

## STOA-NEWS

From the running STOA work programme the following projects have been completed in October and November 2008: *Energy Future of Europe*, *Future of European Transport*, and *Direct-to-Consumer Genetic*. Abstracts of the final reports are given below. After approval by the STOA panel, the full reports will be available for download on STOA's ([http://www.europarl.europa.eu/stoa/default\\_en.htm](http://www.europarl.europa.eu/stoa/default_en.htm)) as well as on ETAG's (<http://www.itas.fzk.de/etag>) webpage.

In the context of the project "Human Enhancement", which is run by ITAS and the Rathanau Institute, two expert meetings have been held during September and October. We below provide a report on the meeting hosted by ITAS in Brussels in September 2008.

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### Completed Projects

#### Future Energy Systems in Europe (October 2008)

Based on the objectives of improving the security of fuel supply and significantly reducing future oil consumption and CO<sub>2</sub> emissions, the STOA project on "Future Energy Systems in Europe" has developed a set of technology scenarios for energy supply in Europe by 2030. The different characteristics, opportunities and priorities for the energy sector in different parts of Europe have been integrated in the energy scenarios for five archetypical EU countries representing different conditions in their existing energy sector and different opportunities to meet the objectives. Common EU27 scenarios have been developed based on the regional energy scenarios. One of the results of the project has been the development of the STREAM energy model, which is capable of delivering fast, user-friendly pictures of both present and future energy situations in Europe. The energy model deals with data and scenarios for EU27,

five European regions as well as for the EU as a whole.

As a key outcome of the project, two essentially different developments of the European energy systems have been described and quantified through a so-called Small-tech scenario and a Big-tech scenario. Both scenarios aim at achieving two concrete goals for 2030: reducing CO<sub>2</sub> emissions by 50 % compared to the 1990 level and reducing oil consumption by 50 % compared to the present level. The final report presents a Small-tech scenario and a Big-tech scenario, the key measures in each scenario, the systems' impacts and environmental and economic consequences. The modelling tool, including all data and results, can be downloaded from the website of the Danish Board of Technology.

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#### The Future of European Long-distance Transport (October 2008)

The projected heavy growth rates in European transport volumes, especially in the long-distance sector, are a serious challenge in several respects: Transport contributes to climate change, the transport system is strongly dependent on oil – a finite resource, and a functioning transport system is a basic pillar for economic growth in Europe. Against this background, the STOA project on "the future of European long-distance transport" focused on the challenges mentioned above in order to contribute to transparency and improved governance in this highly complex field. The project developed scenarios for sustainable, efficient and less oil dependent European transportation along with related policy options.

Three different phases can be distinguished in this project. The first phase encompassed a general scoping, an identification of key challenges for European long-distance transport as well as the definition of targets that should be achieved over the next 40 years. These targets are: a 60 % reduction of CO<sub>2</sub> emissions, a 80 % reduction of oil dependency, and to guarantee a high level of accessibility throughout Europe. In the second phase, scenarios were developed together with an expert working group by using the so-called backcast-

ing approach. This methodology includes the drafting of images of the future (here for the year 2047) which illustrate how a world in which the targets are fulfilled might look like. Three images of the year 2047 have been worked out, which are entitled according to their main settings: 1.) “Strong and rich high-tech Europe”; 2.) “Slow and reflexive lifestyles”; 3.) “Economic pressure and expensive energy”. Following on this, policy packages that could serve as pathways from the present to the images of 2047 are analysed and assessed. In the third phase of the project, key elements of the scenarios were discussed with European citizens from several countries (Denmark, Greece, Hungary).

Results indicate that heavy changes and significant trend breaks are needed if the targets should be fulfilled; this is especially true for air transport and trucking. A combination of several policy measures is needed. Improved competitiveness of the rail sectors is playing a key role. Since several measures are only able to achieve mid- to long-term effects, action has to be taken right now. European leadership is important and, thus, a coherent European vision of a carbon-lean transport system is needed. The citizens’ consultations indicate that Europeans are aware of future challenges and to a certain degree willing to accept effective measures, even if they have personal disadvantages in the short term.

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### **Direct to Consumer Genetic Testing (DCGT) (November 2008)**

Starting at the end of the 1990s, offering genetic testing direct to consumers has entered the market as a new “business model” for genetic testing. Genetic testing so far had been carried out by specialised institutes in the medical sector at referral by a medical doctor. In recent years, new companies offering DCGT merely via internet are constantly showing up. The STOA report provides an overview of the current discussion among experts and public authorities on the current state of offers of DCGT via internet. Guided by analysis of the development of the market and the pros and

cons of DCGT, the report discusses possible options and needs for political intervention.

The most obvious problem of DCGT is that – as is supported by an assessment of 38 DCGT websites carried out in the context of the project – the majority of tests offered directly to consumers are tests for susceptibilities to disease based on so-called SNPs (single nucleotide polymorphisms). These tests are most interesting from a commercial point of view, since they are related to widespread common diseases (such as cancer). Experts regard most offers of testing based on SNPs to be meaningless from a scientific point of view, since the clinical validity of most of the tests has not (yet) been sufficiently proven.

The results of the project support the notion that

- many DCGT offers do not meet a minimum set of quality criteria that can be regarded to be necessary for ensuring adequate information and protection of customers against misleading interpretation of the need for as well as the possible consequences of genetic testing,
- most DCGT offers fail to provide proper information on the scientific evidence behind genetic testing services offered to customers (clinical validity and utility),
- many of the companies offering genetic testing services via internet do not at all include genetic counselling in their services. Only a few urge customers to involve an expert before purchasing a gene test, and “counseling” in most cases only is provided as written information via mail or via web-log.

At the European level, opportunities for regulating the market are opened up by the running amendment of the In Vitro Diagnostic Devices Directive (98/79/EC). To provide for a broad scope of gene tests being covered by the Directive would allow for the establishment of a European system of pre-market approval of gene tests which would restrict the leeway for DCGT, possibly drastically.

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## **Expert Meeting “Human Enhancement”**

### **Shifting Boundaries, Changing Concepts: The Challenges of Human Enhancement to Social, (Dis-)Ability, Medical and Ethical Frameworks**

#### **Meeting of the ETAG project team with invited experts**

**Brussels, Belgium, September 18, 2008**

It was the objective of the meeting to discuss how the perspective of human enhancement (HE) may change or is actually changing such notions as “(dis)ability”, “normalcy”, “therapy”, “perfectibility”, “impairment” and “ableism”, and the related social and ethical frameworks and policies. Furthermore, the prospects of the HE perspective in R&D and human enhancement technologies (HET) in the European context were explored and compared to the American context, particularly with regard to the ideas of the so-called “NBIC initiative” (nano, bio, info, cogno) on “converging technologies” in the US and the reactions to it (in Europe and elsewhere).

The experts attending the meeting were: Rafael Capurro (European Group on Ethics; Stuttgart Media University), Arianna Ferrari (University of Darmstadt), Ineke Malsch (Malsch TechnoValuation, Utrecht), Ursula Naue (University of Vienna), An Ravelingien (Ghent University), Gregor Wolbring (University of Calgary). The covered fields of ethical and social science expertise thereby included, inter alia, neuroethics (pharmaceutics as well as implants), technology-oriented disability and ableism studies, nanotechnology, biotechnology, synthetic biology and other converging technologies as well as the related policy issues.

There was consensus that with regard to HE the central question is: What are the targets and goals of enhancements? Broadly speaking, this relates to societal and political guiding visions and to ideological factors, anthropological concepts, and fundamental

values which shape science- and technology-related debates and activities, and may lead to shifts in the definitions of such notions as health, (dis)ability, impairment, normalcy, and therapy.

It became clear that there is, at least with regard to the broader and more visionary aspects of HE, a differentiation to be made between the enhancement of the species, with its eugenicist overtones, and the enhancement of individuals. Leaving aside the question of the feasibility of genetic enhancements of the species, there was consensus that an enhancement of the species is not suited as a guiding vision, for historical, pragmatic and metaphysical reasons.

While the experts did neither concur in their assessments of the state of the art in the pertinent HET nor in their views on the relevance of the NBIC initiative in the US, there was broad consensus that such visions might be conducive to a specific political shaping of ongoing and emerging developments in second-stage HET. An alternative guiding vision for the development of HET, better suited to the European context, could be the improvement of both individual well-being and social cohesion. This vision was approved by all experts. However, some experts argued that the term “HE” should not be used at all in this political context, because of its problematic character.

Focusing on the example of so-called mood or emotional enhancement, the experts discussed the relations between social and individual factors in HE. One expert argued that HE could be contextualised within a medical framework in which all interventions are conceptualised as measures to help individuals to cope with society. Accordingly, when individuals suffer emotionally, e.g. due to their general shyness, their discontent with their body, or their nervousness in certain situations (e.g. stage-fright), we should not make an artificial distinction between therapy and enhancement, but approve any effective measure to relieve their suffering as a help to cope with society. Other experts disagreed and pointed out that (1) such an approach would further the problematic tendency of a medicalisation of social problems, that (2) in health policy, as in any policy field, we have to set

priorities and that clearly therapeutic interventions should be prioritised, and that (3), in a framework shaped by a radical perspective of HE, the social “duty” to conform to a norm would become a duty to fix yourself to the norm by technological means. While among these experts there was disagreement whether it would make sense to draw a line between therapy and enhancement, they concurred that such boundaries are shifting and that, for example, the road to an enhancement society could be paved by a further medicalisation of social problems and individual needs.

There was broad consensus among the experts that “second-stage” enhancements, particularly those based on new human-technology interfaces, should be assessed with a view on possible shifts in power relations. It was pointed out that the persistent paradigm of control and domination of nature in Western culture, when “applied” to “human nature”, might negatively affect certain European values, as the ones expressed in the idea of Man created in the image of God or in the concepts of human dignity and autonomy. While the “intuitive” rejection of interventions which go “under the skin” might often be to the point, the fundamental question appears to be how such HET might create new options for social and even remote control as well as manipulation of human beings.

Several experts emphasised that the discourse on HE is strongly influenced by an uncritical “faith in science” and that alternative visions of the future and proposals to solve societal problems are largely absent or neglected. When focusing on individual enhancements by technological means, we may fade out such low-tech or no-tech measures as an improvement of school meals or creation of information- and knowledge-rich learning environments. Moreover, the general public is confronted, as a bystander, with some specific imaginations in the modus of “hype and hope” only because they are ventilated by policy actors or members of the technoscientific elite. So, there is a need for alternative imaginations and societal visions related to science and technology and more public participation.

The experts agreed that if concepts of HE are used in a policy context at all, it is of fundamental importance to identify as precisely

as possible the targets and the overarching goals of HE. When it comes to regulatory questions, specific applications (and not technologies) should be targeted, possibly supplemented by the definition of general principles for pertinent research funding and policy, or even by some general bans (for example, in the military context). There is an obvious need for a guiding vision for the further development of research and technologies which are relevant in the HE context, and such a guiding vision should be based on a societal perspective which focuses on social cohesion and distributive justice as frameworks of individual choice.

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