Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

June 18, 2020

The General Director
Ethiopian Communications Authority
consultation@eca-ethiopia.com
contact@eca-ethiopia.com

Re: Dynamic Spectrum Alliance Comments to the Ethiopian Communications Authority stakeholder consultation on Directives – Telecommunications licensing directive

Dear Mr Director:

The Dynamic Spectrum Alliance (DSA) [1] respectfully submits the following comments in response to the Ethiopian Communications Authority consultation on the Telecommunications Licensing Directive.

The DSA would like to congratulate the Ethiopian Government on the progress already made towards reforming the Ethiopian telecommunications sector and for the transition to liberalization which will attract local and foreign investment and introduce competition. This competition is essential to reduce the cost of bandwidth for citizens and to expand the reach of telecommunications networks to promote economic development and reduce the significant digital divide that still exists in Ethiopia. Internet connectivity brings a wide range of social and economic benefits by helping promote digital inclusion and drive sustainable growth.

[1] The Dynamic Spectrum Alliance is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small- and medium-sized enterprises, academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members/.

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

As noted in the DSA comments filed in the Ethiopian Consultation in November, we applaud the vision of the ECA for the telecommunications market to serve as the foundation for a digital economy and offer increased choice, innovation and affordability for consumers. Internet connectivity is key to digital inclusion and transformation and more Internet Services Providers (ISPs) will join a liberalized Ethiopian telecommunications market.

The DSA has no major reservations on the **Telecommunications licensing directive** published on April 27, 2020. However, in the sections below, we offer some comments and further recommendations for consideration.

PART ONE - GENERAL. Section 2. Definitions

The published directive recognizes in the list of class licenses the Internet Service Provider License: "*12) "Internet Service Provider License" means a License issued by the Authority for the provision of Internet access or service including Voice over Internet Protocol (VoIP) services using own or leased Infrastructure".*[2] This is very important, especially because internet coverage is unequal at present and there is a digital divide between cities and rural areas. Although traditional Mobile Network Operators (MNO) may cover major urban areas, a variety of services and infrastructure types will be required to provide reliable internet in the rural areas of Ethiopia where 79% of the population reside. Bridging this divide should be a central aim of any digital transformation effort.

PART ONE - GENERAL. Section 4. Scope of Application

The published directive applies to different categories of licenses: "*1) Individual Licenses; 2) Class Licenses; 3) Radio Frequency Spectrum Licenses; and, 4) Any other License category as may be determined and published by the Authority*.[3]" It correctly recognizes that there are individual and class licenses required to provide different services and identifies a different category for Radio Frequency Spectrum licenses;

[2] Telecommunications Licensing Directive No. 1/2020, Page 3.
[3] Telecommunications Licensing Directive No. 1/2020, Page 5.

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

The DSA urges the ECA to recognize in this or another directive that access to the Spectrum could be on a licensed or licensed-exempt basis and to explicitly indicate that in the last case there wouldn't be any radio frequency spectrum license associated. It is important that the Authority develops a more balanced regulatory approach between licensed, unlicensed, and lightly licensed spectrum access and considering dynamic spectrum access mechanisms in a Radio Spectrum Management directive.

While the DSA does not propose any new categories of licenses at this time, we recommend that the Authority explicitly enable flexible use of fixed and mobile service licenses to accommodate the development and deployment of innovative services. For example, a fixed service licensee should be permitted to use its license to provide connectivity through either traditional ground-based infrastructure or high-altitude platform stations (HAPS), which dynamic spectrum access and light licensing schemes can efficiently enable while ensuring noninterference.

With the latest technological advances, dynamic spectrum access presents new opportunities to bridge the digital divides between urban and rural areas and between the connected and unconnected. New technological innovations have made it possible for spectrum to be shared in a dynamic and efficient manner without interfering with existing incumbent services, boosting connectivity to rural areas[4].

PART TWO - LICENSING REQUIREMENT, PROCESS, AND EXEMPTIONS. Section 6. Exemptions from Licensing

In this section it is indicated that "*1) Notwithstanding Article 5 of this Directive, the Authority may issue an exemption order, pursuant to a transparent Stakeholder Consultation, to exempt a specified Telecommunications Service or class of persons from the requirement of holding a License*." The DSA encourages the Authority to consider in this exemption order not only some specified telecommunication services or class of persons but some frequency bands that could be accessed under a license-exempt scheme following international practices.

[4] DSA Comments to ECA on Stakeholder Consultation No. 001-2019. http://dynamicspectrumalliance.org/wp-content/uploads/2019/11/2019-11-19-DSA-Contribution-to-ECA-Consultation.pdf

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

We suggest adding the following clause: "*2) users in some specific frequency bands are exempt from the requirement of holding a License. The Authority will issue a license-exempt framework, specifying the operating parameters of devices accessing these license-exempt bands*". This clause will be extremely important to enable applications like Wi-Fi, short range devices, TVWS and many other technologies based on license-exempt frameworks.

In the same section the Authority indicates that "*2) Such an exemption shall not jeopardize the Authority's mission to promote fair competition and investment in the sector*."
License-exempt spectrum access is crucial to promote competition, investment and affordable connectivity. Even if there are not incomes from an auction or coverage obligations from a beauty contest, unlicensed spectrum has a direct impact in the economy, as well as broadband connectivity has it in the citizens quality of life and the national GDP.[5]

The third item in the Exemptions from Licensing section of the directive is that: "*3) The Authority shall, before granting an exemption order, ensure that the service to be provided will not interfere or cause harm to Telecommunications Service providers or consumers.*"
The DSA agrees on the fact that it is fundamental to protect incumbent services. It is important to note that license-exempt devices do not necessarily require an exclusive band to operate. There are many opportunities for spectrum sharing, there are examples of cases where different users can coexist in a band and the Authority can implement dynamic spectrum access schemes.

As the COVID-19 pandemic forces governments to introduce social distancing and lock-down orders, ubiquitous digital connectivity is more essential than ever. These orders significantly reduce user's mobility. Network usage patterns have therefore shifted from mobile to fixed data consumption at home. This is mostly through Wi-Fi and fixed wireless connections as consumers engage in long duration tele-working and distance learning activities.

[5] Katz, R. *A 2017 Assessment of the Current & Future Economic Value of Unlicensed Spectrum in the United States*. New York: Telecom Advisory Services. http://dynamicspectrumalliance.org/wp-content/uploads/2018/05/WiFi-Foward_Economic-Value_Shared-Spectrum_Report_05172018.pdf

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

As the pandemic spreads beyond major cities into suburban and rural areas, unconnected or under-connected populations risk becoming more vulnerable and isolated as they lack the digital means to access essential services. There is an urgent need to expand both the capacity and coverage of fixed wireless services.

ECA should consider making more license-exempt or lightly-licensed spectrum available for fixed services such as fixed wireless broadband and stratospheric Internet platforms including HAPS. This will facilitate smaller ISPs, community networks, and stratospheric Internet platforms operating in underserved areas to connect remote and vulnerable communities to vital services like telemedicine, E-learning, remote working and E-government. E-Band (71-76 GHz, 81-86 GHz) has proven particularly amenable to database-enabled light-licensing regimes, which have been adopted by jurisdictions around the world to accommodate flexible and innovative use of the fixed service.

Another good example of a technology that can expand connectivity to underserved rural and remote areas using spectrum sharing is Television White Space (TVWS) where Dynamic Spectrum Access techniques and technologies enable broadband services to be deployed in unused or underused TV broadcast spectrum without interfering with broadcast or other incumbent services.

License-exempt or lightly-licensed access to vacant UHF band TV channels can enable rapid deployment of low cost, long-range connectivity in underserved peri-urban, rural and remote areas. TVWS can provide direct connectivity to end user devices or provide a backhaul link for Wi-Fi hotspots, supporting rural clinics, telemedicine and remote learning. The DSA would be happy to provide more details about the implementation of this technology in Ethiopia.

Wi-Fi hotspots can also provide effective connectivity solutions to COVID-19 testing and triage stations, quarantine centers, field hospitals, and support remote working and learning. ECA should establish the operating framework for Wi-Fi, which is one of the most knows examples of license-exempt utilization. Right now, Wi-Fi operation is limited to the 2.4 GHz and 5 GHz band. Studies indicate that there will be a Wi-Fi spectrum shortfall of up to 1.6 GHz in the mid-frequency range by 2025 that will limit the

performance and availability of broadband, directly impacting citizens and businesses. For this reason, is important to consider a clear framework for Wi-Fi, as well as additional spectrum for unlicensed access.

The 6 GHz band (5925 - 7125 MHz) will be critical for enhanced Wi-Fi and unlicensed devices that will support the 5G ecosystem. The FCC in the U.S. has recently approved the unlicensed access to 1200 MHz of Spectrum for Low Power Indoor devices coexisting with the incumbents of that band[6]. Studies have shown that in the U.S. the total economic value resulting from the creation of two categories of low power devices (Low Power Indoor and Very Low Power) operating in the 6 GHz band will reach $153.75 billion dollars between 2020 and 2025.[7]

In order to avoid a spectrum crunch for Wi-Fi services, we invite ECA to consider facilitating license-exempt access to the 6 GHz band. As it was studied in the U.S. and in Europe[8], with appropriate technical and operational rules, Wi-Fi and other wireless devices can co-exist with fixed systems, fixed satellite systems and other existing users of 6 GHz spectrum.

The coexistence might require the use of databases to coordinate more intensive and efficient spectrum sharing. Regulators in a number of countries have authorized automated and even dynamic frequency coordination databases to manage real-time assignments in shared bands. These frequency coordination systems have proven they can protect incumbent operations, including military and public safety systems, from harmful interference. Although spectrum database coordination is nothing new, it has in recent years evolved from manual, to automated, to dynamic – adding automation and propagation modeling to static licensing data. Database solutions are active today from low- and medium- to high-frequency bands, and with various degrees of complexity. Database technologies are widely available, sufficiently mature, scalable and secure. For more information please see the DSA's Databases paper.

[6] See Unlicensed Use of the 6 GHz Band, Report and Order and Further Notice of Proposed Rulemaking, https://www.federalregister.gov/documents/2020/05/26/2020-11236/unlicensed-use-of-the-6-ghz-band
[7] Katz, R. 2020. *Assessing the economic value of unlicensed use in the 5.9 and 6 GHz Bands*. Telecom Advisory Services. http://wififorward.org/wp-content/uploads/2020/04/5.9-6.0-FINAL-for-distribution.pdf
[8] ECC Report 302. Sharing and compatibility studies related to Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) in the frequency band 5925-6425 MHz. Approved 29 May 2019

Spectrum sharing can be implemented for non-exclusively unlicensed spectrum access, when a clear framework is established. That was the case of the CBRS framework in the U.S. in the 3.5GHz band. On September 2019, the FCC approved five private Spectrum Access System (SAS) administrators to commence initial commercial deployments (ICD) in the CBRS band.[9] The SAS is a dynamic DSA database that coordinates frequency use among the tiers of access and protects incumbents from harmful interference. The CBRS system in the US demonstrate the viability of shared spectrum use among secondary and opportunistic users, while also ensuring protection of military and satellite incumbents from harmful interference. It should be kept in mind, however, that CBRS is a unique framework suited for a unique spectrum environment in the US requiring the accommodation and protection of unpredictable naval radar use. Spectrum sharing regimes need not be as complex in other countries or contexts. Indeed, DSA supports spectrum sharing regimes that are only as complex as required by the particular environment.

PART TWO - LICENSING REQUIREMENT, PROCESS, AND EXEMPTIONS. Section 6. License Application Conditions and Requirements

It is indicated in this section that: "*In the case of a resource-dependent service, the Authority shall determine the availability of such resource such as spectrum or numbering and that the applicant has secured a reservation or assignment of such resource.*" It is important to clarify that this would not apply in the case of license-exempt spectrum in the bands defined by the "exemption order" referred in part two, section 6.

PART THREE - INDIVIDUAL LICENSES. Section 17. Radio Frequency Spectrum Dependent Individual License

This section indicates that "*the issuance of a License that is Radio Frequency Spectrum dependent shall:*
1) Not convey an automatic assignment of the Radio Frequency Spectrum, unless where the Authority assigned such Radio Frequency Spectrum for the applicant; and,
2) Be conditional upon meeting the requirements for the assignment of a Radio Frequency Spectrum indicated in Part Five of this Directive."

[9] Public Notice, Wireless Telecomms. Bureau and Office of Engineering and Tech. Approve Five Spectrum Access System Admrs to Begin Initial Commercial Deployments in the 3.5 GHz Band, GN Docket No. 15-319, DA 19-915, (rel. Sept. 16, 2019). https://docs.fcc.gov/public/attachments/DA-19-915A1.pdf

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

As previously stated, the DSA considers that it should clarify that there will be specific cases in which licensees will access license-exempt RF Spectrum and therefore do not necessarily require an exclusive assignment of radio frequency spectrum.

PART FIVE - RADIO FREQUENCY SPECTRUM LICENSES. Section 27. Methods of Radio Frequency Spectrum Licensing

This section lists several methods through which the Authority may issue a Radio Frequency Spectrum License. The DSA suggests that the Authority add "*Self-Coordinated Light Licensing*" to this list.

Self-coordinated light licensing has proven to be a particularly efficient and flexible method for licensing fixed services in millimeter wave spectrum bands. For example, several jurisdictions around the world have successfully implemented light-licensing frameworks in E-Band (71-76 GHz, 81-86 GHz), which has enabled robust backhaul connectivity for broadband services in rural areas. We recommend that the Authority adopt a similar flexible framework for bands such as E-Band to promote efficient use of the spectrum and innovative use cases (e.g., HAPS).

PART FIVE - RADIO FREQUENCY SPECTRUM LICENSES. Section 33. Radio Frequency Spectrum Usage

In this section the Authority states that: "*1) A Licensee shall ensure that the Radio Frequency spectrum assigned to it by the Authority is efficiently utilized as provided in the Radio Spectrum Management Directive. 2) The Authority reserves the right to review the usage of the Radio Frequency Spectrum assigned to the Licensee.*"

This seems to indicate that there will be a specific **Radio Spectrum Management Directive**. The DSA celebrates that decision and hopes to see this directive establishing a clear framework for unlicensed, light-licensed and dynamic spectrum access. We would appreciate any guidance from the Authority about the expected timeline to publish this directive. The DSA is ready to work closely with the Authority to provide technical information, examples of international regulations and any additional support that might be useful.

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

The Authority is referring to the efficient use of the assigned radio frequency spectrum. This has been a widely discussed subject by spectrum experts worldwide, specifically regarding the metrics to verify if spectrum usage is efficient or not. The DSA believes that instead of a "use it or lose it" approach, the Authority should consider an "Use it or share it approach". This promotes the more intensive use of the spectrum, allowing market access to unused spectrum by smaller and non-traditional ISPs, as well as for enterprise and institutional use, in rural and underserved areas.

Conceptually, use-it-or-share-it rules authorize opportunistic access to licensed spectrum that is locally unused or underutilized, coupled with the assurance that users will not interfere with licensees and will in fact vacate the spectrum as needed once the licensee commences service. Until the spectrum is actually put into service in a local area it should be available for non-interfering use by networks and devices. Opportunistic access reduces spectrum warehousing in areas where the economics are least attractive for MNOs and large ISPs, particularly in rural and other less densely populated areas with low ARPU. A "use it or share it" approach creates a general incentive for licensees to build out services more quickly, since opportunistic use of the band will demonstrate that smaller ISPs and other users are finding value in the unused portions of their license area. This will discourage spectrum warehousing and increase access for operators that are ready to deploy, but who lack needed spectrum access in that local area.

PART EIGHT - MISCELLANEOUS PROVISIONS. Section 43. Register of License

In this section it is mentioned that: "*1) The Authority shall maintain registers containing:*

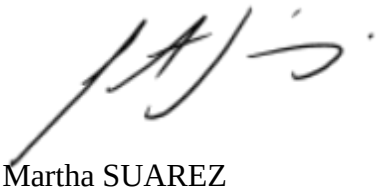
a) All Individual, Class, and Radio Frequency Spectrum Licenses issued by the Authority; and,
b) The name and registered office of each Licensee.
2) The Authority shall make the register of License publicly available."

The DSA celebrates the Authority's plan to make the register of License publicly available, that is an important decision for transparency and a first step for the implementation of Dynamic Spectrum Access frameworks. To maximize the value of the registry, the DSA suggests that to the extent possible the registry

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

should include structured data (including technical information), should be available online, and should be regularly updated.

Respectfully submitted,



Martha SUAREZ
President
Dynamic Spectrum Alliance
Martha.Suarez@dynamicspectrumalliance.org