



TUNISIA'S GLOBAL VISION FOR DIGITAL RADIO



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TUNISIA'S GLOBAL VISION FOR DIGITAL RADIO



1- Digitization stages in Tunisia



2- FM landscape occupation



3- Why DAB+ ? Benefits ?



4- Vision of Tunisia Digital 2025



5- Tunisian Trial Period and decisions



6- Tunisian DAB+ ensemble

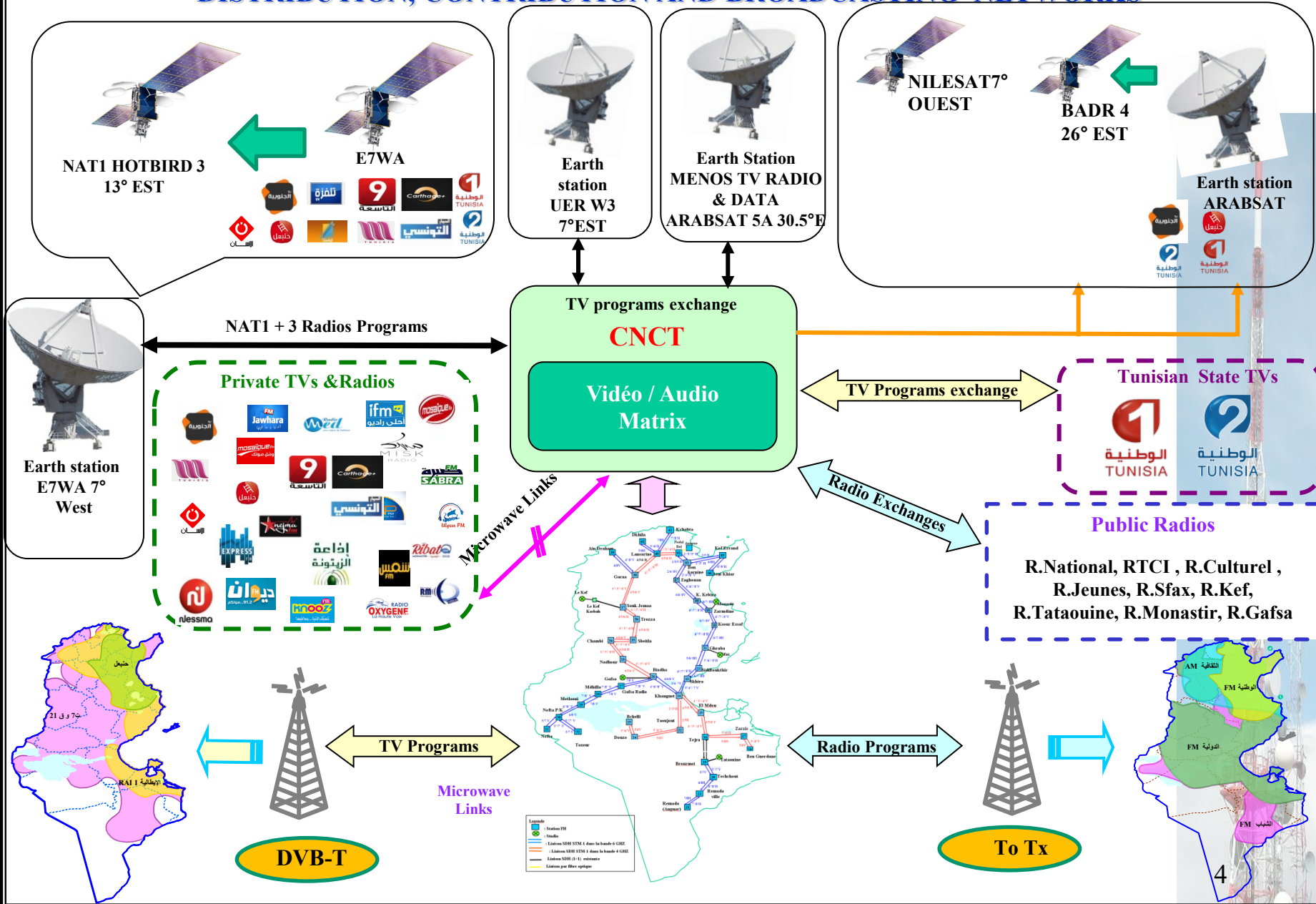


7- Conclusion & Recommendations





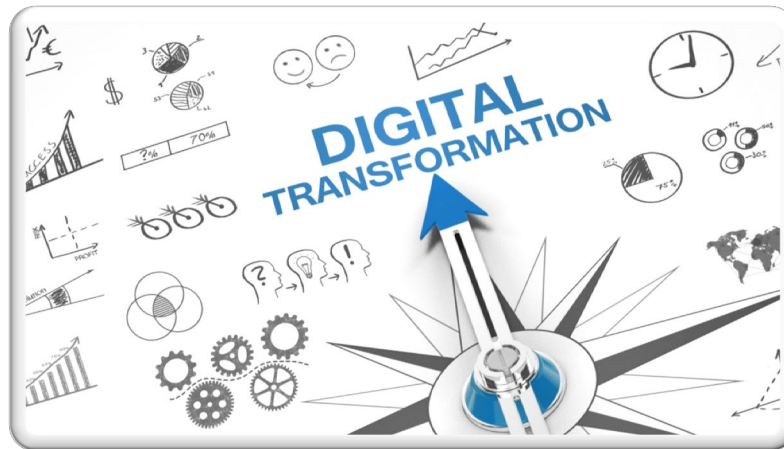
DISTRIBUTION, CONTRIBUTION AND BROADCASTING NETWORKS



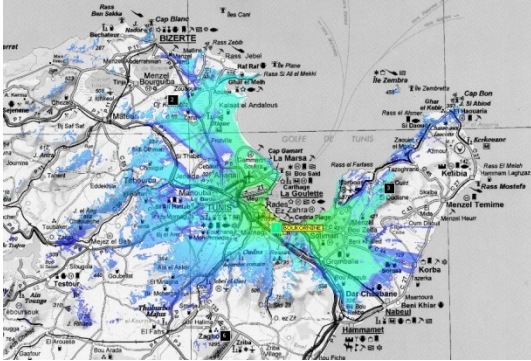
TUNISIA'S GLOBAL VISION FOR DIGITAL RADIO



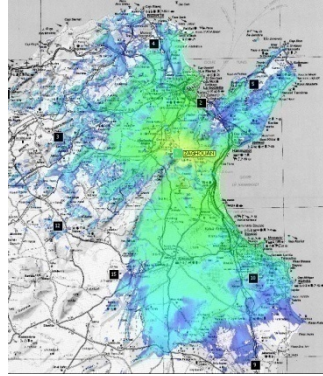
1- Digitization stages in Tunisia



Station Boukornine

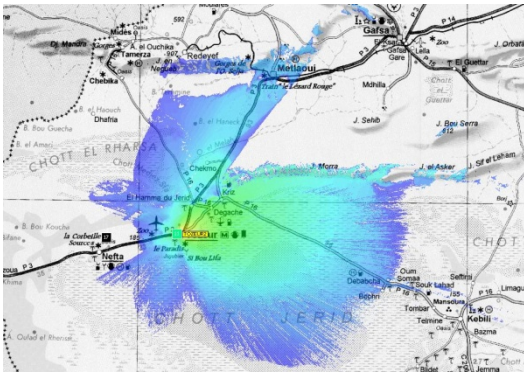


Station Zaghouan

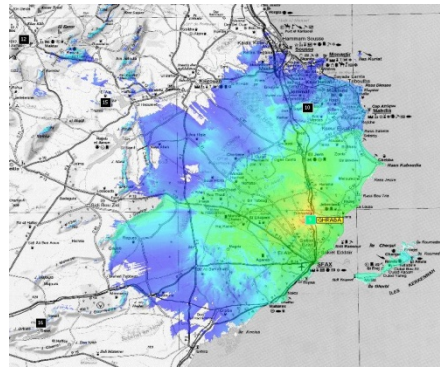


DVB-T Coverage : 98%

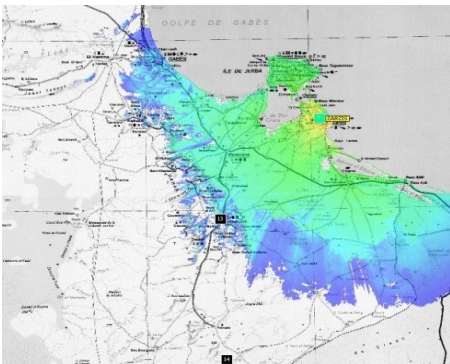
Station Trozza



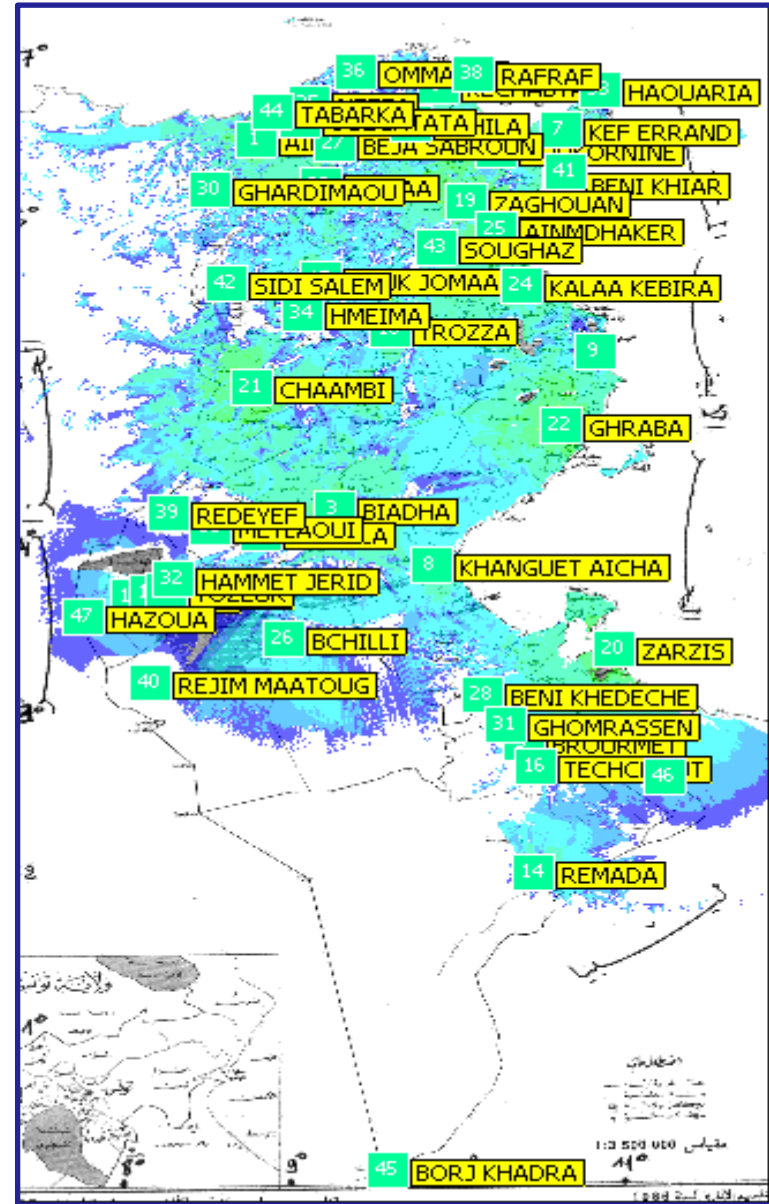
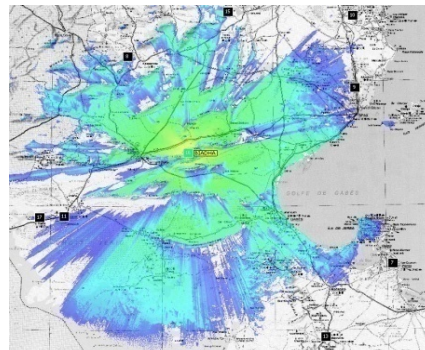
Station Ghraba

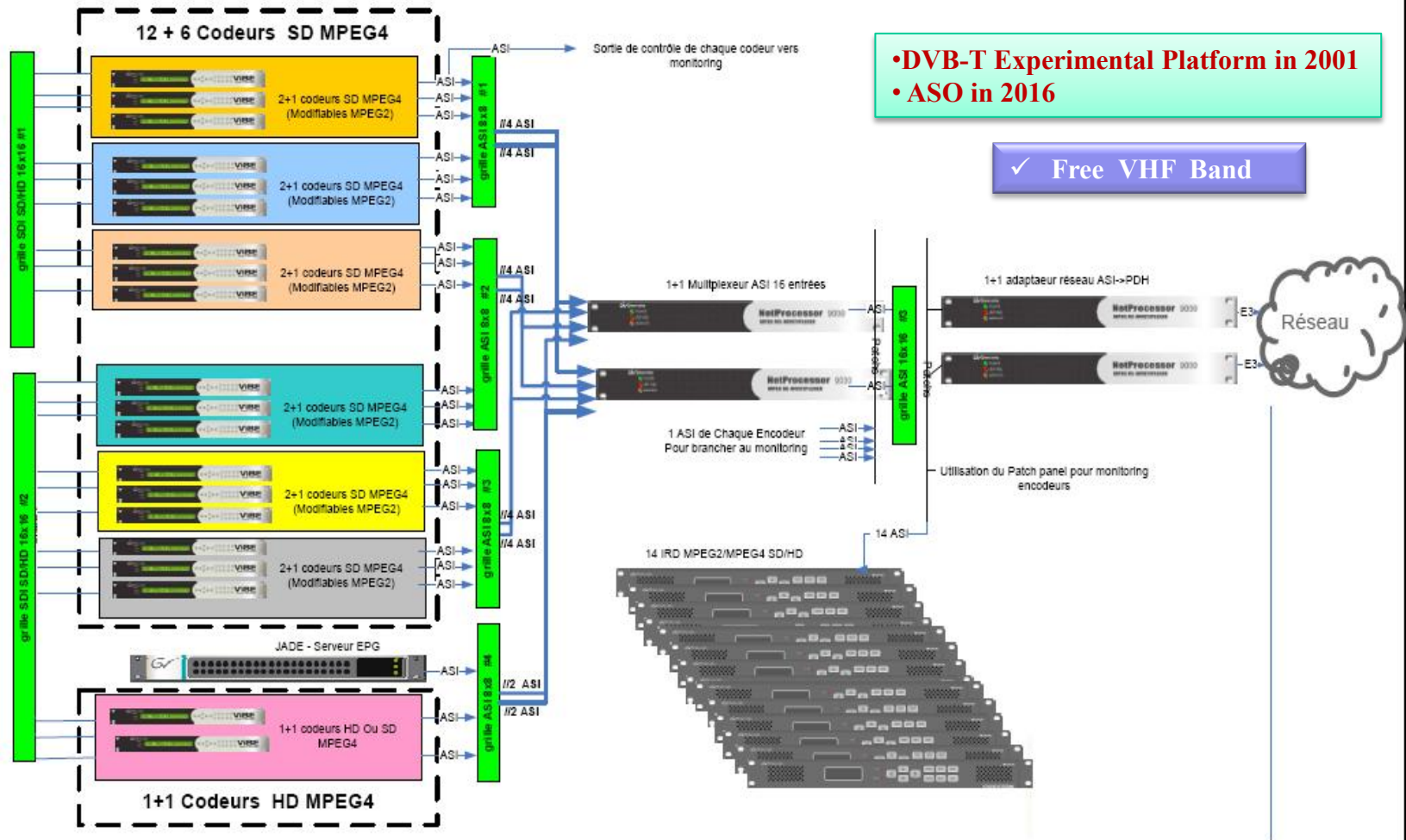


Station Zarzis



Station Biadha





• DVB-T Experimental Platform in 2001
 • ASO in 2016

✓ Free VHF Band

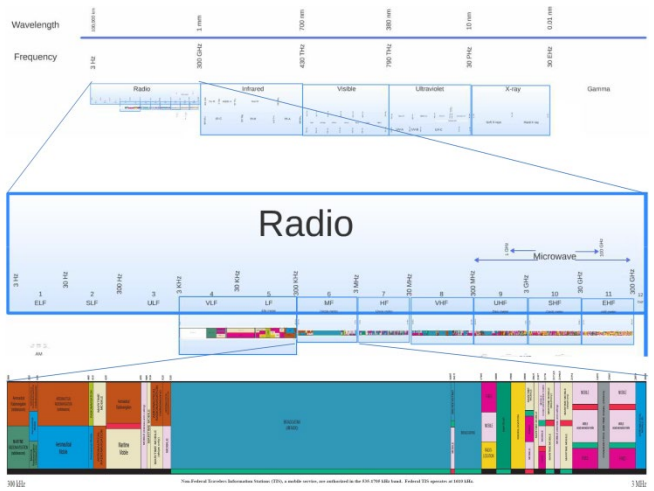
- * National broadcasting network composed of 64 stations.
- * 14 programs in SD (standard definition) or 10 SD programs and one HD (high definition) program.
- * DVB-T broadcasts in UHF band, MPEG4 AVC compression standard (SD / HD), Modulation 64 QAM, MFN.
- * DVB-T coverage is 98% of the population..
- * Commissioned: May 2010



DAB+ PROGRESS REPORT IN TUNISIA



2- FM Landscape Occupation



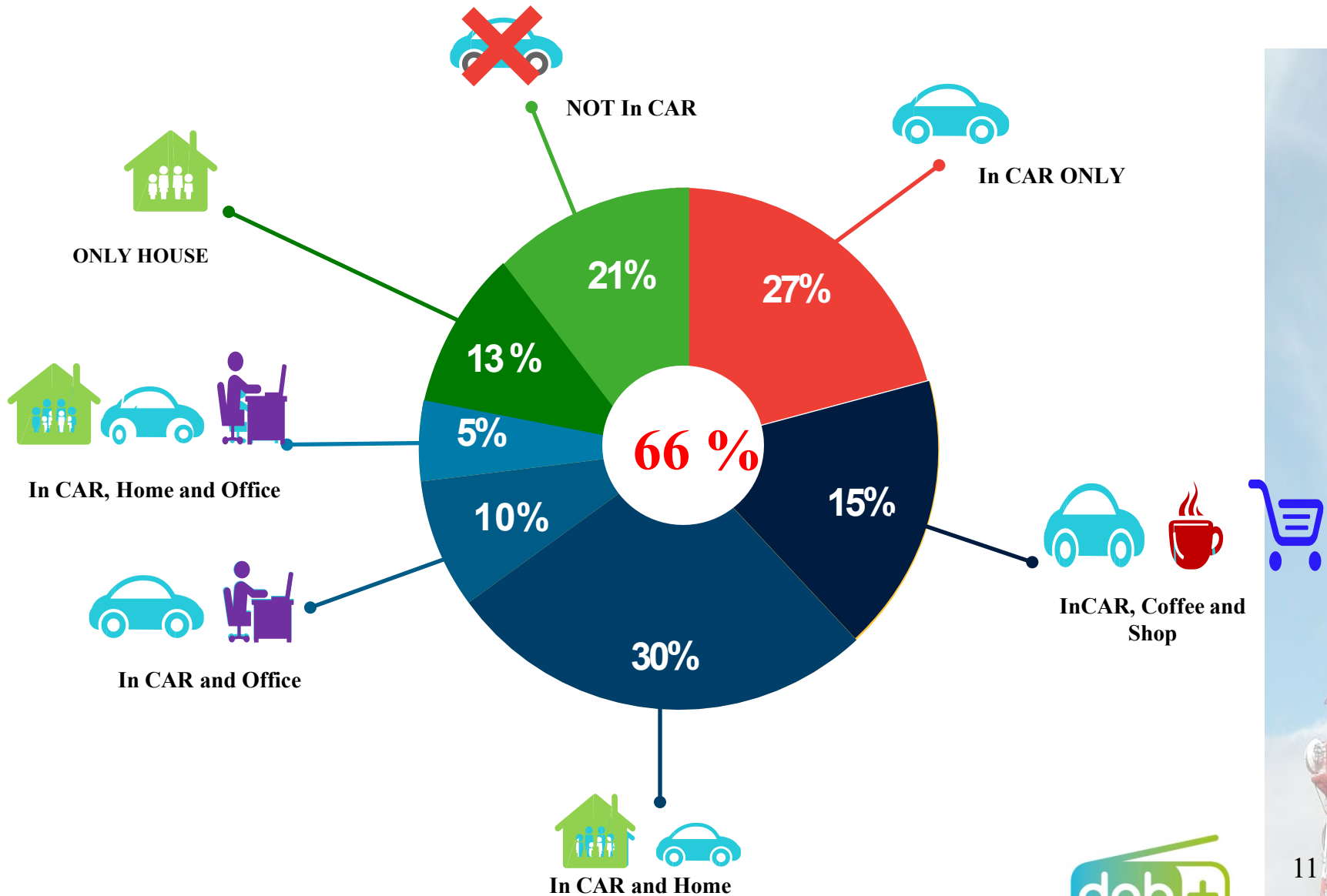
In many markets, FM spectrum is full – difficult to innovate



- **Overloaded airwaves**
- **No capacity for new services / poor audio quality**
- **Difficult to innovate**
- **Long term decline**



The Car is the 1st Radio listening means in Tunisia



3- Why DAB+ ?



For broadcasters, the competitive landscape is changing

Online music services



- Digital music services
- Smart devices
- Competition with FM radio

A digital radio wave is moving across all over the world



Terrestrial Systems



DXB

DAB-IP

DAB-H

Qualcomm
MediaLO

MMB

ISDB-T



3GPP
INITIATIVE

WiMax

WiFi

WorldSpace

DVB-S
SATELLITE

Telecom Systems

Satellite Systems



COSMOS

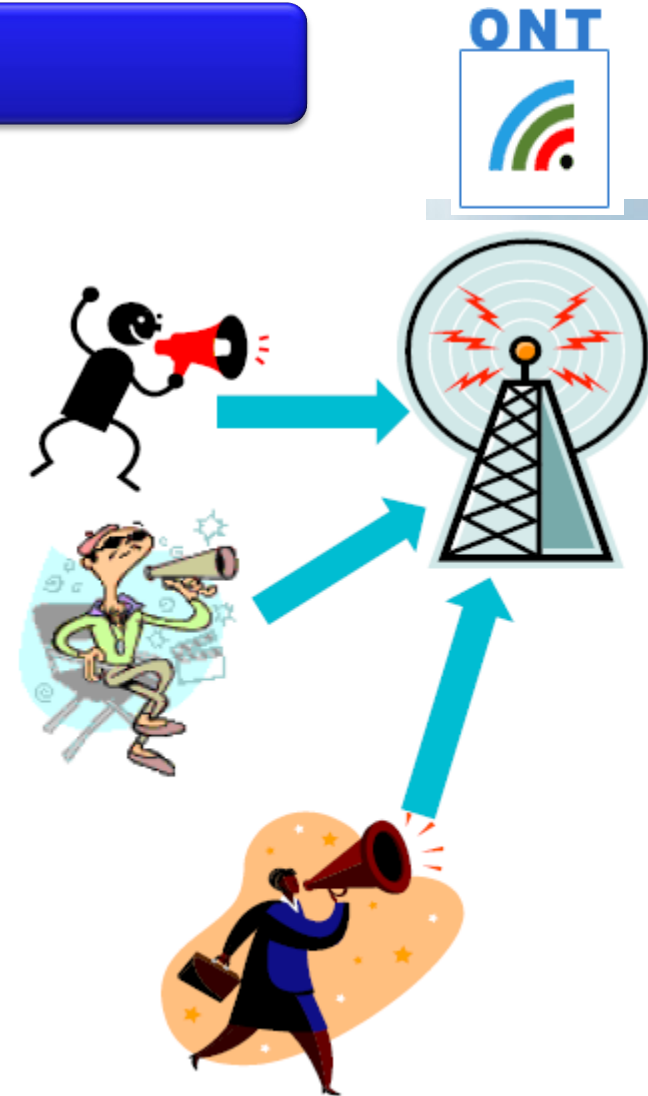
SATELLITE
RADIO

SIRIUS
SATELLITE RADIO



Benefits of DAB+

- Replaces the existing AM and FM audio broadcast services
- Very well suited for mobile reception S/N
- High robustness against Multipath Reception
- High quality digital audio services (near CD quality)
- Ancillary data transmission (travel and traffic information, Automatic tuning - PAD)
- Larger coverage area than current FM and AM systems
- Efficient frequency spectrum use
- Low transmitting power
- Most Cost effective infrastructure



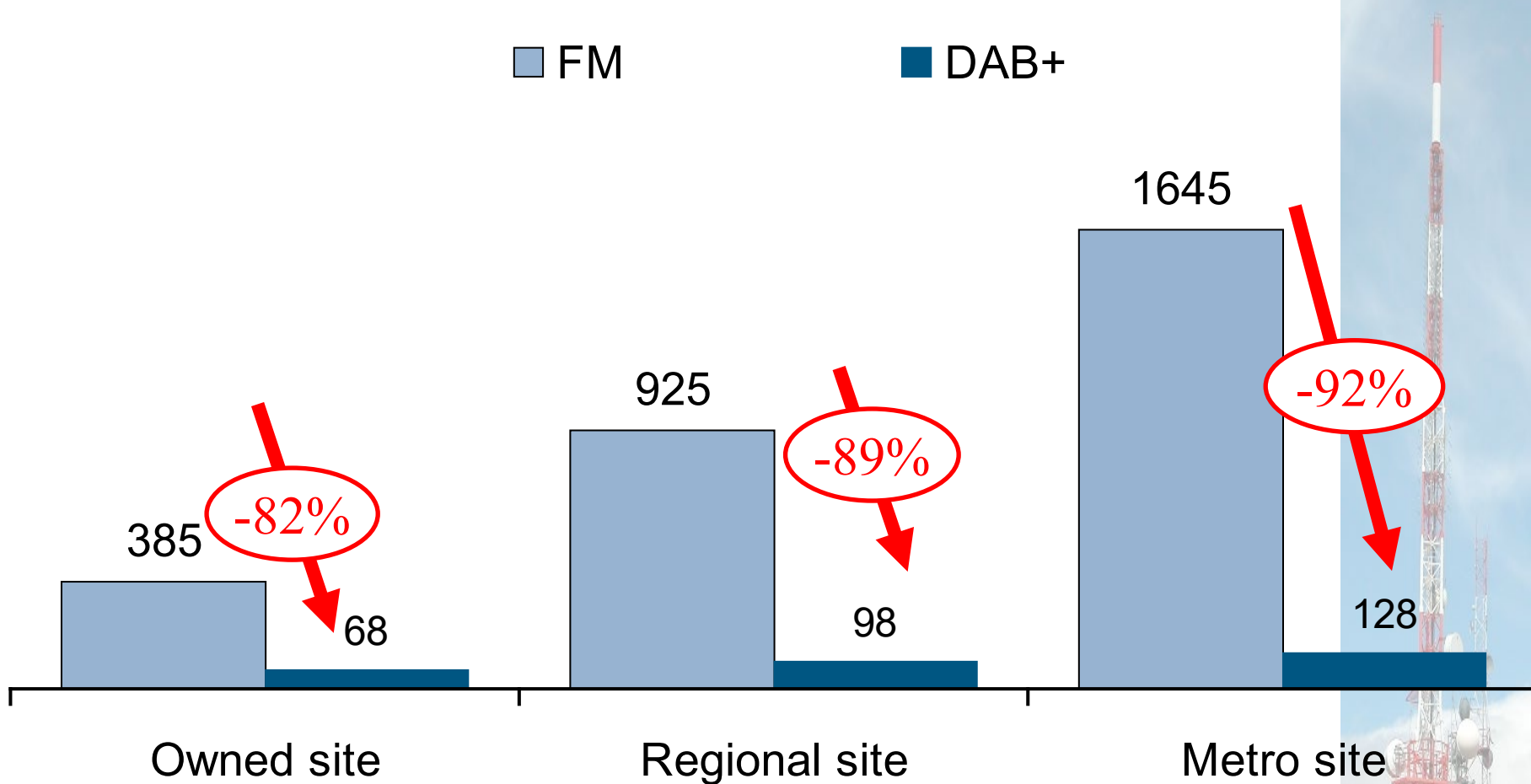
DAB+ offers lower distribution costs



Annual cost of transmission¹, \$k

■ FM

■ DAB+



Source: Harris Broadcast

Note: (1) Opex costs; on DAB+, assumes 18 services on multiplex

Personal / Portable / Smartphone receivers

Different functionality for different areas of the home

Kitchen, Living room and Bedrooms

- Stand alone or HiFi connected
- Easy to operate
- Good sound and external connections to HiFi
- Good DLS display



Options

- More volume
- Colour screen
- Docking
- Smartphone control app



European Digital Radio Alliance established in March 2016

Countries population coverage



Norway

99.7 % of pop coverage
ASO FM 2017



UK

97.3 % of pop coverage
50% DAB+ share platform



Germany

98 % of pop coverage



Switzerland

99.5 % of pop coverage
ASO FM 2021-2024



Denmark

98 % of pop coverage



Netherlands

95 % of pop coverage



France

20 % of pop coverage



Czech

DAB+ coverage 80% by
end 2019



Italy

80 % of pop
coverage



Austria

29 % of pop coverage



Poland

56 % of pop coverage



Belgium

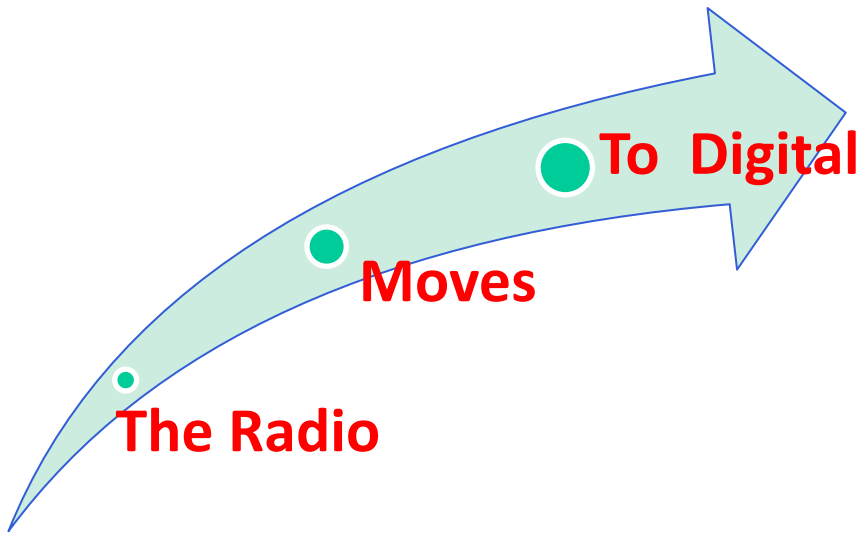
95 % of pop coverage



Australia

65 % of pop coverage



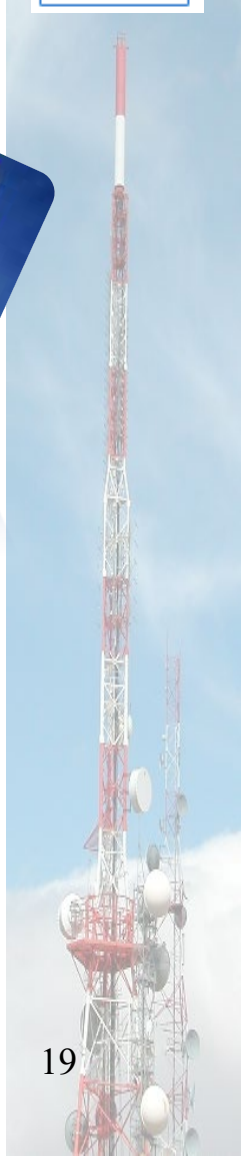


❖ for more programs

❖ for a better reception

❖ for a better sound

❖ for wide broadcasting area



EMERGING MARKETS

Algeria



Trial DAB+
7%
coverage

Austria



National
launch May
2019 – 60%
coverage

Croatia



Trial DAB+
70%
coverage

Czech Rep.



Regular
DAB+ 66%
coverage²⁹

Greece



Trial DAB+
Athens

Hungary



Trial DAB+
30%
coverage

Indonesia



Trial DAB+
Jakarta 2
million
population
coverage

Ireland



Regular
DAB 52%
coverage³⁰

Kuwait



Regular DAB+
100%
coverage

Serbia



Trial DAB+
Belgrade 35%
coverage

Poland



Regular
DAB+ 56%
coverage³¹

Romania



Trial DAB
10.4%
coverage³²

Slovakia



Trial DAB+
38%
coverage

Slovenia



Regular DAB+
73%
coverage

South
Africa



New 8 month
DAB+ trial
from March
2019³³

Sweden



Regular DAB
41.8%
coverage³⁴

Tunisia



Regular
DAB+ Q2
2019 50%

Thailand



DAB+ trial
Bangkok April
2019, 14%

Turkey



Trial DAB+
21.5%
coverage

UAE

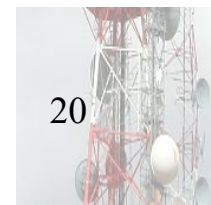


DAB+ receiver
specifications
published

Ukraine



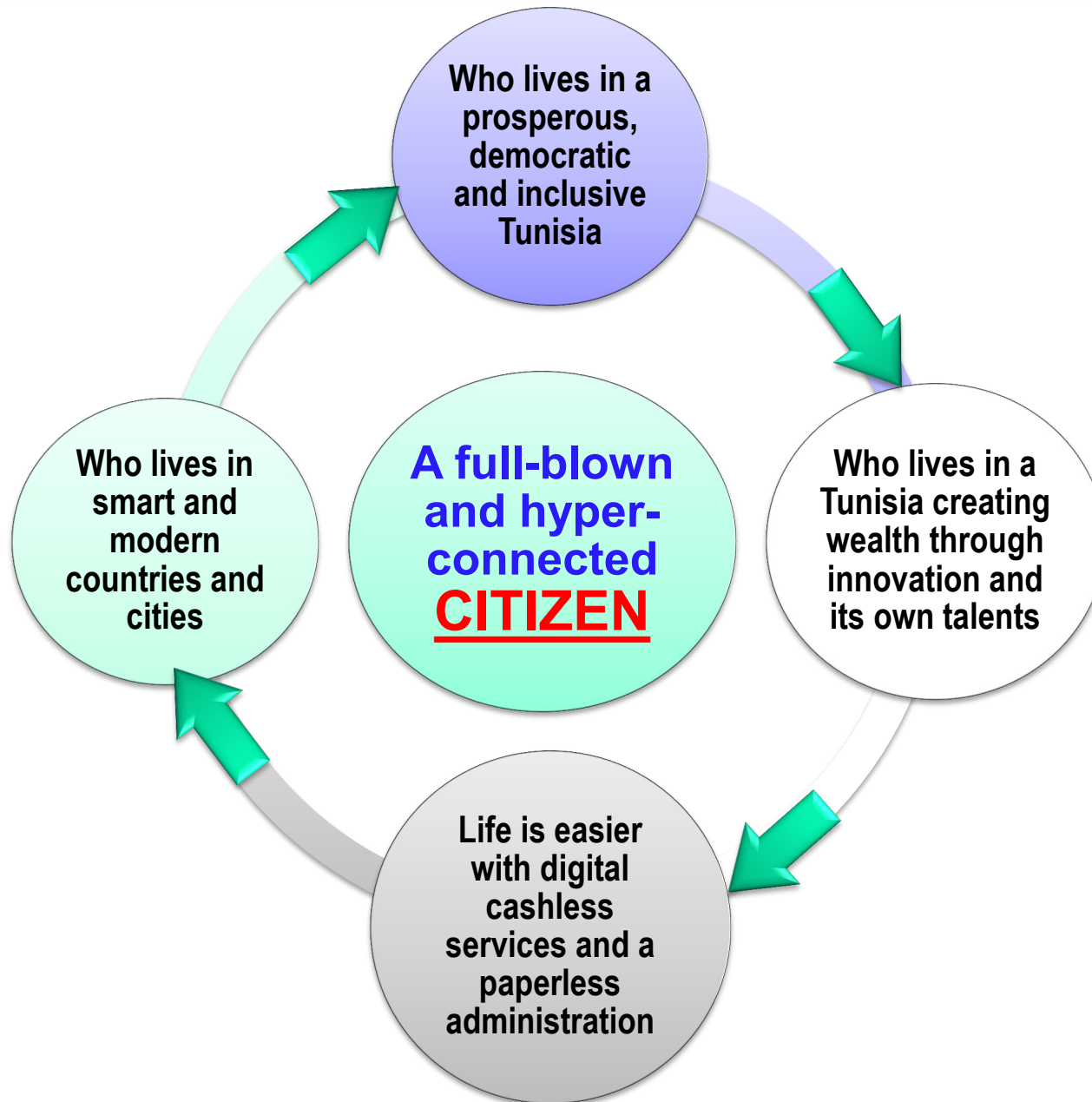
Regular
DAB+ Kyiv
2018-2025



4- Vision of Tunisia Digital 2025



VISION OF TUNISIA DIGITAL 2025

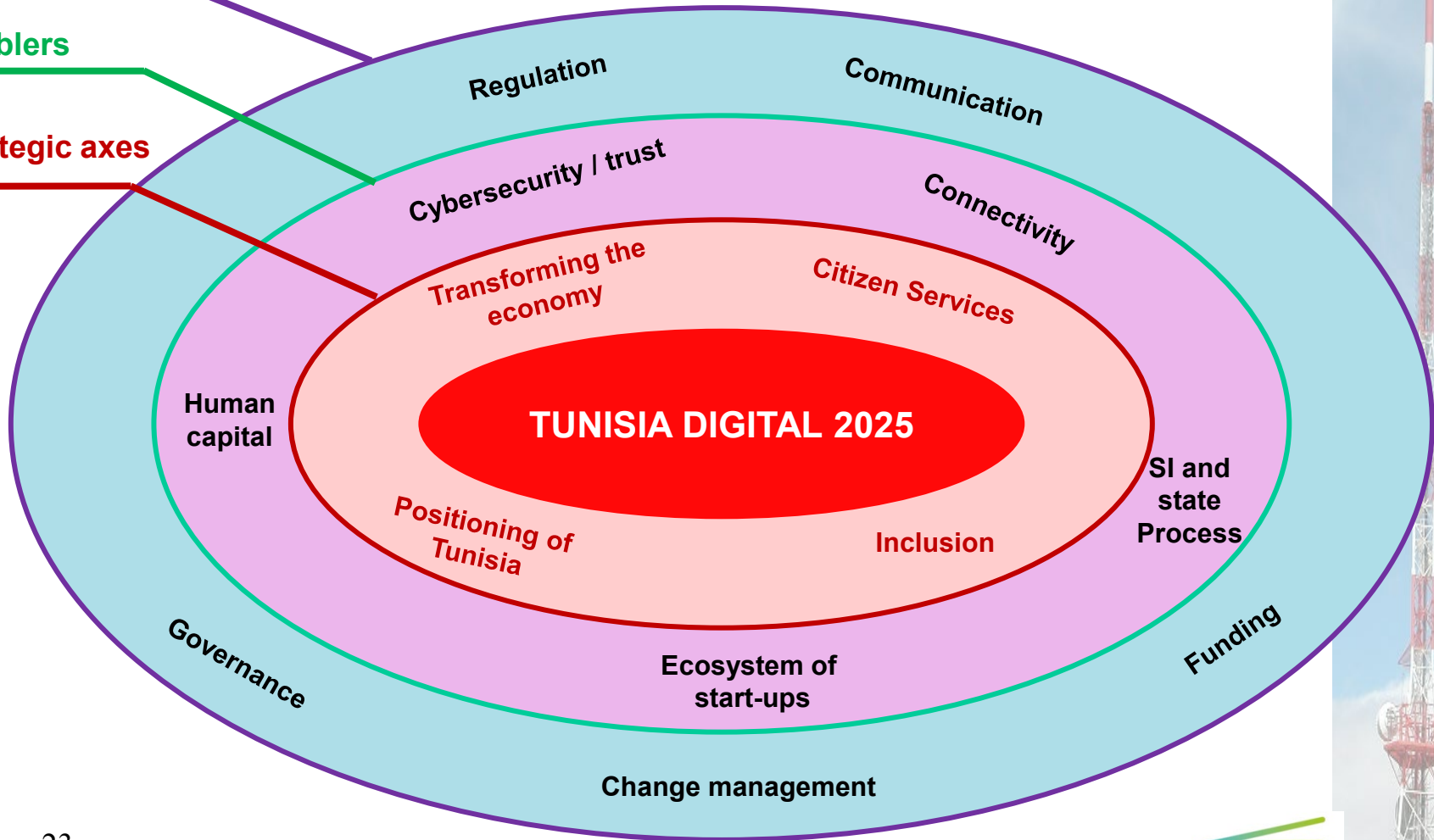


AXES TO BE ADDRESSED

Key conditions for success

Enablers

Strategic axes



5- Tunisian Trial Period and decisions



DAB-Tunisian Experimental Platform (2008-2018)



- ❑ **DAB+ trial in 2008**
- ❑ **500W transmitter in Boukornine, 12 C**
- ❑ **DAB allotments assigned in Channels 10 and 12**
- ❑ **Field strength 68db μ V/m for portable & indoor reception**
- ❑ **One Multiplex of 12 programs/bitrate 96 kbps & one TV program**

- ❑ **In 2010: adjunction of two other transmitters in Kef Errand and Zaghouan working in SFN configuration (channel 12C)**

VHF band (174-230MHz) national plan enables the transmission of 5 to 7 multiplexes

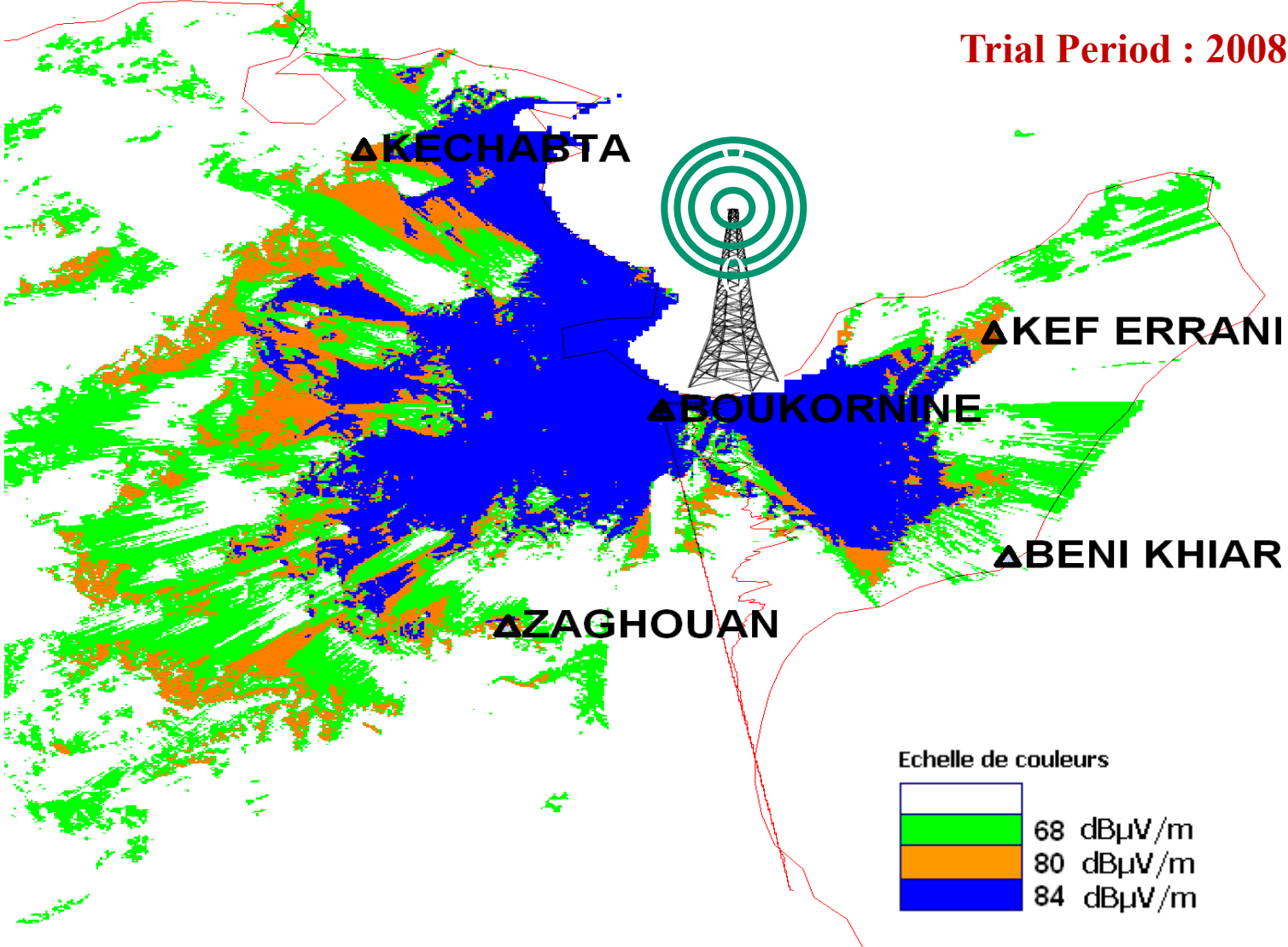
- ◆ **140 radio programs with national coverage**



Planning Tool "SIMPAR"



Trial Period : 2008-2018



Echelle de couleurs

	68 dB μ V/m
	80 dB μ V/m
	84 dB μ V/m



DAB-Tunisian Experimental Platform (2008-2018)



DAB-Tunisian Experimental Platform (2008-2018)



6- Tunisian DAB+ ensemble



ONT's DAB+ Project

1+1 DAB Head End

DAB+ Platform 2019

The Head End is composed of 36 encoders in (1+1) configuration
 → Broadcast of 18 Audio programs (AES mode)



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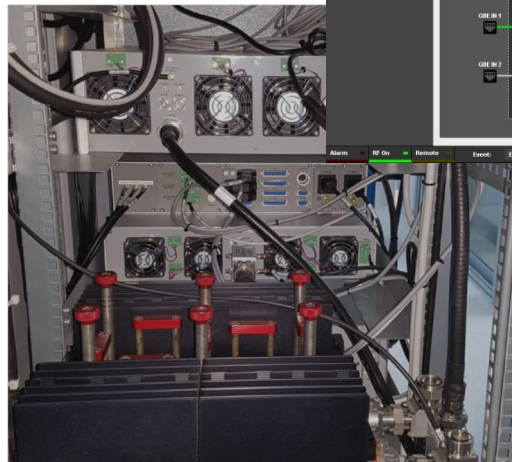
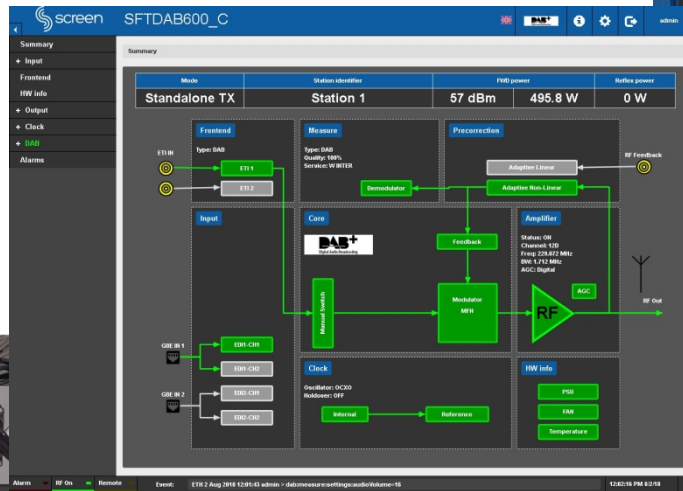
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DAB+ ONT Project

1st phase: 2019

1st Phase

Four transmitters are installed in Zaghouan, Boukornine (capital state tunis), Kchabta (Bizerte) and Kef errand (cap bon).



DAB+ Platform 2019

ARK-X – SFT600 DAB

GRAPHICAL USER INTERFACE

screen SFTDAB015

USERNAME

Summary

+ Input

Frontend

HW Info

+ Output

+ Clock

+ DAB

Alarms

Summary

Mode	Station Identifier	FWD Power		Reflex Power
Standalone TX	Station 1	40 dBm	10 W	0 W

Frontend

Type: DAB

ETI IN → ETI 1 → ETI 2

GBE1 IN → EDI1 - Ch1 → EDI1 - Ch2

GBE2 IN → EDI2 - Ch1 → EDI2 - Ch2

Measure

Type: DAB
Quality: 100%

Demod

Pre-correction

Adaptive Linear ← RF Feedback

Adaptive Non-Linear

Input

Core

Quantum Branch → Modulator SFN

Feedback ← Demod

Amplifier

Status: ON
Channel: 21
Freq: 474.0 MHz
BW: 8 MHz
AGC: Digital

AGC

RF → RF OUT

Clock

Oscillator: TCXO
Holdover: OFF

GPS → Reference

HW Info

PSU

FAN

Temperature

Alarm: RF On Remote Event: EVENT 9 Nov 2016 16:05:00 Start DAB Modulator 1:30:50 PM 17/9/16



DAB+ Platform 2019



Boukornine



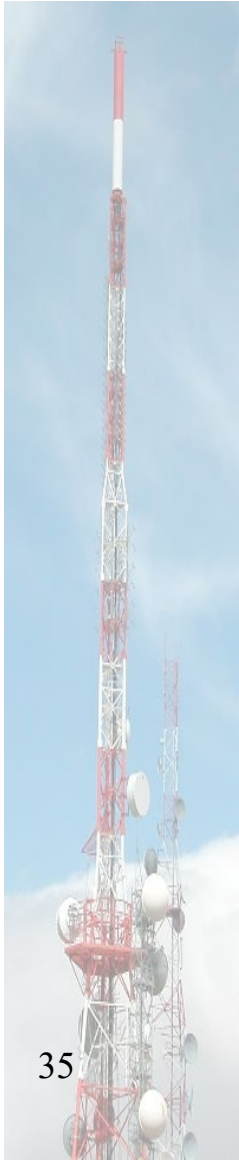
DAB+ Platform 2019



Zaghouan



CNCT HeadEnd



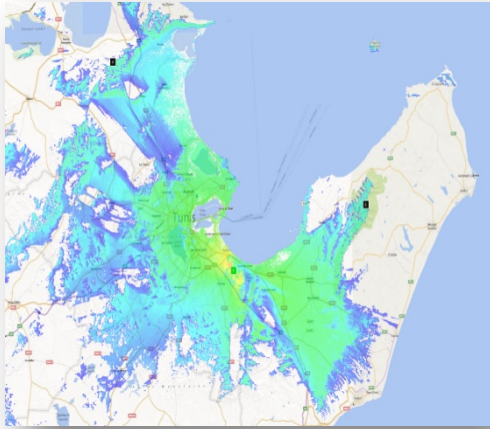
Kef-Errand Station



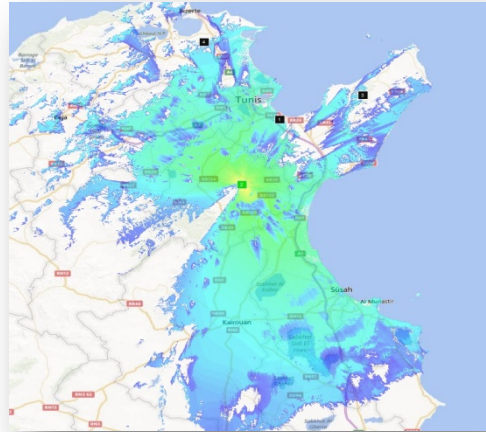
Khabta Station

DAB+ Coverage : 51 %

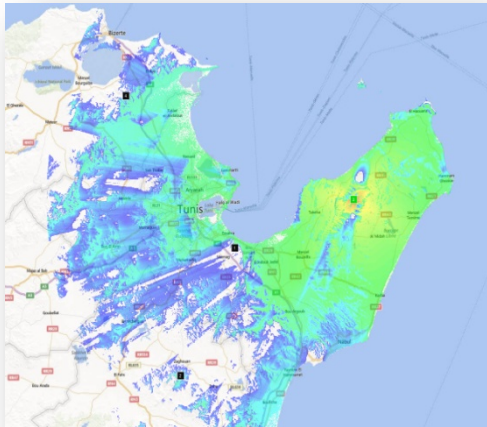
Boukornine Station



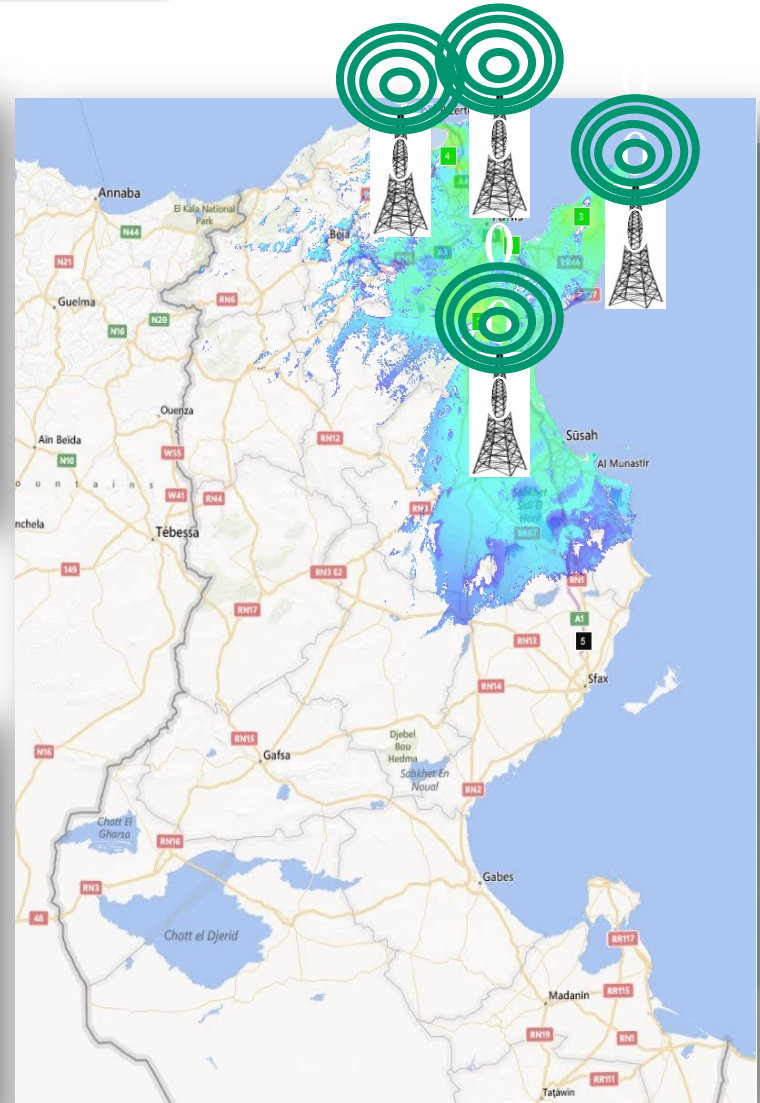
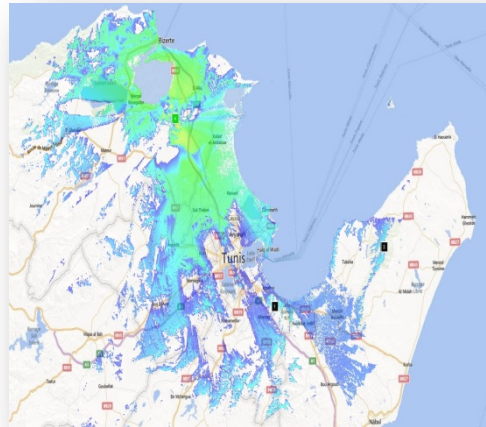
Zaghouan Station



Kef Errand Station

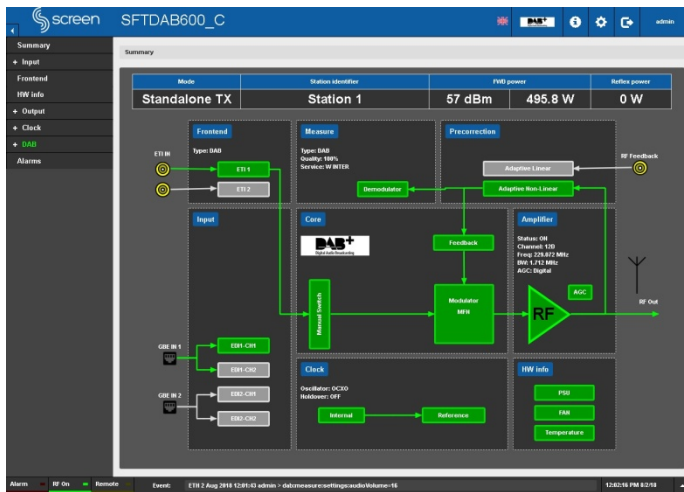


Kchabta Station



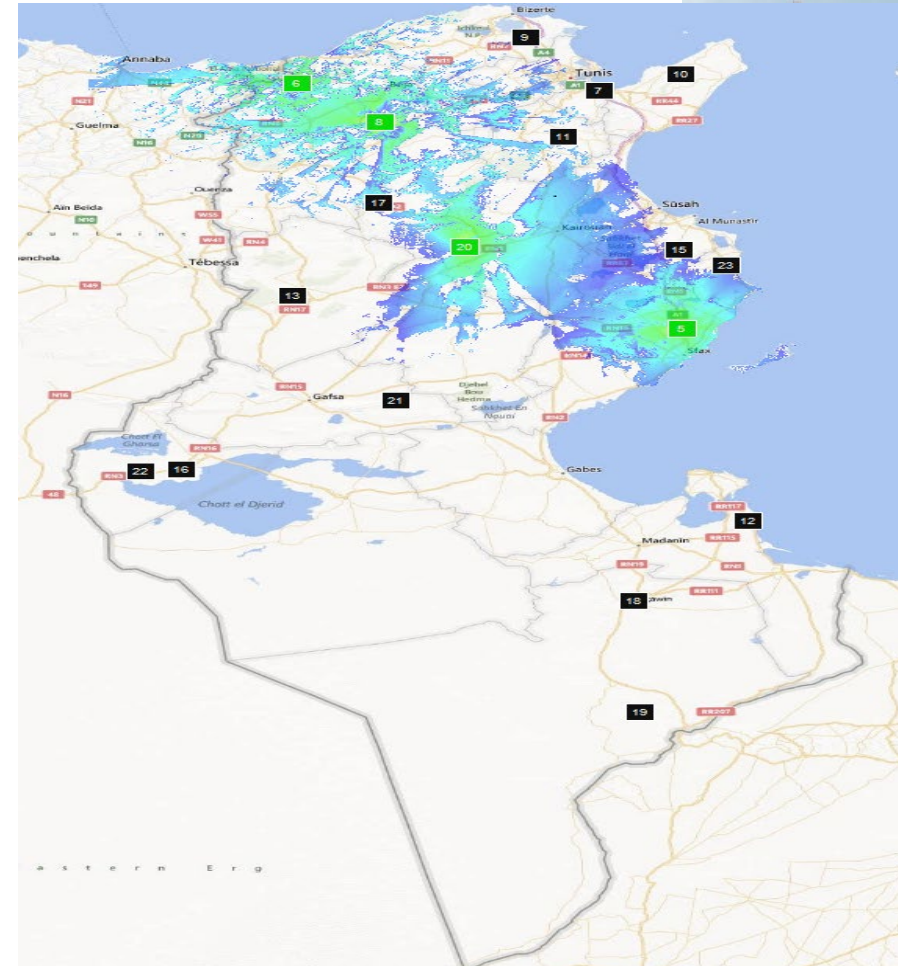
ONT's DAB+ Project

Four new sites will be installed in the following stations : Ain drahem, Goraa (beja), Trozza (Kairouan) et Ghraba (sfax).



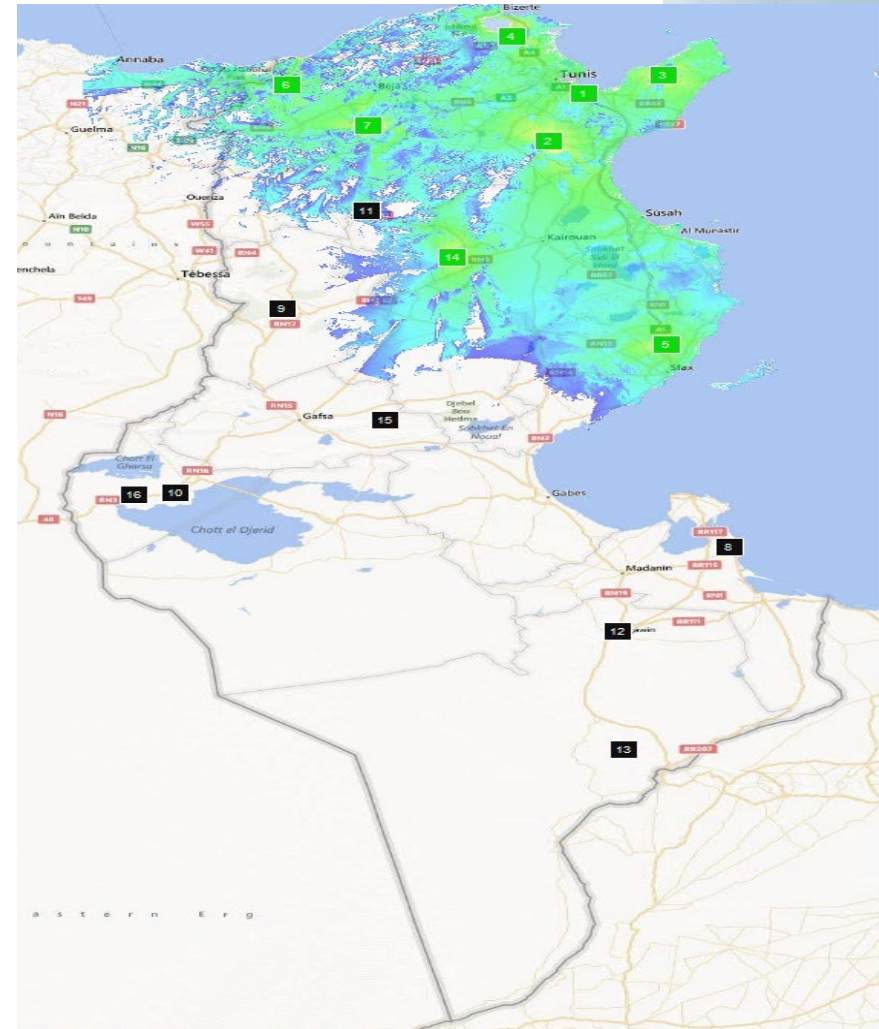
Expected coverage of DAB+ in Tunisia

Four new sites will ensure
a coverage of **24%**
of Tunisian population



Expected coverage for DAB+ in Tunisia 2020

The two phases will reach **75%** of tunisian population



GLOBAL TUNISIA' VISION FOR DIGITAL RADIO

6- Conclusion & Recommendations



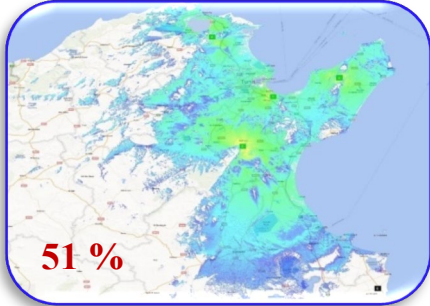
DAB+ Rollout Progress

2019

- Deployment of 4 transmitters
- MUX of 18 programs
- 51 % population Coverage



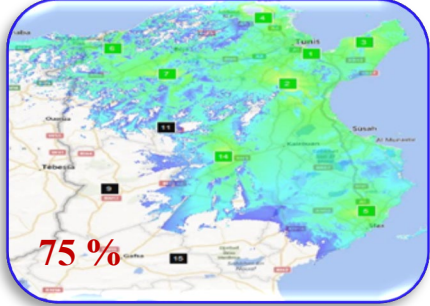
2019



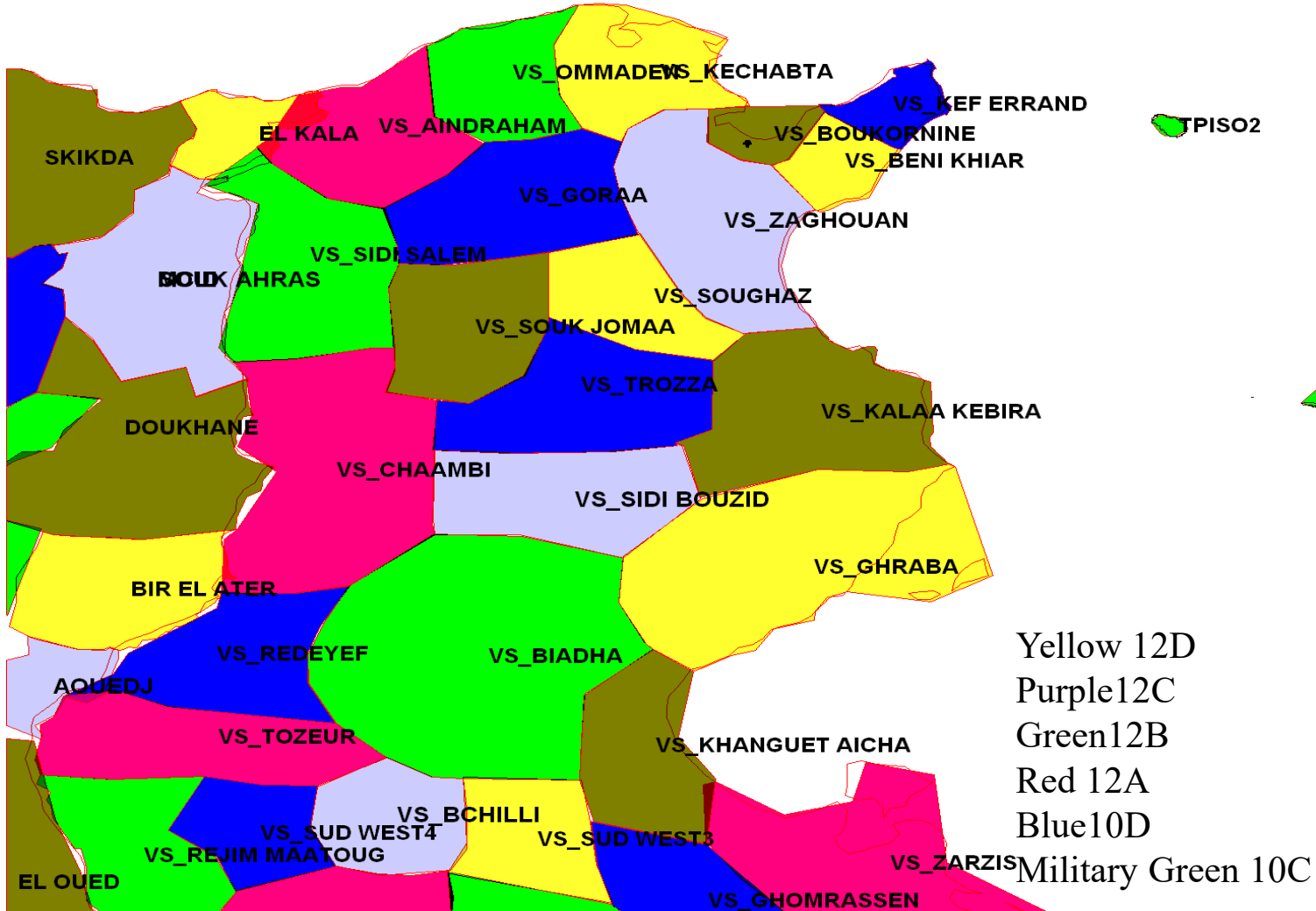
2020-2022

- National Coverage
- Up to 5 multiplexes

2020



Frequency allotment for DAB+ according to RRC 06



Tunisia DAB+ Rollout Progress



PHASE 0:

- Tests, trial period (2008-2018)

PHASE 1:

- June 2019 (51 %)

PHASE 2:

- T2 2020 (75 %)

PHASE 3:

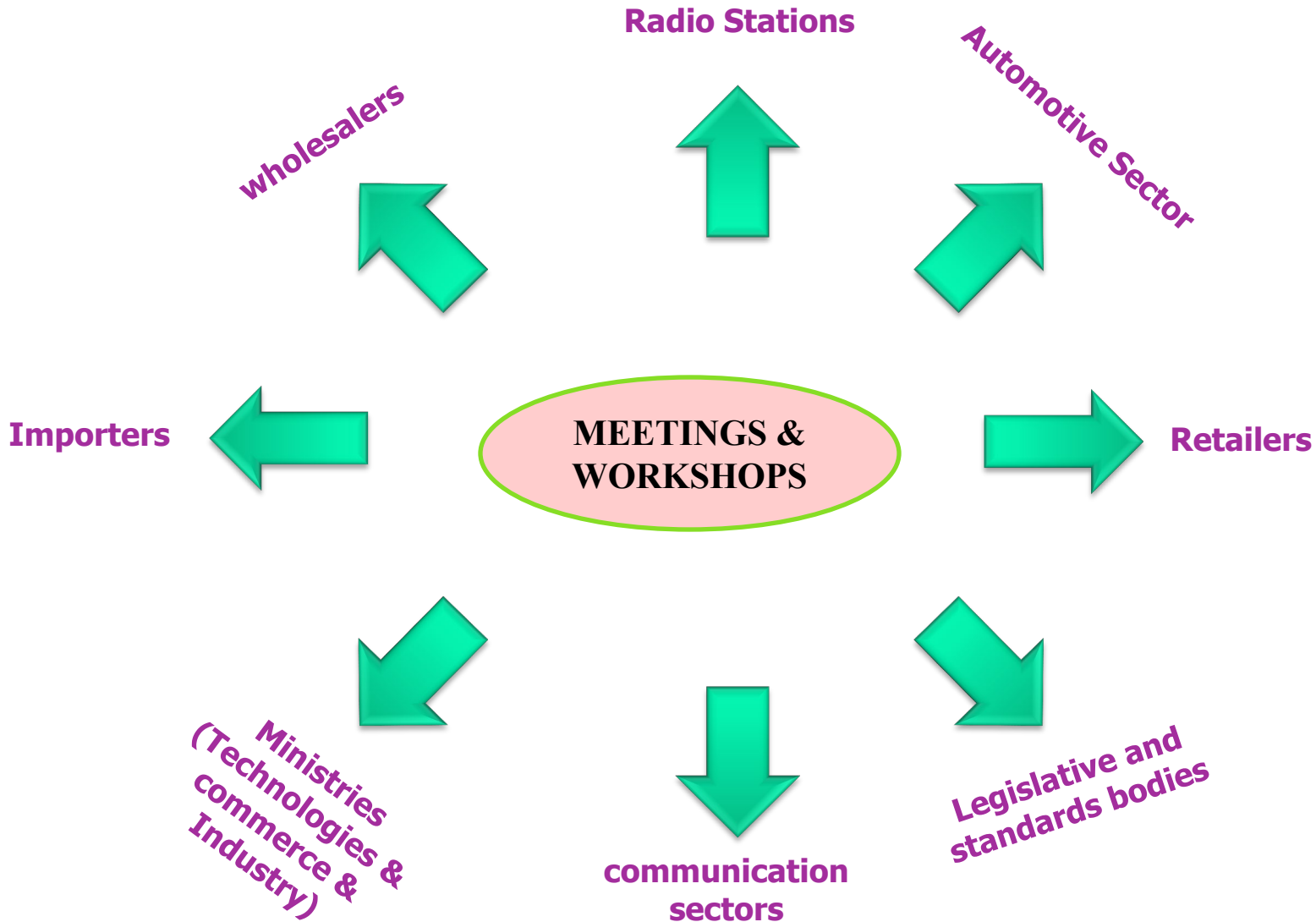
- T1 2021 (85 %)

PHASE 4:

- T1 2022 (99 %)



Collaboration Is the Key For The Successful Roll Out Of DAB+



Key to success is political vision and industry collaboration

The Five Cs

Policy & regulation

Coverage

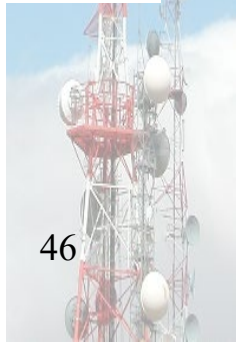
Content

Consumer devices

Cars

Communication

Collaboration



Conclusion

1

- **Conduct tests and experimentations**

2

- **Set the legal and legislative framework for integrating the specifications of receivers whether manufactured locally or imported.**

3

- **Set a timetable for the integration of this service into the reception equipment. It is advisable to start with cars and other vehicles**

4

- **Form a national committee composed of legislative bodies from radio and communication sectors, bodies responsible for standards, in order to develop a national road map for its implementation**

5

- **2020 : all devices sold to consumers or provided by the automotive industry have to be digitally DAB+ (regulated by LAW- B2B & B2C)**



ACTION PLAN FOR DAB+ DSO



➤ Invite the broadcasting organizations that have started the service to respect the following steps :



Put Flashes on various media to inform the audience of the benefits of digital audio broadcasting



Use this service to broadcast archival programs from the national heritage as well as specialized programs.



Invite manufacturers of radio receivers to organize exhibitions to advertise their products and to provide various quantities and models.





THANK YOU

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Video publicitaire

