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## Building Hydrogen Valleys: lessons learnt from the ground

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### 1) About Enercy

### 2) Hydrogen Valleys: concept & examples

### 3) Building a Hydrogen Valley: challenges & lessons learnt

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### **OUR EXPERTISE**

Hydrogen & Renewables



#### **Circular Economy**



Innovation & Capacity Building EU Funding

International Collaborations **Project Management** 

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### Hydrogen Valley: the concept

Integrated H2 ecosystem (local/regional) including deployment of hydrogen across the whole value chain (supply/distribution/end-use) and multiple applications across sectors (heat, power, mobility, industry)



#### **Create economies of scale**

Source: Adapted from FCH JU

### **BIG HIT – 1st HYDROGEN VALLEY TEST CONCEPT**

#### Location: Orkney Islands (Scotland, UK)

#### Rationale:

- ✓ RES curtailment = economic penalty
- ✓ Decarbonize local economy
- ✓ Boost local economy (innovation + Jobs)

#### **Deployment solution:**

- ✓ Local energy system based on hydrogen
- ✓ Basic infrastructure for future projects

12 partners from across Europe (+ supporters)

Budget: circa. 13.5m, PPP co-funding structure

Project timeline: 2016-2022



This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 700092. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe and Hydrogen Europe research.



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### **HEAVENN H2 VALLEY**

#### Location: Northern Netherlands

#### Rationale:

- ✓ Reduction of gas exploitation (loss of GDP/jobs)
- ✓ Sustainability: decarbonize local economy
- ✓ Boost local economy (skills & capacity building)

#### **Deployment solution:**

- ✓ Regional energy system based on Green Hydrogen (4 Clusters, multi-project approach)
- ✓ Create economies of scale for regional hydrogen economy (supply & demand)

30 partners from across Europe <u>Budget</u>: circa. 97m€, PPP co-funding structure

Timeline: 2020-2026



This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 875090. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe and Hydrogen Europe research.



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### **GREEN HYSLAND**

#### Location: Island of Mallorca, Spain

#### Rationale:

- ✓ Closure of local cement plant (loss of income & jobs)
- ✓ Sustainability: decarbonize local economy
- Boost local economy (skills & capacity building)

#### Deployment solution:

- ✓ Local energy system based on Green Hydrogen (6 integrated sites + infrastructure)
- ✓ Create economies of scale for Hydrogen-based local economy

31 partners from across Europe <u>Budget:</u> circa. 50m€, PPP structure

Timeline: 2021-2026



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### Learning by Doing – Challenges and Lessons learnt (I)

#### Technical:

- Deployment of H2 across entire value chain (legal, logistics, boundaries/interfaces, geography, climate)?
- RCS & lengthy permitting (pre-commercial deployment)?
- Operational competence: local training & up-skilling?

#### Solutions:

- ✓ Allow for contingency in costs & timescales
- ✓ Incorporate experience (Project Management, Engineering & Integration)

#### Financial:

- Multistakeholder co-funding structures and business models?
- Management of PPPs & private/public co-funding?

#### Solutions:

- ✓ Incorporate local/regional off-takers at the earliest stage (demand aggregation)
- $\checkmark$  Set up PPPs and create suitable co-funding structures at the design stage



Credit: Gasunie 2021



Credit: EME

### Learning by Doing – Challenges and Lessons learnt (II)

#### Social:

• Public awareness & acceptance? (local authorities & communities unfamiliar with H2)

#### Solutions:

- ✓ Local community involvement from start
- ✓ Work on public awareness and social acceptance from start

#### Policy:

- Alignment with policy objectives?
- Insufficient green hydrogen supply capacity and high price?

#### Solutions:

- ✓ Integrate scope with EU and local/national policy & economic framework (local champion / project promoter)
- ✓ Incentivise green hydrogen production (incl. manufacturing capacity)



Credit: EMEC 2021



### **NEXT STEP: CONNECTING HYDROGEN VALLEYS**

#### **Cross-border initiatives**

# Replication & co-operation with other regions



#### ✓ Sharing <u>know-how</u>: de-risk deployment of future projects/H2 Valleys

✓ Creating economies of scale: commercial implementation of green hydrogen

# Thanks!

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