CLIL

STEAM

TECHNOLOGICAL FIELDS • UDA 3:
Energy

Feltrinelli Scuola
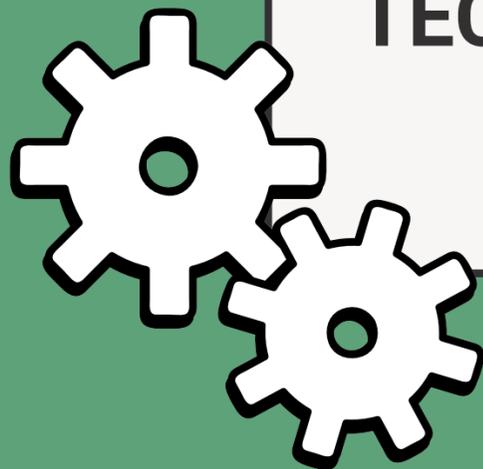
1. CREATE YOUR OWN MAP

Have a look at the mind map below, then sketch your own version in your exercise book.

ENERGY

UNIT OF MEASUREMENT

Joule (J)
1J1 J1J = **the energy required to perform work** (moving an object 1 meter with a force of 1 newton).
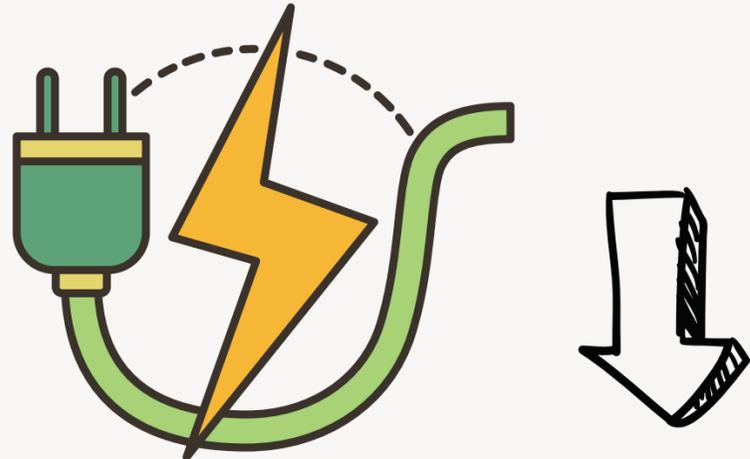
DEFINITION

The capacity of a system to perform work.

WORK

Method of transferring energy
L=F×s (F = force; s = distance)

FORCE

A force that changes the state of rest or motion of an object. F=m×A (m = mass; A = acceleration)
Unit of measurement = Newton (N)

ENERGY

TYPES OF ENERGY

- Light (or radiant) energy
- Thermal energy
- Electrical energy
- Chemical energy
- Potential energy
- Mechanical energy
- Nuclear energy
- Sound energy

ENERGY TRANSFORMATION

Conversion from one form of energy to another to facilitate its use

- Lamp: electrical energy to light and thermal energy
- Fuels: chemical energy to thermal energy
- Solar panels: light energy to thermal energy
- Photovoltaic panels: light energy to electrical energy
- Hydroelectric power stations: potential energy to electrical energy

SUSTAINABILITY

Energy Transition: Developing solutions that meet current energy needs without compromising the needs of future generations.
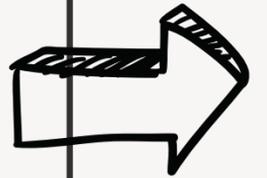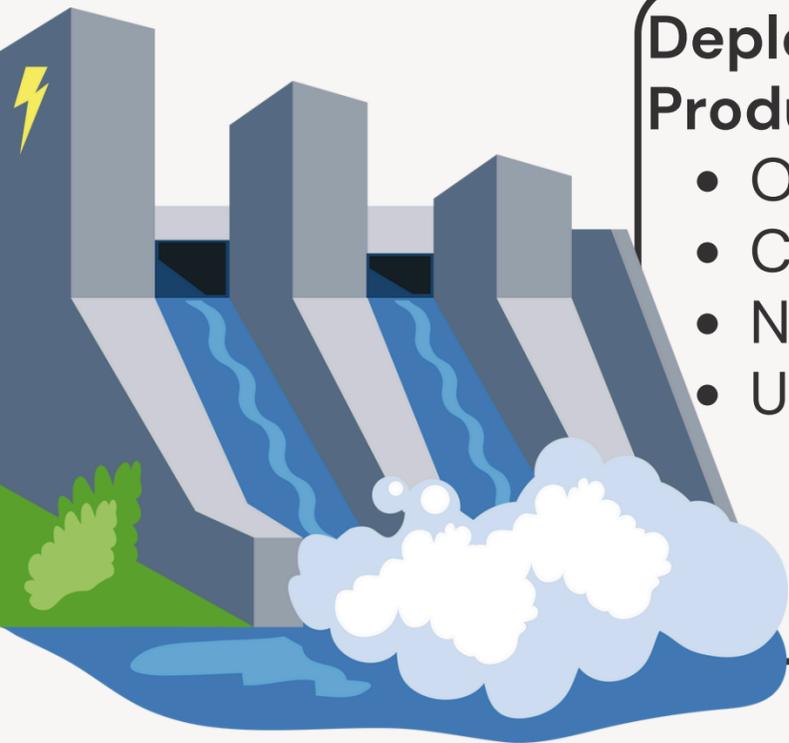
ENERGY SOURCES

NON-RENEWABLE

Principal contributors to **atmospheric pollution** and **climate change.**

RENEWABLE

Sustainable, Lower environmental impact, Zero greenhouse gas emissions

**Depletable Sources.
Produce greenhouse gases.**
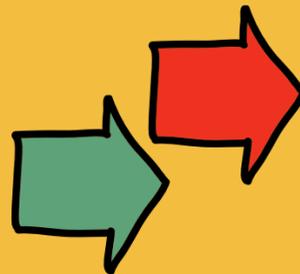- Oil
- Coal
- Natural gas
- Uranium

Generate no emissions
- Solar
- Wind
- Hydropower
- Geothermal energy
- Biomass

2. CREATE YOUR OWN TEST

a. Indicate whether the following statements are true (T) or false (F).

1. Energy is the ability to do work.

   T F

2. Potential energy can be converted into kinetic energy.

   T F

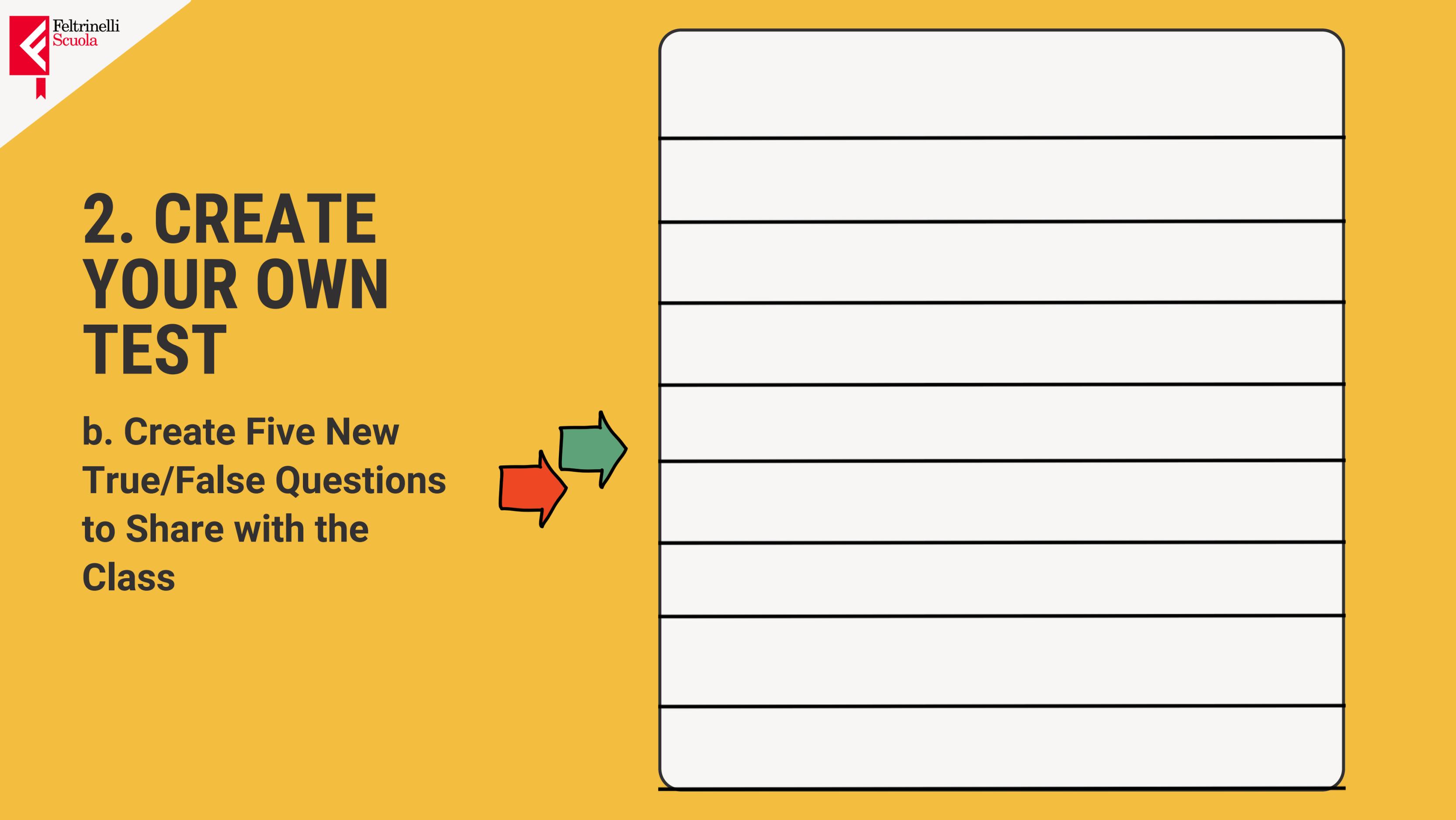3. Renewable energy sources are finite.

   T F

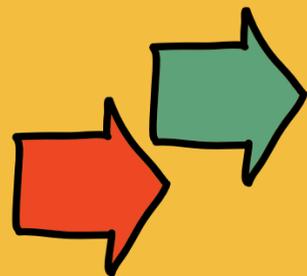4. Hydroelectric power stations utilise wind energy.

   T F

5. Transitioning to renewable energy sources helps reduce pollution.

   T F

2. CREATE YOUR OWN TEST

b. Create Five New True/False Questions to Share with the Class

3.ANALYSIS OF RENEWABLE ENERGY PRODUCTION IN ITALY

The table presents **the production of energy from renewable sources over the period from 2020 to 2023.**

Represent the data in the graph or chart that you deem most appropriate. You may draw it on graph paper, millimetre paper, or input the data into an Excel sheet.

Annual Production of Renewable Energy in TWh

Type of Resource	2020	2021	2022	2023
Hydroelectric	46.8	44.5	38.2	51.1
Solar	24.9	25.5	27.4	30.0
Wind	20.1	21.3	22.9	24.1
Biomass	17.6	18.0	18.5	19.1

TWh (Terawatt-hour)
1 TWh is equivalent to 1,000 billion watt-hours (or 1 million megawatt-hours). If a solar plant generates 1 TWh annually, it means it has produced enough energy to power approximately 300,000 homes for a year.

The data shows consistent growth in renewable energy, which, in 2023, accounted for around 43.7% of national electricity production, with sustained growth across all major sources.

HYDROELECTRIC
Notable variation due to water conditions, with a decline in 2022 followed by a significant increase in 2023.

SOLAR
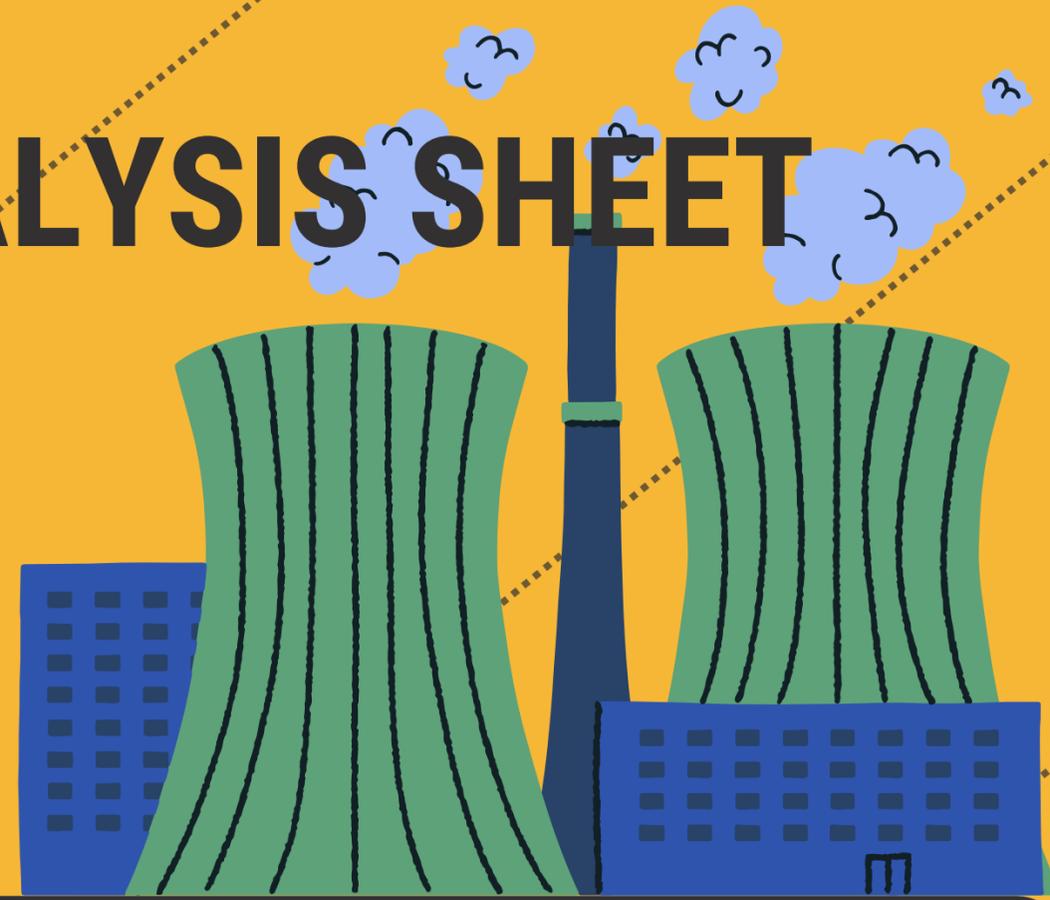Steady growth driven by the increase in photovoltaic installations.
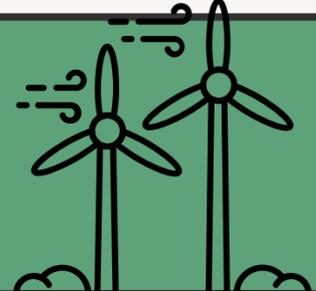
WIND
Progressive increase from 2020 to 2023.

BIOMASS
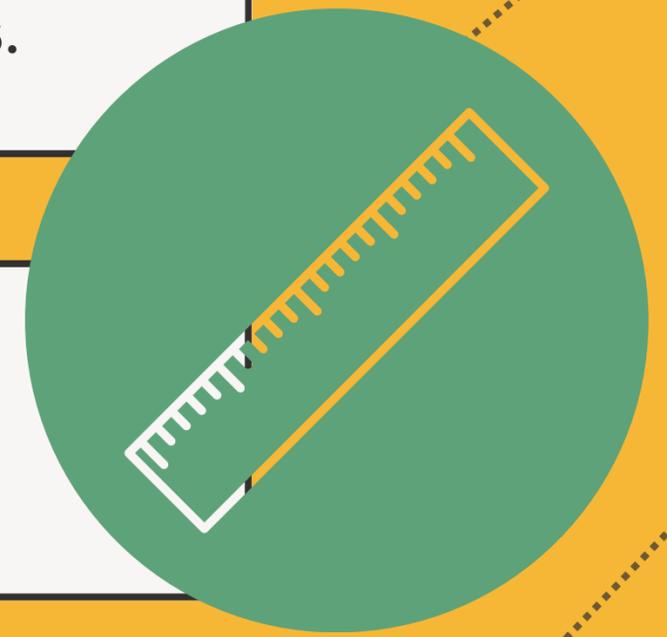Stable production with slight increases throughout the period considered.

Summary

3.POWER PLANT ANALYSIS SHEET

HOW?

Objective:
To explore how a power plant operates.

Materials:
- Drawing tools
- Textbook

ACTIVITY:

Choose a type of power plant from those studied, and then design and create either a summary poster or a technical sheet that highlights the following elements:

a. Name and type of energy source used

b. Components and operational cycle

c. Energy transformation processes

d. Advantages and disadvantages

Alternatively, create a multimedia presentation with five slides.