Small scale Hydrogen permitting consultation response analysis and discussion

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Introduction

The current legislation requires anyone producing Hydrogen to obtain an environmental permit, regardless of the process or the amount of Hydrogen produced. This means that small Hydrogen producers that have little or no environmental impact must go through the same permitting process as large polluting installations. Recognising the growing interest in Green Hydrogen production in Wales, and the positive contribution it can make to achieving the Net Zero ambition we are looking at ways to ensure there is a proportionate and efficient mechanism to permit certain types of small-scale Hydrogen production that are considered low risk. We are proposing an online application system that is limited to 2 types of small-scale Hydrogen Production.

Polymer electrolyte membrane/Proton exchange membrane

Alkaline electrolysers

Applicants must complete an online questionnaire and provide some basic information. This will enable us to produce a permit with standard conditions specific to that application. As the questions are designed to rule out any higher risk applications these permits will only be obtained if the following conditions are met:

- No fossil fuel is used on site as part of the Hydrogen production.

- Water will be obtained from mains supply or through abstraction of surface water at less than 20 m^3 per day or using an existing permission.
- Any wastewater will be discharged to sewer, soakaway or taken away by tanker.
- At any given time, less than one tonne of Hydrogen will be stored on-site.
- There will be no emissions to air other than Oxygen or Hydrogen.

We are satisfied that by meeting the conditions above the risks of pollution occurring are extremely low. The operator will need to comply with all permit conditions.

About the consultation

The consultation gave the public, statutory and non-statutory bodies an opportunity to assess the risk assessment carried out, a draft permit and provide opinion on the validity of the approach.

Questions in the consultation

We asked the following questions in the consultation

1. Do you have any objections to making the application procedure an online system?

2. Do you have any objections to only being consulted on the minded to issue decision?

3. Any other comments?

Methodology

All consultation responses were collected via citizen space. The responses were then downloaded and analysed. We contacted two respondents for further information on comments made.

Consultation responses

We received 9 separate responses from different companies, organisations and individuals. All were supportive of the approach.

Answers to the questions raised in the consultation

All of the consultees provided responses to all of the questions and made additional comments.

1. Do you have any objections to making the application procedure an online system?

There were no objections made to making the application online only, one consultee said that this was a good step.

2. Do you have any objections to only being consulted on the minded to issue decision?

No objections were made to the reduced consultation period.

3. Any other comments?

All respondents welcomed the approach, some of the comments received are reproduced below:

- ‘’A very welcome initiative that puts Wales on the front foot in the drive to net zero.’’
- ‘’This is a pragmatic step that should assist industry’’
- ‘’A great step forward as we move to net zero. We need to make sure due diligence is followed of course but that we don't hinder good quality, beneficial projects. A great initiative.’’

3 of the 9 consultees recommended changes to increase the capacity of water intake to enable 10 MW electrolysers be included or to include other types of electrolyser. We asked for further detail on these suggestions by directly contacting the consultees although at this time we are not increasing the capacity of the water intake.

Summary

All consultees were supportive of the approach and welcomed this initiative. Some changes were requested to allow the approach to be applied to different technologies and larger electrolysers. Full consultation responses can be found in Appendix 1.

Next steps

- Publish the landing page and application form online during October 2022
- Gather data on performance of units and ease of handling applications
- In April 2023 look at expanding the approach to other types of electrolysers with similar emission profiles.

Appendix One

Q1. Do you have any objections to making the application procedure an online system?

No (100%)

Q2. Do you have any objections to only being consulted on the minded to issue decision?

No (100%)

Q3. Any other comments?

- A very welcome initiative that puts Wales on the front foot in the drive to net zero.
- This is a pragmatic step that should assist industry.
- We very much welcome the intention to simplify and speed up the process of licensing activities.
- Permitting needs to be fast as we have solar h2 projects in Wales in development
- One of the conditions is "Water will be obtained from mains supply or through abstraction of surface water at less than 20 m3 per day or using an existing permission"

  This water has to be treated to ensure pure water is available to the electrolyser, but the amount of water input required for a certain output is dependent on the water quality and method of purification. 20 m3 per day is roughly equivalent to a 1 MW electrolyser, but the actual electrolyser size allowed under this scheme would be heavily dependent on the water quality and the purification process. This condition could lead people to favour certain types of water purification to allow them to be under the limit in this scheme.
- Pembrokeshire County Council very much support this simplification to the process for permitting the production of small scale green hydrogen via electrolysis of water. Such systems have little or no environmental impact and therefore should not be subject to the same permitting process as large polluting installations. It is heartening that NRW have recognised the growing interest in Green Hydrogen production in Wales, and the positive contribution it can make to achieving Net Zero ambitions. A proportionate and efficient mechanism to permit small-scale H2 production installations that are extremely low risk is very welcome and will assist those involved in this strongly emerging sector. It would also be welcome that any such installations already granted a permit under the 'old' consenting system are transferred to this new system including reduced cost for ongoing permit fees. Well done NRW. Wales are ahead of the game.
- A great step forward as we move to net zero. We need to make sure due diligence is followed of course but that we don't hinder good quality, beneficial projects. A great initiative.

- We would support limits of 40,000m3 of water use per day and 5tonnes of hydrogen storage and the ability to include coupled refuelling. This would equate to ~ 10MW electrolyser with enough storage to cope with a plant breakdown of several days. This would fit well with the DNS threshold for renewables consenting so one could imagine a relatively straight forward consenting and permitting path for a <10MW electrolyser with behind the meter renewables, providing hydrogen for transport uses.
- The consultation currently limits the qualifying electrolyser technologies to polymer electrolyte membrane, proton exchange membrane and alkaline electrolysers. In line with environmental approaches such as Best Available Techniques, it would be preferential for qualification process to remain technology neutral, provided that the technology can meet the specified environmental requirements. This is particularly important in technology areas such as the electrolyser field, where other techniques such as solid oxide electrolysers are innovating to participate in the market. We note that such limitations are not present for the standard rules permit currently being utilised for small scale electrolysers in England (Standard rules SR2009 No2 – Low Impact Part A Installation). We therefore recommend that the application system is available to all small scale electrolyser technologies.
- The consultation web page states that “Water will be obtained from mains supply or through abstraction of surface water at less than 20 m3 per day or using an existing permission”. The wording is ambiguous as to whether the 20 m3 per day limit applies only to the abstraction of surface water or whether it also applies to mains water. Parameter 3 of the environmental risk assessment suggests that the 20 m3 limit applies to both mains and abstracted water.

  As the aim is to limit potential environmental impacts associated with the electrolyser and the use of mains water is not associated with local environmental impacts, we recommend that the 20 m3 per day limit should not be applied to electrolysers which source water from mains supply. Furthermore, the permit should also allow for water from other sources, e.g., wastewater from other production processes.

  The use of the 20 m3 per day limit on surface water abstraction aligns with the requirement to obtain an abstraction licence which does provide some indication that a project is low risk. However, we would like to clarify that providing an operator has obtained an abstraction license prior to application for an electrolyser permit, this permitting route would be available.
- The current qualification conditions would exclude small scale electrolysers which discharge to surface water from this more efficient permitting process. Given that discharge volumes are likely to be small and simply comprise a more concentrated solution of the source water, we feel it would be appropriate to allow some level of discharge under this regime where it can be demonstrated that there will be no adverse environmental effects. The standard rules permit currently being utilised for small scale electrolysers in England (Standard rules SR2009 No2 – Low Impact Part A Installation) currently sets the following requirements in relation to surface water discharges:
    - Substances from point source emissions to water or air shall not be released at a rate that is greater than that determined as “insignificant”, as set out in the Environment Agency’s H1 Environmental Risk Assessment.

- There shall be no direct discharge of aqueous waste within 10 km upstream of a European Site or a SSSI; within 100 metres upstream of a National Nature Reserve, Local Nature Reserve or Ancient Woodland, or within a National Park.

We recommend that the same conditions should be included in the proposed list of qualifying conditions in addition to the allowance for wastewater 'discharged to sewer, soakaway or taken away by tanker'.

- The consultation web-page states that 'At any given time, less than one tonne of hydrogen will be stored on-site'. However parameter 6 of the Environmental Risk Assessment suggests hydrogen storage is limited to two tonnes at any one time. We would support a limit of two tonnes of hydrogen storage as this represents the safe limit above which a Hazardous Substances Consent would be required.
- The permit in condition 2.3.1 refers to 'Low Impact Hydrogen Production criteria', it is not clear if this is referring to criteria in the introductory note of the permit, the accompanying risk assessment or something else. It would be useful to get clarity on this and if it is relating to something else, then additional information should be provided to make a full assessment of the proposals.
- The consultation refers to small scale hydrogen production. As set out, the only elements imposing a potential size limit are (i) that less than one/two tonnes of hydrogen is/are stored on site and (ii) the 20 m3 abstraction limit where an abstraction license is not in place or mains water is not used. As such the proposed approach could cover a range of installation sizes. We therefore recommend that the permitting approach is badged as 'low impact hydrogen production' rather than 'small scale'.
- Schedule 1 of the permit includes a refuelling station as a directly associated activity. We recommend that Schedule 1 should also allow for a tube refuelling facility and associated liquification plant as this would enable flexibility to provide hydrogen either directly to vehicles or for delivering compressed hydrogen in a tube trailer to an end customer, e.g. bus refuelling depot. Similarly the permit should allow for other directly associated activities commensurate with the applications specified in the permit introductory note (injection into the onsite gas main and research applications).