

# **> DISTRIBUTION PLATFORM COST-BENEFIT ANALYSIS FOR RADIO BROADCASTERS AND LISTENERS**

## **> LOW-COST DAB+ BROADCASTING TOOLS**

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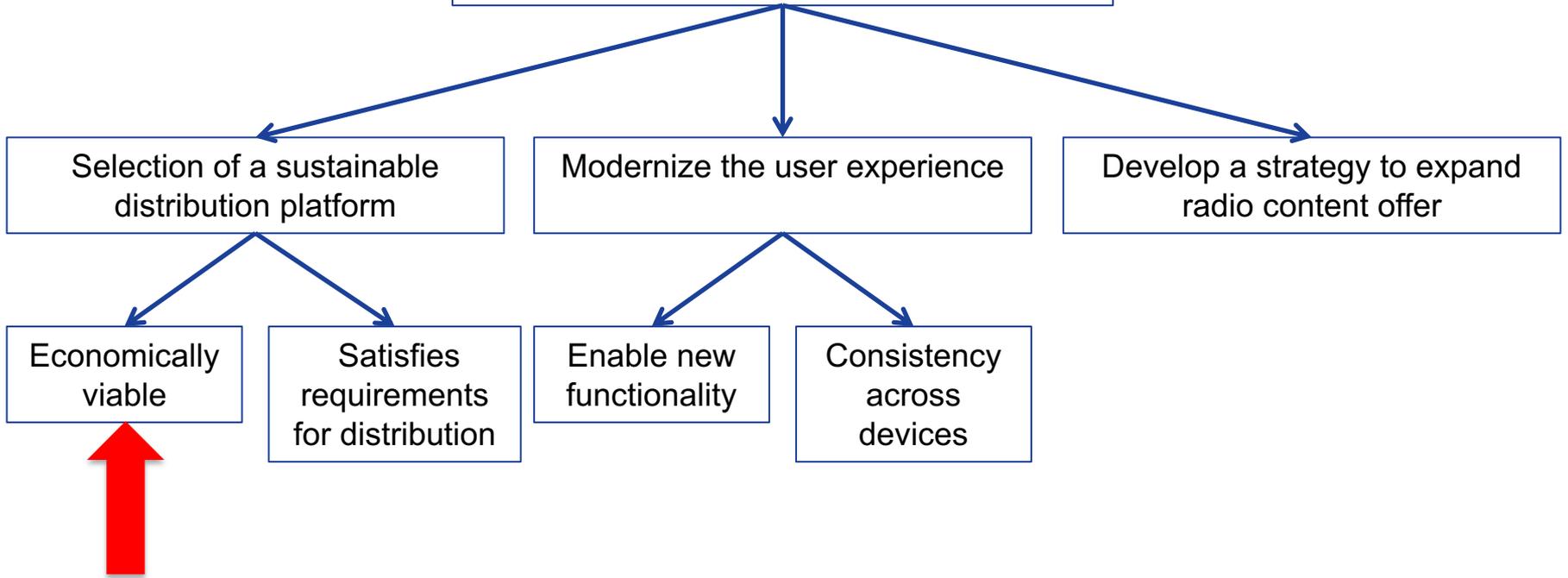
**EBU**

OPERATING EUROVISION AND EURORADIO

**WHAT ARE WE TALKING ABOUT?**

**A PROCESS TO MAKE RADIO  
“FIT FOR THE FUTURE”**

# RADIO DIGITIZATION



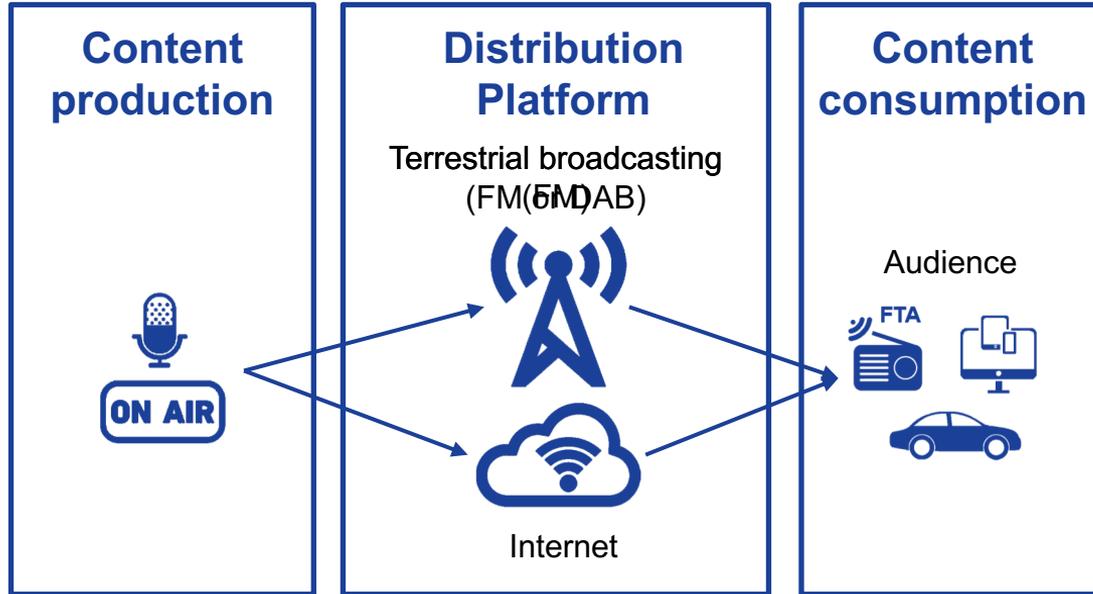


This presentation shows the outcome of the technical review.

Further explanations on methodology, assumptions and input figures can be found in the review document.

[https://tech.ebu.ch/publications/tr\\_2017\\_radio](https://tech.ebu.ch/publications/tr_2017_radio)

# **WHAT IS THE MOST COST-EFFECTIVE DISTRIBUTION PLATFORM?**

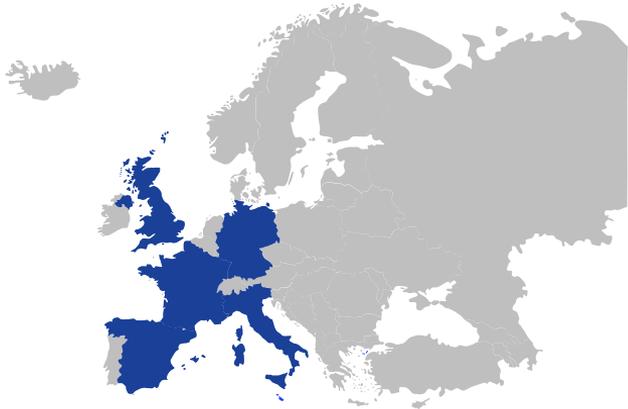


The economic sustainability is a **key argument**

# SCOPE

To provide an indication of the costs to transmit and to listen to radio

(Not all possible variables like universality, reach, ease of use, ... are considered)



The big five European markets as baseline

- Population: 321 M (63% of the union)
- Area: 2 Mkm<sup>2</sup> (46% of the union)
- GDP: 13212 Billion\$ (71% of the union)

Normalised country (scalable model)

- Population: 72 M
- Area: 390k km<sup>2</sup>

Distribution:

National broadcaster costs for FM, DAB and internet.

Reception:

Listeners costs to listen on the move.

# **RADIO DISTRIBUTION COST**

# RADIO DISTRIBUTION COST DEFINITION



## OPEX

- Energy consumption
- Heat dissipation
- Site maintenance cost
- Site rental cost
- ...

## DATA REQUIRED

- Number of transmitters
- Transmitter power
- Site categorization and associated costs

## FM

- Networks analysis
- Members data
- Categorization techniques based on transmitter power

## DAB/DAB+

- Reverse engineering
- Members data



## OPEX

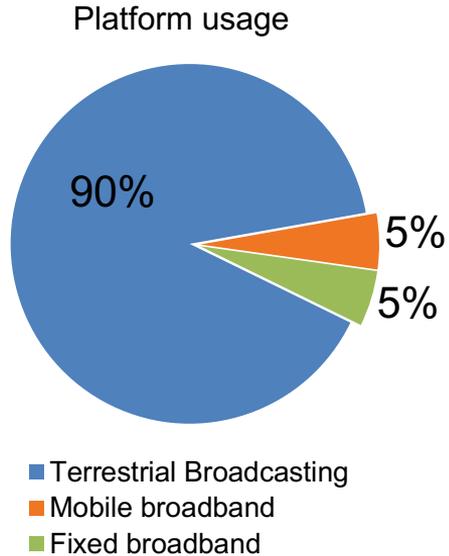
- GB of data distributed via CDN

## DATA REQUIRED

- Price per GB
- Listening time
- Bitrate
- Population

- CDN pricing
- EBU statistics

# KEY STATISTICS FOR RADIO DISTRIBUTION



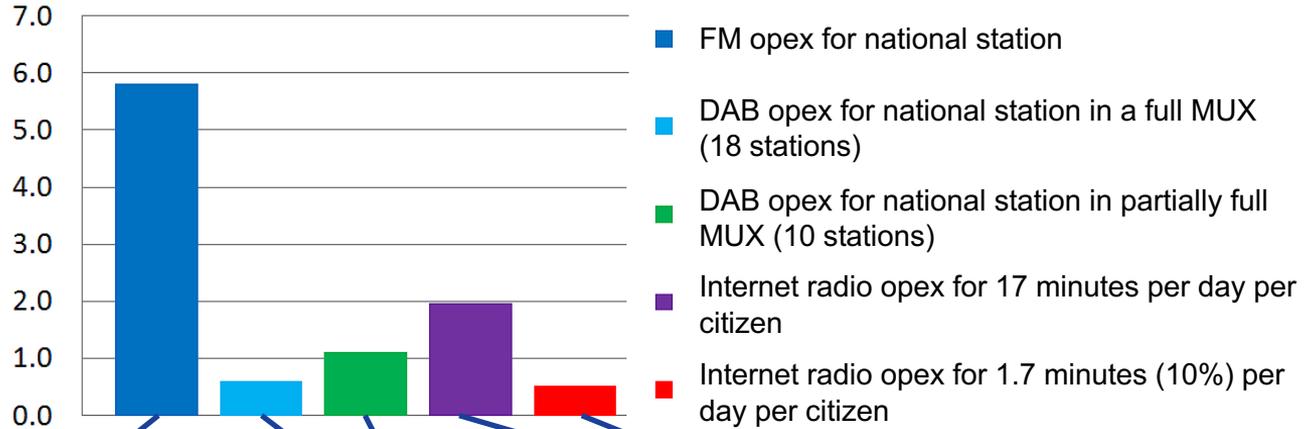
According to EBU statistics:  
National radio daily listening time per citizen: ~17 minutes



All listening time through the internet: 17 minutes  
Realistic listening time through the internet: 1.7 minutes

# RADIO DISTRIBUTION COST ANALYSIS

OpEx comparison in M\$



FM is by far the most expensive distribution technology

Due to multiplex technology, DAB is inexpensive. In the best case it could be 10 times cheaper than FM

The expense for internet distribution is highly variable and can easily grow larger than DAB and similar to FM

# RADIO RECEPTION COST

# RECEPTION USE CASE

Reception Use Case	FM	DAB	Wi-Fi	MBB
<b>Indoors</b> (at home, in the office,...)	Available	Available	Available	Available
<b>In car</b> (via traditional radio, smartphone...)	Available	Available	Not Available	Available
<b>On the move</b> (portable radio, smartphone, ...)	Partially Available	Partially Available	Not Available	Available

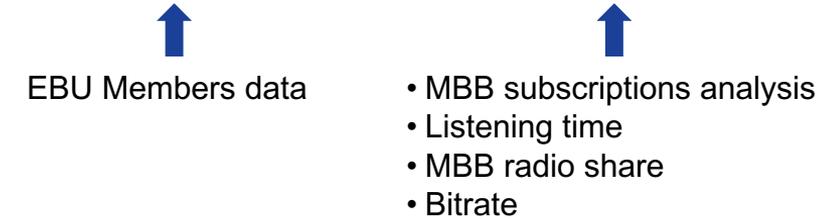


In this case Terrestrial Broadcasting might not be sufficient.  
Mobile broadband ensures full availability of radio in this scenario

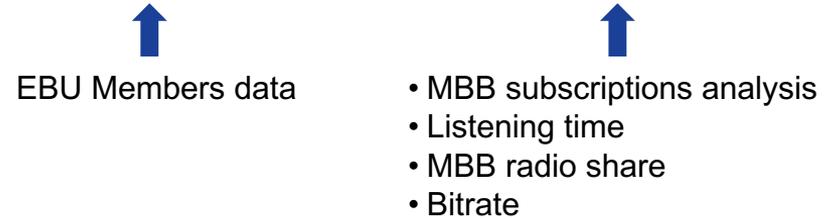
# RADIO LISTENING COST DEFINITION

	<b>FM</b>	<b>DAB</b>	<b>Wi-Fi</b>	<b>MBB</b>
<b>Public broadcaster licence fee</b>	<b>FTA, no additional expense</b>	<b>FTA, no additional expense</b>	<b>Fixed broadband subscription</b>	<b>Mobile broadband subscription</b>

Cost to access radio	
Broadcasters licence fee	LTE subscription with sufficient data allowance

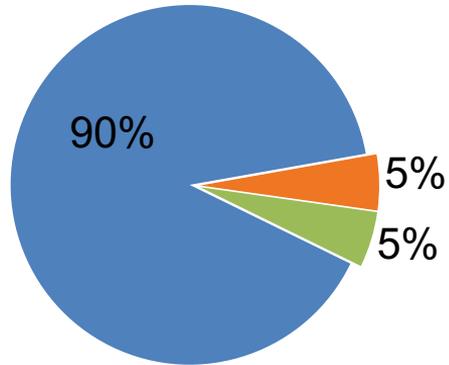


Actual expense	
Broadcaster licence fee allocated to radio	LTE traffic allocated to radio



# KEY STATISTICS FOR RADIO CONSUMPTION

Platform usage



- Terrestrial Broadcasting
- Mobile broadband
- Fixed broadband

2:29 hrs of Radio per day in the big 5



7 minutes of mobile Radio per day in the big 5

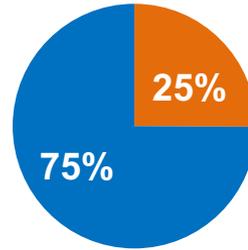


150 MB per month for radio @96kbps

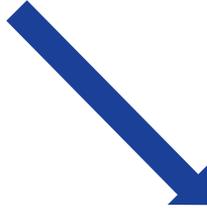
# RADIO LISTENING COST ANALYSIS

## Yearly expense on radio (71 euro), realistic LTE radio listening

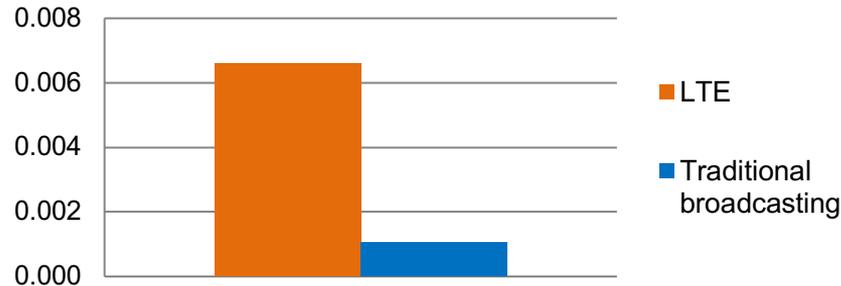
At first glance 25% is not high but...  
Realistic LTE radio listening is about **5%** of the total listening time and it accounts for the **25%** of the real expense.



- LTE yearly expense to listen to radio (realistic case)
- Broadcaster licence allocated to radio



## Listening cost per minute in euro



For listeners 1 minute of radio over LTE networks costs **seven** times more than listening on terrestrial broadcasting networks.

# CONCLUSIONS

## Radio transmission

- 1) DAB is a much cheaper option than FM, it allows cost sharing due to the MUX architecture.
- 2) DAB cost saving is significant and it would allow the creation of new content and employment
- 3) Internet delivery only is not competitive with the current pricing level
- 4) Internet delivery expense is much higher than its current percentage market share

## Radio listening

- 1) Internet is now part of everybody's life but mobile broadband is too expensive for media consumption
- 2) Internet-only delivery would prevent many families from accessing information and entertainment due to a prohibitive access cost
- 3) The current expense for internet radio listening is much higher than its current percentage market share.

**A DAB+ backbone with additional hybrid services is the way forward.**

# LOW-COST DAB+ BROADCASTING

## HISTORY OF LOW COST DAB

**2006-2008:** Development of the original tools by the Canadian Communications Research Centre (CRC)

**2009:** CRC opens up the source code of the multiplexer to freely use

**2010:** CRC opens up the source code of the modulator. DAB+ multiplexing added. Trial broadcasts in Ireland and Switzerland.

**2011:** Long-term tests started in Denmark.

**2012:** High-power DAB+ test across Geneva, during EBU Radio Week

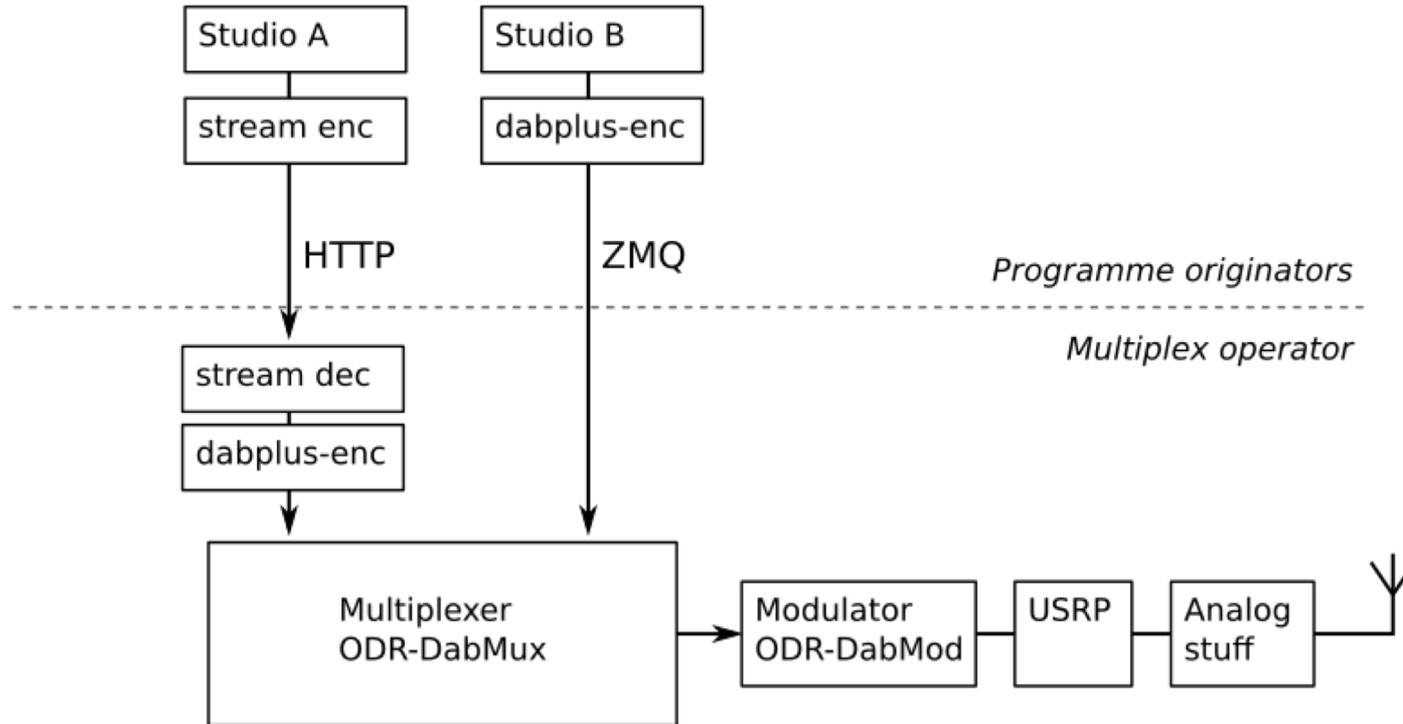
**2013:** Pilot commercial services started in Switzerland, using low-cost DAB+. UK Report on using low-cost DAB+ for small-scale services.

**2014:** Regular DAB+ transmission in Geneva. Services in Marseille, France. Regular transmissions in Zurich.

**2015:** UK Small Scale trials commenced. Additional sites added in Switzerland

**[WWW.OPENDIGITALRADIO.ORG](http://WWW.OPENDIGITALRADIO.ORG)**

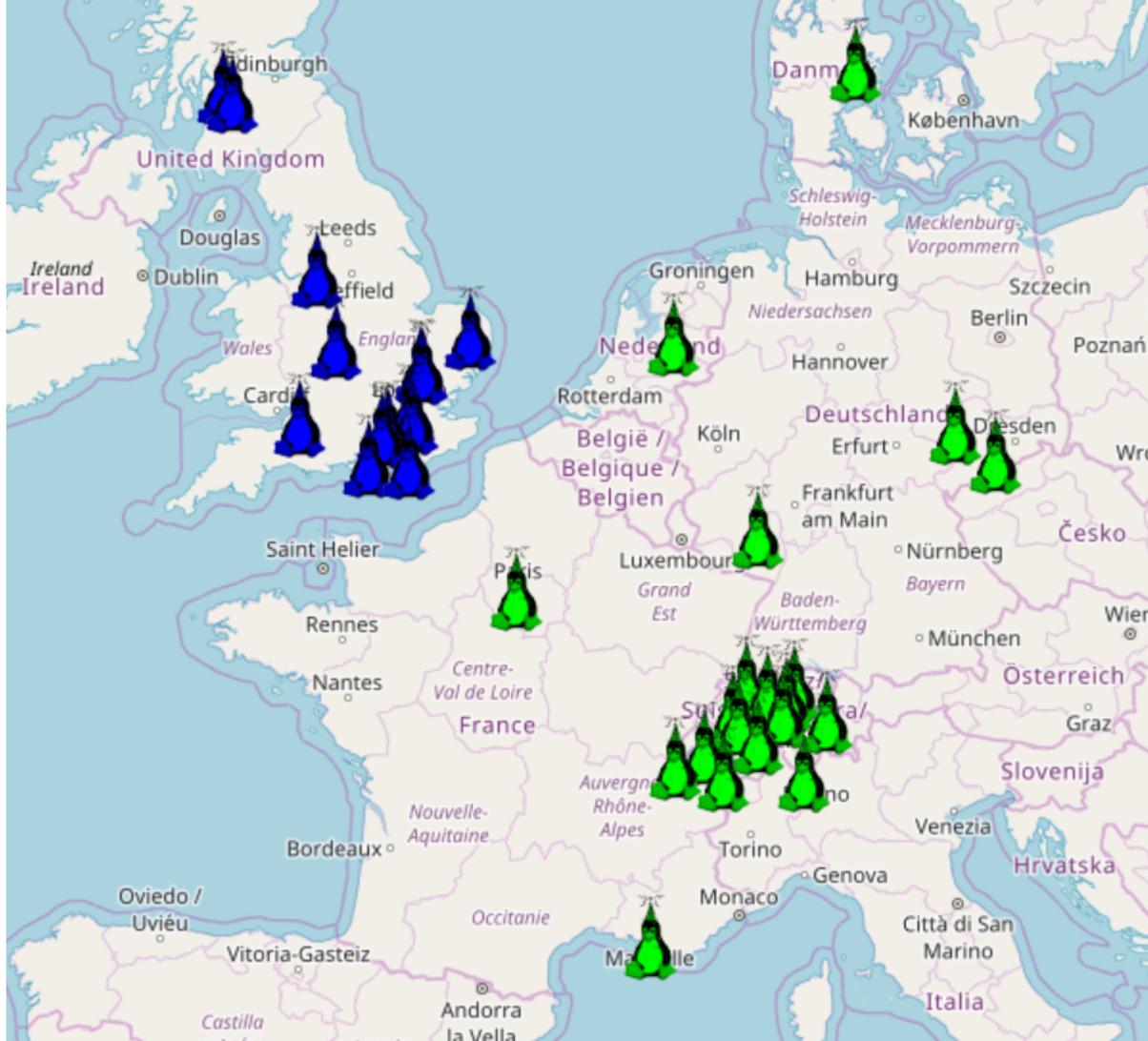
# LOW-COST BROADCAST CHAIN



## CURRENT PROGRESS\*

- UK Minimux Trials (10)
- Germany (3)
- Netherlands (1)
- France (2)
- Denmark (1)
- Switzerland (13)

\* Taken from [opendigitalradio.org](http://opendigitalradio.org)



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# UK MINIMUX TRIALS



## TRIAL SETUP

- Off-the-shelf computer
- UPS, Network Switch
- Power Amplifier
- Mask filter
- SDR Peripheral
- Small encoding boxes at each radio station (for contribution)
- Served over consumer broadband
- Some run as managed services
- Some integrated with existing contribution (e.g. AES67)

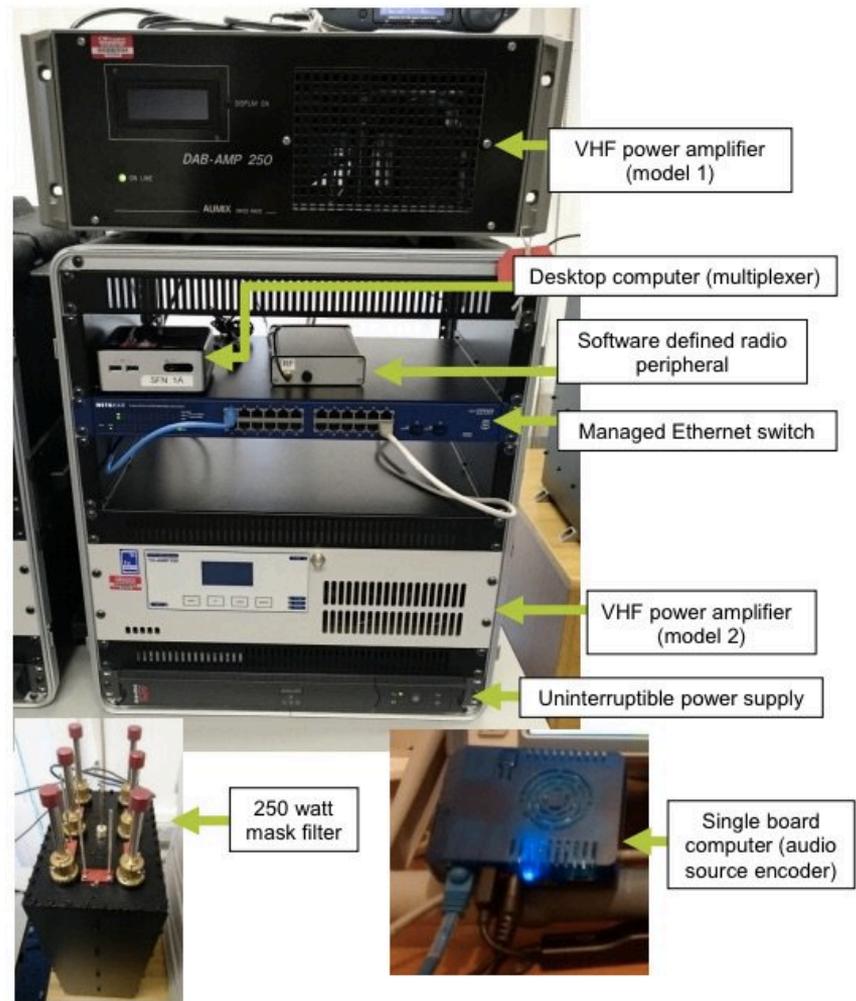
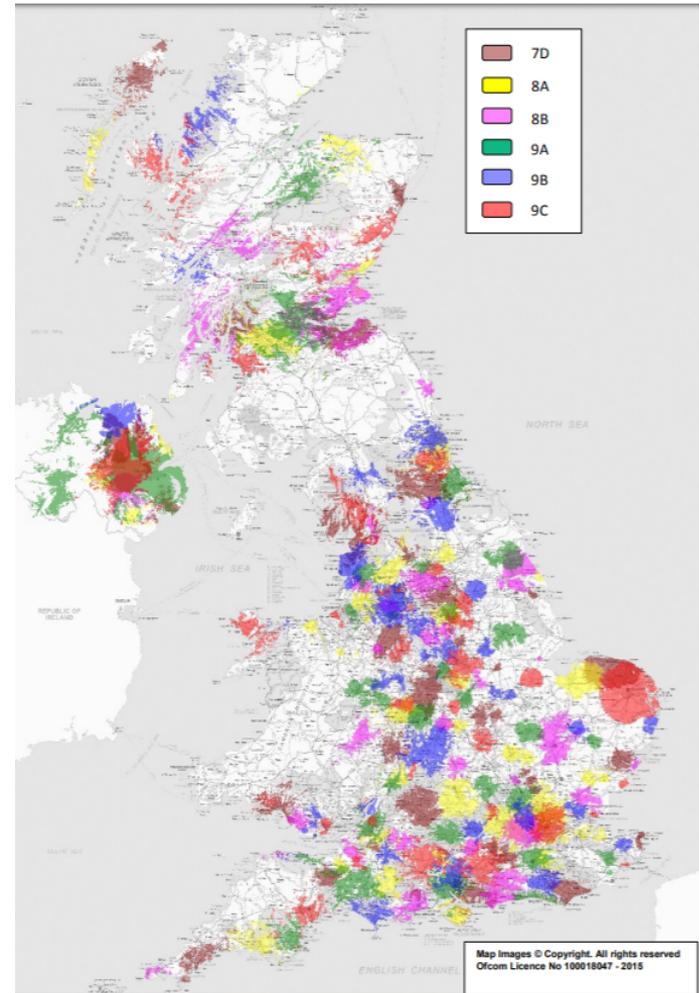


Figure 1: Trial transmitter equipment – main components

## MINIMUX TRIAL CONCLUSION AND FUTURE EXPANSION

- Trials considered a success: > 150 additional services now on air from 10 multiplexes
- Great interest from community station
- Potential for great coverage, additional services
- Feasibility study concluded for **192** 'small scale' multiplexes
- Expanded use of Band III spectrum
- Proposed transmission sites modest: 100W ERP



**THANK YOU!**

