Creation and transformation of energy service markets The important role of external agents for stimulation of energy efficiency activities in non-energy intensive target groups

Kora KRISTOF, Stephan RAMESOHL
Wuppertal Institute for Climate Environment Energy GmbH, Energy Division

1 - SYNOPSIS

The paper describes the contribution of external actors to the stimulation and the management of energy efficiency projects of small and medium sized enterprises and municipalities.

2 - ABSTRACT

In the target groups of small and medium sized enterprises and municipalities, internal activities are not sufficient to enforce a large scale implementation of energy saving activities. Although a wide range of cost-effective efficiency potentials exists, in most cases external impulses are needed to trigger profitable measures. The findings of recent socio-economic research emphasize the input of external actors as "door-openers", "process managers" and "coaches" for an adoption of efficiency technologies and social innovations, and point at their crucial role for energy service market transformation. With regard to the observed important role of external relations, a high impact can be expected from policy support of network and communication infrastructures in both target groups. As a guideline for strategic energy policy making direct interventions and framework regulation aiming at removing obstacles to the rational use of energy should, thus, be combined with indirect measures of network formation and social marketing. It should be the objective to generate a fostering environment to stimulate and enable external actors to provide adequate energy related support to SME or municipalities, and to improve the external milieu for energy efficiency activities.

3 - INTRODUCTION

In most small and medium sized enterprises (SME), rational use of energy (RUE) receives only little attention due to the minor share of energy costs compared to other cost factors. Energy issues hardly get to the top of the management's agenda, and many profitable potentials for energy efficiency remain untapped. Although operating in a diametrically different environment, municipal authorities, too, systematically neglect profitable RUE options. Even when keeping the typical differences of these sectors in mind, in both non-energy-intensive target groups, energy saving activities are impeded by a wide range of comparable barriers: energy related decisions are suffering from insufficient knowledge of efficiency options, from prevailing routines of investment practice, and from a lack of appropriate financial and personnel resources (Hermes et al. 1998, Enquete 1995, DeCanio 1993, Gruber, Brand, 1991, Energie und Klima 1990). As a direct consequence of insufficient activity, the manyfold existing and profitable potentials are not turned into a demand for energy efficient investments and services, which hinders the development of self-sustaining markets in this area. When looking at the growing number of energy service providers and the range of available technology options offered by suppliers, a core question for energy policy and energy market professionals emerges: how to stimulate and foster the demand for energy efficiency solutions in these target groups?

In this context, an in-depth understanding of the socio-economic foundations of energy related behaviour in the target group gains importance. Evidence from recent empirical work in this area indicates that in both target groups the general process of implementing RUE measures can be characterised by similar determinants and patterns. The analyses discovered a multitude of influencing factors which determine the course of the implementation process[1]. As one core finding, however, all studies emphasize the importance of external actors to alter the perception of energy issues and to mobilise RUE measures in these target groups. In this paper, external actors are understood to be engineering and consulting firms, energy service companies (escos), utilities, technology suppliers, administrators of public efficiency programmes and industrial associations etc. With regard to their importance for enhancing energy efficiency in non-energy-intensive target groups, this paper is concentrating on discussing the impact of external relations on energy efficiency measures undertaken by firms and public authorities. The objective is to answer the following guiding questions:
What can external actors contribute to the various stages of successful implementation processes (section 5)?
What are important aspects for successful cooperation with external partners (section 6)?
How to facilitate the cooperation with external actors and what are the conclusions for the design of energy policy programmes (section 7 and 8)?

4 - THE EMPIRICAL FOUNDATION

The paper is based on findings from two recent qualitative socio-economic studies in the field of public energy saving activities and rational use of energy in small and medium enterprises from industry and service[2].

Concerning the target group of *municipal and public actors*, a comprehensive empirical study examined mobilisation and implementation processes in the field of municipal energy conservation and climate protection activities in Germany. In a first phase, 22 successful energy conservation and climate protection projects on the local and regional level were analysed with regard to their factors of success and underlying driving forces (IfP/ISI/WI 1997). By analysing these "best practice" examples - e.g. in the field of pilot programmes on the market introduction of renewable energies, initiatives of ecological building and impulse programmes of further training in rational energy use - factors were deduced which facilitate the initiation and implementation of energy conservation and climate protection programmes. Factors which can be assigned a general central significance for the success of energy conservation and climate protection programmes are the *cooperation, participation* and the *motivation* of the participants involved. In a second phase of case studies, therefore, - in close co-operation with local participants - active organised intervention (social marketing, setting up networks, participatory observation and involvement of external actors etc.) took place in three community/regional climate protection processes (IfP/ISI/WI 1999). Via the experiences gained in this second phase of case studies, it was possible to supply scientifically sound and at the same time practically relevant *strategies to promote social learning and innovation processes for successful climate protection on a community level*.

With regard to energy efficiency in *small and medium sized enterprises (SME),* the *InterSEE* project provided in-depth qualitative socio-economic analyses of successful activities in Germany, Austria, Denmark and Switzerland (InterSEE 1998). The empirical investigation of individual company examples was based on a sample of 38 industrial and commercial enterprises from 11 different sectors, covering 10 technical and 4 organisational groups of RUE measures realised (see Tab. 1). Including the external partners involved in the cases studies, 63 firms and institutions were studied with a far larger number of actors involved and interviewed (158)[3]. The given heterogeneity of examples was a helpful contribution to investigate the similarities as well as the differences between the various cases in relation to the respective basic conditions, company cultures, individual and joint activities. Special attention was given to the social and organisational processes, and an examination of interactions between the internal company activity and external actors constituting the social and economic context of the energy system. Therefore, external partners, who were involved during the implementation processes such as suppliers, public authorities (federal, regional, local), public institutions, energy agencies, public and private utilities, industrial associations, consultants, universities, and standardisation institutions, have been questioned, too.

Table 1: Overview of company case studies of the InterSEE-project

Energy efficiency measures	Sectors						
	Iron, metal, mechanical engineering Industry	Electric/ Electronics Industry	Wood and Sawmill Industry	Food Industry	Rubber and plastic Industry	Service	Other
Motors and drives	3	2	2	3	1		
Ventilation, Air-Conditioning	2	1		1	1	2	1
Lighting	4	2	1		1	4	1
Heat Production, Heat recovery	11	2		3		2	2
Energy management systems	5	2	2		2	3	1
other	6	2	1	2	1	6	3
Total no of firms	**12**	**3**	**2**	**6**	**3**	**7**	**5**

5 - ENERGY EFFICIENCY IS A SOCIAL PROCESS - WHAT IS THE ROLE OF EXTERNAL PARTNERS?

As a common feature of both studies, the analyses started out from an interdisciplinary approach, which describes the implementation of energy saving measures as a social process in time. Contrasting to the rather static, micro-economic focus of traditional barrier analyses[4], the new perspective taken enables a distinct investigation of change processes over time, and the related communication and interaction of various actor groups and levels. Especially with regard to the process features, the empirical studies pointed out interesting similarities of the principle determinants and driving forces of successful implementation processes - regardless whether SME or municipal activities are concerned.

As depicted in Fig. 1, the implementation process can be understood as a sequence of perception, acting and learning. In the beginning of the process, the given corporate culture or the traditional role of energy within local politics and administration, as well as personal dispositions of the actors prepare the background for the perception of triggering impulses. Once identified as an option for RUE measures, the impulses need to be transformed into concrete ideas for energy efficiency projects. At this stage, the opportunity to act is recognised for the first time, the idea for a project is born, and the preparatory information search as well as formulation of decision alternatives takes place. Often neglected by traditional economic analyses, the initial phase is of special importance for the whole process because it prepares the ground for the decision in economic terms, and decisive features of the final outcomes are already pre-determined at this stage.

Furthermore, special emphasis is also put on the post-decision phase, where concrete action is followed by an evaluation of the activity. Positive experiences, new energy related competences and improved energy data are some of the factors which facilitate taking up of new projects and, thus, can contribute to continuous and self-dynamic activities, and to a gradual evolvement of an *"efficiency culture"*. Under favourable conditions, this last stage can represent the beginning of a search for new options and new projects, i.e. the process can become part of the closed cycles of continuous action as the foundation of a self-sustaining demand for energy efficiency solutions.

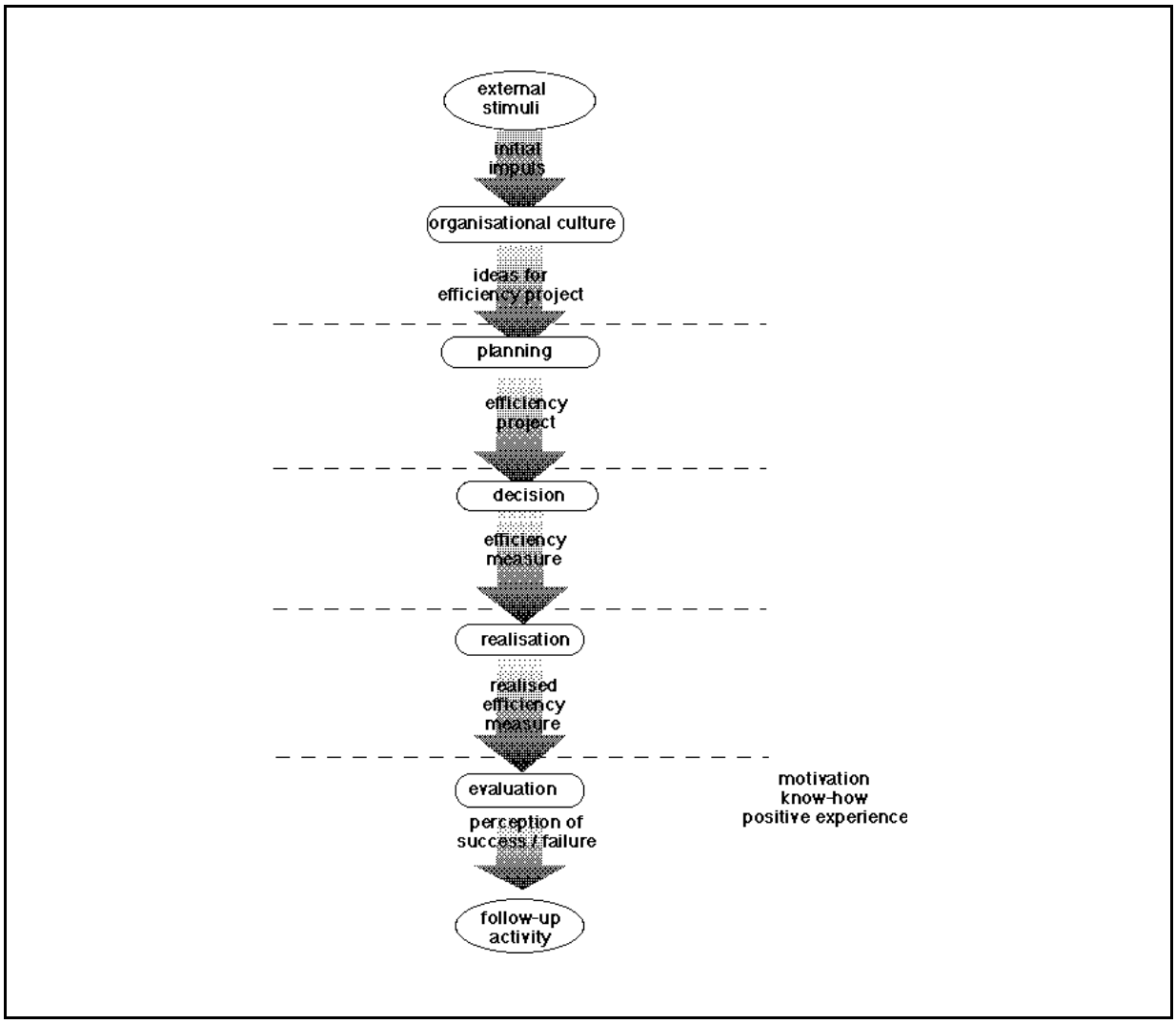

Figure 1: Overview of the implementation process of energy efficiency measures

5.1 What can external actors contribute to the specific process phases?

>From the ideas until the final realisation, the various process stages impose multiple requirements and challenges to the actors involved. This concerns energy related know-how and knowledge but communicative and leadership tasks. as well According to the different steps of the implementation process, external actors, too, can make changing contributions to the initiation, decision and realisation of RUE measures.

5.1.1 Phase of first impulse and initiation

As already mentioned, both for most SME and public authorities energy costs are only of secondary importance. Direct and powerful pressure to engage in energy efficiency as a means to assure competitiveness and economic survival is missing, so that a systematic search for cost cutting options hardly takes place. Therefore, prevailing routines and standard operation rules of "normal" business practice tend to neglect energy efficiency as an arena for action. Therefore, in most cases energy efficiency measures require a deliberate deviation from routine behaviour in order to initiate changes of the technical and organisational structure of the company's and authority's energy system as well as changes in energy related behaviour of staff.

The case study findings indicated that such a shift in routine practice is hindered by a multitude of psychological and organisational barriers which are known from organisational and innovation research (DeCanio 1993, Rogers 1995, Hauschildt, Schewe 1997). For instance, the stimulation of energy efficiency measures in SME as well as

in public authorities is strongly influenced by the efficiency-culture and the related incentive structures which have already been established in the institution. They can hardly be altered in the short term, and serve as the general, historically developed background that determines the opportunities to start energy efficiency activities and to create a general motivation to become active in energy efficiency. Under average conditions, however, profitable RUE measures do not enforce themselves but depend on distinct impulses to be perceived as an attractive field for action. With regard to decisive stimuli to start action, it has to be distinguished between:
Internal stimuli: Action with impact on energy efficiency can be pushed by business-related *problems* (breakdowns, insufficient quality, competition, scarcity of resources etc.) and *opportunities* (re-investment, new personnel, change of ownership or management, shift of product or process, move to new location etc.). External actors are often needed to solve the problem, so that they have the chance to initiate efficient solutions that go beyond the business as usual case.
External stimuli: There are energy-related means of *pressure* (regulation, price increases etc.), *incentives* (subsidies, funds, awards, support etc.) and *positive examples* (information, best practice cases etc.). Here, external actors can transmit and amplify policy as well as market signals. In giving direct impulses, they can act as change agents who help to foster the diffusion of energy efficient solutions (cf. Rogers 1995).

Thus, at the start of a RUE project external actors often play a decisive role in drawing attention to the issue by providing new information, data, ideas etc., and, thus bringing it on the agenda. At the same time, they can induce a new interpretation of already existing information and data. In addition, they contribute to the needed mobilisation of internal key actors to think about energy efficiency and to initiate the planning, decision and implementation process of RUE measures.

5.1.2 Phase of planning and decision

Most SME and municipal bodies have no or only very limited internal knowledge of energy efficiency and therefore depend on external backup, e.g. for the calculation of profitability, for the investigation of possible government subsidies, for the provision of an overview on energy consumption and for technical or organisational recommendations. Thus, in the second stage, external partners primarily contribute to the elaboration of concepts, increase the quality of planning, widen the range of considered alternatives and often prevent unrealistic target setting.

The implementation of energy efficiency is closely connected with a need for new patterns of behaviour and investment practice, which induces a special challenge for process management. In this regard empirical evidence emphasizes the fact that a motivated key player inside the company, who expands and promotes the idea, is a basic condition for the required organisational and behavioural changes (cf. Hauschildt, Schewe 1997, Howell, Higgins 1990). The key actor has to coordinate the development of concepts for the project (e.g. in interaction with other internal or external company actors), has to try to use or foster positive personnel relations (e.g. by a staff-orientated, cooperative style of leadership) and to establish an internal coordination structure for the project (workgroups, meetings, timing). During all these task, the internal key actors can be supported by operational and strategic assistance from an external partner.

Since motivated key actors often do not belong to the top levels of hierarchy, a first priority has to be seen in gaining the commitment of top executives. In this phase, reluctance, doubts and uncertainty has to be overcome by clear, pragmatic and convincing proposals for action. External partners can support the internal key actor significantly through their expert reputation, additional data and arguments etc. In addition, a neutral external agent - e.g. in the role of moderator - facilitates the integration of interests, suggestions and scepticism of all participants, which are often not communicated explicitly via internal channels.

5.1.3 Phase of realisation

In the early stages of the conception and realisation of an energy efficiency project, the development of an implementation plan with concrete (interim) targets and the documentation of goals and realisation schedules helps to trigger or to re-animate activities, especially with respect to the crucial step from discussion to action. At this point, expert participation can serve as an intermediate process control which prevents blind activism and

indicates inefficiencies and failures. Often, the external experts initiate a management of complex challenges by organising and dividing them into smaller and feasible implementation steps.

As a second aspect, external coaching of organisational changes (decentralisation of responsibilities, project teams) helps to use and to expand internal resources, experiences and know-how.

Furthermore, the planning and realisation of a RUE measure involves several different partners such as suppliers, engineering companies, financing institutions, approving authorities, but also cooperation partners like other SMEs, network contacts etc. In this regard, an important contribution of external actors can be seen as supporting the interface of the SME or authority with other actors, or even in assisting the project manager in selecting, managing and controlling suppliers and contractors. They establish, maintain and coordinate relations and communication links, and thus help to gain access to resources which are beyond the scope of the SME or the municipal institution[5].

5.1.4 Phase of evaluation and continuation

Monitoring of activities by installing meters, taking measurements and controlling consumption, allows an assessment and feedback of positive results, which contributes to an increased motivation to continue. It facilitates the transition to a new cycle of learning and efficiency activities. In this regard, external actors often play the role of an independent evaluator, and can provide special motivation to the participants. In cases of negative experiences, they can compensate the staff's disappointment by concrete suggestions for improvements and changes. Additionally, they serve as a source for new ideas and suggestions for follow-up activities.

5.2 Summary

Summing up, four principal functions of external actors can be derived:
External agents *provide the decisive impulse* to identify untapped energy efficiency options and to start action.
External experts serve as a *source of energy related information and know-how*, and, thus, compensate deficiencies which are typical to both target groups.
External partners *support the internal key actor* during his process management tasks, and help to overcome difficulties and internal irritations during the course of implementation
External partners serve as *communication interface* with the institution's working environment and help to establish and coordinate the external relations which are needed to implement RUE measures.

6 - ASPECTS OF SUCCESSFUL COOPERATION

Obviously, external partners can provide comprehensive support to energy efficiency activities in SME as well as in public institutions. A deliberate use of external contributions and professional service support would thus promise a significant benefit to all participants. However, the integration of external partners imposes considerable problems and challenges, too. There has been a great deal of disappointing experience from unsuccessful partnerships, so that one may ask for formal and factual criteria for a successful involvement of external actors into RUE measures of SME or municipal authorities. In this regard, some observations and suggestions can be derived from the empirical material:
Usually, the involvement of external experts is not planned by the SME or authority from the very beginning of activities. In most cases, the external actors themselves have taken the initiative to start or to join a project. This requires an active approach and offer of inputs to (potential) internal process leaders. In these cases, concrete options and responsibilities of cooperation are not clearly defined ex-ante in the sense of a contract specification. The degree of external involvement often evolves gradually as the work progresses, and the timing and the scope of the external contribution depend on a specification of particular tasks such as professional auditing, process moderation and coaching etc., which cannot be fulfilled by internal personnel (e.g. due to lack of know-how or time). However, sooner or later a successful cooperation requires a clear cut, transparent and commonly accepted definition of responsibilities and tasks during the whole process. Otherwise the cooperation runs the risk of touching critical areas of competence and power, provoking resistance and opposition of internal staff. In

addition, ambiguous responsibilities feed unrealistic expectations and hopes regarding the external input - a source of needless disappointment and frustration.
When the involvement of external forces is too strong, then there is the risk that the internal process will become dependent on the external driving force. Therefore, external partners must not be allowed to dominate the internal participants in order to maintain the motivation and self-responsibility of staff which is a decisive pre-condition for their commitment and, thus, for the lasting success of the process. Long-term orientated but clearly specified, limited and scheduled inputs of external experts, for example, avoid such a destructive dominance, and increase the benefits from cooperation. Related to the previous aspects, sufficient freedom to develop one's own ideas, to intervene in planning and decision-making, and enough room to act for both parties turned out to be a decisive pre-condition for successful cooperation.
Depending on the specific nature of the process and structure of participants, external coaching can be useful, but does not seem to be a mandatory requirement for successful activities. In distinct critical stages such as the step from concept to realisation, however, external moderation can provide a helpful contribution to maintain process dynamics. If needed, external moderators have to prove methodological competence and maitain strict neutrality towards participants and alternatives. In this regard, the typically restricted knowledge and familiarity of external partners concerning the internal situation ("outsiders to the local history") proved to be a positive sign of independency rather than an indicator of missing competences. Because of their independence and distance to internal quarrels, external partners are perceived differently to internal players, which offers them the possibility to act as a catalyst - especially when external actors are able to communicate a position of neutrality (e.g. in the absence of any hidden agenda).
As a basic, but nonetheless often neglected primary condition for successful cooperation, all contacts, agreements and activities require the full backing from top management in order to get authorisation for operation, and access to needed resources.

7 - HOW TO FACILITATE THE ESTABLISHMENT OF EXTERNAL RELATIONS - NETWORKING AND MARKETING AS CORE ELEMENTS OF MARKET TRANSFORMATION POLICIES

With regard to the benefits of cooperation discussed, the energy policy question arises: How to encourage the involvement of external actors in energy efficiency activities of the target groups? Under the current situation, the contact of the SME or the municipality to a competent and trustful partner often results from an individual and coincidental situation due to the absence of institutionalised and working energy service markets. A systematic merging of the supply and demand side of efficiency markets still does not take place. Furthermore, the readiness to spend money on external process support and coaching is limited, although external partners can make fruitful contributions to all process stages and to the superior project management. Bearing in mind the low priority of energy issues due to relatively small energy bills, this reluctance acts as an additional barrier to the development of self-dynamic energy service markets - a vicious circle of "insufficient demand ⇨ low market activities ⇨ insufficient stimulation of demand" impedes the creation and further development of market relations and win-win-cooperations.

What can be done to overcome this "lock-in" situation?

Both target groups are characterised by their own insufficiently developed activity and self-interest, so that existing energy service providers as well as policy actors experience them as reluctant and relatively passive target groups which are difficult to address. Therefore, from the external perspective, a crucial hurdle is to get in touch with a partner, to stimulate action for the first time and to create a "demand-pull" for energy efficiency activities. Once measures have been successfully implemented and cooperation has taken place for a while, the access to follow-up activities is easier. From this perspective, innovative energy policy in the field of SME and municipal authorities can be primarily seen as a communicative, organisational and cooperative challenge, which emphasises the strategic value of network formation and marketing strategies.

7.1 Networking

For SME, the dissemination of possible efficiency measures and positive best-practice experiences through external relations, such as local and regional networks or branch-specific workgroups, provides a strong support for internal activities, mainly at the beginning of the process and during the last phase (Modell Hohenlohe 1997, Schilli 1996). Typically, the adoption of efficient energy technology in non-core areas of production is characterised by imitation rather than by invention of new solutions. In this context, pilot and demonstration projects gain special importance by allowing the development and testing of innovative technologies not yet taken by the target group itself. Positive examples provide the necessary proof of feasibility and reliability which is needed to convince hesitating decision-makers. Similar to SME, municipal bodies often need direct transfer of specific information during the stages of planning, decision, and realisation in order to uncover opportunites to act or to expand the range of options. Existing networks of municipalities (such as the Climate Alliance, Klima-Bündnis 1996) or associated service providers can facilitate common learning through the exchange of ideas and experiences. Under the current situation, however, municipal actors hardly undertake the systematic direct marketing of experiences, and bi-lateral communication relies on spontaneous and coincidential contacts of single actors. Starting from this point, strengthening the given networks can facilitate the inter-municipal exchange through pooling of information, better handling of communication flows and creation of specific platforms for direct cooperations. In order to increase the attractiveness of network relations in both target groups, the exchange of information and experiences should not be restricted to energy issues only. Empirical evidence emphasizes the value of deliberately using of existing links in core areas of activity or with regard to pressing problems (such as environmental regulation). Contrary to pure energy circles, networks orientated to a broader concept of resource efficiency promise to benefit from the manifold synergies between sustainability, organisational efficiency and competitiveness.

7.2 Marketing

In the context of professional communication and marketing of policy programmes and individual efficiency service offers, the findings suggest putting special emphasis on the differentiated analysis of the specific requirements, needs and characteristics of the various target groups. This differentiation plays a prominent role to prepare the ground for a more detailed market segmentation and the development of user-specific marketing offers. Taking the InterSEE results as an example, we derive the conclusion that industry - and even the SME sector - cannot be treated as a homogeneous target group. The empirical results suggested a typology for the SME sector which has been developed with regard to the two dimensions of technical and organisational capacity to act. It provides a first orientation on the characteristics of various implementation patterns, and the particular areas of strengths and weaknesses. Consequently, policy and service providers will not be able to design a suitable "one-size-for-all" offer, but have to develop strategies with distinct profiles and priorities which are offered to the specific sub-target groups. In the following Tab. 2, the four "customer" types and related implications for the role of external actors and networks are briefly sketched.

Table 2: Four company types and their implications for external relations

General characteristic	role of external actor	role of networking
Type 1 Advanced: energy efficiency has a high priority in all areas of action.	Firms are likely to realise RUE measures on their own, but they take any external support and opportunities to continue, develop and expand their activities	Actors from these companies are often active in energy or environmental networks, searching for new impulses and ideas and simultaneously striving for social recognition of their successful engagement, which motivates them to continue. They are easy to address.
Type 2 Motivated management: top-management decided to put more weight on energy efficiency but technical capability is still missing	Energy audits or other technical help could give impulses to realise energy efficiency measures, and service offers such as third party financing are suitable to overcome internal deficiencies	Participation in working group meetings provides orientation and the exchange of best practice examples serves as an important source of information and, thus, as a means to imitate successful activities.
Type 3 Technical solution: internal key actor with sufficient technical capacity is ready to undertake RUE projects, but top-management's commitment to energy efficiency is limited	External partners can strengthen the argumentation towards top management, e.g. via communication of best practice	The key actors of Type 3 companies benefit from personnel and technical support by network contacts, which provide additionally social recognition and motivation which they lack at home.
Type 4 Starters: lack both organisational and technical know-how	This type only realises very evident cost-effective energy efficiency measures and depends on external stimuli to start action (convincing energy audits through trusted external partners and clear proposal of economically feasible measures).	These firms hardly participate in networks, but working groups could provide fostering background to establish internal energy efficiency infrastructure

8 - POLICY IMPACTS

Up to now, the two areas of policy marketing and network formation have been underestimated in impact and synergetic potential, and neglected by energy policy-making. The empirical findings discussed above, however, point out the limits of traditional regulatory intervention and tax driven incentives when socio-economic process dynamics are concerned. In order to integrate the important domain of external relations into measures and strategies, strategies of social marketing provide a structure for an integrated design of market transformation programmes based on explicit use of existing social relations. The approaches are characterised by a gradual and cyclic process, consisting of the phases of analysis, concept elaboration or modification (targets, programme structure and organisation, marketing mix), development and refinement of measures, implementation, evaluation and feedback (Novelli 1984, Prose 1994). Core elements of social marketing strategies are:

Clear definition of the desired impact in the target group and related success criteria
Analysis of target groups and market mechanism
Design of actor specific ranges of instruments
Recruitment of a wide array of cooperation partners
Design of marketing and PR campaigns tailored to the specific target groups
Establishment of supportive networks
Evaluation and controlling of activities and programme performance

The Swiss and German RAVEL programme can serve as an example how to turn this concept into market transformation programmes (RAVEL 1996, EA NRW). These programmes are targeted as an economic strategy for stimulating and exploitating market potentials for efficiency technologies and services in order to strengthen

competitiveness, growth and employment in future markets. They follow the impulse programme principle (see Fig. 2): Experts prepare specialised seminars which provide the necessary background knowledge, ensuring that it is both practice-orientated and didactically sound. This includes course documentation, checklists, software tools, etc. These seminars are offered to professional associations and further education institutions, so that they are able to reach the various target groups within the framework of their well-established and widely accepted further education channels. A distinct feature of the impulse programme is to generate cooperation among the various energy service market players, from manufacturers to consumers, developers to suppliers, legislators to providers of finance, and specialists to the general public. Regular evaluation allows a permanent refinement and improvement of the programme.

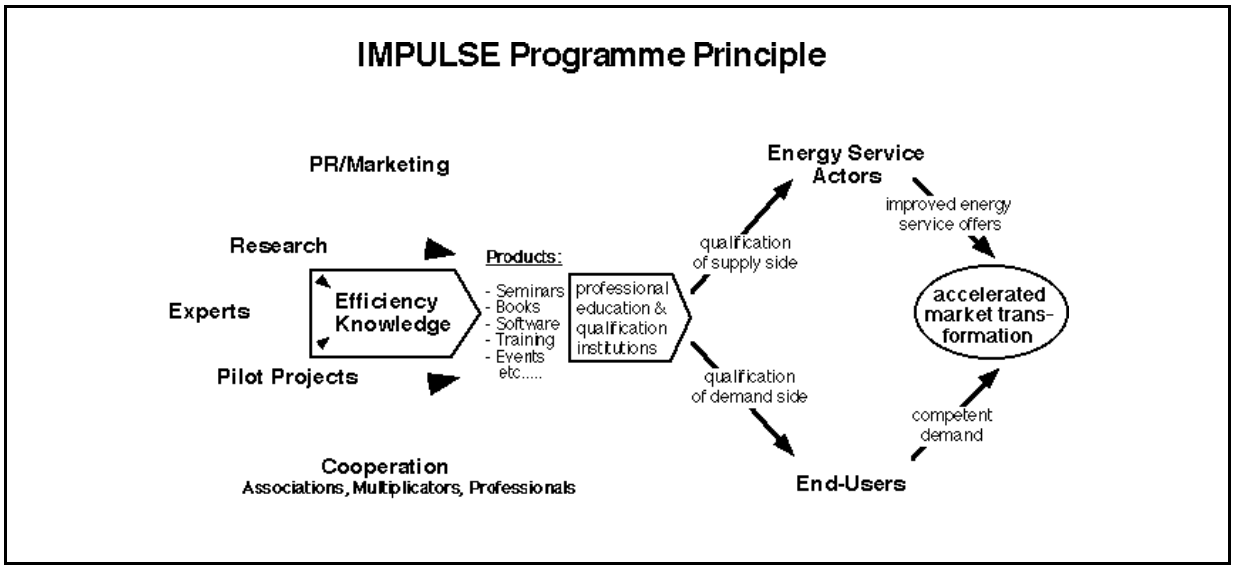

Figure 2: The principle of IMPULSE-Programmes for market transformation

9 - CONCLUSIONS

The empirical socio-economic research basis of this paper generated a new quality of insights into the implementation of RUE measures. Especially social, psychological and organisational determinants for energy efficiency implementation - which are often neglected and underestimated in their impact - could be identified. The empirical findings indicated that a large-scale implementation of profitable RUE measures in the target groups of municipalities and SME is not automatically enforced by internal activities, and in most cases external impulses were needed to trigger profitable RUE measures. The stimulation and management of energy efficiency projects require a motivational and communicative background as well as organisational capacities which - apart from a limited number of forerunners - are rarely given in these target groups. In this context, external actors serve as "door-openers", "process managers" and "coaches" for adopting of innovative technologies and social innovations, and thus, play a crucial role for market transformation in the target groups.

Therefore, in both target groups, the internal momentum of energy efficiency activities can be fostered and accelerated by economic and social marketing of energy services and external cooperation. Increased involvement into the rational use of energy in turn creates a growing demand for energy services and technologies - the vicious circle mentioned in section 7 can become a self-enforcing and interdependent growth dynamic. In this context, a high impact can be expected from policy support of network and communication infrastructures. As a guideline for strategic energy policy making, direct interventions aiming to remove obstacles to the rational use of energy should thus be combined with indirect measures, which try to generate a fostering environment to stimulate and enable external actors to provide adequate energy related support to SME or municipalities thereby improving the external milieu for energy efficiency activities (e.g. through grants and funds providing venture capital and assets for innovative service providers and third party financing models) (see Fig. 3).

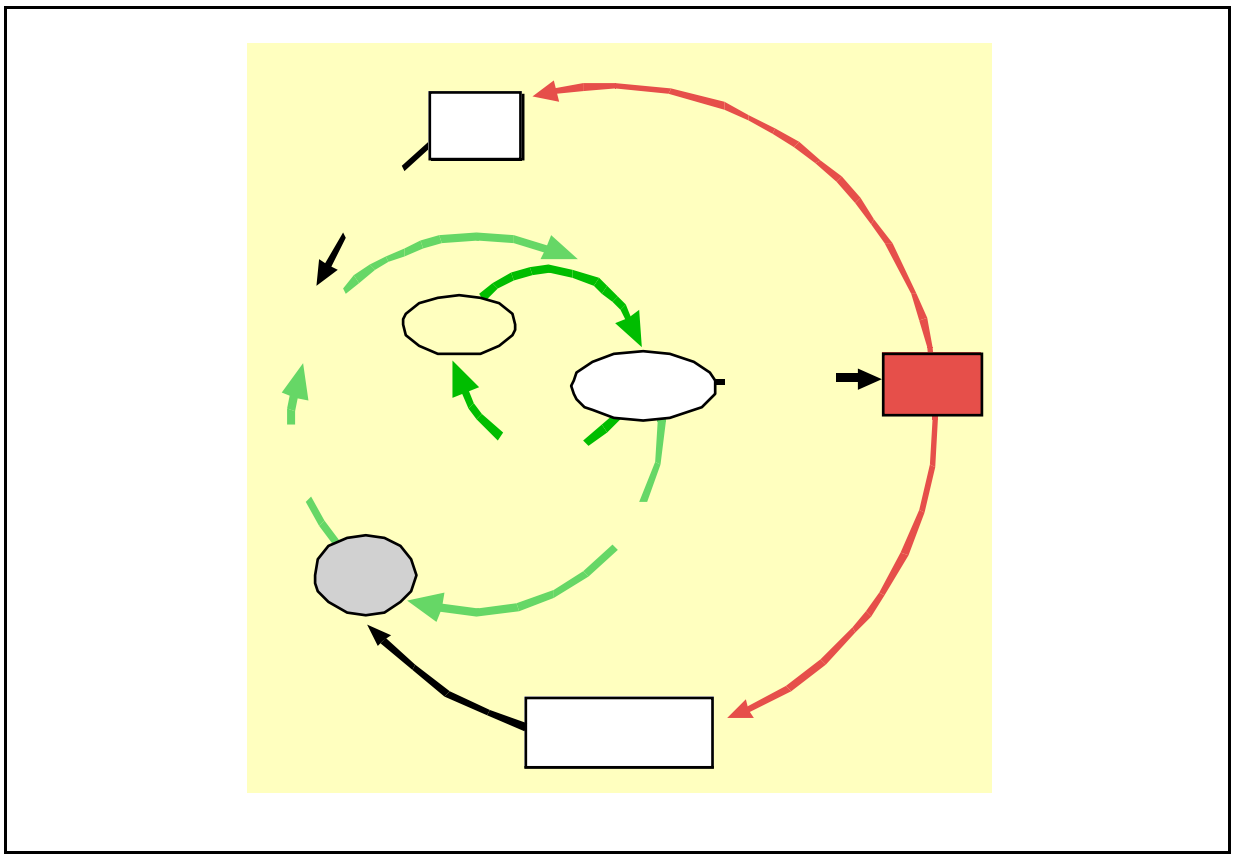

Figure 3: An integrated approach to energy policy-making

10 - ACKNOWLEDGMENTS

The authors gratefully acknowledge the financial support of the German Research Society (DFG) and the European Commission (DG12), and the contributions of the involved project partners Energieverwertungsagentur E.V.A. (Vienna), Fraunhofer Institute ISI (Karlsruhe), Institute for Local Government Studies AKF (Copenhagen), Institute for Psychology (Kiel), Amstein&Walthert (Zurich) and Bush Energie (Felsberg).

11 - ENDNOTES

(1) Most of the following findings for the SME sector are supported by the results from a similar empirical research project on the conditions for taking-up advanced energy technologies in larger industry (TTI 1998).

(2) The two different projects contained many different case studies, each of them with its own context and history. With regard to the need of general comparability for the empirical case studies, a similar concept for the interview procedure in both projects was derived. It served as an orientation for the interviews and the case studies in order to guarantee common standards of data collection and processing. The interviews have been condensed to significant core statements which describe crucial experiences and judgements expressed by the interview partner. They have been selected by the research team. By screening the core statements, the major positive impulses supporting the implementation of energy efficiency measures (fostering factors) have been identified and structured for each case. The set of fostering factors from all cases represented the basis for the cross-case analysis, where all sets of fostering factors were compared and a common pool of fostering factors was assembled from all the cases (cf. Lamnek 1993, Mayring 1990)

(3) It has to be stressed that the two projects did not aim to provide a representative analysis in a statistical sense. Due to the focus on qualitative aspects of successful processes, the goal of reaching a comprehensive coverage of sectors and RUE measures was of minor importance.

(4) cf. Gillissen et al. 1995, Velthuijsen 1995, Sanstadt, Howarth 1994, Krause et. al. 1993

(5) cf. the concepts of "gatekeepers" (Katz, Tushmann 1981) and "relations-promotors" (Gemünden, Walter 1995)

12 - REFERENCES

DECANIO, S. 1993. *"Barriers within Firms to Energy-Efficient Investments"*. Energy Policy, Vol. 21, No.9 (September 1993), p. 906-914.

ENERGIE UND KLIMA. 1990. *"Vol. 2 Energieeinsparung sowie rationelle Energienutzung und -umwandlungen, Vol. 10 Energiepolitische Handlungsmöglichkeiten und Forschungsbedarf"*. Bonn/Karlsruhe .

ENERGIEAGENTUR NORDRHEIN-WESTFALEN (EA NRW). *"Impulsprogramm RAVEL"*. http://www.ea-nrw.de

ENQUÊTE KOMMISSION "Schutz der Erdatmosphäre" des Deutschen Bundestages, Studienprogramm Band 3 Energie, Teilband II. 1995. *"Analyse von Hemmnissen und Maßnahmen für die Verwirklichung von CO_2-Minderungszielen"*, Fraunhofer Institut für Systemtechnik und Innovationsforschung, ifo-Institut für Wirtschaftsforschung, Gesellschaft für Energieanwendung und Umwelttechnik, Bonn.

GEMÜNDEN, H., WALTER, A. 1995. *"Der Beziehungspromotor: Schlüsselperson für inter-organisationale Innovationsprozesse"*. Zeitschrift für Betriebswirtschaft (ZfB), No. 65, p. 971-986.

GILLISSEN M. ET AL. 1995. *"Energy Conservation and Investment Behaviour of Firms"*. Vrije Universiteit Amsterdam, Dep. of Environmental Economics, Universiteit Utrecht, Department of Science, Technology and Society.

GRUBER E., BRAND M. 1991. *"Promoting energy conservation in small and medium-sized companies"*. Energy Policy 19 (1991), No. 3, p. 279-287.

HAUSCHILDT, J., SCHEWE, G. 1997. *"Gatekeeper und Promotoren: Schlüsselpersonen in Innovationsprozessen in statischer und dynamischer Perspektive"*. Die Betriebswirtschaft (DBW), Vol. 57, No. 4, p. 506- 516.

HERMES, H. ET AL. 1998. *"Tools for the dissemination and realisation of rational use of energy in small and medium sized enterprises"*. University of Stuttgart, Institut für Energiewirtschaft und Rationelle Energienutzung (IER), Forschungsbericht Band 45.

HOWELL, J., HIGGINS, C. 1990. *"Champions of Technological Innovations"*. Administrative Science Quarterly, No. 35, p. 317-341.

IFP/ISI/WI [Projekt Klimaschutz/Institut für Psychologie, Fraunhofer Institut für Systemtechnik und Innovationsforschung, Wuppertal Institut]. 1997. *"Interdisziplinäre Analyse der Umsetzungschancen einer Energiespar- und Klimaschutzpolitik: Hemmende und Fördernde Bedingungen der rationellen Energienutzung für private Haushalte und ihr Akteursumfeld aus ökonomischer und sozialpsychologischer Perspektive"*, Kiel/Karlsruhe/Wuppertal

IFP/ISI/WI [Projekt Klimaschutz/Institut für Psychologie, Fraunhofer Institut für Systemtechnik und Innovationsforschung, Wuppertal Institut]. 1999. *"Mobilisierungs- und Umsetzungskonzepte für verstärkte kommunale Energiespar- und Klimaschutzaktivitäten"*, Kiel/Karlsruhe/Wuppertal.

INTERSEE. 1998. *"Interdisciplinary Analysis of Successful Implementation of Energy Efficiency in Industry, Service and Commerce"*. Project under the JOULE Programme of the European Commission DG XII, Wuppertal Institute, AKF-Institute for Local Government Studies, Energieverwertungsagentur, Fraunhofer Institute ISI, Institute for Psychology/Uni Kiel, Amstein & Walthert

KATZ, R., TUSHMANN, M.. 1981. *"An investigation into the managerial roles and career paths of gatekeepers and project supervisors in a major R&D facility"*, in: R&D Management, No 11, p. 103-110.

KLIMA-BÜNDNIS EUROPÄISCHER STÄDTE MIT DEN INDIGENEN VÖLKERN DER REGENWÄLDER ZUM ERHALT DER ERDATMOSPHÄRE / ALIANZA DEL CLIMA E.V. (Klima-Bündnis). 1996. *"77 Klima-Bündnis-Ideen: Beispiele aus der kommunalen Bildungs- und Öffentlichkeitsarbeit"*, Frankfurt a.M.

KRAUSE F. ET. AL. 1993. *"Cutting Carbon Emissions: Burden or Benefit?, The Economics of energy-tax and non-price policies"*. Energy Policy in the Greenhouse, Volume II, Part 1, INTERNATIONAL STUDY FOR SUSTAINABLE ENERGY PATHS (IPSEP)

LAMNEK, S. 1993. *"Qualitative Sozialforschung"*. Band 1. Methodologie. (2.Ed.). Weinheim.

MAYRING, P. 1990. "Einführung in die qualitative Sozialforschung". Munich.

MODELL HOHENLOHE. 1997. "Fördergemeinschaft betrieblicher Umweltschutz", D-74638 Waldenburg, Germany

NOVELLI, W. 1984. "Developing Marketing Programmes". In: Frederiksen, L., Solomon, L., Brehony, K. (Eds.), Marketing Health Behaviour, pp. 59-89, New York, 1984

PROSE, F. 1994. "Ansätze zur Veränderung von Umweltbewußtsein und Umweltverhalten aus sozialpsychologischer Perspektive". Senatsverwaltung für Stadtentwicklung und Umweltschutz Berlin (Eds.): Neue Wege im Energiesparmarketing, Materialien zur Energiepolitik in Berlin, Vol. 16/1994, p.14-23

RAVEL (Impulsprogramm RAVEL). 1996. "RAVEL Kompetenz: Schrittmacher für nachhaltigen Erfolg". Final Report, Bundesamt für Konjunkturfragen, Bern.

ROGERS. E. 1995. "Diffusion of Innovations", 4th. Ed.

SANSTADT, A., HOWARTH,R. 1994. "Normal markets – market imperfections and energy efficiency". Energy Policy 22(1994)10, p. 811-818.

SCHILLI, A. 1996. "Energy Management Model - Case studies of the Energy Model Switzerland and Energy Model Zurich". Amstein&Walthert AG, Zurich.

THE TAVISTOCK INSTITUTE (TTI) (Ed.). 1998. "Understanding the take up of advanced energy technologies". Final Dissemination Report. The Tavistock Institute, AROC, Danish Technological Institute, Free University Amsterdam, London.

VELTHUIJSEN J. 1995. "Determinants of Investment in Energy Conservation". Rijksuniversiteit Groningen.