

ENERGIA HYDROGEN



Wind to Wheel

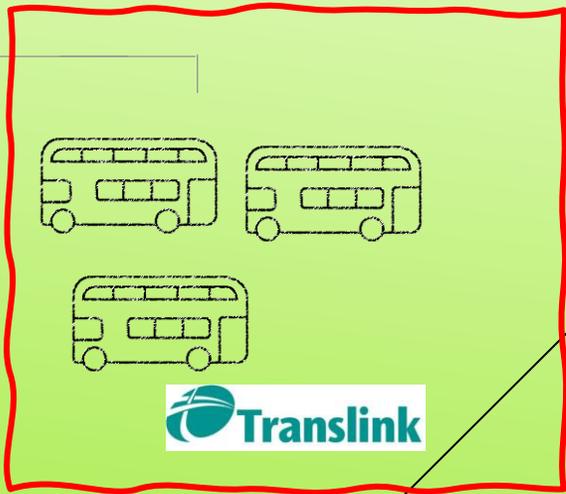
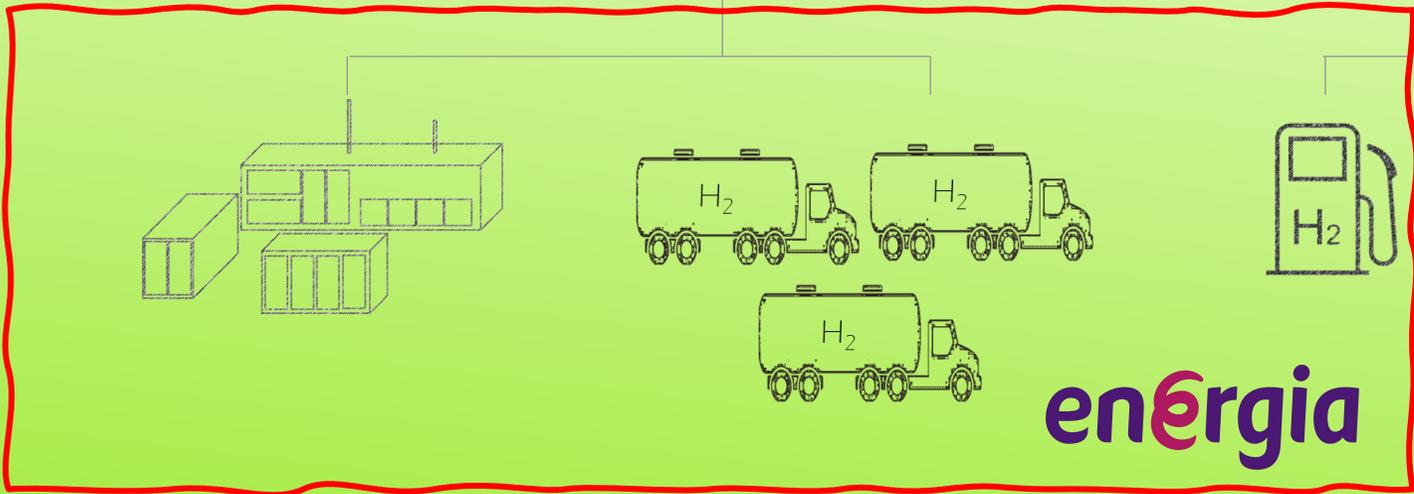
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GENCOMM AND ENERGIA



en^érgia





LESSONS LEARNT

en^érgia

GENCOMM - THE BEGINNING



Becoming a Project Partner



- Finding the right project
- Getting project partners - They have to be symbiotic and not competitive
- Defining the project parameters
- What happens when a project partner drops out?

Making the Numbers Work



- Match funding means your organisation has to make a commitment
- When the numbers are large the financial scrutiny is greater
- Cost to produce (from green energy) and cost at the pump

Hydrogen Market - Creation of Demand



- Where is the demand on the island of Ireland?
- Creating a market for hydrogen with customers
- Lobbying in NI and London to get OZEV grant funding
- High pressure Fuelling Station and Hydrogen Fuel cell busses
- Contracts for the supply of hydrogen - Public Procurement rules

GENCOMM - THE BEGINNING



Board Approval



- Getting board approval for a research project
- Stepping into a different field from the company's norm
- Being the first mover with new technology



Specification of Plant and Equipment



- Deciding on what technology is needed
 - Electrolyser
 - Compressor
 - MEGC trailers
- Talking with manufacturers and suppliers
- Low Technology Readiness Level (TRL)

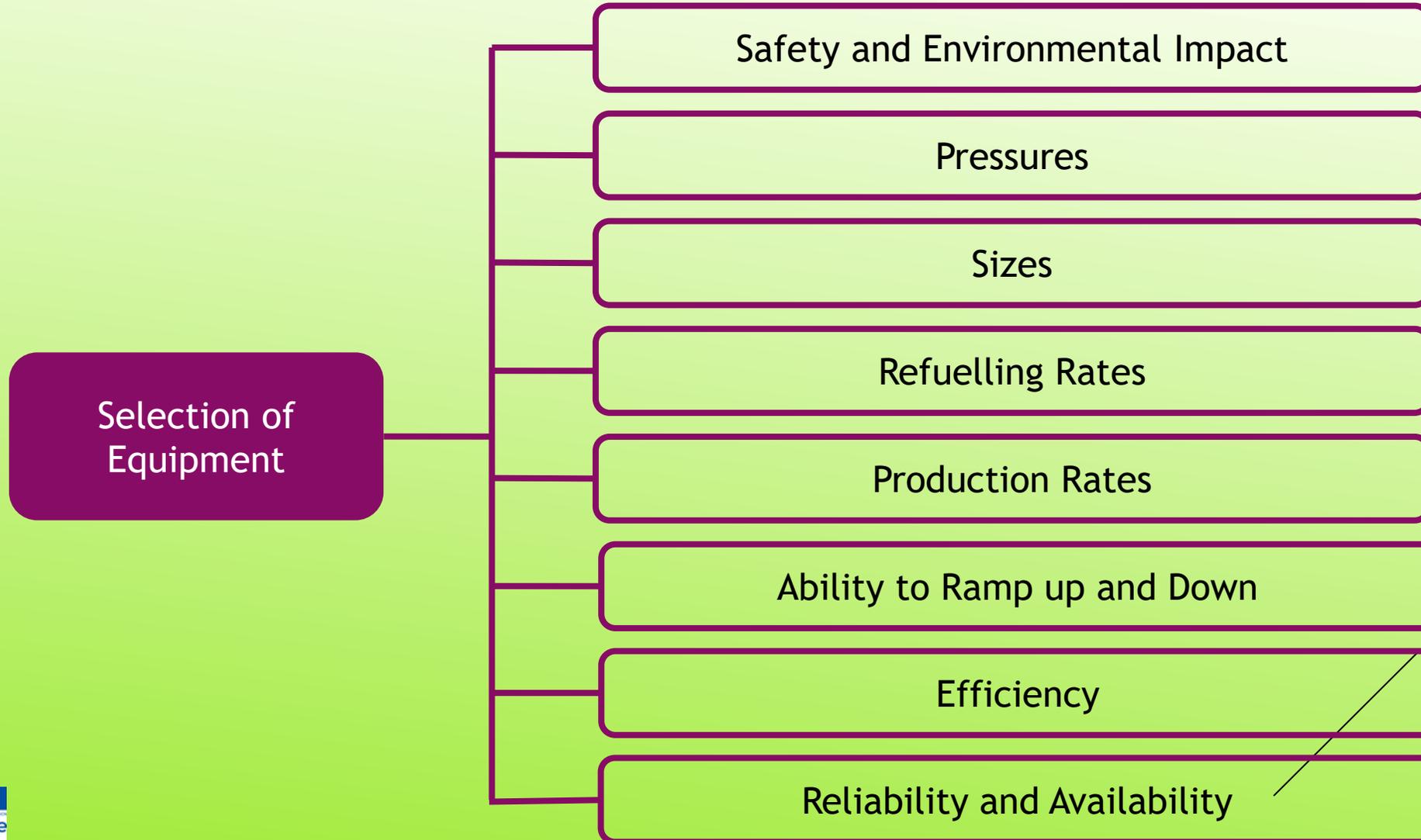


EU Tender Process

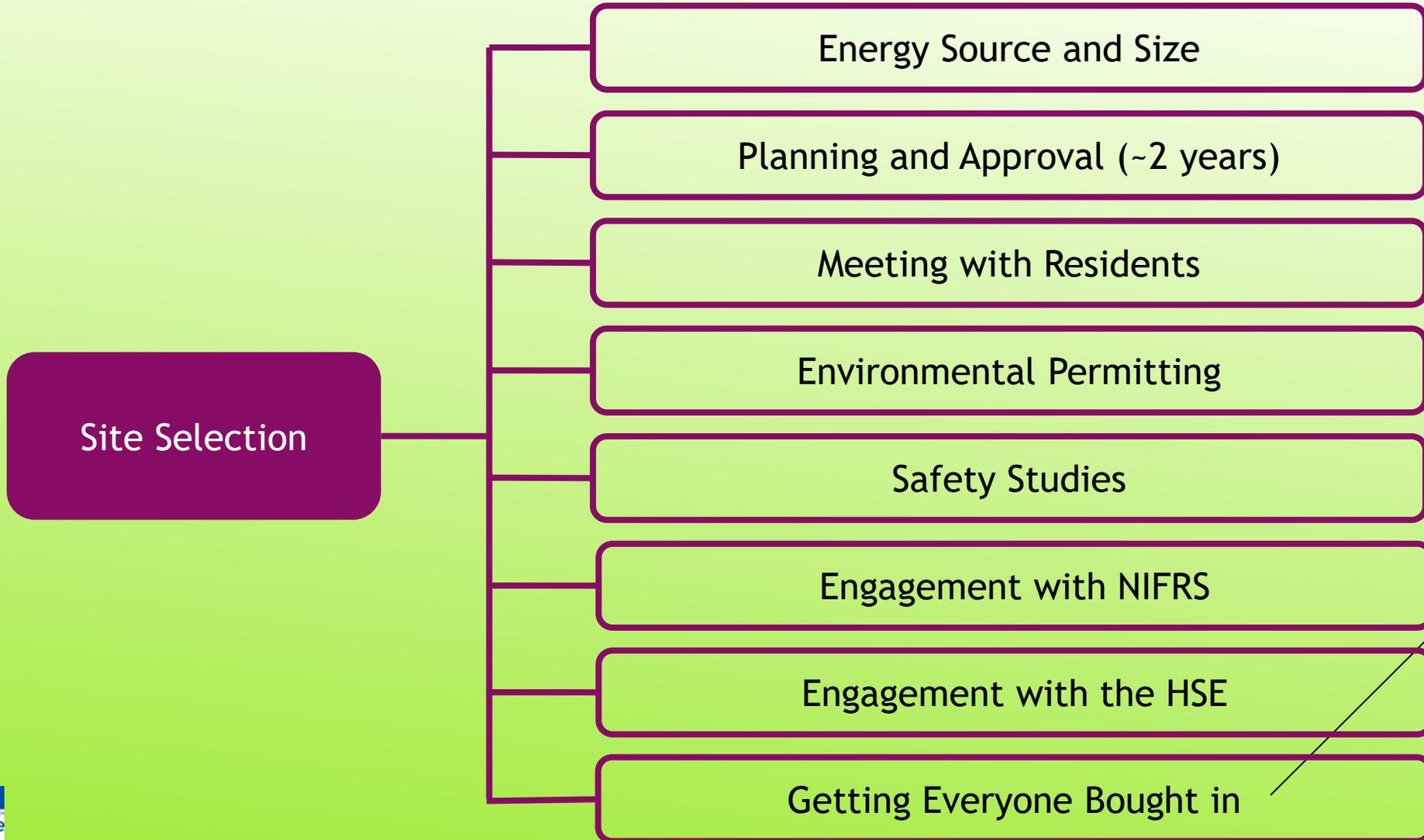


- Complexity of EU tenders
- Tendering
- Time scales for minimum tendering periods in the EU
- Assessment process

EQUIPMENT SELECTION



SITE SELECTION



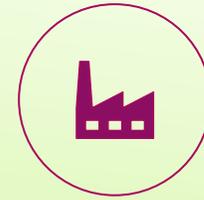
HYDROGEN REFUELLING STATION



Operating Seven
FCEV Buses



15 Tonnes of
Hydrogen Dispensed



Over 180 Tonnes of
CO2 Displaced

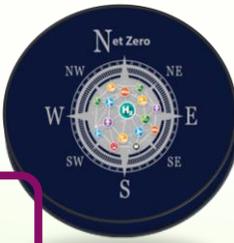


Refuelling Time
Approximately
15mins



Mobile Storage on
Site

HYDROGEN REFUELLING STATION



DSEAR, HAZOP, HAZID

Consequence Analysis

Explosion Modelling

Safety Distances

Operation and Maintenance

Monitoring of Safety Systems

Measurement of Hydrogen use

Billing

Hydrogen Deliveries

HYDROGEN MEGC TRAILERS



MEGC Hydrogen Trailer

- The trailer consists of 94 Type II carbon fibre hoop wrapped cylinders within a 20' container.
- The trailer's maximum capacity is 320kg of hydrogen at 300bar.
- The cylinders are vertical with the manifold at the rear for connection.

HYDROGEN MEGC TRAILERS



ADR/MOT

Tank Inspections

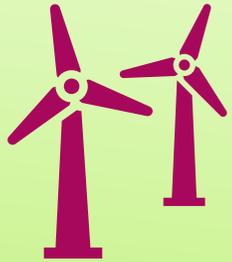
Human Interaction

Operation and Maintenance

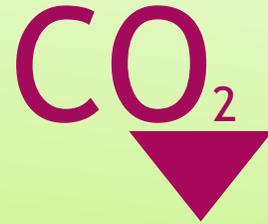
Purging and Hydrogen Quality

Standardised Connections

LONG MOUNTAIN WIND FARM



27.6MW



CO₂ savings of more than 15,000 tonnes per annum

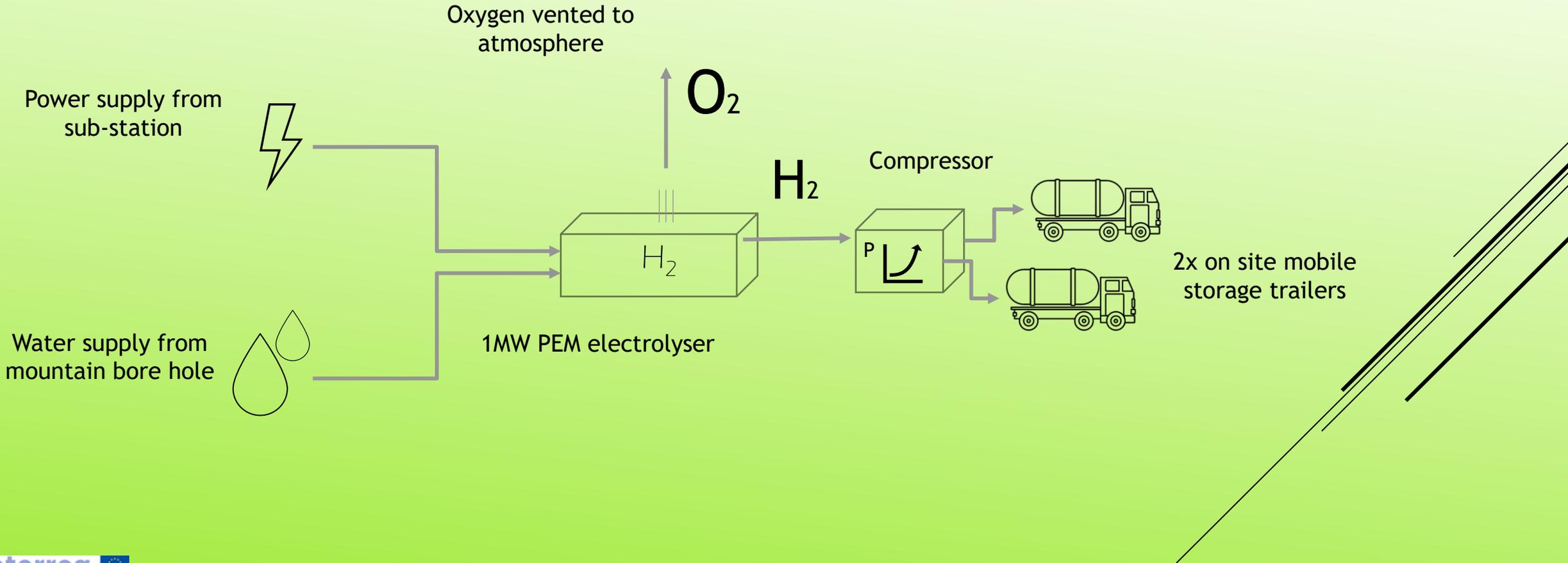


Generating enough energy to meet the annual electricity needs of over 15,000 homes

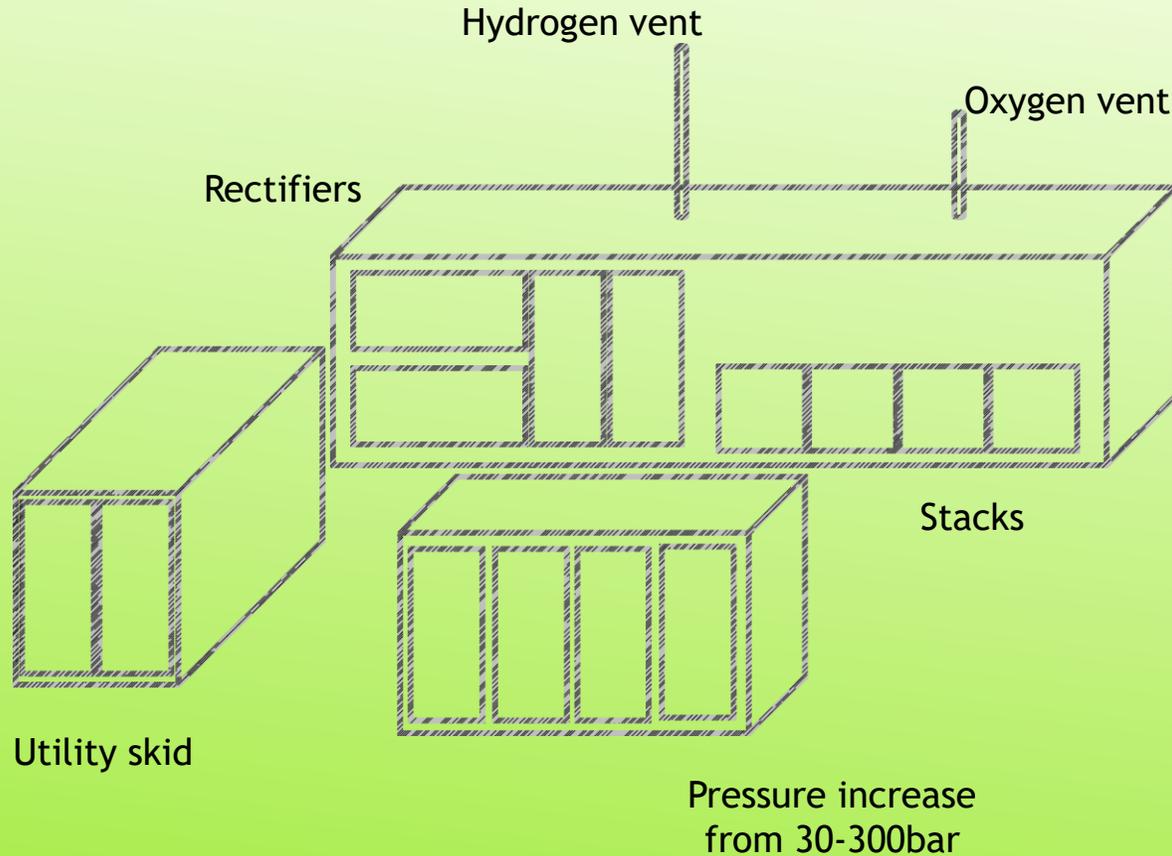


Annual community benefit fund of more than £55,000 supporting local community projects

HYDROGEN PRODUCTION



HYDROGEN PRODUCTION



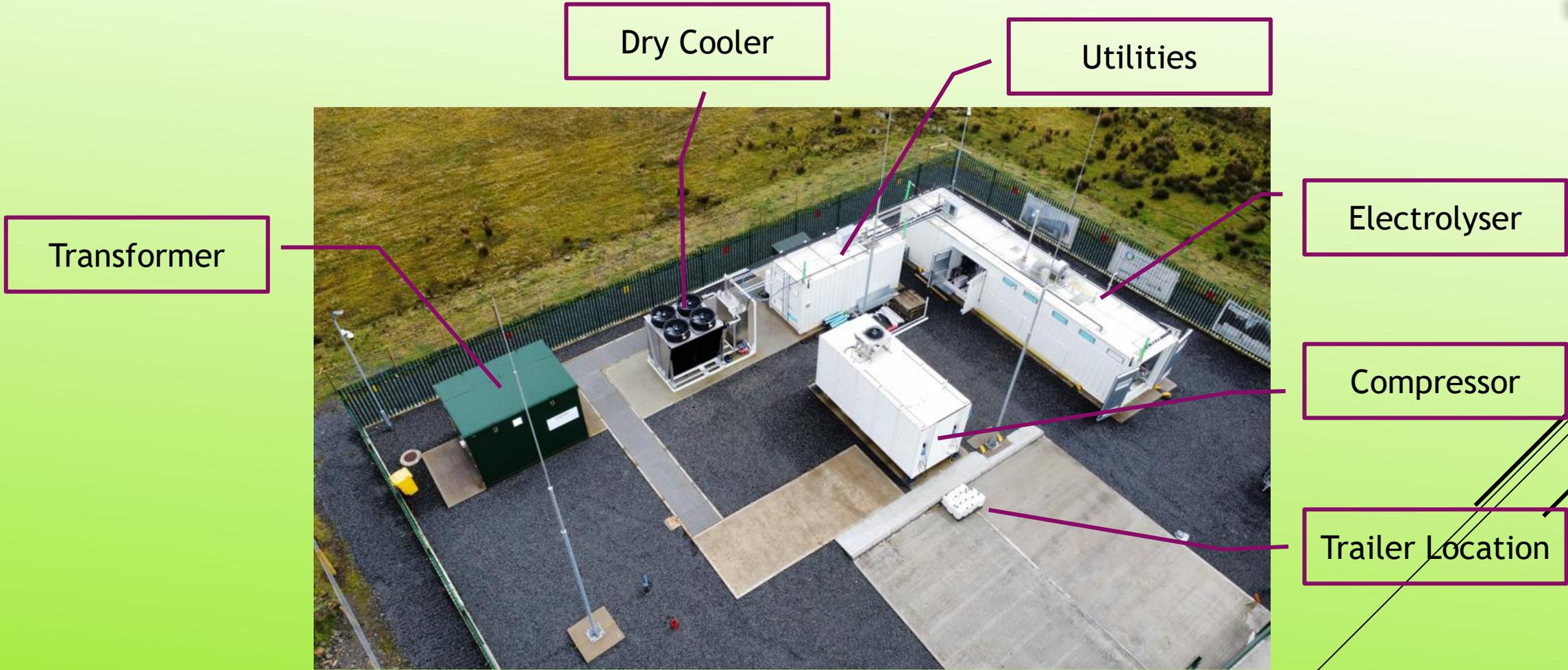
Electrolyser

Stack output 1MW
Hydrogen purity 99.999%
Flow rate 200Nm³/h
17kg hydrogen an hour
PEM technology
Efficiency 70-80%

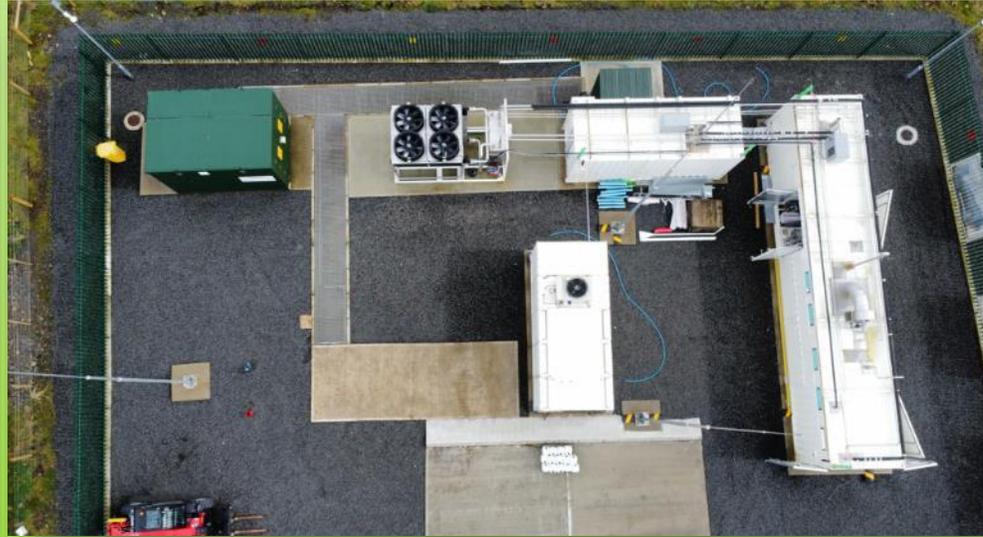
Compressor

30-300bar pressure range
Twin filling points
Automatic trailer swap over
Trailer level detection to allow slower production of hydrogen at the electrolyser

HYDROGEN PRODUCTION



HYDROGEN PRODUCTION



HYDROGEN PRODUCTION - CHALLENGES



- Safety studies
- Consents and approvals from neighbouring assets
- Cost of materials
- Budgets constraints
- COVID-19/BREXIT
- Connections and agreements

- Market expansion
- Operation of plant - skills shortage
- Industry gaps in knowledge
- Lack of guidance
- Asset integrity
- Constant delays

WHAT GENCOMM/OZEV HAS DELIVERED?



The first hydrogen refuelling station on the island of Ireland



The first hydrogen public sector buses on the island of Ireland



The first green powered electrolyser on a wind farm in Ireland & the UK

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LOOKING FORWARD



Rathsherry Wind Farm
Co. Antrim

INSTALLED CAPACITY
21.15MW

OPERATIONAL SINCE
2017

NO. OF TURBINES
9

ANNUAL COMMUNITY BENEFIT FUND
£37,000

Artemis
TECHNOLOGIES



Hydrogen
Mobility Ireland

Interreg EUROPEAN UNION
North-West Europe
GenComm
European Regional Development Fund

NSAI



CASE
Centre For Advanced Sustainable Energy

Hydrogen
Ireland

HyLIGHT



Interreg EUROPEAN UNION
North-West Europe
GenComm
European Regional Development Fund

WIND ENERGY
IRELAND



QUESTIONS?

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