

NHH



ENE – ENERGY, NATURAL RESOURCES AND THE ENVIRONMENT

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ENE – ENERGY, NATURAL RESOURCES AND THE ENVIRONMENT

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- Different methods and approaches
- Focus on certain sectors where Norway has comparative advantages

- Energy and electricity markets
- Management of natural resources
- Environmental management and sustainable production
- Shipping and transport



OBJECTIVE

- The objective of the ENE profile is to educate the next generation of interdisciplinary leaders and professionals in the fields of energy, natural resources, sustainability and the environment.
- Future development and prosperity depends on access to energy and on reliable supplies of natural resources.
- Exploitation of such resources has significant impact on the environment and climate, and getting the balance right is critical in a world where sustainability is becoming more and more important.





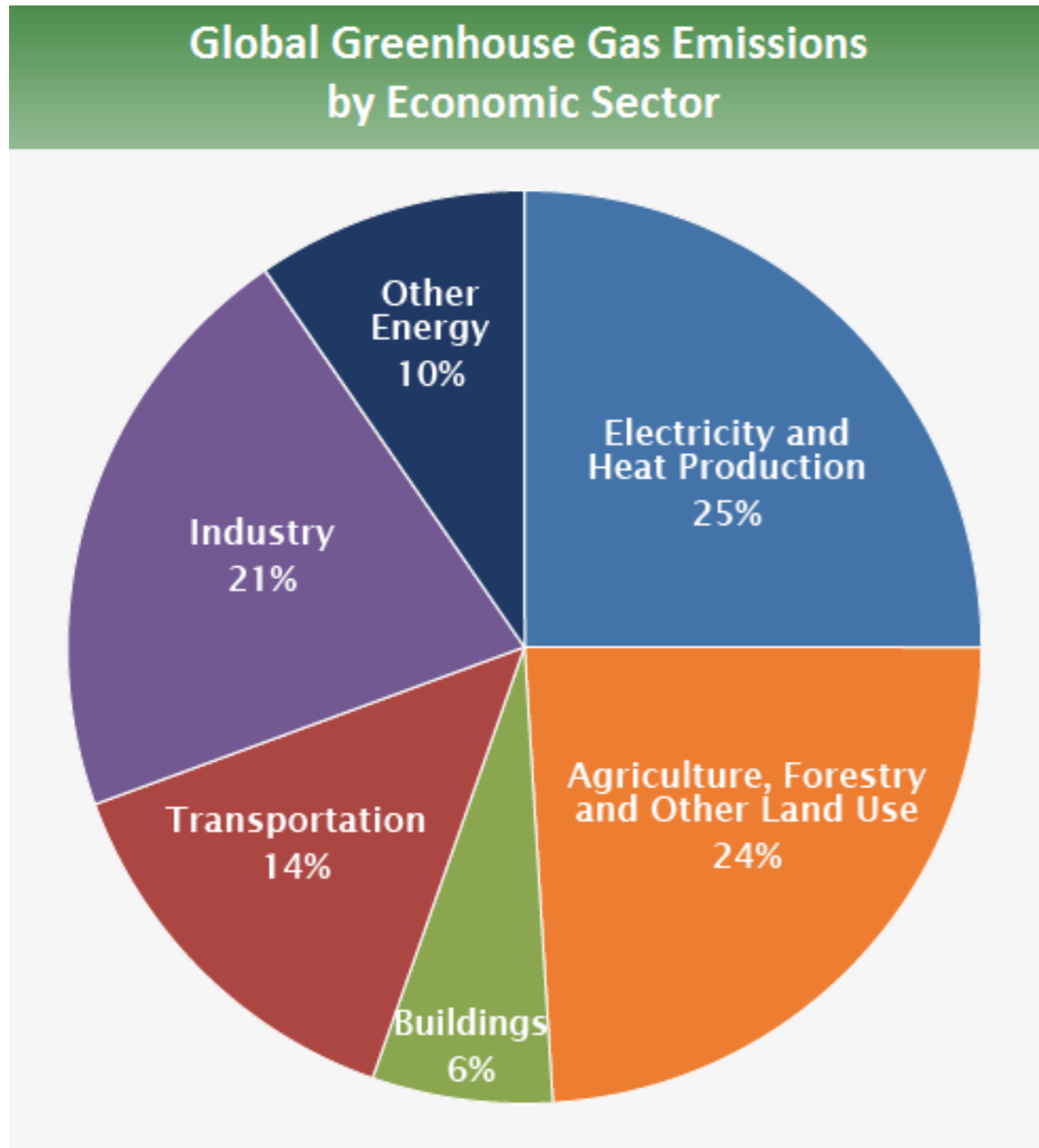
SUSTAINABLE DEVELOPMENT GOALS





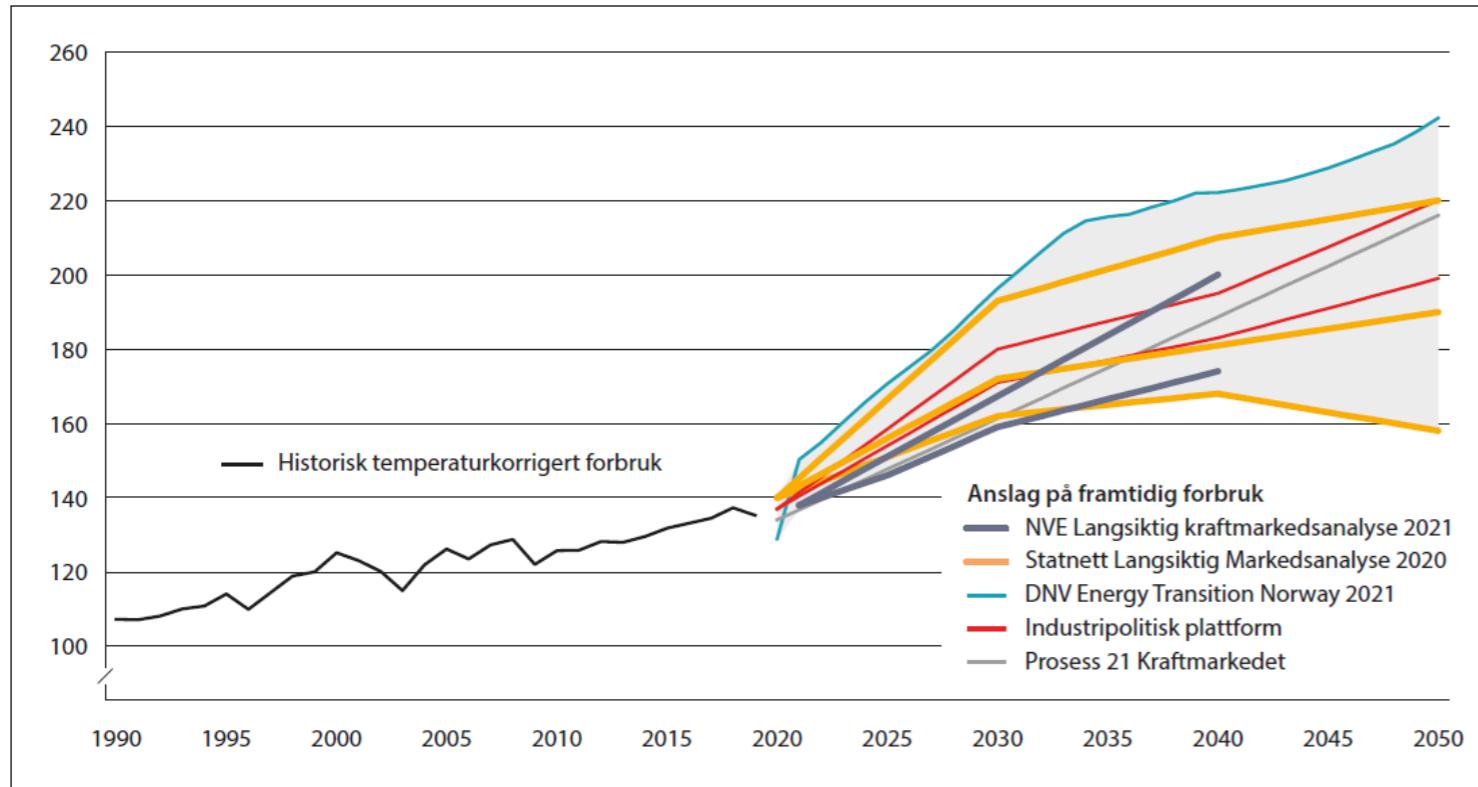
ENERGY TRANSITION AND DEEP DECARBONIZATION

- In the 2015 Paris Agreement, world leaders agreed to cut greenhouse gas emissions radically
- This aim of deep decarbonization will affect all sectors; energy, transport, industry, and buildings, as well as our everyday lives
- Integration of large quantities of (often variable and non-dispatchable) renewable power reduces the carbon footprint of the energy and electricity sector and contributes to decarbonizing other key emitting sectors, such as transport, buildings and industry



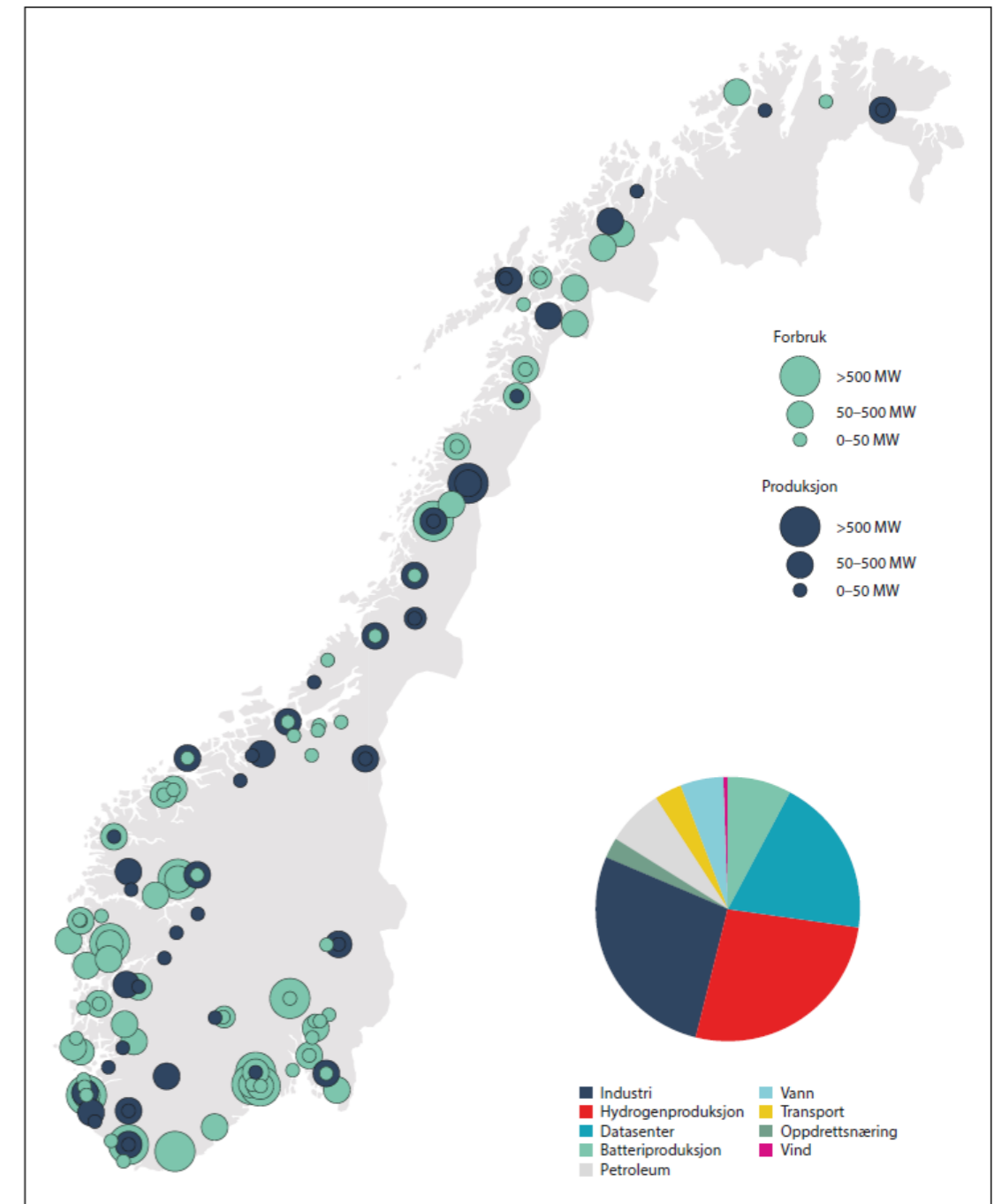
Source: [IPCC \(2014\)](#)

RAPID AND LARGE INCREASE IN DEMAND FOR ELECTRICITY



Figur 5.1 Ulike aktørers anslag på kraftbehovet framover

Kilde: SSB (2022), NVE (2021), Statnett (2020), Prosess 21 (2020), LO et. al (2020) og DNV (2021)

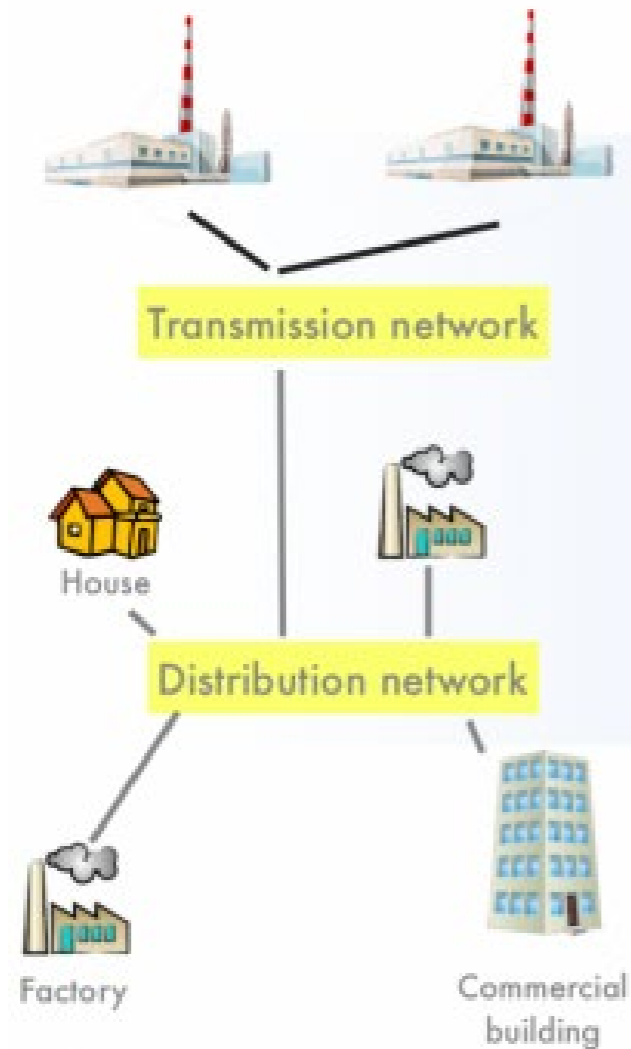


Figur 5.3 Tilknytningssøknader for nytt forbruk og ny produksjon 2018 til høsten 2021

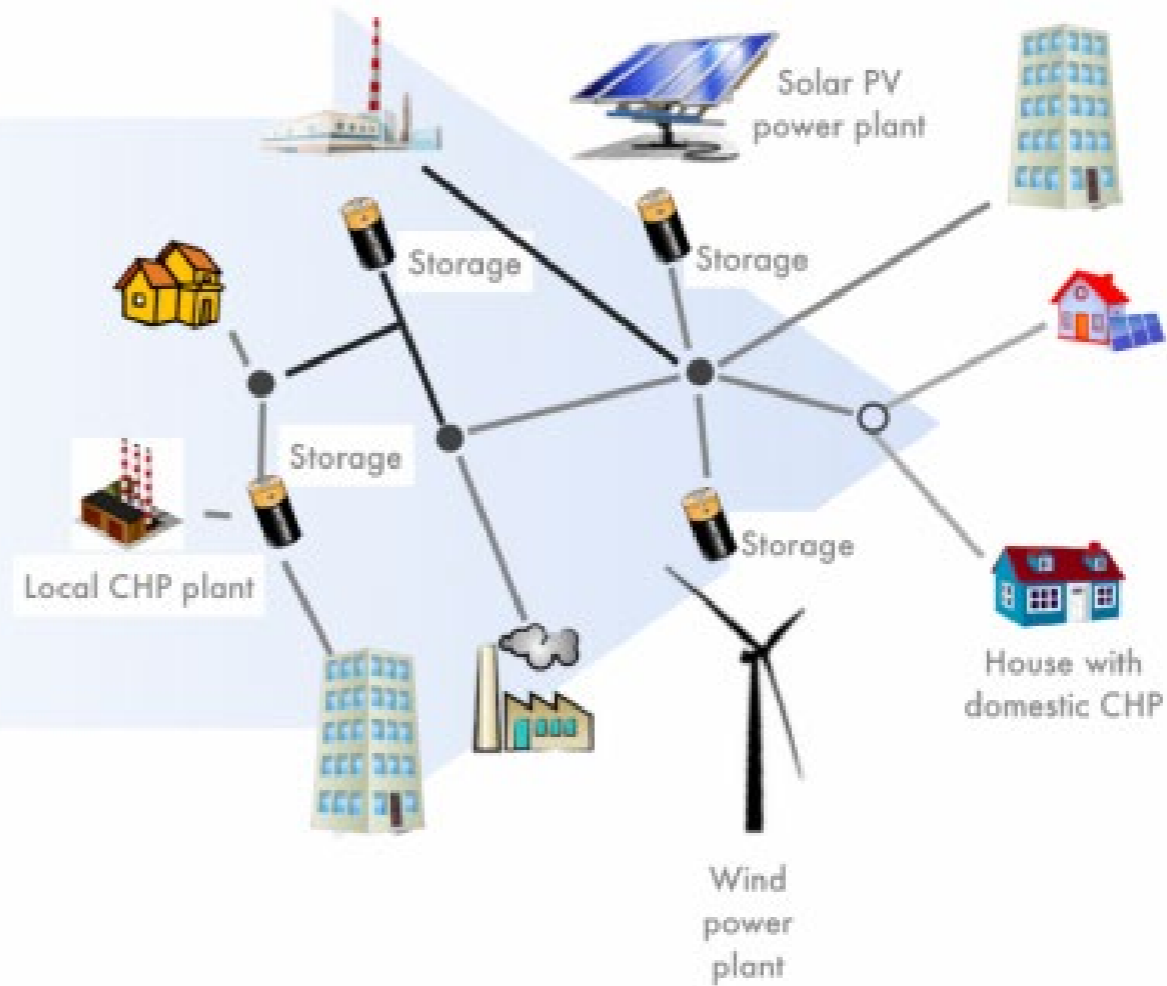
Kilde: Statnett (2021)



Yesterday Centralized Power



Tomorrow Clean, local power



J. Farrell, 2011 (adapted from European Commission)



SUBJECT AREA

- The ENE major broadly focuses on:
- Economic fundamentals of energy and natural resource value chains
- Strategic responses to more competitive energy and natural resource markets
- Interactions of business and government in commercial energy and natural resource development
- Environmental impact of business and government decisions



LEARNING OUTCOME

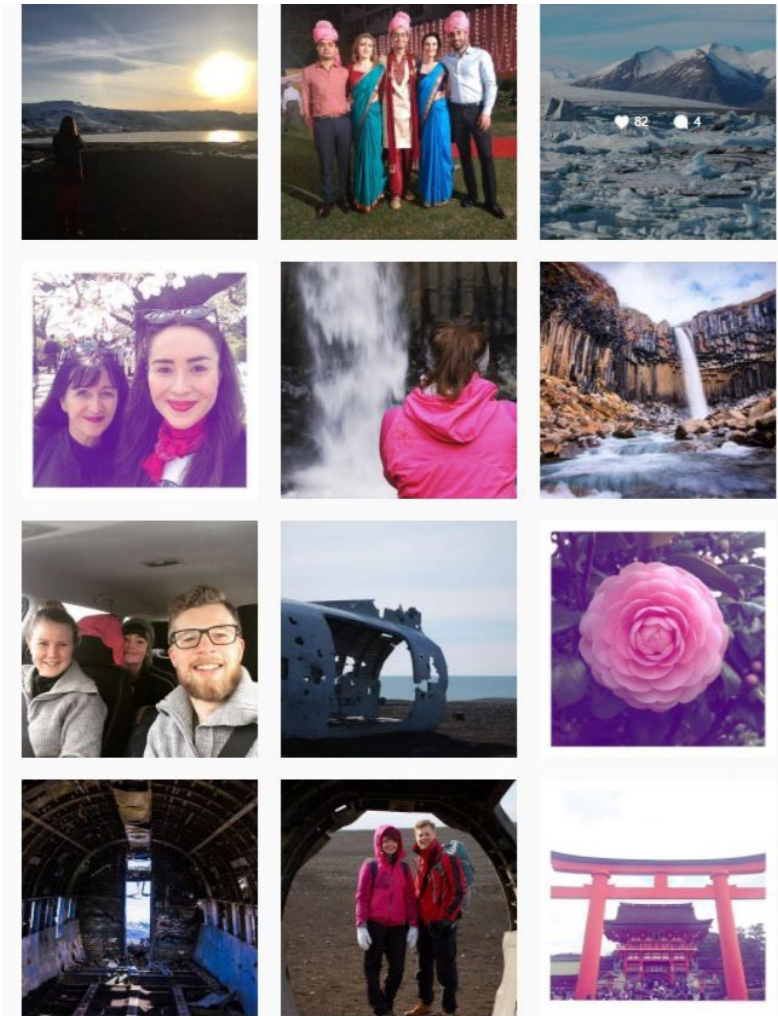
- You know theories, models and tools for analyzing energy and resource sectors and questions related to sustainability in any sector and industry.
- You can use this knowledge to choose appropriate methods when facing new challenges and to solve practical problems.
- You know methods and subjects necessary to understand, advance, and critique issues related to the interaction between humans and the environment.



CAREER OPPORTUNITIES

- Interesting job opportunities in the energy and resources sectors, shipping, finance, consulting, media and communication, IT, public administration, and with NGOs.
- The job opportunities are not limited to specific sectors, as sustainability has become a key concept in all industries.
- The ENE major is a general education in business economics.
- Candidates will also be well prepared to progress to doctoral studies.





#nhhworldwide

INTERNATIONAL OPPORTUNITIES

- All teaching is in English.
- ENE has admitted students from all parts of the world, with a majority from Europe.
- The profile offers a global and interdisciplinary approach.
- After their time in Bergen students have proceeded with international careers.
- Fellow students form the basis for an international network of friends and colleagues that stays with them for life.
- Quite a few have got jobs in new small companies or have started their own companies.
- Can be combined with CEMS MIM and Double Degrees.



DOUBLE DEGREE PROGRAMMES



Partner university	Specialization	Major at NHH	Spots
Bocconi	EMIT, Marketing, Marketing Management	ENE (EMIT) ECN, STR, MBM	7 (2-3 per specialization)
HEC Montreal	Operations and Global Supply Chain Management	ENE	2
HEC Paris	Sustainability and Social Innovation (SASI)	ENE, but may accept other majors	2
Ivey	International Business (IB), Business Analytics (BA)	IB- All BA-BAN	5
Louvain	Management Science, Business Engineering, Supply Chain Management	All, ENE	6
Luiss	Strategic Management, Innovation and Sustainability	ENE	5
Mannheim	Master in Management	All	6
Nova	Master`s in Finance/ International Master`s in Finance	FIE	5
University of Queensland	Global Management	All	5



INTERDISCIPLINARY FOCUS



- The focus is not on methodology but on topic/field/sector
- Methodological approaches:
 - Qualitative
 - Quantitative
 - Empirical
 - Theoretical
 - Modelling
 - Optimization
 - Financial markets
 - Management
 - Strategy
 - Market analysis
 - Studies of innovation and entrepreneurship



4 TRACKS



- Energy and Electricity

- Analysis of electricity markets and regulation
- Oil and gas
- Hydropower
- New renewable energy



- Natural Resources

- Management of natural resources
- Fisheries and aquaculture
- Forestry
- Minerals, oil and gas





4 TRACKS



- Environment, Climate and Sustainability

- Sustainable production and environmental footprint
- Management / policies / strategy
- Innovation and new business ideas



- Shipping and Transport

- Shipping economics and finance
- Analytics





PROGRAMME STRUCTURE

- The programme consists of 12 courses and a thesis, adding up to a total of 120 ECTS credits - 90 credits for the courses and 30 credits for the thesis.
- Normally one would follow courses in three semesters and dedicate the final semester to the thesis.



PROGRAMME STRUCTURE

- The general course plan for a major in ENE comprises:
 - 45 ECTS credits from the ENE specialization.
 - 22.5 ECTS credits from other specializations.
 - 22.5 ECTS credits from amongst all the specializations at NHH, including the major, possible minor, or on exchange.



PROGRAMME STRUCTURE

- In order to widen the range of relevant topics, a series of seminars are offered. A seminar counts as 1/3 of a regular course. A combination of three seminars counts as a full course.
- A seminar typically lasts one week and is given at the beginning or end of each semester.



PROGRAMME STRUCTURE

- One seminar can be replaced by an internship of a duration of at least one month in a company or an organization whose main activities are within the ENE sectors (ENEINT).
- Topics given in seminars are subject to change in order to focus on current topics of interest and the availability of guest lecturers and expertise.



MANDATORY COURSES

- ENE423 Economics of the Environment and Climate
- It is mandatory to have at least one of the listed core courses
- It is mandatory to have at least one of the listed empirical methods courses

MANDATORY COURSES

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Mandatory course: ENE423 Economics of the Environment and Climate

• Core courses – minimum one course

- ENE424 Electricity Markets
- ENE425 Sustainable Energy
- ENE431 Shipping Economics and Analytics
- ENE478 The Economics of Petroleum and the Energy Transition
- ECO439 Resource Economics

• Empirical Methods – minimum one course

- BAN400 R Programming for Data Science
- BAN401 Applied Programming and Data Analysis for Business
- BAN402 Decision Modelling in Business
- ECN402 Econometrics
- STR402A Methodology for Master Thesis

COURSES AND TRACKS – SOME EXAMPLES



• Energy and Electricity

- ENE421 Energy and Resource Industries
- **ENE424 Electricity Markets**
- **ENE425 Sustainable Energy**
- ENE434 Energy Industry Analytics
- ENE471 Machine Learning for Energy Markets Data
- ENE472 Canadian and US Energy Markets: Meshed and Challenged
- ENE474 Energy Finance
- ENE475 Natural Gas Markets
- **ENE478 The Economics of Petroleum and the Energy Transition**
- BAN423 Benchmarking with DEA, SFA, and R

• Natural Resources

- ENE421 Energy and Resource Industries
- ENE475 Natural Gas Markets
- ENE476 Offshore Energy Resources
- ENE477 Deep-sea mineral resources
- **ENE478 The Economics of Petroleum and the Energy Transition**
- ENE479 The Economics of Fisheries and Aquaculture
- ENE482 International Fisheries Management
- ECN429 The Economics of Aquaculture and Fisheries
- **ECO439 Resource Economics**

COURSES AND TRACKS – SOME EXAMPLES



• **Environment, Climate and Sustainability**

- ENE421 Energy and Resource Industries
- **ENE423 Economics of the Environment and Climate**
- **ENE425 Sustainable Energy**
- ENE435 Sustainable Supply Chain
- ENE452 Seminar: Climate Change and Ethical Challenges
- ENE456 Corporate and Private Environmental Responsibility
- ENE467 Energy and Climate Policy
- ENE481 Climate Risk
- ACC413 Sustainability & ESG Reporting
- BUS446 Sustainable Business Models
- ETI450 Corporate Social Responsibility
- FIE421 Macroeconomic Analysis and Sustainability
- FIE459 Sustainable Finance
- MBM432 Sustainable marketing

• **Shipping and Transport**

- ENE421 Energy and Resource Industries
- ENE430 Commodity Trading and Transport
- **ENE431 Shipping Economics and Analytics**
- FIE460 Ship Finance and Marine Insurance



THESIS

- Through working on your thesis, you will develop your analytical skills and gain a deeper understanding of theoretical and/or empirical possibilities and challenges within your chosen field.
- Tutoring is mandatory.
- The thesis should be between 75 and 120 pages.
- You should cooperate with another student in writing your thesis. If there are special reasons for it, you can apply to write alone.

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ANY QUESTIONS ABOUT ENE?

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