ECONOMIC DEVELOPMENT AND TRANSPORT COMMITTEE

Date: 26 January 2006
Time: 9:00 – 12.30
Venue: National Assembly for Wales, Cardiff Bay
Title: Techniquest, the Women into Science, Engineering and Construction (WISE) Campaign and WISE in Wales

Report to the Economic Development and Transport Committee

Techniquest, the Women into Science, Engineering and Construction (WISE) Campaign and WISE in Wales

26 January 2006

This document contains reports for the Economic Development and Transport Committee review on science policy in Wales from Techniquest, the Women into Science, Engineering and Construction (WISE) Campaign and WISE in Wales.

The first report from Techniquest summarises our strategy, which was developed from our year-long strategic review (completed November 2005, p1 - 5), followed by detail of the strategy (p6 – 16). The report from the WISE Campaign follows, including information on WISE in Wales (p17 – 19).

Dr Anita Shaw
Development Director, Techniquest
Chair, WISE in Wales
January 2006

Techniquest has spent the last year thoroughly reviewing all aspects of its activity to create a new strategy and five-year plan. This plan aims to build on our success and improve our impact. So, what's in store for Techniquest from now until 2010?

Society is more complex, more interconnected, and more reliant on science and technology than ever before. We believe that an effective interface between people and science is of increasing importance. It is vital for Wales to have the skills to keep its infrastructure going and to be able to continue to develop a successful and sustainable economy. It is also crucial that the general public are able to engage in the science issues affecting all our lives.

Techniquest's mission is therefore of huge importance, and our review has concluded that we must make every effort to make a difference, making the best possible use of our skills, experience and resources to enthuse, motivate and engage more people. We have looked closely at how we do this and how, within the wider community of science centres and other organisations with similar interests, we can do this better.

Our aims which emerged from the review are:

▪ within Wales to redouble our efforts to overcome the twin obstacles to participation in science: distance and disadvantage

▪ outside Wales to develop Techniquest's reputation as a world leader in 'regionalisation'

▪ to pursue a long-term plan to develop methodologies to measure our impact on society

▪ to maintain the quality of our interactive exhibits, but make greater use of digital media, TV and radio to get our messages across

▪ to carry out environmental enhancements to our Cardiff Bay site in the short term

▪ to undertake more substantial changes at our Cardiff Bay site to utilise currently unused space in the medium term

▪ to sell more high quality, proven interactive exhibits at low prices

▪ to increase our fundraising activity and focus on developing partnerships to help us to deliver our mission.

1. Overcoming obstacles to participation

As an organisation, Techniquest is already well established within its region, and reaches some 380,000 people per year. However we wish to reach more than this, and our research showed that two major factors were still holding back our work: distance and disadvantage. The first major plank of our new plans is therefore:

▪ within Wales to redouble our efforts to overcome the twin obstacles to participation in science: distance and disadvantage

We have an array of plans to tackle this, including more community outreach and greater use of digital media. Our largest plans however involve working to offer more services to schools within Wales. We see schools as the natural venues within which to reach a cross-section of the population, including in particular those children for whom an appreciation of the value of learning and interest in science is not necessarily encouraged at home. Of course schools have the added benefit of having professional and skilled staff on site! By working closely with the formal education system, and by developing appropriate resources to support teachers in the delivery of the National Curriculum and in their training requirements through programmes of continuing professional development Wales-wide, we believe we can make a major difference here.

2. Regionalisation

Techniquest has gained an enviable world-wide reputation within our field, and has become a significant player overseas, regularly working with science centres and educators across the world to develop and improve their services. During the review we have considered how we can best continue to contribute to the field overseas and elsewhere in the UK. We decided that our innovation and experience of 'regionalisation' was of greatest value, and our aim is to:

▪ develop Techniquest's reputation as a world leader in 'regionalisation'

Thanks to the stable support of the Welsh Assembly Government, Techniquest has developed strong roots within Wales since our doors first opened nearly 20 years ago. The distinctive Techniquest experience is now offered extensively within our region, at our flagship science centre in Cardiff Bay, at other sites across Wales and through a variety of outreach programmes. As we now take this further forwards, with plans such as virtual networks, dispersed 'hubs', and two-way channels for expertise and ideas, the expertise and methods we are developing will be a major contribution to our field worldwide.

3. Measuring impact

Our review looked at the important issue of measuring our impact. Techniquest already evaluates its exhibitions and programmes to help achieve our desired outcomes, and we intend to strengthen this further. However, this does not provide clear information about the wider impact of our work on society. We are not alone in this; it is notoriously difficult to measure motivational and behavioural changes where the effects are indirect and long-term. Indeed, the underlying psychology of motivation and affective learning is not as well understood as other forms of learning. This led us to the next conclusion:

▪ to pursue a long-term plan to develop methodologies to measure our impact on society

We already have a strong background in research through our links with various universities. As a science centre, we do not have the full range of research skills and resources to do this on our own, and so we will strengthen further our ability to work with specialists and partners to achieve this. Our aim is to achieve the first clear results in five years' time. A new post of Head of Research and Evaluation has been created, and will lead on this aspect of our plans.

4. Media

Techniquest is renowned as an innovative exhibit designer and developer. Over the years we have excelled in creating new exhibits on all aspects of science and many of these can be seen in other science centres worldwide. However, the big changes in communication technologies in the last few years have provided new ways to reach audiences, leading to the next part of our plans:

- to maintain the quality of our interactive exhibits, but make greater use of digital media, TV and radio to get our messages across

Our interactive exhibits remain as popular as ever, but we believe that by carefully using new technologies too we can engage more diverse audiences, more effectively. Additionally, the web and other digital media will allow us to elicit audiences' views on social and ethical issues or to keep them updated on contemporary science research. We aim to work with established organisations, such as those in the broadcast media, to reach new audiences, and have identified those aged 14-19 years as one of our main target audiences with which to work through these media.

5. Cardiff Bay site

Our review also looked carefully at our operations at our main Cardiff Bay site. We have identified that this site will remain the 'hub' around which our Wales-wide activity will be based. However, due in large part to improvements that have taken place nearby, the building is now not used to its maximum effect.

This leads to the next two main conclusions from the review:

- to carry out environmental enhancements to our Cardiff Bay site in the short term
- to undertake more substantial changes at our Cardiff Bay site to utilise currently unused space in the medium term.

We commissioned an environmental report which highlights the areas where Techniquest can adopt a greater environmental awareness, both in our programmes and exhibitions, and our infrastructure. From this we have stunning plans to develop our entrance to the east side of the building and to develop exhibits outside the building, adding to the experience of visitors to Cardiff Bay as a whole, and to the comfort of our visitors.

Our second phase will build on these initial changes and focus on using unused space on site to its best advantage. Opening up more exhibition space for temporary exhibitions is a key priority, as is providing better facilities for our planned increase in working with schools and teachers Wales-wide.

6. Commercial strategy

Techniquest has a very successful trading arm, generating income to support our mission. We are a leader in hiring and selling high quality exhibits to science centres, exhibitions and festivals. To build on this success we have decided to further strengthen this activity, improving our ability to:

- sell more high quality, proven interactive exhibits at low prices

Our trading company is to put in place improved production methods, making top quality exhibits available at lower prices. Our very busy in-house design team and prototyping facilities will also be improved, and whenever possible we will make these available to external clients.

7. Fundraising and partnerships

Techniquest is widely recognised as one of the best science centres world-wide and we have a long history of working with partners to share our skills and enrich our projects. However, our plans now require an even stronger focus on partnership working, and most of our new ideas will require funding from external organisations. To this end, the final part of our new plans is:

- to increase our fundraising activity and focus on developing partnerships to help us to deliver our mission

We have an ambitious, but achievable strategy that builds on the very best aspects of our success over the last two decades. However, this will only be achieved with the generous help of funders, donors and sponsors, and on developing partnerships with those who can help us in the delivery of our mission.

By researching and developing coherent and strong proposals, we aim to offer best value for money to all funders, tailoring our projects to their needs wherever possible.

Techniquest
January 2006

STRATEGY

A1 Mission

A1.1   Primary mission statement:

Our mission is to engage people with science and to motivate them to learn more

A1.2   Our primary audience is the people of Wales, and we will actively deliver our mission in a way that is equitable in terms of where people live, and is responsive to the relative 'need' of different sections of society;

A1.3   In areas outside Wales we will seek to deliver our mission in collaboration with suitable organisations in those areas, usually other science centres;

A1.4   Techniquest aims to support the Welsh Assembly Government's objectives as follows:

Economic   Strengthening Welsh competency in science, technology and engineering

Social   Enhancing understanding of the scientific and technological challenges facing society

Individual   Helping people develop skills to realize their full potential.

A2 Vision

A2.1   In five year's time Techniquest will:

A2.1.1   be making a substantial and identifiable[1] impact within Wales on the take-up by pupils of science and science-related courses;

A2.1.2   be making a substantial and identifiable[1] impact within Wales on the quality of public debate about key issues which may arise from contemporary science;

A2.1.3   be making a positive and substantial impact within Wales on public engagement with science and technology;

A2.1.4   provide a wide range of well-designed and well-targeted services throughout Wales which will engage and motivate the population;

A2.1.5   be making available all services offered within Wales in both the Welsh and English languages;

A2.1.6   taking into account practical constraints, be making proportionately more services accessible to "disadvantaged"[2] people in Wales than to others;

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[1] Subject to fundraising and partnership support, methodologies that enable the measurement of impact will be developed by the proposed research and evaluation group, and the required measurements will be made.

A2.1.7   be taking into account practical constraints, making services equally accessible to people throughout Wales irrespective of where they live;

A2.1.8   continue to be one of the world's foremost science centres, recognised as a leader in developing and delivering audience-centred services through effective collaborations;

A2.1.9   be operating a larger and more vibrant destination for public and school visitors at our flagship centre in Cardiff Bay.

A3 Values

A3.1   For those who participate in our services, we believe that:

A3.1.1   we must offer safe, friendly and non-discriminatory experiences;

A3.1.2   our content should be editorially independent, balanced and authoritative.

A3.2   In terms of how we work to deliver our mission, we believe that:

A3.2.1   engaging the public in science and science-related matters is a vitally important task, one that requires professionalism at all times;

A3.2.2   enjoying our work, and being seen to do so, is part of conveying a positive image of science;

A3.2.3   a friendly and positive working environment is helpful to achieving our mission.

A3.3   In terms of the society in which we operate, we believe that:

A3.3.1   a better understanding of the world around us is of benefit to people and their environment;

A3.3.2   a technologically-rich society can be a better, fairer and more sustainable society;

A3.3.3   a rational approach to problems, which is fundamental to the science process, is one that should be supported and promoted;

A3.3.4   presenting science in an engaging and motivating way can enhance its fascination and interest.

A3.4   In terms of how we work with other organisations, we believe that:

A3.4.1   working in collaboration with other organisations which have similar values is both necessary and important;

A3.4.2   it is in our interests to actively seek such collaborations;

A3.4.3   in order to deliver, collaborations and partnerships must be appropriately defined and structured to work well;

A3.4.4   other organisations have capabilities and strengths that we do not possess, and we should recognise that it is in our interests to work with these organisations in order to deliver our mission.

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[2] "Disadvantage" is taken to mean those who face obstacles in gaining access to formal or informal science education (these may be people within groups who: are socially deprived, have a poor family environment, are not catered for well by formal education, are economically poor, have special educational needs, or are from ethnic minorities)

A4 Delivering the mission

A4.1 All-Wales strategy

A4.1.1 We will place a priority on reaching Welsh audiences, and will aim to provide access to our services on an equitable basis without penalising their geographic location as far as practically possible, and will also aim to address social disadvantage. This means that all our activities in Wales will be guided by the principle of equal access to all, in proportion to need. A guide to present and planned services is available to the committee on request.

A4.1.2 The graph[3] shows the results of research conducted by Techniquest into the present approximate impact of Techniquest across Wales. In broad terms, the strategy referred to above translates to seeking to reduce the disparity between the impact in different Unitary Authorities – or to 'levelling' the graph.

Relative Impact: Overall Visitor figures for Public and School Audiences Across Wales (stacked)

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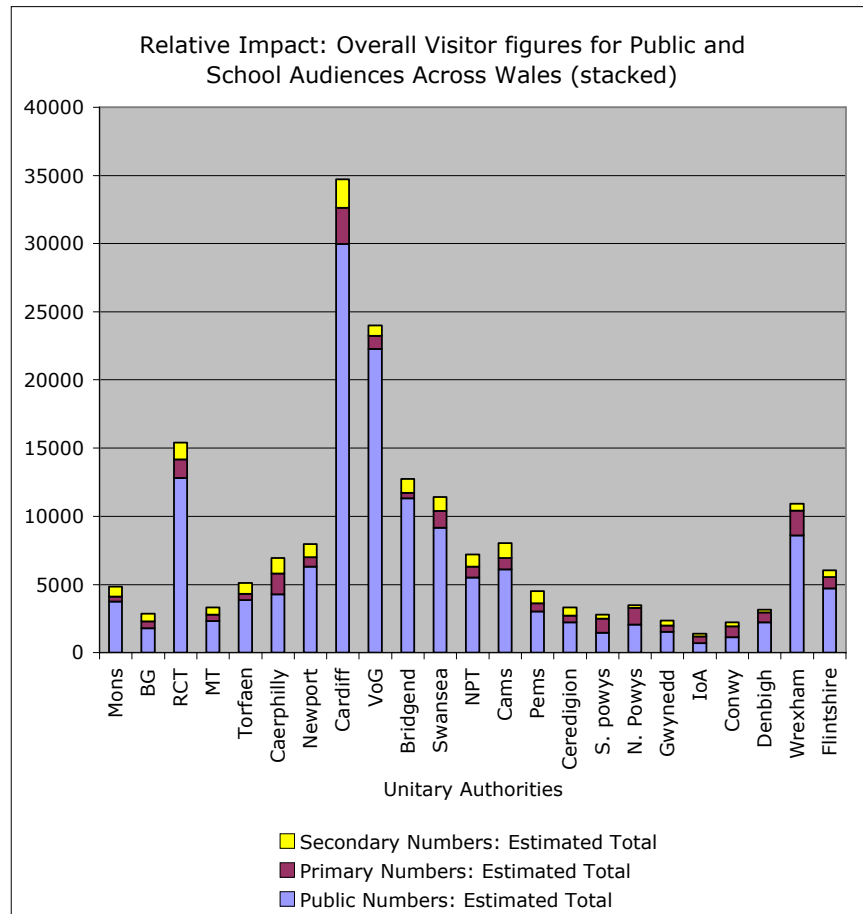
[3] The graph is based on data gathered by the review which is available to the Committee on request. To produce this graph, school visits were assumed to involve an average of 30 pupils for primary schools, and 50 pupils for secondary schools.

A4.1.3　Satellite centres are seen as a key method of delivering our mission in Wales, and we will seek to establish and maintain centres in any part of Wales where they are economically sustainable. These areas will be defined chiefly to minimize travel distance; however a number of other factors will also be considered, such as:

  i)　local circumstances;

  ii)　existing boundaries affecting related services (such as local authority boundaries)

  iii)　competing attractions;

  iv)　available long-term funding.

A4.1.4　To deliver the mission, a major expansion of outreach, both for public and for schools is seen as necessary. Outreach is seen as an excellent compliment to Techniquest's permanent sites in Wales, and growth of this activity is a major feature of the proposals in this document.

A4.1.5　Expanded outreach would be accompanied by a consolidation of the permanent centres, which provide a valuable and cost-effective service. Expansion at the Cardiff Bay site is planned, and increases in overall visitor numbers is believed to be achievable. A new permanent centre in NW Wales is also sought, subject to the outcome of pilot projects at Electric Mountain (Gwynedd) and Techniquest@NEWI (Wrexham) in 2005/2006.

A4.1.6　For schools, we envisage increasing the scale of outreach substantially over five years, from around 35,000 pupil sessions per year, to at least 500,000 pupil sessions per year. An outline programme and plan has been identified, based on proven methods for cost-effective, high-quality outreach services. Economies of scale are vital, not only to achieve the impact required, but also to make such services cost effective so that they are financially sustainable.

A4.1.7　Wider and more substantial benefits can be achieved by integrating the outreach proposals into a wider portfolio of support for teachers across Wales, designed to provide them with tools and techniques to motivate and inspire pupils in science. A network of Science Learning Centres has been established by DfES specialising in continuing professional development for science teachers in England. There is no equivalent network in Wales. Techniquest's strategy is to establish a "virtual network" of teacher support services to include continuing professional development for teachers and schools' outreach provision.

A4.1.8　Increased public outreach is also planned. To be effective, this work must target occasions and venues where people gather in large numbers for other purposes, such as shopping malls, sports events and railway stations.

A4.2　UK and overseas strategy

A4.2.1　Because we will regard Wales as our priority, we will mainly engage in other UK or overseas activities either to pursue commercial business, or to promote Wales (as part of a

coordinated exercise with bodies such as the Welsh Assembly Government or British Council).

A4.2.2   Outside Wales our first priority is to work cooperatively as part of the world-wide network of science and discovery centres. This fosters a stable situation for organisations where they feel able to provide mutual support within a specialised field, and increases Techniquest's access to UK-wide and European funding sources.

A5 Delivering the vision

A5.1 Major developmental initiatives

A5.1.1   The review has identified a number of major initiatives seen as necessary to fulfilling the mission and delivering the vision over the next five years, for which additional funding will be required. Details are available to the committee on request.

A5.2 Measuring impact

A5.2.1   Despite the traditional difficulties of measuring the impact of informal education, Techniquest will strive to resolve them and to carry out key monitoring measurements including those set out in the mission and vision statements.

A5.2.2   The research and evaluation function proposed in this document will, subject to funding, work with partners to develop the necessary methodologies and conduct the necessary studies.

A5.3 Status within the sector

A5.3.1   The proposals in this document involve activity that is at the cutting-edge of the informal science education sector. This activity has been selected to build on Techniquest's strengths, and wherever possible, helps progress those areas in which the organisation is already seen as most innovative.

A5.3.2   For example, the wider interpretation of the mission to include all people within our designated region of Wales, rather than just those who are able to travel to a single central location, is an important distinction and one that is a natural extension of current trends in the sector.

A5.3.3   Staff will continue to participate in professional forums in the UK, Europe and worldwide, and to draw attention to Techniquest's achievements.

A6 Delivering the values

A6.1 Visitor experience

A6.1.1   Health and safety will continue to be a major priority. The existing high standards of customer care will be maintained. We will seek to overcome obstacles to our services caused by geography (those living farthest from our Cardiff Bay headquarters) and disadvantage (by substantial expansion of schools and community outreach).

A6.2 Promoting the value of science

A6.2.1 A professional approach to operating the existing range of services and to developing new and innovative services, will ensure that Techniquest displays its values to audiences.

A6.2.2 A greater focus on issues generated by contemporary science and technology, from climate change to nanotechnology, will increase the support Techniquest can give to improving public debate and informing social and political policy in science-related matters.

A6.3 Partnerships

A6.3.1 Techniquest has benefited in the past from a positive approach to partnerships. Increased partnership activity is an important theme of the new strategy.

A6.3.2 Of greatest strategic importance is the proposal for Techniquest to play a key role in establishing a Wales-wide "virtual network" of teacher support services to include continuing professional development for teachers and schools' outreach provision. This will be linked to the National Science Learning Centre in York.

A6.3.3 Other important partnership strategies include:

i) major plans to work with Welsh educational organisations such as the National Grid for Learning (NGfL), the General Teaching Council of Wales (GTCW) and LEAs to deliver improved support for teachers;

ii) a strategic partnership with Cardiff University focusing on science communication research and outreach;

iii) an enhanced relationship with Techniquest@NEWI, involving co-operation on important strategic initiatives and closer links on fundraising and marketing;

iv) substantial plans to work with partners in all areas of Wales, to deliver services to schools and communities;

v) increased partnership activity with other science centres, particularly with members of the ecsite-uk and ecsite Europe organisations.

A7 Engagement & Communication strategy

A7.1 Audiences – the need for research

A7.1.1 The Review has concluded that Techniquest requires more objective monitoring of audiences, identifying their needs, and measuring the impact of its services. It should be noted that this is a position common to others in the science communication field.

A7.1.2 In terms of categorization of audiences, the review has shown that a simple categorization by age alone is unsuitable for Techniquest when planning to refine and develop its services. This is because at least two very important obstacles to achieving the mission in Wales, as in many other areas, are not age related; they may be classed as 'deprivation' and 'geography'.

A7.1.3 The points made above lead to the conclusion that the definition of audiences requires several overlapping categories, rather than a simple system based on different age groups. This approach is

necessary to enable important issues of geography and deprivation to be examined separately for different age groups, and if necessary other classifications could be used in relation to particular services or options to which they were crucial.

A7.1.4 To address these needs, Techniquest will pursue a strategy of working with suitable partners to undertake the necessary research and to develop tools and methodologies that will reinforce Techniquest's ability to fulfill its mission effectively. The plans to achieve this are available to the Committee on request.

A7.1.5 It is recognised however that this is a major undertaking, and that it will be several years before this can be fully achieved. In the meantime, the main priority is to pursue the mission in attainable areas.

A7.2 Audience development strategy

A7.2.1 The following table sets out the main elements of the proposed strategy, and the reasons in each case:

Strategy	Reason
Increase services offered to schools in-situ, especially for schools that are not close to permanent centres offering a Techniquest-style curriculum linked service.	Techniquest can readily target services to schools that are further from Techniquest's fixed-sites. Schools provide an excellent route to reaching children from all social backgrounds.
Pursue a key role in launching and operating a Wales-wide virtual network of teacher support services, to include continuing professional development for teachers, and schools' outreach provision.	Teachers are in an excellent position to motivate and engage pupils in science, but in many cases lack the support to do so. The Science Learning Centres in England are central to the UK government's strategy in the sector, and this role will help leverage funding and influence at a UK-wide level.
To expand audience numbers at Techniquest's permanent centres, particularly in Cardiff Bay. To continue to targeting family groups, but also seek to encourage new audiences where they are visiting as part of a family group, such as: teenagers, ethnic minorities, people with low academic expectations.	There is evidence that Techniquest is attracting a more affluent and educationally well-disposed audience. Through targeted marketing and programmes, it is thought more socially disadvantaged groups could be attracted. Techniquest's main appeal is to families, but it has limited appeal to those who do not visit in a family group.
To increase the number and range of events and outreach taking place for non-school audiences in non-school locations around Wales. This would primarily be achieved by targeting places and times where	The primary difficulty for Techniquest in reaching non-school audiences is attracting people in large numbers. However, this can be overcome by providing services in situations where people are already gathered, such as

Strategy	Reason
large numbers of people are already gathering.	sports events, shopping malls or railway stations.
Greater use of the web and internet to reach new audiences.	For certain audience groups this method overcomes the obstacle of travel entirely. It is recognised that access to the internet is not yet widespread, particularly so for people suffering social disadvantages.

A7.3 Audience development

A7.3.1 It is proposed that Techniquest develops both the volume and diversity of its audiences in Wales substantially, through:

i) schools outreach;

ii) public outreach;

iii) satellite centres in Wales;

iv) visitor operations at the Cardiff Bay site;

v) website.

Details of plans to achieve this are shown later in this document.

A7.4 An increased focus on 14-19s

A7.4.1 Techniquest has considerable expertise in engaging this age range in school groups. Substantially increasing their participation, both through formal education structures and in their leisure time, has the potential to play a key part of achieving Techniquest's mission. This is also a priority area for the WAG, and is the subject of new approaches such as the Learning Pathways 14-19 document.

A7.4.2 This is traditionally a difficult target group for Techniquest's Cardiff Bay site to attract in large numbers. The general design and ambience of this site is not seen as attractive to many in this age group, and the review has concluded that the changes required could be off-putting to existing audiences.

A7.4.3 Developing effective ways to engage teenagers is challenging, and this is an area where all projects should be regarded as experimental. Few well-tested and proven methods exist. Therefore:

i) any work should include good research and evaluation, and Techniquest should also keep abreast of world-wide developments in this field;

ii) where possible, projects should be carried out with partners able to provide relevant expertise;

iii) Techniquest@NEWI is seen as a key partner in this area, since the centre itself, and NEWI, have important knowledge and skills in this area.

A7.4.4 The proposed strategy is to target this group in venues other than the Cardiff Bay site, or on our website, in the following ways:

<ol type="i">
working with existing venues and websites that attract this age group and work closely on their concerns and interests;
designing problem-solving activities, and developing equipment to support the delivery of practical, vocational courses, particularly where engineering or manual skills are involved;
engaging teenagers in controversial issues involving science and technology that increasingly affect their everyday lives;
providing teenagers with mechanisms whereby their views and ideas can input into policy-making;
improving the quality of digital media aimed at this age group.

A7.5 Subject Matter

A7.5.1 Techniquest's mission concerns science, comprising scientific knowledge and the process of science. In terms of subject matter, science is present in a wide variety of subjects, well beyond the traditional headings of physics, biology and chemistry.

A7.5.2 However, a degree of structure within this broad range is desirable, and it is proposed that across all its activities Techniquest places roughly equal emphasis on each of the following aspects of science:

<ol type="i">
'hard' or theoretical sciences such as physics, chemistry, biology, and maths;
'soft' or practical science subjects such as environmental sciences, engineering, psychology, social sciences, physical geography;
non-science subjects that nevertheless have a science component, such as music, art, archaeology, social geography;
subjects that help develop the intellectual tools that enable the addressing of areas such as exploration, discovery, critical thinking etc. This would include maths, history of science, reason and logic, experimentation and empirical testing.

A7.5.3 Techniquest will place a greater emphasis on the science behind environmental threats and sustainability in recognition of the particular challenges faced by Wales. This may encompass each of the four aspects of science listed above.

A7.5.4 In response to the greater need in society for a higher quality of public debate about contemporary science, this type of subject matter will become a more important part of delivering the mission. Techniquest's work will more often be aimed at older audiences, and will take place at a range of different venues.

A7.6 Forms of Engagement

A7.6.1 A wider range of engagement-routes and wider range of media will be used in future, such as:

<ol type="i">
wider use of schools outreach, comprising small exhibitions, specially designed resources, shows, workshops, demonstrations and digital media;

<ol type="i" start="2">
wider use of exhibitions and programmes at short-term public events;
greater use of the web;
greater use of broadcast media such as newspaper, radio and television;
greater use of educational software and hardware such as interactive whiteboards, CD-ROMs;
programmes that first engage audiences in debate with scientists and encourages feedback on their views and comments (such as Techniquest's Genetic testing programme, SciZmic's Debate with a difference, and the BA's Visions conferences);
programmes that involve the participants in deeper analysis and discussion of the issues (consensus conferences, DEMOCS, Citizens' Juries and focus groups) where the results are sometimes communicated formally to policy makers.

A7.6.2 Increased use of outreach forms a major part of this review, and has been considered thoroughly;

A7.6.3 As part of the review research, Techniquest has considered the effectiveness of its own schools outreach, and those of other organisations in the UK and overseas. This work has led to the following conclusions:

<ol type="i">
cost effectiveness is critical to a sustainable schools outreach service. The design and logistics must take advantage of every opportunity to keep costs down;
good schools outreach must enhance the activities of schools and the methods of their teachers, not provide a substitute;
a one-size fits all solution has advantages but is not sufficient. A suitable blend of different standardised or bespoke methods tailored to local circumstances that complement each other is essential.
particular attention has also been given to the interaction between schools outreach and visitor patterns to our permanent sites. In the past Techniquest has viewed schools outreach as causing schools to be discouraged from visiting the centre in Cardiff Bay. Since there is very little existing information, Techniquest conducted a study as part of this review which did not find evidence of this effect. The results of this study are available to the Committee on request.

A7.7   Techniquest model of Learning theory

A7.7.1 Techniquest's communication strategy is based on an underlying model of learning theory, which is to be applied to all aspects of Techniquest's communication strategy. This is available to the Committee on request.

A7.7.2 It is recognised that this theory is not well supported by evidence or research, and the proposed research function is intended to evaluate this. The model will therefore be reviewed and updated when necessary.

A7.8   Welsh language strategy

A7.8.1　Techniquest recognises the importance of the delivery of its programmes and activities in Welsh as a necessary part of our all-Wales mission.

A7.8.2　Techniquest's strategy is to strive to make all its services available in Welsh by 2010.

A7.8.3　A Welsh language policy needs be written for the whole business and should be passed by the Welsh Language Board for approval. A Welsh language policy will assist with consistency and maintain standards.

A7.8.4　Working within a bilingual community is seen as a positive feature of Techniquest when compared with other UK science centres. Because many countries outside the UK are bilingual, it is helpful to Techniquest's international profile and to the success of its commercial services that techniques that are needed to work bilingually are embraced and practised as fully as possible.

Techniquest
January 2006

1. **WISE National Campaign**

1.1.   The Women Into Science, Engineering and Construction (WISE) Campaign was launched in 1984 by the Engineering Council and the Equal Opportunities Commission.

1.2.   The aim of WISE is to promote science, engineering, technology (SET) and construction to girls in schools.

1.3.   To achieve its aim, the WISE campaign targets:
- **Girls and Women**
- **Parents**
- **Teaching Staff**
- **Careers Advisers**
- **Employers**
- **Politicians**
- **Media**.

1.4.   WISE activities include:

Girls and Women

Girls and women are the main target for WISE activities. The Campaign does much to promote engineering as an attractive career to them and to help them overcome, if applicable, the difficulties of joining a male dominated industry.
The Campaign promotes WISE to girls and women through publications, posters, videos/DVDs, competitions, lectures, and role models.

The *WISE Outlook programme* is a three-day programme run at local colleges, enabling Year 9 girls (age 13/14) to experience engineering first-hand. Girls take part in hands-on engineering projects, designing and making something for themselves, work in teams to develop presentational skills, talk to women students and staff from technical colleges and meet women engineers to talk about their work and careers.

In addition, the *WISE Directory of Initiatives* is produced yearly and lists awards, courses, visits, and other initiatives on offer to women in the UK to promote science and engineering to girls and women.

Parents

WISE research shows that stereotyping, a major problem in attracting girls and women into science and engineering, starts at an early age. Parents have a very powerful influence on the attitudes and choices of their children.

To this end, WISE has produced a publication for parents demonstrating what can be done to encourage their daughters into science, engineering, technology and construction.

Seminars and conferences are also organised, aimed at parents.

Teachers, Lecturers and Careers advisors

Teachers and lecturers need to understand the specific needs of girls, particularly in a mixed school situation.

WISE has commissioned various research projects and has published booklets aimed at teachers in primary schools, secondary school and in further and higher education. These guides of good practice demonstrate what can be done within an institution to promote positively science, engineering, technology and construction among girls and young women.

A careers guide, *SET for a great future,* an aid for interview techniques, *Managing your interview,* and a guide to single sex teaching, *In a Class of their Own?* are also available.

Teachers are encouraged to work with careers officers to ensure the most impartial careers advice.

Employers

If industry is to compete, it must ensure that it recruits from 100% of the population, men and women.

The Campaign surveyed women engineers and employers and found that the single most important barrier to women in engineering was the issue of career breaks.

WISE therefore published a booklet and video, aimed at employers, demonstrating the economic benefits of offering career breaks to their employees.

In addition the Campaign informs employers, on a regular basis, through its newsletters, of WISE activities and how they can become involved.

Members of the Media

The media is a most powerful mechanism for informing and influencing the attitudes of people, particularly at an early age.

The Campaign is pro-active in contacting the press, TV and radio to promote WISE through regular press releases, press conferences, articles and meetings.

Increasingly we are finding that members of the media contact us for advice on their articles/programmes.

1.5. Although the campaign has made some progress with the percentage of women in SET having raised from 7% in 1984 to 18% now, still much needs to be done.

The current issues facing women in SET and construction are:

- Problem of stereotype about science, engineering and construction, and about what is perceived to be appropriate for men and women to be and to do.

- Lack of experience that girls have in technology, as they are not given the same toys and do not benefit from the same technical experiences as boys at an early age. As a result of this they do not have the same confidence in the subject.

- The teaching of subjects such as maths, science and technology is not always girl-friendly, and at times, teachers do not give girls the same time and attention as they do to boys.

- The lack of women engineers role models. Many girls will know women teachers or doctors but very few will have come across women working in science, engineering and construction. They will therefore not consider these professions as suitable for women.

- The need for industry to do more to attract and promote women within a company. Networks and membership schemes should be investigated as well as crèche and career breaks. Colleagues attitudes, if negative, need to be handled.

- Finally, women themselves need to grow in confidence and self-esteem in order to compete in what is still a man's world.

2. WISE in Wales

The work of WISE is complemented by three committees:
- WISE in Wales
- WISE in Scotland

- WISE in Northern Ireland.

WISE in Wales was launched in 1992 to cater for the specific needs of girls and women in Wales. Its committee comprises representatives from the scientific community, careers advisers, education/business groups, and science communication specialists.

Its activities include:
· the development of two bilingual videos for girls aged 11-14 years, to engage them in the sorts of careers that are available in science, engineering and construction
· the design and development of an interactive website
· the running of a workshop in science communication for female PhD students, culminating in the development of bilingual posters to describe their work and the wider social context; the posters were sent to all schools in Wales
· 'taster' days at Cardiff University for Year 8 girls to give them an idea of the opportunities available to them as scientists and engineers
· a regular newsletter for teachers and careers advisers to update them on current issues and courses to encourage young girls to pursue a career in science, engineering or construction.

The WISE Campaign
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