



SUSTAINABLE
DEVELOPMENT

**Sustainability Examples
from the USA and Canada**



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Contents

Precis	1
1. The purpose of the report	
2. Introduction	2
a) What is Sustainability?	2
b) Why North America?	2
i) The USA	2
ii) Canada	3
3. New York	4
a) Environmental Protection Agency – Pollution Prevention	4
b) New York's Waste Management Plan	5
c) Natural Resources Defense Council	6
4. Toronto	7
a) Guelph 2000 – community based sustainability	7
b) Ontario Hydro – Sustainable Energy Development	8
5. Seattle	9
a) The Growth Management Plan: "Toward a Sustainable Seattle"	9
b) "Indicators of Sustainable Community" – Sustainable Seattle	10
6. Portland	10
a) Northwest Power Planning Council	10
7. Vancouver	11
a) Greater Vancouver Regional District Plans	11
b) British Columbia Commission on Resources and the Environment	12
c) Fraser Basin Management Program	12
d) Life Cycle Assessment/Life Cycle Management	13
8. Conclusions	14
Sustainable Development Publication Series	15

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Sustainability Examples from the USA and Canada

Precis

Throughout the USA and Canada there are many organisations working on sustainability. From strategic plans containing sustainability principles to organisations established specifically to address sustainability issues, sustainability is beginning to permeate and influence community, legislative, environmental and local authority organisations and procedures.

There are many innovative examples of action that have been taken that could be applied in the UK. Community participation and public involvement in producing forward plans was an important element of the examples. There are many good quality "how to" manuals on community participation that have been produced from direct experience.

Rather than theoretical debates, sustainability was at the centre of real issues. New York's Waste Management Plan decided how waste would be dealt with in the future. It had to balance economic, community and environmental dimensions. The community based Guelph 2000 project gave citizens advice on energy, water and waste reduction methods – leading to cost savings.

Seattle's Growth Management Plan sought to balance population and economic growth and quality of life. British Columbia's Commission on Resources and the Environment produced a series of plans which incorporate sustainability. Non governmental organisations (NGOs), like the Natural Resources Defense Council (NRDC), were trying to ensure that the Government was taking sustainability seriously.

1. The purpose of the report

The purpose of this report is to give an insight into the structures which either apply, debate or which influence progress on sustainability in order to stimulate discussion in these and related areas.

The report gives both general and specific examples. Specifically an insight is given into the energy scene in the USA. It is not the purpose of this report to give a detailed analysis but several areas of interest are examined: least cost planning, the North West Power Planning Council and the Natural Resource Defense Council's (NRDC) work on energy. Although these topics may not be wholly representative of the overall energy

scene they do provide a useful snapshot of various mechanisms. The New York Waste Management Plan and its production are also discussed. This gives an insight into US waste management planning. The mechanisms by which sustainability was being addressed and progressed are discussed.

The land use planning system in North America is different to the UK's. However, I came across several examples of recent legislation enacted to ensure balanced planning: Seattle's Growth Management Plan, British Columbia's Commission on Resources and the Environment (CORE) and the Greater Vancouver Regional District's (GVRD) plans. All these plans seek to balance economic, social and environmental issues.

Community involvement and public participation routes are discussed. Community based initiatives are represented by Guelph 2000 in Ontario. This program gives advice to citizens on energy, water and waste reduction – leading to cost savings. The Green Communities Initiative in Ontario is a provincial initiative designed to encourage community based planning and moving beyond NIMBYism. The NRDC is also involved in a community project in New York to establish a paper mill that uses recycled paper.

There were several mechanisms for discussing/planning/ implementing sustainability such as Round Tables which operate at federal, provincial and local levels and specific programs like the Fraser Basin Management Program. Life cycle assessment (LCA) as an environmental decision support tool is also described.

There were many established and emerging structures and organisations for progressing sustainability in North America. Culturally there are many differences between North America and the UK. The emphasis on community participation is an emerging movement in the UK but fairly well established in North America, especially Canada and British Columbia. Sustainability was given a high profile and there are many organisations both community based and statutory working to progress sustainability.

2. Introduction

This report is a by-product of several visits to North America over the last 3-4 years, including one as part of a Winston Churchill Travelling Fellowship in August 1994 and participation in seminars. Developments in this field are rapid and some of the details will have changed. The examples serve as thought provoking demonstrations on sustainability.

a) What is sustainability?

The key elements of sustainability are the balancing of economic, community and environmental issues and aspirations. Sustainability in its widest sense is about quality of life. A commonly asked question is "How can we achieve the standard of living we want?" However, many feel that standard of living, as measured by money flows in the economy such as GNP or GDP, is too narrow a definition. Quality of life encompasses a wider range of issues such as the environment, participation and equality for present and future generations. Ultimately the environment is the source of our wealth, lifestyles and services. Resource extraction, raw material conversion, using energy and producing waste, and clean air, water and land are key elements affecting our present quality of life and the ability of future generations to obtain the quality of life they desire.

Overall, sustainability is about the priorities we set ourselves as societies and communities. The questions that arise from this are:

What level of economic well being do we want and need?

What environment do we want and need?

What is the relationship between the two?

What about the communities around us – how do we affect their economies and environment?

How do the actions we carry out today affect future generations – will they be able to fulfil their needs and aspirations?

How do we set our overall priorities as societies and communities?

What debates and representations are necessary to establish a consensus on the level of our quality of life?

Clearly there are many important issues that are being raised through sustainability. Rather than the more strategic questions on sustainability this report explores how others were implementing some of the conclusions they had arrived at about sustainability. They serve as thought provoking examples.

b) Why North America?

There were many interesting developments on sustainability in North America. Could they be of relevance to the UK? This section gives a brief overview of developments in the USA and Canada.

i) The USA

In the USA President Clinton established the President's Council on Sustainable Development (PCSD) in June 1993. It was hoped that it would be a partnership of the 25 members who were high ranking representatives from industry, government, environmental, labor and civil rights organisations. Its co-chairs were World Resources Institute president Jonathan Lash and Dow Chemical executive David Buzzelli. The aim of the PCSD was to:

- advise the President on matters involving sustainable development
- develop and recommend to the President a national sustainable development action strategy that will foster economic vitality
- advise on an annual Presidential Award .. toward the advancement of sustainable development; and
- advise the President on conducting a public awareness and participation campaign on the importance of and the appropriate uses of the nation's natural and cultural resources.

There were six main task forces on the PCSD looking into the following areas:

- Eco-efficiency
- Energy and transportation
- Natural resources management and protection
- Principles, goals and definitions
- Public linkage, dialogue and education
- Sustainable communities

In addition three interim teams were formed to conduct scoping research into:

- Population and consumption
- Climate change
- Sustainable agriculture

The PCSD meetings were held throughout the USA such as Seattle, Washington DC and Chicago in order to encourage public dialogue and to integrate local expertise from communities around the country. There was no PCSD office with 15 full time staff.

Reports from the early meetings were encouraging. David Buzzelli, Dow Chemicals executive recalling a PCSD dinner with the Vice President, Al Gore, said "The vice president very clearly said to the council, 'If we knew how to do this folks, we would have done it ourselves.' So there's no guidebook for what we're doing. This new path we're on, we're in the process of learning as we go along." The Sierra Club's President, Michele Perrault said "Some hard issues, growth for example, have yet to be discussed by the Council... And the big question of how to deal with consumption..." There were also concerns about leadership opportunities for individuals from the grassroots level on the PCSD.

At the Seattle meeting of the PCSD, Buzzelli and members of the PCSD spent an evening with Ted Strong (Executive Director, Columbia River Inter-Tribal Fish Commission) and representatives of about fifteen Pacific Northwest tribes. Buzzelli recalled "They demonstrated to us the shared relationship they have between themselves, their families and the earth – a relationship that doesn't have segments in it. It's a continuum for them, and it cuts across everything, as opposed to being vertical silos, which is the way we think of things." Apparently he was also seen doing tribal dances!

The PCSD represents one part of a larger sustainability movement in the USA. If the President appears to be interested in sustainability then this gives a clear signal that sustainability is an important national issue.

ii) Canada

Canada has pioneered the round table approach to sustainability. There was a National Round Table on the Environment and Economy (NRTEE) whose mandate was to "play the role of catalyst in identifying, explaining and promoting in all sectors of Canadian society and in all regions of Canada the principles and practices of sustainable development." It had 22 members, an additional 22 on the various task forces and a secretariat of 19. It reported directly to the Prime Minister and was an independent forum composed of influential individuals from government, business, science, environmental groups, academia, labour unions and native peoples, making decisions by consensus. One of

its original members was David Buzzelli, Dow Chemicals executive also co-chair of the PCSD in the USA.

Consensus was an important element of Canadian round tables at national, provincial and local levels. The NRTEE 1992/93 annual review stated "For consensus to operate, people must abandon command and control patterns of conduct. And only if they abandon them can there be the kind of interchange among equals that is so necessary in trying to weave sustainable development into the multitude of our activities." Guiding principles of the consensus process have been set down. It should have or be:

- Purpose Driven – people need a reason to participate in the process
- Inclusive not Exclusive – all parties with a significant interest in the issues should be involved in the consensus process
- Voluntary Participation – the parties who are affected or interested participate voluntarily
- Self Design – the parties design the consensus process
- Flexibility – should be designed into the process
- Equal Opportunity – all parties have equal access to relevant information and the opportunity to participate effectively throughout the process
- Respect for Diverse Interests – acceptance of the diverse values, interests, and knowledge of the parties involved in the consensus process is essential
- Accountability – the participants are accountable both to their constituencies and to the process that they have agreed to establish
- Time Limits – realistic deadlines are necessary throughout the process
- Implementation – commitment to implementation and effective monitoring are essential parts of any agreement.

This sort of thinking is unfamiliar territory to many people. The NRTEE had 13 initiatives including:

- Project De Society
- Reporting on Sustainability
- The Education Task Force
- Sustainable Communities
- Sustainability and Prosperity
- Economic Instruments Collaborative
- Consensus Decision Making
- Forest Round Table on Sustainable Development
- Pulp and Paper Round Table
- Trade and Sustainability
- Sustainable Fishery
- Rural Renewal
- The Communications Program

It was estimated that there were between 100 and 200 round tables operating in Canada, 60 in British Columbia alone – although the provincial British Columbia Round Table had been disbanded. Sustainability was important to Canadians and was becoming a part of Canadian culture.

The following sections describe specific sustainability initiatives.

3. New York

Several initiatives are described in detail from New York. They are: the US Environmental Protection Agency's Pollution Prevention program; New York's Waste Management Plan; and the work of the Natural Resources Defense Council (NRDC). Others which are interesting but not covered in detail include:

- the work of Professor John Kallos at Colombia University who was establishing a course on sustainability and a round table similar to those in Canada; and
- the Regional Plan Association (RPA) who were applying the principles of sustainability to regional planning and have worked since 1929 to improve the quality of life in the New York/New Jersey/Connecticut metropolitan area by creating a long term plan. RPA recommends policy improvements, fosters cooperation amongst organisations and involves the public in shaping its own future. Its area of research include land use planning, transportation, economic development, the environment, governance and social policy. It was a not for profit organisation funded by corporations, foundations, governments and individuals.

a) Environmental Protection Agency – Pollution Prevention

In May 1992 F. Henry Habicht II, Deputy Administrator, EPA, Washington sent a memo to all EPA personnel defining pollution prevention. It was designed to be consistent with the Pollution Prevention Act 1990 and the EPA's Pollution Prevention Strategy. It stated: "Pollution prevention means 'source reduction', as defined under the Pollution Prevention Act, and other practices that reduce or eliminate the creation of pollutants through:

- increased efficiency in the use of raw materials, energy, water, or other resources, or
- protection of natural resources by conservation.

The Act defined 'source reduction' as any practice that:

- reduces the amount of any ... pollutant.. released into the environment.. prior to recycling, treatment, or disposal and
- reduces the hazard to public health and the environment..."

The memo said that pollution prevention required a cultural change – one which encourages "anticipation and the internalising of real environmental costs by those who may generate pollution.." and "to find the most cost effective means to achieve those goals."

Similar issues are being tackled by UK regulatory bodies but it is interesting to note the reference to the need for cultural change in order to pursue the goal of pollution prevention. Until recently attention has been focused on technological "end of pipe" solutions for pollution abatement or clean up. The memo uses the word anticipation – identifying where the problems may occur and solving them as near to the actual process as possible. In the words of Benjamin Franklin, "an ounce of prevention is worth a pound of cure." This approach to pollution prevention is consistent with the principles of sustainability.

In June 1993, Carol M. Browner, EPA Administrator put out a Pollution Prevention Policy statement which laid out the elements of pollution prevention and confirmed the 1992 definition of pollution prevention. The elements included:

- regulations and compliance
- state and local partnerships
- private partnerships
- federal partnerships
- public information/right to know
- technological innovation
- new legislation

In order to implement these elements the EPA has several programmes. There are ten Regional Pollution Prevention Coordinators in the USA who are responsible for managing the Pollution Prevention Incentives for States (PPIS). This includes grants for:

- technical assistance
- technical training
- education and outreach
- regulatory integration
- demonstration projects
- legislation and infrastructure
- awards and recognition

One example of assistance from the PPIS is Florida's Waste Reduction Assistance Program which saved businesses \$3.7 million and translated into a reduction of over 4 million pounds of hazardous waste.

The EPA was implementing an Environmental Justice through Pollution Prevention programme. The EPA defined environmental justice as "the fair treatment of people of all races, cultures and income with respect to the development, implementation and enforcement of environmental laws, regulations, programs, and policies."

The EPA were implementing innovative programmes that addressed the issues of sustainability. Interestingly, there were parallel developments already in the UK.

b) New York's Waste Management Plan

There are approximately 7.5 million residents in the five boroughs of Manhattan, Queens, Bronx, Brooklyn and Staten Island that make up New York. In 1990 they produced nearly 14 million tonnes of waste including household, industrial, construction and demolition, sewage sludge, dredgings and medical waste. 8 million tonnes is household waste which is projected to grow by 15% to 9 million by 2010.

There is only one active landfill site in New York City, the 2,900 acre Fresh Kills landfill in Staten Island. It began accepting waste in 1948 and the word "kills" is derived from the Dutch word for "creek". It operates 24 hours a day, 6 days a week and receives 14,000 tonnes of refuse a day. Most of the municipally collected refuse is delivered by barge. At the present rate of fill the Fresh Kills landfill will rise to peaks of about 450 feet about a third of the height of the Empire State Building.

Waste management is a significant issue in New York. The Plan was on the front page of the New York Times between reports of events in South Africa and the Soviet Union in September 1992. A key issue was "How can consensus be built on the way to deal with all the waste?"

The New York City Department of Sanitation prepared a waste management plan which was approved by the New York State Department of Environmental Conservation in October 1992. There was federal, state and municipal legislation requiring the production of the plan but it was also seen as being a good idea in itself.

There were several goals that drove the formulation of the strategy. These included the need for reliable waste management options, the need to conserve existing landfill, cost, environmental protection and implementation. The Plan includes:

- waste prevention programmes, which were seen as being the most cost effective waste management technique but their effectiveness is difficult to predict
- expanded residential waste recycling program
- composting facilities

However if these were successful there would still be an estimated 6 – 12,000 tonnes a day for disposal. To meet this need one of the three existing incinerators will be upgraded to conform to new air pollution regulations.

Other programmes include:

- reduction of medical waste volumes
- out of state landfilling of sewage sludge until composting/stabilisation facilities are in place
- recycling of construction waste
- dewatering of dredge spoils

Overall, the strategy is to continue landfill, develop incineration and waste prevention/recycling programmes.

There were several interesting aspects of the development of the plan. It was developed with an eye on potential litigation. At some point the statements and research in the plan could be challenged in court. For instance if an incinerator was to be developed it might face local opposition which could result in a legal challenge. Several steps were taken address this and to attempt to build consensus on the plan:

- Advisory Committees were made mandatory under the recycling law passed in 1988. There was one in each of the 5 boroughs and one city wide which formed a technical working group. This included full time environmentalists who met with the project managers one morning every other week. If there was disagreement on any aspects of the work it was redone. At the end of the process environmental groups produced their own plan called "Recycle First". It was felt that this was in general agreement with the waste management plan.
- There was wide consultation on the plan. There were formal "hearings" in each of the five boroughs and comments were received from statutory agencies, community organisations and the general public.

- Independent analyses was carried on the information in the plan by an advisory committee and environmental organisations. This was paid for by the Department of Sanitation and its purpose was to offer the plan for scrutiny by experts with a view to discussing emerging issues.
- Comments received were printed in the plan and changes that followed from the comments are indicated in the plan.

Waste management is an issue that touches on many sustainability areas such as quality of life, environmental justice, environment and cost. Following the Plan's recommendations waste management facilities would need to be developed. Therefore consensus on its form was important. It was not envisaged that this consultation process would result in no litigation. Rather, it was designed to give as many people as possible an input to the plan.

A full analysis was carried out of waste management options in order to help in constructing the strategy. The criteria used to assess the options included:

- environmental – air, transportation, water, public health, energy, land use, visual, noise, odour and siting
- direct economic – total cost of proposed systems
- secondary economic – jobs, cost of waste management to industry

It was estimated that in the proposed system, the most significant energy impact would be the reduction due to the use of secondary materials rather than virgin materials in the manufacture of new products. As for secondary economic impacts it was estimated that 22,000 new jobs would be created by the proposed system in manufacturing industries that use recycled materials. Directly, \$300 million fewer dollars a year would be spent on waste management by tax payers and businesses.

The New York waste management plan was formulated to address specific local issues. Its approach highlighted ways in which the principles of sustainability can be pursued in statutory plans.

c) Natural Resources Defense Council.

NRDC's mission statement contains the following:

"NRDC's purpose is to safeguard the earth...We seek to establish sustainability..to foster the fundamental right of all people to have a voice in decisions that affect their environment..NRDC strives to help create a new way of life...one that can be sustained indefinitely without fouling or depleting the resources that support all life on Earth."

From the environmental viewpoint of sustainability this mission statement has everything – stewardship, equity, futurity and quality of life. NRDC is a national non profit organisation and has 170,000 members and professional staff that include lawyers, scientists and other environmental specialists. It combines the power of law, science and people in its work. The NRDC has campaigns in the following areas: water, the global environment, cities, air, health, land, nuclear weapons, energy and partnerships and public information. The NRDC is involved in several energy campaigns. It has been calling for energy efficiency standards and in 1994 the US Department of the Environment proposed strict new minimum efficiency standards on consumer appliances including electric and gas water heaters, room air conditioners, cooking ranges and ovens and televisions. It was estimated that the new standards would save consumers \$66 million and reduce US carbon emissions by 41 million tonnes.

The Consortium for Energy Efficiency, with NRDC's guidance and support from the EPA, was a group of 24 utilities which funded a \$30 million "Golden Carrot" contest for refrigerator manufacturers to produce the most energy efficient appliance. A refrigerator was chosen as the winner that would yield the greatest energy savings and uses no ozone destroying CFCs compounds. The programme was continuing on washing machines and commercial rooftop air conditioners.

The NRDC is an advocate of least cost planning (LCP) and demand side management (DSM). These methods seek to reduce demand for energy by implementing energy efficiency programmes that are directly supported by energy utilities. Before the construction of a new energy generating station can commence, several states have laws that require the utilities to demonstrate that this is the least economic, social and environmental cost option. This has lead many utilities to invest in energy conservation programmes – insulation, energy

efficient appliances, low energy lighting, heating controls etc as it is cheaper than building new power stations. In this way the utilities can reduce the cost of capital and revenue investment in new plant. Consumers also have reduced energy costs. So both utilities and consumers benefit from lower costs and there is less atmospheric pollution from power stations and other environmental impacts.

Reducing the demand for energy has a direct commercial consequence for the utilities – it reduces their income. However they are often allowed by the regulators to increase their prices following DSM programmes. This allows them to maintain their income base. This has a double advantage for consumers as they reduce their energy cost through conservation and avoid price rises on that portion of energy that they would have been using. DSM and LCP programmes were coming under pressure from the deregulation of the energy supply industry in the USA. The restructuring of the energy industry in the UK during the 1980s was partly used as a justification for deregulation.

There was concern over a plan to build a hydro-electric plant at James Bay in Northern Quebec, Canada. The NRDC lobbied against the project on the grounds of its environmental and social impact and also because of a perceived lack of need for the energy it would generate. NRDC lobbied the customers for the project – those that would buy the energy. These were in New York State. In 1992 the Governor of New York cancelled a contract for power from the project. Following continued advocacy the New York Power Authority cancelled a 20 year contract for energy from the plant. NRDC lobbied New York City's utility, Consolidated Edison which postponed its decision on purchasing power from the plant. This (James Bay) was a traditional non government organisation (NGO) issue. NRDC was being successful in its advocacy.

However this was only one aspect of the approach of the NRDC. They were actively involved in proposing positive solutions to environmental issues. Evidence for this is given above but they were involved in many forward planning projects. Along with other organisations NRDC produced a document called "America's Energy Choices". The document modeled several future energy scenarios: a Reference case, which reflected the current policies and trends; a Market case, which selected energy technologies based on cost minimisation for customers; an Environmental case, which assigned monetary values

to environmental impacts and a Climate Stabilisation case, which sought to meet CO₂ (the main greenhouse gas) reduction targets. The scenarios measured future energy demand, atmospheric emissions and costs to consumers.

The Reference case showed that on present trends energy consumption would rise by 41% and CO₂ emissions by 58%. The 3 other scenarios achieved energy and emissions reductions, greater renewable energy use and greater monetary savings. In the Climate Stabilisation case national energy demand would be reduced by nearly 50%, with renewable energy supplying 50% of requirements, CO₂ emissions would be cut by 25% by 2005 and 70% by 2030 and consumers would have a net saving of \$2.3 trillion.

NRDC also operates in the waste management area. In May 1994, NRDC with the Banana Kelly Community Improvement Association in South Bronx and 2 paper companies announced plans to develop a paper recycling mill in the South Bronx. It would use waste paper to produce high grade pulp for printing and writing paper. It would also provide jobs and social services to the community. US Vice President Al Gore praised the project for showing that "economic development, job creation, and environmental protection can work together for the benefit of us all." NRDC had the expertise, remit and motivation to put forward innovative plans, working in partnership, that will apply the principles of sustainability.

4. Toronto

a) Guelph 2000

Some communities are being supported in putting forward positive environmental plans for their development through the Green Communities Initiative in Ontario, Canada. It was coordinated by the Ontario Ministry of Environment and Energy and the Ministry of Natural Resources.

Guelph 2000 was an example of a community based initiative designed to help Guelph citizens to implement positive environmental action. This was done through their "Home Green Up" programme. The team of trained advisors assessed people's homes, on request, looking for ways to reduce energy, water and waste and to prevent pollution. People received a detailed assessment of the house's energy and water use and waste output. Ways to reduce these were laid out in a

report. Water and energy saving showerheads and water tap aerators were installed at no charge. Guidance was also given on selecting contractors and suppliers of energy and waste saving devices. During the comprehensive visit the advisor looked at heating, cooling and ventilation, insulation, water fixtures, air leakage and waste output.

It was said that the "Home Green Up" could cut energy and water use by up to 50%. It also created new business for local merchants and contractors that supplied energy and waste saving products and so is a key link in combining sustainability and economic development. The ratio of its funding to sales of environmental products was used as one of its performance indicators. A Canadian bank – Canada Trust also offers EnviroLoans. These were used to finance home improvements that help reduce energy, water and waste use. They were significant and were worth up to \$7,500 with fixed interest rates for a period of up to 10 years.

Guelph 2000 operated group Neighbourhood Green Up projects, commercial and industrial and educational programmes. It had an office in the town centre where people could drop in to discuss the programme and where literature and information was available as well as energy, water and waste saving products. Guelph 2000 was an effective model that may be applicable to the UK. It helped people to reduce costs as well as reducing environmental impacts. It had a range of initiatives to suit its customers – advice, practical applications and help with finance. It was also helping to stimulate the local economy by boosting the demand for energy, water and waste reduction products. It was a good example of an initiative that can combine what are often seen as conflicting issues – cost and environmental savings. It was making an excellent and innovative contribution to sustainability.

b) Ontario Hydro – Sustainable Energy Development

Ontario Hydro (Ontario's energy utility) had a Director of Sustainable Energy Development. He was playing a key role in implementing Hydro's new sustainable energy development program initiatives which were designed to put Hydro in a leadership position in North America.

Their strategy was one that combined business and sustainability. A key to sustainability was seen as being efficient energy and resource use, combined with prevention, reuse and recycling of wastes. Japan was cited as proof that this approach worked. Between 1973

and 1984, the energy and raw material content of a unit of Japanese production dropped by 40% and it continued to drop – one of the reasons for Japan's competitive edge. Hydro wanted to put Canada in a position to make the most of sustainability and its opportunities.

Hydro was dedicated to becoming a "leading example of sustainable development" and helping Ontario become "the most energy efficient and competitive economy in the world." The incentives for these changes were enormous. In Canada, the sustainable technologies market was expected to grow to US\$12 billion by 2000. Their strategy included measures to:

- Introduce a positive institutional culture
- Integrate environment and economics in decision making
- Adopt full cost accounting to help guide decision making
- Strengthen energy efficiency and demand management programs
- Shift from compliance to leadership on environmental performance
- Deploy Hydro procurement power strategically
- Develop, adopt and promote sustainable energy technologies
- Increase international market opportunities for sustainable energy use
- Introduce new working relationships with stakeholders, communities and government
- Communicate opportunities for sustainable energy use

These principles may be relevant to other organisations that are interested in sustainability. How did a huge utility like Ontario Hydro propose to make the transition necessary to meet the challenge? In order to show commitment at the highest level it was recommended that the Chairman take on the title of Chief Sustainable Development Officer. His message would include:

- Meeting regulations is not enough – to prosper Hydro has to go beyond compliance
- Environmental considerations are part of the decision making process not an afterthought
- Managers and employees need to be more entrepreneurial
- Hydro operations need to become more energy efficient
- More time and money has to be devoted to renewable energy technologies
- Decision making needs to be more open and transparent

Again these messages could have wider relevance.

New forums for stakeholder consultation were recommended including an advisory round table, a rolling review of the planning process and hearings on rates. Admitting that momentum was lost on demand management programs Hydro responded that "the focus of programs should be efficiency and competitive improvement, not simply reduced use." This would help to move away from the principle of the more energy that is used the cheaper it is. This was seen as a disincentive to reduce energy use and purchase more efficient equipment and products.

In 1992 Hydro burned 8.2 million tonnes of coal and emitted 210,000 tonnes of acid gas and 26 million tonnes of CO₂. Any reduction beyond compliance will mean that Hydro will be better off in the long term. A commitment was made that by 1996, 3 out of every 4 R&D dollars would be spent on sustainable development.

This is a radical programme but Hydro is facing many challenges. Increasing competition, a huge deficit and job losses are part of its restructuring. Sustainability is intended to be a major element and driving force for restructuring. The task force's recommendations are reviewed by Ontario Hydro's Board of Directors, the Chief Executive and management. The decision making process was guided by the principles, strategies and objectives from the task force on sustainable energy development.

5. Seattle

a) The Growth Management Plan "Toward a Sustainable Seattle"

In July 1994, the city of Seattle adopted a plan for managing growth for 20 years called "Toward a Sustainable Seattle". The dilemma for the Pacific Northwest lies in its environment. It is bountiful, vast and inspiring. People want to live and visit the Northwest for these reasons. Companies relocate to Washington state because it is a port, hundreds of miles nearer to the growing economies of South East Asia than San Francisco. The quality of life for its employees is such that companies keep them in their employment longer. So more and more people and businesses are moving to the Pacific Northwest resulting in pressure on the environment.

The planning process was prompted by Washington State's Growth Management Act (GMA) which was passed in 1990. The Act was a response to the development pressures facing the state. It was an important step in the development of policies to address growth in the state. In 1992 the population was 522,000. This is projected to rise to 594,000 by 2014. 60,000 new households will be needed as well as an additional 146,600 jobs. The elements required to be considered by the GMA include: land use, transportation, housing, capital facilities and utilities. Other elements that have been included by the county and city are economic development, neighbourhood planning and citizen participation elements.

Discussions with Seattleites about their community brought out the values and their visions for the plan. These were grouped into the core values of:

- Community
- Environmental Stewardship
- Economic Opportunity and Security
- Social Equity

These core values guided the preparation of the plan. There is a reference to a Native American proverb which says "Every decision must take into account its effect on the next seven generations". This consideration of future generations is a key element of sustainability as are the core values of the plan. To preserve the best existing qualities of Seattle's neighbourhoods whilst responding positively and creatively to the pressures of growth and change, the concept of urban villages was formulated. Urban villages seek to encompass:

- diversity of people – age and cultures
- pedestrian orientated commercial areas
- a variety of housing types
- community facilities within walking distances
- transit, bicycle and pedestrian facilities to neighbouring villages
- a unique identity reflecting local history, features and culture

Seattle also wants to be a city for families and to maintain and enhance its own character. The plan underwent an environmental impact assessment which included land use, transportation, air quality, housing and noise impacts for several growth scenarios.

With any plan of this strategic importance and size there is inevitably a large amount of documentation. Much of this was designed to be accessible to non specialists. A newspaper format was used for the citizens guide to the plan. It had easy to understand explanations of the issues and interesting and engaging diagrams and illustrations.

b) "Indicators of Sustainable Community"

– Sustainable Seattle

The mixture of community input and sustainability to the debate about the quality of life in Seattle was not only evident in the Seattle's Growth Management Plan but was present in other projects. Since 1990, Sustainable Seattle has operated as a voluntary network and civic forum. They developed the Indicators of Sustainable Community project which sought to measure progress towards sustainability. The work was done by more than 200 volunteers and published in a report. Its findings include the following:

- increasing numbers of children are being born with low birthweight, being raised in poverty or turning to violent crime
- fewer people are voting
- wild salmon are disappearing
- more people are driving more miles
- energy consumption is increasing
- more waste per person is being produced

The general conclusion from the project was that Seattle was moving away from the goal of sustainability. The purpose of the indicators was to act as input to the planning process and business and economic development, to inform the media and the community to act as a catalyst for people to make choices in their personal lifestyles so that Seattle can move towards sustainability. It was produced with few resources and is a stimulating input to the debate about sustainability.

6. Portland

a) Northwest Power Planning Council

15 years ago four states in the Pacific Northwest – Idaho, Montana, Oregon and Washington, prompted by the Northwest Power Act of 1980, began collaborating on a project to ensure that the energy requirements of the region would be met at the lowest possible cost. This is a region that had a population of 9 million in 1990. Forecasts predicted this reaching nearly 12 million in 2010 if it grows at a medium rate, with household sizes decreasing. In 1991 the Pacific Northwest Electric Power and Conservation Planning Council – the Northwest Power Planning Council for short – published its plan. The region had the capacity to generate nearly 18,000 megawatts in 1990. But the region's power surplus had gone. This was due mainly to the region's economic recovery and population growth.

The plan had 4 objectives:

- 1 To buy low cost resources
- 2 Shorten lead times, improve flexibility
- 3 Confirm cost and availability
- 4 Actions supporting implementation

The Council also saw the plan balancing several issues – direct costs, reliability and the environment. The 4 objectives seem to cover the first two of these issues but what about the third?

Before dams were used to generate power on the Columbia River and its tributaries, 11 to 16 million adult salmon swam through on their way to their upriver spawning beds then back to the sea. The dams blocked that path but they also generated nearly two thirds of the region's electricity. By the time the 1980 Act was passed only about 2.5 million salmon swam the waters and their numbers were declining. This was not just a conservation issue. The salmon were an important commercial resource for local fishermen especially Native Americans. The Council's Columbia River Basin Fish and Wildlife Program, which was being updated in collaboration with fisheries agencies and Native Tribes, called for a series of measures to protect and enhance production of the salmon. This included spilling water over dams or flushing it through reservoirs to benefit the fish. This amounted to hundreds of megawatts of lost power each year.

Following state and tribal recommendations the Council also designated 44,000 miles of streams to be protected from new hydropower development. The plan integrated the program, making it a constraint on the plan requiring trade-offs between power generation and conservation. Another imperative for the integration of conservation issues in the plan was the US Endangered Species Act. Several runs on the Columbia River were likely to be declared threatened or endangered. The plan had to balance both Acts – the Endangered Species Act and the Northwest Power Act.

The power requirements of the region could rise to 25,000 megawatts and the plan carried out a number of forecasts to predict future energy requirements and costs. In all cases the resource that gave the region time to adapt to uncertainties was conservation. It was hoped that Objective 1 of the plan could be satisfied in the first instance by acquiring 1500 megawatts of power through conservation measures. They were proposing spending up to 11 cents per kilowatt-hour in some instances to achieve these savings. The plan also predicted that

efficiency spending by consumers and utilities would total about \$7 billion between 1991 and 2000.

Objective 3 was being satisfied in part through assessing the costs of generation from renewable resources such as biomass, geothermal and wind. Objective 4 would require new policies to be developed to decouple a utility's profits from the amount of energy it sells. This is something that was discussed earlier in the section on New York. Least cost planning also played a part as did cooperating with appliance manufacturers to improve their products' energy efficiency. This could be encouraged by indicating that a larger market could be guaranteed through coordinating some West Coast conservation activities and sharing research and development agendas and findings.

7. Vancouver

a) Greater Vancouver Regional District (GVRD) Plans

In February 1993, the GVRD Board adopted the policies in "Creating Our Future 1993" as an expression of an action program to protect and enhance Greater Vancouver's livability.

The vision of the plan was:

"Greater Vancouver can become the first urban region in the world to combine in one place the things to which humanity aspires on a global basis: a place where human activities enhance rather than degrade the natural environment, where the quality of the built environment approaches that of the natural setting, where the diversity of origins and religions is a source of social strength rather than strife, where people control the destiny of their community, and the basics of food, clothing, shelter, security and useful activity are accessible to all."

This vision was followed by a number of principles that guided the planning process. The transport element of the plan was an interesting example of the implications of implementing sustainability policies. One of the principles was that the region would give priority to walking, cycling, goods movement and then private autos. This was a principle that was aimed at improving air quality. The prevailing wind was westerly so pollution was carried up the valley into farmlands affecting crops. In the mid 1980s a study showed that crop loss due to air pollution in the Fraser Valley was valued at about \$8 million.

The Greater Vancouver region is bounded by political and natural features. Directly to the north the city is

skirted by the mountains of Grouse, Seymour, Burke and others, to the south is the US border and the region lies at the mouth of the Fraser River overlooking the north east Pacific Ocean.

The environment is a distinguishing characteristic of the region. The environment and the climate are some of the key reasons that people move to Vancouver but these features also constitute geo-political constraints on growth. There are 55,000 hectares of farmland in the region - among the most productive in Canada. However, this farmland represents only 28% of designated Green Zones in the region. These issues are what make the key principle in the plan so important. It stated:

"The region will manage its growth to preserve green areas, provide regional parks and open space, maintain farming and contain urban sprawl."

The consequences of this principle for the implementation of the plan are far reaching. The document "Managing Greater Vancouver's Growth" detailed the actions necessary to bring about a liveable region.

In 1993 there were 1.8 million people in the region. This was projected to grow to 3 million in 2021. A third of this growth would be from migration within Canada, a third from immigration from outside Canada and a third from natural increases. The average household size was declining from 2.6 persons per household on 1991 to an estimated 2.4 in 2021. These things together would require an additional 600,000 dwellings. If present planning policies continue unchanged there would be no more land for single family housing in the region by 2006. Given the constraints above this represented enormous pressure on available land and it would inevitably lead to development in Green Zone areas if the existing patterns of development continued.

The provision of housing was seen as the greatest challenge. Present lot sizes were 10,000 square feet - 100ft by 100ft. This results in 3.25 dwellings per acre. To accommodate the projected increase of dwellings would therefore require the development of 125,000 acres. If the lot size was reduced to a density of 9 units per acre (110ft by 33ft) it would require only 78,000 acres of land. The plans were proposing this in order to limit development to outside the Green Zones. The development was also to be concentrated in existing urban areas rather than spreading further along the Fraser Valley. Having formulated the principles and decided on appropriate action, particularly in the area of

housing, what other implications were there from the plan? Transportation had to be managed to conform with the plan. If the existing planning system persisted, 37 more lanes of bridge and tunnel watercrossings would be needed just to contain congestion at present levels.

The transport plan for the region had several key features. Rather than building a major highway from the outlying areas of the region to facilitate movement into the city, emphasis and reliance was placed on public transportation rather than private vehicles. It was felt that a major highway would lead to people living further away from employment centres leading to development in Green Zones and long commuter journeys, with their associated environmental impacts.

The networks of light rail and bus routes were planned to reflect the preferred settlement pattern. There was only one major highway planned and that was to transport goods to the port to the south of Vancouver. It was designed to be used primarily for that purpose and not as a through route to other destinations. There was only a low level of upgrading proposed for inter regional highways. This was in a region that was growing rapidly along with its tourist area directly to the north in the mountains such as the ski resorts in and around Whistler. These two reasons alone would probably prompt most planning authorities to consider the construction or upgrading of highways.

Vancouver already had an established public transport system which includes buses and light rapid transit (LRT) trains. Vancouver has the SkyTrain which runs on an elevated monorail above and through some of the regional town centres and into the heart of the city. The plan sought to expand these systems rather than relying on highways.

The GVRD plans were a good illustration of sustainability principles being followed through into land use and transportation policies and programmes.

b) British Columbia (BC) Commission on Resources and the Environment (CORE)

Canada's economy relies on the provision of commodities such as coal, minerals, gas, oil, food stuff and timber. Extraction of resources is therefore a key economic issue and has been since the country came into being. CORE's mandate is set out in the Commissioner on Resources and Environment Act which was passed in 1992. The Act required the development of a BC wide strategy for land use and related resource

and environmental management. Part of this mandate was to encourage the participation of Aboriginal peoples in the planning process.

The plan for Vancouver Island was one of the first of the series of plans for the province. The plans stated that "BC is on the path to a sustainable society." Due to environmental and commercial pressures it was also faced with "loss of environmental options, resource jobs, community stability and business certainty...the people of BC have recognised the need for change and have advocated a transition to sustainability and a new resource economy."

The Vancouver Island land use plan recommended that 23 additional protected areas should be designated, bringing the total to 13% of the Island's land. These areas contain a variety of land types such as mountains, lakes, forests and coastal areas. This protection had a cost. It was estimated that the protected areas would result in an estimated 4.5% reduction in timber harvest from Crown Land, about 580,000 m³ per year. It was further estimated that this could result in the loss of 5-600 jobs. An economic transition strategy was proposed that focused on provision of alternative employment, increased economic diversification and new jobs in forestry such as alternative silviculture and harvesting practices. New opportunities for tourism would also be preserved by the protected areas.

A key question was "Who will pay for the transition?" Public and private sources could have included increased revenue from stumpage, increased corporate profits from rising timber prices, industry funding for training and increased costs of recreational access. A study had indicated that most people in BC would vote for a proposal to establish a wilderness fund to offset the loss of provincial revenue from increased protected areas. A willingness to pay survey indicated that each household would contribute up \$135 to support such a fund. So people seemed willing to pay for sustainability when they could see a firm benefit.

c) Fraser Basin Management Program (FBMP)

FBMP's role was summed up in their strategic plan for 1993-1998 as:

"...the partners in the Basin should look to the Board as network builder and helper rather than an overseer."

But why was the Fraser Basin a focus for sustainability? Its influence was more than just that of river. It flows 1,325 km, drains 234,000 square kilometres – a quarter of the province and is home to 2 million people. It supports two thirds of BC's population and labour force and it is the source of:

- 80% of the gross provincial product
- 48% of the net operable forest area
- 46% of the long-run sustainable yield of timber in the province
- 60% of BC's metal mine production
- 44% of provincial farmland
- 66% of sockeye and 60% of the pink salmon catch from BC streams; and
- 49% of the province's sport fishery catch

The Fraser is said to be the greatest salmon producing river system in the world. The Basin was facing tremendous pressures.

With these figures in mind and the pressure of development, in May 1992, the federal, provincial and local governments signed the "Agreement Respecting the Fraser Basin Management Program." This was a five year coordination arrangement for sustainability in the Basin.

The FBMP was to achieve its goals through 5 actions:

- Development of management strategies in areas such as water resources management, waste management and community economic development
- Monitoring of demonstration projects
- Analysing institutional arrangements
- Auditing sustainability
- Information collection and management

A summary of one of the demonstration projects serves to illustrate the nature of some of FBMP's work. The Salmon River Watershed Management Partnership/Roundtable was in the Lower Fraser Valley/Langley. This area was one of the few largely intact watersheds near Vancouver, it was a valuable fish and wildlife resource and was facing increasing pressure from urbanisation and development. The Partnership was formed to look at the present management systems for the watershed and to develop a cooperative community driven management plan. The Partnership included representatives from Langley, the citizen based Langley Environmental Partners Society, First Nations, BC Ministry of Environment, Lands and Parks, Ministry of Agriculture, Fish and Food, Department of Fisheries and

Oceans, the University of British Columbia's Westwater Research Centre and service clubs.

Planning sessions were completed and erosion control and interpretive work advanced. The Partnership hoped to receive funding for construction work that would enhance the wildlife of the area. The FBMP was also assisting 5 other demonstration projects.

d) Life Cycle Assessment and Management

Life cycle management (LCM) is being increasingly used by industry, institutions, academia and governmental and multinational organisations. The following section describes broad developments in the area of life cycle assessment and management.

LCM has been described as "an integrated approach to minimising the environmental burdens and reducing the economic costs associated with a product or service over its life cycle." Life cycle assessment has been described as "a decision making tool to identify environmental burdens and evaluate the environmental consequences of a product, process or service over its life cycle from cradle to grave." LCA seeks to enable good decision on LCM. A traditional view of product evaluation encompassed: quality, cost and service. There is an emerging view that as well as cost becoming more important in a competitive market, environmental acceptability is an issue that has to be integrated into products and services. Cost is being defined wider as: the cost of the resources to produce the product – which must reflect real costs such as scarcity, land use etc, cost of transformation and cost of disposal. The major environmental factors include resource depletion, human health, ecological health and social welfare such as lifestyle preferences and economic trade offs.

Life cycle stages encompass energy and raw material inputs to the product's life cycle. The stages in this life cycle are: raw material acquisition; manufacturing, processing and formulation; distribution and transportation; use/reuse/maintenance; recycling and waste management. Outputs are also be considered in terms of usable products, water, air and solid waste discharges and other environmental releases. An important factor in the process of life cycle management is the consideration and definition of boundaries.

Limitations to this methodology include: its complexity, data availability, cost, it is time consuming, credibility, communication surrounding the process and its

acceptance in the market place. Systems are being developed to attempt to overcome these.

LCM is beginning to be used throughout industry to assist:

- product stewardship programs
- assessing design options
- selection of material types
- environmental claims in the market place
- benchmarking environmental performance
- identifying areas for improvement
- providing information to suppliers and customers

It can be applied to a wide range of products and studies have been carried out on: agricultural practices/food products; automobiles; buildings and construction materials; chemicals; household goods (white goods, clothing etc); electronic products; energy supplies; packaging; paper products and plastics and many more.

LCA/LCM could be useful in informing decision at various levels and is linked to other techniques such as pollution prevention, environmental management, industrial ecology, green procurement, extended producer responsibility/product stewardship, environmental assessment and full cost accounting. Its use for strategic options and policy appraisal in areas such as waste management is also being investigated.

Although complex and problematic in some circumstances LCA/LCM seems to be a growing methodology that could inform many areas of decision making that affect the environment.

8. Conclusions

The examples above illustrate the actions and debates that have been taking place around the issue of sustainability in North America. They represent attempts to incorporate the principles of sustainability into real world circumstances through planning, assessments and programmes. As such they serve as food for thought on how they might inform similar processes in the UK.

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