SDG14 Future of the Ocean
MM3: Offshore Renewable Energy

Micro-Module 3: Offshore Renewable Energy

Research and Development

Lesson 2: Analyze Maps Related to Onshore Wind Farms

Subjects: Climate Action and Sustainable Development, Design, English, Engineering Science

Lesson Title and Summary: Analyze Maps Related to Onshore Wind Farms

In this lesson, learners engage with interactive online maps displaying wind turbine generation capacity. The introduction outlines objectives—note-taking, record-keeping, and data analysis. Learners are divided into small groups with devices or utilize a shared display. They explore maps on Eirgrid and Wind Energy Ireland websites, noting wind farm details, locations, and toggling different generation types. Data analysis involves note-taking, producing graphs to highlight trends like yearly wind farm commissioning, and calculating energy production per county or province. This lesson fosters digital navigation, data interpretation, and analytical skills in understanding wind energy's geographical distribution and impact.

Vocabulary: Interactive Maps, Data Analysis, Geographic Distribution, Onshore Wind

In this lesson, the learner will:

- Explore interactive wind energy maps online.
- Analyze and interpret data from wind farm maps.
- Create visual representations like bar charts to showcase trends.
- Develop skills in note-taking, record-keeping, and digital navigation.

Materials

- Worksheet: Onshore Wind Farms
- Teacher‘s Notes
- Internet access
- Notepad and pen, or word-processor on laptop
- Calculator

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ACTIVITY INSTRUCTIONS

Activity 1: Introduction (5 minutes)

1. Explain to learners that there are online interactive maps showing the wind turbine generation capacity.
2. Explain to learners that they are going to visit the websites containing these maps and explore the information they contain.
3. Highlight the key objectives of the lesson: note taking, record keeping, and data analysis.

Activity 2: Set-up online (5 minutes)

1. Depending on the number of resources (iPads/ laptops/ computers etc) and the number of learners, divide the class into small groups. If there is only one device in the classroom, consider projecting it onto the whiteboard/ wall for the entire class to follow.

Activity 3: Visit the websites and answer Questions on Worksheet 4 (20 minutes)

1. Invite learners to navigate to the map on Eigrid's website. Learners can explore the number of wind farms, and their names and locations via the map. They can also toggle-on and -off the wind-farms with other types of generation.
2. Invite learners to navigate to the map on Wind Energy Ireland's website. Additional information on this map includes the energy capacity of the wind farm, and the year it was commissioned.
3. Have learners answer the questions on Worksheet: Onshore Wind Farms.

Activity 4: Present the findings (20mins)

1. Invite learners to present their findings to the class and to highlight the top three most interesting things they found.

REFLECTIVE EXERCISE: 3-2-1

- Three things they feel they have learnt from the exercise
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the site / exercises

Use Post-its or a Mentimeter survey - mentimeter.com to gather reflections

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EXTENSION / REDUCTION ACTIVITIES:

Reduction: For a shorter class, answer only questions 1-7 on the worksheet or reduce the time for class discussion of their results.

Extension: For a longer class, invite learners to create a poster of their findings to the questions in the worksheet.

See Media Communications 3: Research - this micro module supports a learners micro-project to share their research findings. The micro-module supports learners who may consider taking Leaving Certificate Design and Communications Graphics as well as providing transferable skills in visual communication methods.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Website: Wind farm maps on Eirgrid website: https://www.smartgriddashboard.com/#all/transmission-map

Website: Wind farm maps on Wind Energy Ireland Website: https://www.windenergyireland.com/about-wind/interactve-map

Local Trip / Expertise / Additional Work and Assessments

Organise a visit to Eirgrid's National Control Centre. It is the nerve-center of the country's entire electricity grid, and its where the Engineers work to make sure the lights stay on in everyone's homes.

Organise a talk with a local electrical engineer or electrician who can talk more about how we connect wind farms to the electricity network. Develop some interview questions to ask them.

Encourage and support learners to undertake the SEAI One Good Idea competition - https://www.seai.ie/blog/one-good-idea/

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TEACHER'S NOTES

Online interactive maps

There are online interactive maps showing the location and size (in electrical terms) of the On-land (aka onshore) wind farms in Ireland. Wind farm (electrical) size is typically measured in MegaWatts (MW). Typically household appliances use KiloWatts (KW). A kilowatt is 1000 Watts and a Megawatt is a 1,000,000 Watts.

The figures below are screenshots taken of the maps on the Eirgrid website and the Wind Energy Ireland Website. The maps should be identical – depending on how well they are updated by the respective authors – but the level of detail provided for each wind farm is different on both sites.

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OFFSHORE WIND FARMS

Answer the following questions based on information you can find on Eirgrid's website and Wind Energy Ireland's website:

Website: Wind farm maps on Eirgrid website:
https://www.smartgriddashboard.com/#all/transmission-map

Website: Wind farm maps on Wind Energy Ireland Website:
https://www.windenergyireland.com/about-wind/interactve-map

1. How many wind farms are in Ireland?

_____

2. Where are they mostly located?

_____

_____

_____

3. Name 5 different wind farms; why do you think they were named that?
   1. _____
   2. _____
   3. _____
   4. _____
   5. _____

4. What other types of renewable energy do you see on the map?

_____

_____

_____

5. Which wind farm has the largest energy capacity, and what is that capacity?

_____

_____

_____

6. What is the wind farm with the least amount of energy capacity; what is that capacity?

_____

_____

_____

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OFFSHORE WIND FARMS

7. Why do you think there are such differences in capacity?

8. Which year had the most new wind farms constructed?

9. When was the first turbine constructed?

10. Try and produce a bar chart showing the number of new wind farms commissioned each year – which will show an interesting trend. What is that trend?

11. Calculate the amount of energy produced in each county or each province by adding the amounts quoted in the maps for each individual wind farm.