



EVERYWH2ERE

Making Hydrogen affordable to sustainably operate
Everywhere in European Cities

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MISSION

Temporary diesel gensets are used everywhere in our cities (fairs, markets, construction sites, temporary events and concerts...) and Non-road diesel engines account for 5-10% of fine-particle pollution in urban environment. Fuel cell (FC) can easily replace these technologies promoting 0 noise, 0 emission temporary generation. The main objective of EVERYWHERE project is to demonstrate at TRL8 easy to transport "plug and play" FC gensets. Demonstration results will be capitalized for replication, business model, environmental and logistic analysis.



PROJECT PARTNERS





EVERYWH2ERE Vision



TRL 8 – Plug and Play – Reliable
0 emission – 0 Noise
Interesting for Cities and Events' Organizers

A DEMONSTRATION TO MARKET PROJECT!



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 779606. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe and Hydrogen Europe research





EVERYWH2ERE Abstract



European cities can become living lab for the demonstration of FC and H₂ technologies, starting from their use in niche, but everyday applications such as temporary gensets that are used in construction sites, music festivals and temporary events.

EVERYWH2ERE project will integrate already demonstrated robust PEMFC stacks and low weight intrinsically safe pressurized hydrogen technologies into easy to install, easy to transport FC based transportable gensets. **8 FC containered “plug and play” gensets (4x25 kW + 4x100 kW)** to be tested in construction sites, music festivals and urban public events all around Europe.

EVERYWH2ERE MAIN ACTIVITIES

- Demonstration campaign
- Three replicability studies for the use of the gensets in new contexts
- A detailed business, logistic and environmental analysis (Support Tool)
- Strong dissemination and stakeholders' engagement campaign (city, event industry ecc.)

Start Date: 1 February 2018

End Date: 31 January 2023





EVERYWH2ERE Objectives



MO1: Capitalize EU FC industry expertise and close to market products in automotive/backup power communication sectors, towards the design of reliable, easy to use transportable FC gensets (WPI)

MO2: Realization and demonstration of eight PEMFC transportable gensets (4x25 kW and 4x100 kW) integrated with pressurized H₂ storage (WP2-3-4)

MO3: Leverage demonstration campaign for the future techno-economical replicability of the FC gensets (WP5-6) – Realization of a Logistic Decision Support tool

MO4: Demonstration of economic viability, safety and environmental sustainability of the novel solutions (WP5-6) – Realization of replication feasibility studies and an E-Handbook for replication

MO5: Communication, dissemination and preparation of the future deployment of the new EVERYWH2ERE gensets through public and private stakeholders engagement (WP7) – Stakeholders and City Groups



EVERYWH2ERE Challenges



- High TRL to be achieved: TRL 8
- Logistic, permitting, environmental (at LCA level) aspects to be studied
- Proper contractual arrangements
- **A pre-industrial project**
- Dissemination and Stakeholders' engagement is crucial: let's make EU and cities aware of EVERYWH2ERE!
- A long but well structured project both in terms of responsibilities and timing

Why EVERYWHERE H2 GENSETS?



The market is currently served by internal combustion engines (fed by diesel, compressed natural gas, propane etc.) and batteries. Compared with IC generators and batteries, PEMFC systems are:

	Fuel cell	diesel	battery
Reliability	+	-	+
Extended run time	++	++	--
Emissions	++	-	++
Noise	+	-	++
Efficiency	+	-	++
Ambient condition	+	+	-

Key performance indicators

- #zeroemission
- #zeronoise
- #fast start up
- #easy to connect and operate
- #low maintenance
- #efficiency above 50%
- #subzero start (-20°C)
- #reduced installation time
- #ATEX and normative compliancy

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GENSETS CHARACTERISTICS

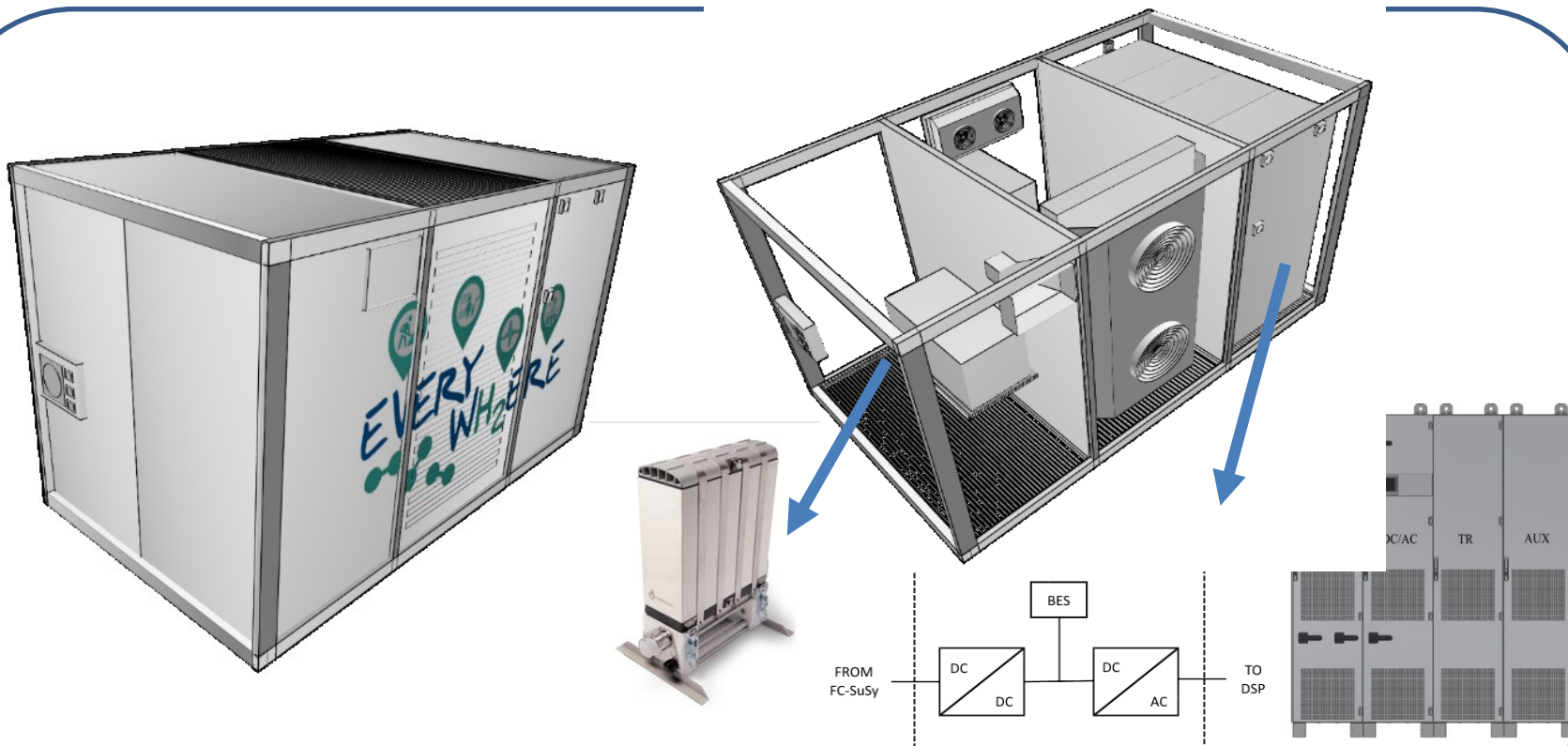
- Two gensets sizes manufactured (25 kW and 100 kW)
- "Plug and Play"
- Pre-industrial prototypes
- Transportable gensets
- Based on H₂ Fuel cell
- H₂ storage control
- Safety devices
- ATEX Containered Solution

Two boxes solution:

- H₂ tanks @350 bar
- FCPS 10 ft ISO-container



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SPECIFICS	25 kW GENSET	100 kW GENSET
Rated kVA	25	100
Electric out	230/400 Vac 50Hz	230/400 Vac
DC net out at max cont power	234 A ; 153 V (from the stack)	450 A/300 V
Voltage Regulation Method	Off grid inverter	Off grid inverter
Fuel	Pure Hydrogen (10 bar)	Pure Hydrogen (10 bar)
Fuel Cell System @POWERCELL	PCS MS-25 SuSy, S2 stack with 264 cells	PCS MS-100 SuSy, S3 stack with 455 cells
Maximum Gross Weight of the FCS container/part (kg)	Ca. 1800	Ca. 1800
Dimensions L x W x H (mm) of the FCS container/part	10ft container (3050 x 2440 x 2590), about half of space occupied by FCS	10ft container (3050 x 2440 x 2590), about half of space occupied by FCS

H2 STORAGE SPECIFICS@MAHYTEC and LINDE integration	25 kW GENSET	100 kW GENSET
Number of tanks in the system	3	9
Total volume of the tank	660L (3 x 220L)	1980 L (9x220 L)
Mass of H2 stored (at 350bar)	15,6kg (3 x 5,2kg) at 15°C	
Maximum refilling pressure	525bar	
Temperature of use	-20°C to +65°C	
Certification	TPED	
Dimensions (single tank)	L 2200mm / diam 488 at the largest	



EVERYWH2ERE: A demonstration to Market Project



DEMONSTRATION IS CRUCIAL IN EVERYWH2ERE – In Construction sites and Events

Construction Demosites: Alicante Construction Site - Spain

Music Festivals: more than 25 LoS collected by DI

Public Temporary Events: FHA (1x25 kW +1x100 kW + logistic budget) and ENVI (1x25 kW) received support from local authorities to test the genset at local events (Huesca Film Festival, Slow Food Festival etc.)



greenmusicinitiative



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DEMONSTRATION

Construction Demosites: Alicante Construction Site - Spain

Music Festivals: more than 25 LoS collected by DI

Public Temporary Events



DEMONSTRATION WILL START in summer 2020

The prototypes (4x25 kW and 4x100 kW) will be tested in construction sites, music festivals and urban public events all around EU. These events will be important showcases to promote FC potential to a large audience in order to increase their social acceptance and public awareness. An active involvement of public authorities and industrial stakeholders will foster the spreading of FC gensets opening a potential market doorway towards viable EU cities and Hydrogen economy.

WE ARE SEARCHING NEW EVENTS TO INSTALL OUR GENSET!





EVERYWH2ERE: A demonstration to Market Project



DEMONSTRATION IS CRUCIAL IN EVERYWH2ERE – Why Music Festivals?



**Our fun needs Power...
Music needs to be everywhere!**

1. Power is generally one of the five largest single production costs for a festival.
2. The quantity of fuel consumed is often considered a fait accompli by festival managers.
3. Initial research suggests that inefficient generator use is common at events in the UK.
4. The main cause of fuel wastage is lack of information about requirements and lack of communication between contractors and festivals, festivals and suppliers.
5. Power can represent up to 70% of an event's 'core' carbon footprint (core excludes audience travel and transport).
6. Fuel costs are rapidly rising, and the energy market is forecast as increasingly volatile.
7. **The festival sector has a unique opportunity to contribute to carbon reduction, showcase new technologies, test them in rough environment and engage with audiences**



EVERYWH2ERE: A demonstration to Market Project



DEMONSTRATION IS CRUCIAL IN EVERYWH2ERE – Which kind of help we need

DESIGN EVERYWH2ERE GENSET

- Support in the definition of current power supply habits
- Support in the identification of festivals energy demand profile (urban/non-urban)
- Identification of potential operational constraints (i.e. location of the gensets in festival area, hydrogen refuelling issues, permitting aspects etc.)
- Analysis of current gensets ownership/management models (contracts, costs etc.)

TEST EVERYWH2ERE GENSET

PROMOTE EVERYWH2ERE GENSET

Hosting H2Corner, promote EVERYWH2ERE via social/website etc.



**MORE THAN 35 FESTIVALS SIGNED OUR LETTER OF SUPPORT ONE YEAR AGO!
LET'S MAKE THIS SUPPORT ACTUAL IN A MUTUAL BENEFIT WAY!**



What Everywh2ere consortium can offer:



CONTRACTUAL ARRANGEMENTS AND MARKETING ASPECTS

✓ **FULL RENTAL GENSET CONTRACT**

transport + installation + fuel (cost/day) up to the hosting partner.

EVERYWH2ERE can contribute to cover the gap cost between the EVERYWH2ERE genset and a correspondent standard genset

✓ **MID-RENTAL GENSET CONTRACT**

transport + installation (cost/day) up to the hosting partner. EVERYWH2ERE consortium covers gas supply costs.

✓ **FREE CONTRACT**

the whole demonstration costs (transport, installation, gas) can be covered by the project

(LIMITED NUMBER OF OPPORTUNITIES)



EVERYWH2ERE: A demonstration to Market Project



Key Exploitable Results	TRL
PCS Fuel Cell Stack	7
Ejector for Cold Operation	5
H ₂ Storage Control / Safety Devices	6
ATEX Containerized Solution	5
H ₂ Tanks	7
Power Management (Electronics / Control)	6
EVERYWH2ERE GENSET	6

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Project Demosites

MAIN APPLICATIONS:



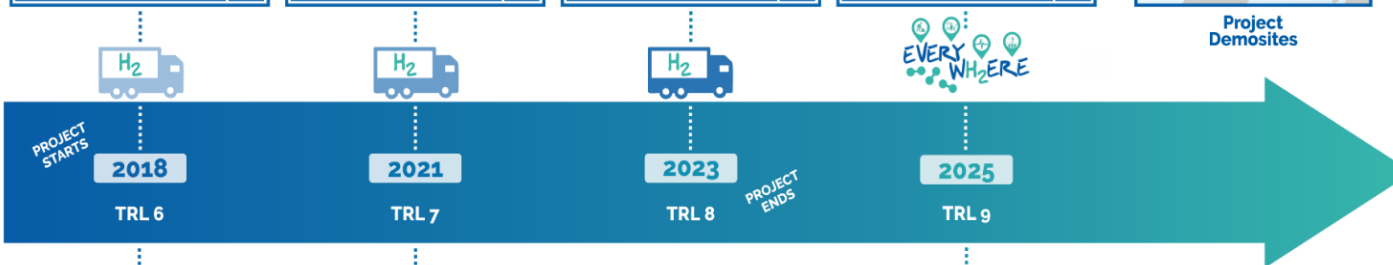
MARKET DRIVERS:

- Reduction of noise in urban contexts guarantees night working periods for construction companies
- Increasing of environmental sensibility of festival and events organizer
- Reduction of H₂ costs thanks to RES driven electrolysis and the spreading of HRS all around EU cities

ADDITIONAL MARKETS:



Replication Feasibility Studies



Project Starts

Project Drivers

- Reduction of emission and noise in urban contexts (construction sites and events)
- Increased penetration of EVs and distribution networks instabilities at urban level that won't allow energy demanding cable grid connection
- Increasing number of festival / events / MICE sector all around EU

Intermediate Achievements

Demonstration in Construction sites, Temporary events, Music Festivals

Standards & norms definition

- Definition of best practices and measures for the installation of the EVERYWH2ERE gensets in urban contexts and construction sites
- Standardization of control systems protocol, H₂ tanks and refueling procedures
- Overcoming authorization barriers for what concerns installation of Hydrogen generators and pressurized tanks in urban contexts and crowded location
- Health and Safety Certification for the integrated system

Manufacturing

- Upscale the production capacity of fuel cell stacks, H₂ tanks and safety devices
- Develop a dedicate integration scheme and procedure for a standardized system
- Development of a standard ATEX Container (ventilation/firewall) and Power Management System with suitable dedicated power electronics (not RES adapted power electronics anymore)

Further demonstrations

- Demonstration of the EVERYWH2ERE Gensets in different climates also thanks to ejector introduction
- Application in other countries (Environmental, Logistics & Energy market scenario)

Marketing

- Start to promote the EVERYWH2ERE gensets among rental companies, energy utilities, event organizers, construction companies, hydrogen supplier etc.
- Selection of the first entry markets: urban construction sites, environment sensible events
- Assessment of the final business model for the commercial exploitation of the EVERYWH2ERE Gensets



EVERYWH2ERE Consortium



EVERYWH2ERE

An Industry Driven Consortium

This guarantees:

- Industrial and Market interest to project outcomes and marketability
- Facility to involve stakeholders
- Strong commitment to genset realization
- A common «project business» to be pursued made by «different actors' business»
- Ability to overcome contingencies



EVERYWH2ERE Stakeholders group



IN EVERYWH2ERE Two Stakeholders group will be composed
EVERYWHERE CITIES (ICLEI) and EVERYWHERE Industrial Support Group (FHA)



Main targets:

- EVERYWH2ERE CITIES – Workshop within M12: Analyze current bottlenecks/challenges towards decarbonization of local temporary power supply (link with FCH JU City and Regions Initiative)
 - EVERYWH2ERE INDUSTRIAL SUPPORT GROUP – Workshop within M48 after demonstration campaign starting
- Stakeholders from FC sector, event organizers, construction companies will be involved via questionnaire (D1 – M18) for market and stakeholders' interest assessment. Their support is crucial to foster replication and marketability.

PLEASE JUST CONTACT US TO JOIN EVERYWH2ERE!



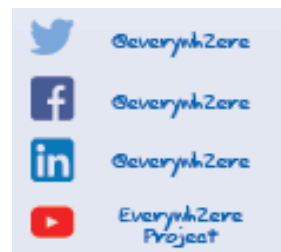
How to join EVERYWH2ERE



STEP I: GET IN TOUCH WITH US!

www.everywh2ere.eu

Follow us on Twitter, FB, YouTube, LinkedIn



STEP II: Regions & Cities Interest Group
Fill in our Expression of Interest

STEP III: HOST A DEMONSTRATION!

Sign our letter of engagement and host a demonstration



Be among the first cities to promote a society powered by Fuel Cells! A unique opportunity to promote your Sustainable Energy Action Plan and green identity!

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Regions & Cities Interest Group



- ✓ **Subscription to a Regions & Cities newsletter** to receive in-depth coverage on how fellow regions and cities make use of hydrogen gensets in their temporary events
- ✓ **Opportunities to directly exchange and cooperate with other cities and region** on innovative policies for zero emissions, zero noise construction sites and other temporary events
- ✓ **Receive feasible and effective policy recommendations** to support your zero-emission targets

Regions & Cities Interest Group



...and you need EVERYWHERE!

- Take part in a pan-European demonstration campaign
 - Host hydrogen gensets in your cities
 - Set up a H₂-Corner and reach out to citizens
- Contribute to and make use of the Logistic and Environmental Support Tool
 - Prove that it makes business and environmental sense!

THANKS FOR YOUR TIME

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