

# Inertia Requirements for Renewable Power Systems

## 1 – Introduction

- 1 Learning objectives of the course
- 2 Motivation for the course
- 3 Introduction to the course

## 2 – The Concepts of Power System Stability and Control

- 1 The different timescales for power system control
- 2 The basics of frequency stability
- 3 Standards for frequency stability

## 3 – The importance of Inertia in Renewable Power Systems

- 1 What is inertia in conventional power systems
- 2 Inertia in renewable power systems
- 3 How to increase power system inertia without storage solutions
- 4 How to increase power system inertia with storage solutions

## 4 – Dynamic Power System Modelling (For Experts)

- 1 Introduction to PowerDynamics
- 2 Building a grid model in PowerDynamics
- 3 Running a grid model in PowerDynamics
- 4 The dynamics of conventional generators
- 5 The dynamics of different inverters connecting renewable power plants to the grid

## 5 – Case Study (for Experts)

- 1 Introduction to a case study of a conventional and renewable power system
- 2 Accessing the simulation platform used to build the case study
- 3 Model building - from nodes and lines to a power grid model
- 4 Model building - data requirements
- 5 Results of the case study - with base scenario
- 6 How to fine tune a renewable power system to gain greater stability

## 6 – Lessons Learned

- 1 How to overcome low inertia - an evaluation
- 2 How renewable energy can contribute to a power system's overall inertia

