Interview questions: Exploring the Challenges and Opportunities for Green Hydrogen Generation and Utilization in UK Agriculture : A Focus on Arable Cropping and Livestock

1. Hydrogen is being explored as a clean energy source for various industries, including agriculture. H_2 can be produced using renewable energy (eg solar PV, Wind), which is called green hydrogen. In agriculture, H_2 can potentially power machinery, heat greenhouses, and help produce fertilizers. However, there are several challenges and opportunities to consider in generating and using hydrogen in farming.

    a. What will be the main benefits and difficulties of producing and using hydrogen as a fuel in farming, particularly for following:

        - Hydrogen-Powered Tractors
        - Hydrogen powered machinery for plowing, planting, and harvesters and Irrigation systems.
        - Fertilizer Production (Ammonia Synthesis)
        - hydrogen generators for post-harvest processes like grain drying and cooling?

    b) What are the main operational challenges in integrating hydrogen (H2) into farming activities, such as hydrogen-powered harvesters or using hydrogen generators for post-harvest processes like grain drying and cooling?

    c) What are the key risks and drivers to consider when investing in green hydrogen production using renewable energy in the agriculture sector, given that this technology is not yet widely adopted?

    d) What will be the risks associated with transportation and storage of hydrogen in farming?

2. What types of farms in terms farming activities would be practically more suitable for H_2 production and why?

3. Our analyses indicate that generating green hydrogen through electrolysis and storing it in compressed storage is the most cost-efficient method for agriculture. In your opinion, what logistical and operational challenges might arise with this approach?
4. The cost of producing H2 is still high. In your opinion, are there any specific financing models or mechanisms that can support farmers in adopting hydrogen in agriculture?
    a. What types of subsidies would support their adaptation?

5. One potential revenue stream is to treat farms as refuelling stations, allowing them to sell hydrogen to heavy and medium-duty vehicles from the surrounding industry. In your opinion, what operational challenges might farm face in becoming hydrogen refuelling stations?

6. UK government provided some public subsidies or incentives to promote sustainable farming such as Sustainable Farming Incentive (SFI). Do you think these incentives are sufficient to help farmers start using hydrogen-powered machinery or produce hydrogen on their farms?
7. How can tax credits be structured to help farmers adopt hydrogen production and use in agriculture? For example, could getting a tax break for installing hydrogen equipment or using hydrogen-powered machinery encourage the use of H2 machinery?
    a) What potential challenges or barriers might farmers face in accessing and utilizing tax credits for hydrogen production and adoption.