NanoElectronics Roadmap for Europe: Identification and Dissemination

D7.4	Dissemination, Communication and Data Management plan update		
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ABSTRACT:

This report of the Project "NanoElectronics Roadmap for Europe: Identification and Dissemination" (NEREID) is an update of the "Dissemination, Communication and Data Management plan" given in D7.3. It gives an updated description of the project's dissemination idea to start from a dissemination subject (all publishable NEREID results including the evolving roadmap) and perform different dissemination actions/tools to reach the dissemination objectives.

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[1] PU = Public; CO = Confidential, only for members of the Consortium (including the EC services).

[2] R = Report; R+O = Report plus Other. Note: all "O" deliverables must be accompanied by a deliverable report.

[3] eg DX.Y_name to the deliverable_v0xx.   v1 corresponds to the final release submitted to the EC.

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7 Status = "Draft"; "In Review"; "Released".

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TABLE OF CONTENTS

Introduction

The objective of NEREID is to define a new roadmap for Nanoelectronics in Europe covering research from Beyond CMOS to Heterogeneous Integration/More than Moore, in this way complementing the Multi-Annual Plan of ECSEL. Thus, it is leveraging the strengths and needs of the European eco-system, in order to identify early promising novel technologies and to help focusing resources on key R&D topics all along the innovation chain.

Therefore, NEREID has based its roadmap on the requirements of the European semiconductor and application industry and on the achievements of other European initiatives, in particular on the initiative "European Nanoelectronics Infrastructure for Innovation" (ENI2) and the commission's coordination action "Ecosystems Technology and Design for Nanoelectronics" (NANOTEC). Involving a large group of industrial and academic experts, NEREID covers all TRL's, with a clear identification of short-term objectives while the focus is set on medium- and long-term objectives and priorities.

In this context, the promotion of a wide dissemination through linked European organizations is mandatory. Thus, the roadmap has been and will be disseminated by all NEREID partners and

participating academic and industrial organizations, to be used as reference for future European, regional and national research programs. Last but not least, it will contribute to the International Roadmap for Devices and Systems (IRDS) as its European representative. The dissemination plan in D7.2. includes a concept of data management, which has been regularly updated.

1.   Dissemination

1.1   Introduction

One of NEREID project's main purpose is to disseminate its result, the "NanoElectronics Roadmap for Europe" to a broad audience engaged in Micro- and Nanoelectronics coming from industry and academia as well as to policy makers and public authorities especially at European level. This will be carried out by all partners following the NEREID dissemination idea.

1.2   Dissemination Idea

The following picture illustrates schematically how the dissemination of NEREID works.
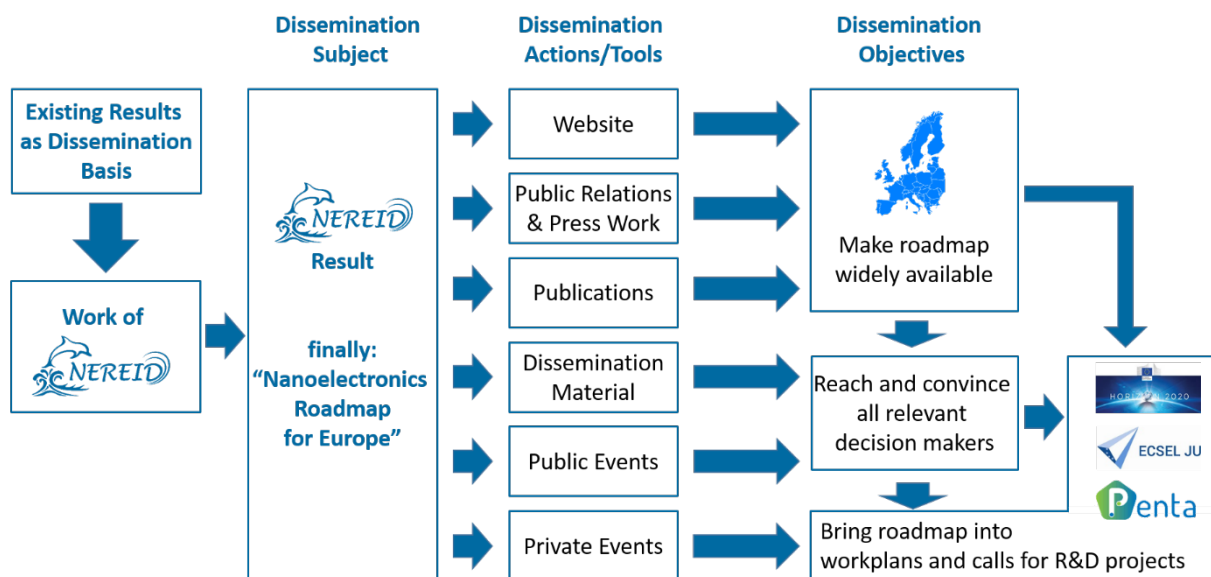

Figure 1 The NEREID dissemination concept.

Starting from existing results in the field as a dissemination basis, the project's work will lead to the dissemination of the "NanoElectronics Roadmap for Europe by different dissemination actions/tools (3rd column of figure 1) in order to meet the three main dissemination objectives (4th column of figure 1). In the Deliverable 7.2., The blocks shown in figure 1 have already been explained in detail in the deliverable D7.2..

Each dissemination action undergoes the IPR validation process foreseen in the consortium and grant agreements and is therefore submitted to the NEREID General Assembly for approval.

1.3 Dissemination Actions/Tools

To bring the NEREID roadmap to the attention of decision makers in Micro- and Nanoelectronics and to make it widely available, NEREID foresees dedicated dissemination actions/tools:

- **Website**:

    A regularly updated dedicated public web portal, where NEREID results will be available;

- **Public Relations and Press work:**

    PR (i.e. mailings, press, …) to bring NEREID ideas and news to the targeted audience;

- **Publications:**

    Contributions to other national and international workshops and conferences, peer-reviewed scientific and technical Journals and general publications;

- **Dissemination Material**
    - Production and distribution of leaflet(s) /presentation of poster(s) introducing NEREID and its results
    - Multimedia (e.g.,. videos) for information purposes;
    - Prepare electronic and paper version (also downloadable) of the roadmap;

- **Events**
    - Organize NEREID side events and presentation at major European ICT conferences
    - Presentation of NEREID results to relevant organizations, expert groups and networks (public and private)
    - Participation of NEREID representatives in international meetings for developing collaborations with countries outside the EU, which are key players in the field of Nanoelectronics
    - Organize at least one dissemination Workshop related to one major ICT event in Europe (EFECS2018 in Lisbon has been chosen) ;

1.3.1 Website

A website (www.nereid-h2020.eu) has been set up and is updated regularly providing different communication functions. The website is used as external (open access) and internal (password-protected) communication tool as described in deliverable 7.1. It will be maintained even after the end of the project, for future roadmap activities. Several indicators check the efficiency of the webpage: number of hits, visits and downloads. The following graph in figure 2 shows a rather constant number of visitors along the last 500 days. Remarkable are the peaks, which correspond to events, where NEREID was present: The first peak in March/April 2017 corresponds to the 2nd General Workshop. Some enhanced activity is visible in late summer around September 2017, where NEREID presented the Mid-term roadmap during ESSCIRC/ ESSDERC. Finally the large peak in December 2017 corresponds to the presentation of the Mid-term roadmap at EFECS in Brussels and the cross-domain workshop in Barcelona.
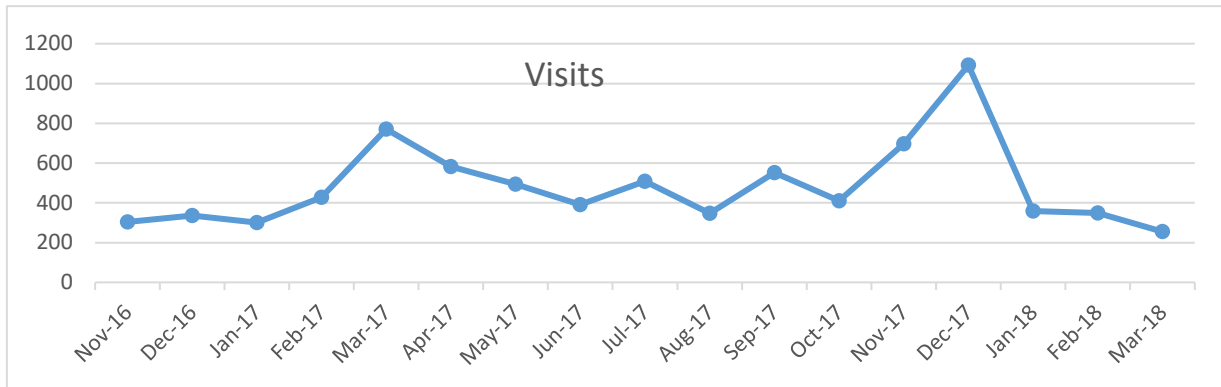
Figure 2 Visits at the NEREID website since November 2016.

The distribution of the visits per country is from all continents but mainly from Europe 80.7%, followed by Asia with 9.5%, Northern America with 7.1% and the other with 2.70%. The following figure 3 shows the distribution of the visits per country for all countries which are above 1%.
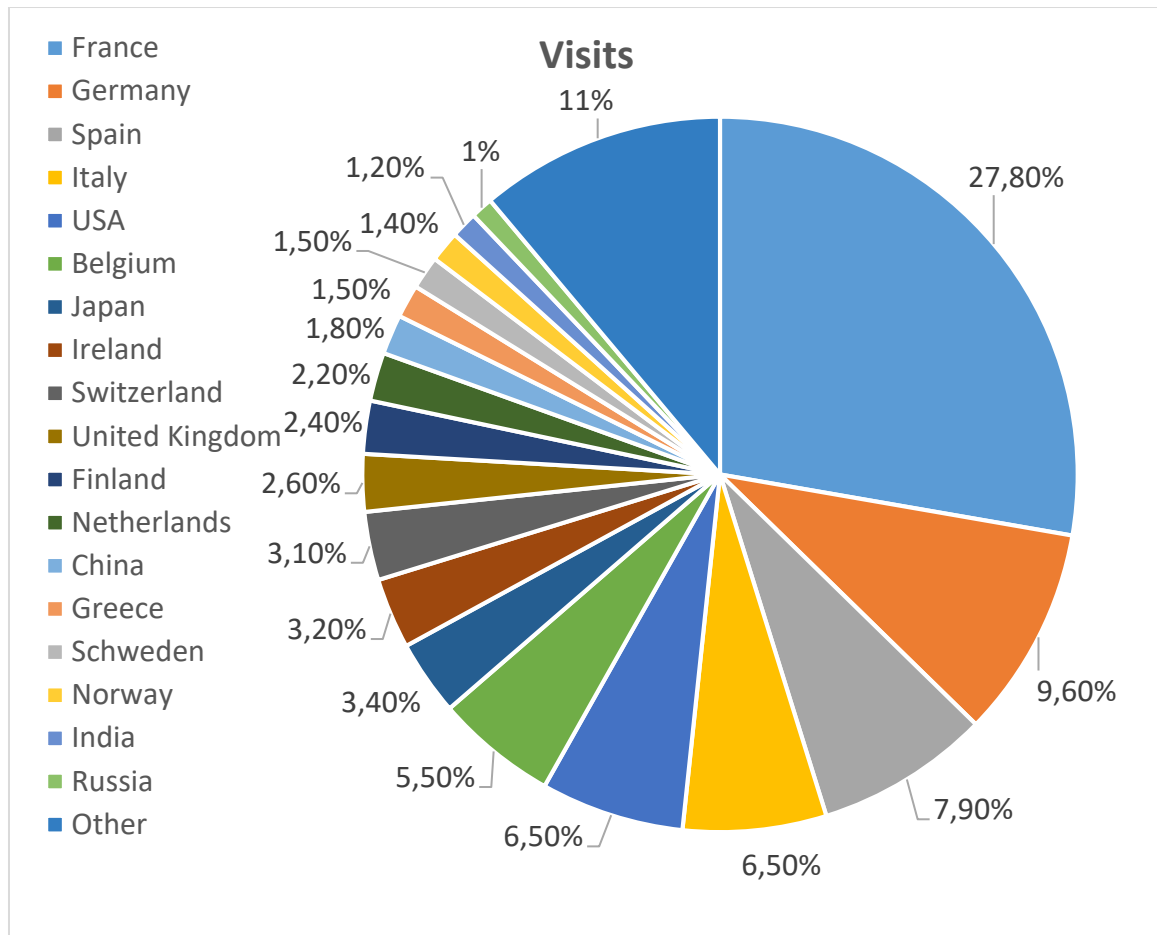

Figure 3 Visits at the NEREID website since November 2016.per country

The open-access part of the Action website contains information on NEREID for the general public. This comprises general information on NEREID and its recent results, information on NEREID General and Domain Workshops, events related to NEREID, publications and links to the participating institutions.

6

The password-protected part of the NEREID website is the fundamental communication and data management tool for the project members as described in section 2 of this report.

1.3.2 Public Relations and Press Work

To bring and spread the NEREID ideas, goals, achievements and news to the targeted audience and to the general public, three press releases have been written and distributed, which are also available at https://www.nereid-h2020.eu/press/pressreleases):

- February 2016: "H2020 project NEREID has been launched to map the future of European Nanoelectronics"
- April 2016: "H2020 project NEREID collected recent application needs to map the future of European Nanoelectronics"
- December 2017: "H2020 project NEREID presents the first version of its roadmap on the future of European Nanoelectronics"

Further press releases will be released. Several partners have submitted and will submit the press releases to a local, national media and have included and will include a link to it on their websites.

Schedule: It is planned to release at least one press release per general or domain workshop if publishable content is carried out from that event. Additionally, once publishable results (i.e. a roadmap release) are available, a press release will be distributed. This has resulted at the moment in the planning of three press releases:

- The first one regarding the 3rd General Workshop,
- The second on the NEREID presentation at ESSCIRC/ ESSDERC in September 2018
- and a press release concerning the publication of the final version of the roadmap in close connection to the final dissemination event.

While the email distribution of the press releases has been proven useful to support the distribution of NEREID ideas/results, the release of a periodic newsletter has been discarded due to the large intervals between publishable material becoming available. Social networks exept LinkedIn (which has to be examined) are not considered for distribution, as it is assumed that those media are not very much used in the context of NEREID.

1.3.3 Publications

The dissemination towards researchers external to the project has been planned to take place at repated events (s. 1.3.5), through articles published in peer-reviewed scientific and technical journals, and by members contributions to other national and international workshops and conferences in fields related to the NEREID activities. All publications, including papers, booth appearance, posters, oral presentations, etc., are indicated in advance for their promotion in the NEREID website and will be reported shortly afterwards. They appear as regular reporting and are monitored on the website at https://www.nereid-h2020.eu.

As special achievement on can point out a joint publication on NEREID and its Mid-term roadmap in the "newsletter edacentrum" (ISSN 1862 2283, https://www.edacentrum.de/en/newsletter) which appeared in December 2017. It is entitled:

- "NEREID: NanoElectronics Roadmap for Europe: Identification and Dissemination"

and is available at https://www.nereid-h2020.eu/press/inthepress.

Schedule: Further release of these publications is not planned, as the preparation of a publication is under the responsibility of the project partners and will be taken in the case an appropriate occasion arises.

1.3.4 Dissemination Material

The steering committee decided to postpone the production of a promotional leaflet towards the last year of the project. Instead, a poster with general information and pictures to catch interest has been produced for the 2017 European Forum of Electronics, Components and Systems (EFECS), where NEREID presented its Mid-term roadmap. Updates of it will be carried out on demand and to coincide with a suitable to disseminate the latest NEREID results.

As Multimedia's impact is steadily growing these days, the NEREID dissemination foresaw also the creation and presentation of videos. As a first step in multimedia an eight-minute movie has been produced to present the main highlights of the 1st General Workshop (Grenoble, April 13-13th 2016) and interaction between the NEREID partners, application and technical experts. The trailer can be seen at https://www.nereid-h2020.eu.

1.3.5 Events

One of NEREID's most important dissemination method is the public and private presentation at dedicated events related to Micro- and Nanoelectronics. NEREID will benefit from established events and therefore will use those for the dissemination of the roadmap and for the collection of inputs. Among the events targeted are:

- The European Nanoelectronics Forum (ENF)
  since 2017 European Forum for Electronic Components and Systems (EFECS)
- The European NanoForum
- The ESSDERC/ESSCIRC Conference
- The EUROSOI-ULIS Conference
- The bi-annual ICT Conference organized by DG Connect
- The DATE Conference
- The SEMICON Conference
- European conferences on Nanoelectronics organized by Intel
- Nanoelectronics, Applications, Design & Technology Conference (NADTC)
- FTM-Workshop

Other events will be planned at national level (e.g.,. the edaWorkshop). All partners are encouraged to promote NEREID at conferences and workshops where they may be speaking to an audience characterised by nanoelectronics practicioners. Moreover, as the roadmap will be based on the contributions of a wide base of experts coming from different industrial and academic institutions, this will also contribute to a further wide dissemination of results. To ensure that the NEREID roadmap is taken into consideration in the decision process for future research and development projects, NEREID foresees:

- Roadmap presentation to the main research and industry organizations supporting the ECSEL JU: AENEAS, EPOSS, ARTEMIS-IA, and to the EUREKA cluster PENTA;
- Roadmap presentation to DG Connect and DG Research as well as the Science Excellence Future Emerging Technologies. The latter concerning the Beyond CMOS section of the roadmap;
- Through WP8 and the Advisory Group, presentations to the industrial associations in the sector like ESIA and SEMI, at the IRDS meetings and towards other international associations, with the purpose to converge with worldwide roadmaps in a global vision and effort to adavcne nanoelectronics;
- Deployment of the roadmap in the European R&D&I strategy through the direct involvement of partners and associated experts in the Work Programme definition for FP9, the ECSEL JU and the EUREKA programs.

Schedule: During the first year of the project, the following public appearances took place besides the first General Workshop (in Grenoble in May 2016) and the various domain workshops:

- European Nanoelectronics Forum (ENF), November, 2015,
  NEREID kick-off with a whole session
- EU Nano Day - INC12, May 10, 2016, Leuven, (single presentation)
- EU-Taiwan Nanoelectronics Workshop, June 2, 2016, (single presentation)
- EU-Korea Nanotechnology Workshop in Seoul, on October 6th, 2016
  (single presentation on NEREID, its goals and work)
- Semicon Europa, Oct. 26th 2016, Grenoble, (single presentation on the "Techno Market")

During the second year of the project, several events have been exploited for dissemination besides the second General Workshop held in Athens in April 2017 during the same week as the EUROSOI-ULIS Conference, and the various domain workshops. In particular, there were the following public conference participations of NEREID:

- European Nanoelectronics Forum (ENF)
  in Rome on November 23-24, 2016, NEREID was present with its General Assembly
- IRDS-Meeting, December 2, 2016, Atlanta,
  (Several NEREID-partners contributed to the IDRS activity)

- Workshop on the future of the electronic components and systems (preparation of FP9), April 27th 2017, Brussels, (single presentation)
- edaWorkshop & European Nanoelectronics Applications, Design & Technology Conference (ADTC), May 8-10, 2017, Dresden, Panel Session "Long Term Scientific Research Roadmap NEREID"
- Session submission at DATE, March 27-31, 2017, Lausanne, was not accepted
- SINANO-NEREID Workshop organized on Sept 11, 2017 in Leuven in the framework of ESSDERC-ESSCIRC2017 to present the draft Roadmap
- European Forum for Electronic Components and Systems (EFECS) December 4-6, 2017, Brussels, NEREID was present with its General Assembly, the mid-term roadmap has been presented by poster at the SINANO booth and within a speaker's corner session

Further activities are planned.

Following the success with the SINANO-NEREID workshop in 2017 (s. above) it is intended to repeat it as a half day workshop in 2018 at ESSCIRC/ESSDERC 2018 which will take place in Dresden, September 3rd 2018.

At the end of the project, NEREID will organize one dissemination workshop related to one major European ICT event. The most promising European event in this way is EFECS2018, which will take place on November 21-22, 2018, which is past the project runtime. As there might be no better event for a broad dissemination of the final roadmap it is therefore intended to extend the project runtime cost-neutral by one month, to have the EFECS18 as an opportunity to organize and co-locate the final dissemination workshop there. The general possibility for this has already been checked with representatives of AENEAS, one of organizing associations of EFECS. Currently it is planned to ask for a slot in the plenary to present the final NEREID roadmap, as it would serve better, than a side event before or after EFECS. Such a side event or a presentation at a speaker's corner, could complement the plenary talk, but is not strictly necessary.

Furthermore, the cost –neutral extension of the project runtime would offer the opportunity to present the NEREID final roadmap at the biannual ICT conference, this year in Vienna on December 4-6, 2018. For this, opportunities and conditions need to be examined. It will probably have a wider impact in the context of ICT in FP9 and will be politically important for dissemination regarding the EC and the member states side.

1.3.6 Mid-term roadmap

By providing the mid-term roadmap for download on the NEREID website, a wide dissemination has been enabled. Until the end of February 2018 nearly 70 people requested to download the roadmap. As their contact information is collected as a condition for download, they can be contacted in order to enable their participation into the roadmap improvement process. To organize and perform this, a questionnaire currently is set up, that allows to collect feedback in a standardized form.

1.3.7 Design of the final roadmap

The design and layout of the document is also important to its success. Therefore, the current document is examined to derive a layout design that supports the readability and the appearance of the final document. The result will be improved in an iterative manner with project partners.

1.4 Role of Partners in Dissemination

The coordination of the dissemination is mainly under the responsibility of ECN, which is also the leader of the corresponding work package 7 and its tasks (7.1 and 7.2). ECN is also responsible for the definition of dissemination program, the design and set-up of the web portal as well as for the organization of dissemination events and the preparation of corresponding materials.

ICN2 gives support to the definition of dissemination program and enforces the dissemination towards scientific community in Excellent Science. Grenoble INP, SINANO and AENEAS, who are the administrative, technical and industrials leaders of the project, will disseminate the objectives and results of NEREID in the framework of European and International events. AENEAS will also give support to dissemination events and serves as an interface to industrial research organizations and programs. All other partners will contribute to the dissemination by compiling publishable technical content and by bringing the NEREID ideas and results to people.

2. Communication and Data Management

2.1 Introduction

One of the NEREID project's main purposes is to disseminate a commonly defined roadmap; therefore, communication is a very essential part of the project. It comprises not only the project's communication to people outside of the project as described above, but also the communication inside the project and its data management. The latter follows certain rules and regulations and is carried out actively by all partners, using different means of communication.

2.2 Communication Tools and Rules

The NEREID communication tools comprise meetings, conference and phone calls, email and the website.

2.2.1 Meetings

NEREID meetings are held regularly during the year. NEREID foresees to hold one initial (kick-off) workshop, a yearly General Workshop, project reviews, the dissemination activities described above and several Domain and cross-Domain Workshops. Thus, NEREID offers good opportunities for regular meetings of the steering committee (SC), in addition to frequent conference calls (s. 2.2.2), and in and

between the work packages. All SC meetings are initiated and organized by the project coordinator INP while work package meetings belong to the responsibility of the work package and task leaders.

2.2.2 Conference and Phone Calls

Conference calls bridge the gaps between meetings and are held regularly between them. The steering committee, for example, gave itself the rule to communicate at least every two month, either in a meeting or in a conference call..

2.2.3 Email communication

Email communication is of high importance for quick offline information exchange with the additional advantage, that the communication can be stored easily. Together with a set-up of email reflectors it also offers the opportunity to communicate to and inside several distinguished groups. In NEREID the following Email reflectors have been set up:

- General Assembly
- Steering Committee
- Advisory Board
- Work packages
- Administrative/financial/legal representatives
- Industrial co-leaders
- Application experts

2.2.4 Website Communication and Data Management

While the public (open access) part of the web platform is dedicated to the communication of NEREID to the public, the password-protected intranet is used for internal communication. It serves as a communication centre with full document management facilities and flexible role-based access rights. It can be used as internal discussion forum, for document exchange, minutes of the meetings, draft of roadmaps and in general storage of work in progress. The workspace offer the possibility of shared editing of working documents (enabling off—line shared editing). It contains all the information on the project network including databases, working documents and published articles, and serves as an internal forum for sharing ideas, data, questions and answers.

4. Conclusion

This report described the update of the current dissemination, communication and data management planning of NEREID. It considers the project's main purpose to bring the "NanoElectronics Roadmap for Europe" to a broad audience and in particular, to all relevant decision makers engaged in Micro- and Nanoelectronics coming from industry and academia as well as to policy makers and public authorities at European level. Finally, this effort will lead to introduce the roadmap into the decision process for R&D projects by bringing its content into work plans and calls for those projects.