# Holiday homework Mathematics

Saturday, May 15, 2021 10:57 AM

This holiday homework is made by Aadish Chauhan and Achintya Shukla of class X B . In this holiday homework we have attempted the basic arithmetic question related to the energy consumption in India with the help of official data taken by the internet , later in this module we have analyzed the facts and figures and presented the statistics of the energy consumption in India and finally we have summarized the learning outcomes of our module .

## Problems

**Note : since this project is collaborated that is why we have divided the work into half, so Aadish has done the first 4 question and the last 4 are done by Achintya(me).**

1. percentage of biomass fuel consumption all over the world is = 14 %
   fraction of 14 % = $\frac{14}{100} = \frac{7}{50}$
   Therefore 7/5 th of the total energy consumption in the world is of biomass fuel.

2. Biomass fuel coming from wood = $\frac{1}{4}$
   Biomass fuel coming from crop residues = $\frac{1}{3}$ $(of\ total\ biomass)$
   Biomass fuel coming from animal residues = $\frac{1}{8}$ $(of\ total\ biomass)$
   Total fraction = $\frac{1}{3}+\frac{1}{4}+\frac{1}{8}=\frac{6+8+3}{24}=\frac{17}{24}$
   percentage of all sources = $\frac{17}{24}$ x100 = 70.8333 %

3. Basic electric cost savings = $\frac{1}{5}$
   Heating cost savings = $\frac{1}{3}$
   total fraction saved from your utility bill = $\frac{1}{3}+\frac{1}{5}=\frac{8}{15}$
   monthly bill value = ₹ 4000
   amount saved each month = ₹ 4000 x $\frac{8}{15}\sim$ ₹ 2133

4. Percentage of energy requirement fulfilled by wind turbine = 20 %
   fraction of energy requirement not fulfilled by wind turbine = 80 % = $\frac{80}{100} = \frac{4}{5}$ ( 0.8 )

5. Percentage of India's energy consumption that is renewable energy = 26 %
   Percentage of India's energy consumption that is petroleum source energy = 29.55 %

   $\therefore In\ India\ \%\ of\ energy\ consumption\ that\ is\ renweable\ is\ 26\% \Rightarrow out\ of\ every\ 100\ units\ of\ engrgy\ consumed\ in\ India\ 26\ units\ are\ from\ renweable\ sources\ in\ m$
   $\Rightarrow fraction\ that\ represents\ this\ information\ is = \frac{26}{100} = \frac{13}{50}.$
   $\therefore \frac{13}{50}\ of\ the\ energy\ consumed\ in\ India\ is\ renweable\ enegy\ .$

6. Percentage of India's energy consumption that is petroleum sourced ( represented by x ) = 29.55 %
   Percentage of India's energy consumption that is renewable energy(represented by y) = 26 %
   Then let $\tau$ ( called tau i.e greek letter) represent the percenatge by which petroleum sourced enegy is used nore than renweble energy .
   $\Rightarrow\ \tau = x - y$
   $\Rightarrow\ \tau = 29.55\ \% - 26\ \% =\ 3.55\ \%$
   $\therefore\ \tau = 3.55\ \%$ .

**Remark : Mathematically this tells us that in every 100 units of enegy if $\mu\ units\ of\ energy\ used\ is\ renewable\ then\ \mu + 3.55\ units\ of\ energy\ are\ pertoleum\ sourced$ .**

7. Let us assume that old light bulbs use $\mu\ units\ of\ energy$ .
   from the questions statement $\Rightarrow$

new bulbs use $= \mu - \left(\mu \times \frac{75}{100}\right) units\ of\ energy = \frac{\mu}{4}. unist\ of\ energy$.

$\Rightarrow amount\ of\ enegry\ that\ is\ ued\ extra\ in\ boith\ the\ bulbs = \mu - \frac{\mu}{4} = \frac{3}{4}\mu$. ( $this\ is\ the\ energy\ that\ is\ used\ extra$ )

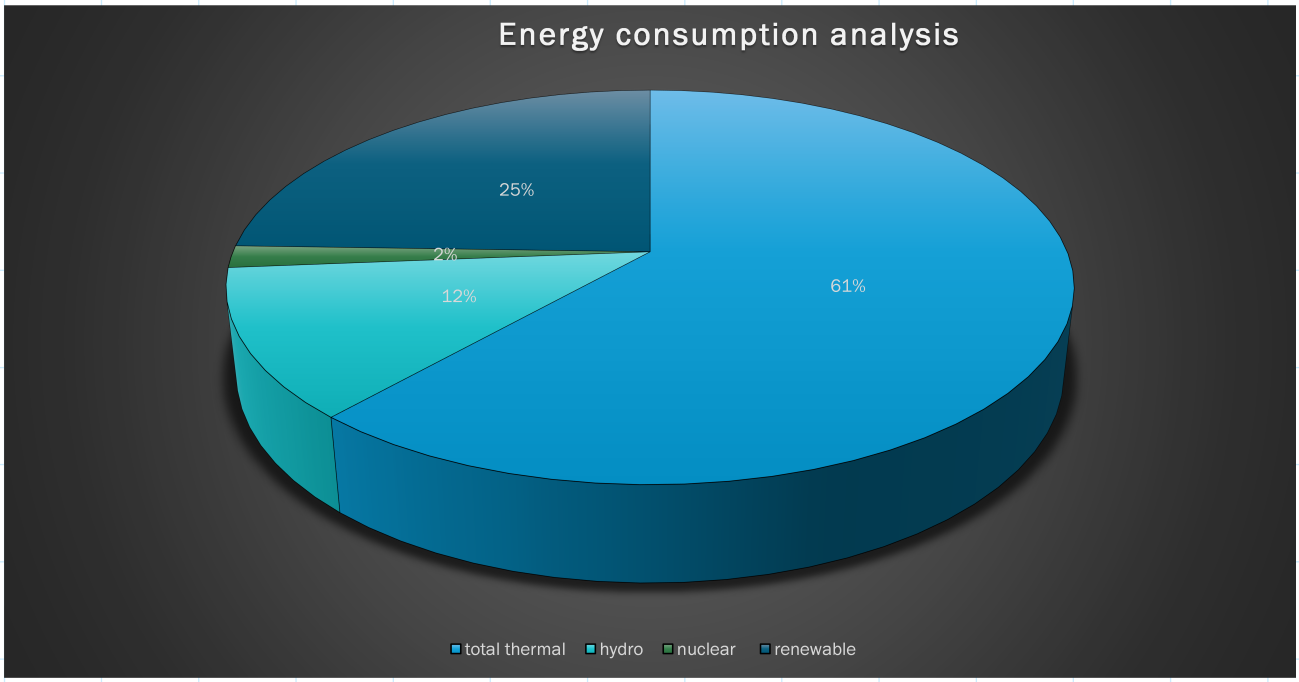
$\Rightarrow fraction\ of\ enegry\ that\ is\ wasted = \frac{extra\ used\ enrgy}{energy\ that\ is\ used\ in\ old\ light\ \ bulb} = \frac{\frac{3\mu}{4}}{\mu} = \frac{3}{4}$.

$\therefore \frac{3}{4} th\ of\ the\ energy\ that\ is\ used\ by\ an\ inefficient\ bulb\ is\ wasted\ incomparsion\ to\ a\ new\ bulb.$

`

8. This data is from Indian ministry of power for 2020-2021

| energy type | percentage in total |
|---|---|
| total thermal | 61.50% |
| hydro | 12.20% |
| nuclear | 1.80% |
| renewable | 24.50% |
| | 100.00% |




LEARNIG OUTCOMES :

We have learnt from this project the percentages of different kinds of fuels used in the world by all the research done to answer the questions given. Also, we have learnt through the informative paragraph given in the Holiday Homework pdf the importance of the fourth largest energy source (biomass) in the world, plants store 10 times the annual consumption of energy which however is insufficiently used due to technological and economic constraints.

This project has helped us understand in detail the importance of biomass and how much it is used, the ways it can be used etc.

We have learnt from this project the percentages of different kinds of fuels used in the world by all the research done to answer the questions given. Also, we have learnt through the informative paragraph given in the Holiday Homework pdf the importance of the fourth largest energy source (biomass) in the world, plants store 10 times the annual consumption of energy which however is insufficiently used due to technological and economic constraints.

This project has helped us understand in detail the importance of biomass and how much it is used, the ways it can be used etc.

## Visual tool

**PREFACE: THIS MODULE IS MADE BY AADISH CHAUHAN ANAD ACHINTYA OF IN THI MODULE WE DISCUSS METHODS TO SAVE ENEGRY .**

Green choices or choices to conserve the environment have to be taken on all levels as factories using non-renewable energy in the amounts that they use it is very harmful for the environment and the energy resources are being wasted while there is a greener and renewable solution to this. By using renewable energy like solar or wind or even geothermal energy, we can save ourselves from the pollution which is caused by the production of electricity (just one thing among many) and we can use it for longer. Geothermal energy does emit few air pollutants but it is still much lower than the emissions of current energy sources.

Energy sources like Biomass play an important role in the conservation of energy as it only uses waste, plants and other organic materials. Nuclear energy can also be used as it produces fewer greenhouse gases than the conventional energy sources. Energy conservation can even begin from us by simply switching of the lights, fans, and taps etc. when we are done with their usage. It can also be done by using environment friendly appliances like, we can use LEDs instead of halogen bulbs.

The choices to save energy are mostly easy to do and are important for future generations.

**Source credit:**

**Renewable energy and energy efficiency**

**westernresourceadvocates.org**

https://westernresourceadvocates.org/clean-energy/renewable-energy/

THE ORIGNAL LINK TO AADISH's PDF IS GIVEN BELOW

Saving energy