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

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| A map of the north and south america  Description automatically generated | Objective: To visualize wind power potential and aspects that relate to wind energy utilization in India. Data Source: **Download Wind Data**: Energy Data Info  **Content of Data**: Wind Speed and Power Density |
| **Figure 1.1: Average Wind Speed and Power density at a Hight of 100 m** |  |

## Steps Taken:

First step is to data Importing. Second step is data analysis by using histograms to categorize wind speed. Next step is to categories to Wind Speed and Power Density [See Fig 1.1].

## Results:

Figure 1.1 shows the classification of wind speed and power density using different categories. The analysis helps identify regions suitable for wind energy projects.

# Exercise 2: Download and visualise the wind speed and power density map for Denmark.

## Objective:

To download and visualize wind speed and power density maps for Denmark.

## Steps Taken:

First step is to load data (.TIF) files for wind speed and power density.

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| A screenshot of a computer  Description automatically generated | Second, set Coordinate System which is **ETRS89 / UTM zone 32N** (See Figure 2.1). Next step is to analyse Histogram and apply symbology for categorized wind speed and power density into classes. |
| **Figure 2.1** |  |

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| Then next step is to add Wind Turbine Data, which is imported CSV file and reviewed its content (See Figure 2.2). Then next step is to visualize Wind Turbines to use Graduated Symbols and Unique Values to map for power capacity and manufacturers (See Figure 2.3 and 2.4). | A screenshot of a computer  Description automatically generated |
|  | **Figure 2.2** |

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| **Figure 2.3** | **Figure 2.4** |

Last but not least, enhance Map Design to added grid, north arrow, and scale bar (See Figure 2.5).

## Results:

Figures 2.5 show wind speed classifications and power classifications show in lagend. Figures 2.3 and 2.4 display wind turbine capacity and manufacturer distributions.

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| A red and white map  Description automatically generated | A screenshot of a computer  Description automatically generated |
| **Figure 2.5** |  |

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

# Exercise 4: Local Wind Farm Planning (Location: Lindewitt Municipality, Schleswig-Holstein).

# Exercise 5: Editing Points, Lines and Polygons

# Exercise 6: Visualise the results with colours and transparency

# Exercise 7.1: Convert (Rasterize Vector to Raster) the electric grid layer to an input raster for distance mapping. Calculate the distance from the grid in metres (r.grow.distance).

# Exercise 7.2: Make a simple noise map for a planned wind farm in priority area „PR1\_NFL\_036“

# Exercise 8: Offshore Wind Energy Planning in Sweden