# Making the Best of Valuable Talent

## Executive Summary

*Prepared by*

# The Hawley Group

**A joint initiative of the Engineering Council
and the Department of Trade and Industry**

Final Version
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C/o Engineering Council 10 Maltravers Street London WC2R 3ER

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# Hawley Group Board Members


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                    Robert Foster      Director – Innovation Services
                    Anthony Kesten     Head of Engineering Policy Unit
                    Michael Tubbs      Industrial Advisor – Innovations Unit

DfEE representatives:-
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                    Eric Galvin                                  from 1-10-00

EC representatives:-
                    Malcolm Shirley   Director General
                    Iain Sturrock     EC Senate Member
                    David Worskett    Director Communication and Marketing/
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                    Paul Langdell     Project Director

# Making the Best of Valuable Talent.

# Overall messages from the report

# "Making the Best of Valuable Talent"

The Overall messages from the Interim Report of The Hawley Group

The Hawley Group's interim submission to Lord Sainsbury goes into considerable detail addressing the agreed objectives and indicating ways in which the Engineering Council can become a more relevant and potent force.

This introductory paper is designed to provide a crisp case for the critical changes – which need to take place – if the EC is to make that leap. It represents a snapshot of current thinking and work in progress; there is a considerable amount of work ongoing and still to be done.

The thinking is based on considerable research, conducted throughout the life of the Hawley Group, supplemented by a period of intense information gathering activity, from the broader engineering community and industry leaders – independently conducted and statistically sound. Experienced judgement has then been applied.

The findings are both encouraging and highly consistent, in that clear areas of *real need* and, therefore, *opportunity* exist. They also confirm that an independent body – such as the EC but in a *new* guise – can meet some of those needs, acting in ways that are genuinely complementary to the role of the Institutions.

## A Strategically Robust Position

Critical to this is an understanding that the broader engineering community has identified, *for itself*, where it needs *help*. It recognises that an individual's career success may well depend on it. Equally industry shares the same concerns and, *for itself,* recognises that future successful growth may also depend on it.

The combination – *in a push/pull effect* – is powerful.

Strategically it is about **"making the best of valuable talent".**

This applies to *individuals*, *to industry*, to *education* and is, *de facto*, fundamental to **wealth creation**.

## The *New* Engineering Council

A *new EC* offering, to help achieve the above, will be dependent on its *relevance*, *efficiency* and *excellent communication* to be *credible* and, in time, become the *"natural"* place to turn to for its acknowledged expertise.

For it to genuinely embrace the wider engineering community and, achieve wider public recognition, use of the term "engineer" will need to be reviewed. This will impact on what the *new EC* is actually called.

The most important finding is that engineers *recognise* and *want* to be more broadly qualified – but *not* necessarily in the conventional sense - rather in ways which are *relevant* in skill sets to their job, company or industry.

A crucial need, in many cases, is for engineers to be *multidisciplinary* – not just in engineering terms (CPD convention) but in more *general management* areas where the development of these skills is seen as fundamental to *career progression and real wealth creation.* Industry leaders feel the same, recognising that broadening a sense of community, particularly through far better *commercial awareness/skills*, is essential to the more inclusive approach of modern management and the requirement, for contributing managers, to have a clear understanding of their place in the **creation of value**.

For the *new EC* to provide a **bridge between individuals and industry**, to help achieve this, would be truly beneficial. It is an important extension of CPD, in that it is significantly more important than previously supposed and can rank equally or ahead of technical competences.

For the *new EC* to possess an authoritative, overall understanding of what is on offer and how it can be applied (effectively identifying and promoting "best in class" solutions to CPD needs), coupled with greater recognition of internally managed CPD processes, could seriously *accelerate* the pace at which individuals are able to make their *contribution* more *effective* in the **wealth creation process**.

There follow a number of relevant bridges to complement this.

- The first is providing **a bridge between "old" and "new" economy management styles and needs** – knowing that, in effect, most businesses fall within a spectrum between the two. Both individuals and industry indicate a need to understand this better – with a view to harnessing those elements that generate *greatest benefit*, identifying and exploiting knowledge – economy features, whose application have broader appeal and, importantly being assisted in discovering *how* to do it.

- The second is in the availability and definition of *information*. Engineers either suffer from information overload or difficulty in sourcing it. Those in the latter position, often at the leading edge, find gaining and sharing information difficult – whether as part of a defined subject, in the development of multi-disciplinary knowledge or in support of sustainability. The new EC could provide a **bridge between the need for information need and how it is supplied** – as a "clearing house" capable of directing individuals or businesses to the best, most relevant place for the information they need, real-time accurate, fast to access and, definitively, **value adding**.

- Similarly, in helping industry recruit the right individuals, to provide **a bridge between "qualifications" and what they actually mean**. This would include the existing registration process, supplemented by a definitive assessment of overseas

qualifications. As the recruitment process becomes more complex and an increasing number of internationally qualified people apply for high-tech jobs, the need to *best match* individual and job is becoming both more difficult and more potentially damaging if the match is wrong. Getting it right **adds value**.

- To help the profession and business prepare for the future by providing a ***bridge between today's knowledge and what it may lead to in the longer term,*** through ***"foresight"*** and long-range predictive techniques.

- The final ***bridge is between industry and the education system*** itself – to help ensure that individuals are appropriately educated and that needs of industry are met – if only in providing the basic "raw" talent which industry then moulds to meet its specific requirements. There are enormous variations in the quality of teaching establishments and, again, knowing the precise expectation of specific qualifications would be of **positive value.**

## The *New EC's* Public Face

Highly effective communication of the *new EC's* role will be critical. Existing perceptions of it are thin; therefore, creation of *a highly focused positioning* – of relevance and authority – because it *will do* a series of important things that individuals and industry both *really want*, is essential. It will need to be a segmented process, to respond to the specifically *relevant* needs of identified audiences and help comfortably embrace the broader engineering community.

That the profile of the EC is relatively bland makes this possible; stronger views exist about the institutions – whilst many changes have been introduced, they are perceived as being largely buried in *old thinking* and *"irrelevance"*- which would make credible ownership of these new services difficult to achieve.

**E-enablement** of this process (with a website or portal of the highest quality) – as a communication tool and in provision of the services described, as a *facilitator* – will be a pre-requisite. It is the obvious and appropriate vehicle for these audiences and as such, a *major profile builder*.

Indications suggest, if properly executed, some of these services could be E-provided either on a subscription or pay-on-use basis.

The broader question of *funding* and *constitution* will need addressing, including the extent to which activities can be revenue generating.  To achieve a transition of this sort will require funding initiatives beyond registration subscriptions and some sponsorship – with a guarantee of financial support to maintain the intensively resourced services which will need to be provided.

## Taking Work Forward

The main Interim Report contains some 43 recommendations. The work involved in delivering these will be considerable. To facilitate this, the recommendations can be grouped into seven primary "activity clusters". These are set out in the appendix to this Overview. These activity clusters should be the basis for the implementation plan.

## Summary

- Strategically, "**Making the Best of Valuable Talent"** has direct relevance to individuals, industry and education in the ultimate **wealth creation** process.

- By recognising the common need to be more *commercially attractive* the opportunity presents itself to the *new EC* to bridge a series of critical gaps between:

    - Relevant overall capability need and supply
    - "Old" and "New" economies
    - Defined information needs and supply
    - Individuals' qualifications and skills and the right job
    - Definition of future needs
    - Industry's needs and education system supply

- By doing this the *new EC* will be providing needed services of real *benefit*, which will be capable of sustained *relevance* and, therefore, materially affect **value creation.**

- If it does this *properly* then the *new EC* will be a credible provider.

- Communication will be critical to profile and usage; creating a broader understanding, amongst the wider engineering community and beyond, it will require new language including a re-assessment of the term "engineering".

- Financing and constitutional issues will need to be addressed to ensure on going high level service delivery

The **time critical** nature of this process cannot be over stressed. The needs are there and, if not met by the *new EC,* they will be met in **other, sub-optimal, ways.**

**Hawley Group**

**Activity Clusters**                   appendix to "Overall Messages" report

**The Basis for Implementation Work**.


**Introduction**

The main interim Report contains 43 recommendations.  In order to facilitate the process of implementation these can be grouped into seven areas, or 'activity clusters' as follows.  These seven areas should provide the basis for the future work programme of the Hawley Group and its partner organisations during the course of 2001.



**Activity clusters**

**1)  Communications**
           Generic
           Specific audiences
           Web sites
                 Portal definition
                 Updating

2)  **Maintaining relevance**
           How do we keep up to date
           What trends must be plotted
           What 'foresight' exercises are needed
           Where will we need to be on a rolling 2 year basis


**3)  Key services**
           CPD
           Commercialisation
           Information flows
           Developing best in class
           Identifying best practice
           Creating a 'clearing house'

**4)  Education**
           Links into schools, colleges and universities.
           Centres of excellence
           Structure of degrees

**5) Social Responsibility**
            Sustainability
            Licensing
            Safety
            Environment

**6) EC Structure**
            Constitution
            Governance
            Name

and following on from these EC structure issues:-

**7) EC Finance**
            Funding requirements and sources
            What can be self funded
            How are profit centres created

From JAST 5 XI '00

# Main Report

**13 DECEMBER 2000**

**MAKING THE BEST OF VALUABLE TALENT**

**INTERIM REPORT OF THE DTI –ENGINEERING COUNCIL WORKING
GROUP ON THE FUTURE ROLE OF THE ENGINEERING COUNCIL**

**Background**

1. This interim report by the Working Group on the future role of the Engineering Council (known as the "Hawley Group") responds to the request by the Minister for Science, Lord Sainsbury for a strategic paper to be ready by mid-December 2000. The aim of the report is to allow action to implement the proposals to be put in hand quickly in the New Year. The overall Terms of Reference of the Group, and its agreed strategic objectives, are at Annex 1.

2. This is a short document that covers the themes and topics set out in Dr. Robert Hawley's letter and attached paper for Lord Sainsbury dated 26 October 2000. (Annex 2). Its theme is turning knowledge into wealth by making the best of valuable talent. To achieve that, the overall messages from the studies and the research are that the wider engineering community will have to :
    ♦ Do far more to bring together and unify the knowledge base
    ♦ Give engineers entrepreneurial and business skills
    ♦ Improve the means for keeping knowledge up to date

3. The report's proposals for achieving these aims are firmly based on the work carried out since the Hawley Group was established fifteen months ago. The overall report of the seven "review groups" which have worked throughout this period is at Annex 3. We would like to record our gratitude to all the companies who seconded staff to us to help with the work.

4. The more recent work of the Group has focused heavily on new research and surveys. These have been targeted at people working in the "wider universe of engineering" identified by Sir Robert Malpas. In tackling this area, the research breaks new ground. In business and industry, there has been remarkable support for the exercise. People, from chairmen to young graduates, have been hugely enthusiastic about talking to us. They have been determined to express their views about the engineering profession in general, the Engineering Council, and the way in which they serve the wealth-creating economy.

5. The Group, throughout its work, has been fully aware of the considerable changes already being made within the Institutions, with the aim of modernising and increasing their relevance to members and potential members. This report in no way seeks to understate the value of such changes. However, it is important to recognise that they are for the most part aimed at the existing world of engineering, rather than the wider engineering community. Moreover, many of the changes are relatively recent, and it is too early to assess their impact.

6. The messages from the work carried out for the Group are unequivocal. The profession (defined as the Engineering Council and the nominated and associated professional engineering Institutions recognised by the Privy Council) does not serve economic needs adequately, and this is almost certainly the last chance to put things right. Already a large proportion of engineering and technological skills are not adequately catered for by the existing engineering profession. The Malpas Report identifies perhaps 1.5 million people working in engineering occupations who are not part of the Profession. This contrasts with the 600,000 who are. The need for more multi-disciplinary skills is not yet being adequately met. These problems are not unique to the UK. They exist in many other developed countries, where efforts are also being made to tackle them. The Hawley Group has not yet found any evidence that these problems are being more effectively dealt with elsewhere.

7. However, research among the wider "knowledge-based" business community, at every level from chief executive downwards, confirms that the opportunity exists to put the problems right. People not only believe that the Engineering Council should take on a wider and more relevant role, they also believe that it is feasible for it to do so. Indeed, unless the Council and the profession together change, in order to provide the support and skills which the new knowledge-based economy needs, both will rapidly become irrelevant. If the right action is not taken now it will be too late.

8. Well-focused, radical change will have the support of the innovative, wealth creating, business community. The research findings (Annex 4) make this clear. The following recommendations therefore seek to ensure that, for the future, the Engineering Council will add value, directly and indirectly, to the rapidly growing knowledge-based economy on which future prosperity and sustainability now depend. This will continue to need to be done in partnership with other bodies, some of whom will to take the lead on certain issues.

**Promoting Engineering with relevant partners**

9. The promotion of engineering is seen as very important. This view is as prevalent among those who are not currently part of the profession as among those who are. It was perceived as an area in which both the Council and the profession have failed up till now. Whilst the individual needs of Institutions were recognised, there was almost complete agreement that much greater coherence was needed. Too many voices are currently giving confused messages. Too little attention is being paid to the real needs of specific customer groups and audiences. There needs to be a more coherent and targeted approach using modern communications techniques.

10. A special project group examined this area, and it remains clear that a number of Institutions are particularly committed to their own views about the best approaches, notably in respect of communications with schools. Where specialist input into the curriculum is needed, the Institutions are best placed to provide it, and have indeed done so with success. The project group report (Annex 5) contains proposals, for example on audience segmentation, professional

evaluation of initiatives, and types of "message", which we endorse in principle, although further detailed work will be needed. Our main recommendations are:

- **Adopt a structured and co-ordinated approach for Council and Institution communications with the educational community, feeding in different levels of message for different age groups, using a common communications "pack" and mailing arrangements to simplify the entire process.**
- **Concentrate on promoting engineering as part of the "Science, Technology, Engineering and Maths (STEM) mix", taking steps to ensure that all relevant parties genuinely buy into this. The Council should play a leading role in supporting the Government's plans for giving a greater emphasis and more support to the delivery of STEM activities to schools.**
- **Agree a shortlist of clear "generic messages", consistently delivered, about SET, on which the Council should focus, with Institutions developing more specific, but related messages.**
- **Develop a clearer understanding of the attitudes and needs of people working in the wider "knowledge economy" and tailor messages to suit this community.**
- **Urgently undertake work on the idea of establishing a combined "STEM Media Centre", if possible building on what already exists but capable of achieving a step change in the quality and topicality of material being provided to the media.**
- **Encourage appropriate "clusters" of Institutions to pool their public relations resources in the interests of effectiveness and economy.**
- **Urgently explore the option of using the Campaign to Promote Engineering (CPE) to take over the promotional activities of the regional Professional Engineering Institutions (PEI's) under the aegis of the Engineering Council.**
- **Develop a "generic" engineering careers advisory service to fill the current gap in this area, working in close partnership with EMTA and other providers.**
- **Develop proposals modelled on the successful use of the concept of an "Engineers Week" in the United States.**
- **Develop a top quality web site providing information about engineering and technology as well as value-adding services.**
- **In all of these activities ensure that full use is made of outstanding achievements and "role models", and that elements are included specifically to encourage more women into engineering and technology.**


**Continuing Professional Development  (CPD)**

11. Continuing Professional Development was widely perceived to be important and difficult. The Group is fully aware that many Institutions are already active in this field. However, this activity is largely aimed at development within their respective professional disciplines. It remains the case that few employers are yet familiar with the concept, and among those who are, the emphasis is often more on cross-disciplinary and non-specialist CPD.   There is also concern that CPD could become yet another layer of bureaucratic qualification and cannot hope to keep up with the rate of changing knowledge. There is a small minority who

regard the attainment of a given level of capability (e.g. CEng, IEng, EngTech, a first degree, or NVQs) as sufficient, with additional skills being job specific, and obtained in the working context.

12. This is not the majority view. Most people said that a key feature of the knowledge-based economy is the speed with which knowledge grows and changes. CPD is the only effective way of ensuring engineers and technologists keep up with such rapid change – and can demonstrate that they are doing so. Employers in the knowledge economy are increasingly concerned by the problem of how to tell whether job applicants or existing employees are keeping up to date. CPD should not become a constraint on companies for which flexibility and speed are vital. However this is a question of how, not whether, it is introduced. It was stressed that CPD should facilitate cross-disciplinary development.

13. The most important message, however, was that it must encompass non-engineering skills, such as business management, basic finance, marketing and communications. These are vital if engineers and technologists are to contribute more effectively in the business environment. Amongst employers and employees alike, in the knowledge economy, the priority has moved away from very high level specialist qualifications to a requirement for a sound, practical scientific and technical base, combined with generalist skills.

14. The Group endorses this approach. CPD needs to be structured; capable of being audited; and integrated as much as possible with the needs of the business. It should be flexible and attractive. This implies an emphasis on practical experience, and a balanced approach to the amount of time people are likely to be required to put in outside their normal working hours. In company training is likely to be one of the most effective ways forward. Although the overall message is very clear, more work is needed to develop a full understanding of the skill sets or modules that are required. That is particularly challenging at some levels where complex judgements on issues are often required. Only when this work is done will it be possible to take decisions about the range of modules and about who should provide them. We make the following recommendations:

- **Implementation of a comprehensive CPD structure should become a top priority.**
- **Work should now take place to develop a menu of CPD "modules", capable of being undertaken by engineers and technologists, of any discipline, often within the work environment. The menu should include modules on entrepreneurship, business management and sustainability.**
- **Work should also identify the most appropriate suppliers of the modules. In many cases these will be Institutions; in some cases universities or business schools. Use of e-education should be examined.**
- **The Engineering Council should develop ways of ensuring broad comparability of the various modules, auditing the bodies providing them and ensuring they are kept up-to-date.**
- **A proper research programme in this area should be initiated without delay to increase understanding of the future requirements of employers, particularly in the innovative sectors of business.**

- **An index of "role model" organisations should be created, to assist others with benchmarking and best practice.**

15. Society sets increasingly high priority on safety, risk management and on sustainability. Mistakes by engineers, or failure to follow their advice, can have catastrophic consequences. The achievement, at one point in time, of a specific qualification (e.g. CEng, IEng or EngTech) does not necessarily signify a current level of competence in such critical areas. This is at odds with public expectations and it is unlikely this situation will remain acceptable to public opinion for much longer. The way to address this problem is again through CPD, so that employers will at least be aware whether an engineer has appropriate up-to-date knowledge in a given field.

16. Successful completion of the relevant CPD module(s) would be a genuine indicator of competence in the field concerned, particularly if that CPD work is externally assessed. Put simply, registration followed by CPD in the relevant area should enable an engineer to be licensed to practice in the field concerned, if public pressure for such licensing develops. Even without such pressure, formal CPD will create greater confidence. This should be the model. For these broader social questions we recommend that:

- **Government should give a lead by, for example, developing requirements for CPD and up-to-date skills for its own engineers in key areas of work such as the environment, safety regulation, or defence.**
- **More work should now be undertaken to develop a framework whereby registration, combined with CPD, leads to the licensing of engineers who perform critical safety and environmental functions.**

**Engineering Education**

17. Support to schools has been covered in the section on "Promoting Engineering". This section deals with the relationships between employers and tertiary education. The difficulties of assessing future skill requirements are compounded by the fact that many employers are not themselves sure about the issue.

18. Most employers agree that there is an urgent requirement for practical engineers and technologists (Incorporated Engineers and Engineering Technicians). They are more important to most businesses than more theoretically based Chartered Engineers (although there will always be a need for the latter). For some businesses the need for people with "sub-degree" qualifications is just as great, and should be met by increased encouragement of Advanced Modern Apprenticeships. Employers also stress the growing importance of a multi-disciplinary approach as well as the need for general business skills. Current Institutional structures and the structures of many university courses are thus widely regarded as poorly aligned with business needs. There is dissatisfaction with the arrangements for dialogue between business and the academic

community on these issues. This dissatisfaction is shared by a significant element of the academic community itself. Models exist, here and in the United States, for better linkages. Against this background, the Group now recommends that:

- **New arrangements should be developed to facilitate dialogue between business and the academic community. This should be a major new role for the Engineering Council working with appropriate groupings of Institutions.**
- **Increased resources and effort are needed to complete quickly the current work reviewing differently structured university courses to see which approaches seem most likely to deliver people with the skill to meet business needs.**
- **That analysis should be used as the basis for considering whether a limited number of universities, (including the Open University) could form the nucleus of a new category of "Technical Universities" specialising in the provision of engineering and technology graduates to business.**
- **A study should be carried out among engineering and technology graduates now employed in business to identify weaknesses in their education to first degree level, and the areas of additional training (non-company specific) which they have required within five years of entering employment.**

**Registration of Engineers**

19. The number of registered engineers has been in decline for some years, and without remedial action this decline will worsen for demographic reasons. The Council's "Recognising Excellence" campaign, working mainly within the existing engineering "sector" makes a start at addressing the problem. Individual Institutions are also developing new marketing initiatives. By themselves, however, these measure are unlikely to be able to do more than halt the decline.

20. For a variety of reasons, and in particular those relating to international recognition, it is essential that the standards for achieving registration in its present forms are not diluted. Proposals for improving current registration processes at Council and Institution level are contained in the Report of the BER Working Group at Annex 6.

21. The research conducted in the high-tech and knowledge-based economy clearly indicates, however, that registration in its present form, and the professional status it affords, are well down in the list of priorities for most people. The fact that they have not in practice even joined existing Institutions is clear evidence of this. The research suggests that the problem is that registration by itself and the attainment of a specific, one-off qualification is not a sufficiently attractive or useful "offering". But the research also confirms that there are combinations of "offerings", including registration, which might be significantly more attractive.

22. For employers, growing concern about assessing both competence and capability when recruiting or choosing technology suppliers and partners suggests that services to ease the problem would be genuinely attractive. This is especially so when skill shortages drive employers to look overseas. Employer support for

registration and CPD would be much stronger if a link to the profession also helped them with these problems.

23. For employees, interest in "status" is higher in some sectors than others. In general, however, in the "knowledge economy" people are judged by what they have done rather than by formal qualifications. (Some product specific qualifications - e.g. Microsoft - are viewed more favourably). There is interest in involvement in work with potential commercial benefit, such as the development of international standards. Most interest however is in services that provide fast and reliable access to cross-disciplinary knowledge. The problem of "information overload" was repeatedly referred to during the research programme. Younger new technologists still place great importance on a business culture which encourages easy exchange of knowledge within the company, but broader access must be Internet based. The idea of a first-class web site providing a portal to such services, and a degree of quality control, is attractive.

24. Evidence of current competence is thus more important than registration alone for people working in the knowledge economy. Thus registration plus CPD is a significantly more credible and useful proposition. Unless registration and CPD are perceived as commercially relevant, and linked to other services, they will be seen as a constraint on flexibility and innovation, not a source of added value. The potential usefulness of CPD and licensing for those in government responsible for safety and sustainability also means that there should be common ground between government and employers on this. This assessment leads us to the following recommendations:

- **There should be specific research into the type of competence and registration facility that would meet the needs of employees and employers in the high-tech/knowledge economy.**
- **There should be a sharper focus on the characteristics of Incorporated Engineers, with the aim of building their image and status. They should be portrayed as clearly different, and clearly equal to Chartered Engineers. The message at present is confused and until this is corrected, perceptions will not change.**
- **Attempts should be made to increase awareness of the value of the Engineering Technician qualification, building on the important additional funding recently announced by Government for specialised Further Education colleges.**
- **Further work should be undertaken to encourage Advanced Modern Apprenticeships.**
- **The provisions in SARTOR for reviewing and monitoring its relevance and effectiveness should be more widely explained, and more "open" processes put in place for taking account of concerns. The Institutions and the Council have a shared responsibility for this.**
- **Rapid development of internationally recognised qualifications and provision of advice on whether qualifications are comparable could be of real help, notably for smaller companies without the capability to make their own assessments. The Engineering Council's efforts in this field need to be given higher priority, and greater government backing, for example through relevant inter-governmental organisations.**

- **For registration (and the role of the Engineering Council) to win wider support, the Council will have to develop a number of other roles, access to which is perceived as valuable by businesses, employees, or both. These need to be defined, together with ways of delivering them, in particular via the Internet.**
- **Once the added benefits of a registration package have been identified, the Council's relationship (including funding and communications) with registrants should be re-examined.**

**Future Engineering Impact**

25. Sir Robert Malpas' report "The Universe of Engineering" redefined the sector to embrace the much greater numbers of technologists and scientists working in the new knowledge-based economy. The boundaries of this "universe" will constantly expand, and no definition is final. The approach adopted does, however, now give engineering the right scope. This is in itself important and helpful in understanding the impact of the profession in its widest sense.

26. Understanding of this impact is still very limited. The research we have undertaken barely scratches the surface. An increasing proportion of engineering and technology companies are providing "business to business" services. Companies in traditional sectors are looking for "technology partners" to work with them in modernising processes and products. How such trends are developing, and how best to support them, will require constant monitoring.

27. Because engineering and technology support a growing number of other sectors, a reappraisal of the economic linkages would be helpful. Economic analysis of the ways in which value is added by the cross-sectoral application of engineering and technology skills is an important element of the structure of the future economy. Traditional economic models based on old definitions of engineering are no longer an adequate basis for policy-making.

28. The rate of change is now so fast that work to understand what is happening will need regular updating. This will not only be important for the purposes of setting standards, accrediting university courses, or approving CPD modules. It will be increasingly in demand as a benchmarking service for businesses without the time or capability to undertake this for themselves. This is another area in which the Engineering Council might be able to develop a service that would be seen as adding real value at both company and individual level. One element of such a role could be to run a regular "Foresight" exercise to look at likely changes.

29. The impact that engineering can have on supporting sustainability is another major aspect that has only recently begun to be properly appreciated. Apart from handling this in the CPD context, it has been suggested (by Forum for the Future) that regular auditing and reporting of "best practice" and achievement in this field would be a stimulus for best practice.

30. On "Future Engineering Impact" we therefore recommend:

- **Regular monitoring is needed to understand the widening scope, and changing needs (skills, services etc), of those in the "universe of engineering".**
- **Economic modelling of the ways in which knowledge-based engineering and technology companies add value to others, frequently across sectors, should be undertaken to support future policy making.**
- **Ways should be examined of establishing a "benchmarking" service, identifying significant changes and developments among organisations in the "knowledge economy", for the benefit of the profession and of business.**
- **The contribution of engineering and technology to sustainability should also be the subject of regular monitoring and reporting.**

**Achieving Consensus**

31. The Working Group was asked to find ways of improving the coherence of the engineering profession's views, particularly in dialogue with Government. Many of those we have consulted have argued that engineering would benefit from having a "single voice". However, others, and in particular Institutions, have argued that a "single voice" is neither practicable nor desirable because there are frequently alternative, valid points of view. There is also much contact with Government on detailed technical issues, which can only sensibly be handled by the appropriate Institution or sector representative. The way to reconcile these two points of view, it has been suggested, is to concentrate more on developing and presenting properly balanced views from the profession, reflecting differences where they exist.

32. While this will frequently be the right approach, it should not absolve the profession from the duty of trying to achieve consensus where possible. The greater the degree of consensus on major strategic questions of public policy, the more likely it is that the profession's views will carry weight. There are a number of issues that should be handled at a pan-Institutional level. The most important are educational standards and curriculum issues; the relevance of both to the skill requirements of business and industry; the overall contribution of engineering to sustainability; engineering and risk management; and engineering's contribution to wealth creation. For all of these a clear, authoritative single voice is needed, and is appropriate.

33. An almost unanimous view from business and industry, from Government and from sister organisations is that the current structure of the profession, with thirty four Institutions is too fragmented. This damages the profession itself, as well as its effectiveness and relevance to the UK economy. Many of those we have talked to have stressed, however, that a reduction in the number of Institutions can only come about voluntarily, and as a result of an increase in trust between those concerned. Such changes cannot be imposed, but they can be facilitated. Building bridges of this kind should be a task for the Engineering Council.

34. The way forward that has received most support is through progressive "clustering". Analysis shows that many Institutions, particularly the largest, are

active across many sectors of the economy. Other institutions are more likely to relate to narrower sectors, or to particular types of knowledge. Annex 7 indicates, however, some opportunities for clusters which relate to broad business sectors, but also shows that some Institutions are "enablers" supporting economic activity very widely. There are already good examples to follow. The Construction Industries Council (CIC) provides one good model for tackling problems of this kind. (Annex 8). It could be applied both at Engineering Council level and for appropriate groupings of Institutions, as in the construction sector.

35. In the light of these findings, we consider that the next steps in this area should be:

- **Encourage other appropriate clusters of Institutions to adopt the CIC model.**
- **Study other appropriate organisations so as to "benchmark" best practices and structures as a basis for changes within the engineering profession.**
- **Restructure the Engineering Council so that it is able to develop and present coherent views, on behalf of the profession, on the generic issues identified above.**
- **Strengthen the Engineering Council's Government relations capability so that it is able to act as an effective "clearing house" for the profession's links with Government (many of which should still be at Institution level). Establish a high-level public affairs group to oversee this process.**
- **Identify useful experience and "best practice" from previous initiatives that have succeeded in bringing Institutions together, in this and other sectors, and facilitate discussions among Institutions who would find this helpful.**

**The Engineering Council**

36. We were also asked to consider, in the light of all these conclusions and recommendations, whether the overall structure and governance of the Engineering Council should change. The proposals in this paper would lead quickly to a distinctly different Engineering Council. While still acting as the registration and regulatory body for the profession, it would also assume a strategic "bridging" role on a number of major issues. It would therefore need to take account of the fact that many people with engineering qualifications in the wider economy regard themselves as technologists with cross-disciplinary skills rather than traditional engineers. The "new" Council would have a far greater involvement with business and industry – particularly the innovative "knowledge-based" economy. As the Council develops a unique understanding of this sector, it should become the natural and preferred source of advice about it. It is important to stress again that the research in this sector shows that there is support for the Council moving in this direction, together with a belief that it can and should do so.

37. All of this would move the Council a long way from being a "registration body" with some promotional activities, almost wholly funded by the subscriptions of individual registered engineers. This funding base would not be adequate for the new role. Nor would it be appropriate, as the role would extend beyond the specific interests of the registrants. It is therefore essential that alternative sources of funding and revenue are developed, over a sensible period of time, to allow the wider role to be performed. It is a role which would be clearly complementary to

that of the Institutions and to the work of other major sister organisations, notably EMTA and EEF.

38. The current governance of the Council is based on a Senate of 54 people predominately from two constituent groups – individual engineers and engineering Institutions. With a wider remit and constituency, the "new EC" would need different forms of expertise, quicker decision-taking and more business experience. To have relevance to the "knowledge economy" the "new EC" would have to perform not only better, but also very differently. Ways will have to be found of establishing links with those highly qualified people working in the "knowledge economy" who are not likely to wish to take up registration in its present form. This must entail significant change to the Council's constitution and governance. The Internet would be a key element in providing service. The name itself, the research tells us, does not and will not, strike the right chord with members of the new knowledge and technology community. We therefore recommend that:

- **A study of alternative corporate structures should be undertaken urgently, so as quickly to identify the most suitable model for achieving the aims set out above.**
- **Work should also start immediately on identifying appropriate funding for the Council's potentially wider new role in the context of a three year "business development plan"**
- **There should be professional research to identify a new name that has the necessary resonance with tomorrow's engineers and technologists.**

**Conclusion**

39. In preparing this interim report we have not been able to do full justice to all the supporting work, or to the many constructive comments and submissions we have received. More details are contained in the annexes. The full material will be available when the further work identified in this paper is completed. We plan to produce further reports during 2001, so that by the end of the year a "new" Engineering Council will be ready and able to take up its role.

40. Our aim, with this paper, is to capture the very clear thrust of what people have said to us; to set the course that the Council and the Government should now follow; and to identify the specific next steps. These will then allow the delivery of a reconstituted, more effective (and possibly renamed) Engineering Council; able to play a full role in revitalising and adding value to the knowledge-based economy of the future by bridging the interests of individuals and businesses in the wider "universe of engineering".