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Forum

Changes in national building research organizations

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There seems a tone of regret and surprise in the articles in the September/October 1997 issue of *Building Research and Information* (BRI, 1997) regarding the re-orientation of national building research organizations for the future. Yet for the organizations in developed countries, which was the implicit focus of this special issue, a re-invention now was perhaps inevitable – or even overdue.

Seaden (1997) has accurately charted the nature of the change in character of national building research agencies in OECD countries over the past 50 years, as the need for rebuilding of infrastructure brought with it some specific needs. We can best summarize those needs as 'applied physical and engineering sciences'. The recent 50th anniversary celebrations of founding of the major organizations BRI in Japan in 1996, and CSTB in France and IRC in Canada in 1997, are testament to how a concept obviously came to maturity in the late 1940s. BRE celebrated its 75th anniversary in 1996. Readers of this journal will instantly recognize the pre-eminent roles in the construction-related applied physical and engineering sciences that each of these organizations has played.

Given this evidence of organizational maturity, some self-analysis and potential re-focusing – or a re-analysis promoted by government as a principal funding source – of the national building research organizations should hardly be coming as a surprise to the research sector. And it would be of little surprise to find that this review was leading to a significant change in the remit of the organization compared to 50 years ago. In other businesses, the examples of companies producing

the same products in the same ways as 50 years ago are rare. We should be under no illusions that building research is a business – even if the dividend at the end of the day is 'better building' rather than a sum of money in the hands of the owners. If those who are paying for the operation of the organization – whether government or industry – are not satisfied with the dividend they are receiving, they will find another organization which seems more prepared to meet their need.

It should not be difficult to convince governments of the importance of building and construction research, given its massive capacity for infrastructural underpinning of the rest of an economy. As Seaden has pointed out, the construction sector is around 10% of economic activity in most developed countries. In separate studies in Australia (Stoekel and Quirke, 1992) and New Zealand (Poot *et al.*, 1998) economists independent of the construction sector have shown that an improvement in efficiency in the construction sector would lead to an improvement in the performance of virtually all other sectors of these economies. Both economies are dependent on export, but are otherwise rather dissimilar. Australia's economy rests on mineral-based exports and New Zealand on agriculture-based exports; and the Australian economy is five times the size of the New Zealand one.

So it might be argued that a basic building block for any economy is to have an efficient building and construction sector, and that a government is derelict in its duty if it does not ensure that some means to develop the industry's efficiency is

available. It is however a long step from this to argue that a government *must* fund a national building research organization.

Our experience in New Zealand is a classic example of an alternative route for government to ensure such a mechanism for industry improvement. The government has for the past 28 years maintained legislation (at the request of the industry) requiring payment by the builder of a 'Building Research Levy' of 0.1% of contract value to BRANZ. Seaden has pointed to New Zealand as being regarded as 'a model of an economic turnaround based on market - oriented policies'. Most New Zealand organizations involved in research delivery using government funds have found themselves, since 1992, in a quite different environment, with the science and technology elements of government departments turned into research companies, bidding for contracts for funding. BRANZ initially received a government 'grant', in recognition of an implicit partnership between the industry and the government, for which the accountability mechanisms were fairly diffuse. This is no longer supplied, requiring BRANZ to compete with the other research institutes (and universities) for funding from the government to address issues which are laid down in a written 'strategy' (FRST, 1995).

This might have been a recipe for disaster, but has not been. The government shows a strong interest in enhanced research for the national good, adopting in 1996 a plan to increase its investment in research, science and technology by around 30% in real terms (to 0.8% GDP) by 2010. While a further review is scheduled for 1999, the share of this funding being allocated to building and construction research is at present scheduled to rise (though the amount is lower in real terms now than in 1984).

The Levy funding has exceeded government funding of building and construction research through the Public Good Science Fund in five of the last seven years. Using this funding BRANZ has developed since 1970 under the guidance of its Board (drawn initially from government and industry appointees, and since 1993 solely from industry) to be the leading resource for development of the building and construction industry in New Zealand. The organization has changed philosophy markedly over this period, in re-

sponse to this industry direction, with introduction of 'user pays for personal benefit' (distinguished from 'Levy pays for general industry benefit') being the most important change, around 1990. The Levy (and contracts for government funding, which are presently about 14% of the income) has provided the ability for the organization to have long-term programmes in the way that Seaden despairs may not be possible in the new order. Thus for example, BRANZ is completing now a 10-year atmospheric corrosion monitoring experiment (Duncan and Cordner, 1991) which has survived right through the period of reorganization of government funding of research, and has been principally funded from government contracts throughout the period since 1990.

It is questioned by some why national building research organizations should continue to be required at all. Seaden postulates a potential future of international research organizations, and there is no doubt that a pool of experts who possess specific information in energy efficiency of building services, for example, could effectively carry out all the research that was needed in all countries, from a base in one country. I cannot see this becoming the predominant pattern though; I doubt that any international organization could have carried out cost-effectively from off-shore the corrosion study referred to above. And as long as a significant element of the building industry world-wide is focused on delivery of shelter, using small- and medium-sized enterprises, it is logical that a local agency is required to provide a local point of contact for the industry, ensuring that new knowledge derived either locally or in another country is applied in a fashion that is sensible for the situation in that country. Davidson (1997) suggests that 'building centres' could fulfil this role in the future.

The key issue for national research organizations for the late 1990s therefore seems to me to be that they must identify who some of the 'stakeholders' are - those who own the organization, those who commission work from it, and those who apply the results it produces - and ensure that they are satisfied with the directions that the organization is following; and if there is dissatisfaction to address it. Davidson makes a number of important points in the special issue, but none more so than that research is only of

value if it is applied. If those who are commissioning work from the organization feel that the available skills are not those required, the commissions will start to be given to others – not necessarily in the same country. BRANZ invests very extensive effort in determining the NZ industry's views on the knowledge that they need – which is not necessarily the research they need, because as in many other countries the application of existing technology and knowledge is often less than perfect. It seems an increasingly common international event now that the industry will assist in the definition of the 'new' knowledge that it seeks – witness the agendas derived in USA (Wright *et al.*, 1995), Finland (VTT, 1997), Europe (Tupamaki, 1997) and Australia (NSW Government, 1997). We are in the process in New Zealand now of convening a further industry statement on its needs, as part of the government's plans for review of its research priorities. There is little reason to believe that the headline items will be significantly different from those found in the agendas derived in other countries: improved productivity, improved site safety, lessened energy requirement, less environmental damage, improved internal environments, and so on. Some of these headlines do not necessarily require advances in applied physical and engineering sciences, which is where our efforts have focused in the past two decades. BRANZ is already working with other agencies which can help us understand why people make the decisions they do, for example on issues such as using a higher indoor temperature rather than reducing energy usage when home insulation levels rise. There seems an expanding need (or perhaps a dawning recognition of the need) to take these social questions into account in ensuring that the research results can be best applied. This rising emphasis on social science issues seems an international trend, as I have observed in the introduction to the CIB 1997 Coordinators Trend Reports (Duncan, 1997).

Yet it may be that in some developing countries, there is still a need for this applied science and engineering focus from their national building research organization. These organizations seem to be struggling for their existence, if their ability to participate in CIB is any measure. But there is still a need for them to ensure that the previous

work done in the developed countries is appropriately applied in the context of that developing country's indigenous materials, indigenous architecture, and local customer expectations of building. This may pose the most significant challenge of any faced by the world-wide building research community. As we continually devise more sophisticated materials and systems, we may be moving in ways that are of even less likely value to these developing countries, for price and local availability reasons; yet ignoring the real problems that they have of delivering environmentally sustainable, affordable buildings to their people using systems which employ local labour. Somewhere along the line, the skilled exponents of applied science and engineering who are being shed from organizations in the developed countries must surely be able to be utilized to meet these emergent needs.

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