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ENVIRONMENTAL ACCOUNTING FOR DECISION-MAKING

SUMMARY REPORT OF AN OECD SEMINAR

ORGANISED BY THE OECD ENVIRONMENT DIRECTORATE IN CO-OPERATION WITH THE OECD STATISTICS DIRECTORATE

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Paris 1995

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RÉSUMÉ

Ce rapport, préparé par le Secrétariat de l'OCDE, rend compte du séminaire OCDE sur "La comptabilité environnementale à l'usage des décideurs", (27 et 28 septembre 1994, Paris). Ce séminaire s'inscrit dans les travaux du Groupe de l'OCDE sur l'état de l'environnement dont un des principaux objectifs est de parvenir à une meilleure prise en compte de l'environnement dans la décision économique. Il a été préparé et organisé en coopération avec la Direction des Statistiques de l'OCDE.

Au cours de ces dernières années, la comptabilité environnementale a bénéficié d'un regain d'intérêt et d'abondants travaux lui ont été consacré. Mais, la plupart de ces travaux éclairaient les aspects méthodologiques. Le séminaire s'est donc intéressé à l'utilité réelle et potentielle des divers types de comptes d'environnement pour les décideurs. Les discussions ont été guidées par trois objectifs : i) faire le point sur les développements dans les pays Membres et les organisations internationales; ii) déterminer l'intérêt pratique et la pertinence des comptes d'environnement pour les décideurs et identifier les écarts qui peuvent exister entre l'offre et la demande dans ce domaine; et iii) définir des orientations pour les travaux futurs.

Les conclusions principales du séminaire se résument comme suit:

- Les utilisations les plus prometteuses des comptes d'environnement se situent aux niveaux où l'adéquation entre l'offre et la demande est la meilleure. Au niveau macroéconomique, où la demande porte souvent sur la mise au point d'une comptabilité économique verte, les discussions ont mis en évidence un écart important entre l'offre et la demande, les usages concrets des comptes étant mal définis et les problèmes méthodologiques non négligeables. Au niveau sectoriel ou mésoéconomique, où la demande est généralement liée à des besoins de gestion ou de planification bien définis (p.ex. gestion de l'eau, gestion des forêts), l'usage des comptes comme outil de décision présente un bon potentiel et l'écart entre l'offre et la demande est minime. Au niveau microéconomique, où la demande émane des entreprises qui, soucieuses de leur image de marque et d'une gestion plus efficiente, ont de plus en plus recours à des outils comme les audits environnementaux ou les analyses de cycle de vie, l'utilité des comptes est réelle et leur pertinence élevée.

- Les problèmes méthodologiques posés par l'évaluation monétaire globale des dommages à l'environnement et de l'épuisement des ressources sont loin d'être résolus et seuls quelques pays s'engagent dans cette voie. D'autres s'orientent vers une approche par milieux ou ressources spécifiques. Cette approche a l'avantage d'être progressive et pragmatique.

- Pour que la mise en place et l'utilisation de comptes réussissent, il est recommandé: i) d'engager et de poursuivre le travail dans une même institution; ii) de consulter tous les acteurs concernés et de les impliquer dans les travaux par une coopération horizontale et verticale ; et iii) de veiller à la crédibilité des comptes à travers une reconnaissance internationale.

- L'interprétation et la diffusion d'informations liées aux comptes d'environnement doivent obligatoirement être accompagnées d'efforts d'information et de formation pour que les utilisateurs des comptes, les journalistes et le public soient conscients des objectifs et des limites de ces comptes.

- Les travaux futurs devront se concentrer sur l'utilisation concrète des comptes et s'incrire dans une démarche pragmatique, en particulier : i) les liens entre les comptes physiques et les comptes monétaires; et ii) les liens entre les comptes et les indicateurs d'environnement.

Dans ce contexte, l'OCDE continuera d'être un forum d'échange d'idées et d'expériences et utilisera son savoir-faire pour mieux intégrer les approches économique et environnementale.

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ENVIRONMENTAL ACCOUNTING FOR DECISION-MAKING

This report, prepared by the OECD Secretariat, provides the summary of an OECD seminar on "Environmental Accounting for Decision-Making", held on 27-28 September 1994 in Paris. The Seminar was prepared and held in co-operation with the OECD Statistics Directorate.

1. BACKGROUND

One of the major objectives of the work conducted by the OECD Group on the State of the Environment is the improved integration of environment and economic decision-making. Environmental accounting provides one of the tools for integration and forms part of the work programme of the Group on the State of the Environment. In addition, National Accounts Experts addressed aspects of environmental accounting at meetings in 1990 and 1994.

During recent meetings, the Group on the State of the Environment identified two trends concerning environmental accounting:

-- To date, a considerable amount of work in academia and by non-governmental organisations (NGOs), national administrations and international organisations has been carried out to develop, discuss and refine methodologies of environmental accounting. Empirical and practical applications of these methodologies have, however, been more thinly spread. Thus, most of the work completed sheds light on the supply side of the tool "environmental accounting". Analysis has dwelt hardly at all on the actual use of environmental accounts and the assessment of how the needs of decision-makers (the demand side) are best taken into account.

-- There is general interest in environmental accounting, articulated by general policy-makers who have mandated work on "green GDP" and "green accounting".

For the OECD Group on the State of the Environment, the question arose how current methodologies and results in environmental accounting could respond to this new demand and how environmental accounts could provide a useful tool for environmental and sectoral decision-making. To discuss these points, the Group agreed to hold a seminar, in collaboration with the OECD Statistics Directorate.

The following three objectives guided the seminar:

-- taking stock of developments in OECD Member countries and international organisations;

-- exploring the policy relevance and practical significance of environmental accounting for decision-making and identifying possible gaps between the supply of and demand for the tool "environmental accounting";

-- outlining strategies for future work.

The interest in these questions by countries was confirmed through the participation of over 80 representatives of OECD Member countries, observer countries and international organisations in the seminar on 27-28 September 1994 in Paris.

Environmental accounting: terminology

The terminology used in OECD work on environmental accounting was adopted in a report to OECD Environment Ministers in 1991. The report made reference to three approaches, distinguished by their proximity to the System of National Accounts:

-- *Natural resource accounts*: natural resource accounts aim at collecting, within a consistent framework, quantitative and qualitative information on the stocks and flows of natural resources. Typically, this information is expressed in physical units.

-- *Satellite accounts*: they complement the economic information drawn from national accounts without modifying the system of national accounts. Satellite accounts combine physical information from environmental statistics and natural resource accounts with monetary information such as environmental expenditure or environmental damage costs. Information drawn from satellite accounts can be used, inter alia, to calculate alternative national accounts aggregates. These alternative aggregates are conceptually different from the adjustment of the system of national accounts as described below.

-- *Adjustment of the System of National Accounts*: this approach aims at adjusting the framework and boundaries of national accounts to deal with their shortcomings with respect to the environment (neglect of the depletion of many natural resources, inadequate treatment of "defensive" expenditure, failure to account for degradation of environmental quality).

The present report uses this terminology. Other useful classifications of environmental accounting exist, however; for example, one proposed by the Netherlands at of the OECD seminar.

2. DISCUSSION OF ISSUES

A set of issues was identified to focus the discussion at the seminar. The following section sums up the discussion held in connection with the various issues.

Issue 1: Who expresses the demand for environmental accounting?

Seminar participants identified three sources of demand:

First, general policy-makers, NGOs and the broader public among whom interest in environmental accounting may be seen. Calls for improved information for decision-making were, for example, articulated:

-- at the national level, for example in the United States, where President Clinton, in his 1993 "Earth Day Initiative", mandated the development of environmental accounting (Annex 2);
-- by international bodies such as the Commission of the European Community and the European Parliament (Annex 2);

-- in major international meetings such as the 1992 Earth Summit in Rio;
-- by NGOs, e.g. the World Wildlife Fund and the Environmental Defense Fund.

This type of demand, motivated by a general concern for the environment, is often formulated in broad terms such as "green accounting" or "green GDP".

Second, environment and accounting specialists. Specialists' demand for environmental accounting is frequently linked to specific sectoral, planning or management needs. This type of demand often involves the development of physical accounts (e.g. energy, forest, water) with clear specifications of the type and use of accounts. Similarly, accounting specialists, who are aware that traditional economic aggregates do not reflect environmental degradation and natural resource use, have advocated the development of satellite accounts and specific information such as environmental expenditure.

Third, the business community and individual firms. The business community increasingly demands environmental accounting at the micro level, for example through eco-audits and life-cycle analysis of products. Demand for these tools is in response to market forces (e.g. "green consumerism") and government policies.

Issue 2: What are the most promising uses of environmental accounts? Are there concrete examples of the impact of information derived from environmental accounts on policy decisions?

In line with three types of demand (see issue 1), three levels of aggregation were identified during the discussion of the uses of environmental accounting:

First, the macro level, which constitutes the highest level of aggregation in environmental accounting, mainly through the calculation of alternative national accounts aggregates such as environmentally adjusted GDP ("green GDP"). It appears it is at this level that uses are least clearly defined and discrepancies between demand for environmental accounting and the current possibilities of supply are greatest. Reasons for this discrepancy are largely rooted in methodological problems and a lack of data, which leave large uncertainties with adjusted aggregates:

Adjustments of national accounts aggregates are based on the observation that traditional measures of economic activity do not or only inadequately reflect the depletion of natural resources and the degradation of environmental quality. The introduction of the consumption of natural capital and the loss of environmental quality constitute the "greening" of GDP. Measurement of these adjustments is, however, difficult, in particular with respect to the degradation of environmental quality. In OECD countries where the degradation of environmental quality tends to be a very important issue, these measurement difficulties weigh heavily. As a consequence, the appropriate adjustments to GDP are either omitted or remain contestable and a gap between demand for and supply of "green GDP" emerges.

Currently, only a few countries pursue the measurement of alternative *national accounts aggregates* and none of the countries present at the seminar intends to adjust its standard *system of national accounts* to reflect resources and the environment.

Second, the sectoral level: environmental accounting at the sectoral level relates to more narrowly defined fields of application than accounting at the macro level. At the sectoral level, accounting is often

in physical terms, dealing with specific environmental media and natural resources such as water, forests or energy. The purpose of sectoral accounting is frequently the management and planning of natural resource use, and associated indicator development. Thus, demand tends to be clearly identified and linked to specific policy questions. Interaction between demanders and suppliers is closer than with accounting at the macro level and fewer methodological problems exist. This narrows a potential gap between demand and supply.

Sectoral accounts: examples from OECD countries

Recent examples of sectoral accounts, mostly in physical terms, include:

-- the recently developed water accounts in Spain: they respond to a pertinent problem of water management and provide: i) a systematic tracing of quantities of water flows; ii) information on the quality of surface water; and iii) links to the economic sphere through expenditure and price data;

-- forest accounts in Japan, which are used to trace national and international flows of timber: this information provides a tool for trade and environment analysis;

-- energy accounts in Norway, which have a well-defined role in energy policy and planning and which are linked to economic models;

-- water accounts in France, which are developed for water management purposes in river basins;

-- accounts for crude oil and natural gas in Alberta, Canada, are developed in physical and monetary terms: they form part of a broader effort to derive National Balance Sheet Accounts and provide information for efficient resource management.

Third, the microeconomic level: during the seminar, it was pointed out that environmental accounting efforts at the firm level were rapidly gaining pace. Enterprises realise that accounting tools provide a reply to green consumerism and can also be a means to reduce costs. The International Standards Organisation is currently concerned with developing standards for environmental audits -- a necessary condition to ensure their credibility. As supply of and demand for environmental accounting coincide at the microeconomic level, no gaps exist and practical relevance is high.

Issue 3: Valuation of environmental degradation and resource use: incremental or comprehensive?

Seminar participants confirmed the significance of methodological and measurement problems associated with efforts at comprehensive valuation, aiming at incorporating all types of environmental degradation and resource use. It was therefore discussed whether incremental valuation, which is limited to specific environmental media or natural resources, constitutes an alternative. Advantages of incremental accounting are that it constitutes a first, concrete step towards more comprehensive valuation and that it illustrates that the use of specific natural resources has its price. The danger with incremental accounting

is the risk of sending the wrong signals: unless carefully presented, these measurements can be misinterpreted as comprehensive accounting, leading to serious undervaluation of environmental problems.

Currently, only a very few countries aim to carry out comprehensive valuations. Several strategies are representative of initiatives in OECD countries. They include:

-- Careful labelling of incremental valuation in the United States: to date, the environmental accounting published by the Bureau of Economic Analysis has been limited to subsoil assets. The Bureau of Economic Analysis is very careful not to associate its work with the notion of "green GDP", so as to avoid misinterpretation of results. Rather, technical wording is used (e.g. "Integrated Environmental Economic Satellite Accounts") to underline the fact that results do not lend themselves to modifying GDP in any comprehensive way.

-- Simplified methods for comprehensive valuation in the Netherlands: the Central Bureau of Statistics (CBS) in the Netherlands aims at providing comprehensive accounting, covering as many environmental aspects as possible. CBS uses a simplified methodology: as the greatest measurement hurdle is the valuation of environmental damage ("damage cost approach"), an "avoidance cost approach" is chosen (which measures abatement costs instead of damage costs) to put money value on environmental degradation. Outcome and interpretation of the two approaches differ significantly, however, and the question remains whether it will be possible to transmit this distinction to users of such accounts, in particular if they are non-specialised.

-- Short-cut methods for incremental accounting at the World Bank: in addition to calculating environmentally adjusted *levels* of net national product (NNP), the World Bank uses a short-cut method to calculate total wealth, including natural and human capital. Under the World Bank methodology, "genuine savings rates" are calculated. Genuine savings are those savings that are left once the necessary deductions for depreciation, depletion and degradation of man-made, natural and human capital stock are taken into account. If genuine savings are zero or negative, a situation of non-sustainability has arisen. Although measurement and methodological problems remain, the World Bank considers genuine savings rates as a pragmatic method, which provides some first indication about non-sustainability, in particular for developing countries.

Issue 4: Institutional arrangements

Institutional arrangements to carry out environmental accounting vary widely among OECD countries. Arrangements include work led by statistical agencies, environment ministries, environment agencies, private institutions and individuals; no single optimal institutional arrangement can be identified. During the seminar, several institutional factors were identified that can foster acceptance and credibility of environmental accounts:

-- continuity of work in one institution;

-- consultation and consensus-building with domestic stakeholders. Accounting necessitates co-operation with sectoral ministries and decision-making bodies (energy, economics, transport, agriculture, water boards, etc.). Involvement of these agencies can be lengthy but has

significant pay-offs in terms of acceptance of results. A similar argument applies to the relationship between regional and federal authorities;

-- presence and recognition of a country's environmental accounts at the international level.

Issue 5: Interpretation and dissemination of results

Providing environmental and economic information to the public is one of the major objectives of environmental accounting. For example, providing citizens with information about the costs of environmental degradation is important in laying the groundwork for informed consideration of environmental policies. At the same time, the results of environmental accounting, more often than not, need qualifications and careful interpretation due to methodological and empirical shortcomings. Thus, the education of users, the interested public and the press turns out to be a key element to ensure appropriate interpretation of results. Experience, for example in the United States, shows that there are many problems in communicating messages emerging from environmental accounting. More effort will thus be needed to inform users and the public about appropriate interpretation, objectives and limits of environmental accounting.

Potential uses of environmental accounts for analysis*

Natural resource accounts (tracing the quantity and quality of resources), in combination with economic models, can be used to analyse various environment/economy issues, including:

- measuring physical scarcity of natural resources;
- improving resource management: generating empirical evidence of over exploitation;
- establishing a balance sheet of resource sectors: analysis of sectoral economic performance (e.g. productivity) taking into account resource depletion;
- measuring total wealth in examining policies for sustainable development;
- valuing environmental degradation and depletion of natural resources;
- measuring the incidence of environmental regulations and taxes;
- estimating optimal emission tax rates;
- measuring the efficiency of natural resource use by economic sector;
- dealing with aspects of international trade and the environment;
- analysing structural changes in the economy;
- linking pollution components to standard macroeconomic models;
- tracing the dispersion and impact of pollution;
- measuring the economic effort to abate pollution and to protect the environment;
- measuring the sectoral costs associated with government regulation and policy;
- measuring unit abatement cost.

** Source: K. Hamilton, "Environmental Accounting for Decision-Making", Background paper to the OECD seminar, September 1994.*

Issue 6: Strategies for future work

Role of OECD

There was consensus among seminar participants that the OECD should build on its experience with the integration of environmental and economic thinking and work towards closing gaps between supply and demand in the area of environmental accounting. In particular, the OECD should continue to provide a forum for the exchange of views, in:

-- the OECD Group on the State of the Environment;
-- the OECD National Accounts Experts Group;
-- ad-hoc meetings, bringing together environmental specialists, statisticians and national accountants.

Generally, work should be concrete, user-oriented and pragmatic in its ambitions to capture aspects of environment/economy interaction.

Specific areas

More specific fields for future work identified by seminar participants were:

-- Linking physical and monetary accounting. While links between physical and monetary accounts are already well-established in conceptual terms (e.g. in the Integrated Environmental and Economic Accounting methodology developed by UNSTAT), the approaches tend to remain separate in practice. Exploring the links between physical and monetary accounts could be fruitful, in particular at the sectoral level. One example of such a link is found in the water accounts in Spain, which combine information on water quantity and quality with information about expenditure on water pollution abatement and mobilisation of resources.

-- Linking environmental indicators and accounting. Often, indicators and accounting stand for two distinct approaches to providing information on the environment. Systems of environmental indicators tend to be comprehensive with respect to environmental issues; they are typically in physical units and are often developed by science-oriented institutions or personnel. Accounting approaches tend to be less comprehensive in terms of environmental issues but provide a more systematic and rigorous treatment for those topics that are included. Environmental accounting very much reflects economic thinking and methodology rather than a science-based approach. While both approaches have their merits and drawbacks, a conceptual integration of the two and increased interaction among their various proponents would be fruitful. The Netherlands NAMEA approach (see Annex 1) constitutes an example of how indicators can be integrated into an accounting framework.

ANNEX 1
OVERVIEW OF CURRENT ENVIRONMENTAL ACCOUNTING ACTIVITIES

Country	Activity	Empirical results available
Canada	Natural resource accounts	
	- forestry	✓
	- energy	✓
	Environmental accounts: greenhouse gas emissions	✓
United States	Satellite accounts:	
	- framework (IEESA)	
	- subsoil assets	✓
	Environmental expenditure	✓
Mexico	Adjustment of national accounts	✓
Japan	Natural resource accounts: forests	✓
Australia	Satellite accounts: expanded national accounts balance sheet	
	Environmental expenditure	✓
New Zealand	Natural resource accounts: feasibility studies	
Austria	Satellite accounts: framework	
	Environmental expenditure	✓
Denmark	Environmental expenditure	✓
	Satellite accounts: framework and emission models	
Finland	Natural resource accounts: wood material	✓
	Environmental expenditure	✓
France	Natural resource accounts:	
	- framework ("patrimony" accounts)	
	- water	✓
	- forest	✓
	Environmental expenditure	✓
Germany	Satellite accounts:	
	- framework (Comprehensive Environmental-Economic Accounting)	
	Adjustment of GDP (in co-operation with the Netherlands)	
	Environmental expenditure	✓
	Input/output analysis of expenditure	✓
Greece	Environmental expenditure	✓ .../...

ANNEX 1 (continued)
OVERVIEW OF CURRENT ENVIRONMENTAL ACCOUNTING ACTIVITIES

Country	Activity	Empirical results available
Netherlands	Adjustment of GDP (in co-operation with Germany)	
	Satellite accounts: integration of indicators in a national accounting matrix including environmental accounts (NAMEA)	✓
	Environmental expenditure	✓
Norway	Natural resource accounts:	
	- energy	✓
	- forests	✓
	- land use	✓
	- fish	✓
	- minerals	✓
	- air emissions	✓
Portugal	Environmental expenditure	✓
Spain	Natural resource accounts: water	✓
	Environmental expenditure	✓
Sweden	Natural resource accounts:	
	- forest	✓
	- sulphur project	
	- energy	
United Kingdom	Environmental expenditure	✓
UNSTAT	Satellite accounts:	
	- framework (SNA Handbook of Integrated Environmental and Economic Accounting)	
	- projects in Indonesia, Korea, Colombia, Ghana	✓
World Bank	Adjustment of national account aggregates	✓
UN-ECE	Natural resource accounts: pilot studies on land use/cover and nutrients	
Eurostat	SERIEE system: pilot studies	
	"Pressure index" project	
OECD	Environmental expenditure	✓
	Natural resource accounts: pilot studies on water and forest	

ANNEX 2
POLITICAL MANDATES TO DEVELOP ENVIRONMENTAL ACCOUNTING: RECENT EXAMPLES

Extract from the 5th Environmental Action Programme for the European Union: "Towards Sustainability"

Endorsed by the Environment Council on 15/16 December 1992

Chapter 15: The Question of Cost

...The following 5-point plan is advanced as a package to be pursued during the term of the Programme in order to [...] devise an appropriate and effective costing mechanism which will serve the dual requirement of environmental protection and sustainable development:

- As a matter of priority, improved information on the state of the environment, appropriate indicators and tolerance capacities must be made available to policy makers in order to better define sustainable development parameters.

- Further intensive research efforts are needed to value and account for the environment; international co-ordination and burden-sharing should be encouraged wherever possible in this domain. Appropriate discount rates should be chosen to safeguard the rights of future generations with due allowance for uncertainty and risk.

- A Community cost-benefit methodology should be drawn-up [...].

- All Community environmental policies and other policies having an environmental dimension must be costed as comprehensively as possible [...].

- Environmentally adjusted (i.e. to take account of the natural resource stock of air, water, soil, landscape, heritage etc.) national accounts should be available on a pilot basis from 1995 onwards for all Community countries, with a view to formal adoption by the end of the decade.

ANNEX 2 (continued)
POLITICAL MANDATES TO DEVELOP ENVIRONMENTAL ACCOUNTING:
RECENT EXAMPLES

Extract of the Minutes of the Meeting of the European Parliament
Resolution on the Inclusion of Environmental Considerations in the alculation of Gross National Product

22 April 1994

The European Parliament,

--having regard to the Fifth Environmental Action Plan "Towards Sustainability";
--having regard to the commitments entered by the EC in Rio, especially Agenda 21;
--having regard to the Council resolution on the Fifth Environmental Plan;

[...]

1. Calls on the Commission to improve the quality and quantity of the collection of environmentally relevant data so that correct assessment and appraisal of environmental conditions may lead to an improvement of the environmental policy and thus to an improvement in the quality of life.

[...]

3. Advocates the closest possible cooperation between Eurostat, the European Environment Agency, the national statistical offices, the national environmental agencies and international organisations such as the UN and especially the OECD, so that meaningful statistical data on the environment can be compiled jointly.

4. Calls on the Commission and the Member States to give an impulse to the scientific community to advance in the discussion and to achieve a consensus on the hierarchy and quantitative evaluation of the different environmental problems in order to come to useful and acceptable environmental indicators, eco-balances and green accounting.

[...]

7. Welcomes the Commission’s environmental pressure index project and calls for its research findings to be made available in the near future; calls on the Commission to put forward as soon as possible practical proposals based on the results of this project.

8. Calls on the Commission, and especially its Statistical Office, to step up its efforts to compile reliable and detailed statistics on waste, and particularly on pollution caused by waste, and on secondary raw materials, since the absence of such statistics is a serious obstacle to the introduction of "green accounting".

[...]

10. Calls on the Commission to conduct in-depth research with a view to proposing new national accounting systems based on the use of physical units (of energy, energy content, biodiversity, quantities of water etc.), rather than purely monetary units [...]

ANNEX 2 (continued)
POLITICAL MANDATES TO DEVELOP ENVIRONMENTAL ACCOUNTING:
RECENT EXAMPLES

UNITED STATES:
EARTH DAY ADDRESS ON "GREEN GDP"

21 April 1993

Our economic statistics measure virtually everything except the value of our natural resources and the environmental costs of our actions. President Clinton has directed the Bureau of Economics Analysis in the Department of Commerce to develop "Green GDP" measures to improve existing economic statistics that ignore the cost of pollution or the value of clean air. These "Green GDP" measures would incorporate changes in the natural environment into the calculations of national income and wealth.

The existing national income accounting system -- used here and in other countries essentially ignores the impact of economic development on the environmental resources that are the foundation of long-term prosperity. The current accounts provide mixed signals: for example, an oil tanker spill can increase GDP if the cost of clean-up is included as income to workers while the pollution costs of fouling the beach go unrecorded.

Within one year the Bureau of Economic Analysis will publish initial estimates of natural resource depletion. After a period of discussion and review, BEA will augment their regular economic indicator series to include a consistent set of natural resource adjustments.

ANNEX 3
LIST OF SEMINAR PARTICIPANTS

Country	Name	Organisation
Australia	Mr. Paul McCarthy	Australian Bureau of Statistics
Belgium	Mr. R. Brulard	Permanent Delegation of Belgium to the OECD
	Mr. Bruyneel	Société Flamande pour l'Environnement
	Mr. Dachelet	Ministère de l'Environnement
	Ms. Gouzée	Bureau du Plan
	Mr. S. Kempeneers	Institut Bruxellois pour la Gestion de l'Environnement
Canada	Mr. Piotr Andrzejewski	Department of Foreign Affairs and International Trade Ambassador for the Environment
	Ms. Alice Born	Statistics Canada, National Accounts and Environmental Division
	Mr. Paul Rump	Environment Canada, State of the Environment Reporting
	Mr. Tim Williamson	Natural Resources Canada, Canadian Forest Service
Denmark	Mr. Robert Heidemann	Danish Environmental Protection Agency
Finland	Mr. Heikki Salmi	Statistics Finland (Chairman)
	Ms. Camille Kippalen	Ministry of the Environment
	Mr. Leo Kolttola	Statistics Finland
	Mr. Heikki Sisula	Ministry of the Environment
	Mr. Erik Wahlström	Finish Environment Agency
France	Mr. Michel Braibant	Institut National de la Statistique et des Etudes Economiques
	Mr. Jean-Pierre Clair	Ministère de l'Equipement, des Transports et du Tourisme
	Mr. Daniel Desaulty	Institut Français de l'Environnement
	Mr. Bernard Guibert	Institut National de la Statistique et des Etudes Economiques
	Mr. Jean-Louis Weber	Institut Français de l'Environnement
Germany	Mr. Oswald Angermann	Federal Statistical Office
	Mr. Manfred Schulz	Permanent Delegation of Germany to the OECD
	Mr. Eberhard K. Seifert	Wuppertal Institute for Climate, Environment & Energy
	Mr. Karl Tietmann	Federal Environmental Agency
Italy	Mr. Roberto Caracciolo	Agenzia Nazionale Protezione Ambiente
	Mr. V. C. Pinnavala	Permanent Delegation of Italy to the OECD
	Mr. Aldo Ravazzi	Ministry of Environment
	Mr. Sammarco	Fondazione Mattei
Japan	Mr. Hiromichi Furido	Forestry and Forest Products Research Institute
	Ms. Mie Katsuno	Ministry of Agriculture, Forestry and Fisheries
	Mr. Yuichi Moriguchi	National Institute for Environmental Studies Center for Global Environmental Research
	Mr. Makoto Osawa	Permanent Delegation of Japan to the OECD

Country	Name	Organisation
Japan	Mr. Naoya Tsukamoto	Permanent Delegation of Japan to the OECD
(cont'd)	Mr. Mitsuyasu Yabe	Ministry of Agriculture, Forestry and Fisheries
Mexico	Ms. Celia de Ita	Sedesol, National Institute of Ecology
	Mr. F. Guillen-Martin	National Institute of Geography, Statistics and Informatics Regional Studies and Input Product
Netherlands	Mr. Peter Bosch	Central Bureau of Statistics
	Mr. M. de Haan	Central Bureau of Statistics
	Mr. R.E. Fredriksz	Ministry of Housing, Spatial Planning and Environment
	Ms. Frieda Fruitema	Ministry of Housing, Spatial Planning and Environment
New Zealand	Ms. Pamela Wilkinson	Permanent Delegation of New Zealand to the OECD
Norway	Mr. Ola K. Hunnes	Statistics Norway
	Mr. Ostein Nesje	Ministry of Environment, Environmental Data Section
Portugal	Ms. Manuela Amorim	Direction Générale de l'Environnement
	Ms. Ivone Martins	Direction Générale de l'Environnement
	Mr. Pedro Nunes Liberato	Instituto De Promocâo Ambiental
Spain	Mr. Angel Herrero	Dirección General de Politica Ambiental
	Mr. José Manuel Naredo	Fundación Argentaria
	Ms. Anabel Vizoso	Dirección General de Politica Ambiental
Sweden	Ms. Sofia Ahlroth	Swedish Institute of Economic Research
	Ms. Marianne Eriksson	Statistics Sweden, Environmental Statistics
	Ms. Eva Hellsten	Statistics Sweden, Environmental Statistics
	Ms. Manuela Notter	Swedish Environmental Protection Agency
	Ms. Inger Ohman	Statistics Sweden, Environmental Statistics
Switzerland	Mr. Patrick Ruch	Office Fédéral de l'Environnement, des Forêts et du Paysage
	Ms. Regula Schmid	Office Fédéral de la Statistique Service de Statistique Environnementale
	Mr. Louis-José Touron	Permanent Delegation of Switzerland to the OECD
United Kingdom	Mr. Alan Brown	Department of the Environment
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