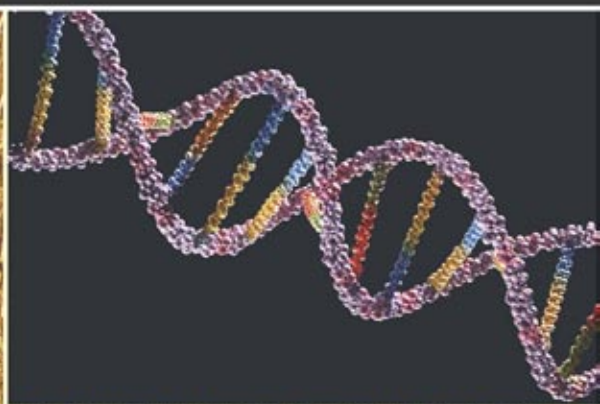




Deutsche Akademie der Naturforscher Leopoldina

German Academy of
Sciences Leopoldina

**Stellungnahme des Präsidiums der
Deutschen Akademie der Naturforscher
Leopoldina zum Entwurf
des novellierten Gentechnikgesetzes
(Gesetz zur Neuordnung des Gentechnikrechts)**



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STELLUNGNAHME DES PRÄSIDIUMS
DER DEUTSCHEN AKADEMIE
DER NATURFORSCHER LEOPOLDINA
ZUM ENTWURF DES NOVELLIERTEN
GENTECHNIKGESETZES

(GESETZ ZUR NEUORDNUNG DES GENTECHNIKRECHTS)



COMMENTS BY THE PRESIDUM
OF THE GERMAN ACADEMY OF
SCIENCES LEOPOLDINA CONCERNING
THE DRAFT AMENDMENT OF
THE GENETIC ENGINEERING ACT

(ACT ON THE RESTRUCTURING OF GENETIC ENGINEERING LAWS)

Edited by
the Presidium of the
German Academy of
Sciences Leopoldina

**Stellungnahme des Präsidiums der
Deutschen Akademie der Naturforscher Leopoldina
zum Entwurf des novellierten Gentechnikgesetzes
(Gesetz zur Neuordnung des Gentechnikrechts)**

Die Bundesregierung legte kürzlich einen Entwurf zur Novellierung des Gentechnikgesetzes vor, der u. a. die überfällige Umsetzung der bereits am 12. März 2001 erlassenen Richtlinie 2001/18/EG des Europäischen Parlaments und des Rates in nationales Recht vorsieht. Mit dieser Novelle sollen rechtliche Rahmenbedingungen für die in der Richtlinie ausgeführte „absichtliche Freisetzung genetisch veränderter Organismen (GVO) in die Umwelt“ geschaffen werden. Daraus ergeben sich weitreichende Konsequenzen für die zukünftige Entwicklung der sogenannten Grünen Gentechnik in Deutschland sowohl für die Forschung als auch die wirtschaftliche Verwertung. Der vorliegende Gesetzesentwurf setzt sehr hohe Hürden für den Anbau gentechnisch veränderter Pflanzen, die sich nicht nur auf die sicherheitsrelevanten Aspekte der Richtlinie 2001/18/EG beschränken, sondern darüber hinausgehende Anforderungen beinhalten, die den Grundsatz der Verhältnismäßigkeit in Frage stellen.

Kern der Richtlinie 2001/18/EG ist die Aufforderung an die Mitgliedstaaten sicherzustellen, daß „**mögliche**“ schädliche Auswirkungen auf die menschliche Gesundheit und die Umwelt, die unmittelbar oder mittelbar durch den Gentransfer von GVO auf andere Organismen auftreten können, sorgfältig geprüft werden.“ In §1, Nr. 1 der Gesetzesvorlage wird dagegen ausgeführt: „Zweck des Gesetzes ist, unter Berücksichtigung ethischer Werte, Leben und Gesundheit von Menschen, die Umwelt in ihrem Wirkungsgefüge, Tiere, Pflanzen und Sachgüter vor schädlichen Auswirkungen gentechnischer Verfahren und Produkte zu schützen und Vorsorge gegen das Entstehen solcher Gefahren zu treffen.“ Hier ist nicht mehr von möglichen, potentiellen oder etwaigen Risiken die Rede, sondern es wird eine Gefährlichkeitsprämisse zugrunde gelegt, die durch jahrelange, weltweite Anbau- und Nutzungserfahrungen mit GVO in keiner Weise gestützt wird und daher wissenschaftlich unredlich ist.

Der Gesetzentwurf nimmt die Richtlinie 2001/18/EG zum Anlaß, eine Koexistenz von konventionellen, ökologischen und gentechnisch veränderten Anbauformen in der Landwirtschaft zu fordern und die Inverkehrbringung der damit erzeugten Produkte zu gewährleisten (§1, Nr. 2). Dieser Ansatz ist im Prinzip zu begrüßen. Tatsächlich lassen jedoch die nachfolgenden Vorschriften jene Gleichbehandlung der Anbauformen vermissen. Hier wird lediglich auf drei gravierende Punkte verwiesen. An den Anbau von GVO im Freiland und die Nutzung daraus gewonnener Produkte wird ein Übermaß bürokratischer Auflagen geknüpft (s. §16). Es werden einseitige, im Umfang erweiterte und zumindest im Forschungsbereich kaum zu erfüllende Haftungsvorschriften erlassen (s. §32). Das Genehmigungsverfahren

sieht die Beteiligung zahlreicher Instanzen vor, u. a. die Mitwirkung mehrerer Landes- und Bundesbehörden, z. B. das Einvernehmen des Bundesamtes für Naturschutz (s. §16, Absatz 4). Die bewährte und effiziente Arbeitsweise der Experten in der Zentralen Kommission für die Biologische Sicherheit (ZKBS) wird durch Gründung zweier Ausschüsse, einen für gentechnische Arbeiten in gentechnischen Anlagen und einen zweiten für Freisetzungen und Inverkehrbringen, aufgegeben (s. §5). Diese neue Arbeitsteilung setzt voraus, daß zukünftig die Antragsteller ihre Forschungsprojekte thematisch nach den zuständigen Gremien ausrichten müssen. Der zweite Ausschuß ist dadurch gekennzeichnet, daß die Hälfte seiner Mitglieder zwar „sachkundige Personen“ sein sollen, aber keine genetischen Fachkenntnisse vorweisen müssen. Diese Konstellationen lassen erwarten, daß das Genehmigungsverfahren zukünftig von sachfremden Kriterien beeinflusst und nicht erleichtert, sondern erschwert und zeitlich verzögert wird. Alles in allem stellt der Gesetzesentwurf kein Vorbild für die allseits geforderten Erleichterungen dar.

Durch die vorgesehenen neuen gesetzlichen Regelungen werden die deutsche Wissenschaft und der Wissenstransfer in den Anwendungsbereich der (Land-) Wirtschaft gleichermaßen nachteilig betroffen. Notwendige Forschungen in der Grünen Gentechnik, die man in allen Industriestaaten der Welt mit großem intellektuellen und finanziellen Einsatz durchführt, werden behindert oder verhindert. Die Chancen, die diese Forschungsrichtung bietet, z. B. die Reduzierung des Eintrages von toxischen Wirkstoffen in das Ökosystem oder die Effizienzsteigerung in der landwirtschaftlichen Produktion, werden nicht tatkräftig aufgegriffen, sondern vertan, indem die Fortschritte blockiert werden.

Die Deutsche Akademie der Naturforscher Leopoldina mit ihrem nationalen und internationalen Ansehen kann angesichts ihres jahrhundertealten Leitspruchs „Die Natur erforschen zum Wohle der Menschen“ solche forschungs-, erkenntnis- und verwertungshindernden Verordnungen nur bedauern. Die vorgelegte Fassung des Gentechnikgesetzes entspricht keineswegs den Leitlinien „Innovation“ der Bundesregierung vom Januar dieses Jahres. Sie beschneidet die nationalen Chancen einer Technologie mit einem hohen Innovationspotential, die von mehr als sieben Millionen Landwirten in etwa 20 Ländern bereits genutzt wird.

Um die ersichtlich werdenden Nachteile für Deutschlands Wissenschaft und (Land-) Wirtschaft abzuwenden, ist es aus der Sicht der Leopoldina essentiell, in den Gesetzesentwurf der Bundesregierung die auf der Grundlage wissenschaftlicher Erkenntnisse beruhenden Vorstellungen der Experten zu integrieren und diesen entsprechend zu korrigieren. Was mit den Regularien für die medizinisch so erfolgreich angewendete Rote Gentechnik möglich ist, sollte auch für die nicht minder wichtige Grüne Gentechnik möglich werden.

**Comments by the Presidium of the
German Academy of Sciences Leopoldina
concerning the Draft Amendment of the Genetic Engineering Act
(Act on the Restructuring of Genetic Engineering Laws)**

Recently, the German federal government proposed a draft law amending the genetic engineering law, which provided, *inter alia*, for the overdue harmonization of German legislation with Directive 2001/18/EC promulgated by the European Parliament and the Council as early as on 12 March 2001. The purpose of the amendment is to create the legal framework conditions for the “deliberate release into the environment of genetically modified organisms (GMOs)” as intended by the Directive. This implies far-reaching consequences for the future development of the so-called Green genetic engineering in Germany as well as for research and industrial exploitation. The present draft law sets very high hurdles to the cultivation of genetically modified plants, which are not only restricted to the safety-relevant aspects of directive 2001/18/EC but contain further requirements that put the principle of commensurability into question.

The core of directive 2001/18/EC is that member states are called upon to ensure that “**potential** adverse effects on human health and the environment, which may occur directly or indirectly, through gene transfer from GMOs to other organisms, are accurately assessed.” In contrast with this, §1, no. 1 of the draft law provides: “The purpose of the act is, with consideration to ethical values, to protect human life and human health, the environment in its system of interactions, animals, plants and material goods from adverse effects of methods and products of genetic engineering and provide against the engenderment of such dangers.” The draft law instead of referring to possible, potential or contingent risks, is based upon the premise of dangerousness, which is in no way backed by the years and the global extent of the experience of cultivation and exploitation of GMOs, and therefore is scientifically dishonest.

The draft law quotes directive 2001/18/EC to demand the co-existence of conventional, ecological and genetically modified forms of cultivation in agriculture and to ensure the marketing of the products so obtained (§1, no. 2). This paragraph would be welcome, on principle. In fact, however, what is missed is that the following articles extend the same form of treatment of different forms of cultivation. However, reference is merely made to three major points. The field cultivation of GMOs and the use of products obtained therefrom is linked to an exceedingly high number of bureaucratic requirements (cf. §16). Lopsided liability provisions are stipulated which are more far-reaching than before and can hardly be met, at least when looked at from the research aspect (cf. §32). The approval procedure involves numerous authorities, such as several authorities at state and federal levels, e.g., the consent of the Federal Office for Ecology (cf. §16, clause 4). The proven and

efficient approach practiced by the experts on the Central Committee for Biological Safety (ZKBS) is given up in favor of two new committees, one for genetic engineering tasks in genetic engineering plants, the other for release and marketing (cf. §5). This new division of duties presupposes that, in future, applicants will have to tailor their research projects to which of these bodies happens to be responsible. Typical of the second committee is that while every other of its members should be “a competent person”, no specialized genetic knowledge is required of them. Under this constellation, it can be expected that any future approval procedure will be subject to criteria unrelated to the field and it will become more difficult to obtain approval and only at a loss of time. All in all, the draft law is not an example of the facilitation expected by all involved.

The proposed new legislation will equally adversely effect German science and the transfer of know-how in the field of application – industry and agriculture. Necessary research in Green genetic engineering, that is forging ahead with immense intellectual and financial investment in all industrialized countries of the world, is obstructed or prevented. The opportunities held out by this research discipline, e.g., a reduction of the input of toxic substances in the ecosystem or an increase in the efficiency of agricultural production, are not only not actively taken up but wasted by blocking progress.

In consideration of its national and international reputation, the German Academy of Sciences Leopoldina, for centuries guided by its motto of exploring nature for the benefit of the human being, can only deplore such ordinances obstructing all research, knowledge and application. The version of the genetic engineering law proposed now does in no way live up to the “innovation” guidelines proclaimed by the federal government in January this year. It curtails the national opportunities of a technology with a high innovation potential that is already used by seven million farmers in about 20 countries.

To avert the obvious disadvantages accruing to Germany’s science, agriculture and industry, it is essential in the opinion of Leopoldina to integrate in the federal government’s draft law the opinion advanced by experts backed by scientific findings and modify the draft accordingly. What has been possible applying the rules of Red genetic engineering so successfully in the field of medicine should also be possible for Green genetic engineering that is not less important.

A Critical Look at German Energy Research and Energy Policy

Thesis paper as a result of the "Energy" Leopoldina Biennial Assembly in October 2003¹

Summary

The German Academy of Sciences Leopoldina, at its Biennial Assembly in Halle (Saale) from October 17 – 20, 2003, discussed questions of the long-term supply of energy in the Federal Republic of Germany. The results of the discussion can be summarized in the following requests addressed to politics:

- The successful energy saving measures in German households, industry and transport must be continued.
- At present, the Federal Republic of Germany is not sufficiently positioned in the supply market of oil and natural gas. As these resources will become increasingly scarce in future, long-term safeguarding measures are an urgent necessity.
- Renewable energies will only supply a marginal part of the future demand of electricity, heat and fuels. In addition to scientific and technological reasons, the expected rise in the prices of energy will define the limits of what industry can afford. The long-term safeguarding of our energy supply will only be possible if a meaningful energy mix of fossil fuels, nuclear energy and renewable energy is attempted. Initial steps towards this target must be undertaken.
- As a result of the policy pursued by the current federal German government, our know-how in the field of nuclear energy is getting lost. The catastrophe-free high-temperature reactors designed and developed in Germany are being improved abroad (e.g., in China) and will probably have to be imported in future. It is an urgent necessity to safeguard the current equivalent know-how.

Whenever energy as a topic is discussed in politics or in public, it is important to develop a framework within which researchers, politicians and the public at large can communicate efficiently to ensure a future for Germany in the energy market. In the past, discussions were all too often loaded with mutual misunderstanding and lack of confidence. This was one of the results of a case study in the Swiss decision-making processes during the nuclear energy debate presented at this

¹ This thesis paper was formulated after the Annual Meeting by the members of an ad hoc commission, headed by the presidium member Herbert Walther (Garching). The commission consisted of Klaus Heinloth (Bonn), Dieter Imboden (Zurich), Bruno Keller (Zurich), Klaus Pinkau (Garching), Siegfried Großmann (Lahntal-Goßfelden), Hermann-Josef Wagner (Bochum), and Dietrich Welte (Jülich).

year's Biennial Assembly. As energy is a very complex topic to discuss, it must be considered from all angles and as a part of this the ecological necessities of social and political long-term perspectives defined in the light of the scientific and technological facts. This is a learning process which involves all structures of society, including science.

I. Secure the long-term energy supply

Making reasonable use of the energy resources available to mankind will be a critical precondition of the future of our planet. This is a particularly urgent requirement for a country with very little indigenous energy resources, such as Germany. It is necessary to develop a strategy ensuring the availability of electricity, heat and fuels while taking into consideration the finite nature of the available resources and the threat of a supply monopoly, on the one hand, and the threat to the environment, on the other. The planning of energy supply requires a lead period of many years and therefore if the supply is to be safeguarded, the necessary decisions should have been made many years ago if bottleneck situations are to be avoided.

The "Energy" Biennial Assembly of Leopoldina in Halle (Saale) from October 17 – 20, 2003 focused on questions of long-term energy supply and the future role of renewable energies. Fundamental scientific and technological questions, economic aspects and what research should contribute were at the centre of discussion. The current situation in the Federal Republic of Germany was at the core of interest.

The results of the meeting and their consequences will now be discussed under the key headings of safe supply, availability and economics. The Academy is preparing a detailed publication of the results, which will be available as a book.²

II. Germany – one of the leaders in energy efficiency in the world

It should be noted that Germany is one of the countries with the highest energy efficiency in the world. Energy saving measures in households, industry and transport have contributed to achieving a high level of energy saving as a result of which the rise in primary energy was slower than expected. This result is – at least in part – also due to the fact that energy-intensive industries have moved to countries where energy is cheap or were closed down for cost reasons. Efforts to save energy should be continued as an important contributor also in future.

² HAUSEN, H. ZUR (Ed.): *Energie. Vorträge anlässlich der Jahresversammlung vom 17. bis 20. Oktober 2003 zu Halle (Saale)*. Nova Acta Leopoldina, N. F., Vol. 91, No. 339 (2004).

III. Fossil fuels

Fossil fuels will remain the primary energy source of electricity, heat and fuels also for the next decades. It is necessary to secure the supply of fossil fuels in Germany under long-term energy policy. Other large European countries have attained a better position in terms of their oil and natural gas supply than the Federal Republic of Germany has. The geographical nearness of Germany to the vast natural gas deposits in Russia is a very big advantage which should shift the balance of the consumption of fossil fuels towards the low-polluting natural gas.

The improved efficiency of power plants as a result of new materials is very important, as are improvements in the efficiency of combustion engines. Of particular significance in this context is the development of the fuel cell.

Methane hydrate on the sea floor may turn out to be a major energy reserve whose exploitation will not be without hazards to the climate, however. Therefore, research in this field is needed and should consider both aspects.

IV. Renewable energy

- (a) *Biomass and biofuels.* The current share of electricity, fuels and heat from renewable raw material sources remains under 10%. Plans pursued by the European Community studying the possibility of the long-term supply of energy put the limit at approximately 10% of the total energy need.
- (b) *Solar energy.* It is not possible to say at this time whether solar energy will be able to make a major contribution to the energy market in the Federal Republic of Germany. Solar energy is a source of choice for local supply niches at out-of-the-way sites, and solar collectors heat buildings and water. Solar energy can play an important role in future provided research and development in the field of solar energy use, for example, the development of a new generation of photocells, the study of photochemical processes such as catalytic fission of water and similar processes, come up with breakthrough results. At the same time, the question of how energy can efficiently be stored should be looked into because no large-scale use of solar energy is conceivable unless suitable storage facilities are available from which energy can be drawn during hours of low or no solar energy input.
- (c) *Water and wind.* Hydropower in Germany has more or less advanced to its limits. It is obvious that there are limitations to wind as an energy source because of the very strong fluctuations in the amount of wind, which rules out wind as a base load source. Wind is not available as constantly as would be needed. So

the maximum share wind can contribute to the electricity we need is probably limited to some 15 %. Energy from wind power systems is a viable alternative mainly at ecologically harmless sites near the sea. At the same time, however, precautions should be taken to ensure the availability of power at times of no wind and the energy distribution network must be reasonably widespread.

- (d) *Geothermal energy.* Geothermal energy is not a primary energy source in Germany and this energy can at best be used for room heating. The global share of geothermal power plants in the total production of energy is some 0.4 %, mainly from the exploitation of natural hot steam wells with sufficiently high steam temperatures of up to 200°C.

V. Energy production from nuclear fission and nuclear fusion

- (a) *Nuclear fission.* The basic supply of energy in the nearer future will not be ensured without nuclear energy. The supply of fossil fuels will become more difficult and renewable energies are no ready substitutes. For this reason, nuclear energy will be a necessity during a transition period. New technologies, e.g., the high-temperature reactor, are safer to use than the current reactor types. Research in these catastrophe-free reactors, whose principal origin was in Germany, has been neglected during recent years. This form of energy will be indispensable in future, including for providing energy in threshold countries. In view of the ecological matters involved and the limited resources of fossil and renewable energies, the related rise in the global demand for energy can only be satisfied by nuclear power plants. It is believed that the problems of reprocessing and final deposition of nuclear waste can be solved. It is necessary to reconsider the use of nuclear energy in Germany. Part of this consideration should be the increasing recourse of European countries to nuclear energy and the unbiased approach threshold countries are taking in this respect.
- (b) *Nuclear fusion.* Advancing the energy production by nuclear fusion to the level of technical maturity will be a long-term necessity. International efforts are underway in this field, currently under preparation is the large ITER Tokamak-experiment using a burning fusion plasma. Following this, other long-term development projects will have to be undertaken until fusion can be practiced at a large scale. It is urgently necessary that the Federal Republic of Germany, a country which made fundamental contributions to this field in the past, should participate in these research and development projects to a reasonable degree.

VI. Outlook

For the further discussion of energy as a political and public topic, it is important to define a context in which researchers, politicians and the public at large can communicate efficiently with each other to secure the future of Germany in the energy market. In the past, discussions were all too often loaded with mutual misunderstanding and a lack of confidence. This was also a result of a case study of the Swiss decision-making processes during the nuclear energy debate presented at this year's Annual Assembly. As energy is a very complex topic to discuss, it must be considered from all angles and as a part of this the ecological necessities of social and political long-term perspectives defined in the light of the scientific and technological facts. This is a learning process which involves all structures of society, including science.

Halle (Saale), December 2003

Weitere Informationen / Further Information

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