Managing Energy Consumption

National Research Programme NRP 71

Call for projects

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What are National Research Programmes (NRPs)?

The research carried out by National Research Programmes consists of targeted research that contributes to the solution of contemporary problems of national importance. Under the provisions of Article 6, paragraph 2, of the Federal Act on the Promotion of Research and Innovation of 7 October 1983 (as of 1 January 2013) the Federal Council selects the topics and foci to be researched in NRPs and mandates full responsibility for implementing the programmes to the Swiss National Science Foundation (SNSF, Division IV).

Article 4 of the Federal Ordinance on Research and Innovation Promotion of 10 June 1985 (as of 1 January 2013) describes the purposes and contents of NRPs as follows:

"[1] National Research Programmes are a means to direct and support coordinated research projects that have a common goal. Where needed, National Research Programmes should strengthen scientific research capacities.

[2] Topics of research are generally appropriate for National Research Programmes if:

a. scientific research on the problem is of national importance;

b. Swiss research can make a significant contribution to the resolution of the problem;

c. solutions require research contributions from multiple disciplines;

d. the research goals cannot be met exclusively through basic research, through research within a specific section of the administration, or through industrial applications research;

e. research on the problem can be expected to produce research results that have practical applications within a five-year time period.

[3] The following criteria should be taken into consideration in setting forth the topics of National Research Programmes:

a. the programmes can provide the scientific basis for decision-making by government and the administration;

b. the programmes can be conducted with international collaboration and are also of great interest to Switzerland."

Summary

The simultaneous implementation of the Federal Council's "Energy Strategy 2050" and the next stage in Swiss climate policy represent a major challenge for the energy sector, as well as for politicians, the economy and consumers. In view of this, in May 2011 the Federal Council took the fundamental decision to limit the NRP (National Research Programme) call for proposals from the State Secretariat for Education and Research (SER)[1] that was planned for 2011 to energy research, and thus specifically to new NRPs focusing on the energy issue. Against this backdrop, on 4 July 2012 the Federal Council approved the National Research Programme "Energy Turnaround" (NRP 70) with a budget of CHF 37 million, and the National Research Programme "Managing Energy Consumption" (NRP 71) with a budget of CHF 8 million, and entrusted the Swiss National Science Foundation (SNSF) with their implementation.

NRP 70 primarily focuses on scientific and technological aspects of the change in energy strategy and on the preparation and introduction of the various stages of implementation of the new energy system at the social, political and economic levels in Switzerland. The focus of NRP 71 is on examining the options for realising the efficiency and sufficiency potentials in the consumption of energy by private, commercial and public-sector end users through steering measures. These two research programmes are closely related and are therefore to be carried out in the period from 2014 to 2018 alongside one another and in a closely coordinated manner.

In Switzerland, research in these two areas is broad-based and internationally competitive, but a variety of important aspects have nonetheless not yet been dealt with to date. With NRP 70 and 71 the aim is to concentrate the existing research potential and generate know-how which will provide politicians and the economy with support for the implementation of "Energy Strategy 2050" and the attainment of other energy and climate policy objectives. Special importance is to be attached to the integration and consolidation of the findings, and thus to fostering their transfer at the political and economic levels.

This call for proposals refers solely to NRP 71 "Managing Energy Consumption". A separate call has been prepared for NRP 70 "Energy Turnaround".

An information event for interested researchers will be held at the premises of the SNSF on 21 August 2013.

[1] With effect from 1 January 2013, State Secretariat for Education, Research and Innovation (SERI).

1. Introduction

In May 2011 the Federal Council took the fundamental decision to limit the NRP call for proposals from the State Secretariat for Education and Research that was planned for 2011 to energy research, and thus specifically to the NRP focusing on the energy issue. The aim is to compile the scientific fundamentals needed by players in the areas of politics, the economy and the administration who are responsible for taking decisions relating to the resolution of the Federal Council concerning "Energy Strategy 2050", within the scope of which Switzerland's energy supply is to be substantially restructured and its electricity supply secured over the long term without the use of nuclear energy.

In order to secure a reliable, environmentally compatible and economical energy supply in Switzerland, the Federal Council resolved to restructure the country's energy system on a step-by-step basis. The necessary measures were specified in the new "Energy Strategy 2050". In the first stage, the goal is to reduce end energy consumption, promote the use of renewable energy and cut CO_2 emissions. Then, in the second stage, the CO_2 fee and the network surcharge for financing remuneration of feed-in at cost are to be combined into a single energy levy. This represents a shift in strategy from the existing promotion concept to a steering system. The intention is for the transition to take place seamlessly and within an acceptable timeframe.

In order to be able to meet the future demand for energy, in particular for electricity, the most important requirement is to reduce consumption. The Federal Council is therefore focusing on promoting energy efficiency right across the board, i.e. in buildings, electrical appliances, trade and industry, the services sector and mobility. In order to accomplish this, it intends to introduce suitable measures, including additional funding for the buildings programme and more stringent energy efficiency requirements. It also expects the public sector to set a good example in this regard.

In order to offset the loss in electricity production from nuclear energy, the Federal Council aims to secure the country's electricity supply by greatly increasing the use of renewable energy while maintaining an acceptable balance between the conservation and use of resources. To ensure that the utilisable potential of renewable energy sources can be exploited, in the initial stage the intention is to increase the level of financial support. Here the focus is on optimising and expanding the existing model for feed-in remuneration at cost. The remaining energy demand is to be met through the use of fossil-fuelled thermal power plants and/or electricity imports.

Against this backdrop, on 4 July 2012 the Federal Council adopted NRP 70 (Energy Turnaround) and NRP 71 (Managing Energy Consumption) and entrusted the SNSF with the mandate of implementing them. For the planned five-year research period, the budgets for NRP 70 and NRP 71 are CHF 37 million and 8 million respectively. The National Research Council elected a Steering Committee for each programme and instructed them to prepare and coordinate the two calls for proposals based on the respective programme outlines (SNSF, April 2012) and feasibility studies (SNSF, April 2012). The two Steering Committees commenced work on 14 March 2013, and the respective calls for proposals were approved on 1 July 2013 by the head of the Federal Department of Economic Affairs, Education and Research (EAER).

The main objective of both research programmes is to propose potential solutions that can be implemented in Switzerland in the coming 10 to 30 years. For the development of the planned research programmes, the SNSF was able to make use of background material provided by the State Secretariat for Education and Research (SER) and the

Swiss Federal Office of Energy (SFOE), including in particular the two reference reports, "Status and Perspectives of Energy Research" (29 April and 12 May 2011) and the "Coordinated Swiss Energy Research Action Plan" (24 April 2012).[2]

1.1 Background

The annual level of greenhouse gas emissions attributable to Swiss consumption, including "grey" emissions (i.e. those resulting from the production of goods outside the country's borders) is approximately 12.5 tonnes per capita, of which 7.2 tonnes are emitted within Switzerland and the remainder occur in the form of grey emissions from the manufacture of products and the processing of energy carriers abroad. In 2010, the direct end energy requirement amounted to 911,550 TJ, comprising 215,230 TJ of electricity (56.5% hydropower, 38% nuclear power), 616,190 TJ of fossil fuels, and 38,090 TJ of wood energy. The share of renewable forms of energy (excluding hydropower) was only 14,750 TJ (or 2.4%).

The challenge for the change in energy strategy consists of two related tasks, namely the withdrawal from nuclear energy as a means of electricity production and the reduction of climate-relevant emissions, both of which have to be accomplished with the aid of sufficiently safe, environmentally compatible and economical technologies for maintaining a high quality of life. For this purpose, the technologies for securing significantly greater efficiency and the use or optimisation of resources that have not been (or have barely been) utilised to date, need to be promoted, on both the supply and demand side. In addition, the potential associated with consciously refraining from energy-intensive behaviour (sufficiency potential) has to be assessed and studies need to be carried out to determine how this potential can be realised. How these tasks are handled is influenced by developments in the areas of energy technology and energy policy in neighbouring countries and at the global level as well as by new climatology findings.

All energy technologies are subject to the laws of nature, which for example determine the maximum degree of conversion from one form of energy into another. The increase in energy consumption that has been ongoing for many years is a social phenomenon that can only be partially attributed to economic factors. It has to be assumed that the relative proportion of electricity to overall end energy consumption will continue to increase.

It is clear that the change in energy strategy concerns not only the substitution of electricity produced from nuclear energy (base-load energy) by electricity generated with the aid of other technologies, but also, in an optimised future energy mix, the use of fossil and synthetic fuels, heat (including geothermal energy), sunlight and mechanical energy. Renewable energy based on solar radiation and wind is unable to meet demand everywhere and at all times, and this means that storage and transport, as well as connecting networks, are of particularly high importance. These primarily scientific and technological aspects form the main emphasis of NRP 70.

However, it will not be possible to bring about the change in energy strategy solely through the development of new technologies. The creation of an effective incentive system for encouraging a change in the behaviour of all participants in the energy market, and establishing the necessary social and political consensus and securing its

[2] BBl 2012 9017; BBl 2013 2611-2616; BBl 2013 2481

successful implementation at the federal, cantonal and municipal levels, represent major challenges. This socioeconomic and regulatory side of the process relating to the change in energy strategy is dealt with in NRP 71.

There are numerous relevant interdependencies between NRP 70 and NRP 71. In view of this, close cooperation and coordination between the two programmes is desirable in terms of both development and implementation, even though the programmes themselves are organisationally separate from one another, are the subject of separate calls for proposals and have their own Steering Committees.

1.2 National and international research environment

As in every industrialised nation, energy research is an important pillar of energy policy in Switzerland. The public sector spends between CHF 160 and CHF 200 million a year on energy research. The main objectives are to ensure a secure and sustainable energy supply, promote Switzerland as a centre of technological research and development, and maintain the high quality of Swiss research. A great deal of value is attached to international cooperation and the efficient transfer of research findings into practical application.

Energy research is explicitly defined as one of the strategic cornerstones of the federal government's "Energy Strategy 2050". In the period from 2013 to 2016, the Federal Council therefore intends to promote research and innovation in the energy sector through additional funding in order to support the implementation of the new energy policy. Additional funding of CHF 202 million for the cited period was approved by Parliament during its 2013 spring session following its debate on the special dispatch concerning the action plan "Coordinated Swiss Energy Research". Support will focus mainly on applied research in areas with particularly high potential for the new energy strategy. An important aspect is also the development of the required expertise with research experience. The proposal has been put forward to create up to seven Swiss Competence Centres for Energy Research (SCCER) in selected thematically oriented areas of research, as well as thirty new research groups at universities and forty SNSF professorships.

Publicly funded energy research is carried out in line with the federal government energy research concept, which is updated every four years by the Swiss Federal Energy Research Commission (CORE). In its concept for the period from 2013 to 2016, CORE has defined four thematic priorities: "Life and work in the future", "Mobility in the future", "Energy systems of the future" and "Processes for the future". Closely linked to this concept are the research programmes of the SFOE (mainly in the areas of energy-economy-society), the pilot and demonstration projects of the SFOE, the newly launched SCCERs as well as the research programme of the Federal Roads Office.

A substantial proportion of the funding for energy research throughout the world is spent on research and development in the area of renewable energy, efficient energy use and energy efficiency. In Germany, for example, within the framework of its 6th Energy Research Programme, the government budgeted just over a billion euros for research and development in the area of renewable energy and almost a billion in the area of efficient energy use and energy efficiency for the period from 2012 to 2014. To take Japan as a further example, the Ministry for Economy, Trade and Industry (METI) budgeted the equivalent of CHF 960 million for 2013 for the promotion of research and development in the field of renewable energy. This amount corresponds to around 10% of the Ministry's overall budget. The largest amounts are intended for research on

wind energy (CHF 398 million), geothermal energy (CHF 193 million) and solar energy (CHF 72 million). A significant amount is also reserved for research in the area of electricity grids, since the timely further development of this infrastructure is essential for the reorientation of the energy system with an increase in the use of renewable energy.

The national research environment

In Switzerland, highly qualified social science research on energy-relevant issues is well established, and numerous issues relating to energy consumption are already being examined, as the following examples demonstrate:

_ One area of research focuses on economic factors and encompasses studies on the impacts of tariff changes and pricing information on energy demand. This research examines the effects of real-time tariffs and smart metering, as well as rebound effects and their significance for the development of energy use, for example. The redistributive effects of tariff changes (e.g. as a result of steering fees) are also an integral part of this area of research.

_ A second area of research focuses on (socio)-psychological aspects and examines factors influencing the construction of energy-efficient housing and the mobility sector. In addition, a variety of psychological and/or social science studies are being carried out regarding non-tariff-related determinants of energy consumption, including those of a cognitive nature and value-based determinants.

_ A third area of research addresses subjects related to the diffusion and adoption of innovations in the energy sector, such as political and market-related measures for promoting electric bikes and electric scooters, public acceptance, transaction costs and innovation dynamics of electric vehicles, and socio-psychological factors in the acceptance of renewable forms of energy. Here, studies are also being conducted on the investment behaviour and choice of technology of companies, as well as lock-in effects.

_ Another area of research focuses on political science aspects and examines framework conditions of energy use and political steering instruments, for example. Here, studies are conducted on the effects of climate policy measures, the influence of subsidies, taxes and regulations on energy demand, and liberalisation of the electricity market. This area of research also closely examines issues relating to the implementation and impacts of state measures and institutional steering mechanisms and focuses on issues such as policy learning and policy diffusion. A further focus of this area is new political steering instruments such as voluntary agreements, independent regulatory agencies, etc., and new enforcement models in a federally structured state.

_ Other social science energy research projects are examining the impacts of increased integration of Switzerland in the European context with respect to climate and energy policy and the interactions between spatial and social issues and energy policy.

The areas of research cited above do not cover the entire range of ongoing social-scientific energy research in Switzerland, but are important research priorities for NRP 71.

International projects have been an integral part of energy research in Switzerland for many years. Special importance is attached to cooperation within the framework of EU and International Energy Agency (IEA) research programmes.

The EU supports research and development through its long-term framework research programmes, the main objectives of which are to strengthen the scientific and technological fundamentals of the industry, promote the development of their international competitiveness and expand the European Research Area (ERA).

The 7th Framework Research Programme was initiated in 2007 for the period up to 2013 with a budget of 53.2 billion euros. Non-nuclear energy research is one of ten priorities and is being supported with a budget of 2.35 billion euros. The goal here is to transform the present-day European energy sector into a more sustainable industry with a broad mix of energy sources.

Switzerland was a founding member of the International Energy Agency (IEA). In the 27 IEA member states, the public sector invests a total of several billion US dollars annually in research and development in the areas of renewable energy, efficient energy use and energy efficiency with the aim of supporting the development of innovative technologies.

For its members, the IEA functions as an extensive forum for coordinating major energy issues, but also as a platform for international research cooperation in the form of "implementing agreements". The main areas of focus are renewable energy, fossil fuels, energy efficiency and nuclear fusion. Switzerland is currently actively involved in more than 20 implementing agreements. All projects relating to energy research are coordinated by the Committee on Energy Research and Technology (CERT), in which Switzerland is represented by the SFOE.

2. Goals

In its "Energy Strategy 2050" the Federal Council assumes that Switzerland's population will increase to over 9 million by 2050. It expects the number of gainfully employed to remain more or less constant in the period from 2010 to 2050, and anticipates an average annual economic growth rate for the same period of around 1.1%. According to the "Political Measures" scenario,[3] the growth rate for the mean absolute end energy demand is expected to fall from +0.7% per annum (1995 to 2010) to around –1.0% per annum (2010 to 2050), while the growth rate of the mean absolute electricity demand is expected to fall from +1.5% per annum (1995 to 2010) to around zero up to 2020, followed by a period of slightly negative growth up to 2035 and subsequently by a slight increase up to 2050. Expressed in terms of energy requirement per unit of GDP, end energy demand is expected to fall from the current –1.2% per annum (2000 to 2010) to between –1.9% per annum (in the "Political Measures" scenario) and –2.3% per annum (in the "New Energy Policy" scenario),[3] while electricity demand per GDP unit is expected to fall from the current –0.2% per annum (2000 to 2010) to between –0.7% ("Political Measures" scenario) and –1.7% per annum ("New Energy Policy" scenario).

[3] Die Energieperspektiven für die Schweiz bis 2050, Energienachfrage und Elektrizitätsangebot in der Schweiz 2000 – 2050 (Energy Perspectives for Switzerland up to 2050: Energy demand and electricity supply in Switzerland in the period from 2000 to 2050). Prognos AG, Basel, 12 September 2012.

In the area of production of electricity from new renewable energy sources, the Federal Council anticipates an increase to around 24 TWh per annum (from the present-day level of < 1 TWh) thanks primarily to an increase in the use of photovoltaics (to approx. 11 TWh), wind energy (to approx. 4 TWh) and geothermal energy (to approx. 4 TWh).

Both NRP 70 and NRP 71 are geared to the targets of the "Energy Strategy 2050" of the Federal Council. In doing so, they focus not solely on saving energy as such but on reducing substantially the consumption of non-renewable energy sources and energy sources with detrimental impacts on the climate, the environment and human beings. Both NRPs operate on the basis of a matrix which shows that for the implementation of the Federal Council's "Energy Strategy 2050" and the attainment of other energy and climate policy objectives there are gaps in knowledge on the supply side and in the area of demand for (renewable) energies, as well as at the interface between supply and demand (market conditions, pricing, structuring of framework conditions through the political and social process, etc.), and that on both the supply and demand sides, scientific, technological and socioeconomic issues will arise.

	Technological aspects	**Socioeconomic aspects**
Supply side	NRP 70	NRP 70
Demand side	NRP 70	NRP 71

Figure 1: Matrix illustrating coverage of essential thematic requirements

The matrix reflects the fact that society and technology are closely interrelated. For this reason, isolated technological solutions can either not be applied at all or not until a later stage unless the relevant scientific aspects of the social, economic and political environment are integrated into the development and application of the technology concerned. On the other hand, the challenges associated with "Energy Strategy 2050" will not be met solely with the aid of new business models or legal reforms.

The two programmes that are to run side by side will be implemented in a closely coordinated form and will jointly focus on the complex issues associated with the targeted change in energy strategy. The following areas of activity are expressly excluded from the scientific focus and priorities of NRP 70 and NRP 71:

_ Research aimed at incrementally enhancing the status of knowledge

_ Nuclear research (covered by existing sources of support)

_ Pilot and demonstration facilities (supported by the SFOE)

_ Basic research (supported by Divisions I to III of the SNSF)

2.1 Goals of NRP 71

The National Research Programme "Managing Energy Consumption" (NRP 71) focuses on the social, economic and political aspects of the change in energy strategy and, in particular, on the fourth quadrant of the matrix depicted above illustrating the coverage of essential thematic requirements.

The main focus of NRP 71 is on social, economic and political issues which largely concern energy demand. Attention is also to be paid to comprehensive issues that concern the interaction between supply and demand. The programme is primarily intended to examine how energy efficiency and sufficiency potentials can be realised in private households, companies, public facilities and institutions through steering measures or corresponding framework conditions. It is also intended to examine how energy suppliers can be encouraged through suitable measures, including official regulations, to develop business models that incorporate incentives to use energy economically (demand-side management). On top of this, economic, legal, political, psychological and social framework conditions and trends are to be identified that foster (or hamper) efficiency improvements or the realisation of sufficiency potentials. This includes impact analyses of federal funding and steering measures. Special attention is also to be paid to interdisciplinary approaches and the integration and involvement of various social groups (including minorities). The intention is for research into practical intervention to be supported in a special module in cooperation with power suppliers and/or municipalities.

2.2 Goals of NRP 70

The main goal of the National Research Programme "Energy Turnaround" (NRP 70) is to implement specific research and development projects with the aim of developing technologically innovative as well as institutionally and socially attractive concepts and solutions for securing a sustainable energy policy in Switzerland.

The resulting solutions have to meet energy supply and demand requirements that secure a high quality of life, while also increasing the innovation potential for energy-related products and services. These have to be developed through close cooperation in a variety of areas in coordinated projects that focus on integrated, system-oriented value chains. This involves both high-risk cutting-edge research at universities (high-risk/high-reward research projects), as well as innovative research and development projects aimed at radically improving existing technologies in cooperation with private companies and public authorities.

NRP 70 is also intended to contribute towards sensitising the general public and politicians to the energy issue and helping break down barriers and potential opposition to sustainable energy technologies. The results, which in part are to be obtained through international cooperation, are also intended to serve as a contribution by Switzerland towards the resolution of European and global energy issues.

The coordinated participation of various researchers and industry partners in a value chain is intended to lead to the creation of new business models which reduce the entrepreneurial risk for each partner. This integral approach will result in higher value-added for Switzerland, since the integration of individual research projects into specific value chains will make it possible to more fully take the general conditions and features particular to Switzerland (geographic, political, sociological and economic) into account.

3. Organisation and structure of NRP 71

Social, economic and political issues and factors are associated with the implementation of the Federal Council's "Energy Strategy 2050" and other energy and climate policy objectives involving similar challenges. In view of this and the need to test the findings of social science studies in cooperation with suppliers or municipalities, NRP 71 is organised in four modules: "Society", "Economy", "Politics" and "Hand-in-hand research on practical interventions". In order to facilitate harmonisation with NRP 70 and clearly emphasise the respective social and economic dimensions, the projects are also allocated to one or more of the following market segments or fields of action: "Buildings", "Industry", "Services", "Electricity supply" and "Mobility". Figure 2 depicts the modular structure of NRP 71:

Society	**Economy**	**Politics**	**Hand-in-hand research on practical interventions**
□ Buildings	□ Buildings	□ Buildings	□ Buildings
□ Industry	□ Industry	□ Industry	□ Industry
□ Services	□ Services	□ Services	□ Services
□ Electricity supply	□ Electricity supply	□ Electricity supply	□ Electricity supply
□ Mobility	□ Mobility	□ Mobility	□ Mobility

Figure 2: Modular structure of NRP 71

Each module incorporates disciplinary and interdisciplinary research in the fields of legal, economic, social and educational science and psychology. Projects are required that facilitate a better understanding of the relationships between the various subsystems. Research is also required which addresses direct and indirect steering and development possibilities (e.g. studies on how the factors determining energy use can be utilised for steering purposes or on incentives to encourage the search for innovative solutions in the energy sector). In all the modules it is important to address those energy sources that have a high potential for efficiency and sufficiency gains and about which significant gaps in knowledge still exist.

4. Main research topics

NRP 71 (Managing Energy Consumption) focuses on social, economic and political aspects of the change in energy strategy on the demand side, whereas NRP 70 (Energy Turnaround) focuses on the technological potentials for realising "Energy Strategy 2050" on both the demand and the supply sides. Since NRP 70 is the subject of a separate call for proposals, this chapter only deals with the research priorities defined for NRP 71.

It has often been demonstrated that it is possible to achieve considerable efficiency gains in energy use in private households and in the commercial and public sectors with the aid of existing know-how, but it is unclear what state and private measures can be applied to this and under which framework conditions and with which social consequences. The question of where potentials exist for consciously refraining from engaging in particularly energy-intensive forms of behaviour (sufficiency potentials), and how these can be exploited, also remains to be examined. This is where NRP 71 comes in.

The main focus of NRP 71 is on social, economic and political issues that largely concern energy demand. The programme is primarily intended to examine how energy efficiency and sufficiency potentials can be realised in private households, social groups, companies, public facilities and institutions through steering measures or corresponding framework conditions. It is also intended to examine how energy suppliers can be encouraged through suitable measures, including official regulations, to develop business models that incorporate incentives to use energy economically (= demand-side management). On top of this, economic, legal, political, psychological and social framework conditions and trends are to be identified that foster (or hamper) efficiency improvements or the realisation of sufficiency potentials. This includes impact analyses of federal funding and steering measures. Special attention is also to be paid to interdisciplinary approaches and the integration and involvement of various social groups (including minorities). The intention is for hand-in-hand research on practical interventions in cooperation with suppliers and/or municipalities to be supported in a special module.

Against this backdrop of challenges for Swiss energy policy, the goal of NRP 71 is to generate know-how which supports municipalities, the cantons, the federal government and energy suppliers in their efforts to more effectively promote the utilisation of efficiency and sufficiency potentials through targeted measures and strategies. NRP 71 therefore focuses directly on the provision of practicable scientific fundamentals for the forthcoming debate on realising the change in energy strategy.

As noted above, NRP 71 comprises four modules: "Society", "Economy", "Politics" and "Hand-in-hand research on practical interventions". In all four modules, projects may address the defined fields of action ("Buildings", "Industry", "Services", "Electricity supply" and "Mobility").

4.1 Module 1: "Society"

Module 1 concerns social issues relating to energy demand in general and the determinants of energy use in private households in particular. Here, individual decisions in various roles can be examined and consideration given to different social groups. The module encompasses energy services such as heating, cooling and lighting, as well as mobility and the provision of information. The main focus is on the analysis of individual and collective behaviour, taking account of changing social, economic and political framework conditions. In essence it concerns the identification and analysis of factors that promote (or hamper) social change towards a more sustainable lifestyle.

Impacts of social trends on energy demand in households

One area of study focuses on general social issues relating to the demand for energy services. The main questions here concern the impacts of demographic, socioeconomic and cultural trends in the area of energy use. One of the obstacles to promoting efficiency is the rebound effect, which occurs when increased energy efficiency gives rise to an increase in demand for energy services, i.e. when savings in energy consumption are compensated (or overcompensated) by consumption for new purposes. Empirical analysis of consumer behaviour is therefore a key topic in NRP 71. Other questions concern the extent to which social trends (e.g. changing lifestyles, changing social expectations, changing social symbols) influence the demand for energy services and how social learning processes can foster desirable trends (= capacity to adapt). Here, the clarification of issues relating to the communication of these learning processes, including the development of approaches to education and communication in the evolution of a new energy culture, is also important. Possible social barriers and forms of resistance which can undermine the realisation of efficiency and sufficiency potentials need to identified, as do any measures that could overcome foreseeable barriers and resistance. With a view to attaining social acceptance of steering instruments, there is a need to examine the potentials of social consensus-building processes (new social contract) as well as resistance to technologies or locations which often hampers the spread of renewable energies too.

Determinants and options for influencing energy consumption in private households

A second area of study concerns energy use in private households. Here the main focus is on analysing individual and collective behaviour in households while taking account of the changing social, economic and political conditions. The objectives of research in this area are to find out which factors influence the demand for energy services in households (lighting, heating, refrigeration, etc.) in the short, medium and long term, and which of these influencing factors can be utilised for steering purposes. How do changed conditions influence consumer decisions? From these studies, conclusions have to be drawn regarding the potentials that can be exploited, as well as obstacles to adapting energy-efficient technologies and forms of behaviour that need to be overcome in line with the new energy policy. Here it is also necessary to examine the role and influencing potentials of value systems and lifestyles that encourage excessive energy consumption (for example, the socio-psychological and socio-cultural determinants of energy consumption behaviour). Of equal importance is the study of the influence of institutional and legal framework conditions (e.g. ownership circumstances, independent structures for granting labels, reporting requirements) which counter the reduction of end energy consumption. Here the question arises as to which changes in values or incentive systems would be required in order to promote the purchase of energy from renewable sources or the reduction of the energy consumption of household appliances. In this context, it is relevant to know more about the role of property owners and landlords with regard to energy-related offers as well as the attitude of tenants towards energy use. The question of how the necessary changes can be brought about also needs to be examined. Another aspect to be addressed concerns the impacts of non-state steering processes (use of labels, certificates, etc.) on energy consumption in private households.

Options for changing mobility and transport behaviour

Past experience has shown that steering energy consumption in the mobility sector is associated with even greater difficulties than steering in other fields of action. In view of this, mobility and transport behaviour as a factor influencing energy demand is to be a focus of research in NRP 71. Here, attention has to be paid to the problem that our prevailing social concept still views private motorised transport as fundamentally desirable and as a gauge of affluence and quality of life. It will only be possible to achieve the objectives of the change in energy strategy if we take a fresh look at mobility. If mobility is regarded as a means for meeting our needs (work, eating, education, relaxation, etc.) and transport viewed as a means to an end, then we endeavour to secure mobility that fulfils our needs and involves as little transport as possible. This is almost inevitably associated with an intermodal or multi-optional perspective in which the most suitable means of transport and forms of mobility are chosen or combined with one another. The prospect of mobility with as little travel as possible entails transport and neighbourhood planning. There are already concepts in Switzerland linking an understanding of a sustainable culture of mobility with the idea of quality of life for residents living at a given location. Whether (and how) such concepts can be adapted for other locations is something that needs to be examined. If we include the problem of utilisation of space for parking, then sharing and one-way mobility systems also have to be addressed. The role played by communal forms of mobility in car sharing systems using conventional and electric vehicles also needs to be examined. Alongside the many possible conditions for a shift in the direction of a sustainable mobility culture, the individual, social and socio-cultural prerequisites for fostering greater respect for sufficiency issues, i.e. the conscious avoidance of mobility behaviour that results in high energy consumption, should also be closely examined. The question here is which social processes and framework conditions can lead to sufficiency-oriented forms of behaviour. This therefore also concerns issues such as the organisation of work, housing and leisure time (within the framework of the new Spatial Planning Act) from the point of view of energy consumption.

4.2 Module 2: "Economy"

Module 2 focuses on the framework conditions and development perspectives for the energy markets in general and the electricity market in particular, as well as on system analyses and macroeconomic correlations, and on microeconomic analyses of companies as purchasers of energy services. Special attention should be paid to renewable energies. In addition, the module focuses on international interdependence and competitiveness in view of the constantly developing energy policy framework at the international level. Due to the heterogeneity of the players associated with the "Economy" module (small, medium-sized and large industrial companies, service providers, public entities), it is to be expected that some projects will focus on specific segments of the economy. Electricity demand, room heating and/or energy demand for mobility and transport should be examined, depending on the relevance for the respective subgroup.

Framework conditions and development perspectives for energy markets, in particular the electricity market

Here, one area of study concerns the analysis of the impacts of economic, social, legal and political developments (e.g. international competition, sectoral transition, liberalisation of the electricity market) on the energy markets, in particular on the electricity

market. The way in which the markets in the energy sector are organised and how they function needs to be examined, as well as how they are regulated at the political level and what the impacts of this are: the focus is on analysing and assessing alternative governance models for energy markets. The liberalisation and harmonisation of the electricity market within the EU, and how Switzerland is (or is to be) integrated into it, should also be addressed. What possibilities exist for the introduction of an electricity business model similar to Switzerland's? This includes the impacts of market regulations with respect to energy pricing and the associated incentive schemes and consequences. Here Switzerland can also learn from experiments and experiences in other countries.

On the basis of these findings, specific issues relating to the structure and instrumentalisation of the framework conditions of the electricity market have to be examined by energy policymakers in Switzerland. Here, attention also has to be paid to measures aimed at unbundling the value chain. This includes examining the role and position of the network operator, the role and rights of the regulator and competition policy in the electricity market, taking into account the special characteristics of the electricity network and the associated consequences for the creation of a market for electricity transmission. In addition there is a need for a better understanding of the correlation between energy policy decisions, risks and public-sector liability.

In Switzerland there are more than 800 electricity networks, most of which are operated by the cantons or municipalities. Traditionally speaking, these entities are intended to generate earnings for their state co-owners through their electricity production. In the future, however, they should also make a contribution towards an increase in energy efficiency while at the same time including representatives of owners, clients and legislators in their management organisation. This gives rise to the question of which governance concepts can be applied to this potentially dilemma-like situation. Against this backdrop, emphasis is to be placed on gaining a better understanding of the way in which electricity supply companies function and on the importance of their ownership structure and legal form for their business model and corporate strategy as well as for their investment behaviour. New regulations need to be considered here that provide electricity suppliers with incentives to increase energy efficiency across the board. The associated research should support supply companies with the development of new business strategies that separate income and the sold quantity of electricity. This particularly concerns the demand side management of electricity companies and any new market partners. It is also necessary to examine whether, and to what extent, services relating to demand side management are an integral part of public services and should thus be co-financed by the public sector. For this purpose, reference can also be made to findings and lessons learned from experiments in other countries.

System analyses and macroeconomic correlations

For the debate on economic and energy policy and further-reaching decisions, estimating and evaluating the impacts of the various electricity supply as well as energy policy options and development paths on employment, income, income distribution and economic growth is of central importance (macroeconomic analysis of measures). This includes examining the impacts of the implementation of the change in energy strategy on the structural transition of the economy and the competitiveness and attractiveness of Switzerland as a business location. Here the costs of the change in energy strategy for the national economy have to be weighed up against the earnings that could be realised through the utilisation of new value-added potentials. The balance between the two and the chronological development of the costs and earnings need to be critically examined. What mechanisms can contribute to disconnecting the growth of energy consumption from economic growth?

An analysis of the correlation between supply security and international trading in energy carriers is also of relevance. In Switzerland, the term "supply security" is defined as a sufficient and secure energy supply at an affordable price. In order to assess the economic viability of energy supply security, research needs to be carried out on the impacts of the future energy mix on Switzerland's energy imports and exports, on the optimal degree of energy autonomy and on the investments in the network, which has to be able to handle the future energy supply and maintain the expected level of Switzerland's energy autonomy or the level of international dependence. This includes questions regarding the effects of the reformed European electricity markets (energy coupling) on Switzerland.

Microeconomic analyses: companies as buyers of energy services

Microeconomic analysis of the behaviour of companies as buyers of energy services represents a third research priority. With an emphasis on the demand side and renewable energy, this concerns issues such as: the behaviour of companies in different situations (e.g. their readiness to pay for alternative forms of energy); price elasticity of energy demand in alternative scenarios; the effects of sharply rising costs of all the main energy sources and companies' reactions, such as more efficient use or substitution with alternatives, modelling and verification of decision making by individuals and population groups as well as effects on behaviour according to various attitudes. Other issues include the status of information and transparency and the existing awareness on the part of companies as market participants regarding certain correlations and options relating to energy saving and alternatives, and thus the role played by information and transaction costs in general. New findings concerning energy demand in association with mobility, its steering (mobility management) and the correlation of alternative mobility systems and housing concepts with energy consumption would be welcomed. In addition, the impacts of specific energy policy measures on competitiveness and companies' choice of business location also need to be examined. Studies that focus on the social framework conditions of energy consumption by companies also need to be conducted which, in addition, examine the question of when companies change their mobility strategies and which operational factors influence their decision.

Another aspect that needs to be examined concerns the behaviour of companies and households regarding the creation and adoption of energy-related innovations and thus the diffusion of such energy-related innovations and the determining factors. Additional research should identify how important energy policy measures (e.g. relating to climate policy, withdrawal from nuclear energy) influence innovation in the private sector and the diffusion of new approaches and which consequences arise for the network (especially with regard to its tariffs and financing). Generally speaking, energy policy strategies of individual companies should be analysed in depth, as well as, for example, why companies often display a great deal of reticence when it comes to investing in apparently low-cost, energy-efficient technologies (in buildings, machines, electrical appliances, etc.). The focus should be on examining not only measures aimed at individual companies, but also – at a higher level – measures that encompass an entire business sector. Furthermore, the impacts of non-state steering processes on energy consumption (use of labels and certificates, corporate social responsibility, explicit sustainability strategies of consumers) need to be studied.

4.3 Module 3: "Politics"

The political will to achieve energy-related environmental and climate objectives and the fact that, generally speaking, energy markets do not meet the demands placed on them in terms of competitiveness are the reasons for the formulation and implementation of energy policy steering instruments. We speak of "market failures", for example, in connection with the natural monopoly on the distribution of electricity and gas (high infrastructure costs), collusive arrangements (e.g. cartels) and oligopolies in the oil and gas markets, negative external effects in the production of electricity and the consumption of fossil fuels, positive external effects and incomplete data relating to new technologies, the presence of public assets in research and the provision of supply security. The degree of political intervention in the area of energy policy is relatively high, despite various initiatives aimed at liberalising the electricity and gas markets. The state is actively involved on both the supply side, for example in the regulation of the production and distribution of electricity and gas, and on the demand side in the form of subsidies for energy-saving building renovation or for the purchase of energy-efficient appliances, for example. Module 3 is intended to help ensure that state interventions in energy markets can be implemented efficiently and effectively. Most state interventions in the energy markets require the consent of the general public if they are to be successful. Questions regarding how much centralisation and how much decentralisation in the production of renewable energy are necessary largely depend on the chosen market governance and need to be evaluated in terms of advantages/disadvantages, costs and production. Political decisions in Switzerland should also be planned in close cooperation with neighbouring countries. This is necessary in order to minimise costs and environmental impacts and strengthen energy security and system stability.

Module 3 gives priority to the analysis of the role of the state in an efficient and effective energy policy, the implementation and acceptance of a new energy policy and its social and economic consequences, and the contribution to be made by the selected policies (for example, transport policy) towards the change in energy strategy.

Options and limitations concerning energy policy steering

In order to achieve sustainable energy supply and demand it is essential that political reforms in the organisation of energy markets are proposed and substantiated on the basis of research. These reforms should envisage the introduction of competition elements as well as define the role of the state, of new energy policy instruments and of future-oriented governance strategies in an internationally embedded federal system. Models need to be developed which ensure that the political will can be enforced more effectively in the future in Switzerland's system of federalism, which is embedded in Europe. In this connection it is necessary to determine which effects can be achieved with measures without budgetary consequences for the state (primarily through regulations) and where the use of budget-relevant instruments would be beneficial. Here it is important to adopt a dynamic view and distinguish between transitional governance and the envisaged new system. With NRP 71, the aim is to create the fundamentals not only for an open, flexible, carefully considered and well-coordinated interim phase, but also for the long term. For this reason, monitoring of technological, social and ecological progress as well as obstacles will be important.

In this area it is therefore necessary to examine existing and planned regulations governing energy policy competencies in Switzerland's federal structure. The existing legislation grants the cantons a relatively high degree of decision-making freedom and financial responsibility. This decentralisation of competencies and duties has given rise

to considerable discrepancies between the cantons regarding legal provisions and behaviour relating to energy consumption. In order to define an efficient and effective energy strategy in the national context, it is important to identify the benefits and drawbacks of the existing distribution of duties between the federal government, the cantons, the municipalities and energy suppliers, and to compare the current situation with other task-sharing models. This entails legal, economic and political issues such as the question of models for promoting cooperation between the cantons in the area of energy policy, aspects relating to the necessity for new federal competencies in the area of energy (demand), the (special) role of towns and agglomerations with respect to networks and mobility and the effectiveness of new public and private-sector cooperation and financing models in the area of energy policy (e.g. energy agencies, public/private partnerships). Other questions arise in connection with the options and limitations concerning the strengthening of enforcement intensity, the diffusion of promising enforcement models between cantons and municipalities, and evidence-based energy policy-making in general. There are also various pending issues to be dealt with regarding political decision-making processes in Switzerland, i.e. the relationship between direct democracy, the various options for objecting to infrastructure projects and the requirements of the change in energy strategy. Finally, the interaction between Swiss and European energy policy should be examined, since various EU decisions and energy policy measures have (and will continue to have) both direct and indirect impacts on Switzerland (steering levies, electricity networks across Europe, regulation of motor vehicle energy consumption, etc.).

"Side effects" and implementation potentials for energy policy steering and coordination

The second thematic area in module 3 deals with the "side effects" of energy policy measures aimed at promoting efficiency and sufficiency, for example redistributive effects between population groups or regions, and with issues relating to the potentials in the political process for implementing energy policy instruments.

Research in this area should generate findings on the social, economic and other impacts of developments or instruments (higher tariffs, steering fees) of energy policy (social exclusion effects, e.g. concerning the utilisation of energy-intensive goods and services). Here, studies should focus on the regional shifts in value added due to steering measures in the area of energy consumption and the potential redistributive effects of political measures (feed-in remuneration at cost, steering fees, negotiable quotas for renewable energy) between population groups and between cantons and municipalities. Attention should also be paid to the impacts on minorities or social groups with a low level of political influence (women, people with a migration background, children). Furthermore, measures need to be proposed and evaluated which could reverse these undesirable effects. An understanding of the social and ecological impacts of intensified European cooperation on energy development is another important aspect.

It is also important to examine which impacts go hand in hand with different policy designs and what their chances of enforcement are in the political process (for example, changes motivated through incentives and promotion policy versus regulation based largely on levies).

Special contribution of transport policy towards the change in energy strategy

The third thematic area in module 3 focuses on the question of how the interests of energy policy can be effectively integrated into other areas of policy (for example, spatial planning, environmental, agglomeration policy), especially transport policy. In the next

few years, huge public investments are to be made in public and private transport (e.g. agglomeration programmes, railway infrastructure, renovation of motorway infrastructure). However, energy efficiency has played a more subordinate role in the past few decades in Swiss transport policy in comparison with other factors such as availability, safety, CO_2 emissions, air pollution control, noise abatement, etc. In the course of the upcoming adaptations that will be required in transport policy financing mechanisms (mobility pricing, etc.), it is possible that a time window may exist for a fundamental modification of the instruments mix, for example with regard to the use of regulatory or financial steering mechanisms.

In the area of transport, the focus of debate is above all on the energy consumption of vehicles per kilometre. Here, the fact that a variety of effects (urban sprawl, commuter behaviour, etc.) have prevented overall energy consumption in the transport sector from being separated from economic growth to date is something that is being largely ignored. The question that needs to be examined now is, which political instruments could be used (in the areas of energy, transport, environmental and/or spatial planning policy) to secure this separation.

4.4 Module 4: "Hand-in-hand research on practical interventions"

This module comprises projects that observe and evaluate current concrete measures for steering the energy consumption of private companies and public institutions, energy suppliers, municipalities and cantons in the form of a "natural field experiment".

Examples of practical interventions permitting such accompanied research include the experimental introduction of a new tariff structure in a clearly defined region, voluntary agreements to reduce energy consumption concluded between a specific group of players and a given supplier, and the implementation of a bundle of measures in a given municipality or canton.

Since research in this area promises various direct benefits, but the options for research projects are limited (as the number of suitable practical interventions of this kind is limited), this module is open for all types of high-level projects that examine measures aimed at reducing energy demand.

As a rule, it is assumed that the measure to be examined will be co-financed by the sponsor, so that research funding only has to be budgeted for additional activities (such as data collection in a control group). Projects in this module may also be the start of a more far-reaching CTI project.

The objectives relating to the know-how to be generated in this module do not differ from those of the other modules. However, it is expected that hand-in-hand research on practical interventions will generate detailed know-how of direct practical relevance to processes and their outcomes, including, in particular, the identification of specific learning and exchange processes.

5. Practical significance and target audience

NRP 71 will yield know-how that contributes towards the rapid and cost-effective achievement of the efficiency and sufficiency increases in the area of energy consumption that are called for in Switzerland's climate and energy policies. The programme is structured so that it can directly generate valuable know-how for defining energy poli-

cy measures at the municipal, cantonal and federal levels and support various players (e.g. energy suppliers, large-scale consumers) in their efforts to adapt to the changing framework conditions.

It will help network the existing potential in Switzerland in the area of socioeconomic energy research beyond the limits of individual disciplines and thus contribute towards the strengthening of Swiss energy research over the long term. Through the support of top-level projects, the intention is that the results of NRP 71 will also attract international attention.

At the political level, the programme will help identify which measures can be applied (and where they can be applied) to exploit efficiency and sufficiency potentials in the area of energy use. This will help the federal government, cantons and municipalities to realistically estimate efficiency potentials and take appropriate measures. Furthermore, the programme will identify undesirable side effects of energy policy measures at an early stage.

For the private sector, NRP 71 will clearly show which strategies for adapting to the new energy policy environment will make economic sense, and which institutional and legal obstacles will have to be eliminated in order to give companies sufficient room for manoeuvre for making the necessary adjustments. Against this backdrop, it is to be anticipated that research carried out in the framework of NRP 71 could be transferred to CTI projects.

Furthermore, the research in module 4 "Hand-in-hand research on practical interventions" is intended to give rise to cooperation between research groups, state players and the private sector that will contribute towards the direct transfer of findings.

6. Programme flow

NRP 71 is a five-year programme, and the duration of individual research projects must not exceed 48 months.

A programme synthesis is planned to bundle the scientific findings from the various projects. The focus here, however, will not be on the individual scientific details, but on the overlying findings and the political, social and economic conclusions.

7. Submission procedure and project selection

The call for proposals as well as forms, regulations and directives for the submission on the *my*SNF portal can be found on the website www.snsf.ch.

In order to better coordinate the research projects and set the relevant research priorities, a two stage submission procedure has been set up: pre-proposals are submitted first, then full proposals. Pre-proposals and full proposals must be submitted in English as they will be evaluated by international experts.

Pre- and full proposals have to be submitted online on the *my*SNF web portal. For the use of *my*SNF, prior user registration on the *my*SNF homepage (https://www.mysnf.ch) is required. Previously opened user accounts remain valid and provide unlimited access to all funding schemes of the SNSF. New user accounts have to be opened 14 days before the submission deadline at the latest. The submission of documents by postal

delivery is only accepted in exceptional cases and after consultation with the programme coordinator.

The pre-proposals and full proposals must be submitted in accordance with the guidelines issued by the SNSF, and the project duration is to be limited to a maximum of 48 months. A pre-proposal may be submitted either in NRP 71 or in NRP 70, but not in both. The Steering Committee reserves the right to transfer an NRP 71 pre-proposal to NRP 70 after consultation with those responsible for the pre-proposal. If a proposal involving the same research project is or was simultaneously submitted to another research initiative, this must be declared by the applicants.

The Austrian Science Fund (FWF) and the Deutsche Forschungsgemeinschaft (DFG) will participate in NRP 71 within the scope of the Lead Agency agreement. It is therefore possible for German and Austrian researchers to participate in NRP applications, provided that such a co-operation is regarded as useful. More information on these agreements can be found on the website www.snf.ch. However, it is not permissible for German or Austrian researchers to submit their own projects or take charge of the larger part of an NRP project; they may only act as project partners under Swiss project leadership. With regard to the FWF, the maximum project duration is 36 months and the running time of the Austrian and the Swiss parts of the project must be identical.

7.1 Pre-proposals

The deadline for submission is 17 October 2013. The pre-proposal should provide an overview of the planned research as well as information on the following points:

To be entered directly on the *my*SNF portal:

_ Basic data and summary

_ National and international cooperation

_ Budget: approximate personnel and material costs

Documents to be uploaded in PDF format:

_ Research plan (project description):

- Research topic and objective of the project
- State of research
- Methods
- Timeframe and milestones
- Expected benefit and possible application of results
- List of the three most important publications in the field of the pre-proposal
- List of the three most important publications of the applicants

The project description must be submitted using the template document provided on the *my*SNF portal. It must be written in English and must not exceed six A4 pages.

_ Short CVs of the applicants of a maximum of two A4 pages each

Possible scenarios for successful use of the results must already be presented in the pre-proposal. In addition, the pre-proposal should mention the type of cooperation to be envisaged with partners during the different phases of the project, if applicable.

NRP 71 places an emphasis on the implementation of different theoretical and methodical approaches. The development of new methods is not supported, however.

The Steering Committee evaluates the submitted pre-proposals and makes a decision based on the criteria mentioned in chapter 8.3. Members of the Steering Committee of NRP 70 will be consulted in the course of the evaluation, if necessary.

7.2 Full proposals

In the second stage of the submission procedure, the Steering Committee will invite the authors of the selected pre-proposals to submit full proposals. The full proposals must be written in English and submitted online via the *my*SNF portal in accordance with the guidelines of the SNSF.

Research proposals are reviewed by international experts. In addition, the Steering Committee may invite the applicants to present their project to the Steering Committee at a colloquium where details of the proposals can be discussed in depth and problems resolved. Subsequently, the Steering Committee will decide which research proposals are to be recommended to the National Research Council (Division IV; Presiding Board) for approval or rejection.

7.3 Selection criteria

Pre-proposals and full proposals will be reviewed on the basis of the following criteria:

_ **Scientific quality and originality**: in terms of theory and methods, the projects must be in line with international scientific standards and the state of the art in the field. In addition, they must have innovative components, be clearly delineated from ongoing projects and generate added value.

_ **Concordance with the goals of NRP 71 and relevance for the "Energy Strategy 2050"**: the projects must pursue clear, realistic goals. They must comply with the scientific objectives and research priorities described in the call and fit the overall framework of NRP 71. The projects must make a specific and significant contribution to the realisation of the "Energy Strategy 2050" or clearly and convincingly show that they have the necessary potential.

_ **Application, transfer** and utilisation strategy: National Research Programmes have a clearly defined mandate with regard to knowledge and technology transfer (KTT). Projects that are highly relevant for practice are therefore prioritised.

_ **Personnel and infrastructure**: the personnel and infrastructure of the project must be adequate to the pursuit of its objectives.

Prior to the scientific evaluation, the Administrative Offices of Division IV "Programmes" will check whether the formal criteria are met (cf. Funding Regulations of the SNSF). Pre- and full proposals that do not meet the formal criteria will not be forwarded for scientific evaluation.

7.4 Schedule and bugdet

The schedule of NRP 71 is as follows:

Call for pre-proposals	8 July 2013
Deadline for pre-proposals	17 October 2013
Invitation to submit full proposals	end of January 2014
Deadline for full proposals	end of April 2014
Final decision on full proposals	August 2014
Start of research	September 2014

NRP 71 has a budget of CHF 8 million. The available funds are expected to be distributed across the four modules as follows:

Module 1: Society	CHF 1,7 million
Module 2: Economy	CHF 1,7 million
Module 3: Politics	CHF 2,4 million
Module 4: Hand-in-hand research on practical interventions	CHF 1,0 million
KTT and administration	CHF 1,2 million

On 21 August 2013, an information event for interested researchers will be held at the SNSF, Wildhainweg 21, Berne, Plenary Hall 21, 14:15 to 16:15. The number of seats is limited. Please register before 31 July 2013 via e-mail to nrp71@snf.ch.

7.5 Contact persons

For questions concerning the submission and evaluation procedure or NRP 70 in general, please contact the programme coordinator Dr. Stefan Husi at nrp71@snf.ch or 031 308 23 43.

The contact person in financial matters is the Division IV head of finance, Roman Sollberger (roman.sollberger@snf.ch or 031 308 21 05).

8. Actors

8.1 Actors of NRP 71

Steering Committee

Prof. Dr. Andreas Balthasar, Department of Political Science,
University of Lucerne, (President)

Dr. Konrad Götz, Institute for Socio-Ecological Research (ISOE), Frankfurt/Main

Prof. Dr. Beat Hotz-Hart, Department of Economics, University of Zurich

Prof. Dr. Miranda Schreurs, Head of Environmental Policy Research Centre,
Freie Universität Berlin

Prof. Dr. Petra Schweizer-Ries, Prof. of Sustainability Science, Bochum University of Applied Sciences and adj. Prof. of Environmental Psychology,
Universität des Saarlandes

Prof. Dr. Hannelore Weck-Hannemann, Prof. of Political Economy, Institut für Finanzwissenschaft, Universität Innsbruck

Delegate of Division IV of the Research Council of the SNSF

Prof. Dr. Frédéric Varone, Faculté des sciences économiques et sociales,
University of Geneva

Programme coordinator

Dr. Stefan Husi, Swiss National Science Foundation (SNSF), Berne

Head of knowledge and technology transfer

N.N.

Representative of the federal administration

Dr. Pascal Previdoli, Deputy Director, Head of the Energy Economy division,
Swiss Federal Office of Energy (SFOE), Berne

For the State Secretariat for Education, Research and Innovation (SERI)

Dr. Claudine Dolt, SERI, Berne

8.2 Actors of NRP 70

Steering Committee

Prof. em. Dr. Hans-Rudolf Schalcher, ETH Zurich (President)

Prof. Dr. Göran Andersson, Power Systems Laboratory, Department of Information Technology and Electrical Engineering, ETH Zurich

Prof. em. Dr. René L. Flükiger, Département de Physique de la Matière Condensée (DPMC), University of Geneva

Prof. Dr. Beat Hotz-Hart, Department of Economics, University of Zurich (*member of the Steering Committee of NRP 71 who will attend meetings of the Steering Committee of NRP 70*)

Dr. Tony Kaiser, President of the Federal Energy Research Commission (CORE), Consenec AG, Baden-Dättwil

Prof. Dr.-Ing. Matthias Kleiner, Institut für Umformtechnik und Leichtbau (IUL), University of Dortmund, Germany

Prof. Dr. Martha Lux-Steiner, Director, Institute for Heterogeneous Materials Systems, Helmholtz-Zentrum Berlin

Prof. Dr. Dimos Poulikakos, Director, LTNT-Laboratory of Thermodynamics in Emerging Technologies, ETH Zurich

Dr. Jan van der Eijk, Technology and Business Innovation Consultant, Dordrecht, Netherlands

Delegate of Division IV of the Research Council of the SNSF

Prof. Dr. Peter Chen, ETH Zurich

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Dr. Claudine Dolt, SERI, Berne