Power-to-X: applications and cost developments

IIII renademy

1-Introduction

1 Introduction to the course

2 - Introduction to sector coupling

- 1 Definition of sector coupling
- 2 Opportunities and challenges associated with sector coupling
- ${\bf 3}~{\sf RES}$ shares in the power generation mix
- 4 Direct versus indirect use of electricity definition and processes
- 5 Direct versus indirect use of electricity comparison of overall
- efficiency in different sector coupling technologies
- 6 Electrification versus technology mix

$\mathbf{3}-\mathbf{Direct}$ electrification in the heating and cooling sector

- 1 Technologies and applications overview
- 2 Electric heat pumps description of technologies
- 3 Electric heat pumps main cost drivers
- **4** Cost comparison: sector coupling versus conventional technologies and future developments
- **5** Electric heaters description of main technologies and cost parameters
- 6 Demand profiles and flexibilization strategies

4 - Direct electrification in the transport sector

- **1** Technologies and applications overview
- **2** Passenger cars description of technologies
- **3** Passenger cars main cost drivers and expected future developments
- **4** Passenger cars Cost comparison: sector coupling versus conventional technologies
- 5 Passenger cars infrastructure requirements
- **6** Trolley trucks technology description & infrastructure requirements
- 7 Demand profiles and flexibilization strategies

5 – Indirect use of electricity

- 1 Renewable synthetic fuels and their applications
- 2 Production of hydrogen from renewable electricity
- **3** Electricity generation in fuel cells
- 4 Relevant cost drivers for renewable hydrogen production
- **5** Production processes for synthetic methane and synthetic
- liquid fuels and expected cost developments

6 – Regulatory framework

- **1** Supporting the profitability of sector coupling & incentivising flexibility
- 7 Summary of the course