



An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Digital Terrestrial Television (DTT) and the Long-Term Future Use of the Sub-700 MHz Band

2rn response to request for information

2rn submission

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Commission for Communications Regulation

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1 Background

- 1.1 In October 2024, the Commission for Communications Regulator (“ComReg”) commissioned Frontier Economics Ltd (“Frontier”) to prepare a report on the potential future uses of the sub-700 MHz band in Ireland post-2030. Three broad scenarios are currently envisaged for this report:
- (i) **DTT/PMSE use of the whole of the sub-700 MHz band:** This would maintain the status-quo i.e. DTT and wireless audio PMSE continue to use the full of the sub-700 MHz beyond 2030;
 - (ii) **Shared use of the sub-700 MHz band:** DTT and wireless audio PMSE continue to use part of the sub-700 MHz band, while another part of the sub-700 MHz band (e.g. 617-698 MHz “the 600 MHz band”) would be made available for other uses sometime after 2030; and
 - (iii) **DTT/PMSE no longer use the sub-700 MHz band:** Switch-off of DTT sometime post-2030, thereby releasing the whole of the sub-700 MHz band for uses other than broadcasting.
- 1.2 In relation to each of the above, Frontier would, at a high level:
- set out information on the current situation (i.e. regulatory framework, current use of 700 MHz band, technology development, potential uses of sub-700 MHz band, and stakeholder analysis);
 - set out information and analysis on the potential future uses of the sub-700 MHz band in relation to the above three scenarios;
 - summarise the key outcomes in Ireland under each scenario and identify and assess actions that could be taken by ComReg and other stakeholders to promote the interests of end-users and the efficient use of spectrum.
- 1.3 The aim of this report is to inform ComReg, and other stakeholders, of relevant information on the potential future uses of the sub-700 MHz band post-2030 such that timely actions can be taken to ensure the efficient use and management of the radio spectrum.
- 1.4 The purpose of this request for information is to inform Frontier’s assessment of the current and future use of the radio spectrum used by 2rn to provide its DTT network.

2 Questions for 2RN

2.1 ComReg invites 2RN to provide its views on the following matters and would welcome a written response to these questions.

2.1 Maintenance, Repair and Replacement of Equipment

2.2 Noting that much of 2RN's DTT network investment may have occurred at specific points in time¹ and may therefore need replacement at specific points in time, the following questions relate to the maintenance, repair and replacement of DTT equipment.

Q. 1 What is 2RN's current annual expenditure on maintenance, repair and replacement of DTT equipment? Has this changed over the last 5-10 years? Does 2RN currently foresee any large changes in this expenditure over the coming 5 to 10 to 15 years, and if so, why?

2RN: [REDACTED]

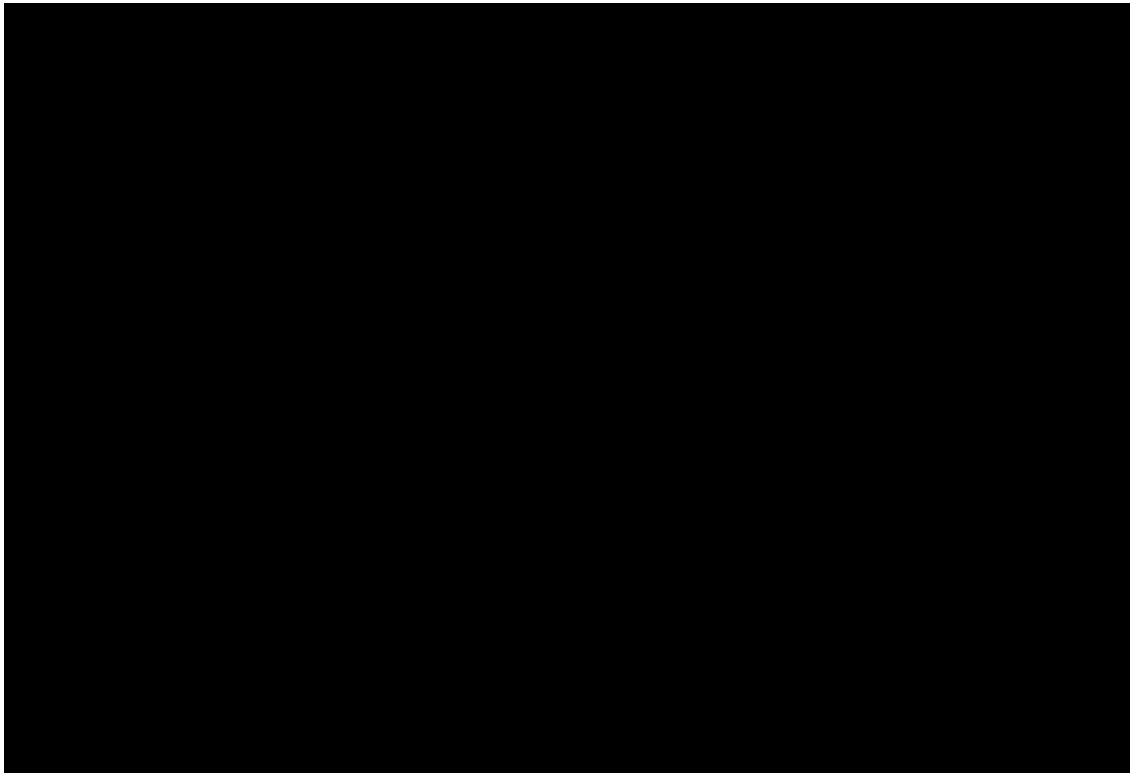
[REDACTED]

Other than business as usual asset replacements, 2rn also expects to invest, as a necessity, over the coming 15 years, in the Long Life Assets listed in the below table. All of these asset classes have a 40 year regulatory life and their costs are recovered over that period via tariff charging.

¹ For example in the period prior to Analogue Switch-off in October 2012 and in the period prior to DTT's migration out of the 700 band which was completed in March 2020.

Scenario (iii) of the potential future uses of the sub-700 MHz band in Ireland which envisages a switch-off of DTT sometime post-2030 creates an investment uncertainty for 2rn with respect to these assets which will need to be addressed.

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Q. 2 What factors are taken into account when replacing equipment, noting that some broadcast equipment / infrastructure for DTT is now fully depreciated but still in use.

2RN: *2RN operates highly resilient broadcast network infrastructure that is able to continue operation even following severe weather events when mobile, fixed telecoms, and national electrical infrastructure have failed. As such the objective is always to replace equipment in an ordered and timely manner that ensures that the overall efficiency and reliability of the DTT network infrastructure is optimised. However given that much of 2RN's DTT network investment occurred at specific points in time it is not practical, for a number of reasons, to replace large amounts of equipment as it reaches full depreciation and therefore a more extended schedule is applied to replacement of equipment with priorities considered and applied.*

Q. 3 How long does 2RN typically expect equipment to remain in service before being replaced?

2RN: *The expected life of various types of equipment in the network ranges between 5 and 40 Years depending on the type of Equipment.*

Q. 4 Has 2RN considered any plans or estimated costs of replacement of depreciated equipment, or other equipment, over the next 10-15 year period?

2RN: [REDACTED]

2.2 Potential DTT upgrades (e.g. DVB-T2), hybrid broadcast/broadband services and/or other broadcast technologies

2.3 In 2RN's response to the RSPG questionnaire on the UHF band, 2RN stated:

"We continue to increase the efficiency of the DTT platform with more advanced encoding to increase the number of services while minimising the cost and disruption to viewers and broadcasters, and more power efficient transmitters contributing to

sustainability targets. We are investigating hybrid broadcast/broadband services and the delivery of more advanced image and sound services."²

DTT encoding / compression upgrades

- Q. 5 What plans does 2RN envisage over the next 5-10 years and beyond to increase the efficiency of the DTT platform in relation to the deployment of more advanced DTT encoding or compression upgrades (e.g. from MPEG-4 to HEVC, or advanced MPEG-4 standard) or the use of more power efficient transmitters?

2RN: *More Power Efficient Transmitters – 2RN will complete the replacement of all 1st generation DTT transmitters with the most efficient transmitters currently available by the end of 2026. This will increase electrical efficiency from approximately 20% to approximately 40%, thus reducing electricity consumption. Further increases in electrical efficiency have not been identified by equipment manufacturers.*

More advanced encoding and compression – 2RN has recently upgraded the DTT headend to utilise more efficient MPEG4 encoders. It is unlikely that significant further efficiency gains will be developed for MPEG4 implementations. Further efficiency gains in this area would most likely require a change to a different encoding standard such as HEVC which would require an equipment (TV/Set-top-box) change for many Saorview viewers.

- Q. 6 What factors would 2RN consider in any such upgrade and does it have any high level information on these. For example:

1. What would be the key benefits of such upgrades?

2RN: *Reduced electrical consumptions/costs with more efficient transmitters. More capacity for service development/enhancement/expansion with more efficient encoding.*

2. Would these changes result in any operational or network savings (e.g. power consumption)?

2RN: *More efficient transmitters is resulting in reduced power consumption.*

3. What would be the broad categories of costs involved and could you provide high-level 'rule of thumb' estimates of the scale of those costs?

2RN: A change in encoder standard would require changes within the network (replacement headends), and more crucially changes in end user equipment for those viewers who's TV/set-top-boxes are not capable of decoding the newer encoding standard. A viewer impacting change like this would also require a period of simulcast to ensure that viewers could make the transition. This could involve significant network costs with additional infrastructure needed to encode, distribute and broadcast.

4. Other?

Transition to DVB-T2 and user's device compatibility with DVB-T2

Q. 7 Does 2RN have plans to upgrade to DVB-T2 and what would this involve from the network side?

2RN: No plans to upgrade to DVB-T2; this would need to be a customer led initiative. It would involve some reconfiguration of existing transmitters, and a period of simulcast (with the associated additional network infrastructure for simulcast).

Q. 8 What factors would 2RN consider in any such upgrade and does it have any high level information on these, e.g. the benefits of any such upgrade, the broad categories of costs that might be involved, users' device compatibility with DVB-T2

2RN: Potential benefits could be more capacity that could be used to deliver higher quality/resolution video, or more services, or increased coverage reach. The categories of costs involved would be transmitter reconfiguration costs, simulcast costs, publicity/information campaign costs, costs for end users where they have to replace receivers or TVs.

Q. 9 Does 2RN have information on the percentages of Saorview TVs/devices in Ireland that currently support DVB-T2?³ Does 2RN have any views on how this percentage might evolve over the coming decade?

2RN: No, we have no data on this. However, it is worth noting that although DVB-T2 has been a mandatory requirement of the Saorview/Nordig receiver spec since 2013, HEVC has only been a requirement since 2017.

³ [Digital Terrestrial TV Receiver Specification](#) "All IRD (Integrated Receiver Decoder) shall support DVB-T/T2 demodulation; the support of DVB-T2 demodulation changed from an optional to a mandatory requirement on 1st January 2013 for the Irish DTT network. The IRD shall support all DVB-T2 requirements as specified in NorDig Unified IRD specification v3.1.1 and later."

Number of DTT Multiplexes

Q. 10 Should 2RN implement higher compression/encoding and/or upgrade to DVB-T2, would two DTT multiplexes still be required to facilitate the current DTT Saorview services? With such an upgrade could current Saorview services be served on 1 mux?

2RN: *With higher compression/encoding and DVB-T2, all current services could be accommodated on a single mux. With a DVB-T2 upgrade only, or an encoding upgrade only (e.g. HEVC) current services/coverage could not be facilitated. However, we believe that two muxes would still be required to allow the platform to continue to develop with more and better services.*

Q. 11 Considering the 2009 Act obliges ComReg, if requested, to issue at least six multiplexes, does 2RN have any views on whether a third (or more) multiplex would be required in the next 5-10 year and beyond, and if so why? To implement a third (or more) multiplex what would 2RN need to put in place to make this happen?

2RN: *A third multiplex would be required if broadcasters seek to put more services or more HD, or UHD services on the platform. To implement a third multiplex 2RN would need to add headend/encoder capacity, configure distribution, and add a transmitter (with associated combining) to each broadcast site.*

Hybrid broadcast/broadband services (e.g. DVB-I, 5G Broadcast, Other)

Q. 12 What hybrid broadcast/broadband services and/or other broadcast technologies are 2RN investigating?

2RN: *HbbTV is supported currently and there are ongoing discussions re adding DVB-I to the NorDig and Saorview requirements specifications. We are planning to test 5G Broadcast.*

Q. 13 For each of the technologies/services listed below, does 2RN have a view on their potential use in Ireland and whether these technologies/services could play a role in the future delivery of broadcasting services in Ireland over the next 5-10 years and beyond?

1. 5G Broadcasting

2RN: *We are keeping an open mind to future possibilities with 5GBC and are in the early stages of planning a localised 5GBC test. Widespread mobile use would likely require a hybrid network with more low tower low power sites (e.g. a mobile cellular network). We would be keen to understand possible business cases and adoption by mobile device manufacturers.*

The ability to deliver emergency communications from highly resilient broadcast network infrastructure is a key benefit of 5GBC.

2. DVB-I

2RN: DVB-I could have a role in delivery of IP channels or an interface for broadcaster players, either via the EPG or via the TV or STB interface

3. HbbTV

2RN: HbbTV could have a role in the delivery of an app like the Freely application in Ireland. We are not aware of any plans by broadcasters to develop such an app.

4. A web-based TV application that would extend beyond the RTÉ Player such as the Freely application available in the UK - [Freely | Stream Live and On Demand TV for Free](#)

2RN: A HbbTV app like Freely would currently be supported on Saorview approved devices if one were available. We are not aware of any plans by broadcasters to develop such an app

Q. 14 At a high level, what factors would 2RN need to consider before deploying any such technology/service (e.g. benefits, costs, user device compatibility, other). Would 2RN or other stakeholders also need to take enabling actions to support the rollout of any such service/technology?

2RN: New technologies like 5G as discussed above would be deployed following a customer driven request, in the case of DVB-I and HbbTV 2RN would have no role in deploying any solution beyond making sure the platform supports the standards correctly

Q. 15 Regarding viewing TV over broadband,

1. Does 2RN have a view on whether that are barriers to widespread live viewing of TV via broadband, for example in being more difficult to efficiently compress some live content (e.g. sports) which places a bigger load on broadband networks.

2RN: No. However, we do believe that TV via broadband cannot completely replicate DTT services – see Q25 for further details. We also think that it is important to consider that there may be a gap between broadband coverage and take-up.

2. Does 2RN have any information on the percentage of TVs in Ireland that currently have internet capability or how that might evolve over time?

2RN: No

2.3 Three broad scenarios post 2030

2.4 The following questions relate to the three broad scenarios post-2030 being considered in ComReg's study:

- (i) Scenario 1: DTT/PMSE use of the whole of the sub-700 MHz band;
- (ii) Scenario 2: Shared use of the sub-700 MHz band;
- (iii) Scenario 3: DTT/PMSE no longer use the sub-700 MHz band.

2.5 In response to the RSPG's question on "*What other uses (after 2030) of the 470-694 MHz range, could arise in your country?*", 2RN stated:

"We expect that this band will be required for DTT in Ireland well into the 2040's, alongside the continued sharing with PMSE applications."

Scenario 1: DTT/PMSE continue to use the whole of the sub-700 MHz band;

Q. 16 Could 2RN outline why it believes that DTT would use the whole of the sub-700 MHz band until well into the 2040's?

2RN: *Currently there is no indication of any plans to replan the spectrum, or any notable falloff in DTT use. Therefore continued use of existing spectrum is expected.*

Q. 17 To maintain a DTT network into the 2040s what categories of equipment would need to be replaced and how would this affect 2RN's cost expenditure (e.g. would a large increase in expenditure be incurred at a specific time period?)

2RN: *Network equipment refresh is ongoing and relatively smooth with no large increases in expenditure expected until the mid 2030s when the remaining large masts - not replaced during the initial DTT rollout - will be due for replacement.*

Q. 18 Does 2RN have a view of whether maintaining a DTT service could be more environmentally efficient than delivering TV over broadband (i.e. IPTV), considering also that a universal broadband network is being rolled out in Ireland via the National Broadband Plan and commercial operators? If yes, why?

2RN: *We believe that with current levels of DTT use in Irish homes, DTT is substantially more environmentally efficient than delivering TV over broadband. For reference please see the LoCat project ([Home - The Locat Project](#)) which incorporated electrical consumption from 2RN (before recent more efficient transmitter upgrades at all high power sites – i.e. during a period of heavier electrical consumption in the DTT network than today). The LoCat project found that DTT was 10 times more efficient than OTT or Managed IP TV in terms of energy consumption / green house gas emissions in Ireland (LoCat Final Report - Annex A: Summary of 2020 results for all EU28 countries, p46).*

Q. 19 In this scenario, what impact would this have on end-users, if any?

2RN: *This scenario is optimum for Irish citizens; maintaining access to a reliable and resilient, true free to air source of trusted information helping to defend democracy and offer choice for entertainment and information access. In this scenario the DTT platform has the opportunity to develop and grow to meet users' needs, while also supporting the continued growth of shared services like PMSE to support the entertainment, events and content creation industries in Ireland. This scenario also permits other flexible uses of the spectrum in accordance with European UHF Decision. Currently 2RNs broadcast networks (including DTT and FM radio) are the only platforms in Ireland, fully operated from within the state, that have the resilience to withstand severe weather events (e.g. storms and flooding), and continue to deliver vital public information when other platforms have failed – for this reason we believe that support of the conditions necessary to sustain and develop these networks well beyond 2030 must be facilitated.*

Scenario 2: Feasibility of vacating the 606-694 MHz band

Q. 20 Under the current coordinated DTT spectrum plan (as coordinated with the UK, France and WEDDIP) and with the Saorview's current technical characteristics (i.e. using DVB-T and MPEG4), does 2RN consider it feasible to accommodate current DTT Saorview services within the 470 – 606 MHz range (i.e., vacating the 606 – 694 MHz range).

1. If yes, what actions would be required to make this happen. What stakeholders would be involved in these actions? What would be the broad categories of costs involved and could you provide high-level 'rule of thumb' estimates of the scale of those costs?

2RN: *Detailed planning and coordination with the UK following consultation with the relevant Irish government departments regarding broadcast spectrum policy. The broad categories of cost would include: planning, network reconfiguration (including combiner and antenna retuning/replacement, replacement of some transmitter amplifiers), installation and operation of simulcast transmitters, rescanning and in some cases rooftop antenna replacement or adjustment for viewers.*

2. If no, what actions would be required to make this feasible? What stakeholders would be involved in these actions? What would be the broad categories of costs involved, and could you provide high-level 'rule of thumb' estimates of the scale of those costs?

Q. 21 If DTT services were reduced to 1 mux, would there be any significant percentage of DTT costs saved?

2RN: *Some operational costs (mostly electrical power) would be reduced. Most other costs are common.*

Q. 22 In this scenario, (DTT only uses 470-606MHz), what impact would this have on end-users, if any?

2RN: *Disruption for viewers who must rescan or adjust/replace their roof-top antennas. Potential opportunity loss for viewers to experience growth in the DTT platform if the remaining spectrum did not allow sufficient room for future DTT developments. Less opportunity for PMSE users, particularly for large outdoor productions/events.*

Scenario 3: DTT no longer uses the sub-700 MHz band

Q. 23 In 2RN's view, is it possible to provide the current DTT services using spectrum in the VHF band instead of spectrum in the UHF band? If yes, what factors would need to be considered and what actions would need to be taken?

2RN: *Without further analysis we would estimate that it could only be possible to provide an equivalent service using VHF spectrum if DVB-T2 and HEVC (or a more efficient encoding standard) was used. However, there are several major issues to consider:*

- An entirely new broadcast transmission network would be needed, including transmitters, filters and antennas (and in some cases structures to support the larger VHF antennas).

- New roof top antenna for every viewer, in addition to suitable TV/receivers

- Simulcast of UHF and VHF networks, and significant disruption to TV viewers

- Further development of the DTT platform would be very limited.

Q. 24 To facilitate any seamless switch-off of the DTT service in the future, what high-level factors and legislative obligations⁴ would need to be considered in relation to any replacement TV distribution platform (e.g. free to consumers, universally available, easy to use service, etc.)?

2RN: *We do not believe that the services offered by DTT can be completely replicated by any other distribution platform. See Q25 below.*

Q. 25 Considering the following TV platforms, does 2RN have a view on whether these could be considered a suitable replacement for DTT in the future or are there certain DTT characteristics that might never be replicated in these platforms.

1. the universal rollout of, and access to, high-speed broadband coupled with the development of an appropriate web-TV application

2RN: *No. TV over broadband is not a suitable replacement for DTT as it is unable to replicate several key features of the DTT platform including:*

- True free to air access to public service media with no subscription needed and anonymous viewing

⁴ E.G. the "Principal objects and associated powers of RTÉ" as set out in Section 114 of the Broadcasting Act.

- **Trustworthy access to trusted content without gatekeepers, from within state**
- **Robust, reliable, resilient and secure network (able to operate in emergency situations such as after severe weather events, or electrical outages)**
- **Most energy efficient way to deliver broadcast video**

2. 5G broadcasting

2RN: 5G Broadcasting is designed to bring broadcast services to mobile devices in a more efficient way. It is not optimised for delivery of high quality video to fixed large screen viewers like DTT is, and as such is likely to be a less efficient way to deliver this service. Furthermore, if rolled out as a mobile network or a hybrid broadcast/mobile network some of the benefits of existing broadcast networks (e.g. resilience, reliability, security, possibly prominence of Public Service Media Content and anonymity) may be lost.

3. Satellite (e.g. Saorsat noting that this can be received by the whole community of the state)

2RN: No – it is possible that it will become more difficult to secure access to a suitable spot beam to cover only Ireland in the future. Furthermore, satellites (as currently used) and typically satellite uplink facilities are not controllable from within the state.

Q. 26 If DTT services were to be switched off, what broad percentage (if any) of the large, fixed costs associated with the DTT network (e.g. towers and masts) could be removed/saved? Regarding the remaining fixed costs, how would these costs likely impact the prices charged to 2RN's other customers, e.g. 2RN's radio customers (e.g., RTÉ/Bauer Media) and 2RN's commercial customers?

2RN: A relatively small proportion of fixed costs would be removed. In today's costs RTÉ & Radio/Bauer medias costs would increase by between [X] and [X].

Q. 27 In this scenario (DTT were no longer to use any spectrum) what impact would this have on end-users, if any?

2RN: Loss of choice for viewers. Loss of reliable direct access to trustworthy information, threatening democracy. Loss of access to resilient information source for emergency situations that can withstand severe weather events. Increased carbon footprint.

2.4 Other considerations

Q. 28 Should 2RN consider that there are other considerations relative to this study, please provide details of same.

2RN: *We believe that PMSE requirements, current and future, in Ireland may be underestimated and under-represented. It seems that there is no coordinated industry grouping in Ireland representing the needs of PMSE users, and as a result this sector may be under-represented and difficult to reach when considering the future use of this spectrum. Without any analysis we would assume that UHF PMSE use in Ireland is proportionally broadly similar to other European countries and the UK where this industry continues to express serious concerns about any potential future loss of access to high quality UHF spectrum. We draw your attention to the following most recent report from an industry group in the UK expressing concern and highlighting the impact of any further losses of UHF spectrum to the events and media industries: [BEIRG - Spectrum Report Rev1.2 Final March 24th 2025.pdf](#).*