

## HyNet Hydrogen Production Plant 1 – Technical Note

### EPR Response 16 – Process monitoring

#### Summary

Provide a detailed description of the proposed process monitoring for the following parameters:

- a) Energy efficiency
- b) Resource efficiency (including water usage)
- c) Carbon capture efficiency
- d) Hydrogen product specification
- e) Captured CO<sub>2</sub> specification

#### Details

- a) **Energy Efficiency** - Feedstock fuel (natural gas and ROG), as well as hydrogen product, will be fiscal metered (flow rate and composition). The thermal efficiency of the plant can be monitored real-time by dividing the energy content of product hydrogen by that of feedstocks. This efficiency metric can be adjusted to include power consumption for an overall view of plant efficiency; note that imported power will be metered from SPEN.
- b) **Resource efficiency (including water usage)** - Key performance indicators (KPIs) will be established for the site to monitor resource efficiency. Water imports, for example, will be fiscally metered from United Utilities; this would allow period assessments (perhaps daily) of water consumed per kg of H<sub>2</sub> product. A similar approach will be applied to produced plant effluents, amine consumption etc.
- c) **Carbon capture efficiency** – CO<sub>2</sub> emissions from the site will be directly monitored (fired heaters) or estimated/calculated by an agreed methodology if “de-minimis” or intermittent sources. Capture rate will then be calculated by the below equation:

$$R = \frac{\text{CO}_2 \text{ potential} - \text{CO}_2 \text{ emitted}}{\text{CO}_2 \text{ potential}}$$

- d) **Hydrogen product specification** – Depending on the criticality of each component (i.e. will an excursion cause immediate issues with the distribution network, or a longer-term issue), each component will be monitored by online analysers or routine sampling.
- e) **Captured CO<sub>2</sub> specification** - Depending on the criticality of each component (i.e. will an excursion cause immediate issues with the transport and storage system, or a longer-term issue), each component will be monitored by online analysers or routine sampling.