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Τομέα Τεχνολογιών Πληροφορικής και Επικοινωνιών

ΠΑΡΟΧΗ ΥΠΗΡΕΣΙΩΝ ΣΥΜΒΟΥΛΟΥ ΑΞΙΟΛΟΓΗΣΗΣ ΣΤΟ ΠΛΑΙΣΙΟ ΤΟΥ ΕΡΓΟΥ: «SUPERFAST BROADBAND»

ΣΧΕΔΙΟ ΠΑΡΑΔΟΤΕΟΥ Π3$_{2019}$ (english version)**:**

ΣΥΝΤΟΜΗ ΕΤΗΣΙΑ ΕΚΘΕΣΗ ΕΝΗΜΕΡΩΣΗΣ 2019

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Ανάδοχος

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1. Brief Description of the SFBB Voucher Scheme

Basic Objectives, identification elements

The SFBB voucher is a typical demand stimulation measure, in the form of a voucher scheme, the aim of which is to maximize the take-up of NGA-based services by citizens on a nation-wide basis, with the overarching aim behind the measure being the desire of the Hellenic Republic to bridge the existing digital divide in Greece. The beneficiaries of the measure are individuals (including the self-employed) and undertakings, who are willing to receive a new retail SFBB_Service (or to upgrade an existing service to a SFBB_Service) offered by Telecommunications Service Providers over any existing NGA infrastructure. Participation in this Project is available to every Telecommunications Service Provider which is licensed or authorized by the Greek NRA (EETT) for the provision of electronic communications services under category B0104 (Broadband Access/Internet Access), on equal terms.

The term "SFBB_Service" refers to any retail telecommunications service Offer which is made commercially available by any Telecommunications Service Provider, whether on a stand-alone or a bundled service offering basis (i.e., single play, 2-play, 3-play, 4-play, etc.), and which satisfies the following criteria:

- The availability of the necessary terminal equipment (i.e., the modem/router).
- Access to the Internet, with real downlink speed of at least 100Mbps.
- The wholesale service is available as a Virtual Local Unbundling (VLU) with technical specifications and minimum features that comply with the Greek NRA (EETT) Decision 808/002/27-4-2017 (and any future relevant EETT Decisions), with a real downlink speed of at least 100Mbps, readily upgradable to 1Gbps.

The measure is being implemented through a technologically neutral SFBB voucher, which is issued to each individual beneficiary for the sole purpose of redeeming it for the acquisition of an SFBB_Service available from the published and approved list of Offers by the Telecommunications Service Providers that are certified in the IT System for the Project. Each individual beneficiary is entitled to a single voucher. The total economic value (inclusive of VAT) of an SFBB voucher is designed to cover:

- high speed Internet connection costs amounting to EUR 13 per month for a maximum of 24 months; and
- a one-off connection cost amounting to EUR 48.

Approval, activation of the measure, extension

The legal basis of the SFBB measure is Joint Ministerial Decision no. 39734/207 "Super Fast Broadband Voucher Project" (Government Gazette B' 1907/29.05.2018), as amended by Ministerial Decision no. 50/23.01.2019 "Prolongation of the Final Activation Date for the SFBB_Vouchers" (Diavgeia AΔA: ΩM0K46MΠΥΓ-BOO) that extended the activation date of SFBB_Vouchers by one year until March 31ˢᵗ 2020.

Also, the project implementation guide of the SFBB measure was adopted with Ministerial Decision no. 151.137/337-Γ/04.06.2018 "Participation Guide for the SFBB Voucher Project" (Diavgeia ΑΔΑ: 6ΑΡ646ΜΠΥΓ-ΓΡ3).

The SFBB measure was approved by DG Competition with DG COMP state aid Decision C (2018) 8363/07.01.2019 (SA.49935/2018). Due to the standstill clause included in the above state aid Decision, the SFBB measure practically commenced after January 7th, 2019.

2. SFBB Implementation Progress

SFBB IT system

The Super Fast Broadband IT System aims to support the measure with the following actions:

- Every beneficiary/citizen checks whether a SFBB service is available at their address. In case of availability the beneficiaries are registered through their TAXISNET credentials and obtain the SFBB voucher.
- The Telecommunication Providers (Suppliers) publicize the approved SFBB offers and they serve the orders based on the issued vouchers. In a next step they enter all necessary information concerning the related orders.
- Orderings can also be served by franchisees and/or commercial providers provided that the Telecommunication Providers have certified them as authorized representatives.
- A committee, defined by the Joint Ministerial Decision and the SFBB measure participation guide, is responsible to certify the Telecommunication Providers, approve the SFBB offers and is reviewing/monitoring the reports, statistics and generally all the parameters of the measure.
- Similarly to the above, another dedicated committee, defined by the Joint Ministerial Decision and the SFBB measure participation guide, checks all necessary payments related documents and approves final payments.
- A dedicated help desk addresses all issues related to beneficiaries' questions in a timely manner.

The Super Fast Broadband IT System services are being described briefly in the following paragraphs.

Citizens and Beneficiaries

- Initially every potential beneficiary enters the address of interest (postal code, address, number) and checks if there are available offerings in the IT System. The IT System provides all actual offers and their network providers.
- After that, the beneficiary is registered at the IT System through TAXISNET credentials in order to acquire an SFBB voucher related to the address of interest. An SFBB voucher can be issued only for an address where SFBB services are available by network providers.
- The actual voucher can be printed or received via email.

- The registration process, through TAXISNET credentials, involves checking of whether they are undertakings or not. In that case the beneficiaries of that specific type are informed that the voucher applies only under the constraints of the "de minimis" regulation. At the same time the system checks if the stakeholders violate the requirements of the regulation (EK) 1407/2013, article 1, and in that case, they are informed that they are not eligible for a voucher.
- The beneficiaries can also be informed on:
  - The points of sale where the offers are available using the issued vouchers.
  - Their order details.
  - FAQs or help desk support.

Telecommunication Providers

- Every Telco provider has to be registered in the IT System and has to fill and submit an application form in order to participate in the list of approved Providers.
- They also submit:
  - their SFBB services offers for approval.
  - the areas where they provide the SFBB services.
  - the available points of sale and the IT System user accounts that are authorized to carry out the orders.
- They approve their franchisees and their other authorized representative point of sales.
- They are also able to submit all necessary documentation related to the orders.
- They communicate their questions to the help desk via mobile platform.

Authorized Representative Enterprises

- They are registered at the IT System and declare the Telecommunication Providers they cooperate with.
- In case they are a franchisor of a specific network, they approve their franchisees.
- They define the responsible points of sales and the user accounts that can actually carry out the orders of the beneficiaries.
- They carry out the orders of the beneficiaries based on the submitted vouchers.
- They communicate their questions to the help desk via mobile platform.

Management entity of the SFBB measure

- Approves the participation of Telecommunication Providers at the related list.
- Approves the SFBB offers that are submitted by the Telecommunication Providers.
- Monitors the reports, statistics and generally all the parameters of the action (beneficiaries, Telecommunication Providers, offers, invoicing, payments etc).
- Checks the payment procedures based on the submitted supporting documentation, defined by the national regulations and laws.
- Monitors the progress of the measure.

SFBB HELPDESK

The granting authority together with EDET SA (acting as the technical partner of the measure) has set up a Helpdesk dedicated to the SFBB measure, that:

- Answers the questions that have been submitted via the mobile platform by all the stakeholders (beneficiaries, Telecommunication Providers, franchisees).
- Records all the communications and associated responses.

To this date, 11.080 questions have been answered by the SFBB Helpdesk, of which 10.756 came from citizens and 324 came from the Telecommunication Service Providers.

SFBB Registered Telecommunications Service Providers and Available Offers

To this date, the granting authority has approved the registration of 7 Telecommunication Service Providers to the Participating TSPs List in the SFBB IT System, namely Cosmote, Vodafone, Wind, Optiland, Medianet Invest (INALAN), Forthnet, HCN (Hellenic Cable Networks) and Citiwave Systems, with Ministerial Decisions no. 401/25.6.2018, 430/3.7.2018, 609/17.9.2018, 567/3.7.2019 and 131/31.1.2020.

In the SFBB IT System, the above eight (8) Telecommunication Service Providers are registered in the Participating TSPs List, whereas 294 different users (franchisors, franchisees, other) are registered either as TSPs (201 users) or as commercial business firms (93 users). The allocation of the registered users per Region is shown in the next Table:

REGION	Number of Registered Users
EASTERN MACEDONIA & THRACE	2
ATTICA	170
NORTH AEGEAN	1
WESTERN GREECE	19
EPIRUS	2
THESSALY	9
IONIAN ISLANDS	1
CENTRAL MACEDONIA	30
CRETE	5
SOUTH AEGEAN	4
PELOPONNESE	20
CONTINENTAL GREECE	3
Other	28
SUM	**294**

To this date, the granting authority has approved 37 offers of SFBB_Services by 3 Telecommunication Service Providers, namely Cosmote, Vodafone and Wind, with Ministerial Decisions no. 431/3.7.2018, 502/26.7.2018, 538/2.8.2018, 3/3.1.2019, 636/31.7.2019 and 722/24.9.2019.

In the SFBB IT System, the TSPs' approved Offers for SFBB_Services are currently 46 (due to a few replacements of old offers with new, accordingly with the legal basis and the

implementation guide of the measure). The allocation of the SFBB_Offers per Telecommunication Service Provider (TSP) is shown in the next Table:

TSPs	Number of SFBB_Offers
VODAFONE	14
COSMOTE	12
OPTILAND	2
HCN	3
INALAN	1
WIND	14
SUM	**46**

SFBB network construction progress

Initially, the SFBB measure targeted approximately 133.405 subscriber lines (i.e. number of households and businesses), corresponding to 2.81% of the total subscriber lines in Greece (4.749.693), in accordance with the anticipated forecast set forth in the private investment plans submitted during public consultation (declared coverage until end 2018). These target lines are allocated in the Prefectures of Attica (106.080), Thessaloniki (15.481), Larissa (10.970) and Messinia (874). Also, the target buildings in these initially declared coverage areas amount to 38.900 discrete buildings / address points.

The declared coverage of the SFBB measure is regularly and continuously being updated in the SFBB IT system. By December 19th 2019, the total number of discrete buildings / address points that are declared as target buildings in the SFBB IT system is 93.360 (which corresponds to 320.131 target subscriber lines) and is geographically distributed by municipality as shown in the following Table. To this date, private operators have implemented actual coverage (homes passed) of 43.737 buildings (which corresponds to 149.974 target subscriber lines), i.e. 46,8% of the target (declared) coverage.

MUNICIPALITY	Declared Buildings	Homes Passed Buildings
AGIOY GEORGIOY	505	0
AGIOY DIMITRIOY	782	0
AGIOU IOANNH RENTH	535	0
AGIAS PARASKEYIS	671	0
AGRINIOU	1126	0
ATHINAS	11.404	5.926
AMAROUSIOU	1.261	986
ANABYSSOU	86	0
VYRONAS	6.603	6.555

MUNICIPALITY	Declared Buildings	Homes Passed Buildings
GALATSIOU	733	733
DAFNIS	2.801	0
DIONYSOU	1.461	0
DRAPETSONAS	1.290	0
ELEUTHERIO KORDELIO	286	286
EPANOMHS	542	0
EUKARPIAS	1.883	1.391
EXEDOROU	2.255	0
ZOODOXOU PHGHS	1	1
HLIOUPOLHS	1.239	1.152
HRAKLEIOU	1.437	0
THESSALONIKIS	5.242	4.948
IALYSOU	28	0
IERAPETRAS	1.708	0
ILIOY	397	0
KABALAS	1.961	0
KESARIANI	466	464
KALAMARIAS	2.615	2.615
KALAMATAS	159	159
KALLITHEA	15	15
KARDITSA	2.074	1.081
KATERINH	1.168	0
KERATSINIOU	737	0
KHFISIAS	980	958
KILKIS	494	494
LAMIEON	1.393	0
LARISAION	358	358
MELISSIWN	555	0
METAMORFOSHS	772	0

MUNICIPALITY	Declared Buildings	Homes Passed Buildings
NEA ERYTHRAIA	124	120
NEA IONIA	2.157	0
NEA SMYRNH	786	514
NEA FILADELFEIA	1.481	0
NEA HALKIDONA	777	0
NEO PSYXIKO	91	90
PALAIAS FOKAIAS	41	0
PALAIO FALIRO	616	616
PANORAMATOS	795	765
PAPAGOU	47	47
PATRAS	1.974	0
PIRAEUS	8.309	6.555
PETALOUDWN	16	0
PETROUPOLHS	1.854	0
RAFINAS	498	0
RETHYMNOU	1.030	806
RIOU	510	0
RODOPOLEOS	146	0
RODOU	780	0
SERRES	334	334
SPARTIATWN	1.392	1.121
TAVROS	413	413
YMITTOU	368	0
XAIDARIOU	461	0
HALANDRIOU	669	641
HALKIDEON	2.153	0
HANIWN	4.461	655
PSYXIKOU	366	366
WRAIOKASTROU	1.903	1.787

MUNICIPALITY	Declared Buildings	Homes Passed Buildings
CHOLARGOU	785	785
Grand Total	**93.360**	**43.737**

SFBB Beneficiaries (registered, issued vouchers, active vouchers, self-employed, SFBB contracts i.e by city)

To this date, 9.717 beneficiaries are registered in the SFBB IT System, i.e. 3.04 % of the target (declared) subscriber lines or 6.48 % of the target (actual homes passed) lines. Of these, 2.236 are self-employed and 148 are of the agricultural sector. Of those registered beneficiaries, 9.353 have issued a voucher and, of those, 8.976 have active vouchers i.e. Telecommunication Service Providers have published valid SFBB_Offers. The total number of implemented connections (orders) that already receive SFBB_Service amounts to 3.714 subscriber lines, i.e. 1.16% of the target (declared) subscriber lines or 2.48 % of the target (actual homes passed) lines. Currently, the maximum subsidy value is 1.337.040.00 €, i.e. 2.67% approximately of the approved budget (50 mln. €) of the SFBB voucher scheme.

You can see below the statistics of beneficiaries (registered, issued a voucher, active voucher) by December 19th, 2019 of the SFBB measure:

Number of beneficiaries per month - year
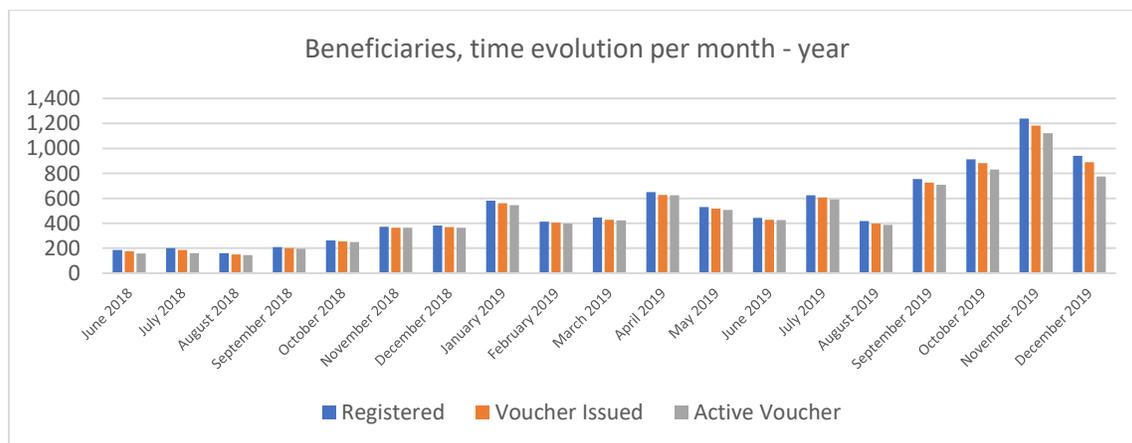
Number of beneficiaries per prefecture
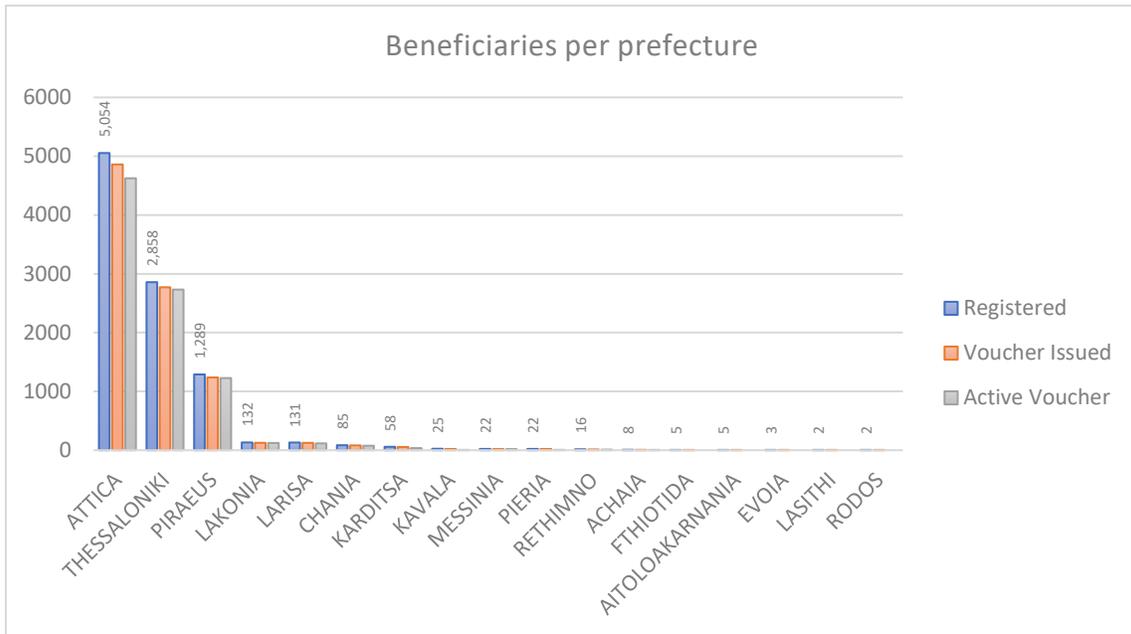
Number of beneficiaries per municipality

NUMBER OF BENEFICIARIS PER MUNICIPALITY
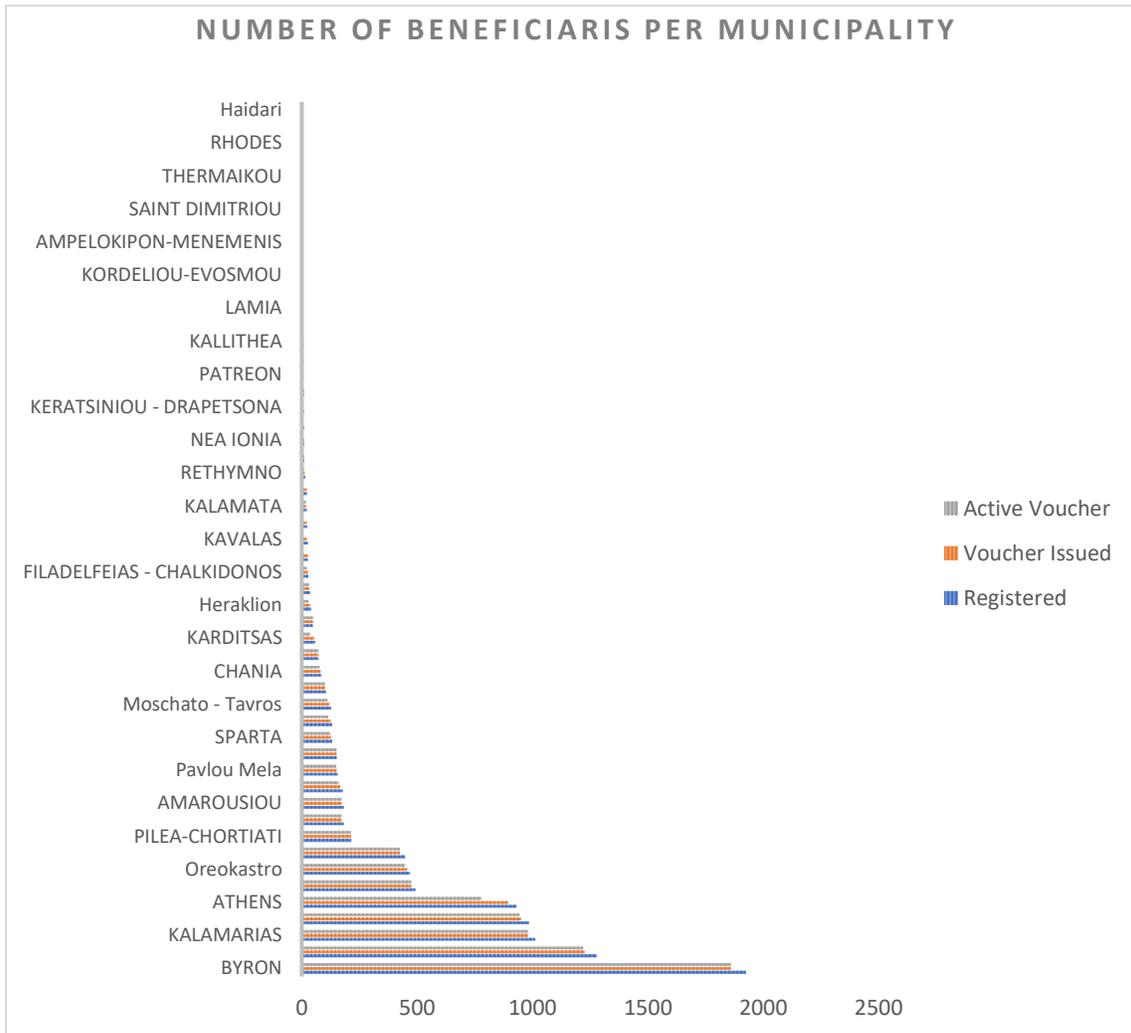
Number of beneficiaries of type "undertakings" (self-employed)

Vouchers of undertakings (self- employed)

Region	Value
RHODES	0
LASSITHIOU	1
EVIAS	0
AETOLOAKARNANIAS	1
FTHIOTIDAS	2
ACHAIAS	1
Rethymnon	8
PIERIAS	7
MESSINIAS	4
KAVALAS	10
KARDITSAS	29
CHANIA	47
LARISSA	46
LAKONIAS	71
PIRAEUS	230
THESSALONIKI	799
ATTICA	980
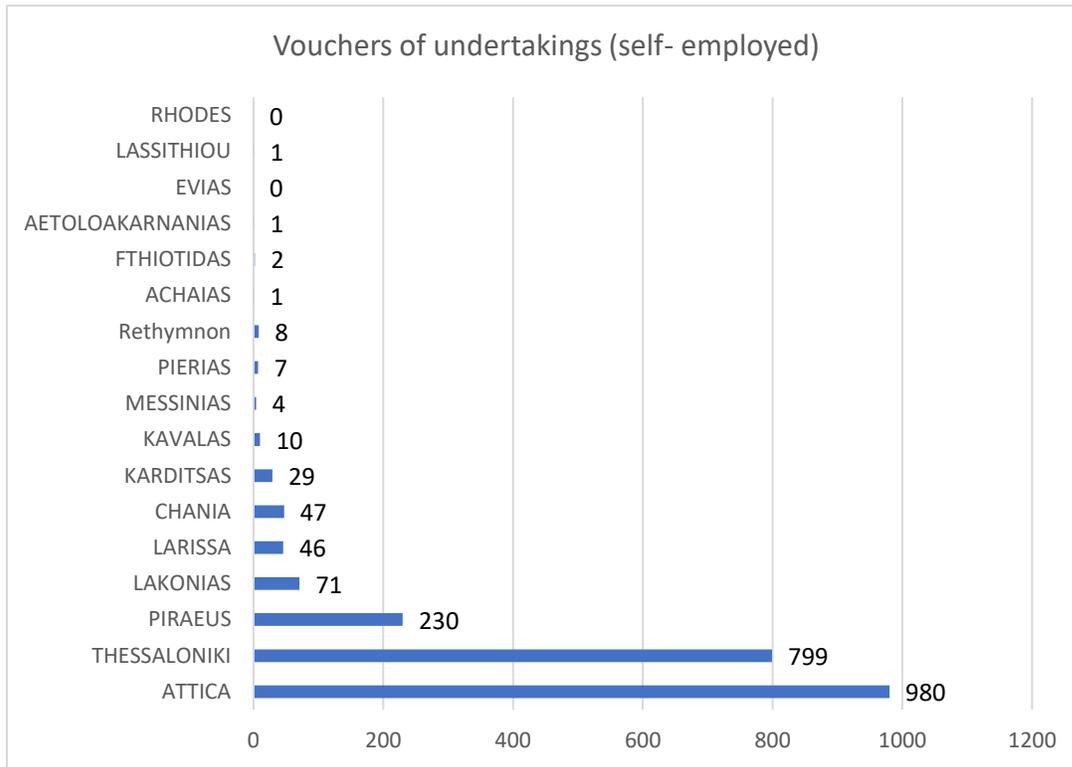
Prices of SFBB_Services

Lag of NGA take-up is due to a late start of NGA services in Greece, but mainly to the level of premium that consumers have to pay for high speed services (how much more expensive is a high speed broadband connection with regards to a basic one).

Figure 16 - Speed premiums from 12-30 to 30-100 Mbps by country
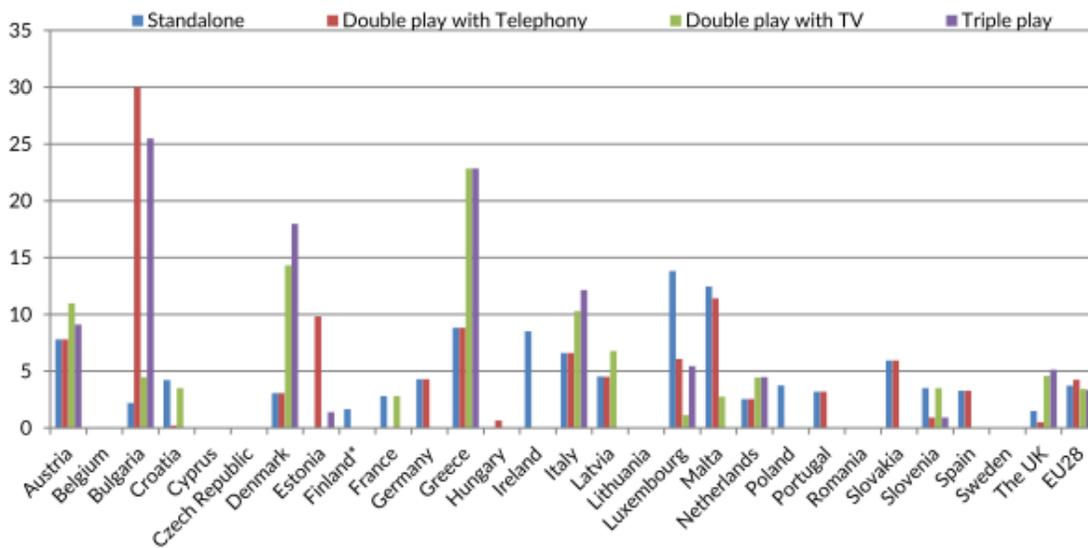
In Greece, consumers pay between 8,8€ and 22,9€ extra for a 30-100 Mbps broadband offer compared to a 12-30 Mbps offer depending on the bundle type. This is five times more than on EU average, where consumers pay about 3,4 to 4,3 EUR extra for the same upgrade.

Thus, Greek citizens hesitate to upgrade their Internet connection. One of the reasons is the price. Since the take up of services >50Mbps is low, TSPs have no incentives for investments on Very High Capacity (VHC) infrastructures and the prices remain high.

By covering the major part of the overhead that customer has to pay in order to migrate to VHC connection, the SFBB voucher scheme provides incentives to foster the demand for enhanced internet services, aiming to bridge the digital divide and ameliorate the country's digital profile (broadband penetration / services).

During the design of the SFBB measure, in order to define the value of the SFBB_voucher, the following three-stage approach has been used:

(1) Wholesale Floor Price

In mid-2017, when the measure was initially proposed, there was no offering of comparable retail services in the market (*i.e.*, 100 or 200 Mbps). Therefore, there was no means by which to quantify the price premium that end-users have to pay in order to migrate to higher speed services. As a proxy for this price premium, we relied upon the regulated wholesale price of the 100 Mbps service (to serve as a base price, thereby avoiding any inadvertent margin squeeze situation). The NRA announced[1] the wholesale prices for the FTTH/VLU service and, based on these prices, the calculation of the voucher value was performed as follows:

Calculation of the SFBB_voucher value (based on 100/10 Mbps)

Connection cost	57.01 €
Monthly cost Floor Box	20.40 €
Monthly cost BEP	15.08 €
Months	24
Subsidy %	60%
Voucher Floor Box	327.97 €
Voucher BEP	251.36 €
Share of Floor Box	50%
Share of BEP	50%
weighted average voucher value	289.66 €
VAT	24%
Final voucher value	**359.18 €**

(2) NGA Benchmark Prices

By the end of 2017, retail services of 100 and 200 Mbps were launched by TSPs (based on FTTC vectoring technology). It was therefore possible at this stage to quantify the price premium for a transition from basic BB to higher speed BB services. This assessment suggests that the

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[1] https://www.eett.gr/opencms/opencms/admin/News_new/news_0738.html

amount of the voucher is lower than the price premium and, as such, validates the initial voucher value calculation. As is evidenced from **Annex III.5.2**, the weighted incremental cost (premium) the Greek subscribers will have to pay in order to migrate from basic broadband services to 100-200 Mbps FTTC services (assuming a modest 20% will go to 200Mbps) is EUR 424 approximately over the period of two years.[2] Therefore, the total economic value of an SFBB voucher under the notified measure (EUR 360) is lower than the premium but is expected to allow the vast majority of covered by the voucher scheme lines to migrate to SFBB_services.

(3) SFBB Benchmark Prices

Based on the accepted SFBB_Offers, we were able to confirm the robustness of the price estimates contained in Points 1 and 2 above. Based on those prices, the following table summarizes (as of 19/12/2019) the cost premium that end-users would be required to pay (prior to the SFBB voucher). It should be noted that prices are for comparable services (*i.e.*, not plain Internet access but bundled services). The reason for this is that high speed services are not offered in plain Internet access options, but only in bundled offerings. Accordingly, in order to compare the price difference, we need to use the equivalent bundled 24 Mbps service.

Given that the SFBB voucher value is EUR 360, it is evident that users will be requested to cover by themselves a significant part of the premium to migrate to higher speed services.

2-years cost for BB services (setup cost + 24 x monthly cost)						
	basic BB (up to 24 Mbps)	100 Mbps (FTTH) prior to voucher	Δ	basic BB (up to 24 Mbps)	200 Mbps (FTTH) prior to voucher	Δ
Cosmote	754	1.200	446	754	1.440	686
Wind	598	1.176	578	598	1.488	890
Vodafone	648	1.214	566	648	1.550	902
average	666	1.197	**530** (653 in June 2019)	666	1.493	**826** (949 in June 2019)

In other words, the voucher scheme covers a significantly lower amount than the price premium required for the transition from basic Internet access services to SFBB_services.

It is worth noting that (from the currently 37 offers available) Telecommunication Service Providers have reduced the relevant prices of their approved SFBB_Offers, to make them more attractive (the Δ for the average 100 Mbps (FTTH) service compared to the basic BB service has been reduced during the last 6 months from 653 € to 530 €, whereas the Δ for the average 200 Mbps (FTTH) service has been reduced from 949 € to 826 €).

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[2] More specifically, given that a percentage of subscribers is expected to migrate to higher than 100 Mbps services (assuming a modest 20% will go to 200 Mbps), the weighted price is EUR 425 for two years.

During the evaluation of the SFBB measure, it is foreseen to monitor the evolution of prices, i.e. whether providers will choose to set prices even at a lower level, for their customers to maintain their connections after the two years subsidy.

The Ministry (General Secretariat of Telecommunication and Post) carried out a series of meetings with all market players in order to assure a better operational coordination of the measure, by responding to issues that rise during the SFBB project lifecycle. In this framework the following improvement interventions are being examined:

- possibility of providers to issue the SFBB vouchers on behalf of the beneficiaries, after checking eligibility issues (including de-minimis for the undertakings), which will improve the overall experience for the consumers,
- facilitating the permits issued by the Local Authorities (municipalities) for rights of way during the FTTH networks deployment, by setting up a working group with the participation of the Ministry, the municipalities, the providers and the NRA (EETT),
- capability to issue SFBB vouchers in areas without fully defined addresses (using geo-position instead of physical address), and
- possibility of not abolishing the aid in the event of a barrier due to debt, since most of the consumers finally pay their debt.

1.1. Presentation of Analytical SFBB Progress Data

You can see below the statistics of orders (implemented connections) by December 19ᵗʰ, 2019 of the SFBB measure:

Number of orders by day, time series
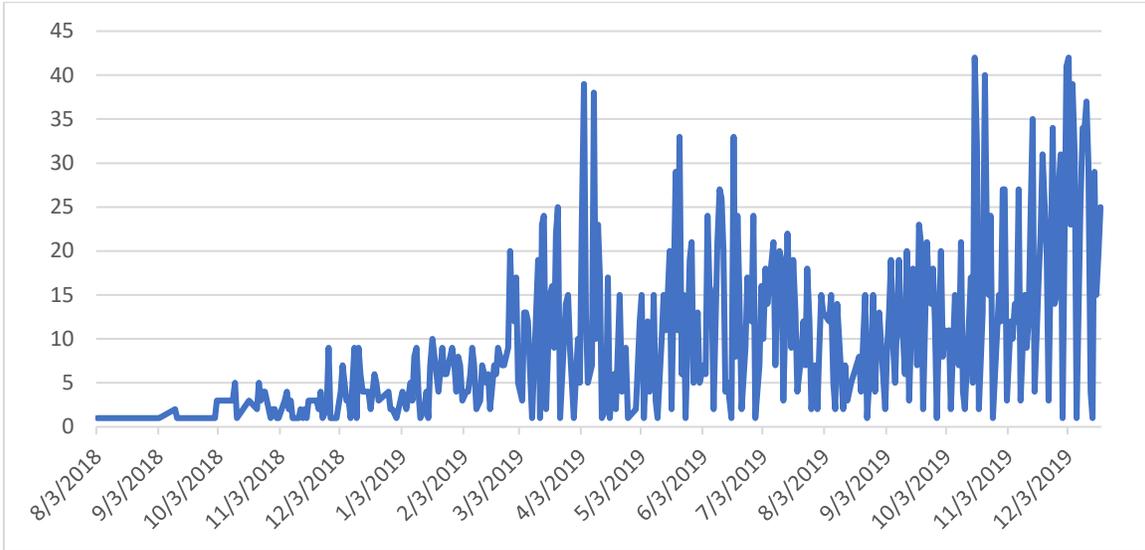

Number of orders by day, cumulative sum, time series
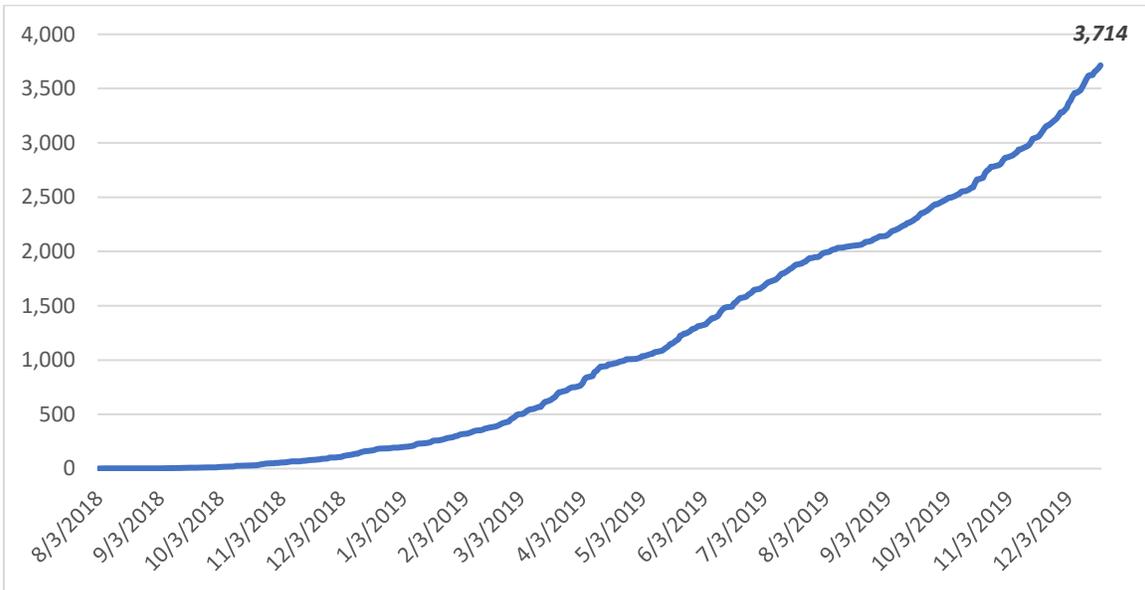
Total number of orders (aggregated data), time series (month - year)
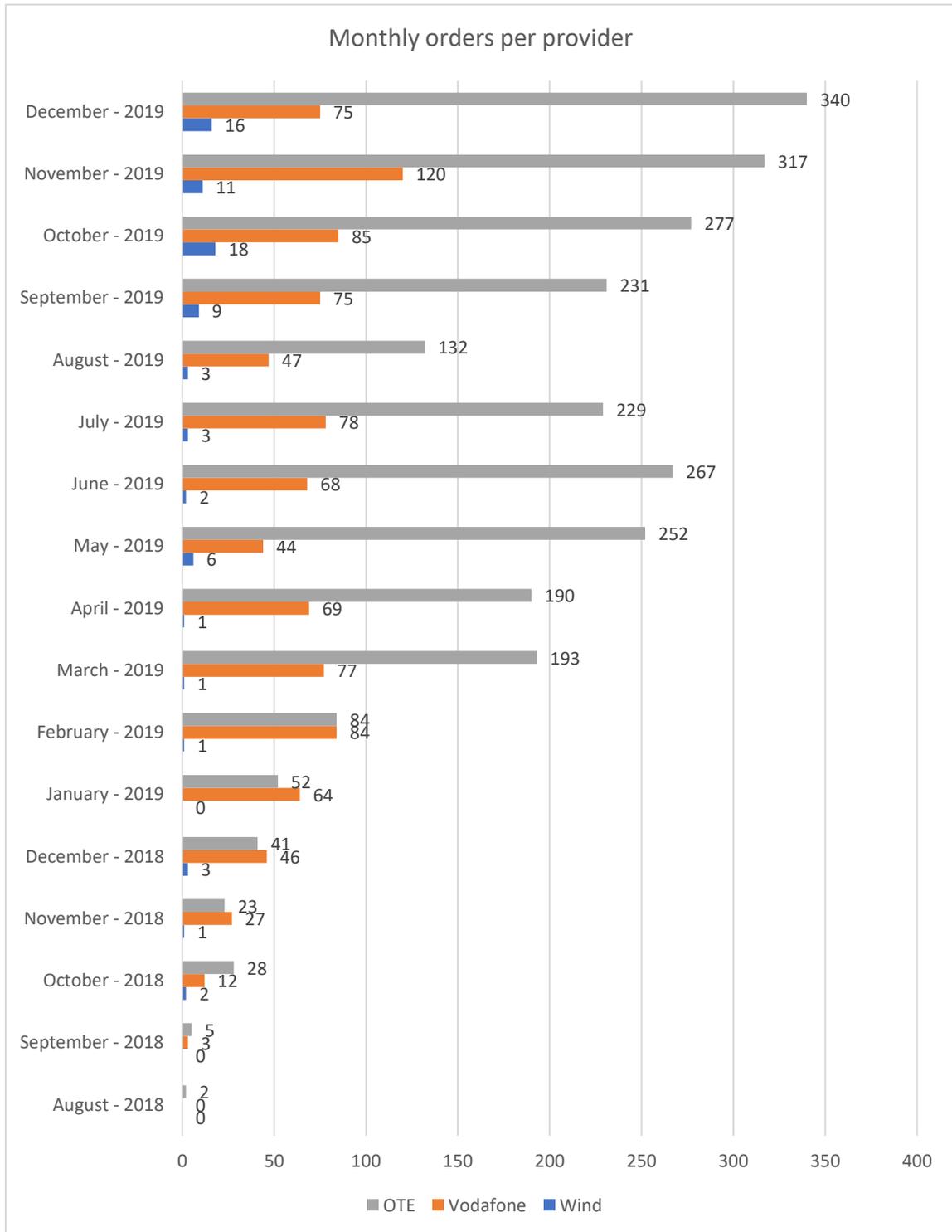
In the above graphs it is shown that, progress in the orders (implemented connections) was practically zero before the date of the state aid decision (January 7th, 2019), but there is a significantly increased potential over the past two months.

Number of orders by day by provider
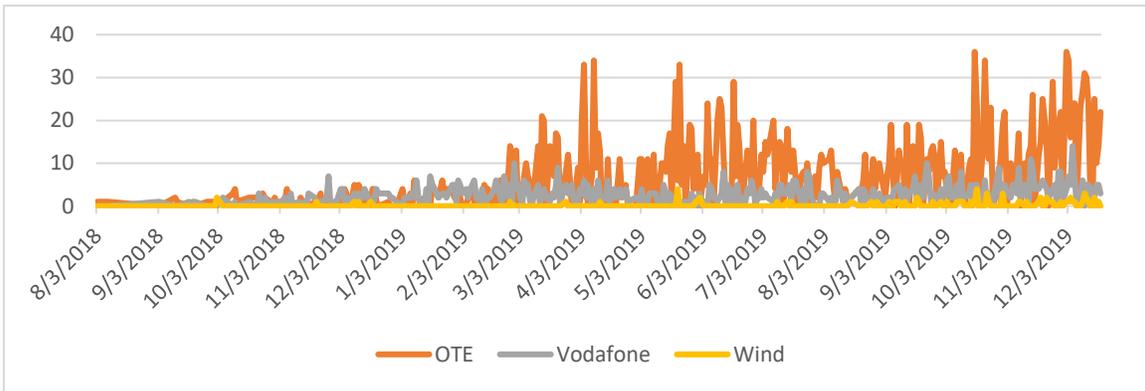
Cumulative sum by provider
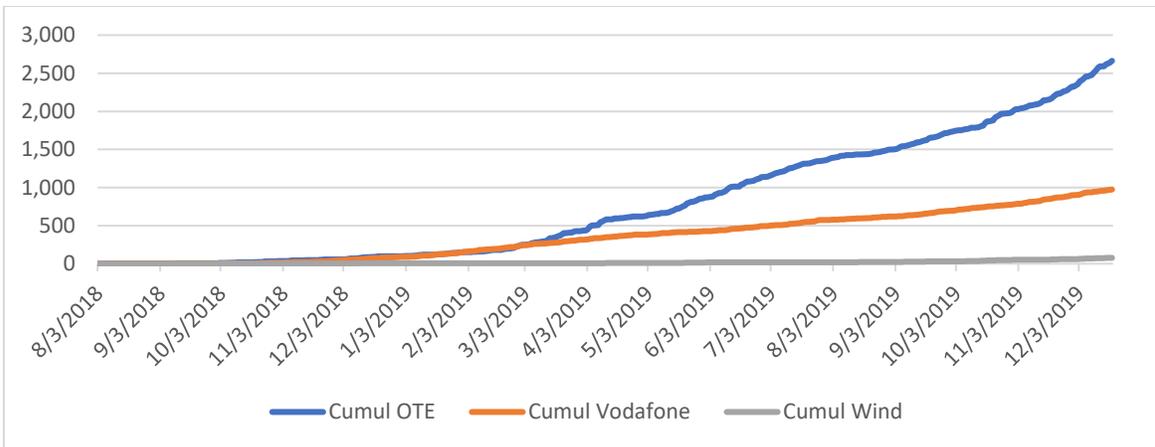
Share of orders amongst providers
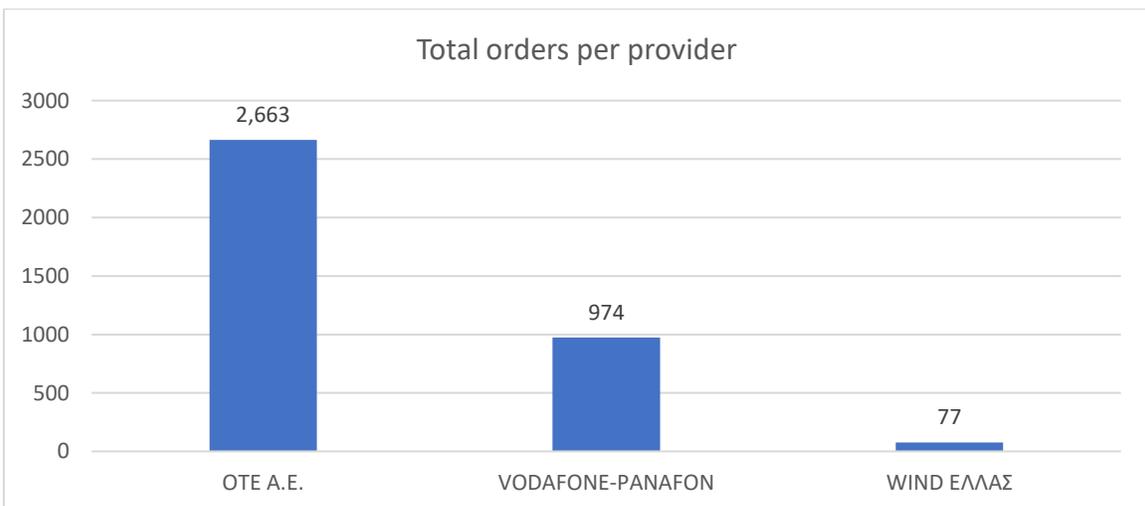
Orders by download speed and provider (100-200 Mbps)
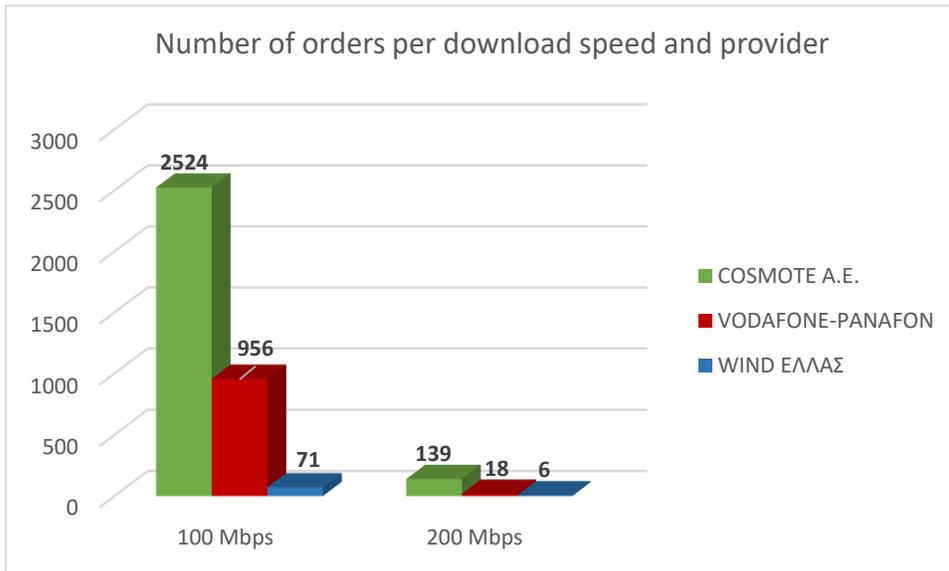

Maximum value of aid by provider
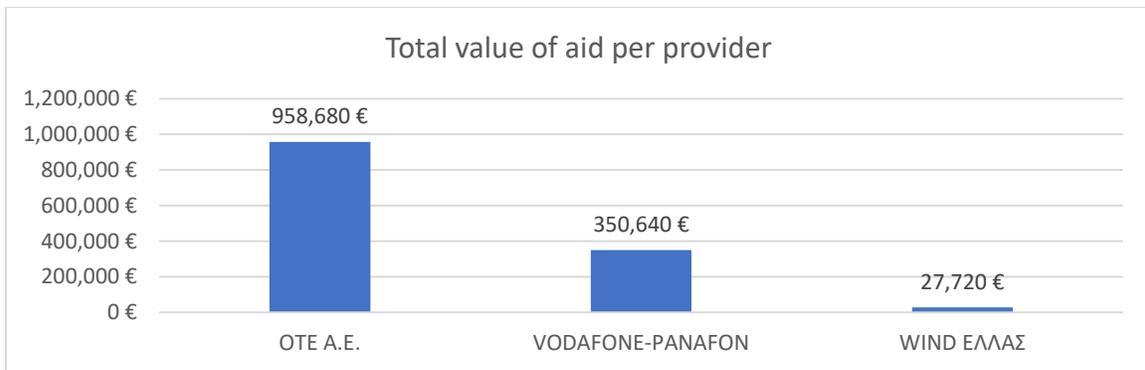
Of the 37 approved SFBB_Offers, thirty-three (33) offers are double play and four (4) offers are triple play. Also, sixteen (16) offers are for 200 Mbps whereas twenty one (21) offers are for 100 Mbps. Finally, six (6) are offers for business/enterprise/office and thirty one (31) are home offers.

Evolution in time of orders by provider
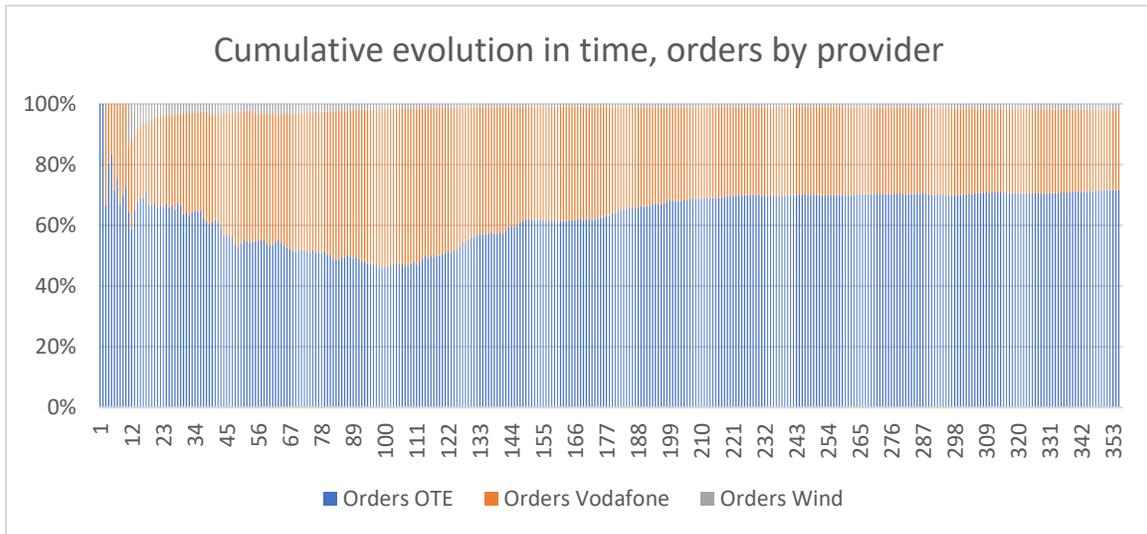
Total orders by prefecture of the Greek territory

Orders by municipality per provider
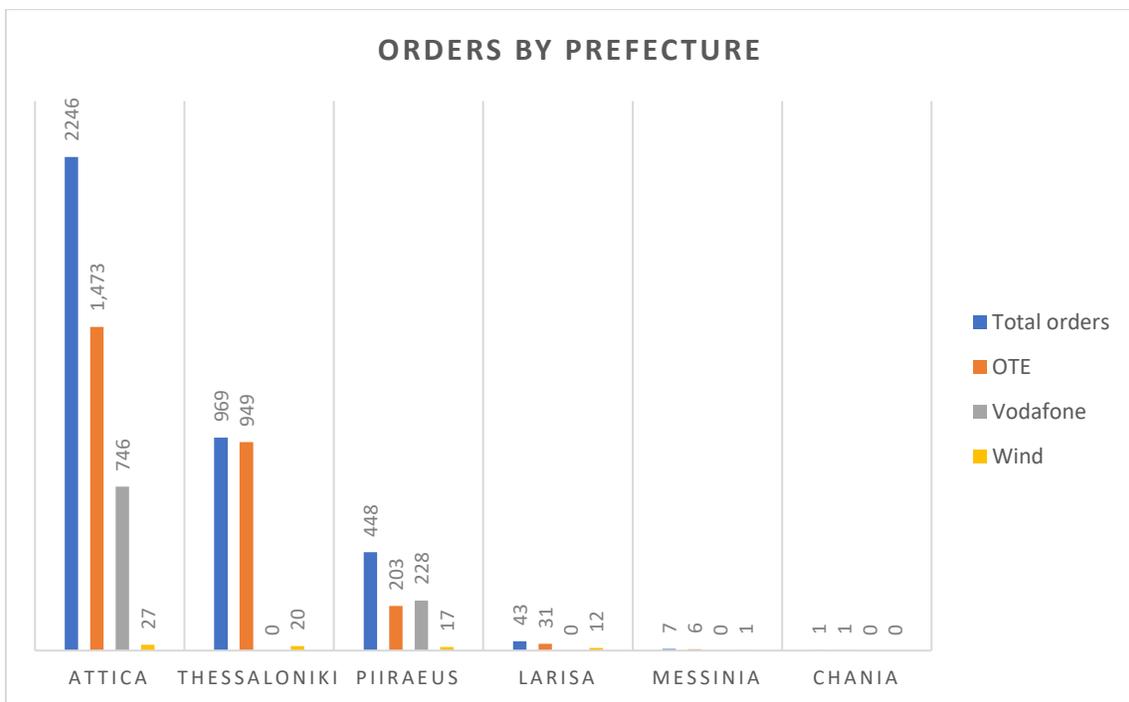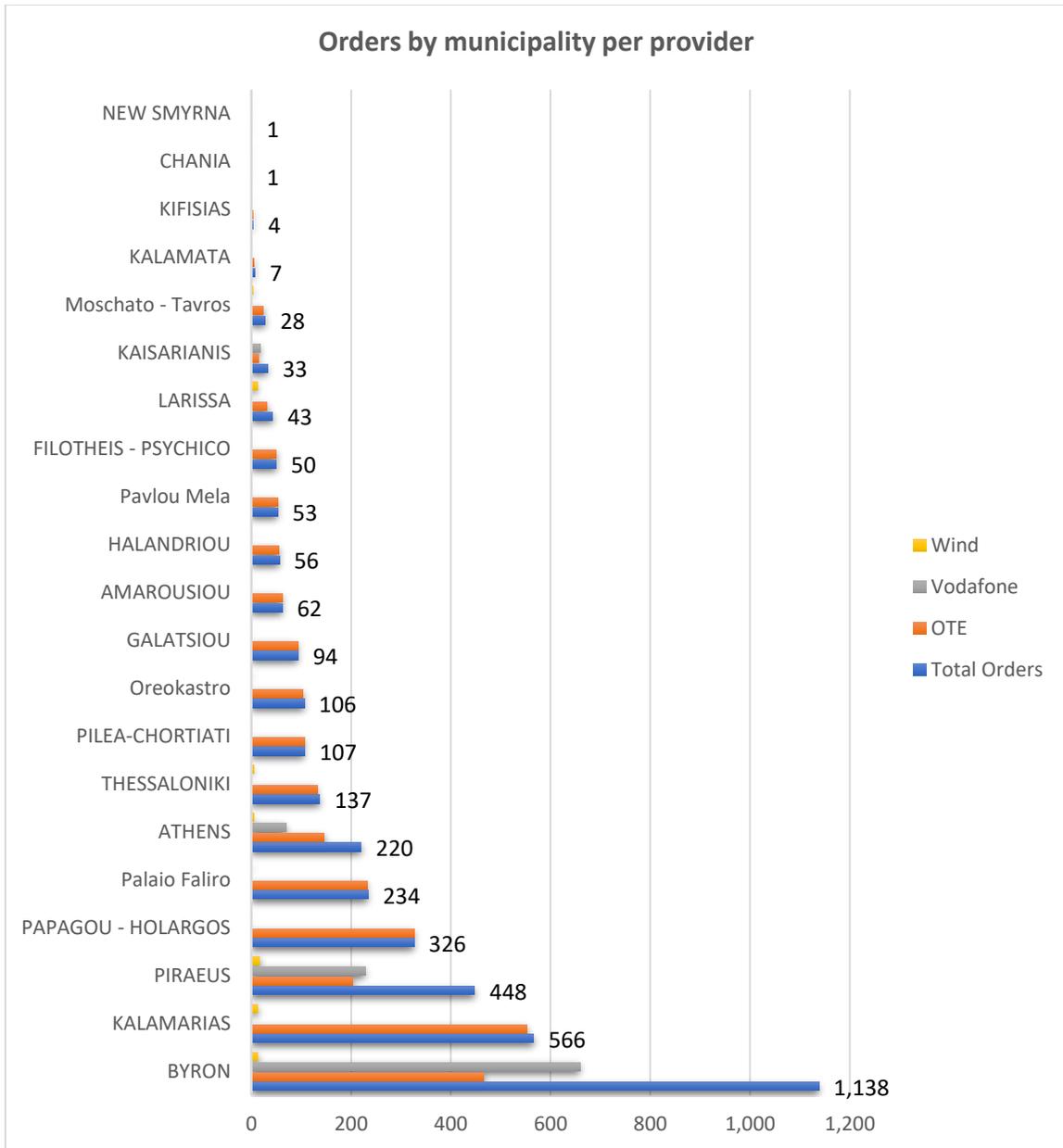
3. SFBB Evaluation

2.1. Key findings

The measure has still rather slow progress mainly due to the following reasons:

<u>Delay in deployment</u>

Prior to launching the SFBB project a "Mapping of Private Investment Plans in NGA for year 2018 - phace C» was conducted where operators declared their planned coverage until the end of 2018. These plans have been the base for the design of the SFBB project. Due to various reasons these plans have not progressed as initially planned and actual coverage until the end of 2018 lagged considerably behind the declared coverage. Actual coverage until 19/12/2019 marginally exceeded the coverage that was declared for 2018, practically corresponding to one full year of delay of deployment compared to the initial plan. This delay had considerable impact in the progress of the SFBB project since the installed base was far more limited than initially envisaged. The delay was due to the fact that operators had very limited experience in the deployment of SFBB-compatible infrastructures and needed to adapt several operational and commercial processes and systems to be able to actually achieve a satisfactory pace of deployment.

	Cosmote	Vodafone	Wind	Forthnet	**Total**
Declared coverage until end 2018 (Active subscriber lines)	52.090	28.053	35.975	17.287	**133.405**
Declared coverage until end 2018 (Buildings)	11.635	13.638	8.587	5.040	**38.900**
Actual coverage until end 2018 (Buildings)	4.399	5.525	517	0	**10.441**
Actual coverage until 19/12/2019 (Buildings)	28.384	13.294	945	0	**42.623**
Actual coverage until 19/12/2019 (Active subscriber lines)	97.329	45.585	3.240	0	**146.154**

The reasons are:

- The permits that need to be issued by Local Authorities (municipalities) who play a key role as the owner of land and issuer of permits (Rights of Way), during deployment of the providers' private networks.
- The delays that in some cases wholesale providers face with some Local Authorities (Municipalities). Although the law provides for an implicit issuance of the license in case of unjustified delays (Law 4463/Government Gazette Aʹ 42/30.03.2017, article 4, paragraph 4.στ), telecom operators are reticent in using this provision because they are not willing to confront the public authorities; instead, they try to resolve the issue by complying to the greatest possible extent to their will.
- The novelty of NGA constructions (civil engineering works) in the consumers' premises (intra-buildings), although the specifications for intra-buildings infrastructure for the

support of high-speed networks are clarified by Law 4463 (Government Gazette A' 42/30.3.2017).

Nevertheless, there is a growing trend in deployment and further areas are expected to be deployed during 2020 and 2021 (declaration of future coverage is not mandatory and some operators may choose not to declare their future deployment plans).

Cumulative # of covered buildings per wholesale provider
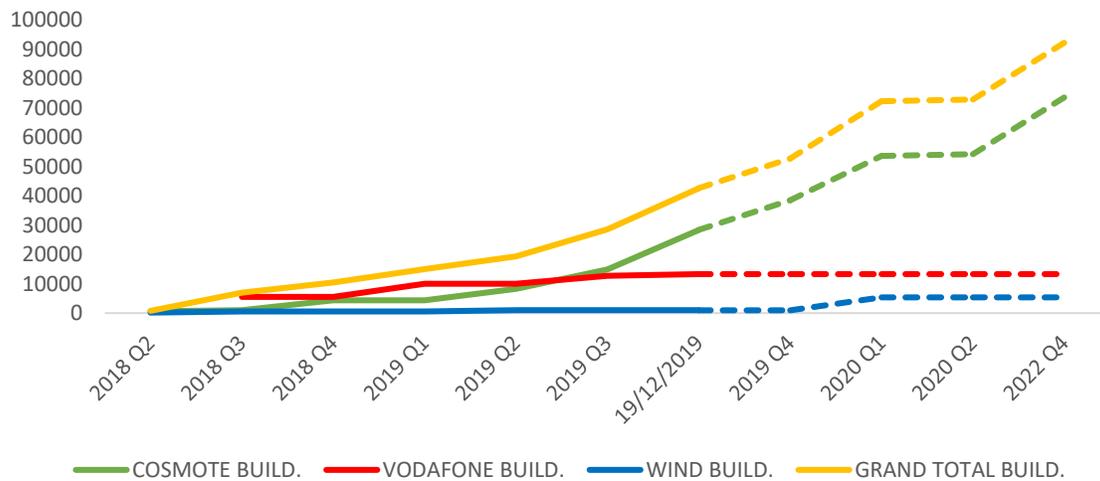
Furthermore, the mix of wholesale providers' coverage was changed, with a stronger representation of Cosmote and weaker representation of Wind and Forthnet (Vodafone deployed the initially planned number of buildings albeit with a delay of one year): During the course of 2018-2019, Cosmote has considerably shifted its strategy towards SFBB-compatible infrastructures, whereas Wind and Forthnet maintained a more conservative strategy investing in infrastructures non-capable of providing SFBB services. It is worth noting that Forthnet's acquisition by a new investor is expected to materialise early in 2020, and that Wind is for sale as of 2019Q4. This explains to a large extend the conservative approach followed by these two operators with regards to their investment plans. Furthermore, it is worth noting that several smaller infrastructure providers have deployed FTTH infrastructures, but are not providing them through a wholesale scheme and therefore, their services are not considered as compatible with the SFBB service definition.

Delay in commercial exploitation of the deployed customer base

SFBB services are available (as of 19/12/2019) to an addressable market of 149.974 active subscriber lines. Although the SFBB project has attracted 9.731 beneficiaries who have issued a voucher (corresponding to 6.7% of the addressable market, which is considered as a very good sign of customer interest), only 3.714 connections have already been implemented so far (corresponding to 2.6% of the addressable market). This is due to several reasons:

- Operators needed to develop processes/systems and needed to reallocate operational resources in order to be able to wholesale their SFBB-compatible services to third parties. Even Cosmote, who had experience in wholesale operations, had to develop new processes and systems for the provision of SFBB- compatible services. This has resulted in considerable delays in processing incoming orders after the end of the network construction: It was not uncommon to have the network deployed but no connections were provided because of the delays in setting up all necessary processes and systems to be able to actually provide the service.
- Commercial processes and practices of the retail operators have not yet been developed in order to successfully commercialize SFBB-compatible services. Considering that the services are offered in very limited geographic areas, specific commercial practices (ie door-to-door campaigns) are needed to have high impact. Such highly localized practices have not yet been utilized by retail operators.
- The list of beneficiaries that have issued a voucher but have not proceeded in applying for a service to a retail operator has not yet been made available to retail operators in order to avoid unsolicited promotional communications. This has to be reconsidered, in order to allow retail operators to actively promote their services to interested beneficiaries, conforming of course to proper GDPR practices.
- A consistent publicity of the SFBB measure -that is anticipated to increase public awareness- is not yet in place; it is estimated that the SFBB campaign will be launched to the media within 2020. So far, consumers have been informed of the SFBB voucher by their Telecommunication Service Providers by which they receive broadband services. It is obvious that, depending on the particular commercial policy that one TSP follows, the consumers' level of awareness is different amongst different TSPs.

It is also worth noting that in the beginning of the measure in 2018, providers were reluctant to carry out orders before the state aid decision was issued, although approximately 17.000 buildings were declared in the SFBB IT system (as of 28.06.2018). The actual commencement of the measure took place after the state aid approval on January 7th 2019, so the aid is practically available for 12 months. Until that date, the number of orders (connections implemented by providers) was just 54.

Limited number of retail operators

Although 4 different retail operators actually have available 23 service offers (promoting them through their websites-see below), the vast majority (98%) of the activated connections are served by Cosmote and Vodafone. While these operators have organized their retail operations and have streamlined the provision of SFBB services, the others (namely Wind and Optiland) have not yet achieved to efficiently organized their processes and thus have very limited or zero participation in the SFBB project. Also, Forthnet, a significant retail operator with a broadband market share of 13% is not participating in the project. A potential explanation is that these operators are rather focused on commercializing FTTC vectoring products, thus limiting resources that can be allocated to commercializing SFBB services.

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Επιλογή

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Επιλογή

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2. Σε περίπτωση που δεν μπορείς να λάβεις την επιδότηση επικοινώνησε μαζί μας εδώ για να ενεργοποιήσεις το πρόγραμμα που έχεις επιλέξει!

Σημείωση:

Το κόστος σύνδεσης είναι σε προσφορά 50€ (από 190€), χρεώνεται εφάπαξ και περιλαμβάνει τα τέλη ενεργοποίησης και εγκατάστασης Οπτικής Ίνας μέχρι το σπίτι (FTTH). Οι ωφελούμενοι της δράσης Superfast Broadband θα λάβουν επιδότηση 48€ (τελικό κόστος σύνδεσης 2€). Οι τιμές συμπεριλαμβάνουν Φ.Π.Α. 24% και δεν υπόκειται στο Τέλος Συνδρομητών Σταθερής Τηλεφωνίας 5% του άρθρου 55 του Ν. 4389/2016.

2.2. Assignment of the SFBB Evaluation Conduction

The tender procedure for the SFBB evaluation has been concluded and the contract is expected to be signed, with a total budget of €74,640. It should be noted that, the duration of the contract is 3 years i.e. until the end of 2022 for the final evaluation report, with an option for one year extension for the annual report of 2023.

The **methodology context and budget estimation** of the evaluation assignment to independent (external) evaluator, is the following (and is conformant with the notified evaluation plan of the SFBB voucher scheme):

The **First Deliverable** is the **Methodology Framework** whose indicative structure and necessary content should include at least:

- Formulation, reporting and analysis of the underlying basic assumptions of the methodology (hypothesis about the perfect substitution of VDSL connections with SFBB, assumption of common macroeconomic data and other demand-side factors for neighboring OCCAs) and documentation of their realism, in proportion with the availability of relevant data.

- Specification of the questionnaire and definition of the parameters to be considered (and correspondingly of the form of the questions). These should include at least the following parameters: income, level of education, number of children in the household, age, employment status, importance of internet use, use of streaming services, etc. The contractor will be invited to enrich this list with excessive number of parameters whose significance will be evaluated during the specification of the model (General to Specific Approach) and that will be obtained through field research.

- Analysis of the methodology for defining Control and Treatment Group, checking of available parameters for the 1st level of analysis (OCCA level), list of parameters to be considered when matching OCCAs between Control and Treatment Group at the 1st level of analysis.

- Estimation of the appropriate time for the interim and final evaluation (and field surveys), depending on the evolution of the number of beneficiaries receiving SFBB_services due to the measure.

- Determination of the sample size for the 2nd level of analysis and documentation of the population based on the proposed limits.

- Analysis of the methods and of the model to be used at the two levels of analysis (OCCA and person / household) and theoretical explanation of the specification process when assessing the parameters to be included.

- Descriptive Analysis of the data of neighboring OCCAs based on the data that will be available from the providers as well as other parameters available from the Hellenic Statistical Authority or equivalent reliable source.

The **Second** and **Third Deliverables** relate to the **mid-term** and **final evaluation** report:

The two project evaluation reports will need to answer the following questions, which are accompanied by an indicative approach of their analysis.

<u>Impact of the project on % NGA take up (percentage of NGA connections)</u>

The analysis to be carried out by the contractor concerns two different levels of analysis of variable of interest, namely: (a) at OCCA level; and (b) at person / household level.

The basis of the methodology is the comparison between a Control and a Treatment Group. For conducting the field survey, it will be assumed that VDSL services (offered in areas not eligible for the where the SFBB voucher) are substitutes for the SFBB services to be offered through the measure. The Control and Treatment Group will consist of neighboring OCCAs, which are assumed to share common characteristics, in terms of the basic parameters that affect the demand for these particular services.

The first level of analysis will be carried out with Descriptive Analysis (or equivalent) based on cumulative data at OCCA level that will be provided by Telecommunication Service Providers and possible other variables if decided to be taken into account and if data is available from the Greek Statistical Authority or equivalent reliable sources. The first level of analysis will refer to the % NGA take up variable. The 2nd level of analysis will be carried out by field survey at person / household level taking a sample from Control and Treatment Group, using as variable of interest the use of SFBB services (variable 0/1). Because of the nature of the variable, the available models will refer to Non-Linear Regression (e.g., logit or other proposed alternative) that will be determined by the 1st Deliverable (Methodological Analysis). The field surveys will be carried out for the mid-term analysis during the implementation of the project in a time which will depend on the number of beneficiaries that will constitute an adequate Treatment Group. Correspondingly, for the 2nd method it will be used the data that will be generated by the field research that will take place within a reasonable time after the end of the project. It is noted that, also in the second level of analysis, the parameter of interest is the % NGA take up that will be driven by the "use of SFBB services" variable per person / household.

At analysis level 1, the probability of checking causality relationships by checking pairs of adjacent OCCAs using the attribute of whether SFBB service is provided or not, will be examined.

Two field surveys, in two different Groups each, are required, at the person / household level. The final deliverables will be the two evaluation reports (interim and final), together with the statistical data used and the procedure by which the analysis was carried out.

Is there evidence of changes in the parameters of competition as a result of the measure (including crowding out)?

The evaluation at this level will be carried out with Descriptive Analysis using available data to determine the market position of operators for each NGA technology (FTTH, FTTC) and the price level of SFBB and other NGA (eg VDSL) services. The data will be provided by the operators in regards of the number of broadband subscribers per Postal Code (annual data, end of each year) and based on these, the market share per operator will be determined. Accordingly, data will be available in regards of which operator has built the infrastructure that provides these services per Postal Code for further combinatorial analysis.

Based on the annual change in market shares, documented conclusions will be provided on the degree of the impact of the project on market share and any possible changes of market share.

These results will be included in the interim and final evaluation by aggregating the data on the evolution of all relevant sizes for the reference years (so the interim analysis data will be done with a subset of the data to be used in the final analysis).

Was the measure appropriate for the problem that it encountered?

The contractor will be required to make a comparison between the measure and the corresponding projects carried out in the EU. This will be done with Descriptive Analysis and descriptive comparisons, in order to draw conclusions on the implementation of future projects, subject to availability of relevant data.

This question is answered in the final evaluation report.

Was the most effective measure used?

As mentioned above, the analysis of the % NGA take up change will take place also after the end of the project, in order to determine whether connections are maintained after the end of the subsidy period. Depending on the results of this study, the use of survival analysis will be considered, in order to determine the likelihood of an NGA connection being canceled, provided that it was pre-existing in the previous period.

This question is answered in the final evaluation report.

DETERMINATION OF SAMPLE SIZE

The sample size for the field surveys is determined by a series of specific assumptions:

• Population size: the full size of the population of potential beneficiaries

• Confidence Level: 95%

• Margin of error: 3% -4%

Based on the above and for error margin values of 3%, 3,5% and 4%, the corresponding sample size (following the principles of random sampling) will range from 1060, 780 and 600 observations, respectively. Therefore, field surveys should address and collect the above observations from each designated Group, per survey (interim and final).

Time to perform field research

Interim evaluation: At a time when sufficient number of SFBB connections is available in the treatment group population. An estimation of the appropriate time will be made in the first deliverable and flexibility will still be foreseen. The initial assessment is that interim evaluation should take place at a time when sufficient number of beneficiaries are receiving the aid, which is estimated to least 10% of the potential beneficiaries.

Final evaluation: At a time after the end of the last date for activation of vouchers depending also on the percentage of activations that took place late, near this time. For the usability of the data, the Treatment Group should have a sufficient number of beneficiaries who have received the Voucher and have completed their 2-year period of use (initial estimation is 10% of beneficiaries no longer receiving aid).

Regarding the Mid-Term Evaluation

As seen in the previous section (analytical data from the project's current state of implementation) the project **has not yet reached a "mature" stage** and thus a Mid-Term evaluation **at its current level would not fulfill the needed requirements or provide any useful information**. The purpose of such evaluation is to assess the implementation of the measure in terms of effectiveness and efficiency and to help improve its design in parallel with other measures included in the national NGA Plan. Specifically, the critical question (among others of the evaluation) is "to what extent has the measure resulted in an increased take-up of NGA connections ".

Until the 19ʰ of December 2019 only 3.714 beneficiaries have finalized their orders and are included in the SFBB aid scheme, from an estimated pool of 135.000 potential beneficiaries, which accounts for less than **2.75%** and the corresponding subsidy is only **2.67%** of the available budget.

Lastly considering the distribution of the current active beneficiaries at OCCA level (which is the observation level for the descriptive as well as the control group regression analyses), we can conclude that at the current state a complete evaluation would be impossible.

Considering the proposed methods for the evaluation, the above creates the following problems (per method).

1. Simple Difference in Difference analysis

For the first method the evaluators will conduct a Simple Difference in Difference (DiD) analysis between the OCCA Control Group and the OCCA Treatment Group. Based on one of the assumptions of that method and specifically the assumption that "Neighboring OCCA share similar characteristics regarding the variables that cause Demand for SFBB or substitute connections" there will be a matching process between neighboring OCCA'S from the two groups. The Treatment Group structures will be based upon the areas of intervention of the project and the Control Group will be defined by the neighboring OCCA's based on the choices made for the Treatment Group. The two groups must have similar characteristics in particular as regards parameters such as income, age, educational level, etc, so that they are in principle comparable to each other as the logic of DID analysis is based on parallel trend assumption regarding the evolution of the variable of interest. The matching process will increase the likelihood of the parallel trend assumption, as the chosen units will be characteristically equivalent. This analysis is intended to provide descriptive information on the differences between these two groups in terms of the changes in NGA % take-up over that period. The impact of the measure is defined as the difference between the change in NGA % take-up in the treatment group minus the change in NGA % take-up in the control group. If the two groups actually share the same characteristics, the variable of interest would change proportionally in the same time period in the absence of the measure and therefore their difference would statistically insignificant.

$$\Delta_{NGA} = (\overline{y}_{T,2} - \overline{y}_{T,1}) - (\overline{y}_{C,2} - \overline{y}_{C,1})$$

T refers to the Treatment group, to which the measure applied

C refers to the control group, to which the measure is not applicable

1,2 refer to Time 1 and 2 that the measurements were made and the data was collected

The above change (increase) in NGA % take-up will then be applied to the actual size (total number of premises) of the OCCA Treatment Group at the time of evaluation, since it reflects the actual increase in NGA % take-up due to the measure after the deduction of the NGA % take-up that would otherwise occur (as proved by the Control Group).

- However, the results estimated from the method may suffer from selection bias as:A number of parameters of interest are not available at OCCA level (as is income, percentage of unemployment etc)
- The treatment group is likely to be less commercially attractive, on average, than the control group (places where NGA connections were available). This could lead to the levels of additional coverage attributable to the intervention to be understated
- Regarding the parameter of interest (% of NGA connections) its potential nonlinear evolution may include a number of problems, including that during the matching process the observations have to be characteristically equivalent. If in the Control Group the NGA connections were available at a previous stage (as it is expected) and the time evolution and trend might differ in condition to the time of availability i.e. following a logistic Curve ,making the comparison with the Treatment Group might understate or overstate the schemes impact, as it's evolution might be slower as it is based upon the time that the service was available. This is seen in the following graph as it's not viable to compare the second linear trend with the first etc.
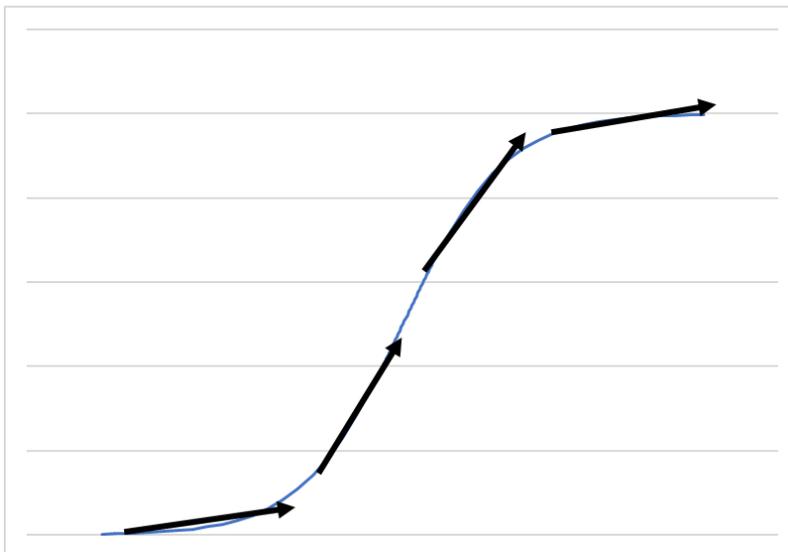
In the current phase of implementation that Treatment Group cannot be defined as the implementation has not yet achieved an acceptable level of distribution between the OCCA's that are included in the scope of the project. If defined, that Treatment Group would:

- Not represent the full scope of intervention areas of the project

- Include large disparities between the OCCA'S included, as the implementation does not happen contemporaneous between the areas of intervention
- Would underestimate the project' s impact on the increase on take-up of NGA connections

- Would not produce any reliable results regarding the effectiveness or efficiency of the project and thus would not lead to any useful information
- The evaluations results would be incompatible with the ex-post evaluation and thus any conclusions made in synergy of these two reports would be inaccurate

2. Control Group Regression

The evaluation questions addressing the impact of the aid on the beneficiaries of the scheme will be answered primarily by means of a simple difference-in-difference analysis between the treatment group and the identified control group. Depending on the availability of data (at OCCA level), in case of inability to conduct the first in a way that will give viable results leads to the conduction of the second method.

The second method regards the conduction of a Nonlinear Regression Analysis with a dataset that will be available via questionnaires from random sampling of the observations from the Control and Treatment Groups that were firstly defined (at OCCA level) during the DiD analysis of the first method. That dataset will be at household/individual level and will thus include a number of further macroeconomic and social characteristics that are unavailable at OCCA level. A model that could be used (a range of alternatives will also be considered) is that of the logistic regression. Using the control group dataset the evaluators will estimate the model at individual/ household level.

In the equation $y_i = a + \beta x_i + \varepsilon_i$, i denotes an observation (household/individual etc). Through running logistic regressions with various combinations of explanatory variables (that will be provided from the survey) the evaluators will use their professional judgement and a number of tests regarding statistical inference to determine the model (i.e. combinations of coefficients and explanatory variables) that best fit the observed dataset in the control group.

The same best-fit model will then be applied to the treatment group dataset to predict the counterfactual probability of NGA subscriptions per observation and hence the % NGA of subscriptions at the treatment Group. The actual (or realized) number of subscriptions will also be available and the counterfactual % NGA subscriptions will be subtracted from the actual % NGA subscriptions, in order to estimate that additional % coverage (and hence the additional number of subscriptions) attributable to the intervention for the selected period.

For the sake of the argument, if the above method was conducted (regardless of the problems we described) several problems would arise and specifically:

- As the project has not yet reached a mature stage the survey that would collect the data to be used as inputs of the proposed model (logit or other) would be biased as it would underestimate the project' s impact (as the project is currently at an early stage of implementation)

- As the implementation does not happen contemporaneous between the areas of intervention differences between the OCCA's of the Treatment Group would be exaggerated
- As only 2.75 % of the potential pool of beneficiaries have finalized their participation in the project, when distributed between the OCCA'S they don't represent an adequate percentage of the per OCCA population that would produce a significant statistical output of the survey, if that survey was conducted (as the margin of error for the sample size selection is much greater)
- Nonlinear methods (either Non Linear Least Squares of Maximum likelihood) regarding the proposed models for the second method (Logit, Probit, Linear Probability model etc, i.e. Qualitive Response Probability Models) need a large enough sample to guaranty the asymptotic properties of the residuals. If that condition is not satisfied the problem of inference arises regarding the model specification stage.

2.3. Projection of the Project Implementation- Reaching a Mature Stage

There are several problems that arise in forecasting the projects implementation numbers. Specifically, the available data (aggregated monthly) consist of only 19 observations (August 2018 to December 2019). With the current availability of data, several assumptions have to be taken into account, in order to limit the number of possible model alternatives.

To provide a range of feasible forecasts for the number of orders that will be placed until the December of the current year we considered and estimates three different models:

- Exponential

$$Orders = e^{(a_0 + a_1 * time)}$$

- Quadratic

$$Orders = a_0 + a_1 * time + a_2 * time^2$$

- Linear

$$Orders = a_0 + a_1 * time$$

Method 1: Regarding those models and their forecasts, we chose to supplement the results of the simple linear model, as its forecasts are not as optimistic as the Exponential model or as pessimistic as the Quadratic model.

Linear model results

Method: OLS estimation

$$Orders = -28.08 + 27.39 * time$$
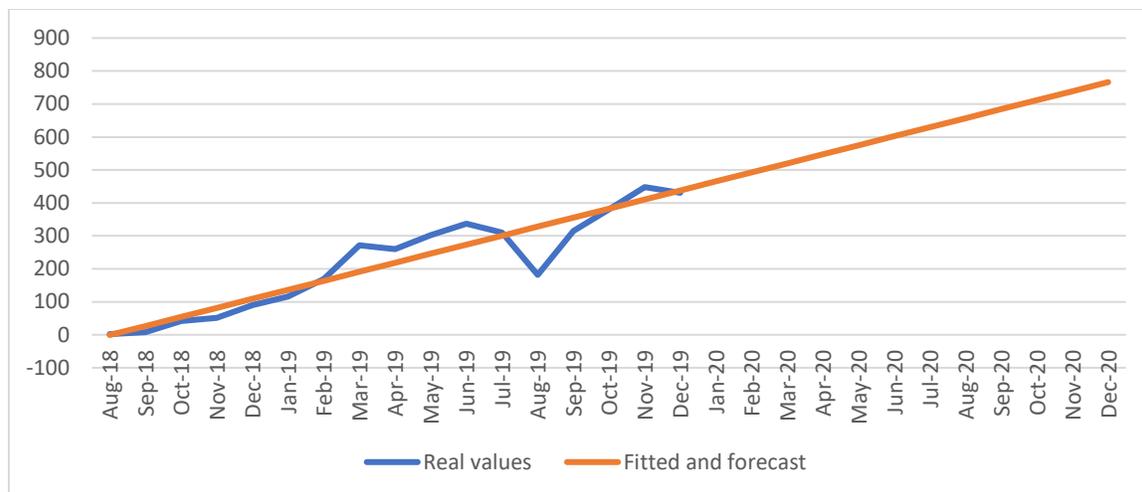
And the cumulative data
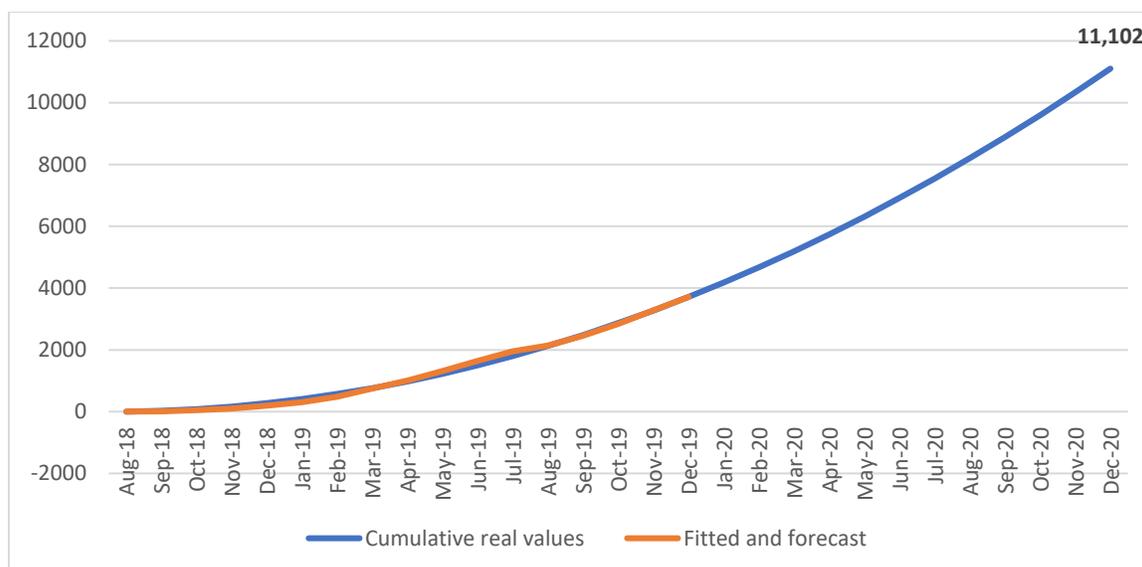
Based on these projections, an adequate number of beneficiaries will have been achieved by December 2020 (just over 11.102 orders as projected).

Method 2: estimation based upon the number of active vouchers, total orders and the inclusion of an ad hoc premium based on the current lag that appears between activation of voucher and actual order. We take as an a priori condition for the following forecasts that 10%/20%/30% of the active vouchers that have not yet placed an order will place it within the year 2020 (corresponding to the low, medium and high scenario).

1. Forecast based on the number of active vouchers
2. Use a percentage of the forecast as the actual number of orders
3. Compare with real values and present the forecast based on the above number
4. Represent the band of possible forecasts with the "premium" of the above condition

Linear model results

Method: OLS estimation

$$Orders = 68.29 + 40.41 * time$$
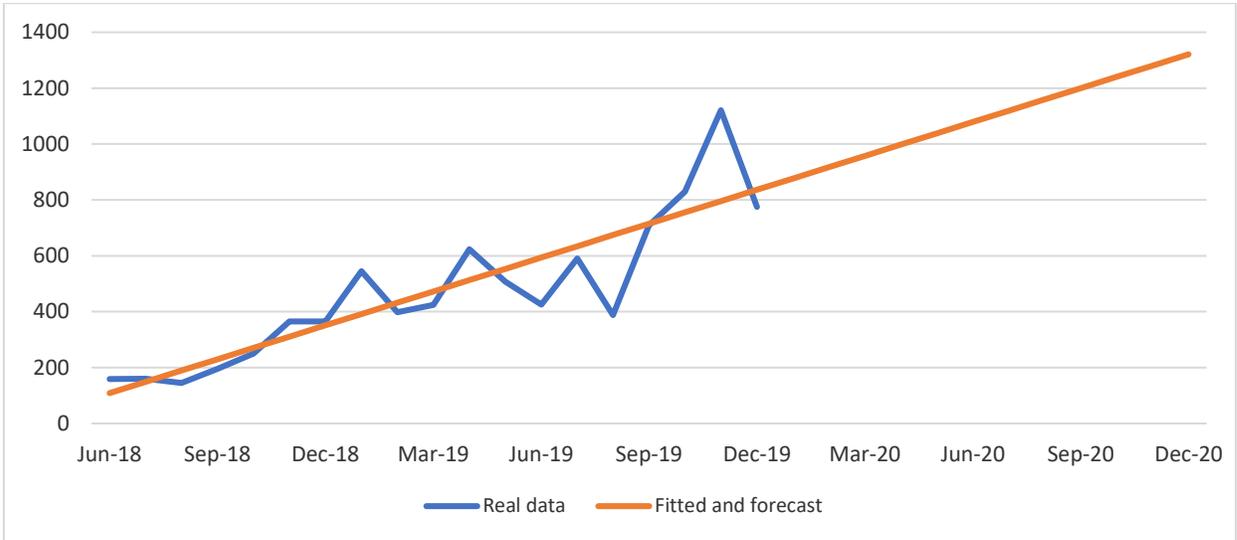
The graph for the premium is the following (actual data and data with premium)
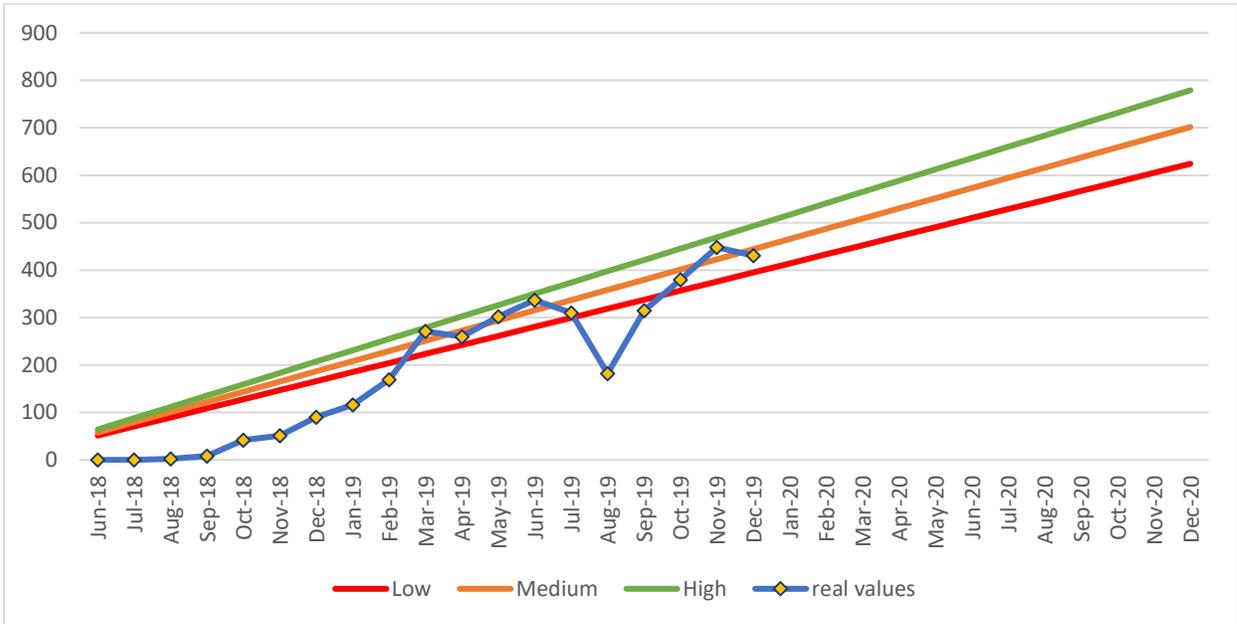
That gives us a range of 10.469 (cumulative) orders by the end of December 2020 to 13.067 orders with **the middle range being at 11.768 orders[3].**

Concluding remarks regarding the forecasts

Imposing linearity in the above described model (linear evolution with independent variable only the variable of time) we received some comparatively, to other forecasting alternatives, realistic projections. The previous model did not take into account the following:

- The positive impact that scheduled publicity actions will have in the evolution of the number of vouchers and orders
- Any nonlinear evolution in the rate of change of the time series that remains hidden due to either the level of aggregation of the available data or that currently the function behaves approximately as a linear process (and they are statistically inseparable)

Regarding the 1st phase of the evaluation of the measure scheduled to be done within the next three months, it should be noted that:

- The implementation of the measure has not reached yet a mature stage and the creation of treatment and control groups won't be representative of the full scope of the project, leading to biased results
- Nonlinear Least Squares and Maximum Likelihood Estimation need a large enough sample to guarantee that hypothesis testing and inference can be actualized. If not, there will be problems during the project specification process, as the General to Specific approach is based on hypothesis testing regarding parameter significance

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[3] *A third method was applicated based on the available data (aggregated in quarters) and what appeared to be a linear or close to linear evolution of activations (as a percentage) condition upon the semester in which they were available. Based on the data and imposing linearity (as there is an inadequate number of observations per availability semester) forecasts were produced with the estimation of linear model for the available data. The previously described method yielded forecasts greater than even the exponential model. As these were overly optimistic, we can conclude that the condition of linearity within the certain context might not be realistic enough.*

4. Publicity

On March 27th, 2019, by contract no. 151.085/230-B (19SYMV004681409 2019-03-27), the publicity of SFBB was assigned to an advertising company, for the design and production of publicity material for the SFBB voucher. The duration of this contract was four (4) months and the budget amounted to 23.312€ (inclusive of VAT). The contractor identified the target audience and proposed the strategic media plan and the campaign creative concept, addressing a media mix that included all types of media: Press, TV and radio spots, interactive web banners, web and social media (Facebook, You Tube) campaigns, google display network, etc., and focusing on burst as well as continuity publicity.

In particular, the following materials were produced for the campaign

- TV spot (30") for broadcasting through TV and Youtube channels
- Spot Radio (45")
- Interactive Web banners (300X250,728X90) for promotion in the context of a web campaign
- Printed listings for targeted campaign in the press
- Advertising via Facebook and Twitter (Social Media campaign)
- Communication plan with proposed media and budgeting allocation per category (print media, radio, tv, internet), in accordance with the current institutional framework for the distribution of advertising costs.

Given the changes to the new political leadership and the structure, name and context of the Ministry of Digital Governance from 07/2019, both the information provided by the 1st Contract and the promotional material of the 2nd Contract need to be updated, in addition, the promotional products (of the 2nd Contract) were not utilized.

Within the year 2020, public awareness and motivational communication campaigns are planned to participate in SFBB action through its advertising campaign on the radio, the Internet and by conducting Roadshows at regional and local level, in areas SFBB is available at that time.

These actions will take place after the selection procedure for a Contractor, with an estimated budget of € 250,000 (from national sources). The relevant request for proposals is under preparation.