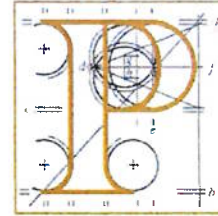


Our Case Number: ABP-317560-23



An
Bord
Pleanála

John Dooley & Val Martin
6 Riverchapel Bank
Riverchapel Wood
Courtown
Co. Wexford
Y23 FF99

Date: 16 May 2024

Re: Proposed windfarm development including 13 no. wind turbines in Bunnyconnellan, Co. Mayo and hydrogen plant in Castleconnor, Co. Sligo.
Carrowleagh, Bunnyconnellan, Co. Mayo and Curraun, Castleconnor, Co. Sligo.

Dear Sir / Madam,

An Bord Pleanála has received your recent submission in relation to the above mentioned proposed development and will take it into consideration in its determination of the matter. Please accept this letter as a receipt for the fee of €50 that you have paid.


The Board will revert to you in due course with regard to the matter.

Please be advised that copies of all submissions / observations received in relation to the application will be made available for public inspection at the offices of the local authority and at the offices of An Bord Pleanála when they have been processed by the Board.

More detailed information in relation to strategic infrastructure development can be viewed on the Board's website: www.pleanala.ie.

If you have any queries in the meantime please contact the undersigned officer of the Board. Please quote the above mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully,


Raymond Muwaniri
Executive Officer
Direct Line: 01-8737125

PA04

Tel	Tel	(01) 858 8100
Glao Áitiúil	LoCall	1800 275 175
Facs	Fax	(01) 872 2684
Láithreán Gréasáin	Website	www.pleanala.ie
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64 Sráid Maoilbhríde	64 Marlborough Street
Baile Átha Cliath 1	Dublin 1
D01 V902	D01 V902

An Observation on Firlough Wind Farm and Hydrogen Plant

Planning application number ABP- 317560/23. This is a joint submission by John Dooley and Val Martin and this part is submitted by consent by Val Martin, Drumsallagh< Kingscourt, County Cavan joint with John Dooley, 6 Riverchapel Bank, Riverchapel WOOD Courtown ,County Wexford Eir Code Y23FF99

Firlough Wind Farm, Co. Mayo and Hydrogen Plant, Co. Sligo Observations based on research for Response to Request for Further Information Planning Application Reference ABP-317560-23 ,

This Planning Application HAS to be rejected because the Wind Energy Guidelines **DO NOT** have An SEA as required and as set out in ECJ Judgement Below

ECJ Judgment C-24/19

This request for a preliminary ruling concerns the interpretation of Article 2(a) and Article 3(2)(a) of Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (OJ 2001 L 197, p. 30).

The request has been made in proceedings between A and others and the Gewestelijke stedenbouwkundige ambtenaar van het departement Ruimte Vlaanderen, afdeling Oost- Vlaanderen (regional town planning official of the Flanders Department of Land Planning, East Flanders Division, Belgium), concerning the decision to grant development consent to a generator and supplier of electricity for the purpose of the installation and operation of five wind turbines on a site that is near to A and others.

Legal context

International law

The Convention on environmental impact assessment in a transboundary context, signed in Espoo (Finland) on 26 February 1991 ('the Espoo Convention') was approved on behalf of the European Community on 24 June 1997 and entered into force on 10 September of the same year.

Article 2(7) of the Espoo Convention provides:

'Environmental impact assessments as required by this Convention shall, as a minimum requirement, be undertaken at the project level of the proposed activity. To the extent appropriate, the Parties shall endeavour to apply the principles of environmental impact assessment to policies, plans and programmes.'

European Union law

According to recital 4 of Directive 2001/42:

'Environmental assessment is an important tool for integrating environmental considerations into the preparation and adoption of certain plans and programmes which are likely to have significant effects on the environment in the Member States, because it ensures that such effects of implementing plans and programmes are taken into account during their preparation and before their adoption.'

Article 1 of that directive, headed 'Objectives', provides:

'The objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.'

An Observation on Firlough Wind Farm and Hydrogen Plant

Article 2 of the directive reads as follows: 'For the purpose of this Directive:

"plans and programmes" shall mean plans and programmes, including those co-financed by the European Community, as well as any modifications to them:

which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government, and

which are required by legislative, regulatory or administrative provisions;

"environmental assessment" shall mean the preparation of an environmental report, the carrying out of

14 consultations, the taking into account of the environmental report and the results of the consultations in decision-making and the provision of information on the

decision in accordance with Articles 4 to 9;

Under Article 3 of the same directive, headed 'Scope':

'1. An environmental assessment, in accordance with Articles 4 to 9, shall be carried out for plans and programmes referred to in paragraphs 2 to 4 which are likely to have significant environmental effects.

2. Subject to paragraph 3, an environmental assessment shall be carried out for all plans and programmes,

which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste

management, water management, telecommunications, tourism, town and country planning or land use and which set the framework for future development consent of projects listed in Annexes I and II to [Council] Directive 85/337/EEC [of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (OJ 1985 L 175, p. 40)],

...

Directive 2011/92/EU of the European Parliament and of the Council of 13 December

2011 on the assessment of the effects of certain public and private projects on the environment (OJ 2012 L 26, p. 1) repealed and replaced Directive 85/337.

Point 3(i) of Annex II to Directive 2011/92 refers to 'installations for the harnessing of wind power for energy production (wind farms)'

Having regard to the foregoing considerations, the answer to sub-questions (h) and (i) of the second question is that, where it appears that an environmental assessment, within the meaning of Directive 2001/42, should have been carried out prior to the adoption of the order and circular on the basis of which a consent, which is contested before a national court, relating to the installation and operation of wind turbines was granted with the result that those instruments and that consent are incompatible with EU law, that court may maintain the effects of those instruments and that consent only if the national law permits it to do so in the proceedings before it and if the annulment of that consent

would be likely to have significant implications for the electricity supply of the whole of the Member State concerned, and only for the period of time strictly necessary to remedy that illegality. It is for the referring court, if necessary, to carry out that assessment in the case in the main proceeding

Above is essentially the context and decision of ECJ's JUDGEMENT on compliance of the Belgium Wind Energy Guidelines with European Law. Which they found these Wind Energy Guidelines are Plans and Programs as set out on Directive 2001/42/EC but without An SEA are not compliant with EU Law. Irish Wind Energy Guidelines are identical to the Belgium Wind Energy Guidelines save a requirement that the wind turbines are operating when measured for noise compliant with DBA, insensitive to Low Frequency Noise, when the wind turbines are actually operating. The Irish Guidelines have no Strategic Environment Assessment. As admitted by An Bord Pleanála Planning Inspector when addressing responses to additional information in the case of Derrinlough Wind Farm planning application. Given ABP reaction to the Dredge and Guagane Barra cases, where granted wind farm planning permissions were withdrawn when Judicial Reviews intended to challenge them on the issue of the Irish Wind Energy Guidelines required An SEA but

An Observation on Firlough Wind Farm and Hydrogen Plant

did NOT HAVE An SEA. .ABP should refuse to consider this Planning Application any further until the Planning Application is resented using Wind Energy Guidelines quoting The Strategic Environmental Assessment which makes them compliant with EU Law.This Planning Application must rejected because the current Wind Energy Guidelines have been classified as not complying with EU Law by The ECJ in decision C-24/19.

Now looking at the Hydrogen Plant.

In one of the submissions in "Significant Additional Information Letter from insurance Broker" ROMERO Insurance Broker Ltd 8 Airport West Lancaster Way Yeaden Leeds L919 7ZA to Jennings O'Donovan & Partners , Finiskiln Business Park ,Finiskiln Co.Sligo F91 RHH9 Signed by Kieran Kennedy Director of said firm dated 29 February 2024 . Said the following" Re:Proposed windfarm development in Bonnieconlon Co.Mayo and hydrogen plant in Castleconnor Co.Sligo.

In our experience as an insurance with over 25 years history arranging residential ,commercial and industrial property both in UK and Ireland, it is our view that the houses located near the proposed hydrogen plant in Corraun, County Sligo will be able to obtain private home insurance at normal market rates"

We are going to operate on the assumption that to obtain ["private home insurance at normal market rates" So the risk to these private homes will be the same as the risk to normal homes without this particular Hydrogen Plant being a neighbor.

Response;

There are also significant design issues with the Hydrogen Plant.That would challenge the letter of assurance from ROMERO insurance Broker Ltd 8 Airport West Lancaster Way Yeaden Leeds L919 7ZA to Jennings O'Donovan

In documentation associated with this planning permission application it is stated that the wind farm is the only supply source for The Hydrogen Plant See2.2.1 below. Research carried out the use of wind farms to the only source of electricity to Hydrogen Electricity is too risky and could cause the Hydrogen Plant to explode. Because of the variability and intermittency of wind generation.

"2.2.1 Electricity Supply **.A 110 kV, 78 MW electricity supply, routed via a dedicated power cable from the windfarm substation,** will provide power to the Hydrogen Plant for the electrolytic conversion of water to hydrogen for subsequent distribution. The electricity supply will be routed to site via a dedicated high voltage (HV) and low voltage (LV) switchboard and stepdown transformer located to the east of site."

An Observation on Firlough Wind Farm and Hydrogen Plant

In a paper called “Design considerations for industrial water electrolyzer plants”

Abstract

Design considerations for industrial water electrolyzer plants

Md Rizwana, Vidar Alstadb, Johannes J'aschkea,*

aDepartment of Chemical Engineering, Norwegian University of Science and Technology, 7491 Trondheim, Norway

Yara Technology and Projects, Yara International ASA, Hydrogen 67, 3936 Porsgrunn, Norway

The motivation of this work is to propose a shared balance of plant (BoP) and power supply (PS) design for industrial scale alkaline electrolyzer plant that has reduced CAPEX with a minimum loss in OPEX for variable load operation. Three important aspects are: a) flowsheet - either shared or individual BoP and PS per stack, b) variable or constant lye flow rate per stack and c) sizing of cooling duty in the lye circulation loop. Steady-state optimization shows that individual BoP per stack (with higher CAPEX) is optimal when the plant is expected to operate at high capacity. For shared BoP and PS, the hydrogen production is higher by 8-12% when operated with variable lye flow rate compared to fixed lye flow rate. Our results further suggest that lye cooling duty should be designed based on the cooling requirements of the degraded electrolyzer stacks at end of life

“ At lower current densities, there are technological challenges related to alkaline water electrolysis as the hydrogen concentration in oxygen can increase to dangerous levels (lower explosion limit of hydrogen in oxygen is $> 4\%$) [49].

“The proposed hybrid system by Niaz et al. **was connected to a battery energy storage system (BESS)** to ensure the electrolyzer's operation with no support from the grid electricity. The optimal size for such a BESS was determined by solving a MIDO problem that minimize the levelized cost of hydrogen. “

However inserting a Battery Electric Storage System will not solve the problem of lower current densities given the stated intention in this Planning Permission in the planning application to have a link to the grid to dispatch intermittent and variable wind generation the Grid. Operational decisions as to how much power can be dispatched to the grid must be made in the context of the safe operation of the Hydrogen Plant no such Decision(s) have been made in this Planning Application. This is sufficient reason to **REJECT THIS PLANNING APPLICATION**. It is a characteristic of wind turbine (farm) to generate large frequencies of **ZERO OUTPUT** or low to very low MW output. Indeed in the years 2018 and 2019 the entire grid of circa 3500MW installed capacity on 50 occasions produced **ZERO OUTPUT**, and on 2022 occasions produced from .0001MW up to 50MW, from Eirgrid's Data, the observations being taken on 15 minute intervals.

Below is a frequency Analysis of the Irish Grid Wind Generation Output for the Year 2018 and 2019

You can see the Higher the Frequency the lower the Output The Higher the Output the Lower the Frequency. Using Average Capacity Factors is **PRETTY USELESS** in projecting likely daily output. Using Averages is pretty much a waste of time when planning daily beyond the period of reliable Weather Forecasting which to day is 5 days. A 13 week output planning period for Hydrogen Production is a waste of time.

An Observation on Firlough Wind Farm and Hydrogen Plant

Therefore to prevent an explosive situation arising in The Hydrogen a continuous and reliable back up supply of Electricity has to be provided. The capacity of the wind farm is too low to reliably charge a Battery Electric Storage System to the level and the capacity required to prevent dangerous and unsafe situations arising but there is no provision in this Planning Application even for an Intermediate Battery Electric Storage System. So this Planning Application HAS TO BE REJECTED. As the design of the total proposal will have to be significantly modified to ensure safety of operation..

Irish Grid output Frequency Analysis for Years 2018 and 2019

Ouput Frequencies	Output Range in MW	Frequency Observed per 50MW increase in Output	Duration in Hrs OVER 2 Years	MW Electricity use per house per yr	Production Hrs per annum
51	0	50	12.75	4.45	6.375
2073	<=50	2022	505.5	4.45	252.75
4871	<=100	2798	699.5	4.45	349.75
7785	<=150	2914	728.5	4.45	364.25
10532	<=200	2747	686.75	4.45	343.375
13253	<=250	2721	680.25	4.45	340.125
15389	<=300	2136	534	4.45	267
17411	<=350	2022	505.5	4.45	252.75
19251	<=400	1840	460	4.45	230
20935	<=450	1684	421	4.45	210.5
22661	<=500	1726	431.5	4.45	215.75
24394	<=550	1733	433.25	4.45	216.625
25976	<=600	1582	395.5	4.45	197.75
27423	<=650	1447	361.75	4.45	180.875
28963	<=700	1540	385	4.45	192.5
30501	<=750	1538	384.5	4.45	192.25
31928	<=800	1427	356.75	4.45	178.375
33272	<=850	1344	336	4.45	168
34591	<=900	1319	329.75	4.45	164.875
35858	<=950	1267	316.75	4.45	158.375
37056	<=1000	1198	299.5	4.45	149.75
38254	<=1050	1198	299.5	4.45	149.75
39439	<=1100	1185	296.25	4.45	148.125
40628	<=1150	1189	297.25	4.45	148.625

An Observation on Firlough Wind Farm and Hydrogen Plant

41745	<=1200	1117	279.25	4.45	139.625
42806	<=1250	1061	265.25	4.45	132.625
43829	<=1300	1023	255.75	4.45	127.875
44919	<=1350	1090	272.5	4.45	136.25
45985	<=1400	1066	266.5	4.45	133.25
47005	<=1450	1020	255	4.45	127.5
48014	<=1500	1009	252.25	4.45	126.125
49028	<=1550	1014	253.5	4.45	126.75
49991	<=1600	963	240.75	4.45	120.375
50983	<=1650	992	248	4.45	124
52020	<=1700	1037	259.25	4.45	129.625
53013	<=1750	993	248.25	4.45	124.125
54012	<=1800	999	249.75	4.45	124.875
54982	<=1850	970	242.5	4.45	121.25
55970	<=1900	988	247	4.45	123.5
56958	<=1950	988	247	4.45	123.5
57883	<=2000	925	231.25	4.45	115.625
58876	<=2050	993	248.25	4.45	124.125
59900	<=2100	1024	256	4.45	128
60765	<=2150	865	216.25	4.45	108.125
61885	<=2200	1120	280	4.45	140
62375	<=2250	490	122.5	4.45	61.25
63149	<=2300	774	193.5	4.45	96.75
63831	<=2350	682	170.5	4.45	85.25
64439	<=2400	608	152	4.45	76
65024	<=2450	585	146.25	4.45	73.125
65418	<=2500	394	98.5	4.45	49.25
65759	<=2550	341	85.25	4.45	42.625
66038	<=2600	279	69.75	4.45	34.875
66284	<=2650	246	61.5	4.45	30.75
66486	<=2700	202	50.5	4.45	25.25
66635	<=2750	149	37.25	4.45	18.625
66789	<=2800	154	38.5	4.45	19.25
66892	<=2850	103	25.75	4.45	12.875
66951	<=2900	59	14.75	4.45	7.375
66984	<=2950	33	8.25	4.45	4.125

An Observation on Firlough Wind Farm and Hydrogen Plant

66988	<=3000	4	1	4.45	0.5
66990	<=3050	2	0.5	4.45	0.25
66991	<=3100	1	0.25	4.45	0.125
66991	<=3150	0			0

If, subsequently, the plant for The Hydrogen Plant is redesigned to include a Battery Electric Storage System and a new planning permission is submitted. The Risks of including a Battery Electric Storage System giving the issue of Thermal Runaway and explosion of The BESS , in close proximity to a plant processing an even more volatile product , would be too risky .A more reliable less volatile storage system should be used or alternatively a link to the grid be recommended to reduce risks to a minimum. Any new plan should include guidelines for the safe operation of the Hydrogen Plant like a mandatory Preventive Maintenance Plan with the recommended Preventive Maintenance intervals for specified critical activities in The Hydrogen Plant. Recommended procedures for the handling volatile chemical should also be specified.

Processing Hydrogen in a location like this inclose proximity nearby private residences is too unsafe no matter what conditions are set down in any in any Planning Permission Granted it should be REJECTED as the site is unsuitable and should be in a more remote site. That in the event of an explosion shrapnel thrown out would not damage nearby residential houses as they would be too far away.

No matter what happens in the future the design of the Hydrogen Plant and the proposed is too dangerous and could explode at anytime once production commenced.For SAFETY REASONS as well as the legal non compliance of the Wind energy Guidelines this Planning Application must be REJECTED.

John Dooley

Retired Industrial Engineer

Member of The American Institute of Industrial Engineers

Planning application number ABP- 317560/23. This is a joint submission by John Dooley and Val Martin and this part is submitted by consent by Val Martin, Drumsallagh< Kingscourt, County Cavan joint with John Dooley.

1) Recommendation. I recommend this application be refused.

2) Reality of this proposal.

This is an application for a wind farm and hydrogen plant. The developer claims electricity to power the hydrogen plant will be generated by the wind farm. As the capacity factor of the wind farm cannot exceed 20% in any one year, it follows that 80% of the electricity consumed in the hydrolysis of water into oxygen and hydrogen will come from fossil fuel generated from mains electricity. The accepted load factor for all Ireland's wind farms is shown in their companies various annual accounts and was

calculated at 20% due to wind speeds. This wind farm will produce 20% of its nominal value annually. It will only be an appliance to consume fossil fuel generated electricity as part of unassessed green hysteria.

3) The application is unlawful by failing to comply with the SEA Directive.

This application states it is proposed under the Irish government's plan or programme for energy and for renewable energy. The SEA Directive 2001/42/EC specifically states that all plans or programmes for a list of industries must be assessed and an Environmental Report produced with public participation. This Directive is transposed into Irish law by Statutory Instrument 435/2004. This transposition removes from Irish planning authorities any excuse that it is a matter for the government. The transposition means the government played its part and it is mandatory for Irish planning authorities to apply the law. Failure to do so is corruption. Planners have (up until now at least) refused to ensure compliance. Failure to abide by the rules in place has been a central point in all Irish public inquiries over the years on various scandals. These are usually presided over by a Judge and result in a set of recommendations restating the laws which were broken. I am campaigning to have a public inquiry into this corruption in which all planning officials will be questioned and for laws to make it a criminal offence to disregard the law. I ask the Bord here to comply with the law but they never did so previously.

Article 3(2) of the SEA Directive states that the Environmental Report sets the framework for future planning consent for projects under the EIA and Habitats Directives. The EIA or EIAR is the Environmental Impact Directive Report under Directives 2011/92/EC as amended by Directive 2014/52/EC. Therefore there can be no EIAR without the overarching SEA Report. The applicant here does not include a copy of any such SEA Environmental Report which must now be demanded before this application was proceed.

4) Background to EU Directives.

The Aarhus convention and the Espoo Conventions were international agreements in which Ireland is a party. The Treaty on the functioning of the EU and the Lisbon Treaty

guaranteed certain rights to the public including rights to a good environment and participation rights to planning decisions. The SEA, EIA, Habitats and Pollution Control Directives being examples of these being written into European and Irish law. The reasoning behind this is to mandate a proper examination of all plans and programmes from an environmental and engineering viewpoint. Qualified engineers must examine all electricity based proposals and qualified chemical engineers

must examine all chemistry based proposals etc. Qualified personnel must sign off on hydrogen storage and combustion. This removes from planners the need to be qualified in everything. There is no SEA report on anything contained in this proposal. Note Schedule of S.I 435/2004 sets out what (must among other things) must be contained in the said Report. Schedule 2.

The need for the project is not assessed, the exact saving on co2 gas is not accurately assessed. The wind turbine in this project will consume electricity as well as consume it.

5) The EIAR.

In the absence of an Environmental Assessment Report under the SEA Directive, planners have up until now sought to rely of the EIA Report from the developer. There is a clear conflict of interest in this which is what SEA was designed to overcome.

The non technical part of the EIAR at paragraph 2 is wrong. The EIAR requirement is due to wind farms with more than 5 turbines or above 5 mega watts capacity require an EIA.

It may be determined by the planners that an EIAR is needed due to the likely impact on the environment, but it is mandatory due to Annex ii sub article (3) (i) of the EIA Directive copied by the Irish transposing law. This needs to be amended as it is misleading.

Schedule 5 at Para 6 (b) of the EIA Directive names installations for production of inorganic chemicals. 6(f) names production of explosives, hydrogen in air is an explosive although not under the Explosive substances acts in Ireland. In Schedule 5 (Part 2) wind farms are included when above a certain size. This one is above that size. An EIA is mandatory.

Schedule 5 (Part 2) (6) (a) of the PD Regulations 2001 requires an EIA for production of chemicals and hydrogen is a chemical.

6) The latest EIA Directive.

The EIA Directive 2014/52/C amends the 2011 Directive in two ways. The cumulative effects must be assessed which was already in the Planning and Development Act 2000 and expertise must be used by those compiling the EIAR. This means that whosoever produced the EIA Non technical and technical summary must sign off with his or her name and qualification and experience.

Who is D. Keily, C. McCarthy, A. Phelin, R. Davis, M. Forbes, J. McElvaney, T. McGloin, J. Healy, S. Lee, S. Molloy, C. Birney, R. Gillian, C.

O'Reilly, Sarah Keily, M. Sullivan, or L. McCormack? What is their course of study? What is their experience?

No qualification or experience is given for any of these. It could be a list of the local tidy towns group for all we know.

Approval by the National Standards Association of Ireland is not a qualification. There must be one or more natural persons who sign their name followed by the abbreviation for a recognised qualification. We are dealing here with a dangerous explosive flammable gas after all. See paragraph 33 of the preamble to the 2014 Directive relating to expertise in regard to the purpose of the Directive and Article 5 (3)(b) which states ***“ the competent authority shall ensure that it has or has access to sufficient expertise to examine the environmental impact assessment report ”*** This replaces and inserts the corresponding Article of the main EIA Directive and was put in to make sure in cases like this there is expertise and that the experts have experience and sign their name to the part of the EIA they are responsible for. Consider if this were a nuclear waste disposal project, would this EIAR pass?

7) Case CJEU 24/19.

I agree with John Dooley's submission on the 2006 Wind Energy Guidelines. They have been ruled unlawful by CJEU case C-24/19 which went on to say all existing wind farms must be pulled down. The 2019 Guidelines have no probative value and cannot be included in an EIAR. I live and work a farm within 520 and 580 metres of the 5 turbine Raragh wind farm built in 2019 per Cavan 270/09. I can verify that the noise is terrible and the noise and shadow flicker mitigation in the planning consent was ignored by the developer. The noise is present in both calm and windy conditions which is like 1000 horses pulling carts over a cobbled street a half a mile away.

In calm conditions there is a constant whine for the yaw mechanism. It is important that the make and model of turbines is stated precisely. Each model has a unique noise profile.

8) The technical report.

Who are Jennings and O'Donovan Partners consultant engineers? What is the expertise of those who compiled this report? There has to be a signature with qualification and experience according to Directive 2014/52/EC.

Summary of Val Martin's objections.

An Observation on Firlough Wind Farm and Hydrogen Plant

- a) Lack of Environmental Report under the SEA Directive or modification of same.
- b) The Irish Wind Energy Guidelines were ruled unlawful by the CJEU so that the turbines are a danger to the health of local residents.
- c) The 2019 Draft Guidelines have no application as they are incomplete.
- d) The EIAR is illegal under Article 3(2) of the SEA Directive.
- e) There is no record of the expertise of the natural persons who compiled the EIAR as required by Directive 2014/52/EC.
- f) There is no examples of where this type of hydrogen plant was installed anywhere else in the world.
This application is for a dangerous project and is experimental, it should be refused and the Minister for Energy should ensure compliance with the law assessing Ireland's renewable energy needs and updating the 2006 Wind Energy Guidelines with public participation. No wind farm can be built until this is done.

Signed _____
(Val Martin) Bachelor of Business Studies.

An Observation on Firlough Wind Farm and Hydrogen Plant

Link to other papers dealing with electrolysis to produce Hydrogen by splitting water into HYDROGEN and OXYGEN.

A Review of hydrogen generation ,storage , and applications in power system “ by Leijiao Ge a. , Bohan Zhang b. , Wentao Huang b. , Yuanzheng Li c. , Luyang Hou d. , Jianbo Xiao b. , Zimu Mao b. , Xiaoping Li

<https://www.sciencedirect.com/science/article/abs/pii/S2352152X23027056>

“Due to the fluctuating renewable energy sources represented by wind power, it is essential that new type power systems are equipped with sufficient energy storage devices to ensure the stability of high proportion of renewable energy”

EFFECTS OF RENEWABLE ENERGY UNSTABLE SOURCE TO HYDROGEN PRODUCTION:
SAFETY CONSIDERATIONS

Melted, D.1, Liponi, A1, Rastelli, D.2, Rizza, M.E.2, Ferrari, L.1, Desideri, U.1

1 DESTEC, Univeristà di Pisa, Largo Lucio Lazzarino, 56122, Pisa, Italy, daniele.melideo@unipi.it

2 McPhy Energy Italia Srl, Via Ayrton Senna n. 22, San Miniato (Pisa), 56028, Italy

<https://hysafe.info/uploads/papers/2021/131.pdf>

EFFECTS OF RENEWABLE ENERGY UNSTABLE SOURCE TO HYDROGEN PRODUCTION:
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ABSTRACT

Hydrogen is considered a promising energy carrier for a sustainable future when it is produced by utilizing renewable energy. **Nowadays, less than 4% of hydrogen production is based on electrolysis processes. Each** component of a hydrogen energy system needs to be optimized to increase the operation time and system efficiency. Only in this way hydrogen produced by electrolysis processes can be competitive with the conventional fossil energy sources. As conventional electrolyzers are designed for operation at fixed process conditions, the implementation of fluctuating and highly intermittent renewable energy is challenging. **Alkaline water electrolysis is a key technology for large-scale hydrogen production powered by renewable energy. At low power availability, conventional alkaline water electrolyses show a limited part-load range due to an increased gas impurity. Explosive mixtures of hydrogen and oxygen must be prevented; thus, a safety shutdown is performed when reaching specific gas contamination.**

The wind and PV nominal power were set equal to the electrolyser nominal power. **The electrolyser must work in a power range of 20-100% nominal power [31] to avoid safety issues.** In fact, at lower powers, the lower currents lead to higher HTO and, consequently, to possible explosive atmospheres in the stack as shown in Figure 2. Therefore, the electrolyser power input was set equal to the renewable wind/PV power whenever the

<https://www.nrel.gov/hydrogen/renewable-electrolysis.html>

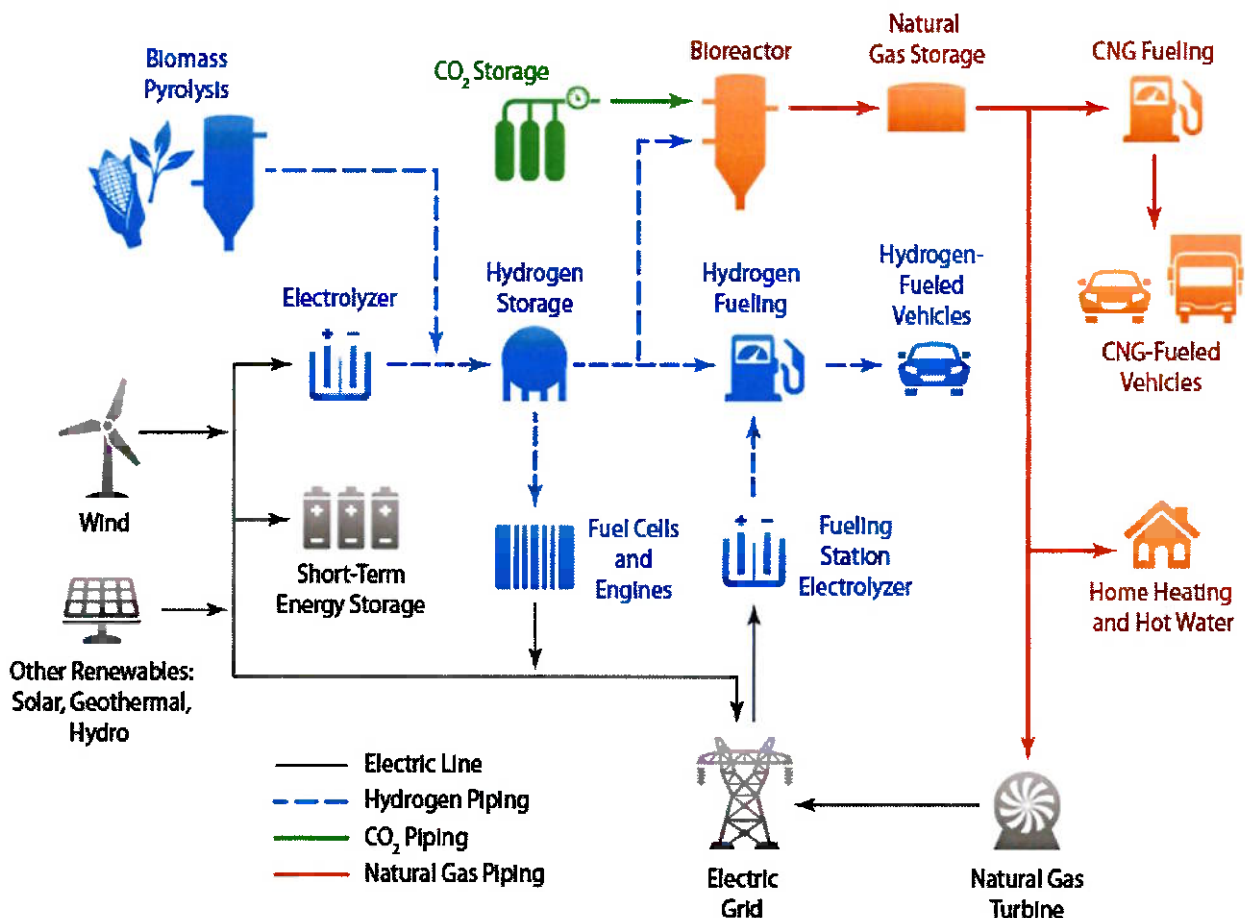
Systems Engineering, Modeling, and Analysis

An Observation on Firlough Wind Farm and Hydrogen Plant

NREL develops and validates component and system models to assess and optimize a variety of system scenarios and control strategies for renewable hydrogen production and electricity/hydrogen cogeneration.

“Traditional physical hydrogen storage technologies such as compressed hydrogen, liquid hydrogen, and adsorbed hydrogen have been widely used but have many limitations, such as low storage density, high cost, and poor safety, etc. Therefore, some new hydrogen storage technologies have emerged in recent years, such as underground hydrogen storage. It has advantages in terms of efficiency, safety and cost of hydrogen energy storage and will be expected to be further promoted and applied in high proportion of renewable energy systems.”

This diagram depicts various scenarios for producing renewable hydrogen and electricity.



Systems Integration and Component Development

NREL develops power electronics interfaces for renewable electrolysis systems to characterize and test the performance of electrochemical devices. Testing also examines how the fluctuating power output of a wind turbine impacts electrolyzer operation. Systems performance is quantified based on the efficiency of stack and electrolyzer systems as well as their ability to accommodate renewable electricity sources.

The renewable-electrolysis systems that NREL studies incorporate a common direct current (DC) bus (electrical conductor) **fixed with a battery bank connected to a wind turbine, photovoltaic array, and an electrolyzer. Typically, small wind turbines are set up to charge batteries and require connection to a constant voltage DC bus and power electronics to regulate power output and to convert wild alternating current (AC) to DC.**

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