

## **Summary of advisory report 37**

### **OUTLINES OF SCIENCE POLICY**

In this present report the Advisory Council for Science and Technology Policy (AWT) argues its positions in respect of the science policy the government will pursue for this term of office. As an advisory report will also be published shortly on the innovation policy to be pursued, the present document concentrates on the government's relationship with the public knowledge institutes: the universities, the Netherlands Organisation for Applied Scientific Research (TNO) and the large technological institutes (LTIs), as well as coordination between the departments. It is the Council's view that a reorientation of science policy is required, which reorientation does not relate specifically to the goals. The underlying goals of reinforcement and better utilisation of the knowledge infrastructure are still relevant. A reorientation is necessary on the ways of achieving these goals. It sees a further emancipation of the knowledge institutes as a leitmotif. This emancipation is only wise if it is accompanied by:

- clear agreements on goals and parameters;
- accountability of the institutes;
- performance testing;
- a government that is prepared to translate performance results into the terms of reference and funding of the institutes.

This requires a different government policy, not only in regard to instruments but also to culture. On the one hand, the government will be placed at arm's length as the institutes will themselves bear responsibility. On the other, the proposal requires an active government which is clear about what it aims to achieve, develops the instruments to test performance, and also intends to draw conclusions from these results. The Council recommends shaping the relationship between the government and knowledge institutes via the institutes' programme of strategic plans and contractual relationships between the government and the individual institutes.

#### **Universities**

University education is based on the presence of academic research in the curriculum as an educational instrument - for creativity, for questioning what exists, for shaping models, for verifying measurements, etc. in the chosen disciplines. If this takes place at the cutting edge of the research environment, this will continue to inspire students to pursue a career in academic research. This does not alter the fact that in pursuing their professions many graduates these days need to have considerable knowledge of domains in social fields in which other disciplines also play a role, in addition to their own discipline. Understanding and communicative skills that transcend their disciplines are also indispensable, leading to a broadening of and differentiation in the courses.

In the Council's view this demands considerable efforts on the part of the educational institutions to achieve this. It finds that in the current funding model a university does not see any particular reward for its teaching performance. At present, the distribution among the universities of government funding for both education and research is largely fixed (about 80%). Institutions going mainly for research are better off than those that take extreme care about the quality of their teaching. Teaching needs to pay better in funding.

The present "fixed 80%" in the funding of teaching in the universities is going to change into a highly output-based distribution model. The Council endorses this plan. In its view, a

modification of the distribution model for research monies is also called for. It advocates distributing a substantial portion of these research monies among the universities based on the actual amount of teaching a university does. This portion should comprise the resources for so-called education-related research as well as the resources for high-risk innovative research, to be seen jointly as 'fundamental research funding', the size of which depends on the teaching load.

The present model contains a component for the education-related research, the "interrelationship component" as it is termed. The Council advocates an increase in this part of the budget, partly in order to reinforce education-related research, first degree projects and expanding lecturers' knowledge. The review committees should take the quality of the first degree work and the up-to-dateness of the lecturers into account in their assessment. The universities' research budget should further be based on their ability to perform high-risk research, whereby failure should not mean a more stringent assessment risk for those concerned. For this reason the Council deems it desirable that at least 15% of the university research budget should be placed outside the scope of formal pre- and post-assessments. Their share in the indirect source of research funding as a result of innovative government-funded research will speak for itself.

The Council advocates a further critical analysis of the distribution among the universities of government funding for research. The Netherlands, like other small European countries, has opted to concentrate publicly financed research in its universities. The Council is not convinced that the existing, historically determined distribution among the universities is optimum. The various academic areas have each developed in their own ways and their research needs have changed accordingly. As universities are increasingly going to project themselves in the field of research, each in its own way, it is only reasonable that the distribution of funds among the universities should be reconsidered.

Aspects that should play a part in this distribution are quality-related competition, social relevance and macro-effectiveness. Transferring funds from the first (government) to the second (research organisations) source provides guarantees that these aspects can be recognised. However, the Minister has decided not to undertake such a transfer. The Council argues that the Minister has no tools within the first source of funds for basing distribution among the universities on said aspects; he has no direct powers to do so. It deems linking the distribution model to the research quality assessment ineffective for numerous reasons. The path of the so-called depth and breadth strategy is not a good solution either from a structural point of view, although the Council is in favour of executing the second stage of the depth strategy. What is left for the government is 'to work indirectly', which means ensuring that external signals are sent to the universities on a regular basis concerning quality, social relevance and macro-effectiveness in the expectation that the universities will pick up these signals. The Council takes the view that one of the tasks of the Supervisory Boards of the universities is to ensure that the signals are properly picked up by the Governing Boards.

The current system of the VSNU review committees and KNAW-ECOS assessments provide the universities with important signals about the quality and embedding of their research. What is missing is the explicit revelation of the social involvement of university research. 'Political' appreciation for the research can be increased, with appropriate budgetary plans, by making domain-based reports on the involvement of the university in answering social issues in addition to the said assessments.

### **Netherlands Organisation for Scientific Research (NWO)**

The Council thinks that now a decision has been taken not to transfer funds and NWO will receive no additional funds from that direction, this should have consequences for the functioning of NWO. Seeing the transfer has been abandoned, the universities themselves have ample funds for deploying research resources along a broad front. NWO (in this case NWO-I) can now concentrate more on providing additional incentives for top international research in the Netherlands in new, highly promising areas of research and using 'up-and-coming talent'. In addition, the Council sees an important role for NWO as implementing organisation for research specifically focusing on society (i.e. NWO-II). One of the aims of transferring funds was to reinforce this function of the NWO. No transfer means a limit on the government's ambition to provide an extra boost for socially relevant research. If additional funding were to become available in the government's present term of office, the Council would advocate using

these resources for NWO-II.

### **Para-university institutions**

On the position of the para-university institutions the Council stands firm: funding in competition and collaboration/integration with universities. The Minister still has to take a final decision on their embedding.

### **Netherlands Organisation for Applied Scientific Research (TNO) and the large technological institutes LTIs**

With regard to TNO and the LTIs the Council notes that further emancipation should be pursued, but making sure there are clear and controllable conditions regarding the playing field and regarding the spending of public money. The Council does not consider the unlimited growth of these institutions in all kinds of direction to be efficient: they will drift away from their actual task and false competition will arise with other parties, among them private parties. The Council advocates a more specific remit for these institutions, as already outlined in earlier reports.

### **Coordination**

The consequences of new technologies (biotechnology, ICT) affect various departments. Legislation and regulations in many fields have an impact on the processes of innovation in the public as well as the private sector. Monitoring can result in regulations being amended or in compensatory research policy. One department may encourage research into a new technology, while another delays development of the product as a result of isolated legislation and regulations, unintentionally restricts commercial exploitation as a result of fiscal measures, etc. Research into social problems transcends departmental boundaries and requires everyone to pull together. There is a need for greater coordination. The Council sees a more powerful role for the Ministers of Economic Affairs and of Education in this and other fields.

### **Specific points for the agenda for science policy**

In its report the Council outlines a number of subjects that are on the agenda for science policy on which it will issue advice this year.

#### *Strategy for technical and natural sciences*

An initial problem in the case of the technical and natural sciences is their 'dilution': there are few students and a wide range of courses being offered. Is that efficient? A second problem is the room for innovation. Besides the necessary focus on the basic subjects, is there sufficient capacity for innovations at the interface of disciplines and subdisciplines? A third problem is the distribution of the research funds among the subject areas. The number of students at the technical universities has risen sharply compared with the natural sciences at the general universities, but this shift has not been translated to the research funds due to the rigid distribution model.

#### *Large investments*

Investment in research is increasingly being influenced by ICT and, for example, the question of whether simulation or physical models are used. What investments can be expected? How should decisions be taken, what criteria should apply and can international agreements be made? How does the ICES approach compare with the intensive, competitive considerations that are customary in the regular sources of funding?

#### *Women in the university and research world*

The number of women on the academic staff of the universities and research institutes is low, even by international comparison, and there are also few women working in the private R&D sector. The academic world is consequently depriving itself both in terms of quantity (new talent is not being tapped) and of quality (diversity in approach enriches research). Measures that really work are urgently required.

#### *European R&D policy*

The EU's Fifth Framework Programme is still far off, but a fundamental formation of ideas is already needed now. The roles between the EU and the Member States have not been

sufficiently demarcated. Consequence: duplications and unnecessary bureaucracy.

*Foresight studies*

In consultation with many of those concerned the AWT has drawn up a list of social themes for the foresight studies. What new interdisciplinary knowledge questions is the community facing and will the knowledge infrastructure be able to tackle them? Three studies have already commenced: construction, water and behavioural sciences. The need for foresight studies on themes that constitute part of criminality, ICT, the services sector, education and cultural sciences is being examined.

