Assignment I

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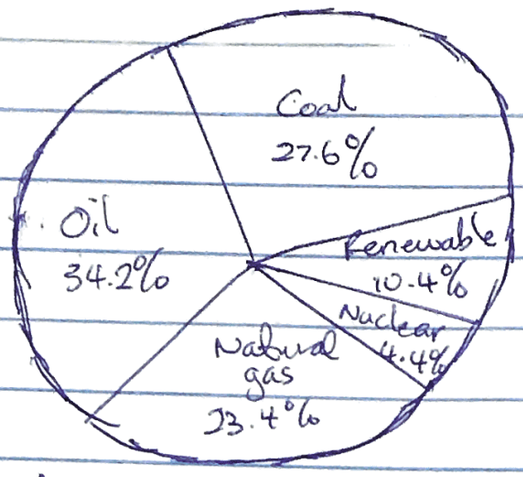
Course: CHE 574

1) Forms of Energy
- Chemical Energy Kinetic Energy
  is energy in moving objects or mass
  $K.E = \frac{1}{2}mv^2$
- Potential Energy
  is any form of energy that has stored potential that can be put to future use
  $P.E = mgh$

2) Sustainable Energy/sources	Non sustainable Energy/sources
- Sustainable sources are not easy to set up.	Non-sustainable sources are cheap and easy to use
- These are sources that don't run out	These are sources that run out
- They are also referred to as renewable sources	They are also referred to as non renewable sources
- Examples include wind, water, sun	Examples include coal, oil, natural gas
- These are sources that can be produced naturally	These are sources that can be produced artificially

3)



Piechart of Resource mix

For the case of Nigerian environment, it is noticed that the areas focused on for energy sourcing is the oil sector together with the artificial sources / non sustainable sources ie the coal, natural gas etc. The renewable energy is not widely used in the Nigerian environment due to low awareness and expenses involved in setting it up.

Assignment II

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Average ambient temp between Monday 17th and Friday 21st of February 2020

	DAY		NIGHT
17th February	35°C	-	25°C
18th "	36°C	-	25°C
19th "	35°C	-	25°C
20th "	36°C	-	25°C
21st February	37°C	-	25°C

$$P = \frac{\Delta Q}{\Delta t}, \quad P = \frac{K \cdot A \cdot \Delta T}{L}, \quad Q = P \times \Delta t$$

where P = rate of energy transfer (in watts)
Q = Energy transfer (J)
Δt = change in time (s)
K = thermal conductivity
A = Area
L = thickness of material
ΔT = difference in temperature

Assumptions
K_{air} at (35°C - 37°C) = 1.4
A = area of land in abuad = 1,300,000 m^2
L = average thickness = 0.991m

For Monday: $\Delta T = 35 - 25 = 10°C$
Tuesday = $\Delta T = 36 - 25 = 11°C$
Wednesday = $\Delta T = 35 - 25 = 10°C$
Thursday = $\Delta T = 36 - 25 = 11°C$
Friday = $\Delta T = 37 - 25 = 12°C$

Monday $P = \frac{1.4 \times 1300000 \times 10}{0.991} = 18365287.59\,W$

$Q = P \times \Delta t$

$\Delta t = 6hrs = 6 \times 3600 = 21600s$

$Q = 18365287.59 \times 21600 = 396700\,MJ$

Tuesday $P = \frac{1.4 \times 1300000 \times 11}{0.991} = 20201816.35\,W$

$Q = 20201816.35 \times 21600 = 436300\,MJ$

Wednesday $P = \frac{1.4 \times 1300000 \times 10}{0.991} = 18365287.59\,W$

$Q = 18365287.59 \times 21600 = 396700\,MJ$

Thursday $P = \frac{1.4 \times 1300000 \times 11}{0.991} = 20201816.35\,W$

$Q = 20201816.35 \times 21600 = 436300\,MJ$

Friday $P = \frac{1.4 \times 1300000 \times 12}{0.991} = 22038345.11\,W$

$Q = 22038345.11 \times 21600 = 476000\,MJ$

$\text{Average} = \frac{396700 + 436300 + 396700 + 436500 + 436300}{5}$

$= 420460\,MJ$

∴ The average daily thermal energy from the sun readily ABUAD is 420460 MJ

Diagram of an Anemometer