University of Vaasa

Demand driven Energy education in Finland / University of Vaasa

Vice Rector Annukka Jokipii

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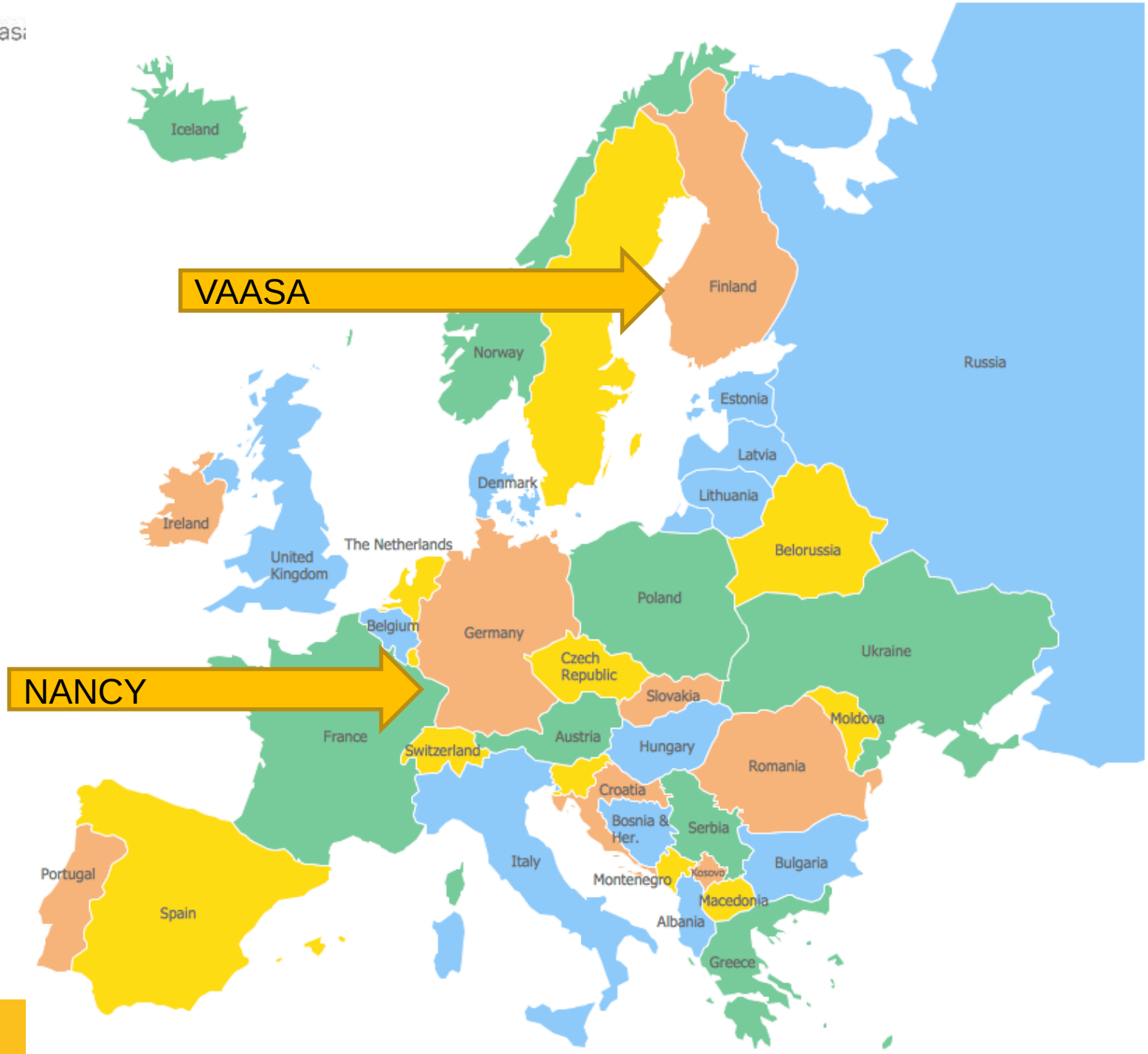

VAASA
NANCY
Iceland
Norway
Finland
Russia
Estonia
Latvia
Lithuania
Denmark
Ireland
United Kingdom
The Netherlands
Belgium
Germany
Poland
Belorussia
Ukraine
Czech Republic
Slovakia
Moldova
France
Switzerland
Austria
Hungary
Romania
Croatia
Bosnia & Her.
Serbia
Bulgaria
Italy
Montenegro
Kosovo
Macedonia
Albania
Greece
Portugal
Spain

University of Vaasa

University of Vaasa

- Maritime Campus

University of Vaasa in numbers

- 1968
  - Established as a public university
- 5000
  - Students: undergraduate, graduate and doctoral
- 476
  - University staff
- 40 million Euros
  - University budget

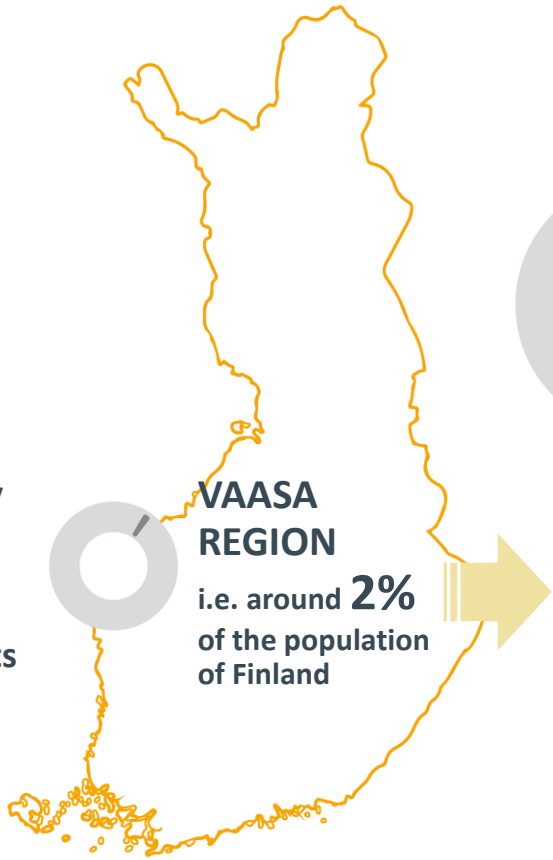
Vaasa region

- Location
  - 63.1°N, 21.61°E

- The city of Vaasa is located in Western Finland on the coast line next to Sweden
  - Sweden / city of Umeå is located 70 kilometers West of Vaasa
  - Vaasa is bilingual Finnish and Swedish (+ 120 nationalities)
- Industrial base
  - Largest energy and environmental industry concentration in the Nordic countries

Vaasa energy technology region

VAASA'S energy technology hub employs
11 000 engineers, Masters of Science and other experts



VAASA REGION
i.e. around **2%** of the population of Finland

produces
5,5%
total export of Finland

produces
12% of technology industry exports

is around
30%
of Finland's energy technology exports (1/3)

ARE ¼ OF FINLAND'S EMPLOYEES IN THE ENERGY SECTOR

Flagship businesses in the region

WIND & SOLAR

- ABB
- Mervento
- Vacon/Danfoss
- The Switch/Yaskawa
- Ampner
- Roaming

ENERGY EFFICIENCY BUILDINGS

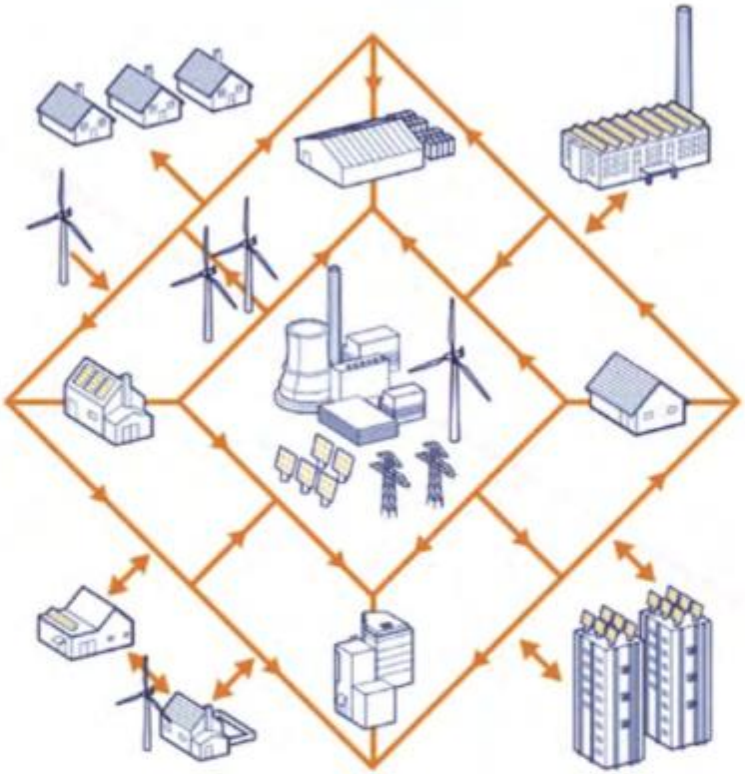
- ABB
- There Corporation
- Vacon/Danfoss
- Comsel
- Lumitar
- Granlund
- Wapice
- Fidelix

ENERGY EFFICIENCY INDUSTRY

- ABB
- Vacon/Danfoss
- There Corporation
- The Switch
- Vamp/Schneider
- Arcteq
- Comsel
- Granlund

DATA & COMMUNICATION

- Wapice
- Anvia
- CO-Automation
- Comsel



R&D PLATFORMS, PILOTS AND EXAMPLE INSTALLATIONS

- Energy Research Centre (VEBIC)
- Sundom Smart Grid
- Vaskiluodon Voima
- Westenergy
- Illumination pilots at Botnia Arenas
- Suvilahti residential area
- School at Porvarinkatu
- Stormossen biogas
- Vaasa gas buses

POWER PLANTS

- ABB
- Citec
- Wärtsilä
- VEO
- Adiabatix
- Uwira
- Wapice

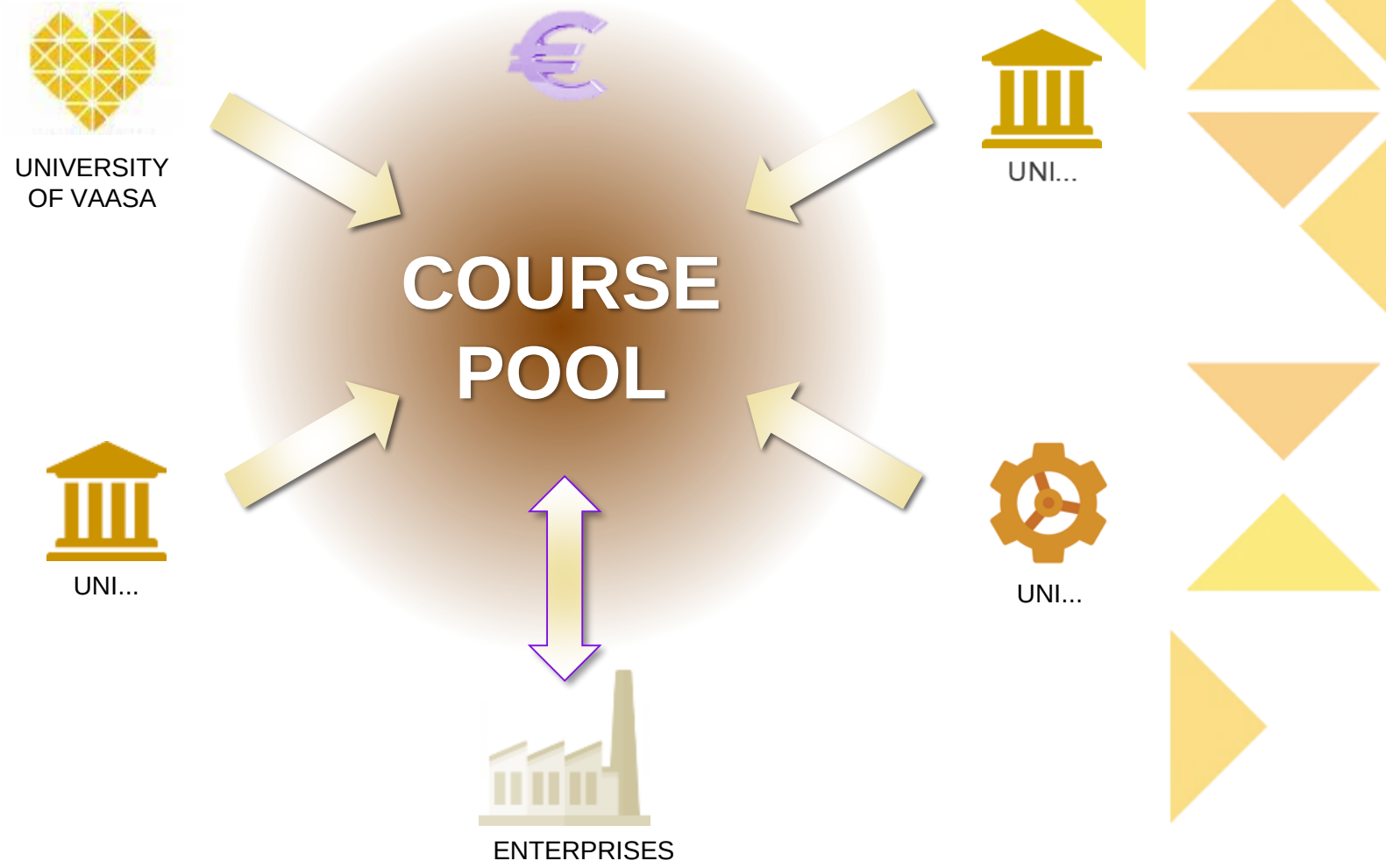
GAS

- Wärtsilä
- Stormossen
- Citec
- Uwira
- Wapice

GRID AUTOMATION

- ABB
- Vamp/Schneider
- VEO
- Arcteq
- Ampner
- Ravera
- Comsel
- Maviko
- Wapice
- Crimppi

Course Pool Structure



Ongoing demand driven education project

FITech
FINNISH INSTITUTE OF TECHNOLOGY

- Finnish Institute of Technology **(FITech) TURKU**
- Marine technology 2017-2012
- Southwest of Finland
- 7 Universities
- FITech makes studying flexible:
  - programmes for Master of Science in Technology, minor studies, as well as different courses and projects together with companies.

- University of Vaasa: Energy Technology, 20 credits

Energy Technology, 20 ECTS

- Obligatory courses, 15 ECTS
  - Marine and power plant engines, 6 ECTS
  - Engine fuels and lubricants, 4 ECTS
  - Exhaust and flue gas after-treatment technologies, 5 ECTS

- Optional courses, 5 ECTS
  - Heat transfer, 2.5 ECTS
  - Physical basics for energy technics, 5 ECTS
  - Renewable energy sources and distributed energy production, 2.5 ECTS

Forthcoming/planning in process projects

- **Energy storage (35 ECTS, 7 courses) 2018 ->**
  - 2 Universities
  - 2 Universities of Applied Sciences
  - Course pool: Energy storage, circular economy, battery technology
- **FITech VAASA**
  - Master program in energy storage (120 ECTS)
- **Safety** in Energy production, delivery and storage
    - Possible course pool: Smart grids, society's' ability to maintain the basic economic functions, security of supply, resilience, energy economy, 5G, microgrids, data analytics

How to respond to new and urgent market demands?

- Design of the programmes should be carried out in close cooperation with research partners and industrial partners.
- The university staff should have the leading role and include the necessary pedagogical view. Visionaries should be included in these teams.
- An easy way to start: Visiting lectures and sharing of presentations.

Lessons learned, recommendations

- There is a demand to get quickly new education on these new topics
- We are constantly hiring more new Tenure Track – researchers who have strong knowledge and can also contribute to the teaching of these topics
- One good practice is to produce joint visions of the future and roadmaps together with Universities and industrial partners
- We are willing to co-operate with other Universities to create competitive programs together also in future

University of Vaasa

A University within a thriving region

The Vaasa region is a hub for internationally networked entrepreneurship and energy technology