

### Erasmus Days 2020 - TUL

Institute of Electrical Power Engineering Faculty of Electrical Power Engineering Lodz University of Technology



Hubert Białas Hubert.bialas@dokt.p.lodz.pl



With the support of the Erasmus+ Programme of the European Union











#### **EU-Asia Collaboration for aCcessible Education in Smart Power Systems (eACCESS)**

**eACCESS** Capacity building project in the field of higher education

The project is funded by the European Union (EU) Erasmus + program (total project founding of almost 1 million €

Eight project partners: three from Europe and five from Asia

Project duration: 3 years

Development and implementation of modern study programs in the field of Smart Power Engineering at Asian partners

Creating new laboratory facilities and subjects as well as an innovative online learning platform.















# The aim of the EU commissiondecarbonization

#### Build an energy system that:

ensures affordable energy for all consumers

increases the security of the EU's energy supplies

creates new opportunities for sustainable growth and green jobs

reduces our dependence on energy imports

brings environmental and health benefits – e.g. through reduced air pollution

Key targets for 2030:

At least 40% cuts in greenhouse gas emissions (from 1990 levels)

At least 32% share for renewable energy

At least 32.5% improvement in energy efficiency









#### **Problems**

- Constantly growing energy demand
- > Ensuring a power balance in power systems
- Development of a new power system control algorithm
- Ensuring the required quality of energy
- > The need to educate the management of a modern power system

#### **Transformation of power systems**

- > Decentralization of power systems
- Creating energy markets
- Increasing share in the energy mix of renewable sources, which replace large conventional power plants
- Striving for reduce the impact of power systems on the environment
- Change in the structure of production creation of a new group of prosumers
- Striving for area balancing energy clusters

# Why do we need an education access project?





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Many Southeast Asian countries are undergoing rapid industrial revolution and industrialization processes. This increases the demand for energy, in particular electricity. Obtaining a cheap, safe and reliable source of electricity and modernizing the power system is of key importance for further economic development.

Higher education institutions are expected to produce technical staff, engineers, experts and tutors which will able to design, maintain and further develop advanced technical solutions, as well as to train other staff resources like technicians and managers, who will be up to the job and ready to effectively and efficiently adopted and use modern power technologies.







# eACCESS project pillars







# TUL in eACCESS project



Main project coordinator

Lead the work to be conducted in the work package WP1 (Preparation), WP5 (Quality Plan), WP7(Management) and number of individual tasks (T1.1, T2.1, T2.3, T5.1,T5.1,T7.1-T7.4)

Link between the consortium and the EACEA agency

Participation in the development or modernisation of master and undergraduate teaching modules at partner universities



Support in the design and implementation of new laboratories (High Voltage Laboratory, Computer Laboratory, Smart Grid Laboratory)







### Structure and Work Package



















#### **Institute of Electrical Power Engineering**

#### Structure and research areas

new units



#### Electrical Networks Division

Analysis of transient and steady states in electrical networks

Renewable Energy Sources •Analysis of Distributed Generation units impact on power system operation, "network capacity" for



#### Power Plant Division Reliability of the power units

Self-demand systems of power unit



#### High Voltage Division

Partial discharges in high voltage equipment
Environmental impact of electrical equipment and systems



Fransport and Energy Processing Division

• Drive systems in electric rail vehicle

Safety systems in Automatic Train Control (ATC) and Automatic Train Protection (ATP)





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### Distributed Generation Laboratory

- Capstone C30 gas microturbine
- Wind generators Fortis Wind Energy 11,6 kW
- Static and tracking PV systems
- PULSTAR hydrogen system with Ballard fuel cells
- Real-Time Digital Simulator RTDS
- Scada System BTC Prins
- Inverters
- Loads
- Network Model

#### 11/3/2020

### Meetings and Events

#### **Recent Events**

- Kick-Off Meeting : Virtual Meeting, 26-27 March 2020
- CBHE Workshop by EACEA: Brussels, 27-28 January 2020



**Upcoming Events** 

• work meeting in Jakarta (physical meeting) - March 2021



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# EACCESS team at the Lodz University of Technology









Dr Tomasz Siewierski PhD. Eeng, Senior, Lecturer tomasz.siewierski@p.lodz.pl



Dr Tomasz Piotrowski Professor tomasz.piotrowski@p.lodz.pl



MSc Eng. Hubert Białas Lecturer hubert.bialas@dokt.p.lodz.pl





## Thank you for your attention !



Lodz University of Technology ul. Żeromskiego 116 90-924 Łódź



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Hubert Białas



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