With Introductions by
Jim MacNeill and Robert Purves

and Forewords by
Gro Harlem Brundtland
Rajendra Pachauri
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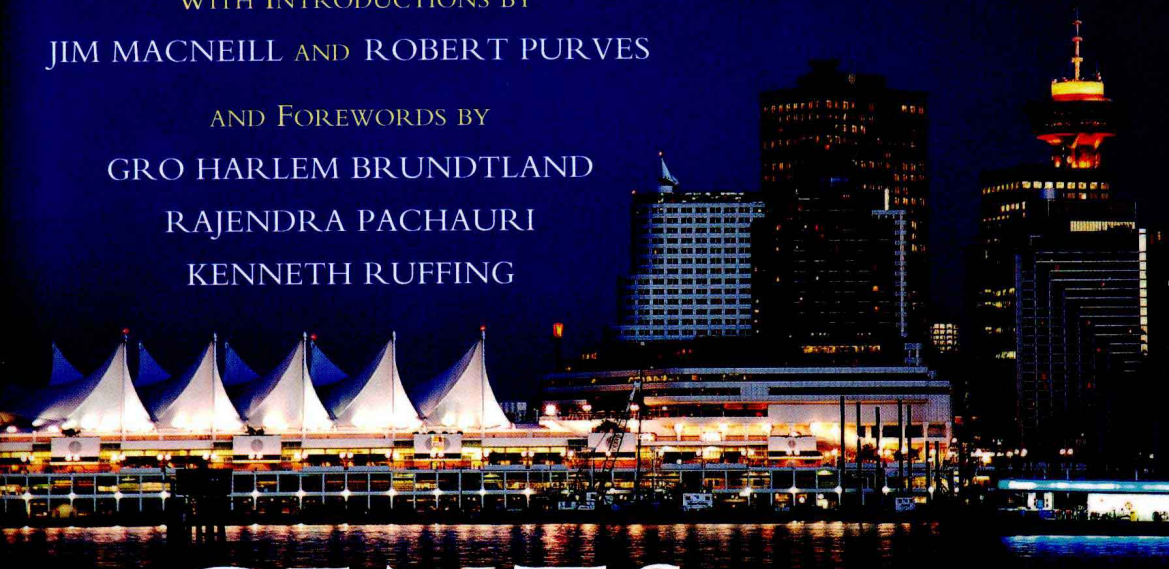

CENTS AND SUSTAINABILITY

Securing Our Common Future by Decoupling Economic Growth from Environmental Pressures

Michael H. Smith • Karlson 'Charlie' Hargroves
& Cheryl Desha

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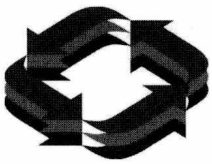

The Natural Edge
PROJECT

publishing for a sustainable future

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Forewords

I

Dr Gro Brundtland

Former Prime Minister of Norway, Chair of the World Commission on Environment and Development, Director General of the World Health Organization, Special Envoy on Climate Change for the United Nations Secretary-General Ban Ki-moon

When we published *Our Common Future* in 1987 it was intended as an urgent message to the world. We warned that if action were not taken rapidly then the current unsustainable form of development would lead to significant environmental degradation and greatly exacerbate current levels of poverty. Now, some 20 years on it is clear that this warning has not been heeded to the extent to which it was intended and as a result we have some significant challenges to face in the coming decade. *Our Common Future* sought to bring about recognition that the many crises facing the planet are interlocking elements of a single problem relating to the lack of sustainability in our development. As the world today faces rapidly rising food and oil prices, climate change, lack of water and sanitation, the importance of what we discussed 20 years ago is finally being understood.

I think there is more of an understanding today about sustainability issues, especially because of increased awareness and understanding on the climate issue. Climate change is the most dramatic part of the broader sustainable development picture. The climate issue itself has led to an increased understanding of the main messages we were seeking to communicate in *Our Common Future*, namely that:

- the problems we face are in fact shared by all;
- there is no way to avoid them or for someone else to solve the problem;
- it is going to hit all of us in our lifetimes (not in our grandchildren's);
- there is a need for greater global cooperation to successfully address these issues in time.

You can see the changes already. Global warming is accelerating. Leading climate scientists are warning that humanity may already have passed the

thresholds for dangerous climate change. Sir John Holmes, the UN relief coordinator, warned that 12 of the 13 major relief operations in 2007 were climate related, and that this combination of disasters effectively amounted to a climate change 'mega disaster'.

This issue of climate change has entered the minds of many more people. It has helped to widen the perspectives we tried our best to communicate some 20 years ago. When you consider climate change and how to mitigate and adapt to it you get into many aspects of sustainable development. For instance, investments in avoided deforestation have significant biodiversity benefits, investing in hybrid cars and higher car fuel efficiency standards reduces urban pollution, and greater investment in public transport and cycling infrastructure provides significant public health benefits and reduced obesity. The climate change issue is also motivating countries, businesses and people everywhere to find ways to reduce the burning of non-renewable fossil fuels in their homes and in transport. Climate change has helped us widen our perspective and understand more about the seriousness of the lack of sustainability as well as inspiring a new momentum for change globally.

This new book, which rigorously seeks to build on from *Our Common Future*, will greatly help to ensure that this new momentum for change is well informed and supported to achieve the changes needed for genuine sustainable development. Twenty years ago, *Our Common Future* was widely endorsed by the World Bank, the Organisation for Economic Co-operation and Development (OECD), and many governments around the world. But despite this overwhelming endorsement, by the early 1990s, with many countries in economic recession, some government leaders and vested interests reduced momentum for change by playing on citizens' fears that sustainable development would significantly harm economic growth and cause job losses. Hence the central message of this new book – 'that economic growth, profitability, social justice and environmental protection can all be achieved simultaneously and are reinforcing' – is of vital importance.

In this new book the team from The Natural Edge Project has summed up the key message from *Our Common Future* simply and elegantly, and I quote:

> *If business, governments and citizens continue with development that is not sustainable, we will indeed become economically richer for a time but significantly poorer environmentally and socially long term. However, if we choose to truly embrace and commit to achieving sustainable development, it is not too late to help all people and future generations become better off and improve their quality of life in every way – economically, socially, and environmentally. It is not too late if business, government and the citizens of the world make the commitment to leave a positive legacy of sustainable prosperity, environmental sustainability and opportunity for future generations.*

This new book and its online companion is a key resource for decision-makers and those wanting to find ways to constructively address long-standing challenges to achieving sustainable development. Over my career, in many positions of responsibility, an unspoken rule has often applied, that is if you wish to achieve change, help people to understand that the economic costs of action are far less than those of inaction. In other words, demonstrate, where possible, that cost-effective practical solutions exist based on a rigorous economic cost–benefit analysis. This book brings together such studies, which do just this across the major aspects of sustainable development. This new book, in showing how effective and proven strategies of achieving social and environmental sustainability are already helping economic growth, has the potential to be truly world changing.

This new publication is informed by a range of significant studies that have appeared since *Our Common Future* was published, including the Intergovernmental Panel on Climate Change (IPCC) assessment reports, the UK *Stern Review* and the UN Environment Programme (UNEP) *GEO-4* report. It includes projects with which I have been involved, like the Commission on Macroeconomics and Health: Investing in Health for Economic Development, chaired by Professor Jeffrey Sachs, which I initiated while Director General of the World Health Organization (WHO). The Commission's report showed that the economic benefits of scaling up investment in health in Africa from US$6 billion per year to US$27 billion would lead to: 'eight million lives saved from infectious diseases and nutritional deficiencies [which] would translate into a far larger number of years of life saved for those affected, as well as a higher quality of life'. The economic benefits of this were shown to be significant, leading to at least US$66 billion in direct benefits, as the report outlines:

> *the actual benefits could be much larger than this if the benefits of improved health help to spur economic growth (and help nations to escape the poverty trap), as we would expect. The improvements in life expectancy and reduced disease burden would tend to stimulate growth through: faster demographic transition (to lower fertility rates), higher investments in human capital, increased household saving, increased foreign investment, and greater social and macroeconomic stability.*

Such investments would significantly help poor countries break out of the poverty trap and be able to shift from negative to positive economic growth. At the same time, the cost of such an investment to the wealthy countries is minimal, estimated at one thousandth of their annual wealth. In other words, the cost of such an investment to the relatively wealthy countries would barely be noticed in a nation's annual GDP figures. Throughout this book you will find the latest economic studies, such as this study on health, that are building

momentum to embolden efforts globally for action to rapidly achieve sustainable development. This work addresses the central concerns of those hesitant about making a commitment to sustainable development and communicates clearly that we already know how to achieve sustainable development cost effectively.

This book also shows that we do not have much more time to wait. Drawing on evidence from the latest IPCC and Millennium Ecosystem Assessment reports, this publication shows that such commitment and actions to achieve sustainable development are needed now. I commend the team from The Natural Edge Project and their partners for undertaking to develop a response to *Our Common Future* to mark its 20th anniversary. This book, *Cents and Sustainability*, brings together significant evidence from the last 20 years to demonstrate that environmental and social sustainability and economic growth need not be incompatible but rather can reinforce each other.

II

Dr Rajendra Pachauri
Director General of the Energy and Research Institute, Delhi, Chief of the Intergovernmental Panel on Climate Change, Co-recipient of the Nobel Peace Prize

It gives me great pleasure to contribute this foreword to *Cents and Sustainability* and to support a response by our next generation to the seminal publication *Our Common Future*, following its recent 20th anniversary. The book, *Our Common Future* (also known as the Brundtland report), will forever be remembered for its early enunciation and popularization of the concept of 'sustainable development'. This leading work has paved the way for numerous efforts, such as the 1992 Earth Summit in Rio de Janeiro where the UN Framework Convention on Climate Change (UNFCCC) was first launched. However, the importance of considering sustainability in development policies and practice has not been widely realized till recently. As is often the case it is only the occurrence or the threat of a crisis that spurs human society to unusual actions and changes in pathways.

In the case of sustainable development, I think the wake-up call has really come from the sudden growth in awareness and understanding of the scientific concerns regarding human-induced climate change. Along with a comprehensive assessment of a range of issues set to challenge mankind, *Our Common Future* took an overview of a range of findings related to climate change in 1987 and clearly outlined the growing scientific consensus at the time that:

> *After reviewing the latest evidence of the greenhouse effect in October 1985, the World Meteorological Organisation (WMO), the UN Environment Programme (UNEP) and the International Council of Scientific Unions (ICSU), (which three years later formed the IPCC) scientists from 19 industrialised and develop-*

> *ing countries concluded that climate change must be considered a 'plausible and serious probability'. They estimated that if present trends continue, the combined concentration of CO_2 and other greenhouse gases in the atmosphere would be equivalent to a doubling of CO_2 from pre-industrial levels, possibly as early as the 2030s, and could lead to a rise in global mean temperatures greater than any in mankind's history. Current modelling studies and experiments show a rise in globally averaged surface temperature, for such a doubling, of somewhere between 1.5 and 4.5 degrees Celsius.*

This remarkable work outlined in detail the risks and potential responses to mitigate and adapt to climate change, covering areas such as energy efficiency opportunities, renewable energy, biomass and policies to price carbon dioxide emissions in detail. *Our Common Future* was one of the first works to demonstrate that through implementing such climate change mitigation solutions economic growth could cost effectively be decoupled from greenhouse gas emissions. As *Our Common Future* stated:

> *During the past 13 years, many industrial countries saw the energy content of growth fall significantly as a result of increases in energy efficiency averaging 1.7 per cent annually between 1973 and 1983. And this energy efficiency solution costs less, by savings made on the extra primary supplies required to run traditional equipment ... The costs of improving the end-use equipment is frequently much less than the cost of building more primary supply capacity. In Brazil, for example, it has been shown that for a discounted, total investment of $4 Billion in more efficient end-use technologies (such as more efficient refrigerators, street lighting, or motors) it would be feasible to defer construction of 21 gigawatts of new electrical supply capacity, corresponding to a discounted capital savings for new supplies of $19 Billion in the period 1986 to 2000.*

Our Common Future concluded that with the right mix of policy and a carbon price signal to further encourage 'the design and adoption of more energy efficient homes, industrial processes and transportation vehicles ... [and] investments in renewables ... within the next 50 years, nations have the opportunity to produce the same levels of energy services with as little as half the primary supply currently consumed'.

During the time the UN Brundtland Commission was drafting *Our Common Future*, tragedies such as the African famines, the leak at the pesticides factory at Bhopal, India, and the nuclear disaster at Chernobyl, USSR helped to focus world attention on *Our Common Future*'s main messages. Also from 1987 through to 1999, scientists investigating ice core samples from

Antarctica discovered that atmospheric carbon dioxide and methane levels had already exceeded the 'natural' peak atmospheric levels for the last 400,000 years. The 1987 Vostok ice core results also showed that humanity is actually adding human-made greenhouse gases to a peaking of the natural cycle of carbon dioxide (CO_2) and methane (CH_4). Carbon dioxide levels in the atmosphere are now over 380 parts per million (ppm). The growing awareness of the seriousness of this situation led to the formation of the Intergovernmental Panel on Climate Change (IPCC) in 1988 by the UN Environment Programme (UNEP) and the World Meteorological Organization (WMO) to provide objective information about climate change to the public and to policy-makers. The IPCC was established in 1988 through a resolution of the UN General Assembly. One of its clauses was significant in having stated:

> *Noting with concern that the emerging evidence indicates that continued growth in atmospheric concentrations of 'greenhouse' gases could produce global warming with an eventual rise in sea levels, the effects of which could be disastrous for mankind if timely steps are not taken at all levels.*

The IPCC's first report was published in 1990 and it broadly agreed with the conclusions about climate change outlined three years earlier in *Our Common Future*. It warned of the risks of inaction, called for a 60 per cent reduction in greenhouse gas emissions and outlined ways to mitigate climate change. In many ways Our Common Future in 1987 laid a foundation which helped world leaders to embrace the first IPCC report in 1990. In 1990 Margaret Thatcher, then UK Prime Minister, stated the following about the IPCC's first report:

> *Today with the publication of the report of the Intergovernmental Panel on Climate Change, we have an authoritative early-warning system: an agreed assessment from some three hundred of the world's leading scientists of what is happening to the world's climate. They confirm that greenhouse gases are increasing substantially as a result of man's activities, that this will warm the Earth's surface with serious consequences for us all ... There would surely be a great migration of population away from areas of the world liable to flooding, and from areas of declining rainfall and therefore of spreading desert. Those people will be crying out not for oil wells but for water.*

Since 1990, the IPCC has published three more assessments. By 2007, when the IPCC published its Fourth Assessment, the scientific work had advanced to the point where we, the IPCC, could say that there is absolutely no doubt that we, the human race, have substantially altered and are continuing to alter the Earth's atmosphere.[1] As stated in the Fourth Assessment Report, 'warming of

the climate system is unequivocal', and 'most of the global average warming over the past 50 years is very likely due to anthropogenic greenhouse gases increases'. Eleven of the warmest years since instrumental records have been kept occurred during the last twelve years. In the 20th century the increase in average temperature was 0.74°C, sea level rose by 17cm and a large proportion of the northern hemisphere snow cover receded.[2]

Many aspects of the climate science are far better understood today, such as the science of abrupt climate change, which has found that anthropogenic factors can lead to some impacts that are abrupt or irreversible, depending on the rate and magnitude of climate change. For instance, the rapid melting of the Arctic sea ice, which is another amplifying effect as it allows more solar energy to be absorbed, could imply metres of sea-level rise. Other such positive feedbacks that are also of great concern to the IPCC and need to be better understood by decision-makers are discussed in Chapter 1 of this book. The increased evidence of abrupt changes in the climate system, the fact that CO_2 equivalent levels are already at 455ppm, plus the current high rate of annual increases in global greenhouse gas emissions reinforces the IPCC's Fourth Assessment finding that humanity has a short window of time to bring about a reduction in global emissions if we wish to limit temperature increase to around 2°C at equilibrium. The IPCC's Fourth Assessment calls for global greenhouse gases to peak no later than 2014–2015 and to rapidly decrease after that to 80 per cent below 1990 levels by 2050 to achieve this.

This is a significant and historic challenge but the team from The Natural Edge Project shows in this book that a wide range of research, investigations and practice now exist demonstrating that it is achievable. In this book the authors will update the climate-change related material in *Our Common Future* and show that there is now a wealth of studies and empirical evidence to demonstrate the substantial potential to significantly and rapidly decouple economic growth from greenhouse gas emissions cost effectively. For example, *The Stern Review* found that the costs of inaction on climate change would range from 5 to 20 per cent of GDP leading to a global recession. Conversely, the IPCC found in the Fourth Assessment Report that achieving equilibrium (using best estimate climate sensitivity) of around 2.0–2.4°C would lead to a reduction in average annual GDP growth rate of less than 0.12 per cent up to 2030 and beyond up to 2050.

In this publication, The Natural Edge Project builds on *The Stern Review* and the IPCC Fourth Assessment to explain succinctly why the costs of mitigation have been misunderstood and exaggerated in the past. It shows that economic modelling has made clear for almost 20 years that the costs of action are relatively small compared to the costs of inaction. This book shows that one of the reasons why the costs of action are relatively small is that there are multiple co-benefits for actions that reduce emissions of greenhouse gases at the local level in terms of economic development, poverty alleviation, employment, energy security, reduced air pollution, better biodiversity outcomes and local environmental protection. The book provides a detailed overview of how

best to reduce the costs of mitigation and for the first time brings together an overview of those countries leading in implementing strong climate change policy globally from which other countries can learn.

Still, some decision-makers fear that if their government or business commits to ambitious short-term targets by 2020 this may harm their economies or profits or reduce their business competitiveness. This book, and others like it, shows that this does not need to be the case. The authors demonstrate that energy efficiency, smarter building codes and regulations, retrofitting buildings, better demand management and avoided deforestation (plus reforestation and soil sequestration), and smarter approaches to sustainable transport, can provide significant reductions rapidly within the next 5–12 years while maintaining strong economic and job growth.

Complementing this book, The Natural Edge Project has developed a comprehensive 600-page online capacity-building programme entitled 'Energy Transformed: Sustainable Energy Solutions for Climate Change Mitigation', which provides technical detail to complement the IPCC's Third Working Group's publications on climate change mitigation. The Natural Edge Project's online resource is a comprehensive resource to assist and empower people globally to play their part to reduce greenhouse gas emissions. I also highly recommend it for the university sector and for professional groups such as engineers and architects who have a key role to play in helping business and government to reduce their emissions.

Finally, I am also very pleased that the authors discuss how poverty reduction and climate change mitigation strategies can be combined to help countries escape the poverty trap. Perhaps the greatest challenge of the 21st century is how to end extreme poverty while also achieving environmental sustainability. There are 1.6 billion people who do not have access to electricity, and there are similar numbers who have no access to clean water and live in a state of environmental insecurity. The Natural Edge Project is to be commended for tackling this vitally important issue and highlighting where in the world communities, regions and nations are already creating solutions to this great challenge of our time.

Notes

1 IPCC (2007) *Climate Change 2007: The Physical Sciences Basis*, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, see 'Global climate projections'.

2 Pauchari, R. (2007) 'Coping with Climate Change: Is Development in India and the World Sustainable?', 2007 K. R. Narayanan Oration, Australian National University (ANU).

III

Dr Kenneth G. Ruffing
Coordinator of the OECD African Economic Outlook, former Deputy Director and Chief Economist of the OECD Environment Directorate, and Deputy Director of the UN Division for Sustainable Development

The leitmotif of this book is how to decouple environmental pressures from economic growth while simultaneously making progress towards attaining the Millennium Development Goals. It thus addresses a number of economic, social and environmental dimensions of sustainable development.

Ultimately, environmental pressures can be reduced only be reducing the level of output (negative economic growth) or by transforming the economic processes that underpin growth in such a way as to reduce the pressures (emissions of pollutants, greenhouse gases and destructive use of natural resources) per unit of output. Since buoyant economic growth is a necessary, but by no means sufficient condition, for achieving most of the goals, the former is not an option. That leaves us with decoupling. Because environmental pressures are multiple, there is no single overarching solution – no magic bullet. There is, instead, a need for a 'decoupling agenda'. In fact, governments with well-established environmental programmes are all pursuing such agendas without necessarily labelling them as such.

The literature on environmental indicators distinguishes between 'relative' and 'absolute' decoupling. In the former situation, the environmental pressures continue to increase, but at a slower rate than the relevant driving variable (usually GDP). In the latter situation the environmental pressures actually fall in absolute terms, while the relevant driver continues to grow.

The book restates the case for reducing environmental pressures. Failure to do so will entail very high costs to ourselves and future generations; and the technological means and the policy tools needed already exist and, in most cases, have been deployed in one country or another. Finally, the costs of implementing a decoupling agenda are eminently affordable, amounting to only a few percentage points of future increases in GDP. These costs have been extensively assessed by the OECD and others.

Goals of environmental policy

The policy challenge is to achieve absolute decoupling in a cost-effective way to the point that the requirements of environmental sustainability are met. These can be summarized by four criteria: regeneration, substitutability, assimilation and avoiding irreversibility. A few words describing each are provided below using language that was agreed by OECD Environmental Ministers in May 2001.

Regeneration means that renewable resources shall be used efficiently and their use shall not be permitted to exceed their long-term rates of natural regeneration. Substitutability means that non-renewable resources shall be used

efficiently and their use limited to levels that can be offset by substitution by renewable resources or other forms of capital. Assimilation means that releases of hazardous or polluting substances to the environment shall not exceed its assimilative capacity; concentrations shall be kept below established critical levels necessary for the protection of human health and the environment. When assimilative capacity is effectively zero (e.g. for hazardous substances that are persistent and/or bio-accumulative), a zero release of such substances is effectively required to avoid their accumulation in the environment. Avoiding irreversibility means that irreversible adverse effects of human activities on ecosystems and on biogeochemical and hydrological cycles shall be avoided; the natural processes capable of maintaining or restoring the integrity of ecosystems should be safeguarded from adverse impacts of human activities; and the differing levels of resilience and carrying capacity of ecosystems must be considered in order to conserve their populations of threatened, endangered and critical species.

In the recent report, the *OECD Environmental Outlook to 2030*, the costs of policy inaction were found to be particularly high for water pollution, especially in developing countries; for air pollution the costs were as much as a few percentages of GDP in the US, the European Union (EU) and China; and for climate change, the costs of inaction were in the range of 1–10 per cent of global output.

The roles of the main actors

Governments, business and households can all contribute to the common task of decoupling. The voluntary actions of business and households can directly reduce the intensity of some environmental pressures; they can also reveal the relatively low costs entailed by many measures which reduce environmental pressures; and they can help raise environmental consciousness which can lead to heightened expectations (and demand) for government action.

Business can benefit from voluntary action to reduce environmental pressures, especially when the measures reduce costs (eco-efficiency) or help the firm to secure a competitive edge in certain markets. Households can also benefit directly by reducing costs (for example, water and energy) through more efficient behaviour.

However, voluntary actions are no substitute for action by governments, especially since the costs of pollution are often borne only to a small degree by the polluters themselves, but mostly by others. Government policy measures are thus required to 'internalize' these costs, and thus make the 'polluter pay', a principle politically binding on OECD member countries. With regard to natural resource use, the problem is often that of open access to common resources such as fisheries. Without restrictions on access to ensure that resource use is kept within the limits of sustainable use, resources will be overused. This is because it is not in the interest of any single producer to reduce effort since this will only serve to increase the profits of other producers

if they do not follow suit. Once access is controlled by a suitable regulatory framework, charges can be levied equal to the value of the resource rents. Application of this second OECD principle, that of 'user pays', is a necessary but not always sufficient condition for ensuring sustainable use of natural resources.

Environmental policy measures

Government has an array of measures at its disposal for implementing environmental policy, including: direct regulation of the command and control variety; economic instruments such as environmental taxes and tradable emission permits; and information tools, such as pollutant release and transfer registries and environmental labelling. These instruments can be used singly, or in combination, and the judicious selection of a suitable policy instrument (or mix) can substantially reduce the cost of achieving environmental goals.

Information for decision-making is crucial for making sound policy and for monitoring progress. Indicators to measure decoupling have been developed and are regularly published by the OECD as part of its key indicators, as well as by the European Commission, and many national governments. These are based on a small subset of environmental data that are now regularly collected by members of the European Commission and by other OECD countries. The more extensive pollutant release and transfer registry systems often track dozens of particular pollutants known to have negative impacts on human health and the environment. These inventories are also increasingly being made available online. An OECD-coordinated programme to assess the potential impacts of chemicals produced in high volumes also generates information useful to governments and the general public in deciding on the stringency of environmental regulations.

Estimates of the cost of more ambitious environmental policies

Efficient environmental policies are important since direct expenditures for pollution prevention and control in OECD countries already range from 0.5 to 2.1 per cent of GDP. It is important to recognize that increasing environmental expenditure in itself does not reduce GDP; instead it redirects economic activity toward the purchases of goods and services required for environmental management. The size of the environmental goods and services industry was estimated at more than US$650 billion worldwide in 2005, about 1 per cent of world GDP. Jobs are created in the waste management industry in the supply of engineering goods (pipes, pumps, filters, etc.) for wastewater management, consultancy services for undertaking environmental impact assessments, and specialized energy products, such as wind turbines, solar panels, etc.

However, there is an indirect effect on GDP. It has been estimated, for example, that the additional costs of implementing measures to reduce a number of environmental pressures could lower GDP in OECD countries by

about 1.2 per cent in 2030, and more ambitious measures to reduce CO_2 to a safe level by 2050 could cost even more, slowing the rate of GDP growth by about 0.1 per cent per year over 25 years. This indirect impact on GDP arises from increasing the capital and/or operating costs of production in areas affected by regulation as calculated by mathematical economic models that assume full employment and an economy-wide savings rate that does not change in response to the increase in capital-output ratios which some types of environmental policies would impose on business.

So securing environmental stability does come at a cost. The displacement effect mentioned above means lower final consumption of goods and services purchased by households as some labour and capital are transferred to the sectors producing environmental goods and services; and slightly lower productivity (by raising the cost of production) which would mean slightly lower GDP in the future than would otherwise be the case. However, the environmental benefits that would accrue to ourselves and future generations are widely estimated to exceed these costs when both are properly calculated.

Introductions

I

Jim MacNeill, OC
Secretary-General of the World Commission on Environment and Development, and chief architect and lead author of its report, Our Common Future *(1987)*

When we launched *Our Common Future* at a major event in London on 27 April 1987, I never expected that within a year our recommendations would be endorsed by the UN system, regional bodies like the Association of Southeast Asian Nations (ASEAN), OECD and the Commonwealth, as well as the World Bank and all of the regional banks. Nor did I expect that within two years, our recommendations would begin to reshape curricula in universities and graduate schools and would become a preoccupation of a growing number of leading companies worldwide. Nor that within five years, our recommendation that an international conference be held to review progress and develop plans for a global transition to more sustainable forms of development would be realized through the 1992 Earth Summit in Rio.[1] I also never expected that within a few years the words 'sustainable development' would become part of the common everyday lexicon of humankind. I must add in that respect that I also never thought that the concept of sustainable development could and would be interpreted in so many different ways. I sometimes think that a new way to define 'infinity' is the ever-expanding number of interpretations of sustainable development. Many of these, of course, are totally self-serving. In fact, the concept raises profound questions about values and about our relationship with nature, on whose integrity and stability all life depends, as well as implying a revolution in the way we now do business.

In 1987, we thought the concept was plain enough. We defined sustainable development in several ways including ethical, social and ecological. A number of the definitions appeal to me: for example, development based on 'consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire'. Or development that, 'at a minimum ... must not endanger the natural systems that support life on Earth: the atmosphere,

the waters, the soils and the living beings'.[2] Only one definition grabbed the headlines, however, and stuck, unfortunately to the exclusion of all the others. It's the one that features the need for intergenerational equity:[3]

> *Development which meets the needs and aspirations of the present generation without compromising the ability of future generations to meet their own needs.*

In addition to defining the concept from various perspectives, the Commission put forward a number of broad directions that development must take if it is to be sustainable. We called these directions and the policy changes needed to achieve them 'strategic imperatives'.[4] They range from ensuring a sustainable level of population, to increasing equity within and between nations, to reducing poverty, reducing the energy and resource content of growth, reorienting technology, and merging environment and economics in decision-making. We also discussed other imperatives like opening information systems, supporting human rights and empowering indigenous peoples.

These imperatives are fundamental to any transition to sustainability. Some of them have received considerable attention since 1987 and we've seen some progress. In no case, however, has it been at the pace and scale needed to keep up with the unsustainable trends we charted in *Our Common Future*. Our failure to address these imperatives more effectively and rapidly is, I think, linked directly to our failure to make any real progress on the most critical of the imperatives: the urgent need to 'merge environment with economics in our processes of decision-making', not only in the cabinet chambers of government but also in the board rooms of industry and the kitchens of our own homes.

I call this the 'forgotten imperative of sustainable development'. Yet, it is the most important imperative of all. If we change the way we make decisions, we will change the decisions we make – if we don't, we won't. One of the key assumptions underlying *Our Common Future* was that we could and would change the way we make decisions. This new book by The Natural Edge Project, *Cents and Sustainability*, will help us move significantly in that direction.

We have in fact made some progress on this imperative but, in my experience, mainly in the corporate sector in Europe and Asia.[5] In the governmental sector, with perhaps a few small exceptions, there has been very little movement. We devoted an entire chapter of *Our Common Future* to the institutional and legal changes needed for sustainable development and, in my view, we could hardly have been more clear. Some of us who were there will recall that during the late 1960s and 1970s, governments in over 100 countries established special environmental protection and resource management agencies. But, without exception, they failed to make their powerful central economic, trade and sectoral agencies in any way responsible for the environmental implications of the policies they pursued, or the revenues they raised, or the expenditures they made. Moreover, almost without exception, the new

environmental agencies were given extremely limited mandates. They were told to focus on the downstream end of the development cycle. In fact, they were told to take development as a given and to worry about ways and means to deal with the negative effects of development on health, property and ecosystems. Moreover, they were told to do so almost exclusively with add-on technologies, add-on policies and add-on politics.

Our economic, trade, energy and other sectoral agencies, on the other hand, retained their historic mandates intact, along with their unfettered control over the tax system and over a critical menu of incentives, such as grants and subsidies to industry, fossil fuel and nuclear energy, agriculture, fisheries, forestry, etc. These are, of course, the policies that command the biggest budgets. These are the policies that encourage farmers to spend their ecological capital or build it up. These are the policies that encourage the forest industry to draw down its forest capital or build it up; that encourage industry to build environment into product design or not; and manufacturing processes and marketing that encourage consumers to use more or less energy, or to purchase or not purchase environmentally friendly products.

What is the most significant statement of environmental policy that any government makes in any given year? Clearly, it's not the report of the minister of environment. As I have observed and stated repeatedly since my days in the OECD, it is the budget of the minister of finance. The government's annual budget sets out the framework of incentives and disincentives within which businessmen, farmers and households make their decisions. It determines, more than any other single statement of government policy, whether development will move in directions that are sustainable or unsustainable. In terms of power and resources, with few exceptions, the environment agency is the low man on every totem pole. In my years with the OECD, the Commission and the World Bank, visiting governments around the world, I often noted that if there were 25 ministers in the government, the last on the protocol list, and the weakest, is the environment minister. Unless, of course, they had a sports minister, or an urban affairs minister – in which case, environment may rise a few ranks. Yet, as you all know, whenever there's an environmental problem – whether it's a polluted well or soil erosion or climate change – everyone expects the environment minister to solve it. I remember a meeting in Oslo in the mid-1980s sitting around a table discussing this with Mrs Brundtland. She was then Prime Minister and had been Norway's Environment Minister for years. She said, and I paraphrase, 'Yes, Jim, you know, it's true. Environment ministers do spend most of their time trying to repair the damage caused by the policies of their colleagues.' The Earth can no longer bear the consequences of these institutional arrangements. It is past time to make the strongest ministers in government responsible for the ecological consequences of their policies. In 1960, global population stood at 3 billion and global GDP came in around US$6 trillion. Today, with population at 6.5 billion and GDP around US$60 trillion, our economic and ecological systems are now totally interlocked: till death do them part. It is time for governments to end the institutional divorce between the environment and the