



energie atomique • énergies alternatives

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Position of the CEA on the Horizon 2020 Program

The CEA's General Outlook on Horizon 2020

The French Alternative Energies and Atomic Energy Commission (CEA) is generally satisfied with the proposal made by the Commission on the Horizon 2020 program. Horizon 2020 shows ambition, both in the targeted objectives and in the proposed budgets. Its structure is innovative and relatively clear, even though there remain decisive unknown elements such as the financial regulation.

The indicated budgets seem to us generally good, even though they do not show a strong increase in comparison with the budgets granted by FP7 (7th Framework Program for Research and Technological Development) for the year 2013. However, the CEA is worried about the possible risk of budget reductions after the future budgetary negotiations. With a decreased budget, Horizon 2020 will not be able to live up to its ambitions.

A few points still require clarification:

- The synergy or the articulation between the pillars and the structural funds is not developed enough. The first pillar focuses on basic research, the second pillar on industrial innovation. How does the third pillar, which focuses on societal challenges, actually interact with the first two, knowing that its actions cover the whole chain of innovation?
- The instruments of public-private partnership such as the JTIs (Joint Technology Initiatives) and the PPPs (Public-Private Partnerships), turned towards innovation and collaboration with companies, were set up during FP7. It took them some time to run smoothly and they are now operational. What is their future in the Horizon 2020 program? How are they going to be integrated into this three-pillar structure?

The integration of research infrastructures in local, regional, and global innovation ecosystems is a priority for the CEA. The pooling of competences around clusters of research infrastructures, through large R&D centers that supply technologies, will enable Europe to be innovative and to be at the best level of global competitiveness. Horizon 2020 must encourage this approach.

Even though some Member States still question the EIT (European Institute of Innovation and Technology), the CEA wishes to insist on the importance of keeping the EIT in the Horizon 2020 program at the level of funding proposed by the Commission. The EIT encourages innovation in applied research, in collaboration with the industrials all the while training the future European entrepreneurs. After the first stage of implementation, which is starting to produce results, supporting the institute is absolutely necessary.

Finally, except for the issues of safety, the budgetary proposal for fission research shows a terrible lack of ambition when it comes to designing the reactors of the future. Consequently, it will remain difficult to attract young researchers and engineers to work on these undervalued scientific and technological fields.

Pillar 1 - Excellent Science

The CEA supports the proposal of the Commission for the first pillar "Excellent Science", which goal is to develop basic knowledge in order to feed applied research later on. This pillar is absolutely necessary to ensure Europe's competitiveness and its capacity to innovate in the middle and long run. A high-risk basic research (ERC – European Research Council, FET – Future and Emerging Technologies), feeding an applied research that meets industrial needs, is essential to the success of Horizon 2020.

The European Research Council:

The CEA is pleased that the ERC, which is without a doubt one of the greatest success of FP7, has been strengthened. This simple and flexible instrument enables one to take risks. It is adapted to target and reach excellence on the chain of innovation from academic excellence to technological excellence. The ERC Horizon 2020 budget should remain the same as the ERC FP7 budget for the year 2013.

Future and Emerging Technologies:

The CEA insists on the necessity to support collaborative technological research, which is a source of ideas and development for innovation. The funding instrument "Future and Emerging Technologies" is in this respect perfectly adapted and must be promoted. The CEA is pleased about the increasing importance of FETs in comparison with FP7, and about the increase in the range of addressed issues. The CEA notes the division of FETS in three types: FET Open, FET Pro-active, and FET Flagships. Even though the FETs Open are clearly anchored in the first pillar, the FETs Pro-Active and FETs Flagship require strong coordination with the second and third pillars of Horizon 2020. The governance of these FETs raises important issues such as: who will manage them? Will they be divided among many Directorates-General (DGs) of the Commission? The CEA expresses its wish to see the excellence of the FETs maintained in strong coordination with the societal challenges and the industry. Integrating the three types of FET into the first pillar would most likely guarantee a more demanding selection for the scientific and technological excellence of these projects.

Marie Curie Actions:

For the CEA, mobility of researchers is an essential tool for creating relationships with its European and international partners. The CEA therefore appreciates the positive analysis of the Commission on the Marie Curie Actions, but notes however the weak increase in the Marie Curie budget between FP7 and Horizon 2020. In Horizon 2020, the Marie Curie and EIT budgets, even though they are managed by the same DG (DGEAC -- Directorate General for Education and Culture) will need to be independent from one another: the CEA is indeed worried about the possibility of a transfer from the EIT's budget to complete the Marie Curie's budget.

During FP7, the Initial Training Networks (ITNs) turned out to be a much demanded instrument for the scientific community, and, even though they represent 40% of the budget of the "People" Specific Program, the success rate remained under 10%. The CEA is therefore pleased to note that this instrument could be opened to the "Co-funding" (COFUND) system. The CEA indeed supports the generalization of the co-funding system, which, thanks to financial leverage, enables to increase the amount of funding. The CEA however wishes the co-funding of the Commission to increase from 40 up to 60%. The CEA considers that the possibility of funding trans-European mobility for short stays, as it is currently done for mobility to a third country, is a good part of the proposal.

Research Infrastructures:

The goal of the EU is to enable the setup of research infrastructures of international renown to support the scientific and technological excellence of Europe and to ensure its access for research teams. The CEA is pleased about the work already achieved on the ESFRI (European Strategy Forum on Research Infrastructures) and on the legal status of the ERIC (European Research Infrastructure Consortium).

The success of CERN, among other things, encourages an ambitious and structured policy, made possible thanks to the good relationship between the financial instruments of Horizon 2020 and the structural funds. The particulars of this synergy in Horizon 2020 are still to be defined.

The integration of research infrastructures into local, regional and global innovation ecosystems are a priority. In the places where research infrastructures will be set up, the innovation potential and the human resources of the infrastructures will be enhanced by the partnerships between scientists and industrials and by the training of the industrials in charge of the development of the technologies.

The new research infrastructures require research and development of generic technologies. Only by pooling competences around research infrastructures' clusters in large R&D centers (technology suppliers), will Europe succeed in becoming a significant actor on the global research stage and in being innovative and at the best level of global competitiveness.

These research infrastructures' clusters will have to make long-term visions a reality by setting time milestones for generic technologies. They will have to identify the needs of R&D in terms of the construction of facilities for the different communities and for the promotion of greater future usage. These centers will also be technology suppliers and will ensure the co-development with the industry.

Pillar 2 - Industrial Leadership

The CEA supports the proposal of the Commission on the pillar "Industrial Leadership". It deals with fostering the creation of innovations in technological research, which are close to the market's needs, in order to transfer these innovations to European industrials to enable them to increase their competitiveness.

For the CEA, the EIT at the crossroads between the three pillars will contribute especially to the second pillar. The EIT has been set up to foster innovation in applied research in relationship with the industrials and to enhance the training of entrepreneurs. The first step of implementation is finished, the KICs work better and better and are starting to produce results. The CEA supports the requested budget for the EIT in Horizon 2020 and advises not to reduce it at the risk of seeing the instrument collapse before producing the expected results.

Leadership in Key Enabling Technologies (KETs) and Industrial Key Enabling Technologies (MultiKETs): The High Level Group on KETs has done an excellent job of defining the strategic Key Enabling Technologies for Europe. These technologies have to be more promoted with industrials in assembled systems. With this in mind, the CEA asks the set-up of a funding instrument in Horizon 2020, called MultiKETs, with its own governance structure. In FP7, the KETs are currently funded by programs such as the NMP (Nanosciences, Nanotechnologies, Materials and new Production Technologies) or parts of ICT (Information and Communication Technologies), up to EUR 6 billion. In the budget of the KETs set forth in the second and third pillars of Horizon 2020, the necessary budget for MultiKETs is not identified.

In addition, the repartition of KETs and MultiKETs budgets between the second and third pillars will have to be further explained.

This issue of repartition of the funding between the second and third pillars also concerns the JTIs and the PPPs.

Pillar 3 - Societal Challenges

The CEA supports the proposal of the Commission for the third pillar, "Societal challenges", a new approach focused on facing the great challenges and not on scientific or technical fields. However, the programs proposed yearly in order to face these challenges will have to focus on well targeted and defined areas.

The CEA notes that the first challenge "Health, demographic change and well-being" is very wide. The proposed text raises many questions but is not balanced. It is important to make choices when the budget is limited. The CEA is therefore surprised by the succession of points (about fifteen) and wishes that the Commission clarify its intentions.

The CEA demands that, in the second challenge "food safety, sustainable agriculture and bio-economy", the part dedicated to bio-economy and bio-technologies be up to the challenge.

The third challenge "safe, clean and efficient energies" integrates the question of the role of EERA and its sustainability. EERA has been working in the spirit of the third pillar for several years by gathering research organizations from all the Member States around the societal challenge of energy. EERA is the backbone of R&D activities along the innovation chain which aim preparing middle to long term technological evolutions to the service of European industrial capacity. It carries its activities through thematic aggregated actions structured and conducted in the different EERA Joint Programmes. This is a way for national or regional RTOs and University Institutes to open reciprocally and integrate their programmes to more efficiently work on common projects through sharing and exchanging programme results. For joint program implementation, it should be created virtual institutes managed under the umbrella of an EERA legal entity which is to be settled to coordinate the activity and to manage the funding of the joint programs developed by the alliance.

EERA is a key player in innovation and works in close collaboration with EIT initiatives to improve European competitiveness at international level.

The fifth challenge "Fight against climate change, efficient use of resources and raw materials" takes into account issues of environmental and sustainable development. However, it is necessary that the balance between research and innovation be made clear. It is important that this challenge play the lead role in setting the objectives of the environmental policies and the rules to respect in order to assess the environmental performances of the developed technologies.

The sixth challenge "Inclusive, innovative and secure societies" seems too heterogenic to the CEA, which asks that it be split into two different challenges. The challenge regarding safety issues is very different from the one about cohesion and innovation, which relates more to social and human sciences. Both their budgets and instruments will be completely different.

The CEA demands a clarification of the articulation between the third pillar and the first and second pillars. The third pillar seems to intersect the first and second pillars in the sense that it will fund activities ranging from basic research to the commercialization of products and services. Coordination will therefore be necessary:

- The first and third pillars will overlap when the challenges require basic knowledge. How will this be managed? For example, what will the relationship be between the FETs and the third pillar?
- The second and third pillars will overlap when the challenges of the third pillar necessitate applied research activities. The MultiKETs have their place among societal challenges, but how will they be taken into account and funded in the six challenges? It will be important to answer these questions in the work programs.

The Joint Program Initiatives (JPIs) in FP7 already tackle the challenges presented in Horizon 2020. Their position in the first pillar and in the six challenges of the third pillar of Horizon 2020 must be clarified.

Rules for Participation

The CEA is pleased to see the introduction of the electronic signature.

The flat rate of 20% for indirect costs would represent a significant decrease of the funding for the participating organizations. We would like to add the possibility for non-profit organizations to declare their real indirect costs, even though it might mean getting back to a 75 % rate of financing for eligible costs. If the real indirect costs were to be used and considering the absence of methodological change, the organizations would like to see their FP7 methodological certificate renewed.

Horizon 2020 is not precise about the maximum funding limit at 100% or 70%. How will the projects be defined as eligible for a 100% or 70% funding and by whom? It is essential to standardize the relationship between the areas, since the funding limits will be indicated in the work programs.

The funding of management activities is clearly insufficient. It is already difficult to find volunteer organizations to coordinate these projects, but a partial funding of the activity will discourage even more the few applicants. This seems to us incoherent with the wish of the Commission to see more projects coordinated by industrials. We want that management activities be funded up to 100% in any case.

The definition of the productive hours taken into account by the Commission needs to be clarified. We would like to be sure that the Commission will accept the usual accounting principles of the participants.

Intellectual property:

The objectives set in Horizon 2020 in terms of patent registering are far more ambitious than the results currently obtained in the framework of FP7. The conditions of protection and exploitation of intellectual property will have to be enticing enough so that the research actors and especially research centers be motivated to invest in this area. It is not the case in the current proposal.

The CEA also recommends adopting a policy of dissemination of the knowledge acquired during Horizon 2020 that will be coherent with the protection of European interests. In this respect, the Open Access has to be used with great care and measures must be implemented in order to encourage a preferential exploitation of the intellectual property acquired during Horizon 2020 in Europe or in associated third countries.

The EIT

The CEA wishes to insist on the importance of keeping the EIT and its funding in Horizon 2020. The CEA is worried by the possibility of a transfer from the budget of the EIT to complete the Marie-Curie budget. Such a move could be fatal to this new instrument and would in any case discourage the pertinent teams to answer the future calls on the KICs.

The EIT was set up within FP7 because too few European projects of the FPs currently create wealth and employment.

The objectives of the EIT are to contribute to a competitive European economy by fostering the transfer and valorization of activities in terms of higher education and research and innovation in an “entrepreneurship”/“business” context. The KICs were set up to meet this need. They aim at enhancing the collaboration between the industry, the higher education system and research on societal challenges (climate, energy, TIC) that represent a major common interest.

One of the challenges will be to keep industrials mobilized by limiting the administrative charge that still hangs over the actors. The assessment of the results of the KICs is based on the measure of KPIs (Key Performance Indicators). It is consequently a contract of performances and not a contract of means. This should probably simplify the follow-up of the means dedicated by the partners.

Finally, the EIT encourages excellence and its co-location centers are therefore always located in the same groups of European countries. Would it be possible for the other countries, which are currently

trying to increase the excellence of their scientific research, to benefit from Feder funds that would compensate this unbalanced situation?

Iter

The CEA demands, in agreement with the French position, the reintegration of the ITER and GMES (Global Monitoring for Environment and Security) budgets in the budget of the European Union.

The CEA indeed deems unacceptable that the ITER project should be excluded from the Euratom FP and from the multiannual financial framework. These proposals are not in accordance with the principles of good budgetary discipline and risk to weaken the ITER project both in terms of financing and governance.

Research on nuclear fission and fusion within the framework of Euratom

The EURATOM proposal of Horizon 2020 that defines the framework for research and innovation for the development of nuclear technologies basically presents the same volume of yearly expenses than FP7 (JRC – Joint Research Center excluded). This proposal clearly lacks ambition to face the challenges of the European energy policy. In our view, fusion and fission research programs are not supported enough.

However, the significant increase in the budget of the JRC is really questionable.

For fusion research other than ITER construction (“accompanying programme”), the CEA noted that Euratom funding is low in comparison to the 7th framework programme. This does not seem consistent with the objectives of the European fusion roadmap for Horizon 2020. In particular, the CEA considers that training the European “ITER generation” is of the utmost importance. Europe, to take full benefit of its investment in ITER construction, should play an important role in the exploitation phase of the facility, in a competitive international environment, and achieve a prominent scientific and technical output.

Furthermore, the CEA will closely follow the setting up of the new organisation in charge of implementing the fusion research programme for Horizon 2020. This new organisation should ensure a long term vision, shared with the European research institutions, and maintain the substantial level of integration reached by the programme, which has made Europe a leading partner in the field of fusion research.

For fission research, the CEA is favorable to the continuation of studies on safety in order to guarantee the best level possible for the facilities and so that Europe can weigh in international discussions.

But Europe's weight will also result from its capacity to promote new projects such as the development of fourth generation reactors. This will require the continuation of research activities in other areas than safety, and to support ambitious demonstrators' projects that could attract young and talented researchers.

France, and this includes the CEA, is developing the ASTRID project, a demonstrator, which development was planned in the Industrial Initiative of the SET Plan. This sodium-cooled fast neutron reactor will present numerous advantages such as the total recycling of materials, the preservation of the uranium resource and a sustainable management of waste and radioactive materials thanks to transmutation.

In the framework of the great national loan, Astrid benefits from French funding up to EUR 650 million for the years 2010 to 2017. Since the Euratom FP only plans limited funding for demonstrators, the CEA wishes that additional funds be raised at European level with other instruments such as structural funds or revenues from the sale of carbon credits.