

Project acronym	Life Bitmaps
Project full title	Pilot technology for aerobic Biodegradation of spent TMAH Photoresist solution in Semiconductor industries
Project Number	LIFE15 ENV/IT/000332

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Dissemination level		
PU	Public	X
PP	Restricted to other program participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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1. Summary

The purpose of the present document is to outline the communication and dissemination activities that have been implemented so far to promote the Life Bitmaps project according to the “Dissemination and Outreach Plan” reported in **Annex_D1_1_ DISSEMINATIONS AND OUTREACH PLAN**.

Dissemination activities have been focused on the extent to which the experiences, results, achievements in general, gained within Life Bitmaps, can be utilized by the Electronic and Semiconductor (E&S) industry.

In the above plan the first step has been that to define the purpose of dissemination in order to decide on the audience, message, method and timing of related actions.

The plan outlined in **Annex_D1_1** has been prepared in the initial phase of the project and includes the following elements:

- Key Messages to be delivered;
- Target groups;
- Dissemination strategy and identification of possible activities;
- Dissemination tools and indicators

Refer to **Annex D1_1** for details of contents and definitions.

Dissemination activities have been intended as a source of significant stakeholders feedback that will help to adjust project activities, if needed. They have been carefully selected and planned since the project beginning in order to make an efficient use of the resources employed to the scope.

2. Dissemination tools

With the aim to raise awareness of the project goals, the tools featured to sustain the dissemination towards the target groups have been prepared according to the general perspective to distribute achievements and results to the widest audience as possible. Most of the following dissemination tools have been prepared since the initial phase of the journey in order to extend the information generated by the experiences, results, achievements and debates within the LIFE BITMAPS project associated and usable by all interested organizations and individuals:

2.1 Logotype and graphic identity

Refer to the following deliverable for details and contents:

ANNEX D1_2_ Logotype and Graphic Identity

2.2 Notice board and leaflet

For contents, refer to the following deliverable (paragraph 5.2.4 pages 17-20)

ANNEX D1_1_ DISSEMINATION AND OUTREACH PLAN

2.3 Website

Refer to the following deliverable for details and contents:

ANNEX D1_3_ WEBSITE

In particular newsletters are planned to be published on the project website and distributed periodically, especially when a relevant event occurs. The aim is to inform about project progresses and to stimulate discussions involving the project stakeholders

2.4 Video

Towards the end of the project, it will be evaluated the arrangement of a demonstrative video (5-10 minutes) with the aim to depict the results and outcomes of LIFE BITMAPS.

3. Dissemination activities

From the dissemination standpoint, the project should be divided in three phases. In the preparatory phase (from the project start to the workshop held in L'Aquila in May 2017 and described below) the dissemination activities have been aimed to make the public aware of LIFE BITMAPS objectives and expected results. The LIFE BITMAPS official website has been developed; a first version of leaflets and posters has been designed and presented. Templates for documents and presentations have been created. Most of the dissemination material produced at this stage will be used throughout the project life.

It has to be pointed out that in the initial stage of the project dissemination, activities were not limited to specific groups, but rather addressed to the general public in order to make it aware of the project's existence and goals.

The second dissemination phase aimed to pursue stakeholder involvement, is actually in progress and its duration will be enlarged compared to the original plan due to difficulties encountered for the design and the purchasing activities of the pilot plant. It will be considered substantially completed once the pilot system for the TMAH treatment will be started up and first evidences will be available in order to organize (in the late spring or early in the summer 2018) the "Open Day" at the LFoundry premises with the aim to demonstrate results of the pilot plants and initial project's achievements. During the actual phase, the consortium is using tools and arranging activities to effectively spread the Life Bitmaps identity, scopes and first relevant results towards more targeted groups.

A key activity in terms of networking is represented by the periodical updates on the project progresses made by the project coordinator at the "ESH and Sustainability bi-annual meeting" organized by ESIA (European Semiconductor Industry Association) including most of the microelectronic companies with operations in Europe. The outcomes of the project are particularly attractive for those companies considering the huge amount of TMAH solution used yearly by the sector and the different approaches adopted for the treatment of this pollutant.

Given the particular interest of the sector on the LIFE BITMAPS project, two members of the ESIA ESH and Sustainability Committee have been selected to take part in the steering board of the project. One member is employed at IMEC

(Interuniversity MicroElectronics Center – which is a research center on nanotechnologies) whereas the other one is an employee of STMicroelectronics.

An important stakeholder of the project is the Regional Authority (Regione Abruzzo). They have been involved at the beginning of the project in order to accept the re-classification of plants and systems which will feed the TMAH pilot plant from “waste treatment” to “water treatment”. This re-classification, was fundamental because, in principle, it allows the allocation of the pilot plant as part of an integrated system aimed to operate a “water treatment”. It was formally accepted by the authority in October 2016 upon a constructive discussion that give to the coordinating beneficiary the opportunity to put in evidence the advantages resulting from the projects’ outcomes. Furthermore, the Authority required to keep them informed about the project results.

A proceeding was started in October 2017 in order to get form the Authority the specific authorization to put into service the pilot plant. Based on the initial documentation issued for that purpose, the authority required some further explanation and evidence (which have been forwarded to them) in relation to air emissions. The final authorization is expected to be granted at the end of January 2018 or early in February 2018.

Moreover, contacts were established with the University of Parma responsible for the LESSWATT project to start networking activities.

In order to spread an integrated and coordinated image of Life Bitmaps to partners, stakeholders and a European audience, dissemination of the project contents, purposes and outcomes has been carried out through a combination of the following activities (however, when appropriate, the tools depicted in the previous paragraph have been used)

- Workshops
- Participation in Conferences
- Networking within industry associations (ESIA) and other projects

and publications

- LIFE BITMAPS project website

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- Papers in thematic conferences
 - Mass media and Press release

In details, the project Life BITMAPS and its first results have been presented at the following conferences/workshop:

- Workshop for the presentation of the BITMAPS Project held at the University of L'Aquila, May 31st 2017. Title of the Workshop: “**Sinergie tra ricerca e industria**”.

This workshop had been identified as a project deliverable in the original project plan and details including the workshop agenda as well as the tools arranged to promote the event are reported in the **ANNEX D1_4_Kickoff Workshop Event**.

- A publication of the workshop on University Socials (Facebook page, web page) and on local newspaper was made.
- Workshop program :
<http://www.univaq.it/include/utilities/blob.php?table=evento&id=722&item=programma>
- **EESD2017 (2017 International Conference on Energy, Environment, and Sustainable Development)** April 21st -22nd 2017, Phuket, Thailand.
 - Presentation of the paper: “Kinetic study of aerobic degradation of tetramethylammonium hydroxide (TMAH) at room temperature” by I.De Michelis, A.Di Renzo, M.Saraullo, F.Veglio’
 - <http://www.eesd2017.org/>
- **Sixth International Conference on Environmental Management, Engineering, Planning and Economics and SECOTOX conference**, Thessaloniki, June 25th-30th, 2017.
 - Presentation of the poster: “Treatment of TMAH solutions from microelectronic industry: a combined process scheme “ by Prisciandaro, Innocenzi, De Michelis, Tortora and Vegliò.

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- <http://cemepe6.civil.auth.gr/>
 - **Presentation of the Project at the Final Conference of the Photolife Project** ("Process and automated pilot plant for simultaneous and integral recycling of different kinds of photovoltaic panels"), Rome July 24th, 2017.
 - Title of the presentation: «Il progetto LIFE BITMAPS per la gestione di sostanze pericolose esauste quale opportunità di sviluppo sinergico tra privato ed istituzioni» by Ida De Michelis.
 - <http://www.photolifeproject.eu/>
 - **Exhibition “Street Science” in l’Aquila** September 29th 2017, presentation of the BITMAPS Project.
 - <http://www.univaq.it/include/utilities/blob.php?item=file&table=allegato&id=2891>
 - **Ninth Carbon Dioxide Utilization Summit**, 18th-19th October 2017, Reykjavik, Iceland
 - Presentation of the poster: “LIFE BITMAPS project for the biodegradation of Tetramethylammonium Hydroxide (TMAH) in the wastewaters of semiconductor production: neutralization of waste by CO₂ in lab and pilot scale” by Saraullo, De Michelis and Veglio’.
 - <http://www.wplgroup.com/aci/wp-content/uploads/sites/2/2017/05/CCOe5-MKT-Agenda.pdf>

For what concerns similar activities, plans for 2018 include:

- **Eighth World Congress and Expo on Recycling** scheduled to be held on June 25th-26th, 2018 in Berlin, Germany.
 - Presentation of the paper “Treatment of wastewater from microelectronic industry: process analysis of a combined process scheme, by Innocenzi, De Michelis, Tortora, Prisciandaro, Vegliò.
 - <http://recyclingexpoconference.blogspot.it/>

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- **Scientific paper:** “*LIFE BITMAPS: a combined process scheme for the treatment of TMAH solutions from microelectronic industry*” The paper will be submitted in march on “Environmental Science and Pollution Research” Journal.

The following press releases have been published so far :

1. Finanziato progetto dell’Ateneo 16/07/16 Il Centro
http://www.ilcentro.it/l-aquila/finanziato-progetto-dell-ateneo-1.1475119?utm_medium=migrazione
2. Collaborazione impresa-universita 15/07/16 UNIVAQ
Finanziato dall’ue un progetto da 1,6
Milioni di euro per lo sviluppo di tecnologie
Sostenibili a tutela dell’ambiente
http://www.univaq.it/include/utilities/blob.php?item=allegato&table=comunicato_stampa&id=769
3. Workshop Meeting of LIFE BITMAPS 31/05/17 Lfoundry
<http://www.lfoundry.com/en/news/detail/workshop-meeting-of-life-bitmaps-2017-05-31>
4. Workshop Meeting of LIFE BITMAPS 26/05/17 UNIVAQ
<https://www.facebook.com/search/top/?q=Universit%C3%A0%20degli%20Studi%20dell%27Aquila%20%20bitmaps>

The third project phase starting from the second half 2018, will be mainly focused on stakeholders engagement. An evaluation of compliance with Life Bitmaps high level objectives will also be addressed. This will imply a more targeted use of the media and a major participation in events to present Project’s result. In the third phase it will be important to spread the results achieved aiming to reach as wide audience as possible. On the base of results achieved and on the impact assessed in the project, it will be fundamental to target for the Final Conference and

meanwhile show how Life Bitmaps results could represent an opportunity for stakeholders

4. Intermediate dissemination results

In order to track the effectiveness of the dissemination, some key performance indicators (KPI) have been defined. For financial reasons it is not planned to use a professional media observation tool. Trends of the KPIs are checked on a half-year basis since the end of the first year of the project. The following table reports the status for the identified indicators al 31/12/2017:

INDICATOR	STATUS (31/12/2017)	COMMENT
Number of press releases	4	Reported in the previous paragraph
Number of scientific articles	1 Scientific article	In preparation . Reported in the previous paragraph
Provided public deliverables	7 pub. deliverables	7 out of a total of 19 identified public deliverables have been completed so far.
Visitor numbers on homepage	716 Visitors	A total of 1368 sessions have been opened by 716 visitors starting from 1 st January 2017 thru 31 december 2017 (*)
Number of downloaded publications	-	Feature available early in 2018 in the website
Number of recipients receiving the newsletter regularly, differentiated by stakeholder group	-	Feature available early in 2018 in the website

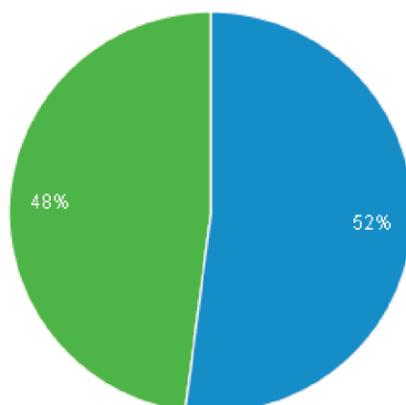
Table 1 - Key performance indicators status updated at the end of 2017.

(*) Further statistics in terms of accesses to the web site, grasped by Google Analytics follow:

Sessions	1368
Visitors	716
Pages visualized	4020
Visualized pages per session (average)	2.94
Running time per session (average)	00:03:01
Bound Frequency	59.06 %

Table 2 : Data of use for the LIFE BITMAPS website during 2017

■ New Visitor ■ Returning Visitor



Graph 1 - Returning visitors on the LIFE BITMAPS website.

5. Focus of next dissemination activities

As in the third project phase the Life Bitmaps pilot will be validated, a more targeted use of the media and publications as well as an intense participation in events to present the project's result will be pursued in order to get the stakeholder engagement. KPI will be continued to be monitored and new indicators will be set-up in order to better evaluate the effectiveness of the dissemination initiatives during that phase. In fact the website will be updated in order to include more functionalities aimed to generate the information associated to the number of downloads and the number of recipients differentiated by stakeholder groups who will receive the project newsletters.

During the third dissemination phase an incessant contribute from a communication resource of the coordinating beneficiary will be guaranteed to the consortium in order to continuously sustain that phase of the project and maintain a special focus on dissemination up to the Final Conference.

Pilot findings and results will be shared and discussed during the ESIA biannual Working group meeting during 2018.

BITMAPS project aims to contribute to the EU environmental policy and waste legislation and possibly influence governance bodies to improve recycling behaviour and stimulate the “green business”. For this, the necessary contacts with the EU competent authorities would be established well in advance to the third phase ensuring the project’s EU added value. The following EU competent DGs will be approached in order to check their engagement:

DG ENV who may take advantage from BITMAPS outcomes to initiate, define and put in practice legislation and measures in the EU to favour the uptake of technologies for water resource preservation.

DG ENTR whose primary aims are to promote industrial innovation to generate new sources of growth, encourage the growth of SMEs and promote an entrepreneurial culture and strengthen the industrial base in Europe. This DG will be surely much interested in BITMAPS results and follow-ups

At the end of project, a layman's report will be prepared in Italian and English and published on the project's web pages and as well be available on paper. It will be addressed to a large public of industrial and institutional stakeholders, interested citizens, environmental organizations, waste treatment operators. The report will be made available as well to the Commission services in order to disseminate the results of the LIFE Environment program.

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