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Challenges and opportunities of TVWS deployment in Colombia

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Advantages and disadvantages of TVWS compared to other technologies

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Advantage

- ✓ Scheme of operation without cost, but under the modality of free use of spectrum with registration in the ANE Database.
- ✓ It promotes efficient use of the spectrum by operating under a sharing scheme.
- ✓ It works in low frequency band which allows good distances in the data links.
- ✓ Channels in remote areas are unlikely to become unavailable, even in the long term.
- ✓ Technology already proven and with success stories in operation.

Disadvantages

- ✓ Channel availability in municipalities as indicated by the ANE.
- ✓ Future channel availability cannot be guaranteed.
- ✓ It has no protection against interference, it cannot cause harmful interference to TV channels.
- ✓ Low availability of equipment
- ✓ Automation of the database in development

Challenges in TVWS deployment

- ✓ Improve the offer of TVWS devices in the market.

- ✓ Promote and encourage the demand for this technology as an alternative connection in remote areas of the country. The ANE initially promotes this use by allowing the use of this spectrum, which is currently assigned to television operators. With the conditions established in the regulations, it has been possible to demonstrate, through pilot tests, connections of up to 15 km in distance and with a download speed of up to 10 Mbps.

- ✓ From the ANE to accompany the process of maturation of the ecosystem for this technology

TVWS operating conditions according to Resolution 105/2020

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❖ General conditions:

- ✓ TVWS devices will operate in the band with primary allocation to TV:
- ✓ TVWS may not cause harmful interference.
- ✓ TVWS cannot claim protection against interference.
- ✓ TVWS must interact with the Database (BDEB) managed by the ANE.
- ✓ While the ANE automates the BDEB, the request for available channels can be made manually and will be valid for up to 6 months, before the expiration of that period the applicant has to re-request the availability analysis. After automated, devices will need to be configured to request every 24 hours.
- ✓ Requests must include the identification data of the person in charge indicated in the resolution.
- ✓ The BDEB allows turning off devices in a zone, devices of a certain type or a specific device, if required.
- ✓ If the cause of interference does not turn off or provide a solution, the ANE may impose the sanctions of Law 1978 of 2019.

TVWS operating conditions according to Resolution 105/2020

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- **Technical operating conditions:**
  - ✓ Operation with 6 MHz channels in the band 470 to 698 MHz, allocated to TV.
  - ✓ Point-to-point or point-to-multipoint operation, only at fixed locations.
  - ✓ TVWS equipment must incorporate geolocation with a margin of error less than +50 meters.
  - ✓ The BDEB indicates the list of channels available in the location of the request, considering:
  - ✓ Protection margins, Maximum powers, Maximum heights, Channels prohibited by zones.
  - ✓ TVWS devices will be able to use more than one channel from the available channel list.
  - ✓ The BDEB can change the availability at any time, even restrict access in some area.
  - ✓ Height above the average of the terrain less than 800 meters.
  - ✓ Maximum power delivered to the antenna of 12.6 dBm measured in any 100 kHz segment.
  - ✓ Unwanted emissions shall not exceed a power of -42.8 dBm measured in any 100 kHz segment.
  - ✓ 14 dBm maximum antenna gain.

TVWS ANE-USTA Project

Objective: Development of the platform - TV white space database –TVWS

Phase 1 (2018) - Investment USD 52K

Achievements:

Design, development and production of the robust database.

Design based on the study and analysis of Colombian regulations.

Benchmark of functionalities of other existing solutions.

Implementation of the standard communications protocol (PAWS) adapted to the conditions of the country.

Phase 2 (2020) - Investment USD 65K

Achievements:

Calculation method implementation according to recommendation ITU-R P1546-6 (600MHz, land path, 50% of the time)

Functional tests of the platform in a real and controlled environment with TVWS device manufacturers

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