



Montreal, October 26, 2019
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Senior Director
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235 Queen Street
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RE: Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band (Canada Gazette, ...Part I, Gazette Notice SLPB-002-20, August 2020)

Dear Sir / Madam,

1. ECOTEL Inc. ("ECOTEL") is pleased to submit these comments to Canada's Minister of Innovation, Science and Economic Development in response to the on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band.
2. ECOTEL is a registered Wireless Service Provider licensed in several areas across Canada to operate wireless LTE networks addressing markets in remote regions where other wireless service providers provide limited services.
3. ECOTEL's primary mission is to design, deploy and operate highly secured private LTE cellular networks targeted to mission critical and specialized industrial applications for the Oil, Mining and Utilities markets.
4. Autonomous Truck control system, PLC and SCADA Services, Sensors/Flow meters, real time monitoring and Trucks Collision avoidance systems are just a few of these mission critical applications which benefit from the superior and advanced robustness, security, reliability and performance provided by the LTE wireless technology.
5. ECOTEL is a pioneer in the 4.0 industry revolution, bringing the companies in the mining and oil industry into this new technological era and helping them to increase their efficiency and improve workers security. ECOTEL is allowing new generation of workers to safely and remotely controlling mining equipment located 3 km

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underground. ECOTEL is now exporting Canadian technologies and knowledge to industries operating in multiples countries including USA, Mexico, Chile, South Africa, Finland and Australia.

6. In addition to our industrial focus, ECOTEL also deploys and operates costs effective LTE cellular networks aimed at providing Data & Voice mobility services to remote & rural communities or enterprises.
7. ECOTEL was granted the first subsidy from Federal and Provincial Governments to offer broadband services along the 155 road and in adjacent municipalities and communities in Haute-Mauricie and Lac-St-Jean.
8. ECOTEL is continuously seeking access to new spectrum and, in addition to existing spectrum licenses owned, ECOTEL constantly tries to negotiate spectrum subordination agreements with other carriers in different locations in Canada though so far with very limited success.
9. ECOTEL has also been helping Canadian industries to help on premise COVID tracking using their patent pending technology.
10. As an active actor in the IoT market, building creative solutions for its customers for more than a decade, ECOTEL acquired a privileged view and understanding of this market and its key components (spectrum regulation, technology, business drivers, etc.)
11. As such, ECOTEL strongly believes that the vast majority of 5G benefits for the Canadian economy will not come from the current inherited wireless operator business model but will instead come from the enhanced productivity along the whole provisioning chain of the various market verticals. The benefits of 5G will be felt from resource extraction to the end-product manufacturing and industry 4.0 initiatives.
12. The current model for spectrum attribution cannot foster innovation as both main contenders, namely the traditional wireless operators and the current and upcoming players in the private network industry (the Innovators), are feeding from the same finite resource: spectrum.
13. The traditional operators use the spectrum to monetize it directly by selling a “pipe” to their customers and let the over-the-top service providers (most of them outside of Canada jurisdiction) capture the vast majority of the benefits associated with this ecosystem.

14. The “Innovators” on the other hand are actually using the spectrum as a platform to develop and enable solutions that will increase Canadian industry competitiveness in many market verticals. Ecotel solutions are currently addressing the primary sector of the mining, forest and oil Industries. As explained further, the potential is huge as each portion of the verticals can benefit from the use of the technology to increase its productivity.
15. The presence of those innovators has a multiples effect:
- 1) it fosters a new “solution” industry in Canada
 - 2) it helps increase Canadian industries productivity
 - 3) it increases the safety of the workers
 - 4) it contributes to exportation. Ecotel is already exporting its solution to USA, Mexico, Finland, Chile and Australia
16. The solutions developed by the “Innovators” are based on industry requirements that are most of the time not compatible with the way the public networks have been engineered. For example, Ecotel solutions bandwidth requirement is mostly uplink driven (meaning the vast majority of the traffic is flowing from the mobile/device towards the base station and Core Network), while the bandwidth requirements for public networks are mostly downlink driven.
17. Of course, there are and will be some case scenarios, when the required spectrum/bandwidth is low, where it might be possible for “innovators” to use the public network. But in most of the cases, the resources required by both contenders make it impossible to share a unique spectrum band that will serve both.
18. The potential of 5G for economic growth is enormous. For example, the smart manufacturing market is set to grow to \$1 trillion according to ABI, with 4.3 billion wireless connections predicted by 2030¹. With the lack of specialized work force, automation is the only option for Canadian industries to compete with other worldwide industries.
19. Take for example the car industry. Tesla is currently leading the innovation and technology over the traditional long-established car manufacturers. We are asking ISED to support Canadian innovative initiatives.

¹ Siemens joins Ericsson-led UK Industrial 5G Accelerator
<https://enterpriseiotinsights.com/20200924/channels/news/siemens-joins-ericsson-led-uk-industrial-5g-accelerator>
<https://www.ericsson.com/en/news/3/2020/ericsson-and-digital-catapult-to-unlock-5g-potential-with-uk-smart-manufacturing-partners>

20. Thus, making the spectrum available to the highest bidder may no longer be the go-to de facto solution as it would impair the potential economic growth by many folds.
21. Ecotel sees a similarity with what happened to the Quebec aluminum industry in the past. The government agency asked the power utility company to reserve energy blocks to foster specific targeted high-potential industries. Over the years, it helped foster the whole aluminum industry, initially mostly target at the first transformation which was power hungry. Then it gave an opportunity to the second transformation industry to grow and it rapidly expanded to the end product manufacturing in some cases. The overall benefits on the economy of dedicating a part of this limited resource (power at the time) instead of selling it directly is obvious now. The window of opportunity is now for ISED to foster a new era of Industry 4.0 by dedicating significant spectrum resource to private networks.
22. Other regulators in the world have already recognized this paradigm shift and chose to act promptly to make sure their country would stay at the forefront of this blooming market.
23. In UK, Ofcom put in place two key policies to ensure private networks would not lack vital spectrum resource². The first action was to dedicate the 3.8-4.2 GHz band (400MHz of spectrum) for local private and shared networks. Then, they required national operators to relinquish unused spectrum to enterprises while taking provisions to mitigate potential interference between the private and the public networks using the same spectrum. It covers spectrum holdings in the 800 MHz, 900 MHz, 1400 MHz, 1800 MHz, 1900 MHz, 2100 MHz, 2300 MHz, 2600 MHz and 3.4 MHz.
24. This may seem too much spectrum at first glance, but when projecting ourselves in 10 years from now, where for example the manufacturing processes will make use of real time Artificial Intelligence to feed Augmented Reality, one can easily understand the amount of data that will need to transit on the network and the spectrum requirement associated with. Even now, ECOTEL has to stretch the limits of the WBS spectrum available to serve its customers wishing to implement autonomous vehicles and remote control of extraction equipment. In some cases, the bandwidth requirement of a single mine pit, may reach up to 200-300 Mbps (mostly uplink traffic) with the current equipment.
25. Germany, France, Sweden, Netherlands, Japan, Australia, Chile are countries allowing industries to have access to spectrum for their private LTE networks.

² <https://enterpriseiotinsights.com/20190725/channels/news/uk-releases-masses-of-spectrum>

26. In Germany, the government dedicated the 3.7Ghz to 3.8Ghz range to private LTE networks. Industrial companies such as Bosch, BMW, BASF, Lufthansa, Siemens and Volkswagen are leveraging the 5G technology in their manufacturing plants.
27. Recent GSMA Intelligence report showed that in addition to spectrum set aside for verticals industries, regulators in other countries began to attach new license obligations such as Sharing/Leasing of spectrum to achieve better outcomes.
28. Furthermore, the propagation characteristics of the 3500 MHz band, especially the high attenuation through building walls, make that band very suitable to be used in manufacturing and industrial spaces as it will not interfere the network of the adjacent building or plant.
29. For all these reasons, and as further described here in, ECOTEL recommends that the 3700-3800 frequency block be instead reserved for the development of private networks, leaving the remaining 180 MHz between 3800 and 3980 MHz for large mobile carriers. In addition, as per Telesat proposal, it appears that a supplementary 100 MHz could be freed in the future. This would potentially allow 280 MHz of adjacent spectrum for the existing mobile carriers.
30. ECOTEL is also asking ISED to put in place a new policy framework to make available to private networks the unused spectrum from other bands, which has been a key contributor to the current digital divide we see today.
31. The 3650-3700 MHz band (also known as WBS) is currently today the only band left for small Canadian Service providers to provide fixed and mobile data services using 3GPP ecosystem. Thanks to CBRS in the United States, these small Service Providers can now use off-the-shelf 3GPP equipment to deliver high speed connectivity.
32. Up to now, WISP's were using proprietary point-to-multipoint technologies operating in 3.65Ghz. 3GPP devices such as terminal and phones allow WISP to lower the cost of the equipment. By moving WISP to 3900Mhz, ISED would prevent WISP from using standard 3GPP equipment and force them to use expensive proprietary technologies.
33. ECOTEL requires to keep an access to WBS band to provide 5G services to remote communities where no licensed spectrum is "said" to be available to sublicense from larger operators, even if, in most of the cases, licensed spectrum is not even being used by these licensees.
34. ECOTEL considers that using government money (grants) to pay for the proposed migration (from WBS to the 3900-3980MHz block), as proposed by ISED, is not an

efficient use of Canadian taxpayers' money. Moreover, this would create a risk of using expensive and limited ecosystem.

35. For the reasons stated above, ECOTEL is proposing to keep the current WBS block as a shared band as it has shown it has its purpose to serve Canadians.
36. ECOTEL recognizes the requirement for an efficient use of the spectrum due to its limited nature. As such ECOTEL is proposing to apply technical rules to the utilization of the that block (WBS), similar to the ones used for the 3450-3650 MHz block.
37. ECOTEL is also proposing to remove power limitation associated to the WBS block utilizations in the tier-4 located outside of urban areas. The application of the same technical rules as the 3500Mhz band, as suggested in the last paragraph, would guarantee a peaceful coexistence between both geographically and frequency adjacent users.
38. The combination of the last 2 recommendations would provide incentive for rural WISPs to pursue their migration toward 3GPP based equipment. This would result in an improvement of both WISP`s customers experience and spectrum efficiency. All that as zero cost for Canadian taxpayers, when compared to the proposed ISED WBS user migration which is likely to turn into a hundred of millions venture.
39. In addition, maximum power limit and antenna down tilt can be used by the operator to prevent interference.
40. Some may argue that they require all the possible spectrum to cope with the increasing traffic. ECOTEL would refer them to the recent 3GPP release which provides different ways to make use of DSS (Dynamic Spectrum Sharing) in their existing bands, thus allowing for a smooth transition toward 5G but dynamically sharing spectrum between LTE and 5G.
41. ISED has to understand that the key benefits of 5G in public network will come mostly through network densification. Adding spectrum to existing site will not increase spectral efficiency as the highest throughput can only be achieved in extremely good radio conditions (very close to the radio). The densification will translate into additional small cells serving indoor or limited outdoor areas. Thus, allowing for better frequency reuse which limits the requirement for humongous amount of spectrum.
42. ECOTEL believes that 200 MHz of spectrum in the 3450-3650 MHz block combined with the advancement in DSS is sufficient for existing major carriers to initiate the transition toward 5G and offer a decent "pipe" to the customers until 6 GHz and millimeter wave spectrum becomes available.

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43. The table below presents ECOTEL’s allocation proposition for the entire spectrum between 3450 and 4000 MHz:

Blocks	Usage
3450-3650 MHz (200 MHz)	Flexible use leftover to be auctioned in 2021
3650-3700 MHz (50 MHz)	Left as Shared Use using same technical rules as the 3450-3650 MHz block and available for private network
3700-3800 MHz (100 MHz)	Dedicated to private network utilization to serve Industry 4.0
3800-3980 MHz (180 MHz)	Flexible use to be auctioned (which could be extended in the future up to 4200 as per US)
3980-4000 MHz (20 MHz)	Guard band with FSS

44. Below are specific answers from ECOTEL to ISED's questions as per the Consultation on a Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band.

Q1— ISED is seeking comments on the timelines for the development of an equipment ecosystem using 5G technologies in the 3800 MHz band. In particular:

a) the ecosystem maturity level and readiness of equipment under band classes n77 or n78 for the Canadian market

45. The development of a new ecosystem compatible with Canadian market is mainly driven by the US wireless market. This accounts for radio station but mostly for the terminals who are often the missing link in the equation. Not only the supported band is required but the right combination of bands has to make sense for a Canadian operator (to match its spectrum assets).

46. The opening of the CBRS band (3550-3700 MHz) combined with both the upcoming auction of the 3700-3980 MHz block and the recent announcement by FCC to auction the 3450-3550 MHz block in US has opened the trail for the n77 band ecosystem.

47. At this moment, n78 radios are available that can cover 3300-3800 MHz. In addition, some vendors already announced the availability in Q1 2021 of new radios for denser areas (massive-MIMO) that will cover the 3800-3980MHz block (namely n77D). On the device side, the latest iPhone is certified for n77.

b) the ability of existing or future base station radios to handle multiple technologies and band classes at the same time (i.e. whether all four band classes (B42, B43, n77 and

n78) or a subset of these band classes are able to operate on the same base station radio) and how it may affect the adoption of 5G technologies in the 3800 MHz band

48. For the reason explained above, the base station radio will be built according to US Carrier specifications. As of Today, they are deploying n78 radio which are not compatible with n77 compatible nor upgradable. This means for example, that a small WISP who would buy B48/n78 radios to use in the WBS band in Canada could not reuse them to operate in the 3900-3980 MHz block.

Q2—ISED is seeking comments on the potential linkages between the equipment ecosystems using 5G technologies in the 3500 MHz and 3800 MHz bands. In particular:

a) whether contiguity between the 3500 MHz band and 3800 MHz band is preferred given that 3GPP specifications allows for non-contiguous carrier aggregation

49. Since the 5G radio can accommodate aggregation of multiple none-contiguous carriers within a same band frequency band, the requirement for contiguity between 3500 MHz band and 3800 MHz is no longer a necessity.

b) whether there are any technical or operational impediments (e.g. equipment limitations/challenges to support aggregated use of spectrum, or requirements for additional base station radios) that would be incurred if operators have a large frequency separation between frequency blocks in one or both bands, and at what point (i.e. how wide the frequency separation) such impediments would become significant

50. Based on its experience with equipment vendors, it is ECOTEL understanding that limitation factor is not around the frequency span over which carriers can be aggregated in a given band but more around the overall bandwidth it can process.

51. As explained in the previous section, the equipment vendors chose to address the issue by offering a 2-tier approach. A first set of radio equipment that will cover the lower part of the band (3400-3800 MHz) already available to server n78 band, and another set that will address the upper portion of the band spanning from 3700 MHz to 3980 MHz for the moment, but likely to extend to 4200 MHz as this part of the spectrum will become available in the US.

c) whether the equipment ecosystem deployed for the 3500 MHz band will be able to operate in the 3800 MHz band, and whether this equipment could easily be extended to 3800 MHz after being deployed

52. As explained above, the 3500 MHz band equipment will not be able to operate in the upper portion of the 3800 MHz band.

Q3-ISED is seeking comments on how the difference in technical rules between the U.S. and EU could impact Canada's ability to leverage the economies of scale from the global 3800 MHz ecosystem. In particular:

a) would the difference in technical rules (such as out-of-band-emission (OOBE) power limits) result in two distinct region-specific equipment ecosystems

53. Based on experience with similar case in other bands, ECOTEL's view is that there won't be a different equipment ecosystem for Canada but instead there might be power limitation applied to carriers utilized near the band limit to meet the OOBE.

54. In general, it's always desirable to harmonize technical specifications with the ones approved by the FCC.

b) which equipment ecosystem would be more suitable in the Canadian environment (noting that Canada has, for the most part, aligned with the U.S. on low- and high-band spectrum for 5G but in the mid-band, Canada is more aligned with the EU in the 3500 MHz band (3450-3650 MHz)) and specifically, whether Canada should generally align its technical rules with the U.S. or the EU in the 3800 MHz band

55. Keeping in mind that the right combination of frequency band needs to be present in the terminals and that most of the other bands already in use are aligned with the US market, Canada should make every efforts to stay aligned with the US ecosystem.

Q4-ISED is seeking comments on the proposal to add a primary mobile service, except aeronautical mobile, allocation in the 3700-4000 MHz band to the CTFA and the specific changes shown in annex B.

56. ECOTEL agrees with the proposal.

Q5-ISED is seeking comments on developing a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz band.

57. ECOTEL agrees with this approach as it will allow for a more efficient use of the band and could allow the smaller operators serving remote communities to add mobility to their portfolio of services using the WBS block.

Q6-Given the proposal in section 7.2 on developing a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz band, ISED is seeking comments on the proposal that no new FSS earth stations be authorized in the 3700-4000 MHz band in the future and that the authorization of new FSS earth station licences be limited to the 4000-4200 MHz band.

58. ECOTEL agrees with the proposal, but, as explained in the preamble, is strongly suggesting that ISED follows Ofcom's lead in reserving a significant portion for private networks required to enable the full potential of 5G for Canadian Industries.

Q7-ISED is seeking comments on the proposal to implement a 20 MHz guard band between 3980-4000 MHz to protect FSS operations in 4000-4200 MHz band from proposed flexible use operations in the 3700-3980 MHz band.

59. ECOTEL agrees with the proposal as it contributes to align Canada with the US ecosystem.

Q8-ISED is seeking comments on the proposal to maintain a primary allocation to FSS in the entire 3700-4200 MHz band and the proposal that existing FSS earth stations in satellite-dependent areas remain licensed in the entire 3700-4200 MHz band.

60. ECOTEL agrees with the proposal as it contributes to align Canada with the US equipment ecosystem.

Q9-ISED is seeking comments on the future demand for C-band in rural and remote areas such as the North, including the following:

a) the trend towards using higher frequencies by FSS operations to provide broadband connectivity

61. New satellite services such as LEO will be using Ka band high frequencies. ECOTEL would like to ensure that the ISED policies will favor an efficient use of the spectrum. For example, would the C-Band spectrum used by FSS in rural and remote areas provide a better bit per hertz ratio if it was used to provide terrestrial services such as FWA and mobility services.

62. Moreover, Telesat's proposal as part of this Consultation tends to demonstrate that satellite operators are moving towards higher bands and that demand for satellite services in C-band will become less important and will eventually fade out over time.

b) the ability of using higher frequencies to replace current C-band capacity and the potential timelines

63. ECOTEL confirms that satellite users prefer installing smaller antennas operating in higher Ku and Ka bands rather than C band.

c) the possibility of a trend towards using 4000-4200 MHz in combination with other connectivity options (e.g. higher frequencies satellites or wireline solutions) and when it would be expected to be available for satellite-dependent areas

64. Please refer to response to sub question Q9a.

Q10-In addition to capacity requirements, ISED is seeking comments on other issues that should be considered in maintaining broadband connectivity in satellite-dependent areas.

65. Please refer to ECOTEL's response to sub-question Q9a.

Q11-ISED is seeking comments on its proposal to remove the FSS allocation in the 3500-3650 MHz band and to suppress Canadian footnote C20 in the CTFA as detailed in annex B. In addition, ISED is seeking comments on the proposed grandfathering of the existing earth station operations listed in annex C, such that fixed or mobile stations in the 3500-3650 MHz band will be required to coordinate with these earth stations as specified in SRSP-520.

66. ECOTEL agrees with the proposal.

Q12-ISED is seeking comments on its proposal to remove the primary FSS allocation from 3650-3700 MHz and suppress Canadian footnote C33 in the CTFA as detailed in annex B.

67. ECOTEL agrees with the proposal.

Q13-ISED is seeking comments on:

a) establishing unpaired blocks of 10 MHz for the 3650-3700 MHz band

68. ECOTEL agrees with the proposal of 10 MHz blocks in the 3650-3700 MHz band.

b) establishing unpaired blocks of 10 MHz for the 3700-3980 MHz band

69. ECOTEL agrees with the proposal of 10 MHz blocks in the 3700-3980 MHz band.

Q14-Subsequent to changes to the spectrum utilization described in section 7 and recognizing the need to change the current WBS licensing model, ISED is seeking comments on its proposal to displace the existing WBS licensees and designate 80 MHz of spectrum available for the development of a new shared licensing process in the 3900-3980 MHz band as described in Option 2. Specifically, ISED is seeking comments on:

a) the amount of spectrum proposed (80 MHz) under a shared spectrum licensing process

70. ECOTEL would refer ISED to the preamble of this submission to present its vision for the use of the WBS and 3800 MHz band.
71. According to a recent submission by CANWISP, more than 200,000 subscriber/households are currently served by WISPs in rural and remote communities. A vast majority of them uses the WBS block to offer the services.
72. To keep up with the demand, some of them already invested in the deployment of 3GPP compatible equipment (B48), which makes a more efficient use of the spectrum.
73. Asking them to relocate further up in the band where the propagation characteristics are basically the same is, in ECOTEL's view, a futile exercise. Furthermore, using government grants to pay for it, as proposed by ISED, is definitively not a good use of Canadian taxpayers' money.
74. ECOTEL believes that prior to ask the actual WBS block users to relocate within the same band, ISED may first want to look at new policies that would force the licensees of other bands, for which there is an existing 3GPP ecosystem, to relinquish unused spectrum assets. For example, spectrum in the B66 and B7/B41 bands, which offers better propagation characteristics, could be put in use in areas currently unserved or underserved in terms broadband services. A relocation in those terms may then become a more efficient exercise.
75. As referred to in the previous paragraphs, in the case where licensees could not "find" sufficient unused spectrum to compensate the actual users of the WBS band, then ECOTEL is the opinion that the WBS block must remain as is and that the 3800-3980 be put to auction instead of the WBS block.

b) whether there should be a provision that allows certain users (e.g. existing WBS licensees) priority licensing (e.g. an initial application window before accepting applications from others)

ECOTEL agrees with this approach (priority licensing).

Q15-Given the proposal to implement Option 2, ISED is seeking information on potential costs such as upgrading equipment, which may be incurred by WISPs that are displaced from 3650-3700 MHz to provide services using the 3900-3980 MHz band.

76. As expressed in the previous paragraphs, a relocation without tangible benefits for Canadians is a futile exercise.
77. We do not know today when vendors will manufacture low cost base station operating in those frequencies that could be used by small WISP's.

78. The cost of relocation would include the cost of swapping the LTE site for a 5G site (antenna, radios and baseband unit) since there will not be LTE radios available in the proposed relocation target block. Furthermore, typical non-standalone (NSA) 5G configuration won't be possible which means a 5G core network will be required as well. Specific combination of 4G and 5G band is needed for NSA and 3900-3980 MHz is currently not part of the supported NSA. On the other hand, NSA would be possible in the case of relocation in an unused existing spectrum band such as n66 or n7/41.

Q16-Based on the proposal to implement Option 2, ISED is seeking comments on the proposed displacement deadlines, with WBS operations in urban areas being displaced by December 2023 and all others by December 2025. Respondents are invited to propose other protection and displacement options for consideration, provided they include a strong rationale.

79. ECOTEL is opposed to migrating existing licensees from the 3650-3700 band. In addition, prior to establishing any migration deadline, ECOTEL believes that an efficient and viable solution has to be determined. We should keep in mind that in urban areas, cities and public utilities rely in the WBS band today to operate.

Q17-ISED is seeking comments on the Tier 4 service areas that would be considered urban as defined above and as listed in annex D.

80. ECOTEL agrees with the tier-4 urban service listed in Annex D.

Q18-ISED is seeking comments on whether the moratorium should be extended to include all Tier 4 service areas.

81. ECOTEL believes that until a viable and efficient solutions is found to handle current WBS band users in rural and remote areas, there should not be a moratorium. This would prevent any service provider who wish to improve the service in its area to do so.

82. Canadian Government is currently providing important subsidies to connect remote communities. A moratorium on the only open band available would be against the vision of the Government to bring high speed internet everywhere in Canada.

Q19-ISED is seeking preliminary comments on the future spectrum licensing process for 3900-3980 MHz, including the following:

a) what type of applications are envisioned for this spectrum

83. As detailed in the preamble, ECOTEL believes that at minimum 100 MHz is required to support the expected demand for Industry 4.0 that can be enabled by 5G in the future

and that, instead of reserving the 3900-3980 MHz block for private networks, the 3700-3800 MHz block should rather be reserved for such use, and leave the 3800-3980 MHz block for licensing to existing mobile carriers.

b) what type of shared licensing process ISED should consider (e.g. database approach, licensee to licensee coordination)

84. As per ECOTEL's answer above, the 3700-3800 MHz block shall be reserved for private networks. Usage in that block should be managed through a local licensing process that would include frequency coordination.

85. A database approach, such as SAS (CBRS) in the US, is not compatible with private LTE networks having no connectivity to the Internet for security reasons.

c) what additional measures ISED should consider employing to manage access to the band in high demand areas, such as major metropolitan centres

86. Licenses in the proposed private network 3700-3800 MHz block should be attributed on the basis of first-come-first-served. Licenses could also be attributed for in-building and outdoor usage (campuses).

d) what technical restrictions should be considered (e.g. technical rules similar to adjacent 3500 MHz flexible use band with reduced power levels, a guard band between new flexible use systems below 3900 MHz, shared use above 3900 MHz, etc.)

87. To allow for adjacent block compatibility, the technical rules for the private network block should be the same as the rest of the 3800 MHz band.

e) what type of eligibility criteria, if any, should be established

88. The eligibility should be in line with the use of 5G to improve Canadian industry performance. As such, public networks usage should not be considered as a valid application for the 3700-3800MHz band.

Q20-ISED is seeking comments on its proposal that existing FSS earth stations licensed in 3650-3700 MHz after June 11, 2009, be permitted to continue to operate on a no-protection basis with respect to proposed new flexible use operations.

89. ECOTEL agrees with this proposal.

Q21-ISED is seeking comments on whether the Tier 4 service areas identified for exemption of certain provisions in GL-10 for mmWave bands as listed in annex E would be appropriate to apply for FSS operations in the 3700-4200 MHz band. ISED invites

alternative proposals for areas that would be considered satellite-dependent (e.g. based on Tier 5 categories).

90. ECOTEL believes that the efficient use of the spectrum should always be part of the regulator decisions. Policies should help FSS usage in the 3800 MHz band to decline and let the way to Low-orbit satellite services which will be more efficient. As such, exemptions should then be kept to minimum.

Q22-ISED is seeking comments on whether certain remote industry operations, for example offshore oil drilling platforms, should be included in the definition of satellite-dependent areas.

91. Low orbit satellite when available should be favored as the primary link. ECOTEL believes the 3800 MHz band should rather be used to improve industrial processes.

Q23-ISED is seeking comments on its proposal to modify the existing FSS satellite authorizations to limit FSS operations in 3700-4000 MHz in non-satellite-dependent areas of Canada to a no- interference basis. ISED is also seeking comments on the proposal to adjust the conditions of licence for FSS operations to reflect the proposals as of the FSS transition deadline, including the possible removal of a high expectation of renewal for the 3700-4000 MHz portion of the band.

92. ECOTEL agrees with this proposal and would ask ISED to reserve the 3800 MHz band for more spectrally efficient activity when possible everywhere across Canada.

Q24-ISED is seeking comments on its proposed date of December 2023 as the Canadian FSS transition deadline.

93. ECOTEL agrees with this proposal.

Q25-ISED is seeking comments on how the U.S. transition will impact the availability of FSS capacity in Canada.

94. ECOTEL does not have comments at this time.

Q26-ISED is requesting information to assist with the consequent decision following this consultation. This information includes satellite transponder migration plans, frequencies, and how satellite operators serving the Canadian market will accommodate all Canadian customers, and on which frequencies. Requested information could include, but is not limited to:

- ***the names and number of satellites that will need to migrate to the 4000-4200 MHz band***

- *the number of new satellites that may be required to serve the Canadian market*
- *the locations of earth stations communicating with these satellites*
- *the number of antennas and locations of associated earth stations that will need to be retuned and/or repointed*
- *the flexibility of existing satellites to modify operations according to the different areas of Canada*

95. ECOTEL does not have comments at this time.

Q27-ISED is seeking comments on its proposed transition deadline of December 2023 for FSS earth stations, in which existing FSS earth station licenses would be modified to 4000-4200 MHz in the relevant areas.

96. ECOTEL agrees with this proposal as it keeps Canadian policies aligned with the US.

Q28-ISED is seeking comments on making amendments to the relevant conditions of licence and technical rules in the 3700-4200 MHz band as well as the 3450-3700 MHz band in order to implement the following proposals with respect to protection from interference:

a) prior to the transition deadline, existing licensed FSS earth stations may operate in the entire 3700-4200 MHz band in all areas and be protected from interference from flexible use operations both in-band (3700-3980 MHz) and the adjacent 3450-3700 MHz band

97. ECOTEL agrees with this proposal but would suggest ISED to avoid creating technical rules that would be different from the ones used in US.

b) after the transition deadline, existing licensed FSS earth stations may continue to operate in the entire 3700-4200 MHz band in satellite-dependent areas and be protected from interference from in-band flexible use operations in 3700-3980 MHz, but would not be protected from flexible use operations in the adjacent 3450-3700 MHz band; however, ISED also proposes that flexible use licensees deploying stations in the 3450-3700 MHz band within 25 km of an existing licensed FSS earth station in the 3700-4200 MHz band be required to provide a notification to these operators, one year prior to the deployment of fixed or mobile stations

98. ECOTEL agrees with this proposal.

c) after the transition deadline, FSS earth stations would only be licensed to operate in the 4000-4200 MHz band in non-satellite-dependent areas and would be protected from flexible use operations in the adjacent 3700-3980 MHz band

99. ECOTEL agrees with this proposal as long as it will be in line with radio specification rules of the US.

d) after the transition deadline, FSS earth stations operating in 3700-4000 MHz, in all areas, which are not eligible for licensing could continue to operate as a licence-exempt station without protection from flexible use operations both in-band and adjacent band(s)

100. ECOTEL agrees with this proposal.

Q29-ISED is seeking comments on the proposed change to the CTFA to add the new footnote CZZ proposed above and shown in annex B.

101. ECOTEL does not have comments at this time.

Q30-ISED is seeking comments on how to ensure the continued operation of gateways that support the provision of services in satellite-dependent areas, specifically:

a) how much spectrum would be required at these gateway sites

102. ECOTEL does not have comments at this time.

b) if these stations could be consolidated into two sites, away from major population centres, and where the best locations for those sites would be

103. ECOTEL does not have comments at this time.

Q31-ISED is seeking comments on its proposal to issue interim authorizations for certain existing license-exempt earth stations in the 3700-4200 MHz band.

104. ECOTEL does not have comments at this time.

Q32-ISED is seeking comments on the proposed deadline of up to 90 days after the publication of a decision for submitting applications for these interim authorizations of existing license-exempt FSS earth stations in the 3700-4200 MHz band.

105. ECOTEL does not have comments at this time.

Q33-ISED is seeking comments on its proposal that receive-only earth stations that are not eligible for an interim authorization or whose operators do not seek authorization, could continue to operate as a licence-exempt earth station on a no-protection basis.

106. ECOTEL does not have comments at this time.

Q34-ISED is seeking comments on its proposal that in non-satellite-dependent areas, existing earth stations that operate under interim authorizations receive in-band protection from flexible use operations in the 3700-3980 MHz band until the transition deadline.

107. ECOTEL does not have comments at this time.

Q35-ISED is seeking comments on its proposal that in satellite-dependent areas, existing earth stations that operate under an interim authorization receive in-band protection from flexible use operations in the 3700-3980 MHz band before and after the transition deadline.

108. ECOTEL does not have comments at this time.

Q36-ISED is seeking comments on its proposal that in all areas, existing licence-exempt earth stations that operate under an interim authorization receive no protection from adjacent band WBS stations and flexible use stations operating below 3700 MHz before and after the transition deadline.

109. ECOTEL does not have comments at this time.

Q37-ISED is seeking comments on whether the interim authorization process should also apply to new receive-only FSS earth stations in the 4000-4200 MHz band.

110. ECOTEL does not have comments at this time.

Q38-ISED is seeking comments on the proposed conditions for interim authorizations for license-exempt FSS earth stations in 3700-4200 MHz and new receive-only FSS earth stations in the 4000-4200 MHz portion of the band as detailed in annex G.

111. ECOTEL does not have comments at this time.

Q39-ISED is seeking comments on the proposed eligibility of licence-exempt stations that could apply for an interim authorization. In providing comments, respondents are requested to include supporting rationale and arguments.

112. ECOTEL does not have comments at this time.

Q40-ISED is seeking comments on its proposal to no longer issue new licences for fixed services to operate fixed point-to-point applications in the 3700-4000 MHz band.

113. ECOTEL does not have comments at this time.

Q41-ISED is seeking comments on whether to allow new licenses for fixed services to operate fixed point-to-point applications in the 4000-4200 MHz band.

114. Since this block will likely eventually be opened for flexible use, ECOTEL believes it should not be encumbered with new stations that would have to be migrated at some point in the future.

Q42-ISED is seeking comments on the proposal to grandfather existing point-to-point operations in the 3700-4000 MHz band under existing licences for fixed service (as identified in annex A), such that flexible use systems in these two tiers may not claim protection from, nor cause interference to these fixed service stations.

115. ECOTEL does not have comments at this time.

Q43-ISED is seeking comments on the proposal to rely on technical limits and coordination procedures rather than mandate specific technology solutions (e.g. TDD synchronization between systems) to address interference issues between TDD flexible use systems in the 3650-3980 MHz band.

116. ECOTEL agrees on the principle of using technical limits. Note that as per ECOTEL proposal, private networks are likely to use the same TDD time ratio. Same principles apply to public networks.

Q44-ISED is seeking comments on whether any additional measures should be taken to limit potential interference issues between flexible use systems in the 3650-3980 MHz band.

117. ECOTEL does not have comments at this time.

Q45-ISED is seeking comments on whether specific technical measures should be adopted to address potential interference issues between flexible use systems and WBS systems until the displacement deadline.

a) For co-channel flexible use and WBS operations in the 3650-3700 MHz band, what specific measures may be needed to protect WBS? For example, should new flexible use stations be required to coordinate with WBS stations within a specified distance prior to deployment? Alternatively, should a technical parameter such as a power flux density (pfd) trigger for coordination measured at the WBS receive antenna be adopted? Are there other more appropriate measures that ISED should consider? Should multiple measures, such as a combination of distance and pfd trigger for coordination, be

adopted? How would these requirements impact the deployment of new flexible use stations?

118. ECOTEL recommends frequency coordination among WBS users. If two WBS users are within a specified distance, limited transmission power and antenna down tilt mechanism should be put in place to limit interference.

b) For adjacent band flexible use systems, is there a need to adopt any additional measures, beyond what is currently specified in RSS-192 and SRSP-520, to further address coexistence between these flexible use and WBS systems? If so, what should they be? How many flexible use frequency blocks (or MHz) immediately adjacent to the 3650-3700MHz band could potentially affect WBS systems? How would these requirements impact the deployment of flexible use stations?

119. The 3GPP carriers have built-in guard bands and having adjacent 10 MHz channels would not cause problems.

Q46-Until the transition deadline, in all areas for flexible use in the 3650-3700 MHz band: ISED is seeking comments on the proposal that until the transition deadline, those flexible use licensees deploying stations in 3650-3700 MHz within 25 km of a licensed FSS earth station (not including interim FSS authorization) in the 3700-4200 MHz band will be required to coordinate with the operators in these earth stations.

120. ECOTEL agrees with the proposed coordination. However, the range of 25 km could be lowered considering the propagation characteristic of the 3.65 GHz signal.

Q47-After the transition deadline, in all areas for flexible use in the 3450-3650 MHz band: ISED is seeking comments on its proposal that the current SRSP-520 coexistence requirements for flexible use operations in the 3450-3650 MHz band to protect FSS operations in the adjacent band 3700-4200 MHz be removed.

121. ECOTEL agrees with this proposal.

Q48-For FSS earth stations licensed in the 4000-4200 MHz band and flexible use in the 3800 MHz band, in all areas: ISED is seeking comments on adjacent band coexistence measures, taking into account the coexistence measures adopted by the EU (i.e. a stringent OBE limit) and the U.S. (i.e. a combination of guard band, a typical OBE limit, pfd limits, and baseline minimum filter specifications for earth station operations) and the current Canadian requirements (i.e. a typical OBE limit and coordination distance):

a) What are the benefits and technical limitations associated with the above coexistence measures?

122. ECOTEL doesn't have comment at this time.

b) Which set of coexistence measures above (i.e. EU, U.S., Canada) is preferred? If applicable, comments are sought on the values of the limits in relation to the supported measures.

123. ECOTEL believes it would be best to align with US regulation to maximize the benefit of US ecosystem.

c) Given the proposal in section 9.1 to displace WBS in 3650-3700 MHz and identify 3900-3980 MHz for shared use, are there any additional considerations that may impact the response to a) and b) above?

124. ECOTEL is asking ISED to consider its herein proposed organization of the 3800 MHz band and refrain from displacing existing WBS licensees.

d) Which portion of the 3800 MHz band should the above measures be applied to in order to protect FSS in the 4000-4200 MHz band (i.e. how many frequency blocks or MHz)?

125. ECOTEL does not have comments at this time.

Q49-ISED is seeking comments on what technical requirements should be imposed to ensure co-channel protection of FSS earth stations from flexible use systems, in the relevant scenarios and timeline as stated in sections 9.5 and 9.6. For example, could the pfd limit of -124 dBW/m2/MHz measured at the earth station antenna proposed by FCC above be used to protect co-channel FSS earth station? Alternatively, should other measures be adopted, such as a separation distance as described in section 7.3? Or should a combination of measures be adopted? If applicable, what are the specific values that should be adopted?

126. ECOTEL does not have comments at this time.

Q50-ISED is seeking comments on whether the assumptions made by the FCC about earth stations, including baseline minimum filter specifications for earth station operations as stated above, are applicable to Canadian operations. Is there any additional information that ISED should consider in the development of appropriate technical rules to enable coexistence both co-channel and in adjacent bands?

In providing comments, respondents are requested to include supporting technical arguments and rationale.

In providing comments to Q46-Q49, respondents are requested to consider the coordination burdens such coexistence and protection measures could impose on either flexible use services or FSS earth stations.

127. ECOTEL does not have comments at this time.

Q51-ISED is seeking comments on its proposal to not implement any technical requirements for the coexistence between flexible use operation in the 3650-3980 MHz band and radionavigation operations in the 4200-4400 MHz band, noting the 220 MHz frequency separation between the bands of operation. If this is not sufficient for coexistence, what other measures would be appropriate?

128. ECOTEL does not have comments at this time.

Q52-ISED is seeking comments on the use of an auction as the licensing process for the flexible use spectrum that would be considered as the 3800 MHz band, noting a separate consultation process would be issued, if required, to determine the licensing framework for the range 3900-3980 MHz.

129. ECOTEL refers ISED to its band configuration proposal. Any spectrum reserved for existing WBS licensees and for private network should not be allocated through an auction.

Q53-ISED is seeking general comments on the proposal submitted by Telesat found in annex H, including whether such an approach would be in the best interest of Canadians and more specifically, whether it would result in the faster deployment of 5G services in the affected frequencies; more efficient use of spectrum and what the implications of this repurposing plan would be for other users of the band.

130. ECOTEL believes Telesat proposal is an attempt to substitute itself to the regulator and sees this as a dangerous precedent that should be avoided at all cost.

131. ECOTEL understands that the main value of this proposal is to subsidize Telesat's activities. While it allows to free up and extra 100 MHz of flexible use spectrum faster to auction, it's not likely to provide benefits to anyone until US equipment ecosystem open up to that part of the spectrum. As a result, the proposal does not bring any value for the Canadian wireless industry nor for Canada in both short or long term.

Q54-ISED is seeking comments on whether the Telesat proposal meets ISED's policy objectives outlined in section 3, including:

- a) supporting rural/remote connectivity***
- b) promoting competition in mobile services***
- c) making more mid-band spectrum available to support 5G services***

132. Please refer to ECOTEL's answer to Q53.

Q55-ISED is seeking comments on what elements from sections 7 to 10 of this consultation would still apply or need to change if ISED were to implement the Telesat proposal, in particular:

- a) the proposal for maintaining the primary allocation for FSS in the 3700-4200 MHz band***
- b) the proposed implementation of an exemption to transition for satellite-dependent communities and the proposed changes to satellite licenses to apply it***
- c) the proposal for treatment of WBS incumbents***
- d) the proposal to issue interim authorizations for certain existing licence-exempt earth stations in the 3700-4200 MHz band***
- e) technical considerations for coexistence between FSS and flexible use***
- f) technical considerations for coexistence between flexible use and aeronautical radionavigation systems***
- g) the overall impact on existing users in the 3700-4200 MHz band***

133. As explained earlier, in ECOTEL point of view, Telesat proposal is a dangerous attempt to substitute itself to the regulator and as such should be avoided.

Q56-If ISED were to implement the Telesat proposal, ISED would need to consider the licensing framework for the 3700-3900 MHz band. Thus, ISED is seeking comments on:

- a) whether it should, as proposed by Telesat, issue flexible licenses in the 3700-3900 MHz band using the same conditions of license as those contained in annex H of the 3500 MHz Framework, noting that some conditions may need to be adjusted to reflect the differences in the two bands and the decisions resulting from this consultation process***
- b) whether it should issue a single Tier 1 flexible use licence as proposed by Telesat or align with the 3500 MHz band and issue Tier 4 licences***
- c) what deployment conditions should apply to these licences including Telesat's proposal that the deployment requirements would only come into force after the Minister approves a transfer***
- d) any additional conditions of licence that should apply given the nature of the proposal***

134. Please refer to ECOTEL's answer to the previous questions in regards to Telesat proposal.

Q57-In its proposal, Telesat indicates that it takes no position on ISED imposing a pro-competitive measure such as a spectrum cap or set-aside on the 3700-3900 MHz licences. ISED would review any request for transfer in accordance with provisions related to commercial mobile spectrum through section 5.6 of CPC-2-1-23, Licensing Procedure for Spectrum Licences for Terrestrial Services. However, ISED would also consider the competitive implications on the 3500 MHz and 3800 MHz bands and

consider pro-competitive measures in accordance with the Framework for Spectrum Auctions in Canada. As such, ISED is seeking comments on:

- a) the need for a pro-competitive measure (e.g. spectrum cap or set-aside)*
- b) the type of competitive measure that should be applied*
- c) the amount of spectrum that should be considered under any such competitive measure*

135. Please refer to ECOTEL's answer to the previous questions in regards to Telesat proposal.

Q58-ISED is seeking comments on Telesat's proposals for the transition of FSS earth stations and whether any additional measures are required to ensure a smooth transition.

136. Please refer to ECOTEL's answer to the previous questions in regards to Telesat proposal.

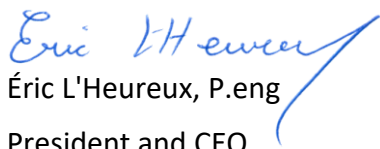
Q59-Telesat's proposal includes ISED allocating an additional 80 MHz for flexible use in the 4000-4100 MHz band. ISED is seeking comments on the feasibility of making this extra spectrum available, specifically:

- a) whether there would be standardized 5G equipment available for this 80 MHz, given that it does not align with the U.S. band plan*
- b) whether there would be FSS filters available, given the reduced amount of FSS spectrum and that it would not align with the U.S. band plan*
- c) whether there would be enough capacity to continue FSS services in Canada with the proposal to reduce the amount of FSS spectrum to 100 MHz*
- d) to what degree would the requirement to protect U.S. FSS earth stations in the border areas have an impact on the ability to deploy flexible use stations near the border and to what degree would this impact the value of this spectrum*

137. Please refer to ECOTEL's answer to the previous questions in regards to Telesat proposal.

ECOTEL thanks the Department for the opportunity to provide these comments.

Yours truly,


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