The technology and the concepts for energy savings have been available for a long time in many fields of application. Despite different assumptions, different data bases and findings, miscellaneous studies prove that economical energy end-use savings in Germany and in Europe total up to approx. 20 to 30% compared to business as usual (BAU) development, if only technologies and organisational approaches already available today are applied (cf. the paper dealing with energy efficiency potentials, available online on the website of the Wuppertal Institute). These addressed energy end-use savings can be realised on the condition that during the next years an efficient solution will be chosen each time in case of refurbishment or substitution of outmoded facilities and appliances.

Nevertheless, the services and public programmes that have been carried out so far have not yet led to a broad implementation of enhancements in energy end-use efficiency and they have not been able to fully overcome the various barriers and interferences. In particular, this is true for small energy saving measures connected with larger difficulties of implementation (“transaction costs“). What is the problem behind this?

The answer to this is not simple. Politics cannot be held exclusively accountable for this along the lines “There is no market failure, there is just a political failure“, thereby arguing that politics should have to establish a framework for efficient usage of energy. Also, energy suppliers and primary producers, who still listen to stakeholders and financial analysts not to invest money in energy efficient technologies and services in order to avoid sale reductions, are not the only ones to be responsible. It takes a long time for people to realise that it is also in the scope of economic interests to take climate protection and increasing energy costs seriously, to become more independent of production, transport and allocation of limited resources and to set the focus on efficiency services. Furthermore, it cannot be exclusively expected from energy users in private households, industry, trade and service sectors in addition to their daily workload that they thoroughly acquaint themselves with possibilities of energy savings and that they make the optimum decision, meaning a decision reducing the life cycle costs. Besides, why should salespersons, and manufacturers completely change to energy efficient
solutions, if these do not necessarily get a higher profit in return and are connected with additional efforts (e.g. advising customers, acquisition of information)? And eventually, it is also not exclusively the fault of science since a satisfying answer to the question of how a broad and sustainable implementation of energy efficiency strategies has not been given yet.

However, one thing is for sure: in order to cap global warming until 2050, below 2 degrees Celsius meaning that greenhouse gas emissions will be reduced by around 80 percent until 2050 in industrial countries compared to the level of 1990, it is necessary to quickly and completely implement the addressed potentials of increasing energy efficiency. Furthermore, additional energy efficiency potentials have to be identified and used. To achieve this aim in the medium to long term, the demand of energy has to be reduced by at least a factor of two. Only by means of the resulting net cost savings the funding of the change to an efficient solar economy can be realised. However, the addressed aspects can only be accomplished, if there is a clear and conspicuous change of direction in politics and economy.

Thinking about energy carriers still basically focuses on the supply side and its expansion. This matter of fact can be illustrated by an example from the energy industry: in addition to fossil and nuclear energy, an expansion of renewable energies has been accomplished in Germany. The accelerated increase and expansion of renewable energies is the appropriate choice and this is important since they have to make a major contribution in order to achieve climate protection aims in the short to medium term but also in the medium to long term. However, besides the expansion of renewables, a reduction of the energy demand is obligatory and essential. Otherwise, the climate problem cannot be solved. A systematic and structural problem solution is slowed down, if progress is not made simultaneously in the field of energy efficiency and renewable energies. This fact also, indeed even more, applies to the international level. In this context, too much priority is given to the expansion of power generation capacities – especially electricity – and to the increase in transport services, cars and infrastructure instead of stressing the indispensable limitation of energy demand by means of intelligent and cost effective solutions.

Against this background, in terms of energy usage it is essential to

- Establish life cycle cost thinking as the general principle – from mining to sustainable waste disposal or recycling and considering the sum of initial investment and running costs. In this context there exists the problem that particularly interests of the capital markets are conflicting with life cycle thinking. Life cycle thinking implies that e.g. a highly profitable investment is not refused due to the fact that the investment pays off after eight to twelve years. However, capital markets call for risk prevention and therefore for short pay-back periods as well as for high profit generation in a short time.
Focus on the technical progress to reduce or prevent energy demands by using – often rather decentralised - intelligent infrastructural, technological or organisational, institutional solutions. In fact, the majority of research funding and venture capital are spent for - more centralised – conventional technologies.

Pose the question which structures and conditions generate unnecessary energy consumption and

Concentrate on the provision of adapted, cost-effective infrastructures and functions / usages (services in the proper meaning of the word) that are really needed in daily life in private households and public administrations, industry and businesses instead of focusing on the supply of cheap energy. Energy consumers are not only interested in low-priced and safe energy. In fact, they are more interested in minimising payment for the achieved benefit, e.g. for heating a living room, for cooling a drink, for drying laundry, for compressed air, the goods which have been produced by a machine consuming energy, the facilitation of daily shopping (e.g. either by moving from A to B by vehicle or e.g. by the infrastructure enabling shopping afoot) or the transmission of information (functional orientation instead of product orientation resp. beneficial orientation instead of offer orientation). An efficient allocation of resources meaning the most cost-effective provision of the requested services or benefits (“least cost solution”) will not be achieved until all levels of service production are optimised. Such an integrated approach to optimisation generates new patterns of production and consumption and requires a new direction in the national general framework concerning markets and public services.

In order to accomplish the needed basic change towards increasing energy efficiency and saving energy and towards taking advantage of the opportunities of these savings, support by the state and by service providers has to meet the different actors in their specific daily situation. Eventually, such policy support should aim at making energy efficiency easy („Make it easy!“), realisable („Make it possible!“) and beneficial („Make it rewarding!“) for the people involved, thereby contributing to the development of the market for energy efficiency technologies and services. Due to the implementation of the support programmes, it also becomes clear that energy efficiency is politically intended and crucial („Make it a policy!“).

A preconcerted, target group-specific, differentiated mix of policy instruments and measures is necessary with integrated measures for market transformation that are directly addressed to certain actors involved in the market. In such a way, the specific circumstances, incentives, barriers and obstacles of the different market actors should be addressed by specific policy mixes.

The six possible elements of such a policy mix are shown in figure 1 and they comprise:

Figure 1: Mixture of policy instruments concerning energy and resource efficiency
Selective economic incentives and assistance for the intended processes of market launch and diffusion are essential – with diverse characteristics, from economic incentives to information and motivation and to cooperative procurement.

A further basic element of the policy mix is the implementation of technological-oriented and structure-oriented framework conditions encouraging efficiency such as standards and labelling, infrastructure planning or regulation of natural monopolies with respect to energy efficiency aspects.

In contrast to neoclassical theory, instruments which influence energy prices such as taxes, maybe emission certificate systems or the abolishment of counterproductive subsidies (subsidy reform) are necessary but not sufficient to enhance energy efficiency.

The funding of research and innovation including integrated funding of a combination of research, development and implementation is fundamental as well as

The funding of education.

The basis should be the definition of targets and objectives, the choice of indicators to measure the achieved outcomes and the development of target-group-specific strategies of implementation provide the basis for energy efficiency.

The importance of an integrated assistance approach is illustrated by having a look at small or medium businesses: in many cases, best practice examples are crucial to show
small and medium businesses that energy efficiency is an important option in order to reduce production costs and to strengthen competitiveness. Even though people have become more attentive to energy efficiency options during the last years due to increased energy costs, targeted information and qualification programmes have still to be provided while at the same time avoiding an information overload of stakeholders. But even if stakeholders have become conscious of these problems and sufficient information is provided, motivation and the impulse to benefit from the addressed cost potentials are often missing. One reason for this is that for instance managers need to focus on the daily routines and on the core business and do not have the time to deal with energy efficiency. Best practice examples of successful cost reductions, the launch of networks (e.g. exchange of experiences among businesses), but also the establishment of efficiency competitions are approaches in order to motivate businesses to take advantage of energy efficiency measures. Finally, an adequate range of offered services helps to implement energy efficiency measures.

Over and over again, resistances and counterproductive economic incentives (e.g. from the financial markets) occur during the implementation of support measures and affect the work of the supporters. Furthermore, the increase in energy efficiency is not always conflict-free. There are existing suppliers of energy carriers that are afraid of a drop in sales and oppose to supportive programmes that are useful from the macro-economic point of view. However, experiences from politics regarding energy savings in other countries (e.g. Denmark or Great Britain) show that it is possible to create the framework in a way that negative economic incentives and resistances of existing power suppliers can be reduced or can even be reversed to active cooperation. However, this requires a transparent framework established by an active political and administrative system. The idea is illusive that such a policy mix can be optimised in a way addressing and resolving all relevant barriers and interferences of the stakeholders and guaranteeing a broad implementation of energy savings in a predetermined period of time. Nevertheless, empirical studies and comparisons of political instruments which are based on defined criteria are able to show promising means and ways and help to avoid mistakes regarding policy instruments.

Furthermore, energy saving measures in Germany and Europe give credence to the claim by these countries of a limitation of energy demand at the international level. In this context, bilateral agreements regarding the transfer of efficiency technologies and of organisational solutions are an adequate instrument besides a multilateral agreement, such as agreements on WTO-compatible efficiency standards and agreements concerning the reduction in subsidisation of the conventional and nuclear energy industry. In addition, a fundamental change should take place turning away from the expansion of the supply-side and leading to limitations and avoidance of demand which become obvious through specific projects and supportive programmes of development cooperation.