

Flexible grid infrastructure & management

1 – Introduction to the course

- 1 Learning objectives of the course
- 2 Introduction

2 – Boundary conditions and procedures for grid operation

1 Transmission grid

The purpose and definitions of grid operation / Limits of grid operation: voltage and current / Limits of grid operation: frequency and stability / Redispatch / Cooperation between transmission system operators / Cooperation between transmission and distribution system operator

2 Distribution grid

Boundary conditions of distribution grid operation / Limits of grid operation

3 – Infrastructure improvements for VRE integration

1 Transmission grid

Thermal monitoring of transmission lines (dynamic line rating) / High-temperature conductors / Phase shifting transformers (PST) / HVDC connections / Flexible AC transmission systems (FACTS)

2 Distribution grid

Voltage regulation devices for distribution grids / Enhanced grid monitoring / Setup and extension of grid control centres / Storage

4 – Congestion management with consideration of low carbon emissions

- 1 Role of the grid control centre
- 2 Redispatch hierarchy
- 3 Use of phase shifting transformers
- 4 Demand side management – temporal shift of existing loads
- 5 Demand side management – activation of additional loads

5 – Summary of the course

- 1 Summary
- 2 References

