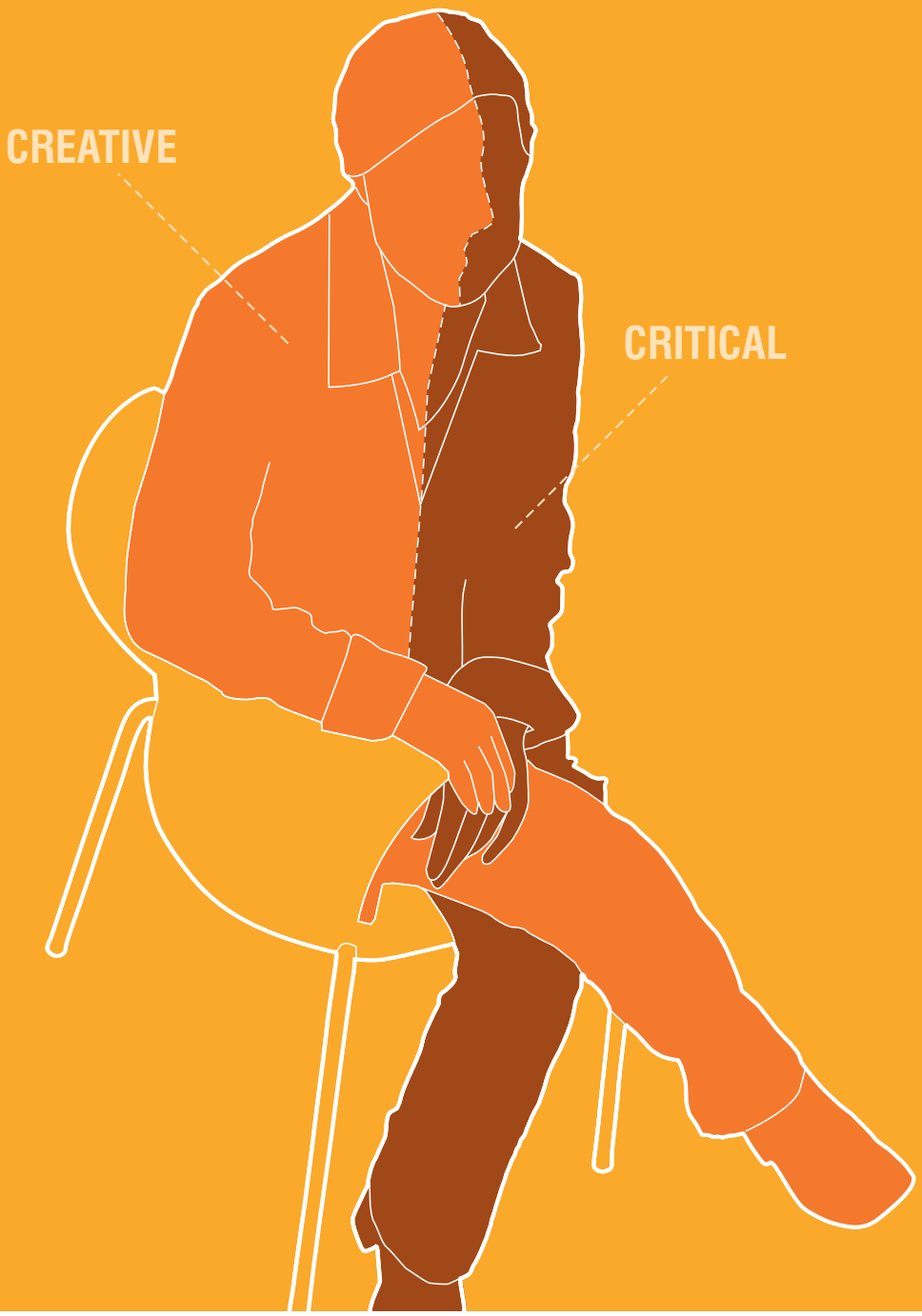
Increasing the Impact of National Research Programmes through Transnational Cooperation and Opening

GOOD PRACTICE GUIDE



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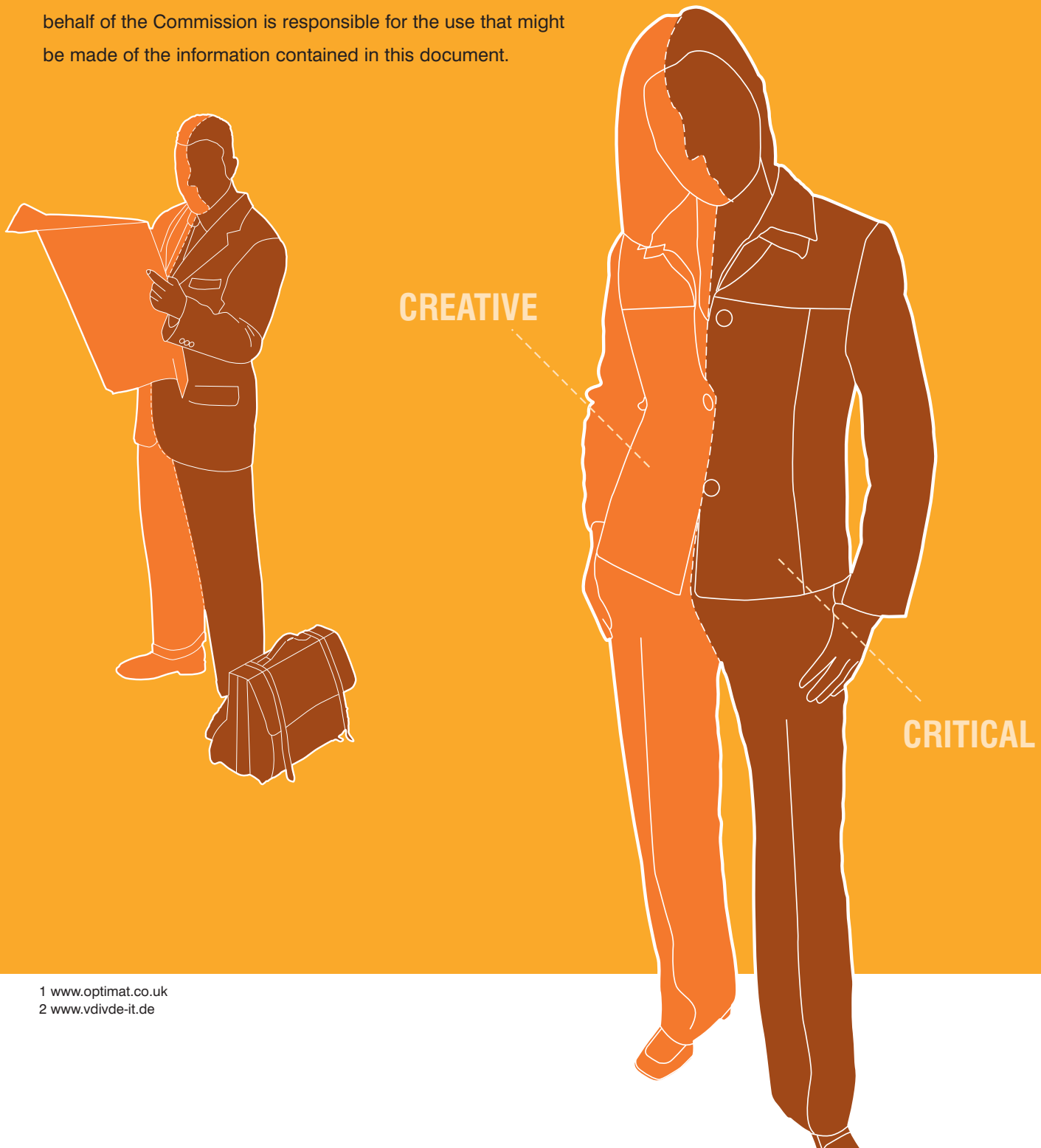
Preface

The views and opinions expressed in this report are those of Optimat Ltd[1] and VDI/VDE-IT[2] GmbH and not necessarily those of the European Commission. They are based on an empirical survey of national programme features and anecdotal information provided by a wide range of national policy makers and administrators.

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of the information contained in this document.



1 www.optimat.co.uk
2 www.vdivde-it.de

INTRODUCTION

This Good Practice Guide has been prepared for national research programme designers and managers that are interested in innovative ways to increase the impact of their investment through transnational cooperation and opening.

It acknowledges the very real barriers that exist and offers some guidance on how these can be avoided, or overcome, when designing programmes. We have also attempted to offer guidance, using practical examples from existing or emerging national programmes, on the transnational strategies and instruments that might be appropriate to achieve particular national objectives. We hope that this will be a useful contribution to wider activities by many others to achieve the goals of the European Research Area[3].

The Guide is based on a 2005 study to *'Examine the Design of National Research Programmes',* which was aimed at identifying factors that promote or inhibit transnational cooperation and technology transfer. The statistics are based on a survey of practices in over 127 national programmes that support basic research, applied research, researcher mobility and SME R&D projects. Some interesting examples were also identified in USA, Japan and China.

The study was sponsored by the European Commission (DG Research) as part of the wider activities of CREST in relation to the application of the Open Method of Coordination (OMC)[4].

We hope that the Guide will be a practical and useful way of disseminating the results of the study and would welcome feedback. If you wish to comment on this document or offer additional insights and suggestions on good practice, please contact angus.hunter@optimat.co.uk.

3 The European Research Area (ERA) encompasses 34 countries including EU Members States (25), candidate countries (Bulgaria, Croatia, Romania, Turkey) and associated countries (Iceland, Israel, Liechtenstein, Norway, Switzerland)

4 http://europa.eu.int/comm/research/era/3pct/index_en.html

TRANSNATIONAL COOPERATION AND OPENING

The concept of ***transnational cooperation*** between national research programmes is not particularly new as many countries engage in scientific collaboration through bilateral agreements. Multilateral cooperation is less common but a number of frameworks are available to facilitate this, including EUREKA and EUROCORES. More recently the ERA-NET Scheme was established to foster the concept of ***mutual opening*** of national programmes to support the development of the European Research Area.

So what are the options for transnational cooperation and mutual opening between national research programmes? Our study indicates that there are seven main options:

1	Allowing national researchers to use programme budgets to participate in transnational research projects
2	Allowing national researchers to use programme budgets to participate in cross-border technology transfer projects
3	Using programme budgets to support cross-border mobility or training of researchers
4	Using programme budgets to support participation in European or international committees or networks
5	Utilising research capacity and expertise from other countries by allowing foreign experts to participate in the national programme (with or without funding)
6	Utilising research capacity and expertise from other countries by allowing participants to use foreign experts as subcontractors
7	Using evaluators from other countries

The rationale for the wider use of such transnational practices, the benefits, and some guidance on how these benefits might be achieved is the subject of this document.

WHY TRANSNATIONALITY

There are two main reasons why it may now be more logical for national administrations in Europe to be creative in designing transnational features into their national research programmes:

1	To take advantage of the opportunities of the European Research Area (ERA) which now encompasses 34 countries
2	To increase the impact on national priorities of public sector investment in R&D

R&D expenditure in EU and related ERA countries is over €200 billion per annum, which represents a huge investment compared with the EU RTD Framework Programme. However, the overall impact on competitiveness, sustainable economic growth and quality of life is limited by the fragmentation of national programmes and duplication of effort. Lack of coordination also inhibits the potential of Europe to speak with a common voice in the international arena.

In addition to the collective benefits of a more integrated ERA there are also more specific reasons why national research programmes should have a more international orientation. These include:

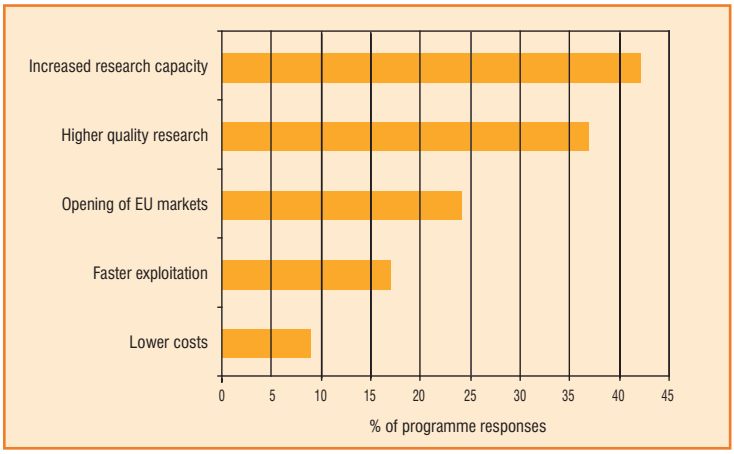
- Most scientific challenges are international and transnational cooperation offers significant opportunities for economies of scale and scope
- The growing diversity of science and technology makes it impossible for even the largest countries to be at the leading edge of every domain that may be required to address national priorities
- Markets and supply chains have become more international and cross-border R&D collaboration will be essential to develop and supply the knowledge-based products & services of the future

WHAT ARE THE BENEFITS

The national programme survey results indicate that the majority of programmes have involved foreign participants or transnational activities, but mostly at a marginal level of investment. Around 60% confirmed that this had resulted in tangible benefits.

The relative frequency of benefits across the programmes surveyed is shown below.

In general, this suggests that the main benefit of transnational cooperation and opening is related to the use of a wider pool of intellectual assets than are available in the country. Tapping into external knowledge and collaborating with other countries that have similar, non-competing interests ***increases research capacity*** and should lead to ***higher quality results*** than might be achieved through unilateral activities alone.



Our geographic analysis also highlights the following national and cultural differences:

- The benefits of ***increased research capacity*** are higher in Northern and Eastern Europe
- ***Higher quality results*** appear to be greater in the smaller countries, particularly in Eastern Europe
- Candidate and Germanic countries appear better than average at ***opening EU markets*** through transnational activities
- Large economies appear to be better than average at achieving ***lower costs*** benefits

The benefits of transnationality also vary between different types of programme according to the survey:

- The main benefit of transnational cooperation and opening between basic research and mobility/training programmes is ***increased research capacity***
- Transnational features within SME programmes appear to be an effective means of ***opening of EU markets***
- Transnational mobility programmes offer the broadest range of benefits

WHY IS IT SO DIFFICULT

Lots of barriers to overcome

The study highlighted 21 specific barriers to transnational cooperation and opening. Some of these are at the policy level. Others are at the programme and even project level.

POLICY LEVEL

- The legal constitution forbids payment to non-residents
- Another organisation deals with international activities
- Transnational activities are focussed on non-EU countries
- Inequality of investment makes it impractical to design joint programmes
- Policy to achieve national priorities through internal capacity building
- Influential decision makers do not see the value
- No significant policy changes to encourage transnational activities

PROGRAMME LEVEL

- Source of funding does not encourage use of funds for transnational activities
- Sharing activities/results would dilute international leadership
- The programme is designed to address country-specific issues
- Insufficient knowledge of similar national programmes
- Different national rules and cycles make it impractical to collaborate
- Financial administration systems not designed to cope with non-national contracts
- Programme owner has limited experience of pan-European collaboration
- No European structures to coordinate cooperation in programme area
- Language and culture diversity makes opening programmes impractical
- Sufficient volume of high quality applications from internal capacity
- No explicit criteria that encourage transnational activities

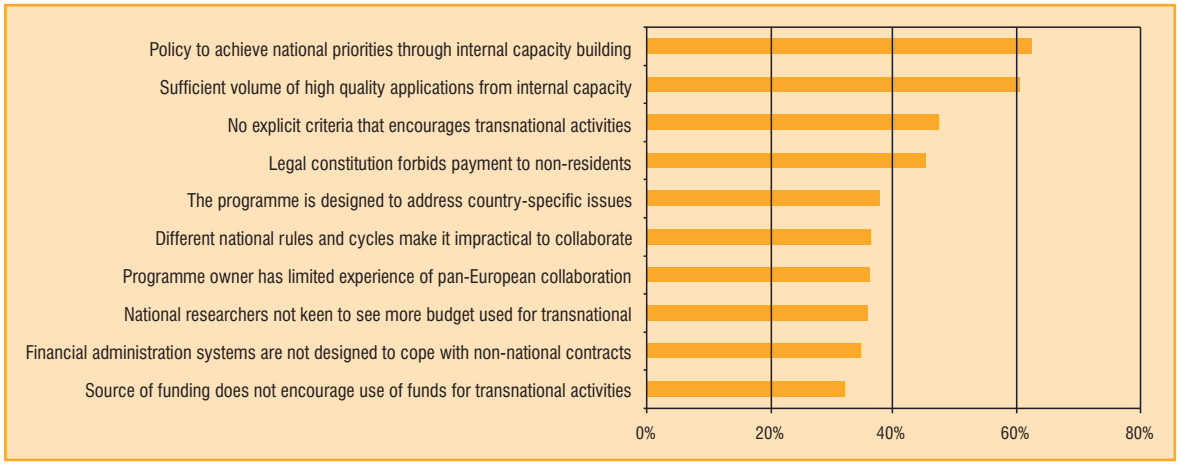
PROJECT LEVEL

- Administration costs of transnational projects outweigh the benefits
- No demand from national applicants for inclusion of foreign partners
- National researchers not keen to see more budget used for transnational

The relative importance of each barrier was tested in the national programme survey.

Some barriers are more prevalent than others

Of the 21 barriers, two appear in more than 60% of programmes and 10 in more than 30% of programmes. These are the most prevalent, but not necessarily the most significant barriers to increased levels of trans-national activity within programmes.



Prevalence varies by type of country and programme

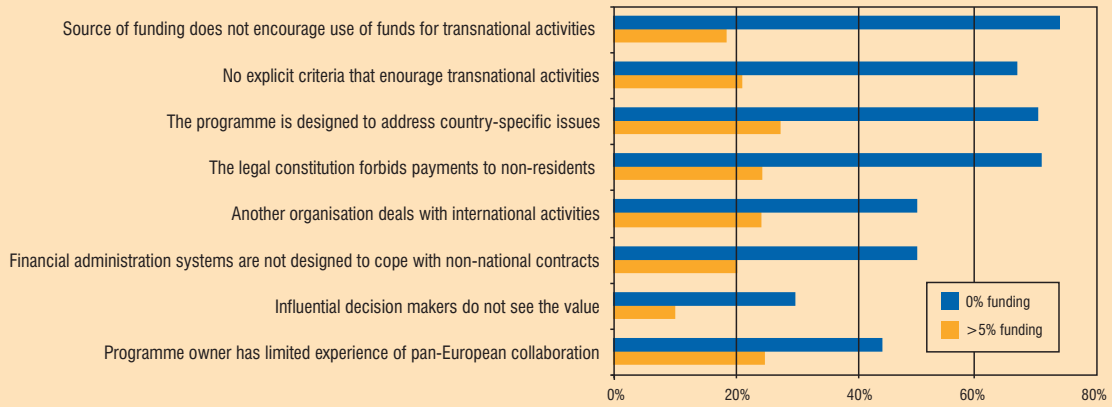
Looking at these top 10 barriers in more detail, we can see some significant differences in their prevalence by both type of country and type of programme. Self-sufficiency barriers are highest in the large countries, legal barriers are highest in southern Europe. Large economies and Southern European countries have a higher than average prevalence of barriers across most of the 10 categories.

	COUNTRY TYPE													PROGRAMME TYPE			
	34 Countries	EU15	10 new EU members	Large economies	Medium economies	Small economies	Nordic	Germanic	Benelux	Northern Europe	Central Europe	Eastern Europe	Southern Europe	Basic research	Applied research	Training & Mobility	SME R&D
Policy to achieve national priorities through internal capacity building	62%	66%	58%	75%	59%	56%	58%	70%	46%	64%	62%	53%	65%	63%	64%	61%	63%
Sufficient volume of high quality applications from internal capacity	61%	65%	50%	64%	64%	33%	59%	68%	71%	58%	67%	50%	56%	59%	60%	57%	61%
No explicit criteria that encourage transnational activities	48%	50%	47%	58%	43%	46%	33%	49%	56%	43%	52%	40%	51%	41%	50%	35%	49%
Legal constitution forbids payment to non residents	45%	47%	21%	50%	46%	27%	38%	57%	34%	36%	49%	30%	68%	41%	45%	38%	49%
The programme is designed to address country-specific issues	38%	38%	53%	56%	30%	41%	15%	56%	19%	27%	42%	40%	56%	29%	41%	24%	39%
Different national rules and cycles make it impractical to collaborate	36%	39%	42%	42%	33%	41%	33%	36%	35%	34%	38%	20%	47%	36%	39%	32%	37%
Programme owner has limited experience of pan-European collaboration	36%	37%	42%	43%	34%	38%	25%	44%	33%	32%	40%	23%	46%	36%	37%	24%	38%
National researchers not keen to see more budget used for transnational	36%	39%	31%	43%	33%	36%	29%	42%	42%	34%	42%	17%	37%	36%	36%	31%	35%
Financial administration systems are not designed to cope with non-national contracts	35%	36%	31%	45%	34%	15%	33%	49%	23%	32%	42%	27%	28%	34%	35%	22%	33%
Source of funding does not encourage use of funds for transnational activities	32%	34%	25%	34%	32%	23%	14%	43%	47%	17%	45%	25%	42%	31%	35%	18%	28%

Although the differences are not significant, applied research and SME R&D programmes generally have higher barriers to transnational activities than basic research programmes. The most significant difference is related to addressing what are perceived to be 'country-specific' issues. Unsurprisingly, training & mobility programmes have lower barriers than the other programme types.

'Open' and 'Closed' programmes give an indication of the most important barriers

Programmes that have spent 5% or more of the budget on transnational activities have fewer barriers overall than those with 0% spend[5]. The prevalence of some barriers reduces significantly in open programmes, whereas others remain in place. This would suggest that the barriers with the greatest difference are the most significant inhibitors of transnational activity. The analysis below shows these significant inhibitors.



Reducing these should be the priority when aiming to increase transnational activity.

The source of funding does not allow or encourage the use of programme funds for transnational activities

Rules that prevent spending on even basic activities such as international networking prevent transnational activity from ever taking place. Using subcontractors and allowing self-funded partners may be the first step in convincing the funding source that transnational activity is worthwhile.
The subcontract option is clearly being used to overcome this barrier in some of the more open programmes. The adoption of training & mobility activities and participation in European multilateral framework programmes are often politically acceptable first steps.

5 In the national programme survey, respondents were asked about their actual spend on transnational activities. Around 15% have no transnationals spend, 33% spend more than 5%. The majority (52%) spend between 0-5% of their budget on transnationality.

No explicit selection criteria that encourage transnational activity

This barrier is particularly prevalent in large economies, where there is less need to cooperate due to comprehensive research infrastructures. Many such programmes allow applications related to transnational projects but the selection criteria may discriminate against them because of the intense competition for funding. This can sometimes also be a problem in smaller economies where competition for programme funding may be less intense and a protectionist policy leads to low quality results and a lack of competitiveness in EU RTD markets. The SBO programme for strategic basic research in the Flanders region of Belgium positively discriminates in favour of project applications that involve leading edge foreign researchers to encourage the development of an internationally competitive science base.

The programme is designed to address country-specific issues

This barrier is particularly common in applied/industrial and also SME programmes. It is probably based on national priorities related to the economic structure, industry clusters, scientific strengths & weaknesses and geographic features. However, it is rather unusual for any of these to be truly country-specific and the barrier is probably more about lack of awareness than lack of opportunity. In practice, there are very few issues in such programmes that are unique to that country alone as witnessed by the number of ERA-NET Coordination Actions that have been spawned by the 6th EU RTD Framework Programme. The barrier is probably a reflection of economic and industrial competitiveness considerations where there may be more sensitivity about sharing intellectual property, knowledge and strategies with other countries. The Nordic and Benelux countries are much more open to addressing country-specific issues with their neighbours that are trying to address similar issues.

The legal constitution forbids payments to non-residents

The relatively high prevalence of this barrier is controversial as the general view at the policy level is that there are no such fundamental legal barriers in most countries. It may be that the financial regulations require special approval for programmes that are ‘international-by-design’ as many of the best examples of paying non-residents are in this category. We believe that programme owners are highlighting a more complex range of barriers or assume that there is a legal barrier if there is no precedent. For example, programmes in Greece are inhibited from paying non-residents because of Structural Funding rules, Agencies may be restricted by their governance systems, the eligibility rules for some programmes are explicitly limited to national applicants. All of these could be regarded as legal barriers to the mutual opening of national programmes.

Leading edge researchers from other countries may be interested and able to cooperate, without being directly funded, as they may be able to be paid by their own programme if it is open to transnational activities. This is particularly common between countries with relatively similar scientific priorities or challenges. In emerging markets, they can be encouraged to come for other reasons (eg to support economic/political cooperation objectives). For example, there is a mixed group of national and foreign researchers working together in the new applied research centres in Hungary. Hungary pays for its own researchers and infrastructure, with foreign governments/programmes supporting the foreign researchers.

Another organisation deals with international activities

This barrier is particularly prevalent in the larger countries where there is a more fragmented structure for research programmes. Germany, for example, makes a very clear separation between its national and international programmes. This makes it very difficult for national programme administrators in such countries to engage in international networking with their peers in other countries. The ERA-NET Scheme has allowed many to achieve such networking for the first time.

Financial administration systems are not designed to cope with non-national contracts

If systems cannot cope with overseas contracts and foreign currencies then the simplest option is to allow international subcontracting by national research participants.

Influential decision makers do not see the value

Some programme administrators believe that there is a general lack of political will in Europe to support the coordination and mutual opening of national programmes. High quality evidence on the economic and political benefits of the internationalisation of national programmes is clearly essential to overcome this barrier. There appears to be a distinct lack of such evidence, partly because much of the international activity is marginal and also because many of the best examples have only been implemented in the last few years.

Programme owner has limited experience of pan-European collaboration

Although many participants within national programmes may have experience of pan-European collaboration through the EU Framework programme and EUREKA, it does not necessarily mean that programme designers and administrators also have experience.

OVERCOMING THE BARRIERS

Enablers of transnational investment

The study highlighted 23 specific enablers for transnational cooperation and opening. They include explicit rules/instruments, lack of legal/political barriers, external influencers, programme owner interest/autonomy and positive prior experience. Some of these are specifically designed to increase the impact of national programmes. Others may be unforeseen consequences of particular aspects of the national programme design.

EXPLICIT RULES/INSTRUMENTS

- Explicit selection criteria to encourage transnationality
- Participation of non-residents encouraged
- Direct payment of non-residents
- Use of evaluators from other countries
- Funding of transnational research projects
- Funding of cross-border technology transfer projects
- Cross-border mobility/training of researchers

LACK OF LEGAL/POLITICAL BARRIERS

- No restrictions on funding non-residents
- Financial systems can cope with contracts/currencies

EXTERNAL INFLUENCERS

- Links with multilateral framework programmes
- Influential decision makers see the value of transnationality
- Change in national policy to encourage transnationality
- Programme funding source encourages transnationality
- Insufficient quality of proposals from nationals
- Demand for inclusion of foreign partners
- Encouragement to divert more budget to transnational

PROGRAMMES OWNER INTEREST/AUTONOMY

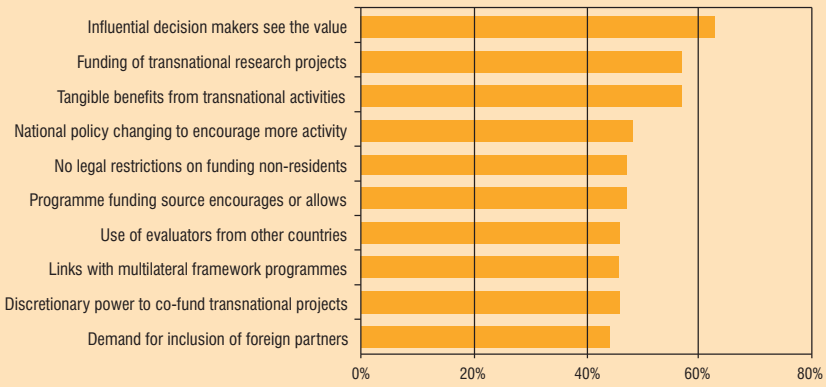
- Knowledge of similar programmes in other countries
- Experience of pan-European collaboration
- Discretionary power to fund foreign researchers
- Discretionary power to fund transnational projects
- Discretionary power to create transnational budget
- Discretionary power to co-fund transnational programme

PRIOR EXPERIENCE

- Tangible benefits from transnational activities

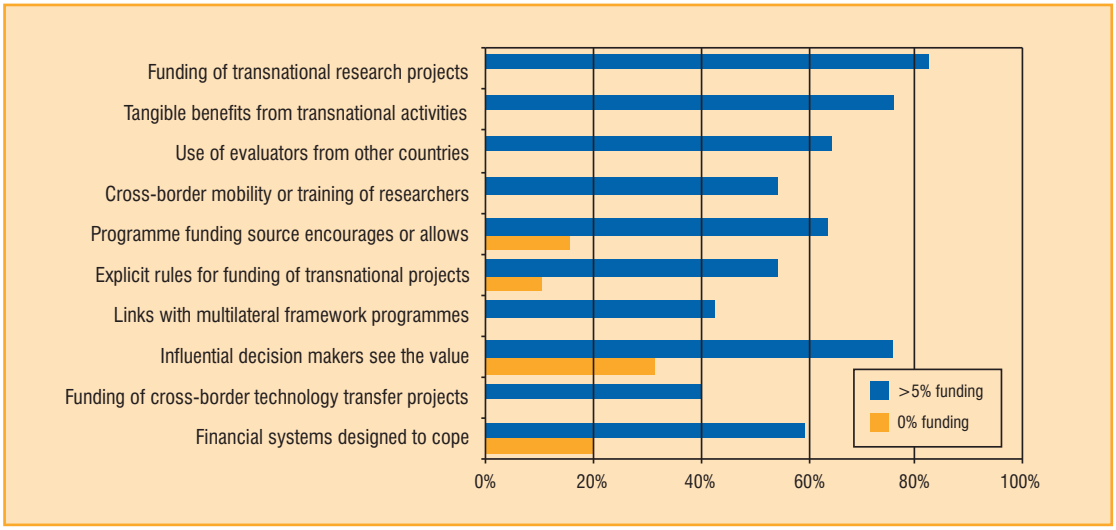
Top 10 Enablers

Of the 23 enablers identified, 10 are present in over 40% of the programmes surveyed. These are the most prevalent but not necessarily the most effective in opening programmes up to transnational activity. However, the top three indicate that top-down encouragement from policy makers, flexibility (or explicit rules) to fund transnational projects and positive prior experience are quite common.



'Open' programmes are clearly using more enablers

Programmes that have spent 5% or more of the budget on transnational activities have a much greater prevalence of enablers. The proactive use or development of these enablers should be given more consideration when designing programmes or adapting at programme review milestones.



It is interesting to note that some programmes are closed to transnational activities (ie 0% spend) even when influential policy makers see the value. This suggests that the degree of transnational cooperation and opening is dependent on bottom-up action from the programme and project level as well as political will. However, the prominence of explicit rules and instruments in this analysis clearly suggests that the degree of transnationality is embedded at the design stage of most programmes.

Different ways to overcome the barriers

The barriers and their relative importance vary from country to country and between different types of programme. Also, some can be addressed at programme level whilst others need some change of policy at ministry or agency level. Some suggestions on logical approaches and strategies at different levels of programme design and administration are provided in the table below.

Barriers	Prevalence	Enablers		
POLICY LEVEL BARRIERS		**MINISTRIES**	**AGENCIES/COUNCILS**	**PROGRAMME ADMINISTRATORS**
Policy to achieve national priorities through internal capacity building	62%	Adopt a more open policy to encourage innovative transnational approaches	Evaluate the potential and actual impact of European collaboration	Provide case study examples and success stories of transnational projects
The legal constitution forbids payments to non-residents	45%	Remove legal restrictions	Clarify legal position and propose options to overcome restrictions	Ask for clear guidance on legal position
Another organisation deals with international activities	29%	Encourage internationalisation of all national research funding organisations	Increase international networking activities	Take advantage of international networking opportunities
No significant policy changes to encourage transnational activities	25%	Develop top-down strategy on coordination of national programmes	Review bottom-up experience of bilateral and multilateral cooperation	Provide case study examples and success stories of transnational projects
Inequality of investment makes it impractical to design joint programmes	24%	Consider more integrated approaches to economic and technical cooperation	Encourage participation in multilateral programmes	Adopt flexible approach to 'a la carte' funding of transnational projects
Influential decision makers do not see the value	16%	Consider strategic, longer term benefits of technical cooperation	Evaluate the potential and actual impact of European collaboration	Provide evidence of tangible benefits from transnational activities
Transnational activities are focused on non-EU countries	12%	Investigate and recognise value of European collaboration	Encourage participation in European multilateral frameworks	Participate in European multilateral frameworks
PROGRAMME LEVEL BARRIERS				
Sufficient volume of high quality applications from internal capacity	61%	Provide additional, dedicated budgets for transnational activities	Develop programmes or instruments that are transnational by design	Highlight lost opportunities for transnational value added
No explicit criteria that encourage transnational activities	48%	Develop top-down strategy on coordination of national programmes	Use selection criteria to encourage transnational projects	Ensure selection criteria do not discriminate against transnational projects
Source of funding does not allow use of funds for transnational activities	38%	Analyse reasons why source of funding does not allow funding non-residents	Identify and adopt innovative approaches from other countries	Highlight lost opportunities for transnational value added
Programme owner has limited experience of pan-European collaboration	36%	Encourage internationalisation of all research programme designers and administrators	Encourage staff to be more involved in international networks	Increase involvement in pan-European collaborative programmes
Different national rules and cycles make it impractical to collaborate	36%	Identify priority areas for coordination and harmonise where appropriate	Provide a degree of flexibility in programmes to allow alignment	Establish coordination interface with related national programmes in other countries
The programme is designed to address country-specific issues	35%	Encourage internationalisation of all research programme designers and administrators	Identify other countries with similar issues and identify areas for value adding cooperation	Identify programmes in other countries that are addressing the same issues
Financial administration systems are not designed to cope with non-national contracts	32%	Use agencies to administer any non-national contracts	Design systems to cope with non-national contracts and currencies	Allow participants to use subcontract option where appropriate
Insufficient knowledge of similar national programmes	28%	Encourage internationalisation of all research programme designers and administrators	Allow programme administrators to travel to meetings, conferences, etc.	Develop links with peers in other countries through participation in networks and events
No European structures to coordinate cooperation in programme area	21%	Support the development of networks and coordination structures	Initiate networks in priority areas	Identify and attend networking events in other countries to build collaborative relationships
Sharing activities / results would dilute international leadership	19%	Assess benefits of transnational activity to support international leadership objectives	Promote transnational activity as a method for developing international leadership	Engage in transnational activities to identify new approaches to best practice programme design
Language & culture diversity makes opening programmes impractical	14%	Encourage internationalisation of all research programme designers and administrators	Adopt evolutionary approach of building from bilateral to multilateral cooperation	More use of English language to enable opening of programmes
PROJECT LEVEL BARRIERS				
National researchers not keen to see more budget used for transnational	36%	Provide additional, dedicated budgets for transnational activities	Develop and promote policies for increased investment in transnational activities	Use case studies to encourage more user interest in transnational activities
No demand from national applicants for inclusion of foreign partners	27%	Encourage involvement of world class researchers by setting explicit allowable budgets	Design selection criteria to encourage more international consortia	Provide explicit rules on the options to use foreign experts
Administration costs of transnational projects outweigh the benefits	22%	Provide infrastructural funding to facilitate more internationalisation of national programmes	Develop internal processes to enable efficient administration of transnational projects	Take advantage of multilateral facilitating frameworks to reduce administration costs

INCREASING THE IMPACT

Our research suggests that most national research programmes are designed to achieve one or more of the following four objectives. In each case, we can highlight examples from the study of the innovative use of transnational cooperation and openness to increase the impact of particular programmes. Some interesting case examples of programmes and strategies to achieve these objectives are presented below.

Develop knowledge-based industries

Most countries are rightly preoccupied by their ambition to develop and attract knowledge-based industries. Such businesses are international by nature or may be exposed to low-cost international competition in the domestic or European market. Many of the SME programmes are therefore trying to increase the flow of knowledge transfer from the science base. Science/industry mobility programmes are also becoming more common at national level. In many cases, these science/industry knowledge transfer frameworks are purely national but there are also transnational examples like the Industrial PhD programme in Denmark and the ProInno programme in Germany.

Industrial PhD Program (Denmark)
This is a mobility, industrial research and technology transfer programme that operates across national borders. The aim is to increase industrial R&D by funding researchers (from Denmark and other countries) to complete their PhD within a company.

Transnational cooperation between countries that have similar priorities in terms of new technology based industries is also apparent in some countries. Japan is particularly active through the JSPS Core-to-Core programme and the NEDO International Research Grant Program. The High Technology Research and Development Programme in China encourages international collaboration and exchange with the overt aim of importation, assimilation and absorption of foreign technologies into Chinese R&D activities. In Europe, Hungary has established three applied research centres, where international teams are working together in key areas like ambient intelligence, biotechnology and nanotechnology.

Internationalisation

There are two types of internationalisation objectives that are apparent in national research programmes; the internationalisation of researchers and the internationalisation of businesses.

Most basic research programmes have international fellowship instruments that are designed to encourage researchers to engage with research groups in other countries. For example, the International Research Fellowship Programme (IRFP) in the United States allows young scientists and engineers to spend time abroad to support the National Science Foundation goal of creating a “diverse, competitive and globally-engaged workforce of US researchers”.

The programmes of Tekes of Finland are underpinned by a strong commitment to internationalisation of industry through research cooperation. There are also some industrial research programmes that are international by design like the CIR-CE programme in Austria. In Turkey, the Industrial R&D Grants programme provides 100% grant incentives to universities if they involve a local company in international research projects. The Torch Programme in China is designed to support the internationalisation of high tech industries and provides an integrated package of instruments including R&D and support to develop a wide range of technical and commercial relationships with other countries. In France, the 'Aide a la Innovation' programme is very flexible and funding can be easily used to participate in a wide range of transnational projects.

CIR-CE Programme (Austria)
This programme supports R&D, networking, and technology transfer projects between Austrian companies, Austrian intermediaries and companies in 15 countries within Central-Eastern and South-Eastern Europe. The aim is to encourage joint endeavours in global markets and all partners are eligible for funding.

Increase scientific competitiveness

Most countries are investing heavily in developing their scientific capacity and competitiveness to address major societal/environmental challenges and also support the development of knowledge-based economies. In some cases, this also supports policy objectives to attract high-tech inward investment. One consequence is that the availability of human resource capacity is becoming a big issue as there is an increasing shortage of leading edge researchers. This problem is likely to increase as countries in Europe implement their policy commitment to increase R&D investment towards the EU target of 3% of GDP by 2010.

The response to researcher capacity shortages varies from country to country. Some are encouraging inward mobility programmes to support domestic research teams. The Foreign Guest Researcher Program run by the National Institute of Standards and Technology (NIST) in the US is one example. Countries like China, Cyprus, Ireland and Hungary are providing attractive incentives to encourage ex-patriate researchers to return either on a temporary or permanent basis. Others like NWO, the research council for the Netherlands, are very proactive in sponsoring national researchers to participate in international projects.

RPT Framework Programme (Cyprus)
This programme has an explicit rule that allows up to 30% of the budget to be spent on foreign researchers. This is designed to increase the quality of industrial research projects and build scientific capacity and relationships. Through this programme, Cypriot researchers are increasing their presence in EU funded research projects.

Some countries are also investing heavily in providing incentives for leading edge researchers from other countries to participate in their national programmes. This is particularly obvious in the Research and Technology Framework programme in Cyprus and the SBO Programme in Belgium, which have explicit rules that allow foreign researchers to use a significant proportion of the programme budgets.

Address societal or environmental challenges

In some respects this is the most obvious and least sensitive area for transnational cooperation and opening. Many of these challenges are global or are common to more than one country. In some cases there is also a relationship to European or international standards and pre-normative research collaboration can be a very effective means of achieving rapid consensus at the standardisation stage as there is a shared ownership of the scientific information and methods.

Food Standards Agency (UK)
The Food Standards Agency in the UK has been promoting its Research Calls to European researchers and engaging in pre-normative research projects with other similar bodies to support the development of European regulations and standards.

THE SEVEN DEADLY SINS

Although some transnational strategies and instruments are relevant to specific national objectives, there are others that apply in all cases where there is some rational for transnational cooperation or opening. An interesting way of looking at these is to consider some of the anecdotal reasons that are given for not engaging in transnational cooperation and opening. We have used the analogy of the 'seven deadly sins'[6] to illustrate the main reasons and offer some closing advice on why these should be avoided.

"We have everything we need right here"

The logic for transnational collaboration is very obvious for smaller countries with weaker scientific infrastructures but less so for the larger economies. However, the growing diversity of science and technology makes it impossible for any European country to be at the leading edge of every area that is relevant to their national priorities.

"We don't have the tools or the budget"

Most of the barriers and enablers for transnational activities are set in concrete at the design stage of many national programmes. It is therefore important to take advantage of design or budget review milestones to create explicit rules and tools to support transnational activities.

"Its too difficult to collaborate in Europe"

The different languages, cultures and relative size of countries within Europe can make it difficult to work together in a practical way. This is certainly true in a universal sense but many have found that a step-by-step approach of developing lasting relationships with particular countries is the best way forward. There are also a growing number of European frameworks that provide the opportunity (and in some cases the resources) to facilitate transnational partnerships.

"Don't fix it if it isn't broken"

The traditional (unilateral) approach to national programmes is often justified by a concern that the objectives will be distorted by transnational activities and that such activities should be handled in a different way. This is a myopic short term view, that is fairly common in industrial research, and inconsistent with government policies that promote the economic opportunities of international markets.

"Who needs the hassle"

National administrations by their nature are resistant to change and it is extremely difficult to engage in activities that do not fit with the operating rules and procedures. However, since industrial and scientific markets are becoming much more international it should follow that national programmes should be adapted to reflect this trend.

"Programme users don't want it"

It is probably true that the less ambitious or able researchers and businesses prefer to work in national programmes without exposure to international competition. But does such protectionism really help them to exploit global markets, achieve inclusion in transnational supply chains or provide a bridge to participate in European RTD projects ?

"We tried it once but it costs more than it's worth"

There is no doubt that transnational projects require a higher investment in administration and coordination. It can also be difficult to quantify the benefits as these are often indirect or difficult to measure, particularly in the short term. It is therefore important to be very clear on the reason for transnational activities within national programmes and take a long term view of the strategic benefits.

6 The Seven Deadly Sins are those transgressions which are fatal to spiritual progress and include envy, sloth, gluttony, wrath, pride, lust and greed.

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