

# French perspective on spectrum issues

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*Spectrum 5.0 : Policy Choice for 5G Deployment*

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# Looking back to the past awards

## Spectrum award objectives

# How national objectives have been taken into account in past spectrum awards

|  | 2001 to 2010  | 2010                                   | 2011   | 2012   | 2015  | 2018                          |
|--|---|--|--|--|---|-------------------------------|
|  | <b>3G</b><br>2.1 GHz (4 awards)   | <b>3G</b><br>2.1 GHz additional blocks | <b>4G</b><br>2,6 GHz FDD                     | 800 MHz  | <b>4G</b><br>700 MHz  | 900 MHz, 1800 MHz and 2.1 GHz |
| MONETISING THE STATE'S INTANGIBLE ASSETS | Fees fixed <i>ex ante</i>   | sealed-bid auction                     | sealed-bid auction                           | sealed-bid auction   | Multi round auction   |                               |
| DIGITAL DEVELOPMENT                      |   |  |  | Coverage: <ul style="list-style-type: none"> <li>✓ Nationwide</li> <li>✓ Priority rollout zone</li> <li>✓ Departmental area</li> </ul> | Coverage: <ul style="list-style-type: none"> <li>✓ Same as 800 MHz</li> <li>✓ on-board coverage of everyday trains</li> </ul> | Coverage obligations          |
| COMPETITION ISSUES                       | Room for a 4 <sup>th</sup> entrant with conditions favouring its expected arrival   | MVNO access criteria                   | MVNO access criteria                         | MVNO access criteria   | Multi band spectrum caps  |                               |
| INNOVATION                               |   |  | Minimum data rate registered in the licences | Minimum data rate registered in the licences   |   |                               |
| OTHER OBJECTIVES                         | 14 technical and economic criteria, including : network quality, service offering and corresponding price, rollout speed... |  |  |  |   |                               |

800 MHz and 2.6 GHz  
auctions

2011-2012

800 MHz / 2.6 GHz

## Three core objectives

Digital development of the territory = primary – ambitious - objective of the digital dividend

|                               | T + 12 years | T + 15 years |
|-------------------------------|--------------|--------------|
| Overall metropolitan coverage | 98%          | 99,6%        |
| Departmental coverage         | 90%          | 95% (*)      |

+ “priority rollout zone” corresponding to the sparsely populated areas

### Competition in the mobile market : a balanced portfolio

Equitable access to spectrum by mobile operators

- Limits on the **maximum amounts of frequencies** that can be granted:
- guarantee of a **minimum amount of spectrum** in the 2.6 GHz band if four players or less are qualified
- **Roaming access** to the 800 MHz network in the “priority rollout zone”

On the other hand, provisions in favour to the **MVNO access**

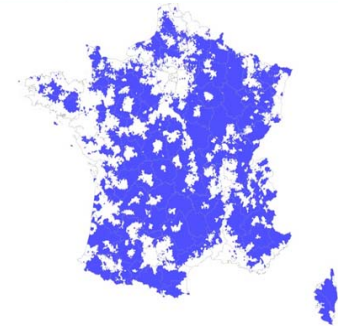
### Maximizing income

This result was among the upper range of European 4G award.

**one-turn combinatorial seal-bid auction**

**bids rated on several criteria**, including the candidate pricing:

**A score** taking into account all the criteria, as the product of the price proposed by the corresponding multipliers



700 MHz auctions

2015

## Objectives



### Monetizing intangible State assets

**Reserve price** of 2.5 billion euros for the entire band.



### Effective and fair competition

**Transparent procedure** that allows mobile operators to manage their outcome.

to prevent a squeeze-out strategy by the 3 MNO granted with 800 MHz frequencies

**Spectrum caps + whole 30 MHz granted in a unique procedure open to the 4 MNO**



### Stimulating investment and regional development

**Coverage obligations** as strong as those attached to the 800 MHz band

**New obligations** pertaining to on-board coverage of everyday trains.



# The procedure

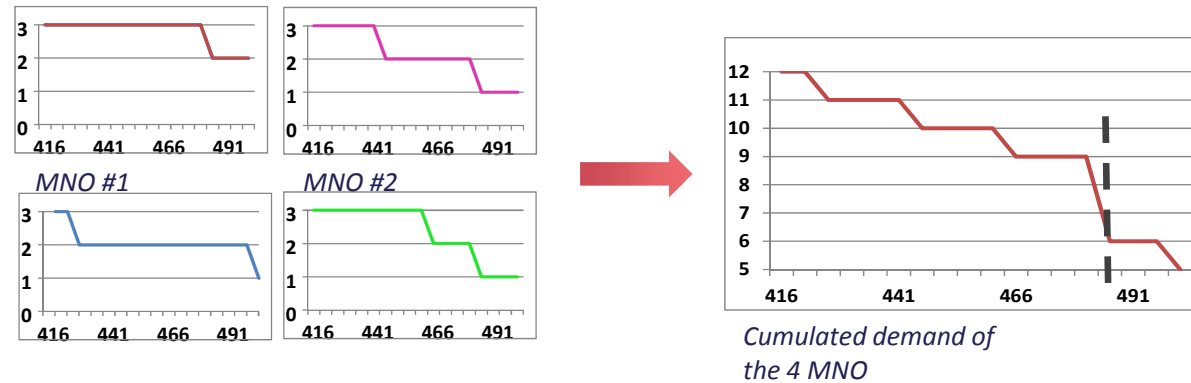
## Spectrum Cap

700 MHz spectrum cap : Maximum 2×15 MHz (3 blocs) per candidate in the 700 MHz band.

< 1 GHz spectrum cap : Maximum 2×30 MHz per candidate in the 700 MHz, 800 MHz and 900 MHz bands (2×95 MHz in total).

Process : a combinatorial clock auction (CCA) to determine the quantity of frequencies allocated to MNOs

End of the auction : when the total demand reaches 6 blocs.



**Total : 466 M€ per bloc of 2×5 MHz = 2,8 G€**



900 MHz, 1800 MHz  
and 2.1 GHz renewal

2018 - New deal for mobile coverage : Historic agreement between the Government and mobile operators that aims to ensure the availability of high standard mobile coverage for everyone in France

# Context of the mobile coverage : why a “New deal” ?

Context of renewal of the 900, 1800 and 2100 MHz band frequency licences expiring between 2021 and 2024 with a 2018 reassignment procedure conducted by Arcep

- 1. Mobile coverage situation**

Regarding the population, good mobile coverage for 2G,3G and 4G



Regarding the geographical area, unsatisfying mobile coverage especially for 4G technology

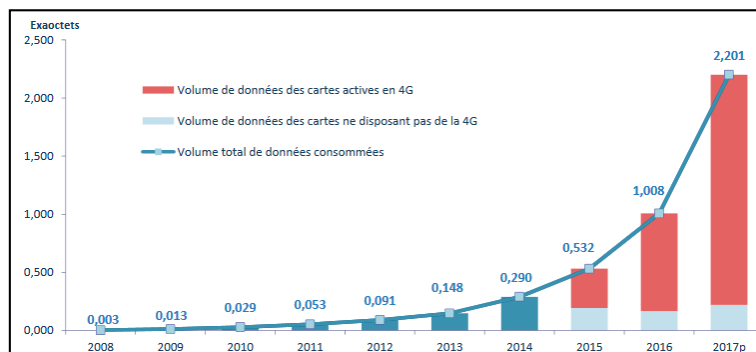


|          | Population | Area |
|----------|------------|------|
| Orange   | 92%        | 65%  |
| SFR      | 91%        | 65%  |
| Bouygues | 90%        | 61%  |
| Free     | 82%        | 48%  |

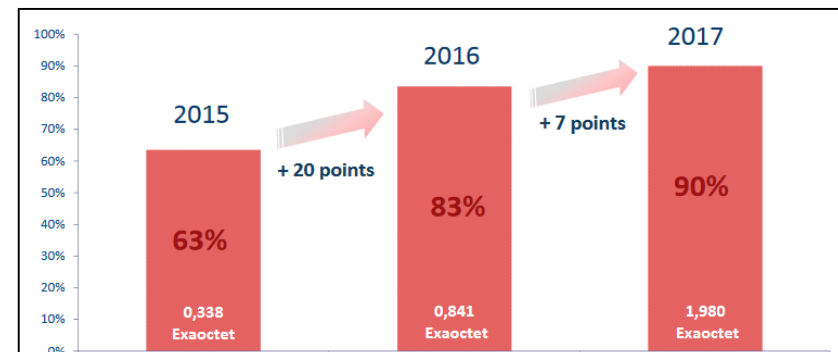
4G Mobile coverage in July 2017

- 2. Mobile traffic explosion**

Data traffic consumption in 2017, in France, has doubled comparing with 2016 (+118,3%)  
--> the consumer needs more data everywhere!



arcep Traffic generated by using all the mobile technologies



Traffic generated by using 4G technology



## Implementing 4 new principles to generalize a good quality mobile coverage for all

### 1. **Change of paradigm for the State**

For the first time in a frequency allocation, the digital coverage of the territory takes precedence

### 2. **Operators' commitments for a gradual improvement of mobile coverage in the daily life of the people**

Generalization of 4G coverage, coverage of major roads, indoor coverage, no more obligation of coverage expressed in terms of a % of the population

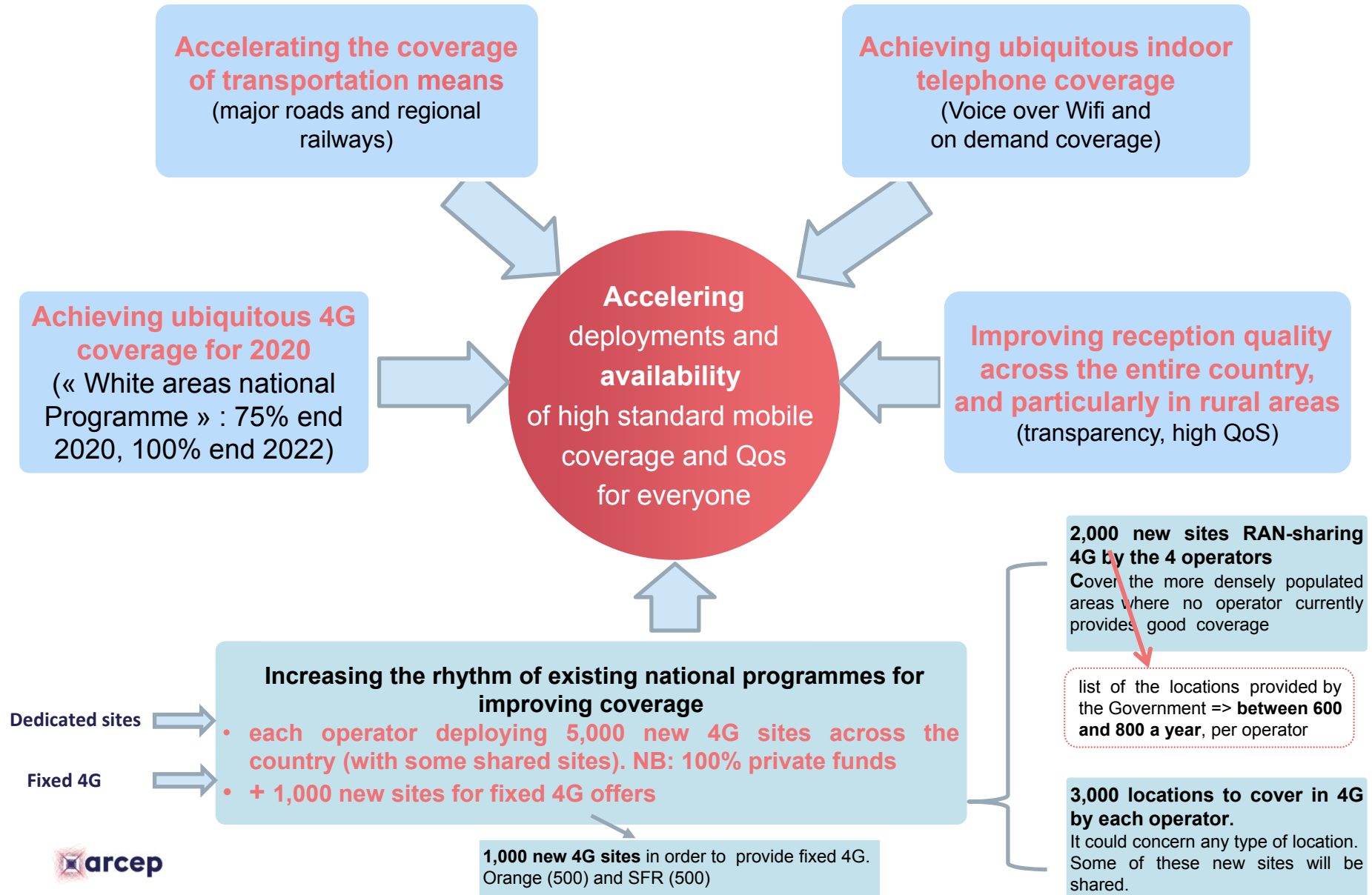
### 3. **A solution for challenge areas**

Operators will use their own funds where the authorities have identified coverage needs

### 4. **Acceleration of digital coverage throughout the country**

The Government will implement measures to simplify deployments under the Housing Bill; other regulatory measures will follow.

# Intended - legally binding and controllable - new commitments for mobile operators



# Looking forward for the future 5G bands... and new challenges

# 5G : a priority subject

## An international mobilisation



Ambitious european action plans to contrast USA and Asia plans

**5G roll-out in one major city in every European country by 2020 and global coverage (every city, motorway and high-speed railway lines ) by 2025**

- National initiatives : government action plans, trials and pilots

**Objective: 5G commercial rollouts in 2020**

## 5G competition

French situation: strong commitment and « on the move » for 5G implementation

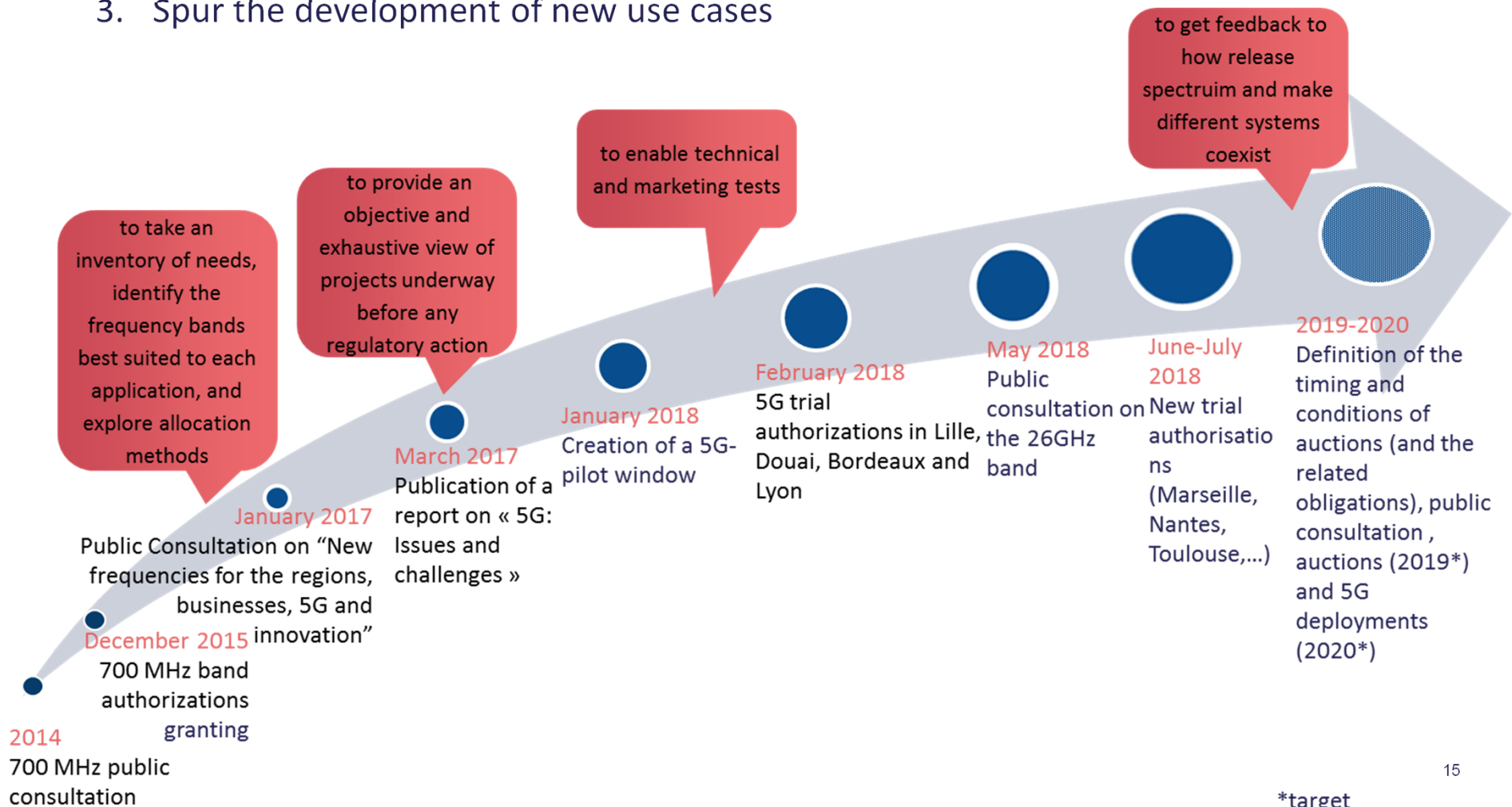
- ❑ 4 operators
- ❑ All committed to the fixed and the mobile rollout
- ❑ Important delays in 4G roll out, particularly in rural areas
- ❑ Gouvernemental plan for having superfast access networks everywhere
- ❑ Active participation to the work of BEREC : Particularly on infrastructure sharing, frequency allocation procedures and coverage obligations
- ❑ Frequencies: a global mission
  - **700 MHz band**: already allocated to operators in France and partially on hand, fully available mid-2019!
  - **C band** (3.4 - 3.8 GHz): requires **relocation** of **existing radio relay links** and **wireless local loop networks** to the lowest end of the band
  - **Millimeter-wave band** (26 GHz): **relocation** of **existing radio relay links**, and definition of **coexistence** between 5G mobile and other existing services (FSS: Fixed Satellite Services, Radio-astronomy, etc.)
  - **Other frequencies**: thoughts about the “L band”, the “2,6 GHz TDD” band,..



# Arcep's spectrum work on 5G since 2014

## Action plan:

1. Release and allocate spectrum
2. Support the improvement and simplifications of the rollout conditions
3. Spur the development of new use cases



\*target

# Action#1: Release and allocate spectrum

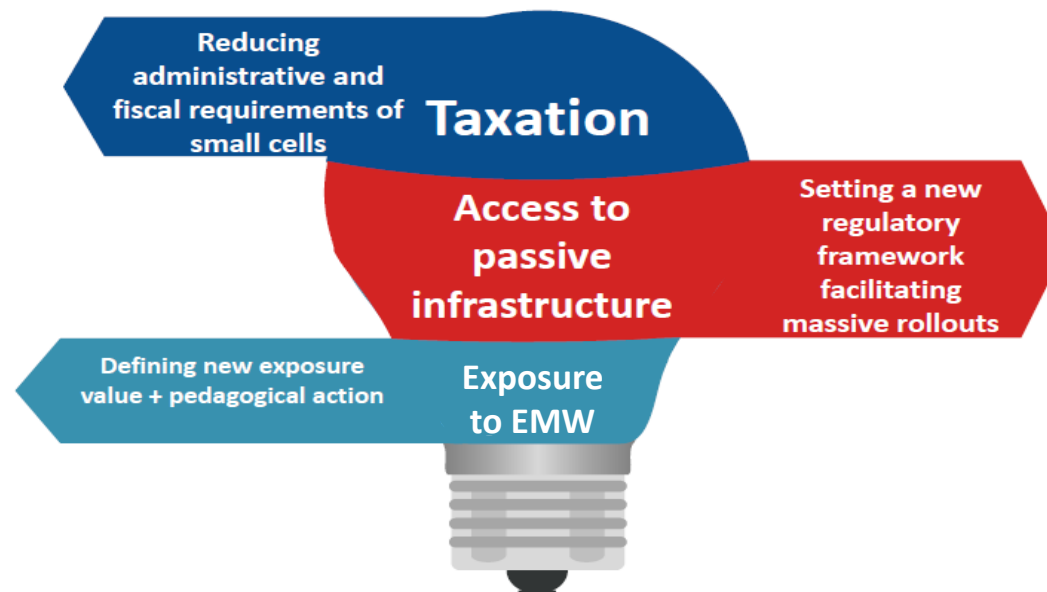
- **May 2018: Public consultation on 26 GHz band**
  - How to make the 26 GHz band available to host 5G?
  - What conditions for the coexistence between 5G mobile and other existing services?
- **Definition of the timing and conditions of auctions (and the related obligations):** for both C band and millimeter-wave band
  - C band **spectrum awards** should take place soon enough to permit 5G dedicated equipment planning and supply for operators;
  - **2019-2020:** first rollouts in C band (3.4 – 3.8 GHz) to meet the objective of **5G commercial launch by 2020;**
  - A specific focus on 2,6Ghz TDD (2575 – 2615 MHz sub band 4G)
    - 40 MHz dedicated to professional mobile radio LTE networks
- **Progressive migration of existing systems to other mobile frequency bands**





## Action #2: Support the improvement and simplifications of the rollout conditions

A **fast 5G rollout** calls for setting a **favorable regulatory environment**, especially with regard to **small cells deployment**, involving contribution of public stakeholders and authorities, and related to:



## Action #3: Spur the development of use cases – 5G pilots

**Principle:** granting temporary 5G licenses for willing operators and vertical industry partners in C band and in 26 GHz band, in **2018 and 2019**.

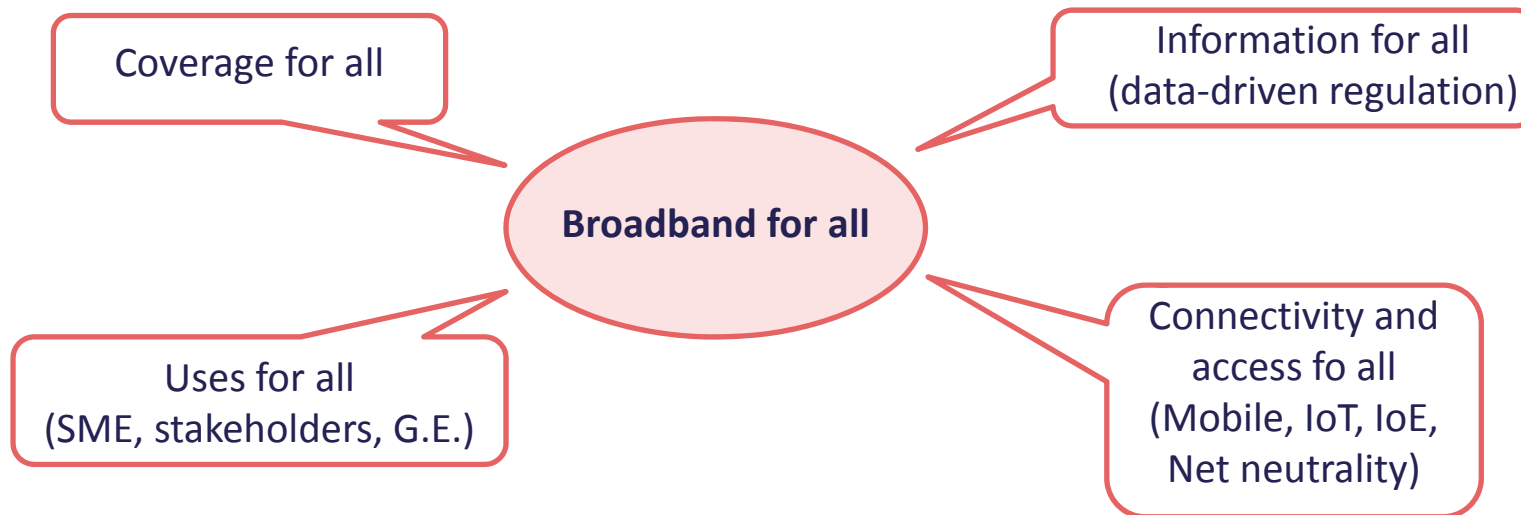
9 metropolitan areas already identified (Lyon, Bordeaux, Nantes, Lille, Le Havre, Saint-Étienne, Douai, Montpellier and Grenoble) and ready for 3400-3800 MHz. Other locations available on request, subject to study.

5G temporary licences already given in main cities

**Objective:** Facilitate technical uses and experiments and implement **5G pilots involving all actors including non-operators (e.g. vertical industries)** allowing to:

- identify actors interested with 5G spectrum;
- deepen understanding of concrete use cases for 5G;
- explore business models and associated challenges for the players of the 5G value chain
- obtain initial feedback that will help shaping 5G frequency allocation, especially regarding cohabitation between actors.

Conclusion : In a nutshell, “Broadband for all” means:



Thank you for  
your attention

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