Technical & Regulatory Challenges in Permitting Pilot Hydrogen Projects

Implications for standardisation

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Magtel Presentation

Technology company based in Córdoba, Spain
Areas of work:


Energy


Engineering

Telecomunication


Digital transformation


Mining


Infrastructure


Trailway

R&D department

- Since 2009, in R&D we incoorporate new technologies and processes to generate value to society and efficiency in the industry.
- We work together with universities, technology centers, investigation centers and companies all around the world.
- Latest projects:

- ❑ **SolarSCO2ol**
- ❑ **HYIELD**
- ❑ **AD-GRHID**
- ❑ **Sunrise**
- ❑ **Magboat**
- ❑ **KODA**
- ❑ **OMEGA-X**
- ❑ **GREEN SEWER**
- ❑ **CRITICALFOG**
- ❑ **Carbon4LIFE**

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HYIELD consortium

HYIELD consortium has extensive experience in innovation and development in fields including:

- Researchers' institutions & tech centers **(EUT, CSIC, SIN)**
- Technology developers **(MAG, WTE, H2S, MIN)**
- Industrial corporations **(CMX, ENG, ARC, SYN)**
- Waste managers as feedstock suppliers **(Veolia, CET)**
- Engineering and strategy consultancies **(ARI, INV)**

SPAIN
Magtel
inveniam
CEMEX
VEOLIA
WtEnergy
enagas
H2SITE
eurecat
CSIC
CETAQUA
GERMANY
Synhelion
ArcelorMittal
LUXENBURG
AristEng
FRANCE
Mincatec Energy
NORWAY
SINTEF

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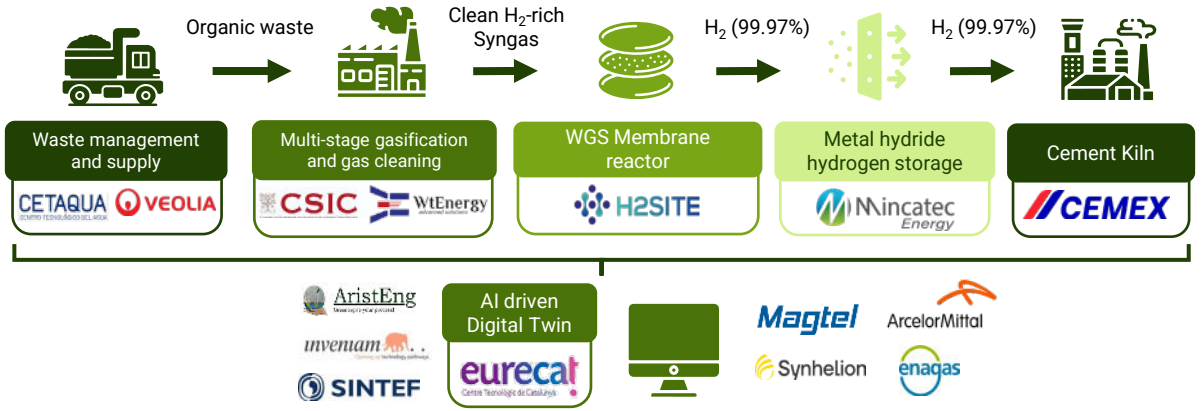
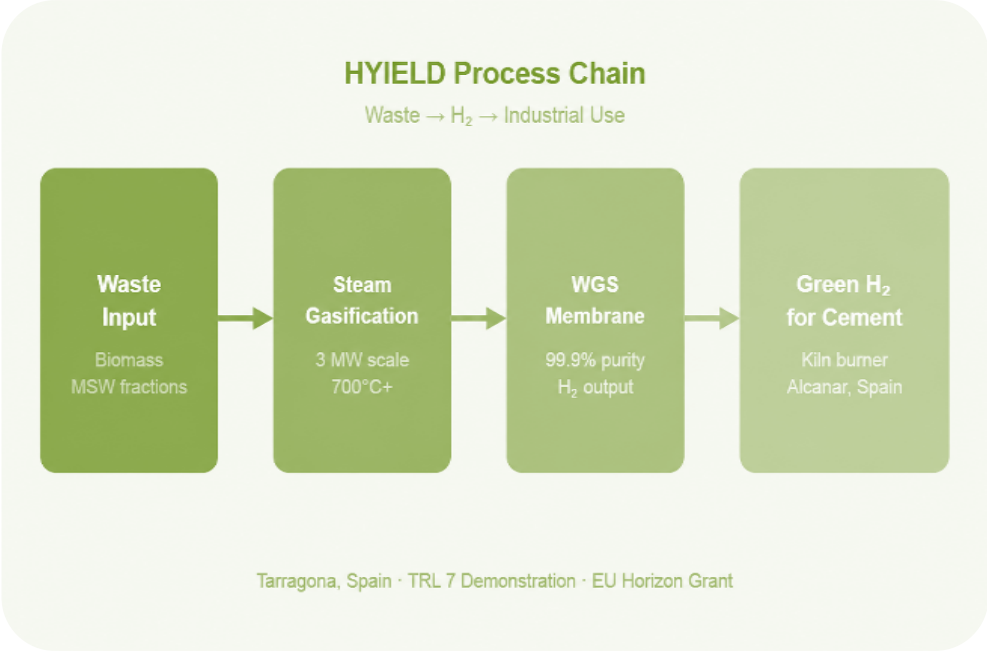
HYIELD demonstration

- CMX's Alcanar plant located in the south of Tarragona, is the selected location for a **demonstration plant**. It is well connected by road and operates a port under concession.
- The plant has integrated:
  - Environmental authorization which includes the use of waste and is ISO 9001, 14001, 45001 and 50001 certified and EMAS registered.
  - Various sources of waste heat.
  - Industrially kilns with hydrogen injection.
  - Possibility of reintegrate ashes in raw materials.



Project Overview

- EU-funded hydrogen pilot – 3MW scale demonstration.
- First-of-a-kind (FOAK) waste-to-hydrogen installation.
- Location – Alcanar, CMX's cement plant, Tarragona, Spain.
- Budget: 15M€ total – 10M€ EU grant (HE - CHP).
- Objective: technology validation, not commercial operation.



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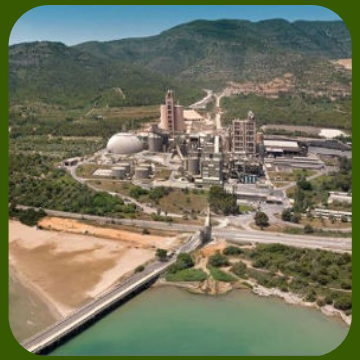
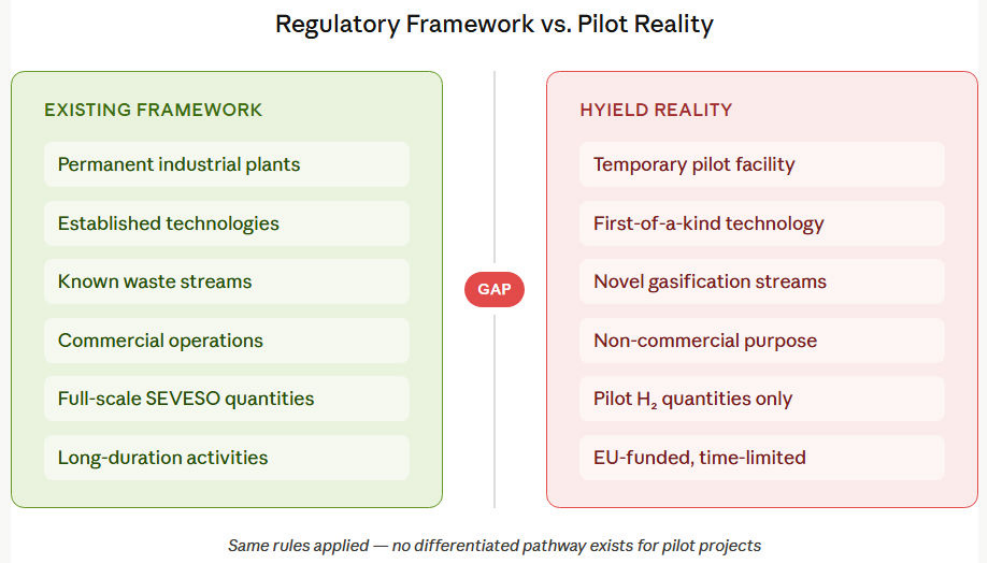
Alcanar Plant



Regulatory Context

- Environmental permit required for H_2 pilot installation.
- Assessment under legislation designed for permanent industry.
- **No differentiated pathway for:** pilot-scale, temporary or FOAK projects.
- Result: disproportionate burden on innovative demonstrations.



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HYIELD - Timeline

MAR.25
Application submitted

Environmental permit application formally submitted by CEMEX (on behalf of WTE).

JUN.25
1st Request WASTE

Clarification of:

- waste streams
- waste composition and
- process mass balance

DEC.25
2nd Request WATER

Clarification of:

- wastewater Management
- boiler blowdown characterisation and
- discharge conditions

FEB.26
Update submitted

Update of documentation reflecting internal relocation of the pilot plant.

MAR.26
New Request SEVESO & lightening
In progress

SEVESO applicability screening and lighting impact assessment under Decree 190/2015

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Permitting Timeline

Initial application submitted

Multiple successive information requests received & New regulatory topics introduced at different stages

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1st Request
WASTE

Clarification of:

- waste streams
- waste composition
- process mass balance

DEC.25
2nd Request
WATER

Clarification of:

- wastewater management
- boiler blowdown characterisation
- discharge conditions

MAR.26
3rd Request
SEVESO & lightning

- SEVESO applicability screening.
- Lighting impact assessment under Decree 190/2015

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Technical Aspects During Permitting

- **Waste streams:** Novel gasification streams — no standard classification codes.
- **Wastewater:** Non-standard streams required case-by-case characterization.
- **H_2 Safety:** SEVESO applicability screening for pilot quantities.
- **Process alignment:** Mapping FOAK processes to existing regulatory categories.

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Project Status and Coordination

- Permitting process currently ongoing (as of June 2026).
- Formal resolution pending — 3 information requests responded.
- Additional institutional interactions underway.
- **Key risk:** Permitting timeline vs. EU-funded project schedule misalignment.
- **Next step:** Facilitate regulatory alignment to protect project timeline.

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Lessons Learned

- Early regulatory engagement is critical — start before submission.
- Pilot and temporary nature must be explicitly stated in all documents.
- Pilot projects generate valuable input for regulatory evolution.

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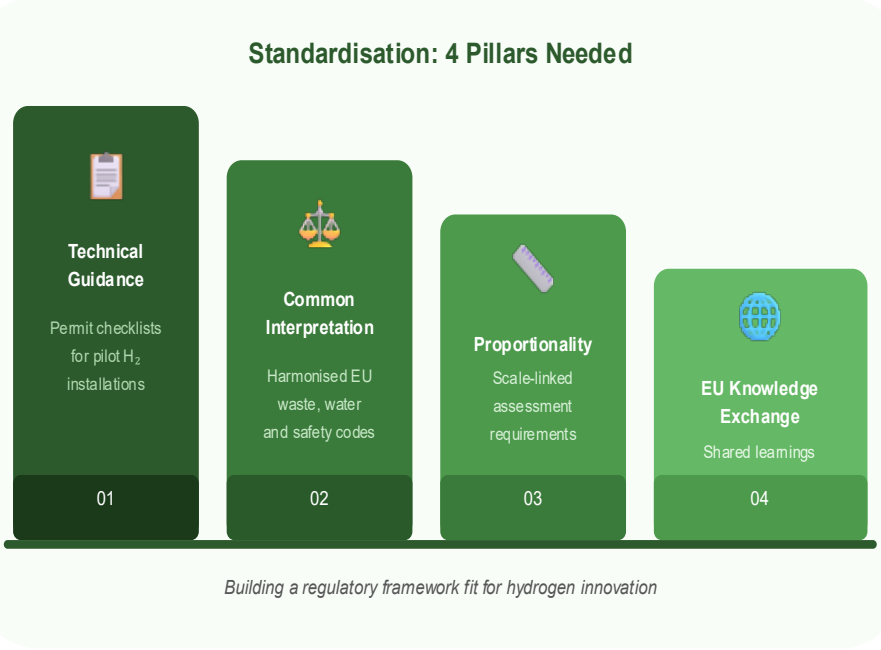
Implications for Standardisation

- **01 — Technical guidance:** Standardised permit guidelines for pilot H_2 projects
- **02 — Common interpretation:** Harmonised EU rules for waste, water and SEVESO
- **03 — Proportionality:** Scale- and duration-linked assessment requirements
- **04 — EU knowledge exchange:** Shared lessons-learned across member states



Building a regulatory framework fit for hydrogen innovation

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Standardization Gaps Identified

- **Gap 1 — No pilot permitting pathway:**
All projects treated as permanent industrial facilities.
- **Gap 2 — Outdated classifications:**
Waste and water codes predate H_2 gasification processes.
- **Gap 3 — SEVESO mismatch:**
Thresholds not calibrated for small-scale demonstrations.
- **Gap 4 — No proportionality:**
Full industrial assessment regardless of scale or duration.

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Lessons Learned: Key Takeaways

- **Engage early:**
Pre-application meetings dramatically reduce information requests.
- **Frame it correctly:**
Always communicate pilot and temporary nature upfront.
- **Map all domains:**
Waste, water, safety and lighting — assess all before submission.
- **Plan for delays:**
Build 6–12 month permitting buffer into EU project schedules.
- **Document everything:**
Each regulatory response is evidence for future standardization.

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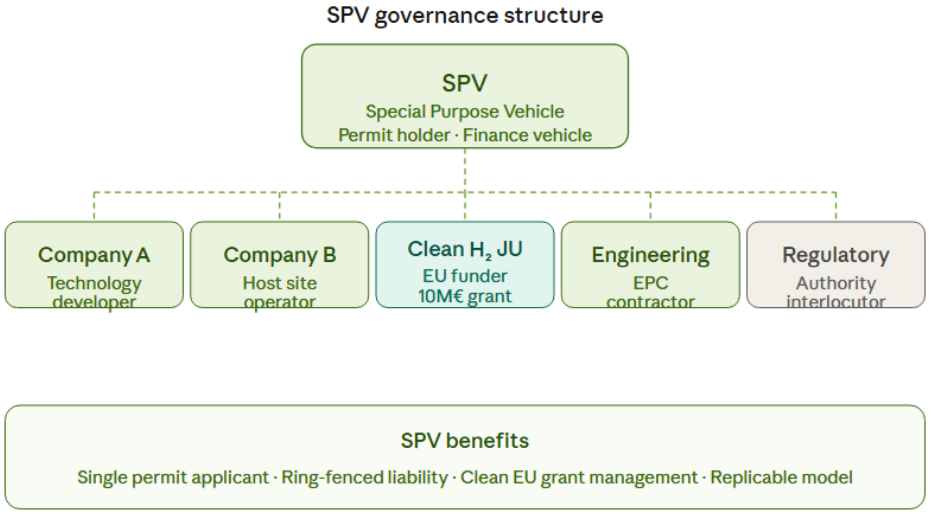
SPV — What and Why?

- **SPV:** dedicated legal entity for a single project — our model for future H_2 projects.
- **Single permit holder:** One regulatory interface for all competent authorities.
- **Ring-fenced liability:** Parent companies protected from project-level risk.
- **Clean financing:** Dedicated vehicle for EU grant and project accounts
- **Replicable:** Template deployable for future hydrogen projects across Europe



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SPV in Practice

- **Formation:**

SPV is permit applicant from day one. Governance and roles defined at inception.

- **Permitting:**

Pre-application engagement activated. Full regulatory mapping before submission.

- **Operation:**

SPV holds all permits. Performance reported through SPV structure.

- **Closure:**

Exit strategy defined from start: permit surrender and site restoration.

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Recommendations

- **Policymakers:**
Create dedicated innovation permitting track for FOAK H_2 projects.
- **Regulators:**
Standard pre-application engagement for novel technology assessments.
- **EU level:**
Harmonise H_2 process codes across member states.
- **Developers:**
SPV from inception + 6–12 month permitting buffer in EU timelines.
- **Key message:**
HYIELD + SPV model = replicable blueprint for EU H_2 permitting.

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Thank you for your time!

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