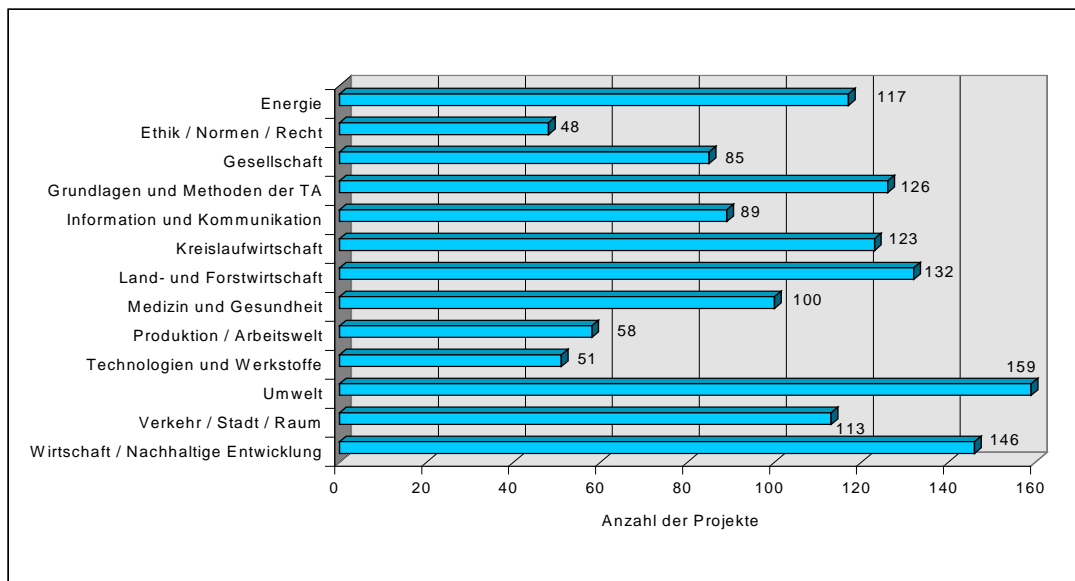


Abb. 4: Verteilung der Projekte auf die Themenfelder



- Land- und Forstwirtschaft
- Grundlagen und Methoden der TA
- Kreislaufwirtschaft
- Energie
- Verkehr / Stadt / Raum
- Medizin und Gesundheit (Abb. 4).

Auf Anfrage der TA-Akademie wurde die Umfrage von einer Reihe von Institutionen und Einrichtungen wiederum dazu genutzt, um auf Gebiete und Themenfelder hinzuweisen, in denen ihrer Meinung nach noch Forschungsdefizite bestehen. Die hierzu bei der TA-Akademie eingegangenen zahlreichen Hinweise, Anregungen und Vorschläge zu möglichem Forschungs- bzw. Handlungsbedarf werden ausgewertet und in ausgewählten Schwerpunktrichtungen thematisiert. Über die Ergebnisse wird an anderer Stelle gesondert berichtet.

Die Dokumentation 2000 (incl. CD-ROM) kann gegen eine Schutzgebühr von DM 30,- bei der TA-Akademie unter der ISBN-Nr. 3-934629-03-2 bestellt werden (Fax: + 49 (0) 711/9063-299).

Kontakt

Dr.-Ing. Manfred Rohr
 Akademie für Technikfolgenabschätzung
 in Baden-Württemberg
 Industriestraße 5, D-70565 Stuttgart-Vaihingen
 Tel.: + 49 (0) 711 / 9063 - 103
 E-Mail: manfred.rohr@ta-akademie.de

The Centre for Energy Policy and Economics – A new TA-Institution in Switzerland

by Eberhard Jochem, Centre for Energy Policy and Economics

The Centre for Energy Politics and Economics (CEPE) is a newly established research centre in Zürich. Its goal is to extend the scientific and technical research work of the Swiss Federal Institutes of Technology in Zurich and Lausanne and the Paul Scherrer Institute (PSI) to include the interface between technology, economy and society. By its analyses of energy economics and policy issues, CEPE also strives to improve the decision-making processes in business and government.

Mission

The Centre for Energy Policy and Economics (CEPE) was established in 1999 in order to extend the scientific and technical research areas of the Swiss Federal Institutes of Technology in Zurich and Lausanne and the Paul Scherrer Institute (PSI) to include the interface between technology, economy and society. Through its national and international interdisciplinary research and advisory activities, CEPE seeks to point out in a timely manner

opportunities, risks, obstacles and impacts related to developments in energy technology and industry, and support necessary transformations. It also tries to contribute to energy innovations in business and technology. CEPE also seeks to improve the bases for decision-making by business and government with analysis of energy economics and policy issues, the drafting of energy policy options and scientific impact analysis of energy policy programs. In addition, CEPE educates students at the Swiss Federal Institutes of Technology in Zurich and Lausanne by providing a curriculum of lectures and seminars as well as colloquia on energy policy and economics.

Organization

CEPE is led by Professors Massimo Filippini, Eberhard Jochem and Daniel Spreng, representing different disciplines by education (economics, engineering, sociology, physics) and a wide range of experience in technology and policy assessment and education. Their interdisciplinary research team of some 15 senior and young scientists is organized in three research groups:

- Energy economics (led by Prof. Filippini)
- Energy and sustainability (led by Prof. Spreng)
- Energy policy and rational energy use (led by Prof. Jochem).

Research Areas

As an interdisciplinary research centre CEPE currently works in the following five areas which, of course, are evolving with increasing staff:

Regulation and Deregulation

The electricity and gas markets in industrialized and emerging economies are undergoing fast changes due to liberalization and privatization. Major themes are: cost of electricity transmission and distribution, regulation of electric power generation, utility sector mergers, power plant investment policy under uncertainty, impacts of short term and long term electricity and gas grids on the development of

energy efficiency, co-generation and renewables.

Hydro-electric Power

Its development in deregulated electricity markets is of major importance given the highly capital-intensive type of technology. Themes are competitiveness, license renewals, political obligations under the Kyoto treaty, competition for use of rivers, external costs and benefits of hydro-electric power, determination of rates and policy measures to reflect net social benefits of hydro power.

Rational Use of Energy

The Council of the Swiss Federal Institutes of technology has formulated a vision of a 2kW per capita industrial society. This means that the annual per capita energy consumption is aimed to be reduced by two thirds of today. Research themes are techno-economic potentials, existing market imperfections and obstacles, but also motivations and traditions, resulting policy measures and business strategies for energy service companies and technology producers, analysis of the impacts of these measures on emissions, employment, regional economic growth and trade.

Sustainable Development

Energy-related research for sustainability reflects the broader context of the energy system. Research themes are energy demand (as a measure of sustainability) as a function of changes in energy services, economic structure, and behaviour patterns; changes in the mix of energy carriers; careful use of energy as a partial goal of social and economic policy.

Energy Perspectives

Projections of energy demand and supply for the mid- and long-term benefit from the research areas mentioned before integrating their research results and experiences and serving as the bracket for the other research fields at CEPE. The results of the impact analyses of the preceding areas are also used to design and assess alternative scenarios of energy demand.

Energy Economics

The deregulation of electricity and gas markets in Switzerland and in the rest of Europe is causing profound structural changes. In this context several questions remain open. First of all it is not yet clear how grid-based energy carriers can be optimally deregulated, to what extent regulation is necessary in an open market, and how free and open access to the network can be implemented for third parties. Second, power producers face major challenges. Distributors are confronted with rapid structural change, while generators must contend with high uncertainties when making investment decisions. Third, it is unclear to what degree electricity and gas prices may drop under competition and how strongly energy demand may react. Fourth, it is unclear to what extent deregulation of the electricity and gas sectors will negatively impact ecological targets (e.g. reduction of greenhouse gas emissions and the prospects for renewable energy), nor is it obvious what measures could be taken to prevent this. The energy economics research group works on these open questions with the help of micro-economic and econometric instruments.

The main topics currently being worked on include the following:

- Analysis of and suggestions for the deregulation of Swiss electricity markets,
- Optimal regulation of access to transmission and distribution networks,
- Competitiveness of hydro-electric power plants under the conflicting demands of deregulation, non-appropriated stream water, and water rates,
- Investment policy of generators under uncertainty, and
- Electricity demand of private households.

Energy and Sustainability

The utilization of hydro-electric power and other sources of renewable energy is an essential element of sustainable development both in Switzerland and abroad. The opening of electricity markets, consistently relatively low prices for fossil fuels, and new developments in power plant technology (e.g. advanced combined cycle gas-fired power plants) lead to the

conclusion that large capital investments in power plants with needs for renovation or construction pose significant long-term financial risks. In collaboration with the energy economics research group, the energy and sustainability research group researches solution strategies for long-term problems of hydro-electric power plants, including the following:

- Markets for so-called green electricity,
- Possibilities to make green capital investments available to hydro-electric power plants, and
- Contributions towards new conceptions of licensing.

A longer-term research focus is the further development of the theory of indicator construction. At the moment the group is investigating the following:

- The meaning of sustainability indicators for researchers in their personal day-to-day research,
- The description of development in India through indicators of direct and indirect household energy consumption,
- Supportive models for "sustainable consumption" and research into the most meaningful variants of household energy consumption indicators for interested laypersons in industrialized countries.

Energy Policy and Rational Energy Use

Solutions to today's energy and environmental policy conflicts can be found through adequate regulation and through accelerated diffusion of energy-efficient technologies. CEPE views a model industrial society as one that makes careful use of its resources. A reorientation of research and technology policy not just towards technological innovations but also towards cost reductions for energy-efficient technologies and the utilization of renewable energy sources is regarded as a central strategy for solving an increasing number of energy policy conflicts. Efficient energy use improves not only the competitive position of an energy-intensive economy but also increases the export prospects of technology producers and energy service companies. Finally, efficient energy use

significantly supports the creation of new jobs through the substitution of imported energy carriers by domestically produced goods and services of the rational energy use sector.

The research group is currently active in the following work areas:

- Efficiency potentials in the industrial and service sectors,
- Estimates of energy demand under various scenarios in the industrial and service sectors,
- Empirical research into market barriers, deficits and related policy strategies, and
- Conception, scientific assistance and impact analysis as well as evaluation of energy-policy measures.

First results and Co-operation

CEPE began its research work in summer 1999 with Swiss and international customer-oriented research and consulting. First smaller projects have been finished on voluntary agreements of industry, energy efficiency potentials in the service sector and future energy demand.

CEPE is a centre for co-operative research. Joint efforts and continuous contact are planned in co-operation with the institutes of the Swiss Federal Institutes of Technology in both Zurich and Lausanne, the Paul Scherrer Institut (PSI), the University of the Italian-speaking part of Switzerland (USI) in Lugano, the Fraunhofer Institute for Systems and Innovation Research (ISI) in Karlsruhe and, on a project-by-project basis, other domestic and foreign collaborators.

This close co-operation is ensured by the joint professorship of Massimo Filippini at the Swiss Federal Institute of Technology Zurich and in the economics faculty at USI in Lugano. Eberhard Jochem is also concurrently active as a senior executive at ISI in Karlsruhe. CEPE has become associate member of the European Network of Energy Research (ENER) in spring 2000 and will take up the secretariat of the Swiss Association of Energy Economists by January 2001.

Contact

Prof. Dr. Eberhard Jochem
Centre of Energy Policy and Economics (CEPE)
ETH Zentrum, WEC
CH-8092 Zürich
Tel.: + 41 1 632 06 48; Fax: + 41 1 632 1050
E-Mail: jochem@cepe.mavt.ethz.ch
or at

Fraunhofer Institut für Systemtechnik und Innovationsforschung
Breslauer Straße 48, D-76139 Karlsruhe
Tel.: + 49 (0) 721 / 6809-169
Fax: + 49 (0) 721 / 6809-280
E-Mail: ejo@isi.fhg.de

« »