Data and materials for teaching

DTU Wind Energy resources

DTU Wind Energy
DTU Wind Energy – teaching resources

Tools and materials

• WAsP software
• WAsP Engineering
• Reader mode or licensed
• Educational licencing
• WAsP freeware tools
• DTU 46200 course notes
• DTU YouTube channels
• DTU websites
• Many more tools not related directly to wind resource...

Courses

• DTU Wind Energy MOOC course
• WAsP e-learning course
• WAsP on-site course
• WAsP certification
• WAsP Engineering course
• HAWC2 on-demand course
• Lidar wind profiler courses
• Educational videos on YouTube
WAsP software

**WAsP** used for WASA analyses

- **Inputs**
  - Observed wind climate
  - Met. stations coordinates
  - Elevation map
  - Land cover map
  - Wind turbine generator

- **Outputs**
  - Predicted wind climates
  - Predicted energy yields
  - Wind farm wake effects
  - Mean wind speed maps
  - Mean power density maps
  - Mean energy yield maps

- Predictions can be based on GWC from
  - Observations (OWC)
  - WRF simulations
  - Global Wind Atlas
WAsP software – WM05 Napier
WAsP tools and licencing

- **WAsP freeware tools**
  - Map Editor
  - Climate Analyst
  - Turbine Editor
  - Terrain Workshop
  - Geo-projection transformer

- **WAsP licencing**
  - Reader mode
  - Demo mode (2 wk)
  - Licensed mode

- **Educational licencing**
  - Single students (MSc, free, 6 mo)
  - Class-room teaching (one licence + n fee)
Software help and course notes

- Software help facilities (F1)
  - Install free software, or
  - Download from DTU Orbit

- Course notes
  - Neither a textbook...
  - nor a software manual
  - but an overview and summary of wind resource assessment and siting using WAsP.
  - General w/ WAsP examples
  - Based on previous courses
  - Emphasis on standards and engineering best practice
  - Download from DTU Orbit
DTU Wind Energy – continuing education

Courses (on-line, free)

• DTU Wind Energy MOOC course
  – Wind energy overview
  – Coursera platform
  – Free admission (or fee)

• Educational videos on YouTube
  – Free access, no support

• Web sites and help facilities
  – Free access and download

Courses (on-line, fee)

• WAsP e-learning course
• HAWC2 e-learning course
• WAsP Engineering course

Courses (on-site, fee)

• WAsP on-site course
• WAsP Certification
• PhD summer school
• Lidar courses
Massive Open Online Course (Coursera)

- Introduction to wind energy
- Wind resources
- Test and measurements
- Economy
- Wind turbine technology
- Aerodynamics
- Materials
- Structural mechanics
- Electrical systems
DTU e-learning courses

- **WAsP e-learning course**
  - On-demand and flexible
  - Access for eight weeks
  - No travelling, cost effective

- **WAsP Engineering**
  - Transformed from on-site

- **HAWC2 e-learning course**
  - On-demand and flexible
  - Included in software licence
DTU on-site courses

- **WAsP 3-day course**
  - Wind resources (IEC 61400-1)

- **WAsP 1-day certification**
  - For WAsP users only

- **WAsP Engineering 3-day course**
  - Wind conditions (IEC 61400-1)

- **PhD summer school**
  - Remote Sensing for Wind Energy

- **Lidar 2-day course**
  - Training in wind lidar profilers

- Plus, courses not related to wind measurements and modelling.

- On-site classroom courses
- Risø Campus or overseas
- Course fee + travel costs
Other software tools

- **EllipSys**
  - CFD wind flow model for complex and steep terrain

- **Fuga**
  - Wake model for offshore energy yield calculations

- **HAWCStab**
  - Aero-servo-elastic stability tool for wind turbines

- **FUSED-Wind**
  - Framework for Unified Systems Engineering and Design of wind plants

- **Becas**
  - BEam Cross section Analysis Software for wind turbine blades

- **CorWind**
  - Wind power time-series simulation for long-term power system planning

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