



European Wind Energy Master

Erasmus Mundus MSc Programme

www.windenergymaster.eu

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International Education and Research

- EWEM as a vehicle for international research and education
- More North-American content in EWEM or even a North-American Msc in Wind Energy

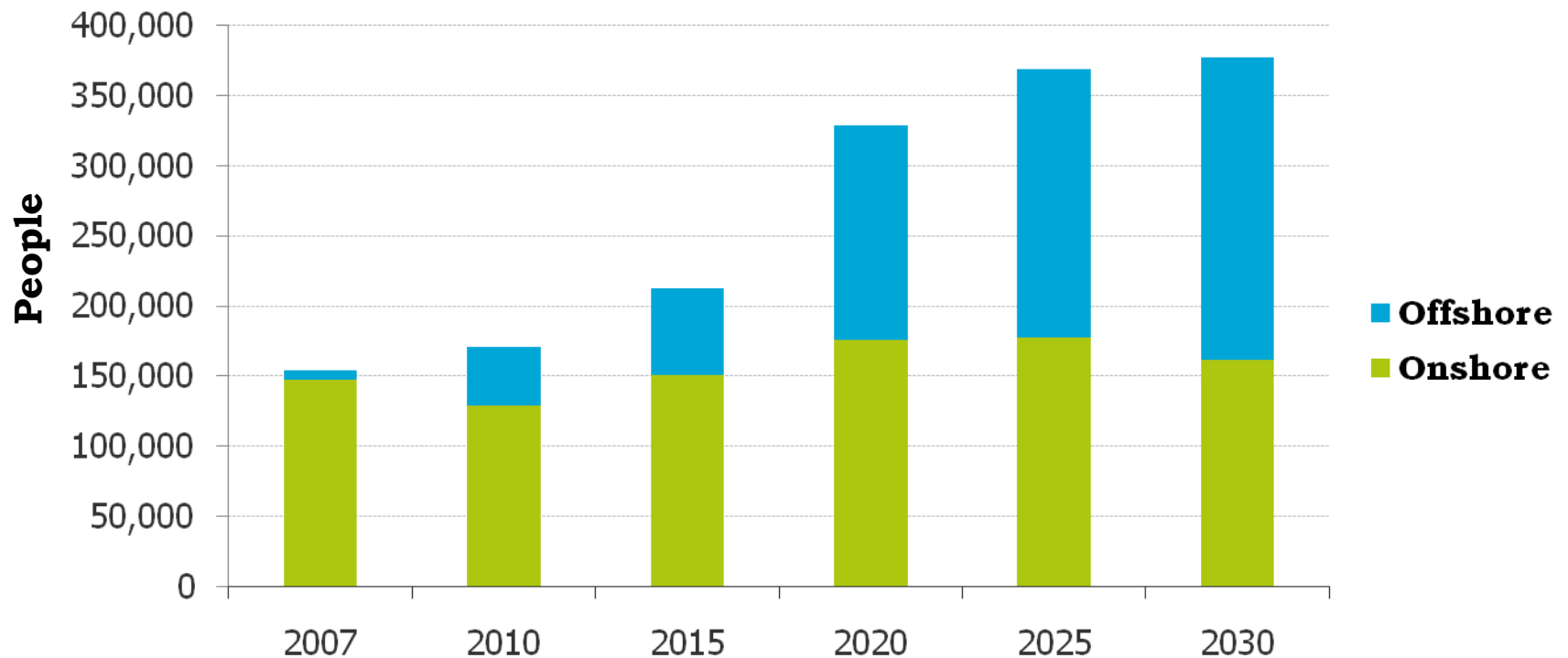
Storyline

- Description of why and how EWEM has been built
- Examples of impact in cooperation and opportunities
- Future possibilities

200k new jobs in European Wind by 2030

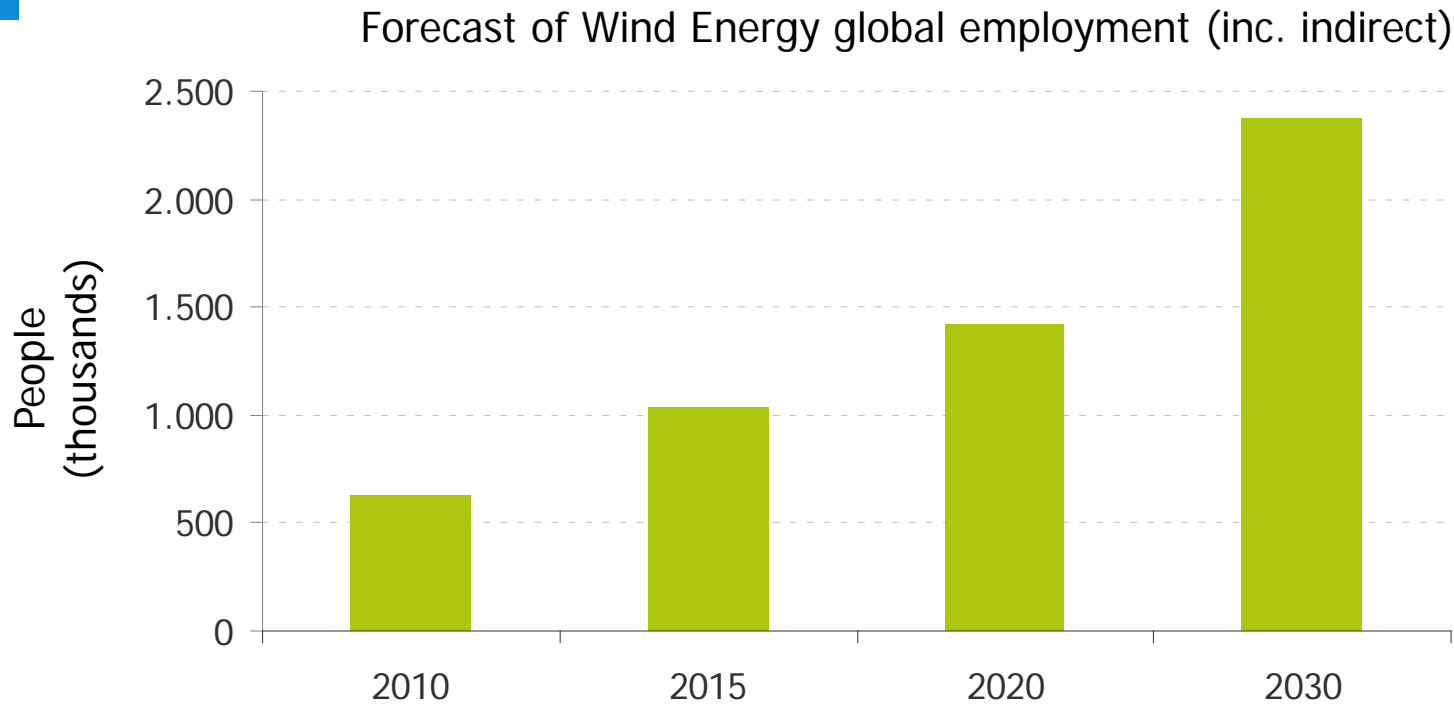
Largest increase in Offshore Wind Energy

Forecast of Wind Energy direct employment in EU



Source: European Wind Energy Association 'Wind at work 2009'

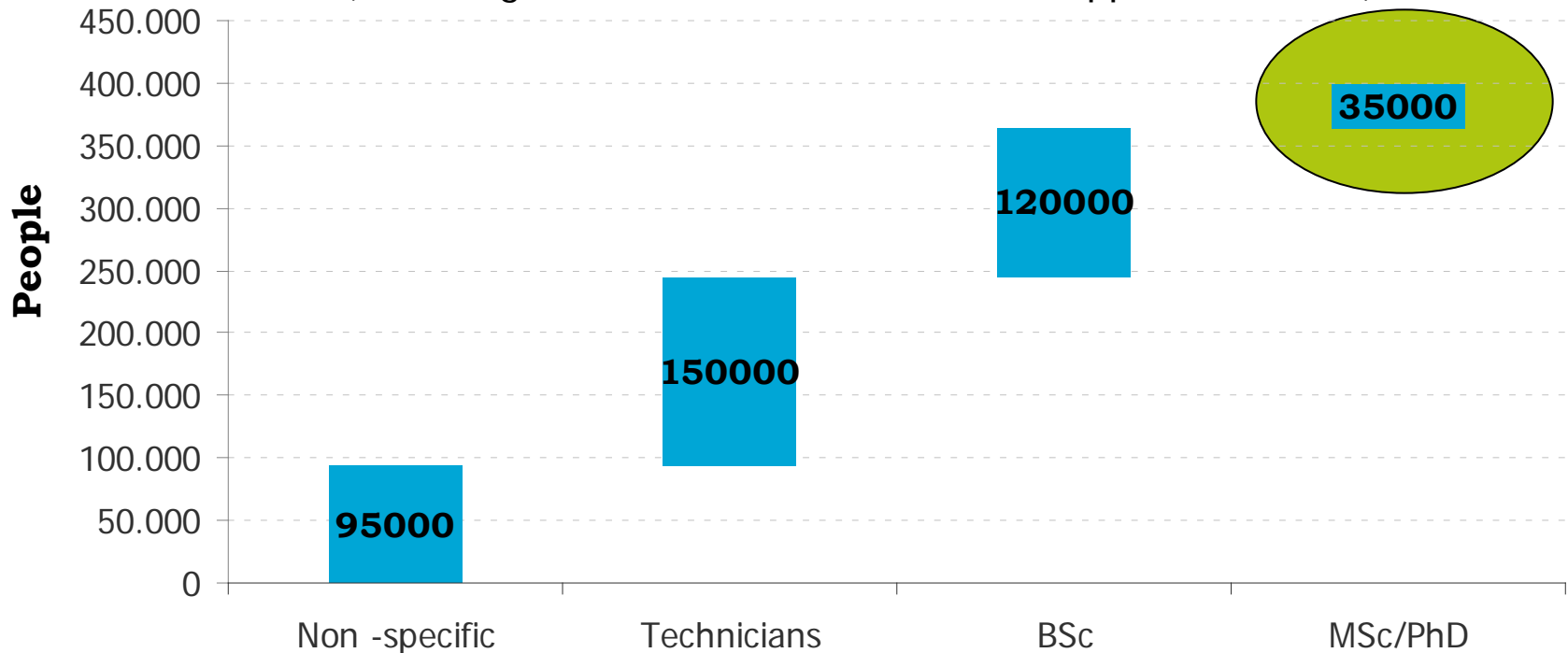
Global demand for qualified wind workers



Source: GWEC 2010 Global Wind Energy Outlook

35.000 new Engineers/Academics needed in Wind Energy

Forecast of new direct employment in EU 2010-2030
(assuming renewal of current workforce, approx. numbers)



Source: Power Cluster project

Stronger together



- Over 250 researchers dedicated to Wind Energy
- Over 100 PhD students in Wind Energy
- Over 200 publications per year in Wind Energy
- Over 110 MSc students every year in Wind Energy

Objective: educate top 2% Wind Energy MSc

- World's best **curriculum**
- **International** environment
- Train **advanced specialists**, with four specialization tracks
- In partnership with the most relevant **research institutions** and **industrial partners**

Erasmus Mundus - supporting excellence



Education and Culture DG

ERASMUS MUNDUS

*"The Erasmus Mundus is designed to foster cooperation between higher education institutions and academic staff in **Europe and Third Countries** with a view to creating poles of excellence and providing highly trained human resources."*

Erasmus Mundus Scholarships

BE OUR GUEST SCHOLAR!

Students	Tuition	Living costs	Travelling costs	Health insurance
Non- EU	Full tuition	1000€/month	8000€	Full
EU	Full tuition	500€/month	3000€	Full

Guest scholars: 1200€/week

From institutions outside EU to be guest scholars at EWEM

EWEM universities scholars to go outside EU

Guest scholars

- Minimum scholarship per visit 2.400€ up to 14.000€
- Take part at any of the four partner universities
- Flexible participation: give a lecture, develop curriculum, web-lecture, supervision of MSc thesis, etc...
- Send Carlos an email c.j.simaoferreira@tudelft.nl

Four specializations: Wind, Rotor, Electro, Offshore

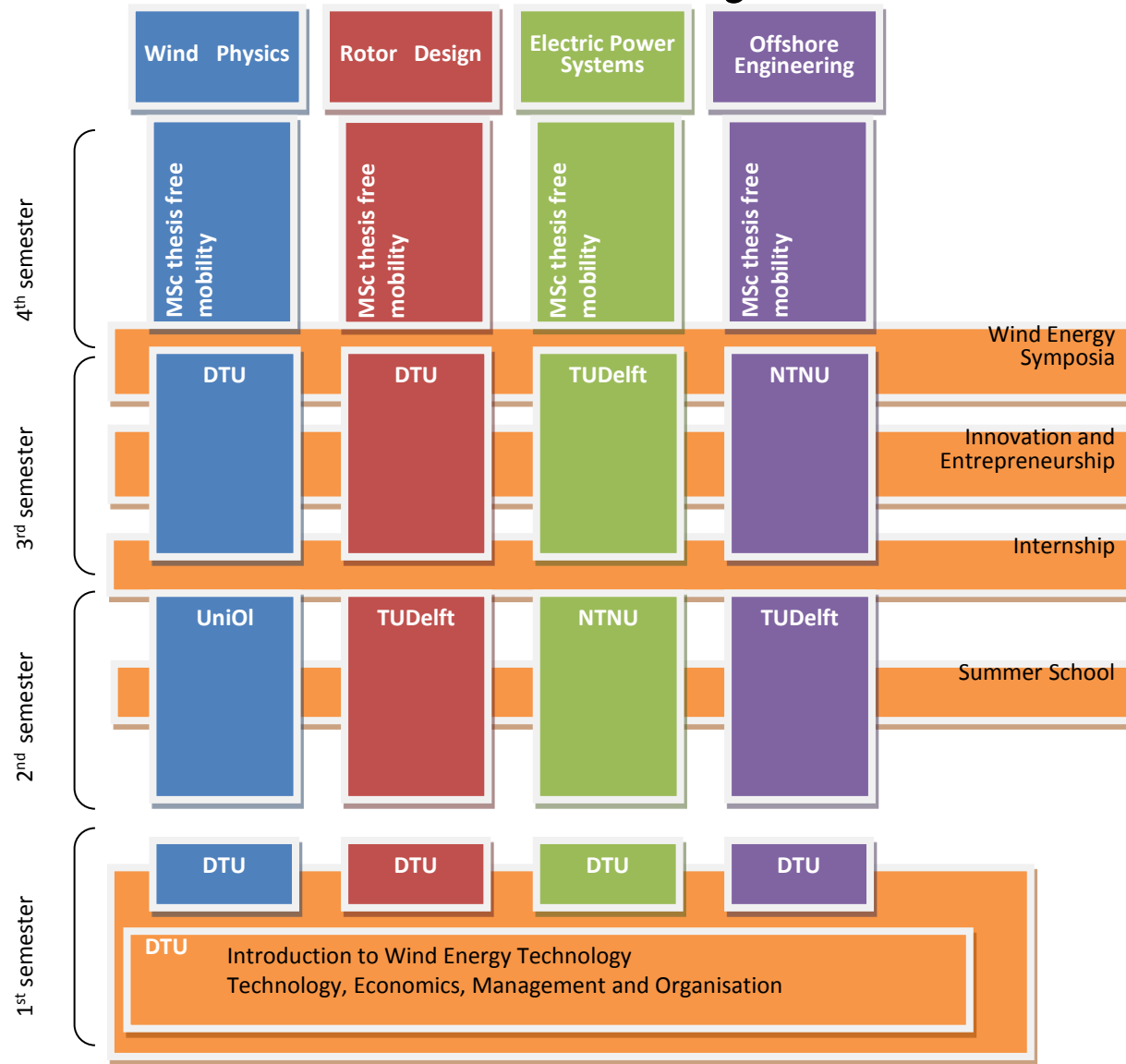
Wind Physics

Rotor Design

Electric Power
Systems

Offshore
Engineering

Structure and mobility



Students receive a double-degree

Wind Physics	Rotor Design	Electric Power Systems	Offshore Engineering
MSc in Engineering Wind Energy (DTU)	MSc in Engineering Wind Energy (DTU)	MSc in Technology - Wind Energy (NTNU)	MSc in Technology - Wind Energy (NTNU)
Engineering Physics (Uni. Oldenburg)	MSc in Aerospace Engineering (TUDelft)	MSc in Electrical Engineering (TUDelft)	MSc in Offshore Engineering (TUDelft)

Associated partners

Wind Energy Associations	European Wind Energy Technology Platform European Wind Energy Association European Energy Research Alliance European Academy of Wind Energy
Wind Turbine Manufacturers	Vestas Wind Systems • Siemens Wind Power General Electric Wind Energy • Suzlon • REPower Kenersy • XEMC Darwind • Mitsubishi Heavy Industries
Utilities and (Offshore) Wind Farm Developers	Statoil Hydro • Dong Energy • RWE Offshore Nederland Vattenfall • E.ON Benelux
Offshore Wind industry	BARD Engineering • Ballast Nedam Offshore
Wind Energy R&D centres Consulting	National Renewable Energy Laboratory • CENER Institut für Windenergie und Energiesystemtechnik Energy Research Centre of the Netherlands Sandia National Laboratories • SINTEF • GL Garrad Hassan Centro Nacional de Energias Renovables • Heinkel Group
Universities	University of Victoria • Indiana University • Nankai University South China University of Technology • Politecnico di Torino Uni Magdeburg • Aalto University • Uni Hannover • TU Munchen Universidad Carlos III de Madrid • University of Massachusetts

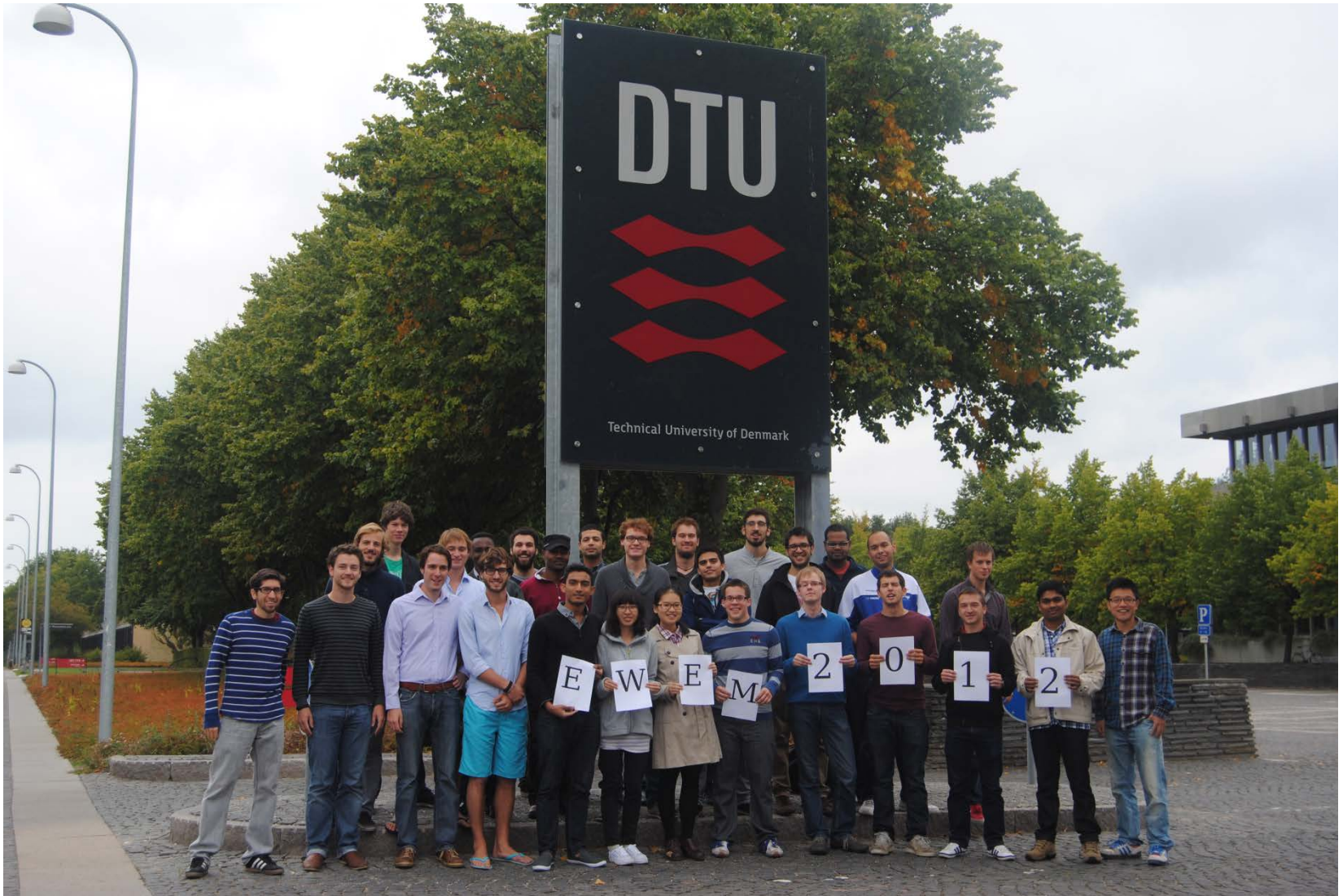
Tuition

EU/EFTA	Non-EU/EFTA
1.800€ per year	13.500€ per year

- Estimated living costs: 1.000 € per month

Student applications

- 2012-2014
 - 180 applications; 100 students accepted; 35 students enrolled
- 2013-2015
 - 220 applications; 120 students accepted; 45 enrolled
- Objective 2017-2019: 120 student enrolled



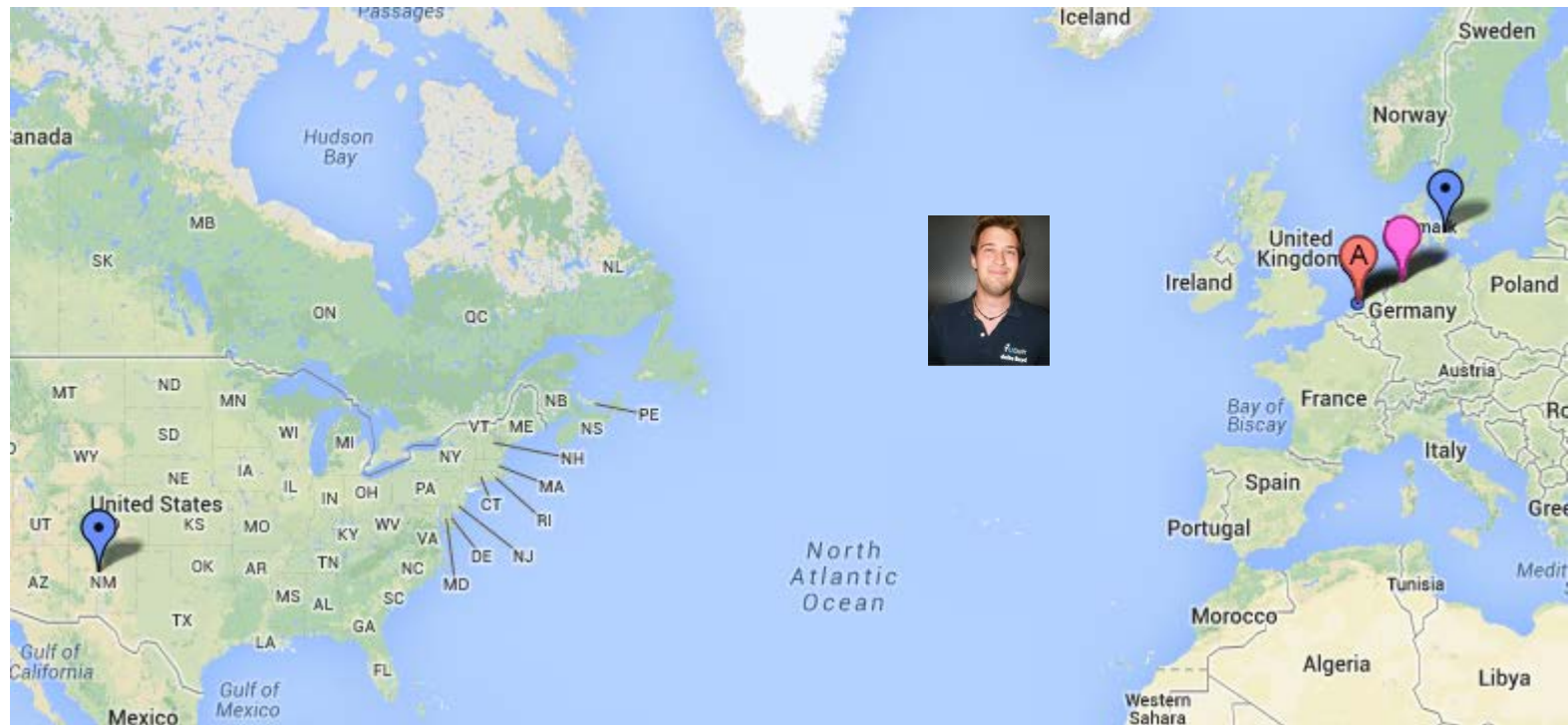
Example: Björn's curriculum

Rotor Design track – Aerodynamics profile

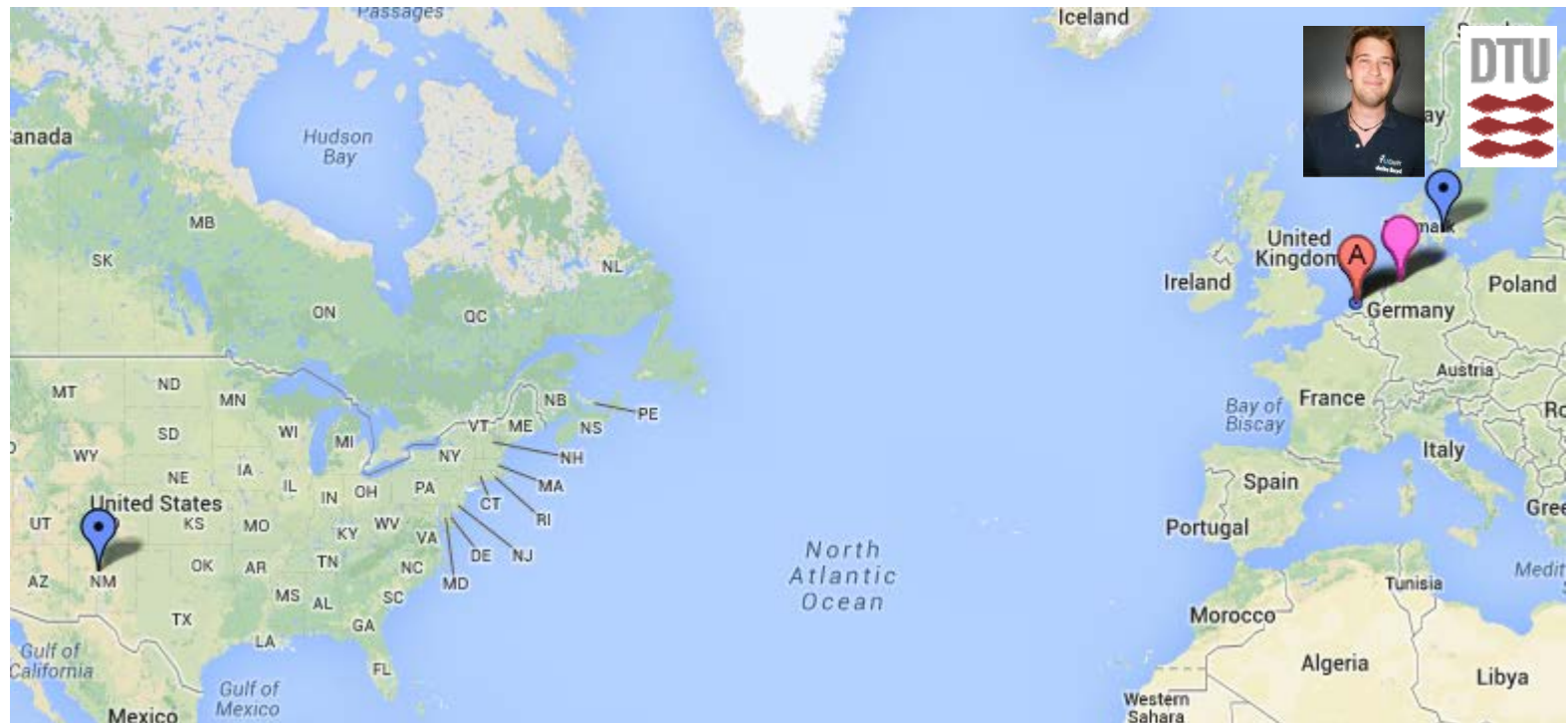


Course name	ECTS	Semester	University
Wind Turbine Technology and Aerodynamics	10	1	DTU
TEMO-Technology, Economics, Management and Organisation	10	1	DTU
CFD	10	1	DTU
Planning and Development of Wind Farms	5	1	DTU
Research Methodologies	2	2	TU Delft
Design and Manufacturing of Wind Turbine Rotor Blades	3	2	TU Delft
Wind Turbine Aeroelasticity	6	2	TU Delft
Rotor Aerodynamics	3	2	TU Delft
Wind and Site Conditions	3	2	TU Delft
Experimental aerodynamics	3	2	TU Delft
Wind Turbine Design	5	2	TU Delft
Fluid structure interaction	3	2	TU Delft
Programming in C	3	2	TU Delft

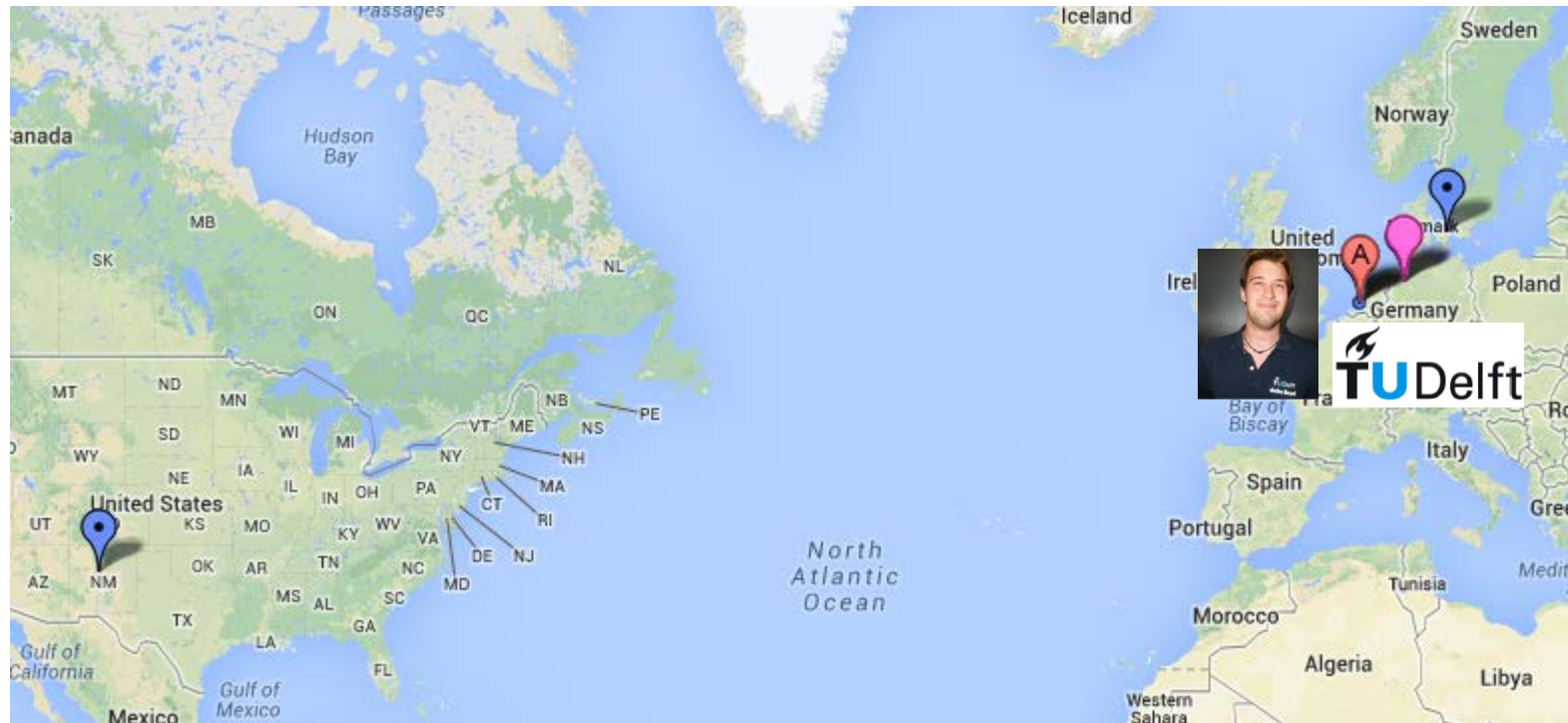
Example: Björn's mobility



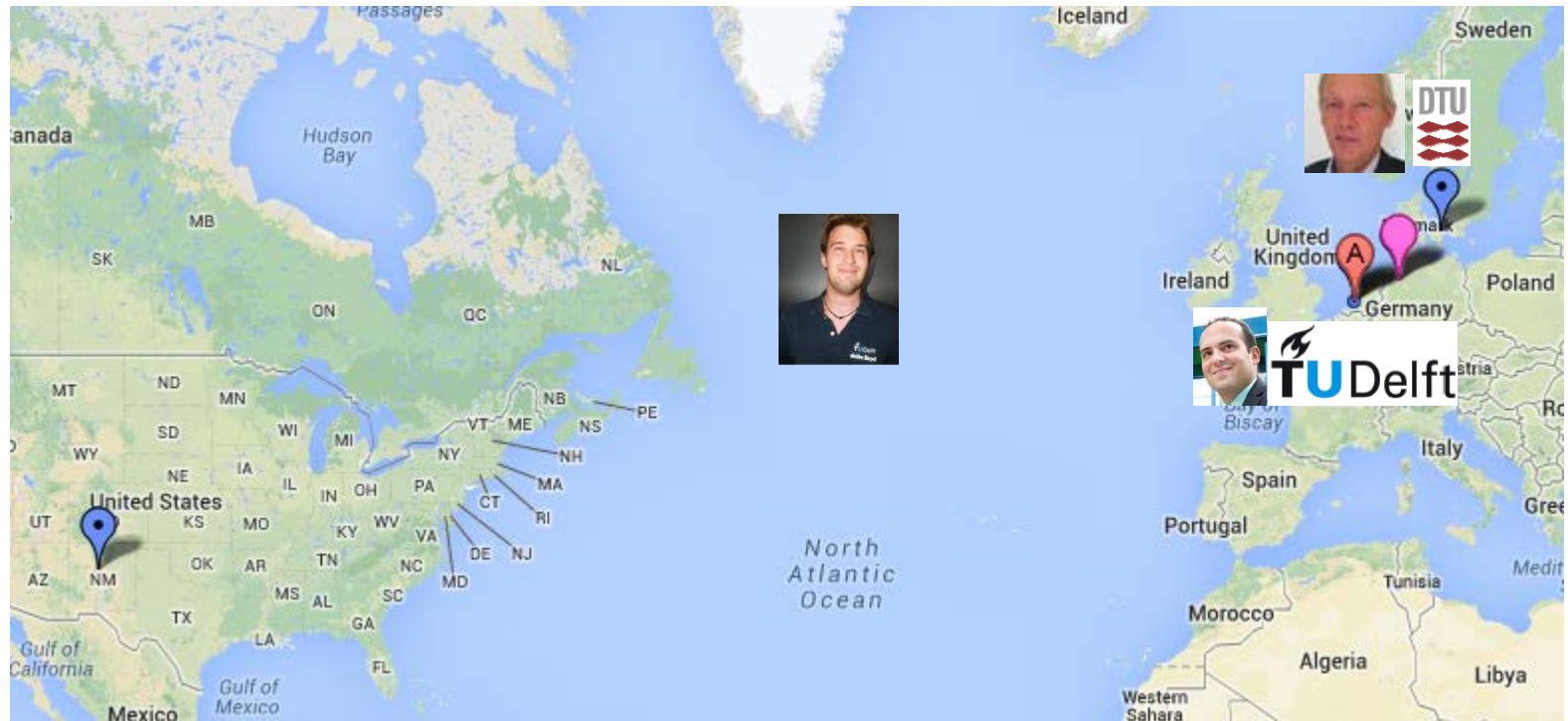
Björn's mobility – 1st semester courses



Björn's mobility – 2nd semester courses



Björn's mobility – MSc thesis



Björn's mobility – MSc thesis



Future steps

- Fifth track: **Asset management and operations in Wind Energy**
- Reach target 120 new students per year
- Erasmus Mundus Joint PhD in Wind Energy
- Expand consortium to non-EU institution
- MOOC - massive open online course