Analysis of stakeholder behaviour

Report of Work Phase 4
of the project

– a research project within the
Altener Program of the European Commission, DG TREN –

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1 INTRODUCTION

INVERT aims to develop a computer model as a support tool for the optimum design for Renewable Energy Sources (RES) and Rational Use of Energy (RUE) policies in Europe. The project is funded by an EU ALTENER grant and led by the Energy Economics Group (EEG) at the Vienna University of Technology. Workphase 4 is an analysis of stakeholder behaviour in response to various policy interventions. The aim is to determine the factors (in combination) that lead to optimum stakeholder response to an RES or RUE policy.

This report describes the process undertaken in developing a framework for evaluating stakeholder behaviour for Workphase 4 of the INVERT project, the hypotheses developed, data collection and analysis, and the conclusions.

The role and behaviour of stakeholders has not been included in an economic model as far as we know, mainly because in an economic model, perfect knowledge and rational behaviour are anticipated. However it is not always the case that stakeholders behave 'rationally' or according to the expectations of the economists, even though their own behaviour might be rational to them given their specific circumstances. In this case we seek to identify what other circumstances can be designed to produce behaviour that is a closer reflection to that described as 'rational'. What issues must be taken into account when designing economic models for promotion schemes. How does this affect the likelihood of full adoption of a promotion scheme i.e. to use the full technical potential of RUE or RES technologies being promoted?

1.1 Objectives

The outputs expected from this work phase were:

- Benchmarks for successful policies together with a set of logical combinations for success. These are important for the computer simulation model
- Evaluation of less successful policies with learning points for future developments
- Discussion of the impacts of different policy factors on target group behaviour

1.2 Structure of the report

The report is divided into six sections:

2. Development of the framework

   This covers the literature search undertaken to find out equivalent work already carried out in this area. No exact matches were found, but much was identified that informs our approach and which helped us develop a model of user behaviour that will allow us to collect data on programmes and test the various factors for significance in achieving successful promotion schemes

3. Data collection and analysis

   Here we describe the process of data collection and present the initial analysis, providing a body of information for further work, and also testing our initial hypothesis that stakeholder actions, programme design and success are linked together

4. Evaluation of success factors

   In this section we carry out some statistical analysis to identify the relationships between certain classes of data and determine which are most important for success scheme design

5. The link with the INVERT computer simulation (WP5)

   This important section describes the methodology determined to modify the potential found through the dynamic cost-curve model in workphase 5. The aim is to identify those elements of scheme design and stakeholder interaction that are most likely lead to successful promotion schemes, or those that put scheme success at risk.

6. Stakeholder behaviour illustrations (or case studies)

   This section describes the implications of these factors in more detail, explaining them with reference to a number of illustrations (or case studies). It aims to put the statistical approach in a real world context, and identifies differences between logical assumptions and statistically valid ones.

7. Conclusions and recommendations.

It should be noted that the model we describe does not identify all the necessary conditions for good scheme design; good practice in management, planning and design are not accounted for, but key elements are highlighted. A scheme developer has to analyse the need, aims and objectives, the appropriate mechanism(s), the delivery agent and target audience, as well as the available budget, before embarking on the scheme design itself. Our work can help identify key issues which should be addressed to reduce the risk of the scheme failing to achieve its objectives, but it cannot guarantee success.

2 DEVELOPMENT OF THE STAKEHOLDER BEHAVIOUR FRAMEWORK

2.1 Theoretical Approaches

In order to provide a framework for assessment and evaluation a number of approaches were investigated. We felt it was important that this part of the project had a sound basis for its structure. Without such a basis, how it would not have been possible to analyse the data collected, nor indeed to know which data *should* be collected.

Our literature review produced few documents that had a direct bearing on the evaluation of stakeholder behaviour in response to policies. Most stakeholder behaviour papers are concerned with influencing stakeholders as part of management theory, particularly in light of adverse action by anti-globalisation organisations. Many are reports on evaluation using stakeholder analysis, or analysing stakeholder responses; these do not analyse the behaviour of the stakeholders themselves, only their opinions. There was an interesting line of thought looking at application of stakeholder approaches to object-orientated software modelling, which led to Agent Based Modelling (ABM), which could be of some use, although ABM is mainly used in predictive modelling.

Indeed the range of papers led us to ask whether we were trying to identify stakeholder *behaviour* or rather stakeholder *response* to the stimulus of a programme that affected them in some way.

The types of approach, options and factors we considered include:

- Stimulus – Pathway – Response models
- Behaviour classification
- Context – cultural and political
- Networks and social capital
- Independence of policy variables
- Barriers (including learning barriers such as unworkable theories held and organisational defences)
- Stakeholder characteristics (goals, ownership, commitment)
- Stakeholder interaction
- Feedback loops

Some of these are described under the headings below, others are referred to in the text.

2.1.1 Stimulus – Pathway – Response

The first approach is to consider stimulus (i.e. policy) and response (i.e. stakeholder behaviour). This is in essence what the work phase aims to identify, and is too simplistic to be useful. The involvement of the pathway for the stimulus could be considered for both the decision making processes of the stakeholder and the physical pathways of policies to reach the end user – either the media of information transfer or the stakeholders who provide the information or delivery mechanisms. This would create a framework in which both the response and the behaviour of the pathway would be analysed, which is too complex in the context of this project.

2.1.2 Behaviour Classification

A project at Loughborough University investigated what makes users read a particular journal (SuperJournal 1998)[1]. The model developed, shown in Figure 2.1, identifies independent variables that the user cognitively operates on 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.

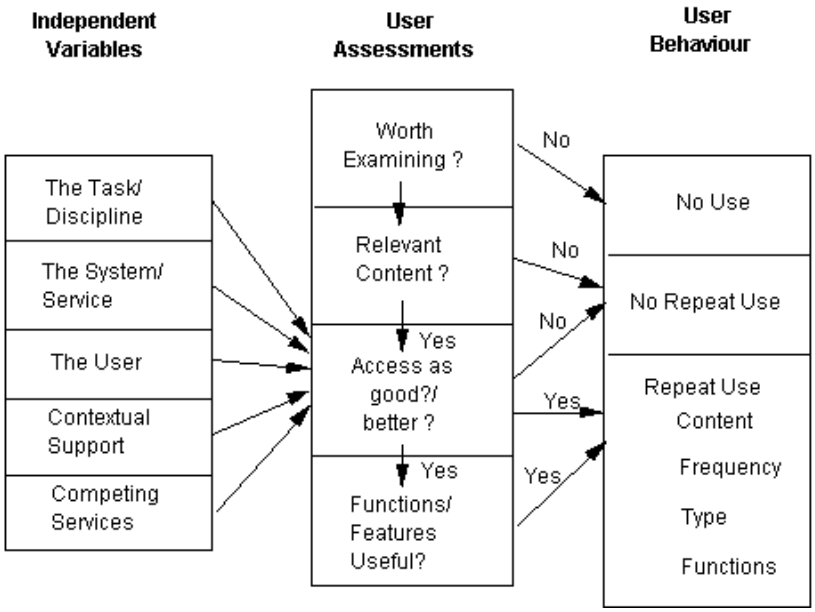

Figure 2.1: Model of Behaviour reading SuperJournal.

This suggests that the Stakeholder Behaviour framework may need to identify the processes of decision making: to act or not to act? However Invert is not concerned with repeated use. It is concerned both with whether a stakeholder acts in a certain way and encourages others to do so as well. This could constitute a 'hierarchy of acting':

- Act and encourage others to act
- Not act but encourage others to act
- Act and place no influence on others
- Not act and place no influence on others
- Act but discourage others from acting
- Not act and discourage others from acting

However, this is not a hierarchy but a matrix, with *act*/*not act* on one side and a continuum of *encourage* to *discourage* (with zero influence in the middle). However are '*act'* and '*encourage others to act'* independent of each other? In purchasing decisions, possibly, but in policy activity, a stakeholder may act to encourage others – that may be their function as a stakeholder. This suggests that the function or role of the stakeholder and whether they carry out this role is a behaviour response that must be captured.

2.1.3 Interaction with other stakeholders

The element of encouraging others to act falls within the scope of interaction with other stakeholders. It is likely that stakeholders do not act in isolation. We propose that the model needs to identify the influence of stakeholders on each other. This links with the network approach, or analysis of social capital discussed below. However models of stakeholder interaction have been developed. One in particular is agent-based modelling (ABM).

[1] http://www.mimas.ac.uk/sj/hypoplan.htm (accessed 16/05/03)

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 (FIRMA, led by the University of Guildford). They combined an ABM with a concept model to predict management of river water processes[2].

> The agent-based model applied here is 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. This is an assumption for agent activities, whereas beliefs represent particular perspectives or world views of an agent. The cognitive agent architecture is documented in Conte & Castelfranchi (1995). The implementation of agent attributes into a computer program can be achieved by assigning rules to each agent by help of declarative statements. This may be conditional expressions that can be written in declarative programming languages like SDML (Moss et al., 1998) (strictly declarative macro language), MIMOSE (Möhring, 1999), PartNet (Conte and Pedone, 1998) or others. The inter-agent structure is a negotiation process about planning strategies and policy measures including side effects.

Another project using ABM is from Imperial College London modelling container transport systems[3]. The work is supported by Prof John Casti of Sante Fe Institute developing this as a system with complexity theory at its heart.

> In the simulation model, key actors will be represented as software agents, each invested with information, resources, constraints, objectives and decision making rules that are based on their real-world counterparts. Heterogeneity amongst actors will be accommodated by means of agent class hierarchies. Each agent will have information about some or all of the variables in the system – infrastructure, services, prices, transit times, cargo flows, competitors' strategies etc - depending upon its role and status. Each agent will also be able to influence the decisions of other agents, depending on its size, bargaining power, and ability to co-ordinate its decisions with those of other agents in the same class (normally though the use of intermediaries such as freight forwarders or cargo consolidators).

This produces a number of useful concepts.

- One needs to understand the agents' goals and beliefs within the framework for analysing behaviour in order to supply the context of their decision making
- The level of detail considered falls into a complex system, indeed complexity theory is even more complex! The framework needs to take account of complexity without being unworkable. Decisions need to be taken on whether to include variables such as agents' views on other agents, and we need to consider whether we can actually obtain such data or even whether such a level of detail is relevant in the overall context of the INVERT model.
- This has synergy with the understanding of the networks and social capital involved in shaping policy responses
- It is obviously possible to translate this into procedural language that can be programmed, which is a useful point for the outcome of Workphase 4 if it can be described into the computer modelling Workphase with known software approaches.

However, ABM is a simulation process, not an evaluation methodology. The ideas may be useful, but they do not provide a complete solution.

2.1.4 Individual behaviour and social capital

A substantial amount of literature on human behaviour, stakeholders and participation is available on Australian and New Zealand sustainable development networks. This is a key issue where engaging stakeholders and identifying how to change behaviour has given rise to a number of modelling approaches.

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[2] http://www.icis.unimaas.nl/projects/firma/description.html (accessed 19/05/03)

[3] Carter 2001; (accessed 19/05/03)
http://www.ese.ic.ac.uk/research/containerworld/Printable_docs/Model_Decis_Carter.htm

A paper by Landcare Research (Allen, W.; Kilvington, M., Horn, C. 2002)[4] gives a useful behavioural analysis framework, using the theory of reasoned action proposed by Ajzen & Fishbein (1980) and applied it to the problem of getting farmers to adopt a particular TB control, as shown in Figure 2.2.

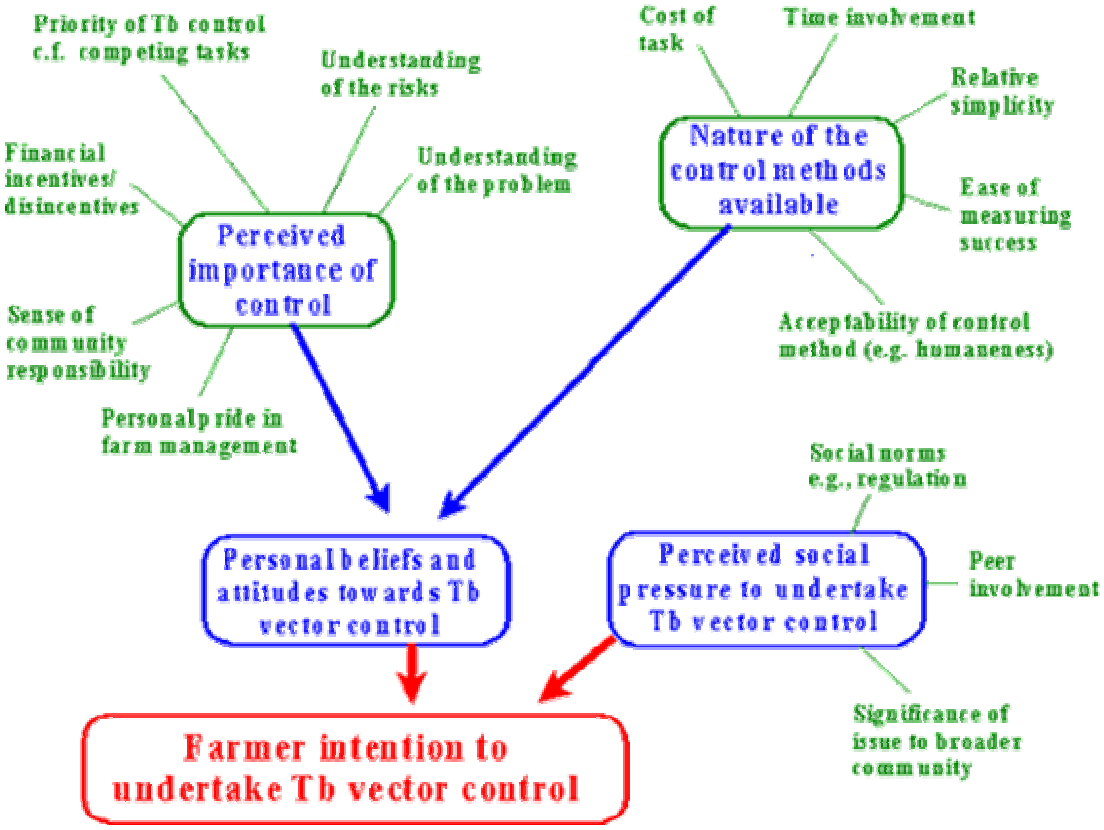

Figure 2.2: Theory of reasoned control applied to farmers (Kilvington et al 1999 in Allen et al, 2002)

Whilst this approach is very useful in identifying the factors and pathways that may lead stakeholders to behave in certain ways, further information from Allen et al needs also to be included. In their research they identified the importance of the context of the farmer and the decision making. This included the nature of the local society, the support networks, the amount of activity promoting the issues, all the activity needed by the farmer in order to receive information for decision making and the stimuli for action. They introduce the need for a supportive environment as follows:

> As the work by Kilvington et al. (1999) highlights it is important not only to look at theories and models of behaviour change that focus on individuals, it is also important to look at models that focus on the social context in which behaviour change takes place. The different theories are neither comprehensive nor exclusive. Rather they are often complementary and many different theories can be used within aspects of any single environmental change initiative.
>
> Social Network Theory (Verity 2002) is a framework that looks at social behaviour through relationships, rather than as an individual phenomenon. This framework acknowledges that in order to facilitate long-term behaviour change, it is necessary to develop a supportive, or enabling, environment. One major aspect of developing a supportive environment is about creating links between people, which allow information and learning to occur across social networks. The creation of these links is referred to in development literature as 'social capital'.

[4] http://www.landcareresearch.co.nz/sal/par_rep.asp (accessed 16/05/03)

Spellerberg (2001 pp. 9–10) defines social capital as

> relationships among actors (individual, groups and/or organisations) that create a capacity to act for mutual benefit or a common purpose. Social capital is the social resource that is embodied in the relations between people. It resides in and stems from the contact, communication, sharing, cooperation and trust that are inherent in ongoing relationships.

An important part of managing learning and behaviour change initiatives is therefore about managing networks, so that they can be used to develop solutions and provide support for individuals within them.

This supports the idea in development for INVERT that the framework for stakeholder behaviour draws from many theories. It also supports that the idea of developing a framework which considers the behaviour of both individuals and organisations and places it within a context that identifies social and cultural factors. This cultural context is crucial to our understanding of stakeholder behaviour in response to programmes.

2.2 Building the framework

Figure 2.3 shows a framework in development that draws on the theoretical elements discussed above. Starting with the output, on the right hand side, stakeholder behaviour is classified in terms of taking action or influencing others to act. This behaviour is then analysed using the theory of reasoned control. In individual behaviour this would suggest two categories of pathways in the decision making: the first is those that are a result of personal beliefs and decisions, from one's own knowledge, skill and value set, and the second those which come from social pressure, the influence of others and from the role of the individual in the society. Personal beliefs can be further categorised through factors related to the importance of the issue, and those that increase an ability (or a propensity) to act.

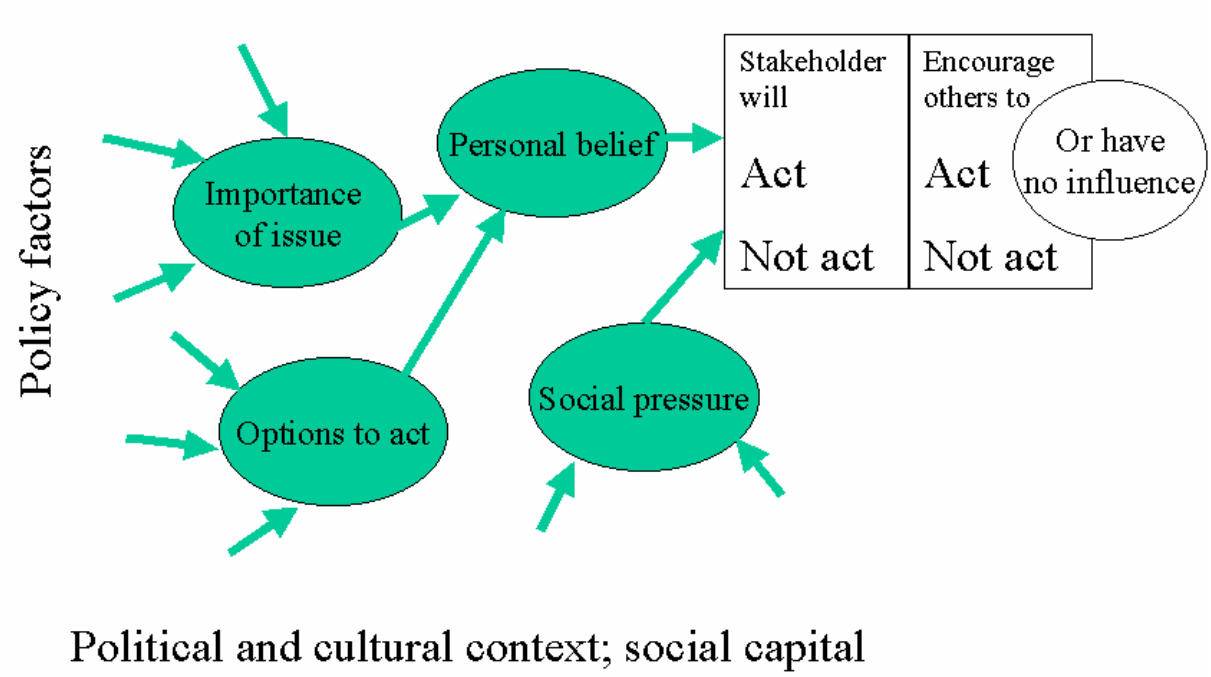

Figure 2.3: Framework for evaluating stakeholder behaviour – version 1

Each of these pathway factors is subject to various inputs and pressures. The inputs are assumed to come from the political and cultural context, social capital and most importantly from the policy factors themselves. The policy factors become the stimuli, the social capital provides the cultural setting and

the decision making process produces the behaviour which can be classified through action or inaction.

Can individual behaviour in this model be replaced by stakeholder behaviour? Organisational goals and beliefs could realistically be used instead of individual ones, but to what extent does an organisation choose to behave in the way that an individual might? ABM described above suggests that the factors described in the theory of reasoned control can equally be identified for an organisation.

If this is a workable framework, then the next steps are to develop categories or typologies for "Action" and "Policy factor" and to identify independent variables that can be measured for political and cultural contexts and social capital.

2.2.1 Consultation on the model

The opportunity was taken to hold an informal consultation with a number of energy policy and behavioural researchers at the eceee Summer Study 2003[5] at St.Raphael, France; the session took place on 4th June 2003, with participants from Novem (NL), University of Amsterdam (NL), the Federal Ministry of Economics and Labour (D), Energy Saving Trust (UK), SRC International (DK), Viegand Analysis (DK) and SFMC (US – an energy consultancy).

The INVERT project was outlined, and the work-phase explained. The question asked was "had anyone had any experience of this type of evaluation before?", and the proposed approach was reviewed and ideas put forward.

None of the participants had direct experience of similar projects although some ideas were presented for follow up[6]. These related to stakeholder behaviour, roles, variables, classification of stakeholders, and other topics.

The main discussion points were:

- Involvement of stakeholders in designing policies
- The design of the policy partially determines the stakeholders – who has been left out?
- Whether we were actually looking at stakeholder roles and interaction between stakeholders rather than 'stakeholder behaviour'
- Policies need to consider the ability/propensity/capacity of the stakeholder
- Theory of decision making among groups may contribute to the ideas
- Focus on case studies, both good and bad, for lessons learnt
- For the model – stakeholders act differently from individuals, but considering knowledge, capacity and goals may be the key inputs to behaviour

[5] European Council for an Energy Efficient Economy (eceee); see www.eceee.org

[6] a project in Groeningen, NL; market diffusion of a residential clothes washer (ref. ACEEE or CEE); NW Energy Alliance project on how different organisations work together; Danish Energy Authority report on progress of Energy Star; Welsh case studies

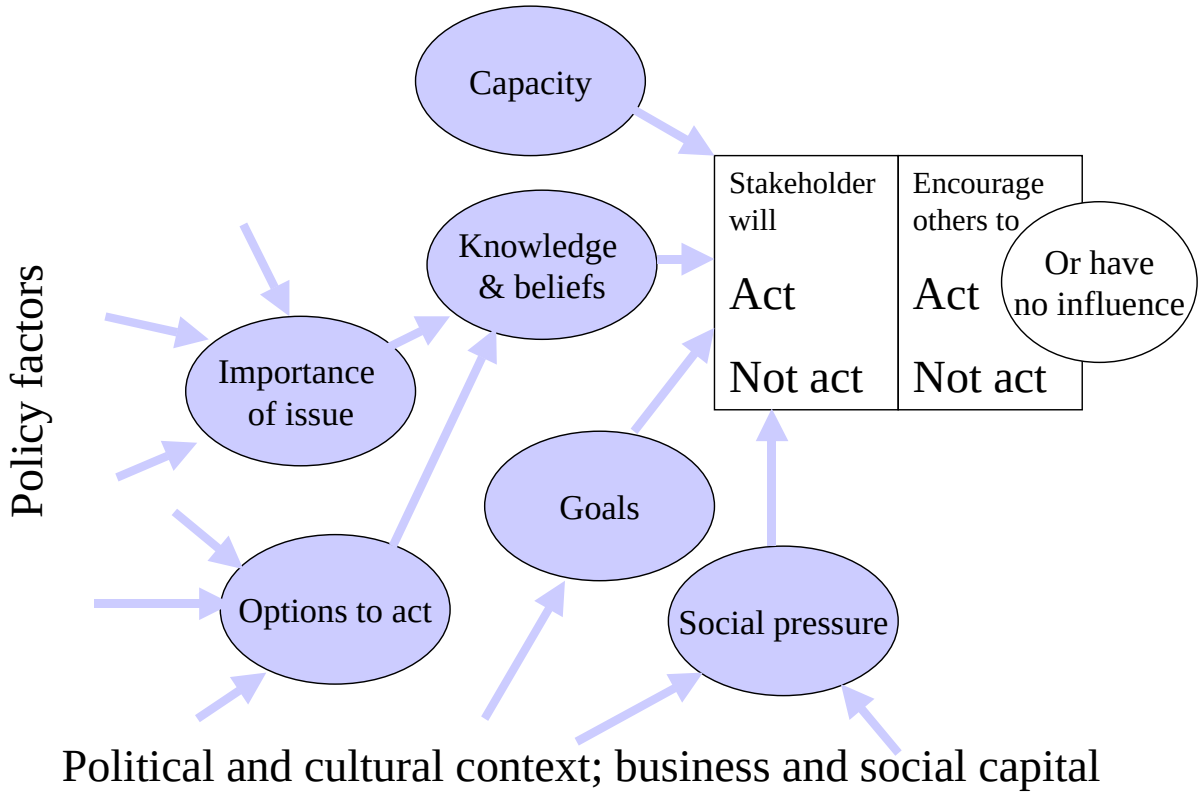

Figure 2.4; Framework for evaluating stakeholder behaviour version 2

From this we get a diagram that adds *capacity* and *goals* to the previous version of the framework, as shown in Figure 2.4. Do the policy factors act directly on the stakeholder or through the knowledge/belief systems? We suggest that the answer is both, or either, depending on the programme design. There are programmes that are designed specifically for certain stakeholders and some that will add to the knowledge and beliefs of stakeholders.

This completes the development of the framework. We can state a hypothesis that we wish to test through our data collection and analysis, but we have yet to determine the detail of variables and classes of data that will be collected and to design the template for data collection.

2.3 How to analyse WP4 data; our hypothesis

The first workphase of the INVERT project produced a catalogue of policies in each of the participating countries, organised according to a "promotion scheme" typology. For each policy that will be included in WP4, partners have been asked to identify measures of success / non-success, which in the absence of quantitative indicators, have been described by a qualitative scale from 1 to 6 as shown in Table 2.1. This means that WP1 describes certain data for us, and we can describe the categories of data, or datasets 'DS*x*', that we need in order to define our framework.

These are:

DS1	Type of policy
DS2	Success rating of policy
DS3	Key stakeholders involved in policy and their characteristics
DS4	Aspects of policy design
DS5	Information on key stakeholder behaviour in delivering role

Further (overriding) data gathered through WP4 will capture cultural factors / cultural context. The proposal is to test the following hypotheses using datasets 1 to 5, and to test all of them within a given cultural context.

Suggestion 1: The policy type (e.g. subsidy, tax, regulation, educational campaign etc) largely determines the types of key stakeholders and their roles in that policy.

H_0: There is no correlation between policy type (DS1) and key stakeholder types (DS3).

H_1: There is a correlation between policy type (DS1) and key stakeholder types (DS3).

If H_0 is false, then this allows us to make the valid assumption there is a link between policy type and key stakeholders involved, which justifies the model taking a different route for stakeholder-related recommendations for each policy type.

Suggestion 2: The presence or absence of certain aspects of stakeholder-related policy design causes key stakeholders to act in certain ways / not act.

H_0: *There is no correlation between the presence or absence of elements of policy design (DS4) and behaviours / non-behaviours of key stakeholders (DS5).*

H_1: There is a correlation between the presence or absence of elements of policy design (DS4) and behaviours / non-behaviours of key stakeholders (DS5).

If H_0 is false, then we can validly assume that stakeholder-related policy design elements affect key stakeholders' behaviour, and may proceed to testing Suggestion 3.

Suggestion 3: Given a certain set of key stakeholders for a policy, various stakeholder-related elements need to be present in the design of a policy to maximise its chances of success (by means of causing key stakeholders to act as intended).

H_0: *There is no correlation between the presence or absence of certain aspects of policy design (DS4) influencing key stakeholder behaviour (DS5) and the level of success (DS2).*

H_1: There is a correlation between the presence or absence of certain aspects of policy design (DS4) influencing key stakeholder behaviour (DS5) and the level of success (DS2).

If H_0 is false, then we can make valid assumptions about key stakeholder sensitive policy design improving the uptake of RES and RUE technologies. Furthermore if H_0 under Suggestion 1 is false, then we can make further valid assumptions about policy design with respect to each policy type. These assumptions translate into recommendations for modifying or adapting the simulation model being developed in WP5.

However, the datasets described above are not yet defined in terms of data to be collected in each of the parts of the framework; policy factors; social capital and cultural context; stakeholder characteristics (goals, knowledge & beliefs, capacity) and role delivery (behaviour).

2.4 Independent variables and their classification into datasets

2.4.1 DS1: Type of policy

The main variables for the type of policy were determined in WP1 [cross-ref] and are defined further in that document. In addition, in order to link more specifically with the simulation model under development in WP5, eight sub-types have been introduced. The metadata for DS1 are therefore:

- Stage of implementation (pre-, implementation, post-)
- Energy type (RUE, RES, both)
- Financial or non-financial
- Sub-type (Subsidy, feed-in tariff, soft loan, tax, tax exemption, regulation, quota, certification)

2.4.2 DS2: Success rating of policy

After extensive discussion within the INVERT partnership, we determined that a qualitative ranking scale of 1 to 6 would be feasible. This is shown in Table 2.1.

Table 2.1: Qualitative rating scale for the success of the policy

Rating	Description
1	The programme was not successful and was abandoned before much money was spent
2	The programme was not very successful in achieving its objectives and used most of the money allocated to it
3	The programme was partially successful in achieving its objectives but maybe not cost-effective
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
5	The programme was very successful - met nearly all or all of its objectives
6	The programme was very successful - met nearly all or all of its objectives, but spent far more than the original budget

After consideration it was also decided that capturing whether a low success rating was due to known financial or other policy design reasons was advisable, otherwise there was a risk of ascribing lack of success to a stakeholder characteristic when this was not a major factor. This implies three metadata for DS2:

- Success Rating
- Financial reason known
- Other design reason known

2.4.3 DS3: Key stakeholders and their characteristics

The metadata described in Table 2.2 aim to capture stakeholder characteristics that inform the central part of the framework and have their basis in classifications of organisations and organisational behaviour.

Table 2.2: Stakeholder Characteristics Metadata

Category	Options	Metadata type
Organisation	Government, government agency, NGO, local government, politician, union, community group, ad hoc group[7], individual, beneficiary business[8], affected business[9], end-user business[10]	Classified by number; 1=Government, etc.
Goals	Political, social, environmental, commercial, religious, military/security/defence	Rating each 0-3

[7] A group formed for the purposes of carrying out a stakeholder role and not existing for an independent purpose

[8] beneficiary business; a commercial entity that gains business benefits from the policy e.g. manufacturer of wind turbines for a wind policy,

[9] affected business; a commercial entity that does not benefit directly from the policy unless from general economic changes (including general lower energy costs), but whose operations are in some way affected

[10] end-user business; a commercial entity that gains direct benefits from the outputs of the policy e.g. lower energy costs for the business as a result of the business deciding to adopt the policy (would include partners in community energy schemes)

Category	Options	Metadata type
Capacity	Financial resources People resources Know-how resources Physical resources	Rating 0-3
Knowledge/ attitude	A matrix with corners: • Knows nothing, unwilling to learn • Knows nothing, willing to learn • Knows a lot, willing to learn • Knows a lot, unwilling to learn	Knowledge of the policy/programme rated from 1-3 Willingness to learn rated from 1-3
Involvement/ attitude	A matrix with the four corners: • Hasn't been involved, unwilling to take part • Hasn't been involved, willing to take part • Has been involved, willing to take part • Has been involved, unwilling to take part	Involvement in the policy/programme rated from 1-3 Willingness to participate rated 1-3

The data need to be easily assessed by the data collector from observation and public evidence about the organisations concerned. Thus when considering how to classify an organisation's goals, a mix of goals can be made by rating the most important goals highly, but also marking secondary goals with lower ratings. The same treatment applies to the capacity of the organisation, with this referring to human and economic capital. The attitude and involvement of the stakeholder with the policy was also ranked.

Table 2.3: Evaluation matrix for stakeholder relationships

Rating	Evaluation description
7	Stakeholders have strong partnerships and work together regularly; will agree a common position and act in their best joint interests
6	Stakeholders have many joint working projects and can work together when they see the need
5	Stakeholders can identify other partners who share their interests but do not have experience in using this to their advantage
4	Stakeholders have access to each others knowledge base but do not work together
3	Stakeholders do not often have contact but have shown ability to form alliance in the past
2	Stakeholders do not have much in common and rarely meet each other
1	Stakeholders have common networks but tend to be antagonists

A more complex and potentially controversial area was to estimate the strength of the stakeholder's social capital by rating his relationships with the other key stakeholders. Whilst we have said that social capital and cultural context are an underlying condition for the whole of the hypothesis, for the purposes of analysing the effect of the stakeholder behaviour on policy success, we have deemed the strength of relationships with the other key stakeholders in the programme to be another characteristic of the stakeholder. The data collectors were therefore invited to rate the strength of the relationship of one organisation with all the others included in that policy, using the evaluation matrix shown in Table 2.3. It must be acknowledged that, as with other stakeholder characteristics, this is a subjective

measure, and there may be considerable variation in the evaluations by different data collectors. The description within the evaluation matrix is designed to minimise different value judgements, but the evaluation still is prone to bias. A self-assessment questionnaire put to the key stakeholders would provide information that would balance the researchers' viewpoint, but the result would still be subjective.

2.4.4 DS4: Policy design

Factors that can be identified in policy design are:

- whether the policy is delivered through an existing organisation or whether a new organisation has to be set up
- whether education of stakeholders is included (such as training or guidance) and whether this was of end-users or intermediaries or both
- whether demonstration of technologies is included (this is further divided by demonstration included or available or by video for later reference, reference sites, or whether only R&D or prototypes of technologies were available for technologies that were less advanced)
- whether additional resources are provided within the policy (such as money to fund the programme or an extra member of staff, not just subsidies); whether these were available to all, or by some sort of allocation system
- the type or marketing or promotion of the policy, and whether funding for this is included. These were categorised as short- or long-term, by policy owner or delivery agent or both, and whether promotion budget or marketing materials were available to stakeholders
- involvement of stakeholders in developing the programme

2.4.5 DS5: Behaviour in delivering role

We considered prescribing roles for classification for each stakeholder, and identifying whether this role was carried out, but instead took the approach of collecting a freeform answer on the role but then asking if they:

- Carried out expected role in policy?
- Did not carry out expected role in the policy?
- Carried out a different role that contributed to the policy?
- Carried out a role that hindered the policy?
- Prevented others from carrying out their roles?

This decision was based on the assumption that we did not need to classify stakeholders by their roles, and indeed we did not wish to predict the roles. If the role is important, we have the information to classify during the analysis.

It was possible that a stakeholder changed behaviour during the programme. For these reason we recorded an early/middle/late assessment as shown in the example in Table 2.4.

Table 2.4: Example categorising stakeholder who changed roles during the course of policy implementation

Role in delivering policy	*Early*	*Mid*	*Late*
Carried out expected role in policy?			X
Did not carry out expected role in the policy?			
Carried out a different role that contributed to the policy?	X	X	
Carried out a role that hindered the policy?			
Prevented others from carrying out their roles?			

It is beyond the scope of the study to ask “why did this happen?”, we can only record what was observed, or can be inferred from reports of the stakeholder behaviour.

2.4.6 Cultural Context

Factors identified to make assessments about the country, region or locality that provide the social context:

- Strength of the political situation
- Decentralised versus strongly centralised control
- Culture of self-help versus culture of “state will provide”
- Economic situation (including whether in a region receiving EU support)
- Urban or rural economy (or a mix)
- Media messages
- General attitude of the public towards the programme issue

The first four were assessed by the use of evaluation matrices (shown in Table 2.5) describing possible options, forcing a decision in case of more complex decisions. The date and region for these data were also recorded, allowing for change in the cultural context over time.

Table 2.5: Evaluation matrix for four cultural context metadata

Political situation		*State Control*		*Activity Culture*		*Economic profile*	
Strong stable political situation	1	Strong, centralised	1	State will provide	1	Strong economic growth	1
Generally stable although flavour of government changes on a defined time basis (e.g. elections)	2	Weak, centralised	2	State leads but provision of resources etc. from other sources	2	Economic uncertainty	2
Becoming stable after a long period of instability	3	Varies	3	Partnerships with organisations needed to achieve progress	3	Mild recession	3
Becoming unstable after a long period of stability	4	Weak, decentralised	4	Strong community focus	4	Deep recession	4
Unstable, likely to change at irregular and unpredictable intervals	5	Strong, decentralised	5	Provide for yourself; individual responsibility	5	EU priority area	5

3 DATA ANALYSIS

Having built the framework set out the hypothesis and specified the data, INVERT project partners were then instructed on the data collection through the use of a template together with guidelines for its completion, plus some assistance with choice of programme and stakeholders. These documents are shown in Appendix 1.

Initially partners assessed one programme and submitted it as if for a pilot so that any difficulties could be solved and key issues identified. An important addition to the metadata for policy design was to identify whether each stakeholder had been involved in the design of the programme. Despite being a function of design of the programme, as the implication is that the programme design included some sort of consultation with key stakeholders, the data are part of the set that comprise stakeholder characteristics, as the answer relates to the stakeholder, not the programme design as a whole. Consequently it will be analysed as if it was a stakeholder characteristic in DS3 even though it is classified as DS4, and if found to be significant in the analysis, would form part of the recommendations on policy design.

Each programme submitted by the partners was entered into a database in order to apply the policy and social context to each stakeholder. Data were checked where any confusion may have arisen and various clarifications sought. The data was then analysed in accordance with the hypotheses described above. Before this hypothesis testing is reported, however, we describe the overall statistics received in the next section.

3.1 Stakeholders & promotion schemes: descriptive statistics

In this section the data are summarised and key points noted. Firstly the individual datasets are described, then we move on to check the hypotheses, then to identify key data types and their relationships with stakeholder behaviour and the success of the scheme. In the following section we develop a methodology for linking this phase with the model in WP5.

3.1.1 Scheme type

The total number of promotion schemes and policies on which data were collected was 46. Within these were 226 stakeholders. Two of these were included as key stakeholders, but the scheme had not progressed as far as their part in it, hence there was no recorded "behaviour" for them, although the rest of their characteristics are recorded.

Table 3.1: Schemes and stakeholders by country

Country	Schemes	Stakeholders	Named stakeholders appearing more than once
Austria	5	27	
Denmark	7	31	Danish Energy Authority (5), Ministry for Economy (2)
Germany	7	41	Ministry for Economy (2)
Greece	7	35	CRES (3), Solar Industry Assoc (2) Ministry of Development (3),
Poland	6	26	BOS(2), KAPE (2), Neutrino (2), NFOS (2)
Portugal	7	34	ADENE (2), DGGE (3), Ministry for Public Works, Transport & Housing (2), Ministry for the Economy (6), Ministry for Towns, Territorial Planning & the Environment (3)
United Kingdom	7	31	Defra (4) DTI (2), Ofgem (2)

The countries represented and the distribution of programmes and stakeholders is shown in Table 3.1. The least number of stakeholders in a scheme was 3, the most was 7.

That some stakeholders were repeatedly featured in the examples provided by some countries is partly to do with the culture of the country and its governance, and partly due to the types of schemes analysed by the partners. It is possible that this repetition has introduced an element of bias into the analysis. However because the same stakeholder may carry out a slightly different role or behave differently in response to different schemes, this has been ignored.

The types of scheme are shown in Table 3.2. Schemes could be of more than one sub-type in combination. The number involved was small and no analysis has been undertaken to distinguish combination schemes from others.

Table 3.2: Types of schemes analysed

Type of scheme	*Schemes*		*Stakeholders*	
	Number	%	Number	%
RUE	13	28.3	64	28.3
RES	14	30.4	75	33.2
Both RUE & RES	19	41.3	87	38.5
Financial	29	63.0	143	63.3
Non-financial	17	37.0	84	37.2
Sub-types				
Subsidy	18	39.1	92	40.7
Feed-in tariff	3	6.5	17	7.5
Soft loan	7	15.2	32	14.2
Tax	2	4.3	8	3.5
Tax exemption	3	6.5	11	4.9
Regulation	9	19.6	38	16.8
Quota	3	6.5	12	5.3
Certificate	5	10.9	23	10.2

In the absence of evaluation of schemes giving any quantitative data for success ratings, this workphase introduced a qualitative rating system. Nearly half the schemes used in this analysis were considered fully successful as shown in Table 3.3 (the description of the ratings were presented in Table 2.1).

Table 3.3: Success ratings for schemes analysed

Rating	% schemes	No. of Schemes	No. of Stakeholders
1	0	0	0
2	13.0	6	27
3	19.6	9	42
4	21.7	10	52
5	45.7	21	105
6	0	0	0

The ratings 2-5 represent an ordinal data range that can be used for statistical calculations, i.e. low is poor and high is good in a linear relationship. Had there been any scores of 6 it would have destroyed this relationship and caused problems for the analysis.

Of those that had not achieved a 5 rating i.e. those deemed to be not entirely successful, a known financial reason existed for 5 schemes, and other known reasons were identified for 7 schemes. In the analysis of unsuccessful schemes those with known financial reasons for low ratings were omitted in order to concentrate on the other design factor and stakeholder relationships.

3.1.2 Policy Design

Thirty nine schemes were delivered through existing organisations and 7 through new organisations set up specifically. There was no significant difference between the levels of success of these schemes and this issue has not been addressed further.

The other main variables that were considered worth evaluating in terms of scheme design were whether stakeholder education was included, the type of access to the technology that was given, other resources included, including financial support for other aspects of the programme, and the marketing or scheme promotion[11] approach. Various coded options were given to these design categories, providing nominal data points for analysis. The technology options were coded after data collection was complete, as the combinations possible were not known beforehand. The incidence of design factor are shown in Table 3.4 to Table 3.7.

Table 3.4: Design factors - stakeholder education

Stakeholder education	Code	Number of schemes
Not known	0	1
Included for end users	1	15
Included for intermediary stakeholders	2	7
Not included	3	19
Included for both types of stakeholder	4	4

Table 3.5: Design factors - technology information

Technology	Code	Number of schemes	% of schemes
Research & Development	1	3	6.5
Reference sites (only)	2	2	4.3
Demonstration included (only)	3	0	0
Demonstration available (only)	4	10	21.7
Video of technology (only)	5	0	0
Demonstration included in combination	6	9	19.6
Other combination	7	3	6.5
None	8	19	41.3
Prototype for information	9	0	0

[11] in marketing terms, promotion is to develop awareness of a product or service and can also be used as a noun. In the INVERT project the word "promotion" is often used as a synonym for a scheme designed to increase take up of RUE or RES, therefore promotion of a promotion is possible, and would lead to confusion for the reader. This document tries to refer to schemes and marketing wherever possible, as promotion could be used in either sense.

Table 3.6: Design factors - additional resources

Resources	Code	Number of schemes	% of schemes
Not known	0	1	2.2
additional resources available to all	1	11	23.9
additional resources for successful applicants (competition)	2	7	15.2
additional resources by allocation	3	2	4.3
additional resources for early adopters (limited number)	4	3	6.5
no additional resources	5	22	47.8

Table 3.7: Design factors - marketing

Marketing	Code	Number of schemes	% of schemes
Extensive marketing by policy owner	1	5	10.9
Extensive marketing by delivery agent	2	7	15.2
Short-term marketing by policy owner	3	7	15.2
Short-term marketing by delivery agent	4	5	10.9
Marketing materials available to support stakeholders	5	2	4.3
Marketing budget available to support stakeholders	6	0	0
Limited marketing support	7	5	10.9
No marketing support	8	4	8.7
Extensive marketing by both owner & agent	9	5	10.9
Other mix	10	6	13.0

3.1.3 Cultural context

The cultural context provides the political social and geographical influences on the scheme. The issues selected were presented in an evaluation table, where the specific rating was described in words and respondents asked to select the nearest situation to the reality for their country (or region). There was also a time dimension to this, bearing in mind that in some countries there has been considerable societal change in the last 10 years. As usual when classifying European countries, the UK provides a difficulty in deciding whether to treat the UK and its constituent countries as one country or four. In addition, some of the schemes described apply in some but not all UK countries. The only other country to provide specific regional schemes was Austria. On this basis the 46 schemes covered 10 countries and 2 regions. The earliest schemes represented started in the 1970s, and the latest in 2004.

The classifications of economy type were 32 - urban, 4 - rural and 10 - both. In 11 situations the political situation was classed as 1=very stable and the rest (35) as stable but may change on a defined basis (e.g. regular elections). The classifications of state control, activity culture and economic profile gave rise to a wider range of responses and also to clustering of certain nations; Greece & Portugal in one group, Denmark and UK providing another, with the older Austria programme also being distinctly different.

Table 3.8: Evaluation matrix for cultural context

Code	*State Control*		*Activity Culture*		*Economic profile*	
1	Strong, centralised	15	State will provide	2	Strong economic growth	9
2	Weak, centralised	3	State leads but provision of resources etc. from other sources	26	Economic uncertainty	22
3	Varies	24	Partnerships with organisations needed to achieve progress	14	Mild recession	7
4	Weak, decentralised	4	Strong community focus	4	Deep recession	0
5	Strong, decentralised	0	Provide for yourself; individual responsibility	0	EU priority area	7

3.1.4 Stakeholder characteristics

226 stakeholders were analysed in terms of their organisation type, goals, resources, knowledge and attitude to the programme and involvement and willingness to take part in it. The relationships with the stakeholders in respect to others involved in the same scheme were also assessed using an evaluation matrix (see appendix 1). Evaluation matrices are a commonly used technique to quantify qualitative behaviour, by describing a set of indicators for each matrix point in such a way that there is a scaled qualitative description measured by a quantitative scale.

Table 3.9: Stakeholder organisation types

Code	Description	Number	%age
1	Government	39	17.2
2	government agency	34	15.0
3	NGO	13	5.8
4	local government	15	6.6
5	politician	1	0.4
6	workers union	-	
7	community group	2	0.9
8	ad hoc group	-	
9	individual	23	10.2
10	beneficiary business	60	26.5
11	affected business	25	11.1
12	end-user business	13	5.8
13	trade body	1	0.4

The results have been scaled into percentages in each table to allow for ease of comparison. As Table 3.9 shows, there was a good representation of government and government agencies amongst

the stakeholders, but not one of each per scheme. The three roles of business together represent 43% of all the stakeholders; many are represented more than once in schemes, such as utility companies and manufacturers. NGOs have a fairly low presence, and these are more common in schemes in Denmark, Germany and the UK.

The assessment of goals and resources (number of organisations rated 1-3 on strength of goal/resource) is recorded in the tables below, but as we will see in the analysis, these do not give us any greater insight into the behaviour of the organisations than simple organisation type.

Table 3.10: Strengths of stakeholder goals and organisational resources

Goals/strength	*1*	*2*	*3*
Social	52	50	37
Environmental	78	63	60
Commercial	37	42	110
Religious	3	-	-
Military/defence	8	-	-
Academic	20	8	5
Resources/strength	*1*	*2*	*3*
Finance	59	102	44
People	52	124	33
Know-how	31	92	88
Physical	57	56	19

The assessment of stakeholders' knowledge and attitude to the policy, their involvement in it and their willingness to take part are all indicators of motivations. The responses are shown in Figure 3.1 by bubbles that indicate the size of the response on a grid where 1 is low and 3 is high.

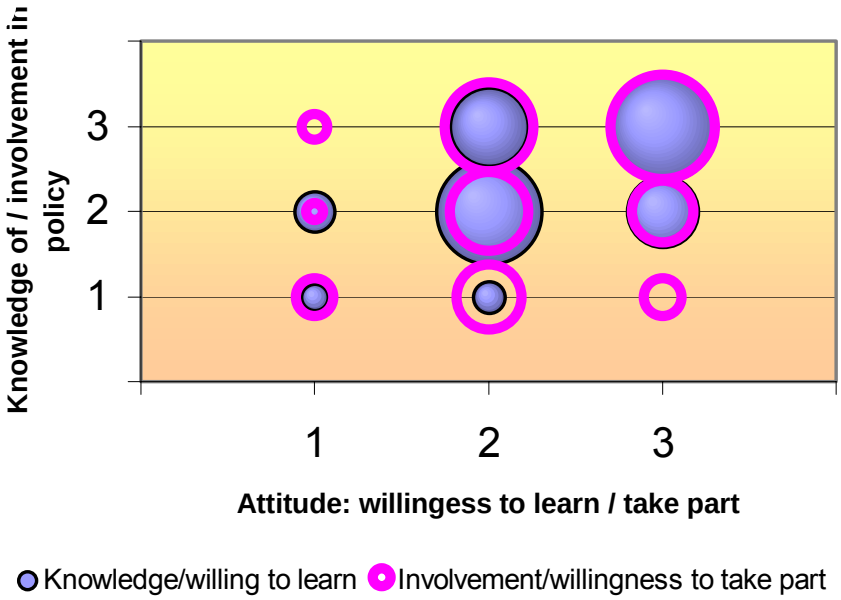

Figure 3.1: Knowledge and attitudes to the policies and promotional schemes

The solid bubbles show that there is a decided tendency for stakeholders to be both knowledgeable about the policy and willing to be involved. The more knowledgeable stakeholders are also most willing to increase their knowledge, but the number who are less knowledgeable and less willing to

learn is small. There is a small but surprising number of stakeholders who are involved but unwilling to take part, indeed, some 6% of stakeholders are in this category (x=1). Again, apart from this small group, there is a clear tendency for those who are involved in the policy to be willing to take part.

The attempt to measure social capital was carried out through assessing the relationships of the stakeholders within each scheme with each other according to an evaluation matrix. Most of the findings from this exercise were inconclusive, and although they are detailed in appendix 2, as no useful information was extracted from the point of view of the workphase objectives they are not discussed further here.

Stakeholder behaviour in response to the scheme was classified by collecting a narrative description of the part the stakeholder was expected to play and whether they carried this role out. The options offered for this are shown in Table 3.11 and range from the positive 'carrying out the role' to a very negative 'preventing others from carrying out their roles'. It was realised that behaviour might change through the life of the scheme, especially where stakeholders had to be persuaded to take part once they had seen the scheme develop. The behaviour categorised as "early, middle and late" as described in Table 2.4 was recorded. Some schemes that were still in progress only provided information up to the current stage of the scheme, allowing for later change. This applied to 2 stakeholders throughout, 12 at "middle" stage and 64 at "late" stage. The full response is shown below.

Table 3.11: Stakeholder behaviour in carrying out role

Behaviour	*Early*	*Middle*	*Late*
Carried out role	168	178	148
Did not carry out role	38	26	7
Carried out different role that helped the scheme	1	1	2
Carried out different role that hindered the scheme	14	7	4
Prevented others from carrying out their roles	3	2	1

Table 3.12: Role types and distribution

Role type	*Description*	*Stakeholders (n=224)*	
		Number	%age
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
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
31	Apply for /adopt scheme (active end-users)	43	19.2
32	Receive outputs of scheme (passive end-users)	6	2.7

Subsequently, it was realised that the codes used in the metadata should be amended to provide a linear scale of response to behaviour type; a simple swap of the second and third listed would suffice. This was done for use in the statistical analysis.

The role descriptions were analysed to provide some categories or role types. These are listed in Table 3.12. Those in the 11-17 group could be described as initiator-manager type roles, in the 20s they are enabler/intermediary type roles, and 31& 32 are types of end-users. The relationship between the types of roles and the types of organisation will be explored later in this report.

This completes the description of the stakeholders and schemes, the next stage is to analyse whether our data support our hypothesis so that we can go on to analyse the specific relationships between programme design, scheme success and stakeholder behaviour in order to provide information for the INVERT model. Once these two stages are completed, the analysis of specific cases and illustrations can be presented.

3.2 The WP4 Hypothesis tested

The hypothesis that allows us to theorise that there is a link between stakeholder behaviour and promotion scheme success was outlined in detail earlier [cross-ref].

The null hypothesis 1 suggests there should be no relationship between Promotion scheme type and stakeholder (organisation) type. By analysis the simplest of these datasets we identified a relationship as follows:

For *pre-implementation schemes* (5 schemes with 22 stakeholders): there is always a type 1 or 2, plus a type 9 or 12, plus one or more type 10.

For *Implementation schemes* (30 schemes with 147 stakeholders): 97% schemes have a type 1 or type 2, and 60% have one or more 10

For *post-implementation schemes* (11 schemes with 57 stakeholders); 96% have type 1 or 2; 64% have type 3 and 96% have type 10

Type 1 is Government Department; type 2 is Government Agency, type 3 is NGO; type 9 and 12 are end-user individual and business respectively, and type 10 is beneficiary business

The results therefore suggest that there is a relationship between the type of scheme and the type of stakeholder.

Null hypothesis 2 suggests there should be no relationship between scheme Design and Behaviour. This was tested by analysing the behaviour of the categories of behaviour early =1,3 and 4 (i.e. carried out role, not carried out role, and carried out different role that hindered the policy.

Table 3.13 below indicates for key policy design issues the number of stakeholders in the behaviour category, and whether the differences between categories are significant or not.

Table 3.13: Significant differences between behaviour types for design issues

Design issue	Behaviour type: 1	Behaviour type: 3	Behaviour type: 4	Behaviour: All types	Difference
N=	168	38	14	226	
Stakeholder education included	99	27	13	131	Significant
Involvement in scheme design	100	6	5	112	Significant
Additional resources	87	16	6	117	Significant

This table shows that for the key issues shown, there was a significant difference in the early behaviour when stakeholder education was included, if they were involved in scheme design and where additional resources were included. The complexity of the technology and marketing options meant that no significant differences were found between those design factors and stakeholder

behaviour, but as we shall see later, these issues were found to be significant in relation to scheme success rating.

This result shows that there is a relationship between scheme design and stakeholder behaviour.

Null hypothesis 3 suggests that there is no relationship between stakeholder behaviour, elements of policy design and levels of success.

This requires a three phase analysis; 'stakeholder behaviour with policy design' was part of H2, therefore this analysis concentrates on 'policy design with success rating' and 'stakeholder behaviour with success rating'.

A correlation between Behaviour and Success can be made statistically as both use a rating scale from 1 to 5, although there is no suggestion that this is a continuous scale. Simple correlation gives 0.27 with Behaviour Early and 0.37 with Behaviour Middle and Late, adjusted for the opposite rankings (1 is high in Behaviour and low in Success). This is a low level of correlation, but does indicate a degree of relationship. When assessing the percentage of those who carried out their expected role (B=1) with successful policies (SR=5), in every case (Early, Middle, Late) the result is significant within the 95% confidence limit.

Analysing elements of policy design against success rating suggests that the following have a significant relationship with success ratings:

- Technology available or included
- Stakeholder education included

As a result, we have shown that there is a relationship between the three elements, stakeholder behaviour, policy design and success, and therefore we are justified in analysing our data further to develop a model.

4 EVALUATION OF SUCCESS FACTORS

More detailed analysis of the data is required in order to identify candidates that might be used to provide indicators of success for scheme design.

Because of the weakness of the correlation between behaviour and success of schemes, the first stage is to explore the relationships between stakeholder characteristics, behaviour and success.

4.1 Social Capital

A candidate indicator that was withdrawn from the analysis at an early stage was stakeholder social capital. Despite the theory, there were no useful indicators that were found to have any correlation with scheme success. Initially, the existence of an antagonistic relationship between two stakeholders within the same scheme was identified as being common amongst schemes with success rating 3 & 4, but further analysis showed that this had no corresponding impact at success rating 2. The analysis was also difficult and with only a few of these relationships amongst 46 schemes, potentially unreliable.

An alternative method used was to consider stakeholder average social capital. Two approaches were tried: firstly the average of the evaluation matrix score for each of the relationships within the scheme, and secondly the average of all the stakeholder averages within a scheme (a scheme stakeholder average social capital). Neither of these produced any correlation with scheme success rating. In this respect we are unable to draw any conclusions about the value of social capital in influencing stakeholder behaviour or scheme success.

4.2 Stakeholder Characteristics

This covers the indicators relating to goals, resources, knowledge and attitude of the stakeholder, as well as stakeholder types. These were evaluated on a matrix with Behaviour Early and Success Rating. Caution needs to be exercised with these analyses as the same stakeholder may be used in different schemes. The list was shown in Table 3.1, but this does not identify classes of stakeholders (e.g. chimney sweeps were cited in three German schemes, manufacturers of RES technologies identified in many schemes, although they may have differing characteristics)

As pictured in Figure 3.1, there is a positive correlation between knowledge and willingness to learn, and also between involvement in the scheme and willingness to participate. Unfortunately, there is no correlation between either of these relationships and success of the scheme. There is, however, a weak correlation between Willingness to learn, Willingness to take part and Behaviour Early (0.66, 0.40 and 0.45). It seems then, that if people are predisposed to take part, they are likely to do so. This raises the question: what predisposes them to take part – is it something about the organisation itself, or are the main factors scheme design?

According to our stakeholder data, the following relationships can be described:

- Stakeholder organisations with good people resources tend to have a good knowledge base (0.51 correlation)
- For Government organisations (n=39) there are:
    - strong relationships between
        - social, military/defence and academic goals
        - environmental goals and scheme success rating
    - strong inverse relationships between commercial goals and attitude (willingness to be involved and to learn)
- For NGOs (n=13) there are:
    - Strong relationships between
        - Political goals and financial resources

        - Social goals and religious goals (small subset)
        - Commercial goals and involvement with the scheme
        - "know how" resources and scheme success rating
    - Strong inverse relationships between
        - Financial resources with knowledge of the scheme, willingness to learn and willingness to take part
        - Commercial goals and people resources

- For Local Government organisations (n=15) there are:
    - strong relationships between social and environmental goals with physical resources, knowledge of the policy and success rating
    - strong inverse relationships between political goals and knowledge of the policy and physical resources
    - this is particularly interesting as it appears there are two types of local government characters, those with strong political goals and those with strong social ones[12]. Those with social goals are also less likely to be involved with schemes, but when they are they are more likely to be successful; the opposite is true for those with strong political goals, i.e. more likely to be involved but less likely to be successful

There were considerable variations in the correlations of characteristics for the three different business types, but only weak correlations when considering all businesses together. This suggests there are some significant differences in the characteristics of businesses carrying out the different roles. In particular, intermediary businesses tended to have a strong correlation between social and environmental goals, but end-user businesses had inverse relationships between success rating and financial or people resources. This area would require more analysis but is not thought to be significant.

With regard to stakeholder behaviour, at least for initial behaviour, only weak relationships were found (for any organisation type) other than for knowledge of the scheme and involvement in it, which is rather what one would expect. The best indicator otherwise, is that of strong environmental goals, where there is a weak correlation for most stakeholders except, bizarrely, NGOs.

4.3 Role type and organisation type

If stakeholder characteristics provide little in the way of robust success factors, is there anything about the role played by the stakeholder, regardless of his organisation type, that assist in identifying success factors?

By examining the descriptions of the expected roles of the stakeholders, the classification in Table 3.12 was drawn up to describe Role Type. The coding allows for a broader "Super" grouping of 1= producer/manager, 2= intermediary, 3= end user to be applied.

Table 4.1 shows the types of organisation distributed against the role types. It can be seen that there is a weighting of government and government agencies towards the management of schemes and of commercial businesses towards the intermediary and end user roles. What is interesting is the comparison between the role types when considering whether they carry out their roles i.e. if the Behaviour Early is as expected. The role types marked in bold in Table 4.1 are all significantly different from the stakeholders as a whole as to whether they carried out their role. In addition, role 17 is significantly different from the rest of the Super 1 group, and 23 is significantly different from the Super 2 group. Again, the numbers are small, so caution is needed, but this has been calculated at the 95% confidence level.

These comments take account of Behaviour Early, but what is the connection with scheme success ratings? Analysing the distribution of role type against success ratings as shown in Table 4.2, we find that there are some significant differences in success ratings for roles 15, 17 and 22. At this stage we

[12] Political goals are aligned more with issues of power and control, social goals with local humanitarian issues

have removed the schemes where there is a known financial reason for the lack of success, in order to focus on stakeholder and design issues.

Table 4.1:Distribution of organisation type amongst roles

	Org type												
Role type	1	2	3	4	5	6	7	8	9	10	11	12	13
11	**10**	**3**	**1**	**2**									
12	8	9								3			
13	**5**	**5**		**1**						**1**			
14	2	1	1							1			
15	**9**	**2**											
16		1								5	1	1	
17	3	2		5					1	4	2	1	
21		7	9		1		1			4			
22	1	2	1	1						8	1		
23				1					2	12	5	3	
24										5	4	1	
25	1	1	1						1	7	3	1	1
31				**5**			**1**		**19**	**8**	**5**	**5**	
32										2	3	1	
Super													
1	37	23	2	8	0	0	0	0	1	14	3	2	0
2	2	10	11	2	1	0	1	0	3	36	13	5	1
3	0	0	0	5	0	0	1	0	19	10	8	6	0

In Table 4.2, the figures show the number of incidences of the role type for each success rating, together with the percentage of successful schemes for that role type in the last row. Although the numbers are very small, the success rating for role type 16 is significantly high, and for 15, 17 and 22 it is significantly low. This requires further investigation as to what influences this result.

Table 4.2: Count of role type for each success rating & significant differences

Count	Role Type													
SR	11	12	13	14	15	16	17	21	22	23	24	25	31	32	Total
2	2	2	3	1	3		4	1	1	1			4		22
3		5			5		8	2	3	4	2	3	4	2	38
4	3	4	2		1	1	2	3	6	2	1	1	9	1	36
5	9	7	4	3	2	5	4	13	2	14	7	11	20	3	104
Grand Total	14	18	9	4	11	6	18	19	12	21	10	15	37	6	200
% 5s	64.3	38.9	44.4	75.0	18.2	83.3	22.2	68.4	16.7	66.7	70.0	73.3	54.1	50	52

As a final analysis of role and organisation type, they are plotted together with the average success rating for the org/role type combination in the intersection cell, as shown in Table 4.3.

The shading is of organisation and role types that are significant (only organisation type 3 was significant in relation to the success rating), and bold type is used for larger numbers of stakeholders (8 or more) in one cell.

Table 4.3: Matrix of average success rating for role/organisation type

Average of Success Rating	Organisation type											
Role type	1	2	3	4	5	7	9	10	11	12	13	Average for Role
11	**4.75**	4.67	5.00	2.00								4.36
12	**3.86**	**3.89**						4.00				3.89
13	**4.20**	3.00		4.00				5.00				3.90
14	5.00		5.00					2.00				4.25
15	**2.78**	5.00										3.18
16		5.00						4.75		5.00		4.83
17	3.00	3.50		**3.20**			2.00	3.50	4.50	3.00		3.33
21		**4.00**	**4.71**		3.00	5.00		5.00				4.47
22	4.00	4.00		3.00				**3.57**	5.00			3.75
23				5.00			3.00	**4.67**	3.75	4.33		4.38
24								4.80	4.00	5.00		4.50
25	3.00	3.00	5.00				3.00	**4.83**	5.00	5.00	5.00	4.53
31				**5.00**			**4.13**	**4.63**	2.67	**4.00**		4.22
32								4.00	4.00	5.00		4.17
(blank)		2.00							2.00			2.00
(average for Org)	3.81	3.90	4.80	3.80	3.00	5.00	3.89	4.41	3.90	4.31	5.00	4.09

The figures in the shaded areas reinforce the view that these are organisation and role combinations that have a relationship with higher or lower success ratings. The clustering of scores around role types 11-15 and organisation types 1 and 2 (especially where larger numbers are concerned) suggest that these issues may be influential in the scheme design, as the roles in this group are concerned with the level of control, management and funding of the schemes, and who is responsible for what aspect.

So, having drawn out some issues regarding who carries out which roles for scheme success, the next stage is to analyse what aspects of the scheme itself could lead to a greater chance of success.

4.4 Scheme Design factors

As indicated when testing the null hypothesis number 3, we have identified that issues of stakeholder education and technology inclusion are significant in the success ratings. The details are shown in Table 4.4. This identifies the significant issues within these design options, although the numbers involved for “resources” mean that these can be ignored.

What this table shows is that there are some key issues within scheme design that influence success. A successful scheme is likely to include stakeholder education for end-users. Marketing by scheme

owner is more likely to be in a successful scheme than other options, and indeed marketing by both owner and agent is more often found in unsuccessful schemes. This could be because these schemes are unpopular or difficult to promote, hence additional effort is made. An alternative explanation is that the marketing by both parties leads to confusion, or detracts from expenditure in other areas of the scheme. Whatever the cause, the result in the data collected is to cast suspicion on schemes which are too heavily marketed.

Table 4.4: Design Factors and success ratings (number of each option by success rating)

	Success rating	*Code*	*2*	*3*	*4*	*5*	*Grand Total*	*SR5 % of total*
Stakeholder education	Not known					1	1	
	Included for end-users	1			3	11	14	78.57
	Included for intermediaries	2	2	2	1	1	6	16.67
	Not included	3	2	5	3	6	16	37.50
	Included for both	4	1	1		2	4	50.00
	Grand Total		**5**	**8**	**7**	**21**	**41**	**51.22**
Resources	*Success rating*		*2*	*3*	*4*	*5*	*Grand Total*	
	Not known					1	1	
	Available to all	1	1	2	3	4	10	40.00
	Available by competition	2		1	1	4	6	66.67
	Available by allocation	3	1				1	0.00
	Limited availability	4			1	1	2	50.00
	None included	5	3	5	2	11	21	52.38
	Grand Total		**5**	**8**	**7**	**21**	**41**	**51.22**
Marketing or promotion of policy	*Success rating*		*2*	*3*	*4*	*5*	*Grand Total*	
	Marketing by scheme owner	1	1	4	1	11	17	64.71
	Marketing by scheme agent	2		2	4	6	12	50.00
	No marketing	8	1			2	3	66.67
	Marketing by both	10	3	2	2	2	9	22.22
	Grand Total		**5**	**8**	**7**	**21**	**41**	**51.22**
Technology in scheme design	*Success rating*		*2*	*3*	*4*	*5*	*Grand Total*	
	R&D included	1				1	1	100.00
	Reference sites included	2	1	1	1	1	4	25.00
	Demonstration available or included	3,4	1		3	14	18	77.78
	Combination exc. demo	5,6,7		1			1	0.00
	No additional technologies	8	3	6	3	5	17	29.41
	Grand Total		**5**	**8**	**7**	**21**	**41**	**51.22**

The addition of 'other resources' is inconclusive. Approximately fifty percent of the schemes that have no additional resources are successful, which is almost the same percentage as all the schemes analysed. Equally there are no significant differences in the other options. Consequently we discard

the inclusion of other resources as a key factor in scheme success, which is not to suggest that they should not be provided if the design of the scheme warrants their inclusion.

Technology inclusion clearly shows that schemes involving demonstration of the technologies involved are more likely to be successful than those that do not, even in non-financial schemes.

The analysis of these factors, and specifically the success ratings of schemes with two of the design options, shows that there is a consistent approach and that two “good” factors are highly likely to be successful, and vice versa. The existence of the design factors appears to be independent in their effect on the scheme success.

Although it is easy to assume that these factors do lead to scheme success, and that logically this connection is tempting, the figures only say that successful schemes are likely to include the factors, not that the factors *cause* scheme success. Nevertheless, because of the natural logic involved, these factors will be used to see if a model can be developed that has a good correlation with scheme success. This model will be developed and tested in the next section, and a discussion included as to how this can be linked with the INVERT model to save public money in promotion scheme design that is being developed in WP5.

Following this, the discussion in section 5 will focus on the findings of the analysis compared with the original model, and consider them in the context of a number of illustrative schemes used in the data analysis.

5 TOWARDS INTEGRATION WITH WP5

Apart from describing and evaluating stakeholder behaviour in relation to programmes and schemes promoting RUE and RES, WP4 aims to use its findings to modify the model being developed in WP5.

The proposition is that there are elements of scheme design which affect the probability of success of a scheme described by the Invert-model. This section aims to develop a system where the scheme design elements in WP4 modify the potential and the costs described by the dynamic cost curves in WP5 using a weighting factor or multiplier. It is not possible to determine the actual probability of success from the data we have gathered.

As a result of the analysis of the stakeholder behaviour data, a number of hypotheses have been derived by analysing the data and identifying significant differences (at 95% confidence), and strong correlations ($p>0.5$) between groups. By representing these hypotheses with individual positive or negative weighting factors we can develop a combination score that reflects the product of all the individual factors, thus resulting in a "design factor weighting" or "design score" that can be applied to the data within the WP5 model. If the score is above 1, then the potential for the scheme remains at that given by the cost-curve model. If the score is below 1, then it reduces the potential in accordance with the score. A score of 0.6 would reduce the total potential to 60% of its original amount.

This section shows how the weighting factors develop from the previous section. There follows a description in more detail explaining the rationale for the weightings and using examples. These are then set in the context of the overall stakeholder model.

5.1 The Linking Hypothesis

There is a relationship between certain aspects of programme design, on their own or in combination with each other, that leads to scheme success. The aspects considered are Marketing, Stakeholder Education and Technology.

The specific elements found to be significant in scheme design are:

- STAKEHOLDER EDUCATION:
    - Positive: Inclusion of education of end-user stakeholders
- MARKETING:
    - Positive: Marketing by scheme owner
    - Negative: Marketing support by both owner and agent
- TECHNOLOGY OPTIONS:
    - Positive: Demonstration available or included or both
    - Negative: other options unless they include R&D or Reference sites

There were no significant aspects of provision of other resources in scheme design.

As shown in section 3 there are also implications for the types of stakeholders carrying out certain roles in the development and delivery of schemes:

- Schemes where the owner or owner/manager of the scheme is from government or a government agency are more likely to be successful. This does not include local government, although this may be due to small numbers involved.
- Where there is a need for a key stakeholder to inspect or certify a scheme e.g. to approve installations, the scheme is less likely to be successful. There are various interpretations on this statement that need to be clarified, as most schemes have some sort of inspection or auditing process. Nevertheless our data shows that where an inspection role is carried out by a KEY stakeholder, there is an element of additional risk.
- Where a key stakeholder gives advice or influences end-users to take up the scheme and this is an independent stakeholder (e.g. advice provider, architects, installer) there is a lower chance of success.

It was also shown in section 3 that there was no relationship between stakeholder involvement in the design of the scheme e.g. through consultation, and scheme success; however on closer inspection this seems to be a feature related to specific cultures. For certain countries, those identified through "activity culture" equal to option 3, partnerships needed, there *is* a relationship between involvement of key stakeholders and scheme success as discussed below, and this has an overall effect on the validity of this stakeholder model.

5.2 Developing the link

Two approaches were tested for integration with the WP5 model; one assumes that the potential within the model is increased by factors that increase the likelihood of scheme success and decreased by poor design factors, and the other assumes that the model has the full potential already and good design factors cannot increase it.

As the analysis developed it became apparent that a combination of both approaches was required; for some factors such as technology provision, good practice was to include demonstration facilities and the potential should be reduced where this is not the case. This was also the approach for some of the role factors; the existence of inspection or advisors of specific characteristics provided a risk that the role would not be fulfilled successfully, therefore if they were needed (as key stakeholders) it reduced the chance of success.

For other factors it became clear that a positive improvement was the most effective model, especially the case of stakeholder involvement for intermediaries, and for government or government agencies carrying out the design role.

A series of models were tested on the data, each one producing a weighting factor, which was then correlated with the success ratings. A number of subsets were considered for these correlations, in order to test whether the proposed model was good for all types of situations of scheme design. These correlations are tabled after the description of the link below. When the correlation for schemes that were rated "3" in the Cultural context: Activity culture i.e. "Partnerships with organisations needed to achieve progress" it gave the result = -0.011 i.e. no relationship at all. As nearly all the other factors testing for a positive correlation between 0.6 and 0.85, i.e. reasonable to very good, this was clearly a problem that needed addressing. It was intuitive that a partnership working culture suggested stakeholder involvement, and while this enhanced the results overall, it also reduced some of the correlations, so that the highest is now 0.78 as can be seen in Table 5.5. So while in the initial analysis, stakeholder involvement in design did not have a relationship with success rating, for certain cultures[13] and sets of stakeholders, there now appears to be a link.

5.3 The link between stakeholders and scheme design

In this section we describe the key questions to be asked and present the weighting factors and calculation in order to decide the weighting or modifying factor for the INVERT model.

A matrix of key factors will be presented as shown in Table 5.1 to Table 5.4. The inputs required will be:

A. Organisation type of the initiator (owner) of scheme (e.g. government department) (chosen from list in Table 5.3)
B. Using the Role Type list (Table 5.4), whether the initiator
   B1. Sets up/designs the scheme only *(=role code 11)*
   B2. Sets up and manages it *(= role code 13)*
   B3. Sets up and funds the scheme *(= role code 15*)
   The combined answer from A&B can be read from the matrix in Table 5.1 to give the multiplying factor
C. Whether an organisation is required to inspect or certify the scheme's outputs (e.g. installations) and they are considered to be a key stakeholder *(= role code 17)*
D. Are end-users likely to rely on advice from a third party in order to take up the scheme (indicator: third party advisers e.g. architects, designers, installers, as key stakeholders) *(=role code 22)*
E. What type of marketing is planned (choose from option list shown in Table 5.2)

[13] The countries affected by this issue were Denmark and UK

F. What type of education is planned (choose from list)
G. What type of technology is planned (choose from list)
H. Whether intermediate stakeholders (i.e. not the policy owner, designer, manager or funder) are involved in the design of the scheme e.g. through consultation process. (yes = 1.2, No =1)

Table 5.1: Matrix for key role and org type multiplier

Organisation / *Role*	*Other*	*1*	*2*
11	1	1.1	1.1
13	1	1	1
15	1	0.8	1
17	0.9	0.9	0.9
22	0.9	1	1

Table 5.2: Matrix for design factor multipliers

Design Factor	*Weighting*	*Description*
S'h educ option 1	1.1	Education included for end-users
2	0.9	Included for intermediaries
3	0.9	Not included
4	1	Included for both end-users & intermediaries
Tech option 1	0.9	R&D included
2	0.9	Reference sites included
4	1	Demonstration available or included
8	0.8	Any other option including 'none'
Marketing option 1	1.1	Marketing by scheme owner
2	1	Marketing by scheme manager/agent
3	0.9	Other marketing/promotion support
4	1	none

Table 5.3: Look-up table for Organisation type

Org type code	*Description*
1	Government
2	government agency
3	NGO
4	local government
5	politician
6	workers union
7	community group
8	ad hoc group
9	individual
10	business inc. trade association

Table 5.4: Look-up table for Role type

Role type	*Description*
11	Set up / design scheme
12	Manage scheme
13	Set up and manage scheme
14	Fund scheme /subsidies
15	Set up and fund scheme
16	Provide finance (commercial or loans)
17	Inspect or certify scheme outputs
21	Promote scheme (market, educate, campaign)
22	Inform or advise end users of opportunities
23	Other intermediary or enabler
24	Affected business (passive)
25	Provide technical input to scheme or products
31	Apply for /adopt scheme (active end-users)
32	Receive outputs of scheme (passive end-users)

The outputs from this question produces a set of weighting figures that are multiplied together to produce an overall score. If this score is above 1, it is capped at 1 so that when applied to the INVERT model, it maintains the full potential calculated through the dynamic cost curve. Lower scores reduce that potential.

The correlations for the whole data group and various sub-groups of schemes between the design factor weighting and the success rating provided with the original data is shown in Table 5.5.

Table 5.5: Correlation of success rating with design factor rating for various sub-sets

Group	*Correlation*
All schemes	0.63
Exc. Those with known financial reason	0.65
Exc. all with known design reasons	0.66
Pre Implementation schemes	0.48
Implementation schemes	0.66
Post-implementation schemes	0.38
Subsidy	0.68
Soft loan	0.47
Political situation 1	0.78
Political situation 2	0.46
Activity culture 2	0.73
Activity culture 3	0.26

The range of correlations on this version of the weighting design gives a range from 0.45 to 0.78 for all but Activity Culture 3 and Post-implementation schemes. This is thought to be acceptable, especially given the small number of schemes in these two sub-sets.

5.4 Worked example

The example selected is from Denmark: Energy auditing of buildings. This is a pre-implementation scheme with five key stakeholders. It has no technology demonstration included, marketing is by the scheme agent and education was included for intermediate stakeholders only. Stakeholders responsible for facilitating the scheme were involved in its design, and this is important as this is an "Activity Culture 3" country.

- Organisation type of the owner of the scheme is a Government agency that designs and manages the scheme (role 12), so the combination of A & B = 1 weighting point.
- Energy auditors are key stakeholders, so it receives a weighting point C = 0.9
- End-users tend to rely on advice from intermediaries such as architects, introducing another lower weighting factor, D = 0.9
- Marketing planned is none (E = 1), Education planned is for intermediaries (F = 0.9), there is no technology demonstration or other options included (G = 0.8)
- Intermediate stakeholders were involved in design (through consultation), so H = 1.2

Multiplying these factors together gives a design weighting factor of 0.755827. This means that the potential for this scheme to be successful is reduce to 75%. The scheme was rated at 3 – partly successful but maybe not cost-effective, by the INVERT partner.

In the next section a number of schemes will be considered in more detail and their calculated design weighting factor compared with the success rating assigned to them. It is probably worthwhile emphasising that our assessment in this hypothesis is one of risk; the smaller the weighting factor the greater the risk that things will go wrong. However, risk does not always materialise, and one of the most important things about scheme design is to weigh the risks and either design them out, or work out how to minimise their importance. Good management is still at a premium, and this model does not attempt to measure that.

6 ILLUSTRATION OF THE SUCCESS FACTORS

We showed in sub-section 5.1 that there were seven success factors, three relating to the roles and organisations involved, one relating to stakeholder involvement in design within certain cultures, and three concerned with the scheme design itself, namely stakeholder education, marketing and technologies. This section discusses the success factors in action, illustrating them with six examples of promotion schemes and comparing actual with predicted success. It also relates the hypothesis back to our model of stakeholder behaviour, and re-examines the importance of stakeholders in carrying out their assigned roles.

The schemes used for illustration are:

- Austria: Small Hydro certificates scheme
- Greece: Operational Programme for Competitiveness
- Poland: Sustainable Energy Education Programme
- Portugal: MAPE grants
- Germany: 100,000 roofs scheme
- UK: DTI PV grants scheme

The last two were selected because they deal with the same issue: promotion of photovoltaic panels on domestic buildings, but through very different approaches. The main characteristics of the schemes are shown in Table 6.1 below, and the success factors compared in Table 6.2.

Table 6.1: Characteristics of the illustrative schemes

Country	Policy name	No. of stakeholders	Stage[14]	Energy[15]	Finance	Subsidy	Feed-in tariff	Soft loan	Tax	Tax exemption	Regulation	Quota	Certification	Success rating
Austria	Small Hydro certificates	5	3	2	✓							✓	✓	2
Germany	100,000 Roofs campaign	7	3	2	✓			✓						4
Greece	Operational Programme for Competitiveness	7	2	3	✓	✓								5
Poland	NFOS Sustainable Energy Education Programme	5	3	3		✓								5
Portugal	MAPE grants	5	2	3	✓	✓								3
UK	DTI Major PV Demo programme	6	2	2	✓	✓								4

Firstly a discussion of each success factor in turn.

6.1 Ownership and Management of Promotion Schemes

The first success factor identifies that where the *design or setting up* of a scheme OR the *design/set up and management* of a scheme is carried out by a government department or government agency, it is *more* likely to be effective than alternative arrangements.

[14] Stage: 1= Pre-implementation, 2= Implementation, 3= Post-implementation

[15] Energy: 1= RUE, 2=RES, 3=both

Table 6.2: Success factors for the six examples

Filename	Policy name	Success rating	Stakeholder education[16]	R&D	Ref sites	Demo inc	Demo avail	Video of demo	Tech Code[17]	Marketing[18]	Activity Culture[19]	Owner/owner-manager[20]	Inspection	Advice provider[21]
Austria	Small Hydro certificates	2	3		✓				2	4	2	2,4		
Germany	100,000 Roofs campaign	4	3						8	3	2			
Greece	Promotion campaigns for energy efficiency & RES	5	3		✓		✓		4	2	2	2		10
Poland	NFOS Sustainable Energy Education Programme	5	4			✓	✓	✓	4	2	2	2		
Portugal	MAPE grants	3	3						8	1	2		✓	
UK	DTI Major PV Demo programme	4	3		✓				2	2	3		✓	10

It is important to understand that this is an improver of the outcome from standard and does not imply that other arrangements are not effective, except in the cases indicated below. It can be explained rationally that government and government agencies are empowered to make decisions on setting up and carrying out the additional functions that might not be available to other stakeholders. An interesting case is that of local government. Theoretically, if they are in a culture where they are empowered to set up promotion schemes, then all should be well, but this is not shown by our analysis of the data (however it should be noted that the number of local governments in this situation was very small). At this stage, therefore, local governments are no better at setting up schemes than any other organisations. One of the few examples is the case in Austria for small hydro certificates, where it can be seen that a positive approach by the local government led to good results and a negative approach to unsuccessful results. So the effect of local government on the success of the scheme may be related to something other than management role, such as willingness to take part.

What should be noted is that the other "leading" roles do not "improve" success if government carries out, for example, the management role. It is clear that there is no additional benefit in having government or government agencies manage the scheme (as opposed to set up and manage) than any other type of organisation. In practice, many of the schemes analysed were managed by government agencies, but it appears that there is no particular relationship between this and any other arrangement. Rationally, this is about quality of contractual arrangements and good management practice by the organisations concerned, not about who is in the role.

An even more interesting result from the statistics is that where a government body takes the role to *design/set up AND funding,* there is a significantly negative effect on the success of the scheme. One

[16] Education: 1= end-users only, 2= intermediates only, 3= none, 4 = both

[17] Technology: 1= R&D, 2= Reference Sites, 4=Demonstration (any combination), 8= other including none

[18] Marketing: 1= by owner, 2 = by agent, 3= other, 4=none

[19] Activity Culture: 2=State leads, 3= partnership needed

[20] Organisation type of Owner-manager; 2= government agency, 4= local government

[21] Advice provider, organisation type: 10=business

possibility might be that the funding is not secure, or that it is subject to political changes, whereas if funding is separate, it is more secure.

6.2 Requirement for certification and/or inspection

Many types of scheme have a requirement for some sort of inspection or control system to be in place, for example, to secure a subsidy, or to certify work to a given standard. There is a distinction here between inspection of specific installations and audit of the scheme or checking a sample of installations. In the example from Portugal, a government inspection is required to receive the grants, in the UK one, the inspection or quality control in order for the grant to be approved is by a business contracted to carry out the work.

The inclusion of a key stakeholder with the role of inspection of some type seems to introduce a risk factor to the scheme design that translates in the statistics to a lowering of the success rate. It may well be that the type of scheme is more risky, rather than the element of inspection itself, but the relationship exists and is modelled by a reduction in the success weighting compared with those schemes that do not have a quality control as a key element within them.

However it should be clearly understood that if a scheme needs quality control it should be provided, not left out simply to improve a statistical weighting.

6.3 Need for advice

In many promotion schemes there is a need for professional or technical advice. Many end-users prefer to obtain such advice from a third party. The introduction of a third party introduces a risk which is outside the control of the scheme designer. How can the scheme designer ensure that advice given supports the aims of the scheme? One way is to provide advice from a source within the design of the promotion scheme, such as a government agency, or a professional body. There is an opportunity to include such advice providers in the design of the scheme so that they are “on message”, giving the expected advice to support the scheme. The problem for all schemes comes when the advice originates from a third party who may not support the objective of the promotion scheme. Most countries within the INVERT partnership suffer from the problem of independent builders or installers that see no reason to change their existing methods, so do not support RES and RUE technologies. They are themselves barriers to the promotion schemes. In the examples, the UK programme relies on advice from solar panel providers to support the initiative, although equally there are government agency advisers. In the end, the advice from the local builder is as likely to influence the end-user as to whether to install the technology or not. One way to overcome this barrier – eventually – is to educate the third parties, as in the example of the Polish Sustainable Energy Education programme, which specifically targets those intermediaries in a position to give advice to end-users.

Again, in the model this success factor does not imply that where end-users rely on the advice from a third party that the advice will be bad; it means there is additional risk, and that risk is reflected in the reduction of the allocated weighting factor.

6.4 Scheme design

It was not possible in such a project to consider the whole issue of scheme design, to determine whether all the systems and procedures necessary for the scheme were included, whether management and accounting principles were followed, whether the plan included proper analysis of risks and contingency options, or indeed, whether the issue was properly scoped in the first place. In linking issues such as inspection or quality control, discussed in 6.2 above, the question “Did the scheme include quality control for every installation” was not asked during the data collection. The relationship was determined from the inclusion of this role within the key stakeholders selected. “Was quality control needed?” followed by “Was quality control provided?” would have gathered the data, but would not have been practical within the scope of this project.

Instead, the approach taken was to assume that the scheme had been well designed in terms of its management systems, and to identify whether some key issues for stakeholder engagement had been included. One issue that was subsequently included was whether there was a known financial or other design reason for lower success ratings. This allowed the analysis of data to take account of

any bias introduced for an otherwise well-designed scheme, in terms of stakeholder interaction, known to have a fundamental flaw. The key issues for stakeholder engagement thus discovered were:

- Stakeholder education
- Marketing
- Access to Technology

6.4.1 Stakeholder education

This considered the problem of whether the stakeholders knew sufficient about the RES or RUE issue to make an informed decision or play their expected role in the promotion scheme. Education can take many forms, including seminars, best practice guidance, access to centres of excellence, networks, newsletters and information leaflets.

As shown in the analysis, where end-user education was included, there was a positive relationship with scheme success. Although there was no significant relationship when education of both end-users and intermediates was included, the numbers were very small, and it is logical to infer that any education of end-users, whether in conjunction with intermediates or not, creates a positive impact. There was no conclusive effect of lack of education, but it appears that education only of intermediate stakeholders has a negative effect. It is not clear why this should be the case, except that it suggests the benefits of raising awareness amongst end-users is more effective than persuading intermediates that there is a business benefit to them to “sell” to the end-users.

In the examples, most have not included stakeholder education, but the Polish scheme focused on education of both intermediates and end-users, and the MAPE grants education was directed at end-users. Both schemes were successful.

6.4.2 Marketing

The elements of marketing included in scheme design that were analysed initially were:

- Extensive or short term marketing by scheme “owner” or “agent”
- Provision of marketing materials for an intermediary
- Provision of specific marketing budgets for intermediaries
- No marketing support

In addition, a number of schemes highlighted marketing by both agent and owner, and some other combination of support. It became clear that marketing by the scheme owner, whether short-term or extensive, was related to scheme success, more so than marketing by the agent or manager, although this was a reasonable option. Although the numbers were small, there was no adverse or positive effect of no marketing at all, consequently this has the same “neutral” weighting as marketing by agent. There are also some schemes in which marketing is not a necessary option.

Schemes where there were other marketing options correlated with lower success ratings. As with the comments on quality control, this does not necessarily mean these options are a bad thing, however it suggests that better or more effective use of marketing budgets can be achieved through ‘straightforward’ approaches. The numbers in this analysis are small, however, and further work would be advisable.

6.4.3 Access to Technology

RES & RUE promotion schemes are expected to be promoting either new technical advances or new ways of implementing existing technical measures. This is taking the wider definition of technology as know-how and application rather than just technical advances. The options offered for data gathering were aligned with the standard innovation path i.e. R&D, prototype, demonstration or reference sites. Demonstration was sub-categorised into availability of demonstration (i.e. a stakeholder could choose to access it) or included within the scheme design (stakeholder was provided with it). The combination of such options led to some difficulty in determining which were the key issues to include

in scheme design, but eventually it became clear that for Pre-implementation schemes, R&D support was a standard, and it did not apply in later stages.

There was clearly a benefit from inclusion or availability of demonstration, either on its own or in combination. Access to reference sites appeared to have little positive effect on the success rating, so that the active nature of demonstration to stakeholders ranked higher in the effectiveness of scheme design than the other options. Other passive technology options such as video of a demonstration were better than nothing, but not effective in improving success, and all other options had a negative effect.

Analysing these effects within the schemes themselves it is clear that some access to technology is important; demonstration providing the standard by which the rest should be judged. Consequently, the weighting for technology provides a reducing factor for every option other than demonstration as none is as effective. This can be seen in the examples: the programmes from Greece and Poland were both concerned mainly with the demonstration of the technologies in order to promote take-up of measures and were fully successful. In the discussion of the programmes below this will be explored further.

6.5 Stakeholder involvement in scheme design

As explained in section 5.1, the relationship between scheme success and involvement of stakeholders in scheme design was not found to be strong when dealing with the whole dataset. However in developing the weighting factor, it was found that there was a real difference between the correlation of predicted success with the success rating between the countries with Activity Culture =2 and those with Activity Culture = 3. The countries in the latter group were UK and Denmark, cultures where partnerships with organisations were needed to achieve success. “Organisations” in this sense were mainly considered to be the intermediary stakeholders, so it is rational to assume that the involvement of these stakeholders in the scheme design e.g. through a consultation process, produces the involvement needed within the activity culture to encourage them to play their expected role. The example used in this section is one where there is less consultation than is normally required for UK schemes, but still one where the main stakeholders expect to be consulted about how a mechanism such as a grant scheme should work if they are to be involved.

6.6 Six illustrations

The summaries of the schemes selected to illustrate our stakeholder behaviour investigation are shown in appendix 3 and their main points of comparison were shown in Table 6.1and Table 6.2. In this section we examine them again and compare our assessment according to the model with the formal or informal evaluation that has been carried out in the country of origin.

6.6.1 Austria: Small Hydro certificates

This mandatory certificate system for small hydro power was set up in 2000 and was abandoned (replaced by the "Ökostrom-Gesetz") at the end of 2002. All utilities and electricity traders were obliged to account for certificates for 8% from small hydro power (<10MW). Small hydro power is concentrated on the western provinces of Austria and hence there was a political conflict about the level of penalty, which could be fixed by each provincial government autonomously (eastern provinces: low, western: high); this also led to discussions about the aims and design of the scheme in connection with promotion for CHP plants. This also meant there was a change in response from the hydro operators, who were initially keen to participate and in fact lobbied strongly in favour of this instrument, but found it increasingly difficult as time went on. The utility companies in the east of the country also responded differently from those in the west, due to the strongly differing level of small hydro electricity potentials and production as well.

The scheme did not work due to the design which did not take into account the goals and behaviour of key stakeholders (different provincial governments). Moreover, it would not have been cost effective due to high windfall profits for existing plants.

The lobbying group for small hydro operators opted for a strong financial promotion scheme for small hydro plants and suggested a quota. The design of the scheme included the option of different levels

of penalty in different provinces of Austria, i.e. penalties could be determined autonomously by each provincial government. Hence, a government was able to impede the proper functioning of the program by low penalties. In fact in one case they impeded it due to differences in promotion (and accounting) for CHP, where the government in question would have much more potential than the Western provinces. Another issue that turned out to be crucial was the high number of very small operators. For them high transaction costs for the generation certificates were a quite important aspect.

So this scheme was judged unsuccessful, and rated 2 by the partner. The model suggests that it should have a score of 0.972 or 97% of potential, which is quite high and would suggest the scheme as designed had a good chance of success. However in this case it can be clearly seen that besides from the key factors identified above, there are some other factors which made the provincial stakeholders not carry out their role to set a reasonable tariff and to promote it accordingly, hence overall the scheme failed. Because these additional factors are very specific for this illustration example and this specific design of the scheme it is not possible to include these into the model.

Can we ask in the design of the model "Is the stakeholder willing to take part?" It is obviously an important part. Perhaps in this instance we should accept that even including all the key factors, if major stakeholders are opposed to a scheme, they will make it fail. Not all the elements of scheme design can be modelled.

6.6.2 Germany: 100,000 Roofs campaign

This was a very effective programme with considerable public support, however the costs to society were a concern. The scheme provided a financial package to house owners to install photovoltaic panels on their roofs. After an initial slow start whilst the finance packages were developed, the take-up was reasonably good, but plumbers and other installers were unprepared as well, which also slowed the implementation of the programme. The media message was that solar energy was good for the country and this helped the marketing effort put into the programme, but the marketing had a relatively short life. This may be because once the programme was started, word of mouth kept the initiative alive. However costs are high, and not least to the electricity distributors who have to solve the technical problems of gird connection without additional help.

This scheme was judged at 4, to be partially successful in achieving its objectives and leading to greater understanding of the issue. It helped the next phase of the programme as seen by the support of the stakeholders later in the scheme. The model suggests it should score 0.78 or 78% of potential, which is a typical score for a programme that doesn't quite achieve full success, and reflects its difficulties well. If the areas where the theoretical approach are examined, it would suggest that the success could be improved by including technical demonstrations and stakeholder education. That they were not suggests as much that the scheme was put into place before all the stakeholders were ready, and that including more end-user information and understanding of the technologies would have helped.

6.6.3 Greece: Operational Programme for Competitiveness

This was one of a number of programmes to promote different RES and RUE issues as part of one over-arching scheme. The Ministry of Development - MoD provide State support to private investment in renewables, rational use of energy and small scale cogeneration. CRES is appointed by law as the National Centre for Coordination in the fields of environmentally friendly Renewable Energy Sources (RES), Rational Use of Energy (RUE) and Energy Saving (E.S.). As such, it can initialise and implement various promotional activities for RE technologies and/or Energy Efficiency addressing various sectors of the economy. A number of RES projects had been constructed as demonstration technologies and these were promoted by the local energy agencies. Most of the stakeholders already had experience of working together, although local energy agencies were not so familiar with working with investors, consultants and constructors. This grant programme (OPC) followed a previous programme of RES investment-subsidy, and the programme took the opportunity to learn from the previous scheme and improve the overall design and operation.

The programme included the key design features of marketing and technology demonstration, and it was rated 5 (fully successful). Although stakeholder education was not specifically included, the activity in other programmes at the same time influenced the overall awareness of the issues. The rating is reflected by the theoretical score: 0.81, which is reasonable, but shows that there is an

element of risk, particularly because of the lack of stakeholder education and the inclusion of consultants as key stakeholders who are influential on the decisions of investors and developers. These risks were in fact reduced by the parallel work as part of the associated campaigns, but this is not reflected within the model.

6.6.4 Poland : NFOS Sustainable Energy Education Programme

This was an educational programme set up by the government agency NFOS designed to stimulate take up of RES& RUE as well as other environmental improvements. Seminars and training were set up for local government, businesses and individuals to enable them to understand how these improvements could benefit them. The project was developed by FEWE and financially supported by NFOSiGW and EU Tempus programme.

The main focus was the education of end-users. It was addressed to the decision makers, municipal government, representatives of businesses, as well as NGOs. The project included five sets of two-week courses, with lectures and site visits to RES facilities in Poland and Denmark: about 200 people were trained.

Many projects and project ideas have emerged as a result of the training courses. In particular:

- The low cost heat energy saving methods have been implemented in a number of municipalities: Swierzawa, Nowa Deba, Dzierzoniow, Czernin, Debrzno. Apart from the energy savings achieved, an important factor was job creation.
- Biomass project in Nowa Deba. A project of a 4 MW (2x2 MW) district heat boiler using biomass produced locally in willow plantation (300 ha).
- A project of 8 MW district heating using straw developed in Lubań.
- Conversion of the district heating system (10MW) in the city of Trzcianka from coal to biofuel coming from plantation of *Salix viminalis*. The municipality earmarked 500 hectares of land for the plantation. Currently, 150 ha are in use.
- 370 kW coal boiler in a local school in Janów has been converted to wood waste produced by a local wood-processing enterprise.
- Creation of an association “Bioenergy for Rural Development”, BRD (registered in court in October 2001, now ca. 130 members, mostly local decision-makers and business representatives,). It is particularly active in the area of promotion of energy plantations and has attracted attention and support of high-ranking national-level politicians.

Not surprisingly this project was rated 5, fully successful, by the partner, and it scores 0.99 or 99% of potential on the theoretical approach. This was affected by the complex marketing of the programme, which rightly or wrongly is seen as a risk, but in this case is fully justified by the take-up by the end-users. There was also little involvement of any of the intermediate stakeholders in the design of the programme, but at this stage, with education and information as the key issue, it is likely that the stakeholders are now well-informed for future involvement with scheme design.

6.6.5 Portugal: MAPE grants

This is a six year programme that started in 2000 with two years covered by this report. RUE & RES are marginal issues in Portugal so the grant scheme was designed to improve the take up of measures and installations. The Ministry for the Economy defined the programme, provides funds and resources and uses ministerial contacts and promotion tools to disseminate the programme. One of the main criteria for official approval of numerous projects (namely for wind power and hydropower) is the decision of the Ministry of Environment, which is based on results from the environmental impact assessment conducted by the proponent of the project. This has proved to be a difficulty, at least in the early stages of the project; the two ministries have very different goals and do not have a history of working effectively together. It is significant that the Ministry of Environment was not involved in the design of the project although they were required to grant authorisations. The result that the scheme has so far fallen short of its objectives could probably be predicted under these circumstances, although progress is now being made.

The project was rated 3 by the partner, partially successful but maybe not cost-effective. The theoretical rating is 0.57 or 57% of potential. The major barrier seems to be the issue of permits for installations, especially for wind power. The ministry concerned with permits was not engaged with the design process so maybe this issue was not properly addressed in the scheme design, either technically or from a psychological point of view. This is an interesting example of the barrier that can occur when certification or inspection is required for a scheme to meet its objectives. Other issues that supported the relatively low weighting for this scheme were the lack of technology demonstration and stakeholder education, although the marketing was a strong feature. With environmental impact assessment being required to move forward on installations, more stakeholder education might be an appropriate design response to support additional dialogue with key stakeholders.

6.6.6 UK : DTI Major PV Demo programme

This is a grant programme which covers large, medium and small scale installation of building mounted or integrated solar photovoltaics (pv). Only the “small grants” are considered in this analysis. Small grants were offered to house owners and communities such as schools, libraries, leisure centres etc. There has been a good response from manufacturers and installers, with the places for “approved” installers being over-subscribed many times.

Initial interest from the public has not translated into a high level of applications for grants (200 recorded in the first year report). Some of the reason is thought to be the overall cost of measures: raising the additional finance (50% grants are being offered) was difficult for many applicants. Low initial take up for community projects has been overcome and this sector now looks to be more promising than private householders. Installation teams have experienced problems with grid connection; whilst the electricity companies were consulted at corporate level, locally, electricity operators have sometimes been reluctant to make grid connections and there has been a need to educate them on best practice in this respect.

Access to funding has been considered and domestic end-users can now be directed to suitable loan sources. Promotion through Regional Development Agencies is becoming an important source as often matching funds can be obtained for community projects.

This was rated 4 by the partner, partially successful in achieving its objectives and leading to greater understanding of the issues. The theoretical score is 0.5668, or 57% of potential, which is rather low, and could imply a very high risk programme. The main reason for this is the low level of marketing, and no inclusion of education or technology, although access to these resources is included in information provided about the scheme. An additional risk factor is the need for inspection by a third party, although there is no suggestion that this arrangement is not working satisfactorily, and it may be that this is not a *key* stakeholder. That the theoretical model reduces the potential to 57% is probably realistic as the true potential is quite high. In this situation the issues tend to be those connected with market diffusion of a relatively new technology, and to do with organisation barriers and whether they can be overcome. To improve the theoretical rating, changes in marketing, education and technology would make a considerable difference. This might then present the scheme designers with the problem that total grant funding might be insufficient to address the demand. The idea that the Invert-model might allow a scheme designer to regulate the achievable potential by including or omitting various key factors is a novel one that will not be addressed further in this report.

6.7 Real stakeholder behaviour compared with the model

Despite the use of the phrase “stakeholder behaviour” to describe this workphase, the analysis has been about stakeholder response to scheme design factors, and whether schemes can be designed to be more successful. We showed in section 4 that there was not a statistical link between stakeholder behaviour and scheme success. We would argue, however that we have determined significant information on how best to provide stakeholders with the opportunity to respond positively to a promotion scheme.

It is noticeable, that in the details of our illustration as shown in appendix 3, less successful schemes tended to have key stakeholders that had not carried out the role expected of them throughout the life of the scheme. These are summarised in Table 6.3. This may not be statistically significant but there is a rational and obvious link. Can the schemes be designed so that stakeholders are more likely to

respond in the way that is expected? The elements that we have described suggest that this is indeed the case. If we refer back to our original model of stakeholder behaviour in Figure 2.4 we identified that policy factors (or scheme design factors) have an influence on the importance placed on the issue by the stakeholder and options available to act. We have gathered data that suggests that different stakeholders process these variables in different ways, yet there is still a lower risk of scheme failure if the stakeholders know that the issue is important (e.g. through education and demonstration of the technology) and know there are options to act (through marketing and education). The way these messages are delivered , or how well they are perceived, appears to be related to the way the scheme is set up, i.e. by an authoritative and reliable organisation such as government.

Table 6.3: Comparison of stakeholder behaviour in illustrative schemes

	Success rating	Organisation type	Expected role	Role type	Behaviour[22]		
					early	middle	late
Austria	2	Government Agency	set up the central database for the certificate trading and process the trading scheme	13	1	1	1
		Beneficiary business	install, operate (or improve operation of existing) small hydro power plants	23	1	2	4
		Local government	determination of the penalty, which turned out to be the crucial point of the whole scheme (eastern: low penalty)	11	4	4	4
		Local government	determination of the penalty, which turned out to be the crucial point of the whole scheme (western: high penalty)	11	1	1	1
		Affected business	fulfil the obligation of the certificate scheme	31	1	1	1
Germany	4	Government Agency	Manage the programme	12	1	1	1
		Individual	Buy products	31	3	1	1
		Individual	install products	31	3	1	1
		Beneficiary business	finance installation	16	3	1	1
		NGO	lobby for programme	21	1	1	1
		Beneficiary business	produce technology	25	1	1	1
		NGO	lobby for the programme	21	1	1	1
Greece	5	Government (Ministry)	The MoD was involved in managing a number of promotion campaigns; they provided the funding for this scheme	14	1	1	1
		Government Agency	Promote the grant scheme through a public competition. In addition they organised conferences, workshops, technical meetings as well as in the publication of leaflets, technical brochures, educational guides, etc.	21	1	1	1
		Beneficiary business	Provides development funding and investment capital for projects.	21	1	1	1
		End-user business	Their main role is the installation of RES/RUE products.	23	1	1	1
		Local government	Installation of RES/RUE products in municipalities, prefectures, regions (where they are established) of Greece	31	1	1	1
		Affected business	The main role is the preparation of RES/RUE projects, and advising as consultants	22	1	1	1
		Affected business	Their role is the construction of RES/RUE projects. They were the beneficiaries of the scheme	24	1	1	0

[22] Behaviour code: 1= carried out expected role; 2= carried out other helpful role, 3= did not carry out expected role, 4= carried out different role that hindered scheme, 5= carried out a role that prevented other stakeholders carrying out their roles, 0= not yet at this stage

					Behaviour[22]		
Poland	5	Government Agency	Set up the programme	11	1	1	1
		NGO	Manage the education seminars and demonstration programmes	21	1	1	1
		Beneficiary business	Participate in the seminar and training	31	1	1	1
		Individual	participate in the seminar and training	31	1	1	1
		Local government	Participate in the seminar and training	31	1	1	1
Portugal	3	Government (Ministry)	Define the programme; provide funds and resources; use ministerial contacts and promotion tools to divulgate the programme	15	1	1	0
		Government Agency	Manage the programme	12	1	1	0
		Government (Ministry)	Deliver authorisations regarding potential sites and main characteristics for power generation units, grid infrastructure and use of water courses	17	4	4	0
		End-user business	Install RES, generate E-RES	31	2	1	0
		Affected business	The electric grid companies have a key role as they have to buy the electricity generated from RES, define the technical condition for the access to the grid and invest in new infrastructures to connect RES power units	23	4	1	0
UK	4	Government (Ministry)	Define programme, provide funds and resources	15	1	1	0
		Government Agency	Manage the programme	12	1	1	0
		Affected business	Inspect installations and approve grant payment	17	1	1	0
		Beneficiary business	To identify the methods and technologies most suited for installation and to get the installations completed successfully	22	1	1	0
		Individual	To apply for and install PV on their roofs	31	1	2	0
		Affected business	Expected to enable installation of grid connected PV, particularly technical issues of grid connection and reverse metering	23	4	2	0

In the model we also indicated that certain cultural contexts were important, but this was more difficult to specify.

We also identified in section 4.2 that for some organisations, those with stronger environmental goals were more likely to be supportive of these types of schemes. However it is very difficult when designing this model either to ask or specify that a key stakeholder hold specific goals in order to take part. Perhaps the best one can suggest is that if the key stakeholders do not appear to hold aims and objectives that are compatible with the programme goals, then good scheme design, stakeholder involvement and education are even more important so that the stakeholder sees that there is a reason to act, and is encouraged to act in the way that benefits the scheme.

7 CONCLUSIONS

7.1 Outcome compared with aims

The aim of this workphase was to identify the behaviour of stakeholders in promotion scheme design and to determine what benchmarks could be identified. Several question arise:

- Were there specific target groups who were more influential in achieving scheme success?
- How could this knowledge be integrated with the Invert-model?

We have identified that there are indeed specific groups and that the roles of these target groups within a promotion scheme may have an effect on the scheme's success. In particular we have discovered that:

- Government and Government Agencies acting as 'owners' or designers and/or funders of schemes make it more likely that the scheme will meet its objectives.
- Local governments may be very influential in achieving scheme success, but equally they may prove influential in reducing scheme success if their own objectives are not aligned with those of the scheme.
- Organisations such as architects or installers who may provide advice to or influence the decisions of the targeted end-user of the scheme introduce an element of risk in that their advice may not support the aims of the scheme.
- Organisations who are required to give permissions or certification of installations in order for schemes to progress are very influential and must be included in the development of a scheme if their co-operation is to be assured.

There were also certain benchmarks for scheme design that have an important influence on scheme success. One could suggest that these are also the key issues for that all-important target group, the end-user or focus of the promotion scheme. Benchmarks were found to be:

- The inclusion of marketing of the scheme by the scheme owner to the end-user stakeholder or target audience for the scheme,
- Including education on the RES and/or RUE issues for the end-users or target audience for the scheme,
- Making demonstration of the technologies involved available, or including them in the design of the scheme,
- Where the social culture of the country or region is to achieve progress through partnerships with business or other organisations, it is extremely important that all intermediate stakeholders who have a role in delivering the scheme, and especially those in an advisory capacity that could affect take-up by the end-user, are consulted or otherwise involved in scheme design. This is also beneficial to other countries and regions.

In determining scheme success we have used a scale that compares achievement with the specific objectives of the scheme (see Table 2.1). There has been no attempt to determine whether the objectives were 'reasonable', but the analysis took into account schemes where there was a known financial reason for lack of success, for example, a very low setting for a key financial incentive.

There were also a wealth of other data recorded on stakeholders, including interesting connections between the organisational goal types and success of schemes. Commercial organisations with a strong environmental ethos tended to be involved with successful schemes, as did socially orientated NGOs. This last observation is particularly interesting as it may reflect the complexity of sustainable energy; not all renewable energy is environmentally benign in the local setting whereas most energy efficiency measures incorporate an aspect of wider social benefit, especially in poorer households. It suggests that further research might be worthwhile in this area, especially with substantial inequalities in wealth across the European Community.

7.2 Modification of Framework for Stakeholder Behaviour

How do these conclusions inform our original framework of stakeholder behaviour? Can we incorporate scheme design and show the links in a graphical manner?

In Figure 7.1 the original stakeholder framework has been modified by the inclusion of scheme design factors shown in green. Our conclusions suggest that stakeholder education, technology and marketing factors within scheme design have an impact that translates into modification of *stakeholder behaviour*, rather than directly on *scheme success*. Other elements of scheme design not assessed in this workphase may impact directly on scheme success independently of stakeholders. These elements might include: the operational system for the scheme; the level of financial incentive included; the inclusion of risk analysis, or the quality of the assessment of the technology potential and demand curves. Those elements that can be quantified on an economic basis are incorporated in the Invert-model that is the main objective of this project.

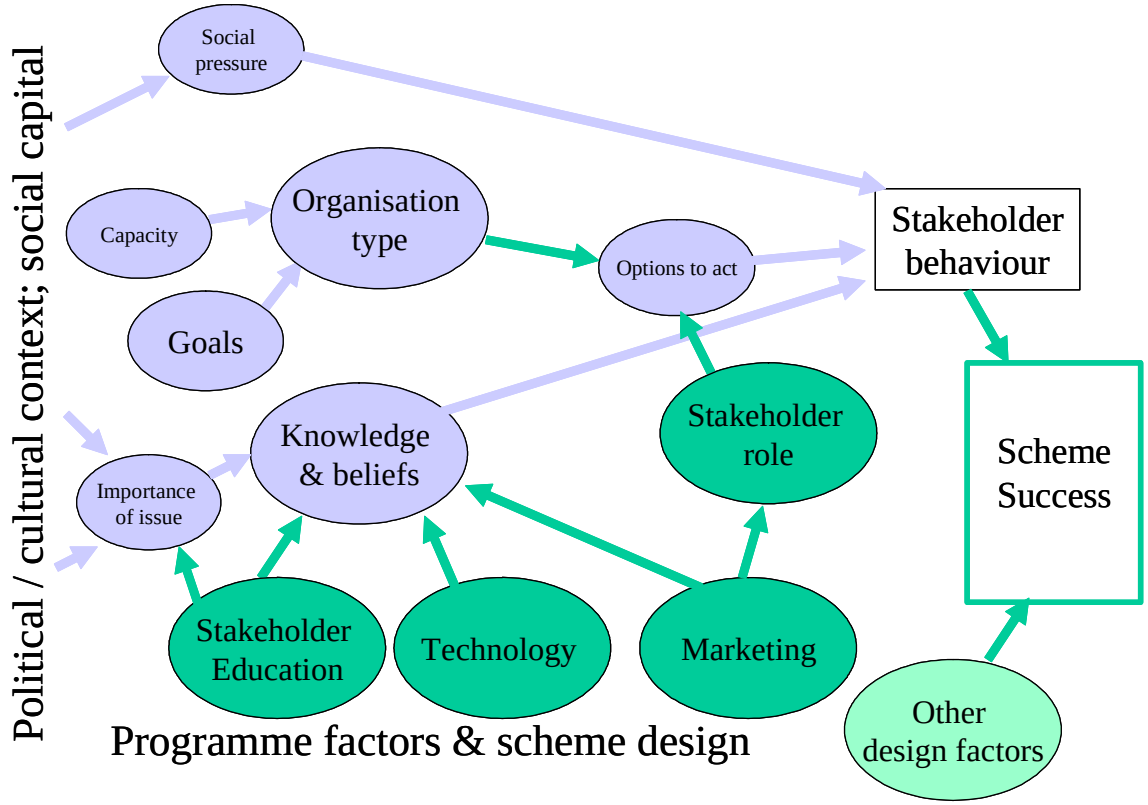

Figure 7.1: Diagram of factors impacting stakeholder behaviour and scheme success

One of the main changes to the original stakeholder behaviour framework that was shown in Figure 2.4 (apart from the change of the axes for cultural context etc and programme factors) is the introduction of two independent classifiers of the stakeholder: *organisation type* and the *role* carried out in the promotion scheme.

It can be seen that all three design factors we have examined affect mainly the *knowledge and belief system* of the stakeholder, but that *marketing* is also linked to the *stakeholder role*, which itself implies certain *options to act* for the stakeholder. Our conclusions on the importance of the type of stakeholder carrying out certain roles leads to the link between *organisation type* and *options to act* being partly defined by scheme design, hence it is shown as a green arrow. The definition of these *options to act* then supplies some of the influences on *stakeholder behaviour*, with *knowledge and beliefs* and *social pressure* remaining independent of the *organisation type* or *role* in determining the response to the scheme design.

It would have been useful if we had sufficient data to be able to test this modified framework further. We recommend that a more focused survey of stakeholder responses in key programmes with similar design factors should be undertaken to test the validity of this framework.

7.3 Summary

In summary then, we have identified a number of benchmarks and target groups that must be addressed in order to maximise the opportunity for a promotion scheme to be successful. We have designed a framework for including influences on stakeholder behaviour in promotion scheme design and we have produced a methodology so that it can be integrated with the overall Invert-model. The next step will be to obtain the stakeholder-related information from a set of independent case studies and test the validity of this framework in the context of the rest of the Invert project.

8 REFERENCES

Allen, W.; Kilvington, M., Horn, C. (2002) *Using participatory and learning-based approaches for environmental management to help achieve constructive behaviour change*. Landcare Research Contract Report LC0102/057, Lincoln, New Zealand. http://www.landcareresearch.co.nz/sal/par_rep.asp (accessed 16/05/03)

Baldwin, Christine (project leader) (1998), *SuperJournal: a project to develop electronic journals.* Loughborough University, UK http://www.mimas.ac.uk/sj/hypoplan.htm (accessed 16/05/03)

Carter, Jonathan (2001); *Modelling Decision Making Processes in UK Container Transport, Imperial College London. http://www.ese.ic.ac.uk/research/containerworld/Printable_docs/Model_Decis_Carter.htm(accessed 19/05/03)*

Krywkow, J., Pieter Valkering, Jan Rotmans, Anne van der Veen (2002) *Agent–based Modelling in Water Resources management*, part of the FIRMA project led by University of Guildford http://www.icis.unimaas.nl/projects/firma/description.html (accessed 19/05/03)

9 APPENDICES

Appendix 1: Guidelines for data collection

Quick start (summary)

This workphase aims to determine the relationship between the way stakeholders are involved in programmes and the design of successful programmes. This will inform the design of WP5 and feed into the case studies.

The work partners are asked to do is:

- Agree the "most important" programmes (in terms of data gathering for Invert) you will report on with Jacky Pett (ACE, UK)
- Complete the template for one of the programmes, choosing only the key stakeholders
- Send the first completed template to ACE by the end of January 2004
- Get feedback from ACE on the first one, and clarify any points that need further discussion
- Complete the templates for the other most important programmes and send them to ACE as you do them. Complete any others if you wish to do so and have time within the project budget.
- Send all completed templates by the end of April 2004 at the very latest.

The rest of this document gives further information about the design of the workphase, the design of the template and explains some of the terms used in the template.

Introduction

INVERT aims to develop a computer model that predicts the optimum design for Renewal Energy Services (RES) and Rational Use of Energy (RUE) policies in Europe. Workphase 4 is an analysis of stakeholder behaviour in response to various policy interventions. The aim is to determine the factors (in combination) that lead to optimum stakeholder response to an RES or RUE programme. We hope that this will prove to be a statistically valid probability matrix that can link with the computer model.

Even if the work-phase just develops narrative illustrations (case studies) of good practice in programme design, and is not successful in developing a probability matrix to add to the computer model, it will be useful. So it is important to identify what specific aspects of programme design lead to good outcomes that can be replicated by others, and what variables are outside the control of the policy maker but affect success.

WP4 Partner Workload

This document gives detailed background to the work phase as well as explanation of the template for the data collection. I have included the theory behind the work phase, an explanation of what we are looking for and why, illustrating it with a model of stakeholder behaviour. This is for your information, but you could just complete the template for each of your policies without reading the rest.

The work that we will all be doing for each of the policies included in WP1 is:

- Identifying the key stakeholders for each of the policies
- Completing a template (enclosed) on each programme with a data sheet for each key stakeholder

We will discuss with each partner separately which key stakeholders to consider.

ACE will carry out a further task;

- Writing an illustration of the programme and the stakeholders behaviour.

We are using the word “illustration” instead of “case study” so that we do not cause confusion with the INVERT project case studies. The illustrations form part of the final report of the workphase. We may ask the partner if they prefer to write the illustration using our format. This will be decided in May 2004, and we will also decide whether we need to get the stakeholders to agree to the wording of the illustration as it will be published in an Invert report.

Theoretical approach

A model has been developed through a combination of literature review, application of social science theory and consultation. It draws on the theory of reasoned control to suggest that stakeholder behaviour, or their fulfilment of their role as a stakeholder, is influenced by their knowledge and belief systems, the social pressures placed on them. These are then influenced by other factors such as the importance of the issue, and the options available to act. Agent based modelling suggests that stakeholders are also influenced by their organisational goals and their capacity to act. "Capacity" in this sense means whether they have the resources (finance, people etc.) available to them to carry out the expected role.

Figure 1 shows these forces acting on the stakeholder. It shows that the stakeholder does not respond in isolation; the social, political and economic context, and the social capital, including the networks within which the stakeholder exists, all have influence. The hypothesis is that all these factors, combined with the design of the policies under examination for this project, have an influence on whether the stakeholder carries out the expected role.

From this model we have developed a set of independent variables that we suggest may have an influence on or describe the stakeholder's behaviour. The variables are grouped as

- programme factors
- social capital/cultural context
- stakeholder characteristics
- stakeholder actions

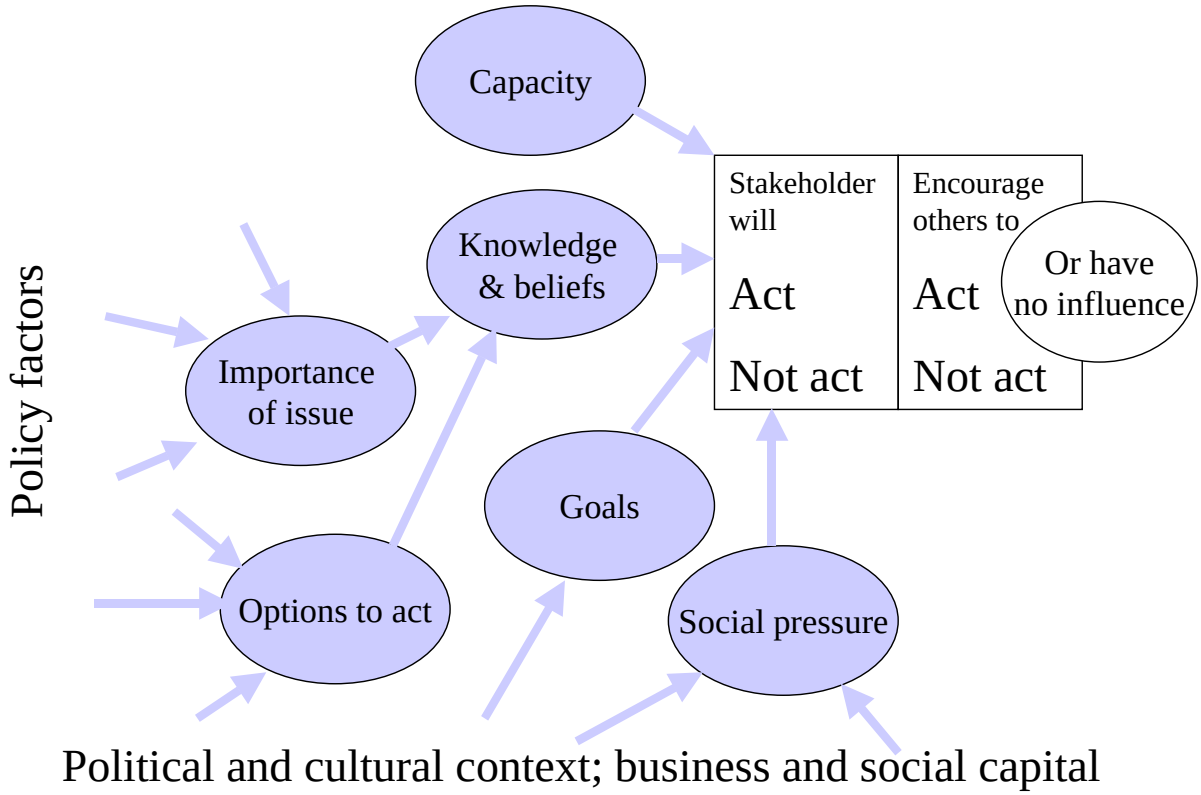

Figure 1; Framework for evaluating stakeholder behaviour

Data collection

For each programme, programme factors and social capital only needs to be recorded once, but the questions about stakeholders will need to be answered for each stakeholder being considered for that programme. To ensure we have enough data, but that you do not do too much work, we will consult with you and agree which stakeholders should be your focus.

We have designed the data collection form as a template and evaluation matrix. This means that you complete any narrative data within the template, and assess the stakeholder or the political context

etc. by marking the appropriate box in the matrix. There is space for additional comments if you wish to make them for each question, and this should be used if you have any difficulty deciding the box to mark.

Design of the template

Header information

This contains the name of the programme and key classification fields shared with WP1; please make sure that the information supplied here matches that supplied for WP1!

Programme factors

We need to assess factors that can be identified in programme design; these include

- whether the programme is delivered through an existing organisation or whether a new organisation has to be set up
- whether education of stakeholders is included - passively through the making information available on request, or actively through a specific education/training scheme
- whether demonstration of technologies is included and the extent of this
- whether additional resources are provided within the programme (such as money to fund the programme or an extra member of staff, not just subsidies)
- the type or marketing or promotion of the programme, and whether funding for this is included
- whether the stakeholder was involved in the design of the programme

Social Capital/Cultural Context

Factors need to be identified to make assessments about the country, region or locality that provide the social context.

We ask for the country (region/locality) name and the date, in order to provide a label for a set of conditions in case we need it again. Use the most appropriate setting for the social context. If it is a programme for Bavaria, or just assessing its impact in Bavaria, then use the name “Bavaria” and describe the local political and cultural context there, not Germany as a whole.

You should be able to assess this based on your own experience of the country or region. Where there has been a change in the conditions during the life of the programme in question, you can indicate this by putting in E for early, M for middle and L for late to show the conditions during those phases of the programme. With four phases put E, M1, M2, L, and so on if it was very complicated, but please keep this simple. The conditions for the majority of the time will be sufficient for this analysis.

Evaluation Matrix 1: Cultural context

Political situation	State Control	Activity Culture	Economic profile
Strong stable political situation	Strong, centralised	State will provide	Strong economic growth
Generally stable although flavour of government changes on a defined time basis (e.g. elections)	Weak, centralised	State leads but provision of resources etc. from other sources	Economic uncertainty
Becoming stable after a long period of instability	Varies	Partnerships with organisations needed to achieve progress	Mild recession
Becoming unstable after a long period of stability	Weak, decentralised	Strong community focus	Deep recession
Unstable, likely to change at irregular and unpredictable intervals	Strong, decentralised	Provide for yourself; individual responsibility	EU priority area

The evaluation matrix shows a description for each factor in order to attempt a classification. It does describe ranges between two extremes but there is no “good” or “bad” answer.

You are also asked about:

- Urban or rural economy:
  - is the area mainly urban in its economy i.e. it has towns and cities and most employment is generated in industry and commerce
  - or is it rural, with much agricultural or other non-built land and most employment generated in agriculture, forestry, fishery and supporting industries. Mining should be included if the mining is relatively small scale and transported to another region for processing and industrial uses
- Media messages
  - Explain the general attitude of the media (advertising, TV, radio etc) to renewable energy and energy efficiency. What is the public perception of these issues?
  - This has been left for you to describe in words.

The element of social capital that needs to be captured is

- Strength of social networks for the stakeholder with other stakeholders involved in the programme

However, unlike other social capital factors, this has the potential to vary with each stakeholder, therefore the data must be collected under the stakeholder variables (see below).

Stakeholders

Stakeholder Characteristics

Five categories of relevant stakeholder characteristics can be assessed during this project. These are shown in Table 4. In order to compare stakeholders these characteristics are presented as types for classification.

Table 4: Assessing stakeholder characteristics

Category	Type	Comment
Organisation	Government, government agency, NGO, local government, politician, union, community group, ad hoc group, individual, beneficiary business[23], affected business[24], end-user business[25]	The types of business are clarified below; if you need further assistance with any terms used, contact ACE
Goals	Political, social, environmental, commercial, religious, academic, military/security/defence?	Rate each from 0-3 to identify mixes of goals; some of this information may be available on corporate websites or from annual reports
Capacity	Financial resources People resources Know-how resources Physical resources	Again rate 0-3 for mix (no money but lots of people etc)

[23] beneficiary business; a commercial entity that gains business benefits from the programme e.g. manufacturer of wind turbines for a wind programme,

[24] affected business; a commercial entity that does not benefit directly from the programme unless from general economic changes (including general lower energy costs), but whose operations are in some way affected

[25] end-user business; a commercial entity that gains direct benefits from the outputs of the programme e.g. lower energy costs for the business as a result of the business deciding to adopt the programme (would include partners in community energy schemes)

Knowledge/ attitude	Knows nothing, unwilling to learn Knows nothing, willing to learn Knows a lot, willing to learn Knows a lot, unwilling to learn	About the subject of the programme
Involvement/ attitude	Hasn't been involved, unwilling to take part Hasn't been involved, willing to take part Has been involved, willing to take part Has been involved, unwilling to take part	

The first category is a simple classification; an organisation is of one type only. The second two categories give types in which an organisation may be stronger or weaker. The classification assigns a score from 0 to 3 to each goal type, where 0 is nothing, or no relevance for the organisation, and 3 is very strong.

For instance, a business would have goals that are commercial, social and environmental. If it has a strong CSR performance you might give 3 for commercial, 2 for social, 2 for environmental and 0 for the others.

The same applies with capacity – rate 0 for none and 3 for very good capacity in each of the capacity types. I would rate our own organisation (ACE) at 0 for financial resources, 1 for people (there aren't many of us), 3 for know-how and 0 for physical resources.

The last two types reflect attitudes to the programme area and are presented on the template as a two-dimensional graph. Mark X where appropriate on the scales.

Stakeholder Behaviour

Two types of stakeholder are considered:

- End-user stakeholder: use (or the focus of) the end result of the programme
- Intermediary stakeholder: Passive or active participation in programme delivery (Promote or deliver the programme, help other get involved, provide facilities or land, influence or enable others)

Key behaviours are whether they

- Carried out expected role in programme?
- Did not carry out expected role in the programme?
- Carried out a different role that contributed to the programme?
- Carried out a role that hindered the programme?
- Prevented others from carrying out their roles?

What should you consider as the "expected role"? It should be the one which would be a reasonable expectation if the programme was well designed. Some stakeholders are normally expected to oppose change; take the view that a well designed programme would provide for this i.e. expect them to carry out a role that did not oppose the change. This means that if they *did* oppose the change, you would class them under "hindered the programme".

What if the position changed during the project? We have allowed for three possible changes, an early/middle/late assessment as shown in Table 5.

Table 5: Possible ways of categorising stakeholder who changed roles during the course of programme implementation

Role in delivering programme	*Early*	*Mid*	*Late*
Carried out expected role in programme?			X
Did not carry out expected role in the programme?			
Carried out a different role that contributed to the programme?	X	X	
Carried out a role that hindered the programme?			
Prevented others from carrying out their roles?			

This stakeholder would have changed to fulfil expectations late. It is beyond the scope of the study to ask "why did this happen", we can only record what was observed, or can be inferred from reports of the stakeholder behaviour. So for this element of recording stakeholder behaviour we have provided the template with a space for describing the role of the stakeholder, if they carried it out and whether they changed behaviour during the course of the programme implementation. Where change in role is not known, assume the final behaviour shown was present throughout.

Summary

The work partners are asked to do is:

- Agree the "most important" programmes (in terms of data gathering for Invert) you will report on with Jacky Pett (ACE, UK)
- Complete the template for one of the programmes, choosing only the key stakeholders
- Send the first completed template to ACE by the end of January 2004
- Get feedback from ACE on the first one, and clarify any points that need further discussion
- Complete the templates for the other most important programmes and send them to ACE as you do them. Complete any others if you wish to do so and have time within the project budget.
- Send all completed templates by the end of April 2004 at the very latest.

If you have any questions about any aspect of WP4, then do contact us at ACE:

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INVERT WP4: WHICH PROGRAMMES TO CHOOSE?

Thank you for your first WP4 data sheets.

We said in December to choose the programmes you would analyse for WP4 from the list you sent to Kaj for WP1. We suggest you choose them bearing the following criteria in mind:

- Choose at least one from each of the main category options i.e.
  - Promotional schemes with financial incentives – RES
  - Promotional schemes with financial incentives – RUE
  - Direct Promotional Schemes without financial incentives (e.g. Regulation)
- Choose at least one Pre-Implementation, one Implementation and one Post-Implementation if possible
- Choose schemes with a range of success ratings
- Choose stakeholders that show a variety of "behaviours" – if they all did what we expected we don't learn so much!

We suggest that you should complete at least 8 data sheets, including the one you have already done. We look forward to receiving these at any time, but to complete them all by the end of April. Thank you!

Jacky Pett

ACE

Data Collection sheet (master)

WP4 Policy Characteristics and Social Capital/Cultural Context

Policy name:

Classifications as presented to WP1

-implementation
Implementation
-implementation

RUE
RES
Both

Financial
Non-financial

Success rating

Policy Factors

Delivery

- Through existing organisation
- New organisation set up

Stakeholder education

- included of end-user stakeholders
- included of intermediate stakeholders
- not included

Technology

- Research & Development included
- Reference sites available
- Demonstration included
- Demonstration available
- Video/film of demonstration available
- Prototype only

Resources (such as money to fund the programme or more staff, not just subsidies)

- additional resources available to all
- additional resources for successful applicants (competition)
- additional resources by allocation
- additional resources for early adopters (limited number)
- no additional resources

Marketing or promotion of policy

- Extensive marketing by policy owner
- Extensive marketing by delivery agent
- Short-term marketing by policy owner
- Short-term marketing by delivery agent
- Marketing materials available to support stakeholders
- Marketing budget available to support stakeholders
- Limited marketing support
- No marketing support

Comments:

Social Capital and Cultural Context

Country/Region		*Date (year)*	
Economy type		Urban	Rural

Political situation		*State Control*		*Activity Culture*		*Economic profile*	
Strong stable political situation		Strong, centralised		State will provide		Strong economic growth	
Generally stable although flavour of government changes on a defined time basis (e.g. elections)		Weak, centralised		State leads but provision of resources etc. from other sources		Economic uncertainty	
Becoming stable after a long period of instability		Varies		Partnerships with organisations needed to achieve progress		Mild recession	
Becoming unstable after a long period of stability		Weak, decentralised		Strong community focus		Deep recession	
Unstable, likely to change at irregular and unpredictable intervals		Strong, decentralised		Provide for yourself; individual responsibility		EU priority area	

Media message	*Public perception*

WP4 Stakeholder Characteristics and Stakeholder Behaviour

This sheet should be completed for each key stakeholder
Copy the sheet within the work book for each stakeholder to be analysed
(Under Edit, click Move or Copy Sheet, and check the box "create a copy")

Name of Stakeholder (organisation)

Reason for inclusion

Stakeholder Characteristics

Organisation

- Government
- government agency
- NGO
- local government
- politician
- workers union
- community group
- ad hoc group
- individual
- beneficiary business
- affected business
- end-user business
- trade body

Was the stakeholder involved in the design of the p

- Yes
- No

Goals Score 0-3 for each

- Political
- social
- environmental
- commercial
- religious
- military/security/defence
- academic

Capacity Score 0-3 for each

- Financial resources
- People resources
- Know-how resources
- Physical resources

Knowledge of /attitude to the policy subject

Knows a lot … Knows nothing

Unwilling to learn … Willing to learn

Involvement with/attitude to policy

Involved … Not involved

Unwilling to take part … Willing to take part

Strength of social networks with other stakeholders involved in the policy

You are invited to assess the strengths of this stakeholders social networks with other stakeholders by completing this evaluation chart for any stakeholders you choose. In the first line place the other stakeholder (name or type) and in the evaluation column underneath, mark which statement best describes this stakeholders interactions with the other one.

Evaluation description	Stakeholder name/type					
Stakeholders have strong partnerships and work together regularly; will agree a common position and act in their best joint interests						
Stakeholders have many joint working projects and can work together when they see the need						
Stakeholders can identify other partners who share their interests but do not have experience in using this to their advantage						
Stakeholders have access to each others knowledge base but do not work together						
Stakeholders do not often have contact but have shown ability to form alliance in the past						
Stakeholders do not have much in common and rarely meet each other						
Stakeholders have common networks but tend to be antagonists						

Stakeholder Behaviour

What was the expected role of this stakeholder in delivering the programme?
(e.g. Manage the programme, install RUE/RES products, encourage others to take action, train

Was this carried out throughout the timeframe of the programme

Behaviour in delivering programme	Timeframe		
	Early	Mid	Late
Carried out expected role in policy?			
Did not carry out expected role in the policy?			
Carried out a different role that contributed to the policy?			
Carried out a role that hindered the policy?			
Prevented others from carrying out their roles?			

Appendix 2: Social Capital data

Policy ID	Stage	Success rating	Stakeholder ID	Relationship with S1	Relationship with S2	Relationship with S3	Relationship with S4	Relationship with S5	Relationship with S6	Relationship with S7	Ave social capital	Scheme soc cap
1	2	2	1		2	6	4				4.0	3.8
1	2	2	2	2		2	2				2.0	
1	2	2	3	6	2		5				4.3	
1	2	2	4	5	5	5					5.0	
3	2	4	8		6	2	2	2			3.0	3.5
3	2	4	9	6		3	4	3			4.0	
3	2	4	10	2	3		1	6			3.0	
3	2	4	11	2	3	1		6			3.0	
3	2	4	100	2	3	6	6				4.3	
4	2	5	12		7	5	2	6	4	4	4.7	5.3
4	2	5	13	7		7	6	6	6	6	6.3	
4	2	5	14	5	7		7	4	6	6	5.8	
4	2	5	15	3	6	7		3	7	7	5.5	
4	2	5	16	6	6	4	3		3	3	4.2	
4	2	5	17	4	6	6	7	3		6	5.3	
4	2	5	18	4	6	6	7	3	6		5.3	
5	2	4	19		6	5	5	2	2		4.0	3.3
5	2	4	20	5		5	5	3	3		4.2	
5	2	4	21	4	5		4	2	2		3.4	
5	2	4	22	2	4	4		5	1		3.2	
5	2	4	89	2	2	2	3		3		2.4	
5	2	4	90	2	3	2	3	3			2.6	
6	2	4	23		2	2	4	7	4	2	3.5	2.7
6	2	4	199	2		2	2	2	2	2	2.0	
6	2	4	200	2	2		2	2	3	2	2.2	
6	2	4	201	4	2	2		2	2	2	2.3	
6	2	4	202	2	2	2	2	4		7	3.2	
6	2	4	203	4	2	3	2	4		2	2.8	
6	2	4	204	2	2	2	2	7	2		2.8	
7	2	5	24		5	5	5	5			5.0	4.2
7	2	5	25	5		2	3	2			3.0	
7	2	5	26	5	2		5	4			4.0	
7	2	5	27	5	5	4		4			4.5	
7	2	5	28	6	5	2	5				4.5	
8	2	5	29	7	5						6.0	5.2
8	2	5	30	5		4					4.5	
8	2	5	31	7	3						5.0	
9	3	5	32		6	5	5	5			5.3	4.4
9	3	5	33	6		6	6	5			5.8	

Policy ID	Stage	Success rating	Stakeholder ID	Relationship with S1	Relationship with S2	Relationship with S3	Relationship with S4	Relationship with S5	Relationship with S6	Relationship with S7	Ave social capital	Scheme soc cap
9	3	5	34	5	6		2	2			3.8	
9	3	5	35	5	6	2		2			3.8	
9	3	5	36	5	5	2	2				3.5	
10	3	4	37		6	4					5.0	5.3
10	3	4	38	6		6					6.0	
10	3	4	39	5	5						5.0	
11	2	5	40		2	3	5	5	2		3.4	3.8
11	2	5	41	2		6	5	2	2		3.4	
11	2	5	42	2	6		6	2	2		3.6	
11	2	5	43	5	2	6		5	6		4.8	
11	2	5	44	5	2	5	5		5		4.4	
11	2	5	45	2	2	2	6	5			3.4	
12	2	3	46		7	1	6	6			5.0	5.4
12	2	3	47	7		4	6	6			5.8	
12	2	3	48	1	4		6	6			4.3	
12	2	3	49	6	6	6		6			6.0	
12	2	3	50	6	6	6	6				6.0	
13	2	3	51		7	1	6	6			5.0	4.4
13	2	3	52	7		4	6	6			5.8	
13	2	3	53	1	4		1	6			3.0	
13	2	3	54	6	6	1		1			3.5	
13	2	3	55	6	6	6	1				4.8	
14	2	3	56		1	6	6	6			4.8	5.0
14	2	3	57	1		6	6	6			4.8	
14	2	3	58	6	6		6	6			6.0	
14	2	3	59	6	6	6		1			4.8	
14	2	3	60	6	6	6	1				4.8	
15	1	4	61		7	3	6	6			5.5	4.2
15	1	4	62	7		2	5	2			4.0	
15	1	4	63	3	2		1	5			2.8	
15	1	4	64	6	5	1		5			4.3	
15	1	4	65	6	2	5	5				4.5	
16	3	5	66		4	4	5	4			4.3	5.0
16	3	5	67	4		6	5	6			5.3	
16	3	5	68	4	6		5	6			5.3	
16	3	5	69	4	5	5		5			4.8	
16	3	5	70	4	6	6	5				5.3	
17	3	5	71		6	6	6	6			6.0	6.0
17	3	5	72	6		6	6	6			6.0	
17	3	5	73	6	6		6	5			5.8	
17	3	5	74	6	6	6		7			6.3	

Policy ID	Stage	Success rating	Stakeholder ID	Relationship with S1	Relationship with S2	Relationship with S3	Relationship with S4	Relationship with S5	Relationship with S6	Relationship with S7	Ave social capital	Scheme soc cap
17	3	5	75	6	6	5	7				6.0	
18	2	5	76		4	4	4	5			4.3	5.0
18	2	5	77	4		6	6	6			5.5	
18	2	5	78	4	6		6	6			5.5	
18	2	5	79	4	6	6		3			4.8	
18	2	5	124	6	6	6	2				5.0	
19	1	3	80		7	6	6	5			6.0	6.0
19	1	3	81	7		6	6	6			6.3	
19	1	3	82	6	6		6	6			6.0	
19	1	3	83	6	6	6		6			6.0	
19	1	3	84	5	6	6	6				5.8	
20	1	5	85		6	6	6				6.0	5.2
20	1	5	86	6		6	1				4.3	
20	1	5	87	6	6		6				6.0	
20	1	5	88	6	1	6					4.3	
21	1	3	153		6	6					6.0	6.0
21	1	3	154	6		6					6.0	
21	1	3	155		6	6					6.0	
22	2	3	91		7	2	6				5.0	5.7
22	2	3	92	7		6	6				6.3	
22	2	3	93	2	6		7				5.0	
22	2	3	94	6	6	7					6.3	
23	2	2	95		6	6	6	2			5.0	5.4
23	2	2	96	6		6	6	4			5.5	
23	2	2	97	6	6		7	6			6.3	
23	2	2	98	6	6	7		5			6.0	
23	2	2	99	2	4	6	5				4.3	
24	2	3	101		7	5	2	2	3	2	3.5	2.9
24	2	3	102	7		5	2	2	3	2	3.5	
24	2	3	103	7	5		2	1	1	2	3.0	
24	2	3	104	2	2	3		3	5	6	3.5	
24	2	3	105	2	2	1	3		1	1	1.7	
24	2	3	106	3	3	1	5	1		3	2.7	
24	2	3	107	2	2	2	6	1	3		2.7	
25	2	4	108		7	2	5	3	3		4.0	4.5
25	2	4	109	7		5	5	3	4		4.8	
25	2	4	110	2	5		4	6	6		4.6	
25	2	4	111	5	5	4		6	6		5.2	
25	2	4	112	3	3	6	6		2		4.0	
25	2	4	113	3	4	6	6	2			4.2	
26	2	2	114		7	7	7	2			5.8	5.0

Policy ID	Stage	Success rating	Stakeholder ID	Relationship with S1	Relationship with S2	Relationship with S3	Relationship with S4	Relationship with S5	Relationship with S6	Relationship with S7	Ave social capital	Scheme soc cap
26	2	2	115	7		7	7	2			5.8	
26	2	2	116	7	7		7	2			5.8	
26	2	2	117	7	7	7		2			5.8	
26	2	2	118	2	2	2	2				2.0	
27	2	2	119		1	7	7	2			4.3	4.4
27	2	2	120	1		4	4	2			2.8	
27	2	2	121	7	4		7	5			5.8	
27	2	2	122	7	4	7		5			5.8	
27	2	2	123	2	2	5	5				3.5	
28	2	5	125		3	4	4				3.7	5.2
28	2	5	126	3		7	7				5.7	
28	2	5	127	4	7		6				5.7	
28	2	5	128	4	7	6					5.7	
29	2	5	129		5	4					4.5	3.3
29	2	5	130	5		1					3.0	
29	2	5	131	4	1						2.5	
30	2	5	132		3	4	4				3.7	5.2
30	2	5	133	3		7	7				5.7	
30	2	5	134	4	7		6				5.7	
30	2	5	135	4	7	6					5.7	
31	2	5	136		7	5	3	5	4	4	4.7	5.2
31	2	5	137	7		7	6	7	6	6	6.5	
31	2	5	138	5	7		3	4	6	6	5.2	
31	2	5	139	3	6	3		3	7	7	4.8	
31	2	5	140	6	7	4	3		3	3	4.3	
31	2	5	141	4	6	6	7	3		6	5.3	
31	2	5	142	4	6	6	7	3	6		5.3	
32	1	5	143		5	7	7	5			6.0	6.1
32	1	5	144	5		6	6	7			6.0	
32	1	5	145	7	6		6	6			6.3	
32	1	5	146	7	6	6		6			6.3	
32	1	5	147	5	7	6	6				6.0	
33	2	5	148		7	5	5	5			5.5	5.9
33	2	5	149	7		7	6	6			6.5	
33	2	5	150	5	7		6	6			6.0	
33	2	5	151	5	6	6		6			5.8	
33	2	5	152	5	6	6	6				5.8	
34	2	3	156		6	6	6				6.0	6.0
34	2	3	157	7		6	4				5.7	
34	2	3	158	6	7		7				6.7	
34	2	3	159	6	7	4					5.7	

Policy ID	Stage	Success rating	Stakeholder ID	Relationship with S1	Relationship with S2	Relationship with S3	Relationship with S4	Relationship with S5	Relationship with S6	Relationship with S7	Ave social capital	Scheme soc cap
35	3	2	160		4	4	4	1			3.3	4.6
35	3	2	161	4		5	5	5			4.8	
35	3	2	162	4	5		4	7			5.0	
35	3	2	163	4	5	4		7			5.0	
35	3	2	164	1	5	7	7				5.0	
36	3	5	165		7	6	6	6			6.3	5.9
36	3	5	166	7		6	6	7			6.5	
36	3	5	167	6	6		6	6			6.0	
36	3	5	168	6	6	6		3			5.3	
36	3	5	169	6	6	6	3				5.3	
37	3	5	170		7	6	6	6			6.3	5.4
37	3	5	171	7		6	4	3			5.0	
37	3	5	172	6	6		6	3			5.3	
37	3	5	173	6	4	6		7			5.8	
37	3	5	174	6	3	3	7				4.8	
38	3	5	175		7	6	2	4	2	6	4.5	4.1
38	3	5	176	7		1	2	7	7	6	5.0	
38	3	5	177	6	1		6	2	2	2	3.2	
38	3	5	178	2	2	6		7	2	2	3.5	
38	3	5	179	4	7	2	7		7	4	5.2	
38	3	5	180	2	7	2	2	7		2	3.7	
38	3	5	181	6	6	2	2	4	2		3.7	
39	3	4	182		2	2	4	4	4	2	3.0	2.9
39	3	4	183	2		4	2	4	2	3	2.8	
39	3	4	184	4	2		2	3	3	2	2.7	
39	3	4	185	6	2	2		2	3	2	2.8	
39	3	4	186	1	4	3	2		3	6	3.2	
39	3	4	187	4	2	3	3	3		2	2.8	
39	3	4	188	2	3	2	2	6	2		2.8	
40	3	5	189		7	7	4	3	5		5.2	5.2
40	3	5	190	7		7	4	6	3		5.4	
40	3	5	191	7	7		7	5	2		5.6	
40	3	5	192	3	4	7		6	6		5.2	
40	3	5	193	3	6	5	6		6		5.2	
40	3	5	194	5	3	2	6	6			4.4	
41	3	5	195		2	3	3				2.7	3.7
41	3	5	196	2		4	4				3.3	
41	3	5	197	3	4		6				4.3	
41	3	5	198	3	4	6					4.3	
42	2	4	207		6	2	6	2	5		4.2	5.0
42	2	4	208	6		7	5	6	6		6.0	

Policy ID	Stage	Success rating	Stakeholder ID	Relationship with S1	Relationship with S2	Relationship with S3	Relationship with S4	Relationship with S5	Relationship with S6	Relationship with S7	Ave social capital	Scheme soc cap
42	2	4	209	2	7		7	6	5		5.4	
42	2	4	210	6	5	7		6	6		6.0	
42	2	4	211	2	3	5	3		3		3.2	
42	2	4	212	5	6	5	6	4			5.2	
43	2	3	213	4		6	3				4.3	
43	2	3	214	2	6		4				4.0	
43	2	3	215	5	3	4					4.0	
43	2	3	226		4	2	5				3.7	4.3
44	2	5	216	7	4	2	5				4.5	
44	2	5	217		2	2	7	7			4.5	4.8
44	2	5	218	2		6	6	4			4.5	
44	2	5	219	2	6		3	2			3.3	
44	2	5	220	7	6	4		5			5.5	
45	2	4	222		6	7	6				6.3	5.6
45	2	4	223	5		1	3				3.0	
45	2	4	224	6	6		7				6.3	
45	2	4	225	7	6	7					6.7	
46	2	2	228		7	5					6.0	5.0
46	2	2	229	7		3					5.0	
46	2	2	230	5	3						4.0	
47	2	4	227		3	2					2.5	3.7
47	2	4	231	3		6					4.5	
47	2	4	232	6	2						4.0	

Appendix 3: Illustration of Stakeholder Behaviour in RUE/RES programme(1)

Key for Behaviour: 1= carried out expected role. 2= carried out other helpful role. 3= did not carry out role. 4= carried out other unhelpful role. 5= prevented other from carrying out their roles

Programme name	*Small Hydro certificates*	*Country*	*Austria*	
Energy type	RES	Stage	Post-implementation	
Success rating	2	Predicted rating	97%	
Scheme Design:	Marketing	Stakeholder Educ'n	Technology	
	None	None	Reference sites available	
Stakeholder name	Organisation type	Role type	Behaviour early/middle/late	Involved in design?
E-control	Government agency	Set up and manage scheme	1/1/1	yes
Small hydro operators	Business	Intermediary/enabler	1/3/4	yes
Provincial governments (east)	Local government	Set up & design scheme (locally)	4/4/4	yes
Provincial governments (west)	Local government	Set up & design scheme (locally)	1/1/1	yes
Utilities	Business	Apply/adopt scheme (end user)	1/1/1	yes
Scheme description				
This mandatory certificate system for small hydro power was set up in 2000 and was abandoned (replaced by the "Ökostrom-Gesetz") at the end of 2002. All utilities and electricity traders were obliged to account for certificates for 8% from small hydro power (<10MW). Small hydro power is concentrated on the western provinces of Austria and hence there was a political conflict about the level of penalty (eastern provinces: low, western: high); this led to discussions about the aims and design of the scheme which were reported in the interested press. This also meant there was a change in response from the hydro operators, who were initially keen to participate, but found it more difficult as time went on. The utility companies in the east of the country also responded differently from those in the west, to the extent of public opposition to the policy.				
Scheme evaluation				
Formally evaluated by country of origin?	Yes	If publicly available, website or reference:	Hans Auer, Reinhard Haas, 2001, "Perspektiven für eine forcierte Nutzung der Kleinwasserkraft in Österreich" Arbeitsgruppe Energiewirtschaft, Technische Universität Wien	

Illustration of Stakeholder Behaviour in RUE/RES programme(2)

Key for Behaviour: 1= carried out expected role. 2= carried out other helpful role. 3= did not carry out role. 4= carried out other unhelpful role. 5= prevented other from carrying out their roles

Programme name	*Operational Programme for Competitiveness*	*Country*	*Greece*	
Energy type	RUE & RES	Stage	Implementation	
Success rating	5	Predicted rating		
Scheme Design:	Marketing	Stakeholder Educ'n	Technology	
	Extensive by delivery agent	None	Reference sites available	
Stakeholder name	Organisation type	Role type	Behaviour early/middle/late	Involved in design?
Ministry of Development	Government	Fund scheme	1/1/1	yes
CRES	Government agency	Promote scheme	1/1/1	yes
GSIA	Business	Promote scheme	1/1/1	
Commercial investors	Business	Installation of RES/RUE products	1/1/1	
Development companies	Local government	Installation of RES/RUE products	1/1/1	
Consultants	Business	Preparation of RES/RUE projects	1/1/1	
Constructors	Business	Construction of RES/RUE projects	1/1/0	
Scheme description				
The Measure 2.1 of Sub-programme 2 of the National Operational Programme for Competitiveness (OPC) / CSF III (2000-2006) is devoted entirely to providing State support (grants) to private investments in: a) renewables, b) rational use of energy, and c) small-scale (<50 MWe) cogeneration. The total budget of Measure 2.1, for the 2000-2006 period of CSF III, is 1.07 billion Euros, of which 35.6% is the public subsidy available to RES/RUE/CHP investments. About two-thirds of the total available subsidy (~ 260 million Euros) is foreseen to be awarded specifically to RES investment projects. Grants are awarded to RES/RUE projects by Measure 2.1 of OPC following rounds of public calls for investment proposals and subsequent competitive evaluation of the submitted proposals (per round).				
Scheme evaluation				
Formally evaluated by country of origin?	Yes	If publicly available, website or reference:	http://www.antagonistikotita.gr/	

Comments in formal evaluation on:		
Design of scheme:	Marketing	Yes
	Stakeholder education	No
	Technology information	Yes
Response:	Intermediate stakeholders	Good
	End users or target audience	Good
Have any recommendations been made to improve scheme? (brief description)		A RES investment-subsidy programme, similar to that of Measure 2.1 of OPC, existed also in the 2nd Community Support Framework (CSF II; 1994-1999) for Greece. This specific programme, the Operational Programme for Energy – OPE, granted cumulatively about 92 million Euros of public subsidies to 78 RES investment projects, having a total budget of about 213 million Euros (i.e. mean subsidy rate ~ 43%) and a total installed capacity of 161 MW_e + 102 MW_{th}. This programme was very instrumental in stirring up substantial RES activity and in materialising a large number of commercial-scale RES projects in Greece (in the period 1997-2000). So, having the experience from the implementation of OPE, MoD (with the assistance of CRES) designed the OPC programme accordingly in order to avoid any potential problems appeared previously.

Illustration of Stakeholder Behaviour in RUE/RES programme(3)

Key for Behaviour: 1= carried out expected role. 2= carried out other helpful role. 3= did not carry out role. 4= carried out other unhelpful role. 5= prevented other from carrying out their roles

Programme name	*NFOS Sustainable energy education programme*	*Country*	*Poland*	
Energy type	RUE & RES	Stage	Post implementation	
Success rating	5	Predicted rating	99%	
Scheme Design:	Marketing	Stakeholder Educ'n	Technology	
	Extensive marketing by delivery agent	Included for all	Demonstration of technologies	
Stakeholder name	Organisation type	Role type	Behaviour early/middle/late	Involved in design?
NFOS	Government agency	Set up/design scheme	1/1/1	yes
FEWE	NGO	Manage and promote scheme	1/1/1	
MPEC LUBAN	Business	Apply/adopt scheme	1/1/1	
Lidia Wojcik	Individual	Apply /adopt scheme	1/1/1	
Trzcianka	Local government	Apply/adopt scheme	1/1/1	
Scheme description				
This was an educational programme set up by the government agency NFOS designed to stimulate take up of RES& RUE as well as other environmental improvements. Seminars and training set up for local government, businesses and individuals to enable them to understand how these improvements could benefit them.				
Scheme evaluation				
Formally evaluated by country of origin?	Yes	If publicly available, website or reference:		
Comments in formal evaluation on:				
Way the scheme was set up (including actors and processes)		The project was developed by FEWE and financially supported by NFOSiGW and EU Tempus programme. The National Fund has a budget line for ecological education supporting such actions. In fact, the project was designed and managed by FEWE using the financial support of the NFOSiGW. Additionally, NFOS was selected to show its		

		financial support schemes for RES & RUE in the form of grants and soft loans for projects. The high range representative of the Fund was a lecturer during the courses.
Design of scheme:	Marketing	The project (courses) was strongly promoted in media, in newspapers, trade magazines, local TV and radio.
	Stakeholder education	The programme of the courses was developed in cooperation with AGH University of Science and Technology, energy experts and specialists. The project included five editions two-weeks long courses, with lectures and site visits in RES facilities in Poland and Denmark, about 200 people were trained. Courses included both components of energy sustainability: RES and RUE
	Technology information	The wide spectrum of green energy technologies were presented during site visits in manufactures and working facilities in Poland and Denmark. Low cost heat energy savings methods were also demonstrated during the courses.
Response:	End users or target audience	Many projects and project ideas have emerged as a result of the training courses. In particular: The low cost heat energy saving methods have been implemented in Swierzawa, Nowa Deba, Dzierzoniow, Czernin, Debrzno. An important additional factor was job creation. Biomass project in Nowa Deba: 4 MW (2x2 MW) district heat boiler using biomass produced locally in willow plantation (300 ha). A project of 8 MW district heating using straw developed in Lubań. Conversion of the district heating system (10MW) in the city of Trzcianka from coal to biofuel coming from plantation of Salix viminalis. 370 kW coal boiler in a local school in Janów converted to locally produced wood waste. Creation of an association “Bioenergy for Rural Development”, BRD, particularly active in the area of promotion of energy plantations and has attracted attention and support of high-ranking national-level politicians.
Have any recommendations been made to improve scheme? (brief description)		It was great interest shown to the projects by potential participants, however one main obstacle occurred. Each course last two weeks and often it was too long for decision makers and local authorities to attend. The solution was to share the participation in the course by representatives from one entity. The courses shall be more specific oriented, i.e. to concentrate on one technology/source of energy.

Illustration of Stakeholder Behaviour in RUE/RES programme(4)

Key for Behaviour: 1= carried out expected role. 2= carried out other helpful role. 3= did not carry out role. 4= carried out other unhelpful role. 5= prevented other from carrying out their roles. 0= not reached this stage

Programme name	*MAPE grants*	*Country*	*Portugal*	
Energy type	RUE & RES	Stage	Implementation	
Success rating	3	Predicted rating	57%	
Scheme Design:	Marketing	Stakeholder Educ'n	Technology	
	Extensive by scheme owner	none	none	
Stakeholder name	Organisation type	Role type	Behaviour early/middle/late	Involved in design?
Ministry for the Economy	Government	Set up and fund scheme	1/1/0	yes
POE Management Office	Government agency	Manage scheme	1/1/0	yes
Ministry for Towns, Terr Planning & Env't	Government	Provide permissions, authorisation	4/4/0	
End-user business/investors in RES	Business	Apply/adopt scheme	3/1/0	yes
Electric Grid Cos	Business	Intermediary/enabler	4/1/0	
Scheme description				
This is a six year programme that started in 2000 with two years covered by this report. RUE & RES are marginal issues in Portugal so the grant scheme was designed to improve the take up of measures and installations. The Ministry for the Economy defined the programme, provides funds and resources and uses ministerial contacts and promotion tools to disseminate the programme. One of the main criteria for official approval of numerous projects (namely for windpower and hydropower) is the decision of the Ministry of Environment, which is based on results from the environmental impact assessment conducted by the proponent of the project. This has proved to be a difficulty, at least in the early stages of the project; the two ministries have very different goals and do not have a history of working effectively together. It is significant that the Ministry of Environment was not involved in the design of the project although they were required to grant authorisations. The result that the scheme has so far fallen short of its objectives could probably be predicted under these circumstances, although progress is being made.				
Scheme evaluation				
Formally evaluated by country of origin?	Yes	If publicly available, website or reference:	http://www.prime.min-economia.pt/presentationlayer/prime_Home_00.aspx	

Have any recommendations been made to improve scheme? (brief description)	Yes. - some adjustments/clarifications in the typologies of potential projects; - Introduction of new criteria for project approval looking at increasing their efficiency and quality; - less stringent requirements regarding investment capacity from own assets.

Illustration of Stakeholder Behaviour in RUE/RES programme(5)

Key for Behaviour: 1= carried out expected role. 2= carried out other helpful role. 3= did not carry out role. 4= carried out other unhelpful role. 5= prevented other from carrying out their roles. 0= not reached this stage

Programme name	*DTI Major PV Demo programme*	*Country*	*UK*	
Energy type	RES	Stage	Implementation	
Success rating	4	Predicted rating	57%	
Scheme Design:	Marketing	Stakeholder Educ'n	Technology	
	Extensive by delivery agent	None	Reference sites available	
Stakeholder name	Organisation type	Role type	Behaviour early/middle/late	Involved in design?
Department for Trade and Industry	Government	Set up and fund scheme	1/1/0	yes
Energy Saving Trust	Government agency	Manage scheme	1/1/0	yes
Halcrow	Business	Inspect/certify installations	1/1/0	
PV providers	Business	Inform/advise end users	1/1/0	yes
Home owners	Individuals	Adopt/apply for scheme	1/3/0	
Local electricity companies	Business	Intermediary/enabler	4/2/0	
Scheme description				
This is a grant programme which covers large, medium and small installations. Only the "Small grants" are considered in this analysis. Small grants were offered to house owners and communities. The take-up by house owners has been slow, although interest has been good. The main issue is that of raising the additional finance (50% grants are being offered). Installations have experienced problems with grid connection; whilst the electricity companies were consulted at corporate level, locally electricity operators have been reluctant to make grid connections and there has been a need to educate them on best practice in this respect. Marketing of small grants is now focused towards smaller community buildings such as schools, although private grants are still available.				
Scheme evaluation				
Formally evaluated by country of origin?	Yes; progress report for end of year 1	If publicly available, website or reference:	http://www.dti.gov.uk/energy/renewables/publications/pdfs/mdpannualreport.pdf	

Comments in formal evaluation on:		
Way the scheme was set up (including actors and processes)		The management of the scheme was contracted to EST by the DTI, along with contracts for inspection and call handling. There was no public consultation.
Design of scheme:	Marketing	Marketing was carried out extensively for a limited period led by the DTI but managed by the delivery agent. Awareness of the programme is maintained through other grant publicity on a general communications base.
	Stakeholder education	See below
	Technology information	Although various sources of information are listed in the grant application, there is no education or demonstration included
Response:	Intermediate stakeholders	Good response from manufacturers and installers, with the places for "approved" installers being over-subscribed many times.
	End users or target audience	Initial interest not translated into applications for grants. Some of the reason thought to be the overall cost of measures; low initial take up for community projects has been overcome and this sector now looks to be more promising that private householders
Have any recommendations been made to improve scheme? (brief description)		Access to funding has been considered and domestic end-users can be directed to suitable loan sources. Promotion through Regional Development Agencies is becoming an important source as often matching funds can be obtained for community projects.

Illustration of Stakeholder Behaviour in RUE/RES programme(6)

Key for Behaviour: 1= carried out expected role. 2= carried out other helpful role. 3= did not carry out role. 4= carried out other unhelpful role. 5= prevented other from carrying out their roles. 0= not reached this stage

Programme name	*100,000 Roofs campaign*	*Country*	*Germany*	
Energy type	RES	Stage	Post-implementation	
Success rating	4	Predicted rating	77.8%	
Scheme Design:	Marketing	Stakeholder Educ'n	Technology	
	Short-term by both agent and owner	none	none	
Stakeholder name	Organisation type	Role type	Behaviour early/middle/late	Involved in design?
Bank for Reconstruction	Government agency	Set up/design scheme	1/1/1	yes
Private banks	Business	Provide finance	3/1/1	
Plumbers	Business	Affected business	3/1/1	
RES branch organisations	NGO	Lobby for scheme	1/1/1	yes
Private sector householders	Individuals	Adopt scheme (end users)	3/1/1	
Technology manufacturer	Business	Beneficiary business	1/1/1	
Environmental NGOs	NGO	Lobby for scheme	1/1/1	
Scheme description				
This was a very effective programme with considerable public support, however the costs to society were a concern. The scheme provided a financial package to house owners to install photovoltaic panels on their roofs. After an initial slow start whilst the finance packages were developed, the take-up was good.				
Scheme evaluation				
Formally evaluated by country of origin?	no	If publicly available, website or reference:		