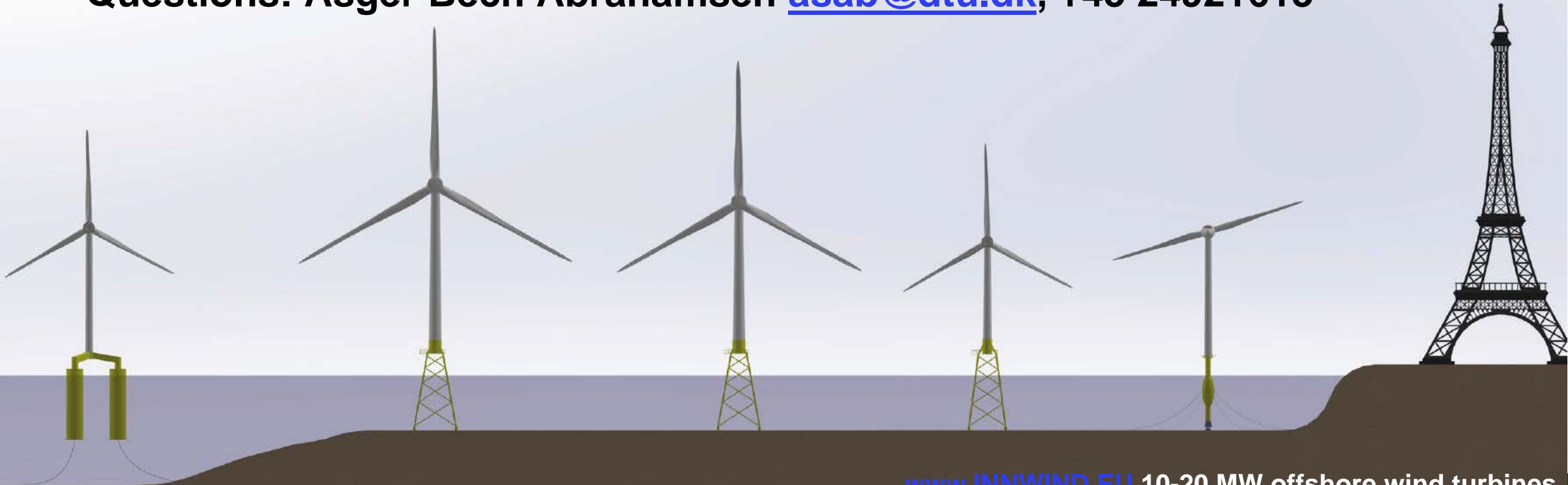


# Wind Energy Innovation Special course 6-27 June 2019

- Innovation = Good idea + Creating value
- Pick the best innovation process
- Determine the best innovation
- Calculate Levelized Cost of Energy(LCoE) of your innovation

Sign up: [studies@windenergy.dtu.dk](mailto:studies@windenergy.dtu.dk) - no later than 29 May 2019

Questions: Asger Bech Abrahamsen [asab@dtu.dk](mailto:asab@dtu.dk), +45 24921613



# Wind Energy Innovation – Course description

## General course objectives

To provide the student with methods of working systematically with innovation within the Wind Energy Sector and training in using the metric Levelized Cost of Energy (LCoE) as a tool for comparing different energy technologies. The students must create a Wind Energy Innovation idea and develop it using the innovation methods and the LCoE evaluations.

## Learning objectives

A student who has met the objectives of the course will be able to:

- **Explain** the basic methods for Staging, Discover/define, Develop, Evaluate and Articulate an innovation
- **Discuss** which innovation methods that are best applicable to wind energy challenges
- **Calculate** the metric Levelized Cost of Energy
- **Estimate** the Levelized Cost of Energy of a wind energy innovation
- **Compare** different energy innovations and conclude which is reducing the LCoE the most
- **Formulate** a description of a wind energy innovation, **mature** the idea using the innovation methods and **reflect** on the impact on the LCoE of the (wind) energy sector
- **Write** a report on an individual Wind Energy innovation development and LCoE evaluation (15 pages)
- **Make** an oral presentation of an innovation development done in a group and conclude which idea provided the largest reduction of LCoE of the group

## Content

The course will introduce a range of method for systematically working with innovation and the student will in group work perform the processes of **staging, discover, define, develop, evaluate** and **articulate** an innovation. A historic review of innovation within the wind energy sector is provided by experts in the field and the student will learn how to evaluate a wind energy innovation with the metric **Levelized Cost of Energy** (LCoE). Different framework conditions for innovation work will be introduced and the students must be able to decide if to use **open co-creating** (such as open source), **public co-creation** (public research project) or **closed co-creation** with the intention of obtaining patents for further creation of start-up companies (entrepreneur strategy) or industrial development.

The students will have to provide an innovation idea or choose one from an industry catalogue for a one week project. They will have to work in groups of 3 and develop their individual innovation together with their group members. At the end of the project period each student will have to report on how their innovation have been improved using the introduced innovation methods and how large an impact on LCoE that is expected. Finally each student will have to assign an owner ship share of the innovation to the other group members in case the innovation idea should be turned into a patent.

## Course Literature

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Fichaux, Nicolas (2009): Wind Energy - The Facts Chapter 1: Technology, Page 1-151, Routledge, Amsterdam Netherlands. ISBN: 978184407710, Free download at <https://www.wind-energy-the-facts.org/>.

Jamieson, Peter (2011): Innovation in Wind Turbine Design, Page 1-165, John Wiley and Sons, ISBN: 9780470699812, Free at DTU Libery.

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