

EIR 202200322629 Documents Master File – Redacted

Introduction

This file provides the contents of documents related to the EIR query, reference 202200322629.

Where redactions are made without further explanation an exception under regulation 11(2) of the EIRs (personal information) applies to some of the information requested because it is personal data of a third party and disclosing it would contravene the data protection principles in Article 5(1) of the General Data Protection Regulation and in section 34(1) of the Data Protection Act 2018. This exception is not subject to the ‘public interest test’, so we are not required to consider if the public interest in disclosing the information outweighs the public interest in applying the exception.

Where redactions are made noting “redaction – internal communications”, an exception under regulation 10(4)(e) of the EIRs (internal communications) applies to some of the information you have requested because it is internal communication between Scottish Government officials about analysis to help inform ongoing research. This exception is subject to the ‘public interest test’. Therefore, taking account of all the circumstances of this case, we have considered if the public interest in disclosing the information outweighs the public interest in applying the exception. We have found that, on balance, the public interest lies in favour of upholding the exception. We recognise that there is some public interest in release as part of open, transparent and accountable government, and to inform public debate. However, there is a greater public interest in high quality policy and decision-making, and in the properly considered implementation and development of policies and decisions. This means that Ministers and officials need to be able to consider all available options and to debate those rigorously, to fully understand their possible implications. Their candour in doing so will be affected by their assessment of whether the discussions on the future electricity system will be disclosed in the near future, when it may undermine or constrain the Government’s view on that issue while it is still under discussion and development.

Documents

10. Document 10

211026 - GATECHECK - Gatecheck report recieved from APP - Peterhead Low Carbon CCGT Power Plant - 26 October 2021

All of the information you have requested is available from the following weblink [Scottish Government - Energy Consents Unit - Application Details](#). Under regulation 6(1)(b) of the EIRs, we do not have to give you information which is already publicly available and easily accessible to you in another form or format. If, however, you do not have internet access to obtain this information from the website(s) listed, then please contact me again and I will send you a paper copy.

11. Document 11
Cabinet Secretary Member's debate – Torness Brief

<p>What</p>	<p>This Members Business Debate has been requested by Craig Hoy MSP</p> <p>S6M-02776 Decommissioning of Torness Nuclear Power Station</p> <p>That the Parliament notes that the decision has been taken to bring forward the decommissioning date of Torness Nuclear Power Station from 2030 to 2028; further notes EDF Energy's assessment that the station is one of the most productive in its fleet of nuclear power stations; recognises that, since the station first started generating electricity in 1988, EDF Energy reports that the plant has produced nearly 280 TWh of zero-carbon electricity, which is understood to be sufficient to power every home in Scotland for 28 years; understands that Torness employs around 500 staff and 250 contractors, with a salary bill of around £40 million annually, which, it considers, boosts the Dunbar and East Lothian economy; notes that Hunterston B power station, in North Ayrshire, has recently shut down for the last time, after what it considers to have been 46 years of reliable energy generation and job creation, and further notes calls urging the Scottish Government to review its decision to use the Scottish planning system to block the development of any future civilian nuclear energy projects in order that nuclear power continues to play a central part in the provision of zero-carbon electricity in Scotland.</p>
<p>Where</p>	<p>The Chamber, Parliament</p>
<p>When</p>	<p>Thursday 24th February 12:45</p>
<p>Key Message(s)</p>	<ul style="list-style-type: none"> • A mixture of renewables, storage and carbon capture technology – as well as increased interconnection across GB and to the continent – can support a secure and decarbonised power sector in Scotland following the closure of the existing large nuclear generators • Our draft Energy Strategy and Just Transition Plan, to be published this year, will provide a roadmap for the future of Scotland's energy system. • We will co-design this Plan with the workers, businesses and communities most impacted by the net zero transition, including those within or associated with the nuclear energy industry. • Under the Electricity Act 1989, the building of any new nuclear power station in Scotland would require consent from Scottish Government Ministers (under Section 36 of the Electricity Act). This is accepted by the UK government.
<p>Why</p>	<p>Torness power station sited to the east of Dunbar, East Lothian, is Scotland's last remaining nuclear fission power station. It has been generating since 1988 and late last year EDF announced that the plant would close two years early in 2028. This combined with the recent closure of Hunterston B has led to increased scrutiny of the Scottish Government's position in relation to nuclear (both traditional nuclear fission and experimental nuclear fusion)</p>

Speech details	Sent as a separate document.	
Supporting official	[Redacted]	
Briefing contents	Annex A: Background to Torness and Nuclear Power Annex B: Background to Just Transition Annex C: Previous Parliamentary Questions Annex D: Nuclear Energy Q&A Annex E: Electricity Generation inc Nuclear FMQ	Page Numbers 3 - 4 5 6 - 7 8 - 12 13 - 15

- **[Redacted – Out of scope]**

Security of Supply

- National Grid ESO has conducted a study of the impact of the earlier than expected closure of traditional nuclear generation in Scotland which concludes that the system will remain secure.
- While this is reassuring, Scottish Government’s view is that there isn’t a yet a clearly articulated vision for how security of supply will be delivered in a zero carbon electricity system.
- Ultimately this is a reserved matter but there are concerns that without the above mentioned vision there is a risk that resilience and security in a zero carbon electricity system are not given sufficient priority.
- **[Redacted- out of scope]**

PREVIOUS PARLIAMENTARY QUESTIONS AND ANSWERS

[Redacted – Out of Scope]

To ask the Scottish Government from where specifically it will source energy that is currently generated by the Torness nuclear power station, following its closure.

— Liam Kerr

A. Security of electricity supply is a reserved matter and is delivered by National Grid ESO across the whole of Great Britain under regulation from Ofgem. NGESO is also responsible for sourcing generation to meet demand.

Scottish electricity supplies are currently considered secure with around 9GW's of secure supply to meet peak demand of around 5GW's. National Grid ESO has conducted a study of the effects of the earlier than expected closure of nuclear generation in Scotland which concludes that the system will remain secure with any potential operational issues and risks being identified and mitigations put in place.

Scotland is a net electricity exporter and in 2020 exported 20.4 TWh of electricity, equivalent to powering every household in Scotland for 26 months. It only imported a little over 1 TWh of electricity, meaning that net exports of electricity were 19.3 TWh in 2020, its highest year on record.

Answered 31/01/2022

[Redacted – out of scope]

Answered 22/08/2021

To ask the Scottish Government whether it will build new nuclear power stations, following the closure of Hunterston within the next 12 months, and of Torness in 2030.

— Liam Kerr

A. It is for developers and the market to decide whether or not to bring forward proposals for new electricity generating stations in Scotland.

Our 2017 Energy Strategy set out our priority for a whole system approach that promotes renewables and other low carbon alternatives as part of a diverse, well balanced energy supply. The Strategy confirmed that we do not support a new generation of nuclear stations under current technologies. The economics of these stations are prohibitive, especially given the falling costs of renewable and storage technologies.

Answered 16/08/2021

Q&A:

Security of Supply

Q: How will Scotland ensure its security of supply once Torness closes?

- Security of supply is a reserved matter and is delivered by National Grid Electricity System Operator across the whole of Great Britain under regulation from the independent energy regulator Ofgem.
- National Grid ESO has conducted a study of the effects of the earlier than expected closure of nuclear generation in Scotland which concludes that the system will remain secure.
- Scotland has sufficient capacity available – with around 9 GigaWatts to meet peak demand of around 5 GigaWatts.

Q: How will Scotland ensure security of supply given the increased demand likely from heat and transport decarbonisation?

- Scotland is currently a net electricity exporter and in 2020 exported 20.4 TerraWatt Hours of electricity, equivalent to powering every household in Scotland for 26 months. Scotland imported a little over 1 TerraWatt hour of electricity, meaning that net exports of electricity were 19.3 TerraWatt hours in 2020, its highest year on record.
- Our ambition to enable the delivery of an additional 8-12 GigaWatts of onshore wind and 25 GigaWatts offshore wind will ensure that Scotland remains a net exporter of electricity whilst ensuring sufficient power for its own decarbonisation ambitions.
- In 2021 Scotland generated enough power to meet demand 96% of the time.
- Scotland also benefits from a high level of interconnection with the rest of the GB and Northern Ireland. In their recent Network Options Assessment National Grid recommended that an interconnector to Norway be considered for installation in the coming years which would provide a further route for electricity export and import.

[Redacted – Out of Scope]
[Redacted – Out of Scope]

To: Cabinet Secretary for Net Zero, Energy and Transport;

SECURITY OF SUPPLY ANALYSIS

Purpose

1. To provide you with analysis, as requested, on the following
 - a. Scotland's electricity supply compared with other countries that do not rely on nuclear power
 - b. The costs of pumped storage hydro compared with nuclear power
2. To provide an updated scope of work for further research on this issue, that reflects existing policy in respect to nuclear

Priority

3. Urgent

Background

1. Security of electricity supply is a reserved policy area, delivered through UK Government electricity policy, Ofgem as the independent GB energy regulator, and National Grid ESO (the GB Electricity System Operator)
2. All aspects of security of electricity supply have historically been provided by nuclear stations, large fossil fuel power stations and hydro (including pumped storage hydro)
3. The closure of Scotland's coal stations during the last decade, the confirmed closure of Hunterston and the earlier than expected closure of Torness, leaves a gap in this traditional provision.
4. National Grid ESO has confirmed that security of supply can be maintained with mitigations put in place and officials would like to undertake their own analysis to enable Scottish Government to scrutinise NGENSO's plans in this area.
5. Following discussion you have requested some further information which officials have set out below.

Scotland's electricity supply compared with other countries that do not rely on nuclear power

6. All non-nuclear countries rely on high levels of flexible capacity to maintain electricity supply. For the majority of those considered, this is provided by thermal generation including gas, biomass and coal power.

7. Norway offers the best comparison given its portfolio of electricity capacity that does not directly include nuclear and aligns with Scottish Governments decarbonisation targets.
8. Our analysis (Annex A) has found that even with high levels of PSH Norway can be exposed to security of supply risks:
9. in winter 2009/2010 security of supply became an issue, when there was a combination of cold weather, low water inflow and a substantial reduction in the availability of power from Swedish nuclear power plants
10. In winter 2010/2011, reservoir levels were extremely low, and in certain specific hours, electricity prices reached record levels after a long period of low temperatures and low inflow.
11. If the Cabinet Secretary would like to gain further insight on Norway's approach to managing security of supply and mitigations that were put in place following these events, Kersti Berge (Director, DECC) would be happy to arrange a call with the Norwegian System Operator.
12. It is important to underline that although Norway does not have nuclear capacity it does at times import nuclear power from neighbouring Sweden

Cost of pumped hydro storage (PHS) compared to Nuclear

2021 prices £/MWh	Pumped Hydro Storage	Nuclear	Onshore	offshore
2025	80.64	108.65	49.46	61.29
2030	80.64	89.21	48.39	50.54
2035	80.64	-	47.31	46.24
2040	80.64	-	47.31	43.01

Table 1 Levelised Cost of Energy (LCOE) – BEIS

1. BEIS latest estimates place PHS as being roughly £10/ MWh cheaper than the cost of new nuclear. However the estimated cost of nuclear was last updated in 2016
2. Unlike onshore and offshore wind which have been subject to a competitive process for subsidy allocation. The costs associated with nuclear and PSH are less transparent.
3. The Contract awarded to Hinkley Point C was negotiated bilaterally and BEIS are bringing forward legislation that will change the support mechanism for nuclear from a market based subsidy towards a Regulated Asset Base model.
4. This will substantially adjust the risk profile for these projects, providing the developer with a guaranteed rate of return which could reduce the cost nuclear even further making it comparatively cheaper.
5. In addition, direct comparisons between the cost of PHS and nuclear must be treated with some caution as these technologies provide very different services to the electricity system
6. PHS is a flexible technology that can ramp up to respond to period of low output (for example days with low wind). PHS capacity is constrained by the amount of water that can be held, the rating of the turbine and the rate at which the water can be released.
7. Nuclear energy provides a source of baseload power that is highly inflexible but consistent.

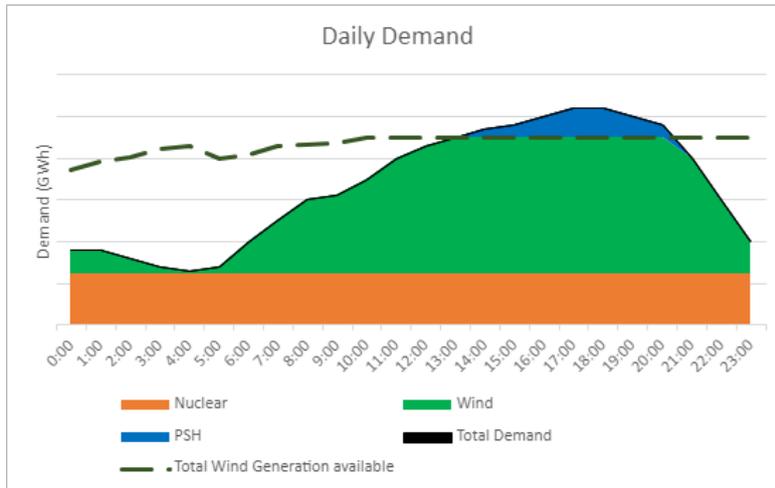


Figure 1 Indicative demand and generation

1. This is illustrated above with Nuclear power not varying throughout the day and PSH discharging at peak demand.

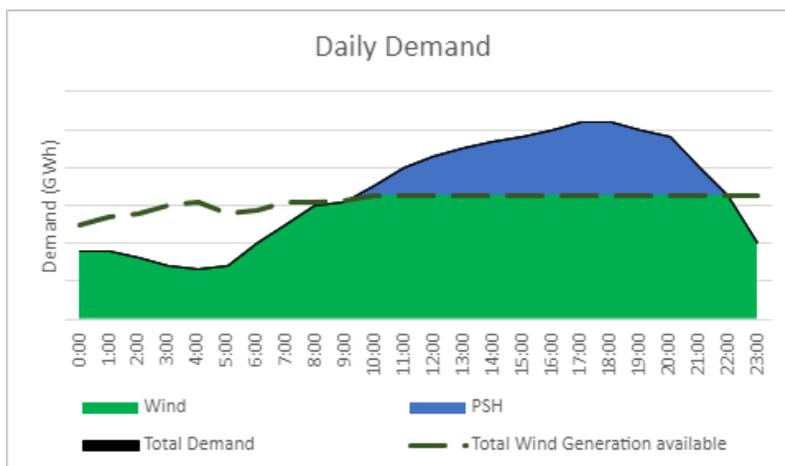


Figure 2 Indicative generation and demand (no nuclear)

2. Removing nuclear capacity from the system will increase utilisation of wind when it is available drawing on greater levels of PHS to meet peak demand.
3. In that context it is worth noting that a recent report by Imperial College (on behalf of SSE) identified that using PHS to “firm up” variable renewables could provide electricity system cost saving of between £44m and £690m per year in 2050.
4. Three quarters of these savings are from the avoided investment in other low carbon electricity generation technologies that would otherwise be needed to meet decarbonisation and security of supply objectives. (such as nuclear, hydrogen-based generation, CCS).
5. The report suggests that 1GW of new PHS capacity (assuming 100h of storage) can help to “firm up” variable renewables to replace 750MW of firm low carbon generation
6. However, removing this consistent baseline of capacity from the system will mean that there is a risk that the capacity of PHS could be exhausted quickly in prolonged periods of low wind output

Proposed Study

7. SG officials intend to commission research, through ClimateXChange, to provide Scottish Government with its own assessment of electricity system security requirements under Scottish Government policy conditions and establish a firm evidenced basis to scrutinise National Grid ESO's plans in this area.
8. The study will be conducted under the assumption that Scotland will not host any new Nuclear sites in the future.
9. The expected output of this work would be a report that answers the following questions:
 - What technology developments need to take place in Scotland to ensure a secure and reliable supply of low and zero carbon electricity out to 2045. This should include generation technologies, networks, flexible response, and storage.
 - What are the likely impacts on transfers of electricity from/to Scotland and the rest of GB, in an electricity system powered almost entirely by intermittent renewables.
 - If Scotland was to have an entirely self-sufficient system what additional volume and type of generation would be required (this should include black start capability)?
 - Are there any expected/planned policy or regulatory developments, such as locational pricing, which could impact the future system, and what impacts will these be expected to have?
10. [Redacted – internal communications]

Next steps

- A draft scope will be submitted to ClimateXChange for approval
- Analysis will be commissioned over a period of 3 – 6 months
- Officials will report back with initial findings and to discuss presentation of any results.

Recommendation

4. That you:
 - Note the content of this submission

[Redacted – Out of Scope]

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constituent Interest	General Awareness
Cabinet Secretary for Net Zero, Energy and Transport			X		

Kersti Berge
William Black
[Redacted]

13. Document 13

'Electricity - Security - Cab Sec NZET submission CXC research on security of supply - 30 March 2022 (vA55134814) (003)'

[Redacted]
Onshore Electricity Policy Unit, DECC
30 March 2022

To: Cabinet Secretary for Net Zero, Energy and Transport;

SECURITY OF SUPPLY ANALYSIS

Purpose

1. To bring to your attention Scottish Government plans to commission research through ClimateXChange that will assess Scotland's security of electricity supply.

Priority

2. Routine.

Background

3. Security of electricity supply is a reserved policy area, delivered through UK Government electricity policy, Ofgem as the GB energy regulator, and National Grid ESO (the GB Electricity System Operator)
4. All aspects of security of electricity supply have historically been provided by nuclear stations, large fossil fuel power stations, pumped storage and hydro.
5. The closure of Scotland's coal stations during the last decade, the confirmed closure of Hunterston and the earlier than expected closure of Torness, leaves a gap in this traditional provision.
6. Given the increased demand for electricity that will arise through the decarbonisation of heat and transport, it is vital that Scottish Ministers remain confident in the actions of the electricity system operator to meet security of supply requirements.
7. Scottish Government's view is that, despite the assertions of the system operator, there is not yet a clearly articulated vision for how security of supply will be delivered within a zero carbon electricity system.
8. A full black out of the Scottish electricity system would have a huge impact on Scotland's society and economy, including up to £1bn lost from the Scottish economy for a full day without electricity supply

Proposed Study

9. SG officials intend to commission research, through ClimateXChange, to provide Scottish Government with its own assessment of electricity system

security requirements under net zero conditions and establish a firm evidenced basis to scrutinise National Grid ESO's plans in this area

10. The expected output of this work would be a report that answers the following questions:

- What technology developments need to take place in Scotland to ensure a secure and reliable supply of low and zero carbon electricity out to 2045. This should include generation technologies, networks, flexible response, and storage.
- What are the likely impacts on transfers of electricity from/to Scotland and the rest of GB, in an electricity system powered almost entirely by intermittent renewables.
- If Scotland was to have an entirely self-sufficient system what additional volume and type of generation would be required (this should include black start capability)?
- Are there any expected/planned policy or regulatory developments, such as locational pricing, which could impact the future system, and what impacts will these be expected to have?

11. [Redacted – internal communications]

Next steps

- A draft scope will be submitted to ClimateXChange for approval
- Analysis will be commissioned over a period of 3 – 6 months
- Officials will report back with initial findings and to discuss presentation of any results.

Recommendation

12. That you:

- Note the content of this submission

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constituent Interest	General Awareness
Cabinet Secretary for Net Zero, Energy and Transport			X		

Kersti Berge William Black [Redacted]

14. Document 14 'OCEA Analysis - Wind Security of Supply - Aug 22'

Wind Security of Supply

OCEA Energy Analysis: August 2022



Half Hourly Electricity Demand Vs. Wind Generation - Scotland 2020

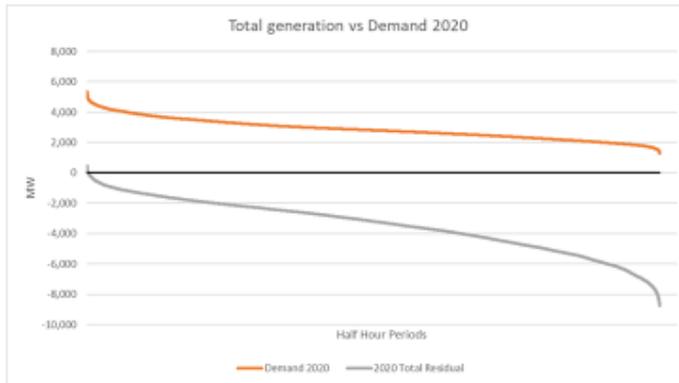


This chart shows:

- Half hourly electricity demand (orange) and wind generation (blue) in 2020 – in chronological order
- Electricity demand and wind generation fluctuate throughout the year (and any given year)
- There are periods when wind generation is sufficient to meet demand and periods when demand exceeds generation.
- Demand is variable, but not as variable as wind generation
- The chart is tricky to interpret though due to the erratic nature of the lines...



Total Generation Vs. Demand - Scotland 2020



This chart shows:

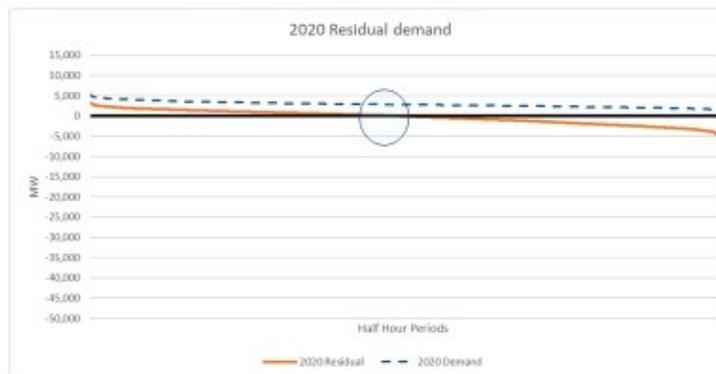
- Half hourly demand in 2020, sorted from highest to lowest
- Residual demand (demand minus **total generation** in each half hourly period) sorted from highest to lowest
- If residual demand is negative then generation is greater than demand, and vice versa.

The takeaways are

- In 2020 electricity demand exceeded supply approx. 0.2% of the time (~1 day)
- **This includes all generation technologies on the electricity system in Scotland in 2020.**



Residual Demand (Renewables only) 2020

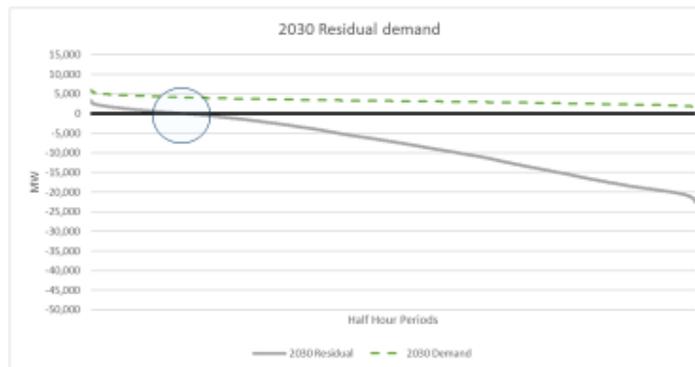


This chart shows that:

- Removing all other (non-renewable) generation technologies from the system in 2020 would result in generation meeting demand only 51% of the time
- Across the year, the volume of excess supply could approximately balance residual demand.



Residual Demand (Renewables) 2030

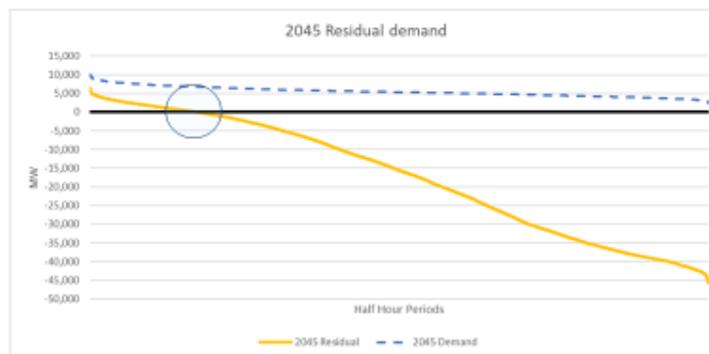


This chart shows that:

- Extrapolating demand and generation data out to 2030 (assuming only renewables on the system), would result in generation meeting demand around 85% of the time
- There would be **circa 56 days in the year when generation from renewables would be insufficient to meet demand**
- See general assumptions slide 11 for details on level of renewables assumed in 2030



Residual Demand (Renewables) 2045



This chart shows that:

- Extrapolating demand and generation data out to 2045 (assuming only renewables on the system), would result in generation meeting demand around 83% of the time
- There would be **circa 63 days in the year when generation from renewables would be insufficient to meet demand**
- This is because demand, peak demand in particular, is expected to increase significantly by 2045
- See general assumptions slide 11 for details on level of renewables assumed in 2030



Residual Demand for renewables



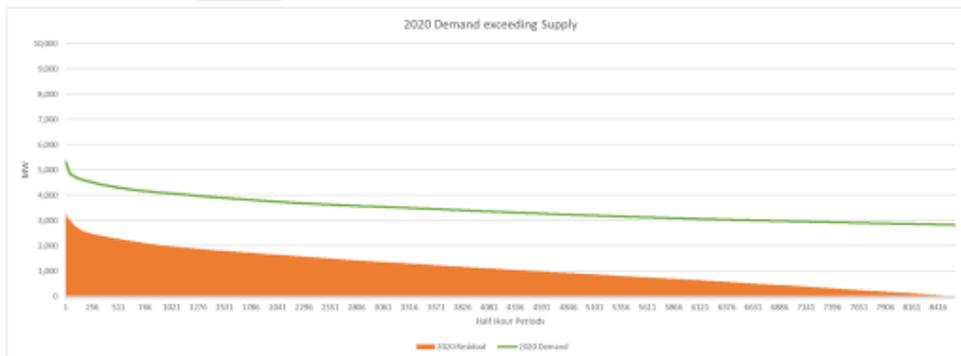
Residual = Demand – (Offshore Wind + Onshore Wind + Biomass + Hydro)

Time when supply is above demand	half hourly periods	%
2020	8985	51%
2030	14890	85%
2045	14535	83%

- Assuming a steady level of demand, the more renewable generation that is put on the system, the greater proportion of time generation will meet demand.
- However, there will always be the risk of extended, extreme periods of very low wind when demand cannot be met by renewables.
- In theory, additional generation (or storage) techs could be added to the system to manage these periods of low wind. However these periods, and the potential add-on techs must be explored in more detail.



2020 Demand Exceeding Supply (renewables only)

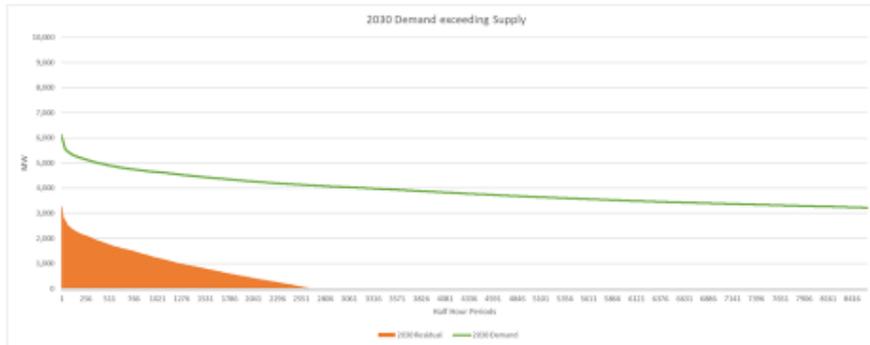


- This chart and the following 2 charts focus in on the half hourly periods where demand > supply
- NB – the x axis represents half hourly periods in a given year, of which there are c17,500 – so these charts only show 50% or 6 months of a year.

2020 Demand Shortfall	Half Hour periods	days
0 - 2 GW	7626	159
2 - 4 GW	953	20
4+ GW	0	0
Total	8579	179



2030 Demand Exceeding Supply (renewables only)

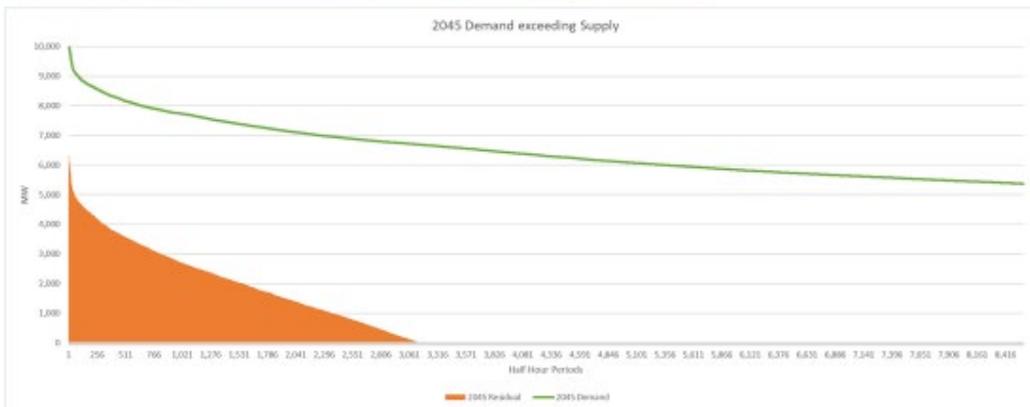


- In 2030, electricity demand would exceed renewables supply for the equivalent of 56 days, and at its peak would be in excess of 3GW

2030 Demand Shortfall	Half Hour periods	days
0 - 2 GW	2342	49
2-4 GW	332	7
4+ GW	0	0
Total	2674	56



2045 Demand Exceeding Supply



- In 2045 electricity demand would exceed renewable generation for the equivalent of 63 days in the year, peaking at over 6GW shortfall.

2045 Demand Shortfall	Half Hour periods	days
0 - 2 GW	1566	33
2 - 4 GW	1173	24
4+ GW	290	6
Total	3029	63



General assumptions

- For 2030:
 - Onshore wind figures inflated from around 8 GW to 20GW
 - Offshore wind inflated from around 1GW to 11GW
 - Hydro and other renewables remained steady at 2020 levels
 - Assumed that Offshore wind load factor increased to around 50%
 - Assumed that baseline 2020 figures could be inflated around 10% because of curtailment. (This is conservative as curtailment was closer to 16%)
- For 2045
 - Onshore wind remains the same as 2030 (around 20GW)
 - Inflated offshore wind figures to 36 GW
 - Hydro and other renewables remained steady at 2020 levels
 - Assumed that Offshore wind load factor increased to around 50%
 - Assumed that baseline 2020 figures could be inflated around 10% because of curtailment. (This is conservative as curtailment was closer to 16%)
- Generation data comes from generators connected to the transmission network. This means small generators such as solar is not included as an individual category. However, they are implicitly included through the demand data which is net demand at the point where transmission and distribution networks cross (Grid Supply Points).



Analytical Gaps & Next Steps

- Potential to add further projects into the analysis (such as Peterhead CCS) to see their impact on security of supply.
- Intend to update with 2021 data when available.



EIR 202200322629 Emails Master File – Redacted

This file provides the contents of emails related to the EIRs request.

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Where redactions are made noting "redaction – internal communications", an exception under regulation 10(4)(e) of the EIRs (internal communications) applies to some of the information you have requested because it is internal communication between Scottish Government officials about analysis to help inform discussion to help inform ongoing research. This exception is subject to the 'public interest test'. Therefore, taking account of all the circumstances of this case, we have considered if the public interest in disclosing the information outweighs the public interest in applying the exception. We have found that, on balance, the public interest lies in favour of upholding the exception. We recognise that there is some public interest in release as part of open, transparent and accountable government, and to inform public debate. However, there is a greater public interest in high quality policy and decision-making, and in the properly considered implementation and development of policies and decisions. This means that Ministers and officials need to be able to consider all available options and to debate those rigorously, to fully understand their possible implications. Their candour in doing so will be affected by their assessment of whether the discussions on the future electricity system will be disclosed in the near future, when it may undermine or constrain the Government's view on that issue while it is still under discussion and development.

Where redactions are made noting "redacted – free and frank advice", an exception under regulation 10(4)e (Internal Communications) of the EIRs applies to some of the information you have requested. This exception is subject to the 'public interest test'. Therefore, taking account of all the circumstances of this case, we have considered if the public interest in disclosing the information outweighs the public interest in applying the exception. We have found that, on balance, the public interest lies in favour of upholding the exception. We recognise that there is some public interest in release as part of open, transparent and accountable government, and to inform public debate. However, there is a greater public interest in allowing a private space within which officials can provide free and frank advice and views to Ministers in briefings. It is clearly in the public interest that Ministers can properly answer Parliamentary questions, provide sound information to Parliament (to which they are accountable), and robustly defend the Government's policies and decisions. They need full and candid advice from officials to enable them to do so. Premature disclosure of this type of information could lead to a reduction in the comprehensiveness and frankness of such advice and views in the future, which would not be in the public interest.

Emails

1. Document 1:

Subject	RE: Electricity Security of Supply
From	[Redacted]
To	[Redacted]; [Redacted]; Low R (Ragne)
Cc	[Redacted]
Sent	15 August 2022 17:25

Yes, sure. A few folk are on holiday this week, but I can set up a call later this week for those who are around.

This is a precursor to the more detailed CXC work, but hopefully it can provide some initial insight.

[redacted]

From: [Redacted] <redacted@gov.scot>

Sent: 15 August 2022 14:17

To: redacted <redacted@gov.scot>; redacted <redacted@gov.scot>; Low R (Ragne) <redacted@gov.scot>

Cc: redacted <redacted@gov.scot>; redacted <redacted@gov.scot>; redacted <redacted@gov.scot>

Subject: RE: Electricity Security of Supply

Hi [Redacted],

Sorry I'm very late to this party!

These slides are absolutely amazing and I think there is going to be a lot of interest in them (indeed I've copied in our DD Ragne).

I'm struggling to get my head a few of them though... could we do a short session on them?

Thanks,

[Redacted]

From[Redacted] <[Redacted]@gov.scot>

Sent: 11 August 2022 16:33

To: [Redacted] <[Redacted]@gov.scot>; [Redacted] <[Redacted]@gov.scot>

Subject: FW: Electricity Security of Supply

FYI – as shared previously, slightly updated results in the below PPT/email.

[Redacted]

From: [Redacted]
Sent: 11 August 2022 15:25
To: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>
Cc: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>
Subject: RE: Electricity Security of Supply

Hi [Redacted],

- [Redacted – internal communications]

As you know we have the CXC project coming up which will look at this in more detail, and from a more technical perspective, so we should get more insight from that. If there's anything else you want us to explore in the meantime let me know.

[Redacted]

[OCEA Analysis - Wind Security of Supply - Aug 22 \(A39978068\)](#)

From: [Redacted])
Sent: 08 August 2022 11:04
To: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>
Cc: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>
Subject: RE: Electricity Security of Supply

Hi [Redacted],

Yes, both are from 2020, so we could inflate the production figures by the level of curtailment. I suppose my thinking was that it would be overly optimistic to include zero curtailment in all future periods (particularly in 2030), so we might want to choose a more 'normal' pattern/volume of curtailment and retain that for these calculations.

Let us know what you think – we got new data today so can hopefully update the workings in the next day or two. If it is more urgent than that let us know.

[Redacted]

From: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>
Sent: 04 August 2022 20:59
To: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>
Cc: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>
Subject: RE: Electricity Security of Supply

Hi [Redacted],

Thanks for this.

I'll look in more detail tomorrow, but I wanted to check if the production data is also based on 2020 figures? Because if that was the case then it shouldn't matter that constraint is higher as the production would be lower by that equivalent (so production+curtailment=potential for any given year).

If the production figures are different or over a larger period than we have equivalent curtailment data for then that's fair enough, I just wanted to check.

Thanks,

[Redacted]

From: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>

Sent: 04 August 2022 17:19

To: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>

Cc: [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted] <[Redacted] [@gov.scot](mailto:[Redacted]@gov.scot)>

Subject: Electricity Security of Supply

[Redacted],

[Redacted – internal communications]

[OCEA Analysis - Wind Security of Supply - Aug 22 details - Objective ECM \(scotland.gov.uk\) \(document 44\)](#)

[Redacted]

PS. We also pulled constraint data but didn't include this as apparently constraints in 2020 were higher than normal, so if we did want to apply an uplift because of that we'd need to agree an approach. Upshot is what we have here is conservative.

[Redacted] Energy Economics | Office of the Chief Economic Adviser
Scottish Government
Atlantic Quay | Glasgow | G2 8LU

[Redacted]

2. Document 2:

Subject	RE: Routine Submission - briefing on nuclear energy and policy issues - August 2021
From	[Redacted]
To	Cabinet Secretary for Net Zero, Energy and Transport; Minister for Business, Trade, Tourism & Enterprise
Cc	Cabinet Secretary for Finance and Economy; Minister for Environment, Biodiversity & Land reform; DG Economy; Berge K (Kersti); Hogg A (Andrew); Black W (William); [Redacted] Director of International Trade and Investment; [Redacted] DECC: Operations Team Mailbox
Sent	09 August 2021 15:44

PO Mr Matheson, Mr McKee

With thanks to colleagues who attended, I attach the following short summary of Friday's key discussion points and the agreed actions.

Baseload and security of supply for post Hunterston / Torness

- Cab Sec asked for a paper that lays out the potential scenarios for Scottish electricity generation and security of electricity supply, in the years to come and post 2030, in light of the coming closures at Hunterston and (later) Torness.
- This will encompass possible gaps and risks, information on responsibilities and possible actions in this area, and the pros and cons attached to these – e.g. deployment of gas with CCS, BECCS, SMR and other options.
- This paper will provide the basis for a further discussion as requested by Cab Sec, as well as key background and context for coming engagements with others (including the GB electricity system operator, with whom Mr Matheson has a call scheduled in early September).
- **ACTION: energy policy officials will draft and forward a paper as requested before the end of this month.**

The STEP reactor process and competition

- STEP (fusion) reactors are long term propositions in terms of actual deployment (forecast is 2040s), and won't play a role in closing the post-Hunterston / Torness gap(s).
- [Redacted – free and frank advice]
- [redacted – out of scope]

Kind regards,
[Redacted].

From: [Redacted]

Sent: 04 August 2021 15:54

To: Cabinet Secretary for Net Zero, Energy and Transport <CabSecNetZET@gov.scot>; Minister for Business, Trade, Tourism & Enterprise <MinisterBTTE@gov.scot>

Cc: Cabinet Secretary for Finance and Economy <CabSecFE@gov.scot>; Minister for Environment, Biodiversity & Land reform <MinisterEBLR@gov.scot>; DG Economy <DGEconomy@gov.scot>; Berge K (Kersti) <[Redacted]@gov.scot>; Hogg A (Andrew) <[Redacted]@gov.scot>; Black W (William) <[Redacted]@gov.scot>; [Redacted] Director of International Trade and Investment <DirectorDITI@gov.scot>; [Redacted] DECC: Operations Team Mailbox <DOT@gov.scot>

Subject: RE: Routine Submission - briefing on nuclear energy and policy issues - August 2021

Further to the briefing submitted on Tuesday (reattached here), and given that Cab Sec will be travelling at the time, I attach the following suggested agenda as a guide for Friday's discussion:

- **Existing nuclear stations**
 - Retiral timelines
 - Security of supply issues and risks
- **New nuclear technologies**
 - Brief summary of STEP / SMR technologies
 - Stakeholder pressure and supply chain / investment opportunities
- **Energy Strategy refresh**
 - Expectations on nuclear policy update
 - Initial view on potential options

I won't be able to take part, but **Andy Hogg** and [Redacted] will lead the discussion from the energy policy side, while [Redacted] or one of his DITI team will also hopefully be able to dial in.

Kind regards,
[Redacted].

From: [Redacted]

Sent: 03 August 2021 07:48

To: Cabinet Secretary for Net Zero, Energy and Transport <CabSecNetZET@gov.scot>; Minister for Business, Trade, Tourism & Enterprise <MinisterBTTE@gov.scot>

Cc: Cabinet Secretary for Finance and Economy <CabSecFE@gov.scot>; Minister for Environment, Biodiversity & Land reform <MinisterEBLR@gov.scot>; DG Economy <DGEconomy@gov.scot>; Berge K (Kersti) <[Redacted]@gov.scot>; Hogg A (Andrew) <[Redacted]@gov.scot>; Black W (William) <[Redacted]@gov.scot[Redacted] >; Director of International Trade and Investment <DirectorDITI@gov.scot>; [Redacted]; DECC: Operations Team Mailbox <DOT@gov.scot>

Subject: Routine Submission - briefing on nuclear energy and policy issues - August 2021

PO Mr Matheson, Mr McKee

I attach a briefing paper addressing a number of current nuclear energy policy issues, ahead of a call between the Cabinet Secretary and officials this coming **Friday (6th August at 10:00)** to discuss these matters. It will clearly be helpful if Mr Matheson has time to read the paper ahead of that discussion.

Kind regards,

[Redacted].

[Redacted]

Head of Electricity Networks / Large Scale Renewables
4th Floor
5 Atlantic Quay
150 Broomielaw
GLASGOW
G2 8LU

[Redacted]

Best wishes,

William

William Black
Deputy Director Onshore Electricity Policy, Strategic Co-ordination & Energy Consents
Directorate for Energy and Climate Change
Scottish Government

Executive Assistant: [Redacted]

Please note I'm working flexibly, if you receive this outwith normal working hours please do not feel you need to pick this up outside of your own normal working hours.

5 Atlantic Quay, 150 Broomielaw, Glasgow G2 8LU

[Redacted] ✉: [\[Redacted\]@gov.scot](mailto:[Redacted]@gov.scot)

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3. Document 3:

From: [Redacted]

Sent: 31 January 2022 14:32

To: [Redacted]

Subject: FW: Oral PQ for wednesday

Hi [Redacted],

Please see below update on the Oral PQ that [Redacted] sent through last week

Just thinking about some supplemental questions to add – any others?

1. What is SG position on new nuclear?
2. How will SG support workers following closure of Torness and Hunterston?
3. How will SG keep secure supply following nuclear closures?

[redacted – out of scope]

4. Document 4:

From: [Redacted]

Sent on: Thursday, October 13, 2022 5:25:08 PM

To: [Redacted]

Subject: FW: PQ Reference: S6W-05501

[Redacted]

Hi both,

Just sending these amended PQ's over for checking before I re-submit on the PQ Tracker.

To ask the Scottish Government from where specifically it will source energy that is currently generated by the Torness nuclear power station, following its closure.

[redacted – free and frank advice]

Answer – *Scotland is a net electricity exporter and in 2020 exported 20.4 TWh of electricity, equivalent to powering every household in Scotland for 26 months. It only imported a little over 1 TWh of electricity, meaning that net exports of electricity were 19.3 TWh in 2020, its highest year on record.*

Looking ahead there are 338 renewable electricity projects with a capacity of 15.2 GW in the pipeline. Were all of this capacity to be delivered it would generate an estimated 36.7 TWh of renewable electricity. It is worth noting, however, that there are a number of factors that mean that projects consented in the pipeline may not progress to commissioning.

Security of electricity supply is a reserved matter and is delivered by National Grid ESO across the whole of Great Britain under regulation from Ofgem. A combination of large scale hydro, gas and nuclear power stations as well as the capacity to import electricity from elsewhere in the UK provide secure supply capacity.

Scottish Electricity supplies are currently considered secure with around 9GW's of secure supply to meet peak demand of around 5GW's. National Grid ESO has conducted a study of the effects of the earlier than expected closure of nuclear generation in Scotland which concludes that the system will remain secure with any potential operational issues and risks being identified and mitigations put in place.

To ask the Scottish Government what it anticipates will be the source of energy that replaces that currently generated by nuclear power stations in Scotland; whether this will be from (a) fossil fuels or (b) renewable wind power; where precisely that power will be generated, and whether it will publish its calculations regarding how the current level of nuclear power generation will be replaced by these alternative sources.

[redacted – free and frank advice]

Answer – *Scotland is part of a GB electricity system that is managed by National Grid in its role as Electricity System Operator. NGENSO is responsible for sourcing generation to meet demand. Scotland is currently a net electricity exporter and in 2020 exported 20.4 TWh of electricity, equivalent to powering every household in Scotland for 26 months. It only imported a little over 1 TWh of electricity, meaning that net exports of electricity were 19.3 TWh in 2020, its highest year on record.*

A mixture of renewables, storage and carbon capture technology – as well as increased interconnection across GB and to the continent – can support a secure and decarbonised power sector in Scotland following the closure of the existing large nuclear generators.

Please feel free to amend as you see fit and as always all suggestions most welcome.

Once you are both happy I can clear on system,

Thanks for all your help on these,

[Redacted]

[redacted – out of scope]

5. Document 5

From: [Redacted]
Sent on: Thursday, October 13, 2022 5:25:21 PM
To: [Redacted]
Subject: FW: Submission - Security of supply analysis

[Redacted]

From: [Redacted]
Sent: 11 April 2022 15:39
To: Cabinet Secretary for Net Zero, Energy and Transport <CabSecNetZET@gov.scot>
Cc: Berge K (Kersti) <[Redacted]@gov.scot>; Black W (William) <[Redacted]@gov.scot>; [Redacted]
Subject: RE: Submission - Security of supply analysis

Hello [Redacted],

[redacted – free and frank advice]

Just to be absolutely clear, electricity security of supply is not considered to be an issue currently and NG's ESO's view is that electricity supplies will continue to be secure after the closure of Torness.

The proposed project came about as a result of a call for invitations to bid for CXC funding. The timescales for this were extremely tight.

[redacted – free and frank advice]

Best regards

[Redacted]

From: [Redacted] **On Behalf Of** Cabinet Secretary for Net Zero, Energy and Transport
Sent: 11 April 2022 11:57
To: [Redacted] Cabinet Secretary for Net Zero, Energy and Transport <CabSecNetZET@gov.scot>
Cc: Berge K (Kersti) <[\[Redacted\]@gov.scot](mailto:[Redacted]@gov.scot)>; Black W (William) <[\[Redacted\]@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted]
Subject: RE: Submission - Security of supply analysis

[redacted – out of scope]

From: [Redacted]
Sent: 30 March 2022 17:31
To: Cabinet Secretary for Net Zero, Energy and Transport <CabSecNetZET@gov.scot>
Cc: Berge K (Kersti) <[\[Redacted\]@gov.scot](mailto:[Redacted]@gov.scot)>; Black W (William) <[\[Redacted\]@gov.scot](mailto:[Redacted]@gov.scot)>; [Redacted]
Subject: Submission - Security of supply analysis

PO/ Cab Sec

Please see attached a short submission which outlines plans for analysis that will be commissioned to assess security of electricity supply in Scotland.

This is a routine submission for information. Officials will report back with further information when it becomes available

Best regards

[Redacted]

[Redacted] [Head of Electricity Networks and Regulation](#)

[Directorate of Energy and Climate Change | Scottish Government](#)

5 Atlantic Quay, Glasgow, G2 8LU [Redacted]



6. Document 6

From: [Redacted]

Sent: 15 December 2021 12:18

To: [Redacted]

Subject: NESOS

Hello [Redacted]

We are aware that EDF are announcing its decision on Torness and I just wanted to check if we are able to reference the NESOS in any way.

[redacted – internal communications]

Grateful if you could get back in the next couple of hours if at all possible as this will inform FMQ's

(We can use other lines if that's not possible however)

Best regards

[Redacted]

[Redacted] | [Head of Electricity Networks and Regulation](#)

[Directorate of Energy and Climate Change | Scottish Government](#)

5 Atlantic Quay, Glasgow, G2 8LU [Redacted]



7. Document 7

Subject	RE: Torness end of generation
From	[Redacted]
To	[Redacted] Black W (William)
Cc	[Redacted]
Sent	15 December 2021 09:46
Attachments	<<RE PQs for Review by COP today if possible .msg>> -

Brilliant, thanks for that [Redacted] and pleased to see that [Redacted] has sent the update to CabSec.

[redacted – free and frank advice]

- What does this mean for security of supply

- The Scottish Government is clear that a mixture of renewables, storage and carbon capture technology – as well as increased interconnection across GB and to the continent – can support a secure and decarbonised power sector in Scotland following the closure of the existing large nuclear generators.
- [Redacted – internal communications]

- The Scottish Government are consulting on an ambition for an additional 8-12GW of Onshore Wind to be installed by 2030, which would complement the existing ambition for offshore wind capacity to reach 11GW by 2030.
- Peterhead power station, owned by SSE, represents the last large scale unabated fossil fuel power station in Scotland. SSE are currently exploring the potential to replace the current power stations with a new CCS enabled natural gas power station before the end of the current decade.
- Scottish Government provided £550,000 of funding to support demonstration of wind energy providing security of supply services including frequency response and black start, at the Dersalloch Windfarm in Ayrshire, which was the first demonstration of its kind in the world.

[redacted – out of scope]

From: [Redacted]
Sent: 15 December 2021 09:00
To: [Redacted] Black W (William) <[Redacted]@gov.scot>
Cc: [Redacted]
Subject: FW: Torness end of generation

Hi all,

Please see [Redacted] update below.

I spoke to [Redacted] about this late last night and he has went ahead and informed the Cab Sec.

I have added the update on the Torness end of generation date to the Briefing for tomorrow's meeting the cab sec has with [Redacted] of EDF. (Just need to tidy up a few things and I will send round for checking this morning before passing to PO)

William I believe you will be in attendance as official support?

Thanks,

[Redacted]

[Redacted]

Utilities, Markets and Networks | Energy Industries Division
Directorate for Energy and Climate Change | Scottish Government
Atlantic Quay | 150 Broomielaw | Glasgow G2 8LU
[Redacted]

From: [Redacted]

Sent: 14 December 2021 19:36

To: Cabinet Secretary for Net Zero, Energy and Transport <CabSecNetZET@gov.scot>

Cc: Critical Infrastructure Resilience Unit <CIRU@gov.scot>; [Redacted]

Subject: Torness end of generation

Good evening,

EDF have informed the RES Team that at meetings of EDF Group board yesterday and today a lifetime review was carried out on four of the currently active AGR stations.

The outcome sees the estimated end of generation date for **Torness** and Heysham 2 reforecast to March 2028 (previously 2030) and the date for Heysham 1 and Hartlepool remain at March 2024.

The news for Torness was not unexpected, given the issues that other AGR stations, including Hunterston B have faced in relation to graphite core cracking in recent years.

It should be noted though that at its last inspection earlier this year there were no cracks found in the Torness graphite core [Redacted – free and frank]

It is unclear how much media attention this announcement will attract and EDF will be posting the attached media piece to their media centre tomorrow morning and will be sending a localised version of this as a release to the local Torness papers.

If you require any more information do not hesitate to contact me.

Regards

[Redacted]

[Redacted]

Scottish Government
Resilience Essential Services Team

5 Atlantic Quay
150 Broomielaw
Glasgow G2 8LU

[Redacted]



8. Document 8

Subject	RE: Environmental Information (Scotland) Regulations 2004 (EIRs) Request - Peterhead
From	[Redacted]
To	[Redacted]
Cc	[Redacted]
Sent	17 October 2022 11:53

...re [Redacted] email below, I agree – we (the ECU) are processing an application to construct and operate Peterhead low carbon CCGT generating station. The issue re how Scotland will meet electricity demand in the event of the power stations at Torness and Peterhead being decommissioned has not yet been part of that process.

Happy to discuss.

Regards

[Redacted]

[Redacted]

Consents Manager | Energy Consents Unit

The Scottish Government | [Redacted]

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From: [Redacted]

Sent: 17 October 2022 11:49

To: [Redacted]

Cc: [Redacted]

Subject: Environmental Information (Scotland) Regulations 2004 (EIRs) Request - Peterhead

Hi [Redacted]

I would expect it is unlikely that ECU would hold anything relevant.

I am copying in [Redacted] who is the case officer for the Peterhead CCS power station application to respond to this request for ECU.

Thanks

[Redacted] | Team Leader | Energy Consents Unit

The Scottish Government | [Redacted]

From: [Redacted]

Sent: 17 October 2022 10:46

To: [Redacted]

Subject: RE: Environmental Information (Scotland) Regulations 2004 (EIRs) Request

Hi [Redacted]

I've attached my response to [Redacted] on this – hope that covers it.,

Let me know if you need anything further

From: [Redacted]

Sent: 17 October 2022 10:22

To: [Redacted]

Subject: FW: Environmental Information (Scotland) Regulations 2004 (EIRs) Request

[redacted – out of scope]

9. Document 9

Subject	211027 - GATECHECK - Gatecheck email issued to consultees - Peterhead Low Carbon CCGT Power Station - 27 October 2021
From	[Redacted]
To	[Redacted]

Cc	[Redacted]
Sent	27 October 2021 13:16
Attachments	<<211026 - GATECHECK - Gatecheck report recieved from APP - Peterhead Low Carbon CCGT Power Plant - 26 October 2021.pdf>> Document 10

Peterhead Low Carbon CCGT Power Station

Dear Consultee,

You previously provided a response to the scoping consultation for the above proposal. DWD Property and Planning on behalf of SSE Thermal Generation (Scotland) Limited, the developers for the proposal, have taken on board the issues raised in the responses received and the attached gatecheck report details how they propose to address them. Can you please advise if you agree what is being proposed in addressing the respective issues raised in your scoping consultation response and please advise if there is anything further that you believe is still required.

I would be grateful for your comments by **17 November 2021**.

If you have any queries regarding this email please do not hesitate to contact me.

Kind regards

[Redacted]

[Redacted] | **Team Leader | Energy Consents Unit**

The Scottish Government | [Redacted]