The programme should work, but will the stakeholders deliver?

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Keywords

Abstract

Designing a programme to promote rational use of energy requires understanding of economic theory, the understanding both of the market and of marketing in order to promote take-up, and good systems design. There must be a delivery agent and a target group. Does it make any difference who these people (or organisations) are? What needs to be understood about other stakeholders in the programme? How are they involved and what can be done to ensure that they assist the programme rather than present a barrier to its success?

An ALTENER funded research project running since 2003 has included analysis of these issues in order to discover how publicly funded programmes delivering rational use of energy (RUE) and renewable energy systems (RES) policies can be made more successful.

Using a framework for stakeholder behaviour adapted from theory of reasoned action coupled with social network theory, the paper identifies the "success factors" that make it more likely that a programme will be delivered by the intermediate stakeholders. The framework is tested through analysis of data collected on forty-six RUE & RES promotional programmes in seven European countries. As a result it has identified various characteristics of key stakeholders in their cultural context together with key scheme design issues that put a programme at greater risk of failure, or of only partial success. This paper presents those factors and characteristics and suggests ways in which programme designers can improve their chance of success through incorporating key stakeholder issues.

Introduction

How should a programme that implements a strategy for rational use of energy (RUE) be designed to maximise the support of, and delivery by, intermediate stakeholders? This is the central question of this paper, which is based on work carried out as part of a larger project to develop a computer model that predicts the optimum design for renewable energy sources (RES) and rational use of energy (RUE) policies in Europe. The project, INVERT, was funded by an EU ALTENER grant and led by the Energy Economics Group (EEG) at the Technological University of Vienna. It commenced in May 2003 and was completed in April 2005 with the presentation of the INVERT computer model at a conference in Brussels. This paper is based on workphase 4, *Analysis of Stakeholder Behaviour*, which is described in a report (Pett et al, 2004) available on the project website (www.invert.at). The project partners are acknowledged at the end of this paper.

The basis for the INVERT model is the examination of economic potential by using *dynamic cost curves* (Kranzl et al, 2004). This takes the approach of identifying the potential for the application of energy efficiency or renewable energy measures based on the building characteristics of the region in question , i.e. number, types sizes of buildings, their orientation to the sun, their construction types; plus regional information such as the potential for renewable energy sources, existing energy production, cost of fuels, together

with population characteristics. The model then develops the facility to predict the response by the end user to various promotion schemes such as incentives or subsidies. The assumption is that the end-user will behave rationally, so that if a choice is presented that is more cost-effective, it will be adopted. There is a reluctance among many economists to apply a sociotechnical dynamic to their models (Kemp 2000); work phase 4 of this project, however, was designed as an analysis of stakeholder responses to various policy interventions. It acknowledged that stakeholders are rarely perfectly rational in the economic sense. They do not possess the perfect knowledge of the market that is required for the economic model. Instead their behaviour is determined by bounded rationality (Samuelson & Nordhaus, 1989), making the best use of the knowledge at their disposal and making their own (possibly subconscious) judgement on whether it is personally cost-effective to pursue further information before making a decision. In short, successful programme design is about much more than setting the level of subsidy, tax or interest rate at the economically optimal level.

The first aim of the work carried out for the INVERT project is to identify how promotion schemes can be designed to increase the likelihood of achieving the desired stakeholder response. By examining a number of promotion schemes from seven European countries could we identify a set of design factors that were more likely to be linked with scheme success? The intention was to link to the INVERT model using the concept of risk to project delivery. Could the issues relating to programme design or delivery that affected or were affected by stakeholders' actions be identified and applied as risk factors to the RUE and RES take-up potential and programme delivery cost calculated by the INVERT model? Although a candidate set of risk factors were developed as presented here, they were not implemented in the model due to project time constraints. The complexity of such an implementation was probably underestimated by the team whilst the feasibility of doing so was probably overestimated.

According to our research, no previous work had been undertaken to evaluate the way stakeholders (participants in the design and delivery process) respond to and participate in a programme, although there is considerable research on how the end-users or target audience of a programme respond (by behaviour or take-up). Also according to our research, there were no directly comparable research projects in the energy field that described a model of stakeholder behaviour. Accordingly, the second aim of the project, and the main purpose of this paper, is to develop a framework for analysing stakeholder behaviour in such a way as to make it possible for non-specialists to describe and collate the relevant information. In this paper, therefore, we explain our model and discuss the outcomes of our sampling of programmes from seven European countries, and conclude that there are approaches to designing programmes to deliver energy efficiency that have a greater chance of successfully engaging those stakeholders on whom programme success ultimately depends.

Development of a framework for analysing stakeholder behaviour

There were three stages to developing a framework by which stakeholder response to programmes and promotion schemes could be assessed:

- Review of previous research and theories in this area

- Development of a conceptual framework for stakeholder behaviour by applying systems thinking to the integration of different theories

- Development of appropriate indicators that could be evaluated by partners without prior knowledge of behavioural science

Most research identified during this project concerning stakeholder behaviour is in connection with management theory, particularly in light of adverse action by anti-globalisation organisations. This research focuses mainly on evaluation processes using stakeholder analysis, or analysing stakeholder responses, but these do not analyse the behaviour of the stakeholders themselves, only extract their opinions. We needed to obtain evidence of stakeholder response to a programme, and identify the key parameters that could stimulate that response. Evaluating 'response' suggested use of more classic ecological routes such as Stimulus - Pathway - Response models, Behaviour Classification, Feedback Loops, Networks and Social Capital (see, for example, Odum 1997). An alternative approach to the task of assessing why stakeholders took part in a programme (or not) would be by barrier analysis (including learning barriers such as unworkable theories held and organisational defences), stakeholder characteristics (goals, ownership, commitment) and stakeholder interaction theories.

Behaviour Classification would allow investigation of what makes actors respond in certain ways. This is demonstrated by research into why users choose to read a particular journal (Baldwin 1998). The model developed identifies independent variables on which the user cognitively operates to make a decision – leading to the behaviour to 'use' or 'not use'. However, feedback may lead to a return visit which may reinforce the initial decision or change it. This suggested the need to identify the questions that a stakeholder would ask in order to reach the decision to participate in a programme. Whilst this is a possible approach, we discarded it on the basis that establishing such a decision-tree was beyond our available resources. We needed to identify a route whereby we could ask our partners for data and analyse it ourselves.

However, the idea of a decision-tree suggests that the stakeholder behaviour framework for INVERT might need to identify factors in programme design that affected the decision made: to act or not to act? This suggested the behaviour or output we were seeking was whether the stakeholder behaved in the way that was expected by the scheme designers, or influenced others to act (if this was not the expected behaviour) in a positive or negative way. An example of this might be architects acting as the advisers for an incentive programme to build super-insulated houses. The programme might rely on the architects promoting this design to the builder. If the architects did not do so, they would not be acting in the expected way. Furthermore, if they actively

dissuaded builders from adopting the programme, they would present a negative influence. Thus from Behaviour Classification theory we drew the critical output indicator: did the stakeholder behave in the way that was expected, and if not, did they influence others (in a positive or negative way) or did they not act at all.

What are the roots of the decision to act? It is likely that stakeholders do not act in isolation. Does the model need to identify the influence of stakeholders on each other? If so, it suggests a *network approach*, or an analysis of social capital as discussed below. Models of stakeholder interaction have been developed, such as *agent-based modelling* (ABM). This approach was used by the International Centre for Integrative Studies, University of Maastricht, in their work as a partner in a project to improve river water management (Krywkow, 2002). They combined ABM with a concept model to predict management of river water processes. It was based upon a complex or *cognitive agent* approach developed by social psychologists. The internal structure of a cognitive agent consists in principle of goals and beliefs. Goals are states of the world desired by a particular agent. It is assumed that agent activities are directed towards goals, whereas beliefs represent particular perspectives or world views of an agent.

This promoted a number of useful concepts, particularly the need to appreciate that the agent's goals and beliefs in building the framework for analysing behaviour supplies the context to their decision making. This has synergy with the understanding of the networks and social capital involved in shaping policy responses.

The majority of the literature on human behaviour, stakeholders and participation that was useful in this research was found on Australian and New Zealand sustainable development networks. How to engage stakeholders and how to change their behaviour has given rise to a number of modelling approaches in this region, such as Landcare Research (Allen et al, 2002) who applied the *theory of reasoned action* proposed by Ajzen & Fishbein (1980) to the problem of getting farmers to adopt a particular tuberculosis control. The decision to act (or not) is rooted in two key "vectors"; personal beliefs and attitudes, and social pressure to take action. The influences on these vectors can be broken down further into a hierarchy of vectors, or factors, such as perception of importance of the issue, ability to take action, cost of measures, cost/importance compared with other priorities and others. The *context* of the decision making was also seen to be important in the New Zealand research. This included the nature of the local society, the support networks, the amount of activity promoting the issues, all the activity that the farmer needs in order to receive information for decision making and the stimuli for action. This wealth of additional support is described as the *social capital*.

These approaches led to the development of the conceptual framework for INVERT stakeholder behaviour. It aims to consider the influences on both individual and organisational behaviour and place them within a context that can distinguish specific social and cultural factors. This cultural context, especially in a pan-European analysis, is crucial to our understanding of stakeholder behaviour in response to programmes.
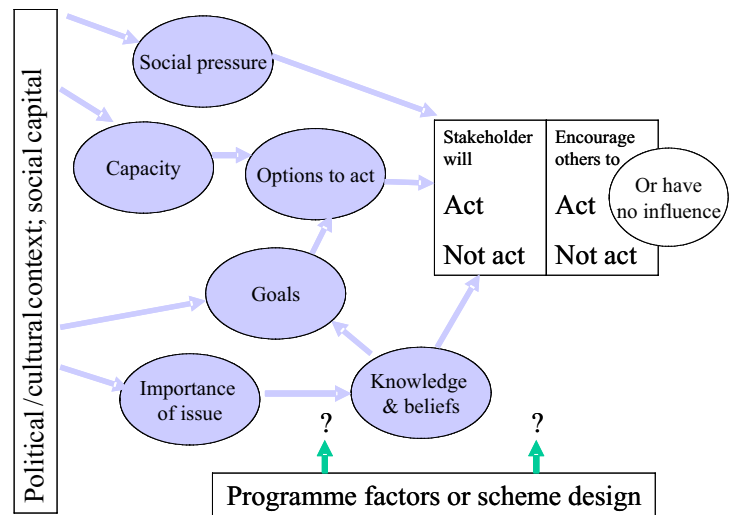

Figure 1. *Framework for evaluating stakeholder behaviour.*

The conceptual framework shown in Figure 1 was developed by applying a systems approach to integrating the theories discussed above:

- behaviour classification describes the type of actions observed

- agent based modelling supplies the context of goals and beliefs leading to actions taken

- the theory of reasoned action suggests that observable behaviour is the result of the stakeholders' knowledge and belief system, coupled with the goals and capacity to act. In turn, knowledge and beliefs are formed as a result of other factors such as the perceived importance of the issue and the options available to act, information about which may be supplied in part by the policy or promotion scheme design itself

- social capital i.e. the social, cultural and political context, which has a particular bearing on organisational goals, and social pressure to take certain actions.

Once this conceptual framework had been drawn up, the nature of indicators that could be measured by partners needed to be determined. How could the project partners identify the goals, knowledge/beliefs, and capacity of stakeholders? What policy or programme design factors could be determined as generic indicators, and how could the political and cultural context be described in most countries for the period of operation of the programme concerned? Could project partners, most of whom had no prior training in or knowledge of behavioural science, really assess the behaviour of stakeholders? This required the framework to be translated into a set of indicators for each factor to be analysed, and for the information described by those factors to be easily identifiable from public sources by the partners. If this could be achieved, then the behaviour of the stakeholders, and the factors leading to those actions, could be analysed for each programme.

FROM FACTORS TO INDICATORS

For each of the factors in the conceptual framework (Figure 1), an indicator was developed, with consultation with the partners to check that they made the same interpretation and could recognise potential sources of information on which to base their judgement. Factors that are shaded in the diagram relate to the specific stakeholder whereas unshaded factors are contextual or related to the programme itself.

Bearing in mind the 'triple bottom line' approach of sustainable development to consider social, environmental and economic goals, we drew further from organisation theories such as those developed by Handy (1976) to suggest organisational *goals* classified into political, social, environmental, commercial, religious and military (or security or defence). The selection of these was partly influenced by feedback from partners when considering particular stakeholders that might be included. 'Military' was included due to their influence on land use for renewable energy plant in some countries. By rating each of these on a scale from 0 (low/none) to 3 (high), differentiation could be achieved between organisations that were commercial but had a strong environmental sense (as evidenced from their environmental policies), campaigning organisation that might have strong political sense but were not concerned with commerce, and a range of other goal mixes. These could be assessed from public statements by and about the stakeholder concerned (from a statement of their aims and objectives, for example).

Capacity of the organisation to carry out work could be divided into financial, people, physical and 'know-how' resources. Financial and people resources are probably self-evident. Know-how refers to the type of intellectual or technical knowledge that could be brought to their involvement in an RES or RUE programme, and is particularly relevant for stakeholders acting in an advisory capacity within the programme. Physical capacity generally refers to the assets of the organisation, principally land or buildings that are relevant to their role as a stakeholder.

Knowledge and beliefs in the model was translated into an assessment of knowledge and attitude to learning on the one hand, and involvement in the issue and willingness to be involved on the other. These were felt to be slightly more likely to be assessed by the partners than belief in the subject matter, which is generally not easily assessed by outsiders, whereas the indicators stated could be assessed from evidence such as reported activities.

It was also felt useful as a headline indicator to know the stakeholder's *organisation type*. A typology was developed that ranged from government department through government agency, non-governmental organisation (NGO), commercial business, trade union, special interest group (especially for community groups), to private individual. Although some similarity could be expected between some organisation types and their goals, it was not assumed that all organisations of the same type had the same goals. It was of particular interest at the early stages of the project whether some stakeholders were different in their behaviour and could be classified by shared goals rather than shared types. A further distinction emerged during the analysis, and fortunately the data had been collected which allowed analysis of the organisation's role or function in the programme or promotion scheme. *Organisation role* was classified retrospectively into three groups; scheme initiators (and *responsables*[1]), intermediaries and end-users. These three groups were sub-divided into the most common forms of role cited by the partners, as shown in Table 4.

The *political and cultural contexts* were assessed by the use of evaluation matrices. These allow a common language and rating system to be used for ranges of political and cultural styles and are referenced in the project report (Pett et al 2004). In the event the political context gave no additional assistance to the analysis. However there were two distinct cultural styles into which most programmes fell, and there were significant differences in some of the outcomes, which will be discussed later in this paper. *Business capital* was, we felt, adequately addressed through the capacity indicator, but *social context* was considered in the light of interaction of the stakeholders with others, and again, an evaluation matrix was utilised to determine the previous relationships of the stakeholders with each other. We believe this is a promising approach to use as a number of theories emerged from analysis of data collected, but none could be tested and verified within the resources of the project.

Turning away from the stakeholders, it was also necessary to analyse generic scheme designs so that indicators could be described for a range of different programmes and schemes. Working through the stages of development of a scheme design the indicators selected were: *scheme type* (financial, non-financial, both, with subsets to classify specific scheme types of interest to the INVERT project), whether the scheme promoted *RUE*, *RES* or *both*, the *marketing* and publicity involved, any additional *resources* provided, and the *technology* included. In this sense we used 'technology' in the extended way that covers skills, abilities, knowledge, systems and processes as well as machines or equipment (van der Vorst et al, 1999) and specifically citing the inclusion of R&D, demonstration sites and use of videos and other visual media for dissemination of technical information. It could be argued that marketing and resources are also technology, but these were specified separately for ease of use. We also included a marker for whether the stakeholder had been involved or *consulted* during the development of the programme. One key scheme design factor was whether the programme or scheme was *successful*. For this we developed an evaluation matrix approach as shown in Table 1. There is a logical fault in this matrix: the rating does not scale in a proper progression: 6 is a worse outcome than 5, which is the option that best describes a successful project. This was not noticed until the analysis had begun but, fortunately, there were no programmes rated 6 so the matrix could be used as a rating scale with no adverse effect on the analysis. It is also arguable that 1 is a better outcome than 2, but again no '1' responses were received.

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1. *Responsables* is used in the French manner to describe those people or organisations who have a (legal) responsibility for the delivery of goods or services including internal services

Table 1. Qualitative rating scale for the success of the policy.

Rating	Description
6	The programme was very successful - met nearly all or all of its objectives, but overspent budget
5	The programme was very successful - met nearly all or all of its objectives
4	The programme was partially successful in achieving its objectives and led to greater understanding of the issue or helped more successful programmes to follow
3	The programme was partially successful in achieving its objectives but maybe not cost-effective
2	The programme was not very successful in achieving its objectives and used most of the money allocated to it
1	The programme was not successful and was abandoned before much money was spent

In response to a request from the partners, a marker was added to note whether there were known reasons for any lack of success for financial rather than stakeholder-related reasons (e.g. subsidy too low to stimulate take-up). It was not clear in the analysis whether this added any information to the overall assessment of stakeholder behaviour.

Finally the indicator of the stakeholder behaviour was also required. As described earlier, the key issue was whether the stakeholder has acted in the expected way or not. If not, then had other action been taken, including influencing others, and has the action been helpful or not, or actually hindered the programme? The scale set up to capture this information is shown in Table 2.

As a refinement, it was possible for the behaviour to be reported at the start, middle and end of the scheme, in case there was a change in behaviour during the period of the promotion.

In summary, the conceptual framework allowed the proposal and collection of data for a set of indicators through which factors influencing a stakeholder's behaviour in a scheme could be assessed. In the next section, we identify the methods used and the information gathered, before discussing the results of the analysis.

Stakeholder response to programmes analysed

During the INVERT project, the seven project partners had analysed programmes to promote energy efficiency and renewable energy sources in their countries in order to provide the basic framework for programme structure analysis. This meant that the basic information on programme factors had been collated, although more detailed information was required on the elements contained in the programme such as marketing or publicity for the scheme, education programmes, demonstration facilities, and any other resources made available to stakeholders. The political, cultural and social capital were captured by means of an assessment of the social and economic structures within the country (or region) at the time of the programme. All of these issues were relatively easy for an objective assessment by the project partner, especially where a formal review or evaluation had been carried out.

In order to obtain stakeholder data, two approaches were considered; firstly, the project partner to make their own assessment based on available evidence such as knowledge of the sector, company documents such as annual reports, evaluations if noted, and where necessary personal experience. This meant that the assessments were subjective. The alternative was to send questionnaires to the stakeholders con-

Table 2. Rating scale for stakeholder action.

Rating	Behaviour
5	Carried out expected role
4	Carried out different role that helped the scheme
3	Did not carry out expected role
2	Carried out different role that hindered the scheme
1	Prevented others from carrying out their roles

Table 3. Schemes and stakeholders by country.

Country	Schemes	Stakeholders
Austria	5	27
Denmark	7	31
Germany	7	41
Greece	7	35
Poland	6	26
Portugal	7	34
United Kingdom	7	31

cerned. The latter was rejected on three counts; time and logistics needed for explanation and turn around, expense, and the likelihood of an equally subjective response. A 'fair' analysis from the partners was thought more dependable, equally valid and more likely to promote consistency at least for the country's own programmes.

An excel spreadsheet covering all the indicators and their scales, plus evaluation matrices as appropriate, together with guidelines were supplied to the partners, and the process was examined at a project meeting. The partners, mainly engineers, energy specialists and systems analysts, found the prospect daunting initially, but by working through an example and discussing ideas, and offering a "test run" they became very positive towards the exercise. In all, data for forty six programmes were collected by the partners, addressing 226 key stakeholders and their relationships. Nearly half the schemes (21) were considered fully successful (rated 5). 13% were rated 2 (not successful and used the budget), 18% rated 3 (partially successful, not cost-effective) and 22% rated 4 (partially successful, improved understanding). The countries represented and the distribution of programmes and stakeholders is shown in Table 3. The fewest identified stakeholders in a scheme was 3, the greatest was 7.

Some stakeholders were repeatedly featured in the examples provided by some countries; often these were government departments or agencies responsible for RUE and

Table 4. Role types and distribution.

Role type		Description	Stakeholders (n=224)	
			Number	%age
Initiators	11	Set up / design scheme	16	7.1
	12	Manage scheme	20	8.9
	13	Set up and manage scheme	12	5.4
	14	Fund scheme /subsidies	5	2.2
	15	Set up and fund scheme	11	4.5
	16	Provide finance (commercial or loans)	8	3.6
	17	Inspect or certify scheme outputs	18	8.0
Intermediaries	21	Promote scheme (market, educate, campaign)	22	9.8
	22	Inform or advise end users of opportunities	14	6.3
	23	Other intermediary or enabler	23	10.3
	24	Affected business (passive)	10	4.5
	25	Provide technical input to scheme or products	16	7.1
End-users	31	Apply for /adopt scheme (active end-users)	43	19.2
	32	Receive outputs of scheme (passive end-users)	6	2.7

RES. It was considered possible that this repetition introduced bias into the analysis, however this was balanced by the counteracting consideration that the same stakeholder may carry out a slightly different role or behave differently in different schemes.

The schemes were equally distributed between those that addressed RUE or RES or both; 63% were financial schemes such as subsidies and soft loans. The non-financial schemes included regulation including building regulations (20% overall) and certification schemes (11%). Financial schemes tended to include more stakeholders than non-financial programmes.

The roles undertaken by stakeholders, and their distribution within the sub-roles are shown in Table 4. As can be seen, the number of stakeholders falling into each category is small. Nevertheless, some statistically significant issues can be identified from our sample, although whether these are reliable, i.e. can be replicated amongst all stakeholders needs testing through further research.

HYPOTHESIS TESTING

The aim of the analysis of the data is to identify features of programme design and stakeholder interaction that suggest factors that are associated with scheme success or lack of it. The first stage, however is to determine whether the basic premise of our framework is correct, that there is a relationship between the indicators and stakeholder behaviour; and whether stakeholder behaviour is actually a factor in the success of a scheme.

The first hypothesis tested was whether stakeholder behaviour was correlated with programme success. This was an important hypothesis, as if we found there was no relationship between stakeholder behaviour and the success of the scheme we had a result of no interest for scheme designers and possibly one that would weaken the arguments of behavioural scientists in policy development. It is arguable whether our two rating scales show a comparable progression, and indeed only a weak correlation (0.37 on the range -1 for negative correlation to +1 for positive correlation). Testing only schemes without a known financial reason for lack of success did not effectively alter this. However, as the majority of stakeholders carried out their expected roles

(74%) and most schemes were judged successful as shown above, we compared successful schemes (rated 5) with non-successful schemes (rated 4 or below) and found that there was a significant difference between the two groups for the percentage of stakeholders who carried out their roles as expected. This means we could test successful schemes against all others, and we found that successful schemes tended to have stakeholders who carried out the roles expected of them and vice versa.

Is this self-evident? Are schemes successful because stakeholders carry out their expected roles? Or should the question ask whether the stakeholders actions make the scheme successful? We cannot answer the question of cause and effect, but we can determine whether there are issues about the design of the scheme that are linked with stakeholder actions. This is our second hypothesis: expressed as a null hypothesis we had to disprove "design factors have no relationship with stakeholder behaviour". Because of the design typology, we were limited at this stage to proving statistical significance in the design factors where there were simple responses; this showed that schemes that involved stakeholder education, involvement in scheme design or additional resources, there was a significant difference in the numbers of stakeholders carrying out the expected role than for those that did not include those factors.

Having determined then, that our results do in the majority of cases show a relationship between stakeholder behaviour and schemes success, and that design features do have an association with stakeholder behaviour, the aim was to identify those design factors or indicators of stakeholder behaviour that had the strongest relationships with scheme success. In other words, which parts of our conceptual framework were the key issues related to the desired stakeholder response?

GOALS, CAPACITY AND KNOWLEDGE & BELIEFS

The indicators developed to characterise the framework were tested exhaustively against both success rating and stakeholder behaviour ratings. Although it might be expected, it was clear that the attitudes of organisations such as businesses and NGOs to the issue, and their willingness to take part, correlate strongly with their behaviour in taking

part. This suggests that when engaging stakeholders, if involving an NGO or commercial organisation adds value, then time should be taken to ensure they are willing to take part. It is also particularly interesting that most stakeholders who have strong environmental goals are associated with scheme success (correlation >+ 0.5). For NGOs, on the other hand, environmental goals give no indication of scheme success (at -0.04); however with NGOs, 'know-how' was associated with successful schemes. Financial resources, however seemed to have a negative association for NGOs and behaviour i.e. those with greater financial resources were *less* likely to carry out their expected role in the scheme. End-user businesses, i.e. those commercial entities targeted by schemes seemed to be associated with scheme success if they had strong environmental goals and a good attitude to the issue, but if they had strong finances, people and know-how, they were less likely to be involved in successful schemes. This supports the observed difficulty of engaging large businesses without directed self-interest in RUE and RES in successful energy policy initiatives.

One of the aims of this research was to identify key issues that could be identified by scheme designers in order to feed into the INVERT model, as described in the introduction. To this end we suggested the concept of risk factors affecting RUE/RES take-up and programme delivery cost. Through application of multi-variate statistical techniques, a number of indicators emerged as candidates for careful assessment as to their significance in affecting programme success. As the sample size for some indicators was small, only those with a reasonable population in the context of the data collected (number of schemes in sub-sample greater or equal to 15) were considered sufficiently reliable to be followed through. This approach enabled the following to be proposed as the main risk factors for programme success, with implications for programme design:

- The type of organisation that initiated the programme

- The role this organisation plays in design or managing or funding the programme

- The type of organisation required to certify, inspect, licence or give any specific approvals for the scheme to be taken up (this does not include normal audit type approvals)

- Whether end-users are likely to rely on third parties (i.e. not the originator or managing agent/promoter of the programme) to influence their decision to participate in the scheme

- The type of marketing planned for the programme

- The way the technologies are to be introduced

- Whether intermediate stakeholders (i.e. not the initiators: policy owners, designers, managers or funders) are involved in the design of the scheme e.g. through consultation process

These issues are considered to be the easiest for the promotion scheme designer to consider as they require no in-depth analysis of specific stakeholders. However, the issues of goals and beliefs should be taken into account; the easiest way is not to analyse these, but to engage with the stake-

holders during a consultation process, when the suggestions and counter-proposals will arise from their goals and beliefs, as well as their existing knowledge. It is possible to design an element of information provision into such a consultation process to raise the levels of knowledge during the design stages. The description of these main risk factors is developed in the following paragraphs.

The type of organisation that initiated the programme

The analysis showed that where programmes were initiated by organisations other than national government (or a government agency acting for the government), there was a lower success rating. This lower rating included programmes initiated by local or regional government. This may be influenced by the relatively small number of programmes surveyed initiated by regional government, but one might suggest that the political landscape changes more quickly and may be more dependent on personality in some local administrations than in national ones. Consequently the first issue in the design of programmes is whether the stakeholder initiating the programme has the political will, power and ability to see the programme through.

The role this organisation plays in design or managing or funding the programme

There were significant differences between the success of schemes where the originator set up and designed only; set up and managed it; or set up and funded it (with management by a third party). The most successful combination was the third option: government body setting up the scheme and handing it to a third party to run. However, where a government body was responsible only for funding a scheme, there was a high risk of lack of success. This has face validity: withdrawal of funding for political reasons has no other penalty if there is no other organisational involvement, therefore there is a risk of failure to commit fully to a scheme. The more successful option has government concentrating on the initiation and general support with the third party managing agent accountable for the smooth running of the programme.

The type of organisation required to certify, inspect, licence or give any specific approvals for the scheme to be taken up

A large number of schemes required an inspection or third party approval of some type. Examples include:

- Verification of installation of measures before a grant is paid

- Inspection and approval of building standards

- Licensing or planning consent for renewable energy plant

It did not seem to make a difference whether the type of organisation involved was a government, non-governmental or commercial organisation. The existence of this requirement was shown to be a weak spot in the design of the schemes. The most successful approach was to contract the inspection to a commercial organisation; there was a business benefit for this work to be done. The least successful appeared to be when the task was allocated to a government or local government department. Two issues seemed to be common: lack

of resources for or interest in carrying out the additional work and lack of consultation over how such inspection or licensing would work in practice. The most outstanding example of this was a national energy department failing to achieve licences for renewable installations in specific areas as these needed environmental impact assessments from the same country's environment department.

Whether end-users are likely to rely on third parties to influence their decision to participate in the scheme

The risks are that end-users place their trust in advisers who do not agree with the change being promoted, or it is not in the adviser's own interest to persuade the end-user to take up the scheme. One respondent in the survey classed stakeholders as 'positive architects' and 'negative architects' in order to classify stakeholder behaviour of different interest groups. The positive architects understood the issue (sustainable housing) and believed it was in everyone's best interest for the end-user to take up the scheme (in this case a subsidy). Negative architects, we assume, felt that the extra work was not worth the effort, the subsidy not sufficient to promote change, and consequently tended to dissuade potential end-users from taking up the scheme.

Where there was a positive information flow that enabled clearer understanding especially of the technical issues, it offset the reliance on those acting in their own self-interest, or those just out of touch with modern science and building practice. It should be pointed out that programmes involving architecture professionals were generally well supported by their professional body, but this should be a design feature for a programme of this nature.

Limitations on data collected did not enable the validation of this issue (third party promotion) against the type of marketing planned (next point), but the issues could be connected.

The type of marketing planned for the programme

Linked with the above, where marketing was included and directed by the scheme owner to the end-user, it increased the chance of success. The suggestion is that it is well focused and professionally handled. Other approaches, except for marketing by both owner and agent for the scheme, had a neutral effect. Strangely, marketing that was carried out both by the scheme owner and the agent was associated with a lower chance of success; the two logical alternative explanations are firstly, the different marketing messages confused the end-user, and secondly the programme itself was sufficiently difficult to put across or unpopular that it required heavy marketing. The problem here is the need for additional marketing for a risky programme rather than the risk relating the marketing itself.

The way the technologies are to be introduced

As stated earlier we use the word *technology* to cover not just technical innovation but also the knowledge and skills to introduce them. We found that early stage programmes that included support for R&D were more likely to be successful; the availability of reference sites was linked to success for later stages. The factor best linked with success, however, was the inclusion of a demonstration programme, and the more proactive this was, the more likely it was to be success-

ful. Other combinations that did not include demonstration were highly likely to risk low achievement of objectives.

Whether intermediate stakeholders are involved in the design of the scheme

For most of the countries surveyed, only the policy owner and managing agent were involved in scheme design. The countries in the survey most likely to carry out extensive consultation were Denmark and UK. The analysis of this design feature was re-examined once it was realised that the indicators above produced a good to very good correlation (0.5 to 0.78) with scheme success in a wide variety of sub-set analyses, but were inadequate (0.1, indicating no correlation) for Denmark and UK. Comparing the sub-sets, it could be seen that the rating for *activity culture* for Denmark and UK was different from the rest. These two countries' programmes were rated as taking place within a culture where partnership with commercial organisations was necessary for success. The other countries' data rating indicated that government was expected to lead. There tended to be a much wider consultation with stakeholders in Denmark and UK, so wide consultation might be used as a proxy indicator for the activity culture, but it is not perfect as consultation did not give an acceptable level of correlation with scheme success. There are clearly further issues to be investigated here which are beyond the scope of the available data.

Revising the framework for stakeholder behaviour

Are these indicators sufficient to identify systematically the main issues that scheme designers need to address in order to engage stakeholders for successful outcomes?

The difference in the 'risk indicators' applied to the cultural groups suggests that it is not. We could revise our model to identify the specific programme or scheme designs that operate on the contributing elements of stakeholder behaviour, and further identify the types of organisation and roles they play in the programme as shown in Figure 2, but this does not address the cultural differences. Is awareness of their existence sufficient? Does this merely re-emphasise the need for the programme designer to be aware of a wider range of issues about which judgement is needed in order to design a successful programme? We assert that it is because using our framework can assist the programme designer to consider the stakeholder issues that will make a difference to their behaviour in delivering scheme success. However more is needed to help the scheme designer, especially in areas where engaging stakeholders in programme design is not the custom.

One way to address this is to examine the process of programme design and to identify the stages at which stakeholder engagement is necessary, desirable, or appropriate. Would stakeholder involvement at these key times help to identify the risk elements and thereby lead to design strategies to reduce that risk? This approach is similar to that of a value chain (see for example, Kasanen 2001).

In Figure 3, the left hand column depicts the typical stages of the design of a programme, including a loop from the testing phase back to redesign of the programme (it could ar-

guably go to stage 3 or earlier). At each stage consideration should be given to the role that stakeholder engagement might play. The strength of the arrows connecting the stakeholder role on the right with the programme design on the left show the importance of this engagement.

The role of the stakeholder in Stage 1 is often overlooked; problem definition is implicit at this stage from the viewpoint of the programme owner, often a government body. Often though, different stakeholders have entirely different views as to what the problem may be – so input into framing the problem, from which the aims are derived, might be quite important. This will inevitably lead to some form of politicisation though, which can be thought of as a risk. However, it is important to address the risk at this stage, as it can save a great deal of time later (and discovery of lack of stakeholder support) if it turns out that stakeholders hold very different views from the initiators, or even mutually opposing views to each other. The earlier finding that commercial end-users without strong environmental goals tend to be associated with lack of scheme success supports this suggestion. If the stakeholder does not think there is a problem, they are less likely to respond to the solution prepared without their input. Examples can be seen in lack of response to incentives for improving the energy efficiency of commercial offices (see for example, Wade et al 2002).

Stage 2 is particularly important for the involvement of stakeholders involved in the supply side of the scheme (not necessarily energy supply side). Stage 3, likewise, should address the demand side stakeholders. How acceptable is this programme to them? Involvement in Stage 4 assists in
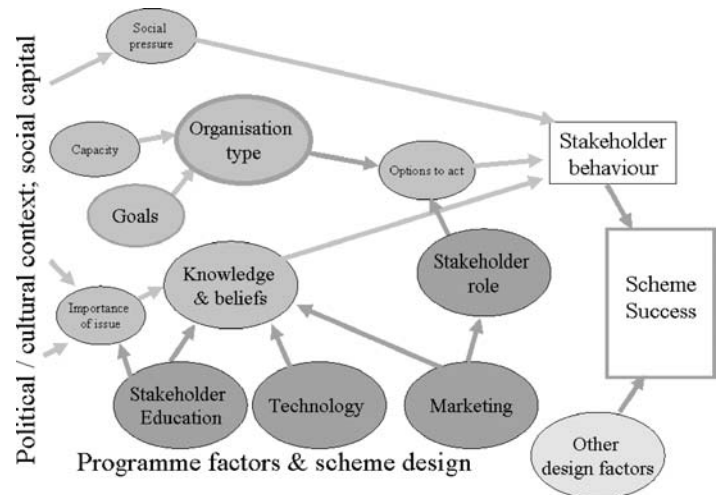
Figure 2. Framework for stakeholder behaviour responding to scheme design.

resolving rollout/logistics and funding issues with stakeholders, and both 4 and 5 are important for involvement of those actually directed to deliver the programme, or its constituent parts. Involvement in Stage 7, "Implementation", depends on the deliverables; it may be that the programme can only be delivered through intermediate stakeholders, and their involvement is not indicated here as a separate issue as they should have been involved in the planning. It may be may be difficult to get stakeholders to take part in Stages 8 and 9, monitoring and evaluation, unless it is actu-
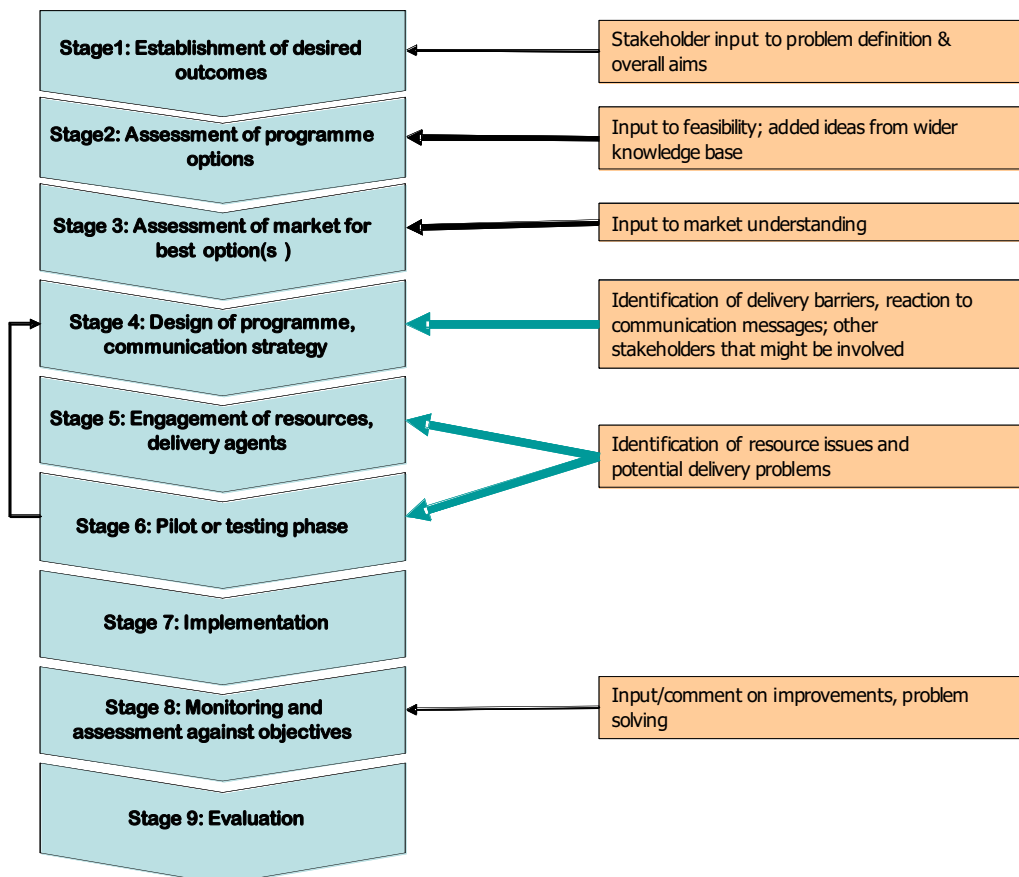
Figure 3. Value chain for programme design and delivery with stakeholder engagement points.

ally their business role to carry out these tasks. Getting an early commitment for these stages from the affected stakeholders might help. An approach such as this, involving stakeholders throughout the design of a programme is not uncommon in the UK and Denmark, as shown by best practice guidance such as that published by the Council for the Protection of Rural England (CPRE 1990). Indeed, broad stakeholder participation is specifically mandated by the Aarhus Convention (UNECE 1998) and programmes for RUE & RES are no exception to this.

The identification of *when* to involve stakeholders, and *which* stakeholders (based on the risk assessment approach), should provide a reasonable prediction of whether they would deliver their roles in a well designed promotion scheme. The question remains: whilst this research shows that stakeholders tend to carry out their expected roles in successful schemes, are the schemes successful because the stakeholders do this, or is it the design of the scheme that causes the stakeholders to behave in this way?

Discussion: towards a better understanding of the problem

In developing a framework by which quantitative data can be obtained we have attempted to solve the problem of how an economic or systems analytical mindset – predominant amongst the INVERT projects' partners – can approach an awareness of the human side of programme design. Doing so has helped to systematise our thinking about programme design for stakeholders as illustrated in Figures 1, 2 and 3. Our framework in these figures is proposed as a starting and reference point for policy makers and programme designers; we therefore recommend that policy makers adopt a formal framework to think through programme design and stakeholder issues systematically to identify risks to programme success. This should sit alongside, and indeed complement, the traditional, more fuzzy methods of instinct and optimism when it comes to the stakeholder part of programme design.

However there are two issues of concern:

- Has the analysis identified that successful schemes (well-designed by assumption) are caused by the appropriate behaviour of stakeholders *or* does good scheme design cause appropriate stakeholder behaviour?

- Does the failure of our key issues to correlate with scheme success in the UK and Denmark imply that there is a different approach needed in cultures where business involvement in scheme delivery is expected?

In order to determine an answer to the first, we would seek to examine promotion schemes in two ways. Firstly, it would be necessary to study stakeholders throughout the development and implementation of a large number of schemes in order to monitor stakeholder behaviour through our indicators, without attention to scheme design. This would lead to examination of the hypothesis that stakeholder behaviour led to scheme success independent of scheme design. Second, it would be possible to work with designers to ensure that schemes were well designed using the value chain approach above (with a control group where no effort

had been made to design the scheme "well"), and to identify the consequent behaviour of the stakeholders. It is unlikely that the first of these approaches could be taken in practice due to the potential for wasting public money. Experimenting like this in the world is surely inappropriate even though such experiments cannot be carried out in a laboratory (for discussion of this issue see, for example, Bylund 2003). It may however be possible to validate our framework through the second approach without deliberately risking programme success; this would not solve the problem of determining the final nature of the stakeholder behaviour, scheme design and success causal relationship.

What of the issue of non-correlation of our findings with scheme success in Denmark and UK? It would be appropriate to review the data for Danish and UK schemes again given this insight, but there are too few schemes involved to give real insight. A wider analysis with more schemes is required, and it would be appropriate to include countries with a similar approach either to consultation during design phases or with the same activity culture. Activity culture is the key indicator that was identified as being the issue in Denmark and the UK, but the different approach to consultation, and hence to scheme design, may also give useful insight to the value chain approach as described in Figure 3. This very fundamental difference between promotion schemes, behaviour and culture between the UK and Denmark on the one hand, and Austria, Germany, Portugal, Poland and Greece on the other (those countries being the ones involved in this project) raises an additional idea. What are the implications of these fundamental differences for other research, particularly that financed through the EU's Framework 6 or Intelligent Energy – Europe (IEE) programme? Does the approach we have taken to codify elements of cultural differences allow greater understanding of these issues when transferring knowledge from country to country, especially using case study approaches? What elements of cultural differences need to be incorporated into models aiming to apply in all European countries? This perhaps is an issue that could be of further interest to behaviourists, especially given the thematic priority in the December 2004 call for proposals to develop understanding of stakeholder acceptability and public perception risks (Cordis 2004). More research, and dissemination of the findings to researchers in policy areas who are not likely to consider behavioural issues, is needed.

Conclusions

Although it is not proven that there is a causal relationship between programme design and specific stakeholder behaviour, the results of this research indicate the likelihood that, in some contexts, programmes can be designed to include factors that increase the chance of their success. However, there are many issues that are not understood, particularly the role of cultures that rely on partnership working and the implications of stakeholder involvement at specific points of programme design. From our analysis there are indications that, for less popular promotion scheme types such as regulation, involving the stakeholders has no effect on scheme success. In this area, the role of inspection is critical. This does not imply that stakeholders should not be consulted.

The risk elements, whilst applied generically across the promotion schemes analysed, are likely to provide different challenges to be overcome depending on the type of scheme and the economic impacts of the scheme on the stakeholders affected. Nevertheless key issues in scheme design remain:

- The initiating organisation and its commitment to the programme

- The design of marketing and technology introduction methods within the scheme itself

- The source, resources and authority or accountability for inspection or licensing

- The culture within which the scheme operates

There is clearly further work to be done to fully understand the last point. A project to determine the critical issues from strategic marketing theories such as strategic partnering, customer segmentation, social carriers of technology, motivation theory, and push/pull strategies might provide considerable insights. Meanwhile, the best programme design needs to consider not just what is to be promoted but who is engaged in the promotion, and to ensure that the risks associated with working with people and organisations, rather than technical solutions, are addressed when considering sustainable energy implementation. If stakeholder behaviour is considered from the start, there is an improved chance that they will deliver.

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