

RenewableNI response to SONI draft Transmission Development Plan 2021-2030

RenewableNI (RNI) is the trade association and voice for the renewable electricity industry in Northern Ireland. We represent over 40 businesses, fostering knowledge exchange, sharing best practice and supporting policy development. Engaged in wind, solar and battery storage, our members make up a large majority of the renewable industry supply chain.

RNI welcomes the opportunity to respond to SONI's consultation on the draft Transmission Development Plan for Northern Ireland (TDPNI) 2021-30.

Policy Context

The UK Government has set in legislation a requirement for a 'net zero' economy by 2050. As the leader in decarbonisation, the power sector will have to achieve zero carbon first, with heat and transport expected to significantly electrify as the main way of cutting emissions. The International Energy Agency has stated that all advanced economies must achieve zero carbon power by 2035¹ and the UK Government has made a commitment to achieve this².

Working in conjunction with Wind Energy Ireland, RNI is committed to driving policy to deliver zero carbon power on the island of Ireland by 2035. This can only be achieved if the necessary level of renewable generation and the required zero carbon system services, are facilitated by the electricity network.

RNI therefore welcomes the publication of the SONI [*Shaping Our Electricity Future Roadmap*](#) (SOEF) which sets out the necessary upgrades required to facilitate an additional 1.5GW of onshore renewables by 2030.

RNI's [*Achieving Zero*](#) report provides a pathway for zero carbon power and concludes that the technologies needed to achieve this are known to us today. RNI contends that SONI must ultimately plan for zero carbon power and working backwards from this, and therefore should recognise that 2030 is only a staging post and not the end goal. This will be crucial in delivering connections for the 1GW from 2030 target for offshore wind outlined in the [*Energy Strategy Action Plan 2022*](#).

¹ Pg 20, [*Net Zero by 2050*](#)

² <https://www.gov.uk/government/news/plans-unveiled-to-decarbonise-uk-power-system-by-2035>

Having passed Final Stage on 9th March, the Climate Change (No. 2) Bill will increase NI's renewable electricity generation target, once it receives Royal Assent. The Bill states:

"15.—(1) The Department for the Economy must ensure that at least 80% of electricity consumption from renewable sources by 2030."³

In particular the revised SOEF should reflect the target of 1GW of offshore wind from 2030, outlined in the *Energy Strategy Action Plan 2022* as well as the 900MW solar envisaged in the *Accelerated Ambition* scenario in the SONI [*Tomorrow's Energy Scenarios*](#). Furthermore, a clear process for connecting offshore renewables will be required.

[Latest figures](#) published by the Department for the Economy (DfE) show that 41% of our electricity consumption in Northern Ireland was from renewable sources (RES-E). This is likely an inflated figure as DfE's methodology of calculating RES-E does not take account for transmission and distribution system losses. RNI therefore welcomes the commitment in the Energy Strategy to review the methodology.

While DfE's RES-E figure may not be an accurate measure, it is a useful way of monitoring trends. The drop in renewable generation in 2021 when compared with 2020, when RES-E was recorded as 49%, does highlight the need for a diverse mix of renewables backed up with zero carbon services and green hydrogen production and storage.

Dispatch Down

The projects outlined in the TDPNI will be vital in reducing constraint levels in NI which had been rising significantly since 2018. Even in 2021, which was a low wind year, constraints remained over 4%. Analysis by Mullan Grid (See Appendix 1) suggests that constraints on the existing N-S Interconnector make up a significant proportion of those experienced in NI and will therefore be significantly reduced by the completion of the second N-S Interconnector.

Curtailment levels in NI have also followed a similar trend with SNSP increases failing to have a significant impact. Mullan Grid assess minimum generation levels of conventional plant (min gen)

³ <http://www.niassembly.gov.uk/globalassets/documents/legislation/bills/executive-bills/session-2017-2022/climate-change-no.-2-bill/climate-chnage-no.-2-bill-as-amended-at-fcs---full-print-version.pdf>

as being the predominant driver of curtailment and note that between April-December 2021 min gen was responsible for all curtailment across the island.

As renewable generation increases there must be a corresponding decrease in min gen, in order to decarbonise our power system. Baringa's *Achieving Zero* study shows how min gen can be phased out while maintaining system security through the deployment of long duration storage technologies and hydrogen fuelled baseload. Highlighting that these technologies are known to us today, Baringa's analysis points to the importance of developing market structures to incentivise investment in such technologies.

Mullan Grid estimate that total Dispatch Down has resulted in lost revenue for renewable generators of £21m, £24.5m and £16m in 2019, 2020 and 2021 respectively. As the power is instead being provided by fossil fuel generators there is also a carbon cost, estimated by Mullan Grid to have equated to 0.688MtCO₂ across the island in 2020.

It is vital that transmission system developments keep pace with the connection of new renewable generation, and we see a corresponding ramping down of min gen, otherwise constraint levels will make future renewable investments unfinanceable and potential carbon savings will not be realised.

Project Pipeline

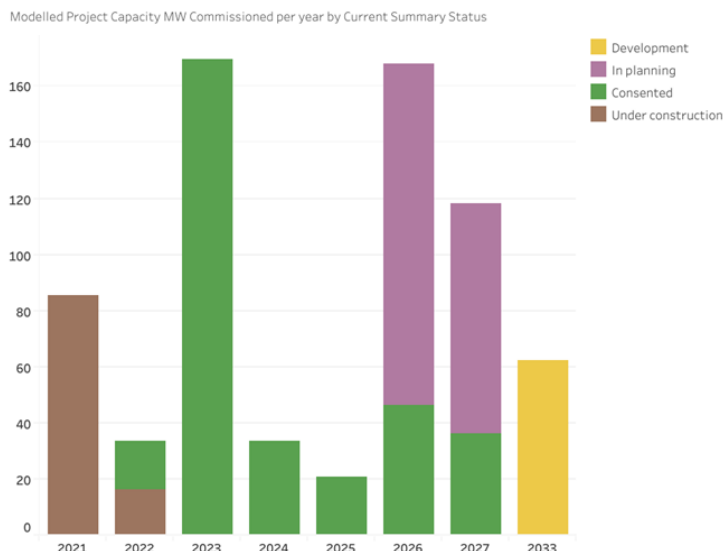
RNI conducted its annual pipeline survey in April 2021 and supplemented this with data from the RenewableUK [*Energy Pulse*](#) resource. It shows that at that time, the following level of projects were in development:

- 1,100MW of onshore wind
- 1,320MW of offshore (wind & tidal)
- 361MW of solar PV
- 578MW of battery storage

See Appendix 2 for further detail.

Analysis using the *Energy Pulse* modelling tool provides an estimated connection timeline for onshore wind projects (NB this does not include approx. 210MW of projects that were at the pre planning stage, details of which were gleaned from the RNI Pipeline Survey).

RNI will be conducting a further pipeline survey in April 2022 and will share its results with SONI and other stakeholders.



Connecting Future Renewable Generation

RNI is concerned that transmission development in NI continues to lag significantly behind the build out of renewable generation. As a result it has become highly challenging for renewable projects to secure bankable transmission access. RNI notes that prior to January this year, there had been no new large scale renewable connections for three years.

RNI welcomes the adoption by NIE Networks of a Non-Firm Access connection policy in January this year which will allow for new connections for projects with a capacity greater than 5MW. This will allow for additional capacity to connect, however these projects will face ever increasing constraint levels to the point where the connection of new renewables becomes financially unviable. At a time when the 80% by 2030 target will require us to connect new renewables at a pace not previously seen, the lack of a Firm Access policy will act as a significant barrier to new connections. The Non Firm Access policy was intended as an interim solution to allow new connections in the absence of a wider energy policy. Now that the Energy Strategy has been published it is vital that progress is made on a Firm Access Policy.

As well as presenting an increase in the volume of transmission reinforcement projects, the TDPNI must accelerate the pace at which these reinforcements are delivered. Otherwise the 80 by 30 target will become unachievable.

RNI notes that the draft TDPNI indicates that 11 new transmission development projects have been added and 2 existing projects have been cancelled. Whilst this may be positive, the pace with which the projects are being developed and progressed to completion appears to be stationary, if not slowing down. With the exception of a small number of projects, namely:

- the North West Voltage Support (improvement from 2026 to 2025)
- Coolkeeragh-Killymallaght-Strabane 110kV Uprate (improvement from 2027 to 2025)
- Part 1 of the Castlereagh – Hannahstown 110kV Reinforcement
- Tamnamore – Drumnakelly 110kV uprate

the majority of reinforcement projects are indicated in the plan as delayed further. The following are examples of delayed projects:

- Mid-Antrim Upgrade (delay from 2026 to 2028)
- North West of NI 110 kV reinforcement (delay from 2026 to 2030)
- Omagh Main – Dromore Uprate (delay from 2022 to 2023)
- Omagh Main – Dromore Third Circuit (delay from 2029 to 2031)
- East Tyrone Reinforcement Project (delay from 2023 to 2026) and
- North-South Interconnector (slipping from 2023 to 2025).

For all but the North-South Interconnector project, reasons for the delay have not been given. We recognise that there can be inevitable delays to projects e.g. relating to planning, but we would urge that every effort be made to avoid delays to projects and we would suggest that clear reasons be given to every project that is being delayed in future. The delays in the Mid-Antrim Upgrade, North West of NI 110 kV reinforcement and North-South Interconnector are beginning to impact quite heavily on the forecast grid constraints, and consequently on the viability of renewable energy projects.

Appendix 3 details the timeline to date of the Mid Antrim Upgrade. This vital improvement has been continually delayed without a clear explanation as to why this has been the case. With only eight years to deliver against the new 80% target we need to see an urgency in developing the grid. RNI is consistently including transmission infrastructure in its calls for a streamlined planning process for green infrastructure projects.

At the UK level we have seen the Prime Minister announce his intention to fast track wind farms as a matter of national security⁴. We will be arguing that a similar approach needs to be taken in NI. Transmission reinforcements must also be included for this to be meaningful. We also recognise that SONI faces resourcing challenges, and we cover this later in this response.

RNI is keen to work in partnership with SONI to ensure that the planning and regulatory systems are favourable to renewable developments and decarbonisation of our electricity system.

We note that the TDPNI includes only projects that have received capital approval. It would be useful to include reference to those more strategic plans such as the projects at concept stage (e.g.

⁴ <https://www.theguardian.com/environment/2022/mar/13/tories-plan-big-expansion-of-wind-farms-to-protect-national-security>

those identified in SOEF). These are suggested to be pre-2030 projects, yet even those projects with approvals are experiencing delays to 2030. A more complete list would be welcomed and help manage expectations more appropriately.

Contestability

As yet, there is no process by which third parties can bid to deliver transmission system infrastructure. At the distribution level, contestability can in some cases deliver new infrastructure quicker and more cheaply than achievable by NIE Networks. RNI believes that the introduction of contestability for transmission infrastructure could bring a greater resource to help enable us to achieve our decarbonisation ambitions.

Publication of Quarterly ATR reports

RNI welcomes the publication of the *Q1 2022 ATR Status Update*⁵ on 2nd March but notes that this is the first such update since 2nd November 2018. ATRs are a contractual obligation on SONI and are necessary to deliver firm access in a meaningful way. RNI members are increasingly frustrated by the continual delays in the delivery of ATRs. While we appreciate that issues such as planning delays, are to a large extent outside the control of SONI, we hope that SONI can at least now provide ATR updates on a quarterly basis to at least keep the customer, and wider industry, informed.

Dynamic Line Rating

The *Shaping Our Electricity Future* roadmap jointly published by EirGrid and SONI in November 2021 identified 'Potential transmission network reinforcements' which included two dynamic line rating (DLR) installations (see references at Table 2, Figure 5, Table 9, Section 5.4.2, Figure 22, Table 25, & Table 26). However, the draft TDPNI makes no reference to these essential schemes to facilitate the connection of additional renewable generation at clustering substations in the west of Northern Ireland.

DLR technology is an established method of maximising the use of transmission assets, which is commonly, and successfully, used throughout Europe. Indeed we understand that NIE Networks has recently been completing trials using this technology on their infrastructure. In addition we are aware that EirGrid are currently tendering this technology for use in RoI. These schemes can be installed

⁵ <https://www.soni.ltd.uk/customer-and-industry/general-customer-information/faqs-atrs/>

with minimum interruption, lower costs, and much quicker timeline than other deeper reinforcements. We would urge SONI to include these two schemes within the final TDP for 2021-2030.

Connecting Offshore

As yet there is no clear process for applying for an offshore connection. While we are unlikely to see turbines in or on the water until the end of the decade, developers are planning projects now, with the [North Channel Wind](#) floating project the first to be publicly announced.

RNI notes that SOEF plans for 100MW of offshore wind, however, any planned offshore project will be of a considerably larger scale. It is important that SONI collaborates with industry to ensure that as developers are planning offshore projects that SONI is simultaneously putting in place the infrastructure needed to bring projects onshore. In this regard, we welcome SONI's recent commitment to establish an Offshore working group between industry, SONI and NIE Networks.

It is vital that grid infrastructure and capacity does not act as a barrier to offshore deployment. It will therefore be necessary to commence work on this in the early years of the TDP to ensure that we are ready to incorporate offshore generation before the end of the decade.

Interconnection

RNI fully supports the development of the second North-South interconnector. While it is disappointing that the delivery date has slipped by two years since the previous estimation of Winter 2023, we are aware of the planning difficulties that the project has faced.

A substantial proportion of current constraints of renewable generation in Northern Ireland would be removed when the North-South interconnector is complete and we therefore look forward to its construction.

RNI welcomes the new target date of 2024 for completion of works to allow the full integration of the 500MW export capacity of the Moyle Interconnector. We note however that Northern Ireland has been a net importer of electricity through the Moyle Interconnector during times of constraint. We would ask SONI, through its role as SEM Operator, that it explores ways to improve intraday trading to allow the market to adequately respond in real time to constraint and curtailment events. We also request that SONI maximises any counter trading opportunities on the Moyle interconnector to reduce DD of Northern Ireland renewable generation.

RNI notes that the LirIC Interconnector Project⁶ proposed by Transmission Investment (TI) is not included within the draft TDPNI. We appreciate that this proposal is at a very early stage. RNI is concerned that the proposal to connect into Kilmarnock South, a region with high renewable generation capacity, would contribute to, rather than alleviate constraints in NI. TI have engaged with RNI and we were clear that we would need to see SONI's detailed modelling and anticipated market flows of the proposed interconnector. Only if these confirm that the LirIC will help to alleviate Dispatch Down under all foreseeable system operating configurations going forward, could we offer our support to this project.

Resource

RNI appreciates that to deliver development of the transmission system at a pace needed to meet the 80 by 30 target, that SONI must be sufficiently resourced. We are concerned that SONI do not currently have sufficient resources to complete the required modelling studies and provide the timely connection offers and studies needed to meet the very pressing timescales for the noted transmission system upgrades and new connections. NIE Networks [Networks for Net Zero](#) study shows that the due to downward pressure increased renewable generation has on the wholesale price of electricity, that there will be a net consumer saving of 1% after taking account of all the necessary grid investments. RNI's *Achieving Zero* study estimates that going from 70% to 80% will result in an additional consumer saving of £50m.

It is important that the Utility Regulator (UR) recognises that the investments needed to incorporate a greater penetration will save the consumer money. RNI is concerned that the UR takes a narrow view of network costs when in reality the earlier we can make these investments, the better the return will be for the consumer. RNI is keen to work with SONI to help make this case. RNI notes the commitment in SOEF to the establishment of an Advisory Council, this is something that we would be keen to see progress and will happily contribute to.

Conclusion

RNI commends SONI's commitment to facilitating increased renewable electricity generation onto the grid. Increased investment and improved planning timelines will be needed to achieve our renewable energy targets and ultimately our decarbonisation ambitions.

⁶ <https://tin.v.com/intercon-projects/liric/#:~:text=LirIC%20is%20a%20unique%20project,the%20other%20in%20Northern%20Ireland>



We look forward to working with SONI and other partners, including the Utility Regulator and NIE Networks, to ensure that the development of the grid continues to be world leading.

A handwritten signature in grey ink that reads "Steven".

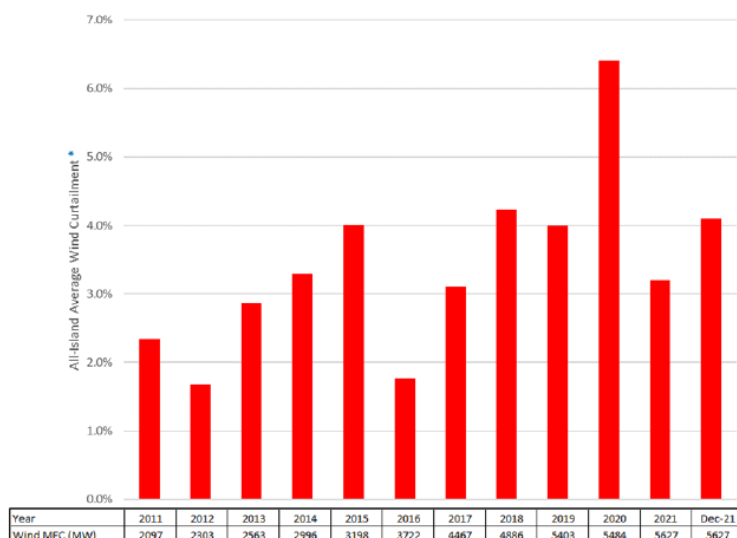
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Appendix 1: Mullan Grid Wind Farm Dispatch Down Analysis February 2022

1. Historical Wind Curtailment



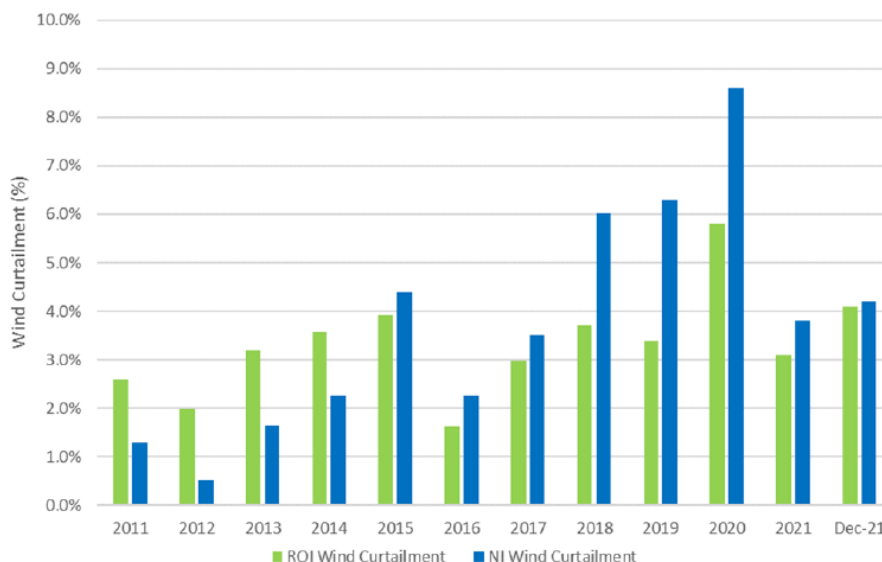
* = % Curtailment of controllable wind presented above. However figures between 2011 and 2015 are MullanGrid estimates as EirGrid and SONI only started publishing data relating to controllable wind farms from 2016 onwards.

Source: Curtailment data from EirGrid & SONI's Annual Renewable Energy Constraint and Curtailment Reports, and Wind Farm Dispatch Down Reports. Wind Capacity Factor data obtained from EirGrid & SONI's 2016 Generation Capacity Statement and Quarterly Wind Dispatch Down Reports.

With the exception of 2012 (EWIC was commissioned and less windy compared to 2011), 2016 (higher interconnector exports, SNSP limit increased to 55% and less windy compared to 2015), 2019 (very high constraints due to 10-month Moneypoint forced outage minimized curtailment) and 2021 (high constraints and very low wind year) wind curtailment has generally been increasing. Significant increase in wind curtailment in 2020 appears to be primarily due to Q1 being a very windy quarter, and lower demand in Q2 due to COVID-19. 2021 wind curtailment reduced back to more expected levels, but is relatively low, most likely due to a combination of less windy conditions, high constraints, an increase in Moyle exports, and an increase in the SNSP limit.

MullanGrid
CONSULTING

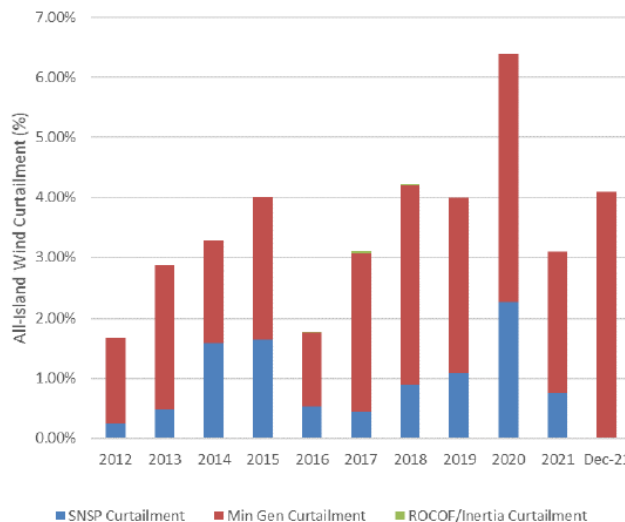
1. Historical Wind Curtailment (cont'd)



Source: EirGrid & SONI's Annual Renewable Energy Constraint and Curtailment Reports, and Wind Farm Dispatch Down Reports

NI curtailment reported by SONI in recent years has been artificially high, because SONI had been incorrectly flagging constraints on the existing North – South interconnector as curtailment – understood this issue was resolved at the start of Q4 2019. However, NI curtailment remains materially higher than ROI and appears to be related to limitations with the existing Wind Dispatch Tool in EirGrid's control centre.

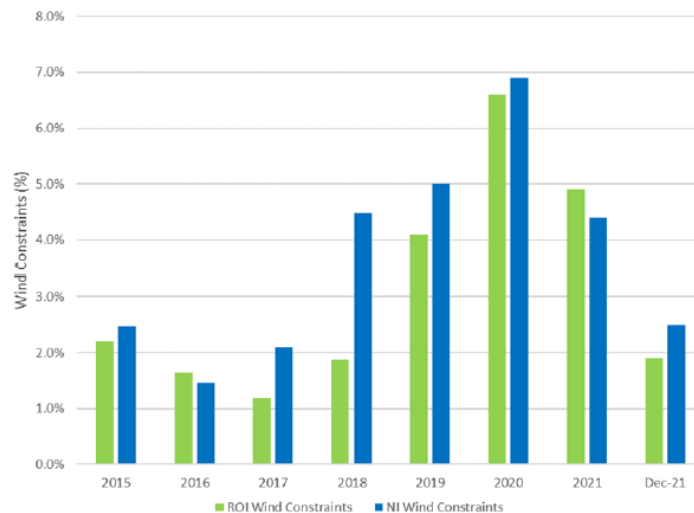
2. Drivers of Wind Curtailment



Source: EirGrid & SONI's Annual Renewable Energy Constraint and Curtailment Reports, and Wind Farm Dispatch Down Reports

- Minimum generation levels of conventional plants has generally been the predominant driver of curtailment.
- The SNSP limit has been increasing since 2015, but there has not been similar levels of improvement to Min Gen (refer to Section 6). It is for these reasons why Min Gen has been the predominant driver of curtailment.
- If wind curtailment levels are to be reduced in the future, it will be necessary that Min Gen levels also reduce.
- Noted that all of the curtailment that occurred between Apr and Dec 2021 was due to Min Gen.

3. Historical Wind Constraints



Source: EirGrid & SONI's Annual Renewable Energy Constraint and Curtailment Reports, Wind Farm Dispatch Down Reports

Average constraints experienced by controllable wind farms in both ROI and NI presented above. However some wind farms have experienced significant double digit constraints in recent years, primarily due to outages associated with transmission reinforcements. In the case of ROI the majority of constraints to date have been experienced in the North West, West and South West regions. Constraints in ROI have significantly increased from 2019 onwards and are mainly due to forced outages. Constraints in NI have increased significantly from 2018 onwards. It is understood that constraints on the existing North-South interconnector make up a significant proportion of all constraints experienced by wind farms in NI. It is worth noting that constraints in ROI and NI 2021 were quite high considering that it was a relatively low wind year.

5. Estimated Cost of Wind Farm Dispatch Down

Parameter	2018	2019	2020	2021
Curtailment (%)	4.2%	4.0%	6.4%	3.2%
Constraints (%)	2.5%	4.3%	6.7%	4.8%
Total Dispatch Down (%)	6.7%	8.3%	13.1%	8.0%
Dispatched Down Energy (GWh)	705	1015	1874	912
Lost Revenue (€)	€49m	€77m	€129m	€70.9m
Dispatched Down Energy equivalent to CO2 emissions from thermal generators (Mt CO2)*	0.256	0.370	0.688	0.345
Dispatched Down Energy as % of Electricity Sector CO2 Emissions	1.9%	2.8%	5.2%	2.4%

* 2021 figures based on 378 gCO₂/kWh, obtained from SEAI "Energy-Related CO₂ Emissions in Ireland 2005-2018" 2020 Report, which is the actual average output of all the gas generators (OCGT and CCGT). Estimates for earlier years based on data obtained from SEAI "Energy in Ireland" annual publications, and NISRA's "Northern Ireland Carbon Intensity Indicator" annual publications

Appendix 2: RenewableNI Pipeline Survey April 2021

Onshore Wind

Planning Authority	Capacity (MW)	No. of Projects
Causeway Coast & Glens	327.0	81
Fermanagh & Omagh	222.8	177
Derry City & Strabane	159.7	49
Strategic Planning Directorate	128.2	5
Mid & East Antrim	120.1	46
Mid Ulster	113.1	98
Antrim & Newtownabbey	18.6	18
Armagh City, Banbridge & Craigavon	13.9	41
Newry, Mourne & Down	6.8	30
Belfast	6.5	5
Ards & North Down	5.0	22
Lisburn & Castlereagh	2.5	11
Total	1124.1	583

Status	Capacity (MW)
Under Construction	103
Consented with grid	135
Consented (no grid offer/unknown)	396
In Planning	212
Pre Planning	278
Total	1124

Offshore

Technology	Capacity (MW)	No. of Projects
Tidal Stream	220	4
FOW	1,100	3
Total	1,320	7

Status	Capacity (MW)
Development (tidal)	120
In Planning (tidal)	100
Pre Planning	1,100
Total	1320

Solar PV

Planning Authority	Capacity (MW)	No. of Projects
Causeway Coast & Glens	171.2	5
Fermanagh & Omagh		
Derry City & Strabane	7.1	2
Strategic Planning Directorate		
Mid & East Antrim	55.0	2
Mid Ulster		
Antrim & Newtownabbey	68.3	3
Armagh City, Banbridge & Craigavon	59.0	3
Newry, Mourne & Down		
Belfast		
Ards & North Down		
Lisburn & Castlereagh		
Total	360.6	15

Status	Capacity (MW)
Under Construction	0
Consented	103
In Planning	55
Pre Planning	203
Total	361

Storage

Planning Authority	Capacity (MW)	No. of Projects
Antrim & Newtownabbey	53.0	2
Ards & North Down	102.8	3
Armagh City, Banbridge & Craigavon	36.0	1
Belfast	?	1
Causeway Coast & Glens	80.0	3
Derry City & Strabane	0.0	0
Fermanagh & Omagh	80.0	2
Lisburn & Castlereagh	50.0	1
Mid & East Antrim	125.0	2
Mid Ulster	5.0	2
Newry, Mourne & Down	46.2	3
Strategic Planning Directorate	0.0	0
Total	577.9	20

Status	Capacity (MW)
Development	283
Consented	120
In Planning	10
Pre Planning	165
Total	578

Appendix 3: Mid-Antrim Upgrade (Previously knowns as new Kells-Rasharkin circuit)

June 2016 - RGLG meeting – SONI, Emerging Development Strategy - Reinforcement in Kells / Rasharkin corridor

March 2017 - Listed in SONI/NIE Renewable Integration Development report as *“The new circuit between Kells and Rasharkin is being taken forward at present.”*

March 2017 – RGLG meeting, SONI presentation “2nd Kells Rasharkin will address principal thermal issues”

August 2017 – SONI and NIE Generation Connections Industry Workshop 2017, listed at feasibility stage

January 2018 – RGLG Meeting – Update, Pre-construction outline design

June 2018 – RGLG Meeting – Update, At outline design stage

Q3 2018 - Listed in SONI ATR list as being scheduled to be complete in 2024

June 2019 – SONI 2018 Final development plan, scheduled completion winter 2024

March 2020 – SONI 2019 draft development plan, scheduled completion winter 2026

November 2020 – SONI 2020 draft development plan, scheduled completion winter 2026

June 2021 - RGLG meeting, Part 1 of process, early stages of stakeholder engagement, Scheduled complete 2027

August 2021 - SONI website project page update, in part 1 of 3 part process. schedule complete 2028