

L'AGENCE NATIONALE DES FREQUENCES (ANFR)

Planning and refarming....

Keywords for spectrum efficiency

ITU Regional seminar
St-Petersburg 6-8 June 2018

Legal Framework

GLOBAL

Recommendations
Reports



Radio Regulations
Radiocommunications Services
One Treaty between States

1

REGIONAL

48 countries



2

Decisions
Recommendations

3

Decisions
Recommendations

4

Standards
Harmonised Standards EN

Electronic Communications

NATIONAL

Government

Frequency National Allocations Table

Governmental Users

Regulation Authorities (ARCEP, CSA)
Individual / General Authorisations

ANFR: an Agency to manage spectrum public resource as “wholesalers” ... but not only !

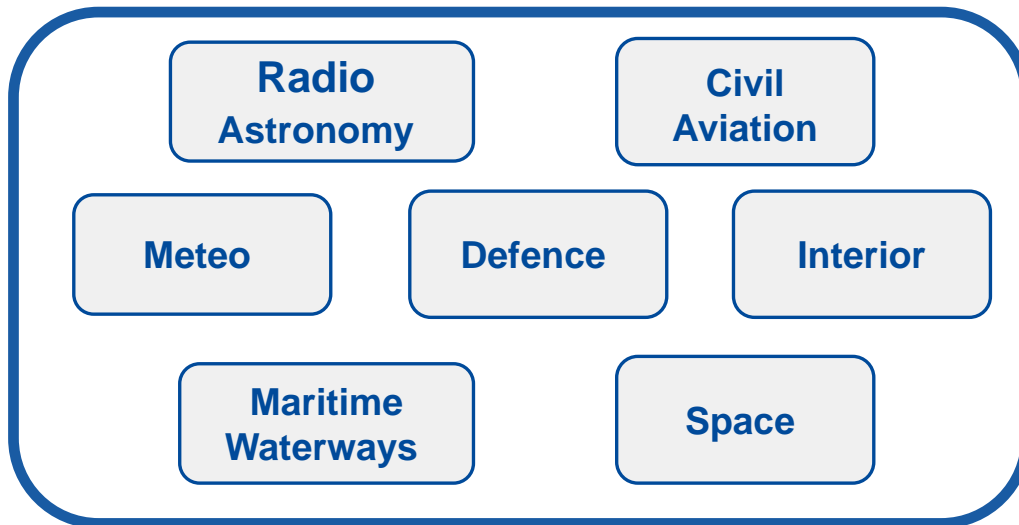
International Negotiation	Management of national Rights	Interference management, surveillance
Coexistence between users	Public Exposure to Electromagnetic fields	Refarming funds
Tour de France, French Open « Major Events »	Innovation Hackathon & Open Data	Maritime Amateur



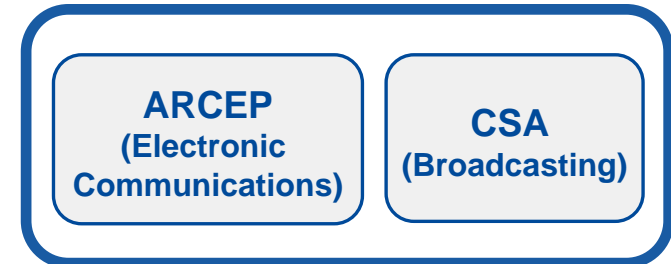
The retail users: who are they ?



Gouvernemental Users



Independent Regulators



ANFR manages spectrum as a “wholesaler”. Administrations and independent authorities decide final usages (assignments, authorizations):

- Commercial Services “electronic communications”: **ARCEP, CSA**
- Ministries using frequencies

Missions of ANFR (1)

- **International Negotiations**
 - Preparing and coordinating France action
 - ITU : WRC, RRC, ITU-R Study Groups
 - CEPT (48 European countries)
 - EU (28 countries)
- **Cross border coordination**
- **Satellite regulation and resources (orbit/spectrum)**
- **National Spectrum Planning:**
 - Assessment of future spectrum demand
 - Spectrum review
 - Sharing and compatibility rules
 - Management of the Spectrum Refarming Fund
 - Economic value of the spectrum

Missions of ANFR (2)

- **National Frequency Allocation Table**
- **Coordination and Registration of Frequency Assignments and Sites:**
 - Maintaining the National Reference File of radio sites
 - Instruction of easements on lands and buildings
 - Coordination and optimization of emission sites on the basis of the electromagnetic compatibility
 - Maintaining the National Frequency Register
 - Coordinating spectrum needs in shared bands
 - International coordination of frequencies (with neighbouring countries and for satellite systems)
- **Exposure to electromagnetic fields**
 - Measurement method
 - Information of Public : Cartoradio <http://www.cartoradio.fr>
 - Government initiative to study the possibility to reduce exposure with all stakeholders (operators, associations, experts)

Missions of ANFR (3)

- **Spectrum Monitoring**

- Compliance monitoring of the use of spectrum:
 - inspection of sites and radio stations
 - monitoring frequencies
- Market surveillance, including SAR (Radio Equipment Directive, RED)
- Investigation of reports for interference:
 - National Centralizing Office (relation with ITU BR)
- Preparation, coordination, temporary assignments and spectrum monitoring for special events:
 - political summits (G7, G8, NATO...)
 - sport events (Tour de France, Roland Garros, 24 Hours of Le Mans Rugby World Cup...), under specific conventions
- Controls and measurements under conventions

- **TV protection**

- TV network coverage issues are identified in advance with CSA
- Protection against LTE at 790 MHz
- Call center (0970 818 818) : 110 446 calls in 2012
- Specific website: www.recevoirlatnt.fr

Missions of ANFR (4)

- **Work in support to assigners on management, control and measurement expertise, under specific agreements:**
 - Radio independent networks managed for ARCEP (assignment, fees)
 - Compliance monitoring, licensing and code for stations in the maritime radio, CRR exams for the Maritime Ministry;
 - Measurement and expertise :
 - CSA
 - Interior
 - Civil aviation
 - Météo France
 - Defence

National Frequency Allocation Table

- **Prime Minister allocates spectrum to the spectrum assigners by publishing a decree relating to the National Frequency Allocation Table (NFAT)**
- **The update of NFAT is prepared by the ANFR and submitted to the ANFR board before being sent to the Prime Minister**
- **Spectrum assigners manage Spectrum:**
 - either for their own needs (Ministries)
 - or to the benefit of operators (ARCEP) or audiovisual programs editors (CSA)

A two-level system (Allocation and Assignment)

France	Spectrum used by Government Agencies	Spectrum used for electronic communications	Spectrum used for broadcasting
Authority allocating frequencies (Services)	Prime Minister based on ANFR proposals National Frequency Allocation Table (NFAT)		
Authority assigning frequencies	Ministries and Government Agencies	ARCEP (Electronic communications)	CSA (Broadcasting)

National Frequency Table Allocation

Example for the maritime VHF band

Frequency allocation separation

Authorized Retail user & status



Authorized Services (FR)

RR			
REGION 1	REGION 2	REGION 3	MHz
FIXED MOBILE except aeronautical mobile	FIXED MOBILE		156,8375
Allocation to services as current RR (information)			
FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space)	FIXED MOBILE Maritime mobile-satellite (Earth-to-space)		5.226
5.226-5.228AA	5.226-5.228AA		161,9625
FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space)	AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space)	MARITIME MOBILE Aeronautical mobile (OR) Mobile-satellite (Earth-to-space)	5.226-5.228A-5.228B-5.228F
5.228C-5.228D	5.228C-5.228D	5.226-5.228E-5.228F	161,9875

REGION 1					REGION 2					REGION 3				
France	Ser	Aff	Statut	Notes	France	Ser	Aff	Statut	Notes	France	Ser	Aff	Statut	Notes
157,450	FIX MXA	PNM ARCEP DEF	PRIO	5.226 F34 F35 F35a	157,450	FIX MXA	PNM ARCEP DEF	PRIO	5.226 F34	160,600	FIX MXA	PNM DEF TTOM	PRIO	5.226 F34 F35 F35a A1
160,600						FIX MXA				160,975	FIX MXA	ARCEP DEF		F34 F35
160,975	FIX MXA	ARCEP DEF PNM	PRIO	A1 F34 F35	160,975	FIX MXA	ARCEP DEF PNM	PRIO	F34 F35	161,475	FIX MXA	TTOM DEF PNM	PRIO	F34 F35
161,475	FIX MXA	PNM ARCEP DEF	PRIO	5.226 F34 F35 F35a F35b A1 A4	161,475				5.226 F34 F35		FIX MXA	PNM DEF TTOM	PRIO	5.226 F34 F35 F35a F35b A4
			PRIO	5.226 5.228AA F34 F35 F35a F35b A1 A4			DEF PNM		5.226 5.228AA F34 F35 F35a F35b A4		FIX MXA	PNM DEF TTOM	PRIO	5.226 5.228AA F34 F35 F35a F35b A4
	FIX MXA	PNM ARCEP DEF	PRIO	5.226 5.228A 5.228B 5.228F F34 F35 F35a F35b A1 A4		MAO MBM	PNM ARCEP DEF	PRIO	5.228C 5.228D F34 F35 F35a F35b A4		MBM	PNM DEF TTOM	PRIO	5.226 5.228E 5.228F F34 F35 F35a F35b A4
	m bt	PNM				MBT	PNM				mao	DEF PNM TTOM		
											m bt	PNM		

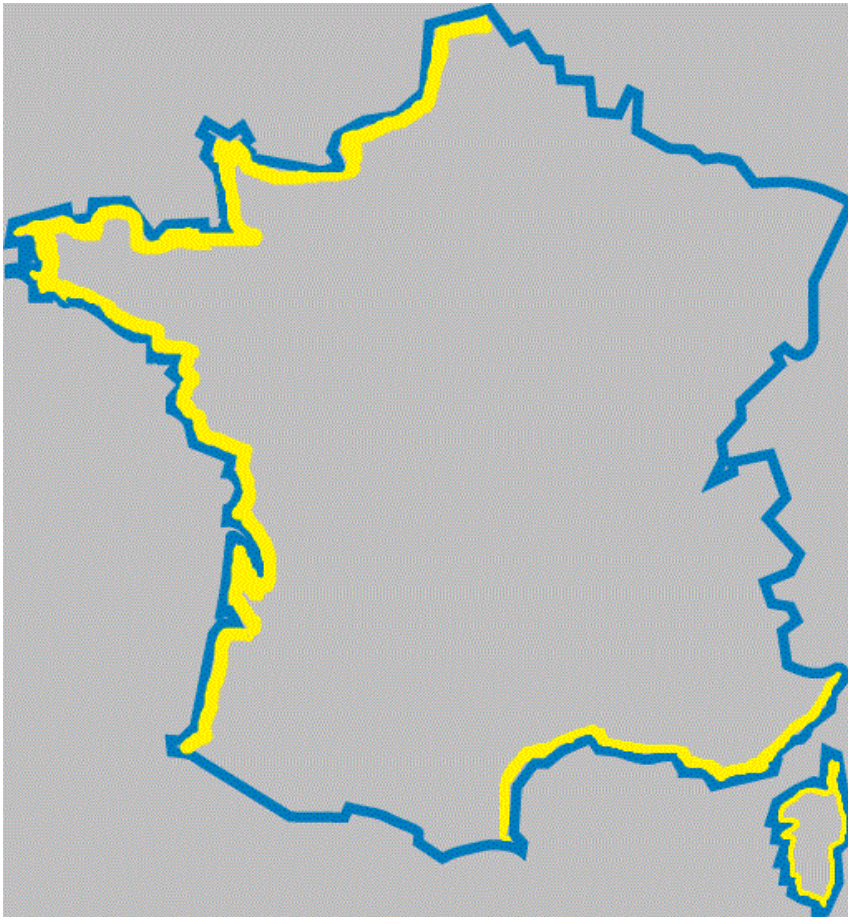
FIX : Fixed service
MXA : Mobile service except aeronautical

ARCEP
DEF: Defense
PNM: Ministry of transport
TTOM

EXCL: exclusivity of usage
PRIO: priority
EQUAL: equality of right for the usage

PNM status PRIO along the coast until 40 km inside territory

We have achieved to regulate a 40 km zone for the maritime mobile Service, in order that the ship could communicate safely along the coast



It's important to have a detail inventory of our national usage, with all the exceptions applicable to the retail users.

NFTA is a tool to help for the planification of the frequencies

But the NFTA is not the ultimate solution for complex issue

Introduction of new bands for the mobile telephony need special measure

What to do?

Spectrum Refarming

But with the help of a spectrum refarming fund

Why a spectrum refarming fund?

When international regulations designate frequency bands for a new harmonized application, it happens that actors who had been using these frequencies for decades, must swiftly leave.

For instance, in recent years:

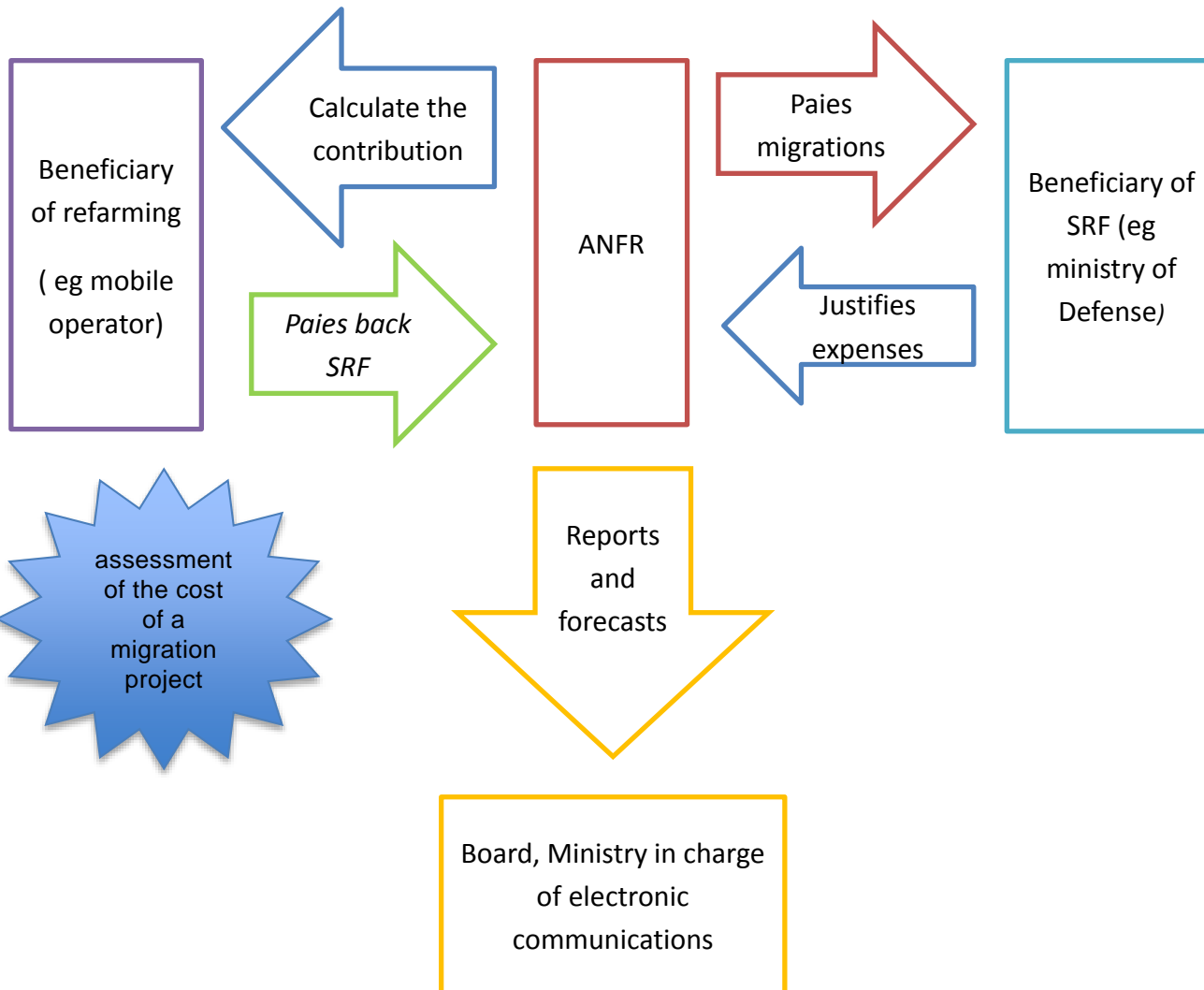
- Defense networks in 2.6 GHz and 900 MHz,
- State security networks in 3.4 - 3.6 GHz,
- Digital terrestrial television in 700 MHz

Have had to migrate in other bands to make room for mobile networks.

When an international decision is released, actors only have a few months or one or two years to set up new networks and most of the time such a move was not foreseeable for them – which means that they are not able to move at once. At this stage, the State may decide that the SRF has to intervene to finance the costly migrations.

France has already financed several dozen of radio networks transfer schemes since 1997 amounting to more than 300 million euros.

What is a spectrum refarming fund?



This fund amounts to 40 millions euros. The initial budget was given by the French State. However the fund is self supplied since 2005 with this described process.

ANFR finances migrations and is paid back at the beginning of every six months by mobile operators.

Each migration project is granted a maximum financing amount from the outset.

What is at stake ?

- **The assessment of the cost of a migration project:** ANFR is in charge of the assessment at the outset. We use our knowledge of previous projects and we debate in an advisory commission on SRF where the beneficiaries of the migration – ie mobile operators most of the time – have their say. This assessment has to be fair (enough money is devoted to migrate networks) and reasonable (so that mobile operators won't feel they pay too much as SRF depends on them).
- **The justification of expenses:** is one of the public finance accounting rules. Thus ANFR checks the invoices – which proves that the expenses really incurred - and monitors the liberation of frequencies on the ground.

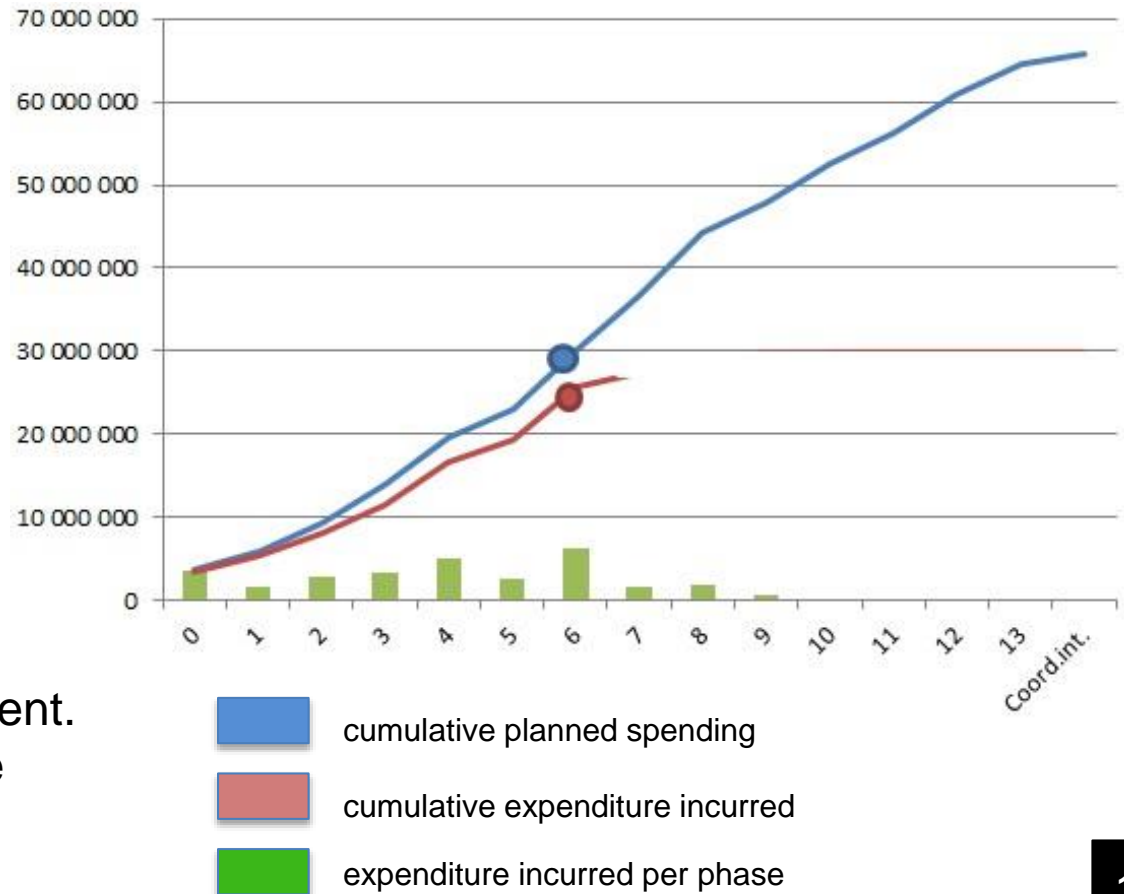
Example for the 700 MHz band

2015 : Six months to set up the legal framework and assess the costs of the migrations (maximum : 67 millions €)

First migrations : 2016 and last 2019

ANFR signs financing conventions with the 4 French broadcasters (TDF, Towercast, Itas Tim, One cast) + some local communities.
The 4 mobile operators pay back ANFR.

The question is to keep under control the amount of money spent.
Trust is essential so that mobile operators keep on paying.



Thanks a lot!

Any question?

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