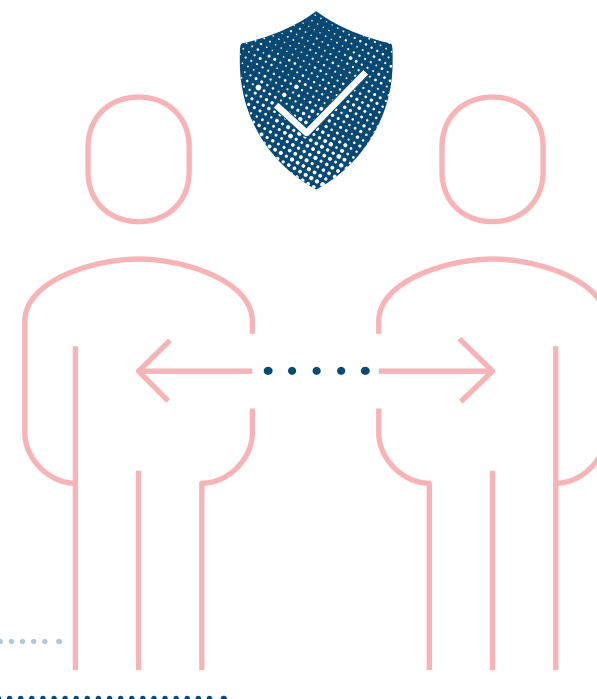
By making critical decisions, taking a lead position, being proactive and responding quickly to the COVID-19 crisis we have maintained the spirit of agility, flexibility, and innovation that has driven GenComm successfully to date. Without doubt, there will be some areas of our emerging plan that will require modification and adjustments but the critical fact is, we have a plan, we have a sat-nav to maintain the project. This cannot be underestimated.

By providing leadership and direction, we harnessed the strength and reinforced the team through resilience and vigour, developing new rapid reaction skills and abilities. Through this 8-stage plan we are endeavouring to future proof and deliver the full socio-economic benefits of GenComm

In project management, when faced with a crisis speed of response is critical. Successful navigation demands a plan that includes immediate and longer-term crisis management strategies that prepares the project and team to succeed in a changed environment.

As we reflect on our journey over the last 3 months, it is easy to forget how tumultuous the first few weeks of the lockdown were. In order to maintain the project we provided clear project wide team instructions that not only assisted project navigation it also instilled confidence in the team and stakeholders. That confidence is the energy of all good projects but must be harnessed, co-ordinated and focused on overcoming challenges and crises to achieve success.

Our response throughout the lockdown has ensured that GenComm has remained operational during the lockdown. This will prove to be critically important as we move beyond the crisis as Europe looks to the green economy to stimulate recovery and growth.



Hydrogen mobility in Germany is growing!

At present, there are about 90 Hydrogen refuelling stations (HRS) in operation in Germany - mainly in conurbations or along long-distance travel routes or the German Autobahnen. An additional 30 refuelling stations are being planned or are currently in the approval procedure.

By the end of 2020, more than 120 refuelling stations should be in operation. The construction of a HRS is a particular challenge due to the federal system in Germany, since the approval for construction and operation is a federal state matter and, above all, the regulations for construction vary significantly from one federal state to another.

The number of hydrogen-powered or fuel cell electric vehicles (FCEV) is also growing. Since 2010, a total of around 725 new registered FCEVs have been registered in Germany, with an upward trend. In 2019 the number was about 210 FCEVs. One of them has been registered for IZES gGmbH since March 2019. The picture shows the vehicle in February 2020 during refuelling at the HRS, which recently opened in the city of Rastatt. Due to the higher number of refuelling stations expected in the short to medium term, also outside the conurbations, it is expected that registrations of FCEVs will also continue to increase.

Dr. Bodo Groß
IZES gGmbH

90 HYDROGEN REFUELLING STATIONS	120 REFUELLING STATIONS IN OPERATION BY 2020	725 NEW REGISTERED FCEV'S SINCE 2010
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New strategy for hydrogen future

Ben Madden, Director of Element Energy writes –
Hydrogen Mobility Ireland is a grouping formed to bring hydrogen transport to Ireland. The group consists of leading transport and energy companies along with policy stakeholders and representatives of other hydrogen initiatives. The group has been active for just over a year. In the first months of the project, the partners worked together with consultancy Element Energy to define a strategy for the way hydrogen mobility can be rolled out in Ireland in the period 2020 to 2030.

[DOWNLOAD REPORT HERE](#) 



elementenergy

Since this first report was published, the partners have been focussed on planning and obtaining funds for the first deployment project which will be based in Dublin. This will involve a combination of buses and cars (in long distance applications such as taxis) and will be served by hydrogen coming from new renewables-linked electrolyzers.

This is expected to have strong links to the Translink bus project which is already underway in Belfast. The large deployment project will be preceded by a series of trial activities in 2021 which will prove the operational viability of the hydrogen fuelled vehicles and of hydrogen as a fuel for Ireland.

In addition, the group has been planning for a subsequent expansion across Ireland, where buses and cars will be joined by trucks, vans and other heavy-duty transport modes. At this stage, the focus is on ensuring the policies and associated codes and standards are in place to permit a rapid roll-out, following success in the first deployment project.



Element Energy continues to provide secretariat support services to the group and have said 'Hydrogen Mobility Ireland is a good example of the kind of ambitious industry led initiatives which are now appearing around Europe. These initiatives have tended to focus on large scale production of essentially zero carbon hydrogen from either direct renewable-coupled electrolyzers (the majority) or generation from hydrocarbons with a link to the capture and storage of the associated CO₂ emissions. They are also increasingly focussed on the supply of hydrogen to heavier vehicle classes such as buses, trucks, trains and ships.

These projects are all in various stages of feasibility and funding acquisition. The next challenge is to move from the studying and engineering phase into implementation. This will require the hydrogen industry to convince policy makers on the value of hydrogen in a net zero carbon energy system and the importance of moving to scale to make the economics of hydrogen energy systems viable. Once policy makers are satisfied about the potential of hydrogen at scale, they can then be called upon to help the sector with supportive policies as it scales up.

As the sector grows, it requires large investments, which carry risks which any individual company cannot bear alone. This is partly because the demand side (vehicles) needs to grow at a similar rate to the supply side (deployment of hydrogen production assets), which requires coordination. It is also because the long-term outlook for hydrogen mobility (and hence long term demand certainty) need to be underpinned to allow long term financing of these large assets.

In this respect, Hydrogen Mobility Ireland is greatly helped by the involvement of a number of policy makers in an observer role, who can hear the findings of the industrial partners and help to shape the thinking as the group defines its ask of policy makers. It is also helped by having created a phased approach (in the 2020-2030 roadmap) whereby confidence building (and profitable) investments can be made in stages as hydrogen mobility rolls out and demonstrates its attractiveness to customers across Ireland.'



Ben Madden
 Director of Element Energy



The MaREI Centre and Hydrogen

MaREI is the SFI Research Centre for energy, climate and marine research and innovation, comprising internationally recognised experts from 13 third level and research institutes in Ireland who engage with stakeholders across more than 36 countries.

MaREI comprises over 220 researchers working with over 70 industry partners, and our research focuses on the energy transition, climate action and the blue economy. MaREI's ambition is to deliver excellent research that has significant societal impact with particular emphasis on supporting business, informing policy and empowering society.

MaREI's research focus on hydrogen is growing and deepening due to a number of key reasons. Our research on offshore renewable energy, including offshore wind, tidal and wave energy points to a massive and untapped renewable energy potential all around Ireland. However our research on energy systems modelling highlights the challenges in integrating these variable resources and the non-synchronous electricity they generate into our power system. Hydrogen production can help address these engineering challenges.

MaREI research on reducing the climate change impacts of transport also leads us to a focus on hydrogen. While private car transport can be and is being (slowly) electrified, heavy goods vehicles, shipping and aviation are likely to require liquid or gaseous fuels and hydrogen is an emerging contender.

220
RESEARCHERS

70
INDUSTRY PARTNERS

36
COUNTRIES



MaREI staff and industry partners at a hydrogen research meeting in Cork.

As we seek to increasingly increase our ambition in climate action, not just in Ireland, but also internationally, the focus on hydrogen as part of the energy transition solutions of the future is growing strongly. Hydrogen is bountiful in supply but is not easy or cheap to harness. Hydrogen usage produces no direct emissions of pollutants or greenhouse gases, but hydrogen production can have negative environmental impacts depending how it's produced. Hydrogen has a very high specific energy value (energy per unit mass) but low energy density (energy per unit volume).

MaREI recently organised a workshop to share different research insights on hydrogen from different MaREI research teams and industry partners. The workshop discussed hydrogen production cost estimates from UCC of approx. €2/kgH₂ for blue hydrogen (produced by steam reforming of natural gas along with carbon capture and storage). This was compared with €3-5/kgH₂ for green hydrogen (produced by electrolysis using renewable sources).



The MaREI 220 strong family at their 2019 symposium in Limerick.

UCC researchers also discussed the recently started ElectroFuels in A Circular Economy (EFACE) project that is one of the SFI Zero Emissions Challenges. Participants also discussed research in DCU on fuel cells and electrolyzers and hydrogen mobility and research in NUIG on hydrogen supply chains, including the GenComm project. The workshop included industry and round table discussions focussed on identifying the drivers and barriers to the H₂ economy in Ireland.

MaREI is currently exploring development of a research programme to address some of the challenges, reduce costs and harness the opportunities and advantages that hydrogen offers.



Brian Ó Gallachóir
 Director of the SFI MaREI Centre and Professor of
 Energy Engineering at University College Cork

HAZEL – Hydrogen enAbled Zero Emissions supply chains

To decarbonise Europe, clean renewable power production must become the main source of energy. Building on the empirical work of GenComm the project team have assembled the HAZEL consortium. This main aim of this group is to develop Power to X solutions for green hydrogen. An estimated increase in offshore wind capacity in Europe from 22 GW today to 240 440 GW by 2050 presents a huge opportunity for a new European Fossil Free Energy Equation.

The consortium consists of 10 beneficiaries including Belfast Met, Ulster University, NUI Galway, Dublin City University, University Wales, University Slovenia, University Saarland, IECEE – Macedonia, IZES – Germany, CNR-ITM Italy and TU Graz Austria.

This is complemented with 10 industrial partners including Bosch, RYSE, Bamford Bus, Gas networks Ireland, Energia, Mebius, Zentgraf, AVL.Iresen, S&K Luxembourg and Mecadi GMBH.

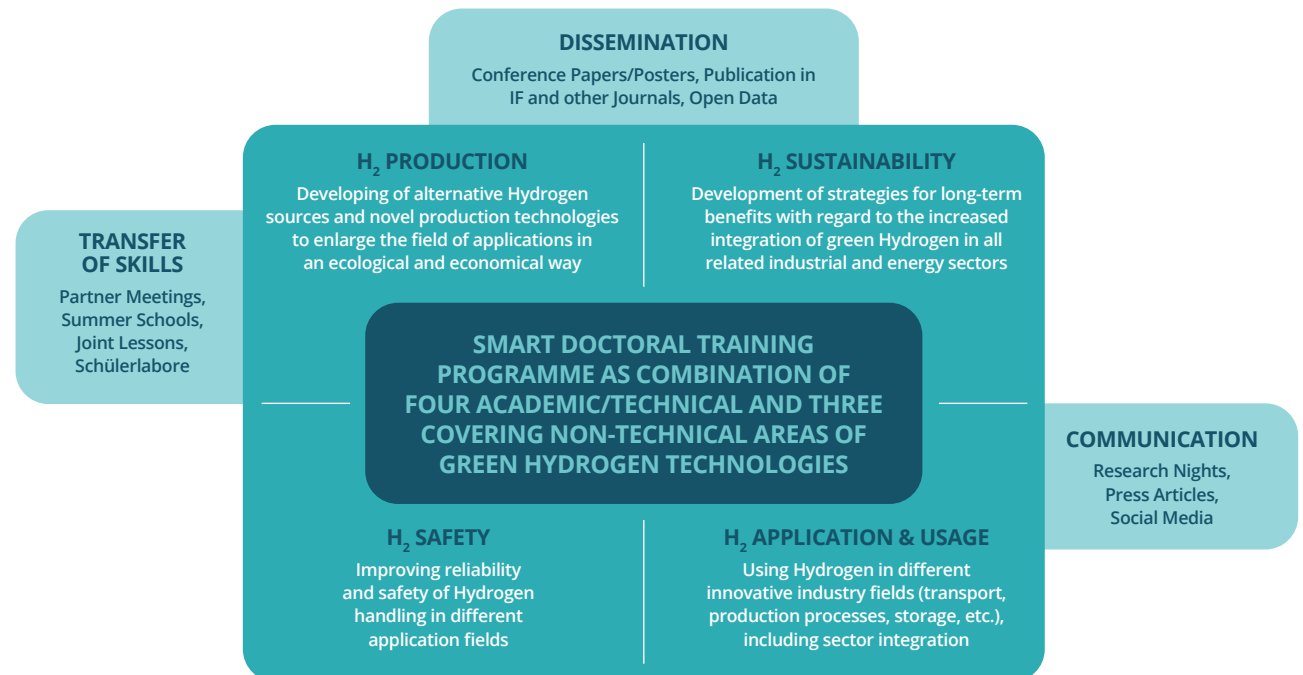


Figure:
Schematic drawing of the structure of the doctoral training programme



HAZEL has 15 highly innovative projects in the Green H₂ sector, implementing Hydrogen technologies with technical focus on the 4 component areas of Green H₂ Production, Safety, Sustainability, Application & Use. These projects cover the entire H₂ spectrum from enhanced production, innovative fuel cells, electrolyzers, valves, health & safety, H₂ modelling, sensors and investment support tools. This is an industrial led H₂ portfolio of 15 interlinked projects, building an EU wide innovation and entrepreneurial network from Macedonia to Ireland.

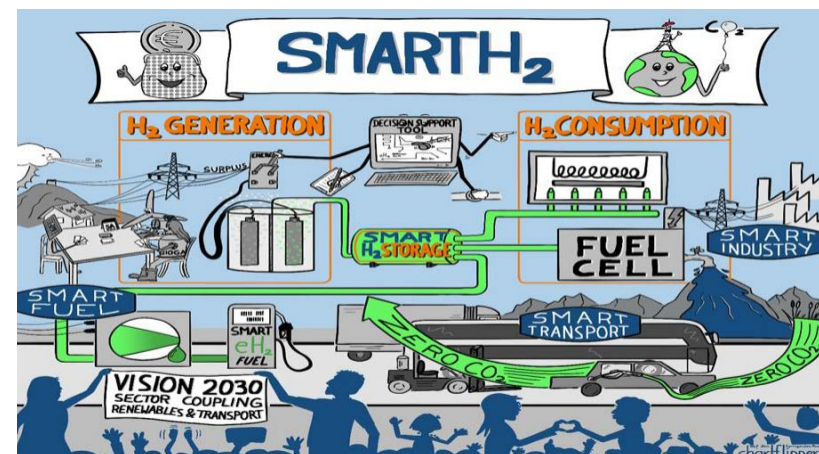
HAZEL will also train a new generation of creative, entrepreneurial and innovative early-stage researchers in the field of implementing renewable Hydrogen as an energy vector, reinforced with the skills to face current and future challenges and to convert knowledge and ideas into products and services for economic and social benefit.

The project will exploit complementary competences of the participating industrial and academic organisations enabling the sharing of knowledge through networking activities, summer schools, secondments, placements, workshops and conferences primarily focused on scientific and technological knowledge through research on individual, personalised and team based projects.

HAZEL is a industry focussed model, one with the depth, rigour and focus of a conventional research while also delivering a commercially competitive research student by embedding innovative, entrepreneurial training modules and peer to peer learning in the mix.

It enhances the R&D model through continuous innovation and entrepreneurship training, master classes and summer schools, thus improving embedded entrepreneurship in the industrial partner organisations.

As part of this work the consortium will be hosting monthly webinars to highlight and demonstrate the technical, commercial and social value of hydrogen in the power to x equation.



GenComm centre stage in European Energy Week 2020



GenComm partners will address two sessions in the 3-day policy conference during European Energy Week 2020 (EUSEW 2020) 22nd – 26th June. The first ever digital edition of the EU Sustainable Energy Week will be held under the theme “Beyond the crisis: clean energy for green recovery and growth”.

The new programme features 30 sessions down from the normal 90. Organised by the European Commission, EU Sustainable Energy Week (EUSEW) is the biggest annual event dedicated to renewables and efficient energy use in Europe.

GenComm is speaking at 2 events in EUSEW 2020

25th June | 14:00 - 15:30 | Session 56356

[Hydrogen: fuelling Europe's energy revolution](#) ➤

25th June | 16:00 - 17:30 | Session 56361

[Boosting the hydrogen economy through international cooperation](#) ➤

Paul McCormack will address the session 'Boosting the hydrogen economy through International cooperation' on June 25th. In this session he will highlight how the GenComm project and partners have accelerated green hydrogen in the power to x (P2X) equation.

In partnership with [Dr Rory Monaghan NUIG](#) Paul will address the session entitled 'Hydrogen: fuelling Europe's energy revolution.' Together they will outline the innovative GenComm, green Hydrogen pilot projects, providing energy security for communities and detail how the Decision Support Tool (DST) is empowering informed decision making in the EU hydrogen energy revolution.

Paul McCormack GenComm co-ordinator stated *'it is testimony to the project, partners, the developed technologies and the associate partners that GenComm is addressing two of the sessions in the policy conference. We continue to drive the renewable energy agenda and are ahead of the green hydrogen curve, ensuring Europe is well positioned to take full advantage of the emerging zero carbon economy.'*



WEBINAR SPEAKER

Ian Williamson

Director of HyEnergy
President of European Hydrogen Association

HYDROGEN – Getting the Green Light, Driving Europe's Green Recovery

WEBINAR | 1 July 2020 | 10am - 12pm BST

REGISTER HERE ►



For more information

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