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HOPE-, HYPE- AND FEAR-TECHNOLOGIES – THE ROLE OF SCIENCE AND POLITICS

Hope, *hype* and *fear* are the attributes of a very heterogeneous group of technologies. They are believed to have the potential to solve global problems (hope), they are associated with far-reaching visions of the future and with overreaching expectations (hype), and because of their impacts that are difficult to foresee and even less to control, they raise concerns no matter whether they are well founded or not (fear). Therefore, these technologies attract a high degree of public and political attention. This results in serious pressure on decision makers to take action and to shape the development of these technologies in spite of but also because of a precarious knowledge base and diffuse interests.

At the EPTA conference three exemplary cases will be explored. Key questions are: How do agenda setting processes proceed, which political strategies are employed to tackle the problems, how does the interaction between science and politics progress, and what part do media and societal discourses play?

1. CASE STUDY: NANOTECHNOLOGY (SIZE MATTERS)

The far-reaching promises of nanotechnology are based on their potential to generate materials for completely new applications, to realise novel processes and systems and on the ability to target and fine-tune their properties by controlling their composition and structure down to molecular and atomic levels. Because of this nanotechnology is expected to trigger innovations in many areas of application and almost all branches of industry. Its development and establishment as a key technology is supported by substantial public funding and support programmes.

»The impact of nanotechnology on health, wealth, and the standard of living for people will be at least the equivalent of the combined influences of microelectronics, medical imaging, computer-aided engineering, and man-made polymers in this century.« (Richard Smalley, Nobel Laureate Chemistry, 2000)

In conjunction with this promise, the question of risks is raised: Artificial nanostructures could end up in the environment e.g. via emissions from produc-

tion facilities or by the release of particles from everyday use of nanoproducts. The impacts on environmental matrices and potential long-term consequences are still widely unknown. It was seen as a necessity to close the knowledge-gaps concerning the impacts of nanotechnology rapidly, to identify potential hazards early enough and to take precautions against them.

In the interest of both the economy and the consumers, politics in Germany and other European countries as well as on EU-level explicitly counted on an extensive impact assessment of the technology and societal and political supervision at an early stage. Accordingly, sizeable research programmes have been launched, new scientific institutions established, joint commissions of diverse stakeholder groups set up and numerous platforms for dialogue in (respectively with) the public at large initiated.

2. CASE STUDY: INTERNET (CYBERDEMOCRACY)

In contrast to the other case studies, the internet is an established – not to say »old« – technology, which however generates new application potentials, use patterns and impacts constantly. It originated in the context of US defence research programs and in the academic realm, but it was subsequently commercialised and turned into a mass medium in its own right. Hope, hype, and fear discourses have repeatedly occurred in cycles in recent years. Because of the wealth of empirical experiences that has been accumulated, the internet may provide a prime example how to deal with hope, hype and fear technologies.

Particularly for the democratic development of societies much hope was placed on the »grassroot net«, which seemed to overturn the difference between sender and receiver. Today, media like e.g. facebook and twitter are discussed to be instruments of responsible societal and social participation not without an inherent explosiveness.

One of the overreaching hopes is the vision of the »salvation of the recipients from their passiveness« by the first universal medium in the history of humanity. Today the democratic protest movements, e.g. in the Arab countries, have demonstrated the importance of the internet. On the other hand it is obvious that the internet is also used to keep citizens under surveillance and to support government interventions even to the point of »switching off« the internet to suppress participation and emancipation.

In general, this sphere of activity and technology is remarkably heterogeneous and multifaceted with respect to its emergence, diffusion and its practical use. At no time a coordinated, structured governmental approach can be diagnosed around the world. At the same time the degree of diffusion and penetration of the technology into society is enormous and their impact on personal living conditions is huge. In most cases the societal discourse proceeds without immediate political attendance, initiation and transmission of theses discourses

typically originate from the relevant economic and the distinct societal stakeholders.

»Since the rise of the Internet in the early 1990s, the world's networked population has grown from the low millions to the low billions. Over the same period, social media has become a fact of life for civil society worldwide... As the communications landscape gets denser, more complex, and more participatory, the networked population is gaining greater access to information, more opportunities to engage in public speech, and an enhanced ability to undertake collective action. In the political arena, as the protests in Manila demonstrated, these increased freedoms can help loosely coordinated publics demand change...« (Clay Shirky, Political Scientist 2011)

3. CASE STUDY: GEO-/CLIMATEENGINEERING

Geo-/Climateengineering has attracted a great deal of attention in light of expected major global problems that are generally thought to be caused by climate change. It cannot be ignored that »tipping points« may exist in the climate system with potentially catastrophic consequences. Examples for suggested measures to counter global warming that have come under scrutiny recently include iron fertilization of the oceans, air capture to reduce the CO_2-concentration in the atmosphere, or the injection of sulphate aerosols into the stratosphere to induce a cooling effect.

This field represents a good example for uncertain and disputed science and knowledge base, risk assessments and debates about possible strategies on a very fundamental level. Many scientists dismiss geoengineering because of unpredictable, dangerous and irreversible side-effects and also advise against too much research commitment and funding. Others could imagine it as a »last resort«, a drastic measure to prevent a breakdown of the earths' climate and to secure the survival of mankind. Politics is also interested in the suggested concepts because they could be adapted to fit national and international strategies of environmental and climate policies. Prerequisites to take up geoengineering as an acceptable tool would be safety, economic viability, and public acceptance.

»However, we are facing an unfortunate reality. The global climate is already changing and the onset of climate change impacts may outpace the world's political, technical, and economic capacities to prevent and adapt to them. Therefore, policymakers should begin consideration of climate engineering research now to better understand which technologies or methods, if any, represent viable stopgap strategies for managing our changing climate and which pose unacceptable risks.« (Congressman Bart Gordon, 2010)