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RADIO SPECTRUM POLICY GROUP

RSPG Opinion

on

the application of EECC Article 28(3) in relation to cross-border interference problems between Italy and Croatia in the UHF band

1. Introduction

In January 2021 the Radio Spectrum Policy Group (RSPG) received a request from Croatia to initiate the procedure foreseen in Article 28 of the European Electronic Communications Code (EECC), in relation to cross-border interference problems with Italy. This opinion has therefore been drafted in accordance with article 28(3) of the EECC: *“In order to ensure compliance with paragraph 1, any affected Member State may request the RSPG to use its good offices to address any problem or dispute in relation to cross-border coordination or cross-border harmful interference. Where appropriate, the RSPG may issue an opinion proposing a coordinated solution regarding such a problem or dispute”*.

The Croatian request is twofold:

- To resolve the interference from Italian TV stations on the channels (i.e. 21, 22, 23, 27, 28, 29, 33, 34, 35, 39, 41, 43 and 45) for which Croatia enjoys international rights (GE06), taking into account the new Croatian plan used in October 2020 for migrating the TV programmes previously operating in the 700 MHz band.
- To resolve the interference from Italian TV stations operating in the 700 MHz band, which will be authorized for use by mobile operators in Croatia in July 2021.

The respective rights of Croatia and Italy according to the GE06 agreement and the Adriatic agreement is provided in Annex 1.

This opinion proposes coordinated solutions to mitigate these two interference issues.

2. Description of the interference situation

2.1 Interference from Italian TV stations to Croatian channels used for migrating TV programmes previously operating in the 700 MHz band


In past “good offices” discussions, the focus was on solving interference to on-air TV channels of neighbouring countries. In the past years, Italy switched-off uncoordinated TV transmitters located in certain regions and operating on channels also in use in Croatia according to the GE06 plan. This resulted in a significant reduction of the harmful interference although Croatia regularly reported the presence of remaining interference on their coordinated TV channels in operation.

On December 2017, taking due account of the UHF EU Decision¹, the Italian Budget Law 2018 set the roadmap for the release of the 700 MHz band, with minor amendments in the Italian Budget Law 2019. The final deadline for the roadmap was set to 30 June 2022.

Then, in order to comply with the UHF EU Decision¹, in October 2020, Croatia migrated their TV transmissions operating in the 700 MHz band. The new Croatian TV plan includes some GE06 channels (21, 22, 23, 35) in the coordination area (Croatian allotments D5, D7, D8, D9) with significant harmful interference from Italian transmitters.

¹ Decision (EU) 2017/899 of the European Parliament and of the Council of 17 May 2017 on the use of the 470-790 MHz frequency band in the Union

HRV Allotment	D5	D7	D8	D9
Channel	28	21	33	21
	23	22	23	22
	29	35	29	29
	34	45	43	45
	43	27	34	34
	39	41	41	28



In operation - channels used since October 2020 (previously not used)
In operation
Not in use - operation to start from December 2021
#Granted license but currently not in use because of the significant interference from Italy
#HAKOM received interest for 2 additional multiplexes

Table 1: Croatian plan in the coordination area since October 2020

In all Croatian GE06 channels (21, 22, 23, 27, 28, 29, 33, 34, 35, 39, 41, 43 and 45), Italy has no international rights in the coordination area but granted authorizations to regional broadcasters (see channels distribution between Italy and Croatia in the Annex 1). The current Italian roadmap is to switch-off these channels between September and December 2021 in the northern part of the Adriatic region (Area 3) and between April and June 2022 for the southern part (Area 4). In order to mitigate the interference to Croatia, Italy put in place a mechanism to incentivize an early release of these channels, which was applied twice (May 2020 and February-March 2021). The number of applicants was however not sufficient to completely switch-off those channels, though 393 allotments (i.e. 1 channel in one province) were released, 73 of them being in the coordination area with Croatia (see the resulting situation in figure 1). The total number of Italian stations which are still in operation on those channels is 765, including 211 with a power exceeding 1kW (see Figure 2) in the coordination area.

Croatian measurements have confirmed that the number of interfering transmitters has been reduced owing to this procedure. However, interference is still present and, in some cases, high, while the penetration of the terrestrial TV platform in Croatia is more than 50% of the households for the 1st TV set and often used as additional 2nd or 3rd set, thus making good reception essential. The interference level is measured at 10 meters (above ground level) and varies among the channels:

- Harmful interference levels of more than 70 dB μ V/m (notably channels 22 and 35) have been measured by the Croatian administration on channels currently in operation and which were not used before (Table 1 – dark green). The situation is particularly critical for these channels since in most cases the operation in the 700 MHz band was significantly less interfered prior to the migration process.
- Harmful interference levels of more than 70 dB μ V/m are also present on channels 29 and 43, that Croatia intends to operate from December 2021. This is also the case for channel 27 which might be licensed after 1st December 2021. Regarding channel 34, harmful interference reaches levels up to 60 dB μ V/m.

- Some harmful interferences with levels up to 65 dBµV/m, are still significant in channels (28, 34, 39, 41) previously in operation (Table 1 – light green), that were discussed in the RSPG good offices but not completely solved.

The Italian roadmap will ensure that in June 2022, Italy will only authorise the use of TV channels where they have international rights, as defined, in this area, by the Adriatic-Ionian UHF multilateral agreement.

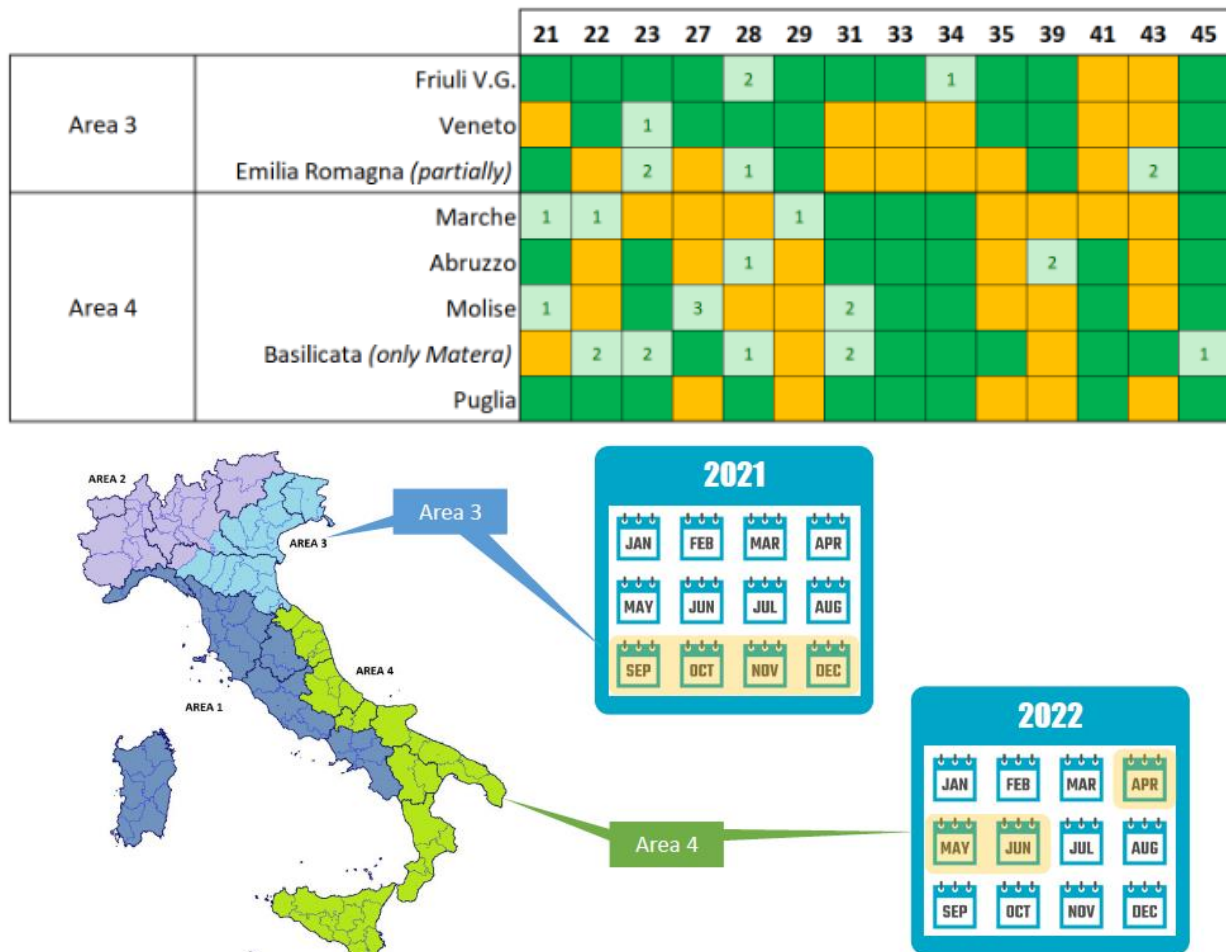


Figure 1: Italian TV broadcasting stations operating on Croatian TV channels (green = 0, light green = up to 3, orange = more than 3)

For Croatia, waiting for the planned switch-off in June 2022 would mean an additional year of interference.

- For interfering transmitters in operation on channels used since October 2020 and previously not used (Table 1 – dark green), Croatia requests to have the situation solved before the summer 2021 due to the risk of exceptional propagation which would worsen the already high level of interference. For Italy, the most critical situation is for channel 35 and, in a lower extent channel 22 (see Table 2). However, some migration should be possible either to some Italian channels or, with the agreement of the Croatian administration:
 - to channel 31, not used by Croatia and lightly used in Italy,
 - to Croatian channel 27 which will not be operational before December 2021, or

- to other Croatian channels where geographical separation is sufficient (e.g. northern Italy for a channel only used in the south of Croatian coast or southern Italy for a channel only used in the north of Croatian coast).

Table 2 provides the number of Italian high power interfering transmitters (>1 kW) with respect to each Croatian channel. This provides only a rough approximation of transmitters of concern. Some of these high power transmitters may have good discrimination towards Croatia. On the other hand, some lower power transmitters may also interfere Croatia. Italy is carrying out a more detailed analysis to prioritize the transmitters to be migrated, taking into account the results of measurements carried out by Croatia. Figure 2 provides information on the RF power distribution of the remaining Italian transmitters using Croatian channels in the range 21-45, as provided by Italy.

- b) For other channels in operation (Table 1 – light green) or to be in operation from December 2021 (Table 1 – dark blue), Croatia requests to have the interference ceased by December 2021. The most critical situation (see Table 2) concerns channels 29 (D8/D9) and 43 (D8), which will be in operation from December 2021. Channel 34 in D5 is potentially affected by transmitters located in Northern Italy (Area 3) that will be switched off in December 2021.

CH Allotment	21	22	23	27	28	29	33	34	35	39	41	43	45
D5			2 (N) + 1 (CS)		3 (CS)	4 (CS)		11 (N)		0		12 (N) + 11 (CS)	
D7	0	7 (N) + 6 (CS)		4 (N) + 14 (CS)					13 (N) + 15 (CS)		6 (N) + 1 (CS)		0
D8			1 (CS)			13 (CS)	0	0			1 (CS)	22 (CS)	
D9	0	6 (CS)			4 (CS)	13 (CS)		0					0

significant:
max E.R.P.
≥ 1 kW

Table 2: High-power Italian transmitters using Croatian channels in the coordination area (N = area3, CS = area4)

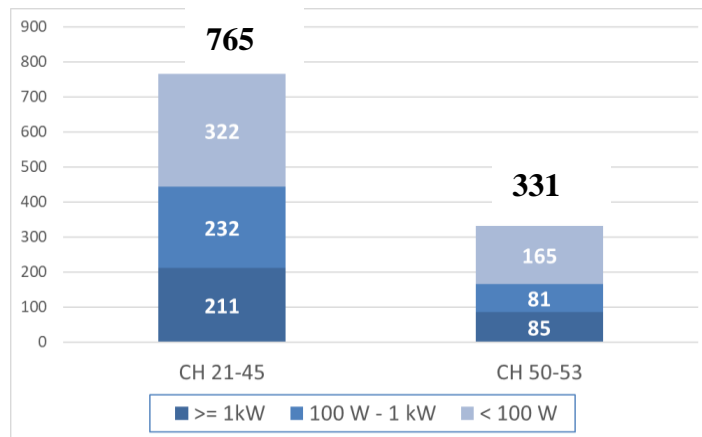


Figure 2: Effective radiated power distribution over Italian stations

2.2 Interference from Italian TV stations in the 700 MHz band

The Adriatic-Ionian UHF multilateral agreement does not address transitional issues² and establishes the need to agree on distinct arrangements addressing these issues, which was not done in the case of Italy and Croatia.

The Italian roadmap for migrating broadcasting below 694 MHz was targeting a complete migration in June 2022 on the Adriatic-Ionian side. However, noting that interference from broadcasting to mobile has much more impact in the base station receiving band, i.e. in the channels 50 to 53, Italy has prioritized in their roadmap the migration of these channels with an earlier date, i.e. between September and December 2021. The detailed continued use of channel 50-53 until this date is given in Figure 3.

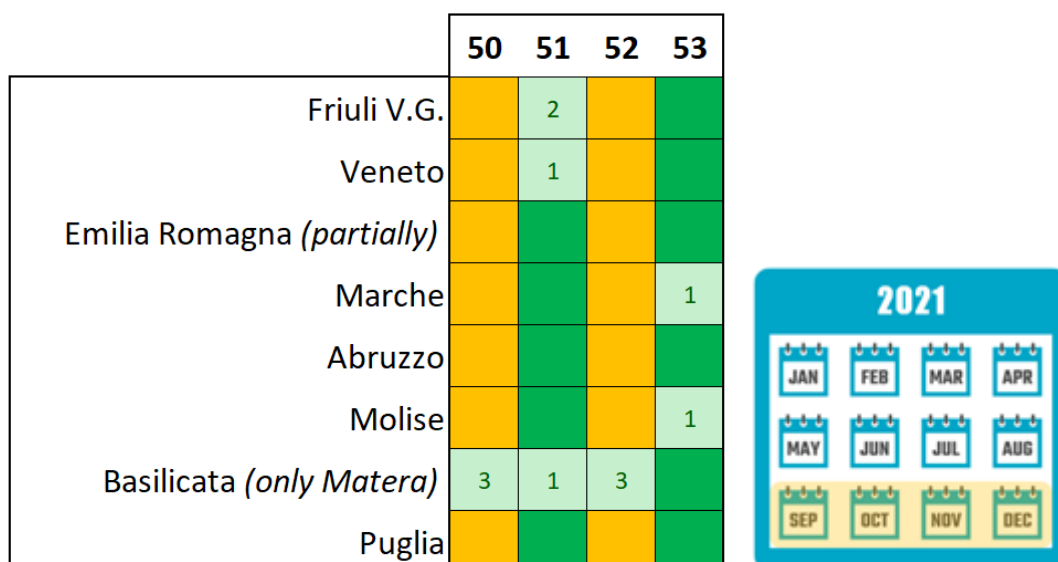


Figure 3: Italian TV broadcasting stations in channels 50-53 (green = 0, light green = up to 3, orange = more than 3).

² Article 12 : “Future use of the 694-790 MHz frequency band and corresponding transitional issues are not part of this agreement and should be addressed by the separate mutually agreed arrangement”

The authorization to the Croatian mobile operators will be granted in July 2021 and this would result in a potential harmful interference situation for a period ranging from 2 to 6 months. Therefore, Croatia requested that Italy ceases transmissions on the channels 50-53 by July 2021.

The channels 50 and 52 are Italian GE06 rights while channels 51 and 53 are Croatian GE06 rights.

The most critical situation is in channels 50 and 52, heavily used by national broadcasters. Italy emphasized the challenges of anticipating the release of the 700 MHz band, due to the change of technology (DVB-T2/MPEG4 and in some cases DVB-T2/HEVC) which has some potential impacts on TV viewers.

On the other hand, channel 53 is already almost interference-free.

Channel 51 is a specific case: this is a San Marino GE06 right. San Marino is not part of the European Union and therefore does not have to comply with the UHF EU Decision¹. The issue of interference in Croatia due to the transmitter located in San Marino's territory has to be discussed in bilateral negotiations between Croatia and San Marino. However, an agreement between Italy and San Marino provides a coverage extension to San Marino with transmitters located on the Italian territory, therefore under the responsibility of the Italian administration, and not coordinated with Croatia under GE06 procedures. In this regard Croatia requested that Italy ceases transmission on channel 51 from its territory by July 2021. The Italy – San Marino agreement states that such transmitters should operate under the envelope of the main San Marino transmitter, i.e. not creating more interference to third-countries. It is yet unclear whether some of these secondary transmitters are the sources of higher harmful interference levels than the primary San Marino transmitter, to any part of Croatia on this channel. Bilateral negotiations are underway between Italy and San Marino, led on the Italian side by the Ministry of Foreign Affairs. The agreement to be defined will concern, among other things, the issue of television broadcasting. The proposal currently under discussion is that San Marino will switch-off not only transmissions on Italian territory but also those on its own territory. This will result in the complete release of channel 51 on the western side of the Adriatic region by the end of 2021.

Concerning channels 50 and 52 in Italy, these are currently used by national operators who have expressed concerns about anticipating the migration to DVB-T2, which implies moving to a channel below 700 MHz. In order to anticipate the release of these channels ahead of the deadline (set by Italian law in December 2021), Italy will consider the temporary migration of some stations to channels 54, 55, 56, 58 and 60 (other GE06 rights of Italy), as far as possible according to their current occupancy status. If necessary, Croatian channels 57 and 59 could also be used for the same purpose, subject to Croatia's agreement.

It is recognized that temporary interference in the 700 MHz terminal receiving band should not be considered as problematic. Terminals are less sensitive to interference, they have lower antenna gain, and lower antenna height, i.e. with surrounding clutter. There may be cases where transmitters close to the border could affect the good terminal reception in certain areas, but these cases should be identified and treated individually, based on the transmitter data provided by Italy.

3. Proposed coordinated solution

The coordinated solution is defined in sections 3.1 and 3.2. Italy and Croatia should report on its implementation at each Good Offices meeting until June 2022.

3.1 Coordinated solution for Interference from Italian TV stations to Croatian TV channels

- Italy should switch-off all transmitters interfering to Croatia in channels 21, 22, 23 and 35 (see Table 2 – dark green), before 1st July 2021.
- Italy should continue to identify remaining interfering transmitters in other channels currently licensed by Croatia in order to switch them off (see Table 2 – light green and dark blue), by 1st December 2021.
- Italy should cease all uncoordinated operation of Italian TV transmitters in the 470 – 694 MHz band, and continue operation in accordance to the UHF Adriatic Agreement, by June 2022 at the latest.

3.2 Coordinated solution for interference from Italian TV stations in the 700 MHz band

It is noted that in accordance with the UHF EU Decision¹, Italy shall cease operation of all TV transmitters in the 700 MHz band by June 2022 at the latest. In addition, in order to alleviate interference to Croatia until that time:

- Italy should switch-off all transmitters of the coordination area in channels 50, 51 (including those transmitting San Marino programme), 52 and 53, before 15th August 2021.
- Italy should negotiate with San Marino with the objective of switching-off channel 51 in San Marino and report to the Good Offices the status of the negotiation in September 2021.
- Italy and Croatia should consider individually the case of TV transmitters which may create strong interference to channels 57-60 (i.e. terminal receiving band), by December 2021.

ANNEX 1

Italian/Croatian rights according to the GE06 agreement and the UHF Adriatic agreement

Note: channel 46, Croatian GE06 right, was converted into an Italian right in the Adriatic agreement in order to keep the balance, noting that Italy lost more channels in the 700 MHz band

GE06 Croatia	GE06 Italy
21	24
22	25
23	26
27	30
28	32
29	36
31	37
33	38
34	40
35	42
39	44
41	47
43	48
45	49
46	50
51	52
53	54
57	55
59	56
61	58
64	60
66	62
67	63
68	65
	69

No	Adriatic Agreement Croatia and eastern part of Adriatic	Adriatic Agreement Italy
1.	21	24
2.	22	25
3.	23	26
4.	27	30
5.	28	32
6.	29	36
7.	31	37
8.	33	38
9.	34	40
10.	35	42
11.	39	44
12.	41	46
13.	43	47
14.	45	48

ANNEX 2
Statement from Italy

While acknowledging Croatia's right to request the application of Article 28, as well as the procedure followed in drafting the present Opinion, Italy cannot make a commitment to respect the deadlines set in the par. 3 "Proposed coordinated solution". This is due, inter alia, to the legal framework of the individual authorisations granted to broadcast operators that give them sufficient rights to resist to any authoritative changes requested by the Administration.

However, Italy guarantees to make all possible efforts to achieve the indicated objectives, as well as to mitigate all residual interference situations in the period until the completion of the Italian release roadmap, according to the priorities indicated in the same par. 3.