EnTranCe: Centre of Expertise Energy

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Hanze University of Applied Sciences Groningen

- Established in 1798
- Professionally oriented higher education
- 70+ Bachelor programmes, 18 Master programmes and 7 Associate degree programmes;
- 17 Schools with 18 different 'cultures' with each their own atmosphere;
- 3 focal areas: Energy, Healthy Ageing, Entrepreneurship
- 26,500 students choose our university of applied sciences;
- There are 3,150 professionals who work at Hanze university of applied sciences.
World Heritage: Marine Wetlands WADDENKUST
Background The Netherlands

• Annual intake UAS (professionally oriented higher education) nationally approx. 100,000, universities approx. 50,000

• UAS: professional Master degrees, universities: research Masters

• Research has been the second pillar of the primary process in UAS since 2003

• Research by professors, researchers and students

• Grants in competition
Structure

Binary system is valuable, but interpretation needs adjustment

Universities:
- research and academic training are key
- smaller and more selective due to attractive professionally oriented higher education

Universities of Applied Sciences:
- Bachelor programme increases quality as a result of higher-quality intake
- focus on core task: the professional Bachelor and Master graduate
- enhancement of research by professors, increasing quality of education
Profile

Institutions should choose a more clear-cut profile

Profiling leads to more variety and enhanced recognisability of the institution among students and companies

Profiling offers opportunities to excel and be recognisable

Profiling has been rewarded ‘extra’, 2% of the budget
Domains and themes

Companies, government institutions and knowledge institutes in Groningen focus on two themes: Energy and Healthy Ageing

Hanze (UAS): comprehensive degree programmes in four domains

1. Technical
2. Arts
3. Man and society
4. Economic domain

We focus on Energy and Healthy Ageing in these domains
Approach

Forming of *Schools* around correlated study programmes.

Forming of six *Centres of applied research and innovation*, in connection with education. So far, 50 professors.

Comprehensive educational framework around the focal points (Ad, bachelor, master and (with the University) PhD.

Collaboration with other universities of applied sciences and vocational trainings institutes.
Centres of Expertise

Contract is based on our policy plan for four years: 
**share your talent. move the world.**

In September 2012 the State Secretary of Education has named the plans of Hanze UAS for the future as 'excellent'. Together with only one other Dutch UAS.

We will get an extra funding from the State Secretary of €2 million for two Centres of Expertise:

- Energy
- Healthy Ageing
Energy Valley region: Economics

- Slochteren GasField
- 42% Dutch Wind energy production (on- and offshore)
- 44% Dutch Green gas production
- 4,200 companies
- 32,375 direct FTE
- €27 Billion investments (inbetween 2010 en 2020), 45% renewables;
Economic view of the region
The goal of the Energy Academy Europe is to consolidate the leadership of the Netherlands in the energy sector and in the transition towards sustainable energy.

- The Energy Academy (EAE) is an international center of excellence in energy education, research and innovation
- 3000 students in 2020
- 100 million Euros investment
- Cooperation with SME’s in EnTranCe (Energy Transition Centre) through testing, experiments and demonstrations
Our Mission at the Centre of Expertise Energy

We speed up innovations needed for the transition towards a sustainable energy society. We contribute by applied research and education.

In co-creation, students, researchers, companies and societal organisations work together on realising this energy transition. In this learning community we develop and share new applicable knowledge and create business opportunities.
The transition to a fully sustainable energy society is one of the main future challenges.

• Usage of fossil fuels have impact on the environment, the climate change and our dependency on other countries.
• The demand for energy will rise considerably.

New sustainable ways of energy supply are needed, which offers security of supply and which are affordable and socially acceptable. The transition offers opportunities for technological, business and societal innovations.

The societal trend of self-reliancy fuels a (new) bottom up process of changing the current energy system. This is an important mechanism for transition. We want to empower people to be able to meet their energy needs in an increasingly sustainable and socially acceptable manner.
Bridging Two Worlds

Hanze UAS

Decentral when possible, central when necessary

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Goals 2022

• Together with partners and local communities we develop concepts for (at Least)5 sustainable (Emission Neutral) communities in our region.

• In 2022 we educated 1500 EAE certified Energy Students

• We realised 15 Energy Startups per year

• In 2022 EnTranCe positioned itself as THE unique fieldlab of the EAE for testing and developing Hybrid Energy Systems

• 20.000 people, representing society, visited EnTranCe and participated in debate on the Energy Transition

• We induced 25 million Euros of investments in our region based on our concepts.
How do we do this?

Educational programmes
- Energy Routes in 10 schools leading to EAE certification
- Learning Community
- Master portfolio
  - European Master Renewable Wenergy
  - Master Sustainable Energy System management
  - Master Energy 4 society (under dev)

Facilities
- Energy Value Chain
- Energy Barn
- EnTranCe

Applied Research
- Hybrid energy system design & Management
- Alternative gasses and hybrid-fuels
- Energy interventions and behaviour, public support and communication
- New economic realities, labour market, governance and legal aspects in the energy sector
- Sustainable communities and local initiatives

Partners
- Business partners
- Governmental partners
- Societal partners
- stakeholders

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Opening by King Willem Alexander

EnTranCe is open

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2015: Commissioner Sefcovic @EnTranCe
EnTranCe: the Energy Transition Centre

- Open Innovation Environment: the Energy Transition Centre EnTranCe
- Co-Creation researchers, companies, students: permanent 75-100 students
- Optimizing chain of education, from vocational to post graduate.
- Joint effort of Hanze University Groningen, Energy Academy Europe and Energy Based companies.
- Focus on demand driven research projects
  - Applied
  - Multidisciplinary
  - Multi-level: MBO, HBO en WO
- Spin off, start-ups
- Growing number of (project)Partners

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Toolkit & Power2X

- LNG
- BioFuels
- Power2X

Smart → Storage → Conversion → Generation

Tool box → Tools

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European Master in Renewable Energy

- Master of Science (MSc)
- International
- Applied Research
Core Semester (30 EC)

Experiments!

Energy Basics
Electrical Engineering
Biomass Energy
Wind/Hydro Energy
Solar Energy
Energy Storage and Distribution

Research Methodology and Numerical Modeling
Geopolitics
Capstone Assignment
Professional skills & Mentoring

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Specialisations

- **PV** at Northumbria University (UK)
- **Wind energy** at NTUA (Greece)
- **Solar Thermal** at Perpignan (France)
- **Grid integration** at Zaragoza (Spain)
- **Ocean energy** at IST Lisbon (Portugal)
- **Sustainable Fuel Systems for Mobility** at Hanze UAS (Netherlands); New in 2015/2016
USPs Master Sustainable Energy System Management

1. Concepts
   - International approach
   - Latest concepts and models
   - Scientific approach

2. Approach
   - Systems perspective
   - Multi-disciplinary
   - Quantitative methods and techniques

3. Core Qualities
   - Develop business cases
   - Calculate business cases
   - Implement projects

PEP! – Powered by Energy Professionals
Perspectives on the sustainable energy system

1. Technology
2. Business and Society
3. Innovation
4. Scenarios and Models

Energy Transition, a holistic approach
social acceptance
energy system integration

central energy
decentral energy
distribution

component energy
wind energy solar energy wave/tidal energy blue energy

renewable energy

H2 storage CO2 capturing

balancing & storage
biomass or biogass

gas power plant

smart grid

consumption + production → prosumer

social acceptance

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