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3rd UNI-SET Energy Clustering Event

*Universities in the Energy Transition: Focus on Smart Energy Systems and Communities*

# The Role of the Electrical (Power) Engineers in the Future Energy Systems

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Outlook Sessions *"Making Energy Systems Ready for the Future: The Role of Universities & Industry"*

*Session 1) Education for the Future Energy System*

Universitatea Politehnica din Bucuresti, Romania

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# Opposite Paradigms

*Are educational practices at universities fit for the future of a changing energy system?*

The world is becoming “more electric”, but the number of Power engineers is low

The *learning*  
paradigm

concept-oriented learning ✓

OR

problem-oriented learning 😞

The University courses offer a systematic and structured view of the Power engineering concepts, not easy to be found outside.

The *formation*  
paradigm

form general-purpose engineers 😞

OR

form “highly skilled workforce” ✓

Forming a good Power engineer requires a wide set of specific competences.

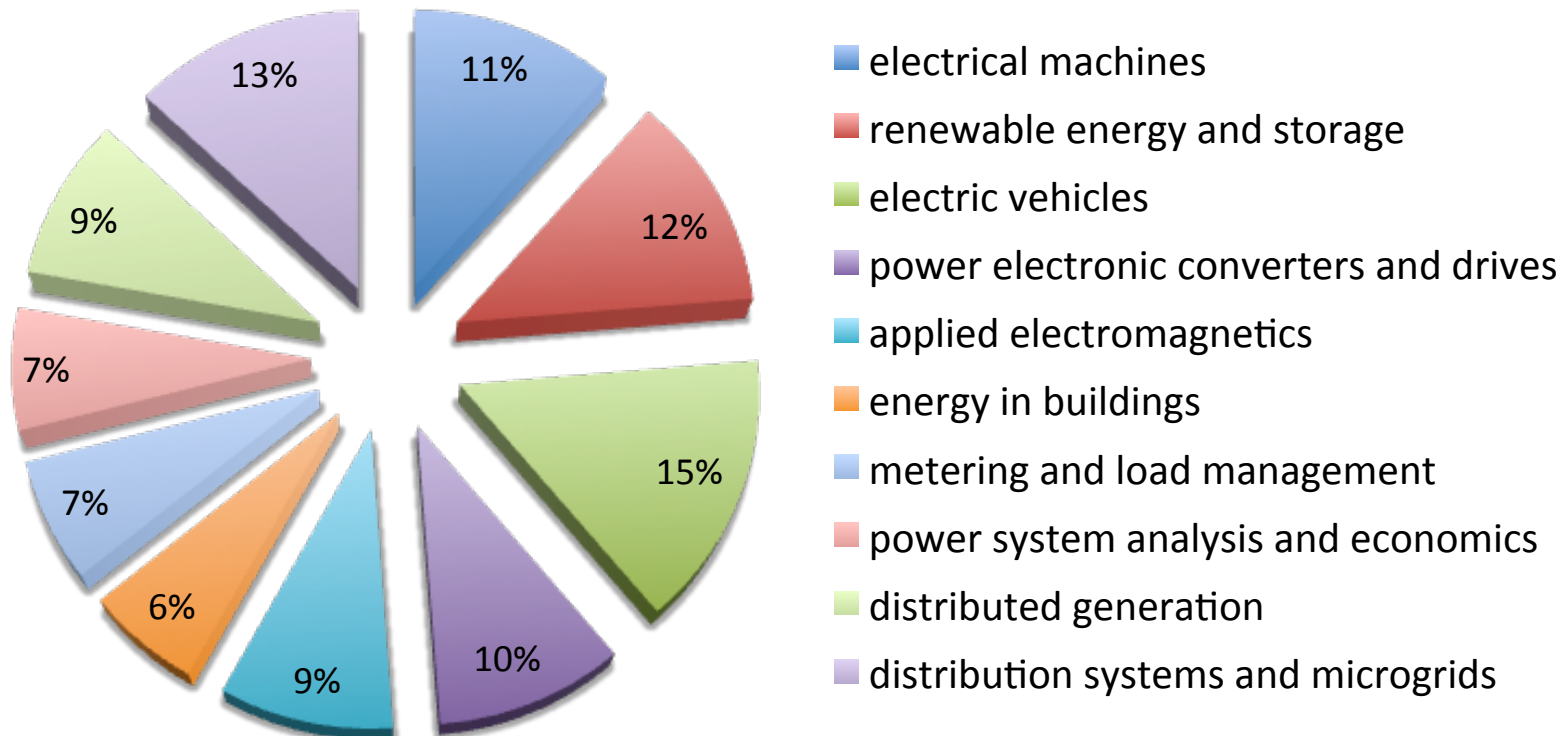
The Power engineering contents are typically not found in other engineering courses.



# Master students' choices

*Is there a need to change or update the contents and educational models to support the implementation of the “Energy Transition” in Europe?*

*An interesting check: topics selected/proposed by the students for the Master thesis*



Years 2014-2016  
(131 Electrical Engineering students)

*Request: personal and original contribution*  
*New trends: electric vehicles and storage*



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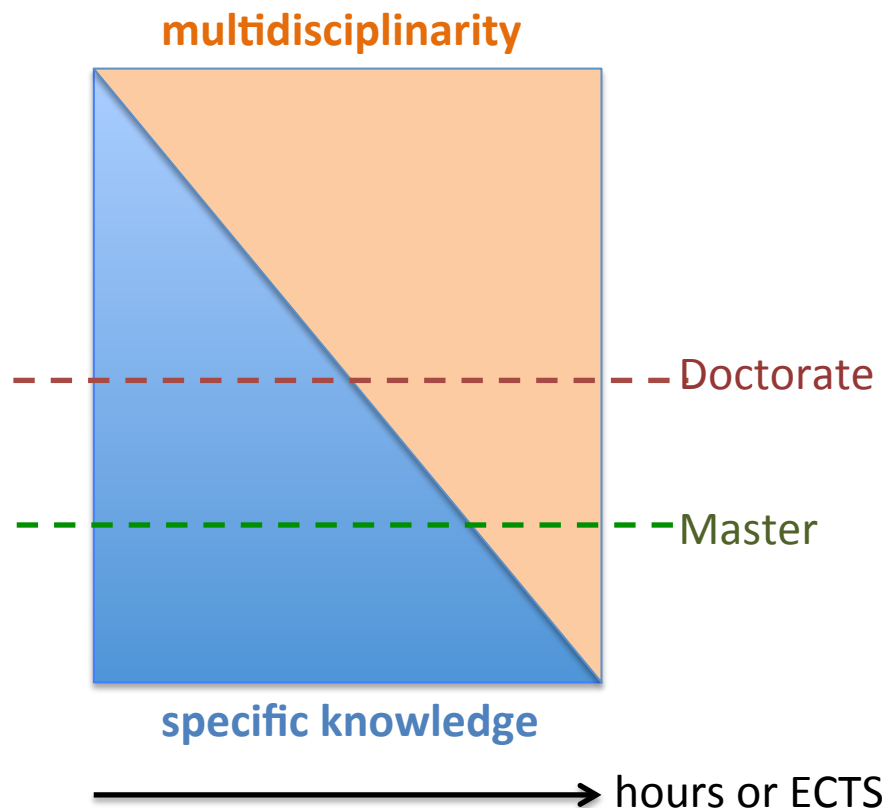
# The Interdisciplinary Content Dilemma



*How important is interdisciplinary education (e.g. integrating ICT, system integration and other topics) for that?*

Example:

*Master course in Electrical Engineering*



**specific knowledge:** Applied electromagnetism, Advances in electrical machines, Power system economics, Electricity markets, Electricity Distribution, Smart grids, Distributed Generation, Power quality, Power electronics, Digital control, Electric drives, Power system analysis, Hydroelectric systems, Cogeneration systems, Renewable energy, Storage, Standards

**multidisciplinary:** Machine design (mechanical, thermal), Advanced statistics, Numerical analysis, Telecommunications, Computer networks, Data mining, Operational research, Management, Transportation systems, Automotive technologies, Sensor networks, Innovation, Entrepreneurship, Sociology, foreign languages, other “soft skills”, ...



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# Thank you for your attention



MOBILISING THE RESEARCH, INNOVATION AND EDUCATIONAL CAPACITIES OF EUROPE'S UNIVERSITIES IN THE SET-PLAN

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