

BIG H₂IT

Building Innovative Green Hydrogen
Systems in Isolated Territories

Work Package 6

D6.1 Dissemination and Exploitation Plan



Grant Agreement 700092

Executive Summary

This Dissemination and Exploitation Plan will maximise the impact of the BIG HIT project through dissemination to follower territories, stakeholders and the wider public. This plan uses the resources and support from all BIG HIT partners to increase the impact and value for BIG HIT dissemination and exploitation.

Specific objectives for these activities in Work Package 6 will:

- Increase the likelihood of project replication and exploitation through informing and communicating the community benefits and the wider business case with follower territories and other potential replicator territories
- Achieve awareness of the project and disseminate results to wider stakeholder networks, building acceptance with specific individuals, the local population, and more widely.

The dissemination and exploitation activities will reinforce the benefits from wider replication and further deployments of renewable energy with fuel cell & hydrogen technologies in isolated or constrained territories.

This Dissemination and Exploitation Plan will be periodically updated throughout the project to ensure that activities planned have a suitable spread of messages and audiences project awareness and maximise the opportunities for replication and exploitation.

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1. Objectives

BIG HIT will demonstrate using electrolysis as a means of converting curtailed renewable energy into hydrogen, its subsequent transportation by land and sea and its utilisation to provide mobility, heat and power. Its breadth and scale is unique in isolated territories.

Central to the plan for dissemination and exploitation will be the replication of the project in other isolated territories. The island of Gozo, Malta, with a population of 37,000 is the project's follower territory, represented by the Ministry for Transport and Infrastructure. The need to move energy from Gozo to Malta replicates (on a larger scale) the transport from Eday and Shapinsay to Mainland. Malta has a National Electromobility Action Plan, which commits it to the testing of hydrogen technologies - the replication of BIG HIT could be the cornerstone of that project.

To achieve maximum impact in potential replicator territories, BIG HIT has also established links with several relevant groupings of islands and similar isolated territories who have agreed to disseminate project information and literature to their members. These are:

- Conference of Peripheral Maritime Regions of Europe (CPMR) includes 160 Regions from 28 States of the European Union and beyond, and represents almost 200 million people,
- European Small Islands Federation (ESIN) is a federation of island organisations, representing 448,000 islanders living on 1,300 small islands all over Europe.
- Scottish Islands Federation (SIF) represents the interests of Scottish islands, sharing good/best practices and facilitating information exchange amongst Scottish islanders
- Early enquiries about BIG HIT from countries such as Greenland.

Thus, the project results will be disseminated to over 1400 EU isolated territories, to maximise the chance of replication.

Additionally, BIG HIT will create a structure to allow further FCH projects in Orkney, meeting OICs objectives.

Together, these will allow direct use of knowledge and IP generated, provide a large market for industrial partners in the consortium and result in a significant additional investment in FCH technologies. It is envisaged that as BIG HIT would have significantly de-risked the rollout of FCH technology, replication will be most likely funded by national, regional or private sources.

The Exploitation and Dissemination plan will be based on this document. This is the focus of Task 6.1 and will be reviewed and updated at the annual Steering Committee General Assemblies. The latest version will be presented in the final and annual reports.

2. Description

During operation and delivery of the project the BIG HIT activities will generate a range of significant knowledge and insights at both the component and system level.

The 12 project partners are:

1. Fundacion Para El Desarrollo De Las Nuevas Tecnologias Del Hidrogeno En Aragon (FHA)
2. ITM Power Trading (ITM)
3. Orkney Islands Council (OIC)
4. Calvera Maquinaria E Instalaciones (CAL)
5. Shapinsay Development Trust (SDT)

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6. Community Energy Scotland (CES)
7. European Marine Energy Centre (EMEC)
8. Danmarks Tekniske Universitet (DTU)
9. SYMBIO FCell (SYM)
10. Scottish Hydrogen and Fuel Cell Association (SHFCA)
11. Giacomini S.p.A. (GIA)
12. Ministry for Transport and Infrastructure, Malta (MTI)

The delivery of the BIG HIT project is organised into 6 work packages with involvement from partners in specific activities:

- Work package 1 is Project Co-Ordination: led by the FHA
- Work package 2 is Deployment Preparation: led by FHA with support from ITM, OIC, SDT, CES, EMEC, Sym, and Gia
- Work package 3 is Installation and Commissioning: led by ITM, with support from OIC, SDT, CES, and Gia
- Work package 4 is Operation, Management of Equipment and Data Analysis: led by ITM with support from OIC, SDT, CES, EMEC, SYM, and GIA
- Work package 5 is Impact and Business Models: led by DTU with support from ITM, CES, and MTI
- Work package 6 is Dissemination: led by SHFCA.

The six work packages with respective Work Package leads and other partner involvement together with respective timelines are shown in following Table.

Work package	Description	WP Lead	WP Partners Involved	Timing (months)
WP 1	Project Co-Ordination	FHA		1 - 60
WP 2	Deployment Preparation	FHA	ITM, OIC, SDT, CES, EMEC, Sym, and Gia	1 - 12
WP 3	Installation and Commissioning	CES	OIC, SDT, CES, and GIA	9 - 15
WP 4	Operation, Management of Equipment and Data Analysis	ITM	OIC, SDT, CES, EMEC, SYM, and GIA	12 - 60
WP 5	Impact and Business Models	DTU	ITM, CES, and MTI	1 - 60
WP 6	Dissemination	SHFCA		1 - 60

The timing and content of the different Work Package activities is a key consideration for the WP6 dissemination activities. An early focus will be on awareness raising and community stakeholder engagement. Once the equipment is deployed and commissioned in the Orkney Islands, the focus for dissemination then includes key learning from the operation and management of the equipment, together with early insights from data analysis. Throughout the project the WP5 activities on impact and business models will need to be closely aligned with WP6 dissemination activities.

There will be ongoing maintenance of demonstration equipment beyond month 60. BIG HIT technologies deployed will be maintained in operation by Orkney Hydrogen Trading (OHT) for at least 1

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year beyond project end and will pave the way for additional projects to deploy transport and energy solutions.

The dissemination for different audiences will make full use of the BIG HIT partner expertise:

- Commercial insights and investment perspectives (OIC, ITM, SFC, GIA, SYM, CAL)
- Financial markets and institutional investors, through trading announcements (ITM)
- Development of appropriate regulation and standards (specifically with environmental and hydrogen regulations), and relevant links with policy making (FHA, SHFCA, ITM)
- Local acceptability of hydrogen technologies (CES, SDT, OIC, EMEC)
- Educational training, including skills and research (DTU)

Refer to Appendix 1 for examples of individual BIG HIT partner dissemination insights and exploitation opportunities.

Refer to Appendix 2 for example timeline of relevant technical and industry conferences and events during 2017. This will be used to identify key opportunities using resources and support from all BIG HIT partners to maximise the impact and value for BIG HIT dissemination and exploitation.

2.1 Communication methodology

The dissemination strategy will be led by SHFCA and agreed at the Steering Committee by input from all BIG HIT project partners. This agreed strategy will be communicated to all partners and will be modified as the project progresses.

The BIG HIT consortium agreement will include the management, ownership and access to knowledge generated in the project (performance data, IPR etc.). This will allow BIG HIT partners, collectively and individually, to pursue market opportunities arising from the BIG HIT project results.

Key to the knowledge management strategy is rules on confidentiality and data sharing. This will be formalized in the Consortium Agreement but is likely to include:

- Non-disclosure agreements between partners to allow open discussion and access to confidential data.
- That data generated in the project should be shared between partners, unless there are good commercial reasons why this is not possible. The Coordinator, backed by the Steering Committee, should try and arbitrate when difficulties arise between partners.

Information released outside the consortium requires approval from the Steering Committee

As well as dissemination activities linked to respective Work Packages, there will also be key learning points from the individual project partners which can be captured for further dissemination. Refer to Appendix 1 for example dissemination insights and exploitation from BIG HIT partners.

The BIG HIT project logo, the FCH2JU logo and the EC logo must be present in all publications, presentations and equipment funded by the project (see Section 2.3.2 for details).

Where possible all BIG HIT reports to be disseminated will be archived using standard software formats. After completion of the project, the BIG HIT reports and results will be self-archived (green open access) using the EU's CORDIS (Community Research and Development Information Service).

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2.2 Target groups

Dissemination will be focussed around WHO (target audiences) will receive WHAT (key messages), and what impact can be expected. These Who – What – Expected Impacts are outlined in Table 2.2

Who Audience	What Key Messages	Expected Impact Dissemination and Exploitation Outcomes
Public and local communities	FCH economic & social benefits, including energy security, and carbon reduction	Understanding of the relevance of BIG HIT for local communities, addressing any specific issues or areas of concern. Dissemination of benefits in terms of local jobs, energy costs, and social benefits. Achieve wider acceptance of FCH technologies and specifically BIG HIT
Follower and potential replicator territories	FCH economic & social benefits, energy security, low carbon	Dissemination of local economic, energy security, and social impacts so that they see how, where, and when to replicate BIG HIT approach
Policy teams and local authorities	FCH economic & social benefits, including energy security and carbon reduction	Dissemination of wider economic, energy security, and social impacts so that they see how, where, and when to replicate the BIG HIT approach
Regulators and environmental groups	FCH low environmental impact, lower carbon emission in heat and mobility sectors	Dissemination of key safety and environmental information so that they understand wider environmental benefits of the BIG HIT approach in difficult areas such as low carbon heat and sustainable mobility
DSO, TSO, RE generators	Potential of water electrolysis to generate green hydrogen to control congested grids and avoid curtailment	Awareness on feasibility of PEM electrolysis to avoid curtailment of RE sources and the upgrading of cables and transformers, and to allow electrical energy to be transferred into other sectors (e.g. heat and transport)
HFC Industry and sector bodies	FCH replication and market scale opportunities	Dissemination of business models to impart scale and impact of replicating BIG HIT approach
HFC companies and experts	FCH market opportunities and timescales	Dissemination of business model so that they see how, where, and when to replicate BIG HIT approach
Skills, Training, and Education Sector	FCH skills curriculum and evaluation, numbers of people and timescale	Dissemination of business model so that they see how, where, and when to develop training and skills to support delivery of BIG HIT approach

Table 2.2. BIG HIT Audiences, Key Messages, and Outcomes

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2.3 Communication tools

The communication methods outlined in Table 2.4 will be used to promote BIG HIT and disseminate its results during the period of the grant: The communication methodology will also agree common formats of presentations, reports and other literature.

Dissemination activities with relevance to stakeholder groups most interested in replication and exploitation (islands, isolated territories, distributed energy) will be targeted to achieve most impact. This will be achieved through the development and use of a forward event planner (see Appendix 2) that enables suitable events to be identified, possible partner speakers to be identified and abstracts submitted.

2.3.1 BIG HIT Project website

The BIG HIT website www.bighit.eu will have two main roles:

- Dissemination of information about the BIG HIT Project: This will contain information for different audiences, news and events listings, as well as a repository for project reports and other background information such as guidelines, methods, evaluation criteria or questionnaires. The website will be added to regularly to encourage return visits. The website will create links with other related projects in order to improve search ranking results, to help promote the project and engage with the wider community.
- Dissemination of information to allow the project to be replicated: Content will form a toolkit of information and resources to facilitate the replication and exploitation of the project. This includes technical reports and case studies that explain how BIG HIT is structured, business models for replication BIG HIT achievements and the lessons learned, so others can benefit from BIG HIT experience. It will also include operational KPIs of operating profit / loss, availability of hydrogen to end-users, average hydrogen transferred each ferry journey, end-user demand curtailed energy not captured due to H₂ storage being full and carbon savings compared to fossil based alternatives. In addition, wider KPIs of reduction in air pollutants (NO_x particulate etc), training, jobs created and acceptability of FCH technologies) will be included.

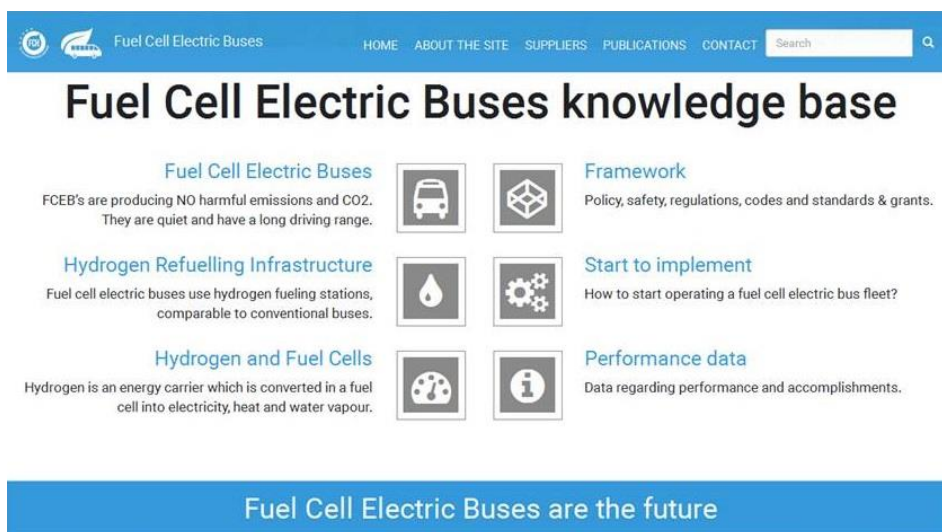
Planned dissemination actions beyond the completion of the BIG HIT project are that the BIG HIT website platform will be maintained for at least 2 years after the completion of the project, to serve as a reference for future EU replications of BIG HIT concept. The public deliverables are envisaged to be maintained for 2 years after the finalisation of BIG HIT project. Its maintenance will be responsibility of SHFCA.

2.3.3 Creation of a Hydrogen Territories Platform

Further development of the BIG HIT communications and information archive might create a web portal that can host information from BIG HIT and other similar projects working on the development of hydrogen islands or territories. An example approach which may be relevant for BIG HIT has been the setting up of www.fuelcellbuses.eu as a web portal allowing interested parties easy access to relevant information from the CHIC project, and possibly other FC bus projects.

This 'Fuel Cell Electric Buses Knowledge Base' portal is in a format that can be easily accessed by interested parties, with sections including details on the buses, refuellers, hydrogen and fuel cells, regulatory guidance, and how to start implementation of Hydrogen Fuel Cell Bus fleets.

The corresponding 'Hydrogen Territories Knowledge Base' portal might include sections with details on the hydrogen production from renewables, hydrogen storage and logistics, hydrogen and fuel cells, regulatory guidance, and how to start implementation of Hydrogen Territory projects.



Fuel Cell Electric Buses are the future

Fuel Cell Bus Knowledge Base launched late 2016. Link: www.fuelcellbuses.eu

After completion of the project, the BIG HIT reports and results will be self-archived (green open access) using the EU’s CORDIS (Community Research and Development Information Service). The CORDIS Projects and Results service is the one-stop shop for information on EU-funded research projects and project results. Users can search CORDIS and will be able to access all the BIG HIT project information from throughout the lifecycle of BIG HIT including the grant details, funding and participants, key reports, the latest multilingual Results in Brief and links to specific publications and other documents.

2.3.3 BIG HIT Graphic material

The BIG HIT project logo has been developed with input from all partners to create a distinct brand:



The BIG HIT logo will be used on all BIG HIT communications (presentations, leaflets, posters, video, etc). A version of the logo without strapline is also available and can be used in situations where space is limited or lo-res format is preferred for mobile communications.

The BIG HIT project logo, the FCH2JU logo and the EC logo must be present in all publications, presentations and equipment funded by the project:



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The BIG HIT project logo, the FCH2JU logo and the EC are to be displayed on equipment funded by the project, this is a requirement from the project funders. There are no specific stipulations on logo size, BIG HIT will take a common sense approach to make these sufficiently prominent and ensure the project funders are properly recognised for the significant support they have provided.

2.3.4 BIG HIT Social and professional networks

BIG HIT will develop wider presence using social media such as Twitter and online groups such as LinkedIn to provide frequent updates. This will be useful for discussing new developments, problems, and issues or concerns. This will be proactive and reactive, sharing our learning with the community, and helping develop the BIG HIT profile.

The use of webinars could enable followers from widely dispersed locations the opportunity to find out more and interact with the project partners on a more meaningful level. This is included as an optional communication tool, and will be considered during the project.

Linked In and Twitter have been established using H2BIGHIT as the handle. Use of Facebook, Youtube, and other social media platforms will be explored and discussed with project partners before implementing.

2.4 Communication Activities

As a consortium, the totality of foreground knowledge gained during BIG HIT will be critical for any isolated territory that wishes to replicate the project. This will allow the consortium to apply as a group for tenders for replication in other territories.

The BIG HIT project communication activities will include specific focus on

1. Identification of ongoing projects for project cooperation (other islands or isolated territories)
2. Publications (in scientific journals, etc.)
3. Identification of appropriate Conference, Events and Fairs for participation by BIG HIT
4. Workshops
5. Public events for the Orkney and Malta citizens

The BIG HIT dissemination and exploitation activities are outlined in the following Table 2.4.

Method/Channel	Description of BIG HIT Dissemination & Exploitation Activities
BIG HIT Website	<p>The BIG HIT website www.bighit.eu will have two main roles:</p> <p>Dissemination of information about the BIG HIT Project: This will contain information for different audiences, news and events listings, as well as a repository for project reports and other background information such as guidelines, methods, evaluation criteria or questionnaires. The website will be added to regularly to encourage return visits. The website will create links with other related projects in order to improve search ranking results, to help promote the project and engage with the wider community.</p> <p>Dissemination of information to allow the project to be replicated: Content will form a toolkit of information and resources to facilitate the replication and exploitation of the project. This includes technical reports and case studies that explain how BIG HIT is structured, business models for replication BIG HIT achievements and the lessons learned, so others can benefit from BIG HIT</p>

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	<p>experience. It will also include operational KPIs of operating profit / loss, availability of hydrogen to end-users, average hydrogen transferred each ferry journey, end-user demand curtailed energy not captured due to H2 storage being full and carbon savings compared to fossil based alternatives. In addition, wider KPIs of reduction in air pollutants (NOx particulate etc), training, jobs created and acceptability of FCH technologies) will be included.</p>
Hydrogen Territory Platform	<p>Further development of the BIG HIT communications and information archive might create a web portal that can host information from BIG HIT and other similar projects working on the development of hydrogen islands or territories. An example approach which may be relevant for BIG HIT has been the setting up of www.fuelcellbuses.eu as a web portal allowing interested parties easy access to relevant information from the CHIC project, and possibly other FC bus projects. This 'Fuel Cell Electric Buses Knowledge Base' portal is in a format that can be easily accessed by interested parties, with sections including details on the buses, refuellers, hydrogen and fuel cells, regulatory guidance, and how to start implementation of Hydrogen Fuel Cell Bus fleets.</p> <p>The corresponding 'Hydrogen Territories Knowledge Base' portal might include sections with details on the hydrogen production from renewables, hydrogen storage and logistics, hydrogen and fuel cells, regulatory guidance, and how to start implementation of Hydrogen Territory projects.</p>
Orkney Islands community and local stakeholder engagement	<p>Communications to address any local questions about adverse impacts, such as concerns about use of ferries for shipping the tube trailers which might cause travel restrictions or delays for other ferry users.</p> <p>This can make good use of <i>Flyers & Local Household Written Communications</i> as outline in section below.</p>
Isolated Territory Associations	<p>BIG HIT will disseminate project information through the Conference of Peripheral Maritime Regions of Europe (CPMRE), the Scottish Islands Federation (SIF) and the European Small Islands Federation (ESIF), providing access to 160 maritime and peripheral regions (through CPMR) and 1,300 small European islands (through ESIF). It is hoped that these will provide ample opportunities for replication. A further opportunity to be explored during the project is the use of webinars, which could enable followers from widely dispersed locations the opportunity to find out more and interact with the project partners on a more meaningful level.</p>
E-mail Newsletter	<p>Visitors to the BIG HIT website will be offered the opportunity to sign up for a regular email newsletter which will give regular updates, develop BIG HIT profile, and achieve wider stakeholder recognition. It will use examples from BIG HIT activities, interviews with project 'champions', quotes from end users and will highlight BIG HIT success and linked opportunities. This will also be distributed via a database of stakeholders and interested parties.</p>
Flyers & Local Household Written Communications	<p>BIG HIT will produce literature (eg flyers) for local dissemination to help inform the community groups and networks of the attributes and benefits of FCH technologies, with the aim of raise their awareness and levels of knowledge so that any negative preconceptions can be dispelled.</p> <p>As example of pro-active written communication with local stakeholders OIC wrote to every household on the islands of Eday and Shapinsay in May 2016 to outline BIG HIT and advised all local residents of the proposals to install hydrogen boilers in the island schools.</p> <p>Further activities in this area will help address any potential areas of concern which may be raised by local stakeholders – individuals or community groups – on</p>

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	any aspects of the BIG HIT project delivery or ongoing activities.
Social Media & Online Groups	BIG HIT will develop wider presence using social media such as Twitter and online groups such as LinkedIn to provide frequent updates. This will be useful for discussing new developments, problems, and issues or concerns. This will be proactive and reactive, sharing our learning with the community, and helping develop the BIG HIT profile.
Webinars (option)	The use of webinars could enable followers from widely dispersed locations the opportunity to find out more and interact with the project partners on a more meaningful level. This is included as an optional communication tool, and will be considered during the project
Related Projects cooperation	Develop strong links with related projects with aim of maximising the dissemination impact and replication opportunities.
Technical & Academic Conferences	<p>European technical conferences and academic events will present opportunities to share BIG HIT achievements with experts in the technical field, but also with potential wider stakeholders and investors. This will utilise presentations, posters, and papers.</p> <p>Conferences with most relevance to BIG HIT will be identifies in a forward event planner (see Appendix 2) that enables suitable events to be identified, possible partner speakers to be identified and abstracts submitted.</p> <p>Using posters at events such as the FCH JU Annual Stakeholder Forum may also be appropriate during the early stages of the BIG HIT project, while work is in progress and also to engage people, gauge their reactions, and get one-to-one industry and stakeholder feedback on wider dissemination opportunities.</p> <p>Ongoing Participation in forums after month 60 will be planned, so that BIG HIT partners can share the results obtained after the project at conferences, fairs and events related to the project targets.</p>
Technical & Academic Publications	<p>WP5 activities will cooperate with other universities such as Heriot-Watt University (in Orkney and Edinburgh) and also University of Groningen (NL)). This may include opportunities for supervision and co-supervision of master and/or Ph.D. students doing project topics related to the BIG HIT project and the BIG HIT concept.</p> <p>Aspire to achieve some publications by partners in reviewed journals in relevant disciplines near the end of the project when we have BIG HIT data and results to report. Copies of all publications will also be placed on the Hydrogen Territories Platform and CORDIS website</p>
Workshops	BIG HIT will use opportunities to deliver workshops at events to gather feedback from participants or from experts on particular issues. Demonstration and hosted visits will also be considered early in the project to get feedback from stakeholders on project activity and to help with local acceptance
Press & Media	Press releases to announce important achievements will be coordinated with and delivered through the Steering Committee. The objective will be to get steady and significant coverage of BIG HIT in national and international press and media throughout the duration of the project. BIG HIT will run a press day at a project launch event in Orkney, using multi-media webcast or similar to widen impact. Issue regular newsworthy updates from all partners throughout the BIG HIT project (aim minimum one per partner per year)

Table 2.4 BIG HIT project Communication Channels & Activities

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The BIG HIT dissemination and exploitation activities will link with the plans for Work Package 1 (Project Coordination) led by the FHA. At the partner level, each will use the foreground knowledge generated in BIG HIT differently. These may include topic areas covering:

- Methods for connecting electrolysers behind the meter of RE sources and controlling them to ensure that the load accurately follows the supply.
- Methods for running electrolysers when directly connected to RE sources
- Methods of connecting catalytic boilers in parallel and combining with existing diesel boilers that have a higher temperature output
- Changing the recharging system of BEVs with FC range extenders to allow the FC to recharge the battery when the car is not in use.
- Knowledge of the most efficient method of moving tube trailers between islands, to minimise the cost per kg of hydrogen.
- Four years of operational data, which will be summarised in 6 monthly reports with operational KPIs which can be widely understood and achieve maximum awareness impact. These will include:
 - Operating profit / loss of OHT
 - Availability of hydrogen to end-users
 - Average hydrogen transferred each ferry journey
 - Curtailed energy not captured due to H2 storage full
 - Carbon savings compared to fossil alternatives
 - End user demand
 - Social impact and acceptability
 - Skills & training, plus any innovation or IP outcomes

This data will be made available for exploitation and also made accessible for verification and re-use by other projects seeking to replicate the BIG HIT approach.

For this knowledge, it will be necessary to apply IPR measures. Identification of IP will be the responsibility of partners and work package leaders (who will follow the new foreground generation in each WP). They will be expected to ensure that the IP is indeed novel (internet / patent searches) and describe the foreground in detail. This information will be brought to the Coordinator (FHA is also Task 6.1 leader and has wide expertise in IP issues from several FCH JU projects), who will work with each partner to define adequate IP protection measures. This will include the development of a business plan (including IPR considerations and protection measures, such as patenting for ownership of results) including:

- Value creation, which provides an overall view of the product/service detailing new and distinctive benefits for addressed industries and potential end-user/customers.
- Industries and end-users/customers, which refers to the market potential and how the targeted groups will be reached.
- Management of internal resources and organisation to deliver the value to the customers.
- Networking, referring to the range of envisaged collaborations with other actors on the market
- Financial and other requirements to bring the results to the market Exploitation Routes

3. Conclusions

This Dissemination and Exploitation Plan will maximize the impact of the BIG HIT project through dissemination to follower territories, stakeholders and the wider public. This plan uses resources and support from all BIG HIT partners to maximise the impact and value for BIG HIT dissemination and exploitation.

Specific objectives for these activities in Work Package 6 will:

- Increase the likelihood of project replication and exploitation through informing and communicating the community benefits and the wider business case with follower territories and other potential replicator territories
- Achieve awareness of the project and disseminate results to wider stakeholder networks, building acceptance with specific individuals, the local population, and more widely.

The dissemination and exploitation activities will reinforce the benefits from wider replication and further deployments of renewable energy with fuel cell & hydrogen technologies in isolated or constrained territories.

This Dissemination and Exploitation Plan will be periodically updated throughout the project to ensure that activities planned have a suitable spread of messages and audiences project awareness and maximise the chances of replication

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Appendix 1: Partner Dissemination Insights & Exploitation Opportunities

Wind Turbine Operator (SDT) dissemination insights and exploitation opportunities may include:

- Four years of operation will provide SDT with considerable financial income and experience of operating an off-grid wind-electrolysis system. This will allow insights into deciding best options to continue providing energy to Orkney Hydrogen Trading once BIG HIT has finished. This will be key learning for dissemination about financial sustainability, linked to analysis in WP5 by DTU. If successful, a second, completely off-grid turbine could be considered which would be a very positive outcome and a key dissemination highlight.

Electrolyser supplier (ITM) dissemination insights and exploitation opportunities may include:

- Learning and insights into the best way to connect, operate, and maintain a MW scale electrolyser with an off grid renewable source and control the system could be used as example of benefit from participation in BIG HIT project. Depending on IP clearance some key insights might be part of dissemination plans and form basis for presentations to take place at key technical or academic conferences.
- There will be significant learning accumulated during 4 years of operational experience of having a total of 1.5MW of electrolysis directly connected to wind turbine on Shapinsay and wind/tidal turbines on Eday. With no or very few existing MW-scale electrolysis systems directly connected to an off-grid renewable resource this will have very good dissemination impact potential, and work to validate and improve technical and operation models could again be part of dissemination plans and form basis for presentations to take place at key technical or academic conferences.
- Use of this combined knowledge on connection, operation, and maintenance of a MW scale electrolyser with an off grid renewable source to support development of further hydrogen territories projects and widely replicate BIG HIT

Suppliers of hydrogen consuming equipment (SYM, GIA) dissemination insights and exploitation opportunities may include:

- Applying the knowledge gained about equipment that has been modified for the BIG HIT project will improve future models, and may also offer additional model for future customers. The learning from 4 years of operational data in a harsh environment (high latitude, coastal marine environment) will help make subsequent models more robust and corrosion resistant, to reduce future customers' maintenance costs, and provide reassurance on the performance and reliability of the equipment in practice which is often a key consideration for other potential users.
- This combined knowledge can be used in the dissemination activities to fully inform potential replicator territories and users to make evidence based decisions which can support the future projects to expand or replicate BIG HIT

System Operators (CES, ITM, OIC – through their involvement with Orkney Hydrogen Trading) dissemination insights and exploitation opportunities may include:

- Take the knowledge gained through operation of the system, its detailed analysis, and the training its staff have received in handling and driving flammable gases and the SCADA hardware and software developed to a) Expand the BIG HIT system with additional projects (either funded regionally or privately) to increase the hydrogen production and end-users and b) take the model of operation and business cases and apply them to other territories with the required modifications as analysed in WP5.

End User (OIC) dissemination insights and exploitation opportunities may include:

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- To learn from both personal experience and data analysed in the 6 monthly reports, about the use of FCH technologies. If shown to be reliable and cost effective, then there will be a strong driver to work with OHT on subsequent projects to expand the system and base more of the council's heat, power and mobility needs on hydrogen. This will have objectives of cost and carbon reduction, and wider societal impacts of reducing fuel poverty and improving energy security.

Education and Research (DTU) dissemination insights and exploitation opportunities may include:

- To learn from the business case, environmental and social analysis that DTU is completing in WP5 and operational analysis completed by others to expand knowledge of wider systems in the hydrogen economy for teaching and research purposes.
- DTU can cooperate with other universities such as Heriot-Watt University (in Orkney and Edinburgh) and also University of Groningen (NL)). This may include opportunities for supervision and co-supervision of master and/or Ph.D. students doing project topics related to the BIG HIT project and the BIG HIT concept.

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Appendix 2: Event Plan for Maximising Impact of Dissemination & Exploitation

A table of forthcoming events/activities has been developed as part of BIG HIT dissemination plans. This format concentrates on events over the next 12 months, but includes key dates out to the end of BIG HIT project in 2021 and for 12-18 months afterwards.

With the increasing level of activity in hydrogen and fuel cells for clean transport, energy storage, and clean embedded generation this planner will be an essential tool to keep on top of all relevant events, to avoid potential diary conflicts, and to identify availability of the most suitable BIG HIT partners for participation in dissemination and exploitation activities. Most of these events will be listed on the BIG HIT website, which will help to further raise awareness of the BIG HIT project and its outcomes.

Event Date	BIG HIT Opportunity	Organiser	Event	Location	Event Comments
25 Jan 2017	ET Speaking	Transition Scotland	Low Carbon Transport and Integrated Local Energy Systems	ECCI, Edinburgh	
7-8 February 2017	NH Speaking	Reed Exhibitions	Energy Storage & Connected Systems	Olympia, London, UK	Should be useful
15-16 Feb 2017	Partner involvement	SHFCA/FHA	Mission from Scotland to Aragon	Zaragoza & Huesca	Being finalised
23 Feb 2017	NH attend	SPREEE	Cross-Party Group on 'Energy System Policy'	Holyrood, Edinburgh	Energy Systems policy update
23 February 2017		SEA	10th Power Scotland Conference	Venue tbc, Scotland	Not listed on SHFCA website, but avoid diary clash if poss.
27 Feb 2017	NH attend	Aberdeen	Opening of second HFC refueller	Aberdeen, UK	
1-3 March 2017		Reed Exhibitions Japan	FC EXPO 2017	Tokyo, Japan	Main HFC event for Asia
13 March 2017		EneField	EneField project dissemination workshop	Birmingham, UK	Afternoon event?
14 March 2017	ET Speaking	Climate Change Solutions	Birmingham 2017 International HFC Conference	Birmingham, UK	
15 March 2017		Scottish Cities Alliance	Aberdeen Hydrogen Summit	AECC, Aberdeen	Essential
14-16 March 2017			International Renewable Energy Storage Conference (IRES 2017)	Dusseldorf, Germany	
16 March 2017			Aberdeen HFC bus conference?	Aberdeen, UK	Details tbc
17 March 2017		HFC Supergen	Launch of HFC SUPERGEN White Papers 2, 3 and 4 (Energy Systems – Security – Economic Impact), and Sandpit	City Hall, London	Will be useful event
21-22 March 2017		Scottish Renewables	Annual Conference 'Scotland's Energy Evolution'	Sheraton, Edinburgh, UK	Not listed on SHFCA website, but avoid diary clash if poss.

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24-28 April 2017	ITM & DTU attending	H2FC Fair	Hannover Messe 2017	Hannover, Germany	Main HFC event for Europe
28 April 2017		HFC Supergen	'Five Years of HFC Supergen' event	Imperial College, London, UK	
5-6 May 2017	tbc	PSI Events	Greenfleet & Evolution Scotland	Edinburgh	Likely to include hydrogen vehicle seminar
8-12 May 2017			Energy Storage World Forum	Berlin, Germany	
10-11 May 2017	Abstracts by 3-Jan-17	Reed Exhibitions	All-Energy 2017	Glasgow, UK	Multiple sessions of interest
18 May 2017	tbc	SPREEE	Cross-Party Group on 'Local Energy'	Holyrood, Edinburgh	May include Orkney?
31 May – 1 June	NH speaking?	Univ of Birmingham	Fuel Cell & Hydrogen Technical Conference 2017	Birmingham, UK	Several sessions of interest
1-30 June 2017	tbc	EU	EU Sustainable Energy Week	Europe	Includes Energy Days & Brussels conference events
5-6 June 2017		CHFCA	Hydrogen and Fuel Cells 2017	Vancouver, Canada	
7 June 2017	tbc	STEP	'STEPping into the Future' seminar	VQ, Edinburgh	May include Orkney?
8 June 2017	tbc	SHFCA	SHFCA member event on Transport (tbc)	Methil, Fife, Scotland	Event/programme tbc
19-23 June 2017		EUSEW	Event in EU Sustainable Energy Week	Brussels	BIG HIT partner event?
21-22 June 2017		BIG HIT	BIG HIT Steering Committee	Sheffield, UK	
28-30 June 2017	Abstracts by 31-Jan-17	HYPOTHESIS XII	Conference	Syracuse, Italy	
2-7 July 2017	Abstracts by 30-Nov-16	European Fuel Cell Forum	The 6th European PEFC & Electrolyser Forum 2017	Lucerne, Switzerland	
9-12 July 2017	Abstracts by 31-Jan-17	WHTC	The 7th World Hydrogen Technology Convention (WHTC)	Prague, Czech Republic	
14-17 August 2017		ICCE	International Conference on Clean Energy	Aberdeen, UK	
6-7 Sept 2017		CENEX	LCV 2017	Millbrook, UK	The largest low carbon vehicle event in UK
10-13 Sept 2017		H2FC Fair USA	Hydrogen + Fuel Cells NORTH AMERICA at SOLARPOWER International	Las Vegas, USA	Partner event to H2FC Fair at Hannover Messe (Tobias Renz)
Mid Sept 2017	tbc	SHFCA	SHFCA 9 th Annual Conference	Glasgow, venue tbc	
Late Sept 2017	Main Event	BIG HIT	BIG HIT Meeting in Kirkwall	Kirkwall	
Nov 2017 (tbc)		FCHEA	FCH Technical Seminar	USA	Well attended & highly respected seminar event

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June 2018 (tbc)		WHEC 2018	World Hydrogen Energy Conference	Rio De Janerio, Brazil	
June 2020 (tbc)		WHEC 2020	World Hydrogen Energy Conference	Iceland	
June 2021 (tbc)	Main Event	BIG HIT	Final project meeting / conference	Malta	
June 2022 (tbc)		WHEC 2022	World Hydrogen Energy Conference	Copenhagen	