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WBB LMP licensing – assessment of consultation responses – and PMSE licence duration

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1 Introduction

In July 2025, ComReg published its first consultation document (ComReg 25/46) in relation to proposals for licensing regimes for Private Mobile Radio (PMR) and Low-Medium Power Wireless Broadband Systems (WBB LMP) in Ireland. This was accompanied by supporting reports from DotEcon (ComReg 25/46a) and Plum Consulting (25/46b).

ComReg received seven responses to the consultation. In this report, we provide DotEcon's assessment on relevant (non-technical) issues raised by the respondents and our resulting recommendations to ComReg.

In summary, we are of the view that:

- Annual licences with annual renewal (subject to payment of fees and compliance with licence conditions) is reasonable. This is consistent with ComReg's standard approach under similar licensing frameworks (which provide evidence of how ComReg ensures long-term access to spectrum for users under those frameworks). Nevertheless, providing additional clarity on the expected long-term nature of this licensing framework and how it will work in practice (for example any substantive changes would be notified to licensees and consulted upon) should provide additional reassurance.
- ComReg could consider extending the rollout period – we expect that a standard rollout period of nine months is reasonable for most applications and would be appropriate for annual licence durations. However, a longer rollout period of up to three years could also be provided for in justified select cases. Any rollout periods longer than three years could be considered by ComReg on an exceptional basis.
- Medium power WBB systems in urban areas should be allowed in justified cases, in particular for users seeking to cover a wide area.
- Licensing low power and medium power WBB systems, as proposed in the initial consultation, appears an appropriate approach as it provides ComReg with an effective way of ensuring the efficient use of spectrum, providing certainty to licensees, and allows for a straightforward approach to assessing the compatibility of new applications with existing LMP WBB systems. There may be benefit in

requiring users to specify a target coverage area (that does not need to be entirely covered by the initial deployment) that is used as part of the application process to assist with licensing the low power areas and medium power base stations; this would support ComReg's spectrum management objective regarding the 3.8 – 4.2 GHz band over the duration of the licensing framework and assist overall planning of the band..

- Fees should be set to at least recover ComReg's administrative costs but should also provide incentives for users to apply for only what they need. We recommend a fee structure with a fixed component plus an amount per low power area or medium power base station that reflects the power used, bandwidth (medium power only), and rollout terms.

We also consider a potential revision to the PMSE licensing framework and recommend ComReg consider allowing for a licence duration of up to 12 months.

2 Licence duration

ComReg has proposed to issue annual licences within the context of a long-term licensing framework. This aims to offer investment certainty and regulatory predictability, while also allowing scope for mitigating the risk of spectrum hoarding and inefficient use, both of which are possible given this is a new licensing framework with significant uncertainty around demand and use.

In its consultation, ComReg proposed that it would issue annual licences on a first-come, first served basis, for which operators would reapply annually. Any changes to the framework would only be made after giving licensees reasonable notice.

Respondents generally disagree with this approach and would prefer longer term licences, with some suggesting a duration of at least ten years. Respondents suggest that annual licences would provide insufficient certainty for their clients to sign off on the major investments associated with new private 5G networks, and that annual reapplication would be overly burdensome.

We believe that ComReg can continue with its proposal to issue annual licences, but extra clarity on the process for licence renewal and the long-run availability of the spectrum and licensing framework would be highly beneficial.

ComReg operates a range of annual spectrum licensing schemes

Annual licences are a core component of practically all of ComReg's spectrum licensing frameworks, except for:

- scarce spectrum awarded via auction (typically used in national public networks, which do not share the same frequencies in the same way as geographically separated local area applications);
- schemes limited to specific use cases with a known set of likely users e.g. Railway Mobile Radio licences[1];
- temporary licences with no prospect of renewal or long-term use; and
- some legacy licence types, like third party business radio (TPBR) licences which ComReg proposed in its consultation to be incorporated into the (annual) consolidated PMR licence.

[1] Licences such as Liberalised Use Mobile Licensees and Railway Mobile Radio Licensee are required to comply with conditions to pay annual fees and provide annual rollout compliance reports.

Thousands of spectrum licences in Ireland are issued with a one-year duration and renewed annually including, for example, the fixed radio link licences which are used by many operators for their backhaul networks that generally have multi-year lifetimes. While the licences issued are for one year, these licensing frameworks provide operators with long-term access to spectrum as the licensing frameworks generally have no expiry dates set in the corresponding Regulations.

For example, the Regulations for Fixed Radio Link licences, which are annually renewed licences, have been in place since 1992[2], over 30 years ago. While these Regulations were revoked and replaced in 2009[3] and 2023[4], users issued annual licences under these regulations have continued to have access to their licensed spectrum. Of the current 11,321 live Fixed Radio Link Licences, 9,044 were issued before the making of the 2023 regulations, and 665 were issued before the making of the 2009 regulations. The oldest Fixed Link Licence that is still live today was issued in November 1997, 28 years ago.

Compared with spectrum users in other contexts, WBB LMP licensees might be particularly reliant on spectrum availability to support investments much greater than simply the associated telecoms equipment and, as the scheme is new, they do not have the experience with annual licence renewals that builds confidence in long run spectrum availability. Nevertheless, annual licensing is the natural approach for most of ComReg's spectrum licensing frameworks, and the approach used in these other schemes provides evidence of what to expect regarding ComReg's management of annual licence renewals for WBB LMP.

Therefore, the relevant questions are whether annual licensing can mitigate the perceived risks raised by consultation respondents and, if so, whether there are any strong reasons for ComReg to depart from its annual licensing approach.

There are two types of potential uncertainty relating to licence duration and spectrum availability:

[2] S.I. No. 319/1992 - Wireless Telegraphy (Radio Link Licence) Regulations, 1992, https://www.irishstatutebook.ie/eli/1992/si/319/

[3] S.I. No. 370/2009 - Wireless Telegraphy (Radio Link Licence) Regulations, 2009, https://www.irishstatutebook.ie/eli/2009/si/370/

[4] S.I. No. 593 of 2023 WIRELESS TELEGRAPHY (FIXED RADIO LINK LICENCE) REGULATIONS 2023, https://www.comreg.ie/media/2023/12/SI-593-of-2023.pdf

- idiosyncratic risks of a particular licence not being renewed or placing an excessive burden on licensees through annual renewal processes; and
- shared risks of major changes to the existence or nature of the WBB LMP licensing scheme.

light-touch renewals process

First, we believe that ComReg could provide additional clarity on how it envisages licence renewals working in practice. Our expectation, based on ComReg's management of other annual licensing frameworks, is that this would effectively be automatic, dependent only on:

- payment of annual licence fees;
- reporting each year on equipment usage and meeting rollout/usage obligations (discussed in the following section).

Annual renewal would be different to the initial application process and would not require repeated justification of the licensee's spectrum requirements, network design etc. We also expect that compliance with technical conditions would only be an issue as the need arose (e.g. following complaints of interference from neighbouring users or to check potential coexistence with new users) rather than forming any burdensome part of the renewal process. This is in keeping with our understanding of ComReg's practices in other annual licence renewal processes.

Expectation of long-term spectrum access

Second, we believe that ComReg could give clearer information on the long-term nature of this licensing framework. For example, by explaining that it would expect the licensing framework to be in place for a minimum number of years, providing licensees with sufficient time to achieve a return on private 5G (and other WBB LMP network) investments.

In our view, this expectation would be credible, because the licensing framework is tied to a European Commission (EC) harmonisation Decision (Decision (EU) 2025/2425)[5] which requires EU Member States to designate and make spectrum available in the 3.8 – 4.2 GHz band for WBB LMP networks, thereby guaranteeing the availability of spectrum for WBB LMP systems while the EC Decision remains in force. Changes to EC Decisions regarding radio spectrum use happen infrequently

[5] Commission Implementing Decision (EU) 2025/2425 on the harmonisation of the 3800-4200 MHz frequency band for the shared use by terrestrial wireless broadband systems capable of providing local-area network connectivity in the Union

and Ireland (through ComReg) is required to implement EC Decisions and ensure harmonisation.

Applications for new WBB LMP licences would be submitted throughout the life of this licensing scheme and better certainty, where possible, should be extended to operators arriving later on. In addition to providing clarification on the long-term nature of the licensing framework, there is likely to be merit in ComReg also providing assurance that any material changes to the scheme would not be introduced without first providing licensees with reasonable notice and the opportunity to comment by public consultation.

We note ComReg's expectation (set out in its consultation) that licensees would have at least five years notice in relation to any proposal to conclude the WBB LMP licensing framework[6] and we agree that the use of ComReg's RSMOP[7], which ComReg publishes every three-to-four years, is a good platform for providing such notice. Licensees would then have the opportunity to respond with comments which ComReg would consider.

Effectively automatic renewals

With ComReg providing clarity on the light-touch renewal process and its expectation of long-term spectrum access guaranteed by an EC Decision (Decision (EU) 2025/2425), we think this scheme could be characterised as *effectively providing automatic annual renewals* (for users compliant with their licence conditions, including payment of fees), *for as long as the regime remains in place*. In our view, this is broadly aligned with the suggestions of respondents, as it would entail neither an administratively burdensome renewal process, nor represent uncertain access to spectrum at renewal (i.e. there would be no scope for refusal of renewals for any discretionary reason).

None of this negates the need for ComReg to manage the efficient use of spectrum and when they arise to ensure that deployments are in compliance with the licence conditions. These are activities that ComReg would carry out on an ongoing basis and are not linked to licence renewal.

ComReg would engage with operators at the time the rollout obligation is due to check rollout conditions have been met, to ensure the spectrum is being used and to prevent a situation

[6] ComReg 25/46, p. 98

[7] Radio Spectrum Management Operating Plan – Document 24/99a is ComReg's current RSMOP for 2025-2028 https://www.comreg.ie/publication-download/radio-spectrum-management-operating-plan-2025-2028-2

where licensees are inefficiently holding licences and preventing other genuine applications from using the spectrum.

3 Rollout conditions

The initial consultation proposed that WBB LMP licences would come with a standard six-month rollout requirement, whereby a licensee would be required to deploy equipment within the first six months of receiving authorisation. This was recommended to protect against inefficient assignment and use of spectrum that could arise if licences were granted without a clear immediate use for the spectrum, thereby preventing access to other potential users. By the end of the six-month period, the licensee would be obliged to have deployed at least one base station and be utilising all of the licensed spectrum and at least one terminal.

Respondents concerned about the six-month rollout period

In the consultation, respondents accepted the need for a rollout requirement but expressed concern over the proposed six-month timeline which was considered very short. Instead, respondents requested that this be adjusted to allow for longer rollout periods in the region of 18-24 months. In particular, respondents argued that long procurement timelines for the equipment made deployment timelines incompatible with a six-month rollout requirement.

Considering the concerns raised by respondents, we believe that ComReg could reasonably provide licensees a somewhat longer period in which to deploy their networks.

Allowing nine months as standard is reasonable

For standard applications, a rollout period in the region of nine months would seem to balance the concerns raised by respondents about the longer time horizons for network deployment, whilst also protecting against spectrum sitting unused for significant periods of time and denying access to other potential operators who could make more immediate use of a valuable resource. A nine-month rollout obligation would also allow for a period between the point at which compliance would be assessed and expiry of the licence. ComReg would then have time in which to consider what action (if any) to take with the licensee and whether (and on what terms) licence renewal would be allowed on expiry.

Aligned with peer countries

This proposal aligns with the rollout timelines imposed on licensees in other European countries. For example, WBB LMP licences in Sweden, the Netherlands, Germany and Belgium have rollout periods of between six months and one year.

Longer rollout option for select cases

As highlighted in our initial report, we understand that there will be some select network deployments that would justifiably benefit from longer rollout periods beyond nine months. These include, for example, large scale projects that will take a significant amount of time to complete but need certainty over access to spectrum sufficiently early to effectively plan and integrate a network. In these scenarios, a nine-month rollout requirement may not be proportionate. We therefore recommend that a longer rollout period could also be made available by ComReg as a licensing option for justified cases. The maximum rollout period should be limited to avoid a proliferation of requests for excessively long rollout deadlines, and we expect that a maximum rollout period of three years would be sufficient.

Longer rollout should be justified

Longer rollout periods should be justified and would be granted at the discretion of ComReg. Applicants seeking a rollout period longer than nine-months would need to specify the additional time needed (up to the three-year maximum, noting that applicants may specify less), with sufficient justification and details of their proposed deployment process (e.g. a detailed rollout plan with interim milestones). ComReg could then assess and accept/reject the plan at its discretion, or request adjustments or further details.

For the avoidance of doubt, our suggestion is that the three-year timeline is a limit and not a default - licensees would be given a rollout period of between nine and 36 months, corresponding to the duration they have demonstrated necessary for the project.

Higher fees for longer rollout

We expect the number of users requiring longer rollout to be limited. However, they will likely impose additional costs on ComReg through a more complicated application process as well as some ongoing administrative/monitoring cost to ComReg. The licence fees during the longer rollout period should reflect these additional costs. There may also be some benefit in charging higher fees for the longer rollout to reduce incentives for applying for longer periods when not needed and encouraging earlier use of the spectrum. We therefore suggest that, until rollout obligations have been met, licensees with longer rollout terms should pay the standard annual fee plus some premium. Licensees will still need to renew the licence annually (via, at least, payment of fees) throughout a longer rollout period.

Exceptional cases

Anything beyond the options outlined above might be considered as an exceptional case, at the sole discretion of ComReg.

4 Medium power restrictions

In its initial consultation, ComReg proposed that "*medium power base stations would not be licensed in the cities unless there are exceptional circumstances*".[8]

This was informed by the observations/recommendations of Plum that, since there is limited scope for co-channel frequency reuse of medium power sites in urban areas and that most urban application could likely be addressed with low power networks, "*medium power licences should not be made generally available in city areas*"[9]. Plum also notes, however, that this should not be an inflexible rule and that some exceptions for use cases requiring wider coverage should be possible.

Several responses to the consultation submit that medium power licences should be allowed in urban settings:

- Druid Software and Analog Devices suggest that the restriction on medium power licences in cities could prevent use of WBB LMP by users operating over wide outdoor sites, such as large pharmaceutical campuses, ports, airports and logistics facilities. They suggest that ComReg permits medium power in urban areas provided the licensee either synchronises its TDD framing with other nearby users or signs a memorandum of understanding with neighbours.
- Sigma Wireless believes that ComReg's proposed policy of allowing medium power in cities only in exceptional circumstances suggests too few medium power systems might be permitted, which could restrict the usefulness of WBB LMP services by unnecessarily hindering viable deployments. Sigma Wireless highlights a number of examples where users would prefer to use fewer medium power radios to provide coverage, rather than having to rely on a larger number of low power radios (which in some cases may not be economically viable). These include both indoor and outdoor use cases. Sigma Wireless proposes that ComReg could require justification for medium power systems to prevent unnecessary use at the application stage.

[8] ComReg document 25/46, pg. 88

[9] ComReg document 25/46b, pg. 21

In contrast, the DECT Forum "*supports the proposal that medium power base stations would not be authorized in cities. DF agrees with ComReg's view that MP use in urban areas could constrain the supply of spectrum for other users*"

Medium power in urban areas should be allowed in justified cases

We agree with Druid Software, Analog Devices and Sigma Wireless that there is a case for allowing medium power base stations in urban areas in justified cases, in particular for users seeking to cover a wide area. On the other hand, as the respondents (including the DECT Forum) appear to have recognised, it would be undesirable to assign licences for medium power to users that do not need them (and could operate without problem using lower power); that could unnecessarily and inefficiently preclude access to spectrum for others, in particular in urban areas where the number and density of users is expected to be higher. Some mechanism is therefore needed for ensuring that medium power licences are granted only where necessary.

While ComReg's proposal to only allow medium power licences in urban areas on an exceptional basis provided some flexibility, in line with the advice of Plum, clearly this is seen as inflexible or a restriction by at least some respondents. Noting that the demand for medium power licences in urban areas might well be somewhat more than exceptional[10] and that the need might be justified in select cases, we believe that ComReg could consider adjusting the phrasing of its proposed approach, so that medium power licences in urban areas would be allowed in justified cases, rather than being considered "*exceptional circumstances*".

Requests for medium power should be justified

In terms of controlling the number of medium power licences assigned (both in urban areas and elsewhere), we believe that the suggestion from Sigma Wireless to require some form of justification on application is sensible, in particular as applications would be assessed on a case-by-case basis anyway. This would mean that:

- ComReg could reject/amend applications for medium power licences that are not needed and ensure medium power is only used where necessary; and
- incentives to apply for a medium power licence in the first place would be limited by the administrative burden of

[10] In particular noting the large range of EIRP levels possible under a medium power licence (as set out in ComReg's initial consultation document, in line with ECC Decision 24(01)) and the potential for applicants to operate a base station at just over the maximum power permitted by a low power licence.

having to provide justification and the expectation of failure if a reasonable case cannot be presented.

Justification for medium power use should not be restricted only to urban areas though. There are other scenarios in which there may be a cluster of potential users outside the urban centres (for example, business parks) where unnecessary use of medium power could create artificial spectrum scarcity. We therefore recommend that all applications for medium power licences should include some explanation for why low power would not be adequate. The level of detail required by ComReg may vary according to the scope for interference with nearby existing or potential future users.

Further, the reuse distances for medium power deployments are greater for those that operate at the higher end of the medium power EIRP range[11]. There may be cases where low power is not the most efficient solution, but where a power level towards the lower end of what is allowed under a medium power licence (e.g. 25-30/dBm/20 MHz) may be optimal. By transmitting at the power appropriate for a deployment, the licensee can provide sufficient coverage for the intended service while also not unduly preventing future users using the spectrum in an adjacent geographic area.

Coordination among users can assist efficient use

Druid/Analog Devices also suggested that synchronisation or signing an MoU with neighbouring users could be a condition of being granted a medium power licence in urban areas.

Whilst the intention behind this, as we understand it, has merit in that it is proposed to ensure medium power licences in urban areas are granted only where the impact on neighbours is proven to be limited (and acceptable to other users), we do not believe it needs to be a formal requirement. New licences would only be granted where they would not create harmful interference to other users. Where no interference issues arise (and provided ComReg is satisfied with all other elements of the application) there would be no need to prevent access to spectrum due to lack of coordination. Where ComReg does identify potential interference issues, the application would not be successful unless the applicant were able to satisfy ComReg that interference would be mitigated. This could (and we expect would) be best supported through synchronisation and/or coordination between the applicant and existing users. Therefore, applicants would likely seek to synchronise/ coordinate where necessary in any case and we do not see the

[11] 24/dBm/20 MHz < Medium Power Range ≤ 44 dBm/20 MHz)

need for it to be a formal pre-condition of getting a licence. Moreover, we would not want to restrict the options available to applicants in terms of demonstrating interference mitigation to ComReg if other measures/techniques might be feasible.

5 Bandwidth

ComReg proposed that it would grant rights of use of sufficient spectrum to individual licensees to meet their needs. It also seeks to avoid speculative access to additional spectrum, in particular because the considerable worst-case separation distances for frequency re-use means there is a potential for scarcity if large bandwidths are assigned. ComReg did not propose to set any cap on the bandwidth of an individual licence, but proposed that:

- applicants would need to provide rationale and plans for their bandwidth requests; and
- licensees would need to periodically report to ComReg on actual bandwidth use.

Consultation respondents are keen for large bandwidths to be made available. Sigma highlights that, while bandwidth needs are elastic with respect to cell traffic, using larger bandwidths is less complex, especially as traffic demand is difficult to predict before the network is operational. Some respondents are also concerned that the justification and ongoing reporting requirements will place a significant burden on them.

We do not think that respondents' needs for a straightforward application and compliance process or access to large bandwidths necessarily conflict with ComReg's high level proposals.

Requested bandwidth must reflect network requirements

Justification for the requested bandwidth on application and no strict cap on bandwidth per individual licence are appropriate as this allows ComReg to consider the request in the context of the local demand/interference environment. For example, a request for larger bandwidths for low power indoor use would be easier to accommodate than a request for a larger bandwidth at a medium power base station due to the difference in base station transmit power. Provided that bandwidth requests are derived from reasonable network planning, we do not expect this to place any significant burden on operators.

If the precise bandwidth requirement is uncertain, or if the operator could use less bandwidth but with a small loss in efficiency/increase in network costs, we would expect ComReg to consider whether licensing the full requested bandwidth might harm existing or potential future users. The aim is to facilitate sharing of the band by neighbouring users where possible. Therefore, while ComReg proposed no bandwidth

caps, some benchmark bandwidths naturally arise based on the number of symmetric users that could be accommodated within the 400 MHz available, i.e. 80 MHz (five operators), 100 MHz (four operators, and the amount often raised as ideal for many likely network deployments) and 200 MHz (two operators).

Benchmark values for assessing applications, not caps on what can be applied for

Operators should dimension their bandwidth requests to their specific needs, and there could be good reasons why operators' requests would not match any of these benchmark values above. However, we expect that with:

- up to 80 MHz (minimum of five operators in the same – or overlapping – geographic area) there is likely to be limited impact on the risk of congestion, so assessment of smaller bandwidths on applications may, in most cases, not need to be particularly onerous;
- up to 100 MHz ComReg may need to consider requests more carefully in cases where there is a risk of congestion (e.g. in urban areas), but such requests are likely to be common (as a 100 MHz channel is generally widely sought after) and, if reflective of network needs, could be justified; whereas
- beyond 200 MHz, the operator might effectively monopolise the band, and requests would likely only be accepted if there is a very low likelihood of other potential users in that area being negatively affected by not being able to get access to spectrum in the foreseeable future.

These are not caps, and ComReg would likely assess whether an application would cause spectrum scarcity holistically: alongside bandwidth, there are other parameters that would likely be considered including power levels, the scope for synchronisation and the potential for other applications in that area.

Periodic confirmation that the full bandwidth remains in use would not be burdensome

As with other reporting requirements, we expect that periodic updates of bandwidth usage would not be burdensome, once the initial rollout requirements had been met. In meeting the rollout requirements, we expect that operators would have confirmed their need for the full licensed bandwidth[12] and, from then on, changes to bandwidth requirements would be unlikely/infrequent.

We discuss fees in the following section, but we expect the fee structure to provide incentives to return marginal bandwidth if

[12] In this assessment, it may be necessary for licensees to provide network logs to demonstrate the network throughput and bandwidth usage,

it is no longer required, so, in normal circumstances, the ongoing reporting to ComReg might simply be confirming that the operator is still using the entire licensed bandwidth when it pays its fees. However, in certain instances ComReg could request licensees to provide additional information (e.g. network logs to demonstrate network throughput, bandwidth usage etc.) as this would provide valuable information should spectrum in a given area begin to become scarce.

6 Licence structure / area

In its draft guidance to regulators on planning WBB LMP networks,[13] the CEPT Working Group FM60 ('FM60') sets out that there are two broad approaches that could be taken:

1. "*Case-by-case planning, w[h]ere the national regulator ensures interference-free coexistence based on the technical parameters given in the license conditions (output power, antenna configuration etc).*
2. *License conditions including requirements on maximum field strength levels, for example at the border of the license area.*"

ComReg has proposed two licence types

In its initial consultation, ComReg proposed two licence types:

- **Low power**: licensee can deploy any number of low power base stations in any configuration within a 50m radius of a specified geographic coordinate.
- **Medium power**: a licence would be issued for an individual medium power base station at a given location with specific technical conditions (within the limits set out in the relevant EC documents). In defining these technical conditions, the effective geographic coverage of the licence would be assessed on a case-by-case basis. This is in line with the first option presented by FM60.

As noted in our initial report the approach proposed by ComReg has the benefits of being relatively simple to understand and implement for both ComReg and licensees. We also expect that it is likely to be suitable for the majority of WBB LMP applications.

Potential benefits of area licensing

However, in our initial report we also highlighted that there could be potential benefits from a licensing framework that supported more flexible network deployments with user-defined coverage areas and no restriction on the network deployment within that area (provided all pre-specified licence conditions are met). This would be more in line with the second approach suggested by FM60, where it would be necessary to define technical restrictions at the borders of licence areas (such as field strength limits). In particular, we suggested that this option could offer the benefits of:

[13] https://cept.org/documents/fm-60/89932/042-annex_draft-ecc-recommendation-on-lmp-and-mfcn

- giving licensees the freedom to design and adjust their networks in a way that would best serve their usage requirements within the area; and
- allowing for more precisely defined licence borders that would potentially support users making more efficient use of the available space and spectrum through sophisticated RF setups in areas with a higher density of WBB LMP networks.

Such an alternative approach could help to offer licensees better flexibility and certainty over what they will/will not be able to do with their network deployment in the future. In particular, where licences are not attached to an individual base station at a specified location, licensees would be able to adjust or add to their network as desired within their licensed area in response to changing requirements or usage, without the administrative requirement of having to apply for new or amended licences. Moreover, a licensee would have more certainty over being able to make those adjustments in the future without the potential for other networks being deployed in the meantime that then, because of interference concerns, prevent them from doing so.

Whilst none of the responses to the consultation explicitly indicated a desire for this option, feedback received during the stakeholder engagement exercise suggested at least some stakeholders would welcome an area-defined approach to licensing to support sophisticated network deployments and changes to the network in the future.

Concerns over area licensing

In its consultation document, while ComReg noted that an area-based licensing approach could be beneficial for a licensee with sophisticated network planning capabilities or for campus-type networks with multiple base station deployments, ComReg also noted the potential concerns raised by Plum Consulting, which informed ComReg's preliminary view that an area-based approach is not practical at this juncture. These concerns were over:

- the complexity of establishing appropriate restrictions (e.g. field strength limits) at licence borders, and whether that would be disproportionate and/or impractical for the majority of use cases.
- the need to make assumptions about the technical characteristics of the (unknown) services to be protected and the potential this has for inefficient spectrum planning which could result in unnecessarily, and inefficiently, sterilising access to spectrum for other users.

This is more of a problem for medium power licences where separation distances can be up to 22 km in scenarios where users' TDD frames are not synchronised.

Further, ComReg was of the view that, as rollout of services develops, it will be important to understand the intended service areas of applicants as this will inform the most appropriate licensing option (e.g. either LP or MP) and assist in ensuring the most efficient use of spectrum.

We recognise the concerns and agree with ComReg that it would be undesirable to issue WBB LMP licences that create a high risk of unnecessarily sterilising spectrum for other future users.

Further specification on licensing

In relation to stakeholder concerns around wanting greater flexibility and certainty for the overall area they wish to have licensed, some further specifications on the proposed licensing approach (as outlined below), coupled with longer rollout periods, may help to provide greater comfort.

A reasonable approach might be to structure licences such that:

- a single licence would be issued to allow for use of the spectrum with one or more medium power base stations and/or one or more low power areas[14];
- the location and technical parameters of the medium power base stations and the location of the low power areas would be specified on the application and set out in the licence;
- the licensee would also specify on application a particular (contiguous) "target area" that would inform ComReg of the area the applicant wishes to cover with its network and would assist overall planning in the band;
- the licensee may adjust its network (i.e. relocate or add medium power base stations or low power areas, or adjust the technical parameters on medium power base stations) within the target area via a licence amendment, subject to approval by ComReg (e.g. that this would not cause interference to other users) and payment of any associated fees.

The target area would be primarily used by ComReg to inform the issue of authorisations for the low power areas and medium power base stations to be listed on the licence, and to assist ComReg in its overall spectrum planning for the band. For the

[14] Where a 'low power area' is defined as per the original ComReg proposal i.e. a circle with a 50m radius centred at a specified geographic coordinate.

avoidance of doubt, the target area itself would not form part of the licence and licensees would not have any protection rights in relation to that area.

Target areas should be justified

For target areas to be useful in overall spectrum planning, applicants should expect to need to justify them. It would not be reasonable for a user to define a target area that it clearly does not need in the foreseeable future. ComReg should therefore reserve the right to reject applications specifying target areas that it considers unreasonable.

Wide area low power usage under one licence

We also believe that the above proposal should largely deal with concerns raised by the DECT Forum in relation to low power licences. In its response to consultation, the DECT Forum asks for low power licences with larger coverage areas than the 50m radius circles ComReg has suggested. It argues that there are users that would wish to deploy low power networks over larger areas (such as industrial complexes, factories and ports) and that would benefit from being able to do so under a single licence rather than multiple assignments that cover the whole area.

Under the proposals above, those users would be able to manage their needs (in a given area) under a single licence, as suggested by the DECT Forum. Users would of course still need to specify multiple low power areas to cover their desired footprint, but we would not expect it to be particularly onerous for users to establish where those need to be. Once in place, annual renewals and any amendments would all be completed for a single licence. We are therefore of the view that no further measures are necessary to better accommodate users wanting low power deployments with larger coverage areas.

7 Fees

Our views on objectives for the WBB LMP fees were set out in the first consultation. To recap, we believe these to be:

- **Administrative cost recovery:** Revenues collected from the licensing scheme should cover the costs to ComReg associated with the framework.
- **Incentives for efficient use:** The framework should encourage the efficient assignment and use of 3.8-4.2 MHz spectrum and encourage licensees not to take more than they need to operate. Financial incentives should align with these goals and could apply to the amount of bandwidth, the coverage area, power levels, base stations to be deployed and indoor/outdoor usage.
- **Avoiding barriers to take-up:** The potential use cases for this spectrum are varied. The fee structure, while maintaining the incentives outlined above, should not discourage take-up by atypical projects.
- **Transparency and consistency:** Clarity and certainty of fees is important to users who rely on these licences and essential to attracting investment in emerging technologies needing long-term investments.
- **Practicality:** The fee structure must be feasible for ComReg to implement and maintain.

Respondents to the consultation broadly agreed with these objectives, but requested more information and the opportunity to comment on a more developed fees proposal.

This section provides our recommendations to ComReg on an appropriate fee structure and level. These proposals are presented, in accordance with the objectives for the WBB LMP fees above, on the assumptions (discussed separately in Section 6 and Section 3) that:

- a given licence would cover one or more low power areas (50m radius circle around a central coordinate) and one or more medium power base stations operating within a specified target area;
- rollout obligations would typically need to be met within 9 months, but longer rollout terms may be granted in justified cases.

It should also be made clear that our assumption is that annual fees would be indexed to CPI, which is now standard practice across ComReg's various spectrum licensing regimes. This is the

most practical and predictable way to help future-proof the fee levels and avoid scenarios where fees become outdated and significantly misaligned with ComReg's administrative costs.

7.1 Administrative costs

Significant uncertainty around costs and demand

Ideally the revenues achieved from the WBB LMP licensing fees should at least cover ComReg's administrative costs of running the framework over an appropriate time period. Where these costs are incremental to issuing new licences, each licence should cover its incremental cost, plus a share of the fixed cost of operating the licensing scheme over an appropriate period. We expect that incremental costs, largely relating to time spent processing applications and monitoring licences, will be greater than for other spectrum licence types (e.g. PMR) and that ComReg will incur significant fixed costs of setting up the WBB LMP.

We expect ComReg's administrative costs to be driven by:

- fixed costs of running the framework and the supporting systems in place e.g. ComReg's Radio Frequency Monitoring Network (RFMN);
- incremental costs of processing applications, which will likely vary depending on the number of low power areas and/or medium power base stations applied for, as well as the complexity of the network proposed; and
- ongoing costs of monitoring compliance, resolving issues, finance and HR etc.

A clear issue with introducing a new licensing scheme, however, is that the level of administrative cost and in particular the usage of the scheme (i.e. the number of licensees across which fixed costs should be distributed), is highly uncertain. Moreover, demand is likely to develop over time, with the expectation that initial take-up of licences will be relatively modest, but that the WBB LMP market will develop over time; this could be a fairly rapid development, but that is also highly uncertain.

Fess based on best estimates

It is therefore very difficult to establish the relevant level of fees to cover off ComReg's costs over an appropriate period. There are significant risks to ComReg of under-recovery if the fees are too low or demand does not develop as expected. ComReg will need to rely on a best estimate of what the appropriate level of fees needs to be, ensuring that, at a minimum, it is comfortable that the incremental cost of processing an application and

ongoing administration of the licence is likely to be covered. ComReg may (and should reserve the right to) adjust the fees (within reason) once the licensing scheme is more mature and both demand and associated costs are better understood. However, taking a conservative approach to setting initial fees will help to protect ComReg against the risk of under-recovery, and also provide more assurance to users that the fees will not need to increase in the future.

Objective to cover costs over the lifetime of the scheme

We also anticipate that ComReg will need to target recovery of fees over the lifetime of the licensing scheme rather than on an annual basis, given expectation over demand developments. At this stage our working assumption is that the licensing scheme will run for a minimum of 20 years. This most likely means:

- under-recovery of annual costs in the short-term, when demand is expected to be modest and costs may be higher (for example, due to initial tasks for creating the new licensing scheme and refining administrative processes); and
- over-recovery of annual costs in the later stages of the scheme once demand has increased, recouping earlier losses.

Fixed fee plus fee per LP area/MP base station

On this basis, we propose that the fees should therefore include a fixed element (i.e. to cover ComReg's costs of running the licensing framework and general application processing) as well as an amount per low power area or medium power base station included on the licence, to cover the incremental cost of processing and administering each element.

7.2 Incentives for efficient use and opportunity cost pricing

There is potential for WBB LMP use to expand (potentially rapidly) to the point that there is localised conflicting demand across users. We expect this to be more of a risk in urban centres, such as Dublin, but also in densely developed industrial areas. Many organisations that could be expected to have a use case for WBB LMP systems will be situated on business parks/ industrial estates located on rural sites or just outside cities/large towns. Therefore, there is potential for congestion even outside the cities wherever there are "clusters" of possible

users. With the IDA objective for regional development[15], we might expect this to become more of a factor over time, and the WBB LMP fees should be structured with this in mind.

Fees structure should support efficient use through opportunity-cost principles

Mitigating the risk of future scarcity requires maximising the extent to which the spectrum is allocated and used efficiently. This means users should only take out licences for what they need, so as not to unnecessarily prohibit access to spectrum for others. Ensuring this will be a significant objective of ComReg's general approach to licensing the spectrum for WBB LMP networks, via information/justification requirements on application, licence conditions and compliance checks. However, as discussed in our previous report, there is (some) scope for promoting efficient use of the spectrum through incentive measures built into the fee structure.

We therefore recommend that the fees follow opportunity-cost principles i.e. to reflect the impact that assigning a particular licence might have on the options for other potential users of the spectrum. Whilst we cannot realistically expect to measure the opportunity cost, we can consider the obvious key drivers that can be used as parameters in the fee structure.

The opportunity cost of a LMP WBB licence is primarily related to:

- the **bandwidth** assigned, as that sterilises use of particular frequencies over a certain area; and
- the area over which use of the licensed spectrum is sterilised for other users, which is directly proportional to the **power level** used.

Limited opportunity cost from LP

For low power licences this impact is likely to be very small, given the separation distance estimates provided by Plum[16]. Potential interference issues would be highly localised leading to limited scope for scarcity (i.e. even if a low power user was assigned a large bandwidth, the likelihood of that prohibiting use of the spectrum by any other user would be small).

The potential opportunity cost of the low power areas is limited to prohibiting access to the spectrum for others in the immediate vicinity of the network. In principle, opportunity costs should have the same structure as for medium power licences (i.e. increasing in bandwidth and power within the range), but the differences between types of low power licence

[15] https://www.idaireland.com/latest-news/press-release/ida-ireland-launches-new-five-year-strategy

[16] ComReg document 25/46b, page 14

are negligible. A fixed fee per low power area provides a modest incentive to economise on the number of areas used, and we see no particular need for stronger incentive effects from low power licence fees.

Bandwidth and power are relevant parameters for MP

However, where medium power licences are assigned, the scope for sterilising spectrum extends much further and the case for aligning fees with opportunity cost gets stronger as the power level used increases. At a minimum, medium power base stations should exceed the cost of a low power area, to incentivise use of low power where possible, although we believe there is also benefit in including incentives for using lower power within the medium power range. We therefore propose that the fee for each medium power base station should increase in the power level used at that base station as well as the bandwidth licensed, creating meaningful incentives for the licensee to use only what power and bandwidth they need.

We suggested in our previous report that a licensed coverage area could be used as a parameter in the fee structure. However, licensees are not formally granted a coverage area under the licence. Whilst a target area would need to be specified on application (which ComReg would use for spectrum planning purposes), this does not confer any protection rights on the licensee over the whole of that area. Moreover:

- the target area may not reflect the initial deployment of the user, since the whole of the area does not need to be covered; and
- power levels will more accurately represent the overall area affected by the licensee, with required separation distances between users potentially extending beyond the borders of the target area.

7.3 Proposed fee structure

Based on the considerations set out above and the objectives for the fees, we propose a fee structure that, for a given licence, comprises:

- a fixed component; plus
- the sum of fees associated with all low power areas included on the licence (with a flat rate charged per area); plus

- the sum of fees associated with all medium power base stations included on the licences, each of which has:
    1. a fixed component to ensure the price is at least the price of a low power area; and
    2. a variable component that increases in bandwidth and power.

The proposed fee, F, for a given licence is given by:

$$F = \delta + \tau n + \sum_{j=1}^{m} (\tau + \mu \cdot b_j \cdot p_j)$$

Where:

- δ is the fixed component of the licence fee (constant)
- τ is the fixed fee per low power area or medium power base station (constant)
- n is the number of low power areas included on the licence (variable)
- m is the number of medium power base stations included on the licence (variable)
- μ controls the general level of the variable component of the fee for each medium power base station (constant)
- b_j is the bandwidth licensed for base station i (variable)
- p_j is a measure of the power level used at base station i (variable)

Admin costs of MP covered by incentive parameters

The administrative burden (incremental cost) of assessing a medium power licence will likely increase with the power and bandwidth requested. This is because the extent to which ComReg will need to assess the applications against relevant spectrum management considerations will increase as the potential impact on other users becomes more widespread. The structure of medium power administrative costs therefore follows the key drivers of opportunity costs as described above; both are reflected in the variable component for medium power base stations that increases in both power and bandwidth. Including τ in the incremental fee per medium power base station ensures a licensee pays at least as much for any medium power base station as it would for a low power area. This is included to incentivise use of low power wherever possible.

We expect that the level of fees resulting from these incentive parameters (if set as recommended below) should be sufficient to cover the corresponding administrative costs.

7.4 Parameter values

7.4.1 Fixed fee and minimum per area/station (δ and τ)

As discussed above, it is very difficult to form an accurate estimate of either the administrative costs faced by ComReg or the number and nature of licences those need to be covered by. We therefore need to rely on setting fees at a level that provides ComReg with sufficient confidence that the incremental cost of each licence, plus a reasonable share of the fixed costs of running the framework, is covered over a reasonable period (e.g. minimum 20 years).

Propose $\delta = 400$ and $\tau = 100$

Rough estimates of the staffing costs associated with processing and administering a low power licence (i.e. requiring limited checks and with very low risk of interference) as well as ComReg's fixed costs of running the WBB licensing scheme suggests:

- δ should be set at approximately €400; and
- τ should be set in the region of €100 – 200.

Setting τ at the lower end of the range would mean the cost of a licence including a single low power area would come with an annual fee of €500, with an incremental fee of €100 for each additional low power area.

7.4.2 Bandwidth (b)

Linear relationship between fees and bandwidth

The relationships between bandwidth licensed with a medium power base station and the corresponding opportunity cost appears to be fairly simple; the greater the bandwidth included in the licence, the less there is available to others. We believe it is appropriate to set the variable fee for a medium power base station directly proportional to the bandwidth licensed (noting that the overall level of the incentives component of the fee is controlled by μ).

7.4.3 Power levels (p)

For the power level parameter, p, we suggest that ComReg splits the range of power allowed under a medium power licence into multiple 'power bands' and varies the value of p across those bands. Applying a linear relationship between

power and price is difficult due to the margins for error around measuring power emitted by a base station. We are therefore of the view that splitting the medium power range into multiple 'power bands' is more appropriate and simpler, removing the need for precise measurement of power.

Three 'power bands'

We expect that dividing the overall 20 dBm medium power range into three approximately equal bands (low, middle, high) would be sufficient to allow reasonable variation in incentives across the overall medium power range. Given the EIRP limits proposed by ComReg (which are aligned with ECC Decision 24(01) and Decision (EU) 2025/2425), we suggest the power bands and mid-points set out in the table below.

Table 1: Proposed medium power bands

	BW ≤ 20 MHz		BW > 20 MHz	
Power band	**Range**	**Mid-point**	**Range**	**Mid-point**
Lower	24 – 31 dBm	27.5 dBm	18 – 25 dBm	21.5 dBm
Middle	31 – 38 dBm	34.5 dBm	25 – 32 dBm	28.5 dBm
Higher	38 – 44 dBm	41 dBm	32 – 38 dBm	35 dBm

Setting p in proportion to excess base station range

The value of p would therefore take one of three values, one for each of the power bands set out above. An appropriate principle for determining the three values would be to set them in accordance with a measure of the relative potential congestion that could result from bases stations operating at power levels in the respective bands. For this purpose, we need to consider power in absolute terms (i.e. mW not dBm) as that is roughly proportional to the area sterilised by the base station and therefore reflective of the potential scarcity it might cause.

Excess power is the relevant measure

We assume there is some radius around a base station within which it is unlikely that any conflicting user would locate (e.g. due to the licensee being the freeholder or leaseholder of the site) – call this the 'domain' of the base station. There will be a power level, p_0, at which the range of the base station is equivalent to its domain. The relevant measure of potential congestion and opportunity cost is therefore the *excess* power above p_0, since that measures the range over which the user could feasibly sterilise the spectrum for others (i.e. the area outside the base station's domain). It is difficult to know exactly

what level p_0 should be set at (and that may differ across base stations). We expect that it will fall below the maximum allowed for low power areas, but prudence suggests not setting it at the top of the low power range. We therefore suggest using the mid-points of the low power range as the basis for measuring excess power. These are:

- 12 dBm (15.9 mW) for BW $\leq$ 20 MHz; and
- 9 dBm (7.9 mW) for BW $>$ 20 MHz

$p = 1, 5$ *or* 23

With the power bands set out above, there is approximately 7 dBm between the mid-points of the low and middle bands, and 6.5 dBm between the mid-points of the middle and high bands.

The corresponding *excess* power levels (in mW) are in a roughly 1:5:23 ratio. Table 2 provides the mW power levels and excess power for each of the medium power bands set out above.

Table 2: Excess power in medium power bands

	BW $\leq$ 20 MHz		BW $>$ 20 MHz	
Power band	**Mid-point (mW)**	**Excess power (mW)[17]**	**Mid-point (mW)**	**Excess power (mW)**
Lower	562.3	546.5	141.3	133.4
Middle	2,818.4	2,802.6	707.9	700.0
Higher	12,589.3	12,573.5	3,162.3	3,154.4

We can therefore set:

- $p = 1$ for the low medium power band
- $p = 5$ for the middle medium power band; and
- $p = 23$ for the high medium power band

Opportunity cost and power level relationship

Setting p in accordance with those ratios makes the assumption that the density of potentially conflicting users (users that might have made use of the spectrum but cannot) is uniform across the range of the base station. However, there are arguments that suggest the density of conflicting users might be non-uniform and in fact may change as the distance from the base station increases.

[17] Excess power is calculated as the mid-point of the corresponding medium power band (in mW) less the mid-point of the low power range (in mW).

This could occur, for example, if users are clustered, so the number of impacted entities is relatively large within a certain distance of the base station but falls (potentially significantly) once the base station range extends beyond the cluster. In this case, we might expect the marginal opportunity cost to increase with power initially but then fall once the power exceeds a certain level. On that basis, the relative opportunity cost of base stations operating with different power levels might be better reflected by scaling back the dependence of fees on power, in particular at the higher end of the power range.

On the other hand, there may be cases where this assumption does not hold. On large campuses, for example, the range of a base station operating with higher power might not reach the point at which the density of users falls. Having incremental fees declining in power might therefore have the undesirable impact of incentivising use of higher power levels to achieve the desired coverage when it would be preferable (from a spectrum management perspective) for the user to instead build more infrastructure at a lower power.

Having a declining impact of power on fees is therefore somewhat risky, and there is no clear approach to measuring or dealing with different patterns of conflicting user density around different base stations. We therefore propose that the power parameter is set on the simple assumption of uniform density of users.

7.4.4 Incentives level for medium power (μ)

μ controls the overall level of the fee for each medium power base station and determines the intensity of the incentives built into the fee structure. Ideally the value of μ would be set to ensure the fees paid by licensees reflect the opportunity cost of the licence assignment. However, it is not straightforward to establish what an appropriate value might be. There are three broad approaches ComReg could consider taking, only one of which seems viable.

Opportunity cost is difficult to measure directly

Calculating the opportunity cost of granting access to the spectrum would provide the most accurate basis for setting μ. However, we have no reliable way of doing so given the significant uncertainty and lack of information about the potential users/uses of the spectrum, density of deployments, user valuations etc. Moreover, the opportunity cost is likely to vary significantly across locations. In many, if not most, cases

there will be no scarcity of spectrum (and very low risk of future scarcity) and the opportunity cost will therefore be zero, even with large bandwidths and high power (e.g. at a remote site with only one potential user). We therefore do not see detailed opportunity cost measurements as a feasible option for the basis of setting μ.

Using value of alternative spectrum not realistic

Another approach that could be considered is to estimate opportunity cost by looking at the **value of alternative spectrum** that could be used to provide similar services. That would give an idea of the cost to operators from having to use alternative means for providing services if the 3.8 – 4.2 GHz spectrum were not available. In this case, the most logical alternative band to look at is the 3.6 GHz band, which current licensees could potentially make available on a localised basis to users wanting a private network. The value of the 3.6 GHz band (based on prices paid for the spectrum) could provide an indicator of the minimum amount we might expect licensees to charge for access to the spectrum. A significant problem with that, however, is that it would be very difficult to establish a reasonable estimate of the value of the spectrum at a sufficiently localised level to reflect private network usage.

Contribution to cost stack gives a rough view of appropriate level

In the absence of more precise options for determining the level of incentives to apply through opportunity cost estimates, we could instead form a view of what an appropriate level of fees might be based on the **contribution of spectrum costs to the overall cost stack** of deploying a private network. Put differently, we consider whether the spectrum costs associated with deployment of a new medium power base station are reasonable relative to the corresponding infrastructure and other deployment costs. We recognise that deployment costs are also uncertain, but we can avoid some complicated (location specific) assumptions by using this broad approach. If the spectrum fees are much smaller, they are unlikely to yield sufficiently strong incentives to influence users' deployment decisions. If they are much greater then it is likely that the fees are disproportionately and unnecessarily high. We believe that a proportionate approach is to set annual spectrum fees at the same order of magnitude as the annual hardware costs.

Calibrate μ based on middle power band and 80 MHz

With no obvious alternative methodology for calibrating μ, we propose that a reasonable approach would be for the spectrum fees associated with a medium power base station in the middle of the power range with 80 MHz of spectrum to make up 50% of the total annual cost of the base station. Our understanding is that many users could have demand for 100 MHz, but for a

significant proportion 80 MHz would be sufficient. If licensees operate with 100 MHz, at most four users could be accommodated in any given location. At 80 MHz, at least one more user could be accommodated. Setting fees such that there are reasonable incentives for marginal users to apply for 80 MHz rather than 100 MHz therefore seems prudent.

Publicly available information suggests incremental hardware costs in the region of €10 – 50k[18] per station, although there is some uncertainty around this. If we adopt a conservative approach and use a value towards the lower end of the range, say €20k, assuming an asset life of approximately 10 years gives a rough annual hardware cost in the region of €2k, allowing for some depreciation.

$\mu = 5$

We then need to set μ such that the fee for an incremental medium power base station in the middle power range with 80 MHz of spectrum is approximately equal to €2k:

$$\tau + \mu \cdot b_j \cdot p_j = 2000$$
$$\Rightarrow 100 + \mu \cdot 80 \cdot 5 = 2000$$
$$\Rightarrow \mu \approx 5$$

7.5 Indicative prices

Based on the principles and discussions above, the proposed fees for WBB LMP licences are calculated as:

$$F = 400 + 100n + \sum_{j=1}^{m} (100 + 5 \cdot b_j \cdot p_j)$$

For reference, the table below sets out the range of annual fees for a licence with a single medium power base station under different power levels and with different bandwidths. The incremental fees for additional bases stations can be calculated by subtracting the fixed fee (δ) from the numbers below.

High power fees are large, but need to be

We recognise that prices for base stations operating in the highest power band may be considered high. However, this is reflective of the fact that stations using those power levels are likely to sterilise the spectrum over a much larger range than

[18] https://netsupportline.com/private-5g-network-deployment-costs/#capex

https://www.uctel.co.uk/blog/cost-and-roi-of-deploying-a-private-5g-network-in-the-uk

those at lower power. For efficient spectrum management, it is important that users are incentivised to operate with networks that minimise the potential impact on others wherever possible.

Table 3: Indicative medium power fees

Bandwidth	Low power band	Middle power band	High power band
10	€550	€750	€1,650
20	€600	€1,000	€2,800
30	€650	€1,250	€3,950
40	€700	€1,500	€5,100
50	€750	€1,750	€6,250
60	€800	€2,000	€7,400
70	€850	€2,250	€8,550
80	€900	€2,500	€9,700
90	€950	€2,750	€10,850
100	€1,000	€3,000	€12,000
110	€1,050	€3,250	€13,150
120	€1,100	€3,500	€14,300
130	€1,150	€3,750	€15,450
140	€1,200	€4,000	€16,600
150	€1,250	€4,250	€17,750

7.6 Longer rollout premium

Longer rollout terms should come with a premium on fees

ComReg may allow for applications requesting a rollout period longer than the standard 9 months proposed (i.e. up to three years). In this case, it would be appropriate for licensees with longer rollout terms to pay some premium for that option to:

- reflect the likely additional costs to ComReg from a more complicated application assessment (since ComReg would

need to review the proposed rollout plan and corresponding justification) and ongoing monitoring of rollout; and
- create incentives for users to apply for longer rollout only if necessary.

Main concern is incentives

Again, it is difficult to form a firm estimate of the additional costs to ComReg in relation to managing longer rollouts. However, we anticipate that the incentives built into the standard fee structure should be sufficient to cover those extra administrative costs. Cost recovery is therefore less of an issue, and the bigger concern is ensuring there are sufficient incentives for only those users really needing a longer rollout period to apply. There is no clear approach to determining a precise number for this, but:

- it needs to be large enough to be effective; and
- the users we anticipate needing longer rollouts will be those engaged in large infrastructure projects for which the spectrum fees will represent a small proportion of overall costs, so there is limited scope for pricing of the users with genuine need for longer rollout.

3 x standard fee for longer rollout

On this basis, setting the fee for a longer rollout at **three times the standard rate** would be appropriate.

In this case, the fee formula set out above in Section 7.3 could be expanded as:

$$F = \delta + \sum_{i=1}^{n} e_i \tau + \sum_{j=1}^{m} e_j (\tau + \mu \cdot b_j \cdot p_j)$$

where:

- e_i controls the rollout premium applied to low power area i, with $e_i = 1$ where the standard fee rate applies and $e_j = 3$ for a low power area subject to the longer rollout premium; and
- e_j controls the rollout premium applied to medium power base station j, with $e_j = 1$ where the standard fee rate applies and $e_j = 3$ for a base station subject to the longer rollout premium.

Licensees can save by rolling out some or all of the network faster

For clarity, we propose that:

- the longer rollout premium would apply as appropriate to the incremental fees for individual base stations or low power areas within a licence – this means that an applicant may apply for a licence with some base stations/low power areas on the standard rollout terms (and which would then

need to be deployed within 9 months) and other base stations/low power areas with an extended rollout (which it would pay extra for); and

- if a base station/low power area on longer rollout is deployed earlier than planned, the licensee would not have to pay the premium for subsequent years (e.g. if it applied for a base station with a rollout period of three years but deployed within two years, the premium would then not apply for the third year).

8 PMSE licence duration

Whilst the previous chapters set out DotEcon's assessment on the non-technical issues raised by the respondents in relation to WBB-LMP, this chapter considers a potential revision to the PMSE licensing framework in relation to licence duration.

As discussed in our previous report the maximum duration of PMSE licences previously recommended was six months, in line with the current approach. We suggested that longer licences would likely be of limited benefit given the ready availability of spectrum and options for taking a full PMR licence if the spectrum is needed over a longer timeframe.

Longer PMSE licences may benefits some users

Whilst no respondents to the consultation commented on this, some stakeholders expressed an interest in longer durations during the stakeholder engagement, and we have considered the matter further. The PMSE licence data indicates a polarised split of licence terms between:

- users wanting the spectrum for relatively short periods (less than 10 days); and
- users applying for the maximum 6 months duration.

It is not unreasonable to think that at least some of those taking out six-month licences require year-round ability to use PMSE equipment (e.g. organisations with internal conference facilities). Longer (maximum) licence durations would reduce the frequency with which those users would need to submit new licence applications, in turn reducing the administrative burden they face from managing their licences.

We consequently believe that it may be beneficial for ComReg to increase the maximum PMSE licence duration that users could apply for. Making the maximum 12 months, say, would (i) better support users needing licences full-time and (ii) remain consistent with the general PMR licensing framework.

Incentives to use short licences where longer terms not needed

However, if longer licences are allowed, it may then be prudent to offer some (financial) incentive for not taking longer licences than needed. Whilst there is currently no scarcity of PMSE spectrum and it is issued on a shared non-interference non-protected basis, it would not be ideal to artificially limit supply (and increase the risk of scarcity emerging) through a proliferation of long licences that are not used for most of that time. This incentive does not need to be large as there is limited value in holding longer licences for security of spectrum access (given the lack of scarcity).

Recommendation for two PMSE duration options

On this basis, we recommend ComReg considers making PMSE licences available in the following two duration categories:

- **up to 3 months**, with a fixed fee (per typical channel[19]) of €100; and
- **up to 12 months**, with a fixed fee (per typical channel) of €131.50 (i.e. half the base fee for a PMR licence, as per the PMSE fee under initial proposals).

In addition, we previously suggested that the per kHz fee would be constant across licences issued in the same band i.e. so if the typical channel in a band was 12.5 kHz (which would then be subject to an annual fee of €130.50), a licence for 6.25 kHz would cost half as much (i.e. €65.75). However, we believe it would be prudent for ComReg to apply a floor to the fee for a PMSE licence as not doing so could risk licence fees that do not cover the incremental administrative cost of the licence. It is very difficult to estimate these incremental costs, but they are likely to be relatively low given the online and fairly automated licensing process. We therefore believe that a price floor equal to half the fee for a typical channel is likely to be sufficient. This means that any given PMSE licence fee would be at least €50 for a 3-month licence and €65.75 for a 12-month licence.

[19] As discussed in our previous report, this is the typical bandwidth for the specific PMSE frequency band licensed, which may differ across bands in accordance with the differing needs of use cases. For example, wireless cameras operating in the higher frequency bands (2 – 10 GHz) typically need bandwidth of 10 MHz (and often up to 20 MHz), whereas PMSE operations in the UHF bands typically use 2x12.5 kHz channels.