



EUROPÄISCHE AKADEMIE

zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen
Bad Neuenahr-Ahrweiler GmbH

Direktor: Professor Dr. Dr.h.c. Carl Friedrich Gethmann

NEWSLETTER

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EDITORIAL

■ The results of the work by the interdisciplinary project groups of the Europäische Akademie GmbH are published as memoranda in the series "Ethics of Science and Technology Assessment", publisher Springer-Verlag. These studies, concluding the work by the project groups, are discussed and presented to the interested public, representatives of science, press and politics within the range of a book presentation. Thus, the Europäische Akademie fulfills its task to make the recommendations and assessments of scientific and technological advance accessible to politicians, scientists and the public.

In 2008 four running projects of the Europäische Akademie will be concluded. In June the project group "Societal Implications of Electrical Power Grids" will present its volume "Die Regulierung elektrischer Netze" at the Landesvertretung Rheinland-Pfalz in Berlin. The project group "Responsibility for Future generations. Implementation of Sustainability in Schooling" is planned to conclude its work in September with its book presentation in Bonn. Book presentations by the working groups "Pharming. Genetically Modified Plants and Animals as Future Production Site of Pharmaceuticals" and "Fuel Cells and Virtual Power Plants as Elements for a Sustainable Development" will take place again in Berlin at the Berlin-Brandenburgische Akademie der Wissenschaften at the end of October and at the beginning of December.

The Newsletter reports about the implementation of presentations and presents parts of the studies including their results at regular intervals. FW

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FOCUS

Pros and cons of nuclear energy: Private versus social costs

Thomas Ziesemer

Whether or not nuclear energy should be used as a means against climate change cannot be determined on the basis of lower CO₂ emissions alone. Other aspects have to be taken into account as well. It is hard, though, to find other favourable aspects, because (i) it is an unnecessarily costly technology if all cost items in regard to risks of terrorism, safety and nuclear waste as well as costs of scrapping are correctly taken into account rather than being waived as implicit subsidies, (ii) the political situations in the relevant countries of procurement are not more favourable than for the alternatives. The costs of electricity from fourth generation reactors which may be an option for the future are unknown by now. As an intermediary solution, until long-run solutions are found, nuclear energy is likely to crowd out the renewable and sustainable technologies. The remaining chance for nuclear energy is based on high CO₂-prices to be paid by the competitors and low insurance costs, risks being born by society. This scenario, however, represents an unfair competition through an asymmetric handling of the principal of causation.

■ It is difficult to doubt that nuclear energy leads to *lower CO₂ emissions*. Germany has twice as much emissions per unit of Gross National Income than France has, whereas France has three times the share of nuclear energy in electricity production. In a consideration of data over time, the relation between emissions and the share of nuclear electricity, once it is corrected for the growth of the GDP per capita, is getting statistically insignificant and the effect is getting weak. The reason probably is the development of traffic which is the major culprit in CO₂ emissions. While nuclear energy can play a role in electricity production it is important in traffic only to the extent that there are electric cars. CO₂ is a global problem. Worldwide electricity causes only 9% of the CO₂ emissions because electrification is low in many poor countries but, of course, has positive growth rate there. About 17% of electricity arise from nuclear generation. These facts imply that most emissions stem from traffic, and therefore nuclear energy cannot

help us out here, and even getting electricity free of emissions one would need a six fold expansion of nuclear energy. This would have implications for terrorism, safety and uninsurable risks, but also for the prices which would increase strongly. In Germany energy production causes 43% of CO₂ emissions and 28% of electricity is nuclear. The scope for nuclear energy is clearly higher in Germany than on a world scale. Nuclear energy can have a potential of 40% of energy production. Summing up, it is clear that nuclear energy could play a role in reducing emission in electricity production. The critical question then is whether or not it is a cost effective way of doing so or whether there are less costly ways to achieve the emission reduction of Germany and the EU. The privatisation of power generation in the UK has shown that nuclear power stations were not perceived to be profitable and therefore had to be taken out of the privatisation programme in 1989, and in recent times nuclear energy is planned by economies with a

strong central planning component. Another argument that is sometimes mentioned in favour of nuclear energy is that alternatives like gas come from *politically risky* regions whereas uranium does not. The countries which deliver uranium to Germany are Russia (19%), UK (26%), Canada (47%) and France (8%). A look at international trade statistics reveals that France and the UK get 30% of their uranium from Russia. Taking this into account, Germany ultimately gets 29% of its uranium either directly or indirectly from Russia. As far as natural gas imports of the EU are concerned, we get the information that 29% of uranium and 25.37% (.43 x .59) of gas come from Russia. The dependence on Russia therefore is about equally large for uranium and gas.

Terrorism, safety and insurance issues are closely related to nuclear energy because of its relation with nuclear weapons. In the Netherlands a scientist named Khan worked in the area and diffused his knowledge to Pakistan enabling it to become a nuclear power. The USA recently paid \$100 Mio. to support safety measures in Pakistan. The administrations of the USA were keen on not giving any knowledge or technology to any state, until they had the chance to make a big business deal with India. And the French government was keen to sell nuclear installations to Iran. When business deals become possible, issues of terrorism seemingly are of secondary importance. Governments all-too easily are inclined to be sloppy about terrorism when their own firms can make good deals. This is clearly one of the negative aspects of nuclear energy.

Risks of nuclear meltdown have always been belittled by the producers themselves. Most of the nuclear power stations were built when governments believed them. However, the problems in Harrisburg and Tschernobyl have induced the security authorities to become stricter. Joskow argues that this has increased costs of new plants and regards it as the major reason why no nuclear plants have been built in the USA since 1979. In the EU the insurance liability has recently been increased to €700 Mio. per plant. Schneider and Zweifel found out that Swiss citizens would prefer higher insurance rather than taking into account a higher price for energy. Thus, competition is clearly biased in favour of nuclear energy and risky technologies at the costs of their competitors, also the renewable and sustainable ones which have not received as much support during the decennia as nuclear energy did, although some of them are highly subsidised now.

Future generations of reactors are told to be much safer by their proponents. Of course, the judgement about this cannot be left to the interested parties but should be left to insur-

ance companies and pooling consortia. They have the right incentives to do this correctly. If they underestimate the risk, they get bankrupt when providing insurance, and if they overestimate the risk, they ask a too high premium driving them out of the market. Once these new reactors come up, the nuclear power stations should have no separate insurance arrangements than any other business, and these arrangements should be in line with modern economic knowledge. Of course, the market for insurance will only work well, if there is a complementary market for independent scientists in this area. If all scientists hypothetically are dedicatedly in favour of or against nuclear energy, insurance companies will not want to start any judgement at all, and the market for insurance will not work in this part of the economy.

Another principle of good economic order serving the purpose of welfare maximisation is the principle of causation. Every individual, firms, households and institutions alike should bear the costs for items such as production costs, nuclear waste, and decommissioning costs for nuclear power plants and risks discussed above. Once these principles are applied, nuclear energy becomes much more expensive than it was told to be in the past. Not applying this principle provides an implicit or off-balance subsidy.

One of the critical questions then is what *energy supply* should look like in the long run. The whole controversy, as summarised so far, has also been subject of debate in the Netherlands. The federation of employers has claimed that electricity will be thirty percent more expensive without nuclear energy. As decisions on power stations are due, the government (great coalition) has asked a fact-finding commission to sum up what is known. Its outcome is that nuclear energy is not cost efficient when all costs are taken into account, and gas fired stations are a better complement to the fluctuation of wind and sun energy which must be the long-run solution in the Netherlands. Similarly, Joskow (2006, 17–18) argues for the USA that even at a CO₂ tax or price of \$30–50 the advantages do not outweigh the baggage from risks for safety, proliferation and waste disposal problems.

Of course, in the long run nuclear power technology will be improved, too. In the scientific publications by RWE (energy company), however, we find that the high temperature reactor (HTR) is part of the fourth generation which is not yet installed and still requires more research. In Finland and France where so-called EPRs (Evolutionary Power Reactor) of the third generation are in the process of construction now, the political and economic relations seem to be similar to those of the 1970s in Germany. Joskow (2006) suggests that suppliers of the Finnish power

station, unlike the French one, have calculated costs erroneously low. Much of the long-term development will depend on the price for CO₂. As some German and Dutch electricity producers have decided to invest in coal fired power stations and perhaps use the CCS (carbon, capture and storage) technology, the price of CO₂ will go as high as it is necessary to make CCS profitable, if the CO₂ obligations of the EU are to be achieved. Currently, the costs for CCS are calculated to be €40 per ton CO₂. On the other hand, the price of a ton of CO₂ in the European trading system is fluctuating around €20. Thus, at current information on CCS costs we have to expect an increase by €20, because €40 is the price which is necessary to achieve the climate change goal of the European governments. According to the famous ‘Social Cost of Carbon Review’, a price of €30 rather than €40 was to be expected. This change in the expected cost of CO₂ will of course be part of the price of electricity and raises the chance of other sources of electricity. In particular the price of €40 is fairly close to the upper bound of the range assumed by Joskow (2006) when rejecting the nuclear alternative. In this respect the delicate aspect is that the price will only be that high, if electricity producers opt for coal rather than for nuclear energy. This may leave scope for some small share of nuclear energy but if that is getting large, it will not be profitable, because then CO₂ permits will have low prices. On the other hand, with China and India planning tenths of new reactors, this will increase demand considerably and raise prices which then must be expected to rise and increase prices of nuclear energy again. The Dutch firm Eneco wants to develop its long-term electricity supply without nuclear and coal energy. In this case, the implicit calculation must be that nuclear energy will not be competitive, once the principle of causation is applied on all issues discussed above, and that electricity from coal fired plants will be too expensive because of the costs for CCS and the tradable permits. One interesting idea is the Zero Emission Power Plant combining gas firing with the CCS where the storage part happens in former gas bells. Living without coal and nuclear energy is seemingly not impossible but perhaps not likely in the light of plans for investments in coal fired power stations. One of the plans to build coal fired power was recently revised though. The Dutch firm Nuon declared that they had become too expensive since the last announcements of and the final decision on plans. They now prefer to invest in gas-fired stations. The future development of prices of energy sources and technologies seem to be fairly hard to predict even for the companies themselves. In this respect time will show the future development of the market.

The crucial point is not who is pro and who is con nuclear power, rather we need to have good institutions according to which the principle of causation is obeyed as one of the principles of a well-functioning market economy. Then the market can decide about nuclear energy, if governments allow for this. We will see whether or not this line will be followed when nuclear energy is at stake. The future will show who gets most government support, ideas of central planning as they tend to come back on the side of the proponents of nuclear energy or ideas about good institutions including fierce competition in markets and the principle of causation applied equally to CO₂ and all sorts of risks from nuclear energy.

Professor Dr. rer. pol. Thomas Ziesemer is professor of economics at the university of Maastricht. He is participating in the project group "Fuel Cells and Virtual Power Plants as Elements for a Sustainable Development. Innovation Barriers and Implementation Strategies" at the Europäische Akademie GmbH. He was also a member of the group "Sustainable Development and Innovation in the Energy Sector".

Bibliographical information can be requested from the author: T.Ziesemer(at)ALGEC.unimaas.nl

WORKING GROUPS

■ Study Group "The Restoration and Enhancement of Human Capacities by Neuro-Implants": 31/1/07 in Karlsruhe

■ Project Group "Potentials and Risks of Psychopharmaceutical Enhancement": 21–22/2/2008 in Bad Neuenahr-Ahrweiler

■ Project Group "The Research Guiding Function of Metaphors from the Information Sciences and their Relevance to the Transformation of the Philosophy of Man": 26–28/2/2008 in Bad Neuenahr-Ahrweiler

■ Project Group "Fuel Cells and Virtual Power Plants as Elements for a Sustainable Development. Innovation Barriers and Implementation Strategies": 29/2/2008 in Bad Neuenahr-Ahrweiler

■ Project Group "Pharming. Genetically Modified Plants and Animals as Future Production Site of Pharmaceuticals?": 10–11/3/2008 in Bonn

Transformation of the Philosophy of Man

■ The project group "The Research Guiding Function of Metaphors from the Information Sciences and their Relevance to the Transformation of the Philosophy of Man" met in Bad Neuenahr-Ahrweiler from 26th to 28th February for its mid-term-meeting. Scientists of different areas such as biology, informatics

and philosophy had been invited to discuss topics related to the project in order to prepare the closing papers which are expected in February 2009. Invited experts were Professor Dr. Jörg Martin Pflüger (Vienna), Professor Dr. Hans-Jörg Rheinberger (Max Planck-Institut für Wissenschaftsgeschichte, Berlin), Dr. Christina Brandt (Max Planck-Institut für Wissenschaftsgeschichte, Berlin), Professor Dr. Antje Gimmler (Aalborg University) and Professor Dr. Armin Grunwald (ITAS Karlsruhe).

NEWS

Scientific Advisory Council

■ On 14th February the Scientific Advisory Council of the Europäische Akademie GmbH convened for its 26th meeting at the academy in Bad Neuenahr-Ahrweiler. Main topic was the consultation on the final reports of the project groups "Responsibility for Future Generations. Implementation of Sustainability in Schooling" and "Societal Implications of Electrical Power Grids". The latter one was approved by the council and will be published in June 2008. The former study will be revised and evaluated by the council again.

Neuro-Enhancement – Doping für's Gehirn?

■ Um die Folgen von "Gehirn-Doping" durch Glücks- oder Gedächtnispillen ging es am 21. Februar beim von der Europäischen Akademie GmbH und der Kreissparkasse Ahrweiler gemeinsam durchgeführten Kreissparkassenvortrag. Die Referentin Professor Dr. med. Bettina Schöne-Seifert, Lehrstuhl für Medizinethik am Institut für Ethik, Geschichte und Theorie der Medizin an der Universität Münster, erläuterte die Frage, ob die durch den Fortschritt der biomedizinischen Forschung möglich gewordene Stärkung der Leistungsfähigkeit von gesunden Menschen mithilfe von "Neuro-Enhancement" ethisch vertretbar und gesellschaftlich erwünscht sein könnte.

Die Wissenschaftlerin, vorgeschlagen für den Deutschen Ethikrat, stellte die Frage nach der ethischen Bewertung dieser Art von "Doping": Ist es wünschenswert und vernünftig, wenn man Gesunden eine Stärkung ihrer emotionalen Stabilität und eine Verbesserung der kognitiven Leistungen erlaubt, und wie kann man eine solche "Erhöhung" der menschlichen Fähigkeiten ethisch bewerten?

Schöne-Seifert betonte in der Diskussion um das Für und Wider solcher Maßnahmen, dass der Einsatz dieser Medikamente noch hypothetisch sei; es gäbe zwar bereits einzelne Medikamente, bei denen in der Behandlung Kranker zufällig auch positive Wirkungen bei Gesunden festgestellt worden wären und die teilweise auch eingesetzt würden, jedoch begründe sich

die derzeitige Diskussion um solche Medikamente beim Einsatz Gesunder noch auf Versprechungen. So stellte die Professorin ihre Überlegungen zur ethischen Bewertung von Neuro-Enhancement immer auf die These, dass diese Medikamente eines Tages risikofrei und auch positiv wirksam sein könnten.

Was also sollte man seiner volljährigen Tochter raten, käme sie auf die Idee, ihr Examen wie die übrigen Kommilitonen auch mit gedächtnisverbessernden Mitteln zu bestreiten? Müsse man da nicht aus Gründen der Gleichstellung und im Interesse der ausgewogenen gesellschaftlichen Bedingungen davon abraten?

In der Diskussion um die Beantwortung dieser Frage machte Schöne-Seifert deutlich, dass es auch ohne medizinisches Enhancement alltägliche Mittel gäbe, die körperlich wie mental leistungssteigernd wirkten und die gesellschaftlich akzeptiert seien. So käme niemand auf die Idee, den Kaffee am Morgen oder die Förderung von Kindern mit musikalischer Früherziehung als verbotene und unfaire Maßnahmen zu bezeichnen. Warum also sollte man nicht auch Enhancement-Maßnahmen bei Gesunden ermöglichen wollen, die dem Wunsch des Menschen, seine Leistungen zu verbessern und seine Persönlichkeit positiv zu verstärken, entstammen?

Eine eindeutige Antwort auf diese Frage gäbe es bis heute nicht, so Schöne-Seifert. Die Professorin sprach von Regelungen für den Einsatz solcher Mitteln, die zum Beispiel gerade die sozialen Unterschiede angleichen statt sie erweitern würden. So könnte man Kinder mit weniger guten Startchancen in diesem Sinne "enhancen".

Zusammenfassend stellte Schöne-Seifert heraus, dass die Debatte über ein wirksames Enhancement weiterhin hypothetisch bleibe und dass es bisher keine überzeugenden kategorischen Einwände gegen solche Maßnahmen gäbe. Die gesellschaftliche Debatte stehe in einem größeren Zusammenhang, da grundlegende Fragen des gesellschaftlichen Zusammenlebens, nach dem Wohlergehen, der Freiheit und Gerechtigkeit auch hier mit bedacht werden müssten.

Der 15. Kreissparkassenvortrag endete mit einer lebhaften Diskussion zwischen der Referentin und dem zahlreich erschienenen Publikum, die von Professor Dr. Dr. h.c. Carl Friedrich Gethmann, Direktor der Europäischen Akademie, geleitet wurde. Die Europäische Akademie und die Kreissparkasse Ahrweiler freuten sich über das große Interesse und werden die Reihe mit weiteren aktuellen Vortragsthemen fortsetzen.

Professor Dr. med. Bettina Schöne-Seifert ist Mitglied in der Projektgruppe "Potentiale und Risiken des pharmazeutischen Enhancements psychischer Eigenschaften" an der Europäischen Akademie GmbH (Laufzeit 7/06–12/08).

PUBLICATIONS

Carl Friedrich Gethmann

■ Editor: *Oskar Becker, Grundprobleme existenzialen Denkens*, Frommann-Holzboog: Stuttgart-Bad Cannstatt 2008

■ Introduction to: *Oskar Becker, Grundprobleme existenzialen Denkens*, Frommann-Holzboog: Stuttgart-Bad Cannstatt 2008, pp XV–XXXIV

■ “Welche Hauptschule sollte der Vorschule folgen? Zur Architektonik der konstruktiven Vernunft in der Erlanger Schule”, in Jürgen Mittelstraß (ed.), *Der Konstruktivismus in der Philosophie im Ausgang von Wilhelm Kamlah und Paul Lorenzen*, Paderborn 2008, pp 43–62

■ “La concepción de la acción en Ser y tiempo de Heidegger”, in: Gustavo Leyva (ed.), *La Filosofía de la Acción. Un análisis histórico-sistemático de la acción y la racionalidad práctica en los clásicos de la filosofía*, Madrid 2008, pp 533–560

■ “Energie und Ethik. Ethische Aspekte zukünftiger globaler Stromerzeugung”, in: *VGB Power Tech 1/2* (2008), pp 32–35

Georg Kamp

■ “‘Wenn man sich im gemeinsamen Handeln wirklich eine Sprache aufbaut...’ Logische Propädeutik als Mittel zur lebensweltlichen Störungsbewältigung”, in: Jürgen Mittelstraß (ed.): *Der Konstruktivismus in der Philosophie im Ausgang von Wilhelm Kamlah und Paul Lorenzen*, Paderborn 2008, pp 63–91

Karsten Mause

■ “Rethinking Governmental Licensing of Higher Education Institutions”, in: *European Journal of Law and Economics*, vol. 25, 1/2008, 57–78

■ “The Tragedy of the Commune: Learning from Worst-Case Scenarios”, in: *Journal of Socio-Economics*, vol. 37, 1/2008, 308–327

■ “Zur Ökonomik des Konsumentenschutzes im Hochschulsektor”, in: *Jahrbuch für Wirtschaftswissenschaften*, vol. 58(3), 2007, 265–278

LECTURES

Carl Friedrich Gethmann

11/2/2008

■ “Ethos des Heilens versus Effizienz des Gesundheitssystems”

17th annual conference: Medizinischer Dienst der Krankenversicherung in Hessen, Offenbach am Main

16/2/2008

■ “Phänomenologische Ethik”

Scientific Colloquium “Von Becker zu Lorenzen”, FernUniversität Hagen

Georg Kamp

22/2/2008

■ “Warum streiten wir uns und wer hat Recht?”

Lecture for children, Universität Duisburg-Essen, Audimax Essen

Karsten Mause

23/2/2008

■ “Ist Marktsignalisierung im Hochschulsektor ‘sozial verschwenderisch?’”

10th workshop of the Wissenschaftliche Kommission Hochschulmanagement im Verband der Hochschullehrer für Betriebswirtschaft, Ludwig-Maximilians-Universität München

Felix Thiele

28/2/2008

■ “Institutionalisierung der Ethik in der Wissenschaftspolitik”

International Conference, Austrian Federal Ministry of Science and Research, Vienna

PERSONALITIES



■ **ULRIKE HENCKEL**, Dipl.-Päd., studied education science, psychology and sociology both at the Universität zu Köln and the Rheinische Friedrich-Wilhelms-Universität in Bonn and received a degree in education in 1986 (Diplom-Pädagoge).

At the Otto-Bennecke-Stiftung she worked as a lecturer teaching the German education system to Polish and Russian students who wanted to continue their studies in Germany. Later on she was as freelancer in an editing office, dealing with educational texts such as instructional guidelines and schoolbooks for the German language.

In 1994 she began to study philosophy at the FernUniversität in Hagen and the Rheinische Friedrich-Wilhelms-Universität Bonn. She joined the institute of philosophy at the FernUniversität in Hagen and is now coordinating the further training programme “Medical Ethics”, offered by the FernUniversität Hagen, Europäische Akademie GmbH and Johannes Gutenberg-Universität Mainz (www.medizinethik.eu).

Since 2001 she has been working at the Europäische Akademie GmbH as a Ph.D. student; since 2006 she is project coordinator in a collaborative project together with the Universität Marburg: “The Research Guiding Function of Metaphors from the Information Sciences and their Relevance to the Transformation of the Philosophy of Man” (duration September 2006–February 2009).

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Ulrike Henckel, Dipl.-Päd., is project coordinator (together with Thomas Engel, M.A.) of the project group “The Research Guiding Function of Metaphors from the Information Sciences and their Relevance to the Transformation of the Philosophy of Man” at the Europäische Akademie GmbH.

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