T-shore Education

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Theory Exercise

Module:
Power-to-X
Learning scenario:
Introduction to Power-To-X

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Document Author Partner: Skive College

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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.

Table of Contents

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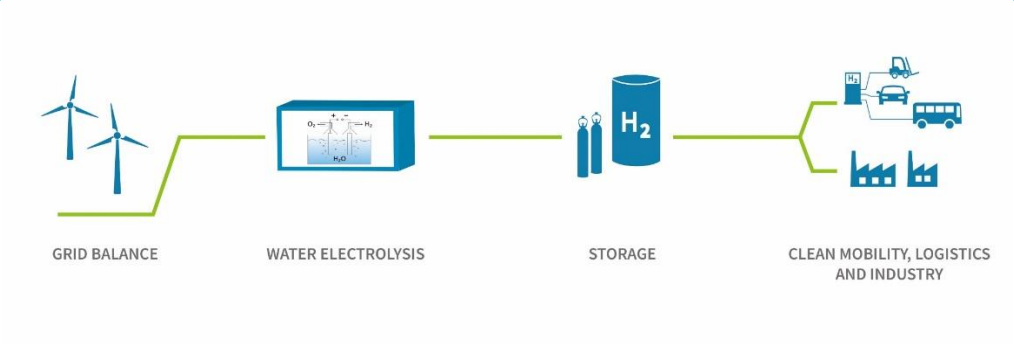
1 Administration

Table 1. Documentation overview

Order number	
Order name	
WTG serial number, range	
Site name	
Date	
Reporting by	



2 Final exam and evaluation form

Final Exam – Introduction to Power-to-X (PTX)

Instructions: Choose the correct answer for each question. Only one answer is correct per question.

Permitted materials: Only your own notes and course materials provided during training.

1. What does 'Power-to-X' (PTX) fundamentally stand for?
   a. Generation of electricity from fossil fuels
   b. Conversion of electricity into other forms of energy or products
   c. Transmission of electricity through high-voltage grids
   d. Electrification of vehicles

   ✅ Correct answer: **b**

2. What energy source is typically used as input in a PTX system?
   a. Coal
   b. Natural gas
   c. Renewable energy (e.g., wind and solar)
   d. Uranium

   ✅ Correct answer: **c**

3. What is one of the main benefits of PTX in the energy system?
   a. Increased use of coal
   b. Stabilising electricity prices alone
   c. Storage and use of surplus renewable energy
   d. Increased diesel generator use

   ✅ Correct answer: **c**

4. What is electrolysis in the PTX context?
   a. A method to transport electricity
   b. A chemical process splitting water into hydrogen and oxygen
   c. A way to extract natural gas
   d. A process for cooling the electricity grid

   ✅ Correct answer: **b**

5. What product can be produced using PTX technology?
   a. Gasoline from sunlight
   b. Hydrogen, methanol, or ammonia
   c. Wood pellets
   d. Electricity for batteries

   ✅ Correct answer: **b**

6. What substance is typically used as input in an electrolysis process?
   a. CO_2
   b. Salt
   c. Water (H_2O)
   d. Oil

✅ Correct answer: **c**

7. What role does CO_2 play in some PTX processes?
   a. It prevents the PTX process
   b. It is used as a raw material for fuel production
   c. It is produced as a byproduct
   d. It is used to generate electricity

   ✅ Correct answer: **b**

8. How can Power-to-X contribute to addressing climate change?
   a. Increase in greenhouse gas emissions
   b. Maintain dependency on fossil fuels
   c. Reduce CO_2 emissions via green fuels
   d. Increase energy consumption

   ✅ Correct answer: **c**

9. What is a challenge in implementing PTX on a large scale?
   a. Too many qualified workers
   b. Lack of industry interest
   c. High energy cost and efficiency loss
   d. The technology is entirely untested

   ✅ Correct answer: **c**

10. What can hydrogen (H_2) from PTX be used for?
    a. Cold water cleaning
    b. Cooling computers
    c. Fuel in industry, transport, and electricity production
    d. Lubricant in gearboxes

    ✅ Correct answer: **c**

11. What is 'green hydrogen'?
    a. Hydrogen produced using coal
    b. Hydrogen produced using renewable energy
    c. Hydrogen stored in green containers
    d. Hydrogen used in agriculture

    ✅ Correct answer: **b**

12. What element is used to produce ammonia in PTX processes?
    a. Nitrogen and hydrogen
    b. Sulfur and coal
    c. CO_2 and oxygen
    d. Oil and water

    ✅ Correct answer: **a**

13. What characterises synthetic fuels from PTX?
    a. Always emit more CO_2 than fossil fuels
    b. Only usable in small-scale plants
    c. Can replace fossil fuels with lower climate impact
    d. Have low energy density

✅ Correct answer: **c**

14. Why is PTX relevant in the offshore wind industry?
    a. Necessary for balancing rotor speed
    b. Enables local use of surplus energy
    c. Prevents corrosion on turbine blades
    d. Increases ocean temperature

    ✅ Correct answer: **b**

15. Which sector can benefit significantly from PTX fuels?
    a. Tourism
    b. Retail
    c. Heavy transport and shipping
    d. Grocery production

    ✅ Correct answer: **c**

3 Participant Evaluation – PTX Module

Name: _____
Date: _____

1. How do you assess your understanding of PTX after this module?

☐ Very good
☐ Good
☐ Average
☐ Limited

2. Which topics from the course did you find most relevant to your work or education?

_____

3. What was the most challenging aspect of the module?

_____

4. Is there any topic you would like more teaching in?

_____

5. Comments on the teaching method and test difficulty:

_____

Date:

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