CRISP Consultancy Commission 00-29

An Action Plan for the Environment Agency

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Executive summary

During 1999 the Construction Research and Innovation Strategy Panel (CRISP) worked on selected topic areas from its Strategic Priorities 1999. Task Groups were formed and reports were prepared. All contained recommendations about the industry's research needs. The recommendations were then drawn together into a series of five topic-based Action Plans. These covered:

- Meeting Customers' Needs,
- Design,
- Sustainable Construction,
- Motivation & Communication,
- the Construction Research Base.

An additional (sixth) source of recommendations on sustainable construction was a report prepared for CRISP entitled 'Construction for Sustainable Development: research and innovation needs', CRISP Commission 99/15. [Further topics have yet to be addressed by CRISP – these include the construction process, components, technology and performance.]

This report takes the recommended actions from the six sources and compares (or maps) them against a set of emerging scientific issues that the Environment Agency (EA) has identified as necessary to underpin its Environmental Vision. The issues identified by the Agency are grouped in nine themes. Each theme has a framework for change beneath it, identifying 5-10 years worth of R&D to be undertaken.

Equivalent reports mapping CRISP recommendations onto their research themes and priorities have been prepared for the Department of Environment, Transport and the Regions, the Engineering and Physical Sciences Research Council, the Economic and Social Research Council, and the Highways Agency.

A total of 125 recommendations were made by the CRISP sources used for this report; these are listed Section 5.

As Table 3.1 on page 9 shows, 28 CRISP recommendations are relevant to the Environment Agency. Of these, 4 are general recommendations, 5 map onto the theme 'Protecting and restoring the land', 5 onto 'Greening the business world', and 14 onto 'Using natural resources wisely'. No CRISP recommendations mapped onto the EA theme of 'Improving and protecting inland coastal waters', 'Ensuring that the air is clean', 'Enhancing wildlife', 'Addressing climate change', 'Quality of life' or 'Reducing flood risk'.

The remaining 97 CRISP recommendations do not readily map onto the scientific issues identified by the Agency.

In terms of the relevance of each Task Group's recommendations to the Environment Agency (again as shown in table 3.1), the percentage of recommendations that map onto the Thematic Priorities is as follows (in decreasing order):

CRISP 99/15 report	84%
Meeting customers' needs	30%
Motivation and communication	8%
Sustainable Construction	7%
Design	5%
Construction Research Base	0%

The Environment Agency is invited to note the recommendations from CRISP as it develops its themes and frameworks for change to support its Environmental Vision.

1   Overview and sources of the recommended actions

During 1999 CRISP worked on selected topic areas from its Strategic Priorities 1999. This resulted in a series of task group and other reports and recommendations being taken to CRISP's Awayday 2000. The Awayday broadly endorsed these reports and CRISP collected together the various recommendations in a series of five topic-based Action Plans. These addressed: Meeting Customers' Needs, Design, Sustainable Construction, Motivation & Communication, and the Construction Research Base. An additional (sixth) source of recommendations on sustainable construction was a report prepared for CRISP entitled 'Construction for Sustainable Development: research and innovation needs, CRISP Commission 99/15, that was not available at the Awayday. All of the six reports are available on the CRISP web site: www.crisp-uk.org.uk.

This report 'maps' the recommended actions from the six existing CRISP sources onto the nine emerging scientific themes and their related frameworks for change that have been identified by the Environment Agency as necessary for delivering the Agency's Environmental Vision.

A brief description of the CRISP Action Plans follows in the rest of this section, while section 2 of the report describes the mapping exercise. Section 3 provides an analysis of the findings from the mapping exercise. The 'maps' themselves are given in Section 4 of the report. Section 5 provides a full listing of the CRISP Task Groups' recommendations and notes which of them map onto the Environment Agency's themes.

1.1   Meeting Customers' Needs Action Plan

This CRISP Topic Area Action Plan was based on a Construction Clients' Forum workshop held in January 2000 in collaboration with CRISP. Its aim was to identify key research and innovation actions to deliver customers' needs; to develop specific research and innovation projects; and to identify appropriate mechanisms to take these forward. At the workshop, each discussion group worked on one of the five priority areas set out in the CCF's Research and Innovation Strategy:
• Construction as a Product
• Re-integrating the Team
• Barriers to Innovation
• Costs of Ownership
• Right First Time, Every Time
to which was added the needs of Small and Occasional Clients. Actions arising are summarised in the table below. The total number of these is 23.

In terms of implementation, the CCF workshop did not identify mechanisms or people for taking its recommendations forward. Nor did it assign priorities to the actions it recommended.

Meeting Customers' Needs: summary recommended actions		
1. Define the overall process of 'construction', from formulation of business need best met by construction activity through to successful operation [9 detailed actions]		
2. Improve client awareness of existing research, with measures to improve up-take and application [4 detailed actions]		
3. Re-assess balance of research spend between 'generating new knowledge' and 'application of new knowledge' [3 detailed actions]		
4. Investigate role of insurance, e.g. for latent defects, against perceived risks of innovation [3 detailed actions]		
5. Redefine role of 'professional advisors' to clients [2 detailed actions]		
6. Investigate increasing need for up-dating of professional skills [2 detailed actions]		

1.2   Design Task Group Action Plan

This CRISP Topic Area Action Plan was based on the work of its Design Task. CRISP identified that research into design had received relatively little attention in recent industry initiatives. Over a six month period of intensive

discussion, the Task Group developed a wide strategy, fuelled by members' papers, and a specially commissioned research review of the field. The Task Group concluded with a delegate workshop to test its propositions. This led to an extended set of 39 recommended actions, which are summarised in the table below.

Design Task Group: summary recommended actions		

1.	Raise the quality of the built environment by placing occupancy criteria centre-field [10 detailed actions]	
2.	Establish sectoral frameworks for design quality supported by evidence-based research [7 detailed actions]	
3.	Initiate quick response project-linked research suited to the needs of industry and occasional clients [3 detailed actions]	
4.	Encourage widespread educational reform to support greater quality in the built environment [8 detailed actions]	
5.	Develop a shared language for design, releasing widest value contribution from all industry and society stakeholders [11 detailed actions]	

1.3   Sustainable Construction Theme Group Action Plan

The CRISP Sustainable Construction Theme Group has been in place for some two years or so. It encourages research and innovation (R&I) to support improvements in the sustainable performance of the UK construction industry. The ultimate aim of this R&I, in the longer term, must be to maximise the industry's contribution towards global sustainable development. The phrase "Think globally, act locally" provides a succinct guide. The Group's task is to translate this into practical actions for the construction industry; acting locally here implies not only individual or company-based action, but collective sectoral action to achieve transformation of the construction market place.

The Group has commissioned a number of reports to help CRISP support this task and respond to the changing industry environment, in particular through the Egan '*Rethinking Construction*' agenda. The group seeks to promote the knowledge in the reports not just to key decision makers in leading industry-related research programmes, but also to those who have influence and interest in providing a more sustainable, effective industry and thereby a more sustainable global environment. Among these, the group has promoted and would wish to promote further its work to groups like the Movement for Innovation (M[4]I) and the Laing Focus Group, in addition to other CRISP groups.

In its *Strategic Priorities* (April 1999), CRISP identified issues relating to sustainable construction as follows:

> 'Sustainability is an issue of increasing national and global concern and, therefore, a key area for research and innovation. CRISP will continue to work to identify those areas where research could contribute quickly and most effectively and support the aims of industry improvement.'

The Theme Group sought, and is continuing to seek, to identify actions that need to be taken forward and to provide output which is as useful as possible to those who will benefit. In the CRISP Topic Area Action Plan for sustainable construction there were four summary actions shown in the table below, and a total of 15 detailed actions.

Sustainable Construction Task Group: summary recommended actions		

1.	Identify and promote research to develop the tools for greater sustainability and help the business case for sustainability [4 detailed actions].	
2.	To co-ordinate the efforts of the research funders to include Sustainable Construction research and innovation at an appropriate level in their programmes. This is to support the construction industry and others achieve greater sustainability [4 detailed actions].	
3.	To influence the development and promotion of a research and innovation database related to Sustainable Construction to help co-ordinate the efforts of the research funders [3 detailed actions].	

1.4 CRISP Commission 99/15: 'Construction for Sustainable Development - Research and Innovation (R&I) Needs'

This study on the research and innovation (R&I) needs for sustainable construction develops and builds on the results of the CRISP-funded report 'Sustainable Construction: Future R&I Requirements, Analysis of Current Position' (March 1999). Its aims were twofold:

1. To develop the findings of a previous study for CRISP entitled 'Sustainable Construction: Future Research and Innovation Requirements, Analysis of Current Position' (March 1999), specifically to enable research funders, the construction industry and other stakeholders to identify sustainable construction R&I needs.
2. To identify methods by which sustainability principles can be embedded within generic construction research rather than treated as a stand-alone topic.

The study was conducted through consultation with the industry, including:
• Development of a questionnaire designed to identify priority areas for research and innovation;
• A consultation workshop to further define priority areas;
• A meeting with key funders designed to develop R&I actions to support these priority areas.

Three main barriers to adopting a more sustainable approach were identified as:
• Lack of awareness of the issues;
• Financial pressures;
• Industry culture.

Eight objectives for research and innovation were identified, shown in the summary table below, further subdivided into 19 themes or items.

The report states that in order to achieve the R&I Objectives, and overcome the identified barriers, a mixture of new research and more effective dissemination of existing research is proposed. Sustainable construction research needs to be interdisciplinary and collaborative with end users. More critically sufficient attention must be paid to the communication of research or innovation findings. This is to allow construction practitioners take pragmatic business decisions that reflect the current best practice understanding of how the industry can contribute to sustainable development.

CRISP Commission 99/15 Construction for Sustainable Development: research and innovation needs		
1. Increase the effectiveness of communication and dissemination of best practice and research outputs [expanded as 2 themes]		
2. Prove and inform the business case for the construction industry to contribute to the aims of sustainable development [expanded as 4 themes]		
3. Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach [expanded as 3 themes]		
4. Understand cultural barriers in the construction industry and what the most effective drivers are for moving the Construction Industry towards Sustainable Construction [expanded as 2 themes]		
5. Develop and interpret Whole Life Costing (WLC) techniques [expanded as 1 theme]		
6. Develop techniques and strategies to effectively manage the existing built environment and infrastructure into the future [expanded as 4 themes]		
7. Understand and use Supply Chain Management to promote the construction industry's contribution to sustainable development [expanded as 1 theme]		
8. Inform and influence decision-making processes of construction industry's Small Medium Sized Enterprises (SME's) [expanded as 2 themes]		

1.5   Motivation and Communication Task Group Action Plan

Working from workshops and research material, the Motivation and Communication Task Group has developed a strategy for improved communications and research uptake for CRISP and its stakeholders. The strategy leads to the set of recommended action summarised in the table below. Each summary action is further subdivided into more detailed sets of sub-actions, of which there are 24 in total. The organisations identified as responsible for implementation are listed against each action.

Motivation and Communication Task Group: summary recommended actions	Importance	Timing	Owners
1. Increase learning and knowledge creation and sharing by developing a learning company approach in construction [6 detailed actions]	1st	This year on long term programme	New CIB and others
2. Improve communication activities by better targeting and specific funding [4 detailed actions]	2nd=	This year	CIB, CIC, CRISP, DETR, EPSRC, ESRC
3. Increase the use of intermediaries in communicating research results [3 detailed actions]	2nd=	This year	CIB, CIC, CRISP, DETR
4. Improve the (usefulness of) interaction of people in academia and industry [3 detailed actions]	4th	This year	CIB, CIC, CRISP, DETR, M^{4}I
5. Develop and implement a CRISP marketing strategy and communications plan [5 detailed actions]	5th	This year	CRISP
6. Compare other industries' and countries experience [2 detailed actions]	6th	Medium term	CRISP, DTI, Universities, Research Councils
7. Develop networks between key stakeholders in construction research and innovation [1 detailed action]	7th	Medium term	CRISP, DETR, DTI, M^{4}I, Universities, Research Associations, Research Councils

1.6   Construction research base

This CRISP Topic Area Action Plan is based on the work of its Construction Research Base Task Group. The Task Group was established to review the condition of the construction research base and to make recommendations to the CRISP Awayday in March 2000. The construction research base is the national capacity to undertake research relevant to construction. It covers a wide range of disciplines but the primary focus below is on the main construction professions, i.e. civil engineering, architecture, and building etc. Statistics in this area are unreliable and recent accurate data is unavailable. DETR figures (1996) suggest an R & D income in 1994 of £148m: £54m in academia, £75m in RTOs, and £19m in construction businesses, including consultants.

The Group believes that the manifest misunderstanding between industry and the research base is part of a wider issue - there appears to be no organisation responsible for the health of the research base. It identified the need for a champion to speak both for and to the research base and for a simple document describing it and its achievements. The Group's set of recommended actions are summarised below.

The Task Group's over-arching recommendations are that there should be a champion for the research base and that CRISP should take responsibility for that role. While other recommendations can be taken up individually, it would be desirable that they are part of an integrated whole, co-ordinated by the champion. The Task Group looks to the CRISP Executive to determine how best to communicate these recommendations to the research base and the industry and to ensure their implementation.

Summary recommended actions	Priority	Timing	Actors
1. Develop, agree, and oversee the role of a champion for the research base	1st	This year	CIB/CRISP*, CIC Research College
2. Improve the quality, relevance and accessibility of statistical data on the research base	3rd	This year	DETR
3. Explore desirability and feasibility of developing a set of KPIs for research organisations	4th	Medium term	CRISP, M^4I
4. Encourage companies to develop and focus more beneficial contact with the research base by appointment, for example, of a Director of Innovation	5th	Medium term	CRISP
5. Produce and widely distribute a simple description of the nature, role, activities and achievements of the research base	2nd	This year	CRISP, EPSRC

* Subject to consultation on new CIB.

2   How the detailed recommendations have been mapped in this document

Section 4 of this report comprises a table or 'map' of emerging scientific themes, and the frameworks for change that lie beneath them, that have been identified by the Environment Agency as necessary to deliver its Environmental Vision. Wherever a recommendation from the CRISP Topic Area Action Plans and the CRISP 99/15 report (the six source reports for this report) clearly fits into one of the Agency's themes, it is 'mapped' against that theme in the table. The intention is to present CRISP recommendations in a form to suit the planning needs of the EA.

Four general recommendations from CRISP Action Plans are relevant to the Environment Agency and are tabulated accordingly.

In the tables in part 4:
* Column 1 describes the EA themes.
* Column 2 lists the frameworks for change under each EA theme.
* Column 3 contains the CRISP topic area Action Plan recommendation wherever it is relevant to the EA.
* Column 4 lists the CRISP topic area Action Plan reference – so the source of each CRISP recommendation can be identified
* Column 5 indicates CRISP's priorities among the recommended actions: 1 = high priority, 2 = medium priority.

For information, all of the recommendations from CRISP Action Plans are listed in part 5 of the report, with those that map onto the Environment Agency's emerging themes identified so they can be seen in context.

3   Analysis of CRISP recommendations against scientific issues identified by the Environment Agency

Table 3.1 (shown at the end of this section) presents an analysis of the CRISP recommendations showing how many of them map on to each of the EA's themes.

3.1   Findings and conclusions from table 3.1

First, two caveats. In interpreting table 3.1, it should be remembered that CRISP has dealt with only certain topic areas; and there may be areas relevant to EA that have yet to be addressed. That is, the present set of CRISP recommendations are skewed towards those strategic issues that lie within the CRISP topic areas addressed so far. Second, simply counting recommendations in the way undertaken here, gives each of them equal weight. It therefore gives more weight to those Task Groups that made more recommendations. An additional point is that 'mapping' CRISP recommendations onto EA themes is a subjective activity which might be undertaken differently by a different author. For all these reasons, the findings and conclusions presented here should be viewed with caution.

The findings of the analysis are as follows:

1. Of the total number of 125 recommendations made by the six CRISP sources, 28 are relevant to the Environment Agency's themes.

2. Of the 28 recommendations relevant to EA, 4 are general recommendations, 5 map onto 'Protecting and restoring the land', 5 onto 'Greening the business world', and 14 onto 'Using natural resources wisely'. No CRISP recommendations mapped onto the EA themes of 'Improving and protecting inland coastal waters', Ensuring that the air is clean', 'Enhancing wildlife', 'Addressing climate change', 'Quality of life' or 'Reducing flood risk'.

3. The remaining 97 CRISP recommendations do not readily map onto EA's themes.

The four general recommendations considered relevant to the Environment Agency are:
- Establish 'Quick Response' funding for sectoral project-based research, allowing 'up-front' innovation support on a project by project basis: inception research: design experiment with operational testing.
- Provide support for communicating research efforts to all stakeholders.
- Require communication plans for all research bids in business language, to cover target audience and benefits to each. The communication plan should be supported by a high level of experience among staff as in the research work. Similarly all other funding bodies to require a communication plan.
- Compare other industries' and countries' experience.

In terms of the relevance of each Task Group's recommendations to the Environment Agency (again as shown in table 3.1), the percentage of recommendations that map onto the themes is as follows (in decreasing order):

CRISP 99/15 report	84%
Meeting customers' needs	30%
Motivation and communication	8%
Sustainable Construction	7%
Design	5%
Construction Research Base	0%

The Environment Agency is invited to note the recommendations from CRISP as it draws up its frameworks for change.

Table 3.1 Summary of number of recommendations against draft Environment Agency themes

	Total number of recommendations from the Task Group	General recommendations applicable to EA	Improving and protecting inland and coastal waters	Protecting and restoring the land	Ensuring that the air is clean	Greening the business world	Enhancing wildlife	Using natural resources wisely	Addressing climate change	Quality of life	Reducing flood risk	TOTAL RELEVANT TO EA	% OF TASK GROUP TOTALS RELEVANT TO EA
Meeting customers' needs	23	0	0	0	0	2	0	5	0	0	0	7	30%
Design	39	2	0	0	0	0	0	0	0	0	0	2	5%
Sustainable construction	15	0	0	1	0	0	0	0	0	0	0	1	7%
CRISP 99/15 Report	19	0	0	4	0	3	0	9	0	0	0	16	84%
Motivation & communication	24	2	0	0	0	0	0	0	0	0	0	2	8%
Construction Research Base	5	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	125	4	0	5	0	5	0	14	0	0	0	28	-

4 The tables

See Section 2 (above) for how the tables were compiled.

Table 4.1 Table of CRISP recommendations relevant to the Environment Agency in general

CRISP Task Group recommendation	Task Group reference	Priority
Establish 'Quick Response' funding for sectoral project-based research, allowing 'up-front' innovation support on a project by project basis: inception research: design experiment with operational testing.	Design 3/2	1
Provide support for communicating research efforts to all stakeholders.	Design 5/1	1
Require communication plans for all research bids in business language, to cover target audience and benefits to each. The communication plan should be supported by a high level of experience among staff as in the research work. Similarly all other funding bodies to require a communication plan.	Motivation 2/2	1
Compare other industries and countries experience.	Motivation 6/1	2

Table 4.2 Table of EA Themes and Frameworks for Change, showing CRISP recommendations where appropriate

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Improving and protecting inland and coastal waters	Determine effects of reductions in river flows			
	Derive an increased range of biological indicators to help pick up impacts from intermittent pollution or unforeseen risks, or to help demonstrate their absence.			
	Develop new methods for measuring environmental impacts (including models).			
	Improve knowledge on land use and the risk of contamination to bathing waters, shellfish waters, rivers and underground waters.			
	Improve knowledge of the impact of groundwater on the quality and quantity or surface waters.			
	Improve knowledge on the impacts of rivers on estuaries and water quality at beaches and shellfisheries.			
	Improve knowledge on urban drainage.			
	Develop new methods of controlling nutrient inputs.			
	Identify the causes and control of eutrophication			
	Quantify the risks posed by chemicals, bacteria and viruses on wildlife and the use of water.			
	Investigate the treatment of seawater for use as a water resource.			
	Assess impact of climate change.			
	Support decision-making at sites where impacts have more than one cause.			

	Support decision-making in the case of scientific uncertainty.			
	Transfer data into information and improve ability to detect impacts and trends.			
	Develop better techniques for assessing aquifer recharge rates and river flow requirements.			
	Develop skills and strategies for public communication of using water wisely – public and sector			
	To assess the effects of demographic change on water resource requirements.			
	Improve knowledge on society's use of chemicals.			
	Quantify the impacts of chemicals and develop treatment options			
	Improve assessment of risk relating to pollutants and improved awareness of tools for cost-benefit analysis.			
	Develop better indicators for monitoring the state of inland and coastal waters.			
	Develop better indicators for assessing the impacts of flow regimes on rivers.			
	Undertake better comparisons between EU member states.			
	Develop wastewater reuse policy			
	Develop and implement biological quality objectives for rivers			
	Develop risk-based standards for impact control			

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Protecting and restoring the land	Integrate land and soil protection issues within all Agency activities.			
	Understand the environmental impact of agriculture.			
	Understand the environmental impact of urban development and minerals extraction.	109. Understand the impact of domestic construction activities on the UK environment.	CRISP 99/15 Objective 8, item 1	1
	Understand sustainable land use – which uses are sustainable in what circumstances?			
	National plan for developing technical skills and expertise in environmental management of land.			
	Understand health issues relating to land contamination.			
	Increase understanding of soil systems and their functions including the retention and infiltration of water.			
	Determine the carrying capacity of soils for specific contaminants.			
	Understand links between soil contaminants and risks to wildlife and other environmental media including water.			
	Increase knowledge of land and agricultural economics.			
	Develop and review the Contaminated Land Exposure Assessment (CLEA) model and guideline values.			
	Develop indicators of land and soil quality including those related to the environmental impact of agriculture.			
	Quantify activities that impact on soil quality including spreading of wastes.			
	Support development of monitoring strategies for contaminants in soil and collection			

	of information for national and regional planning.			
	Measure economic costs of soil deterioration and erosion.			
	Evaluate innovative remedial technologies for soils.			
	Develop soil erosion prevention measures that are economically and ecologically sound. *			
	Describe criteria to evaluate the sustainability of land use options.			
	Provide guidance for determining land capability and matching it to land use.			
	Develop and implement Agency soil strategy			
	Develop public communication programme on land issues.	92. Increase the effectiveness of communication and dissemination of best practice and research outputs [for sustainable construction] through improved dissemination routes and communication strategies and practices.	CRISP 99/15 Objective 1, item 1	1
		98. Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach – through improved stakeholder communications.	CRISP 99/15 Objective 3, item 1	1
		99. Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach – through quantified targets/indicators.	CRISP 99/15 Objective 3, item 2	2
		113. Develop explanation of 'what is' sustainable construction.	Sustainable construction 1/3	1

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Ensuring that the air is clean	Conduct strategic review of R&D air quality requirements			
	Develop interim environmental criteria for a wider range of air pollutants than currently available.			
	Develop risk based health and environmental objectives			
	Develop biological monitoring techniques and strategy			
	Develop environmental indictors for priority air quality issues			
	Develop landfill emission factors			
	Develop national air quality model			
	Develop expertise on assessing impacts of pollutants on human health and natural environment			
	Assess source attribution on regional and national scale using National Atmospheric Emissions Inventory)			
	Develop sensitivity profiles of terrestrial species (lichens, heath etc) in response to air quality.			
	Develop terrestrial monitoring programme			
	Improve understanding of atmospheric processes on local and national scale based on and consistent with DETR models.			

	Contribute to development of databases on emissions and impacts from all sources of air pollution			
	Increase awareness of the importance of releases and impacts from Agency controlled processes in relation to those from other sources			
	Develop air quality communications strategy			

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Greening the business world	Understand overall and relative environmental impacts of business.	96. Understanding the key features of the construction industry and how these enable/prevent sustainable construction	CRISP 99/15 Objective 2, item 3	3
	Develop environmental burdens of industries and impacts to air, land, water.			
	Conduct life cycle assessments of processes of products	49. Develop standard system for preparation and presentation of Whole Life Cost data	Meeting customers' needs 1/5	2
		51. Expand coverage of existing databases of whole life costs and performance information.	Meeting customers' needs 1/7	2
	Understand use of economic measures – understand scope and applicability of tax and return schemes	94. Prove and inform the business case for the construction industry to contribute to the aims of sustainable development – through improved understanding of the business benefits of sustainable construction practices, and industry's financial concerns and motivations.	CRISP 99/15 Objective 2, item 1	1
		97. Prove and inform the business case for sustainable development – devise funding arrangements to promote innovative technologies.	CRISP 99/15 Objective 2, item 4	1
	Investigate use of negotiated agreements			
	Develop environment and health-based assessment criteria			
	Increase competency in EMS and environmental auditing.			
	Develop monitoring methods and programmes for emissions and waste arisings from industrial processes.			
	Understand the effectiveness of industrial processes for the minimisation and treatment of waste and emissions.			
	Develop and implement pollution reduction programmes for key pollutants			
	Develop and implement a risk based regulation strategy to address permitting, compliance and charging			
	Understand emission trading.			
	Develop harmonised approach to environmental licensing.			
	Develop incentive based charging schemes and green taxes.			
	Develop integrated product policy			
	Develop understanding of range of water demand management options.			
	Develop communications strategy and databases for emissions.			

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Enhancing wildlife	Improve knowledge on the ecological requirements of habitats and species and their sensitivities to pollutants and land-use in order to reduce uncertainty in environmental objectives for air, land and water.			
	Improve understanding of physical and biological habitat processes.			
	Improve understanding of factors affecting the viability of freshwater fisheries (incl. pollution, predation).			
	Assess the impact of climate change on ecological requirements and sensitivities of habitats and species esp. inter-tidal habitats along coasts with rising sea levels and sensitive wetlands vulnerable to prolonged droughts.			
	Genetic studies of rare, declining or vulnerable species and feasibility of establishing gene-banks			
	Establish management objectives, processes and guidelines for effective multi-species management*			
	Develop management strategies for fish species requiring conservation*			
	Develop and agree long-term plan for wildlife network			
	Develop and test River Habitat objectives on pilot catchments.			
	Consider wildlife requirements in all Agency activities.			
	Develop indictors of wildlife health.			
	Improve information systems, common standards and integrated databases.			
	Develop smarter remote sensing monitoring			
	Model the benefits of river and wetland restoration.			
	Assess and demonstrate socio-economic benefits of wildlife-friends action.			

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Using natural resources wisely	Develop new tools to allow the assessment of environmental burdens of resources use.	122. Develop appropriate sustainability tests for assessing priorities and research projects and develop sustainability index and criteria covering all drivers relevant to all CRISP key priorities and themes. Make sustainability an intrinsic driver behind each priority.	Sustainable construction 4/1	1
	Improve quality and availability of construction and demolition waste arisings data.			
	Develop understanding on what resources we use and generate and how they are managed. Improve quality and coverage of wastes and resource use information in all industry sectors.			
	Collate information to show and explain material movements through the economy and identify what can be done to reduce demand or wastage.	104. Improved management of the existing built environment and infrastructure into the future – through a mixture of building and infrastructure re-use and refurbishment, including impact assessment of refurbishment on sustainable urban development.	CRISP 99/15 Objective 6, item 1	1

Increase understanding of the effect of economic instruments.	102. Understanding the role of legislation and market forces to promote change (towards sustainable construction)	CRISP 99/15 Objective 4, item 2	2
Increase monitoring and prediction of the impacts of new approaches such as taxes and producer responsibilities.	116. Investigate how to achieve maximum leverage within industry to achieve best diffusion of R&D through sector, especially SMEs with housing, repair, maintenance and refurbishment, respect for people and land use planning.	Sustainable construction 2/2	1
Extend research on LCA.	103. Develop and interpret whole life costing techniques.	CRISP 99/15 Objective 5, item 1	1
Support development of efficient, consistent, risk-based licensing, inspection and waste disposal options.			
Support development of sustainable waste management.			
Integrate the assessment of environmental impacts of waste with life cycle analyses of products and processes which generate waste.			
Investigate the human health and environmental impact of different waste management facilities (including a framework for protection of non-human species from the effects of radiation).			
Develop best practise in sustainable construction. *	100. Develop risk management techniques for sustainable construction.	CRISP 99/15 Objective 3, item 3	2
	101. Understand cultural barriers in construction industry and what the most effective drivers for moving construction industry to sustainable construction – cultural characteristics of the construction industry	CRISP 99/15 Objective 4, item 1	1
	105. Materials management – assess the sustainability costs and benefits of off-site assembly, trial standard specifications for recycled materials.	CRISP 99/15 Objective 6, item 2	2
	106. Use of innovative technologies to minimise resource use.	CRISP 99/15 Objective 6, item 3	2
	108. Understand impact of IT and societal and organisational changes on building requirements, construction industry practices, and design and construction of buildings and infrastructure ('City of Tomorrow').	CRISP 99/15 Objective 6, item 4	1
	110. Inform and influence the decision making processes of construction industry's SMEs towards sustainable construction.	CRISP 99/15 Objective 8, item 2	1
	111. Disseminate convincing evidence of the business (the business and triple bottom line) benefits of environmental good practice throughout construction industry, recognising the nature of SMEs in meeting customers' needs.	Sustainable construction 1/1	1
	112. Develop tools to implement environmental good practice throughout construction industry including Learning by Doing and the application of Whole Life Costing	Sustainable construction 1/2	2

		124. Identify champions for the sustainability agenda.	Sustainable construction 4/3	1
	Develop eel strategy.			
	Develop understanding of tyre disposal and best practice.			
	Develop better understanding of water savings and costs involved in range of demand management options.			
	Clarify energy strategy			
	Develop EU composting directive			

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Addressing climate change	Develop indicators to improve Agency's understanding of climate change on UK ecology, society and economy. *			
	To describe and assess trends in climate change on a spatial and temporal basis where possible using remote sensing methods. *			
	To develop specific plant ecology models for climate change. *			
	Increase technical understanding of risks and uncertainties in climate science.			
	Develop policy for risks and uncertainties in decision making in light of climate change.			
	Increase awareness of international impacts (eg. environmental refugees and changes in food supply) and social issues in regional climate change impact work.			
	Develop communications plan for media and public on climate change.			
	Develop and implement strategy for responding to environmental stress (eg. sea levels, storms, water stress, habitat protection).			
	Develop policy for practical decision making on long-term asset design.			
	Develop and implement long-term strategy for R&D with increased uptake from functions and regions.			
	Improve Head Office co-ordination on climate change issues and develop clear ownership across functions.			
	Develop long term energy vision after investigation of impacts of different energy sources (including consideration of environmental impacts and economic instruments for regulation).			
	Improve understanding of technological options for controlling industrial releases of greenhouses gases other than carbon dioxide (eg nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexaflouride) and how to control under IPC/IPPC Directive.			
	To develop robust methodologies for monitoring methane both in the general & landfill environments so that acceptable limits can be set. *			
	Develop better understanding of methane capture technologies and potential for reducing methane emissions from landfills by methane oxidation.			
	Develop better understanding of carbon sequestration technologies.			

| | To quantify the value of different carbon sinks (e.g wetlands, agricultural tillage practices). | | | |
| To better understand |

	To quantify the value of different carbon sinks (e.g wetlands, agricultural tillage practices).			
	Explore options for regulation of industrial greenhouse gas emissions.			
	Examining the role of the planning system in adapting to climate change and reducing greenhouse gas emissions.			

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Quality of Life	To increase awareness within the Agency of the need to value social and economic impacts .			
	To better understand the role of the Agency in sustainable development.			
	To understand and influence the publics wish to be proactive in environmental issues. *			
	To understand public perception of risk and evaluate participation and risk communication strategies. *			
	To understand how social factors such as changing lifestyles, recreational opportunities and increasing urbanisation, affect the environment. *			
	To understand how low social inclusion and economic practice impacts on the environment.			
	To understand what sustainable development means for urban and rural communities.			
	To develop better communication on the Agency's role and potential to support.			
	To support the monitoring of social and economic impacts for State of the Environment reporting.			

EA Theme	Frameworks for change: knowledge required	Relevant CRISP Recommendations	CRISP Reference	CRISP priority
Reducing flood risk	At the time of writing, a Framework for Change had been prepared in draft under this issue but with respect to the knowledge required, MAFF and the Environment Agency are developing a new joint R&D Programme in Flood and Coastal Defence. This is to have a thematic structure that will follow through from developing strategic policy to constructing and managing defences.	None of the CRISP Task Group recommendations is directly relevant to 'Reducing floor risk'.		

Section 5 All recommended actions arising from CRISP Task Groups 1999-2000

	CRISP recommended action	CRISP reference	Priority	EA Framework
1.	Develop, agree, and oversee the role of a champion for the research base: mobilise sufficient resources for making appropriate and convincing cases for research funding to funding bodies; collect informed opinion on significant trends and issues in research base; monitor effectiveness of mechanisms to maintain and develop research base; identify and promote opportunities for construction industry to benefit from the contribution of the research base.	Construction Research Base 1	1	
2.	Improve the quality, relevance and accessibility of statistical data on the research base.	Construction Research Base 2	2	
3.	Explore desirability and feasibility of developing a set of KPIs for research organisations.	Construction Research Base 3	2	
4.	Encourage companies to develop and focus more beneficial contact with the research base by appointment, for example, of a Director of Innovation.	Construction Research Base 4	2	
5.	Produce and widely distribute a simple description of the nature, role activities and achievements of the research base.	Construction Research Base 5	1	
6.	Examine effectiveness of establishing a networking exchange on buildings in use for all stakeholders.	Design 1/1	1	
7.	Commission scoping studies into existing methodologies for assessing value in buildings.	Design 1/2	2	
8.	Examine current cost-in-use studies in practice, their limitations and areas requiring refinement.	Design 1/3	1	
9.	Investigate flexibility of building uses, to encourage sustainable design through time, to develop a rating system accessible to owners, users and planners.	Design 1/4	1	
10.	Test methods for improving industry's capacity to express its needs – in particular workshops, dialogue, deepening understanding between estranged parties.	Design 1/5	2	
11.	Conduct research into how can understanding of cost, value and worth be improved throughout the project team.	Design 1/6	1	
12.	Invite proposals to research and establish Design KPI's from all (construction) sectors.	Design 1/7	2	
13.	Conduct longitudinal research into building performance over time, including historical and contemporary post-occupancy analysis.	Design 1/8	2	
14.	Integrate building economics into parameters for change on terms understood by all stakeholders.	Design 1/9	2	
15.	Establish appropriate and new ways of approaching post-occupancy assessment	Design 1/10	2	
16.	Conduct research into sectoral initiatives to establish design value, with systematic ordering of criteria to assist comparison and respect differences	Design 2/1	1	
17.	Investigate successes and failures at a design level of the PFI initiatives commissioned by government to date, by sector.	Design 2/2	2	
18.	Integrate urban design into the emerging matrix of building studies.	Design 2/3	2	
19.	Encourage dialogue between sectors to learn from each other's evaluation systems.	Design 2/4	2	
20.	Commission international scoping comparison of design assessment methods in practice including cultural identifiers (Japan, Holland, Scandanavia)	Design 2/5	2	
21.	Commission scoping review how professional institutes in other countries contribute to design awareness and value definition. [also in IMI]	Design 2/6	1	
22.	Conduct research into the effective communication of complex processes with trans-sectoral comparisons.	Design 2/7	2	
23.	Conduct research into the design values of the demonstration projects offered by industry, including conception, development, construction and post-occupancy stages.	Design 3/1	1	
24.	Establish 'Quick Response' funding for sectoral project-based research, allowing 'up-front' innovation support on a project by project basis: inception research: design experiment with operational testing.	Design 3/2	1	**GENERAL**
25.	Establish connecting feedback loops so studies take effect and are seen to do so.	Design 3/3	2	
26.	Raise the profile of Built Environment design within National Curriculum to equal the enthusiasm accorded to the Natural Environment.	Design 4/1	1	
27.	Provide public educational support through regional architecture centres as crucibles for change, debate and visualisation.	Design 4/2	1	
28.	Commission international survey of educational institutes' initiatives at developing common design language – at primary, secondary and	Design 4/3	2	

	tertiary levels.			
29.	Promote education of design professionals in production management with cross-industry placements to fertilise the construction field.	Design 4/4	2	
30.	Expand education of design professionals to include methods of thinking, ethics, social context, communication, as fundamental	Design 4/5	2	
31.	Conduct research into obstacles to raising profile and status of Building Services as a career; sustainability champions.	Design 4/6	2	
32.	Re-integrate architectural research into the demand led improvement of building quality, usefulness and delight; building types, symbolic and aesthetic contribution of architecture are all valuable and sought after.	Design 4/7	2	
33.	Educate current players, encouraging continuing professional education for change and feedback, using trans-disciplinary events and seminars providing specific merit awards.	Design 4/8	2	
34.	Provide support for communicating research efforts to all stakeholders.	Design 5/1	1	**GENERAL**
35.	Investigate inhibitors to team working training during design professionals; 'whole-life' education and illustrate successful initiatives that break this mould.	Design 5/2	1	
36.	Assess effectiveness of 'learned society' model for inter-specialist tasks and interdisciplinary challenges.	Design 5/3	2	
37.	Investigate and monitor institutional (City) inhibitors to client-centred improvement and demonstrate positive alternatives.	Design 5/4	2	
38.	Encourage cross-disciplinary learning from other sectors (medicine, manufacturing, psychology)	Design 5/5	2	
39.	Establish best practice for briefing languages and value-systems by means of successful examples/case studies.	Design 5/6	1	
40.	Conduct research into effectiveness of establishing a think-tank for industry wide research into design, embracing all disciplines across the asset/revenue divide.	Design 5/7	2	
41.	Extend government sponsorship of design champions in the field of the built environment linking CABE, Design Council and regional initiatives.	Design 5/8	1	
42.	Encourage EPSRC/ESRC and other key research sponsors to communicate more widely their current support for interdisciplinary research teams, since such teams are necessary to capture answers to interdisciplinary problems.	Design 5/9	1	
43.	Encourage research sponsors to develop specific policies for design research to guide and invite the issues raised [by the Design Task Group].	Design 5/10	1	
44.	Encourage research sponsors to call for 'outside the box' research into interdisciplinary design issues, with experimental funding outside the conventional research review time cycle, to underpin longitudinal research, encourage short penetrative research commissions that publish and be damned. The industry can provide a wealth of committed individuals prepared to offer valuable support in kind provided their contribution is time limited.	Design 5/11	2	
45.	Examining point of entry to construction process relative to client satisfaction.	Meeting customers' needs 1/1	2	
46.	Investigate the influence of supply chain integration on costs of ownership.	Meeting customers' needs 1/2	2	
47.	Study potential impact of greater standardisation and factory/off-site fabrication on image and appeal of industry, especially to new entrants.	Meeting customers' needs 1/3	2	
48.	Promote adoption of whole life costing as basis of procurement decisions.	Meeting customers' needs 1/4	2	
49.	Develop standard system for preparation and presentation of Whole Life Cost data	Meeting customers' needs 1/5	2	**Greening the business world**
50.	Increase awareness of manufacturers of the need to demonstrate the reliability of whole life costs and performance predictors in relation to international standards.	Meeting customers' needs 1/6	2	
51.	Expand coverage of existing databases of whole life costs and performance information.	Meeting customers' needs 1/7	2	**Greening the business world**
52.	Research and map sources of [building] defects.	Meeting customers' needs 1/8	2	
53.	Research application of Business Excellence Model to construction to achieve zero defects.	Meeting customers' needs 1/9	2	
54.	Improve definition and benchmarking of client skills.	Meeting customers' needs 2/1	1	
55.	Promote the development of defining client requirements.	Meeting customers' needs 2/2	1	
56.	Examine incentives for providing innovative high quality design.	Meeting customers' needs 2/3	2	
57.	Investigate the feasibility of establishing a 'virtual learning organisation' to identify clients' dissatisfaction using post occupancy satisfaction evaluation.	Meeting customers' needs 2/4	2	

58.	Investigate barriers to the uptake and application of existing research knowledge, particularly management and human factors.	Meeting customers' needs 3/1	1	
59.	Integrate existing information and assistance sources to provide 'one stop shop' access.	Meeting customers' needs 3/2	2	
60.	Investigate the feasibility of establishing a small and occasional client-friendly access route to best practice information.	Meeting customers' needs 3/3	2	
61.	Investigate insurance and project funding barriers to the adoption of innovative approaches.	Meeting customers' needs 4/1	2	
62.	Examine the impact of risk management and risk transfer policies on integration.	Meeting customers' needs 4/2	1	
63.	Conduct scoping study of the barriers to adopting voluntary latent defects insurance for contractors.	Meeting customers' needs 4/3	2	
64.	Review, with professional institutions, the function of clients' advisers and changing duties towards clients.	Meeting customers' needs 5/1	1	
65.	Ensure training and education encourage and support innovation.	Meeting customers' needs 5/2	1	
66.	Investigate the management of cultural and personnel issues within procurement teams.	Meeting customers' needs 6/1	1	
67.	Examine the impact of ICTs and object modelling on the structure of project teams.	Meeting customers' needs 6/2	2	
68.	Commission scoping study to provide more detail about real issues and generate understanding of what is needed for SMEs and others and identify 'owners' who will deliver different approaches. Study best practice in learning and knowledge sharing (including the use of case studies) and promote appropriately.	Motivation 1/1	1	
69.	Promote general awareness of the importance and benefits of learning and knowledge creation and sharing.	Motivation 1/2	1	
70.	Promote the idea of a strategic approach to knowledge and understanding that knowledge is value.	Motivation 1/3	2	
71.	Promote work to understand how firms can be changed into learning organisations.	Motivation 1/4	2	
72.	Deepen understanding of how to capture and use project-based knowledge.	Motivation 1/5	2	
73.	Develop the wider use of independent post-occupancy reviews.	Motivation 1/6	2	
74.	Change research assessment process in line with Royal Academy of Engineering recommendations.	Motivation 2/1	1	
75.	Require communication plans for all research bids in business language, to cover target audience and benefits to each. The communication plan should be supported by a high level of experience among staff as in the research work. Similarly all other funding bodies to require a communication plan.	Motivation 2/2	1	**GENERAL**
76.	Provide funds for the synthesis of research outputs and highlight issues from range of sources into a form usable by the construction industry.	Motivation 2/3	1	
77.	Commission guidance on how to communicate research findings to meet the needs of industry to demonstrate the benefits and develop new criteria for successful communications.	Motivation 2/4	1	
78.	Fund intermediaries to undertake 'user friendly' communication.	Motivation 3/1	1	
79.	Co-ordinate more active communication by professional institutions.	Motivation 3/2	1	
80.	Develop merchants and DIY stores and channels of communication.	Motivation 3/3	2	
81.	Produce case studies of successful interactions.	Motivation 4/1	1	
82.	Unbiased research on which types of transfer work best and highlighting success and benefits.	Motivation 4/2	1	
83.	Encourage development of networks.	Motivation 4/4	2	
84.	Raise awareness and profile of CRISP in industry	Motivation 5/1	1	
85.	Act as a facilitator to capture vision of future construction industry and the research required to deliver it.	Motivation 5/2	1	
86.	Develop 'learning toolkit' from [vision-of-future research] and promote to firms (CEO, Human Resource managers) and individuals (through professional institutions and journals), thus moving CRISP from being an industry follower to a leader.	Motivation 5/3	2	
87.	Repackage to add more business emphasis to CRISP topics and papers.	Motivation 5/4	2	
88.	Demonstrate the benefits of research in a business context and compile a clear roadmap of industry research needs.	Motivation 5/5	2	
89.	Compare other industries and countries experience.	Motivation 6/1	2	**GENERAL**
90.	Investigate US PAIR (Partnership for the Advancement of Infrastructure and its Renewal) as a catalyst for implementing innovation in practice.	Motivation 6/2	2	
91.	Investigate a broker body to negotiate between researchers and industry (cf US National Science Foundation).	Motivation 6/3	2	
92.	Increase the effectiveness of communication and dissemination of best practice and research outputs [for sustainable construction] through improved dissemination routes and communication strategies and practices.	CRISP 99/15 Objective 1, item 1	1	**Protecting and restoring the land**
93.	Develop objective methods to assess the social impacts of the construction process.	CRISP 99/15 Objective 1, item 2	2	

94.	Prove and inform the business case for the construction industry to contribute to the aims of sustainable development – through improved understanding of the business benefits of sustainable construction practices, and industry's financial concerns and motivations.	CRISP 99/15 Objective 2, item 1	1	**Greening the business world**
95.	Develop a framework of economic & business assessment methods to assess costs and benefits of sustainable construction practices.	CRISP 99/15 Objective 2, item 2	1	
96.	Understanding the key features of the construction industry and how these enable/prevent sustainable construction	CRISP 99/15 Objective 2, item 3	3	**Greening the business world**
97.	Prove and inform the business case for sustainable development – devise funding arrangements to promote innovative technologies.	CRISP 99/15 Objective 2, item 4	1	**Greening the business world**
98.	Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach – through improved stakeholder communications.	CRISP 99/15 Objective 3, item 1	1	**Protecting and restoring the land**
99.	Improve the quality and form of information to communicate technical and business data to influence key decision-makers of the benefits of a more sustainable approach – through quantified targets/indicators.	CRISP 99/15 Objective 3, item 2	2	**Protecting and restoring the land**
100.	Develop risk management techniques for sustainable construction.	CRISP 99/15 Objective 3, item 3	2	**Using natural resources wisely**
101.	Understand cultural barriers in construction industry and what the most effective drivers for moving construction industry to sustainable construction – cultural characteristics of the construction industry	CRISP 99/15 Objective 4, item 1	1	**Using natural resources wisely**
102.	Understanding the role of legislation and market forces to promote change (towards sustainable construction)	CRISP 99/15 Objective 4, item 2	2	**Using natural resources wisely**
103.	Develop and interpret whole life costing techniques.	CRISP 99/15 Objective 5, item 1	1	**Using natural resources wisely**
104.	Improved management of the existing built environment and infrastructure into the future – through a mixture of building and infrastructure re-use and refurbishment, including impact assessment of refurbishment on sustainable urban development.	CRISP 99/15 Objective 6, item 1	1	**Using natural resources wisely**
105.	Materials management – assess the sustainability costs and benefits of off-site assembly, trial standard specifications for recycled materials.	CRISP 99/15 Objective 6, item 2	2	**Using natural resources wisely**
106.	Use of innovative technologies to minimise resource use.	CRISP 99/15 Objective 6, item 3	2	**Using natural resources wisely**
107.	Understand impact of IT and societal and organisational changes on building requirements, construction industry practices, and design and construction of buildings and infrastructure ('City of Tomorrow').	CRISP 99/15 Objective 6, item 4	1	
108.	Understand and use supply chain management to promote the construction industry's contribution to sustainable development.	CRISP 99/15 Objective 7, item 1	1	**Using natural resources wisely**
109.	Understand the impact of domestic construction activities on the UK environment.	CRISP 99/15 Objective 8, item 1	1	**Protecting and restoring the land**
110.	Inform and influence the decision making processes of construction industry's SMEs towards sustainable construction.	CRISP 99/15 Objective 8, item 2	1	**Using natural resources wisely**

111.	Disseminate convincing evidence of the business (the business and triple bottom line) benefits of environmental good practice throughout construction industry, recognising the nature of SMEs in meeting customers' needs.	Sustainable construction 1/1	1	**Using natural resources wisely**
112.	Develop tools to implement environmental good practice throughout construction industry including Learning by Doing and the application of Whole Life Costing	Sustainable construction 1/2	2	**Using natural resources wisely**
113.	Develop explanation of 'what is' sustainable construction.	Sustainable construction 1/3	1	**Protecting and restoring the land**
114.	Provide information on who is taking effective action with a more effective network of players including champions – examine interaction between the construction industry and key players (planners, utilities, regulators, etc.)	Sustainable construction 1/4	2	
115.	Embed sustainability within the core remit of research funders and develop a more effective taxonomy of industry structure to inform decisions about the applicability of sustainability research.	Sustainable construction 2/1	1	
116.	Investigate how to achieve maximum leverage within industry to achieve best diffusion of R&D through sector, especially SMEs with housing, repair, maintenance and refurbishment, respect for people and land use planning.	Sustainable construction 2/2	1	**Using natural resources wisely**
117.	Develop appropriate sustainability tests for assessing priorities and research projects. Focus on developing issues and research issues of interest to business, that impact on the triple bottom line.	Sustainable construction 2/3	1	
118.	M4I to operationalise and demonstrate the work done by Theme Group and not 'go it alone'	Sustainable construction 2/4	1	
119.	Develop and adopt mechanisms for keeping in touch with global developments in sustainable construction and wider sustainability issues.	Sustainable construction 3/1	1	
120.	Set up email discussion group and linked web pages.	Sustainable construction 3/2	2	
121.	Develop appropriate sustainability tests for assessing priorities and research projects.	Sustainable construction 3/3	2	
122.	Develop appropriate sustainability tests for assessing priorities and research projects and develop sustainability index and criteria covering all drivers relevant to all CRISP key priorities and themes. Make sustainability an intrinsic driver behind each priority.	Sustainable construction 4/1	1	**Using natural resources wisely**
123.	Place theme group member on each of the Groups	Sustainable construction 4/2	1	
124.	Identify champions for the sustainability agenda.	Sustainable construction 4/3	1	**Using natural resources wisely**
125.	Create new themes on: industry positioning; globalisation and industry structures; respect for people focusing on diversity, equality and quality of life issues for construction staff/employees, end users, and wider communities; regulatory codes; financial/fiscal theme.	Sustainable construction 4/4	2	