METADATA (*)

TOPIC C - Training Unit 2: Community-based Distributed Energy Storage (DES)

Source

Partner: **AUTH - Aristotle University of Thessaloniki**

Project: TRINEFLEX - Transformation of energy intensive process industries through integration of energy, process, and feedstock flexibility, Grant agreement ID: 101058174

Ownership

Owner of "Lesson 1: Energy Actors Observatory & Community Empowerment for DES":

- Dr. Ilias Dimitriadis, Post-doctoral Researcher, Data & Web Science Laboratory, School of Informatics, Aristotle University of Thessaloniki

Owner of "Lesson 2: Matchmaking Services for DES":

- Dr. Vasileios Psomiadis, Post-doctoral Researcher, Data & Web Science Laboratory, School of Informatics, Aristotle University of Thessaloniki
- Dr. Theodoros Toliopoulos, Post-doctoral Researcher, Data & Web Science Laboratory, School of Informatics, Aristotle University of Thessaloniki

Owner of "Lesson 3: Business Process Optimization for DES":

- Konstantinos Varvoutas, PhD Candidate/Researcher, Data & Web Science Laboratory, School of Informatics, Aristotle University of Thessaloniki

Owner of "Lesson 4: Distributed ledger technologies for DES schemes":

- George Vlahavas, PhD Candidate/Researcher, Data & Web Science Laboratory, School of Informatics, Aristotle University of Thessaloniki

Owner of "Lesson 5: Data Lake infrastructure & Open Application Programmers Interface technologies in DES":

- Dr. Theodoros Toliopoulos, Post-doctoral Researcher, Data & Web Science Laboratory, School of Informatics, Aristotle University of Thessaloniki

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Abstract

This training unit covers the underlying technologies utilized by the TRINEFLEX Distributed Energy Storage (DES) solution that aims to enable and facilitate partnerships of energy actors over innovative DES schemes. Trainees will be introduced to these technologies and related fundamental concepts, gain an overview of how they work, learn about their role and potential application in the energy sector, and identify the benefits of incorporating these technologies into the developed solution.

Structure

- Lesson 1: Energy Actors Observatory & Community Empowerment for DES
  It deals with:
  - The importance of data analytics in the energy sector
  - How can crowdsourcing enhance our view of the energy market?
  - Community detection algorithms and their applications
  - Community empowerment in the service of DES
- Lesson 2: Matchmaking Services for DES
  It deals with:
  - Innovative DES business models
  - Recommendation algorithms and their applications
  - Intelligent actor matchmaking and networking for the benefit of DES
- Lesson 3: Business Process Optimization for DES
  The lesson will cover the following topics:
  - Introduction to business process management
  - Challenges of business process optimization in the energy sector
  - Business process optimization in the service of DES
- Lesson 4: Distributed ledger technologies for DES schemes
  The lesson will cover the following topics:
  - Introduction to blockchain technologies and DLTs
  - Public vs Private blockchains
  - Use of smart contracts in the energy sector
  - Challenges of transparency and validation in cooperative DES schemes
  - Benefits of DLT-enabled DES services
- Lesson 5: Data lake infrastructure & Open Application Programmers Interface technologies in DES

  The lesson will cover the following topics:
  - Introduction to data lake infrastructures
  - Quick overview of RESTful APIs
  - Open APIs and facilitating cross-sector data exchange in energy ecosystems

Learning Outcomes

Trainees completing this Training Unit will be able to:

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- understand the potential value of data analytics in enhancing awareness in community-based DES solutions
- identify the benefits of recommendation systems in enabling cooperation of energy actors over innovative DES business models
- determine the challenges and prospects of business process optimization in the energy sector
- recognize the contributions of distributed ledger technologies in enhancing transparency and validation for collaborative DES systems
- acknowledge the role of data technologies for facilitating cross-sector information exchange in energy ecosystems

Intended Audience

The training unit contains lessons that will be relevant to a wide range of audiences, including energy stakeholders, technology providers, policy makers, investors and researchers.

Pre-requisites

Participants should possess a basic familiarity with the overall ambition and goals of the energy transition in Europe.

Language: English

Format: Video mp4, PDF

Expected workload

The expected workload of all 5 lessons is 1 hour.

Complementary additional training material:

No additional training material required

(*) The structure of the Metadata for the Training Units derives from the training Metadata model developed within the Leonardo da Vinci project LINKVIT (2013-15, GA N. 2013-IT1-LEO05-04046)

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