Text 1

Nuclear and natural gas energy plants could be counted as "green energy" under controversial EU plans just unveiled

The European Commission says it has decided that both types of energy can classify as "sustainable investment" if they meet certain targets. But the move has divided the EU, and been fiercely opposed by some members. Austria's chancellor responded to the news by saying "nuclear power is neither green nor sustainable". "I cannot understand the decision of the EU," Karl Nehammer said. He said he would back his environment minister, Leonore Gewessler, in pursuing legal action at the European Court of Justice if the plans go ahead. "This decision is wrong," Ms Gewessler said. "The EU Commission today agreed its greenwashing programme for nuclear energy and [the fossil fuel] natural gas." Luxembourg has also said it will join in legal action. The EU has set itself a goal of becoming climate neutral by 2050 and the Commission argues that to get there, a great deal of private investment is needed. Its proposals are meant to guide investors.

Spain, too, has strongly objected to the idea which was debated for months before being formally proposed on Wednesday. But those objections are balanced by support from nuclear-using nations such as France. Nuclear energy involves fewer carbon emissions but has different safety concerns and requires disposal of dangerous waste. Classifying natural gas as "sustainable" also has supporters who argue that some countries which still rely on coal for energy - such as Poland - would benefit from incentives to move to a relatively cleaner supply. Germany, a powerful country in EU politics, relies heavily on gas in its own energy mix though its environment minister, Steffi Lemke, has criticised the plans.

EU officials were keen to stress that the change was not a requirement for any state or company to invest in gas or nuclear. It is instead a highly technical set of rules, called the "EU Taxonomy", about what classifies as "sustainable" so that private investors can decide where to put funds, the commission says. It also regulates what can be said to be environmentally friendly, so that climate-conscious investors can make informed decisions. The list is supposed to recognise green projects that make a "substantial" contribution to at least one of the EU's environmental goals, "while not significantly harming any" of them. Commission officials point to the strict limits on what qualifies. For example, natural gas generation is under a strict CO2 emissions limit, and a requirement to switch to low-carbon gas by 2035. Nuclear power, meanwhile, must be in countries with clear plans and funding for dealing with nuclear waste.

Critics, however, have accused the EU of so-called "greenwashing" - precisely what it says its classification system is supposed to avoid. But the decision to label both controversial industries as "green" is not yet final. In addition to the threat of legal action from Austria and Luxembourg, the European Parliament and the council of heads of state have four months to consider the suggestion and object to it. The bar is, however, relatively high. In order to block the commission's proposed plans, either a majority of parliament members or at least 20 of the 27 national leaders are needed.

Green parties, which together with independents and others form one of the main power blocs in the European Parliament, are fiercely campaigning against the plan. But European Commissioner Mairead McGuinness said "we need to use all the tools at our disposal" to reach the climate-neutral target. Private investment was "key", she said, and the proposals were "setting out strict conditions to help mobilise finance to support this transition, away from more harmful energy sources like coal".
Fonte: https://www.bbc.com

1. **According to the author, what is the European Commission moving to pledge regarding nuclear and natural gas?**
    a. To change a scheme of classification, especially a hierarchical classification, in which things are organized into groups.
    b. To reduce both natural gas and nuclear plants, to become climate neutral in 2050.
    c. To reduce private investment plans on nuclear and natural gas.
    d. To invest in low CO2 emitting power plants using EU funding.

2. **Which of the following is NOT according to the text:**
    a. Austria and Spain are opposing EU's plans.
    b. France and Germany, countries that rely on nuclear and gas, are clearly in favor of the EU decision.
    c. Countries are not obliged to invest in natural gas and nuclear energy.
    d. the Green parties heavily criticize EU's decision.
3. **The decision to label both controversial industries as "green":**
    a. has had legal actions taken from Austria and Luxembourg and the court decision is due within 4 months.
    b. will easily be approved in the European Parliament and the council of heads of state.
    c. have the support of main countries that produce energy.
    d. aims to attract private investment for EU's environmental goals.

4. **EU officials argument that countries that rely on coal will:**
    a. benefit from this decision.
    b. not be affected.
    c. be forced to change to non-CO2 emitting power sources.
    d. will be funded by the EU to change to nuclear/natural gas generation.

5. **Critics have accused the EU of so-called "greenwashing". This means that:**

I - The EU is conveying a false impression or providing misleading information about how a company's products are more environmentally sound.
II - Greenwashing is considered an unsubstantiated claim to deceive consumers into believing that a company's products are environmentally friendly.
III - Although some of the environmental claims might be partly true, companies engaged in greenwashing typically exaggerate their claims or the benefits to mislead consumers.

    a. Only I is true.
    b. Only I and II are true.
    c. I, II and III are true.
    d. None is true.

Text 2 - Microbial fuel cells, a renewable energy technology for bio-electricity generation: A mini-review

Microbial fuel cells is a bio-electrochemical device that converts chemical energy contained in organic substrates into electrical energy by the activities of microbes [9]. The use of organic material such as wastewater in MFC makes it an eco-friendly device that offers a dual benefit of bioelectricity generation and waste management [10], [11].

Structurally a microbial fuel cell consists of two chambers known as the anode and cathode chamber (electrodes) separated by a proton exchange membrane. The anode side contains the electrochemical active microorganisms while the cathode is abiotic. The microbes (bacteria) act as biocatalyst that motivates the degradation of organic materials to produce electrons which travels to the cathode side through the electric circuit. These bacteria are called "Exoelectrogens" (Exo- for exocellular and "electrogens" based on the ability to directly transfer electrons to a chemical or material that is not immediate electron acceptor) [12]. Electrons go through the external circuit arriving at the cathode, and hydrogen ions move to the cathode and react with oxygen to form water in the internal circuit [13], [14], [10]. This, therefore, demonstrates that MFCs is a potential candidate of green "electricity."

(…) As earlier stated on the application of MFCs, especially in wastewater treatment, a large surface area is needed for the biofilm to build upon the anode chamber. Therefore, creating a low-cost electrode capable of resisting fouling could be a novel research. According to Du et al. [45], it is unrealistic to expect that power density output from an MFC to compete with a conventional chemical fuel cell (hydrogen-powered fuel cell). Hence, the fuel in MFC is said to be dilute biomass located in the anode chamber that has limited energy.

Further research is needed in the area of scaling up MFC for large-scale application, though some knowledge has been gained regarding MFC. This is important because of the low reaction rate associated with over coulombic efficiency of 90%, which has been achieved in previous studies.

Fonte: **KeChrist Obileke, Helen Onyeaka, Edson L Meyer, Nwabunwanne Nwokolo, Microbial fuel cells, a renewable energy technology for bio-electricity generation: A mini-review, Electrochemistry Communications, Volume 125, 2021.**

6. **The rationale or justification for doing any research must be gleaned from the existing literature on the subject. An argument to explain the importance of this work is:**
    a. An urgent need for novel fossil fuels for electricity generation.
    b. A need for renewable and sustainable fuels to substitute fossil fuels and develop modern industrial civilization and handling of waste.
    c. A growing need for unsustainable sources of energy.
    d. to reduce the generation of hazardous radioactive wastes

7. **Analyze if the following affirmatives are compatible with the given Text 2.**

I - At the cathode chamber; electrons are known as the useful products from the oxidation reaction at the anode chamber which travels through a conducting wire to the cathodic chamber that contains water to the cathode electrode.
II - the flow of electrons through the external circuit is responsible for power generation.
III - In the cathode chamber, the microbial respiration oxidizes acetate substrate to carbon dioxide, which results in the liberation of electrons and protons.

a) Only I can be true.
b) Only I and II can be true.
c) I, II and III are true.
d) None is true.

8. **The author states that the MCFs are eco-friendly because:**
    a. liquid waste or sewage discharged into a river or the sea can be processed.
    b. It does not emit CO2.
    c. It uses a low amount of fossil fuel.
    d. It produces hydrogen.

9. **According to the text, it is expected that the MCF:**
    a. Has a power density equal or higher than a hydrogen fuel cell.
    b. Gives a performance of electricity generation with a 90% efficiency.
    c. Generates much less power than a conventional chemical fuel cell.
    d. Has an exceptionally high-power efficiency compared to conventional methods.

10. **The author suggests that future research should focus on:**
    a. Building larger MCF plants.
    b. Build knowledge on the MCF principles.
    c. New exoelectrogens.
    d. Novel membranes.