**Fundamentals of Energy Statistics**

## Exercise 1 – Supply and Demand.

**Choose one from the following options for each of the flows: a. Supply side or b. Demand side**

|  |  |  |  |
| --- | --- | --- | --- |
| **FLOW** | **ANSWER** | **FLOW** | **ANSWER** |
| Production of natural gas | Supply | Transportation sector | Demand |
| Final consumption in households | Demand | Own-use in energy sector | Demand |
| Transformation of coal to elec/ty | Demand | Imports | Supply |
| Stock changes | Supply | Final consumption in services | Demand |
| Statistical differences | - | Non-energy use | Demand |
| Exports | Supply | Stock build | Supply |
| Distribution Losses | Demand | Production of crude oil | Supply |
| International marine bunkers | Supply | International aviation bunkers | Supply |

## Exercise 2 – Transformation and energy sector own use.

**Distinguish between transformation and energy sector own use.**

*Scenario 1.* A refinery, which is also an autproducer of electricity, uses 1000kt of crude oil as input to the refinery, 10kt of refinery gas for its energy needs, 5kt of fuel oil to produce electricity, and 1 GWh of electricity for its own lighting needs. How would you classify the following?

Use of 1000kt of crude oil: Transformation

Use of 10kt of refinery gas: Energy industry own use

Use of 5kt of fuel oil: Transformation

Use of 1 GWh of electricity: Energy industry own use

## Exercise 3 – Main activity and auto-producer plants.

**Distinguish between main activity and autoproducers.**

|  |  |
| --- | --- |
| **SCENARIO** | **ANSWER** |
| A publically owned nuclear power plant produces electricity that is sent to the grid. | Main activity |
| A farmer uses natural gas to heat the greenhouse but he realizes that he might as well produce electricity and reuse the heat for the greenhouse. | Auto producer |
| A waste recycling facility uses waste to produce 45 GWh of electricity, as well as some heat. | Auto producer |
| A power plant is owned and run by a privatized company producing electricity and heat. The electricity is sold to the grid and the heat is used for district heating in households. | Main activity |

## Exercise 4. Energy and non-energy use

**Distinguish between energy and non-energy use.**

*Scenario 1.* An industry used 2kt of lubricants for their lubricating qualities in engines, 3kt of fuel oil to fuel a furnace, 1 kt of white spirit as a solvent and another 4kt of diesel to power the engines. How would you classify the following?

Use of 2kt of lubricants: Non-energy

Use of 3kt of fuel oil: Energy

Use of 1kt of white spirit: Non-energy

Use of 4kt of diesel: Energy

## Exercise 5. Calorific values and weighted averages.

**Part 1.** Using the following information fill in the missing cells.

|  |  |  |
| --- | --- | --- |
|  | **NCV** | **GCV** |
| **Natural Gas** | 34200 | 38000\*0.90 |
| **Other Bituminous Coal** | 25800/0.95 | 27157.9 |
| **Motor Gasoline** | 44800 | 47158\*0.95 |

**Part 2**. Using the weighted average formula calculate the following calorific values.

**1**. **Country A has two gas wells with the following calorific values:**

Well A produces 1875 mcm with a GCV of 38420 kJ/m3. Well B produces 1750 mcm with a GCV of 37780 kJ/m3 .

**What is the total production?**

Total production equals 3625 mcm with a GCV of 38111 kJ/ m3.

**2*.* Country A imports gas from four different countries. Calculate the calorific value of the gas imported from each country.**

|  |  |  |
| --- | --- | --- |
| Austria: 530 mcm equivalent to 21021 TJ(gross). | 39662.3 | kJ/ m3 |
| Germany: 27 mcm equivalent to 1038 TJ(gross). | 38444.4 | kJ/ m3 |
| Hungary: 501 mcm equivalent to 19523TJ (gross). | 38968.1 | kJ/ m3 |
| Slovenia: 51mcm equivalent to 1960TJ (gross). | 38431.4 | kJ/ m3 |

**3. What is the total import and average GCV for Country A?**

Total imported gas is 1109 mcm with a GCV of 39262.4 kJ/ m3.