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Measuring Sustainability: the Role of Ecological Footprinting in Wales, UK



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Abstract

Footprinting is a recent academic development and was pioneered in the early 1990s. In a remarkably short space of time footprint studies have been undertaken in North America, Europe and Scandinavia and specialist footprint consultancies formed to take advantage of what appears to be a booming market for their expertise. It is now timely to critically analyse what footprint studies have delivered, and what difference they have made to the way in which decisions are made relating to environmental protection or sustainability. In this working paper we briefly outline the footprint concept and then in subsequent sections situate the footprint within the development of composite environmental indicators; explain the development of indicators, in particular the ecological footprint, in Wales; illustrate the political nature of indicator selection and usage; and, describe the Welsh approach to footprinting. There follows a case study of the application of the footprint to the International Sports Village (ISV), the most high profile current development in Cardiff. We report on the ecological footprint results for Cardiff to provide a context for the work in ISV. Finally, in the Conclusions we suggest how the footprint might contribute to the mainstreaming of environmental issues within the Council's decision-making processes.

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In 2001, Cardiff University won £3.1 million in research funds from the Economic and Social Research Council to develop a Research Centre for Business Relationships, Accountability, Sustainability and Society (BRASS). The Centre is a joint venture between the University's Schools of Business, City & Regional Planning and Law. It brings together the three Schools' existing research expertise on issues of sustainability, business ethics, company law, corporate reporting and business communication.

The Centre started work in October 2001 under the leadership of Professor Ken Peattie of the Business School, Professor Terry Marsden of the Department of City and Regional Planning and Professor Bob Lee of the Law School. The funding of the Centre covers an initial five-year period, but this should just mark the beginning of BRASS' contribution to creating more sustainable and responsible businesses locally, nationally and globally.

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I Introduction

Footprinting is a recent academic development and was pioneered in the early 1990s in Canada by Mathis Wackernagel and William Rees (see Wackernagel and Rees 1996). In a remarkably short space of time footprint studies have been undertaken in North America, Europe and Scandinavia and specialist footprint consultancies formed to take advantage of what appears to be a booming market for their expertise. It is now timely to critically analyse what footprint studies have delivered, and what difference they have made to the way in which decisions are made relating to environmental protection or sustainability. In tackling this issue we have been fortunate to be involved in a partnership-based footprint study in Wales. The partners include: footprint consultants (Stockholm Environment Institute, York), national government (the Welsh Assembly Government), local government (Cardiff Council and Gwynedd Council), environmental protection organisations (Environment Agency Wales and Countryside Council for Wales) and a non governmental organisation (WWF Cymru). The partnership has been based around full and open discussions of the footprinting methodology and its potential application within national and local government, and these have provided us with an invaluable insight into the practices, potential and pitfalls of footprinting. It has also enabled us to reflect upon the role of analysts in the environmental decision making process.

One of our interests has been to analyse how corporate commitments to sustainable development in Cardiff Council play themselves out when a major urban development – International Sports Village – is at the planning and implementation stage. The footprint has provided us with a new window by which to gain insights into the development process and to begin to assess the likely environmental impacts of International Sports Village (ISV). As we argue later, the Environmental Statement arising from the Environmental Impact Assessment, the conventional decision making tool to determine the environmental effects of a new development, is so much a part of the development process that it may seriously underplay impacts. An ecological footprint by contrast provides an alternative measure, and rather different insights on economic and political imperatives on land use development decision-making. Key sources of data from which we have drawn evidence in preparing this paper are existing footprint reports from the UK and elsewhere, the developing literature on

ecological footprinting and key person interviews with footprint practitioners, NGOs and officials in government. Given that the footprint community in the UK is small we have not identified interviewees.

The paper is organised into nine sections. Below in section two we briefly outline the footprint concept and then in the following section (three) situate it within the development of composite environmental indicators. The fourth section explains the development of indicators, in particular the ecological footprint, in Wales. In this section we illustrate the political nature of indicator selection and usage. Section five describes the Welsh approach to footprinting. This is developing footprints for the whole of Wales and also two of its sub-regions, Cardiff and Gwynedd. Section six places the International Sports Village (ISV) as the most high profile current development in Cardiff in the context of redevelopment of the City's waterfront. The Bay development has had a major impact on reshaping the City and also of how it perceives itself. Section seven explains the nature of the ISV development. Staff involved in managing the ISV are keen to include environmental issues in their discussions with potential developers but are not always clear about where they may best place their efforts. So, key issues that we are currently exploring with staff is what sort of environmental data do they require, can the footprint help to fill some of those gaps, and what new issues might the footprint results raise. In section eight we briefly report on the ecological footprint results for Cardiff to provide a context for the work in ISV. We then identify and measure a number of key resource flows that will arise from visitors of the ISV. Finally, in the Conclusions we suggest how the footprint might contribute to the mainstreaming of environmental issues within the Council's decision-making processes.

II What is an ecological footprint?

A footprint measures the area of land and water ecosystems needed to provide the resources and assimilate the wastes of a given population. Typically the population studied is that of a nation state but the footprint can also be applied to a region, city (or other administrative area), firm, person or product. Politico-administrative areas are favoured units for analysis because they have a defined geographical boundary that can then be compared to the footprint area. By showing the impacts of a

population in terms of area, the footprint provides a clear illustration of the ways in which

“biologically productive land area produces or absorbs flows of many of the materials utilised by our society. Uses are often mutually exclusive and are therefore in competition for the finite area of productive land in the world” (ECOTEC 2001, p17).

Within the UK there are two approaches to calculating an ecological footprint, the compound and component approaches (Barrett and Scott, 2001, p16-17). The former considers the consumption of raw materials and relies heavily on existing economy-wide standardised data. The focus is on the nation and the approach is not interested in determining the ecological impact of sub-regions or sectors for example. Instead, it seeks to assess the human demand for different types of land. Within the literature six major types of land are identified: fossil energy land, arable land, pasture, forest, built land and sea space. By way of contrast the component approach to footprinting, which has been pioneered by the Best Foot Forward consultancy, converts space into activities, such as waste, different types of energy consumption, travel and water use. Since the component approach deals with activities it does strike a more resonant chord with the public and policy makers but it is much more data intensive. The component approach is the one being pursued in Wales.

A number of criticisms have been aimed at footprinting and for the most part ably refuted (see ECOTEC 2001, p27-30; Barrett et al 2003 p17-20). It is not our intention to rehearse debates on the strengths and weaknesses of footprinting but rather to move the debate on to a new plane. This is because many of the current debates are being drawn into discussions of methodological refinements and are consequently missing out on the practices of footprinting and potential applications. Our position is that ecological footprinting is becoming an increasingly well established tool for environmental decision making and raising awareness and we should begin to assess its contribution in those terms. What does footprinting offer to decision makers? Will it promote decisions or policies that better protect the environment? Does the footprint raise the environmental awareness of the public or policy makers? If so, in what ways?

III Environmental indicators

GDP and inflation are pre-eminent indicators of economic performance at the national level. According to ECOTEC (2001, p2)

“Many people feel that a unified environmental indicator is needed to offer politicians and consumers a better indicator on which to base their decisions. The success of GDP and inflation shows the role that widely accepted environmental indicators could play in assessing the success of policies and holding policy-makers to account. Some would go so far as to say that the absence of an equivalent environmental indicator tends to downplay the importance of the environment within policy making”.

A good environmental indicator (ECOTEC 2001, p6) should be:

- well understood
- related to some property of the environment that is scarce or constrained, and
- convertible in a meaningful way for a range of environmental concerns.

In addition a single or composite indicator (such as the footprint) should ideally also fill a number of other criteria (ECOTEC 2001, p31):

- Cover all, or at least all important environmental issues
- Cover environmental pressures from all sectors of the economy
- Have resonance with the public, policy makers (e.g. politicians) and the media
- Be manageable to calculate and update
- Provide a clear message as to whether or not environmental conditions are improving or deteriorating.

An ecological footprint is a single indicator (like GDP or inflation) and has considerable merit in providing a focus for the dangers of environmental degradation. However, as critics have pointed out (see ECOTEC 2001, p8) there are three problems faced by any use of single indicators. First, it is claimed that single indicators are not necessary because users are sufficiently sophisticated to be able to handle a number of indicators that use different data sets. Second, single indicators may aggregate irreconcilable issues. Environmental problems are often complex and multi-faceted and cannot be collapsed into a single indicator. Third, by putting different environmental issues into one indicator obscures how pressing specific concerns may

be. Nevertheless when comparing the ecological footprint with other composite indicators such as Life Cycle Analysis or the Dutch National Accounting Matrix incorporating Environmental Accounts (NAMEA) ECOTECH (2001, p39) conclude that it has fewer conceptual or practical problems than its rivals.

So what may make the ecological footprint such a useful indicator? From a research perspective three issues suggest themselves. First, the footprint may be good as an awareness raising tool. The idea of a footprint resonates with the public, policy makers and businesses. It helps to communicate to people, and for them to appreciate, the link between their local (consumption) activities and global environmental impacts. Second, the footprint offers the potential to compare different types of environmental impact. Strategic issues such as transport, waste and energy all adversely affect the environment, and with a footprint policy makers can clearly identify the impact that each of these individual issues will have. Third, and more challenging still, the footprint then offers the potential for policy makers to prioritise their actions in a more informed and integrated manner. For example, as we discuss in the following section, the National Assembly for Wales has adopted the ecological footprint as one of its set of twelve headline sustainable development indicators. As part of a process of regional sustainable development in the UK in the late 1990s Wales was given limited powers across a range of policy areas (e.g. health, education). There was, though, one exception in relation to sustainability the Assembly was given a unique duty amongst legislatures in the European Union to promote sustainable development in all of its activities. Adoption of the footprint as an indicator is a considerable source of pride to the Assembly and marks it out as a leader on sustainability. As the Assembly's first report on its sustainability performance commented:

"We believe that this makes Wales the first country in the world to adopt the Ecological Footprint as an official indicator" (National Assembly for Wales, 2000-01).

The rise to prominence of the footprint indicator is something of a surprise as work on environmental indicators in Wales has generally 'run into the sand'.

IV Indicators in Wales

The UK has a list of fifteen headline indicators for sustainable development (see DETR, 1999). These indicators are intended to comprise a ‘quality of life’ barometer which can be used to measure progress (or lack of it) over time in moving towards a more sustainable way of life. In 2000, the Assembly published a consultation paper on its approach to indicators. As a matter of principle the Assembly expected to follow the lead of the UK government and for its indicators to be consistent with those for the UK to allow comparison.

“At the same time, we need our indicators to support Welsh vision and priorities, which will in some cases, imply a different emphasis to the rest of the UK. Therefore we propose to adopt the UK indicators in Quality of Life Counts, but with changes where necessary to make them relevant in Wales” (National Assembly for Wales 2000, para 21).

For the sake of consistency, changes would only be made for good reasons, or if measurements are impossible in Wales. The consultation paper identified several questions to address in adapting the UK set to a Welsh context:

- Are the underlying aims appropriate in Wales, and compatible with the Assembly’s vision?
- Are the UK indicators chosen to reflect those aims also relevant in Wales?
- Are the same measurements possible and cost-effective in Wales? (National Assembly for Wales 2000, para 21)

The consultation paper (para 24) identified several areas where the UK indicators may not be adequate for Welsh purposes and one of these hinted at the need for developing a footprint indicator:

“The UK indicators cover what we do and produce within the UK. They do not measure the environmental, social and economic costs incurred in producing the goods and services that we consume, including those we import. Do we want measures of the impact of what we consume in Wales?”

Intriguingly the consultation paper does not make any explicit reference to the use of an ecological footprint as an indicator.

Since the publication of the consultation paper, work on developing a full set of indicators for Wales has continually been side-tracked much to the annoyance of environmental NGOs such as the Royal Society for the Protection of Birds (RSPB) and official bodies like the Countryside Council for Wales (CCW). Instead, what has happened is that in March 2001 in its Action Plan to operationalise its sustainable development responsibilities, the Assembly adopted a shortened set of twelve headline indicators for Wales. Nine of these are also headline indicators for the UK. One of the three distinctively Welsh indicators was the ecological footprint. The other two relate to the use of the Welsh language and energy generation from renewable sources, the latter is a UK core indicator but not a headline one.

The construction of environmental indicators and the dominance of some indicators over others is part of a political process in which some issues are recognised as worthy of the attention of public policy and others are not (Yearley, 1991). Within Wales the construction of composite indicators has taken place in an atmosphere of (political) competition. The Index of Sustainable Economic Welfare (ISEW) has been championed by the CCW, a publicly funded body that is dominated by nature conservation interests. Its promotion of the ISEW has been based on a twofold calculation. First, it is designed to show that there is an economic and social value to protecting the natural environment. Second, as a body the CCW can engage in economic and social debates and so need not continually be pushed to the policy fringes of mainstream development debates. The adoption of the ISEW as an indicator by the National Assembly for Wales would add to the credibility of the CCW.

The Ecological Footprint has been championed by World Wildlife Fund for Nature Cymru (WWFC). WWFC's parent organisation had earlier produced the highly regarded *Living Planet Report* (Loh ed, 2000) that had calculated footprints for 152 countries and also a global footprint. Although a well established environment NGO, WWFC as a Welsh-based organisation is a new organisation and has used the footprint as a means of positioning itself both in relation to other environment groups in Wales and with policy makers in the Assembly. In short, the footprint has provided WWFC with a profile, something that makes it distinctive, amongst other NGOs, and gives it credibility with policy makers as it has shown itself willing to engage in a

partnership programme to deliver a sustainability indicator. The fact that the Assembly has adopted the footprint as one of its sustainability indicators is both a testament to the trustworthiness in which the wider organisation is held and also to the lobbying prowess of WWFC. As the then Environment Minister, Sue Essex, commented when presenting the Action Plan on the Sustainable Development Scheme to the Assembly on 1 March 2001:

“we had good discussions with World Wildlife Fund Cymru about the principle of trying to use the ecological footprint as a headline indicator. That is an interesting element. This is easy for the Isle of White [sic] because it is a self-contained unit. It would be interesting to develop and work on the footprint ideas in Wales as an indicator. I would like to explore that further.”

In the current project to develop a footprint for Wales the partners had expected that the Assembly’s commitment to the indicator would ensure its promotion in novel ways, such as contributing to decision making. Until the middle of 2003 that expectation seemed to be well founded, but then in a statement to the Assembly on 24 June 2003 the new Minister for the Environment, Carwyn Jones, set out his sustainable development agenda for the next four years. He outlined six themes and this included issues such as exploring the opportunities for a low carbon economy and making the planning system more proactive. He also stated that he wanted to see

“the ecological footprint [used] as a means of raising public awareness of sustainable development issues”.

This marked a considerable dilution from earlier expectations of the part that the footprint may play in the Assembly. For example, in 2002 in reporting on its sustainability performance against its twelve indicators, the Assembly’s Statistical Bulletin had noted in relation to the footprint that

“it will:

- *show how Wales is performing, including in comparison with the UK and Europe;*
- *guide and monitor the Assembly’s policies and programmes; and*
- *help provide a lead to others in Wales, by clarifying common aims, increasing understanding and promoting action” (WAG 2002, para 20).*

At a stroke the Minister's statement had moved the footprint from a potential decision making tool within the Assembly to a communication one for the Welsh public with an unclear role for the Assembly. As one informed commentator pointed out in an interview:

"I think that people initially did [footprint studies] for awareness raising and I think they do that because it's easy, it's the cushy comfortable side of sustainability isn't it? . . . Nothing wrong with awareness raising and trying to change attitudes and soft policy measures, but they're useless unless you are going to combine them with hard policy decisions. So I think it's the easy way out really" (interviewee).

In the following section we describe the current Welsh approach to footprinting and highlight its distinctiveness compared to earlier UK work. Our comments concentrate on the experience in Cardiff and we briefly compare this with what is happening at a national (i.e. Welsh) level.

V The Welsh approach to footprinting

As part of our work we have undertaken a content analysis of a small number of UK footprint studies and conducted interviews with local authority officers, footprint researchers and NGOs (see Flynn, Collins and Netherwood 2004). In terms of policy integration and organisational buy-in, a number of consistent themes have emerged:

- there was little evidence that senior managers, policy development officers and politicians had been involved enough in the ecological footprint process to achieve organisational 'buy in' to the results;
- there had been little involvement of relevant officers in gathering and validating the data being used in the footprint;
- minimal thought had been put into how the footprint results and analysis would be used to inform policy; and
- few examples exist of the footprint informing policy as a result of a planned process within the authority.

There is general feeling that these early footprint studies had been 'done' as an academic exercise to the authorities rather than developing as a collaborative project,

where the footprint results could actually inform policy and be trusted and used by the client authorities. The evidence is that these footprint studies have actually made little difference to policy. The paucity of tangible examples of the footprint informing policy debate within the authorities brings into question the validity of the footprint ‘study’ itself as a policy tool.

The current Welsh footprint study offers the possibility of analysing two different approaches to overcoming these deficits. As we have already seen at the national level there has been some ambiguity in the role that has been assigned to the footprint. Initially envisaged as a tool to assist decision making the footprints main role now appears to be a communication tool. In part, the redirecting of the footprint role may have been due to politicians becoming nervous about the results of the footprint and what it may imply for the Assembly’s Sustainable Development Strategy. It may also reflect a lack of confidence in the tool as an aid to decision making. Two other points also need to be borne in mind. One is that staff in the Assembly will already be committed to their own decision making tools (e.g. the Integration Tool) and the footprint would have to demonstrate a clear superiority. This would involve the project partners investing time and resource in working with Assembly staff and that has not happened. A second point, and perhaps as a consequence, is that the Assembly and the project partners have tended to adopt an approach to decision making in which the project provides data and then assumes that the Assembly will act upon it. This classic form of rational decision making is one that the Assembly also seems to be sympathetic to as it allows it to more easily manage the demands upon its time and resources. We return to comment on different forms of decision making and what they imply later in the paper.

VI The redevelopment of Cardiff Bay

Cardiff has ambitiously proclaimed itself as one of Europe’s fastest growing cities, and much of that growth has been dependent on developments in Cardiff Bay. Indeed, Cardiff Bay is reflective of a development strategy in which policy makers have sought to promote dynamism and growth (Cowell and Thomas, 2002, p1244). Cardiff, though, is a small city of some 307,300 residents and in terms of its population it just falls within the largest 200 cities in Europe. Consequently

“Political visions of Cardiff’s future have shown a perhaps unhealthy obsession with size. The 2020 visioning exercises benchmarked Cardiff against the administrative size, population, economic trends and facilities of other European cities, concluding that Cardiff was too small for the Premier Division of European Capitals, and needed to expand its administrative boundaries and population in order to compete” (Cowell, forthcoming).

It is Cardiff Bay that has offered the greatest potential for growth. By the 1980s, large swathes of land were in a derelict or underused state. Port related activities had declined dramatically during the latter part of the twentieth century and the closure of the East Moors Steel Works in 1978 released further large tracts of land. The Conservative government of the 1980s seeking to regenerate urban areas sought to bypass Labour controlled councils that dominated British cities and created a small number of quasi private urban development corporations and perhaps the most well known was the London Docklands Development Corporation. These bodies were largely removed from the control of local government and were dominated by private development interests. They were also time-limited bodies to be wound up after ten years of operation. Cardiff Bay Development Corporation (CBDC) was set up in 1987 by the Secretary of State for Wales to regenerate some 2,700 acres of South Cardiff with a population at the time of about 5000.

“The area was characterised by a poor quality environment typical of a run down docklands and inner city area but exacerbated by the amount of tipped and derelict land, which reflected the decline of Cardiff’s Docks activities, mainly coal exporting, steel making and dependent industries. The foreshore, rivers and bay area had been considered suitable only for waste disposal and low grade industrial uses.” (CBDC 1992, p1)

The ambitions for CBDC were considerable. The mission provided by the Secretary of State for Wales on 6 December 1986 was for the Corporation

“to put Cardiff on the map as a superlative maritime city which will stand by comparison with any such city in the world, thereby enhancing the image and economic wellbeing of Cardiff and of Wales as a whole” (CBDC 1992, p2).

There were three key elements to CBDC's strategy. First, its role was largely land assembly and infrastructure provision. This was because of the second feature where it was required to rely upon the private sector to promote development. This led to an *a là carte* mode of development in which CBDC provided an indication of what development it would like to see but it had to rely on the private sector to bring forward proposals. Third, great weight in regeneration was placed upon the significance of so-called flagship developments. These would symbolise the desired change and kick start development (Cowell and Thomas 2002, p1249). The Cardiff Bay flagship project was the creation of a barrage. The barrage was needed according to the chief executive of CBDC because regeneration depends on the view from the shore being

“of a consistent level of fresh water and not the present mud and salt flats. It is folly to suppose that Cardiff can establish an international reputation without that waterfront – and to achieve that a Barrage is essential. The creation of a lake of some 500 acres behind the Barrage, with some 12 kilometres of waterfront will provide innumerable sites for the development of commercial offices, leisure and tourist attractions and housing” (Lane, p26).

With the barrage, the Secretary of State for Wales considered that,

“Cardiff Bay is one of the most exciting developments in the whole of Western Europe” (Walker, p3).

Of course, such hyperbole has not been realised. Nevertheless, the Bay area has seen a mix of residential, office, commercial and cultural development. It is economically vibrant and it is estimated that there are about 5 million visitors to the Bay a year when about 2 million had been anticipated. Sailing is becoming ever more popular and the waterfront has been the site of a number of events.

VII International Sports Village

The ISV is considered to be

'a key development in the context of Cardiff as a European Capital celebrating its centenary as a city in 2005' (Ove Arup 2001, p5).

In addition to creating a landmark sports tourism destination for national and international events, the ISV complex is considered to be an important component of economic regeneration by creating jobs in the area. The project is also considered to embrace sustainability as it lends itself to regenerating an existing Brownfield site and encourage reduced car usage by enhancing the public transport network.

It is envisaged that the development will

"act as a magnet for further development and inward investment which will be important in capitalising on the investment potential from future events in South Wales, including the Ryder Cup in 2010. In addition to use by local residents in Cardiff and the surrounding area, it is also anticipated that the ISV development will promote itself as an urban 'Centre Parcs' role as it will provide long stay accommodation so that visitors will have full use of the site's extensive sports, leisure and entertainment facilities as well as providing a convenient base for exploring the rest of Cardiff and the surrounding area" (Ove Arup 2001, p5).

CBDC was wound up before it could complete the redevelopment of the Bay area. It concentrated its activities on the core areas, those that were closest to the city centre. The one large remaining space was a derelict and contaminated peninsular area. For reasons of sustainability the ISV complex would be located on a Brownfield site in preference to a Greenfield location with all the attendant issues of development in the countryside/urban fringe and potential loss of agricultural land. The Peninsula site was chosen because of

'its combination of land and water resources creating a setting for an imaginative complex' (Ove Arup, 2001 p4).

Development at the ISV has a number of parallels to the rest of the Bay but also some distinctive features. Once again there are some exceedingly high expectations for the site and according to one consultancy:

“the International Sports Village will unquestionably become part of and play a key role in one of the most exciting visitor destinations in Europe” (B3 Burgess Partnership 2002, p13).

Or from another consultancy:

“The ISV project is a key development in the context of Cardiff as a European Capital celebrating its centenary as a city in 2005. . . . The development will create a landmark sports tourism destination for national and international events” (Ove Arup 2001, p5).

Within the ISV there is to be a flagship project that will be the focus of development activity. A key part of ISV is to build a new fifty metre swimming pool to replace the Wales Empire Pool that was lost to give way to the development of the Millennium Stadium in the centre of Cardiff in the mid 1990s. The pool had symbolic, sporting and recreational value and because of this significance undertakings were given that it would be replaced. Once more consultants claim that

“Re-location of the Wales Empire Pool to ... [the ISV] site will act as a catalyst for the remainder of the proposed ISV development” (Ove Arup 2001, p4).

Distinctive features of the development relate to the public-private mix and the nature of the proposed developments, those features that will make it a ‘landmark’. When CBDC was wound up its land assets were transferred to the National Assembly for Wales, and subsequently in April 2000 the Assembly, along with Grosvenor Waterside and Associated British Ports, transferred their ownership of the land within the proposed ISV boundary to the Council (Ove Arup 2001, p5). Development in comparison to that of CBDC should be much more locally and politically accountable. Since the Council owns the land it also gives the Council a key lever in negotiations with developers. This leads to a second distinctive feature as ISV is being developed through a public/private partnership, with a consortium consisting of Cardiff Council and Tyco. The project development master plan, project phasing and consortium

arrangements are led by the Council in its role as master plan co-ordinators, with Tyco in a supporting project management role (Ove Arup 2001, p1). Third, the nature of the developments are planned to be rather different from the rest of that in the Bay (though since it again depends on private developers coming forward, proposals may mimic the rest of the Bay rather more closely than originally intended).

Land use allocations at the ISV are grouped into four principal categories: sports, leisure and entertainment; visitor accommodation, residential accommodation and commercial retail. The sports, leisure and entertainment facilities are considered to be the main facilities that will attract visitors to the site. Within the same area there would also be sports retail, bars, restaurants and food courts. Proposed developments include an Aquatic centre (including water slides, flumes and waves and a separate fifty meter facility, to replace the Welsh Empire Pool). Activities will include swimming, diving, surf boarding, wind surfing. The proposal also includes an indoor Arena with seating capacity of between 6,000 and 10,000 which will host a range of events including ice based events, other indoor sporting events, concerts, exhibitions, and TV spectacles. Other sporting facilities will include a snow dome, ice pad, ice climbing wall, rock climbing, indoor caving, and health and fitness facilities.

It is anticipated that the development will act as a centre point for tourism in Cardiff. A key feature of the development is the provision of on-site tourist accommodation which will provide accommodation for visitors using the ISV facilities, rest of Bay and Cardiff City Centre. Visitor accommodation will cater for a range of requirements and budgets and include self catering apartments (apartels) and a 80 bed Travel lodge. Within close proximity there would be fast food outlets. Luxury accommodation would be provided to include a 4/5 star hotel which would also incorporate conference facilities and a casino. Residential accommodation will comprise of 855 luxury apartments and 142 town houses on site and an additional 470 apartments on a site adjacent to the ISV. Commercial retail within the site will include a food store and dry goods. Smaller retail including sports, bars, restaurants and food will be included within the sports, leisure and entertainment facilities.

The key mechanism by which the likely environmental impacts of the development have been assessed to date has been through an Environmental Statement (ES). The

ES which was prepared for Cardiff Council by an independent team of specialists draw from Arup which provided technical assistance on issues including planning, transport, design and landscaping accompanied the outline planning application to establish the principle of the development. The detailed consideration of individual developments will be the subject of separate planning applications. The ES is one of a number of documents produced to support the planning applications; a Traffic Impact Assessment and a Planning Statement and Retail Impact Assessment. The ES is highly competent in the way in which it tackles suggestions for the remediation of contaminated land on the site. It is also particularly strong in identifying the impacts that will arise during and following the development. Issues that are noted as of particular importance are transport, landscaping and car parking provision, and there is a lengthy consideration of how these impacts might be mitigated to reduce their environmental impact. One of the most interesting features of the ES is the way in which it tackles tourism and its impacts. The ES notes the types of attractions intended for ISV and the accommodation and other services to support them. Indeed, it likens the development to

“an urban holiday village. The intention of the mix is to complement and integrate with other key attractions in the City (Millennium Stadium, Cardiff Castle etc) to consolidate Cardiff’s overall appeal as a tourism destination and reinforce sport/leisure related economic activity and employment” (Ove Arup 2001, p44).

The tenor of the assessment is to consider the economic benefits of tourism and to ignore any environmental impacts that might arise. The assumption appears to be that urban tourism does not have environmental impacts and therefore they are not worthy of consideration (see Ove Arup 2001, p44). And yet at two levels at least it is possible to suggest that visitors to ISV will have environmental impacts and that these may be significant. One is that ISV attractions are intended to complement those in the City (e.g. Millennium Stadium, Cardiff Castle) and those just outside (e.g. Museum of Welsh Life at St Fagans) and will inevitably involve travel to and from these destinations. The ISV will thus accentuate an emerging multi-site visitor experience in Cardiff. Despite the aspirations for the use of public transport between locations it is likely that there will be a heavy reliance on the private car. Second, visitors to Cardiff will consume resources and generate waste and these will be additional to those of

Cardiff residents but will need to be 'absorbed' by the local Cardiff environment, its surrounding areas and beyond.

Drawing on the Ecological Footprint (EF) study of Cardiff and specifically of key aspects of ISV will enable us to begin to make a preliminary assessment of the scale of the environmental impacts associated with the ISV development. It is to a consideration of this that we now turn.

VIII The Cardiff footprint

Results from the Cardiff EF study show that the overall ecological footprint for Cardiff in 2001 was 1,717,807 global hectares (gha). This is equivalent to 5.59 global hectares per capita. Cardiff's total land area is 13,699 hectares (1996 Local Area Profile, Cardiff Council). This means that Cardiff residents footprint is 125 times the actual land area of Cardiff (or 82% the area of Wales 2.1 million hectares). Although these two numbers are not directly comparable their magnitude shows clearly that much more land area is required to satisfy the demands of consumption by Cardiff's residents than is available within the boundaries of the local authority area.

On a per capita basis the Ecological Footprint of a Cardiff resident is 5.59gha/cap is greater than the footprint of a typical UK and Welsh resident (5.33gha/cap) and 5.25 gha/cap respectively. (or 6 per cent greater than the footprint of an average Welsh resident (5.25 gha/cap). When compared to the available global capacity of 1.9 gha/capita, this means that Cardiff residents use resources almost three times the average 'earthshare'. If the world's population lived like the average Cardiff resident we would need almost three planets to sustain this level of resources consumption. So, what are the individual components that have the greatest impact?

The largest single component is food & drink which is accountable for 24% of the Cardiff footprint. Passenger transport and energy are the second largest components, both accounting for 18%. This is followed by consumables (0.64 gha/capita), services (0.26 gha/capita) and housing infrastructure (0.16 gha/capita). Other consumption activities which includes water, holidays abroad and overseas tourists, has a total footprint of 1.26 gha/capita. The ecological footprint for waste is 0.81 gha/capita, but

is not included in the total footprint figure but instead is treated as a satellite account. The reason for this is because the ‘standardised’ footprint approach only counts the impacts of household consumption once. As the standard footprint methodology looks at the environmental impacts of consumables, double counting would occur if the impact of waste from these consumables was also included.

Compared to Wales and the UK, Cardiff has a larger footprint for passenger transport and domestic energy consumption. For food and drink and ‘other’ consumption, Cardiff’s footprint is greater than Wales but similar to the UK. Cardiff’s footprint for housing infrastructure is lower than Wales and the UK. For services, Cardiff’s footprint is similar to Wales but less than the UK. Cardiff’s footprint for consumables and durables, housing infrastructure and other consumables is similar to that for Wales and the UK.

Table 1: Ecological Footprints of Cardiff, Wales and the UK (2001)

Components	Cardiff	Wales	UK
Food/Drink	1.33	1.29	1.34
Domestic Energy	0.99	0.92	0.90
Passenger Transport	0.99	0.78	0.72
Consumables & Durables	0.64	0.64	0.65
Services	0.26	0.24	0.32
Housing Infrastructure	0.16	0.17	0.18
Other consumption (including water, holidays abroad, overseas tourists)	1.26	1.25	1.27
Total EF (gha/capita)	5.59	5.25	5.34
Waste	0.81	0.67	0.67*

* It is estimated that the UK’s footprint for waste will be similar to Wales

Having briefly outlined the impact of key components in the Cardiff footprint and its similarities and differences to Wales and the UK, we can now look at how we might assess the impact of the ISV. The brief review above of the Ecological Footprint data for Cardiff residents provides important clues as to where we might expect tourists to be making significant ecological impacts. So, for example, food and drink, transport and waste are likely to loom large in a tourist ecological footprint. Of course, what this implies is that Cardiff’s development strategy will be accentuating areas where the City’s residents are already making significant ecological impacts.

Since discussions with developers on the physical structure of the site are still at an early stage, we have concentrated on calculating the potential impact of ISV visitors' consumption. As the broad outlines for the development of ISV are known we have used this to estimate the ecological pressure (footprint) of a visitor to the ISV. It is important that the environmental impact of visitors is recognised because so far in the model of development for the Bay promoted by CBDC and shared by the Wales Tourist Board (see CBDC 1995, p8) and replicated in the Environmental Statement for the site, visitors are assumed to be economically positive and environmentally benign. However, it is important that we begin to recognise the environmental impacts of tourism and that these impacts become part of the decision making process. An indication of the scale of the likely environmental impact of the ISV is contained in Table 2 below. Based on information contained in reports supporting the development of the ISV, it is estimated that the development will attract over two million visitors each year. This figure is almost equivalent to one fifth of Cardiff's total visitor figures for 2001.

Table 2: Visitor Numbers and Days for ISV and Cardiff

	ISV (estimated figures)*	Cardiff (2001 STEAM figures)**
Visitor Numbers	2,062,068	10,643,000
Visitor Days	2,297,055	12,076,000

Source:

* Based on estimates contained in Visitor & Tourist Traffic Estimates Report Final Report (Stevens & Associates, 2001).
 ** 2001 STEAM Report (Cardiff County Council, 2002)

STEAM stands for the Scarborough Tourism Economic Activity Monitor (Scarborough because the model was developed there). It is a mathematical model used for estimating volume, value, expenditure and basic tourism characteristics. It measures all aspects of tourism, including visitors who stay with friends or relatives (SFR) and day visitors.

We have sought to identify the likely ecological impacts of visitors to the ISV by comparing them with the traditional Cardiff visitor in the following consumption areas; passenger transport, food and drink, energy and infrastructure (accommodation establishments), and waste. Below we explain how the footprint has been calculated for each of the component areas.

Passenger Transport

The transport component of the footprint includes return journeys made by all visitors (staying and day visitors) to the ISV and journeys made whilst using facilities at the complex.

- Travel to the ISV

Data on passenger transport used to travel to the ISV was obtained from the leisure consultants report on Visitor and Tourist Traffic Estimates (Stevens & Associates, 2001). This report contained an assessment of the demand for each of the fifteen proposed facilities at the ISV together with the number of journeys made by different modes of transport. Where data gaps existed, the Cardiff footprint study and other relevant local data sources were used to provide estimates. For example, the 2001 Cardiff Visitor Survey was used to estimate the home location of ISV visitors. In some instances data assumptions had to be made to ensure a ‘fit’ between the available data and the demands of the footprint model. For example, the transport consultants report stated that 10% visitors using the Snow dome would use public transport to travel to the ISV. As shown in Table 3 below, in this instance it was assumed that there was a 50:50 split between bus and rail.

Table 3: Modes of transport used by visitors at the Snow dome

Visitor origin	Mode of transport	Percentage visitors	Number passenger journeys
Generated on site	-	30	129,000
Generated off site	-	70	301,000
Educational groups	Coach	10	43,000
Social groups	Coach	10	43,000
Staying elsewhere in Cardiff	Public Transport	10	43,000
<i>assumption (50:50)</i>	<i>Rail</i>	5	21,500
	<i>Local bus</i>	5	21,500
Cardiff residents	Public transport	10	43,000
<i>assumption (50:50)</i>	<i>Rail</i>	5	21,500
	<i>Local bus</i>	5	21,500
Other visitors	car	30	129,000
Total visitors			430,000

Distances travelled by each transport mode were calculated by estimating the distance travelled from a visitor's home location (airport of departure for overseas visitors) and the ISV. The total passenger kilometres were then calculated by multiplying passenger journeys by distances travelled. This figure was then doubled to account for return journeys.

- Travel in the ISV

Passenger travel in the ISV included journeys that started and ended within the ISV. Data on passenger transport within the ISV was obtained from the transport consultants 'Summary Transport Assessment' (see TPK Consulting, 2001). This operational assessment contained information on the total person journeys per mode during weekdays and Saturday periods, based on an event taking place at the Arena. Information relating to journey rates had been generated from a trip rate information computer system (TRICS) and the National Travel Survey to establish the number of journeys for individual land uses included in the proposal.

The number of passenger journeys during weekdays and Saturdays was used to estimate the total number of trips per mode per year. Distances travelled by walking and cycling were estimated using the National Travel Survey (DfT, 2002) on most frequent trip length. For distances travelled by bus and car it was assumed that journey lengths would be the same as for cycling. The total passenger kilometres were calculated by multiplying the number of passengers per mode with distances travelled.

Food and Drink

With the exception of visitors using the 4/5 star hotel, it was assumed that an ISV visitor would consume the same types and quantities of food and drink as a Cardiff resident per day. For visitors using the 4/5 star hotel it was assumed that consumption was 25% more per day. The quantity of food and drink consumed was calculated by estimating the number of meals consumed per visitor at each of the fifteen proposed facilities and whether food was 'eaten out' (e.g. prepared in restaurants and hotels) or domestic (e.g. prepared by visitors at home or at self-catering apartments). For example, it was assumed that visitors to the Snow dome would consume two meals

during their visit (i.e. two thirds of the daily food allowance), and that both meals would be 'eaten out'. The total amount of food consumed by ISV visitors was calculated by multiplying the amount of food and drink consumed per visitor at each facility by the total number of visitor days.

Infrastructure (accommodation establishments)

As the quantity of materials required to build each accommodation establishment was not known, they were estimated based on quantities used for house dwelling units. This involved estimating the floor area used per bed unit (including use of communal areas) in each of the different accommodation establishments compared with that of a standard home. The amount of space required by a bed unit at a Travel Lodge and self-catering apartment was estimated to be twice that of a standard house. For a 4/5 star hotel, the floor area required was estimated to be four times that of a standard house. The total number of equivalent house dwellings was calculated by multiplying the total number of bed units for each establishment by the number of comparable house dwelling units. The total number of equivalent house dwellings was then used to calculate the total quantities of building materials required to build all three establishments.

Energy (accommodation establishments)

Energy consumption was calculated for each of the accommodation establishments. Total energy use was calculated by multiplying energy use per bednight with the number of bednights for each establishment. Energy use per bednight for each establishment was based on estimates provided by Gössling et al (2002).

Waste

The quantity and composition of waste produced by the ISV visitors was estimated using data from the Cardiff footprint study. It was assumed that the amount of waste produced per visitor day was equivalent to that produced by a Cardiff resident per day. The total amount of waste produced was calculated by multiplying waste production per visitor per day with the number of visitor days.

We now turn to compare the ecological impacts of the traditional Cardiff visitor with those who are likely to visit the ISV.

Ecological Footprint Results for Cardiff and ISV Visitors

Passenger Transport

Table 4 shows that air travel accounted for 92.5% of distances travelled by the Cardiff visitor compared to 9.2% for the ISV visitor. Excluding air travel, the ISV visitor generates more passenger kilometres compared to the Cardiff visitor. The largest percentage of distances travelled by both types of visitors was by car, 65% for the Cardiff visitor and 81% for an ISV visitor. The ISV as a visitor destination attracts a larger number of activities for social and education purposes. Travel by private hire and non local buses accounted for 48.4% of distances travelled by the ISV visitor compared to 6.3% for the Cardiff visitor.

Public transport (local bus and rail) accounted for fewer passenger kilometres travelled by the ISV visitor compared to the Cardiff Visitor, 1.4% and 28.5% respectively. Travel by taxi/minicab and cycling were used least to travel to Cardiff and the ISV. Walking was not used by either visitor types. It is interesting to note that in the Transport Assessment accompanying the ISV planning application transport consultants considered the site as being

'very accessible by many modes of travel'

including walking, cycling, bus, park & ride, coach (TPK Consulting 2001, p2). However, these initial calculations highlight that the ISV visitor travel will primarily be by car and other private modes of transport.

Table 4: Distances travelled by visitors to Cardiff and the ISV

Mode of Transport	Cardiff Visitor		ISV Visitor	
	Percentage total distance travelled	Percentage total distance travelled (excl air)	Percentage total distance travelled	Percentage total distance travelled (excl air)
Air international	92.5	-	8.88	-
Air domestic	0.0	-	0.32	-
Walking	0.0	0.3	0.0	0.0
Bicycle	0.0	0.0	0.0	0.0
Private hire bus	0.0	0.0	28.1	31.0
Car	4.8	65.0	45.5	50.0
Local bus	1.0	12.8	0.4	0.4
Non-local bus	0.5	6.3	15.8	17.4
Surface Rail	1.2	15.7	0.9	1.0
Taxi/minicab	0.0	0.0	0.01	0.01
Total passenger kilometres (pkm)	4793	358	485	440

Travel by visitors in Cardiff and ISV

The results in Table 5 show that the total distances travelled by visitors in Cardiff and the ISV were very similar, 3.5 pkm and 3.95 pkm respectively. The largest percentage of distances travelled by an ISV visitor was walking which accounted for 87.7% of pkm. For the Cardiff visitor the largest percentage of distances travelled were by car (33.5%). This was closely followed by walking (28.4%) and travel by local bus (25.3%).

Table 5: Distances travelled by visitors in Cardiff and the ISV

Mode	Cardiff Visitor (% total pkm)	ISV Visitor (% total pkm)
Walking	28.4	87.7
Bicycle	0	4.3
Car	33.5	1.9
Local bus	25.3	6.2
Non-local bus	3.1	0
Surface Rail	8.2	0
Taxi/minicab	1.4	0
Total pkm/visitor	3.5	3.95

The results in Table 6 show that international air travel has the largest ecological impact for the Cardiff visitor. Excluding air travel, the car has the greatest ecological impact for both types of visitors. When air is excluded from the calculations the

overall impact of passenger transport by an ISV visitor is greater compared to the traditional Cardiff visitor. The reason for this is because the ISV visitor travels greater distance using private transport modes, in particular the car, and places less emphasis on the use of public transport.

Table 6: Ecological footprint of Passenger Transport for Cardiff and ISV visitors

Mode	Cardiff visitor (gha/visitor)	ISV visitor (gha/visitor)
Air international	0.167	0.002
Air domestic	0.00	0.00
Walking	0.00	0.00
Bicycle	-	0.00
Private hire bus	-	0.006
Car	0.014	0.012
Local bus	0.002	0.00
Non-local bus	0.0005	0.002
Surface Rail	0.001	0.00
Taxi/minicab	0.00	0.00
Total (incl air)	0.184	0.022
(excl air)	0.017	0.020

Food and Drink Consumption

The results for this component show that a Cardiff visitor consumes more food and drink compared to an ISV visitor, 1.5 kg compared to 0.95 kg (see Table 7). The amount of ‘domestic’ food and drink consumed by Cardiff visitor is twice the amount consumed by a ISV visitor. There are two reasons for this. The first is that Cardiff visitors have more opportunities to prepare domestic food as a larger proportion stay with friends and relatives. The second is that there are a larger number of self-catering accommodation establishments in Cardiff than are planned for the ISV. The amount of food and drink consumed that is ‘eaten out’ is also greater for the Cardiff visitor. This is because a Cardiff visitor stays at their visitor destination for a longer period of time compared to an ISV visitor.

Table 7: Food Consumption by visitor type

	Cardiff visitor	ISV visitor
Domestic Kg/visitor/year	0.08 (5.6%)	0.04 (4.6%)
Eat Out kg/visitor/year	1.42 (94.4%)	0.91 (95.4%)
Total	1.5 (100%)	0.95 (100%)

The footprint results show that the Cardiff visitor has a greater ecological footprint for food and drink consumption compared to the ISV visitor (see Table 8). The footprint for food ‘eaten out’ by a Cardiff visitor (0.0084 gha/capita) is almost twice the impact of an ISV visitor (0.0054 gha/capita). This is because food eaten out has a greater ecological impact than domestic food consumption, and the amount of food ‘eaten out’ by the Cardiff visitor was greater.

Table 8: Ecological footprint of Food and Drink

	Cardiff Visitor	ISV Visitor
‘Domestic’ footprint per visitor (gha/visitor)	0.0001	0.0001
Eat out’ footprint per visitor (gha/visitor)	0.0084	0.0054
Footprint (gha/visitor)	0.009	0.006

Domestic Energy (accommodation establishments)

The total amount of energy used by all three accommodation establishments (4/5* hotel, Travel Lodge and Apartel) in one year was 13,633,542 kilowatts (see Table 9). This is equivalent to 6.6 kwh per ISV visitor. The 4/5 star hotel accounted for 91% of the total energy consumption.

Table 9: Energy consumption by different accommodation establishments

ISV categories	Kilowatts/bed night (Kwh)	Number of bed nights	Total Kilowatts
Travel Lodge	36.2	15,573	563,057
Apartel	45.2	16,182	731,345
4/5* Hotel	99.4	124100	12,339,139
	-	13,633,542	13,633,542

The footprint results for the energy component shows that the Cardiff visitor has a larger ecological footprint (0.007 gha/visitor) compared to the ISV visitor (0.001 gha/visitor). A reason for this larger footprint is because Cardiff has greater provision of accommodation which attracts more staying visitors, whereas the ISV will mostly attract day visitors. The table below also shows that the 4/5 star hotel has a larger ecological impact compared to the Travel Lodge and Apartels.

Table 10: Ecological Footprint of energy consumption

Accommodation Establishment	Cardiff visitor footprint (gha/capita)	ISV visitor footprint (gha/capita)
Travel Lodge	-	0.001
Apartels	-	0.0009
4/5* hotel	-	0.014
Footprint per visitor	0.007	0.001

Infrastructure (accommodation establishments)

Table 11 shows the total number of equivalent house dwellings for each type of establishment. It is estimated that the three establishments are equivalent to the floor space of 2540 house dwellings. The 4/5 star hotel accounted for 79% of the total equivalent house dwellings, almost four times the floor area required for the Travel Lodge and Apartels.

Table 12: Bed units and equivalent house dwellings for each accommodation establishment

Accommodation Establishments	Number of Bed Units	Equivalent House dwellings	Percentage total equivalent house dwellings
Travel Lodge (1/2 * hotel)	80	160	6
Apartels (self catering)	190	380	15
4/5* Hotel	500	2000	79
Total	770	2540	100

The results in Table 13 show that the footprint for the ISV infrastructure (accommodation establishments). Based on all ISV visitors the impact is 0.001 gha/visitor. If the impact is based only on staying visitors the footprint result increases to 0.012 gha/visitor.

Table 13: Ecological Footprint of ISV accommodation establishments

	All ISV visitors (total = 2062068)	Staying visitors only (total = 85118)
Footprint (gha/visitor)	0.001	0.012

Waste

The estimated amount of waste produced by all ISV visitors was 2019 tonnes, or 0.001 tonnes per visitor. The footprint results in Table 14 show that the impact of waste for both visitor types is 0.0025 gha/visitor.

Table 17 Ecological Footprint of Consumables & Durables

	ISV visitor	Cardiff visitor
Footprint (gha/visitors)	0.0025	0.0025

Summary of Footprint Results

The footprints results for both visitor types (see Table 15) show that based on those consumption activities considered so far, the impact of the Cardiff visitor is greater

than that for an ISV visitor. When the impacts of the individual components are considered the results show that each of the visitor type contributes to the footprint in different ways. For passenger transport, the ISV visitor has a greater impact compared to the Cardiff visitor as greater distances are travelled using private transport modes, particularly the car. Similarly for food and drink, the ISV has a larger impact as the proportion of food eaten out is greater compared to Cardiff visitor. However, for energy use by accommodation establishments the Cardiff visitor has an impact seven times that of an ISV visitor. This is because Cardiff has more staying visitors, whereas the ISV attracts mostly day visitors.

Table 15: Summary of Ecological Footprint results for Cardiff and ISV visitor

Components	Cardiff visitor Footprint (gha/visitor)	ISV visitor Footprint (gha/visitor)
Transport	0.184	0.022
(excl air)	0.017	0.020
Food	0.004	0.006
Energy (accommodation establishments)	0.007	0.001
Infrastructure (accommodation establishments)	-	0.001
Total EF	0.195	0.029*
(excl air)	0.028	0.027*
Waste	0.003	0.003

* excludes infrastructure

IX Conclusions

Of course, to suggest that economic interests are privileged and environmental interests marginalised in the Cardiff development process is to be expected. What is more interesting is to identify ways in which the footprinting process and results might inform decision making in the City. Rather simplistically we can distinguish between two different ways in which the footprint results might be utilised: one drawing upon a rational model of decision making and the other a more persuasive perspective.

Briefly the rational approach to decision making assumes that analysis is a technical activity and that the decision making process is neutral. Within the rational model is a

distance between analyst and the client of the data. They both have clear and demarcated roles. Whilst these assumptions are clearly weak they do strike a resonant chord. For example, when asked about decision making one footprint consultant explained:

“My key clients are who I would call decision makers or people who help make decisions, decision support officers I suppose... We are offering them help in formulating policy and offering support to provide numbers to the policies which they may or may not put forward to members [elected representatives]” (interview).

The analyst present facts and it is then the responsibility of the decision maker to select the best path by which to pursue their goals. The same consultant went on to claim that based on the footprint data

“I like the idea that they [government officials] can make an informed decision for the first time almost” (interview).

The rational perspective can be contrasted with the persuasive, advocative or argumentative perspective. The approach draws upon the insights into the decision making process provided by Fischer and Forester (1993) and recognises that decisions are made by groups of actors who engage in debate. Actors hold values and aspirations that will differ from their peers and so decision making is a complex and collective process. The ability of individual actors to influence decision making will vary, and, of course, for those concerned with the promotion of sustainability or environmental concerns they are often likely to find themselves needing to win arguments against well entrenched developmental interests. There is, therefore, a need to develop arguments that can gain the support of other interests. It is not simply presenting a case based upon ‘facts’ but *persuading* other actors of the merit of the case. So, for example, from the perspective of the Sustainable Development Unit in Cardiff Council one role of the Task and Finish Group will be to spread the footprint message through the organisation so that its findings can inform decisions.

However, the use of the footprint results and the tool itself as part of a case to persuade other actors to adopt a more sensitive environmental position must also

recognise that at least some of those actors will be wedded to their positions, will deploy counter arguments and bring to bear their own favoured tools. Here, we have to try and make sense of tools (including the footprint) that will often be promoted as a more rational way of making a decision with the recognition that decisions are not made in a rational way. One of the most stimulating studies of rationality and decision making has been that by Flyvbjerg (1998). He contends that

“rationality is context-dependent and that the context of rationality is power” (Flyvbjerg 1998, p2).

Power will vary across space and time and be contingent upon social-structural processes and organisational and actor context (Flyvbjerg 1998, p27). These insights suggest the outputs of tools for sustainable decision making (like the footprint) may become rationalisations for decisions that are made by powerful actors. In other words, the footprint results lend weight to existing developmental trajectories rather than challenging them. So whilst the footprint should raise challenging questions about the level of resource consumption the balance of interests at both an official and political level may mean that these are kept to the margins of an organisation. At the end of the day political considerations (no matter how formulated) are likely to be paramount. A key issue for Cardiff Council is will a new administration elected in the Spring of 2004, and having stronger environmental credentials than its predecessor, make the push to put the environment closer to the heart of decision making on ISV?

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