Submission to "Review of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems Consultation"

For submission to energyconsultation@decc.gov.ie

[redacted]
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Overview

The focus of energy security needs to be security of supply to meet essential needs of households, small businesses and social services. Energy security risk mitigation options should be scaled to mitigate risks to these essential needs, and not be required to be large enough to mitigate risks to the demand of large energy consumers including data centres. Existing data centres and large energy consumers should be responsible for mitigating their own risks, through being required to develop and fund energy storage infrastructure.

Antonio Guterres, speaking on the launch of the 3rd IPCC report says: 'Investing in new fossil fuel infrastructure is moral and economic madness. Such investments will soon be stranded assets — a blot on the landscape and a blight on investment portfolios."[1] Any investment in fossil fuel infrastructure does not protect us from shocks to the supply of the fossil fuel into that infrastructure. It is welcome that the report excludes from the short list a number of fossil fuel infrastructure options. However, the report does not exclude all fossil fuel infrastructure options. If we are to treat the climate emergency as an emergency, we should not be investing in any fossil fuel infrastructure.

In particular, floating LNG FSRU is not excluded from the short list, despite the extensive issues with this approach pointed out in the report itself.

The report argues that there is a "need" for fossil gas, without considering that if we rapidly accelerate and deploy approaches of demand reduction, demand shifting and low-carbon energy storage, we will not "need" fossil gas. In order to treat the climate emergency as an emergency, we must have rapid reductions in *all* fossil fuels in the next ten years.

The report does consider a number of approaches to meeting energy security requirements without fossil fuels, and provides useful analysis of those. This response discusses these further and argues for their urgent rapid deployment, while discussing some key considerations in how they should be deployed to minimise their climate and environmental impact.

This submission also proposes community led approaches to energy security and that energy security be considered at that level.

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[1] https://www.un.org/press/en/2022/sgsm21228.doc.htm

Response to questions 1-3 on risks

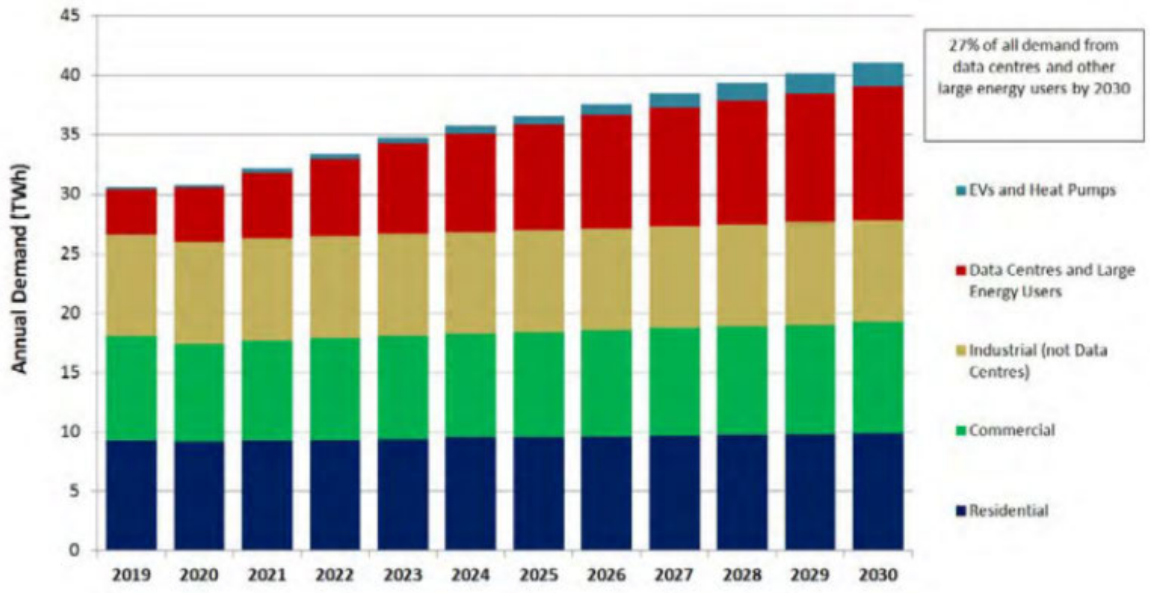
Defining risks too broadly leads to over-estimation of scale of energy security mitigation options needed

When reviewing security of supply, it is important to reflect on exactly what demand we are ensuring we meet with security of supply. The technical report does examine the effects on "Protected customers of gas" who are defined as 'all residential gas customers, small and medium enterprises, hospitals, nursing homes, high-security prisons, district heating schemes and other essential social services. It models the effects of different "shocks" on meeting protected gas customer demand on the one hand, and on meeting all gas demand (including the gas required by the electricity sector to meet unlimited projected electricity demand) on the other hand. However the report is not clear on who protected customers of electricity would be. I am not aware of any official public document which clearly states which electricity customers will be cut off in what order in the event of a shock.

In order to make clear decisions on energy security mitigation options, it should be clearly specified who would be cut off from electricity in the event of a shock in what order, and to analyse the various mitigation options in terms of who would benefit from that mitigation. In other words, if mitigation option A is sufficient to meet the electricity demand of group 1 but not group 2, and mitigation option B is sufficient to meet the electricity demand both groups 1 and 2, then it is clear that the mitigation option B is chiefly for the benefit of avoiding cutting off group 2 during a shock.

The technical report states "Data centres and other LEUs are expected to make up to 27% of total electricity demand by 2030.", which is analysis drawn from Eirgrid in 2021. The report states that "Electricity demand in Ireland is expected to increase substantially over the next decade. The primary driver of this increase in demand is the expected expansion of Large Energy Users (LEUs), particularly data centres. Another driver of increased demand is electrification of heat and transport."

Figure 3.5: Electricity demand composition in EirGrid's Median Demand scenario (TWh, 2019-2030)



Source: EirGrid, All-Island Generation Capacity Statement 2021-2030

However the figure of 27% in 2030 may be even higher, as in its recent Generation Capacity Statement (October 2022), Eirgrid states "Trends in the data centre sector show demand levels around 140 MW higher by 2030 than previous forecasts. There is very strong growth in this sector out to 2024, with continued growth towards the end of the decade." [2] These more recent growth figures are projected *despite* measures announced in November 2021 by the Commission for Regulation of Utilities (CRU) and Eirgrid to limit new data centre connection agreements, and therefore this growth is likely to comprise mostly of demand growth for existing data centres and for data centres who already have connection agreements.

It is clear that if data centres are first to be cut off from electricity during a shock, then the group that the report is chiefly focused on meeting security of supply for, is data centres.

In order to make this clear, and to facilitate clear decision making in the area of energy security of supply mitigation options, the report should run an analysis excluding all large energy consumers including data centres from demand figures, and calculate the effect of shocks on the other electricity customers besides large energy consumers.

It is very likely that such an analysis would show that mitigation options could be scaled back if we assumed that the priority was to meet essential electricity needs during a shock, and not the full projected electricity demand including large energy consumers during a shock.

[2] https://www.eirgridgroup.com/newsroom/eirgrids-generation-capac/index.xml

For example, the report states “Our modelling indicates that a strategic LNG FSRU is the only short-listed option that can fully mitigate all security of supply impacts.” - this should be clarified that this is the only short listed option which will mitigate risks to cut data centres and other large energy users off during a shock, rather than being the only short listed option that can meet the needs of other non-large energy consumers during a shock.

Existing data centres and large energy consumers should be responsible for mitigating their own shock risks, through developing and funding energy storage infrastructure.

Response to questions 4-8 on mitigation options

Investment in fossil fuel infrastructure still being considered in the report

Antonio Guterres, speaking on the launch of the 3rd IPCC report says: ‘Investing in new fossil fuel infrastructure is moral and economic madness. Such investments will soon be stranded assets — a blot on the landscape and a blight on investment portfolios.”[3]

Any investment in fossil fuel infrastructure does not protect us from shocks to the supply of the fossil fuel into that infrastructure.

It is welcome that the report excludes from the short list a number of fossil fuel infrastructure approaches, such as

- Fixed LNG terminal (commercially operated)
- Fixed LNG terminal (back-up)
- Floating LNG FSRU (commercially operated)
- Gas storage facility (commercial)
- Additional gas interconnector
- Additional gas reserves from existing exploration licences
- Additional conventional generation capacity – gas fired

However, the report does not exclude the following options, which should be excluded on the basis of being investments in fossil fuel infrastructure:

- Floating LNG FSRU (back-up)
- Gas storage facility (back-up)
- Increased secondary fuel storage at natural gas power stations
- Onshore slow liquefaction storage facility

[3] https://www.un.org/press/en/2022/sgsm21228.doc.htm

Shaping our Electricity Future Roadmap, a joint publication by the transmission system operators (TSOs), EirGrid and SONI, released in November 2021, estimates that between 2 and 3 GW of new dispatchable capacity is needed across Ireland and Northern Ireland for a secure transition to 2030. All dispatchable capacity needs to be storage, dispatchable renewables and demand response *not* fossil fuel infrastructure. Existing large energy consumers, who are driving demand growth, need to be required a) to pay for this infrastructure b) to reduce their overall demand and c) to increase their demand-responsiveness ie demand shifting from one time to another depending on availability of renewable supply.

Floating LNG FSRU is not excluded in the report

Of the short-listed fossil fuel based mitigation options, the floating LNG FSRU option is the worst option in terms of carbon emissions.

The report notes that “By the end of 2020, there were a total of only 37 FSRUs in operation globally. Ireland’s access to an FSRU may therefore depend on its ability to compete with global demand for a limited number of available units.” This would indicate that Ireland tendering out to lease such infrastructure is in effect incentivising investment in new units of this infrastructure, and is still lock-in to this infrastructure globally if not locally in Ireland.

The report also notes other feasibility issues with this option: “Another implementation challenge is associated with the feasibility of using an LNG FSRU as a strategic store which would only be utilised during periods in which there is a material risk of demand disruptions. Under this operational framework, the LNG would need to be stored for extended periods of time in the FSRU in a pressurised and cooled state. We have not identified any FSRUs which are currently used for this purpose. As such, the technical feasibility of the FSRU to hold LNG for extended periods of time in a pressurised state would need to be determined. The same requirement would apply to any reserves that would need to be held under regulation if introduced for a commercial FSRU development.”

False “need” for fossil gas is over-emphasised in the report

The report repeatedly states or implies that we need fossil gas, and that it is our only option for periods when wind and solar generation are low.

Quotes from the report to this effect:

- “gas will be needed as the principal source of non-variable electricity generation”,
- “the importance of gas-fired generation to provide flexible electricity may increase in the future, following the phasing out of Ireland’s coal and peat power stations, alongside the increase in variable renewable generation and electrification of demand”
- “Electricity generation from variable resources will increase, while coal and peat plants will phase out to achieve Ireland’s renewable targets, driving the need to rely more on natural gas to generate electricity in periods when wind and solar are not able to generate.”
- “When wind is not available, demand for gas in the power sector will increase to meet electricity demand”
- “Given that gas-fired power stations are and will continue to be the main source of electricity generation during periods of low wind”
- “Low wind generation would mean that the system must rely on gas-fired and interconnector capacity to meet demand.”

The technical report does mention “alternative [dispatchable] electricity generation and storage technologies… [including] long-duration energy storage”. However, the above quotes from the report do not account for the fact that if we reduced non-essential demand and accelerated the implementation of energy storage and load-shed demand response, that we would *not* “need” fossil gas.

The report states that “While each of these [storage and non-fossil dispatchable] technologies is likely to play a role in the future energy mix, the deployment potential for some is likely to be limited up to 2030 and even beyond.” However the deployment potential for fossil fuel infrastructure is also limited before 2030. For example the report shows similar timescales for green hydrogen infrastructure investment as for LNG and gas infrastructure investment. Therefore if we are to invest in infrastructure for 2030, we should be investing in non-fossil fuel infrastructure for 2030.

The report highlights Kinsale and Islandmagee as locations for fossil gas storage with “future use as a large-scale hydrogen storage facility” and that “much of the physical infrastructure that would be developed to store natural gas could potentially be re-purposed to store hydrogen in the future.” The question arises as to why we would not simply develop these locations to store hydrogen in the first place, rather than developing them as fossil gas storage locations and later converting them into hydrogen storage locations. Consideration should be given to risks of leakage of hydrogen which is damaging, but not as damaging as risks

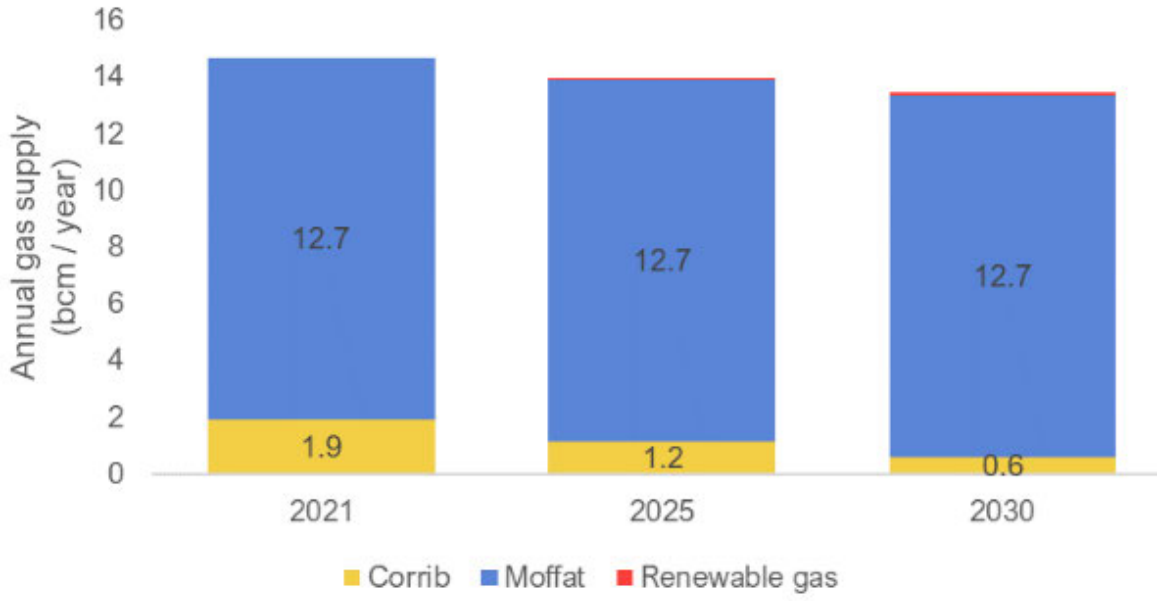
the report identifies of leakage of fossil gas, methane, or carbon dioxide leakage in the case of storing fossil gas there.

The report states that “there is evidence to suggest that the cost of retrofitting an existing CCGT as a H2GT would cost between 15 to 20% of the initial capex of that plant”. Therefore we should invest in hydrogen generation (H2GT) in the first place, not invest in CCGT and later convert to H2GT.

Need to completely and rapidly phase out fossil gas is not accounted for in the report

The report states that “2020 NDP projections for gas supply show very slight decrease up to 2030”.

Figure 4.2: Annual gas supply in Ireland



The report projects that there will be investment in “515 MW of new OCGT plants” by 2025 and another “37 MW of new OCGT capacity” by 2030.

For the electricity sector the 2021 Climate Action Plan sets a target to increase the proportion of renewable electricity to 80% by 2030, and to reduce emissions to a range of 2 to 4 million tonnes of CO2 (MtCO2) by 2030 (a 62-81% decrease from 2018 levels). This looks only at emissions within Ireland, rather than the substantial emissions associated with the extraction of fossil fuels, including gas, which are then burnt in Ireland.

If we are to treat the climate emergency as an emergency, we should be aiming for much steeper declines in emissions from electricity. There should be no new investment in fossil fuel infrastructure, and the gas consumption graph should be showing dramatic and rapid drops to close to zero, through decreases in non-essential energy demand, scale up in renewables, load-shed demand response and energy storage.

Community led approaches - ignored in the report (Question 4)

The report does not discuss energy security at the community level, or potential for community led approaches to energy security. For example there is potential for incentives to balance demand and supply at local levels (as called for by the EU directives on renewable energy communities[4]), thus reducing burden of investment in, and dependence on, electricity distribution/transmission infrastructure. There is also potential to leverage energy storage at community level through batteries in public transport vehicles or other shared transport vehicles, or through local pumped hydro or other distributed energy storage approaches.

Low carbon technologies (Questions 5 and 6)

The inclusion of low-carbon energy security mitigation technologies listed below is to be supported.

Low carbon technology recommended by report	**Considerations and comments**
Additional indigenous biomethane Additional electricity generation capacity – (dispatchable) low-carbon (e.g., biomass)	The sources of biomethane are listed as food waste, manure, sewage sludge, crops, forestry, and straw. Care must be taken that these waste streams are genuine waste which cannot be avoided, and that these inputs do not have better uses than energy production (for example contributing to soil fertility or carbon sequestration). The focus could be that these sources are used on a large scale only during short term shocks rather than on a routine basis. The report notes that “there would be considerable savings associated with converting Moneypoint 1 & 2 from coal to

[4] https://energy.ec.europa.eu/topics/markets-and-consumers/energy-communities_en

Low carbon technology recommended by report	Considerations and comments
	biomass relative to developing new purpose-built biomass", therefore this infrastructure could be rarely used in this way during times of shock without substantial new infrastructure.
Indigenous green hydrogen gas production, with some converted back into electricity during shocks	Hydrogen should be truly green, ie produced when there is excess renewables on the grid, and not produced from fossil fuels (whether or not carbon capture or storage is involved). Care should be taken to avoid leaks of hydrogen into the atmosphere in the development of green hydrogen. Mixing hydrogen with fossil fuels in the gas grid is not an efficient way of heating buildings - electrification of building heating is much more efficient. The focus should be on hydrogen production, storage and generation infrastructure, not gas grid or pipeline investment. The report assumes that 0.46 TWh of hydrogen out of a total of 3 TWh of hydrogen would be injected into the gas grid. This 0.46 TWh of hydrogen would be much better used for other purposes, such as stored for electricity shocks, converted into marine or aviation fuel, used for essential industrial heat or replacing existing grey hydrogen, rather than injected into the gas grid.
Additional electricity interconnection	Additional electricity interconnection will enable Ireland to share its excess wind energy with Europe thus contributing to Europe's decarbonisation, as well as enhancing energy security.
Additional electricity storage – pumped hydro, batteries	The development of Silvermines pumped hydro would support energy security, and other pumped hydro should also be considered. Battery recycling and the sustainability of mining for battery minerals should be considered. While batteries, pumped hydro and green hydrogen are important to consider, other emerging energy storage technologies should also be considered.
Demand side response	Demand side response should be implemented through load shedding or load shifting, or energy storage, not through running of on-site fossil fuel generation by industry.

How to reduce demand (Question 7)

Demand should be reduced by:

- No new data centre connections
- Requiring existing large energy consumers, including data centres, to reduce their overall demand, to time-shift their demand to times when renewables are available, including through requiring them to fund energy storage projects as a condition of operation
- Ensuring large energy consumers face full costs of energy through high prices, and do not enjoy any direct or indirect subsidy to their energy costs or through their access to reliability
- Accelerated program of retrofits and solar PV for all households and community buildings, on a Government run “install now, pay as you go” basis, so that having cash up-front is not a barrier
- Electrification of and improvement to frequency and accessibility of public transport (rail and buses), promotion of active travel, promotion of car sharing, and reduction in use of private cars particularly with single occupancy

Capacity remuneration mechanisms - they currently fund fossil fuel infrastructure, not storage infrastructure (Question 8)

The report notes that “the CRU has directed EirGrid to source and deliver approximately 450 MW of additional generation capacity for the winters of 2023/24 to 2025/26. This direct procurement of additional generation capacity formed part of a package of measures announced by the Irish Government in June 2022.”

Who CRM pays: The Capacity Remuneration Mechanism (CRM) provides regular availability payments mostly for fossil fuel generation infrastructure, and for fossil fuel generators located on-site in industries participating in demand response schemes. This includes incentivising investment in new and expanded fossil fuel infrastructure such as in Tynagh, Galway and in Kilroot, Antrim[5]. The CRM does not provide any dedicated payments for long-duration storage infrastructure. Energy Storage Ireland has highlighted the fact that the current market design does not support the investment in energy storage infrastructure which is needed to meet security of supply.[6]

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5 https://www.tynaghenergy.ie/eph-to-build-338-mw-de-rated-gas-capacity-at-kilroot-in-n-ireland/

6 https://www.energystorageireland.com/wp-content/uploads/2022/05/GameChanger-ESI-Report-May2022-Web-1.pdf

Who pays for CRM: Large energy consumers should be forced to pay for the storage capacity needs that their demand creates. The current version of the capacity remuneration mechanism is like an insurance scheme where all consumers and the Government are paying an insurance premium which primarily protects large energy consumers. Large energy consumers could be required to pay through a capacity subscription mechanism, and so bear the costs of achieving their own reliability.

Capacity remuneration mechanisms should also support community based participation and small scale distributed approaches to reliability, and not only large infrastructure projects.

In summary, capacity remuneration mechanisms should not subsidise reliability for non-essential needs (equity), should not incentivise fossil fuel infrastructure (climate), should promote reliability at household and community level as well as national level (geography), and should be effective at delivering reliability in times of shock (effectiveness).

Response to questions 9-10 on policy measures

Regular reviews of energy security are valuable. However these need to be re-framed in terms of security of supply to meet essential needs of households and social services. It is not appropriate to frame energy security in terms of mitigation of rationing risks to large industrial energy consumers. Until such a re-framing happens, the usefulness of this analysis is limited.

Instead of framing analysis in terms of electricity and gas, it should be reframed in terms of energy.

Energy security should be defined at household level and at community level as well as at national level and international level. Meeting a national energy security standard while households fall into energy poverty, or while local communities are more reliant than they need to be on the failure of or constraints in external generation, storage and transmission infrastructure, is not a complete reflection on energy security.