Denmark

Haitham Al Abdali
and Leah Laughlin
History

➢ Viking Culture
➢ Transformed into modern, prosperous nation
➢ National Day: June 5
   ○ Est. Constitutional Monarchy in 1849
➢ 1949: NATO
➢ 1973: EEC → EU in 1993
Demography

- Danish Culture, Happy culture
- Population: 5,569,077
- Ethnicities: Scandinavia, Inuit, Faroese, German
- Languages: Danish, Faroese, Greenlandic
  - Predominant Second Language: English
- Religion: Evangelical Lutheran (80%)
- 87% in cities
  - 25% of total live in greater Copenhagen
Geography

➢ Northern Europe
➢ Borders Baltic Sea and North Sea
➢ Slightly less than twice the size of Massachusetts
➢ Includes Greenland and Faroe Islands

CIA World Factbook
Climate

➢ Temperate
➢ Humid, overcast

➢ Cool summers
➢ Mild, windy winters

CIA World Factbook

AccuWeather
Government

➢ Official Name: Kingdom of Denmark
➢ Capital: Copenhagen
➢ Constitutional Monarchy
➢ 5 Metropolitan Regions
➢ Welfare
Government

➢ Three Branches
  ○ Executive
    ■ Chief of State: Queen Margrethe II
    ■ Head of Government: Prime Minister Helle Thorning-Schmidt
  ○ Judicial
    ■ Supreme Court
  ○ Legislative
    ■ Parliament: Folketing
Economy

➢ Modern market with high-tech agricultural sector
➢ World-leading pharmaceutical firms
➢ High standard of living
➢ Renewable energy
➢ Maritime shipping
➢ Government welfare measures
Taxes as a Share of Gross Domestic Product, 2008

Source: OECD Tax Statistics, 2010
Economy

➢ Dependent on foreign trade
➢ Imports
➢ Exports
➢ European Union
  ○ Not part of European Economic and Monetary Union
  ○ 1 US Dollar about 7 Danish Krone
Danish GDP, energy use and emissions

Economy

➢ One of the strongest supporters of trade liberalization in the EU
➢ GDP: 55th in world (2013)
➢ GDP per capita: 32nd in world (2013)
➢ Industries
Environmental Issues

➢ Air pollution
  ○ Vehicles
  ○ Power Plant Emissions

➢ Nitrogen and Phosphorus in North Sea

➢ Drinking and surface water polluted
  ○ Animal waste
  ○ Pesticides
Energy Profile

➢ Natural Resources
  ○ Petroleum
  ○ Natural Gas

➢ Electricity
  ○ Fossil fuels: 63%
  ○ “Other Renewables”: 36.9% (as of 2010, 2nd in world)
Energy Profile

Danish oil and gas fields and pipelines

North Sea

Pipeline: Gas
Pipeline: Crude oil
Oil and gas fields

CIA World Factbook
Energy Production

* Petajoule (PJ) is equal to one quadrillion ($10^{15}$) joules.
Energy Production

* PJ = \(10^{15}\) joules.
Energy Imports and Exports

### Imports and exports of energy products, 2013

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude oil [1000 tonnes]</td>
<td>4,670</td>
<td>6,165</td>
</tr>
<tr>
<td>Oil products [1000 tonnes]</td>
<td>7,312</td>
<td>6,619</td>
</tr>
<tr>
<td>Natural gas [million Nm³]</td>
<td>1,292</td>
<td>2,120</td>
</tr>
<tr>
<td>Coal [1000 tonnes]</td>
<td>4,952</td>
<td>52</td>
</tr>
<tr>
<td>Electricity [GWh]</td>
<td>11,459</td>
<td>10,377</td>
</tr>
</tbody>
</table>

### Imports of coal and exports of crude oil by country, 2013

**Imports of coal**
- Russia: 37%
- Colombia: 39%
- South Africa: 6%
- Norway: 1%
- USA: 1%
- Other: 11%

**Exports of crude oil**
- Netherlands: 13%
- UK: 32%
- Sweden: 30%
- Germany: 10%
- Finland: 11%
- Ireland: 3%
- Other: 3%
Energy Profile

➢ As the first country in the world, Denmark is leading the transition to a green growth economy by introducing a goal of becoming independent from fossil fuels by 2050

➢ Wind Energy, Waste Energy
Energy Policy

➢ Goals:
  2. Environmental and Climate aspects related to Energy Use.
  3. Economical aspect, cost effectiveness of energy supplies.
Renewable Energy Profile

![Renewable energy production by type](chart1)

**Consumption of renewable energy – share of total energy consumption**

- **Share covered by net imports**
- **Share covered by indigenous production**

Danish Energy Agency
# Wind Energy

## Number of wind turbines by size

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2,666</td>
<td>6,219</td>
<td>41</td>
<td>6,260</td>
<td></td>
<td>4,721</td>
</tr>
<tr>
<td>499 kW</td>
<td>2,656</td>
<td>3,677</td>
<td>11</td>
<td>3,688</td>
<td>1,397</td>
<td>14</td>
</tr>
<tr>
<td>500 – 999 kW</td>
<td>8</td>
<td>2,283</td>
<td>10</td>
<td>2,293</td>
<td>2,551</td>
<td>10</td>
</tr>
<tr>
<td>1000 – 1999 kW</td>
<td>2</td>
<td>251</td>
<td>-</td>
<td>251</td>
<td>359</td>
<td>-</td>
</tr>
<tr>
<td>2000 – kW</td>
<td>-</td>
<td>8</td>
<td>20</td>
<td>28</td>
<td>414</td>
<td>495</td>
</tr>
</tbody>
</table>

## Total capacity of wind turbines by size [MW]

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>326</td>
<td>2,340</td>
<td>50</td>
<td>2,390</td>
<td></td>
<td>3,539</td>
</tr>
<tr>
<td>499 kW</td>
<td>317</td>
<td>533</td>
<td>5</td>
<td>538</td>
<td>232</td>
<td>5</td>
</tr>
<tr>
<td>500 – 999 kW</td>
<td>6</td>
<td>1,512</td>
<td>5</td>
<td>1,517</td>
<td>1,734</td>
<td>5</td>
</tr>
<tr>
<td>1000 – 1999 kW</td>
<td>3</td>
<td>279</td>
<td>-</td>
<td>279</td>
<td>438</td>
<td>-</td>
</tr>
<tr>
<td>2000 – kW</td>
<td>-</td>
<td>16</td>
<td>40</td>
<td>56</td>
<td>1,135</td>
<td>1,261</td>
</tr>
</tbody>
</table>

Danish Energy Agency
Wind Energy

Number of wind turbines and size of capacity
Number

Production of wind power

Danish Energy Agency
Energy Consumption

Final energy consumption by fuel
(Climate adjusted)

Final energy consumption by sector
(Climate adjusted)
Energy Consumption

Gross energy consumption and final energy consumption (Adjusted)

GDP, gross energy consumption and energy intensity (Adjusted)
Locations to Visit

➢ Copenhagen
  ○ Danish Energy Agency
  ○ Ministry of Climate and Energy Policy