Communication to the Governing Board of the ENIAC Joint Undertaking about the selection of project proposals and the allocation of public funding following negotiations for Call 2008

EXCERPT

Part 2: NEGOTIATION SUMMARIES

Proposal number: 120001	**Acronym:** E3Car
Duration of the project (months):	36
Date of end of negotiation	05/12/2008
Project start date:	01/02/2009

Project summary

The objective of the project is the development of nanoelectronics technologies, devices, circuits architectures and modules for electrical cars/vehicles and demonstration of these modules in a final systems.

Emissions from road vehicles have to be reduced substantially in the future. The ultimate goal of most car manufacturers is to get to a completely electric vehicle, protecting the environment from emissions and noise, with alternative on-board energy sources (solar) and connection to the grid. In this context the project is addressing the development of highly efficient electrical vehicles, the battery control, the high-voltage components (IGBTs, high-voltage FETs) and the architectures and subsystems for the electronics of electrical vehicles.

The project considers both vertical integration with the final user and equipment providers and horizontal cooperation to build a solid nanoelectronics technology base for Europe electrical car industry and establish standard designs and platforms for electrical/hybrid cars.

The project will consider architectures, technologies and modules being applied to electric vehicles on systems and sub-system levels.

New design and concepts are considered for power train, power conversion, power management and battery management. These systems are considered fail safe and fault tolerant and new methods and technologies for improved reliability and increased lifetime will be developed during the validation phase.

In this context the power and high voltage electronics and smart miniaturized systems for power management, engine control and energy recovery systems will be specified and developed, based on the voltage/current range of needed modules. This results in research activities concerning MOS/DMOS or IGBT-Technologies to become highly energy efficient.

The over all targets are energy savings of 35%.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
Infineon Technologies AG	Germany	4.520.572,00 €	754.935,52 €
ATMEL Germany	Germany	2.038.915,00 €	340.499,00 €
Austriamicrosystems	Austria	2.906.909,66 €	485.453,91 €
ON Semiconductor	Belgium	1.955.700,10 €	326.601,92 €
Robert Bosch GmbH	Germany	816.262,65 €	136.315,86 €
STIFTELSEN SINTEF	Norway	930.000,00 €	155.310,00 €
ElBil Norge AS	Norway	800.000,00 €	133.600,00 €
Think Global AS	Norway	175.000,00 €	29.225,00 €
Centro Ricerche Fiat	Italy	2.520.000,00 €	420.840,00 €
STMicroelectronics Srl	Italy	3.161.814,00 €	528.023,00 €
Fraunhofer-Gesellschaft	Germany	399.766,00 €	66.760,92 €
STMicroelectronics	France	892.000,00 €	148.964,00 €
Centro National de Microelectronica	Spain	535.848,50 €	89.486,70 €
Fundacion CiDETEC	Spain	576.895,00 €	96.341,47 €
Okmetic	Finland	811.459,80 €	135.513,79 €
VTI	Finland	1.119.420,00 €	186.943,14 €
VTT	Finland	1.312.848,00 €	219.245,00 €
Alcatel Thales III-V Lab	France	3.985.141,00 €	665.518,55 €
Audi	Germany	997.922,00 €	166.653,00 €
Tyndall National Institute	Ireland	865.000,00 €	144.455,00 €
IMA	Czech	438.000,00 €	73.146,00 €
ATMEL France	France	2.403.253,00 €	401.343,25 €
CISC Semiconductor	Austria	1.096.883,80 €	183.171,00 €
VALEO	France	1.695.520,00 €	283.151,84 €
Consiglio Nazionale delle Ricerche	Italy	385.857,00 €	64.438,00 €
FH-JOANNEUM Gesellschaft mbH	Austria	671.720,10 €	112.177,00 €
Technische Universität Wien	Austria	504.000,00 €	84.168,00 €
SIEMENS	Germany	722.579,90 €	120.670,84 €
Brno University of Technology	Czech	564.000,00 €	94.188,00 €
CEA LETI	France	1.515.379,00 €	253.068,29 €
Infineon Austria	Austria	1.394.894,52 €	232.947,38 €
Philips Electronics Nederland B.V	The Netherlands	957.372,00 €	159.881,00 €
Epyon	The Netherlands	481.750,00 €	80.452,25 €
Total		**44.152.683,03 €**	**7.373.488,63 €**

Proposal number: 120003	**Acronym:** MODERN
Duration of the project (months):	36
Date of end of negotiation	05/12/2008
Project start date:	01/01/2009

Project summary

The influence of process variations is becoming extremely critical for nanoCMOS technology nodes, due to geometric tolerances and manufacturing non-idealities (such as edge or surface roughness, or the fluctuation of the number of doping atoms). As a result, production yields and figures of merit of a circuit such as performance, power, and reliability have become extremely sensitive to uncontrollable statistical process variations. Although some kind of variability has always existed and been taken into account for designing integrated circuits, the largest impact of variability and the greater influence of random or spatial aspects are setting up a completely new challenge. On top of those difficulties, the deficiency of design techniques and EDA methodologies for tackling PVs makes that challenge even more critical.

The objective of the MODERN project is to develop new paradigms in integrated circuit design which will enable the manufacturing of reliable, low cost, low EMI, high-yield complex products using unreliable and variable devices.

Specifically, the main goals of the project are:
1. Advanced, yet accurate, models of process variations for nanometer devices, circuits and complex architectures.
2. Effective methods for evaluating the impact of process variations on manufacturability, design reliability and circuit performance.
   - Reliability, noise, EMC/EMI.
   - Timing, power and yield.
3. Design methods and tools to mitigate or tolerate the effects of process variations on those quantities applicable at the device, circuit and architectural levels.
4. Validation of the modeling and design methods and tools on a variety of silicon demonstrators.

The MODERN Consortium features strong competence and expertise in the field of advanced technologies, with a well-balanced participation between industry and research institutes.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
STMicroelectronics SA	France	731.711,00 €	122.196,00 €
NXP Semiconductors Netherlands B.V.	The Netherlands	5.548.950,00 €	926.675,00 €

Alma Mater Studiorum - Università di Bologna	Italy	680.000,00 €	113.560,00 €
Thales SA	France	1.280.338,00 €	213.816,00 €
TIEMPO SAS	France	974.220,00 €	162.695,00 €
University of Calabria	Italy	340.000,00 €	56.780,00 €
Integrated System Development SA	Greece	665.500,00 €	111.139,00 €
Consorzio Nazionale Interuniversitario per la Nanoelettronica	Italy	680.000,00 €	113.560,00 €
Austriamicrosystems AG	Austria	906.594,00 €	151.401,00 €
Infineon Technologies Austria AG	Austria	1.478.010,00 €	246.828,00 €
Universitat Politecnica de Catalunya	Spain	208.200,00 €	34.769,00 €
STMicroelectronics (Crolles 2) SAS	France	1.085.032,00 €	181.200,00 €
MunEDA GmbH	Germany	763.875,00 €	127.567,00 €
Politecnico di Torino	Italy	1.360.000,00 €	227.120,00 €
Centre Suisse d'Electronique et Microtechnologie	Switzerland	551.250,00 €	92.059,00 €
CEA-LETI	France	1.331.859,00 €	222.420,00 €
STMicroelectronics S.r.l.	Italy	2.512.000,00 €	419.504,00 €
The University of Glasgow	United Kingdom	1.488.000,00 €	64.128,00 €
Montpellier Laboratory of Computer Science, Robotics and Micro-electronics	France	374.053,00 €	62.467,00 €
IMEP-LAHC Laboratory	France	327.666,00 €	54.720,00 €
Graz University of Technology	Austria	189.000,00 €	31.563,00 €
Numonyx Italy Srl	Italy	960.000,00 €	160.320,00 €
Vienna University of Technology	Austria	189.027,00 €	31.568,00 €
Elastic Clocks S.L.	Spain	238.000,00 €	39.746,00 €
Sapienza Università di Roma	Italy	340.000,00 €	56.780,00 €
Delft University of Technology	The Netherlands	1.255.152,00 €	209.610,00 €
Eindhoven University of Technology	The Netherlands	252.000,00 €	42.084,00 €
TEKLATECH A/S	Denmark	157.569,00 €	26.314,00 €
Synopsys Switzerland LLC	Switzerland	495.000,00 €	82.665,00 €
Total		**27.363.006,00 €**	**4.385.254,00 €**

Proposal number: 120005	**Acronym:** IMPROVE
Duration of the project (months):	36
Date of end of negotiation	05/12/2008
Project start date:	01/01/2009

Project summary

Maintaining cost decrease per function, reducing cycle times, improving reproducibility and equipment effectiveness while reducing the environmental impact of the factories are key challenges to be addressed to keep the competitiveness of European SC manufacturers.

Manufacturing Science is the main enabler that will allow overcoming these challenges.

IMPROVE (Implementing Manufacturing science solutions to increase equiPment pROductiVity and fab pErformance) is a focused 36 month project that answers to the "advanced line operations" industrial project of the sub-programme SP8 "Equipment & Materials for Nanoelectronics" of the ENIAC call 1.

IMPROVE aims to improve European semiconductor fabs efficiency by providing methods and tools to better **control the process variability**, **reduce the cycle time and enhance the effectiveness of the production equipment**.

To achieve these objectives, IMPROVE will focus on 3 major development axes.
- The development of Virtual Metrology techniques allowing the control of the process at wafer level whilst suppressing standard metrology steps.
- The development of Predictive Equipment Behaviour techniques to improve the process tools reliability whilst optimizing the maintenance frequency and increasing the equipment uptime.
- The development of Dynamic Risk Assessment and Dynamic Control Plan concepts, suppressing unnecessary measurements steps whilst dynamically improving the control plan efficiency.

For these 3 topics, models will be developed and assessed for different process steps and equipment platforms in different manufacturing lines leading to the development of generic solutions.

The impact of the integration of the developed techniques in the various line decision systems and IT infrastructure will also be evaluated and assessed.

To that end, a strong consortium of industrialists, SMEs, academia and institutes has been made-up, including the major European actors.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
STMicroelectronics (Crolles2) SAS	France	4 985 520 €	832 582 €
STMicroelectronics (Rousset) SAS	France	1 294 131 €	216 120 €
STMicroelectronics S.r.l	Italy	2 293 000 €	382 931 €
Numonyx	Italy	2 577 000 €	430 359 €
Infineon Technologies AG.	Germany	1 235 416 €	206 314 €
Infineon Austria	Austria	997 010 €	166 501 €
Intel	Ireland	642 120 €	107 234 €
Atmel	France	1 888 173 €	315 325 €
Austriamicrosystems	Austria	2 026 675 €	338 455 €
PDF solutions	France	1 995 299 €	333 215 €
Camline	Germany	1 622 666 €	270 985 €
Masa group	France	1 622 425 €	270 945 €
Straatum	Ireland	540 671 €	90 292 €
Probayes	France	430 578 €	71 907 €
Techno Fittings	Italy	1 310 000 €	218 770 €
Fraunhofer-Gesellschaft e.V.	Germany	2 123 100 €	354 558 €
CEA-LETI	France	1 887 771 €	315 258 €
Universität München	Germany	143 500 €	23 965 €
Lexas Research	Ireland	364 250 €	60 830 €
University of Pavia	Italy	451 000 €	75 317 €
University of Milano	Italy	309 000 €	51 603 €
University of Padova	Italy	584 600 €	97 628 €
Ecole des Mines de Saint Etienne-Centre Microélectronique de Provence	France	624 104 €	104 225 €
G-SCOP	France	473 212 €	79 026 €
LAM Italy	Italy	885 730 €	147 917 €
Critical SoftWare	Portugal	328 918 €	54 929 €
ItalianNational Council of Research, Torino/Padova	Italy	739 000 €	123 413 €
LTM CNRS	France	394 370 €	65 860 €
Fachhochschule Wiener Neustadt	Austria	98 518 €	16 453 €
iSyst Intelligente SystemeGmbH	Germany	252 630 €	42 189 €
InReCon AG	Germany	266 000 €	44 422 €
CNR-IMM	Italy	403 000 €	67 301 €
AP-Technologies	Germany	679 150 €	113 418 €
Dublin City University	Ireland	390 950 €	65 289 €
Infineon Dresden	Germany	646 146 €	107 906 €
FAU Erlangen-Nürnberg	Germany	107 007 €	17 870 €
Total		**37 612 640 €**	**6 281 312 €**

Proposal number: 120008	**Acronym:** SmartPM
Duration of the project (months):	36
Date of end of negotiation	08/12/2008
Project start date:	01/02/2009

Project summary

According to studies, worldwide energy consumption is rising dramatically and **will double** in the next 20 years and with it CO_2 emission. The consequence will be an escalating price for energy and upcoming challenges for ensuring Europe´s energy supply.

Reducing Energy Consumption through energy savings can **save up to 30%** of Europe's predicted energy consumption. Achieving efficient use of energy, without restricting the customer, is the political, social and technical challenge of the next decade.

The high level objective of the **SmartPM** project is therefore to **develop application-specific, efficiency-optimized semiconductor power technologies enabling actual deployment of intelligent systems** in large-scale, energy-critical application fields like **home and health**. Applications in these fields require **innovative system architectures and circuit designs, new components, efficient power electronic technologies, and innovative module, interconnect and assembly technologies.** An important aspect is the support and the compatibility of upcoming legislation and regulations for efficient use of energy.

The **SmartPM** consortium will develop semiconductor technologies and module platforms enabling (a) intelligent motor drives for **highly efficient controlled engines in industrial and home applications**, and (b) **efficient power supplies and power management solutions** that will to consume up to **25% less energy by 2012**. The technologies under investigation follow the "More than Moore" path based on Si, SOI and SiC and cover different voltage ranges including low voltage (< 100V), net voltage (120V – 400V) and high voltage (>1000V).

The implementation of the project results will **save up to 25%** of the electrical energy consumption and CO_2 emission without losing performance, comfort or safety. This will reduce **Europe's dependence** on energy suppliers and increase economic **competitiveness** by creating new market sectors and innovative applications for Europe and the world.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
Infineon Technologies AG	Germany	5.040.365,31 €	841.741,01 €
Philips Technologie GmbH Forschungslaboratorien*	Germany	574.830,82 €	95.996,75 €
OnSemiconductor	Belgium	2.102.350,00 €	351.092,45 €
Atmel Germany GmbH	Germany	2.666.064,07 €	445.232,70 €
Fraunhofer Gesellschaft	Germany	1.272.312,37 €	212.476,17 €
Stiftelsen Sintef	Norway	557.500,00 €	93.102,50 €
Consejo Superior de Investigaciones Cientificas	Spain	230.492,20 €	38.492,20 €
STMicroelectronics srl	Italy	2.642.216,00 €	441.250,07 €
Philips Consumer Lifestyle	The Netherlands	736.582,50 €	123.009,28 €
Dublin City University	Ireland	326.775,30 €	54.571,48 €
Kontron Embedded Modules GmbH	Germany	435.251,20 €	72.686,95 €
Elec-Con technology GmbH	Germany	494.334,00 €	82.553,78 €
JLT Mobile Computers AB	Sweden	481.365,00 €	80.387,96 €
GE Vingmed Ultrasound AS	Norway	290.000,00 €	48.430,00 €
Thales Research and Technology - France	France	613.255,00 €	102.413,59 €
ebm-papst Mulfingen GmbH & Co. KG	Germany	686.068,10 €	114.573,37 €
Delft University of Technology	The Netherlands	433.833,65 €	72.450,22 €
Microspire SA	France	243.537,00 €	40.670,68 €
Total		**19.827.132,52 €**	**3.311.131,14 €**

Proposal number: 120009 **Acronym:** SE2A
Duration of the project (months): 36
Date of end of negotiation 05/12/2008
Project start date: 01/01/2009

Project summary

The societal need for a transport infrastructure based upon the availability of safe, fuel-efficient and environmental-friendly cars is clearly recognized by the European citizens and the European Commission. The fulfilment of this ambition is not to be taken for granted, as it requires the development of a host of automotive technologies, systems, software and tools.

The target parameters defined in the ENIAC Strategic Research Agenda for 2011 are:
- Reduction of the annual socio-economic cost caused by road accidents
- Improvement of fuel consumption efficiency
- Reduction of CO2 emissions.

The goals of this ENIAC SE2A project are in line with these target parameters by
- making it possible to reduce the socio-economic costs by 1-2% annually
- enhancing reliability and lifetime predictability to a level of zero ppm and 95% accuracy by the end of 2011
- contributing to the realisation of improving the fuel efficiency by another 5-10% by the end of 2011, by developing 5-10 types of sensors.
- developing 5-10 types of sensors, enabling the achievement of CO2 reduction targets

The project will be executed by a consortium incorporating European industrial, institutional and academic players in the field of R&D and innovation for automotive applications. It has 21 partners, located in 7 European countries. As such, it constitutes a new team with the best qualifications for the job.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
Theta Microelectronics	Greece	396 080,00 €	66 145,00 €
NCSR Demokritos/IMEL	Greece	788 440,00 €	131 669,00 €
FORTH	Greece	521 060,00 €	87 017,00 €
BHE Bonn Hungary	Hungary	940 000,00 €	156 980,00 €
Weszta-T Ltd	Hungary	805 000,00 €	134 435,00 €
Budapest University of Technology and Economy	Hungary	508 000,00 €	84 836,00 €
Muszaki Fizikai es Anyagtudomanyi Kutatointezet	Hungary	1 388 000,00 €	231 796,00 €

Amepox	Poland	183 600,00 €	30 661,00 €
Wroclaw University of Technology	Poland	192 000,00 €	32 064,00 €
Instytut Technologii Elektronowej	Poland	358 800,00 €	59 920,00 €
INESC MN	Portugal	233 903,00 €	39 062,00 €
Instituto de Engenharia de Sistemas e Computadores I&D em Lisboa	Portugal	216 404,00 €	36 139,00 €
INESC INOVACAO, Instituto de Novas Tecnologias	Portugal	132 992,00 €	22 210,00 €
National Institute for Research and Development in Microtechnologies	Romania	264 000,00 €	44 088,00 €
M2i	The Netherlands	774 180,00 €	129 288,00 €
BTE	The Netherlands	1 466 250,00 €	244 864,00 €
NXP Semiconductors Netherlands BV	The Netherlands	9 358 580,00 €	1 562 883,00 €
Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek	The Netherlands	2 439 105,00 €	407 331,00 €
Volvo Technology Coorporation	Sweden	450 000,00 €	75 150,00 €
Optronic	Sweden	130 000,00 €	21 710,00 €
SP Technical Research Institute	Sweden	110 000,00 €	18 370,00 €
Total		**21 656 394,00 €**	**3 616 618,00 €**

Proposal number: 120011	**Acronym:** LENS
Duration of the project (months):	36
Date of end of negotiation	05/12/2008
Project start date:	01/01/2009

Project summary

Water immersion lithography has been widely accepted as patterning technology for the 45nm technology node, but solutions for the patterning of 32nm and 22nm technology nodes are not clear yet.

EUV lithography is not yet available for industrial use, in spite of the impressive progresses registered till now, while multiple beam e-beam lithography is still in development. Double patterning seems to be the only viable option to support the development of future process generations in a cost effective way and within the time limits defined by ITRS roadmap.

Its main advantage consists in enabling the definition of structures beyond resolution capability of existing lithographic tools, without drastic changes in manufacturing infrastructures or huge investments.

Two alternative approaches are possible, both based on existing immersion scanners:
• Double exposure, which implies two subsequent exposure steps, and the use of different combinations of hard masks or innovative resist materials and development process;
• Pitch doubling based on a single lithography exposure followed by the formation of spacers, by material deposition and etch-back, also in combination with CMP.

Both approaches are being actively investigated, but they are still far from maturity. Among the problems to be solved there are the control of mask-to-mask alignment, for double exposure, and the control of the thickness of deposited layers, of defects and of profiles, for pitch doubling. Common concerns are cost, size control and the partitioning of the design. The pitch doubling approach is the more advanced, especially for memories, while double exposure could have a broader application, but will require improvement to equipment.

The consortium includes all required competences to develop all elements of the supply chain required to bring double patterning to industrial maturity, in order to support 32nm and 22nm node mass production.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
Numonyx S.r.l.	Italy	5.980.000 €	998.660,00 €
ASML	The Netherlands	7.580.000 €	1.265.860,00 €
STMicroelectronics (Crolles2) SAS	France	3.982.061,00 €	665.004,00 €
CEA-LETI	France	1.945.187,00 €	324.846,00 €
IMEC	Belgium	1.816.084,00 €	303.286,00 €
Dai Nippon Photomask Europe	Italy	2.045.295,00 €	341.564,00 €
LAM	Italy	426.002,00 €	71.142,00 €
JSR	Belgium	1.098.310,00 €	183.418,00 €
FEI Electron Optics	The Netherlands	4.825.333,00 €	805.830,00 €
MENTOR Graphics	France	326.592,00 €	54.541,00 €
Centro National of Microelectrónica	Spain	195.749,00 €	32.749,00 €
CIDETEC	Spain	341.625,00 €	57.051,00 €
Total		**30.562.238,00 €**	**5.103.951,00 €**

Proposal number: 120016	**Acronym:** JEMSiP_3D
Duration of the project (months):	36
Date of end of negotiation	05/12/2008
Project start date:	01/01/2009

Project summary

The objective of the project « Joint Equipment & Materials for System-in-Package and 3D Integration » is to validate technological solutions for the fabrication of high value-added heterogeneous components and systems.

This theme, generally known as "More Than Moore", intends to gather within a unique system a set of various functions, implemented with elementary components, those generally being from various origins and technologies (memories, logic, sensors, actuators, wireless communication…).

Numerous feasibility studies around the world already concluded positively at the R&D level, and Europe has advantages in the supply chain and a leading position that it should maintain.

For that purpose, the JEMSiP_3D project gathers the majority of the European actors of the domain: material providers, laboratories, research centres and manufacturers of equipments, components and systems.

The project is structured around 5 themes:
• Methodology and evaluation tools to integrate elementary components in 3D systems.
• 3D technologies and integration processes onto materials and non-Si substrates
• 3D technologies and integration processes onto Si, using processes closely deriving from microelectronics
• Reliability methodologies and Analysis for integrated 3D systems
• Performance evaluation and equipment validation for volume production equipment and generic manufacturing

This horizontal project targeting the implementation of production tools for 3D integration and associated technologies will be a direct support to the projects presented to the 6 applicative subprograms defined in ENIAC work programme.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
SUSS MicroTec	Germany	1722187 €	287605 €
FCI Microconnections	France	1782424 €	297665 €
Fraunhofer Gesellschaft	Germany	1625250 €	271417 €
CEA LETI	France	743157 €	124107 €
Infineon Technologies AG	Germany	2194524 €	366486 €
Air Liquide Electronics Systems	France	1623392 €	271106 €
ASM Europe	The Netherlands	480046 €	80168 €
Atotech	Germany	566250 €	94564 €
BESI Fico	The Netherlands	1503750 €	251126 €
FEI Electron Optics	The Netherlands	1931250 €	322519 €
MicReD	Hungary	375000 €	62625 €
NXP Semiconductors	Germany	1436532 €	239901 €
NXP Semiconbductors	The Netherlands	876150 €	146317 €
Koninklijke Philips Electronics N.V.	The Netherlands	1645343 €	274772 €
Replisaurus Technologies	Sweden	1406250 €	234844 €
Schmid	Germany	472750 €	78949 €
SET	France	2794396 €	466664 €
Sintef	Norway	640000 €	106880 €
University of Budapest	Hungary	352500 €	58866 €
Technical University of Delft	The Netherlands	1454122 €	242838 €
TOTAL		**25.625.273 €**	**4.279.419 €**

Proposal number: 120017	**Acronym:** NEPTUNE
Duration of the project (months):	36
Date of end of negotiation	05/12/2008
Project start date:	01/02/2009

Project summary

The European Nanoelectronics Initiative Advisory Council (ENIAC) mentioned in its last Strategic Research Agenda (SRA) dated November 2007 that "Nanoelectronics enables the development of smart electronic systems by switching, storing, receiving, and transmitting information". Future ambient intelligence systems will have to achieve autonomous and self-reconfigurable operations, for real-time and efficient self-optimization of their performance.

Two technologies are now emerging to face these challenges:
- Wide Band Gap (WBG) semiconductors such as GaN and AlN are expected to play a fundamental role in the development of future smart systems and
- RF MEMS switches and RF NEMS switches appear as complementary technologies in order to achieve the re-configurability required for future smart systems.

The route towards re-configurability of high power systems requires the merging of these technologies and functions, but they are not co-integrated up to now.

This is the main concept of NEPTUNE i.e. to bring together advanced microwave functions using WBG MMICs and sensors along with RF MEMS and RF NEMS active interconnections.

The main objectives of NEPTUNE are:
Objective 1: Achieve the integration of WBG devices and RF MEMS switches,
Objective 2: Achieve the integration of WBG devices and RF NEMS switches based on carbon nanotubes,
Objective 3: Realize and optimize WBG based sensors and develop the necessary technology for their monolithic integration with WBG MMICs and RF MEMS;
Objective 4: Provide a robust high performance packaging technology and
Objective 5: Display the integration of all of these technologies through four demonstrators.

The NEPTUNE consortium (made up of 8 partners from 5 countries including 1 major industrial players, 1 foundry, 2 SMEs, 3 universities and 1 research centre, all with significant experience in EU funded projects) is confident that the realization of its ambitious objectives will assist Europe to achieve technological leadership in domains that are targeted by ENIAC.

Costs summary

The negotiation has concluded the following eligible costs. The national funding figures are indicative until the establishment of the national grant agreements:

Partner	Country	Eligible costs	ENIAC JU funding
Thales Research and Technology	France	2.800.435 €	467.672 €
Via Electronic GmbH	Germany	100.000 €	16.700 €
Foundation for Research & Technology - Hellas	Greece	350.000 €	58.450 €
TopGaN Ltd.	Poland	138.000 €	23.046 €
National Institute for Research and Development in Micro Technologies	Romania	264.000 €	44.088 €
SHT Smart High Tech AB	Sweden	325.956 €	54.434 €
United Monolithic Semiconductors GmbH	Germany	29.745 €	4.967 €
Thales Systèmes Aéroportés	France	218.181 €	36.436 €
AGH University of Science and Technology, Faculty of Non-Ferrous Metals	Poland	228.000 €	38.076 €
University of Warsaw	Poland	228.000 €	38.076 €
Total		**4.682.317 €**	**781.945 €**