EUROPEAN RTD 2004 Guide for the Construction and Real Estate Cluster – CREC

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1 Contents: Click *Index finger, or Ctrl+click* a line in the table of contents to directly enter the chapter you want.

2 Text: Click *Index finger, or Ctrl+click* red underlined title, Internet address etc to go to the related Internet site (try here www.villareal.fi) or directly to the external document concerned. Click red underlined person name or email address to send a message to the person concerned.

Espoo Finland, February 2004

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Preface

In advanced European vocabulary "construction" is considered to cover the entire value chain of develop/own, design, manufacture, construct, recycle a building, infrastructure or other constructed assets. This definition is principally considered in this report.

Today in Finland and elsewhere, however, a new expression the Construction and Real Estate Cluster – CREC has been taken to use to cover all activities directly related to construction and real estate (buildings, infrastructure and other facilities = 60-70% of the national wealth). Compared to the above, CREC covers the whole life of a building, hence additional activities concern running the building, which more often is done by facilities management. According to ISO 15686 "*Buildings and constructed assets – Service life planning*", running a facility covers the following activities: Operating, Maintenance, Repairs, Refurbishment, Disposal (and Residual value).

A reason to this approach is the fact that major contractors are moving from plain construction towards taking care of the building/facility for an extended period or its whole life cycle. Also public-private partnership projects (BOOT, PFI; toll roads & bridges, schools, prisons etc) require this approach. This is also a self-evident approach to investors/developers. And any sustainable construction consideration requires CREC!

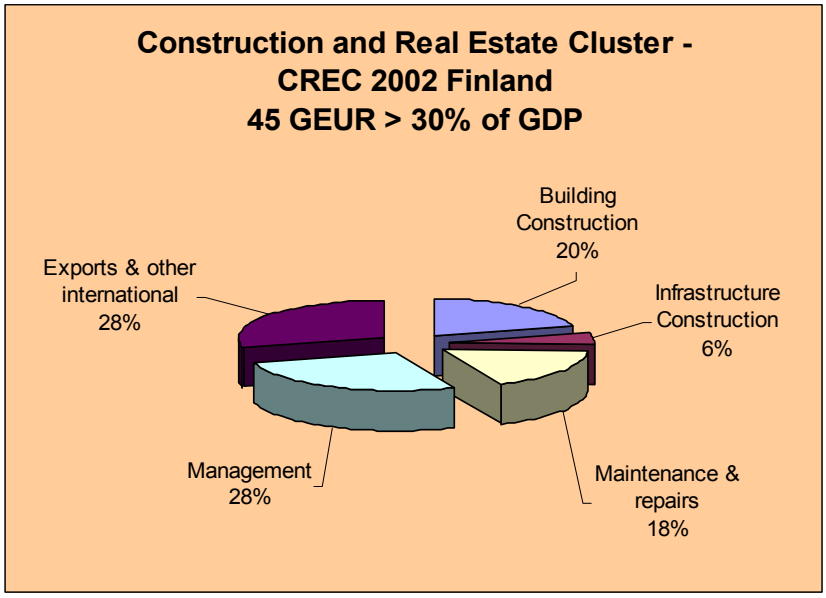


Figure 1 Construction and Real Estate Cluster – CREC, year 2002 Finland.

Source: VTT, a leading construction/CREC research centre in Europe.

The above chart shows that while in Finland construction represents 10% of GDP (or 12% if repairs & refurbishment are counted in), CREC represents over 30% of the same GDP. In the EU construction represents 11% of the total GDP, and CREC nearly 30% of the same GDP!

This shows CREC's magnitude and importance. This should be reflected in CREC's R&D activities at European and national levels. A lot of improvement is needed from all stakeholders.

This guide is particularly for CREC organisations preparing project proposals for the EU's 6th Framework Programme for Research and Technological Development – EU6RTD (or FP6). The guide should be updated after each new call in CREC's interest. At the same time, we should not forget the good opportunities offered by the European networks EUREKA and COST.

We have produced similar guides already in three years for the Finnish CREC, which is holding #1 position in the world for RTD input (0.5% of the CREC turnover total and up to 1.4% of actual construction). Also, I have 15 years hand-on experience on European RTD actions. Some parts of this document refer to Finland trying to give the reader a real life picture of what's happening.

Olavi TUPAMÄKI

Contents

This is an active table of contents with internal hyperlinks.

In the table, the calls in the highest interest of the Construction and Real Estate Cluster – CREC are highlighted in yellow.

Total number of pages = 95.

This document contains hyperlinks to external websites, documents and email recipients.

1 EU'S R&D AT LOW LEVELS

1.1 EU Objective: R&D to 3% of GDP?

In the following I repeat the results of my study about the possibilities to increase the EU R&D input to 3% of GDP by 20010, a bold EU objective. This document was sent 10 Dec 2002 to Commissioner Philippe BUSQUIN.

Fresh data and information received thereafter, such as

- *Towards a European Research Area - Key Figures 2002*,
- *Third European Report on Science & Technology Indicators 2003*,
- *Investing in research: an action plan for Europe*, and
- *Towards a European Research Area - Key Figures 2003-2004*

only confirm what I have said.

In accordance with the agreement of the Barcelona European Council in March 2002, Commissioner Philippe BUSQUIN's issued a communication document *More research for Europe - Towards 3% of GDP (Brussels, 11.9.2002 COM(2002) 499 final)*. There are two principal objectives set: by 2010 to raise the enlarged EU R&D input to 3.0% of GDP and to get 2/3 of this funded by business (industry).

In the document, for the three industrialised competitors, comparable figures are given as follows: Japan 3.0%, USA 2.7% and EU(15) 1.9% of GDP It also says that the gap is widening, since 1994 as proven by following chart. It also shows that EU's percentage has been 1.8-2.0% for the past ten years, no growth at all but decline, actually.

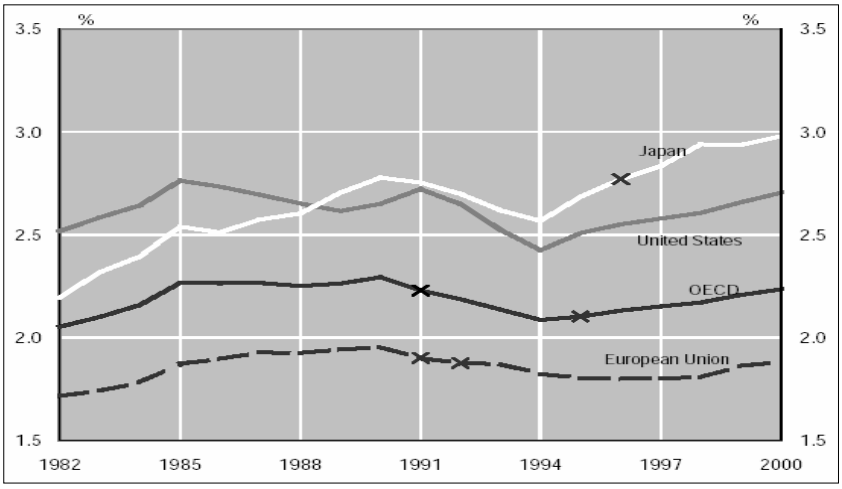


Figure 2 R&D Intensity (GERD/GDP) for the EU, United States, Japan and the OECD countries total; 1982…2000

Source OECD, May 2002

Two small member states Sweden and Finland have already achieved the 3% objective. Let's take a closer look at Finland, which successfully carried through a dramatic change from low R&D input to the #2 position in the world.

Last year 2001 Finland used 3.5% of GDP for R&D, out of which 72% came from industry (also this is above the EU target of 67% aforesaid). If we take a look at history, we can see that it took 15 years in Finland to rise from 1.5% to 3.0% as you can see in the chart below.

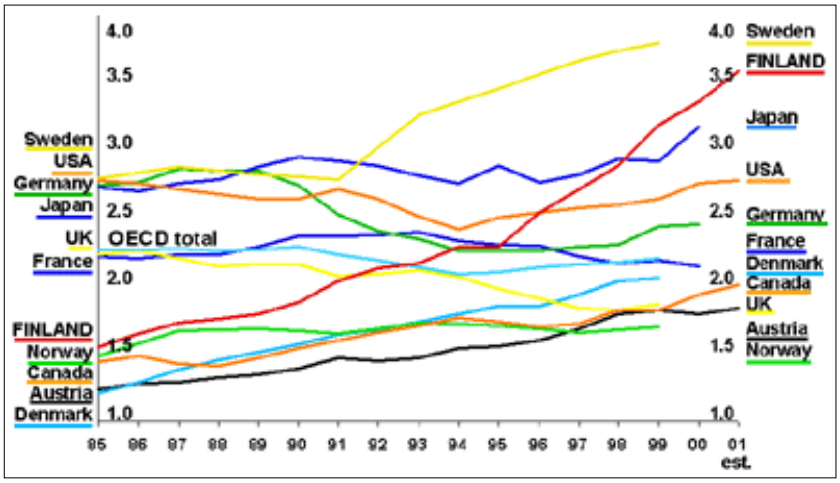
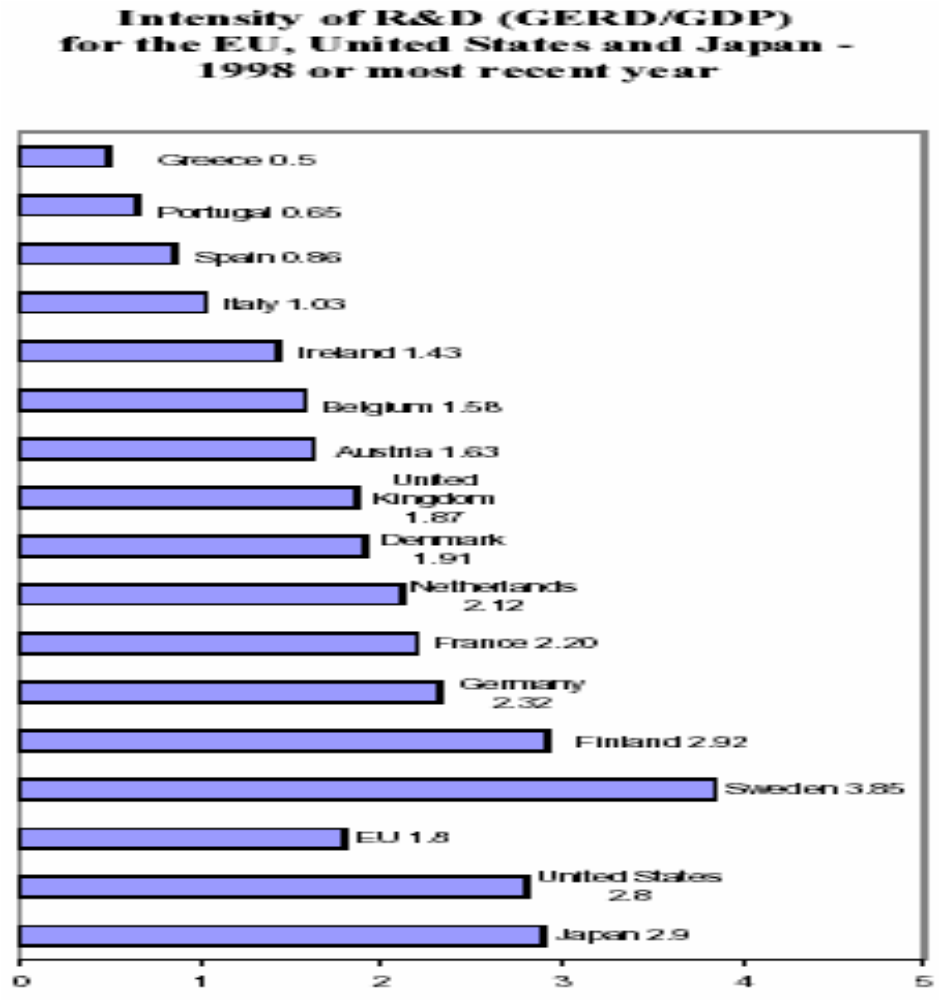


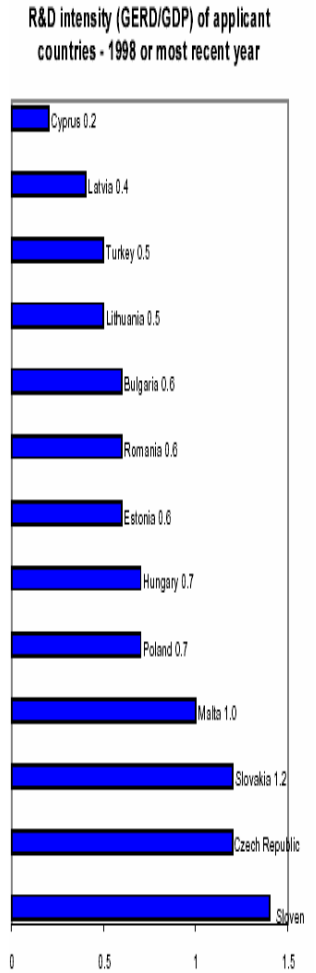
Figure 3 R&D Intensity (GERD/GDP) for the selected Nordic and EU countries, United States and Japan; 1985…2000/01

Source (OECD &) Tekes FI, Aug 2002

You also can see that Finland was the only country able to make this change. It was achieved through the determined government strategies supported by industry plus good fortune. At the same time Germany, the largest member state and the biggest R&D spender in the EU, has been actually declining.

Then, let's take a look at the enlarged EU and the candidate countries in particular. In a very informative document of Mr Philippe BUSQUIN again, *Towards a European Research Area (Brussels, 18 January 2000 COM (2000) 6)*, the following two charts show the R&D percentages of GDP a few years ago *(original source OECD, EuroStat et al)* for the countries concerned.





As the EU(15) R&D input is 1.8-1.9% of GDP, what then will be the same percentage after the enlargement (planned to be completed by 2010)? I have adjusted the above charts to show the reality (the same horizontal scale for intensity in both charts). Anybody can immediately see that the R&D percentage of GDP will drop remarkably after enlargement. According to my quick estimation, the EU(28) R&D of GDP would drop by 0.1% (percentage points)

I showed above that the EU R&D input as percentage of GDP has not increased during the past ten years. In the forthcoming ten years - without a clear strategy and action plan established and duly carried through by the EU and all member states - the union enlargement is going to drag this percentage even lower.

MY JUDGEMENT:

In the EU, the objective to raise R&D input to 3% of GDP by 2010 will not be achieved, not for the present 15 members and even less so for the enlarged union.

PS In the European Research 2002 Conference, 11-13 November Brussels, I heard Mr Hans-Olaf HENKEL, one of the three keynote opening speakers, expressing the 3% objective as wishful thinking and comparable to the 30 years old pledge to raise the developing world assistance to 0.7% of GDP (today the EU aid is less than half of this objective).

1.2 Good news and bad

This is a summary of recent development at EU levels to support the objective of increasing R&D input to 3% of the EU GDP by 2010. There are a lot of good news, yet also bad news.

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EUROPEAN PARLIAMENT CALLS ON THE MEMBER STATES TO INCREASE THEIR EXPENDITURE ON RESEARCH TO 3% OF GDP BY 2010

Cordis 19 Nov 2003

MEPs call on the Member States to increase their expenditure on research to 3% of GDP by 2010 in adopting an own-initiative resolution relating to the Commission communication on the action plan for investing in research in Europe. The House generally endorses the recommendations that the Commission has put forward in its communication and underlines that science and technology have been an intrinsic element of Europe's identity.

Yet, MEPs are critical of the Council for not following up its words with deeds and of the Member States for making little or no effort to increase their R&D expenditure, some of them, indeed, reducing theirs.

Parliament wants the Member States and private investors to increase their R&D expenditure, the required increase being 6% for public investment and 9% for private investment, to reach the average of 8% needed to achieve the target figure of 3% of GDP overall by 2010. To this end, the House calls for an increase also in the European research framework programme, and therefore calls for an increase in the seventh research framework programme budget to €30 billion for the whole period of the programme, to include allowing for enlargement to 25 and more Member States. MEP also call for, in the context of the 6th Research Framework Programme, for the ideas of 'networks of excellence' and 'integrated projects' to be geared more closely to the guiding notion of the European Research Area, and therefore for adjustments to be made, particularly in relation to the size of projects, in terms both of the number of project partners and of the financial volumes involved. Parliament supports the creation of regional networks of SMEs and calls on the Member States and the Commission to support such initiatives as a priority.

Lastly, MEPs call for the establishment of a European Research Council with the purpose of strengthening the world-wide position of basic research carried out in Europe at the highest scientific level by offering long-term funding for that purpose. The body should: primarily be a funding rather than an advisory body; follow a bottom-up approach in stimulating proposals for funding; cover all fields of science, including the natural sciences and engineering, the humanities and the social sciences, using a flexible approach; base its decisions on scientific criteria and have a rigorous and transparent peer review process; be accountable to

its funders, but autonomous in its operations and run by highly respected scientists and focus on financing bottom-up academic research.

The Commission has put forward a package of measures on ways of enabling the EU to raise its research expenditure to 3% of gross domestic product (GDP), on the understanding that one third is to be accounted for by public funds and two thirds provided by the private sector. According to the Commission's calculations, as set out in the communication, the EU spends, all told, 1.9% of its GDP on research, whereas the US spends about 2.7% and Japan 3%. In absolute terms, the US spends €125 bn a year more on research than the EU, which has a larger population.

BUSQUIN TARGETS TWOFOLD INCREASE OF EU RESEARCH BUDGET

Cordis 14 Jan 2004

Research Commissioner Philippe Busquin has confirmed that he intends to call on the EU's Member States to double the Community budget for research in an enlarged Union.

Mr Busquin made the statement in an interview with the French newspaper Le Monde, although his spokesperson has since told CORDIS News that 'this may be a conservative estimate - we will probably aim for more.'

Exact figures cannot be discussed until the Member States agree on the global EU budget for the period 2007 until 2013. While some are hoping to see national contributions rise to 1.24 per cent of GDP, six Member States have already made clear that they wish to see contributions remaining at the current level of 1 per cent.

If Mr Busquin gets his way, EU research funds will increase from the current five billion euro per annum, to ten billion euro by the beginning of the next century. Such a figure would represent ten per cent of public research spending within the EU.

The spokesperson added that Budget Commissioner Michaele Schreyer is believed to be in favour of such a substantial increase to EU research funding, and that a recent report by German MEP Ralph Linkohr illustrates the Parliament's backing for such a redistribution of funds.

NEW STATISTICS CONFIRM DECLINE IN EU RESEARCH INVESTMENT AND PERFORMANCE

Cordis 26 Nov 2003

Warnings by research analysts were confirmed on 25 November when EU Research Commissioner Philippe Busquin unveiled new statistics on Europe's scientific performance, which show a drop in both investment and performance.

'Key Figures 2003-2004' provides comprehensive data on all types of research investment, as well as indicators enabling an assessment of performance. For the first time, the statistics also include data from the acceding and candidate countries, offering an insight into areas of convergence and divergence between the existing and future Member States.

The statistics show that Europe is even losing its leadership with regard to the number of scientific publications published. 'This is the logical outcome of under-investment in basic research,' said Mr Busquin. 'Basic research is increasingly falling victim to difficult budgetary conditions in the Member States, but this is not the right response to ensure growth and prosperity in Europe. [...] The political message is that, more than ever, Europe must make a real effort. Progress is being made at the level of words, but we must now take action.'

The research and development (R&D) investment gap between the EU and the US has continued to grow in favour of the US. Around 80 per cent of the gap is the result of different levels of business R&D expenditure in Europe and the US. For the EU to reduce this investment gap, the annual growth rate for R&D investment would have to be almost doubled - 8 per cent instead of the current 4.5 per cent.

One should not think, however, that private R&D investment is decreasing in the EU. On the contrary, spending increased by 50 per cent between 1995 and 2001. But in the US, expenditure rose by 130 per cent over the same period.

Growth in overall performance declined in almost every Member State between 2000 and 2001, although to a lesser degree than for investment. Looking at the acceding countries, it is possible to distinguish two groups of countries. Lithuania, Latvia, Hungary, the Czech Republic, Malta and, to a lesser extent, Poland, were all catching up with the EU-15 in 2000 and 2001, each with a productivity growth rate that was above the EU average. The remaining acceding countries were falling further behind over the same period, although strong investment growth in Slovakia, Estonia and Cyprus mean that a substantial improvement is likely.

Assessing the impact of enlargement, the Commission concludes that 'Europe's strength in scientific output will be reinforced but its technological performance will not follow the same rhythm, at least in the short term.'

The current Member States hold on to the positions they attained in the second half of the 1990s, although new tendencies are now evident. The southern countries (Portugal, Spain, Greece and Italy) were still lagging behind in 2001, and their catching up with the rest of Europe appeared to have slowed down significantly. France, the UK, Germany, Austria, Ireland, Belgium and the Netherlands all kept their average positions, although Germany experienced a drastic drop in investment growth, which even became negative in 2001.

Finland, Denmark and particularly Sweden were still far ahead of the other Member States in 2001, and were increasing the gap. The figures therefore imply that the current economic downturn is creating more divergence within the EU.

The importance of a strong European research sector has been recognised by Commission President Romano Prodi, as evidenced by his Initiative for Growth, which includes additional investment in research. Mr Busquin welcomed this initiative, and said he believes that other colleagues in the Commission are beginning to see the importance of promoting research.

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EU BUDGET 2007…13 – DOUBLE MONEY FOR R&D?

Financial Times 18 Jan 2004, George Parker in Brussels
EU heads for sharp clash on spending

Europe's big member states are set for another bruising clash with the European Commission over its proposed new €1,000bn ($1,170bn £696.40bn) seven-year spending programme, which seeks to boost EU competitiveness.

Romano Prodi's Commission will ignore demands from countries such as Germany, Britain and France for tight spending curbs, and is set to propose the maximum level of EU spending allowed under current rules.

An internal Commission document seen by the Financial Times reveals plans for heavy spending to help the EU meet its increasingly forlorn target of overtaking the US as the world's most competitive economy by 2010.

There would be a **300 per cent increase in spending on research**, and a 400 per cent rise in spending on transport and other networks. There would also be a big programme of regional aid designed to bring poorer EU areas up to speed.

Michel Barnier, EU regional affairs commissioner, has drawn up a regional programme which would be split 50-50 between existing EU member states a and the 10 new members, mainly from central and eastern Europe.

"You can't raise European competitiveness without cohesion," he said in an interview with the FT. "You can't win a match with part of the team standing on the sidelines."

Other areas earmarked for increases in the next EU budget round from 2007-13 are the EU's foreign and security policy, and measures to tackle illegal immigration and organised crime.

Michaele Schreyer, EU budget commissioner, set out in an internal memo to colleagues earlier this month the clearest idea of how the Commission believes the money should be allocated, citing an indicative year of 2011.

It shows that €69bn - 47 per cent of a €147bn budget for that year - would be spent in the field of competitiveness and regional policy, 8.5 per cent on foreign policy, 6.3 per cent on administration and 2 per cent on other internal policies, including immigration.

The other big item, farm subsidies and other rural policies, would amount to 36 per cent of the total. EU leaders agreed in October 2002 to peg rises in agricultural spending to 1 per cent a year, less than expected inflation.

Officials close to Ms Schreyer and Mr Prodi say a majority of Commission members back **a budget representing 1.24 per cent of the EU's total gross national income**.

Ms Schreyer's aides say if the EU economy grows at the forecast 2.3 per cent a year, the Commission's proposed budget for the seven year period would exceed €1,000bn for the first time.

Mr Prodi has dismissed calls from six of the net contributors to the EU budget - Austria, Britain, France, Germany the Netherlands and Sweden - to cap spending at 1 per cent of GNI as "unrealistic".

He showed last week he is prepared to take on the big member states, announcing plans to take finance ministers to court over their suspension of the EU's stability and growth pact.

Final details of the proposed budget will be adopted by the Commission at a meeting on February 10, kicking off a debate on future EU financing expected to be concluded next year.

Member states have the final say, and the six net contributors signalled their intent when they warned in December that the EU's budget should be subject to the same "painful consolidation" as national budgets.

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MEMBERS REBEL AGAINST INCREASING EU BUDGET

Financial Times 20 Jan 2004 George Parker and Daniel Dombey in Brussels
Members rebel against increasing EU budget

Hans Eichel, the German finance minister, on Tuesday claimed there was growing opposition to European Commission plans for a new seven-year spending programme that would top €1,000bn ($1,257bn, £692bn).

Mr Eichel claimed Italy, Ireland and Slovenia would support six other big contributors to the European Union budget that are demanding tough financial curbs.

"Europe and the European budget should meet the same strict criteria as national budgets," said Mr Eichel, whose government is the EU's biggest paymaster.

A number of finance ministers warned against the Commission's plan, to be formally submitted on February 11, to lift spending to 1.24 per cent of EU gross national income in the 2007-2013 budget period. Last month the leaders of Austria, Britain, the Netherlands, Germany, France and Sweden urged Romano Prodi, European Commission president, to set the budget at current spending levels of 1.0 per cent of GNI.

Karl-Heinz Grasser, Austrian finance minister, said at Tuesday's Ecofin finance ministers' council in Brussels that Mr Prodi's plans were "completely unacceptable".

Gordon Brown, British finance minister, said at the meeting that budgetary restraint was "vital".

The first real test of how each member state lines up in the politically fraught budget debate will come in April at a meeting of finance ministers at Punchestown, near Dublin.

Mr Prodi is preparing for a fight with member states, arguing they cannot ask the EU to do more in raising competitiveness, developing foreign policy, fighting crime and funding enlargement with less money.

"I could never approve a contradiction between our tasks and the necessary resources," he said on Monday in a speech in London.

Finance ministers also locked horns with the Commission over its decision to challenge in the courts their decision last November to suspend the EU's stability and growth pact. Mr Eichel suggested there was no

question of ministers considering the Commission's proposed reforms of the pact - due next month - while a court case was hanging over them.

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EUROPE'S DOOMED ATTEMPT TO OVERTAKE THE US

Financial Times 20 Jan 2004 George Parker in Brussels
Brussels to set out why EU is trailing US

Europe's apparently doomed attempt to overtake the US as the world's leading economy by 2010 will on Wednesday be laid bare in a strongly worded critique by the European Commission.

The Commission's spring report, the focal point of the March European Union economic summit, sets out in stark terms the reasons for the widening economic gap between Europe and the US.

It cites Europe's low investment, low productivity, weak public finances and low employment rates as among the many reasons for its sluggish performance.

The draft report, to be published by the Commission today, warns that without substantial improvements "the Union cannot catch up on the United States, as our per capita GDP is 72 per cent of our American partner's".

It was four years ago in Lisbon that EU leaders, enthralled by the technology boom, proclaimed their intention to overhaul the US as the world's "most competitive, knowledge-based economy" by 2010.

The Commission's report suggests that such a goal now looks hopelessly ambitious, and will make sobering reading for EU leaders as they prepare for their annual update on progress in meeting the targets set at Lisbon.

In many cases the promises made at Lisbon have not been put into national law by member states, with France, Germany, Belgium and Luxembourg - the biggest enthusiasts for deeper European integration - the worst offenders.

The EU's productivity growth rate has been going down since the mid-1990s and is now fluctuating between 0.5 and 1 per cent, compared with 2 per cent in the US.

The report blames low overall European productivity on a lack of investment and poor use of information technology, and warns that China and India are becoming key competitors.

Europe's low employment rate, especially among workers aged over 55, is described as "worrying indeed", while it is deemed unlikely that the EU will meet its employment rate target of 67 per cent by 2005.

"At the same time, several strategic measures to increase our competitiveness have not got off the ground because of a lack of political will," the report says.

It cites failure to agree basic reforms, such as the introduction of a single community patent or the recognition of professional qualifications across the EU.

Ireland, the holder of the rotating EU presidency, wants to use the spring summit to revive the Lisbon process - an annual ritual which usually fails to deliver the promised results.

The Commission argues that 2004 must see a sharp improvement in EU investment, productivity and competitiveness and reforms to social security systems to bring older people back into the workplace.

"It is not too late, but unless we act decisively now we will not meet our targets," said one official.

The report identifies Austria, Luxembourg, Denmark, the Netherlands, Sweden and the UK as the best overall performers in terms of meeting the Lisbon targets.

France and Germany come in a middle band, while Greece, Spain, Italy and Portugal are rated as the worst overall performers.

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RESEARCH TO BE ONE OF PRIME BENEFICIARIES OF HIGHER EU BUDGET PROPOSED BY COMMISSION

Cordis 12 Feb 2004

As was expected following recent comments by Commission President Romano Prodi and Commissioner for Research Philippe Busquin, a proposal on the Commission's future budget between 2007 and 2013, unveiled on 10 February amongst much controversy, makes a claim for higher contributions from the EU's Member States for research and innovation initiatives at EU level.

The Commission highlights three priorities for an enlarged EU: sustainable growth; citizenship, freedom, security and justice; and making the EU a global partner. Research and innovation fall into the first priority, as growth requires 'a more dynamic and better connected Europe,' states the proposal. 'This requires a substantial change in policies to support the Union's physical and knowledge infrastructure. This means action to improve research, boost enterprise and innovation, and establish networks at European level.'

The Commission therefore calls for 'commitment appropriations' to sustainable growth to rise from 47,582 million euro in 2006 to 76, 785 million euro in 2013. The EU's total budget of around 100 billion euro a year today amounts to 0.98 per cent of the EU's GDP. The Commission would now raise that figure to 1.22 per cent of Gross National Income (GNI) in the years after 2007. That would still come in under the permitted upper limit of 1.24%. The proposal is however controversial, as six Member States have already stated their desire to limit expenditure to 1 per cent of GNI.

In terms of research, the Commission's proposal outlines five areas for which more funding is needed: providing grants to research teams selected on a competitive basis; strengthening physical infrastructure and human resources; encouraging public-private partnerships; stimulating the development of 'poles of excellence'; and coordination national research programmes. The proposal also outlines the importance of increased investment in the related EU policies of space and security.

Although the possibility of creating a European Research Council (ERC) is not mentioned explicitly in the proposal, the idea of 'giving financial support to projects carried out by individual research teams selected on a competitive basis at European rather than at national scale, in particular in basic research' fits the description of the proposed council. The Commission recently published a communication on 'Europe and basic research', in which it verified that it would consider funding an ERC.

Turning to infrastructure, the proposal gives the examples of European large lasers, bio databanks in genomics and computing networks as initiatives where increased investment is foreseen. The coordination of national research programmes is envisaged for research fields such as cancer, Alzheimers, nanotechnology and social and economic challenges.

These priorities, all of which would benefit from additional funding, justify an increase in national contributions, according to the Commission. Member States have already committed themselves to raising research spending to three per cent of GDP by 2010, one per cent of which is due to come from the public sector, while EU research funding currently rests at 0.04 of GDP.

'To help Europe to become a beacon of excellence attracting researchers and investments, we must remove the barriers to excellence arising from segmented national programmes. But quality improvements will not be enough,' claims the proposal. 'Increasing the research effort will also be necessary.'

But conducting research alone is not enough to ensure European growth. Promoting technology transfer is also highlighted as a priority by the Commission. 'This should be done through 'knowledge flows and innovation networks'. Innovation policy, meanwhile, 'will also foster investment in innovation, in organisational change and in innovative design solutions.'

Presenting the financial perspectives to the European Parliament on 10 February, Romano Prodi explained that the proposal was drafted by first making political choices, and then basing figures on these priorities. Limiting EU spending to one per cent of GDP would be putting numbers above politics, he said.

1.3 Construction RTD at very low levels

The construction industries are the largest industrial cluster in the European Union (EU) representing 11% of total gross domestic product (GDP) or a quarter of total industrial output. Their 2.7 million enterprises directly and indirectly employ almost 30 million people, 97% of them small and medium-size enterprises (SMEs) with fewer than 20 employees.

There is a constant need for housing. Ageing infrastructure requires massive renovation. Traffic congestion and transport delays cause increasing waste. The costs of preserving the cultural heritage are accumulating.

In order to make all the necessary work affordable, construction technologies and processes must be developed. As construction affects the overheads of other industrial and commercial activities, their competitiveness can be improved with better construction productivity and efficiency.

According to various studies and experiments, the following targets could be achieved:

- 30% more construction at no extra expenditure,
- 50% reduction in delivery time,
- 50% reduction in operation & maintenance costs,
- 50% reduction in primary energy consumption,
- 50% reduction in waste & pollution, and
- 50% reduction in accidents at work.

Assuming a 10% cost saving, construction volume could be increased by 80 GEUR (billion euros) annually in the EU.

Relative to other industries, the construction cluster is less developed. Whereas 2-3% of GDP is generally used for RTD, in the construction industries the percentage is considerably under 1% of their own turnover, even 0.1% in some sub-sectors. This is, because the present-day construction process does not allow any reward for RTD in most sub-sectors.

To serve consumers and society better and to improve their competitiveness and productivity, the European construction industries should substantially increase their RTD expenditure. Unlike other industries, construction takes place in all countries, hence results benefit all. Europe could win with efficient processes and high-technology.

To make this possible, awareness within the European construction industries and the European Commission, the European Parliament and other decision-makers must be increased. Also, more positive attention and additional funding from national and European sources are necessary.

In addition to research & technological development, innovation, demonstration, dissemination and technology transfer should be an essential part of implementation. Here in particular, industry-led integrated RTD between large companies and SMEs is effective. In vertically arranged projects the requirements of customers and end-users can also be properly observed.

Different European and national frameworks and programmes should be made available: the European Union Framework Programmes for Research & Technological Development (EU RTD), EUREKA and COST, as well as PHARE, TACIS, MEDA and the structural funds.

In September 1996, a study was completed in the European Commission – EC titled *Construction – European RTD and Related Activities and Concentration of RTD Priorities*. In this report David MILES, Head of Unit in DG Research, came to the following conclusions:

- Within the EC at least 19 different services across 8 Directorate Generals (DG) are working on activities related to construction RTD.
- Some 300 MEUR of the EU's 4th Framework Programme for Research and Technological Development – EU4RTD will be on projects of particular interest to the construction industries. This represents less than 3% of the EU4RTD total funding of 11,879 MEUR.
- The construction process has considerable potential for technical improvement to the benefit of all citizens.
- Resource should be concentrated into 3 areas: Lean construction, Sustainable construction and Technology transfer & training.
- The inter-service group to be extended to prepare a set of detailed technological targets and priorities.

The conclusive recommendations were partly then reflected in another, very influential document titled *The Competitiveness of the Construction Industry, issued in November (COM(97) 539 final)* issued in the following year by DG Enterprise.

Today there are to two newly established interlocutor groups, where the construction industries and other CREC organisations can easily discuss their strategies and plans, problems and ideas, and to advance RTD on CREC:

- **The Construction Contact Point – CCP** towards the EC (established in October 2002 by Mr Vicente LEOZ-ARGUELLES, Head of Unit in DG Enterprise),and
- **The Forum in the European Parliament for Construction – FOCOPE** towards the European Parliament (established in May 2002 by Mr Den DOVER, MEP).

I am an invited member of both these groups for Villa Real / FutureConstruct.

1.4 Very bad first results

In principle, EU6RTD would offer a real opportunity to carry forward CREC's needs as a large over 100 MEUR integrated project. Unfortunately, however, the EU6RTD including its specific and work programmes does not make any reference to construction, building or other principal activities within CREC. Thus, already from the outset, EU6RTD looked unpromising for the needs of CREC. This is clearly demonstrated by development on the two most important programmes in the past, ie GROWTH and IST.

The programme following EU5RTD/GROWTH, NMP - Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices. Here there is a weak reference to construction under "Knowledge-based Multifunctional Materials" and "Surface science and engineering".

The programme following EU5RTD/IST is again called IST - Information society technologies. Here a weak reference to construction is made under "Products and Services engineering 2010".

The first round of calls opened 17 Dec 2002 and closed in March-April 2003. My snap-shot study on general success rates in the NMP and SDGE programmes gives the following scorings (Success rate % = 100 * approved/applied; lower figures are typically for NMP):

All proposals	Success rate (%)	Comment
Proposals over threshold	20-50	
Proposals approved for funding	5-30	
Funding total	5-20	very tight it is for all

CREC's success was very bad. According to e-CORE et al, in NMP 12 proposals for Integrated Projects (IP) and 6 proposals for Networks of Excellence (NoE) were submitted with the following sad results:

NMP: CREC Proposals	Success rate (%)	Comment
Proposals over threshold	2	Generally much under
Proposals approved for funding	0	Zero
Funding total	0	Total zero!

Also in IST, the results are very bad. According to information received from Construction ICT Roadmap – ROADCON, an IST R&D road mapping project for CREC, none of the proposals were approved for funding!

In SDGE under "Sustainable surface transport", a couple of CREC-related projects were approved. And, there must be a number of CREC-related STREP projects and SME specific CRAFT and Collective Research projects funded in various programmes. Information not available.

The second call in NMP opened 13 Dec 2003, and will close mainly 02 Mar 2004. And, there are now new opportunities for CREC, particularly area **3.4.4.1 Human-friendly, safe and efficient construction,** fully open for CREC IPs! Also, specific research activities for SMEs, CRAFT and collective research, are wide open for CREC proposals.

At the same time, we should not forget the good opportunities offered by the European networks EUREKA and COST.

2 EU6RTD (FP6) 2002…2006

2.1 General

Through a European RTD project you can find effectively a solution to your technological problem in production or other operations. If you have a good idea, some specific and valuable information or other competitive benefit, you can try to penetrate to the European markets via establishing a RTD project about the idea together with suitable partners from other countries. Usually, the coordinator of the project will get the highest benefits. Yet, also as a partner in a project established by others can give you a solution to your problem, and in all cases you can learn. In all cases, you will get internationalised and can find new business opportunities.

The share of construction in the EU GDP is 11%, and the share of the whole CREC nearly 30%. Although being the largest industries, the share of EU's RTD funding has been some 3% only. Guilty parties are everywhere.

The now closed 5th framework programme – EU5RTD was very suitable for the needs of CREC. Altogether 10 key actions offered space for CREC RTD, and some 400 CREC-related projects were funded. They were typically industry originated bottom up RTD projects.

In principle, EU6RTD would offer a real opportunity to carry forward CREC's needs as a large over 100 MEUR integrated project. Unfortunately, however, the EU6RTD including its specific and work programmes does not make any reference to construction, building or other principal activities within CREC. Thus, from the outset, EU6RTD looks unpromising for the needs of CREC. And the first results are very bad, as said earlier.

Yet, there are now new opportunities for CREC, in the now open NMP call (described in details later in this document), particularly area **3.4.4.1 Human-friendly, safe and efficient construction,** fully open for CREC IPs! Also, specific research activities for SMEs, CRAFT and collective research, are wide open for CREC proposals.

Money is there, if you don't try, you definitely don't get anything.

Typically the EU funding is max 50% of the project costs. Let's take an example: You have a project with five partners with equal shares, thus your costs are 20% of the total. As you receive 50% of this from the EU (actually from the European Commission – EC), your final cost is 10% of the total. And the total results will be your property. This means that at 10% input you'll receive 100% output!

In addition, in Finland as well as in some other countries it is possible to get some funding for project proposal preparation from technology funding agencies (Tekes in Finland).

EU6RTD for 2002…2006 opened 17 Dec 2002. The programme offers interesting opportunities for European (and international) R&D projects. This guide is particularly for project proposers, enlightening the RTD priorities and SME[3] activities as long as they are serving the needs of CREC.

The language of technology in the EU is English. Thus also this guide in English is good for various CREC partners from all EU member and accession states. Project proposals can be prepared in all official languages, eg in French or Finnish. The commission, however, have them translated to English before

[3] SME is a company:
- with fewer than 250 employees;
- either with an annual turnover which does not exceed 40 MEUR or with an annual balance sheet total which does not exceed 27 MEUR;
- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

sending them to outside evaluators. Due to their specific technological contents, translation is often very difficult if not impossible. Thus, for a better success, it is always better to prepare the original proposal already in English.

Differently from before, only the basic documents are available in 11 official languages. Some papers are available in English, French and German languages, and the rest in English only.

2.2 EU6RTD aims at European Research Area – ERA

Earlier, the member states were running their R&D policies and activities as per their own liking. This has been possible even with EU funding. Now in EU6RTD, the aim is to create a European Research Area – ERA, where all different national and European activities are working together via open cooperation and coordination, as shown in the following graphics.

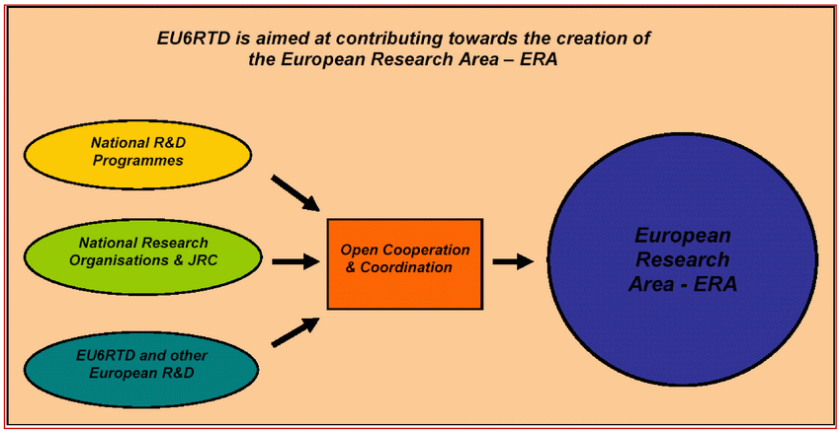


Figure 4 European Research Area – ERA

This objective has to be considered good, particularly so when considering competition with the USA and Japan. This situation is highlighted with their R&D inputs related to their Gross National Product – GDP: USA 2.7%, Japan 3.0%, and EU 1.9% only. And the gap is increasing!

While Finland is already successfully using 3.5% of GDP for R&D, it is questionable if any European coordination is good news.

2.3 What countries are along

EU funded projects can be participated by companies, research centres, universities, industry associations and any other legal entity from the present EU(15) states, associated candidate states (10+2+1) and other associated states (3+2), as shown below.

However, organisations from third countries can participate. In many cases they also can get EU funding. Directly 315 MEUR is available for specific measures in support of international cooperation involving (1) Mediterranean countries (including the Western Balkans), (2) Russia and the Newly Independent States (NIS) and (3) developing countries. Another 285 MEUR is earmarked to finance the participation of third country organisations in the "Thematic Priorities" and in the "Specific activities covering a wider field of research", thus bringing the total amount devoted to international cooperation to 600 MEUR.

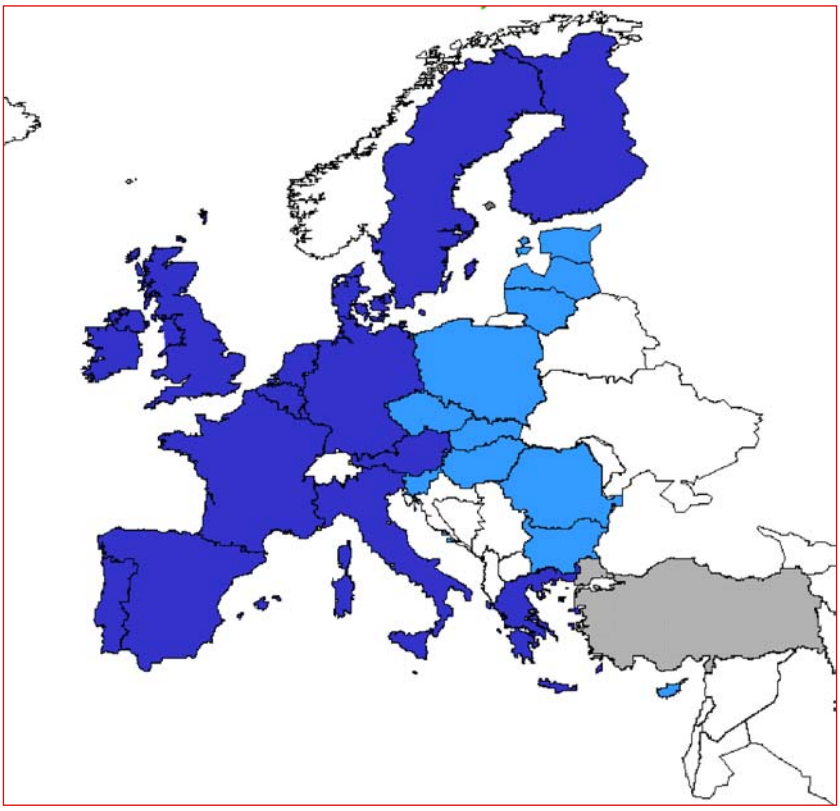


Figure 5 EU15 and Associated Candidate Countries – ACC

2.3.1 MEMBER STATES (15)

Here the countries are listed from north to south.

- Finland (FI)
- Sweden (SE)
- Denmark (DK)
- Germany (DE)
- Austria (AT)
- United Kingdom (GB)
- Ireland (IE)
- Netherlands (NL)
- Belgium (BE)
- Luxembourg (LU)

 France (FR)

 Spain (ES)

 Portugal (PT)

 Italy (IT)

 Greece (GR)

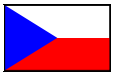
2.3.2 ASSOCIATED CANDIDATE COUNTRIES (10+2+1)

 Estonia (EE)

 Latvia (LV)

 Lithuania (LT)

 Poland (PL)

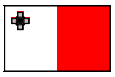
 Czech Republic (CZ)

 Slovakia (SK)

 Hungary (HU)

 Slovenia (SI)

 Cyprus (CY)

 Malta (MT)

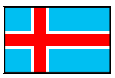
 Romania (RO)

 Bulgaria (BG)

 Turkey (TR)

2.3.3 OTHER ASSOCIATED STATES (3+2)


Norway (NO)


Iceland (IS)


Liechtenstein (LI)


Switzerland (CH)


Israel (IL)

2.4 EU6RTD Contents

A useful total presentation is a 35 page document *The 6th Framework Programme in brief*, which can be found at http://europa.eu.int/comm/research/fp6/pdf/fp6-in-brief_en.pdf. The best Internet addresses to find necessary information are the following:

http://www.cordis.lu/fp6/
http://www.cordis.lu/fp6/find-doc.htm
http://fp6.cordis.lu/fp6/calls.cfm
http://europa.eu.int/comm/research/fp6/index_en.html
http://europa.eu.int/comm/research/fp6/documents_en.html

This guide can be found in Villa Rea's Online Bookshop at www.villareal.fi.

Later in this guide also several additional addresses will be given related to subject in discussion.

2.4.1 EU6RTD – HIERARCHY OF DOCUMENTS

In the following table the hierarchy of documents is presented. It helps to understand the nature of different papers; red underlined Internet addresses take you directly to the document (Euratom's documents and references left out).

THE 6TH FRAMEWORK PROGRAMME 2002-06		
The 6th Framework Programme of the European Community for research, technological development and demonstration activities – EU6RTD http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_232/l_23220020829en00010033.pdf The 6th framework programme of the European Atomic Energy Community - EURATOM		
Rules for Participation http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_355/l_35520021230en00230034.pdf		
Specific Programme "Integrating and Strengthening the ERA" http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_294/l_29420021029en00010043.pdf	**Specific Programme "Structuring the ERA"** http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_294/l_29420021029en00440059.pdf	Specific Programme on "Nuclear Research (Euratom)"

Work Programme Change annually	**Work Programme** Change annually	

1st Call for proposals	2nd Call for proposals	…	1st Call for proposals	2nd Call for proposals	…			
Work programmes Changing each call **Guides for proposers** Change each call								

Although for each Specific Programme there is a Work Programme, it contains generic information only. Accordingly, each call for proposals is attached with its Work Programme, which actually is the most important singular document for proposers.

Also, each call has its own Guide for Proposers, separately for different project types, or instruments as they now are called.

Thus, basic pack for a proposer contains the following three documents:

- **Call for Proposals** (11 languages)
- **Work Programme** (EN, FR, DE)
- **Guide for Proposers** (EN); contains the necessary forms et al.

2.4.1.1 Terms and definitions

Already earlier several terms, abbreviations and acronyms have been used. Here I repeat some terms again as they are used in different EU documents and in this document.

CREC	⇦ Construction and Real Estate Cluster
RTD	⇦ Research and Technological Development.
EU6RTD, FP6	⇦ The 6th Framework Programme of the European community for Research, Technological Development and demonstration activities.
Call	⇦ Call for proposals.
Programme	⇦ Any thematic priority or activity within EU6RTD calls.
MS	⇦ Member State
ACC	⇦ Associated Candidate Country)
AS	⇦ Associated State, including ACC)

2.4.2 EU6RTD – STRUCTURE AND BUDGET

In the following, the whole structure and budget of EU6RTD is presented. The programmes most interesting to CREC are highlighted in yellow. It is these programmes, which this guide presents in details, including open calls and related chapters of the respective work programmes.

Objectives and Activities	Funding MEUR
EU6RTD	**16,270**
1 FOCUSING AND INTEGRATING COMMUNITY RESEARCH	**13,345**
1.1 Thematic priorities	**11,285***
1.1.1 **GPH - Life sciences, genomics and biotechnology for health**	2,255
1.1.1.1 Advanced genomics and its applications for health	1,100
1.1.1.2 Combating major diseases	1,155
1.1.2 **IST - Information society technologies**	3,625
1.1.3 **NMP - Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices**	1,300
1.1.4 **A&S - Aeronautics and space**	1,075
1.1.5 **FSQ - Food quality and safety**	685
1.1.6 **SDGE - Sustainable development, global change and ecosystems**	2,120
1.1.6.1 Sustainable energy systems	810
1.1.6.2 Sustainable surface transport	610
1.1.6.3 Global change and ecosystems	700
1.1.7 **C&G - Citizens and governance in a knowledge-based society**	225
1.2 Specific activities covering a wider field of research	**1,300**
1.2.1 Policy support and anticipating scientific and technological needs	555
1.2.2 Horizontal research activities involving SMEs	430
1.2.3 Specific measures in support of international cooperation	315
1.3 Activities of the Joint Research Centre (JRC)	**760**
2 STRUCTURING THE EUROPEAN RESEARCH AREA – ERA	**2,605**
2.1 Research and innovation	290
2.2 Human resources and mobility	1,580
2.3 Research infrastructures	665
2.4 Science and society	80
3 STRENGTHENING THE FOUNDATIONS OF THE EUROPEAN RESEARCH AREA – ERA	**320**
3.1 Support for the coordination of activities (ERA-NET)	270
3.2 Support for the coherent development of policies	50
EURATOM	**1,230**
GRAND TOTAL	**17,500**

* 15% of this for SMEs[4].

EU6RTD represents 4% of the EU's own annual budget, and 6% of all R&D performed in the EU each year.

2.4.3 SPECIFIC PROGRAMMES

Different programmes, actually priorities and activities, are clustered in specific programmes. They contain all programmes listed in the above table. Grouping, however, does not follow directly the table structure(!).

[4] SME is a company:
- with fewer than 250 employees;
- either with an annual turnover which does not exceed 40 MEUR or with an annual balance sheet total which does not exceed 27 MEUR;
- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

Specific Programme	Amount (MEUR)
1 Integrating and strengthening the European Research Area	12,905
2 Structuring the European Research Area	2,605
3 Direct actions by the Joint Research Centre	760
4 Euratom	940
5 Direct actions for the Euratom by the Joint Research Centre	290
GRAND TOTAL	17,500

In the following, the first specific programme is presented, which covers the programmes in CREC's interest.

2.4.3.1 Integrating and strengthening the European Research Area

2.4.3.1.1 INTRO

In the following table the structure and budget of this specific programme is presented. In accordance with the EC model, two first digits have been left out in programme codes. Programmes in CREC´s interest are again highlighted in yellow. Just for these programmes open calls and related work programme chapters will be presented in this guide.

The specific programme in full can be found at http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_294/l_29420021029en00010043.pdf.

Types of activities	Amount (MEUR)
FOCUSING AND INTEGRATING COMMUNITY RESEARCH [1]	**12 585**
Priority thematic areas of research [2]	**11 285**
1 GBH - Life sciences, genomics and biotechnology for health [3] 1.1 Advanced genomics and its applications for health 1.2 Combating major diseases	2 255 1 100 1 155
2 IST - Information society technologies [4]	3 625
3 NMP - Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices	1 300
4 A&S - Aeronautics and space	1 075
5 FSQ - Food quality and safety	685
6 SDGE - Sustainable development, global change and ecosystems 6.1 Sustainable energy systems 6.2 Sustainable surface transport 6.3 Global change and ecosystems	2 120 810 610 700
7 Citizens and governance in a knowledge-based society	225
Specific activities covering a wider field of research	**1 300**
8 Policy support and anticipating scientific and technological needs	555
9 Horizontal research activities involving SMEs	430
10 Specific measures in support of international cooperation [5] [6]	315
STRENGTHENING THE FOUNDATIONS OF THE EUROPEAN RESEARCH AREA	**320**
11 Support for the coordination of activities [7]	270
12 Support for the coherent development of policies	50
TOTAL	**12 905**

1 Including any amounts provided for under decisions of the European Parliament and Council pursuant to Article 169 of the Treaty.

2 Of which at least 15% to SMEs.

3 Including up to EUR 400 million for cancer-related research.

4 Including up to EUR 100 million for the further development of Géant and GRID.

5 This amount of EUR 315 million will fund specific measures in support of international cooperation involving developing

countries, Mediterranean countries, the Western Balkans, and Russia and the Newly Independent States (NIS). Another

EUR 285 million is earmarked to finance the participation of third country organisations in the "Thematic Priorities" and in

the "Specific activities covering a wider field of research", thus bringing the total amount devoted to international

cooperation to EUR 600 million.

6 Of which EUR 70 million for INTAS.

7 Of which at least EUR 50 million and up to EUR 80 million for COST.

2.4.3.1.2 PRIORITY THEMATIC AREAS OF RESEARCH

The priority thematic areas represent the bulk of expenditure under the sixth framework programme. Through a highly focused Community research effort, the intention is to generate a substantial leveraging effect which, together with actions in other parts of the framework programme and through open coordination with other – regional, national, European and international – frameworks, will result in a coherent and highly effective common endeavour towards their overall objectives.

The actions are therefore described in terms of:

- the overall objectives and expected achievements which are sought in each priority area,
- the research priorities to be pursued by means of Community action.

The priority thematic areas of research are described in terms of their overall objectives and the main research focus. The associated work programme will elaborate further on the detailed research content.

Within the thematic priority areas, the importance of the new instruments (integrated projects and networks of excellence) is recognised as being an overall priority means to attain the objectives of critical mass, management simplification and European added value contributed by Community research in relation to what is already undertaken at national level, and of the integration of the research capacities. The size of projects is not a criterion for exclusion, and access to new instruments is ensured for SMEs and other small entities.

Networks of excellence and integrated projects will be used from the start of the programme in each thematic priority area and, where deemed appropriate, as a priority means, while maintaining the use of specific targeted projects and coordination actions. In addition to research and technological development, they may incorporate the following types of activity, where they are of specific relevance to the objectives sought: demonstration, dissemination and exploitation; cooperation with researchers and research teams from third countries; human resource development, including the promotion of training of researchers; development of research facilities and infrastructure of specific relevance to the research being undertaken; and promotion of better links between science and society, including women in science.

Specific targeted research projects and coordination actions, as well as specific support actions, may also be used in the spirit of the "stairway of excellence" in the implementation of the thematic priorities.

Innovation is an important dimension which must be taken into account in the design and implementation of RTD activities. In particular, networks of excellence and integrated projects will include activities relating to dissemination and exploitation of knowledge and, where relevant, to ensure transfer of technology and facilitate exploitation of results. Where appropriate, special attention will be given to technology transfer to SMEs and to the creation of research-based enterprises as a means of exploiting research results.

The priority research areas include, in certain cases, research at the borders of traditional disciplines where advances will require interdisciplinary and multidisciplinary effort. They will

also each carry out, as appropriate, exploratory research at the leading edge of knowledge on subjects closely related to one or more topics within them. Measurement and testing aspects will also receive necessary emphasis. A particular attention will be given during the implementation of the programme to the coordination between the different priority areas, and between these areas and actions under the heading "policy support and anticipating scientific and technological needs".

The principle of sustainable development, and gender equality, will be duly taken into account. Furthermore, consideration of the ethical, social, legal and wider cultural aspects of the research to be undertaken and its potential applications, as well as socio-economic impacts of scientific and technological development and foresight, will where relevant form a part of the activities under this heading. Research on ethics related to scientific and technological developments will be carried out in the programme "Structuring the European Research Area".

The programmes in CREC's interest follow.

2.4.3.1.2.1 IST – Information society technologies (2)

Information society technologies (IST) are transforming the economy and society. Not only are they creating new ways of working and new types of business, but provide solutions to major societal challenges such as healthcare, environment, safety, mobility and employment, and have far reaching implications on our everyday life. The IST sector is now one the most important of the economy, with an annual turnover of EUR 2000 billion, providing employment for more than 12 million people in Europe.

The IST thematic priority will contribute directly to realising European policies for the knowledge society as agreed at the Lisbon European Council of 2000, the Stockholm European Council of 2001, and reflected in the e-Europe Action Plan. It will ensure European leadership in the generic and applied technologies at the heart of the knowledge economy. It aims to increase innovation and competitiveness in European businesses and industry and to contribute to greater benefits for all European citizens.

2.4.3.1.2.1.1 APPLIED IST RESEARCH ADDRESSING MAJOR SOCIETAL AND ECONOMIC CHALLENGES (I)

The objective is to extend the scope and efficiency of IST-based solutions addressing major societal and economic challenges, and to make them accessible in the most trusted and natural way, anywhere and anytime to citizens, businesses and organisations.

– Technologies for trust and security: The objective is to develop technologies for key security challenges posed by the "all-digital" world and by the need to secure the rights of individuals and communities.

Research will focus on basic security mechanisms and their interoperability, dynamic security processes, advanced cryptography, privacy enhancing technologies, technologies to handle digital assets and technologies for dependability to support business and organisational functions in dynamic and mobile systems.

– Research addressing societal challenges: The focus is on "ambient intelligence" for a broader inclusion of citizens in the Information Society, for more effective health, security, mobility and environment management and support systems, and for the preservation of cultural heritage, integration of multiple functionalities across these different domains will be also supported.

Research activities on "e-inclusion" will concentrate on systems enabling access for all, on barrier-free technologies for full participation in the information society and on assistive systems that will restore functions or compensate for disabilities thereby enabling a higher quality of life for citizens with special needs and their carers. In the area of health, the work will focus on intelligent systems aimed at supporting health professionals, at providing patients with personalised healthcare and information, and

at stimulating health promotion and disease prevention in the general population. Research will also address intelligent systems to enhance the protection of people and property and for securing and safeguarding civil infrastructures.

In the area of mobility, research will focus on vehicle infrastructure and portable systems to provide integrated safety, comfort and efficiency and allow for the provision of advanced logistics info-mobility and location based services. Research in the area of environment will focus on knowledge-based systems for natural resource management and for risk prevention and crisis management including humanitarian mine clearance. In the area of leisure, research will focus on intelligent and mobile systems and applications for entertainment. In the area of tourism, research will address knowledge sharing and interactive services. For cultural heritage, the effort will focus on intelligent systems for dynamic access to and preservation of tangible and intangible cultural and scientific resources.

– Research addressing work and business challenges: The objective is to provide businesses, individuals, public administrations, and other organisations with the means to fully contribute to, and benefit from, the development of a trusted knowledge-based economy, whilst at the same time improving the quality of work and working life and support life-long continuous learning to improve work skills. Research will also aim at a better understanding of the socio-economic drivers and impact of IST development.

Research in e-business and e-government will focus on providing European organisations, private and public, and especially SMEs, with interoperable systems and services to enhance innovation capacities, value creation and competitive performance in the knowledge economy and on supporting new business environments ("business ecosystems"). Research in organisational knowledge management will aim at supporting organisational innovation and responsiveness through elicitation, sharing, trading, and delivery of knowledge. Work on electronic and mobile commerce will target interoperable, multimodal applications and services across heterogeneous networks. It will include anytime-anywhere trading, collaboration, workflow, and electronic services covering the whole value creation cycle of extended products and services.

Research into eWork systems will focus on new workplace designs incorporating innovative technologies to facilitate creativity and collaboration, on increasing resource-use efficiency and on extending work opportunities to all in local communities. Work on eLearning will focus on personalised access to, and delivery of, learning as well as on advanced learning environments at school, university, in the workplace and in lifelong learning in general, taking advantage of the development of ambient intelligence.

– Complex problem solving in science, engineering, businesses and for society: The objective is to develop technologies for harnessing computing and storage resources which are distributed in geographically dispersed locations, and for making them accessible, in a seamless way, for complex problem solving in science, industry, business and society. Application fields include environment, energy, health, transport, industrial engineering, finance and new media.

Research will focus on new computational models, including computing and information GRIDs, peer-to-peer technologies and the associated middleware to make use of large scale highly distributed computing and storage resources and to develop scalable, dependable and secure platforms. It will include novel collaborative tools and programming methods supporting interoperability of applications and new generations of simulation, visualisation and datamining tools.

2.4.3.1.2.2 NMP – Nano-technologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices (3)

The twofold transition toward a knowledge-based society and of sustainable development demands new paradigms of production and new concepts of product-services. European production industry as a whole needs to move from resource-based towards knowledge-

based, more environmentally friendly approaches, from quantity to quality, from mass produced single-use products to manufactured-on-demand multi-use, upgradable product-services; from "material and tangible" to "intangible" value-added products, processes and services.

These changes are associated with radical shifts in industrial structures, involving a stronger presence of innovative enterprises, with capabilities in networks and mastering new hybrid technologies combining nanotechnologies, material sciences, engineering, information technologies, bio and environmental sciences. Such an evolution implies a strong collaboration across traditional scientific frontiers. Leading edge industrial developments involve also a strong synergy between technology and organisation, the performance of both being highly dependent on new skills.

2.4.3.1.2.2.1 KNOWLEDGE-BASED MULTIFUNCTIONAL MATERIALS (II)

New, high knowledge-content materials, providing new functionalities and improved performance, will be critical drivers of innovation in technologies, devices and systems, benefiting sustainable development and competitiveness in sectors such as transport, energy, medicine, electronics, photonics and construction. To assure Europe's strong positions in emerging technology markets, which are expected to grow by one or two orders of magnitude within the next decade, the various actors need to be mobilised through leading edge RTD partnerships, including high risk research and through integration between research on materials and industrial applications.

– Development of fundamental knowledge: The objective is to understand complex physico-chemical and biological phenomena relevant to the mastering and processing of intelligent materials with the help of experimental, theoretical and modelling tools. This will provide the basis for synthesising larger complex or self-assembling structures with defined physical, chemical or biological characteristics.

Research will focus on: long-term, trans-disciplinary and high industrial risk activities to design and develop new structures with defined characteristics; development of supramolecular and macromolecular engineering, focusing on the synthesis, exploitation and potential use of novel highly complex molecules and their compounds.

– Technologies associated with the production, transformation and processing of knowledgebased multifunctional materials, and biomaterials: The objective is the development and sustainable production of new "smart" materials with special functionalities and for building up macro-structures. These novel materials, serving multisectorial applications should possess characteristics to be exploited under predetermined circumstances as well as enhanced bulk properties or barrier and surface characteristics for higher performance.

Research will focus on: new materials; engineered and self-repairing materials; crosscutting technologies including surface science and engineering (including catalytic materials).

– Engineering support for materials development: The objective is to bridge the gap from "knowledge production" to "knowledge use", thus overcoming the EU industry's weaknesses in the integration of materials and manufacturing. This will be achieved by the development of new tools enabling the production of new materials in a context of sustainable competitiveness.

Research will focus on: inherent aspects of optimising materials design, processing and tools; testing, validation and up-scaling; incorporation of life-cycle approaches, obsolescence, bio-compatibility and eco-efficiency; support to materials for extreme conditions.

2.4.3.1.2.2.2 NEW PRODUCTION PROCESSES AND DEVICES (III)

New production concepts which are more flexible, integrated, safe and clean will depend on breakthrough organisational and technological developments, supporting new products, processes

and services, and at the same time decreasing (internal and external) costs. The objective is to provide the industrial systems of the future with the necessary tools for efficient life-cycle design, production, use and recovery as well as appropriate organisational models and improved knowledge management.

– Development of new processes and flexible and intelligent manufacturing systems: The objective is to encourage industry's transition towards more knowledge-based production and systems organisation and to considering production from a more holistic perspective, encompassing not only hardware and software, but also people and the way in which they learn and share knowledge.

Research will focus on: innovative, reliable, smart and cost-effective manufacturing processes, and systems, and their incorporation into the factory of the future: integrating hybrid technologies based on new materials and their processing, micro-systems and automation (including simulations), high-precision production equipment, as well as integration of ICT, sensing and control technologies, and innovative robotics.

– Systems research and hazard control: The objective is to contribute to an improved sustainability of industrial systems and a substantial and measurable reduction in environmental and health impact, that serves to remedy environmental change, through new industrial approaches, as well as enhancement of resource efficiency and reduction in consumption of primary resources.

Research will focus on: development of new devices and systems for clean, and safe production; non-polluting, sustainable waste management and hazard reduction in production and manufacturing, including bio-processes; enhancing company responsibility on products, resource consumption and industrial waste management; studying "production-use consumption" interactions, as well as socio-economic implications.

– Optimising the life-cycle of industrial systems, products and services. Products and production should become increasingly life-cycle and service oriented, in addition to the requirements of intelligence, cost-effectiveness, safety and cleanliness. The key challenge is therefore new industrial concepts based on life-cycle approaches and eco-efficiency, which must allow new products, organisational innovation and the efficient management of information and its transformation into useable knowledge within the value chain.

Research will focus on: innovative product-services systems that optimise the "design-production-service-end-of-life" value chain through of hybrid technologies and new organisational structures.

The research activities carried out within this thematic priority area will include exploratory research at the leading edge of knowledge on subjects closely related to one or more topics within it. Two complementary approaches will be utilised: one receptive and open – the other proactive.

2.4.3.1.2.3 SDGE – Sustainable development, global change and ecosystems (6)

The Treaty confirms sustainable development as a central objective of the European Community. This was emphasised by the European Council in Göteborg and is reflected in the Union strategy for sustainable development, including the Sixth Environment Action Programme. In this context, global change, energy security, sustainable transport, sustainable management of Europe's natural resources, and their interaction with human activities motivate this research priority theme. The activities carried out within this priority aim at strengthening the scientific and technological capacities needed for Europe to be able to implement a sustainable development model in the short and in the long term, integrating its social, economic and environmental dimensions, and make a significant contribution to the international efforts to mitigate or even to reverse current adverse trends, to understand and control global change and preserve the equilibrium of ecosystems.

2.4.3.1.2.3.1 SUSTAINABLE ENERGY SYSTEMS (6.1)

Strategic objectives address the reduction of greenhouse gases and pollutant emissions, the security of energy supply, the increased use of renewable energy as well as to achieve an enhanced competitiveness of European industry. Achieving these objectives in the short term requires a large-scale research effort to encourage the deployment of technologies already under development and to help promote changes in energy demand patterns and consumption behaviour by improving energy efficiency and integrating renewable energy into the energy system. The longer term implementation of sustainable development requires also an important RTD effort to assure the economically attractive availability of energy, and overcome the potential barriers to adoption of renewable energy sources and new carriers and technologies such as hydrogen and fuel cells that are intrinsically clean.

Research priorities

2.4.3.1.2.3.1.1 ***Research activities having an impact in the short and medium term (i)***

Community RTD activity is one of the main instruments which can serve to support the implementation of new legislative instruments in the field of energy and to change significantly current unsustainable patterns of development, which are characterised by growing dependence on imported fossil fuels, continually rising energy demand, increasing congestion of the transport systems, and growing CO2 emissions, by offering new technological solution which could positively influence consumer/user behaviour, especially in the urban environment.

The goal is to bring innovative and cost competitive technological solutions to the market as quickly as possible through demonstration and other research actions aiming at the market, which involve consumers/users in pilot environments, and which address not only technical but also organisational, institutional, financial and social issues.

– Clean energy, in particular renewable energy sources and their integration in the energy system, including storage, distribution and use.

The aim is to bring to the market improved renewable energy technologies and to integrate renewable energy into networks and supply chains, for example by supporting stakeholders who are committed to establishing "Sustainable Communities" employing a high percentage of renewable energy supplies. Such actions will adopt innovative or improved technical and/or socio-economic approaches to "green electricity", heat, or biofuels and their integration into energy distribution networks or supply chains, including combinations with conventional large scale energy distribution.

Research will focus on: increased cost effectiveness, performance and reliability of the main new and renewable energy sources; integration of renewable energy and effective combination of decentralised sources, cleaner conventional large-scale generation; validation of new concepts for energy storage, distribution and use.

– Energy savings and energy efficiency, including those to be achieved through the use of renewable raw materials. The overall Community objective is to reduce the demand for energy by 18% by the year 2010 in order to contribute to meeting the EU's commitments to combat climate change and to improve the security of energy supply. Research activities will focus in particular on

Eco-Buildings to generate energy savings and improve environmental quality as well as quality of life for occupants. "Polygeneration" activities will contribute to the Community target of doubling the share of co-generation (CHP) in EU electricity generation from 9% to 18% by 2010, and improve the efficiency of combined production of electricity, heating and cooling services, by using new technologies such as fuel cells and integrate renewable energy sources.

Research will focus on: improving savings and efficiency mainly in the urban context, in particular in buildings, through the optimisation and validation of new concepts and technologies, including combined heat and power and district heating/cooling systems;

opportunities offered by on-site production and use of renewable energy to improve energy efficiency in buildings.

2.4.3.1.2.3.1.2 *Research activities having an impact in the medium and longer term (ii)*

In the medium and longer term the objective is to develop new and renewable energy sources, and new carriers such as hydrogen which are both affordable and clean and which can be well integrated in a long term sustainable energy supply and demand context both for stationary and for transport applications. Furthermore the continuing use of fossil fuels in the foreseeable future requires cost-effective solutions to the disposal of CO2. The goal is to bring about further reduction in greenhouse gas emissions beyond the Kyoto deadline of 2010. The future large-scale development of these technologies will depend on significant improvement in their cost and other aspects of competitiveness against conventional energy sources, within the overall socio-economic and institutional context in which they are deployed.

2.4.3.1.2.3.2 *SUSTAINABLE SURFACE TRANSPORT[5] (6.2)*

The White Paper: "European transport policy for 2010: time to decide" forecasts a transport demand growth by 2010 in the European Union of 38% for freight and 24% for passenger transport (base-year 1998). The already congested transport networks will have to absorb the additional traffic, and the trend suggests that the proportion absorbed by the less sustainable modes is likely to grow. The objective is consequently both to fight against congestion and to decelerate or even reverse these trends regarding the modal split by better integrating and rebalancing the different transport modes, improving their safety, performance and efficiency, minimising their impact on the environment and ensuring the development of a genuinely sustainable European transport system, while supporting European industry's competitiveness in the production and operation of transport means and systems.

Research priorities

2.4.3.1.2.3.2.1 *(i) Developing environmentally friendly and competitive transport systems and means of transport (i)*

The objective is to reduce the contribution of surface transport (rail, road, waterborne) to CO2 emissions and other environmentally hazardous emissions including noise, while increasing safety, comfort, quality, cost-effectiveness and energy-efficiency of vehicles and vessels. Emphasis will be given to clean urban transport and rational use of the car in the city.

– New technologies and concepts for all surface transport modes (road, rail and waterborne). Research will focus on: high efficiency propulsion systems and their components, based on alternative and renewable fuels, taking into account the fuelling infrastructure; development of zero or near zero emission propulsion systems and components, in particular those integrating fuel cells, hydrogen combustion and their fuelling infrastructure into the transport system; integrated concepts for clean urban transport and rational use of the car in urban locations.

– Advanced design and production techniques. Research will focus on: "transport-specific" advanced design and production techniques, in particular for one-of-a-kind production environments, leading to improved competitiveness through quality, safety, recycling, comfort and cost-effectiveness of environmentally friendly vehicles (cars and trains) and vessels.

2.4.3.1.2.3.2.2 *Making rail and maritime transport safer, more effective and more competitive (ii)*

The objectives are to assure transport of passengers and freight, taking into account transport demand and the need for rebalancing transport modes, while increasing

[5] "Surface transport" is understood to cover road, rail and waterborne transport; waterborne transport covers maritime and inland waterway transport.

transport safety in line with the 2010 objectives for European transport policy (eg for road transport the objective would be to halve the number of fatalities).

- Rebalancing and integrating different transport modes.

Research will focus on: interoperable transport systems, to enable the inter-connectivity of the transport networks, in particular enabling a competitive European railway system and the integration of a European vessel traffic information system; intermodal transport services, technologies (e.g. harmonisation of unit loads) and systems, and advanced mobility management and transport logistics;–

- Increasing road, rail and waterborne safety and avoiding traffic congestion.

Research will focus on: strategies and technologies to increase road safety and to improve maritime safety; concepts and systems for advanced human-vehicle, vehicle and vehicle-infrastructure interaction; large-scale integration and validation platforms for intelligent transport systems (e.g. transport pricing, transport and traffic management and transport information), including satellite navigation applications, new vehicle types and operational procedures to increase capacity and safety, while respecting the environment (in particular in urban and sensitive areas).

2.4.3.1.2.3.3 GLOBAL CHANGE AND ECOSYSTEMS (6.3)

Global change encompasses the complex dynamic changes over different time-scales in the physical, chemical and biological components of the Earth system (i.e. atmosphere, oceans and land) in particular those influenced by human activities. The objectives of this priority area are:

(i) to strengthen the capacity to understand, detect and predict global change and develop strategies for prevention, mitigation and adaptation, in close liaison with the relevant international research programmes and in the context of relevant conventions such as the Kyoto Protocol and the Montreal Protocol;

(ii) to preserve the ecosystems and protect biodiversity which would also contribute to the sustainable use of land and marine resources. Concerning global change, strategies for integrated, sustainable management of agricultural and forest ecosystems are of particular importance for the preservation of these ecosystems and will contribute substantially to the sustainable development of Europe. These objectives will be best achieved through activities aiming at the development of common and integrated approaches necessary to implement sustainable development, taking into account its environmental, economic and social aspects, as well as the impact of global change on all countries and regions of the world. It will foster the convergence of European and national research efforts for common definitions of thresholds of sustainability and estimation methods, and encourage international cooperation in order to achieve common strategies to respond to global change issues.

Research priorities

– Impact and mechanisms of greenhouse gas emissions and atmospheric pollutants on climate, ozone depletion and carbon sinks (oceans and inland waters, forests and soil). The objective is to detect and describe global change processes, associated with greenhouse gas emissions and atmospheric pollutants from all sources, including those resulting from energy supplies, transport and agriculture, to improve prediction and assessment of their global and regional impacts, evaluate mitigation options and improve the access of European researchers to facilities and platforms for global change research.

Research will focus on: understanding and quantification of changes in the carbon and nitrogen cycles; the role of all sources of greenhouse gases and atmospheric pollutants and their sinks in the biosphere; their effects on climate dynamics and variability, ocean and atmospheric chemistry, and their interactions; future stratospheric ozone levels and ultraviolet radiation; prediction of global climatic change and impacts; associated phenomena (e.g. the North Atlantic oscillation, El Niño and changes in sea level and ocean circulation); and mitigation and adaptation strategies.

– Water cycle, including soil-related aspects: the objective is to understand the mechanisms and assess the impact of global change and in particular climate change on the water cycle, water quality and availability, as well as soil functions and quality to provide the bases for management tools for water systems to mitigate the impacts.

Research will focus on: impact of climate change on the components of the hydrological cycle – land/ocean/atmosphere interactions, groundwater/surface water distribution, freshwater and wetland ecosystems, soil functioning and water quality; assessment of vulnerability of water/soil systems to global change; management strategies, their impacts and mitigation technologies; scenarios of water demand and availability.

– Biodiversity and ecosystems: the objectives are to develop a better understanding of marine and terrestrial biodiversity and of ecosystem functioning, understand and minimise the negative impacts of human activities on them and ensure sustainable management of natural resources and terrestrial and marine ecosystems (including fresh water systems) as well as the protection of genetic resources.

Research will focus on: assessing and forecasting changes in biodiversity, structure, function and dynamics of ecosystems and their services, with emphasis on marine ecosystems' functioning; relationships between society, economy, biodiversity and habitats; integrated assessment of drivers affecting ecosystems' functioning and biodiversity, and mitigation options; risk assessment, management, conservation and rehabilitation options in relation to terrestrial and marine ecosystems.

– Mechanisms of desertification and natural disasters: the objective is to understand the mechanisms of desertification and natural disasters (such as those caused by seismic and volcanic activity), including their links with climatic change so as to improve risk and impact assessment and forecasting, and decision support methodologies.

Research will focus on: large scale integrated assessment of land/soil degradation and desertification in Europe and related prevention and mitigation strategies; long term forecasting of hydro-geological hazards; natural hazard monitoring, mapping and management strategies; improved disaster preparedness and mitigation.

– Strategies for sustainable land management, including coastal zones, agricultural land and forests: The objective is to contribute to the development of strategies and tools for sustainable use of land, with emphasis on the coastal zones, agricultural lands and forests, including integrated concepts for the multipurpose utilisation of agricultural and forest resources, and the integrated forestry/wood chain in order to ensure sustainable development at economic, social, and at environmental levels; qualitative and quantitative aspects of multifunctionality of agriculture and forestry will be addressed.

Research will focus on: development of the necessary tools for integrated management of coastal zones (ICZM); evaluation of positive and negative externalities under different production systems for agriculture and forestry; development of strategies for sustainable forest management considering regional specificity; strategies/concepts for sustainable management and multipurpose utilisation of forest and agriculture resources; cost-efficiency of new environmental-friendly processes and recycling technologies within the integrated forestry/wood chain.

– Operational forecasting and modelling, including global climate change observation systems: the objective is to make systematic observations of atmospheric, terrestrial and oceanic parameters including those of climate so as to improve forecasting of the marine, terrestrial and atmospheric environment, consolidate long-term observations for the modelling and in particular prediction, establish common European data bases and contribute to international programmes.

Research will focus on: observations of basic marine, terrestrial and atmospheric parameters necessary for global change research and management strategies, and of extreme events; large observing/monitoring/ surveying/operational

forecasting/modelling networks (taking into account the developments of GMES and providing the European dimension to G3OS 1).

– Complementary research will focus on: development of advanced methodologies for risk assessment of processes, technologies, measures and policies, appraisal of environmental quality, including reliable indicators of population health and environmental conditions and risk evaluation in relation to outdoor and indoor exposure. Relevant prenormative research on measurements and testing for these purposes will also be necessary.

The research activities carried out within this thematic priority area will include exploratory research at the leading edge of knowledge on subjects closely related to one or more topics within it. Two complementary approaches will be utilised: one receptive and open – the other proactive.

2.4.3.1.2.4 Policy support and anticipating scientific and technological needs (1.2.1 ⇨ 8.1)

These activities have a distinct role within the overall architecture of the Framework Programme 2002-2006. They involve common implementation arrangements, and the necessary critical mass, to assure efficient and flexible conduct of research which is essential to the fundamental objectives of Community research and which covers a wide range of needs that cannot be satisfied within the thematic priorities. They will have the following specific objectives:

– To underpin the formulation and implementation of Community policies, bearing on the interests of possible future members of the Union as well as the existing member states, and monitor their effects;

– To explore new and emerging scientific and technological problems and opportunities, including in particular interdisciplinary and multidisciplinary research areas, where European action is appropriate in view of the potential to develop strategic positions at the leading edge of knowledge and in new markets, or to anticipate major issues facing European society.

A feature common to these activities is that they will be implemented within a multi-annual perspective which takes direct account of the needs and viewpoints of the main associated actors (as appropriate: policymakers, industrial user groups, leading edge research groups, etc.) They will be implemented in conjunction with flexible programming mechanism to be implemented during the course of the programme, by which specific priorities, corresponding to identified needs and falling within the objectives indicated above, will be determined.

Priorities thus determined will then be inscribed in the work programme for the specific programme, alongside the priorities deriving from objectives in other parts of the programme, and updated regularly. This will result in a progressive allocation of the budget relating to these activities to the specific priorities identified, throughout the period of execution.

The programming will be carried out by the Commission, and will be based on suggestions received in response to a wide-ranging consultation of interested circles in the EU and the countries associated with the Framework Programme, regarding the topics to be included.

A first allocation of EUR 340 million will be made to the research activities specified below, which have been determined on the basis of needs which can be identified now; the remaining EUR 215 million will be allocated during the course of implementation of the specific programme, in which due consideration will be given to the need for maintaining the necessary flexibility for dealing with "policy support and anticipating scientific and technological needs".

2.4.3.1.2.5 Horizontal research activities involving SMEs[6] (1.2.2 ⇨ 9)

[6] SME is a company:
- with fewer than 250 employees;
- either with an annual turnover which does not exceed 40 MEUR or with an annual balance sheet total which does not exceed 27 MEUR;

Objectives

Small and medium-sized enterprises (SMEs) play a crucial role in European competitiveness and job creation, not only because they represent the overwhelming majority of enterprises in Europe, but also because they are the source of dynamism and change in new markets, particularly those at the leading edge of technology. Although a heterogeneous community, they are all confronted by increased competition resulting from the completion of the European internal market and the need to innovate constantly and accommodate advances in technology. Besides this, an increasing number of SMEs both need and want to internationalise in search of new markets and business opportunities.

SMEs will participate, for the most part, in the activities implemented under the priority thematic areas of research within networks of excellence, integrated projects and specific targeted research projects. In addition, specific schemes for SMEs in the form of actions on collective and cooperative research will be set up. These will be addressing primarily the large community of SMEs with a capacity to innovate but with limited research capability. However, the cooperative research scheme will also allow innovative SMEs to cooperate with universities and research centres.

Overall, in addition to the horizontal activities for SMEs, at least 15% of the budget relating to the seven thematic priorities under this programme will be allocated to SMEs.

2.4.3.1.2.5.1 COLLECTIVE RESEARCH (I)

Collective research is a form of research undertaken by RTD performers on behalf of industrial associations or industry groupings in order to expand the knowledge base of large communities of SMEs and thus improve their general standard of competitiveness. Conducted on a European basis, through substantial projects of several years duration, this is an efficient way of addressing technological needs of significant sections of the industrial community.

Based on schemes existing in many member states, this measure aims at allowing industrial groupings to identify and express research needs that are common to large numbers of SMEs at European level. It should allow to improve the overall European technological basis of whole industrial sectors. By inter-linking industrial groupings in different countries and in financing larger projects with an increased responsibility for project co-ordinators, it will contribute to structuring the landscape of collective research in line with the objectives of the European Research Area.

Collective research projects could cover, for example:

– research aimed at addressing common problems/challenges (e.g. to meet regulatory requirements, environmental performance);

– pre-normative research (research to provide a scientific base for European norms and standards);

– research aimed at reinforcing the technological basis of particular sector(s);

– development of "technological tools" (e.g. diagnosis, safety equipment).

Projects will be managed, on the basis of well-defined guidelines, by industrial associations or other groupings established at European level, or by at least two national industrial associations/groupings established in different European countries. European Economic Interest Groups representing the interests of SMEs are also eligible. A "core group" of SMEs associated to each project will monitor progress from the definition phase of the research to the dissemination of the results obtained.

A two-step approach is envisaged in identifying topics and selecting proposals (call for outline proposals and, after those selected in a first round evaluation have been developed into complete proposal(s), evaluation and selection from amongst these).

- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

The level of funding and contractual arrangements of Collective research projects will depend on their objectives:

– projects aimed at strengthening the competitiveness of a specific industrial sector would benefit from a maximum Community contribution of 50% of the total eligible costs. In such cases the contracting party (the industrial groupings) would own the results;

– projects having a strong legislative or "public well-being" content (e.g. environmental protection, enhancement of public health), could obtain a higher funding. In such cases, the main emphasis will be on a Europe-wide dissemination of the research results. In all cases, dissemination of the results amongst the SMEs would be foreseen through, for example, special training and demonstration ("take-up") actions.

2.4.3.1.2.5.2 COOPERATIVE RESEARCH (II)

Cooperative research is a scheme whereby a limited number of SMEs from different countries having specific problems or needs, outsource the required research to an RTD performer, while retaining ownership of the results. Projects are relatively short term and may address any research topic or field, being based on the specific needs and problems of the SMEs concerned. Other (non-SME) enterprises and end-users will be able to participate in co-operative research projects, under conditions ensuring they do not assume a dominant role, and have restricted access to the results.

These activities may also be carried out by innovative and high-tech SMEs in cooperation with research centres and universities.

Cooperative research will be implemented via an open call for proposals.

Information and advice about the possibilities of SME involvement will be ensured via entry points set up by the Commission, and by making use of the national contact point scheme. This activity will also be responsible for the coordination of a dedicated network of SME National Contact Points in the Member States and Associated States, providing SMEs at regional and national level with information and assistance on their participation in the Framework Programme, including in networks of excellence and integrated projects. Close coordination with the Economic and Technological Intelligence Actions and with the innovation support services, implemented under the heading "Research and Innovation", will ensure that SMEs benefit from all the foreseen instruments and activities.

2.4.3.1.2.6 Support for the coordination of activities (2.1 ⇨ 11)

2.4.3.1.2.6.1 COORDINATION OF NATIONAL ACTIVITIES

The objective is to encourage and support initiatives undertaken by several countries, in areas of common strategic interest, to develop synergy between their existing activities through coordination of their implementation, mutual opening and mutual access to research results, as well as to define and implement joint activities.

The activities concerned must be understood as programmes or parts of programmes, instruments, plans or other initiatives undertaken at national or regional levels and involving public funding to support RTD work, the development of research capabilities, and the promotion of innovation. The activities may be undertaken directly by public authorities or research agencies at national or regional levels or through European cooperation frameworks, in particular the EUROCORES collaborative scheme of the European Science Foundation.

Efforts to encourage coordination activities, using a bottom-up approach, will be carried out in the whole field of science and technology, including across domains and disciplines, in areas such as:

– health: health of key population groups; major diseases and disorders (e.g. cancer, diabetes and diabetes-related diseases, degenerative diseases of the nervous system, psychiatric diseases, cardiovascular diseases, hepatitis, allergies, visual impairment, infectious diseases), rare diseases; alternative or non-conventional medicine; and major diseases linked to poverty in developing countries; palliative care; activities involved will be implemented, for instance, through coordination of research and comparative studies, development of European databases and interdisciplinary networks, exchange of clinical practice and coordination of clinical trials.

– biotechnology: non-health and non-food applications.

– environment: urban environment (including sustainable urban development and cultural heritage, including, for example, ecosite concepts); marine environment and land/soil management; seismic risk.

– energy: new generation power plants ("near-zero-emission"), energy storage, transport and distribution.

The Community will encourage and support initiatives aimed at networking national and regional activities and programmes, by supporting:

– the coordination of independent activities including their mutual opening;

– the preparation and the management of joint activities.

For this purpose, the Community will:

– Support proposals selected following their submission in response to an open call for proposals (2 evaluations per year). Where appropriate, calls for expressions of interest, followed by targeted calls may be published.

Proposals may cover for instance strategic studies and planning, consultation of the research and innovation community, joint calls for proposals and peer review panels, exchange and dissemination of information and results, programme monitoring and evaluation, exchange of personnel.

Proposals will be evaluated taking into account in particular the following aspects: the scope of the resources mobilised, the scientific and technological relevance and impact, the expected improvement in the use of research resources at European level and where appropriate their contribution to promoting innovation.

– Develop an integrated information system, which will be easily accessible, user-friendly and updated regularly, to provide relevant information to:

– policy makers and programme managers: information on national and regional research programmes, instruments, research activities undertaken and planned to help identify

opportunities for coordination, networking or joint initiatives;

– the research community: information on national, regional or joint programmes in which they can participate.

*2.4.3.1.2.6.2 **COORDINATION AT EUROPEAN LEVEL***

The objective is to enhance the complementarity and synergy between Community actions undertaken under the Framework Programme and those of other European scientific cooperation organisations as well as among these organisations themselves. Through increased coordination and collaboration the various European cooperation frameworks will contribute more effectively to the overall coherence of European research efforts and the establishment of a European Research Area. Community participation in international activities can be supported in duly justified cases.

– Scientific and technological cooperation activities carried out in other European cooperation frameworks COST is a long-standing bottom-up mechanism that facilitates coordination and exchanges between nationally funded scientists and research teams in a variety of areas. In order for COST to continue to fulfil its intergovernmental role and to ensure a cost-effective contribution to research coordination within the European research area, its management arrangements must be adapted to the new context. This will entail the establishment by COST member states of an appropriate organisation to which financial support may then be granted under this programme.

Reinforced coordination among the activities of the European Science Foundation, COST and the Framework Programme will also be sought in areas of common interest.

Coordination with EUREKA will be strengthened to improve strategic coherence and complementarity of funding, in particular in the thematic priority areas. Joint information and communication actions will also be organised where appropriate.

2.4.4 WORK PROGRAMMES

For each specific programme there is one work programme, which gives generic rules and guidelines. For each priority and each call there is its own work programme wit more specific contents; these are presented in this document later for open calls in CREC's interest.

Here the generic part of a work program for Integrating and strengthening the European Research Area is shown.

2.4.4.1 Integrating and strengthening the European Research Area – Work Programme

2.4.4.1.1 GENERAL

Following the adoption of the specific programme for research, technological development and demonstration: "Integrating and strengthening the European Research Area" and the rules of participation and dissemination under the EC Treaty, the Commission has adopted, with the assistance of the programme committee, this work programme which sets out in greater detail the objectives and technological priorities and the timetable for implementation of the specific programme, in particular for the first year of operation.

As regards the Priority Thematic Areas of Research, the new instruments (integrated projects and networks of excellence) are recognised as being an overall priority means to attain the objectives of critical mass, integration of the research capacities, management simplification and European added value.

The new instruments referred to will be used from the start in each theme and, where deemed appropriate, as a priority means, while maintaining the use of specific targeted projects and co-ordination actions. In particular, a smooth transition with previous programmes will be ensured.

In terms of participation of the Community in programmes undertaken by several Member States (Article 169 of the Treaty), this is only foreseen, at this stage, in the priority thematic area of research addressing ‘life sciences, genomics and biotechnology for health’.

More information on the provisions for implementing the new instruments is available on Cordis (address/hyperlink to be inserted).

Regarding research activities in areas involving Specific Activities Covering a Wider Field of Research, these will be implemented, at this stage, using specific targeted research projects, co-ordination actions, and specific research projects for small and medium sized enterprises (SMEs).

Concerning Strengthening the Foundations of the European Research Area, the implementation will mostly take the form of specific targeted research projects and co-ordination actions.

Specific support actions, including calls for tender, and co-ordination actions may be applied throughout the programme

In drawing up this work programme, the Commission has relied on advice from advisory groups and, for the Priority Thematic Areas of Research, on the results of a call for expressions of interest, which was launched in early 2002. More information on this, including the list of members of the advisory groups and the results of the call for expressions of interest, is available on Cordis.

2.4.4.1.2 SCOPE OF WORK PROGRAMME

The scope of this work programme corresponds to that defined in the specific programme. The calls for proposals planned within this work programme are those foreseen to close in 2003 along with, in many cases, an indication of those calls intended to close in 2004. Annex A gives an overview of these calls. Some topics in the specific programme have been left until a later stage and these will be addressed in future revisions of the work programme.

2.4.4.1.3 CROSS CUTTING ISSUES

There are several issues that are important to all parts of the work programme. These are addressed here and, as appropriate, elaborated in the various parts. Please note that the work related to statistics in this work programme will be implemented in close co-operation with EUROSTAT, in particular the parts relating to the priority thematic areas “Information Society technologies” and “Citizens and governance in a knowledge-based society”, as well as the part addressing policy-oriented research under the heading “Specific activities covering a wider field of research”.

a) This work programme places special emphasis on the needs of small and medium-sized enterprises (SMEs). In particular, at least 15% of the funding allocated to the Priority Thematic Areas of Research is foreseen for SMEs. In order to reach this objective, special actions are foreseen such as SME specific calls for proposals in the context of the new instruments, reinforcement of National Contact Points, and specific training and take-up measures. In addition, the involvement of SMEs is taken into account in the evaluation criteria particularly for the new instruments. Also the fact that enterprise groupings which represent large communities of SMEs may play an active role in the new instruments will contribute to reaching the above-mentioned objective.

b) Proposers based in Associated States may take part in this programme on the same footing and with the same rights and obligations as those based in Member States. In addition, this work programme underlines the importance of involving associated candidate countries in the Community's research policy and in the European Research Area. Specific support actions will also be implemented to stimulate, encourage and facilitate the participation of organisations from the candidate countries in the activities of the priority thematic areas. These will comprise information, awareness and training activities, promotion of candidate country competencies, support to researchers from these countries to participate in conferences and to prepare proposals, establishment and reinforcement of networks or centres of excellence between Member States and candidate countries, and between centres of excellence of candidate countries and within candidate countries, measures in support of SMEs in candidate countries to better participate, evaluation of RTD systems and policies in a particular field, the screening of research establishments active in a particular field, and prospective studies aimed at defining research policies and organisation of research systems in a particular field.

c) International co-operation represents an important dimension of the Sixth Framework Programme. As a contribution to a European Research Area open to the world, it will be implemented in the Sixth Framework Programme through three major routes:

- The opening of “Focusing and Integrating Community Research” to third country organisations with substantial funding,

- Specific measures in support of international co-operation, and

- International activities under the heading of Human Resources in the specific programme for research, technological development and demonstration "structuring the European Research Area".

The first two, as part of the specific programme “Integrating and strengthening the European Research Area”, are covered by the present work programme. They also correspond to the second activity referred to in Article 164 of the Treaty, which covers co-operation with third countries and international organisations.

- Opening of “Focusing and Integrating Community Research” to third country organisations

Funding is available for the participation of researchers, teams and institutions from third countries in projects within the seven Priority Thematic Areas of Research, as well as under “Specific activities covering a wider field of research”. Under this heading, the activities in question have the following overall objectives:

- To help European researchers, businesses and research organisations in the European Union and in the countries associated with the Framework programme to have access to knowledge and expertise existing elsewhere in the world, and

- To help ensure Europe’s strong and coherent participation in the research initiatives conducted at international level in order to push back the boundaries of knowledge or help to resolve the major global issues.

Any particular issue concerning the international dimension of the seven Priority Thematic Areas of Research and of the Specific activities concerning a wider field of research is set out in the relevant chapter of this work programme.

Participants from all third countries and from international organisations may take part in all activities under this heading in addition to the minimum number of participants required.

Participants from developing countries, Mediterranean partner countries, Western Balkan countries, as well as Russia and the new independent states (see the list of countries in Annex C) can be funded in all activities under this heading .Other third country participants can also be funded in those areas where the relevant part of this work programme makes reference to this possibility or if it is essential for carrying out the research activity.

- Specific measures in support of international co-operation

315 million Euros will fund “Specific measures in support of international co-operation”. In support of the external relations, including the development policy, of the Community, these measures target the following groups of third countries: Developing countries, Mediterranean partner countries, Western Balkan countries, and Russia and the new independent states. The activities and calls for proposals under this heading, which are complementary to the opening of the Priority Thematic Areas of Research, are presented in Chapter 10 of this work programme. Requirements for consortium composition are set out in this part.

- Participation and funding for third country entities under the heading “Strengthening the European Research Area”

International co-operation with third country partners and international organisations will be actively fostered on all topics which will benefit from such co-operation. Furthermore, third country entities and international organisations can benefit from Community financial contribution. To this end, topics for international co-operation will be specified, where appropriate, in calls. This applies particularly to those third countries with whom cooperation agreements have been concluded.

d) Research activities carried out under this work programme must respect fundamental ethical principles and the requirements as stipulated in the decision on the specific programme for research, technological development and demonstration: "Integrating and strengthening the European Research Area". More information on the review procedure is

foreseen in the “Guidelines on Proposal Evaluation Procedures”. Annex B to this work programme also details the issues to be covered in any ethical review.

e) As much as possible and in association with the specific programme for research, technological development and demonstration "Structuring the European Research Area", the mobility of researchers will be promoted, particularly with a view to the successful creation of the European Research Area.

f) This work programme attempts, where possible, to reinforce and increase the place and role of women in science and research both from the perspective of equal opportunities and gender relevance of the topics covered.

g) A particular effort will be carried out to take into consideration the ethical, social, legal, regulatory and wider cultural aspects of the research including socio-economic research, and innovation, resulting from the possible deployment, use and effects of the newly developed technologies or processes and scenarios covered by each of the thematic priorities. This effort will be complemented by socio-economic research carried out within the priority addressing ‘Citizens and governance in a knowledge-based society’.

h) In the context of the regular report to be submitted to the European Parliament and the Council, the Commission will report in detail on progress in implementing the specific programme, and, in particular, progress towards achieving its objectives and meeting its priorities.

2.4.4.1.4 SUBMITTING A PROPOSAL

Proposals should be submitted under the terms of a call for proposals. In order to submit a proposal, a proposer should consult the following:

- This work programme,
- The relevant call for proposals as it is published in the Official Journal of the European Communities, and
- The relevant Guide for Proposers.

These and a number of other useful texts, including the rules for participation and details on the contracts, are available on Cordis (as referred to above).

2.4.4.1.5 CROSS CUTTING PROPOSALS

Proposals are invited to be submitted on the basis of calls for proposals, which are, in the case of the Priority Thematic Areas of Research organised thematically. Proposals that address more than one thematic area will be accommodated by the Commission, provided the proposal addresses areas covered by this work programme.

The specific programme is focused on a number of thematic priorities. They encompass a wide range of disciplines and proposals that cut across the boundaries of themes are to be expected. The criterion of relevance to the objectives of the specific programme is a sine qua non for the further consideration of such proposals. Furthermore, proposals will not be accepted if they do not fall within the scope of the work programme.

Cross-cutting proposals may be categorised as follows:

- Proposals with a clear “centre of gravity”. Given the nature of research carried out today, a large proportion of proposals contain some degree of multi-disciplinarity. These are handled by normal submission and evaluation procedures. For proposals which contain a significant technological or thematic element from a different part of the programme, the procedure involves the proposal being treated by the thematic area represented by the greatest proportion of the proposal (ie, its “centre of gravity”). For proposals where the centre of gravity is not immediately obvious, the Commission will examine the proposal content and decide in which thematic area the proposal is best handled. If a proposal is transferred to a thematic area other than the one to which it was submitted, it will be handled in the frame-work of the new thematic area. However, if the new centre of gravity does not have an open call at the time of transfer, the proposal will be held over, with the agreement of the proposers, until a suitable call is open, but only if such a call is explicitly

foreseen by the work programme. If successful, the proposal will be handled and funded by the thematic centre of gravity.

- Joint calls for proposals. In certain fields, it is clear that proposals will always contain a high proportion of interest for different thematic areas. In this instance, the Commission uses calls for proposals issued jointly by two or more programme/thematic areas, with a pooling of budget. This procedure only occurs for well-defined areas where the cross cutting nature of the proposals to be received can be clearly identified in advance.
- Proposals with horizontal interest. These relate to proposals which are of general interest to all parts of the specific programme but of no specific interest to an individual part. If such proposals are truly innovative and ground breaking, there is the possibility of referring them to the work programme part that addresses “anticipating scientific and technological needs”, once this part is open for the receipt of such proposals. Proposals with a horizontal interest which do not meet this criterion may, if applicable, be handled like proposals with a centre of gravity (see first bullet point).

2.4.4.1.6 EVALUATION CRITERIA AND RELATED ISSUES

The “Guidelines on Proposal Evaluation Procedures” describes the basic procedures to be followed by all programmes under the Sixth Framework Programme of the European Community.

The set of criteria applicable to this work programme is given in Annex B. Any complementary criteria are clearly stated in the relevant part of this work programme. Evaluation thresholds for each set of criteria are given in Annex B and apply unless otherwise clearly stated. In addition, Annex B outlines how the following will be addressed: gender issues, ethical and/or safety aspects, and the education dimension.

All proposals before they are selected for funding and which deal with ethical issues and any proposal for which ethical concerns have been identified during the scientific evaluation may be reviewed by a separate ethical review panel. The “Guidelines on Proposal Evaluation Procedures” gives more details on the evaluation procedure as a whole as well as details of the ethical review procedure.

Furthermore, the work programmes, and consequently their calls for proposals, may specify and restrict the participation of legal entities in an indirect action according to their activity and type, according to the instrument deployed and to take into account specific objectives of the Framework Programme.

Calls for proposals may involve a two-stage evaluation procedure. When such a procedure is employed, this is stated clearly in the call for proposals. More information on this process is given in the “Guidelines on Proposal Evaluation Procedures”.

2.4.4.1.7 SPECIFIC SUPPORT ACTIONS

Support activities are more limited in scope than the accompanying measures of the previous Framework Programmes. These projects aim to contribute actively to the implementation of activities of the work programme, the analysis and dissemination of results or the preparation of future activities, with a view to enabling the Community to achieve or define its RTD strategic objectives. Therefore, a significant emphasis has been placed on Support Actions:

- to promote and facilitate the dissemination, transfer, exploitation, assessment and/or broad take-up of past and present programme results (over and above the standard diffusion and exploitation activities of individual projects);
- to contribute to strategic objectives, notably regarding the European research area (e.g. pi-lot initiatives on benchmarking, mapping, networking, etc.);
- to prepare future community RTD activities, (e.g. via prospective studies, exploratory measures. pilot actions etc.);

as opposed to awareness and information exchange activities, e.g. annual Workshops and Conferences, that would take place anyway without Commission support. The latter activities will not be welcome if they do not serve the programme’s strategic objectives, (in the sense of

the European Research Area, improved co-ordination, public awareness, preparation of future Community initiatives, etc.).

2.4.5 INSTRUMENTS & FUNDING

2.4.5.1 Instrument Descriptions

Earlier all good ideas with well prepared project proposals were able to get funding. In EU6RTD, however, now big projects, actually more like project clusters or programmes, are expected. Accordingly, new instruments (or project types) are introduced, as follows.

Integrated Projects - IP

- Clearly defined development objectives.
- Typically industry-led project.
- Duration 3-5 years.
- Magnitude >30 MEUR.
- EU funding max 50%; usually less, and complementary funding is necessary

Networks of Excellence - NoE (or NE)

- Advancing research and integrating the activities of the consortium partners on a particular research topic and spread achieved excellence.
- Research centre/university-led project; 100-500 researchers in the network
- Duration over 5 years plus continuation thereafter without EU funding
- Magnitude >10 MEUR
- EU funding as per the number of researchers in the network, max 25%.

Typical to both instruments is the autonomy of the project and the consortium (externalisation). The project contents will be refined during the implementation of the project. New sub-projects can be established and new partners taken in through own public call. The budget and received EU funding can be used pretty freely without the detailed scrutiny of person-hours and cost categories by the Commission, which is then concentrating on the results, output instead of input, which is right.

The minimum number of partners is three, from three countries (MS or AS, at least two from MS or ACC). As the projects are big and they need to improve European competitiveness and society, a successful project most probably has a Europe-wide participation, not forgetting candidate states. Dependant on the programme and particular call, IPs and NoEs may be also smaller.

In the last minute of the EU decision-making process, also the conventional projects were -fortunately - approved, described as follows:

Specific Targeted Research Projects – STREP (or STRP)

- Similar to earlier RTD projects
- Typically industry-led project
- Duration 2-4 years
- Magnitude 2-10 MEUR
- EU funding max 50%

This conventional instrument (project type) was returned to the EU6RTD by the European Parliament, as required by European Council of Civil Engineers - ECCE in their position paper (I was chairing the ECCE R&D Task Group). Also here the minimum number of partners is three from three countries (MS or AS, at least two from MS or ACC). An ideal STREP project has 5-8 partners from 3-6 countries.

Specific research projects for SMEs[7]:

[7] SME is a company:
- with fewer than 250 employees;
- either with an annual turnover which does not exceed 40 MEUR or with an annual balance sheet total which does not exceed 27 MEUR;

Cooperative research – CRAFT

- Similar to earlier CRAFT projects; any subject.
- SME-led project, where R&D is mainly performed by research organisations.
- Duration 1-2 years.
- Magnitude 0.5-2.0 MEUR.
- EU funding max 50%.

The ITRE Committee of the European Parliament proposed that Exploratory Award (25,000 – 50,000 EUR) should be returned into EU6RTD, as required by European Council of Civil Engineers - ECCE in our position paper (I was chairing the ECCE R&D Task Group). The parliament, however, gave up after compromise negotiations.

The minimum number of partners is three independent SME participants from three countries (MS or AS, at least two from MS or ACC), and two RTD performers from two countries (MS or AS, at least one from MS or ACC). In addition, some other enterprises and end-users that have a particular interest in solving specific problems or needs of the SMEs involved may participate in the project. The RTD performers must account for at least 40% of the total eligible costs for research and innovation-related activities of the project.

Collective research

- Medium-term research activities carried out by technical research organisations for industrial associations or industry groupings in entire sectors of industry dominated by SMEs at the European level; any subject.
- Duration 2-3 years.
- Magnitude 2-5 MEUR.
- EU funding max 50%.
- Two-stage proposals

The minimum number of partners is two independent Industrial Associations/Groupings from two countries (MS or AS, at least one from MS or ACC), or one European Industrial Association/Grouping established in a Member State or Associated State according to its national law and which is made up of a minimum of two independent legal entities from two countries (MS or AS, at least one from MS or ACC). In addition, there must be at least two RTD performers independent from any other participant from two countries (MS or AS, at least one from MS or ACC), and an “SME core group” of at least two independent SMEs from two countries (MS or AS, at least one from MS or ACC)

Other instruments available, not described here in more details, are:

National programmes carried out jointly - **Article 169**: By governments or national research organisations and industries. Apparently for no good use.

Networking of national programmes: ERA-NETs to be implemented as specific support action (for preparation) and/or coordination action (running); see below.

Specific support actions – SSA: Similar to earlier accompanying measures.

Coordination actions – CA: Similar to earlier thematic networks and concerted actions.

Full descriptions of different instruments can be found at http://europa.eu.int/comm/research/fp6/instruments_en.html and a summary document at http://europa.eu.int/comm/research/fp6/pdf/instruments_111102.pdf.

2.4.5.2 Funding

In the following table funding for all instruments in different cases is presented.

- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

Type of Instrument	RTD Activities	Community Contribution (1)
Networks of Excellence (NoE)	– Priority thematic areas – Policy support and anticipating scientific and technological needs	Grant for integration: maximum of 25% of the value of the capacity and resources proposed for integration by participants as a fixed amount to support the joint programme of activities (2)
Integrated Projects (IP)	– Priority thematic areas – Policy support and anticipating scientific and technological needs	Grant to the budget of a maximum of - 50% for research - 35% for demonstration - 100% for certain other activities such as training of researchers and consortium management (3) (4)
Specific Targeted Research or Innovation Projects (STREP)	– Priority thematic areas – Policy support and anticipating scientific and technological needs – Specific international cooperation activities – Promoting interaction between research and innovation – Developing harmonious relations between science and society	Grant to the budget of a maximum of 50% of the budget (3) (4)
Participation in programmes undertaken by several Member States (Article 169)	– All activities of the 6th Framework Programme	To be defined in subsequent decisions taken on the basis of Article 169
Specific Research Projects for SMEs (CRAFT) (Collective Research)	– Specific research activities for SMEs	Grant to the budget of a maximum of 50% of the budget, and 100% for certain other activities such as training of researchers and consortium management (3) (4)
Actions to Promote and Develop Human resources and Mobility	– Promotion of human resources and mobility	Grant to the budget of a maximum of 100% of the budget (3), if necessary as a lump sum.
Coordination Actions (CA)	– In all the activities of the 6th Framework Programme.	Grant to the budget of a maximum of 100% of the budget (3).
Specific Support Actions (SSA)	– In all the activities of the 6th Framework Programme	Grant to the budget of a maximum of 100 % of the budget (3) (6), if necessary as a lump sum
Integrated Infrastructure Initiatives	– Support for research infrastructures	Grant to the budget: depending on the type of activity, of a maximum of 50% to 100% of the budget (3) (4) (5)

(1) As a general principle, the Community financial contribution cannot cover 100% of the expenditure of an indirect action with the exception of proposals covering a purchase price governed by the terms applicable to public procurement procedures or taking the form of a pre-defined lump sum pre-set by the Commission. However, the Community financial contribution may bear up to 100% of the expenditure of an indirect action if they complement those otherwise borne by the participants. Also, in the specific case of coordination actions, it covers up to 100% of the budget necessary for the coordination of activities funded by the participants themselves.

(2) This rate varies for different areas.

(3) Subject to specific conditions specific legal entities, particularly public bodies, will receive funding of up to 100% of their marginal/additional cost.

(4) The rates of assistance may be differentiated in accordance with the rules of the Community framework for State aid for research and development depending on whether activities relate to research (maximum 50%) or demonstration (maximum 35%) or to other activities implemented, such as training of researchers (maximum 100%) or the management of the consortium (maximum 100%).

(5) The activities of an integrated initiative relating to infrastructure must include one networking activity (Coordination Action: maximum 100% of the budget) and at least one of the following activities: research activities (maximum 50% of the budget) or specific service activities (Specific Support Action, for example, transnational access to research infrastructures: maximum 100% of the budget).

(6) For actions in support of research infrastructure relating to preparatory technical work (including feasibility studies) and the development of new infrastructure, 6th Framework Programme participation is restricted to maximum of 50% and 10% of the budget respectively.

(7) In addition, the JRC will be entitled to participate in indirect actions on the same basis as entities established in Member States

2.4.5.3 How to calculate costs and funding

All usual costs caused by the implementation of the project:

- Personnel costs
- Durable equipment (depreciation)
- Subcontracting
- Consumables (materials, sundries, including software licenses)
- Computing (special)
- Protection of knowledge (patents)
- Other costs (conference fees, bank guarantee etc)
- Overheads

The **Community grant** to be requested for a proposal depends on the cost model applicable to each participant and on the costs for the different activities. Maximum contributions as percentage of the respective costs are as follows:

Activity	Maximum grant as percentage of full costs (participants applying the FC or FCF model)	Maximum grant as percentage of additional costs (participants applying the ACF model)
RTD activities	50%	100%
Demonstration activities	35%	100%
Innovation-related activities	50%	100%
Training activities	100%	100%
Consortium management activities	100% (up to a maximum percentage of 7% of the Community contribution)	100% (up to a maximum percentage of 7% of the Community contribution)

The **cost models** to be applied by the participants have to be chosen according to the following instructions:

- **FC**: a full-cost model in which all actual direct and actual indirect costs may be charged to the contract;
- **FCF**: a simplified variant of the full-cost model, in which all actual direct costs may be charged to the contract, together with a flat-rate rate of 20% of all these direct costs, excluding subcontracts, which will be deemed to cover all related indirect costs;
- **ACF**: an additional-cost model, covering all direct costs that are additional to the recurring costs of a participant (with the exception of consortium management for which recurring costs would also be eligible), together with a flat-rate of 20% of all these direct costs, excluding subcontracts, which will be deemed to cover all related non-recurring indirect costs.

2.4.6 26 EXPRESSIONS OF INTEREST MADE BY THE FINNISH CREC

In the spring 2002 the EC called for initial proposals for Integrated projects – IP and Networks of Excellence – NoE in a form of Expression of Interest – EoI. Over 11,700 proposals came, and some 4-5% from CREC. These proposals can be found at http://eoi.cordis.lu/search_form.cfm.

I analysed all Finnish-origin (= coordinated by a Finnish organisation) 238 EoIs. 26 projects or 11% (!) are serving CREC's need, see the following table.

Project Title	***Acronym***	***Coordinator***	***Contact Person***
1. Development of Methods To Ensure Sustainable Water Resources	*DEMESWAR*	*Kemira Chemicals*	*Timo KENAKKALA*
2. Supporting European Competitiveness in	*Secure-forests*	*Finnish Forest*	*Gerardo MERV*

	the Changing Forest Sector		*Research Institute (METLA)*	
3.	*Demand-Based Optimisation Of Sustainable Forest-Woodchains*	*DEMOWOOD*	*VTT*	*Arto USENIUS*
4.	*Third generation of engineered wood products*	*EWP3G*	*Wood Focus*	*Aarni METSÄ*
5.	*Research and development of knowledge based, ICT intensive mechanical wood production processes, new wood based products and sustainable use of wood resources.*	*eWOOD*	*Lappeenranta University of Technology*	*Jaakko VUORILEHTO*
6.	*Ecological, Energy and Material Optimised Wood Production System*	*EcolOptWood*	*YTI Research Centre of Mikkeli Polytechnic*	*Hannu KUOPANPORTTI*
7.	*Innovative Integrated Tailored Public Transport*	*INNO-INPUT*	*Helsinki City Transport*	*Seppo VEPSÄLÄINEN*
8.	*Sophisticated Simulation Methods and European Traffic Models*	*SIMTRAM*	*LT Consultants*	*Jarkko NIITTYMÄKI*
9.	*Nanoscopic Simulation of Traffic*	*NANOSIM*	*VTT*	*Juha LUOMA*
10.	*Development of Interoperable Pan-European Rail Freight Business*	*RAILNET*	*VTT*	*Pekka LEVIÄKANGAS*
11.	*Network of Center of Excellencies of Industrial Ventilation*	*INVENTERA*	*HUT*	*Markku LAMPINEN*
12.	*Procedures for the Encouragement of Participation in Urban Planning*	*PEP-UP*	*HUT*	*Tarkko OKSALA*
13.	*Global excellence network for environmental rating and performance assessment of buildings*	*GeneratE*	*Motiva*	*Ilari AHO*
14.	*Functional Building Materials*	*FUBUMAT*	*VTT*	*Anne-Christine RITSCHKOFF*
15.	*Intelligent product catalogs for construction*	*i-CAT*	*VTT*	*Matti HANNUS*
16.	*Management of lifetime monetary economy of civil infrastructures*	*INFRALIFEECONOMY*	*VTT*	*Markku TUHOLA*
17.	*Optimisation of performance, usability and service life of buildings*	*na*	*VTT*	*Laura APILO*
18.	*Risk management of contaminated built environment*	*BENRISK*	*VTT*	*Auli KUUSELA-LAHTINEN*
19.	*Smart and flexible*	*SmaF*	*VTT*	*Leena SARVARANTA*
20.	*Sustainable intelligent urban infrastructure*	*SINUS*	*VTT*	*Pekka LAHTI*
21.	*Whole life optimised building concept models*	*LIFEOPTIMUMBUILDINGS*	*VTT*	*Asko SARJA*
22.	*Flexible working – providing highly serviced, re-configurable building space*	*FLEXCORE*	*VTT (RAKLI)*	*Brian ATKIN*
23.	*Healthy living – innovative solutions for delivering affordable, safe, adaptable homes*	*HELPFUL*	*VTT (Kiinteistöliitto)*	*Brian ATKIN*
24.	*Intelligent decision tools – enabling accurate predictions of a building's impact*	*INDECORE*	*VTT (RT)*	*Brian ATKIN*
25.	*Sustainable communities – workable sustainability concepts, buildings and infrastructure*	*SUSCORE*	*VTT (RAKLI)*	*Brian ATKIN*
26.	*Tele-care – utilising innovative housing and advanced ICT in the home*	*MEDICCORE*	*VTT (Kiinteistöliitto)*	*Brian ATKIN*

This list gives a good cross-section about the different ideas, which are seen important to carry forward within CREC.

2.4.7 PROJECT PROPOSAL PREPARATION

2.4.7.1 General

Project proposals must be prepared carefully, fully following the different documents concerned. Below the three most important documents a repeated:

- **Call for Proposals** (11 languages)
- **Work Programme** (EN, FR, DE)
- **Guide for Proposers** (EN); contains the necessary form et al.

While preparing a proposal, it is important to keep in mind the principal evaluation criteria as follows:

- Relevance to the call (is your programme/area/action line and/or instrument now open)
- Potential impact (European added value and contribution to Community policies)
- Scientific and technological excellence and the degree of innovation (also: the quality of the plan for using and disseminating the knowledge, potential for promoting innovation)
- Quality of the consortium (ability to carry out the project successfully, assessed in terms of resources and competences)
- Quality of management (efficient management including the organisational arrangements laid down by the participants)
- Mobilisation of resources (critical mass of resources mobilised)

Any particular interpretations of the criteria to be used for evaluation are set out in the work programme, in particular the way in which they translate into the issues to be examined, including their individual weights and thresholds and the overall threshold. In case of 2-stage call, in the first stage the three first criteria only are considered. On the second stage all six criteria are used.

Always the quality of the project proposal document itself is important! It might be useful to make a 1-2 page intro at the beginning of the document summarising the proposal as per the evaluation criteria (this makes it easier for evaluators, who might not know your business area at all, to understand your proposal suitably for their evaluation process). Also, it might be useful to take a look at Guidelines on Proposal Evaluation and Selection Procedures, which can be found at http://www.cordis.lu/fp6/find-doc.htm.

Project proposal must be .PDF (portable document format of Adobe Acrobat, version 3 or higher) or .RTF format (rich text format by Microsoft). The recommended font size is 12 points, and definitely not smaller that 10 points (= the font size of this guide).

Proposal preparation and submission is possible by one of the following 4 methods:

- On-line preparation and submission using the Electronic Proposal Submission System (EPSS)
- Preparation off-line using the same tool as EPSS, followed by on-line submission via EPSS
- Off-line preparation using the same tool as EPSS followed by submission on CD or diskette
- On paper using form in the Guide for Proposers (however: always send a CD or diskette!)

To assist the Commission in its evaluation planning, proposers (coordinator) are requested to notify their intention to submit a proposal, no matter if they intend to submit electronically or on paper. This can be done at http://www.cordis.lu/fp6/pre_registration.htm.

An informal advisory pre-proposal check service may be offered in some areas (notably for measures for SMEs) by the Commission to researchers. The purpose is to advise potential proposers on whether proposals appear to be eligible and within the scope of the call. Details of the procedure for pre-proposal checks are set out in the relevant Guide for Proposers.

2.4.7.2 Assistance & partner search

Network of National Contact Points – NCPs in all Member States and Associated States is the main provider of advice and individual assistance. As the NCPs are national structures, the type and level of services offered may differ from country to country. In general, the following basic services will be available in accordance with the Guiding Principles agreed by all countries:

- Guidance on choosing thematic priorities and instruments
- Advice on administrative procedures and contractual issues
- Training and assistance on proposal writing
- Distribution of documentation (forms, guidelines, manuals etc.)
- Assistance in partner search

Typically, for each programme (= priority, activity) there is a person in charge. You can find the contact details of the designated National Contact Points for your country at http://www.cordis.lu/fp6/ncp.htm. Specific information about each NCP service is available on its own website.

For SMEs there is a dedicated advisory service within the NPC network. At the above Internet address, click your country and SME in NCP field to find your NCP – SME. Additional useful websites to assist SMEs are found at http://sme.cordis.lu/home/index.cfm, and http://www.cordis.lu/innovation-smes/.

If you need additional partners, potential partners can be found at http://partners-service.cordis.lu/; there is a specific facility for SME search. Here you can also insert your own data for others to see and contact.

Useful information is also available via the Innovation Relay Centre – IRC network in all Member States and Associated States. The IRC Network is organised into 68 IRCs and 220 regional offices which are supported by business services. For further information, go to http://irc.cordis.lu/whoswho/ to find out which is your nearest contact.

2.5 Calls 13 & 17.12.2003 …

2.5.1 GENERAL

In the following, the most interesting programmes (= priorities, activities) are presented. There are some opportunities, however, also outside of these programmes.

The first round of calls 17 Dec 2002 contained altogether 49 (EU6RTD) + 2 (EURATOM) calls. Now, in the "second" round of calls, the following calls in CREC's interest are open:

Date of Call Call Identifier Instruments	Programme Call Title	Indicative Budget (MEUR)	Date of Closure	
			1st Stage	2nd Stage
13 Dec 2003	**NMP (3)**			
FP6-2003-NMP-NI-3 IP, NE	Thematic call in the area of 'Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices – NI'	245	02 Mar 2004	22 Jun 2004
FP6-2003-NMP-TI-3-main STREP, CA, SSA	Thematic call in the area of 'Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices'	105	12 May 2004	na
FP6-2003-NMP-SME-3 IP	Dedicated call for IPs for SMEs in the area of 'Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices'	80	02 Mar 2004	22 Jun 2004
FP6-2003-NMP-STEEL-3 IP	Dedicated call in the area of 'Very low CO2 Steel Processes', launched in co-ordination with the 2003 and 2004 calls of the Research Fund for Coal and Steel.	20	17 Mar 2004	na
	SDGE (6)			
FP6-2003-Transport-3 IP, NoE, STREP, CA	Thematic call in the area of 'Surface Transport 2B'	150	06 Apr 2004	na
17 Dec 2003	**SME (9)**			
FP6-2003-SME-1 CRAFT	Co-operative research projects	75	21 Oct 2004	na
FP6-2003-SME-2 Collect	Collective research projects	41	06 Apr 2004	Mid Sep 2004

Here the following earlier-mentioned link is handy: http://fp6.cordis.lu/fp6/calls.cfm.

There is an individual work programme for each call, which gives you detailed instructions, terms and conditions. Read that through carefully. Work programmes shall be presented later in this document under each CREC-related call.

2.5.2 INTEGRATING AND STRENGTHENING THE EUROPEAN RESEARCH AREA

2.5.2.1 General

What is said in the following, concerns the second round of calls, which opened 13 and 17 Dec 2003. Some explanatory notes are in the following.

- Not all programmes/areas/topics are now open. Concerning the CREC-related programmes not now open (eg Information Society Technologies – IST) there is, however, some useful respective

information presented in this guide as it was in the first call of 17 Dec 2002; all this information appears in light blue.

- Not all instruments (project types) are available; actually, typically one or two instruments only in each call.
- The third round of calls is expected in one year's time; several programmes have also intermittent calls.
- For the same programme each call can be very different; different and/or new areas/ instruments/budgets.

For each programme typically the under-listed information is here presented; however, in such a way as they have been expressed in each call (no standard contents).

- Programme
- Introduction
- Call
  - Call title
  - Call Identifier
  - Date of publication (opening)
  - Closure date(s)
  - Areas
  - Instruments
- Those parts of the respective work programme, which concern the area called above.

Calls in CREC's interest are presented. They all are under the specific programme ”Integrating and strengthening the European Research Area”; practically all interesting programmes belong to this specific programme, as said before.

In the following, for each programme and call, those areas are presented, which are most interesting for CREC. Yet, also some other areas might offer opportunities for some particular CREC project.

In the following, the same titles and numerical codes are used as earlier in this guide. After each title, whenever it is possible, there the respective code in brackets. As earlier, in accordance with the EC model, two first digits have been left out in codes (example: Multimodal interfaces 1.1.2.3.1.6 ⇨ 2.3.1.6).

The abbreviations of different project types are as follows (as per each call's respective wording):

IP	⇦ Integrated Project
NOE, NE	⇦ Network of Excellence
STREP, STRP	⇦ Specific Targeted Research Project
CA	⇦ Coordination Action
SSA	⇦ Specific Support Action
CRAFT	⇦ Co-operative research projects
COLLECT	⇦ Co-operative research projects

2.5.2.2 IST – Information Society Technologies (2) ⇦ NOT open now

2.5.2.2.1 INTRODUCTION

Internet website: http://www.cordis.lu/ist/home.html

Info desk (email): ist@cec.eu.int

2.5.2.2.1.1 Focus on a limited set of Strategic Objectives (2.2.3)

In order to ensure concentration of effort and critical mass, the Work Programme for 2003-2004 is focussed on a limited set of Strategic Objectives that are essential to realise the IST in FP6 goals. They have been defined to mobilise researchers Europe-wide and bring together the effort necessary to address the relevant challenges.

The Strategic Objectives have been selected following an intensive consultation process that included SWOT analyses exploring Europe’s options at the economic, social and technology

levels. They cover technology components, integrated systems and pull-through applications that have been carefully identified so as:

- to reinforce European strengths in areas where it has established industrial and technology leadership: This is the case for example in mobile and wireless communications, in microelectronics and microsystems, in embedded systems, in applied IST for health, transport and business support tools.
- to overcome weaknesses in areas which are critical for European competitiveness and for addressing societal challenges: This is the case for the area of generic software and computing systems and in content development tools. The development of ambient intelligence provides an opportunity for Europe to reposition itself for the next generation of generic products and services building on a large user industry and service providers.
- to exploit new opportunities and respond to emerging needs: Examples include advanced interaction techniques, new sensors and Microsystems, context-aware knowledge handling and Grid based systems to solve complex problems in environment, health or engineering.
- to ensure the co-evolution of technology and applications so that technology advances are exploitable in innovative products and services. Particular attention will be paid to users' needs and to usability and accessibility of technologies and applications. The IST priority seeks to promote integrated approaches to address the vision. This is reflected in the definition and selection of the set of objectives as explained in the following paragraph.

In addition, IST in FP6 will support research to investigate and experiment with future visions and emerging technologies (FET) at the frontier of knowledge in the IST field. This will help new IST-related science and technology fields and communities to emerge, some of which will become strategic for economic and social development in the future and will feed into the mainstream IST activities in the future.

2.5.2.2.1.2 Strategic Objectives covered in the first call (2.3.1)

The list below shows the objectives that will be covered in the first call that will draw mostly on the 2003 budget and partly on 2004 budget.

- *Pushing the limits of CMOS, preparing for post-CMOS*
- *Micro and nano-systems*
- *Broadband for all*
- *Mobile and wireless systems beyond 3G*
- *Towards a global dependability and security framework*
- *Multimodal interfaces*
- *Semantic-based knowledge systems*
- *Networked audiovisual systems and home platforms*
- *Networked businesses and governments*
- *eSafety of road and air transports*
- *e Health*
- *Technology-enhanced learning and access to cultural heritage*

There is a move from technology components via integrated systems to sectoral applications, such as CREC.

2.5.2.2.2 CALL IST-1

Call title: Call 1 of the IST priority.

Call identifier: FP6-2002-IST-1

Date of publication: 17 Dec 2002

Closure date: 24 April 2003.

	Area	Topic	Instru-ments	Budget (MEUR)
2.3.1.6	Multimodal interfaces	Interaction between and among humans	All	65

		and the virtual and physical environment.		
2.3.1.9	Networked businesses and governments	Management of dynamic collaborative networks. Technologies for interoperability. IST as driver for small business and government re-organisation.	All	75
2.3.1.10	eSafety of road and air transport	For road transport, research in distributed intelligent agents, secure communications and advanced positioning and mapping technologies and their integration for supporting the provision of location based value added services.	All	65
2.3.1.11	eHealth	To develop an intelligent environment that enables ubiquitous management of citizens' health status.	All	70

2.5.2.2.3 WORK PROGRAMME

The IST work programme 2003-04 is exceptionally available in all 11 official languages. You can find them at http://www.cordis.lu/ist/workprogramme/fp6_workprogramme.htm.

2.5.2.2.3.1 Multimodal interfaces (2.3.1.6)

Objective: To develop natural and adaptive multimodal interfaces that respond intelligently to speech and language, vision gesture, haptics and other senses.

Focus is on:

- Interaction between and among humans and the virtual and physical environment, through intuitive multimodal interfaces that are autonomous and capable of learning and adapting to the user environment in dynamically changing contexts. They should recognise emotive user reaction and feature robust dialogue capability with unconstrained speech and language input.
- Multilingual systems facilitating translation for unrestricted domains, especially for spontaneous or ill-formed (speech) inputs, in task-oriented settings.

Work can span from basic research in areas such as machine learning and accurate vision and gesture tracking, to system level integration with proof of concept in challenging application domains, including wearable interfaces and smart clothes, intelligent rooms and interfaces for collaborative working tools, and cross-cultural communications.

IPs are expected to address the objectives within a holistic approach enabling, where justified, competition within and across projects. NoEs should aim at lowering barriers between hitherto split communities and disciplines and advance knowledge in the field. They should help establish and reinforce shared infrastructures, including for training and evaluation, annotation standards and appropriate usability metrics and benchmarks. STREPs are expected to bootstrap research in identifiable or emerging sub-domains and to prepare associated communities.

2.5.2.2.3.2 Networked businesses and governments (2.3.1.9)

Objective: To develop ICTs supporting organisational networking, process integration, and sharing of resources. This shall enable networked organisations, private and public, to build faster and more effective partnerships and alliances, to re-engineer and integrate their processes, to develop value added products and services, and to share efficiently knowledge and experiences.

Focus is on:

- Management of dynamic collaborative networks through the development of harmonisation frameworks, open platform specifications, models and ontologies. This includes multi-

disciplinary research into complex adaptive and self-organising systems and modelling, representing, tracking and measuring distributed work and knowledge flows in business networks.

- Technologies for interoperability supporting open networks of intelligent, autonomous, self-adaptive, self-configurable, and scalable software components for networked organisations including SMEs. Novel reference architectures working in dynamic networks using ontologies, agent and Grid technologies, web-services, semantic web and peer-to-peer computing.
- Open, secure, interoperable and re-configurable e-government platforms, applications and multi-modal services. They should be based on European standards, support national, regional and local initiatives and deploy as much as possible open source software solutions for all aspects of inter- and intra-government operations including electronic democracy systems, interaction with citizens and businesses, governmental process re-engineering and knowledge management.
- Managing knowledge to support innovation and business strategies through sharing, brokering, trading and measuring of knowledge and intellectual capital. Research will also cover knowledge modelling from multiple perspectives/levels across the value chain as well as emergent innovation-friendly collaborative and working spaces that facilitate leveraging of tacit knowledge, creativity and resource productivity.
- IST as driver for small business and government re-organisation through local development processes including small business ecosystems and their interactions with local government. Mass deployment actions for one-stop e-government services for all, supported by benchmarking are addressed as well socio-economic research in the governance of networked organisations and e-government models and legal issues.

IPs shall follow a focused and multidisciplinary approach bringing together a critical mass of business and government organisations, academic research labs, standardisation organisations and technology transfer centres. NoEs shall be used to integrate visionary European and international research communities and build up new knowledge. STREPs should target and explore disruptive technologies and highly innovative organisational forms and models. STREPs could also be used to support innovative business and government pilots. Work will build on and complement the member and associated state activities in the field.

Work could also build on past international RTD activities involving US, Japanese and Latin American (e.g. Brazil, Mexico) participants in the area of networked collaborative organisations and will be complemented by demonstration and technology transfer activities for small businesses and governments towards the Mediterranean countries, Russia and the newly independent States (NIS), the Western Balkans, China and Latin America.

2.5.2.2.3.3 eSafety for Road and Air Transport (2.3.1.10)

Objective: To develop, test and assess an integrated and global approach to intelligent road vehicles and aircraft which offers higher safety and value added services, where interactions between the person in control, the vehicle and the information infrastructure are addressed in an integrated way.

Focus is on:

- Research on advanced sensors and communication systems as well as highly dependable software and interfaces to integrate on-board safety systems that assist the driver in road vehicle control; advanced airborne collision avoidance systems for aircraft.
- For road transport, research in distributed intelligent agents, secure communications and advanced positioning and mapping technologies and their integration for supporting the provision of location based value added services.
- For road and air transport, work on vehicle and information infrastructure management systems with emphasis on safety and efficiency.

Proposals will describe how relevant results from non-EU programmes (e.g. PREDIT, Mobilitaet und Verkehr, EUREKA etc) will be combined to contribute to this task. National and regional test infrastructure should also be incorporated where appropriate.

Projects should aim at fostering partnership between advanced research laboratories from the road or air transport industry, telecommunication industry, infrastructure operators, equipment and service providers and users. Coordination will be maintained with other relevant FP6 thematic priorities, notably within thematic priorities 4 and 6. It is expected that the research domains will be covered mainly with Integrated Projects as well as a few STREPs.

2.5.2.2.3.4 eHealth (2.3.1.11)

Objective: To develop an intelligent environment that enables ubiquitous management of citizens' health status and to assist health professionals in coping with some major challenges, risk management and the integration into clinical practice of advances in health knowledge.

Focus is on:

- Research and development on key technologies such as biosensors and secure communication and their integration into wearable or implantable systems that provide citizens and their health professionals with ubiquitous management of health status. The expected outcomes include intelligent and communicating clothing and/or implants that interact and communicate securely when appropriate with other health systems and points-of-care.
- Research on new reliable software tools supporting health professionals in taking promptly the best possible decision for prevention, diagnosis and treatment. Specific focus will be given to research into user-friendly, fast and reliable tools providing access to heterogeneous health information sources, and also to new methods for decision support and risk analysis. The use of GRID technology and open source is encouraged where appropriate.
- Networking of researchers in the areas of medical informatics, bioinformatics and neuroinformatics with the objectives of advancing health knowledge leading to a new generation of *e*Health systems assisting in the individualisation of disease prevention, diagnoses and treatment.

Coordination will be maintained with other relevant FP6 thematic priorities, notably with thematic priority 1.

Proposals will describe how the work complements and enhances the effort in non-EU programmes (e.g. national programmes, EUREKA,…) and international cooperation initiatives. International, national and regional test infrastructure should also be incorporated where appropriate.

Projects should aim at enhancing European industrial competitiveness by building partnerships between advanced R&D laboratories from relevant sectors related to health and healthcare e.g. medical devices, eHealth, telecommunication, specialised software providers, infrastructure operators, equipment and service providers, and users. It is expected that the two first domains will be addressed by Integrated Projects and the third one by NoEs. Some STREPs are expected in all domains.

2.5.2.2.3.5 Joint call with Thematic Priority 3 (2.3.3)

A joint call is foreseen with Priority 3 that will address a strategic objective of the IST priority on "Products and service engineering 2010" that is described below. It will address jointly a research area in Priority 3 that is described in paragraph 3.4.3.1 of the Priority 3 work programme where focus will be given to the *creation. of "knowledge communities" in production technologies.* The joint call will use a two stage procedure.

2.5.2.2.3.5.1 PRODUCTS AND SERVICES ENGINEERING 2010 (2.3.3.1)

Objective: To strengthen further Europe's competitive position by developing collaborative technologies and methodologies for extended service and product development approaches, including associated services and distributed global manufacturing organisation. Community funding should help integrate, in a global context, fragmented European and international (e.g. IMS) RTD efforts in product and process design, and to focus on new holistic product/service concepts.

Focus is on:

– Technologies, engineering methodologies, novel tools, methods and work environments that facilitate collaboration, creativity, resource use efficiency through holistic approaches to products and associated services. Work will consider all product value creation stages, from conception, design, configuration, to production, delivery maintenance, and disposal, as well as work organisation and the work environment

– New and emerging information technologies for the development, manufacturing and integration of miniaturised devices (e.g. smart tags, sensors) and related software into end-products

– Technologies and methodologies for the optimisation of value creation processes in manufacturing, facilitating seamless knowledge and information flow between suppliers and users as well as novel approaches to customisation, fulfilment, logistics, maintenance

– Demonstrating the feasibility and applicability of holistic product design, development and distribution tools and methods in a rich variety of sectoral settings (e.g. automotive, aerospace, construction, industrial textiles, furniture, agriculture and food, transport and delivery, maritime, electronics).

– Global standardisation initiatives in the area of inter-enterprise business processes management and integration (e.g. planning, scheduling and co-ordination), heterogeneous virtual business and manufacturing networks (e.g. for assuring process transparency and traceability of produced parts), shop floor automation as well as knowledge management and security.

Work will build on and help aggregate member and associated states' efforts. In addition, collaboration with the Eureka Factory initiative is encouraged. This For both, technologies and design tools, topics complementing this overall strategy could come forward through the other instruments but should strictly be focused on promising alternative approaches.

Work should, where appropriate, precede and complement work implemented under EUREKA/MEDEA and in initiatives at member and associated state level. The work might also be complemented by major industrial investments thereby demonstrating value for money and that the proposed actions fit in an overall strategy. Activities should contribute to the intellectual property portfolio and to the knowledge that will enable Europe to compete internationally.

2.5.2.3 NMP - Nanotechnology and nanosciences, knowledge-based multifunctional materials, new production processes and devices (3)

2.5.2.3.1 INTRODUCTION

Internet website: http://www.cordis.lu/nmp/home.html

Info desk (email): rtd-nmp@cec.eu.int

2.5.2.3.1.1 NMP Priority introduction (3.2)

The twofold transition towards **knowledge-based society** and **sustainable development** demands new paradigms of production and consumption. There is a need to move from resource-based approaches towards more knowledge-based ones, from quantity to quality,

and from mass produced single-use products to new concepts of higher added value, eco-efficient and sustainable products, processes and services.

2.5.2.3.1.2 Objectives, Structure and Overall Approach (3.3)

The primary objective of this thematic area is to promote real industrial breakthroughs, based on scientific and technical excellence. Radical breakthrough can be achieved through two complementary approaches:

- creation of new knowledge;
- new ways of integrating and exploiting existing and new knowledge.

This requires changes in emphasis in Community research from short to longer term as well as in innovation, which must move from incremental to radical innovation and breakthrough strategies, while emphasising an integrating approach.

The **transformation of industry** towards high-added value organisations necessitates real integrated approaches, either “vertical”, combining materials sciences, nanotechnologies and production technologies, as well as other technologies based e.g. on information technologies or biotechnologies, or “horizontal”, combining multi-sectoral interests.

An integrated approach should cover consumption patterns so that the complete industrial cycle conforms to the societal requirement for sustainability. Particular attention will be given to the **strong presence** and **interaction** of innovative enterprises, universities and research organisations in research actions. **Networks** and **projects** are required that give research organisations and industry access to new technologies, therefore stimulating implementation of new approaches in most industrial sectors, **in particular SME intensive sectors**. A key issue will be to integrate **competitiveness**, **innovation** and **sustainability** into consistent RTD activities. This is why it is extremely important and relevant that industry itself is well represented and integrated in the proposed research projects. The integration of **education** and **skills development** with research activities will play an important role in increasing European knowledge, in particular in nanosciences and their associated new technologies, opening up opportunities for numerous industrial applications. In addition, it is expected that breakthrough research activities should help to foster dialogue with society and generate **enthusiasm** for science.

To realise the work programme the following instruments will be used: Integrated Projects (IP), Networks of Excellence (NE), specific targeted research projects (STREP), co-ordination actions (CA), and specific support actions (SSA). The research areas described below are valid for the 2004 calls, and they specify both crucial research topics, around problems which have to be addressed urgently, and more long-term objectives for which structuring actions are to be preferred.

2.5.2.3.1.3 Knowledge-based Multifunctional Materials (3.4.2)

New, high knowledge-content materials, providing new functionalities and improved performance will be critical drivers of innovation in technologies, devices and systems, benefiting sustainable development and competitiveness. Since their applications have a strong impact on individuals and on society as a whole, a new research culture will be required. RTD activities are expected to be high risk, inter- and multi-disciplinary, long term and generic, with potential benefits in material, maintenance and energy savings as well as on health, safety and the environment.

Breakthroughs will come not only from the new materials developed but also from new processing, overall product design and from the new approaches taken for example using renewable materials or interface design. A further need is to break away from the classical boundaries between types of materials that have characterised European research for the last few decades. To assure Europe's strong position in emerging technology markets the various actors need to be mobilised through leading edge multidisciplinary RTD partnerships and high-risk research.

2.5.2.3.1.4 New Production Processes and Devices (3.4.3)

New production concepts need to be designed, based on breakthrough organisational, quality and technological developments, supporting new products, processes and services. The goal is to support the transformation of European industry towards a more knowledge-based and added value industry for improved competitiveness and sustainability. To this end it is vital to provide the industrial systems of the future with the necessary tools for efficient life-cycle design, production, use and recovery, decreasing at the same time internal and external costs and reducing major accident hazards. Appropriate organisational models and improved knowledge management should support technological developments and innovation routes. Flagship research projects need to be carried out, highlighting the importance of collaboration between research and industry, the major outcome of which would be a framework for "manufacturing in 2010" based on substantial involvement of industries.

2.5.2.3.1.5 Integration of nanotechnologies, new materials, and new production technologies for improved construction, chemicals and surface transport (3.4.4)

This area has been added to the three first areas, as defined in the specific programme, due to the "integrating" challenge of the expected output and due also to the number of EoIs and proposals received on the subject. A specific target should indeed be to put nanotechnologies, materials science and advanced technologies at the service of society, both in terms of improving the quality of life of all people and of creating wealth through novel knowledgebased and sustainable products and processes. The goal is to foster breakthrough applications through the integration of multi-disciplinary research developments in an industrial context.

2.5.2.3.1.6 Cross-priorities actions and links to other research actions (3.4.5)

Joint and co-ordinated calls are to be organised for 2004. Calls for coordinated actions are intended to improve synergies between Member States (current and new) and Associated States research activities as well as with the **Research Fund for Coal and Steel** and EUREKA (in the field of "the factory of the future" and of nano-photonics and nano-electronics).

Clear links also exist between this Thematic Priority and **Priority 2** "Information society technologies", especially in the field of intelligent manufacturing systems, biosensors, and nanoelectronics, which justify developing synergies through a joint call. Clear links exist also between this Priority and **Priority 6** "Sustainable development, global change and ecosystems".

2.5.2.3.2 CALL NMP-NI-3

Call title: Thematic call in the area of 'Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices - NI'.

Call identifier: FP6-2003-NMP-NI-3.

Date of publication: 13 December 2003.

Closure date(s):

- First stage 02 March 2004.
- The closure date for the second submission will be included in the invitation to complete the proposal (indicative closure date: 22 June 2004).

Code	Area	Instrument
3.4.2.3-2	New knowledge-based higher performance multi-materials for macro-scale applications	IP
3.4.3.1-1	New and user-friendly production technologies and their incorporation into the factory of the future	IP
3.4.4.1	Human-friendly, safe and efficient construction	IP

The most important singular area open for CREC highlighted in yellow.

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2.5.2.3.3 WORK PROGRAMME

2.5.2.3.3.1 Engineering support for materials development (3.4.2.3)

The challenge is to overcome EU industry's weaknesses in the integration of materials and industrial manufacturing or processing, by improving materials development and the transfer of this knowledge to industry. Engineering tools will enable the production of new materials in a context of sustainable development and competitiveness.

2.5.2.3.3.1.1 NEW KNOWLEDGE-BASED HIGHER PERFORMANCE MULTI-MATERIALS FOR MACRO-SCALE APPLICATIONS (3.4.2.3-2)

The objective is to understand, design and develop new complex multifunctional materials and structures in order to extend their functions and in-service performances in a context of sustainability. The expected IPs should focus on multi-materials, integrating for example into complex structures metallic,- ceramic- and cement-based materials, soft and cellular materials and polymers, renewable materials, glasses, composites and other materials which are specifically tailored for high performance or which are able to exchange information with their environment. Engineering support may also include up-scaling and eco-design tools as well as life-cycle, product friendliness and standardisation approaches. Substantial industrial involvement is required.

2.5.2.3.3.2 Development of new processes and flexible, intelligent manufacturing systems (3.4.3.1)

The challenge for Europe is to encourage industry's transition towards more knowledge-based and customised production and systems organisation and to consider production from a more holistic perspective, encompassing not only hardware and software, but also people and the way in which they learn and share knowledge. A wide innovation range is expected in a number of industrial sectors, particularly the traditional ones, with the final goal of increased competitiveness and increased private investment in research, in line with the objectives of the Lisbon (knowledge based economy) and Barcelona Summits.

2.5.2.3.3.2.1 NEW AND USER-FRIENDLY PRODUCTION TECHNOLOGIES, AND THEIR INCORPORATION INTO THE FACTORY OF THE FUTURE (3.4.3.1-1)

The objective is to support future cost-effective, high quality, fault-tolerant, eco-friendly, energy-saving, safe and more flexible manufacturing systems. New design and engineering concepts (integrating new materials, mechatronics, communicating machines, eco-processes, etc.) are urgently required.

The objective of expected IPs, in line with clear long-term industrial visions for EU industry, should focus on the emergence of new manufacturing concepts, their validation and the identification of best practices. The expected CAs should be aimed at creating maximum of synergies with "EUREKA Factory" based on a clear roadmap to maintain and improve competitiveness and sustainability of the European Manufacturing sector.

2.5.2.3.3.3 Integration of nanotechnologies, new materials, and new production technologies for improved construction, chemicals and surface transport (3.4.4)

This area has been added to the three first areas, as defined in the specific programme, due to the "integrating" challenge of the expected output and due also to the number of EoIs and proposals received on the subject. A specific target should indeed be to put nanotechnologies, materials science and advanced technologies at the service of society, both in terms of improving the quality of life of all people and of creating wealth through novel knowledgebased and sustainable products and processes. The goal is to foster breakthrough applications through the integration of multi-disciplinary research developments in an industrial context.

2.5.2.3.3.3.1 HUMAN-FRIENDLY, SAFE AND EFFICIENT CONSTRUCTION (3.4.4.1)

Construction projects, including buildings and civil infrastructure represent the biggest capital investment of society. Safety and security are also at the heart of societal concerns. Research activities should therefore not only stimulate better cost efficiency and quality in building and related processes but also more eco-efficiency and safety.

The expected IPs should be led by industry and focus on new and breakthrough process re-engineering approaches to provide novel, efficient and sustainable solutions for the built environment including infrastructure and transport utilities, underground construction and cultural heritage. The objectives within these IPs should include ensuring the safety of workers and the general public against unexpected events with adverse effects but also against damage (safety and security).

Breakthroughs on new construction materials, including those which are environment friendly, and the design and production concepts "beyond conventional approaches" are required for higher quality in building and processes. Truly integrated research activities, including pre-normative research, from user-oriented design through construction processes through maintenance to demolition and recycling, should demonstrate full integration of stakeholders.

2.5.2.3.4 CALL NMP-TI-3-MAIN

Call title: Thematic call in the area of 'Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices'.

Call identifier: FP6-2003-NMP-TI-3-main.

Date of publication: 13 December 2003.

Closure date(s): 12 May 2004.

Code	Area	Instrument
3.4.3.3-2	New life-cycle optimised, safety and environmental technologies for industrial production	STREP

2.5.2.3.5 WORK PROGRAMME

2.5.2.3.5.1 Optimising the life-cycle of industrial systems, products and services (3.4.3.3)

Products and production systems should become increasingly life-cycle, quality and service oriented, in addition to the requirements of intelligence, energy, cost-effectiveness, safety and cleanliness. The key challenge is therefore to promote new industrial and consumption approaches based on eco-efficiency, which must allow the development of new concepts for production, products, processes

2.5.2.3.5.1.1 NEW LIFE-CYCLE OPTIMISED, SAFETY AND ENVIRONMENTAL TECHNOLOGIES FOR INDUSTRIAL PRODUCTION (3.4.3.3-2)

Industrial installations, process and production systems and their infrastructure have a life-cycle extending to several decades. In the context of the sustainable and safe use of natural and industrial resources and installations, any concept of new processes should therefore be based on their global life-cycle impact. Research can contribute through the development of breakthrough approaches for reducing initial investment and resource consumption, improving the whole service-life operational costs and impact, including on environment and safety, and maximising societal benefits. The expected STREPs should seek to develop radically new technologies for cleaner and more efficient production and ultimately the hazard-free industrial activities. Essential issues therefore also include all aspects of hazard control, human and operational aspects. Scientific and technological research activities should aim at the better understanding of material, equipment and operational properties, limits and risks, and

help to develop new design and industrial concepts. STREPs must be supported by key industrial stakeholders. and organisational innovation.

2.5.2.3.6 CALL NMP-SME-3

Call title: Thematic call in the area of 'Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices'.

Call identifier: FP6-2003-NMP-SME-3.

Date of publication: 13 December 2003.

Closure date(s):

- First stage 02 March 2004.
- The closure date for the second submission will be included in the invitation to complete the proposal (indicative closure date: 22 June 2004).

Code	Area	Instrument
3.4.3.1-3	Support to the development of new knowledge-based added-value products and services in traditional less RTD intensive industries	IP dedicated to SMEs[89]
3.4.3.3-1	Support to the development of new knowledge-based and sustainable processes and eco-innovation	IP dedicated to SMEs[89]

Very important area open for CREC highlighted in yellow. Also the other area is good.

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2.5.2.3.7 WORK PROGRAMME

2.5.2.3.7.1 Development of new processes and flexible, intelligent manufacturing systems (3.4.3.1)

The challenge for Europe is to encourage industry's transition towards more knowledge-based and customised production and systems organisation and to consider production from a more holistic perspective, encompassing not only hardware and software, but also people and the way in which they learn and share knowledge. A wide innovation range is expected in a number of industrial sectors, particularly the traditional ones, with the final goal of increased competitiveness and increased private investment in research, in line with the objectives of the Lisbon (knowledge based economy) and Barcelona Summits.

2.5.2.3.7.1.1 SUPPORT TO THE DEVELOPMENT OF NEW KNOWLEDGE-BASED ADDED-VALUE PRODUCTS AND SERVICES IN TRADITIONAL LESS RTD INTENSIVE INDUSTRIES (3.4.3.1-3)

The objective is to promote the shift of the industrial sectors which are traditionally less RTD intensive to high-added-value sectors. The expected IPs should focus on the incorporation of emerging technologies driving new production and organisation paradigms in all phases of the complete/extended value-chain (design, production, supply and distribution) to allow development of new knowledge-based, added value

[8] SME is a company:
- with fewer than 250 employees;
- either with an annual turnover which does not exceed 40 MEUR or with an annual balance sheet total which does not exceed 27 MEUR;
- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

[9] Although generic IP rules apply to these projects, proposals should be clearly led by SMEs. There is important additional information available in a specific guide for proposers to be found at http://fp6.cordis.lu/nmp/call_details.cfm?CALL_ID=109.

and quality products and services in traditional sectors. Addressing the challenge of creating knowledge-based industries at the 2010 horizon, particular attention should be given in the different research projects to education, training and skill development.

2.5.2.3.7.2 Optimising the life-cycle of industrial systems, products and services (3.4.3.3)

Products and production systems should become increasingly life-cycle, quality and service oriented, in addition to the requirements of intelligence, energy, cost-effectiveness, safety and cleanliness. The key challenge is therefore to promote new industrial and consumption approaches based on eco-efficiency, which must allow the development of new concepts for production, products, processes and organisational innovation.

2.5.2.3.7.2.1 SUPPORT TO THE DEVELOPMENT OF NEW KNOWLEDGE-BASED AND SUSTAINABLE PROCESSES AND ECO-INNOVATION (3.4.3.3-1)

(Dedicated call for SMEs jointly with area 3.4.3.1)

The objective is to support traditionally less RTD intensive sectors in the development of more sustainable and safer processes through eco-innovation (new products and production systems and enterprises designed for win-win solutions for business and environment).

The expected IPs should be aimed at incorporating environmental technologies such as new materials processing technologies, eco-design or recycling or through new organisational approaches to change unsustainable patterns of production and consumption. Appropriate attention should be given to health impact assessments on workers and consumers, as well as to education and skill development, and to a committed participation of the private SME sector. In addition this should give support to the Action Plan on Environmental Technologies http://europa.eu.int/comm/environment/etap/.

2.5.2.3.8 CALL NMP-STEEL-3

Call title: Dedicated call in the area of 'Very low CO2 Steel Processes', launched in coordination with the 2003 and 2004 calls of the Research Fund for Coal and Steel.

Call identifier: FP6-2003-NMP-STEEL-3.

Date of publication: 13 December 2003.

Closure date(s): 17 March 2004.

Code	Area	Instrument
3.4.5.1	Very low CO2 and greenhouse gas steel production processes – target 2020	IP

2.5.2.3.9 WORK PROGRAMME

2.5.2.3.9.1 Cross-priorities actions and links to other research actions (3.4.5)

Joint and co-ordinated calls are to be organised for 2004. Calls for coordinated actions are intended to improve synergies between Member States (current and new) and Associated States research activities as well as with the Research Fund for Coal and Steel and EUREKA (in the field of "the factory of the future" and of nano-photonics and nano-electronics). Clear links also exist between this Thematic Priority and Priority 2 "Information society technologies", especially in the field of intelligent manufacturing systems, biosensors, and nanoelectronics, which justify developing synergies through a joint call. Clear links exist also between this Priority and Priority 6 "Sustainable development, global change and ecosystems".

2.5.2.3.9.1.1 *"VERY LOW CO2 AND GREENHOUSE GAS STEEL PRODUCTION PROCESSES" – TARGET 2020 (3.4.5.1)*

Steel has played a key role in the historical development of Europe and in the rise of the region's standard of living and will continue to do so. The impact on the environment of the steel sector is important due to its high level of resource consumption and energy requirements. The global warming challenge will put especially strong pressure on the steel industry to decrease greenhouse gas (GHG) emissions drastically. This is a tough requirement, as the integrated steel production route generates about 2 tons of CO2 per ton of steel. This is already the result of a large effort in reducing the energy needs of steel mills: specific energy consumption has thus gone down by 60% in the last 40 years, while the global emissions of CO2 decreased by 50% during the same period. To go beyond these major achievements, and decrease emissions by a significant factor in line with the post-Kyoto probable requirements for the future, the steel industry needs to develop new process paradigms based on breakthrough technologies.

The expected IP has to present high industrial relevance and to be focused on radical development. The objective is thus to develop radically new technologies for the next generation of iron and steelmaking processes, which will take into account society's long-term sustainability needs, while improving the current high quality of products. Therefore a wide range of technologies with a high potential in reducing CO2 and GHG emissions have to be examined. Some examples are: - carbon-lean technologies combined with CO2 capture and sequestration, innovative use of natural gas and hydrogen, biomass or electricity.

2.5.2.3.9.1.2 *INTEGRATING TECHNOLOGIES FOR THE FAST AND FLEXIBLE MANUFACTURING ENTERPRISE (3.4.5.2)*

This topic is implemented through a joint call with Priority 2 – IST that will be launched in Spring 2004. Objectives and content will be defined together with Priority 2 and will be included in the next revision of this work programme, expected by early 2004.

2.5.2.4 SDGE - Sustainable Development, Global Change and Ecosystems (6)

2.5.2.4.1 INTRODUCTION

Internet website:	http://www.cordis.lu/sustdev/
Info desk (email):	
General	rtd-sustainable@cec.eu.int
Sust. energy systems	rtd-energy@cec.eu.int
Sust. surface transport	rtd-transport@cec.eu.int
Global change and ecosys.	rtd-sustainable@cec.eu.int

2.5.2.4.1.1 Sustainable energy systems - Introduction (6.1)

Europe's energy system demonstrates unsustainable patterns of development characterised by growing dependence on imported fossil fuels, rising energy demand and growing CO2 emissions. These unsustainable patterns are exacerbated in key sectors like buildings and transport that are intimately linked with the quality of life of European citizens. The challenge is to alleviate and reverse these adverse trends to achieve a truly sustainable energy system, while preserving the equilibrium of ecosystems and encouraging economic development.

The strategic and policy objectives of this programme of research into sustainable energy systems include reducing greenhouse gases and pollutant emissions (Kyoto), increasing the security of energy supplies, improving energy efficiency and increasing the use of renewable energy, as well as enhancing the competitiveness of European industry and improving quality of life both within the EU and globally (Johannesburg follow-up).

In addressing these objectives through this Work Programme, a clear differentiation is made between research activities having the potential for exploitation in the short to medium term and those which are expected to have an impact in the medium to longer term. This distinction between the short-to-medium and medium-to-long term time frames is applicable to all indirect research actions in the sustainable energy sector and it is intended that the budgetary appropriations be split equally between the two time frames.

Research activities having an impact in the short to medium term

Community research is one of the main instruments which serve to support the development and implementation of new legislative instruments and other policy measures in the field of energy and to change significantly current unsustainable patterns of development. In the short to medium term, the goal is to pave the way for the introduction of innovative and cost competitive renewable and energy efficiency technologies into the market as quickly as possible through demonstration and other research actions aiming at the market, thus supporting the future development and implementation of the EU Directives on electricity from renewable energy sources and on the energy performance of buildings, as well as the proposed Directives on cogeneration (CHP) and the establishment of regulatory and fiscal measures for the pro-motion of liquid biofuels.

From a programme implementation perspective the objective is to bring forward and demonstrate the next generation of cost-effective technologies at full scale. The scale of demonstration projects should allow a comprehensive life-cycle assessment under real life conditions. New integrated projects will mobilise the necessary actors and resources to create real life laboratories to investigate the optimal market penetration paths and the most sustainable alternatives. Projects will include socio-economic research into the interfaces between the new energy technologies and their markets, for example innovative policy packages, financing mechanisms and user/consumer acceptance.

Proposals addressing short-to-medium term research should comply with one or more of the following guidelines:

- Deliver results, which will accelerate the market penetration of innovative energy technologies with a particular emphasis on 2010 energy policy objectives.

- Consist mainly of integrated demonstration actions with a typical research component of up to about 20% and including, where appropriate, pre-normative research, energy technology integration, dissemination and technology transfer activities. The risks to be addressed are mainly technological and might include market related and financial issues.

- Demonstrate reductions in the costs associated with implementation of new technologies and/or demonstrate how innovative technological solutions can be integrated under full-scale operating conditions.

- Provide inputs for the future development of energy policy and legislation, including the improvement of existing regulatory measures, whilst serving EU research and related policies.

The research components of short to medium term projects should adopt a multidisciplinary approach, including, where appropriate, socio-economic research on the future policy, market and end user impacts of the innovative energy technologies involved, in addition to technology focused research.

Research activities having an impact in the medium to long term

The medium to long term research objective is to develop new and renewable energy sources, and new carriers such as hydrogen which are both affordable and clean and which can be well integrated into a future sustainable energy supply both for stationary and transport applications.

The future large-scale development of these technologies will depend on significant improvements in their cost and other aspects of competitiveness against conventional energy sources. The overall socio-economic and institutional context in which they are deployed will be covered in a synergetic approach, which takes account of energy and other related policies.

Proposals addressing medium-to-long term research should:

- Deliver results which could be widely exploited commercially or otherwise, with a time horizon generally beyond 2010; further development and particularly demonstration type actions may be necessary before technologies are ready for full-scale commercial use.
- Consist mainly of research and development activities (including pre-normative and socio-economic research and the validation of technical and economic feasibility in pilot plants and prototypes), research-related networking activities, training and dissemination activities. The main risks to be addressed are scientific and technological rather than market and financial.
- Lead to the generation, exploitation and dissemination of new knowledge and contribute to the implementation of EU research policy, whilst also contributing to the development of energy and associated policies.

The research activities to be funded in the medium-to-long term should address not only the technological aspects, but also incorporate in a multidisciplinary approach the socio-economic research necessary to overcome the non-technical obstacles for the penetration into markets of the technologies concerned.

2.5.2.4.1.2 Sustainable surface transport - Introduction (6.2)

Surface transport plays a key role in people's everyday lives and is a decisive factor in economic competitiveness and employment. The promotion of its sustainable development with-out sacrificing either economic growth or the freedom of movement has become a central objective of the European Union policy.

Surface transport has to face the challenge of supporting future economic development and subsequent traffic increase without degrading the quality of transport services and protecting the environment. Research and technology developments have an important role to play and are providing the European Transport System with innovative vehicle and vessel technology and new forms of transport organisation and infrastructure.

The sustainable surface transport work programme proposes a set of research objectives which implement the content of the Gothenburg declaration of June 2001 and the Commission White Paper on European Transport Policy 'European transport policy for 2010: time to decide' .

The realisation of ERA across the entire surface transport chain of stakeholders and the different research schemes proposed at national level will be essential to achieve the aims for an Integrated and Sustainable Surface Transport System in Europe. The work programme implementation will, where appropriate, strengthen and complement research carried out under non-EU initiatives such as PREDICT, Mobilised und verger, (LOG CHAIN, DEFACE) Fore-sight Vehicle, EUREKA etc in order to maximise the impact of research within ERA. Also, participation of organisations from Candidate Countries in ERA instruments will ensure a sustain-able development and security of transport in an enlarged Union.

The complexity of the transport system is addressed in an integrated and comprehensive way, through two complementary approaches, that are identified in this work programme as Re-search to support the European Transport Policy and Research, technological development and integration.

Research to support the European Transport Policy addresses research for transport policy with emphasis on short-term implementation and exploitation of results. Research, technological development and integration focuses on the development of new technologies specific to surface transport and on their integration into future transport systems and products with a short, medium and long term perspective.

The technical content of the work programme is described in section 3. Research domains and activities proposed for the calls are presented in relation to the four objectives of the sub-priority as described in the specific programme. They are identified for each objective starting with Research to support the European Transport Policy followed by Research, technological development and integration.

Research domains form a comprehensive and structured set of elements which will be addressed during the entire period of the Framework Programme by means of the different new and traditional instruments which are proposed. Within section 3, the description of research domains is followed by information on the selected topics to be included in the calls with deadlines in 2003. For Research, technological development and integration, additional information is given on possible subjects for the call with deadline in 2004.

An update of this document will be produced every year during the Framework Programme, giving information on further calls and revisions to the proposed research domains as appropriate.

Periodic Calls for Research to support the European Transport Policy are identified with the letter A (1A, 2A, etc.) and periodic calls for Research, technological development and integration with the letter B (1B, 2B, etc.).

Objectives

The sustainable surface transport work programme addresses the following objectives as defined in the Specific Programme:

Objective 1: New technologies and concepts for all surface transport modes (road, rail and waterborne).

Objective 2: Advanced design and production techniques.

Objective 3: Rebalancing and integrating different transport modes.

Objective 4: Increasing road, rail and waterborne safety and avoiding traffic congestion.

2.5.2.4.1.3 Global change and ecosystems - Introduction (6.3)

Global Change and Ecosystems sub-priority is addressing seven areas relative to the issues of:

I. Impact and mechanisms of greenhouse gas emissions and atmospheric pollutants on climate, ozone depletion and carbon sinks

II. Water cycle, including soil-related aspects

III. Biodiversity and ecosystems

IV. Mechanisms of desertification and natural disasters

V. Strategies for sustainable land management, including coastal zones, agricultural land and forests

VI. Operational forecasting and modelling including global climatic change observation systems

VII. Complementary research

The topics of each of the areas which will be subject of the call for proposals issued in 2002 are detailed in the following sections; indicative topics which will be subject of a second call in the second half of 2003 are briefly mentioned.

A cross-cutting dimension of Sustainable Development horizontal to these areas and to the Energy and Transport sub-priorities is contained in the introduction of the Specific Programme for Global Change and Ecosystems; this dimension is also covered for research as indicated at the end of this sub-chapter.

The instruments to be used for the first call are indicated for each topic. Additional elements about the budget, deadline, evaluation of proposals, and links with other priorities are indicated in the last sections of this sub-chapter.

Objectives

The research on global change and ecosystems has to be considered as a major support to the EU strategy for Sustainable Development which has been decided in 2001 at Göteborg and which has been enlarged to an international scale in the context of the Johannesburg

Summit on Sustainable Development (SD) in 2002. The programme of activity offered by the Sub-Priority "Global Change and Ecosystems" will strengthen the necessary scientific knowledge for the future orientation of the SD strategy and the 6th Environment Action programme; it will also provide the socio-economic tools and assessments and the overall management practices. Furthermore it will ensure their implementation at the enlarged EU level and, when relevant, at the world level.

2.5.2.4.2 CALL TREN-1 ⇦ NOT OPEN NOW

Call title: Periodic call in the area of 'Aeronautics and space', 'Sustainable energy systems' and 'Sustainable surface transport'.

Call identifier: FP6-2002-TREN-1.

Date of publication: 17 December 2002.

Closure date(s): 18 March 2003.

Sustainable energy systems

Area	Topic	Instrument
Section 6.1.3.1.1.2 'Large scale integration of renewable energy sources and energy efficiency'	RES-Electricity	CA and SSA
	Distributed electricity generation	CA and SSA
	Electricity storage systems	CA and SSA
	Heating and cooling	CA and SSA
Section 6.1.3.1.2.1 'Eco-buildings'	Innovative architecture aiming at low-energy demand buildings	IP and STREP
	Integration of renewable energy technologies and efficient technological solutions	IP and STREP
	Low energy construction and/or retrofitting materials, innovative components and technologies	IP and STREP
	Innovative building management systems (BMS)	IP and STREP

2.5.2.4.3 WORK PROGRAMME

2.5.2.4.3.1 Clean energy, in particular renewable energy sources and their integration in the energy system, including storage, distribution and use (6.1.3.1.1)

2.5.2.4.3.1.1 LARGE-SCALE INTEGRATION OF RENEWABLE ENERGY SOURCES INTO ENERGY SUPPLIES (6.1.3.1.1.2)

Short / medium term research on the large scale integration of renewable energy sources into energy supplies is needed in support of the EU's commitments to increase the percentage of renewable energy sources in its supply mix. At the same time, the EU is committed to major reductions in energy intensity and this will require substantial increases in the adoption of innovative technologies for the management of energy demand. Research on the large scale integration of renewable energy sources into existing energy supplies and networks should therefore address the inevitable and dynamic interactions between centralised and decentralised energy supplies and demands at the systems level, which is typically more complex when advanced energy management systems are employed.

In this context, priority will be given to two types of action: (i) Support actions which contribute to a better understanding of the potential problems and solutions associated with enhanced distributed generation in existing grids, including hybrid systems and

different levels of renewable energy integration, (including storage where applicable) into electricity and heat distribution grids, networks and related end-use applications; (ii) Large scale integrated projects in clearly defined geographical areas or zones, within which all of the relevant energy flows (supply and demand) can be identified, measured and assessed. Such projects are expected to involve communities together with local industries, agencies, and utilities in cities, towns and rural areas (including islands), which are committed to integrating renewable energy sources (RES) and efficient demand management technologies in a comprehensive and innovative way into their local energy economies.

Projects should address innovative technical approaches to the production, storage, integration and use of : RES electricity, such as wind, biomass and wastes, solar PV, geothermal, and hydro , including where appropriate the integration of distributed electricity generation at different network voltage levels with demand side management programmes, local energy management techniques and the co-ordinated provision of sustainable energy services with a high degree of local autonomy and supply security; electricity storage systems including advanced batteries, hydrogen and other electricity storage devices either for supplying short-term peak demands or for balancing variations in renewable electricity supply, as well as innovative socio-economic approaches to integrated energy planning, leading to local policies, codes, and regulations; Medium and low temperature RES heating and cooling, such as locally optimised schemes for providing heating and cooling from solar, geothermal and biomass sources in buildings and industry, and establishing advanced distribution systems (district heating and cooling networks) with integral storage systems as appropriate; Polygeneration; Liquid and gaseous biofuels and recovered fuel production and processing on a commercial basis and their use in buildings, industry and transport.

The research component of such projects may include the development and analysis of innovative technologies and innovative technology integration schemes, as well as socio-economic analysis and assessments of market impacts, planning, financing schemes, local co-operatives and end user issues.

Research areas and topics for 2003 (Call 2003)

Cost-effective supply of renewable energies:

a) Proposals for Integrated Projects are invited for the following topics:

- Large innovative wind turbines, components and design tools for reliable electricity generation at reduced costs using either onshore or offshore wind farms, including collaboration with experienced actors to address issues of interfaces with electricity grids, modelling of the turbine structures, meteorology issues, and corresponding site assessments that facilitate a move towards design limits, new design principles and materials, including more realistic load assumptions for large machines. Priority will be given to demonstrations in areas with the potential for substantial future market growth.
- Low cost photovoltaic modules with integrated dc/ac inverters that can feed power directly into the grid. The concept should be applicable to modules from different suppliers. The innovation should meet utility requirements for integration with electricity grids at low voltage levels, and also meet the requirements for ease and reliability of building integration.

b) Proposals for Specific Targeted Research Projects are invited in the following areas:

- Innovative combinations of biomass and wastes with fossil fuels for large scale supply of renewable electricity to final users, such as advanced co-firing and co-combustion;
- Innovative wind turbines, components and design tools for reliable electricity generation at reduced costs using either onshore or offshore wind farms;

- Transfer to industrial scale of a new generation of PV technologies / products, including PV in buildings, which demonstrate innovative integrated solutions for supplying solar electricity at lower costs;
- Geothermal energy for electricity generation, combined heat and power (CHP), and/or for heating and cooling, using innovative, environmentally sustainable technologies.

c) Proposals for Co-ordination Actions and Specific Support Actions are invited in the areas described in Section 6.1.3.1.1.1.

Large-scale integration of renewable energy sources into energy supplies:

Proposals for Co-ordination Actions and Specific Support Actions are invited in the areas described in Section 6.1.3.1.1.2. above.

In particular, support is envisaged for actions that will complement the future Integrated Projects to be submitted under the CONCERTO initiative (see below), addressing the following topics:

- RES-Electricity, including the development of integrated energy services, leading to the implementation of local policies, codes, and regulations.
- Distributed electricity generation in existing grids at different network voltage levels, district heat grids, demand side management programmes, local energy management techniques and storage, and the co-ordinated provision of sustainable energy services with a high degree of local autonomy and supply security; including innovative solutions to grid issues addressing the intermittent character of RES.
- Electricity storage systems including combinations of renewable energy systems (e.g. wind park and hydropower storage system), advanced batteries, hydrogen and other electricity storage devices for balancing variations in renewable electricity supply.
- Heating and cooling: integrated heat planning; distribution grids, storage and management systems for RES-heating and cooling.

Research areas and topics for 2004 (Call 2004)

Cost-effective supply of renewable energies:

The cost effective supply of renewable energies activity will not be open for proposals.

Large-scale integration of renewable energy sources into energy supplies:

Priority will be given to Integrated Projects as described below. However, proposals for Specific Targeted Research Projects, Co-ordination Actions and Specific Support Actions are also invited in the areas described in Section 6.1.3.1.1.2.

Managing energy demand and renewable energy supply in high performance communities

- Proposals for Integrated Projects, which address the large scale integration of renewable energy sources into energy supplies together with eco-buildings and polygeneration (see section 6.1.3.1.2) are invited for support under a co-ordinated initiative “CONCERTO”.

Proposals should focus on the demonstration of innovative technologies and innovative technology integration schemes, and should involve all of the relevant market actors, including community representatives, local industries, agencies, and utilities in cities, towns, rural areas or islands. The main aim should be to substantially improve the performance of energy systems for new and / or existing communities, aiming to improve the sustainability of their systems. In order to achieve this aim, projects should apply highly efficient energy saving measures, significantly increase the percentage of renewable energy supplies and integrate the self supply of renewables and polygeneration into eco-buildings.

Such communities should be in clearly defined geographical areas or zones, within which all of the dynamic interactions and relevant energy flows between centralised and decentralised energy supplies and demands can be identified for measurement and assessment purposes. Projects should also adopt, where appropriate, innovative approaches to polygeneration together with innovative energy management practices and advanced technologies in eco-buildings. Renewable energy source-based transport components may also be included.

Projects to be supported under this initiative must therefore meet the requirements of section 6.1.3.1.1.2 for Large-scale integration of renewable energy sources into energy supplies), and of Section 6.1.3.1.2.1. together with the details given in the first Call 2003.SM for Eco-buildings. Concerning Polygeneration, projects should meet the requirements of Section 6.1.3.1.2.2 with a focus on the optimisation of the whole self-supply-demand chain, and may address small, medium or large scale applications, for example a) residential for the individual requirements of residential houses, integrated into a larger network of the community; b) collective or tertiary with district heating/cooling applications; c) industrial scale for larger communities with a special emphasis on reducing the network costs and on overall system efficiency.

Proposers should ensure the commitment of local energy end users, and of the various stakeholders in the relevant energy supply chains as well as community decision makers and other local market actors. Project teams should include researchers with the expertise to address the measurement and analysis of energy flows, as well as socio-economic experience to address matters related to the integration of the approach into local community development plans.

Projects should involve the full menu of energy research activities, typically including up to about 20% for research (development and analysis of innovative energy systems, technology and market/economic risk assessment, socio-economic analysis, performance monitoring, and training), about 75-80% for demonstration (of the integration of RES and RUE technologies), and about 5% for the promotion and dissemination of project results.

Projects are expected to produce well monitored field experience of energy supply and demand patterns, in local energy economies having a high percentage of renewable energy supply, together with detailed information on the performance and reliability of the innovative energy supply and end use technologies involved. A socio-economic research component should analyse the local trends in energy costs, prices and savings, as well as the social impacts, quality and added values of the energy services provided. The projects are also expected to include analyses of technical and market risks, cost reduction potentials and future market potentials for the technologies and approaches adopted.

The results from such projects will demonstrate the high potential for energy savings which can be achieved by addressing energy supply and demand with a fully integrated approach in high performance communities. They should also result in new “good practices”, which can be used in the future as examples to raise the confidence of potential decision-makers, investors and final users.

In addition, the technical and socio-economic analyses from such projects, which integrate technology, social and economic aspects, will support the future development and implementation of energy policy, by providing well documented field experience which can be used as a basis for developing new regulations (e.g. for distributed electricity generation), for improving the security of energy supplies in future energy markets, for the further development of support schemes for RES and RUE technologies (e.g. feed in laws, green certificate schemes, energy taxation), for planning guidance, and for energy cost and price reductions.

2.5.2.4.3.2 Energy savings and energy efficiency, including those to be achieved through the use of renewable raw materials (6.1.3.1.2)

The overall objective is to substantially contribute directly or indirectly to the EU targets of (1) reducing energy intensity by 18% for the year 2010, (2) achieving a global indicative community target of 18% of electricity consumption from co-generation by the year 2010, (3) doubling the share of renewables from 6% to 12% for the year 2010 and (4) contributing to achieving the objectives of the internal market for energy, and (5) the policy of security of energy supply. Projects should also make a concrete input to the European Climate Change Programme.

The demand for cold (including air-conditioning, refrigeration, and freezing) has grown exponentially all over Europe in industry, residential and commercial buildings. This trend is expected to continue in the next years, and to penetrate also the market for private houses. Cooling and freezing are usually very energy intensive, and, if nothing is done, this predicted growth may annihilate all efforts of energy savings in buildings and industry, as targeted in the directive on the energy performance of buildings and in the green paper on security of energy supply. Today many new tertiary buildings are equipped with air conditioning, although appropriate eco-building design could have avoided the need to install air conditioning systems in the first place.

2.5.2.4.3.2.1 ECO-BUILDINGS (6.1.3.1.2.1)

The building sector is at present responsible for more than 40% of EU energy consumption. There are technologies under development, which could substantially improve (up to 30%) the energy performance of buildings, reducing the conventional energy demand in new and existing buildings and substantially contributing to reduce energy intensity, through combined measures of rational use of energy and integration of renewable energy technologies.

The Eco-buildings concept is expected to be the meeting point of short-term development and demonstration in order to support legislative and regulatory measures for energy efficiency and enhanced use of renewable energy solutions within the building sector, which go beyond the draft Directive on the Energy Performance of Buildings.

The projects aim at a new approach for the design, construction and operation of new and/or refurbished buildings, which is based on the best combination of the double approach: to reduce substantially, and, if possible, to avoid the demand for heating, cooling and lighting and to supply the necessary heating, cooling and lighting in the most efficient way and based as much as possible on renewable energy sources and polygeneration.

Priority will be given to integrated research and demonstration projects aiming at improving substantially the energy performance of buildings at a large scale, transferring scientific knowledge into standards and industrial codes, and including the results of socio-economic research on integrated planning and behaviour of users. The projects must go clearly beyond the requirements of existing legislation and thus contribute to a further development of regulatory issues in this sector.

In setting this new approach, the integrated projects should bring together different skills and expertise (urban planners, architects, engineers, system integrators, investors, manufacturers, industry, energy suppliers, owners and renters, etc), take advantage of advanced communication and information tools, and propose new methodologies and techniques.

Research areas and topics for 2003 (Call 2003)

Proposals for Integrated Projects and for Specific Targeted Research Projects are invited in the following area:

High performance eco- buildings:

In particular, support is envisaged for projects that focus on innovative solutions covering all aspects associated to the building itself, from planning, land and building characterisation, construction and life time operation in order to create a wide technological basis for future energy efficiency regulations for the buildings sector.

The main components of the projects should be:

- innovative architecture aiming at low-energy demand buildings, which is based on bioclimatic/ passive solar design combined with innovative building components;
- integration of renewable energy technologies and efficient technological solutions (including polygeneration), taking into account the total energy demand during the full life-cycle of the building and new energy management practices;
- low energy construction and/or retrofitting materials, innovative components and technologies;
- innovative building management systems (BMS) and monitoring performance criteria aiming at least-cost economic solutions based on a Life Cycle Analysis.

Projects should include the definition of goals (energy, environmental, behavioural), procedures (project management, integration and optimisation of planning, construction, maintenance, monitoring, facility management), and documentation (development of user manuals on different levels).

Specific Targeted Research Projects should address one or more of the above mentioned bullet points.

In Integrated Projects, the Commission is seeking the best combination of the above mentioned bullet points in an integrated approach of planning, building and use of the buildings, considering lifetime energy performance with improved cost to benefit ratio. The projects should also include support measures, for example addressing a) the upgrading of curricula and the continuous education of professionals involved in the building sector, b) changes to the planning structure aimed at enhancing building energy performance, c) EU-wide benchmarking and performance indicators for eco-building planning, construction and retrofitting, d) the preparation of guidelines for authorities in which these performance indicators are an integral part of the procedure of granting construction permissions and the basis for structures of energy pricing in order to favour energy saving behaviour of the end user.

The results obtained in each project shall accelerate the market penetration of cleaner and more efficient buildings.

Knowledge and data gathered within replicable examples should be spread widely in order to prepare the ground for more ambitious legislative, technological and market measures to encourage energy savings and sustainability in the buildings sector.

Research areas and topics for 2004 (Call 2004)

Managing energy demand and renewable energy supply in high performance communities:

Integrated Projects under this activity will be supported through a co-ordinated initiative "CONCERTO"- see section 6.1.3.1.1.2.

Eco-buildings:

Proposals for only eco-buildings will not be considered in this call.

2.5.2.4.4 CALL TRANSPORT-3

Call title: Thematic call in the area of 'Surface Transport 2B'

Call identifier: FP6-2003-Transport-3.

Date of publication: 13 December 2003.

Closure date(s): 06 April 2004.

Area	Topic	Instrument
Objective 1 'New technologies and concepts for all surface transport	Quieter surface transport	IP

modes (road, rail and waterborne)'	Research domains 4.11 to 4.16 for all surface transport modes	CA
Objective 3 'Re-balancing and integrating different transport modes'	Increased reliability and performance of the rail system through intelligent vehicles and infrastructure systems and their maintenance	IP
	Research domain 3.16 for all surface transport modes	STREP
	Research domains 3.14 to 3.17 for all surface transport modes	CA
Objective 4 'Increasing road, rail and waterborne safety and avoiding traffic congestion'	Research domain 4.12 for all surface transport modes	STREP
	Research domains 4.11 to 4.16 for all surface transport modes	CA

2.5.2.4.5 WORK PROGRAMME

2.5.2.4.5.1 Objective 1 « New technologies and concepts for all surface transport modes (road, rail and waterborne) »

⇨ Quieter surface transport

Objective: The aim is to develop an integrated technology infrastructure for the efficient control of road and rail ambient noise by considering the attenuation of noise creation at source at both vehicle/infrastructure levels. The activity will support European noise policy to eliminate harmful effects of noise exposure and decrease levels of transport noise creation, especially in urban areas, deriving solutions that will ensure compliance with the constraints of legislative limits.

Scope: Activities will cover the development of holistic external noise abatement solutions which will consider the entire vehicle/infrastructure system, including retrofitting aspects (with the most essential categories of vehicles: cars, trucks, light duty vehicles, motorbikes, trams, trains…) as well as behavioural aspects. Investigations will include noise sources of power train and vehicle, road surface/tyre or rail track/wheel interaction, traffic flow effects, including loading and unloading operations. An overall vehicle, driver behaviour and infrastructure multidisciplinary approach will be needed in order to reach the objectives. Activities will pay special attention to phenomena of propagation, perception and annoyance in order to obtain a true holistic strategy against noise annoyance. The work will include monitoring and maintenance of low noise creation levels and in particular consider critical areas relating to propagation and perception. The potential exploitation of any relevant results in the maritime sector should be investigated.

Expected outcome: Integration of knowledge, methodologies, simulation tools, decision support systems and demonstration of highly efficient systems and technologies, at vehicle/vessel and infrastructure level, for noise reduction and control. Particular attention should be given to urban areas applications. Links and compliance to legislation aspects such as Environment Noise Directive should be considered.

2.5.2.4.5.2 Objective 3 « Re-balancing and integrating different transport modes »

⇨ Increased reliability and performance of the rail system through intelligent vehicles and infrastructure systems and their maintenance

Objective: The long term target for rail is to double and triple its capacity by the year 2020 while reducing the costs, enhancing the environmental advantages and maintaining high level of the safety. This implies, amongst other factors, that, in addition to the development of a dedicated freight network for the main corridors, there would be more intense traffic levels on the remaining network, still largely mixed between passenger and freight, using the same tracks, requiring innovative products, services and organisation. The aim is to provide a higher intensity of services whilst ensuring the integrity of the overall system safety levels through the

development of integrated intelligence systems for industrial products in the domain of rolling stock and infrastructure, traffic management, operational network, and the links between these systems. The activity will contribute to: a) removing the obstacles which impede punctuality, just in time availability of rolling stock (locos, wagons), and the availability of permanent information on travel time and route; 2) improving the maintenance regime by optimising predictive maintenance and reducing routine and unsolicited maintenance requirements for both rolling stock and infrastructure; and 3) enhancing of infrastructure and rolling stock availability, fleet and staff management, dynamic path allocation and booking systems, encompassing intelligent payment and transaction systems.

Scope: The development of a coherent intelligence system providing information to the operators and infrastructure managers to support decision making and optimise railway system performance. The provision of the information shall be based on the demand pattern including e.g. traffic information, information concerning the availability of rolling stock and infrastructure, condition monitoring of active rolling stock, maintenance procedures and operation of rolling stock and infrastructure, diagnostic systems in conjunction with (predictive) maintenance operations. The development of coherent intelligent systems, linked together, including the European Rail Traffic Management System (ERTMS). Systems under the responsibility of rail operators will be developed on a pre-competitive basis.

Expected Outcome: Coherent information systems fed and used by rail operators and infrastructure managers in their own business interest to optimise rail system performance providing all necessary information concerning traffic, operation and transport logistics (such as available slots, departure and arrival times), infrastructure and rolling stock conditions and maintenance. This will provide operation management alternatives which could be used to maximise infrastructure capacity and optimise fleet utility, maximising the profit by increasing the spectrum of the products and services offered and reducing the costs.

⇨ Research, technological development and integration (Research domains from 3.14 to 3.17).

Research will target the development of transport technologies to achieve a sustainable modal shift from road to railways and water-borne routes including inland navigation and short sea shipping. Both innovative vehicle/vessel concepts and their effective integration in multi-modal door-to-door transportation chains will be addressed.

The objective will be to remove congestion from road infrastructure in Europe, to improve the mobility of travellers and goods and to promote a safe and clean transportation system for Europe. Research and policy measures for road freight would seek to limit growth from 50 % to 38% by 2010. Targets for rail include tripling freight and doubling passenger market share by 2020.

Research domains: (in Call 2B domain 3.16 is included for STREPs and all domains are included for CAs. Also all domains are included for SSAs as part of the continuous call)

3.14 Development of vehicle and vessel concepts for both passengers and freight, characterised by interoperability and inter-connectivity, for cross-operation between different transport routes and networks supported by advanced mechatronics, on-board electronics, information and communication systems.

3.15 Development of new inter-modal vehicle/vessel concepts to attain optimal performance in terms of fuel economy, environmental impact (including noise), manoeuvrability (including obstacle avoidance), stability and maximum carrying volume.

3.16 Development of equipment, methods and systems for optimal accommodation, fast loading and unloading of intermodal transport units and definition of optimal use of storage space both in vehicles/vessels and terminals and efficient final distribution of goods.

3.17 Technologies to ensure effective, clean and safe operations of vehicles/vessels in terminals and minimisation of turn-round time combining manoeuvring assistance, terminal auxiliary services, waste management (including ballast water in ports) and integration of telematics support for improved communication with terminals control and management systems.

2.5.2.4.5.3 Objective 4 « Increasing road, rail and waterborne safety and avoiding traffic congestion »

⇨ Research, technological development and integration (Research domains from 4.11 to 4.16)

The research will focus on increasing the capacity of existing and new transport infrastructure by maximising safety and well being of drivers, passengers, crew and pedestrians. The aim will be the development of strategies, systems and technologies to attain optimal operational performance of vehicles/vessels and their supporting infrastructure, seeking to halve the number of transport fatalities by 2010 and increasing capacity by 15%.

Technological innovation will largely rely on computer-based decision support tools, information services on the condition of transport routes (e.g. road holding, sea state or traffic congestion) and vehicle/vessel operational responsiveness.

Research domains: (in Call 2B domain 4.12 is included for STREPs and all domains are included for CAs. Also all domains are included for SSAs as part of the continuous call)

4.11 Integrating technologies for driving, piloting and manoeuvring assistance to improve safety and maximise the effective capacity of the infrastructure, including the secure transportation of hazardous goods.

4.12 Developing technologies to sense and predict natural and infrastructure conditions affecting safety and efficiency of transport operations.

4.13 Developing integrated safety systems which are reliable and fault tolerant (preventive, active and passive) taking into account human-machine interface concepts focusing on the system implementation.

4.14 Designing user-friendly driver interfaces based on human-centred design philosophies taking into consideration bio-mechanical ergonomics, injury reduction measures, environment perception and effective lay-out of signalling and piloting information for improved safety.

4.15 Developing integrated, single platform, modular computer-based training systems for land-based drivers and waterborne pilots, that are cost effective, with monitoring capability of fitness to navigate and muster, including crisis management conditions.

4.16 As part of the development of a large-scale integration and validation platform across modes for the realisation of the intelligent transport vehicle and infrastructure of the future technology will concentrate on intelligent management and guidance systems. This will include satellite navigation systems capable of stabilising vehicle trajectory, with respect to lateral and longitudinal displacement, and will regulate vehicle speed and separation with high accuracy and reliability.

2.5.2.4.6 CALL GLOBAL-1 ⇦ NOT OPEN NOW

Call title: Thematic call in the area of 'Global change and ecosystems'.

Call identifier: FP6-2002-Global-1.

Date of publication: 17 December 2002.

Closure date(s): 08 April 2003.

Area	Topic	Instrument
Area 6.3.II: Water cycle, including soil related aspects	6.3.II.2.1(a)	IP and NOE
	6.3.II.2.2(a)	IP and NOE
	6.3.II.3.1(a)	STREP and CA
	6.3.II.3.3(a)	STREP and CA
Area 6.3.V: Strategies for sustainable land management, including coastal zones, agricultural land and forests	6.3.V.2.2(a)	IP and NOE

Area 6.3.VIII: Cross-cutting issue: Sustainable Development concepts and tools	6.3.VIII.1(a)	STREP and CA
	6.3.VIII.2(a)	STREP and CA
	6.3.VIII.2(b)	STREP and CA
Specific support actions	(See 'Specific support actions' section for details)	SSA

2.5.2.4.7 WORK PROGRAMME

2.5.2.4.7.1 II. Water cycle, including soil-related aspects

The objective is to understand the mechanisms and assess the impact of global change and in particular climate change on the water cycle, water quality and availability, as well as soil functions and quality to provide the bases for management and technological tools for water systems to mitigate the impacts.

The research will focus on hydrology and climate processes, the ecological impacts of global change, soil functioning and water quality, integrated management strategies and mitigation technologies, and scenarios of water demand and availability.

2.5.2.4.7.1.1 II.2. ECOLOGICAL IMPACT OF GLOBAL CHANGE, SOIL FUNCTIONING AND WATER QUALITY

Global change can exert severe impacts on the ecology of aquatic and wetland ecosystems, on the filter and transport functions of soils and on water quality. Assessments of these changes requires a better understanding of the consequences of major hydrological changes, to identify and quantify the key biogeochemical processes and to predict the consequences of global change at different scales. The integrated management of soil-water systems requires a detailed understanding of the properties and the functional role of soils, and the behaviour and fate of pollutants, in order to allow the development of risk-based management approaches. The research will focus on impacts of global change on the ecology of surface water bodies, and on water-soil system functioning and management.

2.5.2.4.7.1.1.1 II.2.1) Impacts of global change on the ecology of surface water bodies

Topic for up to one Network of Excellence or Integrated Project to implement **in 2003**

II.2.1.a) **Assessment of ecological impacts of global change on freshwater bodies, development of ecological indicators of ecosystem "health" and related remediation strategies**. In a phased approach this action should integrate the wide range of expertise needed to assess the combined impacts of medium to long-term global climate and environmental changes on the quality of water, the structure and ecological functioning of surface water and marginal wetland ecosystems, in order to develop a set of representative and sensitive ecological indicators of the health of those ecosystems, and to identify best practices for re-naturalisation.

2.5.2.4.7.1.1.2 II.2.2) Water-soil system functioning and management

Topic for up to one Network of Excellence or Integrated Project to implement **in 2003**

II.2.2.a) **River-soil-groundwater system functioning**. For an improved understanding of the functioning of 'river-sediment-soil-groundwater' systems, this action should focus on the changes of physical, chemical and biological properties of soils caused by changing climatic conditions, land use practices or other perturbations and their impact on water quality, water quantity, and on the development of integrated soil-water numerical models.

Indicative topic for STREPs and Co-ordination Actions to implement **in 2004**

II.2.2.b) **Soil-groundwater protection**. Research on improved and more economic remediation techniques for contaminated soils and groundwater, including monitored

natural attenuation techniques. A specific involvement of SMEs in these actions is envisaged.

2.5.2.4.7.1.2 *II.3. INTEGRATED MANAGEMENT STRATEGIES AND MITIGATION TECHNOLOGIES*

Research will focus on the development of integrated approaches and tools for water-soil resources management in the context of global change – with its different components of climate change, land use change, other anthropogenic drivers, etc. - and integrated vulnerability assessments, taking also into consideration socio-economic and technological aspects of water use. Research will focus on the catchment scale, on the specific aspects of integrated urban water management and mitigation technologies as well as on the management of scarce water resources and mitigation technologies. Emphasis has to be placed on developing flexible adaptation strategies to change, in order to decrease vulnerabilities. This will require specific technological development, particularly for matching with longer drought periods and with more intense rainfall events, especially in urban areas.

2.5.2.4.7.1.2.1 *II.3.1) Integrated water management at catchment scale*

Topic for STREPs and Co-ordination Actions to implement **in 2003**

II.3.1.a) **Twinning European/third countries river basins**. Specific integrated water resources management research activities in case studies, to be carried out on twinned catchments/river basins from Europe and from developing countries. This research activity will contribute to the objectives of the EU Water Initiative launched in Johannesburg at the World Summit on Sustainable Development. The participation of African and NIS countries is particularly requested. The participation of International Organisations is welcome, particularly for establishing interfaces with other bilateral or multi-lateral international co-operation actions.

Indicative topic for Network of Excellence or Integrated Project to implement **in 2004**

II.3.1.b) **Methodologies of Integrated Water Resource Management and Transboundary issues.** This action should be launched through an international partnership, involving European and developing countries, integrating engineering, natural and socio-economic sciences, for developing research activities on river basins in Europe and in different parts of the world, particularly on transboundary catchments.

2.5.2.4.7.1.2.2 *II.3.2) Integrated urban water management and mitigation technologies.*

Indicative topic for STREPs and Co-ordination Actions to implement **in 2004**

II.3.2.a) **Wastewater reuse**. Research on improved, simplified and cost-efficient municipal treatment processes for safe wastewater and storm water re-use in Europe and developing countries.

2.5.2.4.7.1.2.3 *II.3.3) Management of scarce water resources and mitigation technologies*

Topic for STREPs and Co-ordination Actions to implement **in 2003**

II.3.3.a) **Technologies for monitoring and mitigating the impact of water scarcity**. Specific development of innovative and cost-effective mitigation technologies or improvement of existing methods (e.g. artificial recharge, water reuse, water conservation, desalination, etc.) and of technologies adapted to specific conditions of developing countries. The participation of third countries partners is encouraged.

Indicative topic for Network of Excellence or Integrated Project to implement **in 2004**

II.3.3.b) **New approaches to water stress**. Combating water stress requires the development of innovative management strategies, technologies and monitoring systems. Moreover better understanding of the relationships between surface water, soil and groundwater as well as between soils, plants and the atmosphere are needed. Participation of third countries should concentrate on the participation of Mediterranean countries suffering problems of water scarcity.

2.5.2.4.7.1.3 *II.4. SCENARIOS OF WATER DEMAND AND AVAILABILITY*

With the aim of defining a sustainable development framework and to provide to policy-makers instruments in support of policy choices, more advanced analytical tools have to be worked out in order to define more realistic medium- and long-term scenarios of water demand and availability at a wide regional level. The research will concentrate on the development of scenarios for Europe and neighbouring countries.

*Indicative topic for Network of Excellence or Integrated Project to implement **in 2004***

II.4.1.a) **Water scenarios for Europe and for neighbouring countries.** Development of medium-long term (25-50 years) scenarios, based on advanced policy, socio-economic and technological option design strategies, that should become a reference for large scale regional planning. The participation of third countries should cover in particular the areas surrounding the European borders.

2.5.2.4.7.2 V. Strategies for sustainable land management, including coastal zones, agricultural land and forests

The objective is to contribute to the development of strategies and tools for sustainable use of land, with emphasis on the coastal zones, agricultural lands and forests, including integrated concepts for the multipurpose utilisation of agricultural and forest resources, and the integrated forestry/wood chain in order to ensure sustainable development at economic, social, and at environmental levels. Qualitative and quantitative aspects of multifunctionality of agriculture and forestry will be addressed.

Two parts will be addressed in this area, the first one dedicated to the sustainable land-use and the second one addressing the qualitative and quantitative aspects of multifunctionality of agriculture and forest/wood chain.

2.5.2.4.7.2.1 *V.2. QUALITATIVE AND QUANTITATIVE ASPECTS OF MULTI-FUNCTIONALITY OF AGRICULTURE AND FORESTRY/WOOD CHAIN*

The research for the agriculture and forestry/wood chain will take into account the global-local scale, and will use an integrated, multifunctional approach covering environmental, economic, and social levels. Furthermore, the link and complementarity between EU internal and external dimensions of the Sustainable Development are fundamental components of the multi-functionality concept; a particular effort is requested for the integration and participation of Developing Countries (e.g. African Countries).

2.5.2.4.7.2.1.1 *V.2.2) Forestry/wood chain for Sustainable Development.*

Topic for up to one Network of Excellence or Integrated Project to implement **in 2003**

V.2.2.a) **Development and application of integrated approach and tools for long-term sustainability of forest status and productivity.** Role and impact of the complete forestry/wood chain in the context of the EU sustainable development strategy taking into account the multi-functionality aspects, including the regional and international dimensions and the societal needs. The necessary integration and sustainability of the different stages of the complete forestry/wood chain and the targets for the environmental, economic and social objectives at local, regional and global levels should be included in the systems of forest production and technological and industrial processes analysis.

2.5.2.4.7.3 VIII. Cross-cutting issue: Sustainable Development concepts and tools

The objective is to develop concepts and tools for facing the complex challenges expressed in the EU Strategy on Sustainable Development and the Johannesburg Summit and to characterise the sustainability dimension of the relevant policies. The desired tools, including potential positive and negative externalities, will support the Sustainability Impact Assessments, the assessment of the interrelations of environmental, economic and social impacts of policies and measures in qualitative and quantitative terms. The precautionary

principle and the regional aspects to sustainable development will be key elements to be taken into account.

The research will focus on the estimation of thresholds of sustainability and externalities and on the development of tools for integrated sustainability assessment and for the incorporation of sustainability in decision making processes.

2.5.2.4.7.3.1 *VIII.1. ESTIMATING THRESHOLDS OF SUSTAINABILITY AND EXTERNALITIES*

The definition and estimation of scientifically based thresholds of sustainability and points of no-return as a tool for the sustainable management and the characterisation of the state of the environment will have to be addressed; this implies an equal balance between the necessary ecological, social and economic dimensions. This activity will cover: the estimation of cumulative, interactive effects over time caused by current and foreseeable actions; the coupling of data with policy judgements reflecting costs; the identification of time and scale of potential damages; the use of thresholds in policy making. Developing and harmonising methods for evaluating environmental and health impacts are also required.

*Topic for STREPs and Co-ordination Actions to implement **in 2003***

VIII.1.a) **Harmonising and sharing of methods and data** in environmental and health externalities evaluation; extraction of operational estimates from existing studies (excluding energy and transport).

*Indicative topics for Network of Excellence or Integrated Project to implement **in 2004***

VIII.1.b) **Thresholds:** Scientifically based thresholds of environmental sustainability and points of no-return need to be defined and estimated as a tool for the sustainable management and the characterisation of the state of the environment. An equal balance of the ecological, social and economic dimensions should be taken into account. The ecological quality aspects together with valuation of externalities will be used to define and estimate thresholds of sustainability, aiming also at their use in policy-making.

VIII.1.c) **Elaborating new accounting frameworks of externalities:** positive and negative externalities of policies, instruments, production activities and technologies playing a significant role for the Sustainable Development strategy implementation.

2.5.2.4.7.3.2 *VIII.2. DEVELOPING TOOLS FOR INTEGRATED SUSTAINABILITY ASSESSMENT AND FOR THE INCORPORATION OF SUSTAINABILITY IN DECISION MAKING PROCESSES*

Sustainability assessment and Sustainable Development strategy definition need integrated modelling at the macro and sectoral level at the world, EU, national and regional dimensions for policy appraisal, including simulation, scenario building, risk analysis and forecasting. In this respect, the development of quantitative tools and analysis will combine economic with ecological modelling, integrating horizontal and sectoral topics such as technology, land-use, agriculture, forestry, energy, transport, biodiversity and social issues; these tools and analysis must integrate the externalities of policies and technologies. Measuring progress towards Sustainable Development for policy purposes needs also to be strengthened. Education programmes should ensure the dissemination of knowledge and practices relative to this socio-economic research.

*Topics for STREPs and Co-ordination Actions to implement **in 2003***

VIII.2.a) **High level scientific** validation of methodologies, tools and appraisals developed for the Sustainable Development assessment and strategy definition.

VIII.2.b) **Indicators:** sharing and harmonising databases and statistics and building consensus on combined ecological, environmental and social indicators to be used to monitor progress towards Sustainable Development at different geographical levels, in particular the regional one.

*Indicative topic for Network of Excellence or Integrated Project to implement **in 2004***

VIII.2.c) **Innovative methods and tools** for integrated assessment of environmental, economic and social components of Sustainable Development; benchmarking of existing tools and development of new ones; shared analysis on foresight practices for Sustainable Development analysis. Qualitative and participatory tools should also be included, with a view to increasing public participation and involvement in the process.

*Indicative topics for STREPs and Co-ordination Actions to implement **in 2004***

VIII.2.d) **Integrated modelling and quantitative tools development and application** for sustainability scenarios building and specific assessments (macro- and micro-levels; economic, environmental and social dimension, global, regional, local scales); these tools should allow for public involvement in the process.

VIII.2.e) **Education programmes** on social and economic and environmental tools for the implementation of the EU Strategy on Sustainable Development at both EU and international levels (addressed in particular to stakeholders and decision-makers).

2.5.2.4.7.4 Specific Support Actions

Specific Support Actions are projects aiming to actively contribute to the implementation of the work programme, the analysis and dissemination of results or the preparation of future activities, with a view to enabling the Community to achieve or define its RTD strategic objectives.

They will also be implemented to stimulate, encourage and facilitate the participation of organisations from the candidate countries in the activities of the priority thematic area.

The following topics should be considered for **Specific Support Actions *in 2003***:

- **Actions such as the European Network for Research in Global Change (ENRICH)** to build and strengthen co-operation with partners in the developing world on issues such as climate change, biodiversity, ecosystems, natural risks and hazards. The objective of ENRICH is to promote co-operation by training and by integrating critical masses of resources and capabilities of industrialised and developing countries. These activities are complementing other initiatives like the Asian-Pacific Network or the Inter American Institute in Latin America. ENRICH would also be an indicative topic for Specific Support Actions in 2004.
- **Consolidating knowledge on the role of wetlands in the water cycle**. There is a need to synthesise the results of concluded and on-going research activities, both at European and national level, for giving guidance on the hydrological, ecological and socio-economic role of wetlands.
- **European contribution to international observation systems.** Actions toward international co-operation are envisaged with a view to providing a European contribution to the setting-up of observation systems (in particular, in the developing countries) together with non-EU countries such as US (e.g. NASA, NOAA) and Japan. This is needed in order to sustain the role of EU on the international stage and to exploit the technological capacity and methodologies in the area of global change observations.
- **Capitalisation of results from the past research on sustainable agriculture** and perspectives for future research actions. Contribution of the agro-ecological systems to the different land uses. Comparison of existing externalities calculation in agricultural and forest production.

- **Lessons from past research on sustainable production and utilisation of forests.** Characterisation of the multi-functionality aspects of forestry/wood chain with regard to their capacity of natural resource conservation, landscape creation and land-use according to different types of regions (mountains, coastal zones, cultivated areas and urban forests) including their industrial utilisation in the forestry/wood chain and taking into account the role of the actors, institutions and legislation.

2.5.2.5 Horizontal Research Activities Involving SMEs (9)

2.5.2.5.1 INTRODUCTION

Internet website: http://www.cordis.lu/fp6/sme.htm

Info desk (email): research-sme@cec.eu.int

2.5.2.5.1.1 Introduction (9.1)

The main route for SMEs to participate in the Sixth Framework Programme in the activities implemented under the Priority Thematic Areas will be through Integrated Projects (IP), Specific Targeted Research Projects and possibly also through Networks of Excellence (NoE). In addition, FP6 contains specific schemes for SMEs in the form of Horizontal Research Activities: Co-operative Research and Collective Research.

The Horizontal Research Activities (Co-operative Research and Collective Research) are specific schemes for SMEs which address primarily the large community of SMEs with capacity to innovate but with limited research capabilities. The budget available for these Horizontal Research Activities is 430 M€ of which at least two-thirds will be allocated to Co-operative Research Projects. SMEs are also able to participate in the Sixth Framework Programme in the activities implemented under the Priority Thematic Areas through Integrated Projects (IP), Specific Targeted Research Projects and possibly also through Networks of Excellence (NoE).

An eligible SME is a legal entity that complies with the SME definition set out in the Commission Recommendation 96/280/EC (OJ L107 of 30/04/1996 p.4-9)[10] and is not a research centre, research institute, contract research organisation or consultancy firm. A new SME definition[11] will enter into force on 1st January 2005, but it will not apply to calls with closure dates in 2004.

[10] SME is a company:
- with fewer than 250 employees;
- either with an annual turnover which does not exceed 40 MEUR or with an annual balance sheet total which does not exceed 27 MEUR;
- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

[11] New definitions 2005:
SME is a company:
- with fewer than 250 employees;
- either with an annual turnover which does not exceed 50 MEUR or with an annual balance sheet total which does not exceed 43 MEUR;
- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

SMALL is a company:
- with fewer than 50 employees;
- either with an annual turnover which does not exceed 10 MEUR or with an annual balance sheet total which does not exceed 10 MEUR;
- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

MICRO is a company:
- with fewer than 10 employees;
- either with an annual turnover which does not exceed 2 MEUR or with an annual balance sheet total which does not exceed 2 MEUR;

The participation of partners from developing countries, Mediterranean partner countries, Western Balkan countries, Russia and the NIS, is particularly welcome in the horizontal activities involving SMEs. A limited budget is available for the funding of these partners.

2.5.2.5.2 CALL SME-1

Call title: Cooperative research projects

Call identifier: FP6-2003-SME-1.

Date of publication: 17 December 2003.

Closure dates: 21 October 2004.

Area	Instrument	Budget (MEUR)
Any subject across the whole field of science and technology covered by Article 163 of the EC Treaty	Specific research project for SMEs (cooperative research projects - CRAFT)	75

Because any subject is here covered, this programme is good for CREC.

2.5.2.5.3 WORK PROGRAMME

2.5.2.5.3.1 Co-Operative Research - "CRAFT" (9.2)

Co-operative Research is a scheme whereby a number of SMEs from different countries, having specific problems or needs, assign a significant part of the required scientific and technological research to RTD performers. The SMEs retain the ownership of the results. These activities may also be carried out by innovative and high-tech SMEs in co-operation with research centres and universities.

Co-operative Research contributes to the objectives of the Sixth Framework Programme as regards the SMEs and, in particular:

– supports SMEs to respond to the pressures for continuous innovation and technological adaptation that are exacerbated by the completion of the European internal market and the intensification of competition;

– facilitates transnational co-operation in research between SMEs, research institutions and other organisations, which is essential to SMEs' competitiveness and internationalisation strategies, and

– facilitates co-operative relations in research activities between SMEs, research institutions and other organisations and enables SMEs to benefit from the many advantages of networking for innovation.

Projects are relatively short term: duration must be at least one year and with a maximum of two years.

Co-operative Research Projects may address any research topic across the whole field of science and technology.

2.5.2.5.4 CALL SME-2

Call title: Collective research projects.

Call identifier: FP6-2003-SME-1.

Date of publication: 17 December 2003.

- with less than 25% of its capital controlled by organisations which are not themselves SMEs. This threshold may be exceeded if the SME is owned by public investment corporations, venture capital companies or institutional investors.

Closure dates:

- First stage 06 April 2004.
- The closure date for that second submission will be detailed in the request (indicative closure date: mid September 2004).

Area	Instrument	Budget (MEUR)
Any subject across the whole field of science and technology covered by Article 163 of the EC Treaty	Specific research project for SMEs (collective research projects)	41

Because any subject is here covered, this programme is good for CREC. Yet, European cooperation is needed to be successful!

2.5.2.5.5 WORK PROGRAMME

2.5.2.5.5.1 Collective Research (9.3)

Collective Research is a scheme where RTD performers undertake scientific and technological research activities on behalf of Industrial Associations[12] or Groupings in order to expand the knowledge base of large communities of SMEs and thus improve their general standard of competitiveness. The Industrial Associations/Groupings retain the ownership of the results.

Collective Research Projects may address pre-normative research issues, technological problems related to the development and implementation of legislation, and technological problems of whole industrial sectors that could not possibly be addressed by Co-operative Research Projects. The dissemination of results to large communities of SMEs and the training of staff from SMEs and Industrial Associations/Groupings will be expected to be integral components of these projects.

Collective Research Projects will be substantial projects of 2 to 3 years duration A project of longer duration could be accepted if it is necessary to deliver its objectives and when duly justified.

Collective Research Projects can address any subject across the whole field of science and technology and must be of interest to large communities of SMEs. They aim at achieving concrete results in terms of applicable new knowledge either to improve or develop new products, processes or services or to meet other needs of SMEs, and could cover, for example:

– research aimed at reinforcing the technological basis of particular sector(s);

– development of “technological tools” (e.g. diagnosis, safety equipment);

– pre-normative research (research to provide a scientific base for European norms and standards);

– research aimed at addressing common problems/challenges (e.g. to meet regulatory requirements, such as health & safety at work legislation, environmental performance).

Collective Research Projects will include three types of activities:

- Research and innovation-related activities
- Consortium management
- Training activities

Training activities are aimed at technical and managerial staff from SMEs and Industrial Associations/Groupings. Training should focus on results/technologies generated by the project.

[12] The term industrial association or grouping refers to associations or groupings within the enterprise sector.

3 EUREKA

3.1 EUREKA – a Network for Market-Oriented R&D

EUREKA is a pan-European network for market-oriented, industrial R&D. EUREKA supports the competitiveness of European companies through international collaboration, in creating links and networks of innovation. The objective is to bring high quality research and development efforts to the market and to use the multiplying effects of cooperation. The aim is to advance and improve the quality of life

EUREKA has 33 European member states plus the European Union represented by the European Commission. In addition, one country has an associated status, and three others have set up a National Information Point – NIP, hence they are called NIP countries.

In each country, there is a National Project Coordinators – NPC responsible for various EUREKA-related activities. They often locate in technology/funding agencies, such as Tekes in Finland.

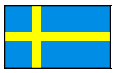
In EUREKA projects, there must be partners from at least two member states. EUREKA projects are funded by national financing agencies, such as Tekes in Finland. The maximum public funding is 50% of the eligible project costs; in most cases and most countries, however, remarkably less is available.

Figure 6: EUREKA Member States 2004; France chairing

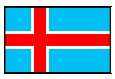
Countries are listed below from north to south.

MEMBER STATES (33+EU)

Finland (FI)


Sweden (SE)


Norway (NO)


Iceland (IS)


Denmark (DK)


Estonia (EE)


Latvia (LV)


Lithuania (LT)


Russia (RU)


Poland (PL)


Germany (DE)


Austria (AT)

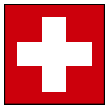

United Kingdom (GB)


Ireland (IE)

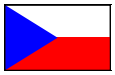

Netherlands (NL)


Belgium (BE)


Luxembourg (LU)


Switzerland (CH)


France (FR)


Czech Republic (CZ)


Slovakia (SK)

 Hungary (HU)

 Slovenia (SI)

 Croatia (HR)

 Yugoslavia (YU)

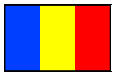
 Spain (ES)

 Portugal (PT)

 Italia (IT)

 Greece (GR)

 Cyprus (CY)

 Romania (RO)

 Turkey (TR)

 Israel (IL)

 EU (EU)

ASSOCIATED COUNTRIES (1)

 Morocco (MA)

COUNTRIES WITH NATIONAL INFORMATION POINTS - NIP (3)

 Ukraine (UA)

 Albania (AL)

 Bulgaria (BG)

In 2003/04 the number of individual industry-led projects was over 700 with a total value of about 2,000 MEUR. In addition, there are several cluster and umbrella projects with a total value of 3,300 MEUR.

All necessary information about EUREKA and its European and national activities including National Project Coordinators – NPCs is available in their renewed Internet website at http://www.eureka.be/.

3.2 What EUREKA offers?

EUREKA offers to companies a safe way to solve their technology problems, to advance their new ideas and to open European and international markets:

- More challenging objectives and faster results through wider European know-how and resources.
- Finding partners and information about the R&D projects of others.
- Costs divided between all partners.
- Already during the applied product development period, to prepare European markets and marketing channels together/via project partners.
- EUREKA status offers wide recognition of the company and its product under development.
- In many member states, the EUREKA status helps to get public funding, compared to other type of R&D project.
- Create a channel to European and national authorities for support actions; they could concern standards, technical trade barriers, public procurement etc.
- Dynamic internationalisation via market-oriented, industrial R&D.

3.3 How to work with EUREKA?

3.3.1 PROJECTS

- Projects are market-oriented, industry-led R&D.
- Partners plan and decide the contents, roles, contributions, cost sharing etc of the project as fit to themselves.
- Partners decide what to do with the results.

3.3.2 HOW TO PARTICIPATE?

When you have a new idea to develop or problem to solve ⇨ take your project idea to your national NPC at your national EUREKA office. The NPC will spread the idea through the EUREKA network to potential partners. Potential partners are also searched in the EUREKA data base. The proposer fills a simple form available at the EUREKA website.

After a new project and at least one another partner are put together ⇨ the proposer (or other agreed project coordinator) fills a project description, as found and instructed at the EUREKA website. This description is also an application for the EUREKA status, and shall be sent to the partners' respective NPCs. Henceforward, the NPCs concerned prepare all actions necessary for the EUREKA process and decision-making.

Sometimes it also possible to join in an ongoing EUREKA project. ⇨ Applicant shall contact the coordinator of the interesting project and then contact NPC for necessary actions. Joining is subject to the acceptance of the original partners.

3.3.3 EUREKA CRITERIA

- Partners from at least two EUREKA member states.
- Project must be innovative, and it should target at a marketable product, process or service.
- Project funding must be secured; EUREKA is not any financing agency, but financing comes from private (min 50%) and public national or other (max 50%) sources.
- EUREKA is continuously open for proposals.

Necessary forms together with related guidance can be found at http://www.eureka.be/ifs/files/ifs/jsp-bin/eureka/ifs/jsps/publicProject.jsp?fileToInclude=launchIdeaInc.jsp.

3.4 What EUREKA offers to CREC?

The following chart gives you a picture of what kind of projects are going on in EUREKA. To give you some additional understanding, Finland, a small country of five million people, had participants in 59 different EUREKA projects, clusters and umbrellas, and 15 (25%) of them a Finnish organisation was a coordinators/project leader (January 2004).

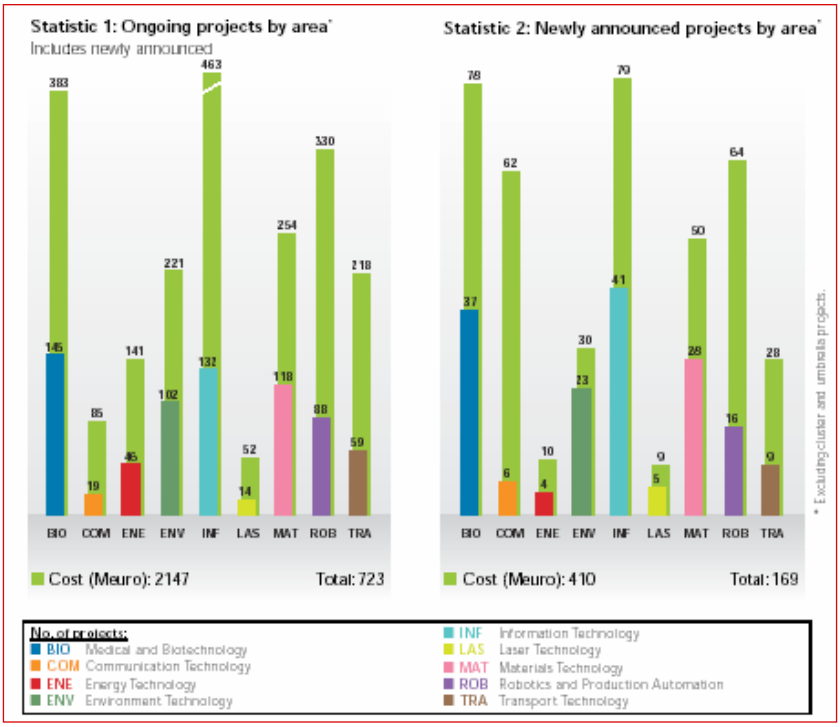


Figure 7: Ongoing and newly announced projects in EUREKA by category.

Source: EUREKA, June 2002

There are over 200 ongoing or completed CREC-related EUREKA projects. This is 1/6 of all projects! As an example, concrete-related projects total at 61. This proves the value of EUREKA to CREC.

4 COST

4.1 COST - European Cooperation in the Field of Scientific and Technical Research

Founded in 1971, COST is an intergovernmental framework for European Co-operation in the field of Scientific and Technical Research, allowing the co-ordination of nationally funded research on a European level. COST actions cover basic and pre-competitive research as well as activities of public utility.

The goal of COST is to ensure that Europe holds a strong position in the field of scientific and technical research for peaceful purposes, by increasing European cooperation and interaction in this field.

COST has 34 actual member states, and 1 cooperating state. In addition, there are 9 states with participating Institutions. Also, cooperation is welcome from non-COST countries and outside of Europe.

COST is based on Actions. These are networks of coordinated national research projects in fields, which are of interest to a minimum number of participants (at least 5) from different member states. The duration of an Action is generally 4 years.

In each country, there is a COST National Coordinator – CNC responsible for various COST-related activities. They often locate in technology/funding agencies, such as Tekes in Finland.

Funding is available to cover coordination costs such as contributions to workshops/conferences, travel costs for meetings, contributions to publications and short term scientific missions of researchers to visit other laboratories. This funding comes from the European Union /European Commission.

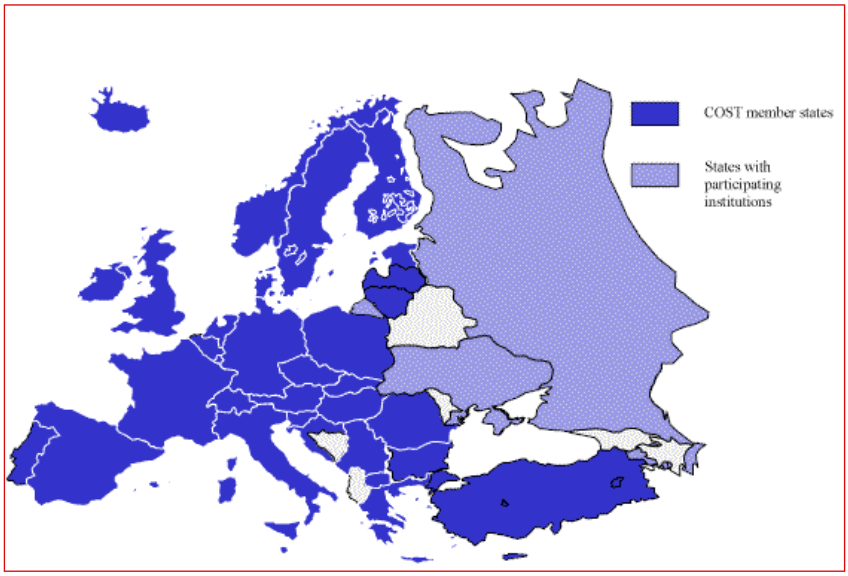


Figure 8: COST Member States and participating countries 2004

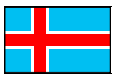
Countries are listed below from north to south.

MEMBER STATES (34)

Finland (FI)

Sweden (SE)

 Norway (NO)

 Iceland (IS)

 Denmark (DK)

 Estonia (EE)

 Latvia (LV)

 Lithuania (LT)

 Poland (PL)

 Germany (DE)

 Austria (AT)

 United Kingdom (GB)

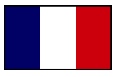
 Ireland (IE)

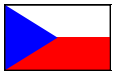
 Netherlands (NL)

 Belgium (BE)

 Luxembourg (LU)

 Switzerland (CH)

 France (FR)

 Czech Republic (CZ)

 Slovakia (SK)

 Hungary (HU)

 Slovenia (SI)

 Croatia (HR)

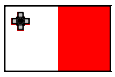
 Yugoslavia (YU)

 Macedonia (MK)

 Spain (ES)

 Portugal (PT)

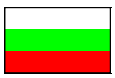
 Italia (IT)

 Malta (MT)

 Greece (GR)

 Cyprus (CY)

 Romania (RO)

 Bulgaria (BG)

 Turkey (TR)

COOPERATING COUNTRY (1)

 Israel (IL)

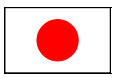
COUNTRIES WITH PARTICIPATING INSTITUTIONS (9)

 Russia (RU)

 Ukraine (UA)

 Armenia (AM)

 China (CN)

 Japan (JP)

 India (IN)

 Canada (CA)

 USA

 Australia (AU)

COST has developed into one of the largest frameworks for research co-operation in Europe and is a valuable mechanism co-ordinating national research activities in Europe. Today it has almost 200 actions and involves nearly 30,000 scientists from 32 European member countries and more than 46 participating institutions from 11 non-member countries and Non Governmental Organisations. In an average action there are partners from 16 countries. The total volume of COST projects is over 1,500 MEUR annually.

All necessary information about COST activities at European and national levels including COST National Coordinators – CNCs can be found at http://cost.cordis.lu/.

4.2 What COST offers?

- The latest scientific knowledge from your own research area. This knowledge is updated continuously.
- Although the actual project costs must be covered separately from national or other sources, COST supports the internationalisation of researchers.
- COST actions help to find partners for future actions; many projects under the EU's framework programmes started from a COST cooperation.
- An average of 60 kEUR per action is available depending on size and activity of the action. This funding is basically used to cover coordination costs such as contributions to workshops/conferences, travel costs for meetings, contributions to publications and short term scientific missions of researchers to visit other laboratories.
- COST has clearly shown its strength in non-competitive research, in prenormative cooperation and in solving environmental and cross-border problems and problems of public utility. It has been successfully used to maximise European synergy and added value in research cooperation and it is a useful tool to further European integration.

4.3 How to work with COST?

- COST is based on actions. These are networks of coordinated national research projects.
- Actions are launched on a "bottom-up" approach. One of its main features is its built-in flexibility. Research areas are not pre-determined but the partners can decide to make a proposal for whatever important topic.
- Each member state can freely select in which action to participate.
- Minimum number of participants is five (5) from different member states. Partners can be research centres, universities, companies, associations or other legal entities.
- When you have an idea for a new COST action, or want to join in an existing action, ⇨ make a brief project description and take it your to your national CNC at your national COST office. Thereafter, the CNC concerned prepares all actions necessary for the COST process and decision-making.
- Project funding must be secured; financing may come from private and public national or other sources.
- COST is continuously open for proposals.

All necessary forms and instructions are available at http://cost.cordis.lu/src/documents.cfm.

4.4 What COST offers to CREC?

In the following table the COST domains and Technical Committees are presented (2002/03). As you can see, there are several domains available for CREC-related actions.

Domain	Technical Committee	CREC-related projects underway
Agriculture and Biotechnology	Agriculture, Food Sciences and Biotechnology	
Chemistry	Chemistry	
Environment	Environment	4
Fluid dynamics	Forests and Forestry Products	8
Food Sciences	Materials	2
Forests and Forestry Products	Medical research	
Informatics	Meteorology	
Materials	Nanosciences	
Medical research	Physics	
Meteorology	Social sciences	
Miscellaneous	Telecommunication Information Science and Technology	
Nanosciences	Transport	10
Oceanography	Urban Civil Engineering	10
Physics	Miscellaneous	2
Social sciences	**CREC Projects Total**	**36**
Telecommunication Information Science and Technology		
Transport		
Urban Civil Engineering		

There are 36 ongoing CREC-related COST actions. It is 1/5 of all ongoing projects! It proves the value of COST to CREC.