ERRAC **European Rail Research Advisory Council**

To:
Liam Breslin
DG RTD

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Answer to the questionnaire for the Green Paper on a common strategic framework for EU research and innovation funding.

ERRAC comprises 45 representatives from each of the major European rail research stakeholders: manufacturers, operators, infrastructure managers, the European Commission, EU Members States, academics and users' groups, ERRAC covers all forms of rail transport: from conventional, high speed and freight applications to urban and regional services. ERRAC is currently chaired by me, Professor Andrew McNaughton (Network Rail). The Vice-Chairmen are Dan Otteborn (Bombardier Transportation) and Manuel Pereira (University of Lisbon).

For more information, we invite you to visit our Website: www.errac.org
We hope this contribution will be of interest and help to the European Commission.
ERRAC remains at your disposal for any further information you may need.

Yours sincerely,

Prof Andrew McNaughton
ERRAC Chairman

Working together to deliver on Europe 2020

The questions in this section correspond to Section 4.1 of the Green Paper.

1. How should the Common Strategic Framework make EU research and innovation funding more attractive and easy to access for participants? What is needed in addition to a single entry point with common IT tools, a one stop shop for support, a streamlined set of funding instruments covering the full innovation chain and further steps towards administrative simplification?

How important are the aspects covered in this question? Important

A simplification is essential, including a one-stop-shop support and a common IT tool. It should however be complimented by a unification of the EU research and innovation programmes, to eliminate the need of catering too many objectives and the spreading of funding. The attraction will also increase if the lead times are severely reduced; methods for this are descried below.

Especially the funding of products near to market until the implementation as demonstrators is of utmost importance for getting the expected effect from the research projects.
Lead times: max. 12 months from ETP's proposal of project titles and descriptions (based on strategic roadmaps) to project start; More flexible timing; Reduce administration burden (=> towards two-step evaluation like in ARTEMIS instead of one-step like in SST).

The industry is today spending a minimum of 50% of the necessary investment to carry on a collaborative R&D project. Experience shows that administration burdens increase dramatically the cost of any EU R&D project undertaken within the current FP7 rules.
One of the intrinsic reasons of the heavy administration may find its root from the fact that the personnel who follow and control that the project comply with the FP rules is completely detached from the R&D activities and the private sector reactivity.
Initiatives that will allow the private sector to administrate the budget and rules compliances for larger scale R&D projects are welcome, provided that a specific working framework has been setup in collaboration with the Commission.

2 How should EU funding best cover the full innovation cycle from research to market uptake?

How important are the aspects covered in this question? Very important

There should be a unified thinking, including the financing, for the whole innovation process. The total cost of a particular innovation should be estimated, different funding models for each steps in the innovation chain should be developed and set. This would, as a basis, mean a higher percentage of public/MS/EU funding in the early stages, and more risk sharing financing in the later stages.

The necessity of a clear implementation/market uptake and a developed cooperation between researchers, financers, business/industry and end users is evident. (not research providers driven but excellence driven; not driven by political aspects)
Part of the ERC-funding should be directed towards need driven basic technology research.

In the context of intensified competition on world markets, R&D with a focus on innovation is an essential tool to help European rail suppliers to retain their global leadership and to develop competitive advantages against other modes of transportation, so as to foster modal shift in favour of the most environment friendly and safest mode of transportation.
This is in line with the Europe 2020 strategy and with the EU's objective to increase the R&D spending up to 3% of the GDP.

Furthermore the rail industry does not generate sufficient operational margins neither to finance speculative research, nor to allow for short cycle renewal of the products.
The unfair situation that the rail transport system has to face in terms of internalisation of external costs is for a large part responsible for this deficiency in investment towards structural changes. It is therefore essential that the EU funds are targeted towards research activities having a clear medium term market uptake and for which concrete industrial results are expected.

Another particularity of the sector is in the strong and complex interfacing of all parts of the rail system (infrastructure, control-command, electrification, vehicles) that makes it difficult, to propose breakthrough innovation really impacting the efficiency and competitiveness of the whole system.

Whilst significant results are being achieved under the existing research programmes, the rail transport sector does not have today the appropriate instruments to launch major industrial research programmes which would be needed to improve its competitiveness.

Especially the funding of products near to market until the implementation as demonstrators is of utmost importance for getting the expected effect from the research projects.
Long-term funding periods (7 years) over different project parts incl. basic research and development, demonstration, preparation of implementation (stage gates after each project step to allow assessment)

The sector would greatly benefit from the setting up of new solutions based on a PPP-thinking, like e.g. Joint Technology Initiative (JTI), which would bridge the gap between pre-competitive, long-term research activities undertaken as part of Framework Programmes and market uptake, engaging a strong commitment from the rail industry and therefore closing the innovation cycle.

3 What are the characteristics of EU funding that maximise the benefit of acting at the EU level? Should there be a strong emphasis on leveraging other sources of funding?

How important are the aspects covered in this question? Very important

The leverage from funding from participating parties is essential for the success and should be mandatory. A well formulated goal, shown as an output in the innovation process, with clear connection to the functions and challenges of the sector, will increase the benefits.
EU-level actions could catalyse MS financing.
EU level to avoid duplication of research, more coordinated approach, shape solutions so that they are useable all over Europe without limitation to a single country

In order to maximise the benefit of acting at EU level two pre-conditions are also needed:

- Obtain a significant critical mass (and consensus) of R&D investors;
- Provide long-term financing and a specific instrument which is flexible enough to allow innovation.

4 How should EU research and innovation funding be used to pool Member States' research and innovation resources? Should Joint Programming Initiatives between groups of Member States be supported?

How important are the aspects covered in this question? Of some importance

JPI´s must be clearly focused and limited to specific issues, and should not be of a thematic kind. The MS and EU funding should be pooled in the different steps of the innovation chain, together with funding from industry and other stakeholders. The stakeholder platforms should be co-financed for identifying strategic challenges and to prioritise short term development areas with a high market uptake.
JPI's need flexibility (in organisational, admin, thematic terms), need to be aligned to "whole chain idea", global coordination at European level, avoid big programme without clear focus

Duplication between National and EU R&D should be avoided but ERRAC stresses the importance of reaching a critical mass in order to achieve the scope of creating innovation.

There is a need to promote R&D programme research projects where the rail stakeholders are involved together with other important stakeholders, e.g. organising authorities for ITS issues. In these domains, the R&D funds are currently very largely allocated almost exclusively to sectors competing with rail, e.g. the private car industry, and this trend should be reversed.

5 What should be the balance between smaller, targeted projects and larger, strategic ones?

How important are the aspects covered in this question? Important

This is very important; the key to success is to have larger targeted project, including the whole innovation chain, with (different) models for financing of all steps up until the market introduction. Large innovation projects could very well total up to a billion € level.
They should have the financing solutions and structures required for a thorough industrial participation. In some initial stages it could be useful to fund more than one initiative striving towards the same goal. (ref last US fighter aircraft development)

Smaller targeted projects should also be endorsed and strategy projects should be of limited size.
Size to be flexible according to need defined in strategic roadmaps; no fixed share between big and small.

Experience within FP7 show that both small and large projects are needed, keeping in mind that it is not necessarily true that the smaller projects are only targeted projects and the larger only strategic ones.

6 How could the Commission ensure the balance between a unique set of rules allowing for radical simplification and the necessity to keep a certain degree of flexibility and diversity to achieve objectives of different instruments, and respond to the needs of different beneficiaries, in particular SMEs?

How important are the aspects covered in this question? Very important

ERRAC recognise the difficulty to have a regulatory framework that is optimal for all, since each group has its own business logics.
Although not only the European Commission should seek to develop a more standardised set of rules aiming at administrative simplification (see answer to question 1) and guarantee flexibility and speed of delivery but the European Commission should focus its R&D instrument to foster the competitiveness of the European industries, one of the priority of the Europe 2020 strategy.
An adaptation to each group, including SME´s, is needed. Different types of projects should have different regulatory frameworks. Distinctive mechanisms and implementing rules should be developed with the business stakeholders in a case by case and sector-by-sector approach.
The flexibility and diversity should be exercised in the planning stages; when an innovation project is agreed upon; the work administration during the implementation should be very simple and focused on the goals. Relevant follow ups should focus on results, not money and time spent.

ERRAC also calls the European Commission to make an extended and wise use of the Articles 187 and 188 of the Treaty on the Functioning of the EU (TFEU) (ex Article 171 TEC) which

allows the EU to set up Joint Undertakings: “The Union may set up joint undertakings or any other structure necessary for the efficient execution of Union research, technological development and demonstration programmes".

7. What should be the measures of success for EU research and innovation funding? Which performance indicators could be used?

How important are the aspects covered in this question? Very important

Until today the European Commission has not put enough value on what would be the most appropriate to determine the success of an EU funded research project for the railway sector, i.e. the market uptake of the investigated research subject.

The European Commission has in the recent years awarded grants to projects which aimed at assessing the impact the EU project results had on European policy. Although this work could be of interest, it cannot deliver any performance indicator on the real success of the project for the European innovation created by the business stakeholders.

It is generally understood that an EU R&D project can be considered as successful which has been able to produce the deliverables requested by the Grant Agreement. But just because a project has been able to successfully comply with its contractual duties toward the Commission it does not mean that the research has been neither effective nor efficient

In order to assess the R&D effectiveness an analysis of the project results shall be made - in the rail sector not earlier than two years after the official end of the project given the specific life cycle times – on its market uptake or an analysis on its likelihood of market uptake (at different stage of the project but also in the proposal phase).

ERRAC, the European Advisory Council (ETP), has defined the market uptake as the most important measure of success for EU research and innovation funding, developing the following performance indicators:

Strong market-uptake:

A project will be evaluated with a strong market uptake if there is clear evidence of use of products or services, processes, dissemination of knowledge, tools, etc. in several countries/products and the major objectives of the project have been implemented. These projects will sometimes lead to additional research to realize their full market uptake.

In terms of performance indicators, it should be aligned to the roadmap and the measure for performance should be how well does the project answer the questions/needs identified in the roadmap.

A high market uptake over time of the EU R&D results must be a major objective of the CSF. The proper stakeholders should be involved in the proposal to be eligible, which means that the categories of participants should be additional criteria; the real competences are also to be considered, e.g. it can be on SMEs but sometimes not. The market uptake issue should be taken into consideration by the European Commission from the very beginning of R&D project selection, which is when evaluating a project proposal. For instance, tenders could be asked to submit an innovation or a business case in order to ensure that the final outcomes of a project will be coherent in the framework of innovation policy. And appropriate instruments should be proposed as a support for increasing the market uptake once a successful project is coming to an end. In addition values and effects upon the European challenges and transport policy should be the overall measurement. The development of indicators is necessary, and they should be continuously improved and simplified. Indicator: comparison against ETP's roadmap and stage gates

8. How should EU research and innovation funding relate to regional and national funding? How should this funding complement funds from the future Cohesion policy, designed to help the less developed regions of the EU, and the rural development funds?

How important are the aspects covered in this question? Of some importance

The need to develop some regions within Europe should be addressed in the needs-analysis and in the Road mapping. Indicators making this attractive, to less developed regions, must be included. The resulting need for innovation should be financed in accordance to the national and regional benefits in such cases, meaning that the steps closer to the implementation should have a clear participation from regional and national funding. Stimulation of networking would reduce duplication.
Regional research should be carried out on (trans-)national level as problems can best be defined from a national/regional point of view.

The EU CSF should be used as a tool for covering the gap between European, national and regional institutional levels. The regionalization process is a European trend. Regions and sometimes cities are gaining more decision-making power in given fields including transport. Europe should both help local decision makers undertaking research when their overall budget are more and more limited ("think Research"), and help them to adopt a European consciousness ("think European"). The interest for a European approach of local issues needs to be incentivized by the EU CSF, taking into account the experience gained by the CIVITAS initiatives, but enlarging it to the need of developing some technical harmonization at European level in many areas (ITS…). Such EU International cooperation should be 100% funded. Representative international associations should also be 100% funded for their participation in EU R&D projects.

Tackling Societal Challenges

The questions in this section correspond to Section 4.2 of the Green Paper.

9. How should a stronger focus on societal challenges affect the balance between curiosity-driven research and agenda-driven activities?

How important are the aspects covered in this question? Of some importance

It does not affect the balance; societal challenges should be addressed in the agenda driven activities. The societal Research should also have a clear value perspective. Curiosity driven research is important, but the agenda-driven research should be given a higher prioritisation. Part of the ERC-funding could be devoted to societal driven basic research.

10. Should there be more room for bottom-up activities?

How important are the aspects covered in this question? Very important

Innovation very often comes from a bottom up approach; in fact the top down approach is mostly needed subsequently –in a second stage – to validate that the "bottom up ideas" make sense and contribute to the overall vision and strategy.

It is important to underline that the confrontation between the bottom-up flow and the overall vision and strategy that is described above is intended coming from the business stakeholders. There is in fact a difference between the purely beneficiaries of the EU R&D funds and the ones who invest a significant amount of budget on R&D within the EU R&D and in private research.
The permanent challenging of bottom up approaches with market visions and strategies should be investor driven in order not to create a too closed loop of interest where the purely beneficiaries also would define the activities for which they are fully funded.

ERRAC calls the Commission to use specific and well established instruments for this combined strategic and bottom up approach at EU level, namely the European Technology Platforms and PPP-solutions as Joint Technology Initiatives.

We see bottom up approach that could also be a researcher driven activity, but again it must align to the roadmap, perhaps where a researcher has identified a technology that could meet a need of the roadmap.

11. How should EU research and innovation funding best support policy-making and forward-looking activities?

How important are the aspects covered in this question? Of some importance

Policies and forward looking is essential for a successful innovation process; therefore the Commission should also make sure that the research and innovation is supported by their policy making. In addition the differences in opinions between different parties about policies and forward-looking aspects must not hamper the innovation progress.
ETPs should contribute significantly to this strategic aspect including policy issues in their roadmaps. Otherwise the desired research outputs will not reflect the identified policy issues.

In general the European Commission should adopt a Common Strategic Framework which does not hamper the implementation of the core political objectives set up at the European level (environment and climate goals). The public transport sector and in particular the rail sector is confronted with a non leveled playing field, suffering from unbalanced competition from the automotive & aeronautical sectors.

12. How should the role of the Commission's Joint Research Centre be improved in supporting policy-making and forward-looking activities?

The definition of important policies and societal challenges should be swift and efficient; JRC should be suitably involved in this, but some JRC funding could be opened up for competitive bidding.

13. How could EU research and innovation activities attract greater interest and involvement of citizens and civil society?

The coordination and project leaderships should be moved away from the research community, towards stakeholders and end-users. The civil society and the citizens must be closer involved by the use of established methods for consultation and open innovations, like carets-wagon

techniques, scenarios et al. The participation of different communities should be active, aiming at defining the most important needs.

Strengthening competitiveness

The questions in this section correspond to Section 4.3 of the Green Paper.

14. How should EU funding best take account of the broad nature of innovation, including non-technological innovation, eco-innovation and social innovation?

If the problems are described in terms of value, results, effects, functions and importance, these factors will be included if an optimal result is after sought. NTP ´s should be closer tied to the ETP ´s.
Close alignment of research funding wit ETP roadmaps

15. How should industrial participation in EU research and innovation programmes be strengthened? How should Joint Technology Initiatives (such as those launched in the current Framework Programmes) or different forms of 'public private partnership' be supported? What should be the role of European Technology Platforms?

How important are the aspects covered in this question? Very important

As stated in the Commission Memo that was published together with the Green Paper, "Innovation requires private enterprises to use cutting edge knowledge to develop innovative solutions and take them to the market. A strong participation of private sector in EU programmes is, therefore, of crucial importance."

The industrial participation in EU R&D activities should therefore be strengthened in order to increase the low level of private finance that is today, accordingly to the Green Paper, the major bottleneck in Europe.

The associated problems today are well described in the Interim Evaluation of the 7th FP, and these problems must be solved. Well-functioning ETP ´s, with a clear, comprehensive and strong stake-holder participation and consultation, is an important facilitator for this, and their scope should be broadened. Roadmaps and action plans, needed for the initiation of innovation projects, must be jointly developed. One key to success would be to have a new type of targeted Large

Innovation Projects, including the whole innovation chain. They must have the long term budget possibility that will motivate large companies to participate at a much higher degree, financially and content wise.

The manufacturing rail industry therefore advocates today the necessity for large PPP-programmes in the form of the JTI ´s, for later parts of the innovation chain. ERRAC exhort therefore the Commission to find solutions for a substantial support of the R&I initiated by the rail industry, in especially the later stages of the innovation chain, e.g. by the creation of a rail JTI.
There should be different models for financing of all steps up until the market introduction. Large Innovation Projects initiated by the manufacturing industries should be then open to broad R&D cooperation; this is achievable mainly through the ETP ´s. Thus, by eliminating the hurdles, as described in the Interim Evaluation of the 7th FP, the fragmentation of the European research and innovation would lessen.
ETPs need continued funding of the EC.

16. How and what types of Small and Medium-sized Enterprises (SME) should be supported at EU level; how should this complement national and regional level schemes? What kind of measures should be taken to decisively facilitate the participation of SMEs in EU research and innovation programmes?

How important are the aspects covered in this question? Important

The cash-flow is often critical to SME ´s. The contributions from EU should be paid out as early as possible.
Industry lead initiatives, such as a new rail JTI, would automatically facilitate the integration of SME in innovation driven R&D activities at EU level. Today those SME are usually asked to participate to National or private funded R&D projects since the instrument available for the rail industries within the Framework Programme do not allow neither flexibility nor long term budget planning; a new generation rail JTI could be the instrument to support the innovation development (development of solution for a specific problem/technology; verification of a solution; market demonstration of such a solution; market introduction of such a solution) and consequently also the increased SME participation in EU funded projects.

17 How should open, light and fast implementation schemes (e.g. building on the current FET actions and CIP eco-innovation market replication projects) be designed to allow flexible exploration and commercialisation of novel ideas, in particular by SMEs?

Coaching of and matchmaking between inventors, innovators, academia, entrepreneurs, financers and buyers, in an integrated environment, would facilitate this. Business boosting initiatives and

centres should be promoted and funding possibilities should be developed. Markets must focus on more than lowest cost, otherwise will novel high quality solutions not be able to compete.

18. How should EU-level financial instruments (equity and debt based) be used more extensively?

How important are the aspects covered in this question? Of some importance

EU level financing instruments (equity and debt based) could be used from the pre-competitive deployment of innovative technologies to the final roll-out of products into the market. ERRAC suggests that in the rail sector the further development these instruments in that direction should happen together with the development of instruments that allow to research on pre-competitive innovative industrial technologies.

19. Should new approaches to supporting research and innovation be introduced, in particular through public procurement, including through rules on pre-commercial procurement, and/or inducement prizes?

Innovation based procurement with a multi-stakeholder involvement (industry, academia and authorities et al) is often an effective enabler of innovative solutions and products; including market introduction and ditto penetration.

The EC must take the political decisions based on EU common interest which allow over a long period of time providing the best services for the European end users and favouring the EU competitiveness in a global economy. As regard the transport sector, the R&D policy should give priority to topics which, when leading to implementation of new products and services, favour a modal shift from private transport modes towards the sustainable transport modes – and especially public transport. In the competition between road and rail, better consideration should be given to rail, in order to attract more passengers and freight on rail. In a global economy, both manufacturing sectors have to be supported so that they can remain world leaders.

20. How should intellectual property rules governing EU funding strike the right balance between competitiveness aspects and the need for access to and dissemination of scientific results?

How important are the aspects covered in this question? Of some importance

This inherent problem does not have one single solution; it should be adapted to the specific case. In some cases, financers might be entitled to a part of the profit, to be used for new innovations. Within innovative procurement; it might be the vendors' property until the final delivery. In other cases, a period with exclusive propriety rights for the participants may be used. The citation index system by the academia is counterproductive, in respect of IPR, it gives the wrong incentive to the researchers and does harm the innovation.
Intellectual property rules should be based on global best practices. It should, to a significant degree, be left to the participants of a given FP project or JTI to define themselves how intellectual property rules are to be applied.

Strengthening Europe's science base and the European Research Area

The questions in this section correspond to Section 4.4 of the Green Paper.

21 How should the role of the European Research Council be strengthened in supporting world class excellence ?

Excellence and competition should be promoted at EU level and the current fragmentation should be counteracted. Part of the budget could be devoted to needs driven basic research that could help the applied research that should also be undertaken at EU level with bigger (financially and strategically speaking) EU instruments.

22 How should EU support assist Member States in building up excellence?

Excellence may not be defined as "citation index". A methodological selection and support process combined with a focus on real problem solving, aiming at well defined goals, will facilitate the build-up of excellence. The importance of projects with focused goals has been proven in e.g. the Manhattan and Apollo projects. It is a national issue to assist academia.

23. How should the role of Marie Curie Actions be strengthened in promoting researcher mobility and developing attractive careers?

The personal effect to the best researchers is very important, and should be strengthened by different means.

24. What actions should be taken at EU level to further strengthen the role of women in science and innovation?

Regard researchers according to their academic abilities but not acc. to gender

25. How should research infrastructures (including EU-wide e-Infrastructures) be supported at EU level?

They are facilitators; and should be developed in cooperation with the relevant stakeholders.

26. How should international cooperation with non-EU countries be supported e.g. in terms of priority areas of strategic interest, instruments, reciprocity (including on IPR aspects) or cooperation with Member States?

How important are the aspects covered in this question? Of some importance

ERRAC agrees with the Green paper suggestion that "for future programmes, consideration is needed on a more differentiated approach according to the specificities of different types of third countries and also to striking the right balance between the goals of strengthening Europe's competitiveness and solving global challenges".
ERRAC believes that until now focus has been too much given to the latter challenge; as highlighted by the Europe2020 strategy competitiveness is key for the future of Europe (and of its industrial capability).

Taking into account the global competition, Europe needs to put the focus on key elements such as research, education and innovation, and looking for collaboration whenever appropriate. However international cooperation should not be forced and happen on voluntary basis, keeping in mind the need to protect the future competitiveness of the EU industry against countries which do not play the game of opening their own market to competition..

In general cooperation with Research and Innovation clusters in emerging economies and other non-EU countries should be encouraged based upon the benefits for the EU and MS, and IP issues should be solved in advance.

27 Which key issues and obstacles concerning the ERA should EU funding instruments seek to overcome, and which should be addressed by other (e.g. legislative) measures?

How important are the aspects covered in this question? Important

The cooperation within ERA should be developed in conjunction with the overall innovation process. EU research funding should further address real large innovation projects, with a clear competitive target that today is mainly performed at National or private level.

In a global market as the rail sector is, a national approach is not sufficient for the rail manufacturing industry global competition needs. The rail manufacturing industry advocates therefore for the creation of a rail JTI, a legislative measure and an instrument that will integrate comprehensive demonstrators which will help to consolidate research and development activities already undertaken at National level, in line with the European Research Area objectives.

Finally ERRAC also recommends that European associations representative of important EU markets and involving a large variety of members not so much inclined to participate in EU projects should be funded at a 100% level for their participation as "voice of the sector", even for non-management tasks.