# STIMESI-2

Stimulation action on MEMS and SiP design

## Deliverable D4.1, D4.2

# Project Periodic Report

Activity report Year 1 (AR1) & Management report Year 1 (MR1)

Due date of deliverable :
Actual submission date :

Grant Agreement number: 257862
Project acronym: STIMESI-2
Project title: Stimulation action on MEMS and SiP design
Funding Scheme: Coordination and support action

Start date of Project : 1.9.2010 Duration : 24 months

Responsible Contractor : IMEC Revision : 0.0
Contributing Contractors : All
Dissemination Level:

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# 1. Publishable summary

*A summary description of project context and objectives,*

**STIMESI - training on MEMS design tools and technologies**

STIMESI wants to stimulate the wider adoption of MEMS technology in university curricula and research programs. The goal is to deliver skilled young engineers and designers to the European industry and to ensure European industrial competitiveness in the More-than-Moore era.

The three STIMESI courses (4-day sessions) are taught all over Europe. They focus on MEMS EDA tools and MEMS technologies offered through EUROPRACTICE. This gives the 650 European academic institutions the chance to start new curricula in MEMS/SoC/SiP design, to start research in MEMS technologies and to have new MEMS designs prototyped.

*A description of the work performed since the beginning of the project and the main results achieved so far*

STIMESI-2 is the successor of the preceding FP7 project STIMESI in which about 400 students and professors from more than 100 institutes in 25 countries have attended a STIMESI course.

Experience over STIMESI-1 has shown that the coupling of the hands-on courses with the design tools, design kits and shared wafer service (e.g. MPW) of the EUROPRACTICE IC Service has resulted in a significant increase in Microsystems design activity in the European academic sector. Consequently in STIMESI-2, it was decided to concentrate on courses for the design tools, design kits and processes which are readily available at affordable prices through the EUROPRACTICE Software Service and the EUROPRACTICE IC Service.

The STIMESI-2 project continues the same training series but with fewer and other partners. Consequently, the course on Tronic's technology was largely adapted and a new introductory course to MEMS design and prototyping was created. This encompasses: course program, syllabus, slides, handouts, and exercises. Next to that, updates of the courses and improvement of the course material was performed to improve the quality and to cope with fast evolutions related to technology changes and CAD tools updates.

Besides the creation and revision of the material for the content of each course, during the first year of the project, much effort was devoted to re-establish the course scheduling and announcement framework of the STIMESI project. The project and registration website were face-lifted, introducing a new style and logo, reflecting the relation with EUROPRACTICE. Many new documents like templates and guidelines were created with the aim to secure STIMESI good practice and to allow smooth roll-out of course events: host handbook with requirements, host feedback form, roadmap of course planning and delivery, invoicing instructions, course feedback questionnaires, STIMESI-access instructions, email-templates, flyers, new style sheet, etc.

After initial set-up of the new course scheduling and announcement framework, STIMESI completed five training courses in the first nine months of 2011 at the following locations: Torino (IT), Lund (SE), Aalto (FI), Fribourg (CH), Leuven (BE). This attracted a total of 56 delegates from twelve countries.

A survey by way of feedback questionnaire shows that attendees are generally very positive and liked the good combination of theory and practice.

*Dissemination*

A stimulation activity like the STIMESI project depends largely on dissemination. A large dissemination effort is required in order to get known. In times when email boxes and other multimedia channels are bombarded with spam and huge amount of commercial advertising, it is hard to reach the targeted public: people that are new to MEMS. Nevertheless, much progress has been made. With success: 'google-ing' the word 'MEMS' + 'Training' ranks STIMESI on the first place, sometimes second place.

The dissemination activities include activities such as the current two web sites maintained by imec (stimesi.org) and STFC (registration site), leaflets and flyers on the different MEMS technologies, promotion of the training courses through various channels, like the website of the EC-funded project EUROTRAINING, MEMS conferences, and most of all, the network of 650 European universities and research institutes known by the EUROPRACTICE IC and Software Service.

*The expected final results*

Access to advanced design flows and industrial processes is highly desired by European universities and research institutes in order to train students in one of the most fascinating and enabling technology nowadays.

Thanks to the STIMESI program a strong stimulation is provided towards European universities and academic R&D labs to help them design using advanced MEMS technologies. Promotion towards academic organization and universities, training of staff and students and then technical support is conducted in order to facilitate the understanding, teaching and hands-on training of newcomers to this field. The support of the technologies with the latest MEMS design tools also further facilitates the teaching of students with hands-on courses and the accessibility of the technology to the newcomers.

STIMESI-2 course attendees can thus put their learned design skills into practice by making real prototypes through the EUROPRACTICE-IC MPW service. This is confirmed by looking at the institutes that submitted a MEMS design through EUROPRACTICE (since the initial MEMS MPW offering): In more than 40% of the submissions, the designer followed a STIMESI training course. Even more, 83% of submitted designs come from institutes where someone attended a STIMESI training course. (Not necessarily the attendant is the designer, e.g. the professor attends a course and one of his/her students submits a design).

STIMESI-2 is a consolidation and evolution of the previous STIMESI project and investment. It validates the strength of the combined offer by EUROPRACTICE Software service[1)], the EUROPRACTICE-IC service[2)] and dedicated training by STIMESI. It additionally addresses an increasing need, in the More-than-Moore era, to deliver skilled young engineers and designers to the European industry to ensure European industrial competitiveness.

1) The EUROPRACTICE Software service offers low cost access to the most popular industrial-standard MEMS CAD software for educational use or non-commercial research

2) The EUROPRACTICE-IC service offers five MEMS technologies through low cost MPW (Multi Project Wafer) runs.

*The address of the project public website*

www.stimesi.org

# 2. Project objectives, work progress and achievements, project management.

## 2.1. Project objectives for the period

The objectives of the STIMESI-2 project for *the reporting period* are summarised below:

a) Objective #1 – delivery of each of the three STIMESI-2 course titles two times a year during the two years project duration, this is, *for the reporting period, six course events*. The course titles are:
   - Introduction to MEMS design and prototyping
   - MEMSCAP: MUMPs® (Multi-User MEMS) processes
   - Tronics and SensoNor MEMS Processes

b) Objective #2 – Collaborate with the Europractice MPW and Software Service for providing access to low cost design tools and prototyping and by making use of the EUROPRACTICE existing European network of 550 universities and 100 research labs, for course announcements and for reaching new institutes starting activities in MEMS.

c) Objective #3 – Stimulate institutes in Europe to start MEMS design activities.

The main target for *the full project* is:

- Deliver training to more than 180 students from the majority of European countries on MEMS design with focus on the MEMS technologies and design tools offered through the EUROPRACTICE IC and CAD Service (funded by the EC). For *the reporting period*, the number of students would scale to about 90 students.

## 2.2. Work progress and achievements during the period

### *2.2.1. Work package Overview, Project timeline and summary of project status*

The STIMESI-2 project is concentrated around delivery of trainings. Three courses are delivered by the respective course owner: MEMSCAP, COREP, and IMEC. During the first project year, the plan was to deliver each course two times.
All involved tasks are grouped according to the relationship to the courses, whether the task is general to the course or to the course event. This sets the overall work package definition, with the exception that all dissemination activities are grouped separately in WP3:

- Aspects related to each course title: WP1
- Aspects related to each delivery of the course (= course event): WP2
- Dissemination activities: WP3
- Management activities: WP4

The project is split in two parts corresponding with Year1 and Year2. Most course preparatory work is planned at the beginning of the project, i.e. in Year1. Evaluation and reporting is planned at the end of each period.

Figure 1 the project timeline as planned with the tasks and work packages for Year1 indicated in yellow.
The actual achievements are indicated in the next Figure 2 where deviations from plan are indicated in red.

In general, the re-establishment of the project took more time than originally anticipated. This is mainly due to two reasons:
First, the work needed to adapt the Tronic's course (by COREP) and for the creation of the new introductory course (by IMEC). This is reflected in the longer duration of WP1.1.
The second reason is the long lead time required to find a host institute and a suitable date for the course event to take place. It takes on average two to three months from the first contact to the final agreement on the course date. Adding a minimum of two months announcement time explains why the first courses took place in the second half of the first project year. From then on, a continuous effort was installed to start

negotiations with many institutes in parallel. This is reflected in figure x where WP2.4 has become a continuous effort and is more centralised by IMEC and STFC.
The decision to hold the first COREP course at Torino –mainly because of a better confidence in the facilities and the organization of hosting institute for the first edition of the new Stimesi course– helped COREP to deliver the planned number of courses. For MEMSCAP, the second course was delivered recently, but in the beginning of Year2. The delay in delivery of the IMEC course was caused by a rejection/cancellation of a host institute: after the course negotiation and date planning phase were finished, the course could not be hold on that location due to possible illegal use of the Europractice software tools by the institute.
At this moment, parallel negotiations are ongoing with several institutes for the next courses in order to be able to announce them in time

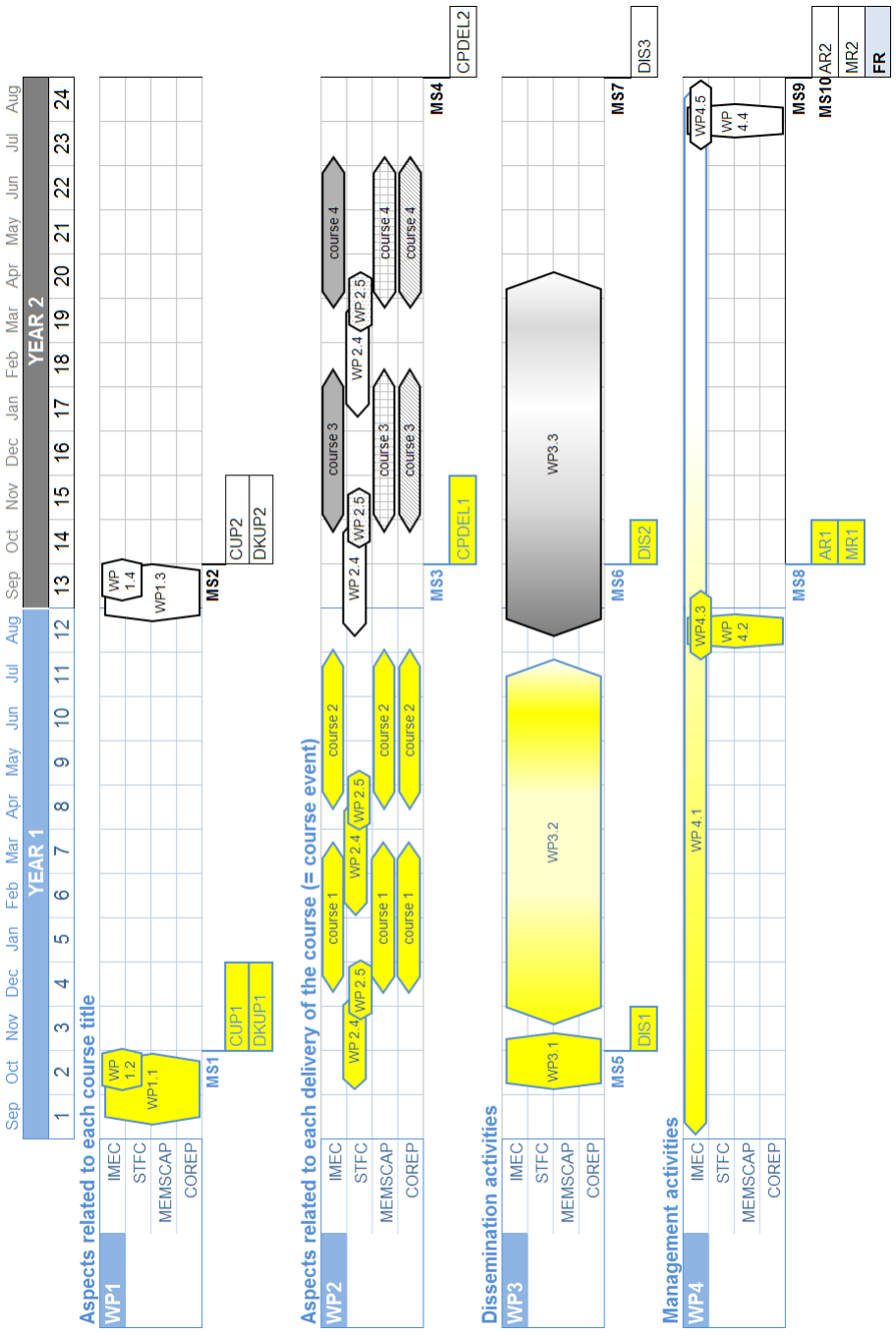



Figure 1: Project timeline as planned with the tasks and work packages for Year1 indicated in yellow

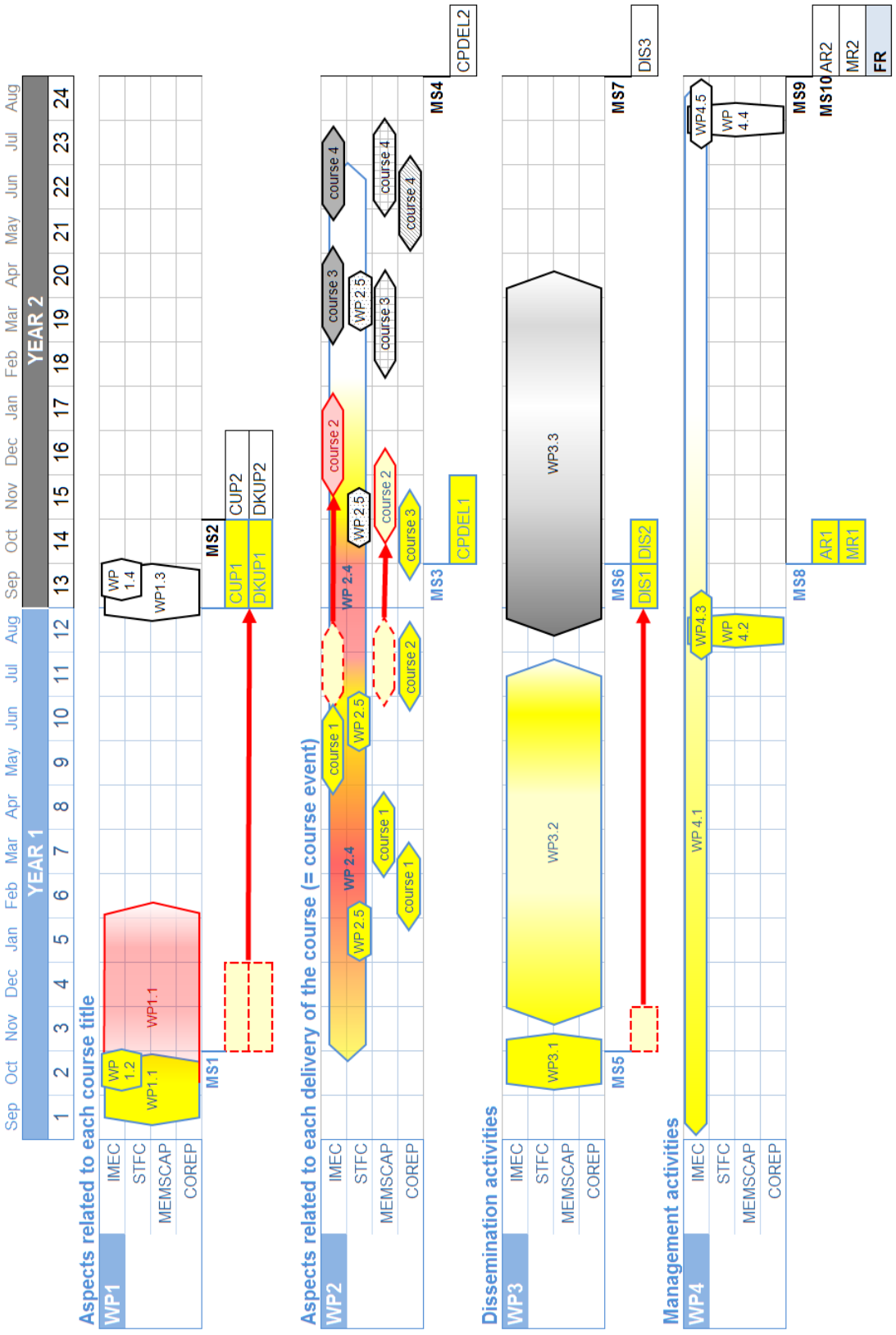



Figure 2: Actual Project timeline: deviations from plan are indicated in red.

The summary of the main tasks carried out during Year1 is:

### Work Package 1: Course material development, revision & update

- Course material development, revision and update
  - Creation of a new course (IMEC) and adaptation of the former SensoNor/Tronics course by COREP. Update of the MEMSCAP course.
  - Course content and brochure setup for each course.
- Design kit development, revision and update
  - Update and check of the used design kits.

### Work Package 2: Delivery of training courses

- Advance course planning
  - Site selection and negotiations with host institute.
  - Creation of templates and guidelines.
  - Training course booking and collection of delegate fees.
- Course event management
  - Coordination with local host institutes.
  - Course schedule and handouts preparation.
  - Software installation at host infrastructure.
  - Registration of course participants and handling of finance.
- Course delivery
  - Delivery of four courses in Year 1 (Torino, Lund, Aalto, Fribourg) and one in the beginning of Year2 (Leuven). This attracted a total of 56 delegates from twelve countries.

### Work Package 3: Dissemination activities

- Initial project and course PR, dissemination: flyers, emailing, website, poster ...
  - The set-up and maintenance of the project website and the web-based registration system.
  - The provision of links with other well-defined channels such as the EUROPRACTICE Software & IC Service network and the EUROTRAINING website.
- Course announcements for every course event.

### Work Package 4: Project management

- General project management consisting of:
  - Organization of administrative part of the project.
  - Co-ordination activities between project partners and with other projects (Europractice).
  - Organization of reporting to the EC.
  - Organization of project meeting (Torino) and Review Meeting (Leuven).

## 2.3. Work package achievements and details for each task

### *2.3.1. Work package 1 : Course material development, revision & update*

**Overview:**

Objectives and a summary of progress towards these objectives listing details for each task carried out during Year1 are outlined below:

- Objective
  - To ensure up to date course material.
  - Guaranteeing course content quality.
  - Providing up-to-date design kits which are used during courses.
- Progress Summary & Status
  - Creation of a new course by IMEC: "Introduction to MEMS design and prototyping"
  - Preparation and adaptation of the former SensoNor & Tronics course by COREP into the course "Tronics and MultiMEMS MEMS Processes"
  - Update of the MEMSCAP course (e.g. MEMS+ part replacing former Architect module)
  - Course content and brochure setup for each course.
  - Update and check of the used design kits.
  - Course preparation meeting 1 held in Torino (COREP): the different courses are aligned and didactic material was exchanged.
- Deliverables and achieved milestones
  - M1.1 (Months 2): Training courses evaluated and prepared, design kit updated & checked.
    *Delayed: due to large effort for developing new course and adaptation of previous courses.*
  - D1.1 (Months 3): Course Update report 1 (CUP1)
  - D1.2 (Month3): Design Kit Update report 1 (DKUP1)
    *Reporting delayed due to milestone delay. Deliverables are delivered at Month 13 together with Periodic Report.*

*Achievements and details for each task*

More details on the above course material development activities are provided in the following paragraphs (per partner)

**Course material development, revision and update by IMEC:**

Experience with the previous STIMESI project and feedback from former course attendees and designers has indicated that there is a strong need for new courses on advanced topics but as well on generic but specific MEMS topics. Therefore, in STIMESI-2, a new course was added to address the need for a general introduction to MEMS– very appreciated by SME's and MEMS novices. The primary aim of this course is to provide an overview of general but advanced aspect of MEMS design: tools, methodologies, design flow, setup, FEM/FEA, co-simulation, Tape Out procedure, and Design Rule Checking (DRC), testing and packaging.

This four day training course tries to give a condensed but extensive overview of many aspects that are involved when entering the MEMS discipline. Starting with some definitions, characteristics and principles of MEMS and placing it in its historical context, the course addresses the chain from initial idea to prototype and eventual production. After an introductory tour into 'small world physics', technology and processing techniques, analog to the life cycle of typical MEMS product, the course focuses on MEMS design tools, methodologies, design flow, setup, FEM/FEA, co-simulation, Tape Out procedure and Design Rule Checking (DRC), packaging, testing, qualification and failure analysis
Real fabricated microsystems and personal experience cases further illustrate methodologies, capabilities and pitfalls. Exercises and hands-on sessions on MEMS design tools are interleaved with the presentations to illustrate and practice the course material.
This course is complementary to the other STIMESI courses which focus more in depth on a given technology and design tool.

The description of the content of the course, like given in the email announcements, is given below:

*Day 1*
Day one starts with some definitions, characteristics and principles of MEMS and places MEMS it in its historical context. The impact of scaling for different physics like the mechanical, thermal, fluidic domain is investigated. Previously fabricated microsystems which are representative of the capabilities of MEMS give a good taste of the power of microsystems. Next, key concepts of technology and processing techniques are discussed.

*Day 2*
The second day of this training course starts with the design cycle 'from idea to product(tion)'. The first part covers the 'creative' aspects of the development: concept, technology selection, layout and 3D modeling. In particular, the most important topics of the session are:

- From Idea to specifications, design space exploration, DFMEA
- Technology mode: custom process, fabless, fablite, MPW, cost, Design Kits & manuals
- Overview of Design tools: layout, process tools, simulators, ... Design tasks, Design cultures

A practical hands-on session using a design layout tool (L-Edit) and a process modeler-emulator (Semulator3D) closes the afternoon.

*Day 3*
The third day of this training course continues on the design cycle 'from idea to product(tion)' with focus on the 'functional verification' aspect: functional verification is mainly done my simulations.
Finite Element Modeling (FEM) and Analysis (FEA) which is the workhorse for multiphysics simulation and verification is covered. Other techniques like Reduced Order Modeling (ROM) and Behavioral Models (BM) and their usefulness are explained in the context of co-simulation of MEMS+IC. Hands-on sessions allow attendees explore these two approaches of MEMS simulation: FEM/FEA and schematic modeling of MEMS using BM's.

*Day 4*
During the fourth day of the course, the next steps on the roadmap to product(tion) are tackled: final layout verification (DRC) and Tape Out. Packaging, testing (characterization, qualification and failure analysis) often undervalued, yet essential for MEMS, are discussed and close the course.

The agenda of the course can be downloaded here.

The "Introduction to MEMS design and prototyping" was delivered for the first time in Aalto (Helsinki). Despite its 'freshness' –not all course material was yet available in handout format– it was appreciated very well by attendees –one of them will be a future host. For the next delivery of this course, improvements on, for example, the hands-on exercises are planned.

**Course material development, revision and update by COREP:**

COREP, following the decisions undertaken in meeting 1, adapted and improved the material inherited by the previous Stimesi project related to the course 'Tronics and MultiMEMS MEMS Processes'.
An update was also done taking some of the results from the FP6 project MicroBUILDER, from which the products realized using Tronics and MultiMEMS where successfully inserted in this new version of the course, giving an effective contribution in terms of giving to the students real examples of the use of the two technologies. Most of these demonstrators where developed by COREP group, so the further improvements reached with the different devices where inserted in the new course material. The most important were a cell counter, a hydrodynamic focuser and a DNA extraction system.

A novelty in the course contents was the presentation of the animation of processes, taken by MicroBUILDER project and previous cooperations, for example with MEMS-Edu website.

About new developments, in 2011 a design of a Micro Gripper was realized by COREP using Tronics technology (see Figure 3). The chips were received in August 2001 and the first tests were started. The parts related to the

design and the simulations of the device where inserted in the Tronics technology presentation and in the next courses will be presented the characterizations that are nowadays at a preliminary stage.

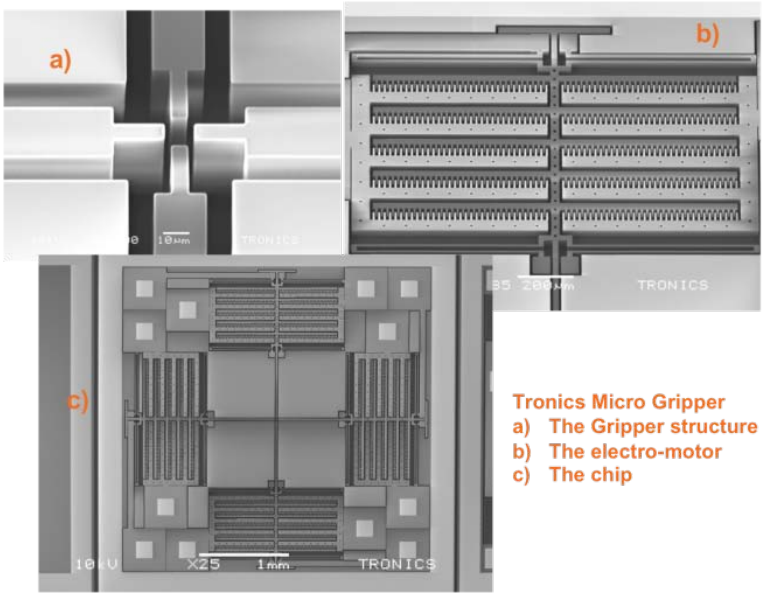



Figure 3: Micro Gripper realized by COREP using Tronics technology

A new general introduction to MEMS technologies was added as first day of the course, so the people arriving from other domains of science can have the opportunity to have a sufficient knowledge useful for successfully follow the course topics. This first day was proposed as a personal choice, so the people already skilled on MEMS technologies can start directly from the first day.
The course brochure with the agenda was prepared and the actual version of course contents can be summarized:

- Day 1: Introduction to Sensing Principles and MEMS Technologies
- Day2: (i) Presentation of Tronics' high aspect ratio micromachining (HARM) of silicon and related hands-on tutorial. (ii) Introduction to the multi-project wafer services and Europractice. (iii) Introduction to Coventorware and start of the Tutorial "Accelerometer Design with the Tronics Process"
- Day 3: Presentation of the SensoNor processes, covering in detail SensoNor's wet, anisotropic etching of bulk silicon and related hands-on tutorial.
- Day 3: Hands-on sessions: (i) Introduction to L-Edit and design of a Flow Sensor using L-Edit with SensoNor's processes. (ii) Continuation/End of the Coventor Tutorials

As reported in the table, doing a comparison based on the number of slides only, a 34.80% of new contents were added.

**Tronics and MultiMEMS MEMS Processes: course slides**

| | Previous | New contents | Total |
|---|---|---|---|
| Introduction to MEMS and sensing | 102 | 78 | 180 |
| Tronics Technologies | 77 | 32 | 109 |
| Sensonor Technology | 126 | 72 | 198 |
| Coventor | 36 | | 36 |
| | 65.20% | 34.80% | 523 |

**Course material development, revision and update by MEMSCAP:**

Comments from trainees who have attended earlier STIMESI 1 courses and comments by the other partners of the STIMESI program have been taken into account to adapt the training material to the level and expectations of the attendees.
MEMSCAP proposed four-day course duration in order to spread out the material.

Year 1 was focused on adding to the course material the characterisation results of an actual MUMPs element. This device has been available for the first 2011 MUMPs training session.
MEMSCAP incorporated more visual media to better demonstrate how MEMS devices work and operate. This visual instruction further enhances the training by showing the attendees the elegance of a MEMS device.

Short Agenda of the course "MEMSCAP: MUMPs® (Multi-User MEMS) processes", like given in the email announcements, is given below[1]:

*Day 1*
Introduction and Overview: Day one starts with an overview of the MEMSCAP history as a case study of the challenges of a MEMS foundry pre- and post-Telecom boom. The benefits of using standard processes and the impact of this strategy in the MEMS Product Development Life Cycle is demonstrated. Finally, an overview of the MUMPs program, its history and growth over the years, will be provided.

*Day 2*
MUMPs Process Overview: A comparison of the strengths and weaknesses of the different processes in regards to device-specific needs will be discussed giving the designer some direction on which process is best suited to his/her device. Examples of customer projects throughout the years will be presented through videos and SEMs.
MUMPs Design Introduction: Basic fundamental rules applicable to all processes will be presented including layout and design rule nomenclature and detailed explanations of consequences associated with breaking design rules. After that, the three MUMPs processes (PolyMUMPs, SOIMUMPs and MetalMUMPs) will be reviewed in detail and tips, tricks, and design hints shared.

*Day 3*
The focus of the third day is on the design and simulation CAD tools from Coventor applied for the MUMPS processes. A general overview on Coventor CAD tools with presentations on capabilities of MEMS+, Designer, Analyser and SEMulator3D will be given.
After an introductory guideline on MEMS+ platform, course attendees will have the opportunity to use the MEMS+ tool, which will be used to simulate a PolyMUMPs variable capacitor. Guidelines to use the MEMS+ model in conjunction with Cadence Virtuoso / Matlab Simulink will be presented.

*Day 4*
The fourth day continues the simulation part of the design cycle, now focusing on the Finite Element Modeling (FEM) using Designer for layout and 3D solid/mesh generation and Analyser for Finite Element Analysis (FEA). Hands-on session on PolyMUMPs will be interleaved with description of example devices in Poly- Metal- and SOIMUMPS and the associated analyses. Finally, virtual fabrication using SEMulator will be presented.

The agenda of the course can be downloaded here.

**Course material development, revision and update: Problems and corrective actions:**

The re-establishment of the project took more time than originally anticipated. This is mainly due to the work needed to adapt the Tronic's course (by COREP) and for the creation of the new introductory course (by IMEC). This is reflected in the longer duration of WP1.1.
The effect of this is a delay in the planning and announcement of the courses and consequently in the delivery of the courses. However, this doesn't hinder the global project and the missing courses will be scheduled in Year2

[1] The MEMSCAP course has two flavors, on based on Coventor tools, the other on SoftMEMS tools. The description given is for the Coventor flavor.

**Design kit development, revision and update by IMEC**

IMEC, as the EUROPRACTICE MPW service enter for MEMS, is dealing daily with designs from many (new) MEMS designers in the different technologies (currently 6 MEMS technologies and 2 Silicon Photonics techno's). Especially for checking designs, a need for robust Design Rule Checking (DRC) files is experienced. Therefore, preparatory work has been done to create and maintain these files in a systematic way. In order to avoid repeatedly entry of the same data in similar design tools, an action is started using a xml database from which technology setup files, coloring scheme files, DRC files as well as layout rule documentation in either doc or html format can be retrieved.
IMEC's experience is also condensed in a highly structured way to convey the required information for MEMS designers (e.g. the SiGeMEMS handbooks ). It is the purpose to extend this gradually to other technologies offered through Europractice. Initial discussion with TRONICS to implement this for the SOIMEMS technology is ongoing. The results will benefice the STIMESI community in several ways: first, extra kits, extensions or improvements to current kits (like Calibre DRC) will become available. Secondly, the systematic (standard) format will allow designers to switch easier between technologies and avoid mistakes. Finally, in this way, a good practice method is indirectly induced, which can be taught in future stimesi courses.

**Design kit development, revision and update by MEMSCAP**

A. HANDBOOK UPDATES

The handbooks were already highly accessible to users being available for free download on the MEMSCAP website. They included detailed process descriptions and design rules. The handbooks are constantly being updated as new process details and tolerances are discovered. In addition, MEMSCAP provides reference material including bibliographies of papers which discuss results from MUMPs, a technical "frequently asked questions" guide which outlines information that is beyond the design rules, and a users' guide to PolyMUMPs from the perspective of a commercial researcher at Microsoft.

Additionally, the website includes the CaMEL (Consolidated Micromechanical Element Library) web pages which include tried-and-true structures that can be used with the MUMPs processes.

*PolyMUMPs, SOIMUMPs and METALMUMPs Processes and Design Rules*

Updates to the PolyMUMPs Design Rules have been incremental over the years as the process has evolved and design features have been corroborated to the process. An upgrade of the version of the design handbook (currently version 13.0) has been implemented during the Stimesi 2 program in 2011. SOIMUMPS has been updated and its is under version 8.0. MetalMUMPS has also been updated and is under revision 3.0.

All of the documents are available on the MEMSCAP web site and free to download and distribute. This eliminates the course attendees to sign any DKLA prior to the course. The STIMESI course material as wel as the design kits was made available through the protected domain of the STIMESI website.

B. ADDITIONAL MATERIAL AVAILABLE TO STUDENTS AND USERS

- PolyMUMPs Run Data
  - The published run data for every PolyMUMPs run is available in one Excel file. It includes measured material properties and tolerances observed during processing.
- PolyMUMPs, SOIMUMPs and METALMUMPs Design Rules
  - This is the most important document to review and understand by users.
  - It is now composed of the following sections: Design rules, Beyond the design rules, Film parameters, Easy Design rules, Layout requirements, and all necessary information about dicing, releasing and CO2 supercritical Drying. It also includes some more reference material to enable users to make a consistent design on that specific process.
- PolyMUMPs, SOIMUMPs, and METALMUMPs CAD Files
  - Basic process setup files and design kits are available for L-Edit and Coventorware software.
- CaMEL Library
  - The CaMEL Element Library web pages are available. They can be readily downloaded from the web.
- PolyMUMPs, SOIMUMPs, and METALMUMPs Reference Library

- For each of the three MUMPs processes, links to the MUMPs Technical FAQ, the Microsoft Research Notes, MUMPs Paper Bibliography, Device Release Instructions, and Substrate Specifications can be found on the web. This includes
  - MUMPs Technical FAQ
  - A Guide to PolyMUMPs by Microsoft Research
  - MUMPs Paper Bibliography
  - MUMPs Die Release Instructions
  - MUMPs Substrate Specifications

- PolyMUMPs, SOIMUMPs, and METALMUMPs Presentations
  - PowerPoint presentations from Short Courses for use as instructional aids or classroom tools are also available. It does not match exactly the MEMSCAP courses developed for Stimesi 2 but provides basic material for understanding the process and design rules.

C. SUPPORTING SOFTWARE UPDATES

Information from the design handbooks had previously been encoded into support files for MEMS Pro, L-Edit, and CoventorWare. This enabled users to build solid models for finite element, perform circuit-level simulation, and access libraries of device templates.

The design kits are bundled with MEMS Pro and CoventorWare licenses at no additional charge, and L-Edit files can be downloaded from the MEMSCAP website.

Particular time and attention was paid to the updating and improvement of the Coventor design kits for SOIMUMPs and MetalMUMPs. These kits are now available in beta version through Coventor and have been fully tested and released.

Furthermore, MEMSCAP outlined a plan with Coventor to run simulations and fabrication in parallel of a particular design to be able to compare results between the CAD tool/design kit and the actual device.

**Design kit development, revision and update by STFC**

CoventorWare 2010 is used extensively on the STIMESI training courses, especially the Designer, Analyzer and Architect3D modules. The current release, CoventorWare 2010, was released during STIMESI-1 and was thoroughly tested to make sure the course material and lab exercises were compatible with the software.

STIMESI training courses make use of MEMS+ from Coventor. MEMS+ version 2 was released in November 2010, this was a major release and included new functionality, significant performance improvements and defect fixes throughout the product. STFC checked the course material and lab exercises against MEMS+ 2.0 and recommended changes to the course material where necessary.

Tanner L-EDIT is also used on STIMESI training courses. L-EDIT v15 was released in September 2010, this was also a major release over the previous version. The STIMESI course material and lab exercises were also tested against this software release.

**Design kit development, revision and update: Problems and corrective actions:**

No problems were encountered with design kit updates during the first year of the project.

### *2.3.2. Work package 2 : Delivery of training courses*

**Overview:**

Objectives and a summary of progress towards these objectives listing details for each task carried out during Year1 are outlined below:

- Objective
  - Delivery of each course, twice a year, during two years, i.e. 12 four day courses, at different convenient European locations which have suitably equipped training rooms with workstations.
  - Providing course attendees course material, exercises and help to enable and facilitate MEMS design and MEMS design training at their home institute.

- Progress Summary & Status
  - Advance course planning
    - Site selection, negotiations and coordination with host institute took more effort than anticipated but resulted in the planning and organisation of 5 course events. Two institutes (Cambridge, Fraunhofer) rejected after initial planning and one institute was cancelled (Sophia)
    - Creation of templates and guidelines: host handbook with requirements, host feedback form, roadmap of course planning and delivery, invoicing instructions, course feedback questionnaires, STIMESI-access instructions, email-templates, new style sheet, etc.
    - Training course booking and collection of delegate fees by STFC
    - Granting access to Tronics Design Kit through Europractice Design Kit License Agreement (DKLA) by IMEC.
  - Course event management
    - Coordination with local host institute (Torino, Lund, Aalto, Fribourg, Leuven)
    - Course schedule and handouts preparation: paper print or in electronic format like CD or online through Stimesi website.
    - Software installation at host infrastructure by STFC including getting and installing required licenses.
    - Registration of course participants and handling of finance (by STFC)
  - Course delivery
    - Delivery of four courses in Year 1 (Torino, Lund, Aalto, Fribourg) and one in the beginning of Year2 (Leuven). This attracted a total of 56 delegates from twelve countries.
      During Year 1 the target to deliver each course, twice a year was not met, due to extra effort to re-launch the project (both on course content and on scheduling). However, this initial hurdle is passed and the missing courses will be scheduled in Year2.
      The number of course attendees is lower than anticipated. Possible reasons are the introduction of a subscription fee, the short announcement period for the first courses (related to the re-launch issues of the project) and in general, the economical climate disfavoring travelling. Announcement of courses more in advance and extra effort to attract attendees will be made as corrective action.
    - Evaluation of courses and statistics by way of feedback questionnaires after each course (by STFC).

- Deliverables and achieved milestones
  - M2.1 (Months 13): Interim assessment of course planning and course delivery
  - D2.1 (Month 14): Report on Course Planning and Delivery in Year 1 (CPDEL1)

Workpackage 2 covers the delivery of each training course, twice a year for two years. This includes course planning, course event management and course delivery.
The courses are held at different locations throughout Europe with the locations carefully planned to give a good geographical coverage as well as having a good infrastructure i.e. transport, hotels. The courses are held at universities that have the necessary lecture room and computer facilities.

The objective in year 1 of STIMESI was to deliver each of the three training courses two times.

| Course | Planned deliveries | Actual deliveries |
|---|---|---|
| Tronics and MultiMEMS | 2 | 3 |
| Memscap MUMPS | 2 | 2 * |
| Introduction to MEMS Design | 2 | 1 |

* includes planned course in Seville in November 2011

The target was to deliver training to more than 180 students (i.e. 90 students per year). To meet this target each course would need to attract on average 15 students.
The first five STIMESI courses attracted a total of 56 students, i.e. an average of 11.2 students per course. It has been noticed that each STIMESI training course has attracted an increasing number of students, starting with 9 on the first course in Torino, ending with 17 at the last course in Leuven.

*Achievements and details for each task*

**Advance course planning by IMEC:**

With the aim to secure STIMESI good practice and to allow smooth roll-out of course events IMEC created many new documents like templates and guidelines:

- *host handbook with requirements*: The purpose of this document is twofold: to invite institutes to host a STIMESI course and to inform candidate host institutes about the requirements, the remuneration and the bonus in case they host a STIMESI course. The invitation request is generally sent to institutes with whom an (informal) contact already exist, who already have some MEMS activities or just interest, and which location is interesting for a large audience (easy reachable). This document explains to potential hosts what they can expect from a stimesi course, what the requirements are (Interest & Eligibility, Facilities and Support) and about the financial issues.
- *host feedback form*: This fill-in form allow the interested host to specify all the necessary data which is needed to prepare a course: exact address of the location where the course will take place, useful web-links for in the flyer, logo's, hotel info, how to get to the institute info, available facilities, contact details for administrative, financial and technical contacts, computer infrastructure... . This is a key document for the course event management.
- *roadmap of course planning and delivery*: This helps the potential host to estimate the effort and get an idea of the subsequent steps from initial agreement about the course date until the delivery of the course. It is also a useful check list during the course preparation.
- *invoicing instructions*: details to the host how to obtain the fixed amount for covering fixed costs (from IMEC) and the registration fee from attendees (from STFC).
- *course feedback questionnaires*
- *STIMESI-access instructions*: instruction leaflet on how to access the STIMESI protected domain.
- *email-templates*, *flyers*, *new style sheet*, etc...

All these documents are part of the established framework to plan, organize and coordinate in an *efficient* way a STIMESI course event. It took some time to cast previous expertise from the former STIMESI project into this form: ideas from partners were exchanged and discussed, proposed and agreed, then documents were made and reviewed.

Once an initial contact is made with an institute –generally through an initial contact with a person from that institute– it takes on average two to three months from the first contact to the final agreement on the course date, , . Reasons are various: getting through the decision taking hierarchy of the host institute, uncertainty about occupation of rooms during normal academic lectures, financial issues, finding a common date for two (host + STIMESI course teachers) or sometimes three parties (+ software teachers), ... .
Once a date for a course has been agreed between the host and STIMESI, the coordination process generally take a second gear. The following list is a summary of a typical roadmap:

Agreement on hosting a course and course title
- Agreement on Date
- Creating flyer: IMEC
- Creating webpage announcement: IMEC
- Creating registration page: STFC
- Announcement by email: IMEC, STFC, Eurotraining, host institute

What will come afterwards:
- After dissemination (email, web, flyer) people will have time to register on the registration site.
- The host will get regular updates from STFC so they can monitor the number of registrants.
- Extra email announcements (as reminder)

Short before the course (1 to 2 weeks before the course)

- A closed domain will be created on mtc-online (accessible) through stimesi.org where protected content can be placed.
  Examples are: presentation slides, hands-on instructions, other documentation,...
  Read+write access to course host and teachers, one common account for course attendees with only read access.
  Access information for attendees will be given during the course, not before.
- Software installation (if necessary) and configuration. Licenses should be asked at STFC.
- Testing of software.
- Printed documentation: will be printed by the course owner and must be sent prior to the course to the course host.
- Catering: Course host has to prepare catering issues. Number can be based on the evolution of registrations.
  The final number of attendees will be fixed/agreed together few days before the course.
  The same applies for the social event.
- If late instructions apply (e.g. change of location of room, or ...) the host needs to send it in time to IMEC or STFC so that we can inform the attendees.
- Payment of the 1000 € : IMEC will send instructions.

Course delivery

After the course:

- Update of the final attendee list with checking if attendees have followed the full course
- Payment of the 200 /participant€ : STFC will send instructions.
- STFC will send attendance certificates.

**Advance course planning by STFC:**

STFC is able to give advice on the suitability of certain locations to run a STIMESI training course. In one case this year, STFC was able to inform STIMESI that a certain location should not be used because several software vendors were investigating the local university for possible illegal use of their software tools. It would therefore be impossible to obtain training licenses for this university until the matter was resolved.
STFC has knowledge of which European universities have purchased MEMS design tools through the Europractice Software Service, and have local expertise and computer facilities which may make them particularly suitable to host a training course.
STFC is also organising the *Course attendees' registration & finances*: see further

**Course event management by STFC:**

STFC works closely with the host institution to ensure that each course runs smoothly. STFC is active in the following areas:

- Training course booking and collection of delegate fees.
  STFC has adapted the course booking website that was used for STIMESI-1 so that STIMESI-2 delegates can easily identify and book their place on suitable training courses. The website includes a calendar of STIMESI events.
  Delegates are sent a confirmation email plus information on paying their course fees. Once a delegate has paid, their status is changed from 'Provisional' to 'Confirmed'.
  For each training course, a dedicated webpage is created which gives some history about the host institution, the course address and links to maps and accommodation.
  Separate webpages for the use of the STIMESI partners are also maintained. These allow the partners to see, in real time, who has booked onto each course. The webpages also provide statistics useful to the STIMESI partners.
- Liaising with local host to ensure local infrastructure is in place.
  STFC work closely with each host to ensure that all the necessary local organisation has taken place e.g. suitable catering has been organised, signs have been put up to direct the delegates, emergency contact numbers are available for the delegates to use on day one.
- Liaising with each delegate.
- STFC confirm each booking and send the delegate payment instructions. Each delegate is provided with a pack of information to ensure they reach the training course successfully and know exactly where to go on day one e.g. maps, directions, travel information, emergency telephone contact numbers.
- Providing software and licenses for the lab exercises.

STFC work closely with a technical person from the host institute to make sure that suitable computers are available for the lab exercises. STFC determine exactly what software and how many licenses are required. We obtain the licenses from the vendors and provide software download instructions. STFC ensures that necessary tests are carried out on the software to make sure it has been successfully installed and the licenses are correct. Nevertheless, some problems cannot always be foreseen. For the MEMSCAP course at Lund, the software licenses did not work at first due to an unforeseen incompatibility between the host's server architecture and the software licenses. There was a 1 hour delay to the hands-on portion of the course until the problem was identified and fixed.

- Paying delegate fees to host institute.
  After each course, STFC will contact the local organiser to determine if there were any no-shows. The agreed fee-per-delegate is then passed over to the host institute.
- Issuing attendance certificates to each delegate.
  Each delegate who attends the whole of the course is issued with a personal certificate.

**Advance course planning by COREP:**

COREP, in cooperation with the group of Vestfold University College, who is responsible for the SensoNor technology part, provided the course 'Tronics and MultiMEMS MEMS Processes' twice in the first project year. The necessary negotiations and coordination with the hosting institutes were carried out. COREP and VUC teachers did a preparation work, with the goal of preparing the course agenda and for harmonizing the course contents. The contacts and management of the courses was done by COREP, who was the responsible for the preparation of support material as CDROMs and printed handouts.

**Course event management by COREP:**

The locations were the first in Torino (Italy) and the second in Fribourg (Switzerland). The choice to do the first course in Torino was mainly related to have the possibility, for the first edition of the new Stimesi course, of a better confidence in the facilities and the organization of hosting institute. The second location was in Fribourg where the tradition of microsystem design and applications is important.
The software for the hands-on sessions was always installed by experts of the hosting institute, with the coordination and supervision of COREP and STFC.

**Advance course planning and Course event management: Problems and corrective actions:**

Site selection, negotiations and coordination with host institute took more time than anticipated.
At this moment, parallel negotiations are ongoing with several institutes for the next courses in order to be able to announce them in time.

**Course delivery by COREP:**

**Course 1**: Torino, Italy, 15th-18th of February 2011
Hosting institute: Politecnico di Torino, Department of Electronics
Course delivery: COREP (3 lecturers) and VUC (2 lecturers)
Number of students: 9
Affiliations of students: Politecnico di Torino (Italy), Italian Institute of Technology (Italy), IMEC (Belgium).

**Course 2**: Fribourg, Switzerland, 12th-15th of July 2011
Hosting institute: Ecole d'ingénieurs et d'architectes de Fribourg
Course delivery: COREP (3 lecturers) and VUC (1 lecturers)
Number of students: 10
Affiliations of students: University of Applied Science in Friburg (Switzerland), Hepia Geneva (Switzerland), EIA-Friburg (Switzerland), Science and Techology Facility Council (UK), IMEC (Belgium), Lund University (Sweden), Nanyang Technological University (Singapore)

**Course delivery by IMEC:**

**Course 1**: Aalto (Helsinki), Finland, June 27-30, 2011
Hosting institute: Aalto University
Course delivery: IMEC (2 lecturers)
Number of students: 10
Affiliations of attendees: Aalto University, Sweden(4), Universita di Trento, Italy (1), Universidad de Sevilla, Spain (1), Universidad de Granada, Spain (1), Budapest University of Technology and Economics, Hungary (1), VTT Technical Research Centre of Finland (Micro & Nano), Finland (2)

*Introduction to MEMS design and prototyping course*
This four day training course tries to give a condensed but extensive overview of many aspects that are involved when entering the MEMS discipline. Starting with some definitions, characteristics and principles of MEMS and placing it in its historical context, the course addresses the chain from initial idea to prototype and eventual production. After an introductory tour into 'small world physics', technology and processing techniques, analog to the life cycle of typical MEMS product, the course focuses on MEMS design tools, methodologies, design flow, setup, FEM/FEA, co-simulation, Tape Out procedure and Design Rule Checking (DRC), packaging, testing, qualification and failure analysis
Real fabricated microsystems and personal experience cases further illustrate methodologies, capabilities and pitfalls. Exercises and hands-on sessions on MEMS design tools are interleaved with the presentations to illustrate and practice the course material.

*Infrastructure*
The main part of the course consists of presentations and was delivered in an auditorium. For the afternoon sessions which contained hands-on exercises the group of attendees moved to a PC-room nearby with 22 computer terminals.

*Feed-Back from Participants*
The "Introduction to MEMS design and prototyping" was delivered for the first time. Despite its 'freshness' –not all course material was yet available in handout format– it was appreciated very well by attendees –one of them will be a future host. Improvements on, for example, the hands-on exercises are planned for the next delivery of this course.

**Course delivery by MEMSCAP:**

The first MEMSCAP course was provided by MEMSCAP in cooperation with Coventor and took place in Lund, Sweden. The course was based upon the course material developed during the first STIMESI project. The course was attended by 9 participants, seven from Europractice members and two from non-Europractice members.

**Course 1**: Lund, Sweden, March 1-4, 2011
Hosting institute: Lund University
Course delivery: MEMSCAP (2 lecturers) and COVENTOR (1 lecturers)
Number of students: 9
Affiliations of attendees: Lund University (Sweden), Ericsson AB (Sweden), IMEC (Belgium).

**Course delivery report by MEMSCAP**
The 1st STIMESI 2 MEMSCAP Training Course comprised awareness training and foundry access training of engineers and graduate students who wanted to learn how to successfully design in MEMSCAP's MUMPs® [2] process platforms: POLYMUMPS, SOIMUMPS, and METALMUMPS. The training encompassed four days of instruction.

[2] Throughout this document, the term "MUMPs" abridges and refers to "Multi-User MEMS Processes."

This training course provided an introduction to the three MUMPS processes, highlighting their different strengths with reference to potential applications. An overview of the design kits has been presented, and design methodologies have been illustrated using hands-on tutorial exercises. A particular emphasis of the course has been placed on familiarizing the participants with the process design rules. In this way, tips and tricks for pushing the process were discussed. In addition, MEMSCAP presented the most common mistakes made by designers of the three MUMPs processes. An overview of MEMS device actuator methodologies that can be realized from MUMPs processes was presented to give the participants a realistic view of which types of actuators are best for certain applications. Mainstream MEMS device approaches were also shared with the audience to link what's possible in MUMPs to what's used in production MEMS devices today.

The format of the course was as follows. The first half of the course presented case studies on products and companies who flourished in MEMS and the reasons why. Participants also heard stories and history of MEMS from the mid-1990s, through the internet and telecom booms of early 2000, tracing the paths of MEMS companies up to the present. On day two, we provided attendees with an overview of each of the processes, an introduction to the design kits and design rules, with a special emphasis on information not contained in the design rules such as methods for better manufacturability and yields from the processes, plus industry and mainstream product information. The second half of the course, days 3-4, concentrated on hands-on design exercises using CoventorWare's tool suite including modeling, layout, and FEM analysis, then linking this activity to real devices.

The PolyMUMPs tutorial sessions made use of both parameterised and non-parameterised cells from the CaMEL library. Example devices contained within this library include: linear comb drives, micro-tongs, and wobble motors. The MetalMUMPS session employed tutorials based upon relay-like devices, whilst the SOIMUMPs hands-on class concentrated on optical devices. In addition, the CoventorWare's libraries were used as example devices.

*Infrastructure*
Sufficient personal computers and workstations have been made available to the course attendees, giving one attendee per computer. The following course-relevant softwares have been previously installed: Coventorware, the design and modeling software offered by Coventor.
The required licenses for the above mentioned software tools have been made available by Coventor. All licenses were installed and tested prior to the course, however the software licenses did not work at first due to an unforeseen incompatibility between the host's server architecture and the software licenses. There was a 1 hour delay to the hands-on portion of the course until the problem was identified and fixed.

**Evaluations and lessons learned by MEMSCAP**
*Participation and Marketing*
A good local turnout of support from the host university helped fill the course, however the presence of several attendees from outside of Academia proved that MEMSCAP's courses bring value to both industry and academia. The industry attendees came to the course focused on a particular area of MEMS applications, being novices to the technology, and used the course to educate themselves on how best to apply MEMS to their particular field of mobile phones and communications. In showing a particular interest in the MetalMUMPs process, it was clear that these attendees were looking to exploit MUMPs and MUMPs-PLUS for their internal projects and came to the course for more detailed information than could be received by static presentations and documentation The areas of study were not as varied as past courses of STIMESI 1. The level of MEMS design experience was virtually zero so the general layout exercises and background information on actuation technologies was particularly well-received. The backgrounds and education levels varied greatly, from graduate student, to post-doc, to PhD student

Because of the inexperienced audience, the MEMS background information was emphasized so that the students could grasp the basic concepts of MEMS design and fabrication.

The support of the local host was superior from an administrative perspective and invaluable from an attendance perspective. The facilities at Lund were adequate to support the class, with the PC lab reserved for the course all week.

All attendees spoke and understood English very well which made the presentation easier to give.

*Availability of PC's and Training Materials*
The computer lab had 40 work stations in a comfortable room. The support staff was very helpful and provided guest accounts for wireless access to the Lund network. Once the issue came up with the license installation, the support staff became very involved to help solve the problem. The idea of providing the presentations on the STIMESI FTP site was well-received by the attendees and appreciated by the presenters!

*Feed-Back from Participants*
The verbal feedback from participants was positive with many good questions posed by the attendees. Direct emails showed an overall good impression of the course.

*Lessons learned*
Hosting courses at less advanced MEMS institutions are always good for both the presenter and host because of the new angles and approaches provided by the line of questioning, usually specific to the attendee's background and interest. This challenges the presentation material for its versatility and allows for some very good question/answer exchanges

**Course delivery: Problems and corrective actions:**

During Year 1 the target to deliver each course, twice a year was not met, due to extra effort to re-launch the project (both on course content and on scheduling). The delay in delivery of the IMEC course was caused by a rejection/cancellation of a host institute: after the course negotiation and date planning phase were finished, the course could not be hold on that location due to possible illegal use of the Europractice software tools by the institute.
However, this initial hurdle is passed and the missing courses will be scheduled in Year2. For MEMSCAP, the second course was already delivered recently, but in the beginning of Year2.

The number of course attendees is lower than anticipated. Possible reasons are the introduction of a subscription fee, the short announcement period for the first courses (related to the re-launch issues of the project) and in general, the economical climate disfavoring travelling. Announcement of courses more in advance and extra effort to attract attendees will be made as corrective action.

**Evaluation of courses and statistics**

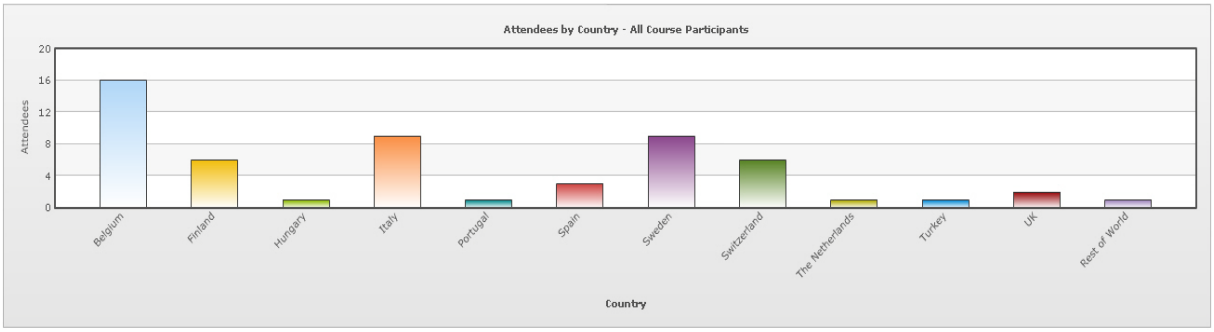
**Course attendees**
STIMESI completed five training courses in the first nine months of 2011. This attracted a total of 56 delegates, as detailed in the table below.

| | | 2011 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Course Days | Participants | | | Training Days | | |
| | | | University | Industry | Total | University | Industry | Total |
| **Tronics & MultiMEMS** | Torino | 3.5 | 9 | 0 | 9 | 31.5 | 0.0 | 31.5 |
| **MEMSCAP MUMPS** | Lund | 3.5 | 9 | 0 | 9 | 31.5 | 0.0 | 31.5 |
| **Intro to MEMS Design** | Aalto | 4.0 | 10 | 0 | 10 | 40.0 | 0.0 | 40.0 |
| **Tronics & MultiMEMS** | Fribourg | 3.5 | 11 | 0 | 11 | 38.5 | 0.0 | 38.5 |
| **Tronics & MultiMEMS** | Leuven | 3.5 | 15 | 2 | 17 | 52.5 | 7.0 | 59.5 |
| **Total** | | | **54** | **2** | **56** | **194** | **7** | **201** |

A further MEMSCAP MUMPS course is scheduled for the Institute of Microelectronics of Seville in November 2011.

The first five STIMESI courses attracted delegates from twelve countries:

| | | | |
|---|---|---|---|
| Belgium | 16 | Sweden | 9 |
| Finland | 6 | Switzerland | 6 |
| Hungary | 1 | The Netherlands | 1 |
| Italy | 9 | Turkey | 1 |
| Portugal | 1 | UK | 2 |
| Spain | 3 | Rest of World (Singapore) | 1 |

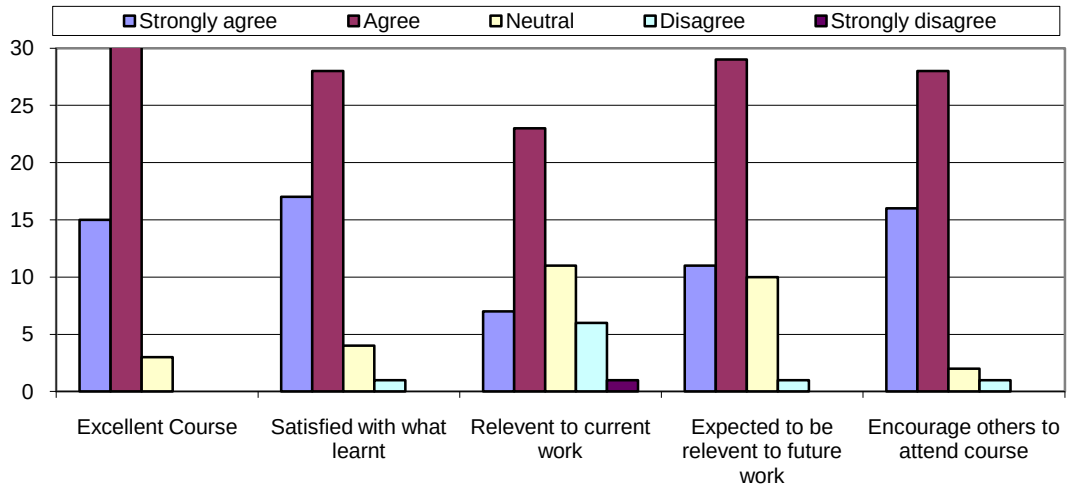


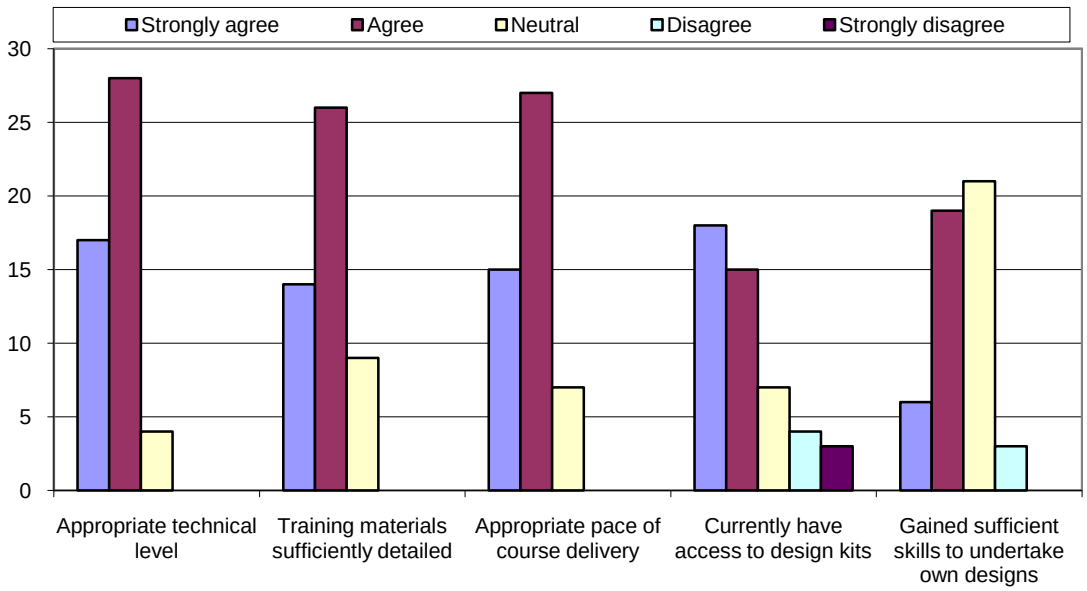

### No-shows

No-shows were a major problem in STIMESI-1, with an average of six no-shows per year. In STIMESI-2, each delegate is charged a modest fee to attend. This helps offset the cost of the course, it also ensures that only serious delegates register who are more likely to attend. We are pleased to report that during the first nine months of STIMESI-2, only one registered delegate failed to attend his course.
Five delegates have registered and cancelled prior to the start of their course.

### Delegate satisfaction

STIMESI encourage each course attendee to complete a short questionnaire after each course to allow us to judge the level of customer satisfaction and to help us identify areas for improvement. 88 % of attendees have completed the questionnaire. A summary of the results for the first five STIMESI-2 courses is given below.






The questionnaire comments were generally very positive. Delegates liked the good combination of theory and practice. There were also some very good suggestions on how the courses could be improved e.g. by including a lecture on MEMS packaging. Some delegates commented that the printed quality of the handouts could be better.

### 2.3.3. Work package 3 : Dissemination activities

Workpackage 3 aims to develop the necessary dissemination material, such as leaflets, flyers, WEB pages, etc, in order to make the university community aware of the STIMESI stimulation action on MEMS.

**Overview:**

Objectives and a summary of progress towards these objectives listing details for each task carried out during Year1 are outlined below:

- Objective
  - This work package aims to develop the necessary dissemination material, in multimedia form such as leaflets, flyers, WEB pages, streaming video recordings, etc, in order to make the university community aware of the STIMESI stimulation action and of all planned courses and activities.

- Progress Summary & Status
  - Initial project and course PR, dissemination: flyers, emailing, website, poster ...
    - The set-up and maintenance of the project website, introducing a new style and logo, reflecting the relation with EUROPRACTICE. (by IMEC).
    - The www.stimesi.org site delivers course announcement and project info, MEMS design related info, protected access to the course material for the course attendees, links to MEMS topics and CAD support at Europractice, including design kits.
    - Protected content with secure password access was introduced for providing course material to course attendees in electronic format.
    - The set-up and maintenance of the web-based registration system by STFC.
  - The provision of links with other well-defined channels such as
    - the EUROPRACTICE Software & IC Service network
    - the EUROTRAINING website
  - Course announcements for every course event:
  - Initial course announcement is two to three months in advance (the first courses had a shorter announcement period). Announcement is generally by email and is repeated two times. Eventually a late reminder showing the latest free places is sent a week before the course.

- Deliverables and achieved milestones
  - M3.1 (Months 2): Initial project and course PR, dissemination ready.
    *Delayed: due to more work for developing new course and adaptation of previous courses.*
  - D3.1 (Months 3): Report on initial project and course PR, dissemination (DIS1).
    *Reporting delayed due to milestone delay. Deliverables are delivered at Month 13 together with Periodic Report.*
  - M3.2 (Months 13): Interim assessment of the results of the STIMESI dissemination activities.
  - D3.2 (Months 14): Dissemination Report in Year 1 (DIS2).

*Achievements and details for each task*

More details on the above dissemination activities are provided in the following paragraphs.

The following dissemination activities have been carried out as part of the Workpackage 3 activities by each of the following STIMESI project partner :

**Dissemination activities by IMEC:**

- *New logo and style*: A new logo has been designed to reflect the closer collaboration with the EUROPRACTICE CAD and IC Service. It incorporates the Europractice E, and uses a similar blue color scheme. The logo is provided in various formats and sizes. Simultaneously with the logo, all documents, emails, webpages and powerpoint presentations adopt a new style.

- *Website*: The STIMESI website received a significant update to reflect the new STIMESI consortium. Most striking difference will be the new style. A new feature introduced is the "Protected Content" area where, for each course event, attendees can download course material. The protected content area is based on the mtc-online domain which is also used by Europractice to give access to the design kits for the different

technologies. Once logged in, the specific course domain is seamless integrated into the STIMESI webpages , , . In this way, extra features are provided like email-list, documents, sources and even discussion groups.
Through this site, all courses are announced. All the course flyers are made available and a direct link to the online booking site maintained by STFC is maintained.

- *Course flyers* : The importance of the course flyer is crucial, since it's the first contact with potential candidates. Offering ample information, right at hand, in an attractive way is therefore crucial. Course flyers act as an illustration representing the quality of the underlying STIMESI courses.
  Since STIMESI-2, much attention is paid to the quality of the course flyers, created by IMEC. A new template has been generated, but as a result of the uniqueness of each course, every flyer needs a great deal of manual work. Especially the part containing local information gets high attention in order to provide correct and high quality information:
  - information about the location of the course with detailed maps and drawings of the training room
  - a list of useful links to the institutes department, the university (hierarchical)
  - 'How to come' instructions with a dedicated Google map (with streetview links if available ) showing the location of the institute, training site, hotels and transportation...
  - Accommodation section with a list of hotels including stars, rate and direct links and emails to the hotels, as well as address and indication on distance from city centre of training location.
  - Some touristic info.
  - The planned social event.

  The course flyers are provided by email and are downloadable on a several locations on all website used within the STIMESI project.
- *Emailing*: E-mail announcements are the workhorse of the dissemination activities. The format of the email shots adopts the following scheme
  - Short intro addressing the reader
  - Html formatted announcement with navigation banner with links to pages and flyers on the stimesi sites.
  - Description of the course, location and about STIMESI
  - Attachment with flyer

  Initial course announcement is two to three months in advance (the first courses had a shorter announcement period). Announcement by email is repeated two times minimum. Eventually a late reminder showing the latest free places is sent a week before the course.
  The email announcement are created by IMEC and relayed to the STIMESI project partners and other contacts.
  Liaising with each delegate, giving extra information to the course attendees is also done by email. (e.g. Transportation tips )
  The following courses were announced during the reporting period:

| | | |
|---|---|---|
| February, 15 - 18, 2011 | Tronics and MultiMEMS MEMS Processes<br>*Politecnico di Torino* | *Torino, Italy* |
| March, 1 - 4, 2011 | MEMSCAP: MUMPs® (Multi-User MEMS) processes<br>*Lund University* | *Lund, Sweden* |
| June 27-30, 2011 | Introduction to MEMS design and prototyping<br>*Aalto University* | *Aalto (Helsinki), Finland* |
| July 12-15, 2011 | Tronics and MultiMEMS MEMS Processes<br>*Ecole d'Ingenieurs et d'Architectes de Fribourg* | *Fribourg, Switzerland* |
| September 13-16, 2011 | Tronics and MultiMEMS MEMS Processes<br>*Katholieke Universiteit Leuven ESAT-MICAS* | *Leuven, Belgium* |
| November, 8 - 11, 2011 | MEMSCAP: MUMPs® (Multi-User MEMS) processes<br>*Instituto de Microelectrónica de Sevilla (IMSE)* | *Sevilla, Spain* |

  All courses are advertising through:
  - STFC: the EUROPRACTICE Software Service network: Mailshot to each of the 2500+ people who have requested from the Europractice Software Service to receive direct notification of relevant events.
  - IMEC: the large email IMEC distribution list of the Europractice-IC service (>650 universities)
  - COREP: the EUROTRAINING network: EuroTraining displayed them on their website. Many other institutes also took over the STIMESI announcements. COREP had also the possibility to use the mailing list of Eurotraining, so the Stimesi courses were always advertised with special emalings to the nearly 7.500 Eurotraining subscribers.

- MEMSCAP MUMPs user database, which encounter more than 500 people, actually using or having used MUMPS services in the past.
- IMEC: Different groups of MTC-online, the knowledge community of Micro Electronics.
- IMEC: The distribution list of all former STIMESI attendees. (including STIMESI-1 workshop attendees).

- *Poster*: For display at the local institute, if requested, a poster was made (e.g. Sevilla ).
- *Publication*: in Parliament Magazine Research Review, 21st edition, April 11, 2011

**Dissemination activities by STFC:**

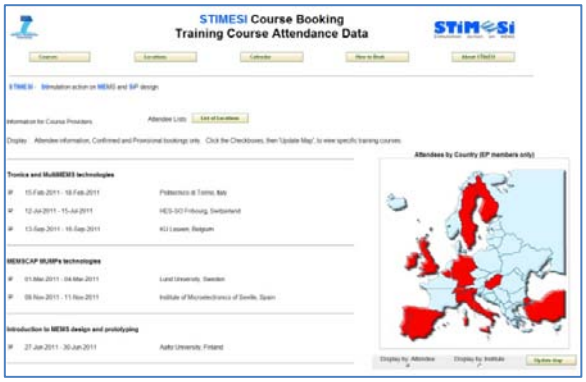
Information about forthcoming training courses is disseminated through the following channels:

- Mailshot to the Europractice Software Service Representative at each of the 670 member institutions throughout Europe.
- Mailshot to each of the 2500+ people who have requested from the Europractice Software Service to receive direct notification of relevant events.
- Through the STIMESI course booking website, which includes a calendar of courses: http://www.stimesi.rl.ac.uk
- Through the main Europractice website: http://www.europractice.com This website includes links to all the Europractice projects and highlights items of 'hot news'.
- Through the Europractice project 'EUROTRAINING": http://www.eurotraining.net This is a directory of micro and nanoelectronic training courses in Europe.

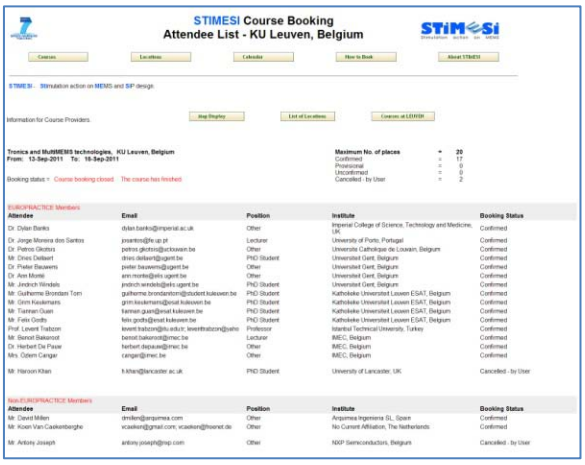
**Websites**

STFC has modified the STIMESI-1 course booking website to make it suitable for the STIMESI-2 project. The website allows potential customers to browse available training courses by course type and by course location. A calendar of courses is also available. Customers can use the website to make their booking.

Additional webpages have been created for the use of the STIMESI partners. These allow the partners to view attendee lists from previous courses as well as bookings for future courses. The webpages give a breakdown of attendees by country to help select locations for future courses.





**Dissemination activities by COREP:**


COREP was the responsible of the publication of the course flyers in the Eurotraining Course Directory . As responsible of this service, COREP had also the possibility to use the mailing list of Eurotraining, so the Stimesi courses were always advertised with special emalings to the nearly 7.500 Eurotraining subscribers .

**Dissemination activities by MEMSCAP:**

MUMPS training session has been announced mainly via three networks:

- Direct mailing to the MEMSCAP MUMPs user database, which encounter more than 500 people, actually using or having used MUMPS services in the past
- Direct mailing to the Europractice network via the IMEC database of users of various MPW services
- Posting of the information on the MEMSCAP web site which relayed the information from the STIMESI 2 organisation.

**Dissemination activities: Problems and corrective actions:**

The dissemination activities suffered from a short delay with respect to the project plan. The cause was the extra effort and time needed for the development of the new course and the adaptation of previous courses. Much preparatory work was done during the beginning of the project. However, due to the long time needed to agree with a host institute settle and fix a course date, this only became visible once course dates were fixed and the dissemination activities were launched. At the start of the second project year, the dissemination framework is in place and parallel negotiations are ongoing with several institutes for the next courses in order to be able to announce them in time. The trend in increasing number of attendees confirms this evolution.

## 2.4. Project management during the period

### *2.4.1. Summary*

This report of the STIMESI project gives an overview of the actual costs and resources spent by the consortium contractors during the first year of the project. After 1 year of activity the following observations can be made :

- Of the total planned budget of ... EUR during the first year of the project ... % has been spent, corresponding to a total of ... EUR

In general, it can be stated that each contractor contributed according his role described in the Description of Work. Although a slight delay is recognized in the number of delivered course events, it is noted that all contractor contributed actually *more* than planned in order to get the project re-established: extra effort was delivered for WP1 'Course material development, revision and update' for adapting the Tronic's course (by COREP) and for the creation of the new introductory course (by IMEC). Extra effort by IMEC and STFC was installed to start negotiations with many institutes in parallel in order to fix course dates long in advance.
Consequently, this has an effect on the actual costs and resources spent by some partners.

### *2.4.2. Consortium management tasks and achievements*

The management of the STIMESI-2 Project is done by the Project Steering Committee, which consists of one representative of each partner in the STIMESI-2 project, the chairman being appointed by the Coordinating Participant, IMEC. Based on the experience with the previous STIMESI project, the existing project management organization was proposed to continue. The Project Steering Committee comes together three times during the full duration of the project. The first meeting was held at the beginning of the project with the aim to launch the project. This meeting coincided with the "course preparation & evaluation meeting" which was held in Torino. The second meeting will take place after the first project year. This meeting is held prior to the first review meeting. In between meetings, as the consortium is relatively small, regular contact on almost a daily basis is maintained by all partners.

The main activities and achievements of the Project Steering Committee during the first year of the project are outlined below:

- Reviewing of the project progress, ensuring the project maintains the technical objectives.
- To ensure that adequate resources are available for completing the project.
- To approve all significant changes in the project workplan and in the deliverables.

The main activities and achievements of the Project Coordinator during the first year of the project are outlined below:

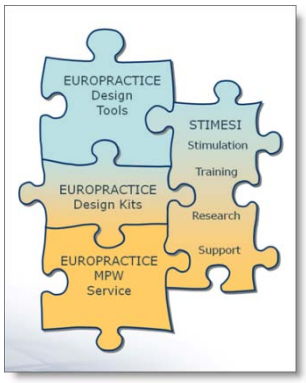
- Organizing the project activities and representing the project outside. Monitoring the progress of the project and report its global status.
- Transfer of all necessary information to the consortium and vice-versa to the European Commission.
- Supervision of the overall activities outlined in the workplan.
- Drive promotion and general presentation of STIMESI to externals.
- Organization of the work flow between the work packages and within the project, e.g. defining interfaces and ensuring hand-over of results within the project.
- Monitoring of deliverables and milestones.
- Coordination and supervision of all legal and contractual aspects including the preparation and updating of the Consortium Agreement.
- Monitoring budget and expenditures.
- Quality control and submission of progress reports to the European Commission.
- Submission of financial statements to the European Commission.
- Receive the financial contribution from the European Commission and distribute it to the partners.

### 2.4.3. co-ordination activities during Project Year1, such as communication between beneficiaries

As the consortium is relatively small, regular contact on almost a daily basis is maintained by all partners.
When an issue drops, like for example the question about the need for paper handouts compared to electronic format and it's benefit for the environment, the question was relayed to all other partners and a discussion was organized resulting in a flexible offer: The resulting guideline is to provide presentation material on CD or online while hand-on exercises will be provided on paper. Yet, the specific nature of the STIMESI project allows for individual choices of each partner.

### 2.4.4. Co-operation with other projects/programmes

The STIMESI project operates in close relation with the EUROPRACTICE IC service and the Software Service. STIMESI Courses address the design tools, design kits and processes which are readily available at affordable prices through the EUROPRACTICE Software Service and the EUROPRACTICE IC Service. In this way, STIMESI benefits from the EUROPRACTICE project but also strengthens it.




### 2.4.5. Problems which have occurred and how they were solved or envisaged solutions

The long lead time required finding a host institute and a suitable date for the course event to take place was initially a problem. While the selection of host institute is the responsibility of the course owner in the original work plan, a shared and continuous effort by IMEC and STFC was installed to start negotiations with many institutes in parallel in order to fix course dates long in advance.

During Year 1 the target to deliver each course, twice a year was not met, (delay both on course content and on scheduling). However, this initial hurdle is passed and the missing courses will be scheduled in Year2.

The number of course attendees is lower than anticipated. Possible reasons are the introduction of a subscription fee, the short announcement period for the first courses (related to the re-launch issues of the project) and in general, the economical climate disfavouring travelling. Announcement of courses more in advance and extra effort to attract attendees will be made as corrective action.

### 2.4.6. List of project meetings, dates and venues

- 7 Sept 2010: General Meeting 1 (GM1): Kick-off meeting, followed by the "course preparation & evaluation meeting" , at COREP, Torino, Italy
- 3 Oct 2011: General Meeting 2 (GM2) followed by Review Meeting 1 (RM1), at imec, Leuven, Belgium

### 2.4.7. Project planning and status

See 2.2.1 page 5, Work package Overview, Project timeline and summary of project status

### 2.4.8. Impact of possible deviations from the planned milestones and deliverables

The delay in M1.1 "Training courses evaluated and prepared, design kit updated & checked" had an impact on the start of te project. More work was needed to adapt the Tronic's course (by COREP) and for the creation of the new introductory course (by IMEC). The effect of this is a delay in the planning and announcement of the courses and consequently in the delivery of the courses. However, this doesn't hinder the global project and

the missing courses will be scheduled in Year2. For MEMSCAP, the second course was already delivered recently, but in the beginning of Year2.

### *2.4.9. Development of the Project website*

The Project Website plays a major role in the dissemination activities of the STIMESI project. It serves as the central place where potential course candidates can find information about coming courses. Attendees of passed courses can find course content and exercises on the protected area of the STIMESI site. The development of the Project website is part of the dissemination activities reported in WP3.

# 3. Deliverables and milestones tables

## 3.1. Deliverables

| Table 1. Deliverables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **no.** | **Name** | **Vsn** | **WP no.** | **Lead beneficiary** | **Nature** | **Dissemination level[3]** | **Delivery date from Annex I (proj month)** | **Actual / Forecast delivery date Dd/mm/yyyy** | **Status No submitted/ Submitted** | **Contractual Yes/No** | **Comments** |
| D1.1 | Course Update report 1 (CUP1) | 1 | 1 | 1 | R | CO | 3 | 01/10/2011 | No submitted | | |
| D1.2 | Design Kit Update report 1 (DKUP1) | 1 | 1 | 1 | R | CO | 3 | 01/10/2011 | No submitted | | |
| D3.1 | Report on initial project and course PR, Dissemination (DIS1) | 1 | 3 | 1 | R | CO | 3 | 01/10/2011 | No submitted | | |
| D2.1 | Report on Course Planning and Delivery in Year 1 (CPDEL1) | 1 | 2 | 2 | R | CO | 14 | 01/10/2011 | No submitted | | |
| D3.2 | Dissemination Report in Year 1 (DIS2) | 1 | 3 | 1 | R | CO | 14 | 01/10/2011 | No submitted | | |
| D4.1 | Activity report Year 1 (AR1) | 1 | 4 | 1 | R | CO | 14 | 01/10/2011 | No submitted | | |
| D4.2 | Management report Year 1 (MR1) | 1 | 4 | 1 | R | CO | 14 | 01/10/2011 | No submitted | | |

[3] **PU** = Public
**PP** = Restricted to other programme 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).
**Make sure that you are using the correct following label when your project has classified deliverables.**
**EU restricted** = Classified with the mention of the classification level restricted "EU Restricted"
**EU confidential** = Classified with the mention of the classification level confidential " EU Confidential "
**EU secret** = Classified with the mention of the classification level secret "EU Secret "

## 3.2. Milestones

| Table 2. Milestones | | | | | | | |
|---|---|---|---|---|---|---|---|
| **no.** | **Name** | **Work package no** | **Lead beneficiary** | **Delivery date from Annex I dd/mm/yyyy** | **Achieved Yes/No** | **Actual / Forecast achievement date dd/mm/yyyy** | **Comments** |
| MS1 | Training courses evaluated and prepared, design kit updated & checked | 1 | 1 | 01/11/2010 | No | 01/02/2011 | Availability of courses & kits for delivering first series of courses, Report: CUP1, DKUP1 |
| MS3 | Interim assessment of course planning and course delivery | 2 | 2 | 01/10/2011 | Yes | 01/10/2011 | Report: CPDEL1 |
| MS5 | Initial project and course PR, dissemination ready | 3 | 1 | 01/11/2010 | No | 01/02/2011 | Availability of brochures & flyers and websites ready & up to date for first series of course. Report: DIS1 |
| MS6 | Interim assessment of the results of the STIMESI dissemination activities | 3 | 1 | 01/10/2011 | Yes | 01/10/2011 | Report: DIS2 |
| MS8 | Review of project activities and management activities during Year 1 of the STIMESI-2 project | 4 | 1 | 01/10/2011 | Yes | 01/10/2011 | Report: AR1 & MR1 |
| | | | | | | | |
| | | | | | | | |

# 4. Explanation of the use of the resources

| Table 3.1 Personnel, subcontracting and other major cost items for beneficiary 1 (IMEC) for the period | | | | | |
|---|---|---|---|---|---|
| Work Package | Item description | Amount in € | | | Explanations |
| | | Support | Management | Total | |
| 1,2,3,4 | Personnel direct costs | 36.899,60 | 2.462,84 | 39.362,44 | Personnel employed to perform contract activities and management |
| 2 | Subcontracting | 4.000,00 | 0,00 | 4.000,00 | Fixed course hosting fee (4 x 1000 €) |
| 1,2,4 | Other direct costs | 2.615,32 | 0,00 | 2.615,32 | Travel and subsistence for meeting Torino: 1 person accommodation and transportation for 2 days + Travel and subsistence for first training in Aalto: 2 persons accommodation and transportation for 5 days (4 days training + 1 day travel) |
| 1,2,3,4 | Indirect costs | 21.627,98 | 1.268,08 | 22.896,06 | |
| | TOTAL COSTS | 65.142,90 | 3.730,92 | 68.873,82 | |

| Table 3.2 Personnel, subcontracting and other major cost items for beneficiary 2 (STFC) for the period | | | | | |
|---|---|---|---|---|---|
| Work Package | Item description | Amount in € | | | nations |
| 1,2,3,4 | Personnel dire | | | | |
| 2 | Subcontracting | | | | |
| 1,2,4 | Other direct co | | | | |
| 1,2,3,4 | Indirect costs | | | | |
| | TOTAL COSTS | | | | |

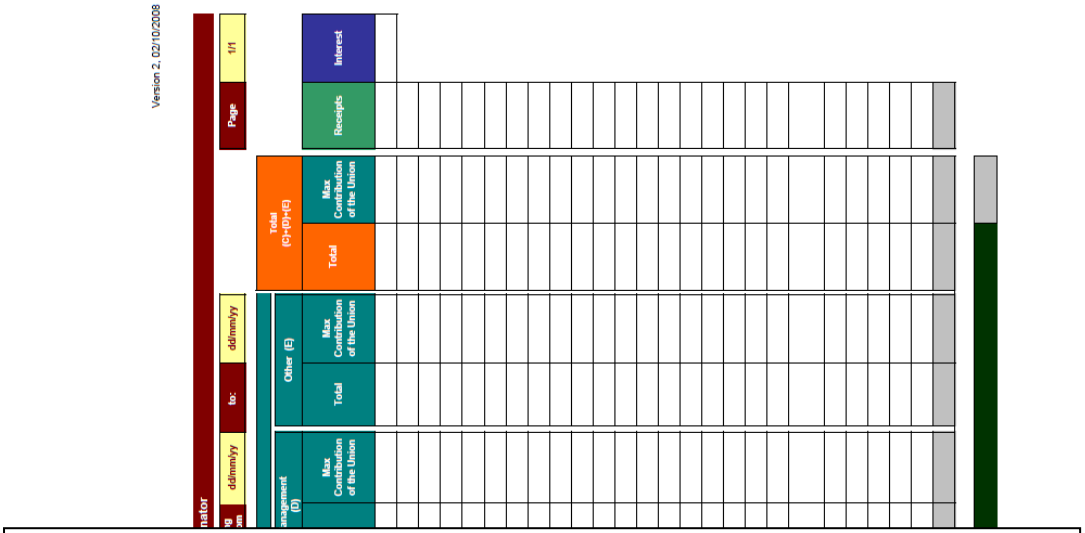
Financial data from STFC is not yet available but will be provided in due time

| Table 3.3 Personnel, subcontracting and other major cost items for beneficiary 3 (MEMSCAP) for the period | | | | | |
|---|---|---|---|---|---|
| Work Package | Item description | Amount in € | | | Explanations |
| | | Support | Management | Total | |
| 1,2,3,4 | Personnel direct costs | 25.307,22 | 739,50 | 26.046,72 | Salaries of 3 persons in support (engineer 15%, product manager 15%, manager 4%), 1 manager in management (1%) |
| 2 | Subcontracting | 1.000,00 | 0,00 | 1.000,00 | Support from Coventor to dispense training |
| 1,2,4 | Other direct costs | 3.683,43 | 0,00 | 3.683,43 | Travel and subsistence for first training in Lund: 2 persons accommodation and transportation for 5 days (4 days training + 1 day travel) |
| 1,2,3,4 | Indirect costs | 5.998,13 | 147,90 | 6.146,03 | 20% of direct costs |
| | TOTAL COSTS | 35.988,78 | 887,40 | 36.876,18 | |

| Table 3.4 Personnel, subcontracting and other major cost items for beneficiary 4 (COREP) for the period | | | | | |
|---|---|---|---|---|---|
| Work Package | Item description | Amount in € | | | Explanations |
| | | Support | Management | Total | |
| 1,2,3,4 | Personnel direct costs | 17.363,43 | 490,46 | 17.853,89 | Personnel employed to perform contract activities and management |
| 2 | Subcontracting | 9.000,00 | | 9.000,00 | Vestfold University College, subcontracting part of work in Work Package 2 |
| 1,2,4 | Other direct costs | 3.560,32 | | 3.560,32 | Travel and subsistence costs incurred in fulfilling contract activities |
| 1,2,3,4 | Indirect costs | 4.184,75 | 98,09 | 4.282,84 | Flat indirect cost 20% rate on contract costs excluded subcontracting |
| | TOTAL COSTS | 34.108,50 | 588,55 | 34.697,05 | |

# 5. Financial statements – Form C and Summary financial report

FP7 - Grant Agreement - Annex VI - Coordination and Support Action



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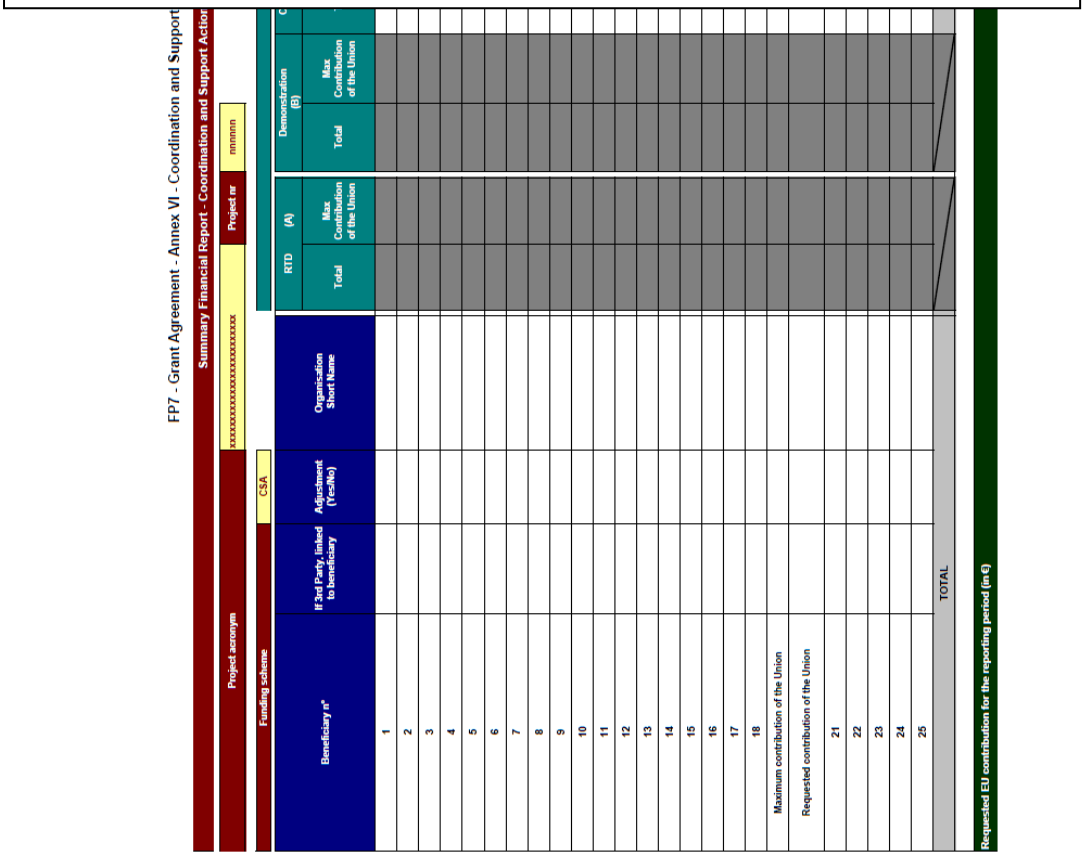

# FP7 - Grant Agreement - Annex VI - Coordination and support action

Form C - Financial Statement (to be filled in by each beneficiary)

| | | | |
|---|---|---|---|
| Project Number | 257862 | Funding scheme | Coordination and support action |
| Project Acronym | STIMESI-2 | | |
| Period from | 01/09/2010 | Is this an adjustment to a previous statement ? | No |
| To | 31/08/2011 | | |
| Legal Name | INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM VZW | Participant Identity Code | 999981149 |
| Organisation Short Name | IMEC | Beneficiary nr | 1 |
| Funding % for RTD activities | NA | If flat rate for indirect costs, specify % | N/A |

**1. Declaration of eligible costs/lump sum/flate-rate/scale of unit (in €)**

| | Type of Activity | | | |
|---|---|---|---|---|
| | Coordination / Support (A) | Management (B) | Other (C) | Total (A+B+C) |
| Personnel costs | 36,900 | 2,463 | 0 | 39,363 |
| Subcontracting | 4,000 | 0 | 0 | 4,000 |
| Other direct costs | 2,615 | 0 | 0 | 2,615 |
| Indirect costs | 21,628 | 1,268 | 0 | 22,896 |
| Maximum reimbursement indirect costs | 2,766 | 172 | 0 | 2,938 |
| Total costs | 65,143 | 3,731 | 0 | 68,874 |
| Maximum EU contribution | 46,281 | 2,635 | 0 | 48,916 |
| Requested EU contribution | | | | 48,916 |

**2. Declaration of receipts**

| | |
|---|---|
| Did you receive any financial transfers or contributions in kind, free of charge from third parties or did the project generate any income which could be considered a receipt according to Art.II. 17 of the grant agreement ? | No |
| If yes, please mention the amount (in €) | |

**3. Declaration of interest yielded by the pre-financing (to be completed only by the coordinator)**

| | |
|---|---|
| Did the pre-financing you received generate any interest according to Art.II.19 ? | No |
| If yes, please mention the amount (in €) | |

**4. Certificate on the methodology**

| | | | |
|---|---|---|---|
| Do you declare average personnel costs according to Art.II.14.1 ? | | | No |
| Is there a certificate on the methodology provided by an independent auditor and accepted by the Commission according to Art.II.4.4 ? | | | No |
| Name of the auditor | | Cost of the certificate (in €), if charged under this project | |

**5. Certificate on the financial statements**

| | | | |
|---|---|---|---|
| Is there a certificate on the financial statements provided by an independent auditor attached to this financial statement according to Art.II.4.4 ? | | | No |
| Name of the auditor | | Cost of the certificate (in €) | |

**6. Beneficiary's declaration on its honour**

**We declare on our honour that:**

- the costs declared above are directly related to the resources used to attain the objectives of the project and fall within the definition of eligble costs specified in Articles II.14 and II.15 of the grant agreement, and, if relevant, Annex III and Article 7 (special clauses) of the grant agreement;
- the receipts declared above are the only financial transfers or contributions in kind, free of charge, from third parties and the only income generated by the project which could be considered as receipts according to Art.II.17 of the grant agreement;
- the interest declared above is the only interest yielded by the pre-financing which falls whithin the definition of Art.II.19 of the grant agreement;
- there is full supporting documentation to justify the information hereby declared. It will be made available at the request of the Commission and in the event of an audit by the Commission and/or by the Court of Auditors and/or their authorised representatives.

| Beneficiary's Stamp | Name of the Person(s) Authorised to sign this Finanancial Statement |
|---|---|
| | Hannelore Marain |
| | Date & signature |

## FP7 - Grant Agreement - Annex VI - Coordination and support action

Form C - Financial Statement (to be filled in by each beneficiary)

| | | | |
|---|---|---|---|
| Project Number | 257862 | Funding scheme | Coordination and support action |
| Project Acronym | STIMESI-2 | | |
| Period from | 01/09/2010 | Is this an adjustment to a previous statement ? | No |
| To | 31/08/2011 | | |
| Legal Name | Science and Technology Facilities Council | Participant Identity Code | |
| Organisation Short Name | STFC | Beneficiary nr | 2 |
| Funding % for RTD activities | | If flat rate for indirect costs, specify % | |

| | Type of Activity | | | |
|---|---|---|---|---|
| | Coordination / Support (A) | Management (B) | Other (C) | Total (A+B+C) |
| Personnel costs | | | | |
| Subcontracting | | | | |
| Other direct costs | | | | |
| Indirect costs | | | | |
| Maximum reimbursement indirect costs | | | | |
| Total costs | | | | |
| Maximum EU contrib | | | | |
| Requested EU contri | | | | |

**Not yet available.**

**Form C will come in due time**

Did you receive any financial transfers as contribution in kind, free of charge from third parties or did the project generate any income which could be considered a receipt according to Art.II.17 of the grant agreement? No
If yes, please mention the amount:

4. Certificate on the methodology

Do you declare average personnel costs according to Art.II.14.2? No
Is there a certificate on the methodology provided by an independent auditor attached to this financial statement according to the Commission according to Art.II.4.4 ? No

| | | | |
|---|---|---|---|
| Name of the auditor | | Cost of the certificate (in €), if charged under this project | |

5. Certificate on the financial statements

Is there a certificate on the financial statements provided by an independent auditor attached to this financial statement according to Art.II.4.4 ? No

| | | | |
|---|---|---|---|
| Name of the auditor | | Cost of the certificate (in €) | |

6. Beneficiary's declaration on its honour

We declare on our honour that:

- the costs declared above are directly related to the resources used to attain the objectives of the project and fall within the definition of eligible costs specified in Articles II.14 and II.15 of the grant agreement, and, if relevant, Annex III and Article 7 (special clauses) of the grant agreement;
- the receipts declared above are the only financial transfers or contributions in kind, free of charge, from third parties and the only income generated by the project which could be considered as receipts according to Art.II.17 of the grant agreement;
- the interest declared above is the only interest yielded by the pre-financing which falls whithin the definition of Art.II.19 of the grant agreement;
- there is full supporting documentation to justify the information hereby declared. It will be made available at the request of the Commission and in the event of an audit by the Commission and/or by the Court of Auditors and/or their authorised representatives.

| Beneficiary's Stamp | Name of the Person(s) Authorised to sign this Finanancial Statement |
|---|---|
| | Date & signature |

# FP7 - Grant Agreement - Annex VI - Coordination and support action

Form C - Financial Statement (to be filled in by each beneficiary)

| | | | |
|---|---|---|---|
| Project Number | 257862 | Funding scheme | Coordination and support action |
| Project Acronym | STIMESI-2 | | |
| Period from | 01/09/2010 | Is this an adjustment to a previous statement ? | No |
| To | 31/08/2011 | | |
| Legal Name | MEMSCAP SA | Participant Identity Code | 998798137 |
| Organisation Short Name | MEMSCAP | Beneficiary nr | 3 |
| Funding % for RTD activities | NA | If flat rate for indirect costs, specify % | 20 |

**1. Declaration of eligible costs/lump sum/flate-rate/scale of unit (in €)**

| | Type of Activity | | | |
|---|---|---|---|---|
| | Coordination / Support (A) | Management (B) | Other (C) | Total (A+B+C) |
| Personnel costs | 25,307 | 740 | 0 | 26,047 |
| Subcontracting | 1,000 | 0 | 0 | 1,000 |
| Other direct costs | 3,683 | 0 | 0 | 3,683 |
| Indirect costs | 5,798 | 148 | 0 | 5,946 |
| Maximum reimbursement indirect costs | 2,029 | 51 | 0 | 2,080 |
| Total costs | 35,788 | 888 | 0 | 36,676 |
| Maximum EU contribution | 32,019 | 791 | 0 | 32,810 |
| Requested EU contribution | | | | 32,810 |

**2. Declaration of receipts**

| | |
|---|---|
| Did you receive any financial transfers or contributions in kind, free of charge from third parties or did the project generate any income which could be considered a receipt according to Art.II. 17 of the grant agreement ? | No |
| If yes, please mention the amount (in €) | |

**4. Certificate on the methodology**

| | | | |
|---|---|---|---|
| Do you declare average personnel costs according to Art.II.14.1 ? | | | No |
| Is there a certificate on the methodology provided by an independent auditor and accepted by the Commission according to Art.II.4.4 ? | | | No |
| Name of the auditor | | Cost of the certificate (in €), if charged under this project | |

**5. Certificate on the financial statements**

| | | | |
|---|---|---|---|
| Is there a certificate on the financial statements provided by an independent auditor attached to this financial statement according to Art.II.4.4 ? | | | No |
| Name of the auditor | | Cost of the certificate (in €) | |

**6. Beneficiary's declaration on its honour**

**We declare on our honour that:**

- the costs declared above are directly related to the resources used to attain the objectives of the project and fall within the definition of eligble costs specified in Articles II.14 and II.15 of the grant agreement, and, if relevant, Annex III and Article 7 (special clauses) of the grant agreement;
- the receipts declared above are the only financial transfers or contributions in kind, free of charge, from third parties and the only income generated by the project which could be considered as receipts according to Art.II.17 of the grant agreement;
- the interest declared above is the only interest yielded by the pre-financing which falls whithin the definition of Art.II.19 of the grant agreement;
- there is full supporting documentation to justify the information hereby declared. It will be made available at the request of the Commission and in the event of an audit by the Commission and/or by the Court of Auditors and/or their authorised representatives.

| Beneficiary's Stamp | Name of the Person(s) Authorised to sign this Finanancial Statement |
|---|---|
| | Yann Cousinet |
| | Date & signature |
| | |

# FP7 - Grant Agreement - Annex VI - Coordination and support action

Form C - Financial Statement (to be filled in by each beneficiary)

| | | | |
|---|---|---|---|
| Project Number | 257862 | Funding scheme | Coordination and support action |
| Project Acronym | STIMESI-2 | | |
| Period from | 01/09/2010 | Is this an adjustment to a previous statement ? | No |
| To | 31/08/2011 | | |
| Legal Name | CONSORZIO PER LA RICERCA E L'EDUCAZIONE PERMANENTE, TORINO | Participant Identity Code | 999635926 |
| Organisation Short Name | COREP | Beneficiary nr | 4 |
| Funding % for RTD activities | NA | If flat rate for indirect costs, specify % | 20 |

**1. Declaration of eligible costs/lump sum/flate-rate/scale of unit (in €)**

| | Type of Activity | | | |
|---|---|---|---|---|
| | Coordination / Support (A) | Management (B) | Other (C) | Total (A+B+C) |
| Personnel costs | 17,364 | 490 | 0 | 17,854 |
| Subcontracting | 9,000 | 0 | 0 | 9,000 |
| Other direct costs | 3,560 | 0 | 0 | 3,560 |
| Indirect costs | 4,184 | 98 | 0 | 4,282 |
| Maximum reimbursement indirect costs | 1,464 | 34 | 0 | 1,498 |
| Total costs | 34,108 | 588 | 0 | 34,696 |
| Maximum EU contribution | 31,388 | 524 | 0 | 31,912 |
| Requested EU contribution | | | | 31,912 |

**2. Declaration of receipts**

| | |
|---|---|
| Did you receive any financial transfers or contributions in kind, free of charge from third parties or did the project generate any income which could be considered a receipt according to Art.II. 17 of the grant agreement ? | No |
| If yes, please mention the amount (in €) | |

**4. Certificate on the methodology**

| | | | |
|---|---|---|---|
| Do you declare average personnel costs according to Art.II.14.1 ? | | | No |
| Is there a certificate on the methodology provided by an independent auditor and accepted by the Commission according to Art.II.4.4 ? | | | No |
| Name of the auditor | | Cost of the certificate (in €), if charged under this project | |

**5. Certificate on the financial statements**

| | | | |
|---|---|---|---|
| Is there a certificate on the financial statements provided by an independent auditor attached to this financial statement according to Art.II.4.4 ? | | | No |
| Name of the auditor | | Cost of the certificate (in €) | |

**6. Beneficiary's declaration on its honour**

**We declare on our honour that:**

- the costs declared above are directly related to the resources used to attain the objectives of the project and fall within the definition of eligble costs specified in Articles II.14 and II.15 of the grant agreement, and, if relevant, Annex III and Article 7 (special clauses) of the grant agreement;
- the receipts declared above are the only financial transfers or contributions in kind, free of charge, from third parties and the only income generated by the project which could be considered as receipts according to Art.II.17 of the grant agreement;
- the interest declared above is the only interest yielded by the pre-financing which falls whithin the definition of Art.II.19 of the grant agreement;
- there is full supporting documentation to justify the information hereby declared. It will be made available at the request of the Commission and in the event of an audit by the Commission and/or by the Court of Auditors and/or their authorised representatives.

| Beneficiary's Stamp | Name of the Person(s) Authorised to sign this Finanancial Statement |
|---|---|
| | Pierluigi Civera Sabrina Iaverdino |
| | Date & signature |

# 6. Appendix: List of links to testimonial material

| | |
|---|---|
| course content day1 | http://www.stimesi.org/documents/PR1/WP1_02_STIMESI_IMEC_course_content_day1.png |
| Handouts day 1 | http://www.stimesi.org/documents/PR1/WP1_06_STIMESI_IMEC_course_content_day1-Handouts.pdf |
| course content day2 | http://www.stimesi.org/documents/PR1/WP1_02_STIMESI_IMEC_course_content_day2.png |
| course content day3 | http://www.stimesi.org/documents/PR1/WP1_02_STIMESI_IMEC_course_content_day3.png |
| course content day4 | http://www.stimesi.org/documents/PR1/WP1_02_STIMESI_IMEC_course_content_day4.png |
| Agenda of the course | http://www.stimesi.org/documents/PR1/WP1_01_Agenda-STIMESI-course_Introduction_to_MEMS_design_and_prototyping.pdf |
| Feedback Questionnaires Aalto | http://www.stimesi.org/documents/PR1/WP1_07_Feedback_Questionnaires_Aalto.pdf |
| Short and detailed agenda of MEMSCAP course | http://www.stimesi.org/documents/PR1/WP1_08_MEMSCAP_Short_and_detailed_Agenda.pdf |
| About SiGeMEMS handbooks | http://www.stimesi.org/documents/PR1/WP1_09_SiGeMEMS_Handbooks.pdf |
| host handbook with requirements | http://www.stimesi.org/documents/PR1/WP2_01_STIMESI_Course_Hosting_Invitation_and_Requirements_v1d2.pdf |
| Stimesi Course Hosting Application and Feedback Form | http://www.stimesi.org/documents/PR1/WP2_02_Stimesi_Course_Hosting_Application_and_Feedback_Form_v1d0.docx |
| Example feedback form from Aalto host | http://www.stimesi.org/documents/PR1/WP2_03_Stimesi_Course_Hosting_Application_and_Feedback_Form_v1d0_Aalto.pdf |
| Roadmap of course planning and delivery | http://www.stimesi.org/documents/PR1/WP2_04_hosting_a_stimesi_course_roadmap.png |
| Invoicing instruction to imec | http://www.stimesi.org/documents/PR1/WP2_05_STIMESI_Course_Hosting_Invoicing_imec_v1d1.pdf |
| Invoicing instruction to STFC | http://www.stimesi.org/documents/PR1/WP2_06_STIMESI_Host_Invoicing_STFC-RAL.pdf |
| Template for course feedback questionnaire | http://www.stimesi.org/documents/PR1/WP2_07_STIMESI_course_Feedback_Questionnaire_template.docx |
| Instructions on how to log in to the protected STIMESI domain | http://www.stimesi.org/documents/PR1/WP2_08_STIMESI_access_instruction_sheet.pdf |
| Example email announcement | http://www.stimesi.org/documents/PR1/WP2_11_STIMESI_course_email_announcement.png |
| Example course flyer (Aalto course) | http://www.stimesi.org/documents/PR1/WP2_10_STIMESI-2 Course_Introduction_to_MEMS_design_and_prototyping_June_27-30_2011 Aalto_Helsinki_Finland_vs03.pdf |
| New Stimesi Powerpoint Style sheet | http://www.stimesi.org/documents/PR1/WP2_09_STIMESI_course_new_style.pptx |
| Finding host: first contact (example) | http://www.stimesi.org/documents/PR1/WP2_12_Finding_host_first_contact.png |
| Finding host: second contact (example) | http://www.stimesi.org/documents/PR1/WP2_13_Finding_host_second_contact.png |
| Finding host: relaying contact (example) | http://www.stimesi.org/documents/PR1/WP2_14_Finding_host_relaying_contact.png |
| View the new logo (different sizes) | http://www.stimesi.org/documents/PR1/NewLogo/View_bitmap_logos.html |
| New Stimesi Powerpoint Style sheet | http://www.stimesi.org/documents/PR1/WP2_09_STIMESI_course_new_style.pptx |
| Stimesi Protected domain on mtc-online | http://www.stimesi.org/documents/PR1/WP3_01_STIMESI_Protected_domain_on_mtc-online.png |
| Stimesi Protected domain in www.stimesi.org context | http://www.stimesi.org/documents/PR1/WP3_02_STIMESI_Protected_domain_on_stimesi_org.png |
| example of Stimesi Protected content in www.stimesi.org context | http://www.stimesi.org/documents/PR1/WP3_03_STIMESI_Protected_domain_on_stimesi_org_w_documents.png |
| Example course flyer (Leuven course) | http://www.stimesi.org/documents/PR1/WP3_04_STIMESI-2_Course_Tronics_and_SensoNor_MEMS_Processes_September13-16_2011_Leuven_Belgium_v3.pdf |
| Google map with indication of Station, hotels and the training site | http://www.stimesi.org/documents/PR1/WP3_05_Google_map_course_Leuven.png |
| Google map with Street View (example of Aalto) | http://www.stimesi.org/documents/PR1/WP3_06_Google_StreetView_course_Aalto.png |
| Example email announcement | http://www.stimesi.org/documents/PR1/WP3_09_STIMESI_course_email_announcement_to_many.png |
| Example email reminder | http://www.stimesi.org/documents/PR1/WP3_11_STIMESI_course_email_reminder.png |
| Example new course announcement and reminder for other course | http://www.stimesi.org/documents/PR1/WP3_10_STIMESI_course_email_announcement_w_reminder.png |
| Example email announcement to contact | http://www.stimesi.org/documents/PR1/WP3_12_STIMESI_course_email_announcement_to_contact.png |
| Example email with transportation tips (snapshot) | http://www.stimesi.org/documents/PR1/WP3_07_Email_w_Transportation_Tips_b.png |
| Example email with transportation tips (full email) | http://www.stimesi.org/documents/PR1/WP3_08_Email_w_Transportation_Tips.pdf |
| Example poster for the course in Sevilla | http://www.stimesi.org/documents/PR1/WP3_13_Poster_Sevilla.png |
| Announcemen Aalto course on Eurotraining website | http://www.stimesi.org/documents/PR1/WP3_17_eurotraining_web_aalto.jpg |
| Announcemen Fribourg course on Eurotraining website | http://www.stimesi.org/documents/PR1/WP3_18_eurotraining_web_hes_so.jpg |
| Eurotraining News (email May 30, 2011) | http://www.stimesi.org/documents/PR1/WP3_15_eurotraining_email_110530.jpg |
| Eurotraining News (email June 16, 2011) | http://www.stimesi.org/documents/PR1/WP3_16_eurotraining_email_110616.jpg |