Research and technological development: setting up the ENIAC Joint Undertaking, nanoelectronics

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The Joint Technology Initiatives are public-private partnerships in industrial research at European level. They were set up as pilots in 2007-2008 under the Seventh Framework Programme in five strategic areas: aeronautics and air transport (the Clean Sky initiative), public health (the Innovative Medicines Initiative (IMI)), fuel cell and hydrogen technologies (the Fuel Cells and Hydrogen (FCH) initiative), embedded computing systems (the ARTEMIS initiative) and **nanoelectronics (the ENIAC initiative)**. The SESAR (Single European Sky Air Traffic Management Research) programme should also be mentioned since it is funded under the Seventh Framework Programme.

An annual report on the progress achieved by the Joint Technology Initiatives Joint Undertakings ('JTI JUs') is required by Article 11(1) of the Council Regulations setting up the individual JTIs. This report contains details of implementation including number of proposals submitted, number of proposals selected for funding, type of participants, including SMEs, and country statistics. This **2011 annual report** follows the **first interim evaluations of the Joint Undertakings** carried out under Article 11(2) of the Council Regulations.

The European Commission, as a co-founding member, was responsible for starting up the JTI JUs. Once they had built up their legal and financial framework and demonstrated their capacity to manage their own budgets, ARTEMIS, IMI and Clean Sky were given autonomy in late 2009, followed by ENIAC in May and FCH in late 2010. Thus, 2011 was the first full year in which all the JTI JUs operated autonomously.

The first interim evaluation was performed on time and assessed their quality and efficiency and the progress achieved towards their objectives. All the reports concluded with a **favourable opinion**: the evaluation panels agreed that the **JUs should continue beyond 2013**. The evaluation panels supported the Sherpa Group's recommendations, in particular that **the current legal framework be streamlined to fit the purposes of setting up and implementing future JTIs**. In this respect, the current 'Community body' status of JTIs should be reviewed. They recommended **reinforcing and streamlining processes and decision-making**.

They also referred to the need (i) for more structured coordination and complementarity with FP7 and national programmes and funds; (ii) for improved communication, to enhance the visibility of JTI actions aimed at the general public and at international level; and (iii) for systematic data collection and a monitoring system for key performance indicators.

Progress achieved by the ENIAC JU: for the period 2008–2013, the Commission allocated a maximum budget of EUR 450 million to Nanoelectronics (ENIAC), which was boosted by ENIAC Member State funding of at least of 1.8 times the EU contribution (EUR 810 million). A matching contribution in kind at least equivalent to the public authorities' total is expected from industry.

The main objectives of ENIAC are: (i) to tackle research and innovation in nanoelectronics technologies and their integration in smart systems; (ii) to help European industry consolidate and reinforce its position in nanoelectronics technologies and systems and (iii) to contribute to further incorporation and miniaturisation of devices, and increase their functionalities while delivering new materials, equipment and processes. As with ARTEMIS, the participation of Member States in funding and governance alongside the EU and industry is a major feature of ENIAC. The submission and evaluation process is similarly two-stage (PO, then FPP).

In 2011, a decline in commitments by ENIAC Member States was reversed and this increase in commitments is expected to continue in 2012. However, it was observed that the 1.8 ratio between the ENIAC JU and the Member States' grants to the projects would likely not be achieved at the life end of the JU. As a consequence, the Public Authority Board took a decision to reduce ENIAC JU's participation from 16.7 % to 15 % of total eligible costs and up to 52 % of the ENIAC Member States' contributions to the calls for proposals. This should result in a ratio close to 1.8, provided that (i) the ENIAC JU uses the maximum EU contribution provided for in the Council Regulation and (ii) the ENIAC Member States fund their participants at funding rates similar to those in the past.

In 2011 ENIAC launched two calls for proposals, call 4 and call 5 (the latter with a one-stage procedure because of a tight deadline). Of the 286 applicants that sent Full Project Proposals (FPP) for the 2011 ENIAC calls, 195 were selected for funding, a good success rate. The balance of partners is very specific to the sector: research organisations (50), industry (71) and SMEs (74) are quite evenly represented while public bodies and academia are absent. SMEs accounted for 37.9 % of all participations from 2008 to 2011 they accounted for 13.30 % of EU funding.

Participants in the calls came from 19 countries, with the Netherlands in the lead, followed by Italy, France, Germany and Austria. EU-12 countries also participated, mostly represented by the Czech Republic, Poland and Slovakia. There was good participation from 'associated' countries, led by Israel, with 5 participants, Norway (3) and Switzerland (1). However, there were no international partners.

Towards the end of 2011, the ENIAC JU launched a call for Expressions of Interest in setting up pilot lines. This call aims to prepare the JU to be a preferred instrument for implementing the KET policy on improving Europe's position in six 'key enabling technologies' including nanoelectronics. The pilot lines will allow innovation at higher technology-readiness levels (4 to 8) providing a bridge to *Horizon 2020*.

In 2011 the **main research objectives** evolved to reflect the latest progress in their fields of technology. ENIAC's Strategic Research Agenda continues to be pertinent to tackling major societal challenges, which very much depends on **improving integrated circuit functionality and reducing power consumption**.

For the future, a number of challenges remain open: the relatively small size of the JUs was considered as 'risky element' by experts involved in the first interim evaluation of ARTEMIS and ENIAC. The independent experts proposed, amongst the possible scenarios for JUs evolution both merging the two and setting up a **joint structure for administrative tasks only**.

It is time to seek **better alignment** of ARTEMIS and ENIAC research agendas **with national programmes**.

Funding for ARTEMIS and ENIAC projects follows a unique tripartite model. Partners obtain much of their funding from their own governments or regional agencies under grant agreements. The JUs also provide funding directly to the partners worth up to about 16.7 % of their eligible costs. This funding model worked well in the first years of ARTEMIS, but **with certain limitations** - mainly caused by sharply lower commitments by Member States in the context of the economic and financial crisis. In 2011, for the first time, the trend was upwards and this is expected to continue in 2012.