

Digitalisation and smart technologies for the power sector

1 – Introduction

- 1 Learning objectives
- 2 Introduction to digitalisation in the power sector

2 – Energy economics background of digitalisation of the power sector

- 1 Fundamentals of digitalisation of the power sector
- 2 Drivers and trends of digitalisation in the power sector

3 – Opportunities and risks of digitalisation for sustainability and decarbonisation

- 1 Opportunity for decarbonisation through RES integration
- 2 Opportunities to expand decarbonisation into other sectors
- 3 Risk: higher power demand and emissions
- 4 Risk: higher emissions due to digital infrastructure

4 – Key technologies

- 1 Computer algorithms
- 2 Connectivity and internet of things (IoT)
- 3 Big data analytics
- 4 Machine learning
- 5 Smart metering
- 6 Blockchain

5 – Smart generation, transmission and consumption

- 1 Smart supply with virtual power plants
- 2 Smart storage
- 3 Smart grids
- 4 Smart demand

6 – Smart markets and process

- 1 Smart markets
- 2 Smart contracts
- 3 Peer-to-peer trading
- 4 Algorithmic trading
- 5 Digital processes and process automation

7 – Risks and cyber security

- 1 Tasks and goals of IT security
- 2 Cryptography and digital signatures
- 3 Attacks and countermeasures

8 – Summary of the course

- 1 Summary
- 2 References
- 3 Further reading

