

Biofuel Obligation Scheme Consultation – Hydrogen Mobility Ireland response

15th November 2019

Introduction

Hydrogen Mobility Ireland (HMI) is a grouping of industrial partners who are committed to the development of hydrogen as an affordable and ultra-low Carbon transport fuel choice across the island of Ireland (32 counties). The group includes a number of industrial partners:

- BOC Gases Ireland
- Bord Gáis Energy
- Bord na Móna
- Coras Iompair Éireann (CIE)
- Energia
- Ervia
- ESB Generation and Trading
- Gas Network Ireland
- Harris Group (LDV)
- Hydrogenics Europe
- Hyundai Cars Ireland
- Indaver Ireland
- Maxol
- Toyota Ireland



This document provides a collective view from the full members of the group on the crucial importance of the proposed changes to include Hydrogen in the Biofuel Obligation Scheme, in response to the consultation request which was issued September 2019. Some HMI members will also respond bilaterally to represent their own companies' individual views on the proposed changes and also to respond on non-hydrogen related aspects.

The HMI Group also benefits from the input of policy stakeholders who attend the Group meetings as observers. For the avoidance of doubt, this document has been prepared only by the full members of the group and does not reflect the views of the policy stakeholders.

Overview of issues relating to Hydrogen as a renewable transport fuel in the Biofuels Obligation Scheme

Hydrogen as a transport fuel is a new significant opportunity for Ireland. At present there are no accessible Hydrogen refueling stations and very little Hydrogen production. Worldwide, activity on Hydrogen as a fuel is now ramping up. There are now thousands of Hydrogen vehicles on the streets in Japan, California and China and global automotive manufacturers are scaling-up production.

The delivery of Hydrogen as an ultra-low carbon emissions mobility solution for Ireland requires hydrogen production, refueling stations and vehicles to be developed and delivered at the same time. Without the certainty of vehicles to use hydrogen, the significant cost and planning challenges

faced in delivering refueling stations, will prevent their introduction, and without the refueling stations they need to operate Hydrogen vehicles will not be ordered. In addition, certainty of Hydrogen demand is needed before ultra-low carbon emission and renewable Hydrogen sources are commissioned. This hugely important transition to a renewable, ultra-low carbon emissions mobility solution, which is well suited for decarbonising Heavy Commercial Vehicles, high-use vehicles and Public Transport, will simply not happen without a clear roadmap that is supported by all of the stakeholders concerned. Hydrogen Mobility Ireland has therefore plotted a measured and achievable pathway for the introduction of Hydrogen in Ireland in our Report “**A Hydrogen Roadmap for Irish Transport 2020-2030**” (HMI Report).

<http://www.element-energy.co.uk/wordpress/wp-content/uploads/2019/10/20190930-Hydrogen-Mobility-Ireland-Final-External-Report.pdf>

This document confirms that industry partners are ready to invest in developing a Hydrogen production and distribution infrastructure for Ireland and in bringing the appropriate vehicles, as part of a coordinated project. It also demonstrates that with sustained effort in the period 2020 to 2030, Hydrogen can become a commercially viable and ultra-low carbon transport fuel, whilst helping the integration of large quantities of renewable energy into the Irish energy system. As such, Hydrogen can be an important pillar in the strategy for the complete decarbonisation of the Irish energy and mobility systems.

Ireland is at an important juncture where decisions made now will enable or disable our ability to reduce carbon emissions from Transport Sector in line with what is required and desired. Decisions to act must be made now to allow progress to be made on reducing HGV and Public Transport emissions this side of 2030. The HMI partners are ready and committed to make significant investments in the development and delivery of this ambition that will have large environmental benefits.

However, it is clear that the Project will also require support and commitment from the public sector to help overcome the barriers associated with low hydrogen demands in the early years of the vehicle roll-out and also the early costs associated with low volume production as the industry ramps up. There are three main policy requests –

1. Capital funding for a dedicated initial deployment project which can kick-start Hydrogen activity in Ireland (Scale – 3 stations, 30 buses, 50 cars, 10 vans)
2. An incentive program for hydrogen-fueled vehicles, particularly for the larger vehicle segments and heavy-use fleet vehicles
3. An incentive scheme which rewards the production of clean hydrogen on a €/kg sold basis – this helps underpin early investments in clean hydrogen production and distribution assets.

In the HMI Report, the Biofuels Obligation Scheme is identified as one of the most promising mechanisms for providing this type of support. Detailed analysis in the Report (which is available to DCCAE) has suggested that the level of support required to enable viable business plans for investment in new plant built in the period up to 2025 should exceed €4/kg which corresponds to €0.028/Megajoule (MJ) on a Higher Heating Value (HHV) basis. This could reduce for new plants built as volumes rise and technologies mature to below €0.015/MJ (HHV) by 2030.

The inclusion of Hydrogen as a biofuel has long been permitted under existing European Directives such as the Renewable Energy Directive 2009/28/EC (RED I), provided the source of the Hydrogen is biogenic. Renewable Energy Directive 2018/2001/EC (RED II) allows the inclusion of Hydrogen generated from non-biological but renewable sources. This is an excellent opportunity for Ireland,

where numerous players are looking to generate Hydrogen from electrolyzers which are coupled directly to renewable energy sources, thereby ensuring a low carbon fuel.

Hydrogen Mobility Ireland strongly welcomes the proposal to include renewable hydrogen in the revised BOS

The level of incentive required to get Hydrogen moving in Ireland is above the one-to-one buy-out price for a conventional Biofuels Obligation Scheme (BOS) Certificate, but below the proposed Advanced Biofuel buyout price.

The Irish Government has the ability to vary a number of factors associated with different fuels. These include multipliers for certain fuel types and also the potential to include Hydrogen in the new category of “Advanced” biofuels.

Hydrogen Mobility Ireland very strongly believes that introducing a combination of multiples or classifying Hydrogen as an Advanced Biofuel, to ensure that the incentive for Hydrogen achieves a level in excess of €4/kg, is crucial to the delivery of an effective and early Hydrogen Mobility solution for Ireland.

The way in which RED II is drafted with respect to Hydrogen does cause some issues for the Hydrogen mobility sector. In particular, there is a requirement for the renewable energy used for the production of Hydrogen to be “additional” to existing capacities. This additionality is not yet well defined. Formal guidance on this is expected to be written and then published by the Commission in a year’s time. In other countries measures are already underway to define “additionality”. Approaches range from a very tight definition “only direct physical connections to renewable electricity projects built at the same time or after the electrolyser” (UK RTFO), to much broader definitions, such as allowing for electricity with a “Guarantee of Origin” from a basket of additional renewable energy sources, or a national accounting system which assesses the amount of new renewable electricity required by electrolyzers and demonstrates at a national level that this additional renewable electricity capacity was installed (Germany, under discussion).

A similar discussion exists for the use of biogas as a pre-cursor for hydrogen production through reformation. A rigid approach sees only biogas directly connected from source to reformer as eligible, whilst an approach based on a broader definition would allow Certificates of Origin for the biogas to be “mass balanced” across the national gas grid network.

These nuances are important as they affect the economic viability of each scheme. For example a very strict requirement for additionality for renewable electricity requires a perfect synergy between the development timelines of a renewable energy project (e.g. a wind farm), the development timescale of a Hydrogen production site and the creation of demand sufficient to justify the deployment of an electrolyser project. This is a challenging synchronicity to engineer and will temper the speed with which the inclusion of Hydrogen in the BOS could otherwise stimulate the growth of the sector.

Ultimately this will be a political choice, but it is clear that some form of support per unit of Hydrogen sold will be required to stimulate the introduction of this fuel, and so it is a critical choice in shaping Ireland’s ability to deliver on the environmental challenges faced in the transport sector. Whilst the BOS (and the overarching RED II framework) are not designed explicitly for Hydrogen, they can provide a major stimulus to the market. This will only happen if they are designed in a fashion which is flexible enough to allow Hydrogen developers to benefit from the Scheme, whilst respecting the requirements to produce genuinely low carbon Hydrogen.

Ireland is at a crucial cross-roads in decisions that must be made now to impact positively on our environmental future. In this very short window there is an opportunity to develop policies that can help maximise the potential for an early switch from carbon emitting to zero-carbon fuels in transport, capable of delivering early initial savings and huge future savings. Decisions on such issues cannot be put off or delayed they must be made now.

Hydrogen Mobility Ireland believes that attention to detail of the rules regarding renewable hydrogen within the revised BOS will have a critical impact on the viability and deliverability of the Hydrogen Mobility Project. If the Project is to be delivered within the timescales outlined in the Report, the rules of renewable hydrogen in the BOS will need to be developed in a way that supports and facilitates the early growth of Hydrogen as an ultra-low carbon fuel in Ireland.

Other countries have treated Hydrogen as an add-on to their existing biofuel policy without considering the opportunity from the perspective of Hydrogen's development as a potential fuel of the future in its own right. In some cases this has led to policy mistakes and rapid policy reversals. The Hydrogen industry in Ireland stands ready to provide any information, evidence or analysis that may be required to help support consideration of the best implementation of a national policy for the development of a Hydrogen Mobility Sector.

The introduction of Hydrogen is facilitated by flexibility in the Hydrogen production projects allowed to enter the Scheme, whilst respecting the need to ensure genuine carbon savings/renewable energy production. **Specific requests for a broader more flexible approach include:**

- **Permitting a Guarantee of Origin scheme for electricity provided to electrolyzers** through the National Grid. This avoids the absolute requirement for a complete physical coupling, whilst still ensuring that renewable electricity is bought for the electrolyzers. A Guarantee of Origin scheme is already operated by SEMO in Ireland and has been proposed in other markets as a good option for simplifying the administration of the electricity elements of the BOS scheme.
- Developing a mechanism such that a **direct connection to any renewable electricity generator** can be considered "additional". One way to achieve this (as suggested in Germany) is to pre-allocate a fraction of the annual increase in renewable electricity generation in Ireland as a national block of "additional" electricity dedicated to Hydrogen production OR via consideration of the net benefit of a future flexible Hydrogen generation system on avoiding constrained electricity (which could then be considered "additional").
- **Allowing Biogas Certificates** for renewable hydrogen production from methane.
- **To allow the period over which an electrolyser operator has to balance the electricity consumption of the electrolyser and the power produced by the generator to be as long as possible.** Requiring instantaneous balancing (e.g. on a half hourly metering system) will lead to large additional costs for Hydrogen storage and oversized production plant, which will hinder the Hydrogen sector's development. For biogas, mass balancing is allowed over a 3 month period and something similar for electricity would be highly beneficial.

Hydrogen is also being discussed as a potential fuel to support industrial decarbonization and also as a fuel for heat to replace natural gas. Hydrogen production and distribution both benefit from economies of scale. As a result, if demands for hydrogen from other sectors are stimulated they can lead to additional investment in production plant and hence benefit all hydrogen users by reducing costs for all. Hydrogen mobility in Ireland would therefore benefit from the wider uptake of hydrogen used for other industries (e.g. heating and industry). Hydrogen Mobility Ireland would

support the introduction of policies which stimulate the use of hydrogen in other sectors of the energy system (both industrial and heat uses).

We have provided a set of responses to the specific questions where the group has a view below:

Question 1 – level of ambition (% thresholds)

This is mainly a question for biofuel companies.

The quantity of Hydrogen required, even under Hydrogen Mobility Ireland's most ambitious scenario is 22 kt/year, which corresponds to ~1.5% of the annual transport fuel consumption in Ireland (by energy, HHV). Hence, Hydrogen will not swamp the Scheme nor should it be seen as a major competitor to other biofuel aspirations. The major growth in Hydrogen consumption is not anticipated until after 2030.

Given that the feedstock for clean biofuel production is finite, we believe the progressive increase of the threshold for renewable fuels will become increasingly hard to meet if non-biological fuels such as Hydrogen are not included. In our view, this makes the case for including Hydrogen in a progressive fashion in the scheme.

Question 2 – Impact of higher biofuel blends – No comment

Question 3 – Move to energy based accounting

This is welcomed and appears consistent with a move to a wider set of fuel types.

One issue which should be considered is the increased efficiency of certain fuels when used in vehicles. For example a fuel-cell vehicle is up to 50% more efficient than an equivalent combustion vehicle. As a result there are more renewable kilometres driven under Hydrogen than an equivalent unit of bio-diesel or bio-ethanol energy.

Hydrogen Mobility Ireland would ask the Department to take this efficiency benefit into account when considering the multipliers for Hydrogen.

A final note is the importance of clarity over the use of the Higher Heating Value for the energy content of the gaseous fuel types.

Question 4 – Date of deployment (2022)

The Hydrogen Mobility Ireland partners will not have deployed significant hydrogen assets in the Republic of Ireland until 2022, so this date will be viable for Hydrogen Mobility Ireland.

Question 5- Advanced biofuel obligations

Hydrogen Mobility Ireland strongly supports the principle of Advanced biofuels being used to allow the introduction of new renewable fuels into the Irish market. The advantage of this formulation is that it allows these new sectors to overcome the very high barriers to entry when working at a small scale.

Hydrogen has exactly these characteristics - it is very hard to make it work economically at the small market entry scales, but it can eventually scale up to become a competitive zero carbon fuel.

Hydrogen Mobility Ireland strongly supports the inclusion of Hydrogen as an Advanced Biofuel.

This approach has been taken in, for example, the UK's Renewable Transport Fuel Obligation scheme.

A further recommendation (based on experience elsewhere) is that the Department might look at how an Advanced Biofuel would eventually cease to be an Advanced Biofuel. I.e. what happens in a success scenario for a specific fuel. This possibility of one of the fuels succeeding creates a risk both for the developers of the fuel itself (“Will my subsidy be removed”) and for the other fuels in the Advanced category (“Will the Advanced category be swamped by this other fuel, thereby ruining my economic viability”). Given that the level of support and/or “Advanced” status are not currently grandfathered, this risk could deter investment in all advanced biofuels. We would recommend that the Department considers this issue and provides clarity on how the scheme will treat a runaway success for one of the advanced biofuels as part of the Advanced Biofuel topic. The group would recommend including consideration of grandfathering or guaranteeing “advanced” status for plants built while the Advanced status is assigned to a specific fuel type, even if they are later removed from the “advanced” scheme. We believe this issue applies to all of the fuels in the advanced category and not just Hydrogen.

Question 6 – Obligated parties (including rail)

From a Hydrogen perspective, the rail sector is one of the more attractive options (Hydrogen is generally more competitive for the heavier vehicle users). See for example the Alstom trains being developed for the UK and European railways. Alstom have confirmed their interest to come to the Irish market with a Hydrogen train if a suitable business case can be developed. Hence, the group would support the inclusion of the rail sector.

Question 7 – Exempted fuels

Hydrogen Mobility Ireland welcomes the exemption for Hydrogen sold as a transport fuel from the BOS obligation. It is important to avoid barriers to the uptake of Hydrogen in the early years. As stated above, as the sector matures it may become economically feasible to impose levies and taxes such as the BOS but at this stage it is likely to deter investment and prevent Hydrogen for mobility getting started in Ireland.

Question 8 – Meeting the Obligation

Hydrogen Mobility Ireland strongly welcomes the inclusion of Hydrogen in the scheme. Please see the Overview above for comments on the way Hydrogen is included, the level of support and the need for attention to the details in the way renewable Hydrogen is considered eligible.

In addition, we welcome the inclusion of fuels for boats and aviation, which are medium and long term target markets for the Hydrogen Sector respectively.

Question 9 - Multiples

As described in the Overview section above, the group believes that to stimulate Hydrogen activity, particularly in the early years, a higher incentive is required than the current level of the basic BOS on an energy basis.

Hydrogen Mobility Ireland therefore recommends that multiples are introduced for Hydrogen, with a view to enabling an incentive of €0.028/MJ or above.

These multiples could be justified using the same logic as that applied to electricity (around the efficiency of the sector) and the fact Hydrogen represents a way of introducing renewable electricity generators into the transport sector directly.

Question 10 & 11 & 12 – limits on specific biofuels

No comment other than to note that the greater the restriction on biofuel feedstocks, the greater the importance of renewable Hydrogen and other renewable fuels of non-biological origin in meeting the target. This, in our view, justifies early attention to the details of the way in which renewable Hydrogen is included in the revised BOS with a view to helping encourage its entry into the market.

Question 13 -Carryover – No comment

Question 14 – Buy-out prices

The group welcomes the increase in buy-out prices which are envisaged through time.

Please refer to the comments in the overview section about the level of support which is likely to be required to kick start Hydrogen activity.

Question 15 – Emergencies and supply disruptions – No comment

Question 16 – Heat sector – No comment

Question 17 – Additional Input

Please see the **Overview section** above for a summary of the specific issues relating to the inclusion of Hydrogen as a renewable transport fuel in the BOS.

We have provided three additional observations below:

- There is some subtlety around the support for Hydrogen schemes as Hydrogen's economics is highly sensitive to volume. At low volume the cost of the Hydrogen supply chain is high and hence a high supporting subsidy is required to get the sector moving. As higher volumes are achieved, it becomes possible to reduce the level of support. The BOS as currently designed cannot cope with this type of volume-related impact. Also, for investor certainty in the early schemes, an ideal Hydrogen support scheme would include some form of "grandfathering" of the subsidy environment to ensure that the business plan does not attract extra premia associated with the risk of an unexpected decrease in the subsidy levels (due to a change in policy). Again this "grandfathering" is not built into the BOS. We would encourage the Department to consider whether there are options to introduce these two elements into the support for Hydrogen.
- In addition to the option of generating renewable Hydrogen for direct use as a transport fuel, RED II also includes the option for making use of renewable Hydrogen as a substitute for existing "Brown" Hydrogen which is used in refineries to be counted towards the BOS. This is not an option that the Hydrogen Mobility Ireland group has considered in detail, but would comment that this is welcome as it would provide a large scale demand for renewable Hydrogen. This would enable larger scale deployment of electrolyzers which in turn would reduce the cost of renewable Hydrogen for all users, including those who wish to use the fuel directly as a transport fuel. In other countries (notably Netherlands, Germany), this RED II stimulated market for renewable Hydrogen is already driving investment into major electrolyser projects. This area will deserve attention as the final details of the BOS policy are prepared.
- Hydrogen can also be produced from a number of ultra-low carbon, but non-renewable sources. Of particular note is the generation from fossil fuels with carbon capture and storage. This is clearly not a part of the RED II, but could be relevant to a successful and low carbon roll-out of Hydrogen in Ireland, particularly in the medium term. Other companies

and groupings will also be interested in low carbon synthetic fuels. The group would encourage the department to also consider policy in this area of low carbon non-renewable fuels, alongside the expansion of the BOS to include explicitly renewable forms of Hydrogen production.