

ED21257/R03/Issue 1

# **Evaluation of the Implementation of Council Regulation 2196/98 (PACT)**

Final report for the European Commission DG Energy and Transport

AEA Technology Environment

November 2000

<b>Title</b>	Evaluation of the Implementation of Council Regulation 2196/98 (PACT) – Final Report
<b>Customers</b>	EC DG TREN
<b>Customer reference</b>	B2000-B2706010-S12.190599
<b>Confidentiality, copyright and reproduction</b>	Unclassified  Copyright AEA Technology plc All rights reserved. Enquiries about copyright and reproduction should be addressed to the Commercial Manager, AEA Technology plc.
<b>File reference</b>	c:\hh\projects\pact\reports\final report_1.doc
<b>Report number</b>	ED21257/R03
<b>Report status</b>	Issue 1

AEA Technology  
E6 Culham  
Abingdon  
Oxon OX14 3ED  
United Kingdom  
Telephone 01235 463962  
Facsimile 01235 463574

AEA Technology is the trading name of AEA Technology plc  
AEA Technology is certificated to BS EN ISO9001:(1994)

	<b>Name</b>	<b>Signature</b>	<b>Date</b>
<b>Principal Author</b>	Heather Haydock		
<b>Reviewed by</b>	Dr George Marsh		
<b>Approved by</b>	Dr George Marsh		

# Executive Summary

This report describes AEA Technology's evaluation, on behalf of DG TREN, of the implementation of Council Regulation 2196/98. This provides a mid-term evaluation of the PACT (Pilot Actions on Combined Transport) programme, covering projects initiated between 1997 and 1999.

This draft final report describes our evaluation methodology, evaluation results, conclusions and recommendations for improving the effectiveness and efficiency of the PACT programme, addressing the key evaluation themes identified by the Commission: It also presents an assessment of future options for the PACT programme.

Our key conclusions from the evaluation of the current PACT programme are as follows.

- The PACT programme is managed very efficiently and the programme team is highly regarded for its professionalism and enthusiasm.
- Most operational measures supported by the PACT programme are cost-effective in terms of avoided carbon dioxide emissions, even without replication.
- Commercial viability is difficult to achieve, even with the start-up support provided by PACT, due to challenging market conditions for combined transport in Europe.
- Member State representatives have questioned the effectiveness of the PACT programme in addressing key market barriers, but appropriate action is being undertaken elsewhere in the Commission.
- There is good awareness of the PACT programme within the existing combined transport community but project results are not adequately evaluated and disseminated in support of Programme objectives such as replication and policy assessment.
- The dissemination aspects of PACT need to be strengthened. This requires a clear strategy defining the roles of the project teams, programme management, Member States and possibly a specialist team for dissemination based in or outside of the Commission.

Our recommendations for improving the efficiency and effectiveness of the PACT programme are as follows.

1. Retain an open, flexible approach to the selection procedure but provide some additional time for proposal preparation and ensure consistent presentation of key data.
2. Introduce more structured project monitoring procedures but take care to avoid unnecessary bureaucracy. For example, a system for reviewing contractor performance at the end of each contract is recommended.
3. Allow multi-year project approvals as well as single year contracts, with continued support dependent on meeting specific milestone targets.
4. Discontinue funding of feasibility studies as precursors to operational projects but allocate some funding to generic studies aimed at market enablement.

5. Improve dissemination by developing a targeted programme-level strategy, issuing new guidelines on reporting to project managers and earmarking resources for independent project analysis and dissemination within the PACT programme budget.
6. Improve monitoring of impacts, including project follow-up for a 3 year period. This would form part of the analysis and dissemination, aimed at providing the evidence to stimulate replication in the market.
7. Adopt better reporting protocols for future PACT projects to improve the quality of analysis of environmental performance.

# Contents

<b>1</b>	<b>INTRODUCTION</b> .....	<b>1</b>
<b>2</b>	<b>EVALUATION METHODOLOGY</b> .....	<b>2</b>
2.1	Clarification of the Intervention Logic .....	2
2.2	Development of Evaluation Frameworks.....	2
2.3	Assembly and Assessment of Initial Data.....	3
2.4	In-depth Data Collection through Interviewing.....	5
2.5	Further Evaluation of Key Quantitative and Qualitative Data .....	5
<b>3</b>	<b>EVALUATION RESULTS</b> .....	<b>6</b>
3.1	Theme 1 - Accessibility .....	6
3.2	Theme 2 – Selection Procedure.....	9
3.3	Theme 3 – Contractual Relationships .....	13
3.4	Theme 4 – Project Monitoring.....	16
3.5	Theme 5 – Personnel Input .....	18
3.6	Theme 6 – Impact on the Market .....	21
3.7	Theme 7 – Member States.....	26
3.8	Theme 8 – Public Awareness and Pilot Character.....	31
3.9	Theme 9 – Environmental Impact .....	36
<b>4</b>	<b>CONCLUSIONS</b> .....	<b>43</b>
<b>5</b>	<b>RECOMMENDATIONS</b> .....	<b>44</b>
<b>6</b>	<b>DISCUSSION OF FUTURE OPTIONS FOR THE PACT PROGRAMME</b> .....	<b>45</b>
6.1	Review of the Current Intervention logic .....	45
6.2	Options for a Future Programme.....	47
6.3	Discussion of Future Programme Options.....	48

Appendix 1: Intervention Logic

Appendix 2: Evaluation Frameworks

Appendix 3: List of Selected Projects

# 1 Introduction

This report describes AEA Technology's evaluation, on behalf of DG TREN, of the implementation of Council Regulation 2196/98. This provides a mid-term evaluation of the PACT (Pilot Actions on Combined Transport) programme, covering projects initiated between 1997 and 1999.

This draft final report describes our evaluation methodology (Section 2), evaluation results (Section 3), conclusions (Section 4) and recommendations for improving the effectiveness and efficiency of the PACT programme (Section 5), addressing the nine evaluation themes identified by the Commission:

- |   |                           |   |                   |
|---|---------------------------|---|-------------------|
| 1 | Accessibility             | ) | Management themes |
| 2 | Selection Procedure       | ) |                   |
| 3 | Contractual Relationships | ) |                   |
| 4 | Project Monitoring        | ) |                   |
| 5 | Personnel Input           | ) |                   |
| 6 | The Market                | ) | Impact themes     |
| 7 | Member States             | ) |                   |
| 8 | Public Awareness          | ) |                   |
| 9 | Environmental Impact      | ) |                   |

It also considers a range of future options for the PACT programme (Section 6)

Our findings are based on information gathered from DG TREN project files and discussions with DG TREN (PACT programme, Internal Evaluation Cell, TEN-T programme and R&D programme), all 15 Member State representatives on the PACT funding committee, 26 project beneficiaries and 9 rejected applicants.

This final report is also available in French.

## 2 Evaluation Methodology

Our evaluation methodology was based on an evaluation framework which gives a structured approach for collecting, evaluating and presenting information. The key features associated with this methodology are:

- The application of a framework that presents information in a transparent and concise form which links to the analysis and recommendations.
- An iterative process of data collection and analysis tailored to the specific needs of the evaluation and covering each of the nine evaluation themes.
- The extensive use of quantitative and semi-quantitative data with benchmarking techniques to provide concise and easily interpretable results.

The evaluation has involved the following sequential tasks, each of which is described below.

1. Clarification of the Intervention Logic
2. Development of evaluation frameworks
3. Assembly and assessment of initial data
4. In-depth data collection through interviewing
5. Further evaluation of key quantitative and qualitative data

### 2.1 CLARIFICATION OF THE INTERVENTION LOGIC

The starting point for the evaluation was to establish a common and agreed understanding, between DG TREN and the assessment team, of the Intervention Logic for the programme. This is important because it guides the emphasis and direction taken in gathering and analysing data relevant to the assessment. Appendix 1 sets out the agreed understanding of the Intervention Logic, and highlights particular issues raised in relation to the nine themes for evaluation.

### 2.2 DEVELOPMENT OF EVALUATION FRAMEWORKS

The basic evaluation framework is shown in Figure 1.

**Figure 1 Basic Evaluation Framework**

Knowledge required	Data assembly	Preliminary assessment	Interviewing	In-depth assessment
Question 1				
Question 2				
Question 3				
Question 4				
Question 5				

The first column of the framework lists the individual questions to be answered for one of the nine assessment themes identified by DG TREN. For example “What is the level of participation of SMEs in the programme?” would be a question associated with the accessibility theme.

The second column indicates the initial data to be collected to answer the question; this may come from the project files or from discussions with EU project officers. Following the above example, it would be appropriate to collect data on the number of SMEs applying to the programme and the number of SMEs involved in successful bids. It would also be important to gather comparable data on larger companies and on SME participation in other programmes.

The third column shows the assessment that can be made using this initial data. For example, the success rate of proposals involving SMEs could be compared against the success rate for other organisations, and the level of participation could be benchmarked against other programmes. Wherever possible we used quantified data and simple indicators of performance. This benchmarking approach has a number of advantages – it allows clear comparisons between sectors and programmes, it enables the results to be reported concisely, it allows the programme managers to monitor future trends and it gives a concise and transparent link between results and recommendations.

The fourth column identifies the additional areas to be explored during interviews. For example, successful and unsuccessful SME applicants may be asked to comment on the application procedure. The questions to be answered at this stage are generally more qualitative.

The final column describes the evaluation of outputs from the interview stage. For example, a cross-comparison and evaluation of the experiences of SMEs in applying to the programme. It may be necessary at this stage to follow up interviews with telephone calls to clarify specific points.

This generic methodology was tailored to the specific requirements of DG TREN during the project inception stage. Appendix 2 shows the evaluation frameworks developed for each of the nine key themes listed in the Introduction.

## **2.3 ASSEMBLY AND ASSESSMENT OF INITIAL DATA**

This stage corresponds to the second and third columns in the evaluation framework.

The PACT programme team provided valuable data on proposals submitted and projects supported during 1997, 1998 and 1999 PACT funding rounds. They also helped us to select appropriate projects for detailed evaluation from the total of 85 supported during the period. Several of these projects were linked, i.e. different phases of the same project were represented in the list.

A full list of projects is given in Appendix 3, with selected projects highlighted in blue. Projects were selected to provide a representative selection of:

- Feasibility and implementation projects

- Different transport modes
- Geographical locations
- Size of project
- Year of initiation
- Year of completion

Figure 2 shows the distribution of projects by year, mode and country, with the selected projects marked by stars. The matrix does not include the 7 projects from 1999 that had not started by May 2000. International projects refer to those projects managed by UIRR or Intercontainer; all PACT projects involve international co-operation.

**Figure 2 Selected projects**

	Rail	Maritime	Inland Waterways	Mixed Modes	Feasibility Study	No of projects (no of selected projects)
Austria	••					2 (0)
Belgium			★	•★		3 (2)
Denmark	• <sup>s</sup>	★				2 (1)
France	•••••★★	• <sup>s</sup> ★★••★		★★★•★	★	19 (10)
Germany	•		••	★• <sup>s</sup> •★	•	8 (3)
International	★★••★••★ •★				•★	11 (6)
Italy	••	•••				5 (0)
Netherlands	★•★••	•		•	•★	8 (3)
Portugal	★★	★			••	5 (3)
Spain	★•••			•★★		7 (3)
Sweden	• <sup>s</sup> •★	★				4 (2)
UK			★ <sup>s</sup>	★	••	4 (2)

Key:     •     1997                   <sup>s</sup>     Study  
           •     1998                   ★     Projects to be reviewed in depth  
           •     1999

EC project files were reviewed to collect additional quantitative data and to prepare for interviews with project beneficiaries. A standard project proforma was used for data gathering from all project files to ensure full coverage and consistency. This standard proforma included details of all proposers (organisation, nationality, size) and their projects (transport mode, value of project, projected traffic shift, start and finish dates). Additional information was collated for the selected projects, using proposals, contracts, reports and other documents. This included quantitative data such as actual traffic shift and qualitative judgements of the usefulness of reports, the quality of progress reporting etc.

## **2.4 IN-DEPTH DATA COLLECTION THROUGH INTERVIEWING**

Interview proformas were developed for interviews with Member State representatives and project beneficiaries. The interview questions were based on the fourth column of the evaluation frameworks shown in Appendix 2.

All but three of these project beneficiaries were interviewed in person; the others were interviewed by telephone because it proved difficult to arrange a meeting or because the relevant manager had moved to another organisation. Interviews were conducted in English, French or German, depending on the preference of the interviewee.

All of the Member State representatives on the PACT funding committee were interviewed; 9 face-to-face and 6 by telephone.

## **2.5 FURTHER EVALUATION OF KEY QUANTITATIVE AND QUALITATIVE DATA**

Information from the project beneficiary and Member State interviews were collated and evaluated, following the fourth column of the evaluation frameworks.

The key findings from this evaluation were presented in an Interim Report and discussed with the PACT programme team and the EC Internal Audit and Evaluation Cell. This Interim Report presented key findings, conclusions and recommendations for each of the evaluation themes, and a list of further issues to be addressed by the project.

Subsequently, additional work has been done on benchmarking, market impacts and dissemination planning (see Section 3). We have also considered the implications of our evaluation findings for the future direction of PACT (see Section 4).

## 3 Evaluation Results

### 3.1 THEME 1 - ACCESSIBILITY

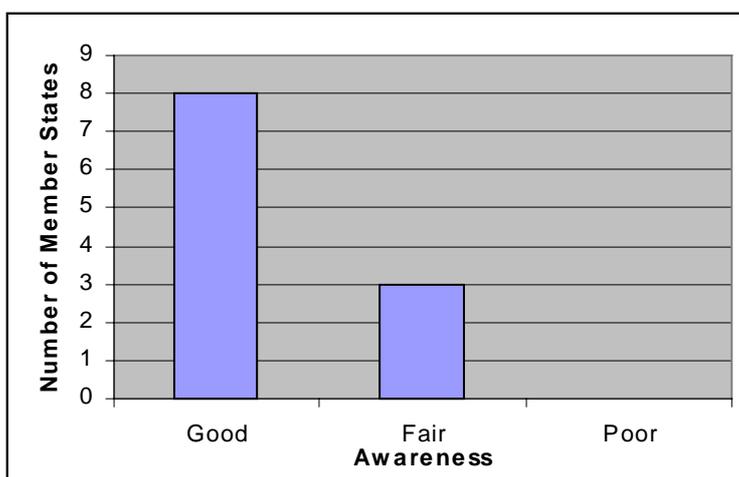
This theme is concerned with how accessible the PACT programme is to potential project teams. This has a number of dimensions:

- **Awareness** - potential project teams have to know about PACT if they are to make bids.
- **Guidance/Assistance** - potential bidders may be deterred if they are not clear whether their project qualifies for support, or if they are not clear on what information is required.
- **Bidding costs** - if the cost of bidding is large compared to the funding available, potential project teams may decide that PACT is not worthwhile.
- **SME Participation** - PACT aims to help Small and Medium Sized Enterprises (SMEs). Is there any evidence that these organisations are finding PACT less accessible than larger organisations?

#### Awareness

Awareness is difficult to measure because it is impossible to identify and count those organisations that are not aware of a programme's existence. Therefore the evaluation has used some indirect measurements. The first of these was to ask Member State representatives to PACT for their assessment of the awareness of the programme amongst relevant industries in their countries. The results presented in Figure 3 show that the majority of the 11 Member States that expressed a view considered awareness to be good.

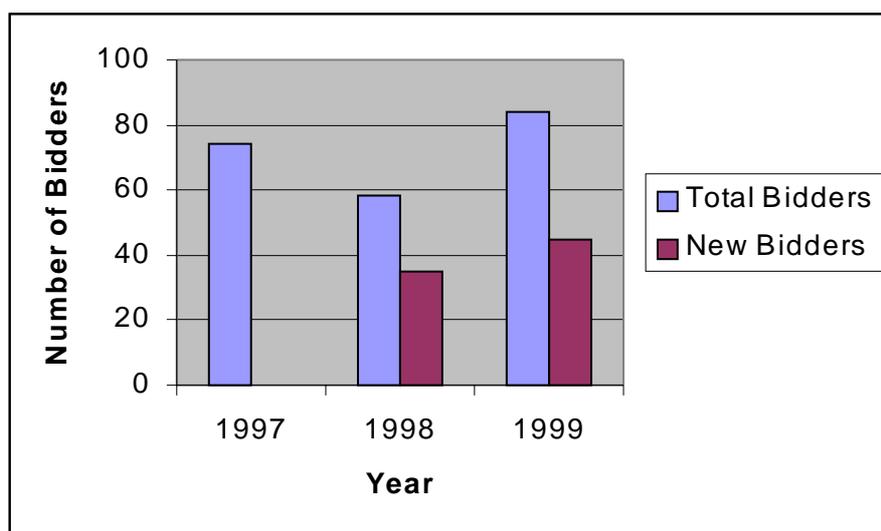
**Figure 3 Member State Assessments of National Awareness of the PACT Programme**



A second measure of awareness is the number of new organisations bidding to the programme year on year. If a large proportion of bids are from new organisations this would indicate a good and growing awareness. If bids persistently come from the same organisations this would suggest limited awareness and the potential development of a "closed club" of programme beneficiaries. Figure 4 shows that following the launch of Phase 2 of PACT in 1997, more than half of proposals in subsequent years have come from new organisations.

Overall these results indicate a good awareness of PACT amongst potential benefiting organisations. Interviews with participating organisations have revealed that this awareness is not attributable to any one action, but occurs through a range of networks. The strongest appears to be trade associations, but others include one to one business contacts, trade journals, regional development organisations and chambers of trade.

**Figure 4 Proportion of Proposals to PACT Coming from New Organisations**



### Guidance/Assistance

Guidance for the preparation of proposals is provided through the PACT User's Guide. Interviews with the leaders of 25 projects showed majority approval with 16 (64%) organisations rating the User's Guide as either good or very good. However, two successful bidders thought the guide was too basic and more detail was needed. In one case this had resulted in the organisation claiming for costs that were not allowable under PACT.

Another measure of the effectiveness of the guidance provided is the number of non-compliant bids. Data for 1998 show that 5 out of 65 bids were not compliant, two because they missed the deadline for bids, and three because they requested funding for research work lying outside of PACT's remit.

Project leaders were unanimous in their appreciation of the additional assistance provided by the Commission's PACT management team when they ask for additional guidance.

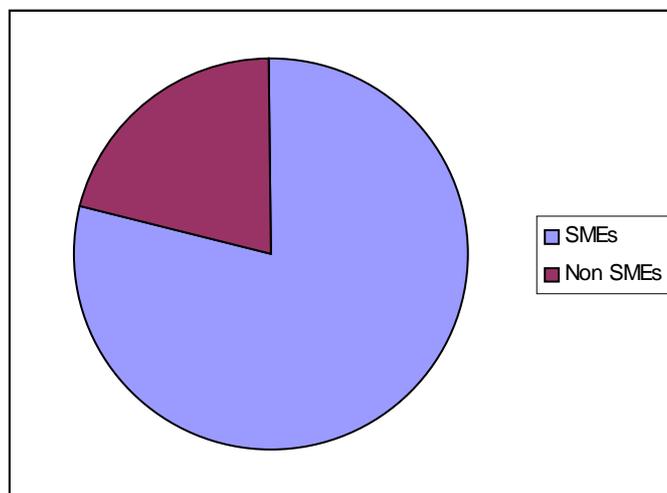
### Bidding Costs

Interviews with Project Managers covered estimates of proposal preparation time. 11 projects were able to give rough estimates, which ranged from <0.5 months to 2-3 months. This wide variation seems to be linked to the effort required to put together consortia and make preliminary assessments of potential Combined Transport schemes. There was no indication from the interviews that the PACT bidding process required a disproportionate amount of effort, in fact some teams considered the requirements less demanding than for other sources of funding.

### SME Participation

SME involvement in projects has been assessed for the majority of projects supported between 1997 and 1999. Aggregate results for the three years are shown in Figure 5, and indicate that at nearly 80% of PACT participants were SMEs.

**Figure 5 Proportion of SME Organisations Participating in the PACT Project**



### Conclusions for Theme 1: Accessibility

- The PACT Programme appears to be well known amongst potential bidders, with several networks of trade associations, trade journals and professional contacts reinforcing awareness amongst stakeholders.
- The guidance to potential proposers given by the User's Guide seems in general to be sufficient, but occasional misunderstandings have occurred. These could be reduced by further encouragement to contact the Commission services at the proposal preparation stage.
- The level of effort needed to prepare proposals may be quite considerable, with 2-3 man months quoted in some cases. This is due to the need to put together consortia and assess combined transport opportunities, and is not a reflection of disproportionate administrative requirements in PACT.
- SMEs are well represented in PACT projects.

## 3.2 THEME 2 – SELECTION PROCEDURE

This Theme is concerned with the efficiency of the selection procedure, and includes the following aspects:

- **Timing** – the timing of the call for proposals and the duration of each stage of the selection process (call for proposals > proposal deadline > proposals sent to MS > meetings with MS > feedback to applicants > contract signature).
- **Level of Resource from Applicants** – the amount of effort required to prepare a PACT proposal, and how this compares with other EC programmes. It is important here to distinguish between the administrative burden and the effort required to plan the project and secure the participation of partners.
- **Level of Resource from EC Staff and Member States** – the amount of effort required from the PACT programme team, other EC officials and Member States in the review and selection of proposals.
- **Clarity and application of selection criteria** – whether the selection criteria are clear to applicants and Member States, how well these criteria are applied in the selection process and how well the criteria reflect the intervention logic and objectives of the PACT programme.

### Timing of the selection procedure

PACT operates an annual cycle for project selection and contract negotiation. The call for proposals is in December with a deadline in February. Proposals are assessed by the EC and then Member State (MS) representatives, with two selection meetings in May and June. A decision is made in July, following formal ratification by the Commission. Documentation for contract negotiation is sent out in August (this was done in September before 1999). Individual contract negotiation is typically completed in 6-8 weeks with the whole contract negotiation process completed by 10 December. In addition, EC staff offer pre-proposal checking at any time of the year.

Table 1 shows comparative data for SMEs participating in three different parts of the 4<sup>th</sup> Framework Programme: Exploratory Awards providing assistance for proposal preparation, Co-operative Research (CRAFT) projects whereby groupings of SMEs pay for third party research and traditional Collaborative Research projects.

**Table 1 Duration of the project selection process (months)**

	<b>Proposal preparation</b>	<b>Evaluation of proposals</b>	<b>Contract negotiation</b>
Exploratory Awards	6	4.9	3.5
CRAFT	5.8	6	5
Collaborative Research	4.6	4.8	4.6
<b>PACT</b>	<b>3</b>	<b>5</b>	<b>4 - 5</b>

The time allowed for proposal preparation in PACT is clearly much less than for the other programmes and some applicants have commented on the difficulty of putting together proposals in less than 3 months including the Christmas holiday. However, it should be

remembered that PACT operates an open call for proposals that changes little year by year. It is therefore possible for prospective consortia to begin planning before December, and to take advantage of the year-round pre-proposal advice available from the EC. This service could be advertised on the PACT web site to ensure the same opportunities for organisations who are new to PACT.

The time allowed for proposal evaluation is comparable with other programmes and would be difficult to reduce without affecting the quality of input from Member States.

The time for contract negotiation is also comparable with other programmes. The contractual terms also allow projects to claim costs as far back as February so organisations do not have to wait for the contract before starting work. Once a consortium is established, it is often not practical to wait 10 months before starting a near-market project. As a result, about 30% of projects start before PACT funding is confirmed. This is not necessarily a sign that the funding is not needed.

The timing of the annual process has attracted some criticism from the rail sector. The current cycle is incompatible with the railway timetables that are agreed in May/June each year, and it has been suggested PACT adjusts its timing to fit. This would mean a call for proposals in April/May with submissions by late summer. This suggestion has its merits but may lead to resourcing problems over the summer period and/or more complaints of limited proposal preparation time. This lack of flexibility in rail timetabling is perhaps systematic of the inherent barriers to combined transport.

### **Level of resource from applicants**

As discussed in Theme 1, the effort required for bid preparation varies widely and is linked to the effort required to put together consortia and make preliminary assessments of potential CT schemes. From the limited data available, we estimate PACT applicants spend about 0.27 Euro per Euro EC funding provided on average. This is not representative of the administrative burden for the reasons given above. Furthermore, unsuccessful bidders have sometimes continued with the project, and so the effort is not always wasted.

Table 2 compares PACT bid preparation costs with those of SMEs bidding into the FP4 programmes described above. It includes only the costs incurred by the proposal co-ordinator, and does not distinguish between project preparation and proposal writing.

**Table 2 Cost of bid preparation for successful applicants**

	<b>Cost per bid (kEuro)</b>	<b>Average grant (kEuro)</b>	<b>Euro bid cost per Euro grant</b>
Exploratory Awards	3.5	40	0.09
CRAFT	24.5	340	0.07
Collaborative Research	24	1220	0.02
<b>PACT</b>	<b>18.2</b>	<b>212</b>	<b>0.09</b>

This analysis suggests PACT applications are disproportionately expensive. However, we believe this is not true once the following factors have been considered.

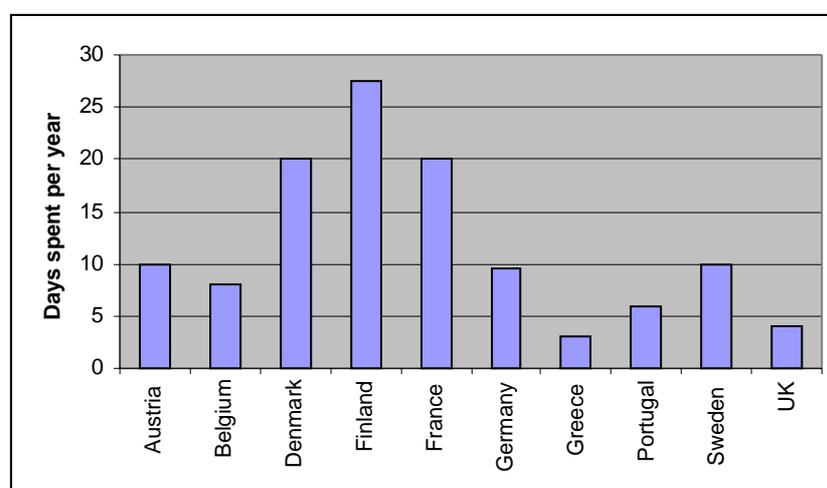
- The high proportion of PACT bid preparation costs that are associated with forming a commercial consortium makes a direct comparison invalid.
- By considering only successful applicants, this comparison is unable to account for the failure rate of bids. The PACT success rate of about 1 in 3 is likely to be higher than the average for Framework programmes. For example, the 5<sup>th</sup> Framework call of 1999 supported only 20% of bids.
- The costs do not include those of consortium partners, which are estimated to total about three times that of the proposal co-ordinator for FP4 bids, but are much less for PACT proposals.

### Level of resource from EC staff and Member States

The EC PACT programme team spends about 252 days per year on project selection, divided between the programme manager, project officer and national expert. This is estimated to cost 153,000 Euro, or 0.025 Euro/Euro grant awarded.

Figure 6 shows the annual resource on PACT project selection for the ten MS representatives who were able to provide an estimate. The average time allocation is about 12 days, which would give total costs of about 121,000 Euro for all Member States; equivalent to 0.02 Euro/Euro grant awarded.

**Figure 6 - Level of resource from Member State representatives spent on project selection**



It has proved difficult to get benchmarking data on EC and MS resourcing for other EC programmes. A bottom-up analysis has suggested that MS resourcing for project selection was much lower on a Euro/Euro basis for the THERMIE programme. However, this is probably due to economies of scale, as the average value of a THERMIE grant was about 3 MEuro.

Interviews with Member State representatives suggest they are happy with their current role in project selection and very appreciative of the assistance given by the PACT programme team.

### **Clarity and application of selection criteria**

The EC programme team uses five selection criteria for proposals:

1. Degree of innovation
2. Viability of the proposed project/technology
3. Number of Member States involved.
4. The extent to which the project would improve the competitiveness of CT and the credibility of the application/project.
5. Value for money (measured as tonne.km traffic shift per Euro funding requested)

Proposals are scored against each of these criteria to provide a basis for project selection. This is used flexibly rather than employing a strict threshold, which allows some additional discretion.

These selection criteria fit well with the intervention logic and objectives of the PACT programme, as they directly address innovation, environmental impact, CT competitiveness and the international dimension.

Member State representatives were all clear on the selection criteria and generally found them appropriate. One MS commented that the innovation criterion was unnecessary and precluded some good proposals; another felt the same way about the need to include more than one country [N.B. These criteria are written down in Council Regulation 2196/98.]

Project beneficiaries were generally clear on criteria 1-4 and were able to express these ideas at interview. Value for money/traffic shift was not specifically quoted as a criterion at interviews and several beneficiaries complained about the need to produce traffic shift data for proposals and reports.

Beneficiaries were divided on the appropriateness of the criteria. Several commented that innovation was the most important aspect while others felt this was overrated and counterproductive for such a market-oriented programme. Innovation is considered further in Theme 6.

### **Conclusions for Theme 2 – Selection Process**

- The timing of the selection process is satisfactory but newcomers to the programme would benefit from more time to prepare applications or some early warning of forthcoming calls.
- There is a long time interval between bid acceptance and signature of contracts, which is not compatible with near market initiatives. The problem is reduced by the facility to refund costs incurred before contract signature (but after the deadline for proposals) - many applicants would be put off applying if they could not claim costs until contracts are signed, some 10 months after bid submission. However, it would be better to reduce this period.
- Applicants and Member State (MS) representatives appreciate the assistance provided by the EC, praising the professionalism and enthusiasm of the PACT programme team.
- The rail sector has proposed a revision of timing to fit in with changes in railway timetables. This would involve a call for proposals in May and bid submission in late

summer. This is worthy of consideration but may lead to resourcing problems over the summer period.

- Benchmarking studies and interview responses suggest that the level of resource from applicants, MS and the EC is comparable with, or less than, that required by other programmes.
- The selection criteria (value for money, credibility, number of MS, competitiveness and innovation) are well understood and follow from the intervention logic for the programme. Environmental benefits are included within the value for money criterion, but should perhaps be emphasised more strongly in communications with applicants.
- Innovation is the most contentious of these criteria, with several complaints that it is unnecessary and reduces the success rate of projects. Innovation is discussed further under Theme 6.
- Some applicants and MS representatives have complained about a lack of transparency in the selection process and a feeling that it is too political. More feedback on the reasons for decisions may help to diffuse this feeling, and also advise unsuccessful proposers on how to strengthen future initiatives.
- Some concern was expressed over the inability to fund Central and Eastern European organisations, which was claimed to create particular problems for inland waterway projects.
- Road freight transport to and from CEE countries has been growing rapidly in recent years, and the promotion of alternative modes is commonly seen as important in alleviating pollution and congestion problems.

### 3.3 THEME 3 – CONTRACTUAL RELATIONSHIPS

This Theme concerns the appropriateness of the contractual terms used by the PACT programme. These terms comprise:

- **Duration** – the length of the contract and the arrangements for contract extension.
- **Level of support** – the absolute and percentage EC contribution to feasibility studies and operational actions.
- **Eligibility of costs** – categories of cost that are eligible for PACT support.
- **Payment terms** – scheduling of EC payments.
- **Other terms** – intellectual property rights (IPR) arrangements and other contractual terms.

#### **Contract Duration**

Many PACT projects get supported for three years, but have to reapply for funding each year. This means applicants can't be sure of the full funding at the start of the project, which increases risk and makes it more difficult to secure other investment. It also leads to more effort on proposal writing and proposal review. Furthermore, new applicants to PACT may be misled into thinking that 5-6 MEuro is available whereas, in practice, around half of this is already ear-marked for continuing projects.

This system does ensure that projects are re-evaluated each year and must demonstrate some progress before further funding is given. However because of the timing of the funding cycle, a new project may have only just started by the time its successor is being evaluated, and so progress may justifiably be very limited.

It may be worthwhile to consider an alternative system whereby the EC awards 3 year grants for PACT projects with second and third year funding dependent on the achievement of milestone targets. This would provide the following benefits:

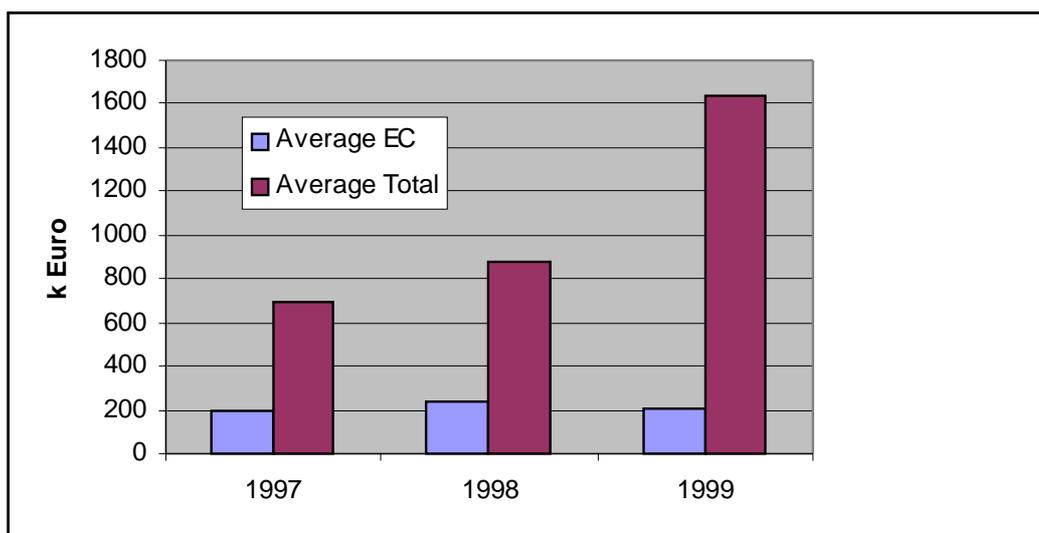
- Applicants need only produce one full proposal.
- Member States can focus on fewer proposals each year, and give them more attention.
- Interim reports can be tailored to the needs of the EC programme team.
- Evaluation of project progress against milestone targets can be done at the appropriate stage of the project rather than a fixed time of year.

### **Level of support**

Analysis in Theme 2 suggests that programmes with larger average grant sizes give proportionately lower bidding costs. This is probably true for EC project selection and monitoring costs as well. It could be concluded from this that PACT's efficiency would improve by moving to fewer, larger projects. However, project beneficiaries expressing an opinion stated that the size of their project was dictated by the nature of the project and the acceptable level of risk, rather than the funding available. This suggests current PACT projects have a natural size of about 500,000-2,000,000 Euro, beyond which the nature of the project would change. It is very difficult to judge whether there is a new category of larger projects that could be attracted into the programme with beneficial results. This could perhaps be determined by an appropriate market study.

Further analysis of the size of PACT projects reveals that the programme has been increasingly successful in attracting larger projects without increasing the average size of its grants. Figure 7 shows the average EC subvention (grant) and average project value by year for 1997-1999.

**Figure 7                      Average Value of EC Subvention and Total Project, by year**



The major change from 1998 to 1999 cannot be explained by any change in the split of operational actions and feasibility studies, as this remained fairly constant throughout the three years studied. The main influence seems to have been the introduction of some very much larger projects in 1999. Six projects over 3 million Euro in value were supported in 1999, including one at 6.8 million Euro. This contrasts with largest single projects of 1.7 million Euro and 2.0 million Euro in 1997 and 1998 respectively.

This trend provides evidence that larger projects can go ahead with much lower levels of PACT support than were provided in 1997 and 1998. This message is confirmed by project beneficiaries, with over 60% of respondents admitting their project would have gone ahead in some form without EC support or would have proceeded as planned with a lower level of support. This is discussed further in Section 3.6.

### **Eligibility of costs**

Eligibility criteria are generally understood and appreciated, although there have been some isolated incidents of beneficiaries asking for payment towards ineligible costs such as the leasing of lorries.

### **Payment terms**

The standard payment terms are 40% payment in advance, 30% on interim reporting once at least 70% of costs have been incurred, and 30% on completion and final reporting. In practice some contractors choose not to prepare an interim report, preferring to avoid the administrative burden and wait for the second and third payments at the end of the project.

These payment terms are generally considered acceptable by beneficiaries but there were two complaints from project managers unaware that they would not get the full grant at the start of the project. This should perhaps have been communicated more effectively at an early stage of the contract negotiation process. Since 1999, beneficiaries have been sent a model contract beforehand for information.

### **Other terms**

Project beneficiaries raised no concerns about IPR arrangements or other contractual terms. IPR is probably not a major issue for these projects as they tend to use rather than invent new technologies.

### Conclusions for Theme 3 – Contractual Relationships

- The Commission should consider multi-year project approvals instead of single year contracts, with continued support dependent on meeting specific milestone targets. This would reduce the risk for beneficiaries, reduce project selection costs and provide applicants with a more realistic view of their prospects.
- A move to fewer, larger projects may reduce unnecessary administration and improve the potential for project replication by raising the profile of individual pilot projects. However, a detailed market study should be undertaken first, to confirm whether more large projects could be attracted into the programme with beneficial results.
- The recent trend towards lower percentage contributions to operational measures should be maintained. Evidence suggests many PACT projects would proceed with less than 20% EC funding and that the “badge” of EC approval is sometimes as important as the funding given.
- All other contractual arrangements seem satisfactory, although there have been instances where beneficiaries have failed to read the terms of the contract and have later incurred unexpected costs.
- Options should be examined for reducing the period between project acceptance and contract signature, which is currently too long to meet the needs of fast moving, near market initiatives.

## 3.4 THEME 4 – PROJECT MONITORING

This Theme is concerned with the monitoring of projects supported by the PACT Programme. In principle this could have a number of objectives:

- **Progress monitoring** - to maintain awareness of the progress to clear the transfer of funds, to help tackle problems and to inform decisions on whether to extend support to later phases of the project.
- **Enhance Programme Experience** - to build up experience of what works and does not work in Combined Transport.
- **Assess Effectiveness** - to measure the success and benefits of PACT supported projects, and their potential for replication.
- **Support Dissemination** - by monitoring projects to report on their achievements and lessons learned to advise other organisations thinking of undertaking similar initiatives.

### Progress Monitoring

Progress monitoring was maintained through periodic telephone contacts between the Commission and the project leaders, together with annual written reports and occasional site visits and meetings in Brussels. Interviews with the Commission team revealed a good in-depth knowledge of projects; their current status, difficulties encountered, successes, etc. The

level of project monitoring by the Commission seems quite sufficient bearing in mind the level of funding (20-30%), and the near market nature of projects, which places a high level of motivation on projects to succeed or terminate to avoid unacceptable losses.

14 out of 85 projects from 1997 to 1999 had Steering Group Meetings. Generally these were instigated by the projects to tackle problems encountered in implementing the schemes. Project teams indicated that Commission involvement in these meetings had been useful for resolving problems.

### **Enhance Programme Experience**

The level of record keeping on progress monitoring activities and Steering Group meetings was relatively low. This is to be encouraged since it makes the records more transparent and accessible to staff new to PACT. However, many records gave little information on the specific technical and commercial factors that affected the performance of the project. This would be useful for informing new staff and would introduce a degree of "corporate learning" that would support any future need to hand over management of PACT.

### **Assess Effectiveness**

The formal assessment of the effectiveness of PACT projects is based mainly on the annual and final reports written by the projects. A review of a sample of these reports has revealed that they are variable in both structure and content. This made it difficult to extract information on the nature of the projects, lessons learned in their implementation and the level of their success. In particular not all projects reported what the projects had attained in terms of combined transport (e.g. tonne/km carried) compared with the original targets.

The Commission have already addressed this problem by issuing guidelines on the structure of final reports, but, as discussed below, this may need further strengthening to support more effective dissemination of project experience (see below).

Furthermore, it was clear that the Commission officials were taking action to be fully aware of the achievements of each project through direct contacts with the project teams.

Another aspect of project monitoring is to check on the continued viability of the schemes after PACT funding is completed. The standard contract provides for this continued assessment. This is particularly relevant with a near market programme like PACT, because it adds to the knowledge base of what projects are likely to be successful. It would also strengthen the dissemination object of the programme.

### **Support Dissemination**

Project monitoring and reporting does not appear to be linked to the dissemination objectives of PACT. In particular the annual and final reports of projects do not appear to be designed to help transfer knowledge and information to the broad combined transport community that may replicate the experience on other routes. Interviews with project leaders revealed a lack of understanding of the target audience for their final reports. Most did not know who the target audience was and other thought it was only the Commission.

The Commission has take action to address this issue by requiring the projects to prepare short summary reports that appear on the PACT web-site. It has also issued more detailed guidance

on the structure of final reports. However, it is unlikely that the project teams have either the motivation or skill to produce reports that are suitable to support dissemination, which is a specialist activity. The aim in specifying final reports should be to ensure that important information on the experience and progress of projects is presented. This could be used by specialist writers to produce tailored dissemination material.

#### **Key Findings for Theme 4: Project Monitoring**

- The Commission's programme management team maintains a good awareness of the progress of projects in order to maintain financial control.
- The programme management team also contributes to problem solving through project missions and participation in Steering Group Meetings. Both were appreciated by the project teams.
- There is insufficient "corporate learning" for "succession management" from project monitoring activities. Mission and Steering Group reports do not define problems and actions sufficiently to advise new staff should there be a change in the Commission's PACT team.
- The assessment found evidence that experience from project monitoring is fed into the evaluation of new bids and into the guidance given to prospective bidders. However, this is done through the knowledge of the programme management team and not documented information. Again this practice does not cater for succession management.
- Project monitoring aimed at assessing the effectiveness of projects depends almost totally on information presented in project interim and final reports. These reports are only specified in general terms and do not always contain sufficient information to fully assess the extent to which projects have attained their original objectives and why. Nor is there any monitoring of the performance of projects after completion, although provision for this is included in PACT contractual arrangements.
- Project monitoring does not appear to be linked with the programme's dissemination strategy. For example with the aim of defining "best practice" for different types of combined transport. Potential investors in replication initiatives would be assured by impartial information from a reputable organisation, detached from the original pilot project.
- Information presented under Theme 5 shows that the effort deployed to project monitoring by Commission staff is comparable to other projects of the Commission, where monitoring is limited to assessing project progress. Further effort would be needed to extend monitoring to assess overall programme effectiveness and to support dissemination activities.

### **3.5 THEME 5 – PERSONNEL INPUT**

This Theme addresses the level of resource deployed on the PACT programme by:

- The EC PACT programme staff, including a seconded National Expert
- Other EC staff
- Member State representatives

This input can be subdivided into the three main tasks of the programme: proposal selection (including preparation of the call for proposals and contract negotiation), project monitoring, and dissemination and awareness raising. In practice, very little effort is currently spent on dissemination and awareness raising so detailed analysis has only been possible for the first two tasks.

### **PACT Programme Management**

Table 3 shows an estimated breakdown of man days by task for the PACT programme team of Stefan Tostmann (Programme Manager), Hannu Pitkänen (Project Officer) and Hervé Arki (seconded National Expert). Project selection includes time spent negotiating contracts.

**Table 3 Resource allocations by task for the PACT programme team**

	<b>Project selection days/year</b>	<b>Project Monitoring days/year</b>	<b>Total days/year</b>
Programme Manager	84	63	147
Project Officer	126	84	210
National Expert	42	0	42
<b>Total</b>	<b>252</b>	<b>147</b>	<b>399</b>

The PACT programme team's effort on project selection was analysed under Theme 2.

Project monitoring benchmarking data is shown in Table 4. Again the PACT programme is compared to SME involvement in three Framework IV programmes. This analysis suggests PACT project monitoring costs are comparable with Exploratory Awards and CRAFT programmes on a cost per grant value basis, but much higher than the collaborative research programme. This is to be expected as there will be economies of scale in contacting project managers, reading reports etc.

**Table 4 Benchmarking data on project monitoring**

	<b>Days per project per year</b>	<b>Average grant size (kEuro)</b>	<b>Monitoring cost per Euro grant</b>
Exploratory Awards	1	40	0.015
CRAFT	10	340	0.018
Collaborative Research	5	1220	0.002
<b>PACT</b>	<b>5.2</b>	<b>212</b>	<b>0.016</b>

### **Other EC Staff**

From discussions with EC staff in the TEN-T and R&D programmes we estimate other EC staff spend about 6 days per year reviewing PACT proposals and assisting the PACT programme team. This equates to a cost of about 0.0006 Euro per Euro grant, giving a total EC staff cost of 0.042 Euro/Euro grant for all project selection and monitoring activities. This compares favourably with the EC energy programmes shown in Table 5.

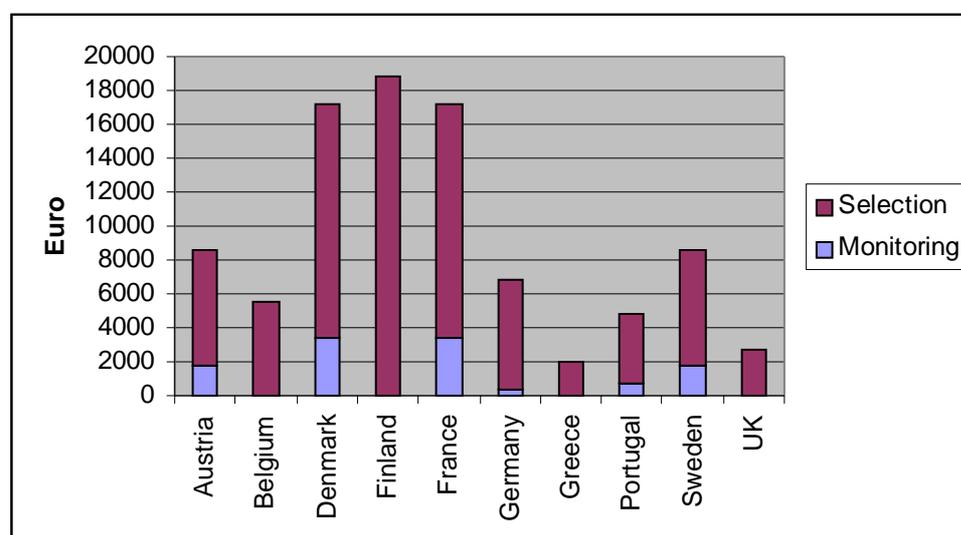
**Table 5 Benchmarking data on project management (1999 data)**

	No of projects per equivalent staff member	Average grant size (kEuro)	Management cost per Euro grant
Altener II	10	119	0.106
SAVE II	15	155	0.054
SYNERGY	7	127	0.142
CARNOT	8	78	0.202
SURE	4	83	0.378
<b>PACT</b>	<b>15</b>	<b>204</b>	<b>0.042</b>

### Member State Representatives

MS representatives report that nearly all their time on PACT goes on project selection, with many having no role at all in project monitoring. Figure 8 illustrates this for the ten MS representatives who were able to give estimates.

**Figure 8 Member State effort on PACT project selection and project monitoring**



MS representatives are happy with their level of involvement, which averages about 12 days per year. They have also been very complimentary about the amount of support they get from the Commission. Two MS expressed the view that they would like more involvement in PACT project monitoring but do not have the time to do it. MS relationships are discussed further under Theme 7.

### Conclusions for Theme 5 – Personnel Input

- The PACT programme team spends about 147 days per year on project monitoring, which equates to about 5 days per project or 0.016 Euro per Euro grant. This seems appropriate to the Programme and project sizes, and is comparable with other EC programmes.
- The PACT programme team is very well regarded by project beneficiaries and Member State representatives.
- Other EC staff from the R&D, TEN-T and Maritime programmes spend about 6 days per year reviewing PACT proposals and assisting the PACT programme team.

- Estimates of time spent on PACT by MS representatives vary from 3-27 days per year with an average of 12 days per year. The majority of this time is spent on reviewing proposals, attending project selection meetings and advising potential applicants.
- MS representatives are generally happy with this level of involvement.

### 3.6 THEME 6 – IMPACT ON THE MARKET

This Theme addresses the impact of PACT on the market for combined transport (CT) in the EU. This is in many ways the most important of the evaluation themes and the most difficult to assess. Our evaluation has covered the following aspects:

- **Innovation** – How innovative are PACT projects? Is there a difference between feasibility studies and operational measures? What is the nature of the innovation?
- **Need for support** – Would these projects go ahead in the same way without EC support or with a lower level of support? Are there additional non-financial benefits of EC involvement?
- **Viability of projects** – What is the commercial viability of PACT projects and have they continued after the period of support? How many feasibility studies lead to operational measures?
- **Traffic shift** – How much freight has been shifted from road transport to combined transport as a direct result of PACT? How much has been shifted as a result of replication of PACT projects?
- **Projects involving national railways** – Are there any important differences in the projects involving State run railways such as SNCF, RENFE and CP?
- **Distortion of competition** – Does the PACT programme distort the market for CT in Europe? If so, what are the effects?

The evaluation of this Theme has relied heavily on interviews with the PACT programme team, Member State representatives and project beneficiaries. We are conscious that this provides a useful but not comprehensive picture of market impacts, as it comes primarily from those involved in the PACT programme.

#### **Innovation**

PACT projects may be innovative in terms of the CT route, the technology employed, the way the CT service is delivered or some combination of these options. Projects with technology innovation include those primarily focused on developing, for example, tracking and tracing technology, and those using a slightly different trailer design on a new CT route. Service innovations include improvements to terminal handling facilities and innovative logistical systems.

Table 6 summarises our understanding of the types of innovation provided by the 33 projects selected for detailed evaluation.

#### **Table 6 Characterisation of Innovation in Selected PACT projects (% of projects by year)**

<b>Innovation</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>All years</b>
Route only	53%	33%	40%	45%
Route + technology	12%	50%	50%	30%
Technology only	29%	17%	0%	18%
Service/Operations	6%	0%	10%	6%

This analysis suggests that almost half of the selected projects offered solely or predominantly a new route, and that only a small and declining number of projects were primarily focused on technological innovation. This picture is confirmed by comments from some of the Member State representatives, who felt innovation was mainly in the routes chosen and was becoming more difficult to achieve.

Some MS representatives and beneficiaries questioned the importance of innovation in achieving the objectives of PACT. They put forward the view that the successful demonstration of a CT operation could lead to replication even if the CT operation was not novel, and that innovation made commercial viability more difficult to achieve. It is our understanding that these comments refer to technological innovation rather than innovation in route, as it would not be credible to propose pilot actions where CT routes are already in operation. There seems to be a perception that technological innovation is favoured over other types of innovation, which may lead some applicants to choose less well developed and therefore more risky technological options. Clearer explanation of this selection criterion in the Users' Guide is recommended, and it may be better to invite technology-only or route-only innovations rather than a combination of both.

The selected projects included very few feasibility studies and so it is difficult to comment on the relative level of innovation of feasibility studies and operational measures. Our initial impression is that feasibility studies may be either specific studies on the feasibility of a particular CT route or generic studies on, for example, the prospects for intermodal transport of chemicals. The former appear innovative but often did not progress to an operation phase, sometimes because the study showed that the route was not commercially viable. The latter may not be strictly innovative but can make an important contribution to market enablement and policy development.

### **Need for support**

As discussed under Theme 3, there is evidence that many PACT operational measures, especially larger ones, are able to go ahead with much lower levels of support than the 30% maximum allowable under PACT rules. Furthermore, interviews with project beneficiaries have indicated that over 60% of projects would have gone ahead in some form without EC support or would have proceeded as planned with a lower level of support.

This was confirmed by telephone interviews with rejected applicants. Three of the nine rejected applicants questioned (33%) reported that their project had continued without support from the EC.

Nevertheless, EC funding is reported to have speeded up market entry and increased partners' willingness to face the financial risk of start-up. Beneficiaries have also highlighted non-financial benefits of EC support including:

- A greater determination by partners to resolve any problems.
- Better project management.
- A mark of EC approval that helps attract partners and clients to the service.

### Viability of projects

According to the PACT Users' Guide, operational measures are expected to increase the competitiveness of CT as compared to road transport and therefore be viable on their own after a maximum period of three years. In order to test this assertion, project beneficiaries were asked to comment on the commercial viability of their projects and, in the case of PACT projects supported in 1997 and/or 1998, whether the project was continuing after PACT support had ended. Their responses are summarised in Table 7.

**Table 7 Perceived commercial viability of selected PACT projects**

	1997	1998	1999	All years
Not expected to be commercially viable	18%	50%	0%	17%
Expected to be commercially viable but some difficulties	18%	25%	33%	25%
Commercially viable now or in the near future	27%	0%	22%	21%
Not relevant or no comment	36%	25%	44%	38%

Given the low level of response and the subjectivity involved, these results cannot be considered statistically significant. Nevertheless, the responses do indicate difficulties in achieving commercial viability in the CT market even with the start-up funding provided by PACT, under current market conditions. Beneficiaries noted the fundamental problems facing any CT start-up due to intense competition within the road sector (reducing prices) and the low reliability/speed of CT due to difficulties caused by customs and railway organisation.

It would be interesting to compare these figures with industry averages for new CT schemes. This would give us some indication of whether the market is very difficult and PACT support makes a real difference, or whether the innovative nature of PACT projects makes them less likely to succeed in the market.

There is an apparent contradiction between the difficulties in achieving commercial viability and proposers' willingness to proceed at lower EC funding levels. There are two possible explanations for this:

- Proposers may underestimate the costs of setting up a service or overestimate their likely market impact. They therefore expect to be able to achieve commercial viability at a lower EC funding level but this is not borne out in practice.
- Commercial viability may be very dependent on non-financial issues such as the availability of equipment, access to rail tracks and ports, the co-operation of partners and

suppliers, and the commercial status of the SMEs involved. In this way the financial assistance of the EC may not be the determining factor in a project's success.

Three of the project beneficiaries (2 from 1997 and 1 from 1998) reported that they were no longer operating the service. All of these were rail projects, and problems with the rail network and increasing rail access charges were given as the reasons for termination.

### **Traffic shift**

We have estimated the traffic shift for 34 of the 63 PACT operational actions (i.e. excluding feasibility studies) between 1997 and 1999 to be a total of at least 3.5 billion tonne-kms. If those 34 projects are representative of the total in terms of traffic shift per project then the total traffic shift from the PACT programme 1996-1998 was about 6.5 billion tonne-kms, or 2.2 billion tonne-kms per year of funding. This is a conservative estimate based on available data and some assumptions on distance travelled and container loading. Details of the traffic shift calculations are given in Section 3.9.

Traffic shift stimulated by the PACT programme will include that of PACT projects and any replications of those projects. We have found evidence of replication (see Section 3.8) but there has been insufficient information available to permit an estimation of the resulting traffic shift. It is also reasonable to expect that feasibility studies will have led indirectly to some traffic shift through, for example, better tracing and tracking of containers. This too has been impossible to quantify.

Table 8 presents figures for the international CT market in the European Union between 1990 and 1996. This shows a steady growth in all modes over the period 1990-96 but more recent data from UIRR and Intercontainer suggests this trend was not continued after 1996 for rail CT and that this market is now stable at around the 1996 level. Inland waterway and maritime CT have continued to grow at about 10% per year since 1996.

**Table 8 Combined Transport in the European Union (international traffic only) in billion tonne-km**

	Rail	Inland Waterways	Short Sea Shipping	All modes
1990	21.4	2.4	80.8	104.6
1991	21.9	2.6	85.7	110.2
1992	23.3	2.4	90.3	116
1993	26.6	2.9	97.9	127.4
1994	29.7	3.4	107	140.1
1995	32.7	3.5	120.2	156.4
1996	36	4.2	140.7	180.9

The traffic shift estimates above suggest that PACT directly contributed to about 1% of combined transport in 1996, excluding the effects of replication. This is a significant impact considering the relatively small budget of PACT.

### **Projects involving national railways**

Only three of the selected projects included national railways (RENFE, Swedish State Railways and CP), and there were no discernible differences in these projects. It seems there are fewer projects involving state railways than there were in the previous PACT programme (1992-1996), and an increasing number involving smaller organisations dedicated to CT.

### **Distortion of competition**

PACT operates very close to the market and so there is potential for unwelcome market distortion effects. Public funding of CT start-up is by its nature a form of market intervention but it may be justified by the need to address market failures such as external environmental costs (of road haulage) and imperfect competition in the rail industry.

We were able to find very few examples where a PACT project was introduced in direct competition to an existing or planned CT scheme. The project selection process reduces the threat of this happening as it gives Member State representatives and other PACT applicants the opportunity to highlight potential problems.

### **Conclusions for Theme 6 – Impact on the Market**

- All PACT operational actions are innovative in terms of the CT route, the technology employed, the way the CT service is delivered or some combination of these aspects.
- Almost half the projects analysed were found to offer solely or predominantly a new route, with only a small and declining number of projects primarily focused on technological innovation.
- There is some indication that applicants are proposing risky technological options on a new CT route in an effort to improve the “innovation score” of their proposal, potentially making commercial viability more difficult to achieve. We recommend providing a clearer definition of innovation as a selection criterion in the Users’ Guide.
- PACT supports two types of feasibility study: specific studies on the feasibility of a particular CT route and generic studies on, for example, the prospects for intermodal transport of chemicals. The former appear very innovative but have often not progressed to an operation phase. The latter are not strictly innovative but can make an important contribution to market enablement.
- Partly because of the timing issues discussed under Theme 2, about 30% of projects start several months before they are approved for PACT funding. It seems likely that some of these projects would happen without EC support, although the funding does speed up market introduction and encourage participants to face the financial risks of start-up. The EC “stamp” also provides additional non-financial benefits - beneficiaries have said that it increases the level of commitment of the partners, raises the profile of the project and increases its attractiveness to potential customers.
- The lower level of funding accepted by projects in 1999 provides evidence that larger projects can go ahead with much lower levels of PACT support than the maximum of 30%. This message is confirmed by project beneficiaries, with over 60% of respondents admitting their project would have gone ahead in some form without EC support and/or would have proceeded as planned with a lower level of support.
- PACT gives start-up support which helps to overcome some of the financial barriers to CT. It cannot hope to address the larger barriers caused by the structure and regulatory

frameworks of the rail and waterborne industries. These barriers are rightly being addressed by other parts of the Commission. Poor performance and reliability of rail services are additional barriers which have led to the termination of PACT projects.

- One of the impacts of this is that PACT projects can fail because market conditions prove too hostile. External influences like the price of road haulage are very important to the viability of projects.
- Traffic shift estimates have been made for 34 of the 63 PACT operational measures supported between 1997 and 1999 (see Theme 9 for further details of the environmental assessment). These 34 projects are estimated to have achieved at least 3.5 billion tonne-kms traffic shift in total.
- We have determined no discernible differences in projects involving State-run railways; the number of such projects is declining.
- PACT operates very close to the market and so there is potential for unwelcome market distortion effects. Public funding of CT start-up is by its nature a form of market intervention but it may be justified by the need to address market failures such as external environmental costs (of road haulage) and imperfect competition in the rail industry.
- We were able to find very few examples where a PACT project was introduced in direct competition to an existing or planned CT scheme. The project selection process reduces the threat of this type of market distortion.
- The longer term viability of PACT projects is not systematically monitored by the Commission; neither is the replication of projects.

### 3.7 THEME 7 – MEMBER STATES

The relationship between the PACT programme and Member States has two main aspects. One is the *process* of interaction between the PACT programme and Member State (MS) representatives. The other is the contribution of the programme *results* to policy development at Member State level.

To minimise duplication with other Themes, Theme 7 concentrates on three topics identified in the evaluation framework:

- **European added value** – the general relationship between the EC and Member States, and what could be done to improve this and make the programme more efficient and effective.
- **Dissemination** – the transfer of project *results* to the MS level. (Other communications with the EC, e.g. for proposal selection, have been dealt with under other Themes.)
- **Policy** – the use of the PACT results in MS policy development.

#### **European added value**

In reviewing MS feedback on PACT, a distinction must be drawn between the *efficiency* and *effectiveness* of the implementation of the PACT programme. Effectiveness refers to the success of the programme in reaching its goals. Efficiency describes how well this process is managed.

Five MS representatives explicitly praised the *efficiency* and flexibility with which the EC manage the programme, although one representative noted the inefficiency of the large number of relatively small projects.

On the other hand, some MS representatives made comments that call into question whether PACT is *effectively* targeted in its current form:

- The UK representative (in particular) noted that CT faces major barriers that require policy action, notably the liberalisation of the railways – see Box 1. This was suggested to imply that PACT can have little effect until the barriers have been tackled.
- Six other MS representatives also highlighted barriers to CT that require actions other than PACT, although none called for PACT to be stopped.

Likewise, it is clear from the statements made by project teams that certain policy actions would make a much bigger difference to the development of CT than PACT. Nevertheless, this does not necessarily imply that PACT should be stopped as a consequence. Four Member States and several beneficiaries noted the critical need for *organisations to learn to work together* to make a success of the intermodal links that are essential to CT, and PACT is seen as supporting this process.

#### **Box 1: Barriers to Combined Transport**

MS representatives and project teams cited a number of barriers to the expansion of Combined Transport (CT):

- *A lack of competition in the rail sector*, owing to a failure to deregulate the market across Europe (opening up rights of access, defining rules for track charging etc). The large public-owned rail operators are widely seen as inefficient, leading to high prices and unreliable services. Improvements in price and reliability are vital to increase the competitiveness of CT against road transport.
- *Extensive border controls* that are perceived to be tougher for the non-road modes.
- *Barriers to interoperability and intermodality* such as incompatible technical standards.
- *A need for information technologies* to enable tracking and tracing of goods and improve the reliability of freight delivery times.
- *The scale of investment and the risk* associated with investing in CT.
- *State Aid regulations* that prevent Member States using subsidies to assist the market take-up of CT.
- *High customs duties and charges* on rail and water links and at terminals.
- The advantage of road transport in not paying all its *external costs*.
- *Poor enforcement of regulations* in the road freight sector (e.g. on driving times).

A number of changes in the targeting of PACT were proposed by the Member States:

- Three MS representatives favour a greater focus on information technology, such as tracking and tracing.

- Five MS representatives want an increase in the Programme budget in order to have a significant impact on the market.
- One MS suggested abolition of PACT (or a focus on technological innovations as an alternative), and one suggested its incorporation in TEN-T (to encourage greater MS ownership of the projects, leading to more efficient management).

In addition, three MS representatives called for a review or relaxation of the State Aid rules for MS support to projects like those funded by PACT. France and Portugal want subsidies to be allowed. The UK argued that PACT is inappropriate under State Aid rules (if its main role is seen as subsidising the start-up costs of new transport services), and suggested these rules should be reviewed to allow Member States to fund appropriate schemes.

Currently State Aid rules allow grants to be made for environmental reasons. The French and UK Governments run similar schemes, making rail track charges more competitive with the road sector and supporting the development of new terminal infrastructure. Box 2 looks at the UK scheme and draws comparisons with the PACT arrangements. Our evaluation under Theme 9 indicates that PACT projects are highly cost-effective in securing environmental benefits, and therefore compare well with the MS schemes.

#### **Box 2: Benchmarking example – UK rail freight grants**

The UK Government provides grants to offset the financial imbalance between rail and road, within the limits of the environmental benefit that will arise as a result of lorry traffic being removed from the roads. Grants are made towards the capital costs of rail freight handling facilities (FFG) or track access charges (TAG).

Annual monitoring of rail traffic passing through a grant-aided facility (FFG) is required. The funding authority verifies the tonnages reported with the goods service operator, and may require repayment if traffic does not reach anticipated levels. Track access grant (TAG) is paid in arrears, against freight quantities independently certified by the track authority.

FFG applications must include “soundly based predictions of the type and quantities of goods that would use the proposed facility”, to show that the freight would otherwise go by road. The alternative road route must be specified, for which at least two road haulage quotations must be provided. For TAG, the road alternative must be detailed, including up to three road haulage quotations for each flow.

FFG and TAG will not normally be paid where:

- Commitments or contracts have already been made before the grant has been approved;
- the facility/service can be commercially justified without a grant, or would proceed anyway without it.

For both types of grant, a detailed framework is provided for the estimation of costs. The financial assessment offsets revenues against costs, and grant is paid against the shortfall on the (negative) Net Present Value for the scheme. The Net Present Value is the difference between the discounted costs and the discounted income stream over the timescale of the project/grant.

#### **Implications for PACT**

- **Intervention logic.** PACT is effectively a subsidy for start-up costs of an innovative service or technology application, but also is intended to be a pilot for the market. The subsidy element seems inconsistent with State Aid rules. Therefore PACT seems to be justified only if it can be shown to seek and achieve wider market impacts rather than primarily helping individual beneficiaries. This means that *replication on a European scale* is the key indicator of its added value relative to schemes like the UK FFG/TAG. The evidence reported under Theme 8 indicates that some changes are needed in the programme arrangements to increase the prospects for such replication.
- **Evaluation and verification of benefits.** With its limited requirements for proposals and reporting (influenced by the limited size of the PACT projects), PACT does not *ensure* that beneficiaries provide the detailed quantitative data that would allow independent and unambiguous evaluation of project benefits against programme objectives (ex-ante and ex-post). Also, PACT does not have a mechanism to ensure independent/reliable verification of project results, unlike the UK scheme. The EC programme managers *do* ask for further evidence where doubts arise at the proposal stage, but *final results* are often not reported in detail.
- **Commercial viability.** In theory, PACT seems open to abuse by operators seeking a subsidy for services that would have been commercially viable and have gone ahead in the absence of PACT funding. In practice, though, evidence from beneficiaries suggests that the tough market conditions for Combined Transport make any scheme risky and potentially unprofitable in its start-up phase. Beneficiaries quoted the PACT funding as speeding up new initiatives even if they might have gone ahead without funding. There is no evidence that beneficiaries are making direct financial profits from PACT (this is not allowed under the PACT contract).
- **Administrative burden.** PACT has been praised for its flexibility and “light” management, which are seen as appropriate to the small near-market actions in this sector. The benefits of more rigorous reporting and evaluation would need to be balanced against the management costs and disincentives for market actors (especially SME’s).

### Dissemination of PACT results to Member States

Originally the MS representatives did not receive the project results. Now the EC tell them what final reports are available and supply copies on request. Reports can also be downloaded from the Web (without the commercially confidential Annexes).

Five MS representatives criticised the lack of detail and variable quality of the project final reports. Observations include:

- a need for better information on the commercial viability and profitability of the new services;
- problems with commercial reluctance to disclose details;
- a need for reports to enable third parties to assess (quantitatively and unambiguously) the impacts on economics, service reliability and traffic/environmental indicators;
- a need for results to be validated.

The EC programme manager previously recognised that final reports were of variable quality, and issued guidance in September 1999 defining a contents list. He agrees that the reports continue to be variable and that some of them do not provide sufficient information on the commercial viability of the schemes to convince potential replicators.

Three MS representatives called for more monitoring and evaluation work to be done by the EC, especially *after* projects have ceased to receive PACT funding. This would include:

- preparation of results in a summary form (project objectives, key results, quantitative indicators, overall assessment of the piloted CT scheme, lessons for others);
- evaluation of longer-term viability and success, leading to the identification of common factors affecting success and failure across projects.

MS representatives requested that the summaries should be provided in a standardised form, whether supplied by the project managers or the EC. (Our experience from the EXTRA project on dissemination of the FP4 transport RTD programme is that projects do not produce consistent summaries of the required quality, and therefore this needs to be done by an independent assessor.)

In addition, the MS representatives called for more effort on dissemination *at a programme level*, including the preparation of an updated brochure of case studies (i.e. examples of good practice) for distribution to stakeholders. Two MS representatives called for an annual seminar each year to assess progress on projects and identify lessons for future policies and projects.

MS representatives may circulate project results within Government departments but generally do not disseminate them to a wider audience.

### **Policy value to Member States**

The results of the PACT projects are seen as having *potential* value in MS policy development, in areas such as:

- understanding the CT market and the types of policy that might best help it to develop;
- learning about the economic competitiveness of CT;
- identifying barriers (such as customs delays) that are created by existing policies and institutions;
- identifying the potential for environmental and other benefits through support for CT.

However, half of the MS representatives indicated that the PACT results have not contributed to policy development, and most of the others did not express a view on this. Therefore the project outputs can be seen as *not* serving this need. This outcome can be explained by the variable quality of project reports reaching the Member States, and the fact that the reporting guidelines do not *ask* beneficiaries to review the lessons for policy. A number of beneficiaries said that they were not aware of the target audience for their report, and assumed it was the Commission.

### **Conclusions for Theme 7 – Member States**

- Member States seem generally satisfied or pleased with the *efficiency* with which the programme is run. However, they have serious reservations about the *effectiveness* or targeting of the programme as currently implemented. Other actions would make a much bigger difference to the development of CT than PACT (such as liberalisation of the railways, simplification of customs procedures and introduction of information technologies).
- Nevertheless, the majority of MS representatives see PACT as having the potential to promote CT (complementing changes in policy), and an *increase* in the programme budget would have significant support.
- Project reports generally provide inadequate detail to convince potential replicators. Also the information from PACT projects cannot be used to set up similar programmes at MS level because this form of support is not permitted under current State Aid rules.
- MS are fully involved in project selection (see Theme 2), but rarely in evaluation and dissemination of results. There is dissatisfaction with the quality of reports coming from the projects.
- There is little evidence of PACT influencing national CT policies. One important reason is that the project reports do not provide appropriate information for this purpose – beneficiaries do not see Member States as a target audience, and the reporting guidelines do not reflect the objective of informing policy.
- To promote replication and assist policy formulation, MS representatives want to see independent evaluation and dissemination of results *at a programme level*, including the generation of cross-project analyses.

### 3.8 THEME 8 – PUBLIC AWARENESS AND PILOT CHARACTER

This Theme looks at the dissemination of project *results* and the evidence for their wider exploitation. In other words, it concerns the *efficiency* and *effectiveness* of the transition from project results to programme impacts on the market.

In this context, the term “public awareness” refers to stakeholders such as trade organisations for vehicle operators (road, rail, shipping), infrastructure (e.g. port) operators, freight service providers, CT-related technology suppliers, major freight service users, policy makers, planners and local authorities. Awareness of the *existence* of the programme is covered under Theme 1.

The main topics of Theme 8 are:

- **Awareness of results** – the awareness raised concerning the project results and the level of interest that this created among stakeholders.
- **Dissemination** – the dissemination strategies and methods used, and areas for improvement.
- **EC profile** – the acknowledgement of programme support when project results are disseminated.

- **Replication** – the evidence for wider exploitation and replication of the schemes piloted by PACT.

### **Awareness of results**

MS representatives generally reported a high level of awareness among potential applicants to PACT, although three Member States indicated that awareness was somewhat limited among maritime transport companies. Trade associations are generally aware of PACT. This position is seen as reflecting the fairly close-knit nature of the sector.

However, this awareness seems to result from promotion of the *programme*, for example through calls for proposals (as discussed in Theme 1). *Results* are not disseminated proactively by the EC or Member States, and the projects themselves do not appear to have the motivation to disseminate their results widely across Europe, even though this is a requirement of the PACT contract and Users' Guide (beneficiaries seem to interpret the requirement as dissemination to their own customers – see below).

### **Dissemination**

There *could* be three main elements of raising stakeholder awareness of project results: project-led dissemination, programme-led dissemination and MS-led dissemination. In practice, project-led dissemination seems to be the only element in operation.

Interview results indicate that:

- Member States do not disseminate the results (and do not regard this as their role). They only receive project reports from the EC on request.
- Project reports generally lack the detail of interest to third parties. The project results are not validated (e.g. by independent data on the quantities of freight carried by the new services).
- Projects raise awareness of the new service they offer among potential customers, but do not disseminate the real “learning” on how to make the service a success. This reflects their commercial self-interest.
- A number of beneficiaries want more guidance on the structure, content and target audiences for their reports. The lack of clarity on whether the project reports go beyond the Commission may influence beneficiaries to withhold certain details.
- Most projects see their customers and potential customers as the targets for dissemination and the EC as the primary audience for the project reports.
- Project-level dissemination is made via conference presentations, journal articles, trade press articles, Web-sites, trade fairs, sales visits, brochures, newsletters, videos, seminars, media advertising and word of mouth.

In general, project reporting and dissemination seem inadequate in terms of contributing to PACT programme objectives. The evidence for this is as follows:

- Member States have not found the results useful for policy development (Theme 7).
- A number of project managers are uncertain about the target audience for their reports.

- There is no pro-active dissemination of project results at a programme level (beyond the Web-site), nor any clear contractual requirement for dissemination at a project level. This is despite the programme goal of achieving replication of projects.
- Some project managers have reported a reluctance to disseminate, to avoid stimulating competition.
- In the hard commercial world of freight transport, it is understandable that beneficiaries would not want to subsidise dissemination primarily aimed at programme objectives

There should be four main audiences for reporting and dissemination:

- potential replicators of the innovations funded by PACT;
- EC and Member State policy-makers who want to learn about the CT market;
- EC programme managers who need to check the project achievements for contract purposes;
- potential customers of the PACT-funded services.

The project managers and sponsors can be relied on to market the new services to customers, out of self-interest. However, we recommend that the EC defines an explicit strategy and guidelines for reporting and dissemination for the other three target audiences, and itself undertakes the dissemination needed to support *programme* objectives.

The main elements of this strategy are suggested to be as follows:

- a confidential project report to the EC and Member State representatives on (a) what was done in the project, (b) what was achieved in terms of results (quantities moved, competitiveness versus road transport etc), (c) the replication potential, (d) learning about success and failure factors, and (e) perceived implications for policy;
- a public report on the results of the project and the opportunities for replication;
- the provision of specific guidelines on these two reports (structure, content and audiences);
- the provision of the public reports on the PACT Web-site;
- direct e-mailing of the confidential reports to MS representatives by the EC;
- the letting of a contract to an independent organisation, which provides for (a) the analysis of each completed project (paper-based and on-site), (b) the development of an *objective* summary of key results and policy implications per project to a *consistent* standard, and (c) the development of an analysis of policy implications and replication potential, integrated across all projects. These outputs would also be provided on the Web and discussed annually at a meeting of Member State representatives.

Compared to the existing guidance on final project reporting (issued 14/09/1999), the revised guidance should include an explicit requirement to identify the contribution of the project to programme objectives. This means providing a clear pathway, with evidence, identifying the following:

- the relation of project objectives and expected results to programme objectives (at the start of the project);
- the extent to which the actual project results and findings have met the project expectations and objectives;
- the contribution of project results and findings to programme objectives.

Awareness of the Web-site will need to be promoted across the EU. This would be relatively easy for the majority of the CT community. However, to attract a wider audience, including SME's, a special effort would be needed. In this case, it may be better to avoid having a PACT Web-site as a separate entity, but rather for the EC to provide a single Web-site acting as a one-stop shop for all transport-related RTD and programmes at EU and Member State level (as part of the European Research Area). There would then be major economies of scale for efforts to raise awareness of the Web resource.

The EC may also wish to consider developing some good practice guidelines for PACT-style projects. These should emphasise the complete life-cycle of the project, covering:

- the set-up phase, where the project objectives and preliminary design are based on the problems to be solved and the higher-level policy objectives;
- the design phase, where critical decisions are made to reduce risks and promote success;
- the management and evaluation work;
- learning from the project and decision-making on exploitation of results.

Guidelines of this sort have been developed in the EC UTOPIA project for the case of pilot and demonstration projects with cleaner road vehicles, based on previous test site experiences. These could provide a framework and model for PACT. They would be particularly relevant if PACT moves towards bigger projects, where the potential for avoiding wasted investment increases.

### **EC profile**

Less than 10% of beneficiaries admitted not acknowledging PACT support. Reasons for this included not being aware of the requirement, early termination of the project and a lack of dissemination.

35% of beneficiaries interviewed said that the PACT “endorsement” had been beneficial to them. For example, they gained increased credibility and greater confidence from customers and partners.

On the other hand, a few beneficiaries found problems:

- they were reluctant to tell customers about the PACT funding in case price reductions were then requested;
- they were reluctant to alert potential competitors to the availability of EC funds;
- one was annoyed by enquiries from other potential bidders for PACT funds (although others said the PR benefits outweighed the disturbance).

## Replication

Member State representatives had a pessimistic view on the effect of PACT projects on replication of CT schemes. Eight MS said there was little or no evidence of replication – some were referring to the lack of information supplied to them, while others were sceptical that PACT could have an effect. Other MS representatives did not express a view.

A specific criticism was made of major CT operators such as UIRR returning to bid for PACT funding for successive similar schemes. This would suggest that PACT funding is acting as a subsidy benefiting the operator, and is not stimulating self-funded replication across UIRR's member companies.

On the other hand, among the projects interviewed, over 55% claimed that the PACT project is leading to further exploitation and expansion by the beneficiary. 35% claimed that the innovation was being replicated elsewhere, and a further 20% claimed that such replication was possible. These success rates seem significant, given the risks of CT investment in the face of tough competition from the road transport sector.

In practice, PACT includes three types of pilot project:

- **Demonstration of technology.** Technological innovation is the primary focus in only a minority of PACT projects (30% of the sample interviewed, but with a further 15% including new technology within a new service offering). However, the evidence suggests that technology demonstrations offer good potential for replication at other locations (e.g. novel crane technology, information technology). This reflects the greater ease of transferring between sites and reaping the financial rewards in doing so, when replicating technologies as compared to replicating “unique” location-specific services. In particular, tracking and tracing is generally perceived to be important and widely applicable for CT.
- **Project subsidy.** A simple subsidy refers to situations where the targeted benefit comes directly from the project, regardless of whether replication or scale-up is required. Around 75% of projects sampled were in this category, targeting the introduction of a new service/route.
- **Market stimulation.** This seems to be the main aim of PACT, and was acknowledged as such by the programme manager. Each project is a demonstration that should lead to replication by the sponsoring organisations *and* by other companies. Over 50% of projects sampled perceived they definitely had a role in market stimulation, while around 25% said this was not their role.

Reasons for the absence of market stimulation included the following:

- the project route/scheme was seen as being unique (e.g. depending on the local geography);
- the beneficiary was keen not to give away his competitive advantage, even though the replication potential of the technology was acknowledged;

Replication requires good dissemination of the learning from the project (and not just marketing of the subsidised service). A conflict arises, because beneficiaries want to protect the commercial value of their PACT investment, and therefore are reluctant to pass on “know-how” that cannot readily be protected. So PACT needs to clarify what replication it expects,

how the legitimate interests of the beneficiaries can be protected, and what this means for the dissemination requirements.

### Conclusions for Theme 8 - Public Awareness and Pilot Character

- Although awareness of the PACT programme may be good among key actors, and projects market the new services to their own customer base, there is a failure to evaluate and disseminate the project results adequately in support of *programme* objectives (particularly replication and policy assessment). This means that the primary purpose of PACT, i.e. replication of the PACT schemes, is being undermined. The majority of replication is by the PACT beneficiaries themselves, and only a minority of projects are replicated by third parties.
- Nevertheless, there is reasonable evidence of exploitation and replication of PACT projects, given that market conditions are not favourable (particularly in the rail sector).
- Commercial constraints (e.g. fear of competition) may limit the usefulness of final reports. This is exacerbated by a lack of clarity on the purpose and intended audiences for the final report, due to inadequate EC reporting requirements. Independent validation of results is not required by the PACT programme.
- There is a need for a dissemination strategy at programme level, distinguishing the needs of different target audiences – project management information for the EC, policy development information for the EC and MS, and evidence to encourage replication by market actors.
- New guidance on reporting and dissemination should be issued to project managers in line with this strategy.
- The EC should take responsibility for evaluation and dissemination in support of the objective of project replication. This would include setting up (and promoting awareness of) a Web-based Information Centre, including e.g. project reports, summaries of main findings, and thematic analyses of what can be learnt from the PACT experiences (e.g. concerning barriers, priority policy actions and “best practice” for CT start-ups). This could form part of a larger Web resource on transport RTD as part of the European Research Area.
- Both the project proposals and the final reports should assess the replication potential. More generally, the proposal and reporting guidance should require an explicit mapping of project objectives and results onto programme objectives.
- EC support is willingly acknowledged.

## 3.9 THEME 9 – ENVIRONMENTAL IMPACT

The environmental costs associated with freight transport are wide-ranging. The major environmental burdens are outlined in the table below for each of the major modal options, along with the main impacts with which they are associated.

**Table 9 Environmental burdens of different modal options**

Burden	Impact	Scale	Road	Rail	Short Sea shipping	Inland waterway
CO <sub>2</sub>	Climate change	Global	++	+	+	+
SO <sub>2</sub> , PM <sub>10</sub> , NO <sub>x</sub> , CO	Health effects Building damage	Local	(+)	(+)	(+)	(+)
Noise	Noise nuisance	Local	(+)	(+)		
Accidents	Death, injury	Local	++	+	+	+
Congestion	Lost time	Local	++			

++ denotes the dominant source of each effect for the freight transport sector; + denotes other potentially significant sources; (+) denotes cases where effects may be limited by the non-urban routes relevant to PACT. The table is not intended to be comprehensive, so some effects such as the ecological impacts of acidification and eutrophication from air pollutants are omitted.

### Availability and Quality of Data for the Environmental Evaluation

The level of detail provided by the PACT beneficiaries, in terms of modal shifts, varied significantly across the applications analysed. For both the proposals submitted prior to funding and the reports produced whilst benefiting from funding, modal shift data were often absent or not specified in enough detail. In summary:

- Of the 63 (non-feasibility-study) projects receiving PACT funding that were analysed, only 9 projects provided an estimate of the likely or actual freight offset in tonne-kilometres.
- 26 of the projects provided an estimate of the likely volume of cargo offset by the project, mostly in terms of TEU (twenty-foot equivalent units) transported. This is a measure of volume commonly used by shippers but provides no details of the likely mass of the load shifted, or of the distance of road transport offset. However, it is familiar to the haulage industry and is measure that the hauliers record for pricing.
- 16 projects attempted an estimate of the likely weight of cargo shifted by combined transport, as a result of the project.
- Only 10 projects directly provided details of the transport distance associated with the projects or the road distance offset, though estimates could of course be made for most other projects based on journey start and end points.

Clearly, the lack of data provided by the beneficiaries creates problems for analysis of the environmental benefits of PACT. This leads to two recommendations:

1. The Commission needs to specify data requirements in a form that the beneficiaries understand, and preferably are already familiar with.
2. The Commission needs to ensure that beneficiaries provide the data – many have clearly ignored requirements specified in the users guide in this area.

Steps have already been taken on both actions, and it is therefore envisaged that future reviews of the programme will be able to consider benefits in a more complete manner than has been possible here.

With an absence of final reports for many of the studies (as many projects had not finished or had only recently finished), compounded by the general lack of data in the final reports that were available, it was difficult to carry out any quantitative analysis of the accuracy of traffic shift estimates made in the original proposals. However, from the selected project interviews a large variation in performance was found. Several projects outperformed expectation and several under-performed. This result is not surprising for projects operating close to the market with great uncertainty as to the likelihood of their success.

### Methods for the Environmental Evaluation

Given the lack of consistent data it was decided that the environmental performance of PACT projects would be gauged against two measures, t.km shifted and the costs of reducing CO<sub>2</sub> emissions. With respect to the second measure the question we posed was whether the adoption of the measures introduced through PACT would be cost-effective in the context of meeting Kyoto Protocol obligations? For this we needed to calculate the cost-effectiveness of PACT projects in terms of € per tonne of CO<sub>2</sub> avoided.

The analysis started by taking or quantifying data in tonne.km avoided through PACT projects. Where not directly available, tonnes diverted from roads were calculated from TEU data, assuming a 14 tonne load per TEU (the average of those cases for which data allowed the calculation to be made). Distance between start- and end-points was measured on a map. Conservative assumptions were taken at this point – the distance was measured in a straight line between the points. Where exact start and end locations were not specified (e.g. ‘Denmark to Benelux’) the shortest possible distance was calculated. In all cases a one-way (rather than return) trip was assumed, again minimising the estimated distance travelled. The rationale followed here was that it would be better to knowingly overestimate cost per unit emission avoided than to attempt to provide a best estimate of unknown error. Overall, it was possible to account for 34 of the 63 (non-feasibility) projects considered in this manner<sup>1</sup>.

In total, for the 34 projects, we estimate that a total of 3.3 billion tonne.km were avoided through the PACT programme. This number is in reasonable accordance with the Commission’s estimate of 5.0 billion tonne.km avoided for the programme as a whole during the assessment period. Comparing against more recent data the Commission have expressed the view that this estimate seems low. This may well be the case, given the adoption of conservative assumptions for the analysis, the fact that many projects were omitted from the calculations and other uncertainties. However, the review team is confident in the general magnitude of the t.km estimates made both here and by the Commission.

Tonne.km data were then converted to an equivalent CO<sub>2</sub> emission using available emission factors (see table, below), and compared with the EU’s contribution to each project. Taken together, this allowed calculation of results in terms of €/tonne CO<sub>2</sub> avoided.

**Table 10 Emission factors, CO<sub>2</sub> emissions(grams/tonne.km)**

Road Freight	190
Railway	30

<sup>1</sup> Ten projects were included more than once (in different phases). The analysis below therefore deals with a total of 24 projects rather than 34.

Maritime Transport	30
Inland Navigation	30

EU average 1995 (EU Transport in Figures, 1998)

We accept that the results generated through this process are prone to significant uncertainty, though the source of this is the paucity of data available on environmental benefits from proposals, reports and via the interviews conducted. Particular areas where data could be improved are estimation of distances travelled per journey per mode for both the original and post-PACT routes, and clarification of the period over which the PACT funding is deemed to be effective. Following the conservative approach, it was assumed that PACT funding was relevant only to the years for which funding was provided where better data were not made available.

The cost of PACT measures was taken against the EU contribution only. Costs incurred by operators were ignored. The rationale here was that the operators' costs reflected the minimum commercial advantage expected from implementation of the scheme. The EU funding, in contrast, was assumed to be required for the schemes to go ahead (although as shown above this is not always the case), and therefore represented the cost attributable to non-commercial (i.e. environmental) interests. We use the phrase €subsidy/tonne CO<sub>2</sub> rather than the conventional €/tonne CO<sub>2</sub> to emphasise that the comparison is not against total cost. The reason for focusing on the subsidy element is that we have an incomplete picture of other financial elements of projects beyond those identified for system set-up, in particular the reduction in costs and improvement in profitability of users/operators.

### Results - €subsidy/tonne CO<sub>2</sub> avoided

Results are shown in Table 11. Overall there is no consistent pattern between cost-effectiveness and the mode that freight was switched to.

**Table 11 Cost of subsidy per tonne of carbon dioxide avoided**

Cost, €subsidy/ tonne CO <sub>2</sub>	Total	Rail schemes	Short Sea Shipping schemes	Other schemes
0 to 10	8	3	5	0
10 to 20	4	2	1	1
20 to 50	6	3	3	0
50 to 100	2	1	0	1
100 to 200	3	0	1	2
200 to 300	1	1	0	0

Comparison with other CO<sub>2</sub> abatement measures shows that a number of the PACT projects appear to perform well in terms of cost. Analysis at AEA Technology considering the UK situation suggests that a 20% reduction in CO<sub>2</sub> to meet Kyoto obligations will have a marginal cost of around €19/tonne CO<sub>2</sub>. This is higher than the subsidies for half the projects for which calculation was possible. Going further, a 30% reduction in the UK is associated with a marginal cost of €170/tonne CO<sub>2</sub> – a level exceeded by the subsidies to only 2 of the PACT projects though in both cases results were prone to very major uncertainties, and could well be overestimated to a significant degree.

Following from the discussion above, the comparison of the costs calculated here with those reported for other greenhouse gas abatement options is not strictly valid within a conventional cost-effectiveness framework. However, the results do suggest that actions on combined transport are likely to be cost-effective when compared to many other environmental improvement options.

The large scatter in the available data meant that it was not possible to conclude whether cost-effectiveness in terms of CO<sub>2</sub> reduction was more closely correlated with the distance per journey or the weight of material shifted from road. However, the correlation with cost per unit CO<sub>2</sub> emission avoided were negative, implying that the longer the distance or the greater the weight of material shifted, the better the cost-effectiveness of the measures adopted. Although not surprising, this result is useful in agreeing with expectation.

### **Other Measures of Environmental Performance**

Given the lack of data available it is not possible to quantify other measures of environmental performance. Inclusion of other environmental benefits (reductions in noise, emissions of toxic air pollutants, congestion etc.) would further improve the cost-effectiveness of the EU contribution to the different projects.

### **Key findings for Theme 9: Environmental Performance**

- Since 1998, the PACT Users' Guide has required applicants to estimate traffic shift in terms of tonne-km offset. However, very few proposals have included the correct information, limiting the extent of analysis possible and making the results of that analysis subject to greater uncertainty.
- Even fewer final reports have provided actual traffic shift data in tonne-km and so it has been necessary to base the environmental analysis on predictions from proposals.
- Better reporting protocols should be developed for future PACT projects to improve the quality of analysis of environmental performance. As a minimum we would expect beneficiaries to be able to provide information on the following:
  - distance of journeys
  - weight of goods transported per journey (this can be based on TEU if necessary)
  - total t.km per year by the combined transport route, disaggregated by transport mode
  - total t.km per year by the original route, disaggregated by transport mode
  - number of years over which the scheme is effective
  - total t.km shifted over these years
- There will be some schemes for which beneficiaries find difficulty in providing these data. If this is the case they should be invited to discuss these problems with the project officers responsible for PACT at the Commission, in order to reach a solution.
- The work undertaken here is prone to very major uncertainties and has had to adopt a number of compromises in order to be able to provide any quantitative estimate of environmental performance. Table 12 provides an indication of what is currently possible, what would *ideally* be possible, and, more realistically, what will be possible in the future.
- Without quantification it can only be assumed that there are net environmental benefits of PACT-type projects. Whilst it is reasonable to conclude that this will be the case generally, scenarios can be developed where it will not apply. A lack of quantification

also prevents prioritisation of projects, based on past performance, to preferentially select those options that are likely to create the greatest environmental benefit.

- Despite the lack of data, we have been able to estimate the likely traffic shift for 34 of the 63 PACT operational actions between 1997 and 1999. A total of at least 3.5 billion tonne-kms traffic shift is estimated for these 34 projects.
- About half these projects achieve carbon dioxide savings for less than 20 Euro per tonne CO<sub>2</sub> avoided (accounting only for the subsidy from the European Commission to the beneficiaries), with two-thirds at less than 50 Euro per tonne CO<sub>2</sub>. This analysis suggests that projects funded under PACT generally perform well in the wider context of greenhouse gas abatement options.
- Taking into account other environmental effects (e.g. reduced emission of other pollutants, of noise, accidents and congestion) and the possibility of project replication would further improve the cost-effectiveness of PACT projects for environmental improvement.

**Table 12 Data needs and results possible from environmental analysis**

	Now Possible	Future Possible	Ideal
Data needs from PACT	Some t/km shift data. Some TEU shift data. Some load (tonnes) shift data. Some vehicle km shift data.	Number of TEU shifted. Estimated average load of TEU or total load shifted. Distance and modes travelled by old route. Distance and modes travelled by new route. Number of trips made or tonne.km shifted.	Full details of new route distance and number of trips. Details of any transport routes replaced. Details of the t/km shift by each mode. Urban/rural breakdown of routes. Details of technologies employed.
Methods	Some direct, some indirect application of emission offsets.	Direct application of emissions offset.	External cost model.
Results	Limited quantification of key indicators. Quality of data varies greatly. Ranking of projects possible, subject to significant uncertainty.	Will allow quantification of key indicators with a much lower uncertainty than is possible at the present time.	Comparison of monetised environmental damage for each project considered. E.g CT vs road.
Issues	A full and more accurate assessment than was possible here will require all beneficiaries to respond.	This level of analysis should be easily achievable if participants are given clear direction, and appreciate the necessity of providing the data.	Too complex in the context of PACT

## 4 Conclusions

Our key conclusions from the evaluation of the current PACT programme are as follows.

- The PACT programme is managed very efficiently and the programme team is highly regarded for its professionalism and enthusiasm.
- Most operational measures supported by the PACT programme are cost-effective in terms of avoided carbon dioxide emissions, even without replication.
- Commercial viability is difficult to achieve, even with the start-up support provided by PACT, due to challenging market conditions for combined transport in Europe.
- Member State representatives have questioned the effectiveness of the PACT programme in addressing key market barriers, but appropriate action is being undertaken elsewhere in the Commission.
- There is good awareness of the PACT programme within the existing combined transport community but project results are not adequately evaluated and disseminated in support of Programme objectives such as replication and policy assessment.
- The dissemination aspects of PACT need to be strengthened. This requires a clear strategy defining the roles of the project teams, programme management, Member States and possibly a specialist team for dissemination based in or outside of the Commission.

## 5 Recommendations

Our recommendations for improving the efficiency and effectiveness of the PACT programme are as follows.

1. Retain an open, flexible approach to the selection procedure but provide some additional time for proposal preparation and ensure consistent presentation of key data.
2. Introduce more structured project monitoring procedures but take care to avoid unnecessary bureaucracy. For example, a system of contractor performance reviews is recommended.
3. Allow multi-year project approvals as well as single year contracts, with continued support dependent on meeting specific milestone targets.
4. Discontinue funding of feasibility studies as precursors to operational projects but allocate some funding to generic studies aimed at market enablement.
5. Improve dissemination by developing a targeted programme-level strategy, issuing new guidelines on reporting to project managers and earmarking resources for independent project analysis and dissemination within the PACT programme budget.
6. Improve monitoring of impacts, including project follow-up for a 3 year period. This would form part of the analysis and dissemination, aimed at providing the evidence to stimulate replication in the market.
7. Adopt better reporting protocols for future PACT projects to improve the quality of analysis of environmental performance.

## 6 Discussion of Future Options for the PACT Programme

The current PACT programme will finish in December 2001 and the Commission is currently considering options for a successor programme. In this Section we consider how the direction and implementation of the programme might be adjusted to take account of experience with PACT, and with the aim of enhancing the programme's impact and effectiveness.

We have approached this in two stages:

1. Assessing and re-appraising the intervention logic underpinning the current phase of PACT.
2. Identifying and discussing a number of options for the future development of PACT.

### 6.1 REVIEW OF THE CURRENT INTERVENTION LOGIC

The current objective of the PACT Programme is to contribute to the increased use of existing networks for CT, as an alternative to road haulage, through the provision of financial support for innovative measures that improve the competitiveness of CT in terms of price or quality of service. An underlying assumption is that innovative actions funded by PACT, by showing commercial viability, will be emulated by other market participants. The assumption of this "snow ball" effect is a main reason for the relatively small budget allocated to the programme.

This intervention logic will hold true under the following conditions:

- Technological innovation (including novel operating procedures) can lead to a sufficient improvement to make CT competitive both on service quality and price.
- Many innovative CT projects are nearly viable without public support and an EC start-up subsidy of up to 30% for 3 years will bridge the gap.
- Once demonstrated, there is sufficient potential for replication of these innovations without EC support.

The following observations relating to the intervention logic are important:

- PACT projects 'per se' account for only about 1% of European combined transport. This underlines the importance of replication if PACT is to achieve its objectives.
- Replication of PACT projects has so far been limited, but it is not clear if this is due to a limited potential for replication or because the dissemination has not been effective.

- It is clear that the commercial viability of PACT projects, and possible replications, is vulnerable to a set of market and operational barriers including the falling prices of road haulage, international rail timetabling, border delays, etc. From the evidence collected, few if any PACT projects have failed because of the failure of the technical innovation.

Notwithstanding these points, it should be recalled that the majority of PACT projects are cost effective options for reducing CO<sub>2</sub> emissions in their own right and therefore should be regarded as ‘no regrets’ measures.

These observations point to some potential adjustments to the intervention logic and/or the way the programme is implemented:

Inadequate dissemination may be limiting replication, but it is difficult to assess to what extent. It may be possible to significantly improve the effectiveness of PACT just by improving dissemination and reporting practices, but this has yet to be proved. Specific recommendations for dissemination are included in Section 5.

Encouraging more technological innovation may also help to improve the market impact of PACT, but only if this innovation is replicable and addresses real market barriers. There is some evidence that the PACT programme has supported less technological innovation and more route-only innovation in recent years. Although innovative CT routes can help to stimulate interest in CT and encourage SME involvement, they are unlikely to make a major impact on the market and are difficult to replicate. Innovation alone will not overcome or reduce some of the barriers to CT.

Some stakeholders have argued that PACT should reduce or eliminate its requirements for innovation, instead supporting projects on their own (environmental) merits or purely for demonstration purposes. This would require abandoning a major part of the current intervention logic and could lead to a radically different approach to supporting CT, such as a subsidy scheme based on traffic shift (like the UK scheme) or a technology transfer programme where the EC demonstrates and promotes “best practice” in CT, aiming at maximum replication.

There is strong anecdotal evidence that market conditions for CT have declined since 1997. Road haulage prices have fallen and the anticipated opening of access to railways has not proceeded as quickly as hoped. In this difficult climate, commercial viability is hard to achieve even with start-up funding and widespread replication is unlikely. However, ongoing EU actions to open up access to railways may improve market conditions in time, and justify a continuation of the current PACT intervention logic.

It could be argued that the very characteristics that make PACT successful – near market, demand driven, high SME involvement – are also those that limit its ultimate potential. Large scale changes in the market for CT are unlikely to be driven by smaller companies without the support of large shippers and railway authorities, and market led projects are unlikely to deliver the degree of technological innovation needed to overcome existing financial and non-financial market barriers.

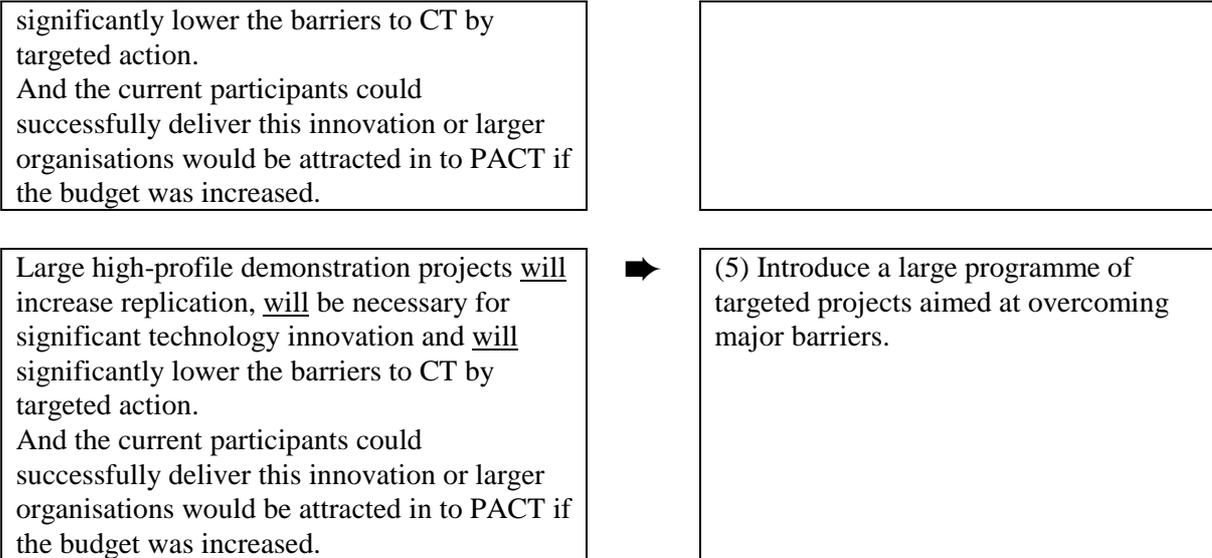
## 6.2 OPTIONS FOR A FUTURE PROGRAMME

The above re-evaluation of the current intervention logic suggests a number of possible future directions for the PACT programme. However, we are still left with the following uncertainties, which cannot be fully resolved by evaluating the current PACT programme.

1. Does technology innovation lead to replication?
2. Does route innovation lead to replication?
3. Do larger high-profile projects increase the potential for replication?
4. Do multiple successful small projects increase the potential for replication?
5. Can technology innovation significantly reduce the barriers to CT?
6. Can some technology innovation only be introduced on a large scale?
7. Are the current PACT beneficiaries (SMEs) able to deliver technology innovation?
8. Could current beneficiaries participate successfully in much larger projects?
9. Would larger organisations become involved if the budget was much larger?
10. Does targeted technical innovation require higher percentage funding by the EC?

We have identified the following five possible options for the PACT programme, depending on the answers to the above questions. Except for Option 3, all options include increased dissemination and strategic learning (this is discussed in the next section). We recognise that these are not the only options but they do serve to illustrate the range of alternatives open to the Commission.

ASSUMPTIONS	OPTIONS
Technology and route innovations can both lead to replication, and technology innovation is achievable at current project sizes by the current PACT beneficiaries.	➡ (1) Keep the current PACT selection criteria, and stress the need for replication.
Technology innovation is more likely to lead to replication, and is achievable at current project sizes by the current PACT beneficiaries.	➡ (2) Refocus project selection criteria to boost technology innovation and stress the need for replication. Consider targeted calls for specific technologies (e.g. tracing and tracking, or logistics).
Innovation is unlikely to lead to replication or significant lowering of the barriers to CT.	➡ (3) Move to a UK-like scheme that funds actual traffic shift. Remove the need for innovation, dissemination or strategic learning.
Large high-profile demonstration projects <u>may</u> increase replication, <u>may</u> be necessary for significant technology innovation and <u>may</u>	➡ (4) Trial the use of large targeted projects aimed at overcoming major barriers.



### 6.3 DISCUSSION OF FUTURE PROGRAMME OPTIONS

An important feature of the current PACT programme is that it is driven by the market, and therefore the choice of innovative measures is based on commercial considerations rather than ‘technology push’. This has clear benefits, but markets tend to take very near term positions, and therefore may neglect longer term but potentially important innovations. Our investigations suggest innovation has been weak in many of the current round of PACT projects. Given the uncertainties discussed in the previous section, we have developed options that offer alternative ways forward for PACT. This assumes the final decision will be driven by policy and budgetary factors in addition to the issues specific to CT covered herein.

Options 1 and 2 aim to retain the strengths of the market driven approach while strengthening both dissemination and ‘strategic learning’. The latter point recognises that innovation alone will not overcome the barriers to CT. However, by operating in the market, PACT projects are building up a strong knowledge base of other barriers to CT and, in many cases, of measures to overcome them. Capturing and disseminating this knowledge could be just as valuable as disseminating knowledge of technical innovations by making policy makers, infrastructure operators and CT investors aware of these barriers and the need for action to overcome them. Options 1 and 2 differ in the weight placed on technical innovation.

The importance of innovation for overcoming barriers is itself uncertain, and for this reason Option 3 removes the need for innovation from the intervention logic. This is a perfectly defensible approach since the analysis has shown that most PACT projects are a cost effective way of reducing CO<sub>2</sub> emissions in their own right, as well as delivering other benefits (e.g. other pollutants, safety, congestion).

Options 4 and 5 are based on the premise that large and high profile demonstrations projects may be needed to attain the significant technological innovations required to reduce the barriers to CT. Such projects would need to be targeted to attract the high

quality of projects needed. Option 4 differs from Option 5 in making a more gradual transition to such a PACT programme, by having a trial period.