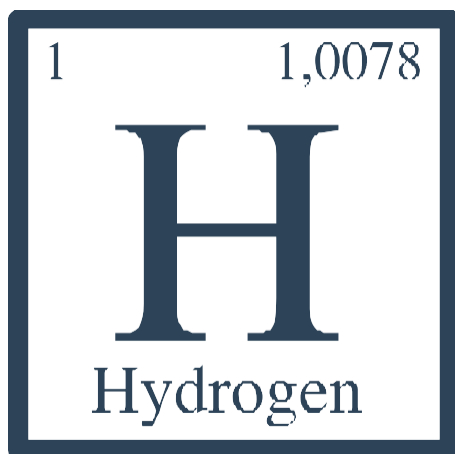




T-shore
Education

Learning Scenario Manual



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Erasmus+

Enriching lives, opening minds.

Module:

Power-to-X

Learning scenario:

**Introduction to Power-
To-X**



Atlantic Technological University		Scalda	
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Note This is a fictive generic document intended for training purposes and therefore may vary from the document provided by a company.

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1 List of equipment

Table 1. List of equipment

Tool name	Model / Version	Quantity
Tool/Item	Quantity	Remarks
HydroBullet Pure Hydrogen Separator	1	R06 or R11 model
Multimeter & Amp meter	1 each	For current and voltage monitoring
Power supply with PWM controller	1	Variable control
Distilled water + Electrolyte (KOH)	–	For electrolysis
Gas collection system	1	Includes bubble demonstration
Thermometer & Pressure gauge	1 each	For monitoring key parameters
PPE: goggles, gloves, antistatic suit	–	Required for all participants
ATEX-approved ventilation	1	Must be operational
Fire extinguisher	1	Nearby during training

2 Instruction

Before training:

- Ensure all equipment is operational and pre-installed
- Review ATEX safety procedures and hydrogen handling
- Print out:
 - Equipment checklist
 - Risk assessment templates
 - Final test (15 MCQ format)
- Prepare safety briefing (HSE + emergency procedures).

2.1 Inspection preparation

Exercise 1 – Theory & E-learning

Format: Moodle course + classroom slideshow

Topics: PtX overview, electrolysis types, safety, gas handling, ATEX, HSE, CO₂, NH₃, H₂ risk understanding



Exercise 2 – Risk Assessment

Guide training participants through: Hazard identification, mitigation strategies, ATEX zones and correct PPE usage

Output: training participant-generated written risk assessment

Exercise 3 – Operation of Hydrogen Separator Cell

1. Startup & safety briefing (15 min)
2. Inspection of setup (15 min)
3. Live operation (60 min)
4. Shutdown & clean-up (15 min)

Evaluate operating efficiency

Exercise 4 – Virtual or Physical Site Visit

Site: GreenLab Skive or HyBalance Hobro

Focus: Electrolyzer, compressor, storage, control

Output: Inspection checklist + short written summary

Exercise 5 – Final Test

Format: 15 multiple-choice questions

Time: 20 min test + 20 min wrap-up

Pass: min. 12 correct answers

Feedback: individual or group review

2.2 Setup for education

2.2.1 Learning Outcomes Summary

Area	Competency
Knowledge	PtX principles, electrolysis, catalysis
Safety & HSE	ATEX, PPE, risk handling, shutdown
Practical skills	Hydrogen separator operation
Analytical skills	Parameter monitoring, error recognition
Communication	Reporting observations, teamwork

2.2.2 Safety Requirements

- Mandatory PPE for all activities
- Fire extinguisher accessible
- Gas venting protocols reviewed before ignition
- ATEX area protocols in effect
- Exclusion zone maintained in workshop



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