# Exercise 1: To visualise wind power potential and aspects that relate to wind energy utilisation in a country of your choice.

A map of india and india

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Step 1: Open QGIS🡪 Open .Tif file form browser Step 2: Right Click on Layer 🡪 Properties Step 3: Properties 🡪 Histogram

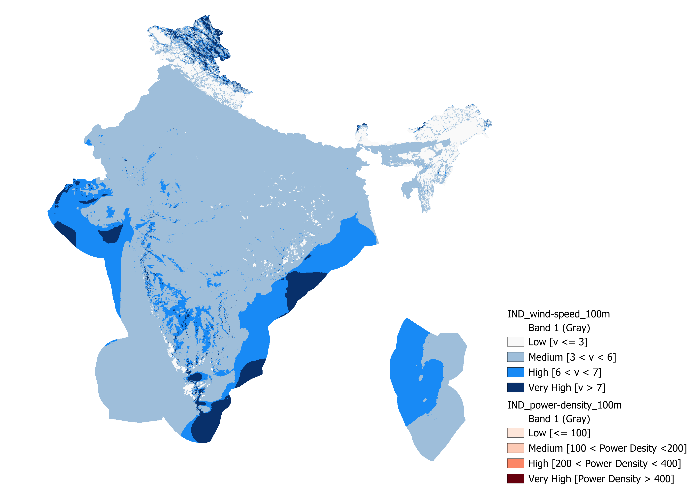
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Step 4: Properties 🡪 Symbology Step 5: Properties 🡪 Histrogram Step 6: Symbology Windowmenu



|  |  |
| --- | --- |
| Country | India |
| Download Wind Data | Energy data info |
| Content of Data | Wind Speed and Power Density |

In a Figure 1.1, you can see the approach used to find the solution for average wind speed at a height of 100 meters. Specifically, in Step 3, my first approach involved analysing the data using a histogram and dividing it into four categories: Low, Medium, High, and Very High. The categories are based on wind speed values as follows:

Low: Less than 3 m/s

Medium: Between 3 and 6 m/s

High: Between 6 and 7 m/s

Very High: Greater than 7 m/s

In Step 4, I applied this classification in the Symbology menu, as you can see in the image.

In a Figure 1.2, you can see the approach used to find the solution for average power density at a height of 100 meters. I followed same approach of Figure 1.1, see in step 5 and step 6.

Low: Less than 100 W/

Medium: Between 100 and 200 W/

High: Between 200 and 400 W/

Very High: Greater than 400 W/

(Figure 1.1: Average Wind Speed at a Hight of 100 m)

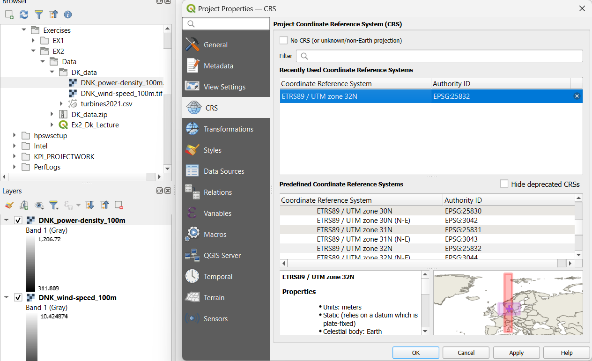
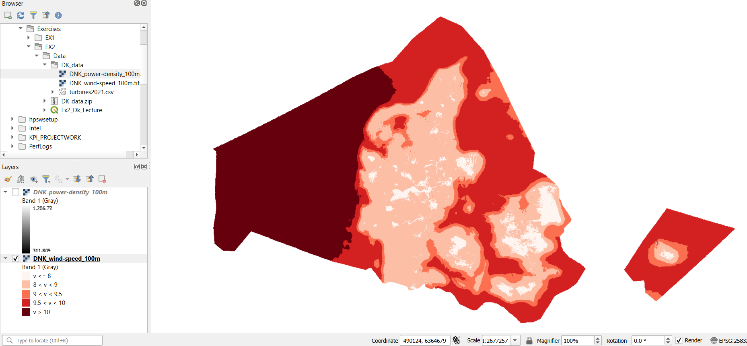
A map of india with different colored areas

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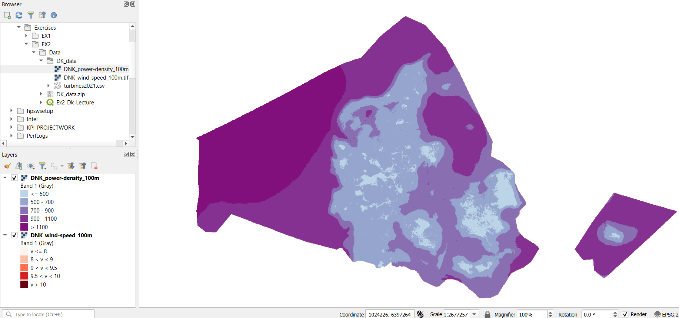
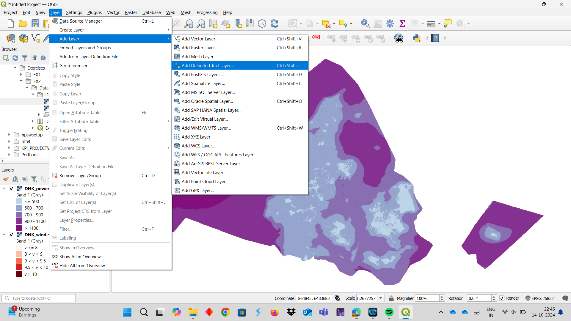
(Figure 1.2: Average Power Density at a Hight of 100 m)

# Exercise 2: Download and visualise the wind speed and power density map for Denmark. Consider type of symbology and choice of colours. Add the csv-file containing wind turbines. Visualise the wind turbines in Denmark by: Installed Capacity and Manufacturer. Use the methods Unique Values, Graduated Symbols, Graduated Colours etc. Add a grid, North arrow etc to your map.

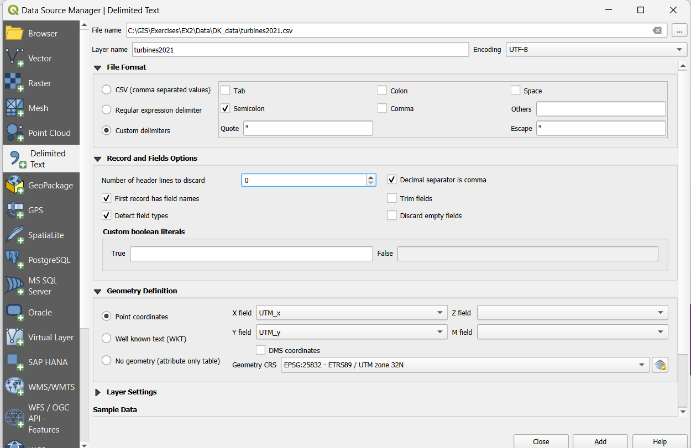
**Step 1:** Open QGIS 🡪 Open .Tif files of Wind speed and Power density map for Denmark, **Step 2**: Project 🡪 Properties [See Fig. 2.1, Change coordinates reference system, Used **ETRS89 / UTM zone 32N**], **Step 3:** Right click on Layer 🡪 Properties 🡪 Histogram [my first approach involved analysing the data using a histogram] 🡪 Symbology [dividing it into categories, names and different colours]. I didn’t include photos of step 2 and 3 because it has included already in Exercise 1. I added only final look photos, see in Fig 2.2 [Wind speed] and 2.3 [Power density].

(Figure 2.1) (Figure 2.2)

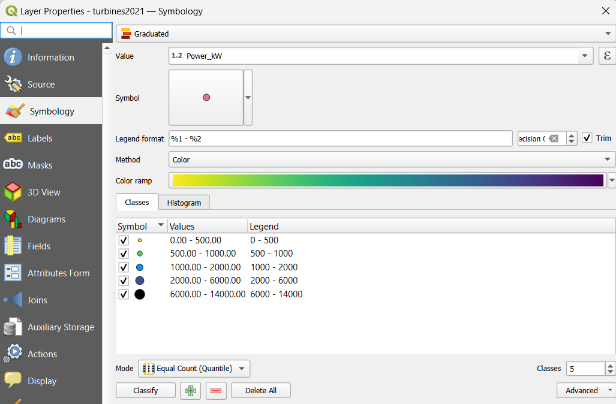
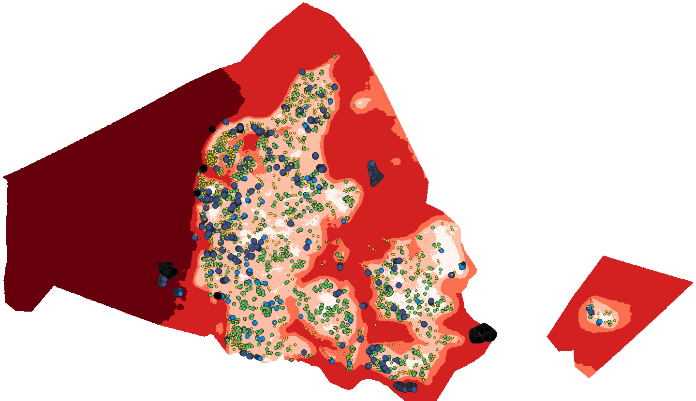
(Figure 2.3) (Figure 2.4)



**Step 4**: Layer 🡪 Add Layer 🡪 Add Delimited Test Layer [See fig. 2.4 and 2.5], Here basically added .csv file of containing Wind turbine. Before added

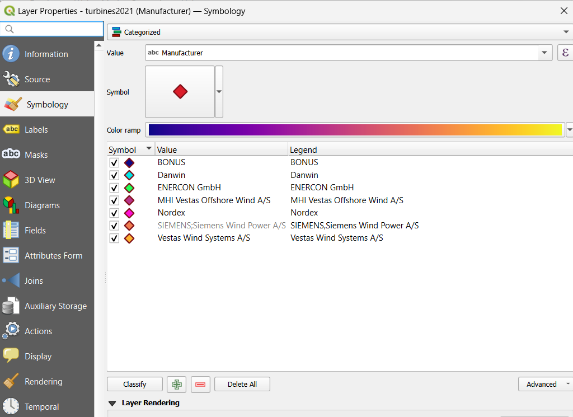
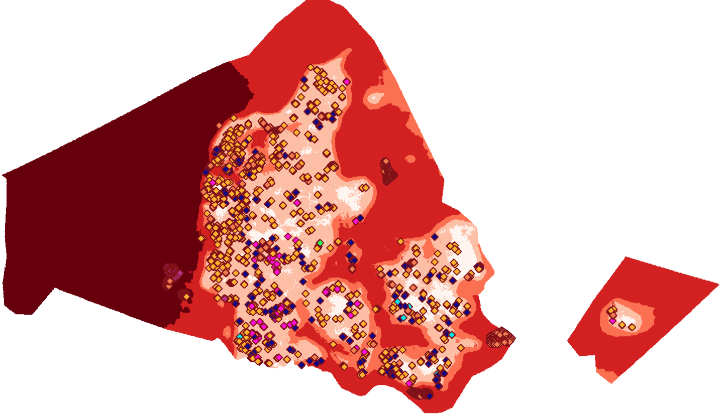
(Figure 2.5)

**Step 5**:

(Figure 2.6) (Figure 2.7)

**Step 6:**

(Figure 2.8) (Figure 2.9)

**Step 8:**

A map of a red triangle with black dots

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(Figure 2.10)

# Exercise 3: Find potential wind energy locations in County Galway, Ireland

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(Figure 3.1) (Figure 3.2) (Figure 3.3)

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(Figure 3.4) (Figure 3.5)

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(Figure 3.6) (Figure 3.7)

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(Figure 3.8) (Figure 3.9) (Figure 3.10)

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(Figure 3.11) (Figure 3.12)

A screenshot of a computer

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(Figure 3.13)

A map of the united states

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(Figure 3.14)