COAL POWER PLANT

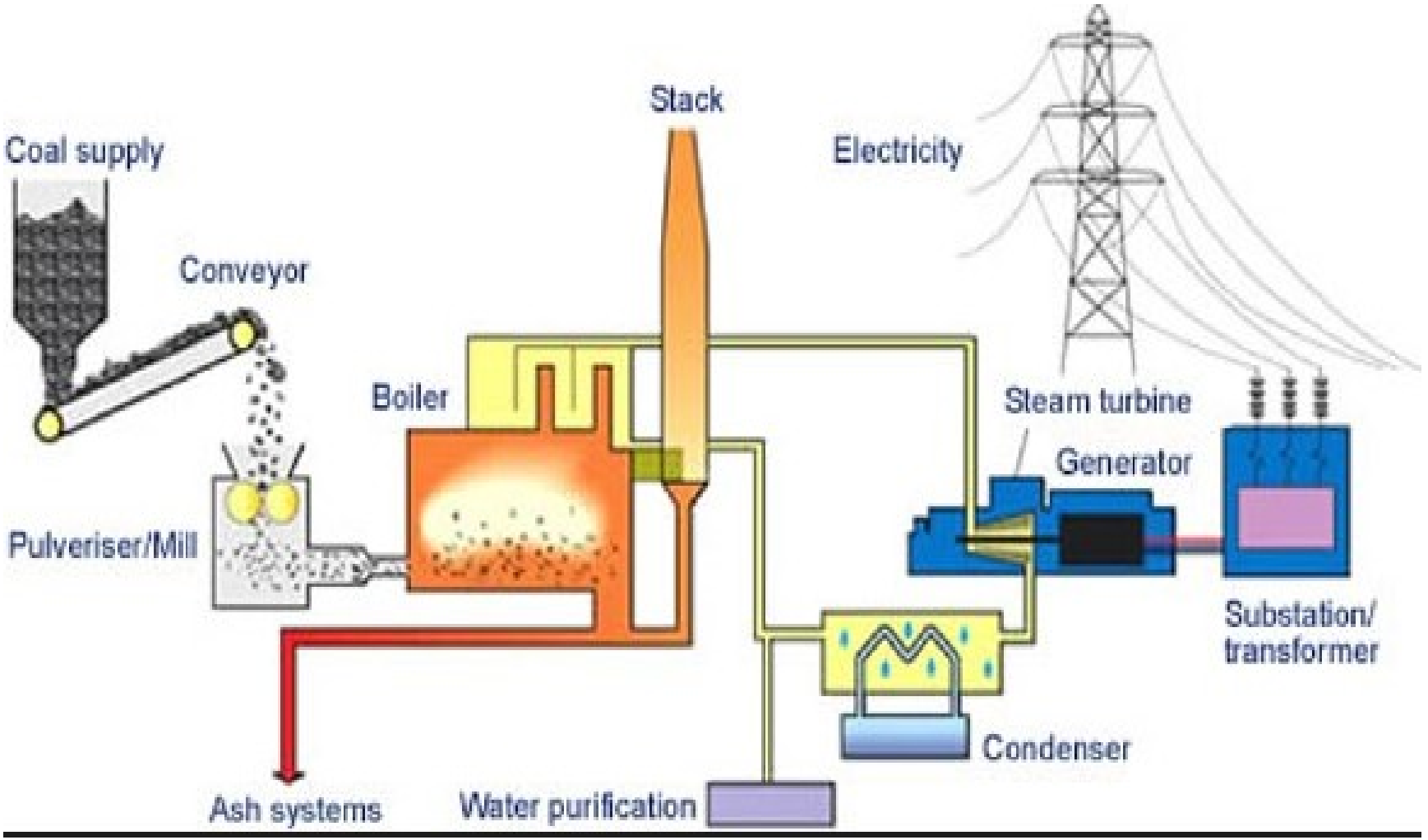
- Objectifs :- je sais expliquer le fonctionnement d'une centrale thermique à charbon traditionnelle

  - lexical: vocabulaire du fonctionement d'une centrale thermique
  - je sais expliquer les différences entre une centrale thermique traditionnelle et une centrale thermique de seconde génération
  - Je sais expliquer la différence essentielle entre une centrale thermique au charbon et une centrale nucléaire

- Tâche intermédiaire: je remarque les différence entre les différents types de centrales thermique
- Tâche finale: j'expose les différence entreune centrale thermique au charbon et une centrale nucléaire

SOMMAIRE

FUNCTIONING SCHEME



Act n°1: I notice and write the unknown words

- Conveyor
- Mill/pulveriser
- Stack
- Ash system
- Transformer/substation

Act n°2 a)with the help of an online dictionary, I choose the best definition. b) I link these words to the corresponding definition

- Conveyor
- Mill/pulveriser
- Stack
- Ash system
- substation

- an installation where electricity is for converted from alternating to direct current, reducing the voltage, or switching before distribution by a low-tension network
- A place where coal wastes are collected
- a flexible endless strip driven by rollers and used to transport objects. in a factory
- A place where substances are reduced in fine particles

Act n°2 correction

- Conveyor
- Ash system
- Substation
- Stack
- Mill/pulveriser

an installation where electricity is for converted from alternating to direct current, reducing the voltage, or switching before distribution by a low-tension network

A place where coal wastes are collected

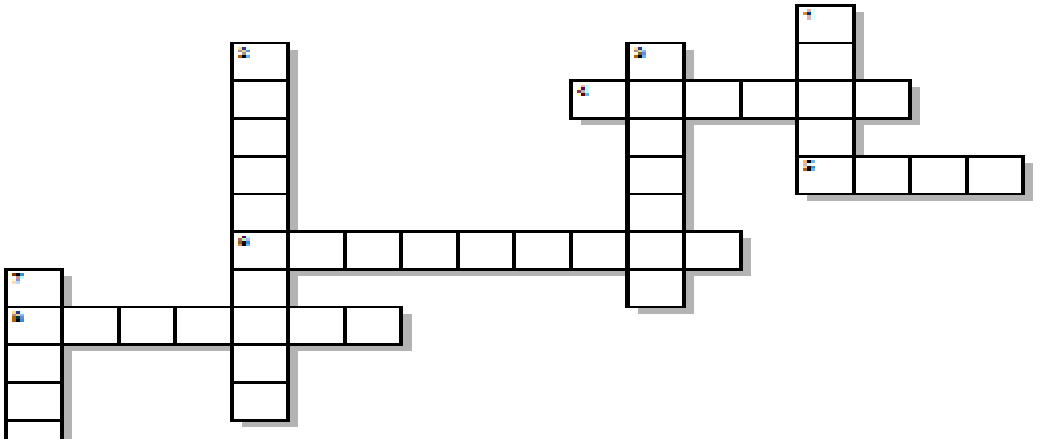
A part of a chimney that rises above the roof of a building

a flexible endless strip driven by rollers and used to transport objects. in a factory

A place where substances are reduced in fine particles

Act n°3: crossword

coal power plant



ACROSS

4 Where water reaches high temperature
5 A place where substances are reduced I, fine particles
6 A place where coal wastes are collected
8 Device where the kinetic energy of a moving fluid is converted into mechanical energy by actioningling a bladed rotor

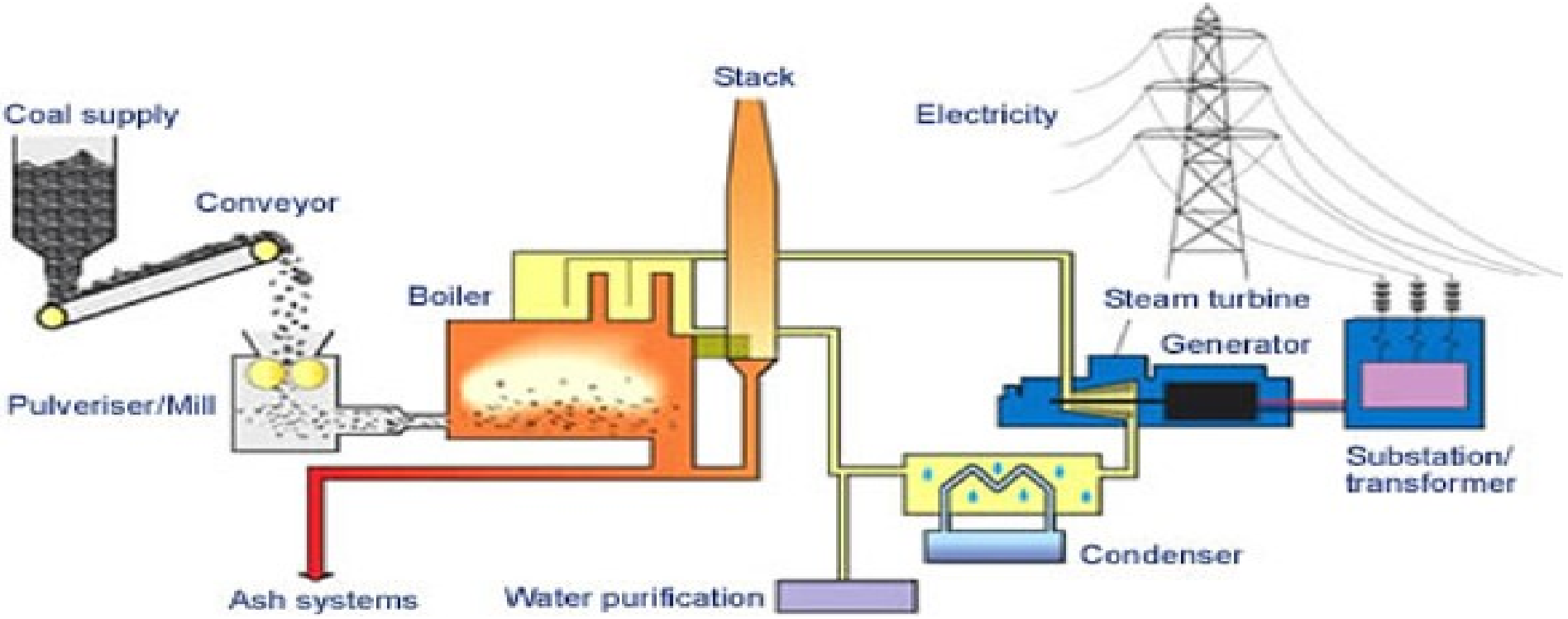
DOWN

1 Vaporised water
2 An installation where electricity is for converted from alternating to direct current, reducing the voltage, or switching before distribution by a low-tension network
3 A flexible endless strip driven by rollers and used to transport objects. In a factory
7 A part of a chimney that rises above the roof of a building

Act n°4 Tâche intermédiaire n° 1 (EE)
With the help of the scheme explain how a coal power plant functions

https://www.youtube.com/watch?annotation_id=annotation_679700&feature=iv&src_vid=9q7_n2E32_g&v=GxHQHcpCWa8

C:\Users\patricia\Documents\fossile energy\Coal_Power_Plant.mp4



Act n°4 (EE) With the help of the scheme explain how a coal power plant functions(summary)

Coal is first milled to a fine powder, which increases the surface area and allows it to burn more quickly. In these pulverised coal combustion (PCC) systems, the powdered coal is blown into the combustion chamber of a boiler where it is burnt at high temperature . The hot gases and heat energy produced converts water – in tubes lining the boiler – into steam.

The high pressure steam is passed into a turbine containing thousands of propeller-like blades. The steam pushes these blades causing the turbine shaft to rotate at high speed. A generator is mounted at one end of the turbine shaft. Electricity is generated when these are rapidly rotated in a strong magnetic field. Then the steam is condensed and returned to the boiler to be heated once again.

The electricity generated is transformed into the higher voltages (up to 400,000 volts) used for economic, efficient transmission via power line grids. When it nears the point of consumption, such as our homes, the electricity is transformed down to the safer 100-250 voltage systems used in the domestic market.

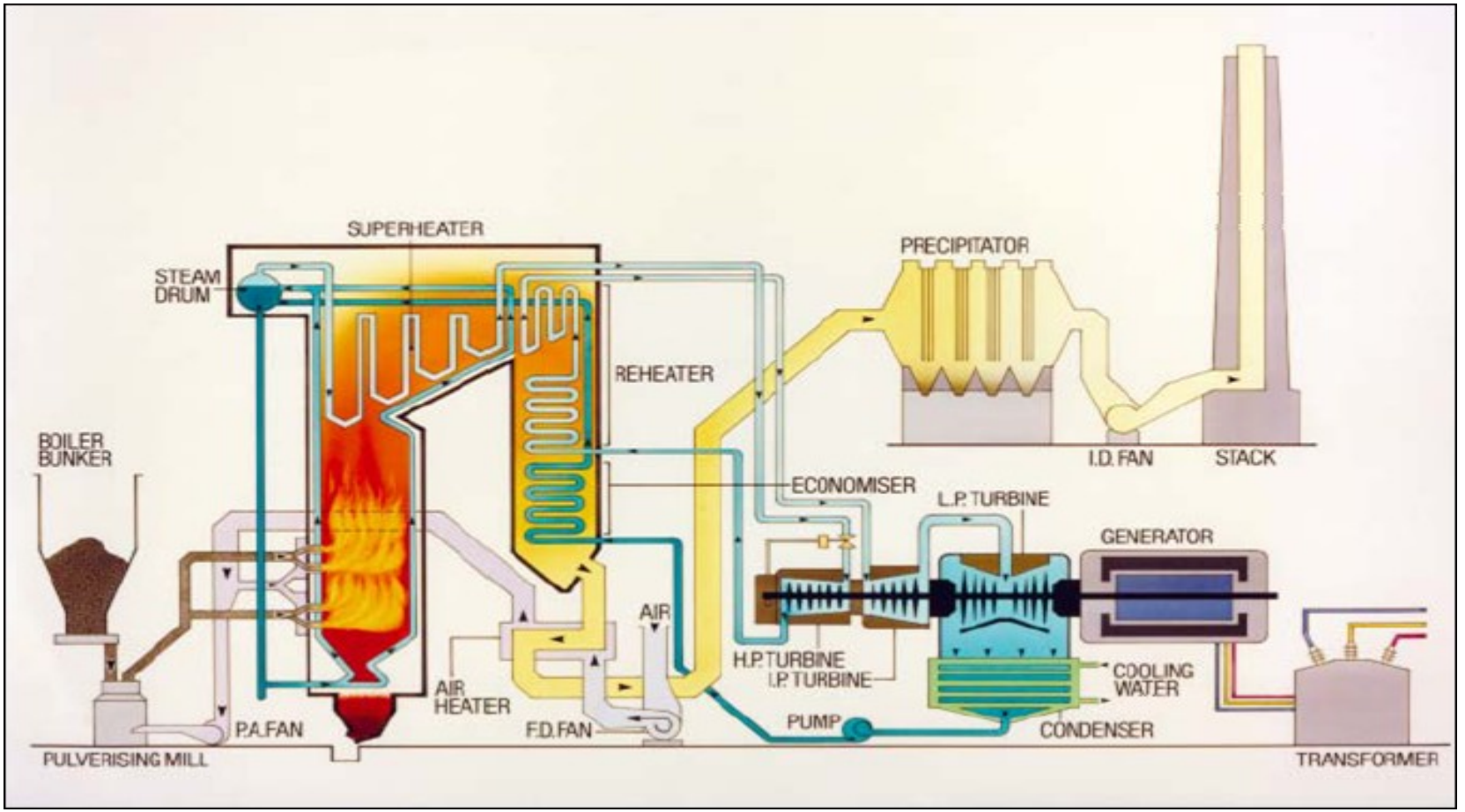
Tâche intermédiaire n° 2

Act n°5: With the help of this video and the following scheme explain what are the differences between traditional power plants and supercritical coal power plants and what are the advantages of supercritical coal power plant

- https://www.youtube.com/watch?v=W1hSFLXADQ0

C:\Users\patricia\Documents\fossile energy\Combined_Cycle_Power_Plant_CCPP.mp4

supracritical coal power plant



correction

The recent Improvements made in conventional PCC power station design and new combustion technologies are being developed. These allow more electricity to be produced from less coal - known as improving the thermal efficiency of the power station. Efficiency gains in electricity generation will play a crucial part in reducing CO_2 emissions at a global level.

Efficiency improvements include the most cost-effective and shortest lead time actions for reducing emissions. This is particularly the case in developing countries where existing power plant efficiencies are generally lower and coal use in electricity generation is increasing. The aim is to emit less carbon dioxide per megawatt (MW) and to use retrofitting system capturing CO_2 .

Improving the efficiency of pulverised coal-fired power plants has been the focus of considerable efforts by the coal industry. Traditional power plants will be replaced over the next 10-20 years with new, higher efficiency supercritical and ultra-supercritical plants and through the wider use of Integrated Gasification Combined Cycle (IGCC) systems.

A one percentage point improvement in the efficiency of a conventional pulverised coal combustion plant results in a 2-3% reduction in CO_2 emissions.

Tâche Finale

- Expliquez les différences entre centrales thermiques au charbon et centrales nucléaires