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Deliverable D6.2: Disseminatin Plan

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Summary

This deliverable presents the Dissemination Plan, that is the strategy agreed and set up by the partners for promoting the DREAM project and for dissemination of new knowledge. More specifically, distinct dissemination objectives, pushed by the communication needs of each partner and by obligations set by the H2020 Grant Agreement are presented. For each distinct objective, the target audience has been identified, so that communication means and key messages can be properly selected to maximize the impact of DREAM promotion and knowledge dissemination. A common action plan, setting out the agreed approach to dissemination throughout the project, is also presented. The second part of the document, summarizes the consortium initiatives for DREAM promotion, from the project starting date to month 12 (M12), and keeps track of the activities performed individually by each partner.

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Executive Summary

Planning efficient and effective promotion and dissemination initiatives has required a careful analysis of the communication intentions and classification of the right target audience. This allows the selection of key messages to broadcast, with the purpose of maximizing the impact of project promotion, and definition of a proper strategy and approach to knowledge dissemination.
This document presents the DREAM dissemination plan and summarizes the activities carried out by the consortium in the first year of the project.
Pushed by the consortium needs and by distinct motivations of each partner, three different communication objectives have been identified: (1) favouring the exploitation of the DREAM outcomes, (2) dissemination of scientific results and (3) creating public awareness on EU-funded research programs. The different communication means and initiatives that the consortium will use comprise internet channels, networking through different means specific to each partner, attendance to showcase events (like conferences and exhibitions) and scientific publications. The messages and content of the communications are initially selected according to the different communication objectives and target groups. Promotion initiatives will be following an action plan agreed by the consortium and will be stimulated and monitored for the entire duration of the project. The activities carried out during the first year of the project consisted in the creation of the DREAM identity, realization of a web-site and promotional material, networking with similar H2020 projects, interactions with standardization bodies, attendance to showcase events, and several other partner's specific actions.

1. Dissemination Plan

1.1 Introduction

The strategy and initiatives agreed by the partners for promoting the DREAM project and for dissemination of new knowledge are proposed in this chapter. The overarching intentions of communication activities are manifold and include development of dissemination and exploitation links to a wide audience, comprising stakeholders in the public and private sectors, maximization of the reputation of the project, sharing of the project results, and impact through various activities and actions.

To define and implement an efficient plan, distinct objectives have been clearly defined as a result of the analysis of the consortium needs, obligations set by the Grant Agreement [1] and specific needs for promotion from each partner. This allowed to identify and classify the different target audiences to be addressed with purposely selected messages and content of communications. At the end, a schedule of different actions has been defined and agreed. Several initiatives have been undertaken, and some are now in the early stages. Nonetheless, the dissemination plan is not a static document. It should be flexible and it must be updated regularly as new results become available or opportunities for new potential communication actions and events present themselves.

The chapter is organized in the following way: Section 1.2 introduces the implementation strategy and reports a summary of the motivations for communication of each partner. Section 1.3 presents the distinct communication objectives defined by the consortium while Section 1.4 analyzes the corresponding target groups and classifies the communication channels and means identified by the partners. Key messages for general promotion of DREAM, to diversified audiences are outlined in Section 1.5. Effort will be paid on the dissemination of scientific results and Section 1.6 explains the strategy defined for this purpose. Finally, allocated resources and action plans are reported in Section 1.7.

1.2 Implementation Strategy

Following the guidelines stated in the Project Proposal of the DREAM project [2], in the context of the WP6, Task 6.1

"*The purpose of this task is to ensure an efficient dissemination of the scientific achievements and adequate communications related to the project. All the partners will contribute with publications in international, refereed journals and at targeted conferences, and will also be active in individual promotion and communication with normal dissemination activities within their channels and areas of expertise. The task will be initiated by the development of a dissemination plan setting out an agreed approach to dissemination throughout the project. The strategy is intended to optimize and maximize the impact of the dissemination and communication activities. The Consortium will approve the dissemination strategy and the detailed dissemination plan before any dissemination takes place. The dissemination goals will be achieved by various other means, including but not limited to: Courses of various types, conferences and workshops, printed documents, web sites, trade shows, press releases, etc. The results of the technological research work conducted in the development work packages of the project will be submitted for publication to international, peer-reviewed journals according to the established dissemination plan. A project website will be set up, providing up-to-date information about the project and its results to the public. Scientific publications will be made available according to the green open-access policy*".

The activities summarized in the project proposal have been discussed within the consortium and organized in a structured way for the definition and actuation of the DREAM dissemination plan. More specifically, the proposal of the plan has required to devise the right ways to reach distinct and well defined common objectives, by considering the partner's needs, by identifying the project stakeholders', and defining the proper communication paths and approaches.

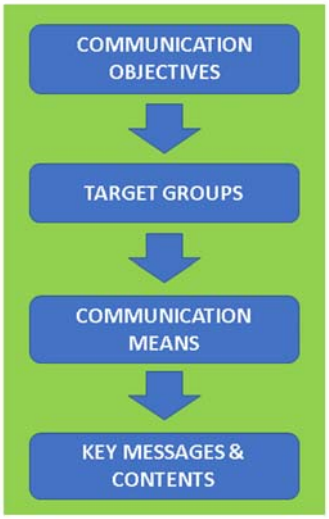


Fig. 1. Implementation strategy for the dissemination plan

As depicted in Fig.1, the implementation strategy has followed an approach that comprises four main sequential steps:

(1) Identification of the *Objectives*. The DREAM dissemination activity has been analysed considering the needs of the consortium and of each partner, with the purpose of defining clear and distinct communication objectives.

(2) Identification of the *Target Groups*. Considering each distinct objective, the specific target audience needs to be classified. In this way, right channels and appropriate messages can be selected to ensure a smooth and effective communication.

(3) Identification of the *Communication Means*. The dissemination activity will exploit channels and means made available by each partner and new ones activated within the consortium. The most appropriate communication means to be used for reaching different target groups have been defined and selected by the consortium.

(4) Identification of the *Key Messages and Content*. The messages must be carefully selected and content properly designed to be effective in reaching the target groups. The consortium has identified messages to broadcast for project promotion and potentially relevant scientific results and new knowledge to be disseminated. Messages will be updated following the project evolution.

All the members of the DREAM consortium are engaged to proactively contribute on project promotion and dissemination. University of Pavia (UniPV), as task leader, will further contribute by coordinating, stimulating and monitoring the activities of the consortium. Forms, reported in the appendix of this document, have been prepared with the purpose of acquiring specific inputs from each partner for preparation of the dissemination plan and to monitor the progress of the activities.

The consortium comprises Industries, Research Institutes and one University. Each partner has a different mission and expertise and contributes to the project bringing its own competence. The consortium has identified common dissemination objectives and has organized shared actions to reach the target audiences. Each partner will contribute to project promotion motivated also by its own communication needs, and by exploiting its network and its typical communication channels and means (such as partner's web-sites, social media, press releases). To this purpose, a survey has been performed. The consortium members, with a short description of the role in the project, typical communication needs and adopted dissemination channels are reported below.

VTT is the biggest contract research organisation in Northern Europe and his mission is to support the European Industry in entering emerging mmWave markets with high business potential. VTT is the coordinator of DREAM and technically contributes by developing the D-band antenna array with beam steering functionality.
The VTT promotion activities are pushed by the need to (1) attract new commercial contracts, (2) strengthen existing cooperations (3) attract funding and (4) rise the scientific reputation and visibility. Typical communication channels comprise internal and external presentation to customers, participation to Industry-oriented events, seminars in Universities, and scientific publications.

Ceit-IK4 Technology Center (CEIT) mission is to provide industry with services through the development of research projects and to train young researchers. The ICT division will contribute to the project by developing part of the D-band radio transceiver chipset in BiCMOS technology.
CEIT communication needs are oriented to the attraction of students and researchers to be involved in the Lab activities, (2) rise the international visibility and reputation, (3) expand cooperations to attract new research contracts and funding.

The typical communication channels include presentations and seminars in Universities, advertising through its internet channels, meetings with customers, attendance to exhibitions and scientific dissemination at international conferences and/or on international Journals.

STmicroelectronics (ST-I) is an independent worldwide broad-range semiconductor supplier and it is ranked in the top ten semiconductor companies in the world. ST has 11 main production sites, 7 Advanced R&D centers and 39 design and application centers, with more than 43600 employees over the world. Within the DREAM project, ST-I will provide the technology platform for IC fabrication, design support and will contribute to definition of system, sub-system and components specification. The Corporate External Communications (CEC) is the organization within ST responsible for developing, managing and orchestrating external communications. The aim is to improve and extend ST's perception globally and increase the consideration of ST as a supplier to existing and future partners. The targeted audiences includes customers, partners, media, industry analysts, and the general public. (Investors and financial analysts are handled separately by our Investor Relations organization. Within the CEC there are 2 teams:

1.the Media Relations team is responsible for building and maintaining the relationship between the Company, its Executives and staff, and the numerous business, technical, and general media that have an interest in our activities. The team often also performs Public Relations functions, where the activities are similar, though typically targeted at broader audiences, including neighbors, customers, suppliers, competitors, and employees.

2.the External Events team work on building ST’s image though the channel of external events, both public and private. The team, distributed across the four ST regions work closely with ST’s organizations to deliver a range of services to ensure a professional presence at trade shows, conferences, customer and investor days.

Dissemination is also performed by driving the standardization activities through management of Standards and Alliances memberships, technology survey on new standards and trends, active participation to standard bodies when needed and aligned with Divisions, quarterly alignment with Divisions, yearly long-term strategy review with the executive staff.

III-V Lab is one of the leading industrial laboratories in Europe in the field of very high speed photonic and electronic circuits for telecom and data center interconnect. Its mission is to develop key components in advance, to validate new concepts or to make demonstrators for mm-wave wireless and high speed optical systems. Based on its long experience, III-V Lab is well qualified to design the functional blocks in D-band and integrate them in large RFIC addressed by DREAM. Communication activities of III-V Lab are focused on the attraction of graduate students to strengthen the design and innovation effort, (2) rise its reputation and visibility to industrial partners (3) expand its cooperation network to attract new research contracts and funding. III-V Lab delivers seminars and talks to Universities, perform advertising through its internet channels and meetings with customers, and disseminate achievements on scientific journals and by attending conferences and exibitions.

ERZIA Technologies SL is a Spanish SME with strong heritage and expertise in RF&MW devices, space, critical applications and Ground Support Equipment. In DREAM project, ERZIA will be in charge of the phased array D-band transceiver platform integration and subsystem validation.
The promotion initiatives of ERZIA within the DREAM project are mainly pushed by the need of attracting new talented engineers to be involved and expand the company. ERZIA is palnning to use its own communication channels and deliver presentation and seminars to students close to graduation.

NOKIA is a global leader in the technologies that connect people and things. Powered by the innovation of Nokia Bell Labs and Nokia Technologies, the company is at the forefront of creating and licensing the technologies that are increasingly at the heart of our connected lives.

The X-Haul department of the Nokia Mobile Network business unit will be involved in the DREAM project with the mission of developing and improving the Nokia Microwave Mobile Backhaul portfolio. Nokia is contributing to DREAM by leading the system analysis and spec definition and with the responsibility for building a proof of concept demo.
The NOKIA communication activities are motivated by the following needs (1) rise its international credibility, visibility and reputation among Customers mainly (Mobile operators), (2) attract new commercial contracts anticipating competitors (3) strengthen its network of cooperation and expand it finding new potential technological partners (4) shape the standardization and regulation environmental making possible future commercial opportunities.
The typical communication and dissemination channels of NOKIA include private events organized by NOKIA with key customers (NOKIA technological Roadmap), advertising through its webpages and press releases to all NOKIA group, presentations during public seminars, international standardization and regulatory meeting, presentations of scientific results at international conferences, publications on scientific journals.

Università di Pavia (UniPV) has a twofold mission: (1) training and education, (2) performing advanced and high-quality research. The Analog Integrated Circuit Lab of the Engineering Department is involved within DREAM, and will mostly contribute by investigating innovative solutions for D-band frequency synthesis in BiCMOS technology.
The UniPV communication activities are motivated by the following needs (1) attract talented students to be enrolled in its basic and advanced education programs, (2) rise its international visibility and reputation, (3) expand its network of cooperation and attract research funding.
The typical communication and dissemination channels of UniPV include public events organized by University, advertising through its webpages and press releases, presentations during lectures, seminars delivered by professors, presentations of scientific results at international conferences, publications on scientific journals.

1.3 Objectives

The purpose of Task 6.1 of WP6, documented in this deliverable, is to ensure that the DREAM project, its results and their social impact will be adequately and effectively promoted by the consortium.

The overarching intentions are manifold and include development of dissemination and exploitation links to a wide audience, including stakeholders, public and private sectors, maximization of the reputation of the project, sharing of the project results, and impact through various activities and actions.

Following the implementation strategy presented in Section 1.2, the communication and dissemination activity is planned to reach three distinct objectives:

Objective - 1 ensure a smooth and fruitful exploitation of the DREAM achievements. This requires continuous identification of stakeholders and potential customers, and establishing contacts though appropriate communication activities, selected contents and messages, starting from the initial phase of the project and continuing up to the conclusion and beyond. This objective comprises also the establishment of close links with other projects active in the same area of DREAM.
To avide conflict issues due to intellectual property rights, the principles followed by all the consortium partners have been and will be the ones defined and agreed in the DREAM Consortium Agreement [4], w.r.t. Section 8 ‘Foreground’, Section 9 ‘Access Rights’ and Section 11’Miscellaneous’.

Objective - 2 dissemination of the scientific achievements. Being the DREAM project supported by public funding of European Community, full share of the new knowledge, scientific and technological innovations with potential users, researchers, industry and other commercial players, must be performed by each partner and by the consortium, as explicitly requested by the Grant Agreement [1].

Objective - 3 expand the public awareness on the relevance of project to categories not directly involved. This action is to demonstrate the benefits and the potentials of transnational cooperation in the framework of EU programs, to sustain and reinforce high scientific excellence and improve EU competitiveness.

1.4 Target Groups and Communication Channels

The three different objectives of the dissemination activity identified are oriented to different target groups, that will be reached exploiting different communication channels with appropriate messages. An overview of the target groups and planned communication channels is given by Fig. 2.

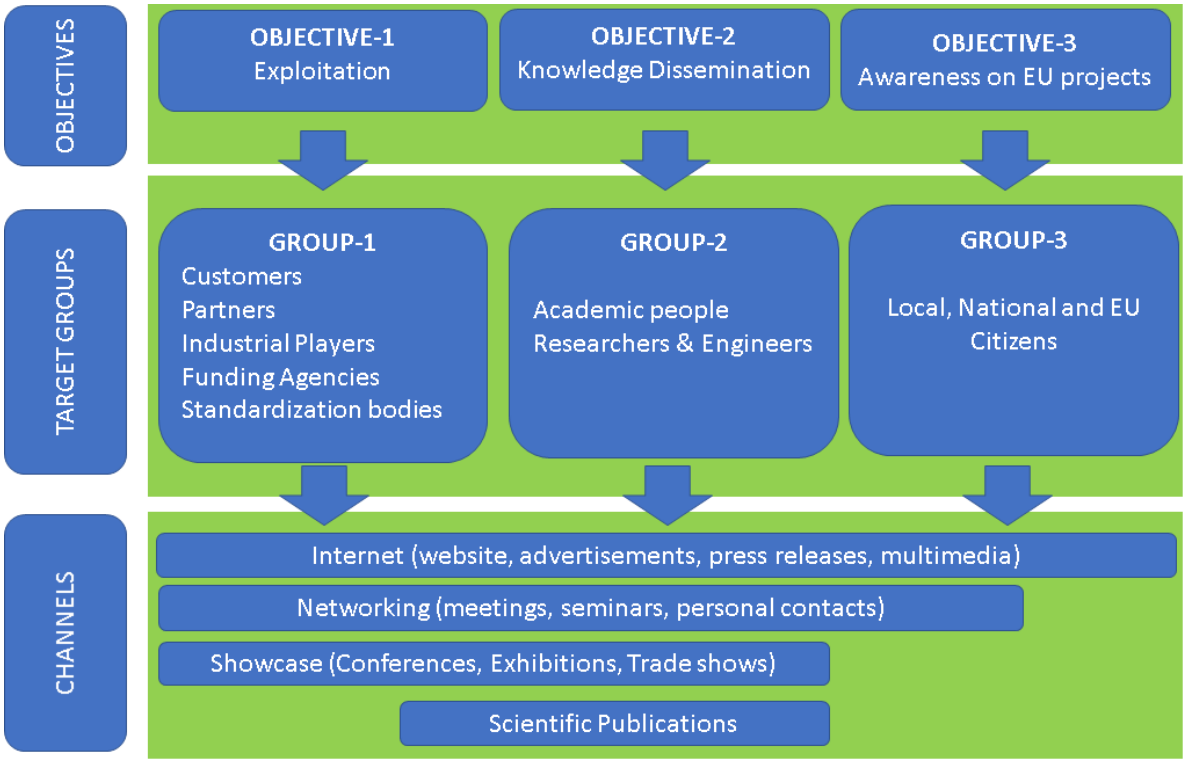


Fig.2 Target groups for each objective of DREAM dissemination and communication means.

Target Groups

The first communication objective, consisting of promotion actions to support the partners' exploitation plans, is focused to a target group which is mainly oriented to business activities and it is characterized by a solid technical background on the subjects of DREAM or complementary fields. For the industrial partners of the consortium, this group is mostly composed of consolidated customers, to which well-established communication channels are already available, and new potential customers that can be reached through the DREAM dissemination activity. For Research Institutes and University, this target group is primarily made of colleagues (of the same or other institution) and potential partners for new funding opportunities, funding agencies, and industry players that could be interested in establishing and supporting new research cooperation. Considering the characteristics and interests of this group, communication messages must clearly highlight the skills of the consortium, identify the innovation, technological advances and know-how expected from DREM project with respect to state of the art, and possibly report time to market for new potential products, market needs and business opportunities.

This target group includes also standardization bodies. Incidence on standardization is considered within the DREAM project (task 6.2 “Standardization & Regulation in D-band” is part of WP6). DREAM will be promoted within standardization groups by ST-I and Nokia-IT and know-how will be exploited for driving the standardization activities. The plans and outcomes of this task are described in detail in a dedicated project delivery [3].

The second communication objective, i.e. dissemination of the new know-how developed within DREAM, is oriented to the scientific community. This target group comprises academic people (professors, researches, students), researchers and engineers of public institutes and private companies. This dissemination activity will start as soon as relevant results from the different technical work packages of DREAM will be available. The most important communication mean is through presentations at international conferences and submission of scientific papers to international journals. Among the partners of the consortium, the Research Institutes and University are expected to be more involved in this kind of dissemination, being regular scientific publication activity a relevant part of their mission.

The third communication objective is to expand the public awareness about the relevance and importance of research projects funded by the European Community. The target group comprises EU population i.e. Local, National and European citizens. The group is characterized by the lack or just a shallow knowledge about technical or technological aspects. Therefore, attention has been placed in the selection and formulation of communication messages. To attract the interest of this group, the content of the communications has to highlight the needs of EU population, with emphasis on social and environmental impact. Moreover, in any kind of communication the composition of the DREAM consortium should be made clearly visible, with the purpose of highlighting the transnational cooperation between different partners and to give the perception about the importance to share knowledge in this way to strengthen the EU leadership and competition on strategic technological areas.

Communication Channels

The bottom part of fig.1 summarizes the communication means, grouped into different categories, that have been identified by the consortium.

Internet. Allowing to reach all the target groups, Internet will be a primary communication channel. A project web site has been realized to present the DREAM project and broadcast key messages. The website will be continuously updated, reporting news, events, project advances, and it will be used as a repository for scientific publications and presentations, according to the Open Access policy of H2020. The website and other internet resources of the partners, such as social communication channels, with an already established audience and network of followers, will be also exploited for advertisements, press releases, communications, and to redirect people to the main DREAM website.

Networking. Another relevant dissemination category comprises networking, with direct and bilateral human interactions. Industrial partners will promote the DREAM project and its results during face-to-face technical and marketing meetings with customers and with internal and external presentations. For Research Institutes and University, this communication mean includes lectures and invited speeches or seminars. Networking will mostly address the first two dissemination objectives and target groups, but during open science dissemination events, periodically organized by public Research Institutes and University, the DREAM project could be promoted also to a general public, reaching partially also the third target group.

Showcases. The first two target groups will be reached also through congressual events. Attendance to conferences, workshops, exhibitions is the third communication channel identified by the consortium. Based on inputs from the partners of the consortium, a list of such kind of events, suitable for promotion of the DREAM project, to present achievements or to disseminate the developed know-how, has been made and it is reported in the Table-I

Table-I. Showcase events suitable for DREAM dissemination.

Showcase Name	Type	Geographic Area	Domain
International Solid State Circuits Conference	Conference	International	Integrated Circuits
European Solid State Circuits Conference	Conference /Workshop	Mostly European	Integrated Circuits
European Microwave (EuMW)	Conference /Workshop /Exhibition	International	Microwave and mmWave components and Systems
International Microwave Symposium (IMS)	Conference /Workshop /Exhibition	International	Microwave and mmWave components and Systems
ICT Event	Conference /Exhibition	Mostly European	ICT community
European Conference on Networks and Communications (EuCNC)	Conference /Workshop	Mostly European	ICT community
IEEE International Conference on Communications (ICC)	Conference /Workshop	International	ICT community
European Conference on Antennas and Propagation (EuCAP)	Conference	Mostly European	Antenna design and propagation
ETSI ISG mWT meetings	Conference	International	Microwave and mmWave for telecom. systems
CEPT ECC SE 19 meetings	Conference	European	Regulation for Microwave and mmWave domain
ETSI ATTM TM4 meetings	Conference	Mostly European	Standardization for Microwave and mmWave solutions
Official ST web site	Announce-ment in electronic media	International	Advanced Semiconductor Technology

Scientific Publications. This communication channel consists in submitting manuscripts for publications on the proceedings of international conferences and journals for scientific dissemination. The primary target group is the research and scientific community. Producing papers accepted on conferences and journals with very high scientific reputation (i.e. high impact factor for the journals and limited acceptance rate for conferences) is a kind of measurement and proof on the relevance and impact of the scientific production of DREAM. This will rise the reputation of the consortium members and provides value to the partner's exploitation paths. Considering the relevance of this kind of dissemination, a dedicated section describing the planned approach and expected outcome is reported in this document (Section 1.6). Based on inputs from the partners of the consortium and WP leaders, a list of journals suitable for scientific publications, considering the different technological areas covered by the DREAM project, has been formulated and reported in Table II. The domain of each Journal is classified also considering the outcomes of each technical work-package of the project. Only journals compliant with the Open Access policy have been selected.

Table-II. List of Scientific Journals suitable for DREAM dissemination.

Journal Title	Publisher	Geographic Area	Impact Factor	Green Open Access	Domain	DREAM WP
Journal of Solid State Circuits	Institute of Electrical and Electronics Engineers (IEEE)	International	4.18	Yes	Integrated Circuits	WP-2
Transactions on Circuits and Systems	Institute of Electrical and Electronics Engineers (IEEE)	International	2.41	Yes	Integrated Circuits	W-2
Transactions on Microwave Theory and Techniques	Institute of Electrical and Electronics Engineers (IEEE)	International	2.90	Yes	Microwave and mmWave components and Systems	WP-1 WP-2 WP-3 WP-4 WP-5
Microwave and Wireless Components Letters	Institute of Electrical and Electronics Engineers (IEEE)	International	2.17	Yes	Microwave and mmWave components and Systems	WP-1 WP-2
Antennas and Wireless Propagation Letters	Institute of Electrical and Electronics Engineers (IEEE)	International	3.45	Yes	Microwave and mmWave components and Systems	WP-1 WP-3

1.5 Key Messages to Broadcast

Providing broadband wireless communications to a majority of European citizens is a major objective of the European Commission. The relevance of the topic, which is the core of the DREAM project, can be understood and well appreciated by all the identified target groups, spanning from potential customers, academic people, researchers and general public i.e. EU citizens not specifically involved in technical or engineering jobs.

DREAM fosters the research and development of advanced, cutting-edge technologies for wireless high data rate communication links, able to cope with the requirements of future cellular networks beyond 5G. The results of the project will contribute to the increase of the mobile backhaul and front haul capacity, addressing the explosive growth of data traffic in present days and in the near future. The technology developed by DREAM will also contribute to a reduction of the costs and power consumption (green radio) of high data rate small cell backhaul/fronthaul links in D-band.

Key messages have been identified for the general promotion of the DREAM project. They will be reported on communication media such as web-site and press releases and adopted to produce promotion material to be used in events like conferences, exhibitions, seminars.

The key messages summarize the DREAM background and explain the project vision and objectives in a simplified manner such that they can be appreciated by all the targeted groups.

Background With a current annual growth rate in the range of 70%, the mobile data traffic of the smartphones, tablets, machine-to-machine and other portable devices dramatically challenges the wireless cellular network which is currently under deployment. Nowadays, there is a shared vision among industry, operators and academy that future wireless networks will have to provide wideband wireless access and ubiquitous computing anywhere and at any time. The human life of the majority of the EU citizen will be surrounded by intelligent wireless sensors, which will bring radical changes to the way we live and do things. Supporting this scenario is a challenge for network operators and wireless network infrastructures and it will demand a tremendous performance improvement of medium range wireless infrastructure. High data-rate millimeter-wave (mmWave) technologies, that demonstrate striking capabilities for the short- and medium-range wireless communications, can bring a tremendous performance improvement. But several technical challenges needs to be addressed by a convergence of advanced semiconductor nanotechnology and a robust wireless infrastructure meshed network with seamless fiber performances.

DREAM Vision DREAM' vision of 5G and beyond mobile networks is a heterogeneous network composed of sub-6 GHz macro-cells overlaid by small cells providing radio access in mmWave frequency bands. These small cells are linked together and to the core network through high data rate wireless backhaul link operating in D-band. While macro-cells will provide broadband and high Quality of Service coverage over extended areas and support mobility, mmWave small cells will enable very high data rate radio access to mobile users and extended traffic capacity locally, for instance in areas with a high density of users or with specific needs for high-data rate communications. In this concept, small-cell off-loading technology developed in past and current networks will allow managing the traffic and splitting the data/control traffic when possible to benefit from the improved performances available in mmWave small cells. DREAM work is focused on the 130-174.8GHz band (D band), which is currently available and benefits of a very huge bandwidth and then of a very high data rate potential throughput.

DREAM Objectives The main goal of the DREAM project is to enable wireless links with data rate exceeding current wireless solutions by at least a factor of 10 by the exploitation of the radio spectrum in D-band (130-174.8GHz) with advanced silicon microprocesses, and by implementing antenna array beam forming technology.

In a very short statement:

DREAM will bring wireless systems to the speed of optical systems

has been selected as a slogan for the project, allowing to express very well and in a concise way the key challenges and potential breakthrough of the technology that will be developed by the consortium.

More specifically, the technical objectives can be outlined as follow:

Objective 1: demonstrate the feasibility of low-cost silicon transceiver analog front end enabling link data rate up to 100Gb/s in D-band. The project targets to enable innovative mmWave systems beyond 100GHz delivering data rate exceeding current wireless backhaul solution by at least a factor of 10.

Objective 2: provide mobile access to content-rich data using a fast and broadband link, which faces the challenge of bringing mmWave radios to both the access points and the User Equipment (UE) in order to exploit the large bandwidth available. Fast mobile broadband access, with low latency enabling high speed end-to-end connectivity even at the cell edge (100Mb/s minimum), will be enabled by the D-band very high throughput inter-small cell backhauling links.

Objective 3: Reduction of the power consumption of the access and small cell backhaul links (green radio): the use of mmWave radios and directive antennas in the short distance links (user access and small cell backhaul) results in a reduced emitted power requirement, more efficient transmitter implementation and a better efficiency of the spectrum usage (higher order modulations with large spectral efficiency can be used due to the more favourable link budget and lower interferences). The project targets to reduce significantly the radios and network power consumption by using mmWave in comparison with existing solutions using lower frequency bands.

Objective 4: Increase the flexibility and the cost saving of the operator networks. The D-band inter small cell backhauling can route data hungry application traffic to fibre network available close to the access points. To optimize the inter-small cell data transferring, to get flexible backhauling and network mesh re-configurability, an important feature of the link solution will be the antenna beam steering functionality.

1.6 Scientific Publications

A significant effort is planned for transferring findings and new knowledge developed within DREAM through the main dissemination channels for scientific achievements, such as presentation at international conferences and manuscripts submitted to scientific journals.

This kind of dissemination is prone to the risks of violating ownership of the results, intellectual property rights or to share information which is believed to be sensitive or strategic for the exploitation of the results by the consortium or few specific members. Therefore, precise rules have been set-up. The principles that will be followed by all the consortium partners are defined and agreed in the DREAM Consortium Agreement [4]. In summary, prior notice of any planned publication shall be shared with the consortium at least 45 calendar days before the publication. In this way each partner can rise objections in case of issues related to confidential information, violation of other partner results or background.

In agreement with H2020 rules [5], green open access will be favoured, where post-prints or publishers' PDFs of the research publications will be made available through one or more of the partners' institutional repositories and on the project portal, at no charge, and after an embargo period of between zero and six months has elapsed, depending on publisher policy. Where green open access is not possible in a particularly desired target publication, the policy is to make a once-off payment, as per gold open access, to the publisher to ensure open access to the publication. This publication will then be accessible from the journal website, as well as being placed on the institutional repositories of one or more partners. Gold open access fees will come from the project budget. As open access is mandatory, publishers that do not allow green or gold open access will not be chosen for dissemination. Funding Acknoledgments in accordance to the Grant Agreement [1] will be included in all the scientific publications.

This formulation is proposed for acknowledgment: "*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 761390"*

The dissemination of scientific results is planned to start from the second year till the conclusion of the project and beyond. All the five technical work packages of DREAM are expected to generate new knowledge worth of publication. Scientific Journals suitable for publications of the activities of each WP have been identified and listed in Table II. The scientific outcomes of each WP are briefly summarized below:

WP1 (Applications, Technology Specifications and Architectures) investigates the heterogeneous wireless network with mmWave small cell access and backhauling. System requirements for small-cell D-band access point and radio transceivers will be developed following a top-down approach and considering different scenarios and use cases. WP1 will provide analysis of D-band frequency arrangement, correspondent regulation and propagation characteristics, and new knowledge about modelling and simulation of the ultra-high capacity wireless networks.

WP2 (Radio analog front end for antenna beam steering) will cover the development of all the D-band radio transceiver functional blocks, such as IQ-mixers, low-noise amplifiers, frequency multipliers, power amplifiers, frequency multiplication, LO generation and distribution in 55nm BiCMOS technology. D-band is presently a domain for niche applications, where very expensive III-V technologies are used. The purpose of WP2 is to demonstrate the viability of silicon to ensure cost effectiveness, compactness and amenability to mass fabrication of D-band radio transceivers. The potential of silicon will be fully investigated. New knowledge about design, simulation and verification techniques, suitable for a silicon VLSI technology are expected from WP2.

WP3 (*Antenna Technology Including Beam Steering Control*) devises low form factor directive steerable planar antenna array solutions suitable for D-band applications. The expected results in terms worth of scientific disseminations are the following: (a) comparison of different beam steering techniques such as phased arrays, reflect arrays…(b) study of solutions for mutual coupling reduction between array elements (c) design and testing of medium-gain beam steering antenna array (d) investigation of co-simulation approaches of antenna elements with RFICs.

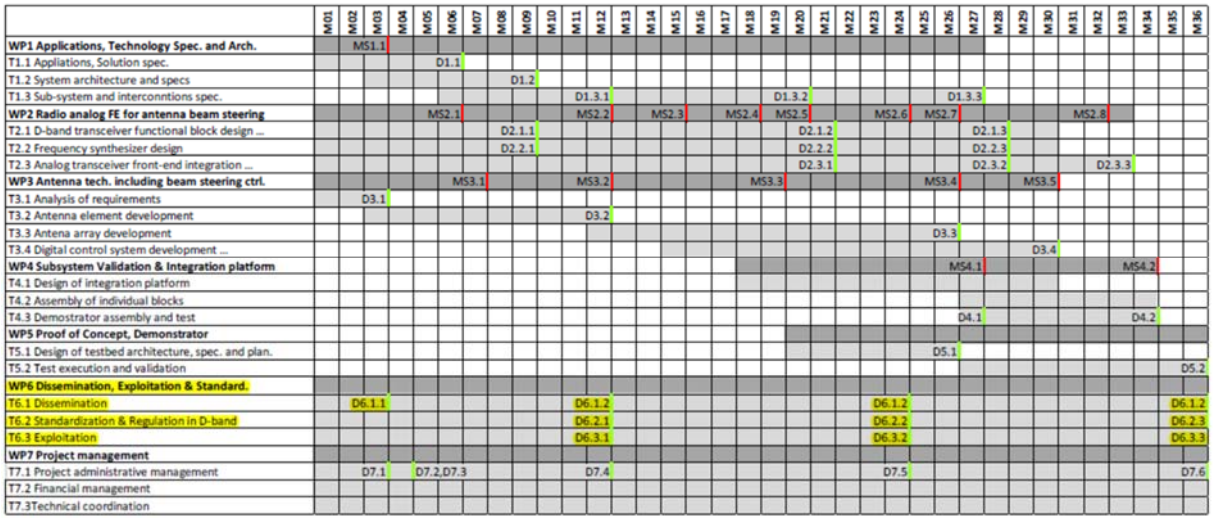
WP4 (*Subsystem Validation and Integration platform*) will deliver D-band radio front end prototype modules, including the integration of the analog transceiver chips with the beamforming antenna array. New knowledge will be developed by investigating and comparing suitable integration platform technologies, such as low-temperature co-fired ceramics (LTCC), liquid crystal polymers (LCP), PTFE films.

WP5 *(Proof of Concept, Demonstrator).* The activity of this WP is aimed at providing the final D-band short-haul ultra-high-speed transceiver demonstrator. In specific, the radio transceiver and antenna array will be driven in real time by a base-band unit, able to handle a high throughput, perform basic functionalities like synchronization and channel estimation and to manage the wireless connection. The demonstrator allows to perform true tests on the field, considering many different scenarios and use cases. The knowledge gained from this kind of experimental results will be of very high scientific interest.

1.7 Consortium Action Plan

The Gantt chart of DREAM, taken from the project proposal, is shown as Table III. This chart details the timing of the work packages and the tasks to be done in each one. It indicates the dates of project deliverables as well together with the timing of the milestones. The highlighted parts are referred to WP6.

Table – III. DREAM Gantt chart with Deliverables and milestones. WP-6 is highlighted.



The resources available from each project partner to carry out WP-6, which includes communication activities, are summarized in the Table IV:

Table IV: WP-6 resources

Partners	Resources (PM)	Budget for personnel costs
VTT	5	38.735,69 €
Ceit-IK4	4	16.893,36 €
ST-I	2	11.840,00 €
III V LAB	1	8.319,73 €
ERZIA	2	7.194,70 €
NOKIA	4	23.600,00 €
UNIPV	9	32.968,42 €

Table V lists the communication actions scheduled by the consortium, based on the objectives and analysis proposed in this document.

Table V. Consortium action plan for DREAM communications.

Partner taking leadership	Action	Content / Purpose	Time
UniPV	realization and update of DREAM website	General project presentation, news, progress & repository	M3
UniPV	Realization of DREAM promotion material (poster, flyer…)	Background, vision and objectives of DREAM	M3
All	Project promotion through individual channels	Background, vision and objectives of DREAM	M3
VTT	Bridge with other H2020 projects on similar topics	Promotion of the project	M6
Nokia & ST-I	Shape the standardization and regulation	Promotion of the project within standardization and regulatory bodies. Shape the regulation aspect and the standardization for fitting with DREAM	M6
Research Institutes & University	Scientific publications on journals and conferences	New knowledge and scientific results	M12
Industries	Whitepapers, participation to exhibitions, trade-shows	Technological achievements of DREAM, possibly with demo	M24
All	Contacts and networking with customers, partners, industry players	Higlight of DREAM achievements for Exploitation	M24

Partner's Specific Plan

The following tables report individual promotion and dissemination need, and the actions scheduled by each partner within the framework of DREAM project.

VTT				
Communication needs	**Target Audience**	**Key contents**	**Means / channels**	**Time**
Attract new commercial contracts	Industry and other research organizations	Presentation of the project, with emphasis on opportunities for industry	(a)Presentations the project to potential customers (b) Poster and flyer in industry events	M0
Strengthen existing collaborations and start new ones. Involvement in new funded projects	Other research organizations. Companies interested on the topic of the project	Presentation of the project with emphasis the contributions and achievements of VTT, know-how and skills gained from this project.	(a) Seminars in other Universities and Companies. (b)Presentations at international conferences. (c)Scientific publications on international journals	M6
Rise the scientific reputation and visibility of the VTT	Scientific community	Results of scientific relevance, new ideas	(a) Presentations at international conferences. (b) Scientific publications on international journals	M18

Ceit-IK4				
Communication needs	**Target Audience**	**Key contents**	**Means / channels**	**Time**
Attract new and talented students to Research Center labs	Students currently attending Degree and/or Master programs in TECNUN (Universidad de Navarra)	Presentation of the project, with emphasis on challenges and training opportunities for high-tech future job positions	(a)Presentations and seminars to students	M12
Strengthen existing collaborations and start new ones. Involvement in new funded projects	Universities, Research Centers and Companies interested on the topic of the project	Presentation of the project with emphasis the contributions and achievements of CEIT, know-how and skills gained from this project.	(a) Presentations to potential clients/partners. (b)Presentations at international conferences. (c)Scientific publications on international journals	M3
Rise the scientific reputation and visibility of the Research Center	Scientific community	Results of scientific relevance, new ideas	(a) Presentations at international conferences. (b) Scientific publications on international journals	M18

ST-I				
Communication needs	**Target Audience**	**Key contents**	**Means / channels**	**Time**
Knowledge sharing	Internal and external, general public, key customers, scientific community	Semiconductor technologies, new IP for MMW front end enabler, silicon based chip set for cellular network infrastructure	Presentations, announcement in electronic media	M24
Announcements and Advertisements	Potential ST's customers	Semiconductor technologies, new IP for MMW front end enabler, silicon based chip set for cellular network infrastructure	Presentations, announcement in electronic media, ST's official web site	M30

III-V Lab				
Communication needs	**Target Audience**	**Key contents**	**Means / channels**	**Time**
Attract candidates for a CIFRE PhD program III-V Lab intends to put in place to strengthen the design and innovation effort within DREAM project.	Students currently attending Master programs and/or Engineering Schools programs	Presentation of the PhD subject and DREAM project, with emphasis on the industrial research dimension and perspectives offered by the French CIFRE program	(a)Presentations and seminars to students through contacts in universities and engineering schools (b) Poster and flyer in University events (c) Add project info on the Lab website	M0
Strengthen existing collaborations and start new ones. Involvement in new funded projects	Colleagues of other affiliations (universities, institutes, companies, etc.).	Presentation of the project with emphasis the contributions and achievements of III-V Lab, know-how and skills gained from this project.	(a) Seminars. (b)Presentations at international conferences. (c)Scientific publications on international journals	M12
Rise the reputation and visibility of III-V Lab	Industrial community	Results of technical and industrial , new performances demonstrated, new system applications enabled	(a) Presentations at international conferences. (b) Scientific publications on international journals	M18

ERZIA				
Communication needs	**Target Audience**	**Key contents**	**Means / channels**	**Time**
Attract new and talented Engineers	Students currently attending Master program at University of Cantabria	Presentation of the project, with emphasis on challenges and training opportunities for high-tech future job positions	Presentations and seminars to students	M12

NOKIA				
Communication needs	**Target Audience**	**Key contents**	**Means / channels**	**Time**
Rise international credibility, visibility and reputation among Customers	Customers: Mobile operators	Presentation of the project with emphasis on contributions and achievements of NOKIA, know-how and skills gained from this project	Presentations and seminars during internal workshops	M0
Attract new commercial contracts anticipating competitors	Customers: Mobile operators	Presentation of the project results as potential feasible solution for current and future cost effective solutions	Presentations and seminars during internal workshop	M6
Strengthen its network of cooperation and expand it finding new potential partners.	Technology providers	Presentation of the project, with emphasis on challenges need to be cope looking for innovative and cost effective solution	1) Presentations to potential partners. 2)Presentations at international conferences.	M0
Shape the standardization and regulation path	Operators and national administrations (regulators)	Presentation of the project, with emphasis on DREAM needs for regulation (spectrum mainly) and standardization (mainly for CE mark)	1)presentation to the regulators 2) presentation to the standardization	M6

UniPV				
Communication needs	**Target Audience**	**Key contents**	**Means / channels**	**Time**
Attract new and talented students in Master and PhD programs	Students currently attending Bachelor and/or Master programs in UniPV and other Universities	Presentation of the project, with emphasis on challenges and training opportunities for high-tech future job positions	(a)Presentations and seminars to students (b) Poster and flyer in University events (c) Add project info on the Lab website	M0
Strengthen existing collaborations and start new ones. Involvement in new funded projects	Colleagues of other Universities. Companies interested on the topic of the project	Presentation of the project with emphasis the contributions and achievements of UniPV, know-how and skills gained from this project.	(a) Seminars in other Universities and Companies. (b)Presentations at international conferences. (c)Scientific publications on international journals	M6
Rise the scientific reputation and visibility of the University	Scientific community	Results of scientific relevance, new ideas	(a) Presentations at international conferences. (b) Scientific publications on international journals	M18

2. Progress Monitoring

2.1 Project Identity

A visual identity has been given to the project by designing a logo that reflects precise aesthetic canons to communicate in an effective and not misunderstanding way the soul of the project. It's the best way to unite the partners within the project, representing DREAM to the society.

The Logo provides the project's intention right from the start, by expressing the core concepts of the project (the overcoming of the present mobile communication network and the introduction of beyond 5G technologies). The logo includes the dissemination to all partners to be used in all communication materials. It will be used for the whole duration of the project for any deliverable, report and dissemination tool.

The logo, reported in Fig. 3, is publicly visible on DREAM website. A common template for slides, reflecting the colours and graphic aspects of the Logo, has been also created and shared within the consortium. It is used in all the related DREAM presentations (internal or external).

Fig. 3. DREAM logo.

2.2 Project E-platform

A DREAM e-platform has been created, consisting of a dedicate project web portal to broadcast public information, milestones, advancements of the project, announcements and all the related scientific publications. This platform is one of the the main communication channels of the project, since it is publicly accessible to everyone. It has been implemented and is managed by UniPV partner through an external agency. The website is online from M3, i.e. November 2017.

The website can be consulted at the following url: http://www.h2020-dream.eu/

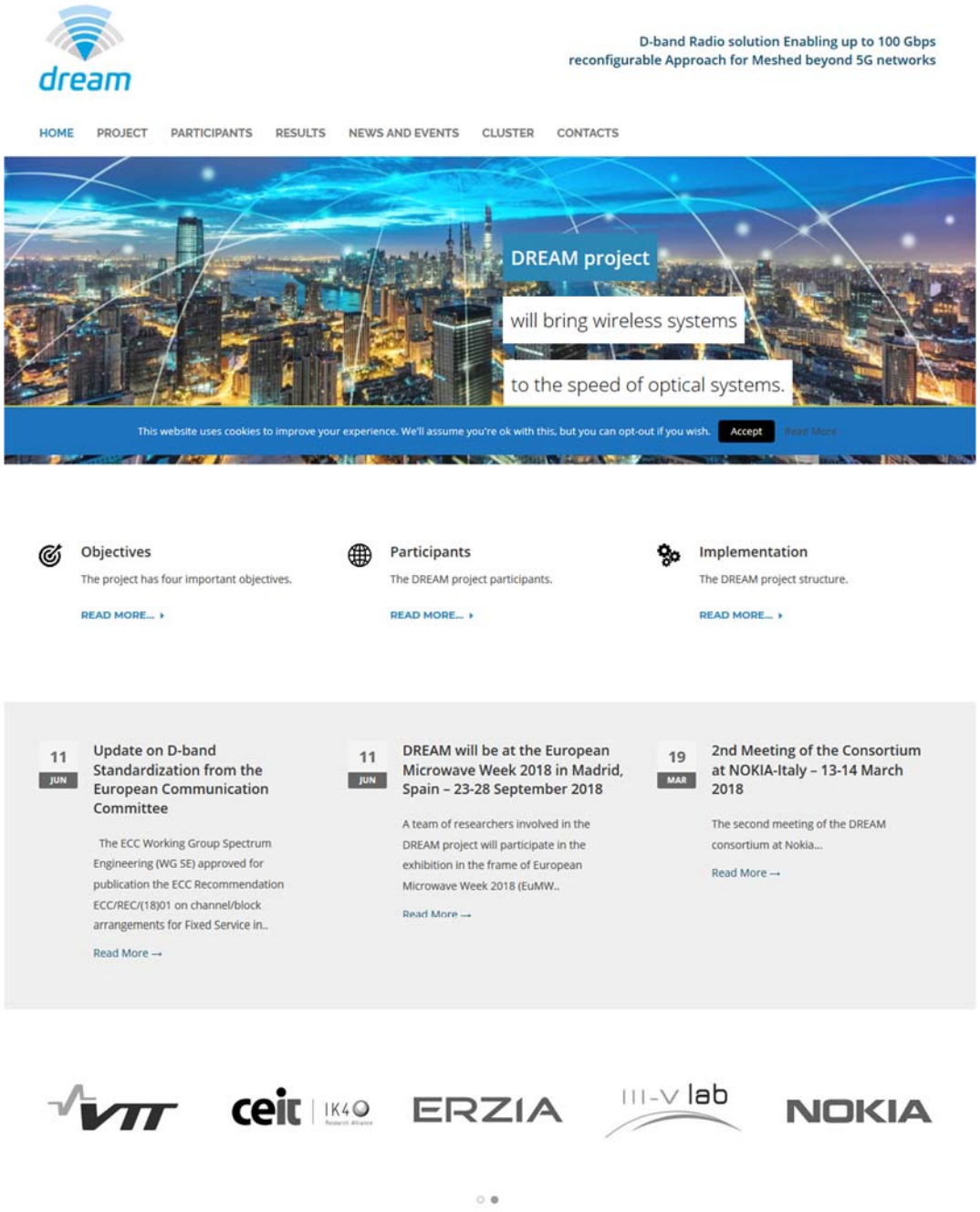


Fig. 4. Home page of the DREAM web page.

DREAM website contains all important facts about the project, which have been divided in five sections:

(1) Project,

(2) Participants

(3) Results

(4) News and events

(5) Cluster

Priority has been given to the news section, which is being constantly updated with the latest information. The page shows the project path since the kick-off meeting held in September 2017. Here is a list of the published news until June 2018:

Published News	**Date**
Update on D-band Standadization from the European Communication Committee	June 2018
DREAM will be at the European Microwave Week 2018 in Madrid, Spain – 23-28 September 2018	June 2018
2nd Meeting of the Consortium at NOKIA-Italy – 13-14 March 2018	April 2018
The DREAM project has been presented at the ETSI ISG mWT meeting #10	March 2018
The DREAM project is presented at Workshop on TeraHertz Communication – March 7, 2018	Feb. 2018
OFCOM UK: Fixed wireless spectrum strategy	Jan. 2018
NOKIA leading effort to push for spectrum above 95GHz	Jan 2018
ETSI TM4 started to work on the new WI deals with D Band – 13-15 December 2017	Jan 2018
ECC D-Band recommendation ready for approval phase and for public consultation – 4-5 December 2017	Dec. 2017
DREAM kick-off plenary meeting in VTT-Micronova – 3-5 Sep. 2017.	Nov. 2017

DREAM website is being regularly updated based on activities and news that are coming up during the project.

Web-Site Monitoring

Close monitoring based on analytical tools have been used to improve the website's efficiency. This enables the consortium to monitor the interest shown to the platform as a result of the dissemination activities undertaken.

Relevant data are shown in Fig.5 from the beginning of the creation of the website to the end of the month of July, which correspond to M3-M11 of the DREAM project.

The website's chart gathers statistics on the number of visitors, which is very positive. The total amount of visits in 9 months is 5834. The number of visits had been almost constant during the first 6 months, with the exception of the peak of January that recorded almost 1600 visits; in the last 3 months there has been a remarkable increase in the number of visits, settling around 1000 per month. Most of the visitors are returning users (69%), that have already been on DREAM website before and are interested in our project. The percentage of new visitors (31%) is also significant and it means that we have been able to attract new audience.

The bottom plot in Fig. 5 groups the visits from geographical areas and demonstrates a good international visibility. In the examined period, the website has been accessed from over 40 countries around the world. The largest amount of visitors comes from Italy (14,9%), followed by USA (7,8%) and India (5,2%).

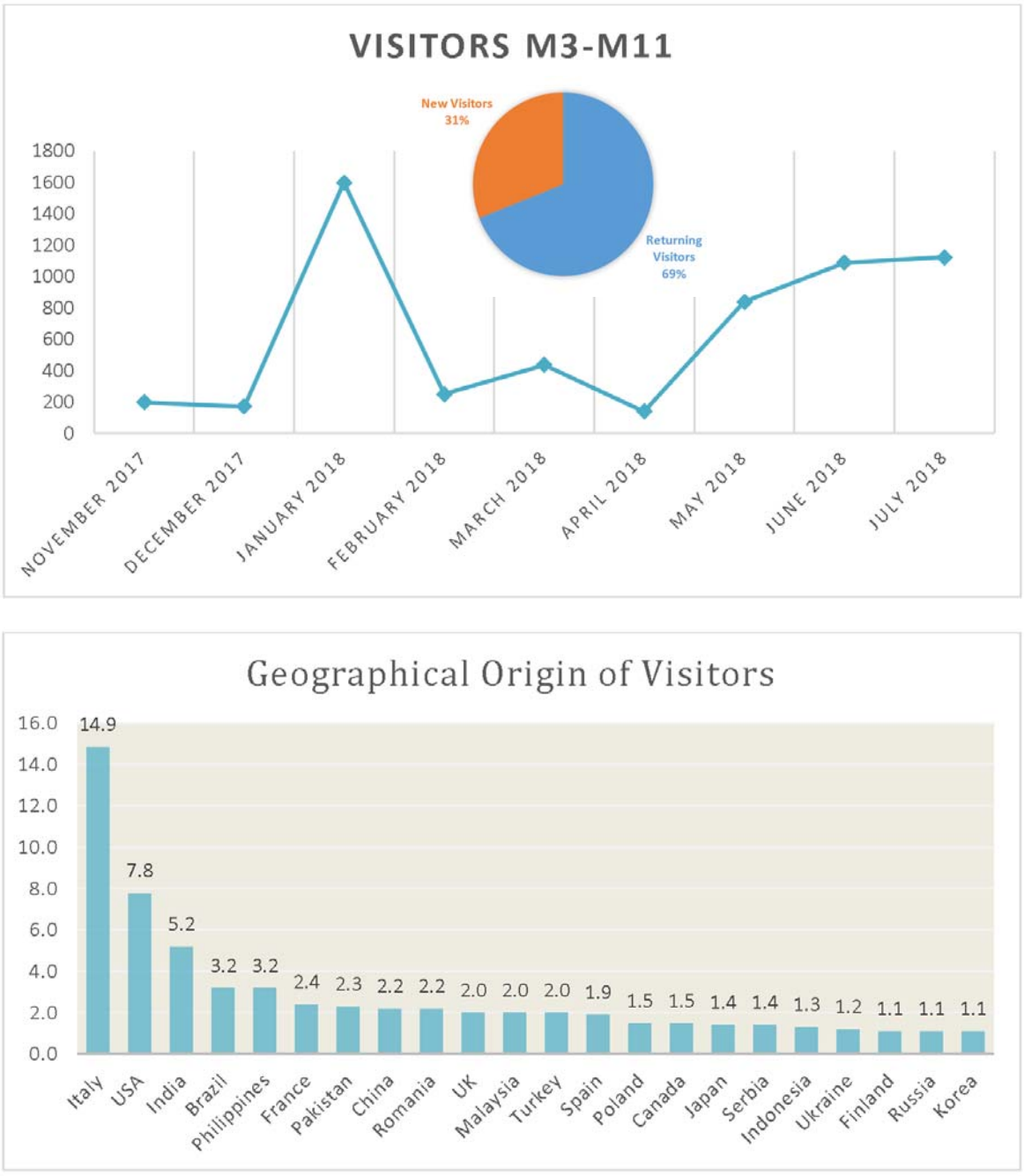


Fig. 5. Visits to dream web-pages (top plot) and origin of the vistors (bottom plot).

2.3 Bridge with other EU projects

Starting from January 2018 (M5), a cluster of UE projects of the same call, H2020 ICT 09-2017 “Networking research beyond 5G” has been established. The purpose is to promote the respective projects within the cluster and to set-up shared and common promotion activities to reach a wider audience and improve the impact of communications. A cluster page is included in the DREAM web-site and reported in Fig. 6. A similar page, with links on the DREAM web site is publicized by the other projects.

Fig. 6. ICT-09-2017 Cluster page.

2.4 Promotional Material

A series of dissemination materials have been produced, in order to define and maintain the common identity of the project, raising its visibility to the public and all the partners through promotional activities.

All the materials will be distributed at the events attended by the partners in order to increase the visibility of the project and extend our network and contacts.

1. Slides for presentation of the DREAM project have been prepared and shared within the consortium for individual promotion. The slides, shown in Fig. 7, summarize the key messages described in this document, i.e. background, vision and objectives of DREAM. In addition, the project organization and consortium composition are presented.

Fig.7 Shared slides for individual DREAM promotion actions.

2. The leaflet (Fig.8) shows a complete view of the project, describing the vision, the objectives, the work plan and the project solution. The main purpose of the leaflet is to provide our audiences with an attractive and written overview of the main project objectives and characteristics. All partener's logos are also displayed on the back page, alongside with DREAM website address. To assist the dissemination effort, the leaflet will be soon published on the project website.

Fig.8a. Leaflet external side.

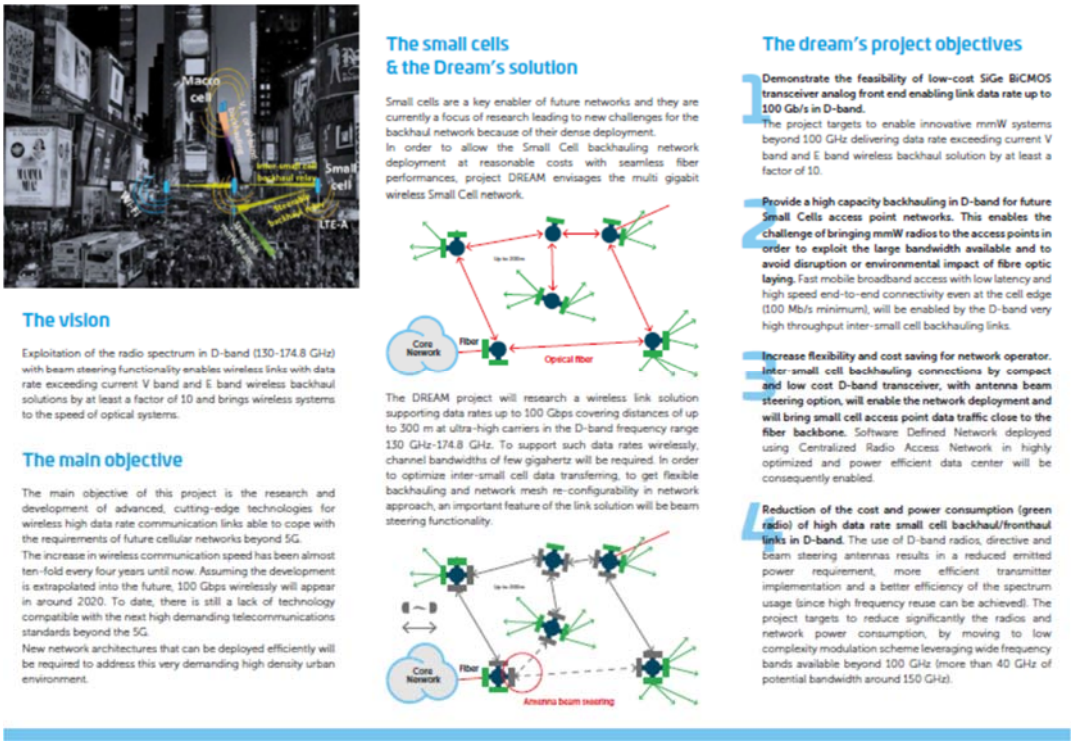


Fig.8b. Leaflet internal side.

3. Alongside the leaflet, a professional A0 paper size poster has been created (Fig.9). The purpose is to catch the audience attention, focusing mainly on the visual aspects. An important part has been given to diagrams and figures which illustrate the core of the project. From the content point of view, the poster of DREAM illustrates its objectives, work plan and includes basic information on the project, together with all partners' logos. The poster will be published on the website and will be available for download.

Fig.9. DREAM poster.