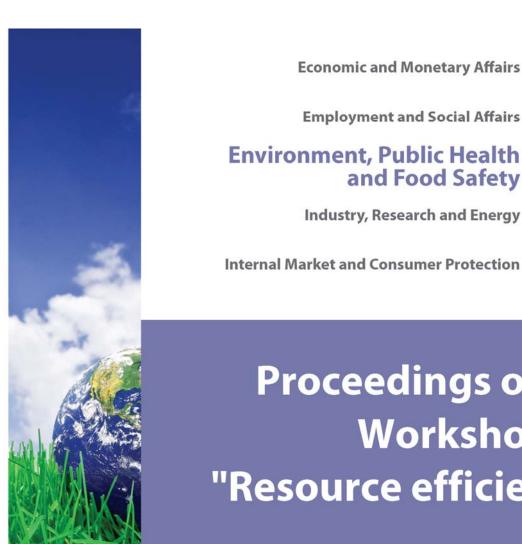


DIRECTORATE-GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT **ECONOMIC AND SCIENTIFIC POLICY**



Proceedings of the Workshop on "Resource efficiency"

WORKSHOP

EN 2012



DIRECTORATE GENERAL FOR INTERNAL POLICIES POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

Workshop on **Resource Efficiency**

Brussels, 31 January 2012

Proceedings

Abstract

Within the framework of the EU 2020 Strategy, the Commission adopted the Flagship Initiative on "A Resource Efficient Europe" in the beginning of 2011. This was followed by the "Roadmap for a resource-efficient Europe", which provides the framework in which future actions can be designed and implemented coherently. The workshop discussed the challenges and best practices in the light of the upcoming European Parliament's INI Report on "A resource-efficient Europe".

This document was requested by the European Parliament's Committee on Environment, Public Health and Food Safety

CONTRIBUTING EXPERTS

Alan SEATTER, Deputy Director-General for the Environment DG, European Commission Helen MOUNTFORD, Deputy Director of the Environment Directorate at OECD Prof. Dr. Ernst Ulrich VON WEIZSÄCKER, Co-Chair International Resource Panel, UNEP Dr. Yasuhiko HOTTA, Deputy Director of the Sustainable Consumption and Production Group, Institute for Global Environmental Strategies, IGES, Japan Dr. Per SANDBERG, Accenture and World Business Council for Sustainable Development Dr. Michael WARHURST, Senior Waste and Resources campaigner, Friends of the Earth Bernard LANFRANCHi, European Affairs Department Veolia Environnement Michal MIEDZINSKI, Coordinator Eco-Innovation Observatory, Technopolis Dr. Christian HAGELÜCKEN, Director EU Government Affairs, Umicore

SUMMARY PREPARED BY:

Mr Arkaitz USUBIAGA, Wuppertal Institute for Climate, Environment and Energy

RESPONSIBLE ADMINISTRATOR

Ms Catherine LAURANSON
Policy Department Economic and Scientific Policy
European Parliament
B-1047 Brussels

E-mail: Poldep-Economy-Science@europarl.europa.eu

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ABOUT THE EDITOR

To contact the Policy Department or to subscribe to its newsletter please write to: Poldep-Economy-Science@europarl.europa.eu

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CONTENTS

1. INTRODUCTION	5
2. BUILDING A RESOURCE EFFICIENT EUROPE	6
3. BEST PRACTICES AND POSSIBLE FUTURE DEVELOPMENTS	10
ANNEX 1: AGENDA	13
ANNEX 2: SHORT BIOGRAPHIES of the experts	15
ANNEX 3: PRESENTATIONS	19
Alan Seatter, DG Environment, European Commission	
Helen Mountford, OECD, Resource Efficiency – The OECD Approach	
Prof. Dr. Ernst Ulrich von Weizsäcker, UNEP, International Resource Panel	
Dr. Yasuhiko Hotta, IGES, Resource Efficiency Policies in Japan	
Dr. Per Sandberg, Accenture, WBCSD Vision 2050	
Dr. Michael Warhurst, Friends of the Earth, Policies for Resource Efficiency	
Bernard Lanfranchi, Veolia Environnement, Examples of best practices for addressing resource scarcity	
Michal Miedzinski, Technopolis, Eco-innovation challenge: turning costs into benefits for all?	
Dr. Christian Hagelücken, Umicore, Improving the recycling of	

materials - a key contribution to resource efficiency

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1. INTRODUCTION

The EU 2020 Strategy calls for smart, sustainable and inclusive growth. To boost the economy in this direction, the Commission adopted seven Flagship Initiatives:

Smart growth

- Digital agenda for Europe
- Innovation Union
- Youth on the move

Sustainable growth

- Resource efficient Europe
- An industrial policy for the globalisation era

Inclusive growth

- An agenda for new skills and jobs
- European platform against poverty

Due to increasing pressures on and the rising prices of natural resources, resource efficiency is one of the key to ensure competitiveness and jobs in Europe. The Flagship Initiative on Resource Efficient Europe aims to create a framework to pave the way for the transformation towards a resource efficient and low-carbon economy model that would contribute to:

- Boost economic performance while reducing resource use;
- Identify and create new opportunities for economic growth and greater innovation and boost the EU's competitiveness;
- Ensure security of supply of essential resources;
- Fight against climate change and limit the environmental impacts of resource use.

In response to the call for a roadmap to define the mid- and long-term goals, and the measures required, the Commission launched the Roadmap to a Resource Efficient Europe. The Roadmap provides the framework to reach the following vision:

By 2050 the EU's economy has grown in a way that respects resource constraints and planetary boundaries, thus contributing to global economic transformation. Our economy is competitive, inclusive and provides a high standard of living with much lower environmental impacts. All resources are sustainably managed, from raw materials to energy, water, air, land and soil. Climate change milestones have been reached, while biodiversity and the ecosystem services it underpins have been protected, valued and substantially restored.

In the context of the coming INI Report on "A resource-efficient Europe" in response to the Commission flagship initiative under the Europe 2020 strategy, the ENVI committee organised a workshop on "Resource Efficiency: challenges and best practices", which took place at the European Parliament in Brussels on Tuesday 31 January 2012.

The workshop was structured in two sessions. The first part of the workshop, chaired by **Gerben-Jan Gerbrandy (ENVI MEP and Rapporteur)**, aimed at stressing the urgent challenge for Europe to use natural resources in a more sustainable manner. The second part, chaired by **Karl-Heinz Florenz (ENVI MEP and shadow Rapporteur)**, consisted in a panel comprising different stakeholders that presented concrete examples and best practices that value resources in a more realistic manner and also lead to economic advantages.

2. BUILDING A RESOURCE EFFICIENT EUROPE

In his opening remarks, **Gerben-Jan Gerbrandy (ENVI MEP and Rapporteur)** thanked the speakers and the attendees for the participation in the event. He stressed then how the increasing prices of resources are affecting not only business, but also regular people. In this vein, he cited the latest report by McKinsey in which it is stated that the European industry could save around \$630bn/year through a more efficient use of resources.

Before introducing the first speaker, Mr Gerbrandy highlighted the diversity of the panels, which brought together representatives from NGOs, business and academia.

Alan Seatter (Deputy Director-General for the DG Environment of the European Commission) started his intervention by stressing the interdependency between the economy and the environment. In this line, he cited the 'Resilient People, Resilient Planet' report published by the United Nations Secretary-General's High-level Panel on Global Sustainability, which states that two thirds of the services provided by nature to humankind are in decline. This has impacts on energy, water and land, ultimately putting food production at stake.

Mr Seatter referred then to the lack of markets and prices to manage ecosystems. As he explained, from an environmental point of view, this fact hinders the identification of problems. From an economic point of view, the lack of markets and prices hampers the proper measurement of opportunities and costs. Thus, he acknowledged the existence of a gap between the economy and the environment, when it comes to ecosystems. Mr Seatter clarified then that the 'Resource Efficiency Roadmap' and the new 'EU Biodiversity Strategy to 2020' aimed among other things at mapping and valuing ecosystems.

In this line, Mr Seatter provided more examples in which the economy and the environment do not meet. For instance, he mentioned that while a considerable rise on premature deaths related to air pollution is expected by 2030, it would be more profitable for companies to invest in cutting the pollution rather than bearing with the costs of lost working time.

As a third example, Mr Seatter stated that 6 tonnes of waste per capita are generated every year. Half of it is dumped at landfills. Thus, he stressed that diverting all this waste from landfills would reduce the GHG emissions in 2%. As for the economic benefits, Mr Seatter pointed out that if the European waste legislation were implemented, the recycling industry's turnover would increase by €40bn/year, while at the same time, 400,000 jobs would be created.

Mr Seatter focused then on the resilience of the financial and environmental systems. In this context, he underlined the role being played by environmental harmful subsidies and by the insufficient access of small companies to funds for eco-innovation.

Before presenting his final thoughts, Mr Seatter highlighted that more research is needed to provide more insights on the interlinkages of the economic and environmental systems, and that special attention will have to be paid to the effects of the European consumption and production patters in the rest of the world.

To finish his speech, he referred to the need to represent the future generations by establishing long-term environmental targets.

In her opening remarks, **Helen Mountford (Deputy Director of the Environment Directorate at OECD)** stated that we have already transgressed the planetary boundaries in relation to climate change, nitrogen flow and biodiversity loss. Then she presented the main findings of the 'OECD Environmental Outlook to 2050' that will be released in March 2012. This report shows the trend on environmental pressures in absence of new environmental policy action.

Ms Mountford explained the main drivers behind the future trends in biodiversity loss and water demand. She also referred to the health impacts of air pollution and to the trends in municipal waste generation. In this context, she highlighted the OECD's Green Growth Strategy and the framework in which it should be put in practice. Ms Mountford mentioned then areas in which some positive trends have already arisen. Absolute decoupling patterns arise for NO_X and SO_X emission, while in the case of GHG only a relative decoupling can be observed. Water use also shows a slight absolute decoupling, but as she pointed out, there is not a significant overall trend. As for waste, results differ considerably depending on the country.

Ms Mountford enumerated then some of the policies that can be put in place to address these challenges. In this vein, she underlined the need to put proper prices on pollution and natural resources. The measures she made reference to include proper water pricing, environmental tax increase, phasing out of environmentally harmful subsidies and household electricity metering.

She pointed out though, that getting the prices right, while important, is not enough. This should be supported by other measures such as information provision (e.g. through labelling schemes), RDI investment and regulations when needed.

In her concluding remarks, Ms Mountford emphasised the need of proper cost-effectiveness assessments prior to adopting any action.

Ernst Ulrich von Weizsäcker (Co-Chair of the International Resource Panel set up by UNEP) began his speech highlighting that so far material consumption and carbon footprint go hand in hand with GDP per capita growth. Thus, he underlined that we have not only to break this correlation, but also to help poorer countries tunnelling through. In this line, Mr von Weizsäcker stated that a fivefold increase in resource productivity could pull most of the countries into a sustainable development path.

After enumerating several fields in which there is a significant potential for resource productivity improvements, Mr von Weizsäcker called for increasing energy and resource prices artificially in parallel to resource productivity gains. He cited Japan's case in the 1970s to illustrate that pioneers do not need to wait for others.

In the winning side of this approach, he included Europe, East Asia and developing countries poor in natural resources, which comprise 90% of the world population. These are in his view the regions that will form an alliance on real climate policy, ecological price policies and on developing the 21st century technologies and habits.

Yasuhiko Hotta (Deputy Director of the Sustainable Consumption and Production Group in IGESin Japan) started his intervention by giving an overview of the evolution of Japanese resource and waste policies. He set the focus on the most recent policy adopted the Japanese government, namely the 2nd Fundamental Plan for Establishing a Sound Material Cycle Society (2008-2013). The Plan, which has indicators and targets, is reviewed every year and revised every five years.

Mr Hotta also made reference to the ongoing international collaborative efforts of Japan with the G8 process, OECD, UNEP, etc. to promote resource efficiency. These include the 3R Initiative and the Regional 3R Forum in Asia. In this line, China (circular economy), South Korea (green growth), Thailand, Malaysia and other Asian countries are starting to embrace the principles of resource efficiency.

Based on the insights provided by the previous review of the Plan, Mr Hotta stated then that Japan will have to shift the focus of its resource policies even more from sustainable waste management to sustainable resource management and enumerated some of the future goals to be pursued:

- Control of natural resource consumption and reduction of environmental impact
- Activities focusing on quality rather than quantity of resource circulation
- Sound material cycle society contributing to local prosperity

In this context, he identified the following issues as key in the Plan to be adopted in 2013:

- Quality recycling
- Promotion of recycling businesses in Japan, but specially in emerging countries
- Response to disaster and safety issues
- International collaboration
- More emphasis on reuse and reduction

During the first Q&A session, **Mr Jo Leinen (ENVI MEP)** asked Mr Seatter how the Commission would operationalize the Resource Efficiency Roadmap in view of the response given by the Environment Council in December 2011. He asked then to Mr von Weizsäcker which could be the measures to be taken in order to reach the mentioned fivefold increase in resource productivity. Mr Leinen finished his intervention by raising the idea of alternative business models such as leasing instead of buying.

Mr Seatter pointed out three areas, which would not necessarily require the cooperation of environmental ministers, in which the Commission would like to implement several measures:

- Taxation and subsidies
- Support for ecologically-friendly products
- Engagement of stakeholders to set resource efficiency indicators and targets in 2013

In his reply, Mr von Weizsäcker agreed with Mr Leinen on the idea of new business models if these were to be implemented in collaboration with the different stakeholders, and at the same time, were to result in less environmental pressures. As for the measures to reach factor five resource productivity improvement, he referred again to the pricing proposal he explained before.

Replying to a request of Mr Unico van Kooten (from Dutch Waste Management Association), the speakers enumerated three short-term policy measures to be implemented in the context of the Roadmap.

Mr Hotta highlighted the following ones:

- Set targets and monitor the progress of the Roadmap
- Structure the related policies (e.g. recycling, sustainable consumption and production, etc.) around resource efficiency
- Support industrial development

Mr von Weizsäcker stressed the need of research in specialty metal recycling, since their current recycling rates are below 1%. This would at the same time create new business opportunities.

Ms Mountford underlined the following actions:

- Getting prices right, especially removing environmental harmful subsidies and fostering transparency in public expenditure
- Improve the information flow towards consumers so that they are aware of the impacts of their choices
- Closer cooperation between governments and business

Last but not least, Mr Seatter made allusion to some of the actions mentioned in his speech, namely implementing the waste legislation and shifting taxes from labour to resource use. As a third measure, he pointed out that governments should invest in skills programmes in the construction sector, so that the unemployed labour force can be adapted to the context of energy- and resource-efficient buildings. In the context of the first proposal, **Mr Karl-Heinz Florenz (ENVI MEP)** stressed that the Commission is the responsible body for ensuring implementation of the legislation. Mr Seatter added then that legal mechanisms were being used, but more importantly, that Member States still had part of the Structural and Cohesion Funds to tackle waste management issues.

DaeYoung Papk (Young & Global Partners) raised then the issue of future competitiveness. Mr von Weizsäcker replied by saying that unless the EU and other countries take the lead in adopting a resource efficient path, the exploitation rate of natural resources will keep on being unsustainable.

Axel Singhofen (Greens/EFA in the European Parliament) asked Mr Seatter and Mr von Weizsäcker whether they thought that in the current growth-driven policy framework it was possible to green the economy to an extent that it could sustain ever-increasing growth. Both panellists gave a similar answer and referred to the 'Beyond GDP' debate in which growth does not necessarily have to be linked to the economy, but to well being.

3. BEST PRACTICES AND POSSIBLE FUTURE DEVELOPMENTS

After explaining the difficulties in the adoption of different waste policies, **Karl-Heinz Florenz (ENVI MEP and shadow Rapporteur)** introduced the first speaker of the second panel.

After giving a brief overview of what the World Business Council for Sustainable Development (WBCSD) is, **Per Sandberg (Senior Manager in Accenture and ex Director at WBCSD)** stated that the front-runners share the same vision as the academia on resource efficiency. He pointed out though, that the business sector applies the long-term thinking combined with the day-to-day reality.

He presented then the WBCSD Vision 2050, which is the result of the acknowledgement by the business community that BAU is a dead strategy. The vision foresees doubling of food production, halving CO₂ emissions, resource efficiency improvement by factor 4-10, etc.

As key enablers, Mr Sandberg cited:

- Resource efficiency and inclusive business
- True costs
- Combination of all kind of innovations, not only technological
- Collaboration among companies

Then, Michael Warhurst (Senior Waste and Resources Campaigner at Friends of the Earth) stressed in the beginning of his speech that he would focus on what should be measured in terms of resource efficiency and how this should be measured. Thus, he identified four main categories, namely, overall use of materials, water footprint, carbon footprint and land footprint. He gave then an overview of the main trends in these areas and highlighted the role played by our imports and their associated rucksacks.

Mr Warhurst concluded his intervention by outlining a few recommendations for the EU in this matter:

- Standardise the resource use indicators and ensure that the data is available to calculate them
- Ensure that policies are impact assessed with these indicators and that the resource efficiency performance of countries is assessed
- Create new policies to increase resource efficiency that contribute to phasing out residual waste and making products resource efficient

After providing a brief introduction of the fields in which Veolia Environnement works, **Bernard Lanfranchi (European Affairs Director of Veolia Environnement)** explained three concrete cases of resource efficiency improvement.

The first example was related to bioplastic recovery from wastewater. As explained, green carbon was recovered from wastewater, and then converted into Polyhydroyalkanoate, which is an ingredient of bioplastics. The resulting bioplastic has been found to be greener than the one produced from croplands.

As a second example, Mr Lanfranchi cited a data centre in France, which recovers the heat produced by the computer systems and transfers it to a district-heating network. This system avoids the emission of a significant quantity of CO₂.

The last example given by Mr Lanfranchi refers to the use of cooking oil for the production of secondary biodiesel. The process entails a 92% reduction of GHG emissions, not only due to the process itself, but also because the heat needed for it comes from the recovery of the waste heat of an adjacent hazardous waste treatment plant.

In his conclusions, Mr Lanfranchi stressed the usefulness of environmental footprint (carbon, water, resources and biodiversity) as a tool for decision-making and risk management.

Michal Miedzinski (coordinator of the Eco-Innovation Observatory project in Technopolis) started his intervention by explaining what the Eco-Innovation Observatory project is about. Before showing some of the results obtained in the framework of the project, he clarified that evidences at company level are rather scarce.

The results show that especially SMEs have a huge potential of eco-innovating at low cost. Likewise, eco-innovation and resource efficiency are increasingly gaining importance in the business sector.

Nevertheless, as Mr Miedzinski pointed out, not only the majority of EU companies do not innovate, but also the ones that do it declare only incremental material efficiency improvements. He concluded by stressing that the current performance is far from enough to reach an absolute decoupling of environmental impacts from economic growth.

In his opening remarks, **Christian Hagelüken (Director of EU Government Affairs in Umicore)** called for closing the cycle of metals by establishing mining and recycling as a complementary system. Nonetheless, he clarified that we are currently far from this aim.

In order to go in the right direction, Mr Hagelüken underlined the need of both technological and business innovation. The latter should pursue collecting more and ensuring that the collected metals are fed into and kept within appropriate recycling channels. In this context, he enumerated several actions to ensure consistent and complementary policies that would enable recycling more and better.

- Create an appropriate and consistent legal framework that could be adapted when needed
- Ensure stringent enforcement
- Support R&D funding and innovative pilot plants to address the grand challenges
- Build European Technology Platforms in a synergetic and complementary way
- Start the European Innovation Partnership on Raw Materials

In his concluding remarks, Mr Hagelüken called for:

- Collecting more and better
- Preventing dubious/illegal exports
- Ensure smart recycling
- Develop innovative processes for difficult material mixes
- Improve data basis
- Create legislative support for the recycling of critical metals
- Enhance university education and applying an interdisciplinary approach beyond engineering

In the second Q&A session, **Sylvain Chevassus (French Ministry of Environment)** provided an overview of a national experimentation carried out by the French Ministry of Environment on environmental information with regard to consumer product.

On a different topic, Mr Gerbrandy mentioned that he had not noticed the mentality change in business to which Mr Sandberg made reference and thus, he asked him to explain this issue a bit more. Mr Sandberg clarified then that the WBCSD Vision 2050 is a platform for thinking a long-term strategy, not a commitment as such. Nevertheless, as he explained, national business communities in seven countries are doing a similar exercise. Likewise, 20-30 companies have used the WBCSD Vision 2050 as input in their strategy sessions.

Melissa Shinn (Friends of the Earth) asked whether the WBCSD would support the adoption of a small basket of indicators (namely, water footprint, carbon footprint, material use and land use) as obligatory in internal accounting at company or product level. In this line, she also asked whether such a measure would help overcoming the barriers to eco-innovation identified by Mr Miedzinski.

From Mr Sandberg's point of view, footprint indicators would be useful for defining ecoinnovation targets, but not to shift consumer consumption behaviour. Mr Miedzinski agreed with Mr Sandberg and pointed out that when it comes to small companies, the target should be to increase awareness raising. This should be done not focusing on technical indicators, but on the message behind in a user-friendly way.

Annick Carpentier (European Association of Metals) formulated the last question. After stressing that working only with the front-runners is not enough, she asked when the platform for cooperation on resource efficiency was going to be set up. Mr Seatter said that the platform should be established in a few weeks. Following Mr Seatter's intervention, Mr Gerbrandy wished that in this era of huge and rapid changes, business associations put more efforts into pulling their weaker members towards the front positions.

After a short recapitulation made by Mr Florenz, Mr Gerbrandy stated that despite most of the stakeholders seem to agree on the agenda on resource efficiency, some Member States do not completely share it, due to the need to deal first with the financial crisis. He concluded then by stating that this is the opportunity to boost future competitiveness and thereby strengthening the European economy.

ANNEX 1: AGENDA

Policy Department A-Economy & Science Committee on the Environment, Public Health and Food Safety (ENVI)

Workshop on Resource efficiency: Challenges and best practices

In the context of the preparation in the ENVI Committee of an initiative report on "A resource- efficient Europe" as EP's answer to the flagship of the Commission, the workshop will consist of an exchange of views between the Members, experts from EU institutions and non-EU countries, academia, NGOs and business in the area of the efficient use of natural resources.

The first part of the workshop aims at stressing the urgent challenge for Europe to use natural resources in a more sustainable manner. The second part will consist in a panel of different organisations to present concrete examples and best practices that value resources in a more realistic manner and also lead to economic advantages.

The workshop is open to the public and the interpretation will be available in EN-DE-FR-NL.

14.30 Welcome and chaired by Gerben-Jan Gerbrandy, ENVI Rapporteur

Part 1: Building a Resource Efficient Europe

Alan Seatter, Deputy Director-General for the Environment DG, European Commission

Helen Mountford, Deputy Director of the Environment Directorate at **OECD**

Prof. Dr. Ernst Ulrich von Weizsäcker, Co-Chair International Resource Panel, UNEP

Dr. Yasuhiko Hotta, Deputy Director of the Sustainable Consumption and Production Group, Institute for Global Environmental Strategies, IGES, Japan

15.30 Q&A, open discussion

Part 2: Best practices and possible future developments

16.10 Welcome and chaired by Karl Heinz Florenz, ENVI MEP

Panel with 5 representatives of different organisations (7 minutes each) to present concrete examples and best practices to addressing scarcity:

- Dr. Per Sandberg, Accenture and World Business Council for Sustainable Development
- Dr. Michael Warhurst, Senior Waste and Resources campaigner, Friends of the Earth
- Bernard Lanfranchi, European Affairs Department Veolia Environnement
- Michal Miedzinski, Coordinator Eco-Innovation Observatory, Technopolis
- Dr. Christian Hagelücken, Director EU Government Affairs, Umicore
- **16.50** Q&A, open discussion
- **17:25** Conclusions by Karl-Heinz Florenz and Gerben-Jan Gerbrandy, ENVI MEPs

ANNEX 2: SHORT BIOGRAPHIES OF THE EXPERTS



ALAN SEATTER, Deputy Director-General for the Environment DG, European Commission

He is former director in the External Relations department of the European Commission, responsible for North America and Canada, Japan, Korea, Australia, New Zealand and Western Europe. He has held several posts in the European Commission, dealing with the Middle East, science and technology policy, enlargement, budget and the structural funds, before which he held posts in the UK civil service and in university.



HELEN MOUNTFORD, Deputy Director of the Environment Directorate of the OECD

Deputy Director of the Environment Directorate of the Organisation for Economic Co-operation and Development (OECD) since October 2010.

She joined the OECD in 1997, and was Head of the Division on Climate Change, Biodiversity and Development from 2006-2010. Her work at OECD has included a leading role in the preparation of the 2001 and 2008 OECD Environmental Outlook reports, as well as analysis of policies in the areas of water pricing, biodiversity

incentive measures, market-based instruments, and reform of environmentally harmful subsidies. Prior to joining the OECD, she managed a local recycling company in the UK and worked for an environmental NGO in Australia.



Prof. Dr. ERNST ULRICH VON WEIZSÄCKER, Co-Chair International Resource Panel, UNEP

Ernst Ulrich von Weizsäcker has served as Co-chair of the International Resource Panel (IRP) since its inception in 2007.

One of the world's most respected thinkers on resource efficiency, his ground-breaking 'Factor Four' concept asserts that by using natural resources efficiently it is possible to halve our use of resources while doubling living standards. In 2008, he was joint winner of the Takeda award for Outstanding Achievement in the Application of New Engineering Intelligence.

Prof von Weizsäcker is Founding President of the Wuppertal Institute for Climate, Environment and Energy. He is a member of the Club of Rome, and former Dean of the Donald Bren School for Environmental Science and Management at the University of California, Santa Barbara, USA.

Formerly Chairman of the Study Commission on Economic Globalisation, as well as the Environment Committee, of the German Bundestag, von Weizsäcker served as Director of the UN Center for Science and Technology for Development and of the Institute for European Environmental Policy. He has a PhD in biology from Freiburg University, Germany.



Dr. YASUHIKO HOTTA, Deputy Director of Sustainable Consumption and Production Group, IGES, Japan

Yasuhiko Hotta is a Deputy Director / Senior Policy Analyst of Sustainable Consumption and Production Group at Institute for Global Environmental Strategies (IGES), Japan.

He holds Dphil in International Relations from University of Sussex in 2004. He was a project assistant of UNU/Zero Emissions Research Initiative at United Nations University/Institute for Advanced Studies, Contracted Researcher (Industrial Policy Area), Mitsubishi Research

Institute, Inc., and Visiting Research Fellow, Centre for Global Political Economy, University of Sussex, UK. He joined IGES in September 2005.

His research focuses on the effects of globalization on reform in environmental policy as well as development of policy concepts for sustainable resource circulation and resource efficiency in Asia; such as Extended Producer Responsibility (EPR).

He has been involved in both policy initiatives and research projects in relation to sustainable resource circulation in Asia such as G8's 3R Initiative and Working Group for 3R Policies for Southeast and East Asia at Economic Research Institute for ASEAN and East Asia (ERIA). He is also a member of Advisory Committee for International Promotion of Recycling Industries as well as a member of Advisory Committee for International Cooperation Planning for the 3R Promotion of Ministry of the Environment of Japan.



Dr. PER SANDBERG, Accenture and World Business Council for Sustainable Development

Per Sandberg is Senior Manager in Accenture Management Consulting, Oslo. He is the Nordics subject matter expert on sustainability, also working on innovation. Per joined Accenture in Nov 2010, formerly having been Managing Director at World Business Council for Sustainable Development (WBCSD) in Geneva, Switzerland. He there directed the flagship Vision 2050 project and the Business Role Focus Area, with a portfolio of sustainability-related activities on innovation, investors, consumption and talent.

Previously, Per was with Norwegian conglomerate Norsk Hydro (oil, gas, aluminium, fertilizer, vinyl), working as internal consultant on innovation and sustainability. He was then also leased out to lead WBCSD's large Sustainable Mobility project.

Per holds a Dr.Ing. in technology & ethics, and an MSc in Chemical Engineering from the Norwegian University of Science and Technology. He has been research leader in the interdisciplinary Norwegian Ethics Program, member of the Graver Commission that developed ethical principles for the Norwegian Petroleum Fund, and facilitator of several "consensus conferences".



Dr. MICHAEL WARHURST, Senior Waste and Resources campaigner, Friends of the Earth

Dr Michael Warhurst has been working for Friends of the Earth in London since November 2005, and now heads up their Economics and Resource Use Programme. He also leads Friends of the Earth Europe's work on Resources and Consumption. His work particularly focuses on resource use and waste policy at EU and UK level, including securing a 50% recycling target in the revised Waste Framework Directive and leading the development of Friends of the Earth's work on measuring Europe's resource use (see www.foeeurope.org/resources)

Previous to this he focussed on chemicals policy, with a particular focus on the EU's new REACH chemicals regulation (Registration, Evaluation and Authorisation of Chemicals), initially at Friends of the Earth in London, and then from 2002 at WWF's European Policy Office in Brussels. During 2005 he spent 9 months working on US chemicals policy at the Lowell Centre for Sustainable Production in Massachusetts, USA.

He has a Degree in Biochemistry from the University of York, UK, a PhD (in the breakdown of chemicals by bacteria) from the University of Glasgow, UK, and an MSc in Environmental Chemistry from the University of Edinburgh, UK.



BERNARD LANFRANCHI, European Affairs Department Veolia Environnement

Bernard Lanfranchi is Director, Green Economy, in the European Affairs Department of Veolia Environnement, the worldwide reference of environmental solutions.

Bernard has held different positions in the Veolia group, which he joined in 1992, first in the waste management division, of which he became VP Markets & Strategy in 2004, and then in transversal corporate functions in research and in European affairs. He has been involved in several European federation and standardization

work groups (FEAD, CEN) linked to resource recovery. He created and chaired the sustainable development commission of the French waste federation (FNADE), and was for 6 years the president of the European recovered fuel organisation (ERFO).

Between 1978 and 1992, prior to his commitment to Veolia, Bernard, who holds an Engineering degree from Ecole des Mines de Nancy (1978), worked in several industrial companies in France and abroad (Europe, North & Latin America, Asia) as a project manager (Stein Industrie, Geostock) and then as a sales manager (Fives group).



MICHAL MIEDZINSKI, Coordinator Eco-Innovation Observatory, Technopolis

Michal Miedzinski has over eight years experience in analysis and evaluation of RTDI and regional development policies and strategies. His expertise is on eco-innovation and resource use issues.

Michal is currently coordinating the Eco-Innovation Observatory, a major three-year EC-funded initiative aimed at providing information and analysis on eco-innovation trends to policy and business actors in Europe. He is also a member of the Expert Committee of the World Resource Forum held biannually in Davos.

During his professional career he has been involved in a number of projects and studies commissioned by the EU institutions (notably

the European Commission), international organisations (OECD) as well as by the regional authorities in many countries (e.g. Italy, France, Turkey).

Michal holds a M.Sc in Regional Economic Planning (honours) from Warsaw University (2001) and M.A. in European Public Affairs (honours) from University of Maastricht and EIPA (2000). He is currently working on his PhD at University of Manchester. Michal has published several book chapters and articles on innovation policy and evaluation.



Dr. CHRISTIAN HAGELÜKEN, Director EU Government Affairs, Umicore

Dr. Christian Hagelüken leads since June 2011 the Department of EU Government Affairs of Umicore. Previously he was responsible for business development and marketing at Umicore Precious Metals Refining. Before 2003 he held different management positions at the precious metals division of Degussa AG.

He has over 20 years of experience in resource management of (precious) metals and is the author of several publications and conference papers. He represents Umicore in relevant associations, working groups and research collaborations,

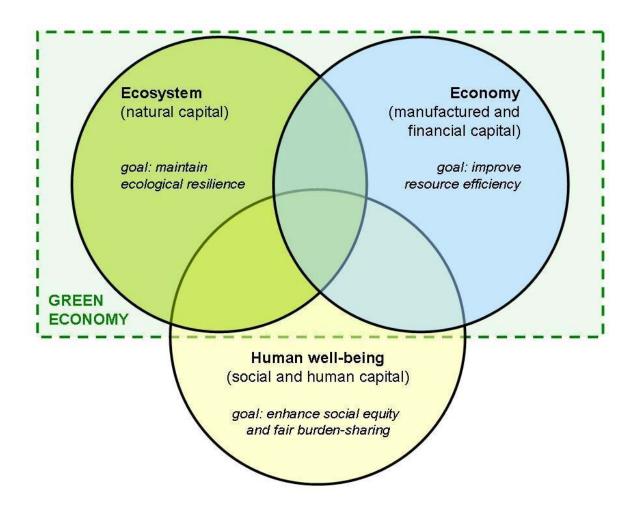
including the EU Raw Materials Initiative, the UNEP Resource Panel and the BDI commodity committee.

Christian Hagelüken studied mining and industrial engineering at the RWTH Aachen, where he obtained his doctorate (Dr. Ing.) in 1991.

ANNEX 3: PRESENTATIONS

Alan Seatter, DG Environment, European Commission			
Helen Mountford, OECD, Resource Efficiency – The OECD Approach	23		
Prof. Dr. Ernst Ulrich von Weizsäcker, UNEP, International Resource Panel	35		
Dr. Yasuhiko Hotta, IGES, Resource Efficiency Policies in Japan	53		
Dr. Per Sandberg, Accenture, WBCSD Vision 2050	61		
Dr. Michael Warhurst, Friends of the Earth, Policies for Resource Efficiency	67		
Bernard Lanfranchi, Veolia Environnement, Examples of best practices for addressing resource scarcity	77		
Michal Miedzinski, Technopolis, Eco-innovation challenge: turning costs into benefits for all?	83		
Dr. Christian Hagelücken, Umicore, Improving the recycling of materials - a key contribution to resource efficiency	93		

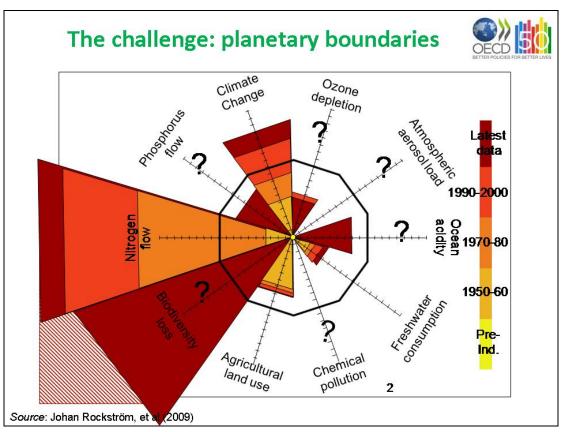
Alan Seatter, DG Environment, European Commission

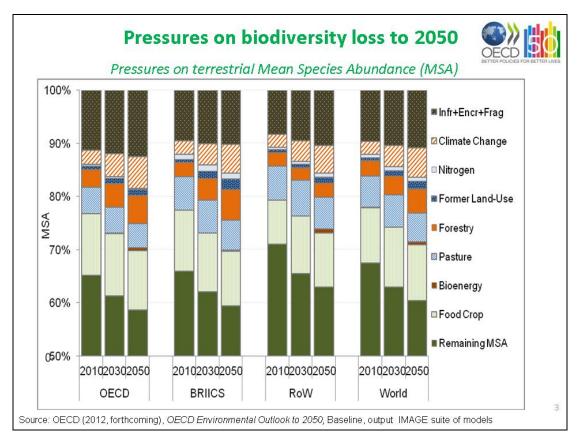


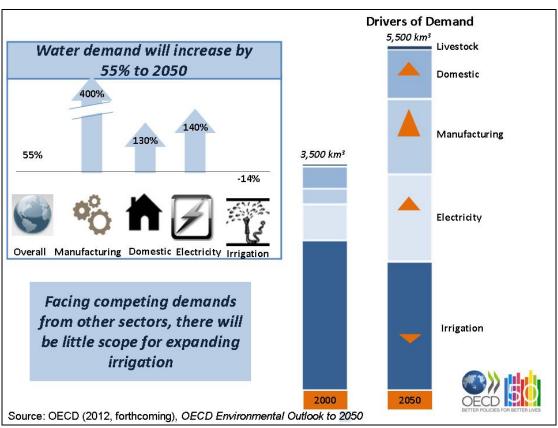
IP/A/ENVI/WS/2011-13 22 PE 475.089

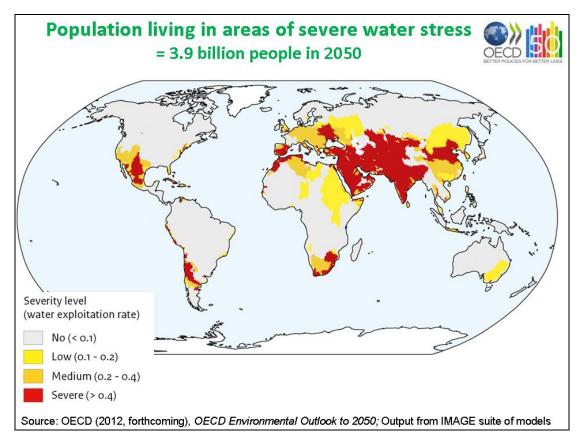
Helen Mountford, OECD, Resource Efficiency - The OECD Approach

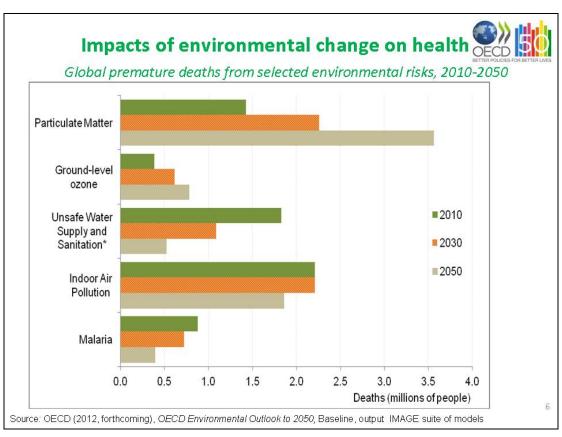


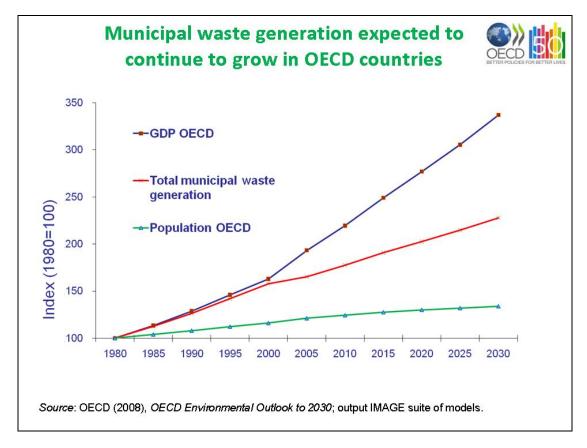














The OECD Green Growth Strategy



Green growth means **fostering economic growth and development** while ensuring that **natural assets** continue to provide the resources and environmental services on which our well-being relies.

It catalyses **investment** and **innovation** underpinning sustained growth and gives rise to **new sources of growth**.

- Multi-disciplinary inter-governmental process:
 25 OECD Committees (Ministries of Finance, Environment, Agriculture, Development Co-operation, Industry, etc.)
- **⇒** We need growth and it needs to be green

Green Growth framework



Enabling conditions

- Balanced tax structures
- R&D and innovation policy
- Competition
- Infrastructure investment
- Openness to trade and FDI

Key policy tools

- Pricing of pollution and resource use
- Subsidy reform
- Regulatory and policy predictability
- Support to basic research and emerging technologies
- Governance of natural assets

Major environmental issues

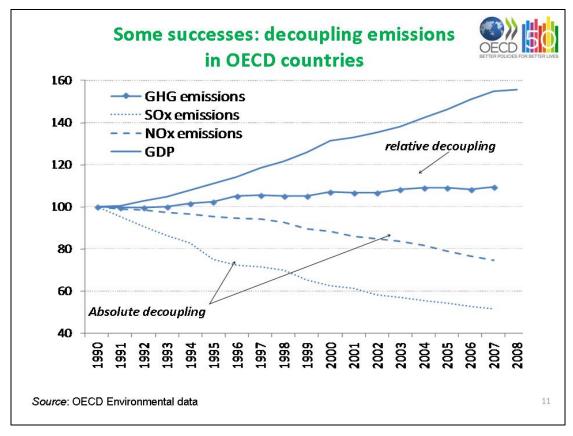
- Water scarcity
- Climate change
- Health impacts of pollution
- Biodiversity loss

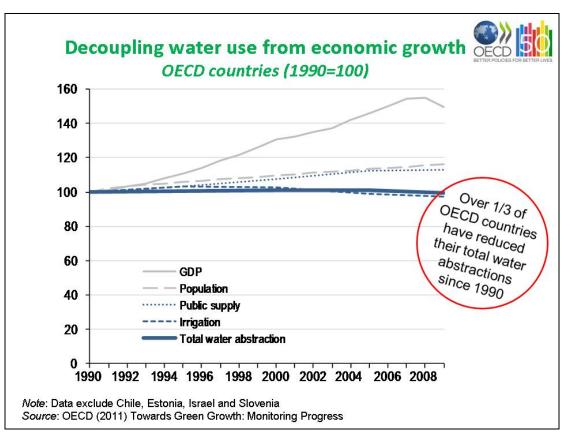
Promoting transition

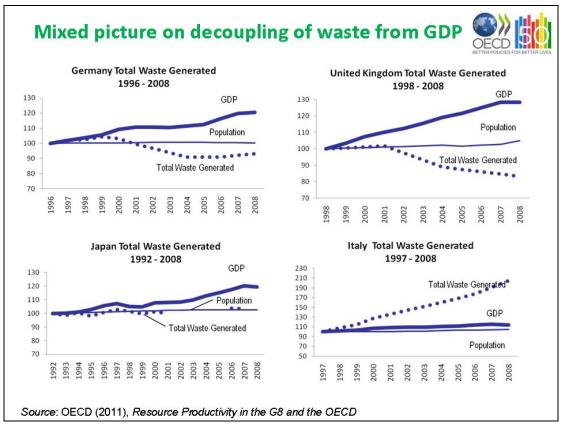
- Skills and labour market adjustment
- Distributional and competitiveness concerns
- · Science and technology cooperation
- · Development assistance
- · Management of global public goods

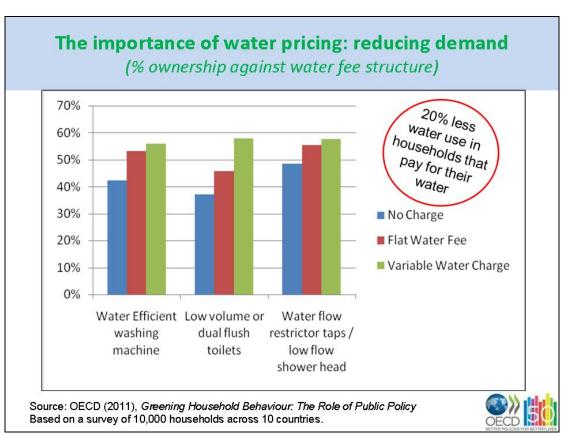
Measurement agenda

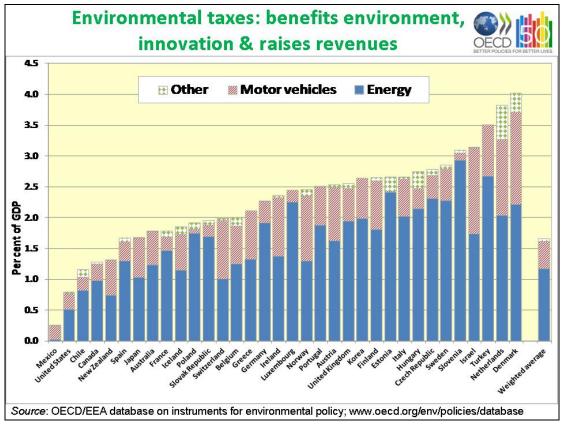
- Productivity of resource use
- Physical evolution of the natural asset base
- Environmental quality of life
- Opportunities arising from environmental considerations
- Evolution of policy and social responses
- Promoting efforts consistent with international standards

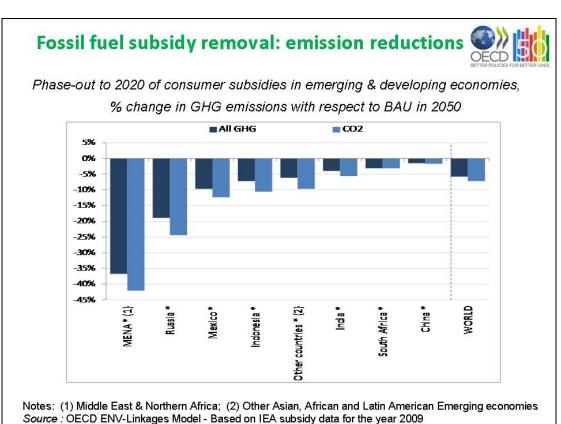


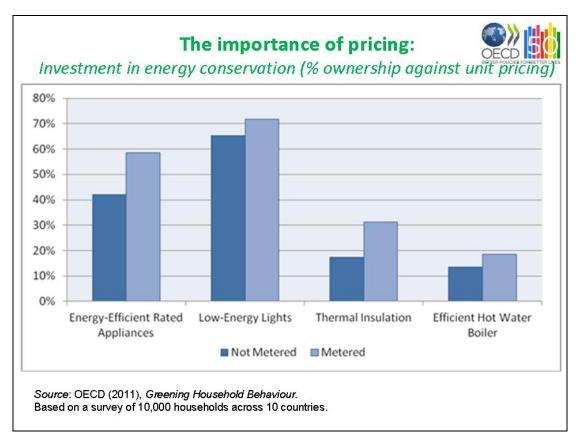


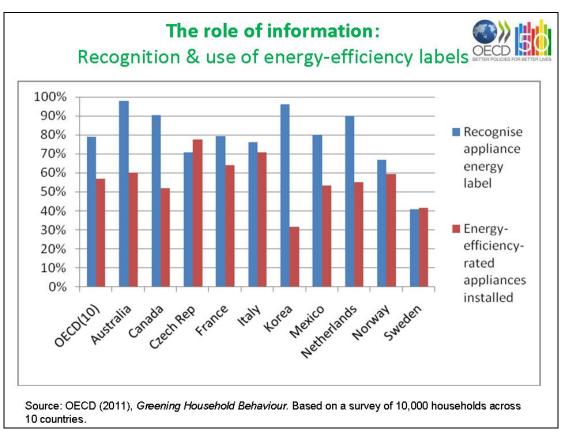


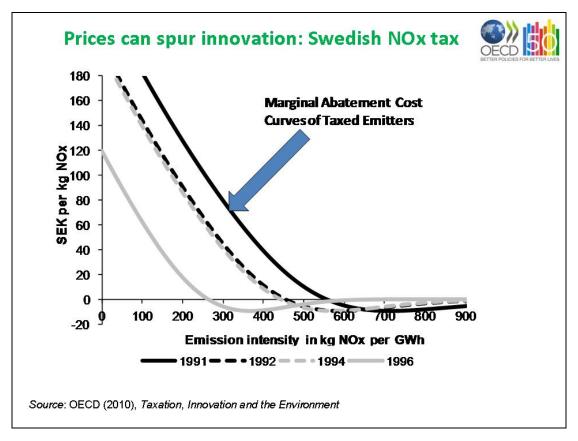


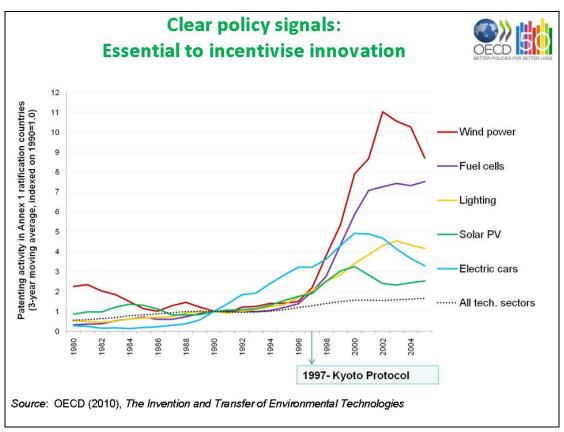


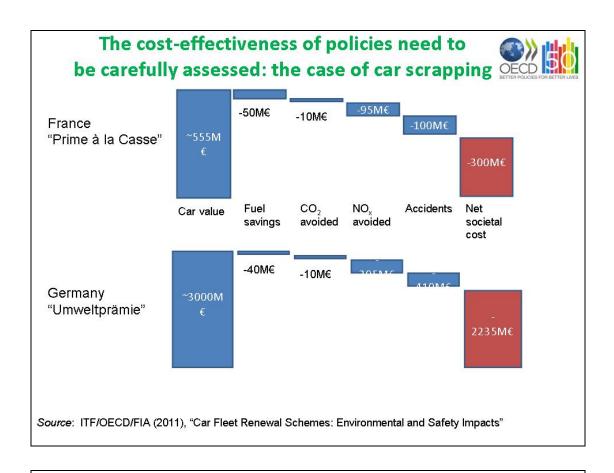












Thank you!

www.oecd.org/env www.oecd.org/greengrowth



22

IP/A/ENVI/WS/2011-13 34 PE 475.089

Prof. Dr. Ernst Ulrich von Weizsäcker, UNEP, International Resource Panel

Workshop on Resource efficiency: challenges and best practices

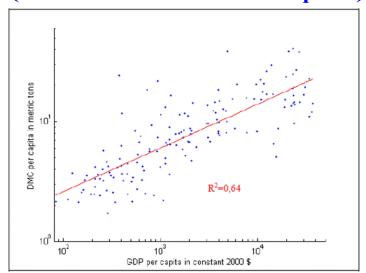
Tuesday, 31 January - 14:30 - 17:30 European Parliament, ASP A3E2

Prof. Ernst Ulrich von Weizsäcker Co-Chairman





GDP still goes with **DMC** (**Domestic Material Consumption**)



The picture is from the first Decoupling report of the Panel



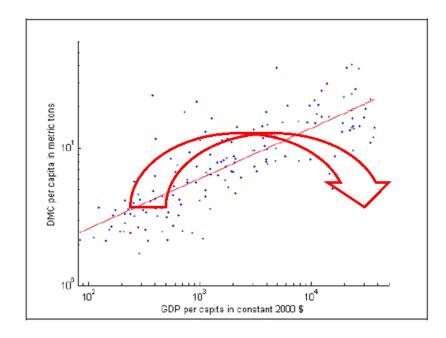




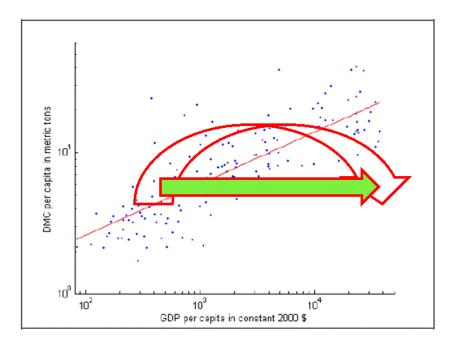


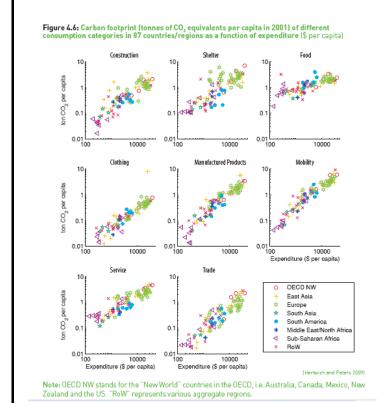


"Absolute" Decoupling means to actually reduce resource consumption, i.e. creating a ,Kuznets Curve'.



... and assist developing countries to tunnel through the Curve



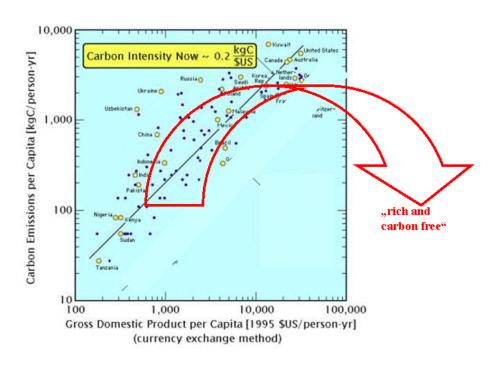


Also carbon footprints grow with GDP.

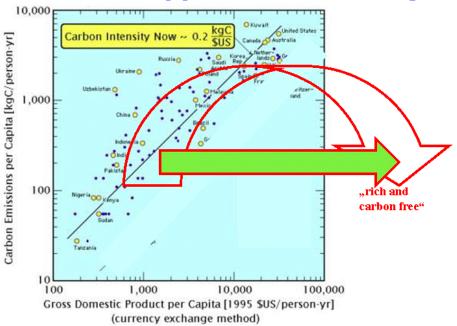
So we also have to create a

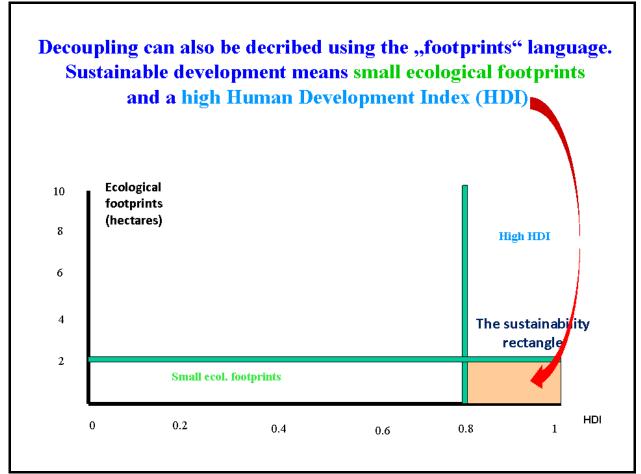
"Kuznets Curve of decarbonization"

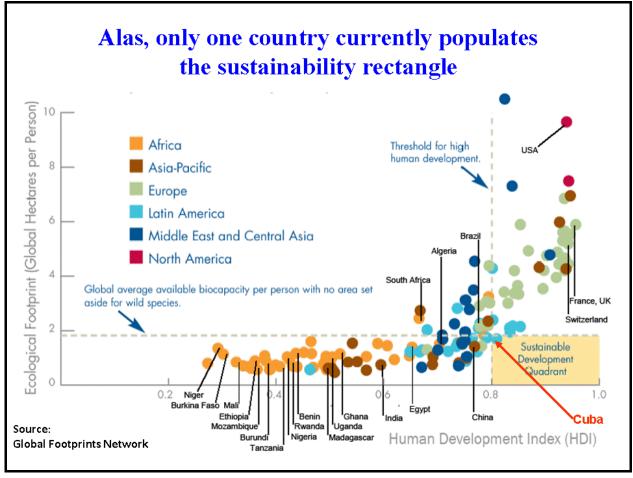
So far, GDP goes with CO₂ intensity. We have to break this correlation, i.e. creating a Kuznets Curve of decarbonization.



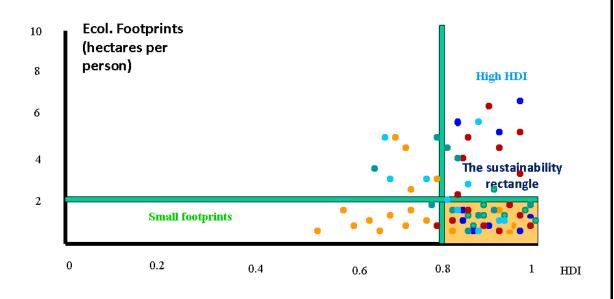
So far, GDP goes with CO₂ intensity. We have to break this correlation, i.e. creating a Kuznets Curve of decarbonization. And then help poorer countries tunneling through.

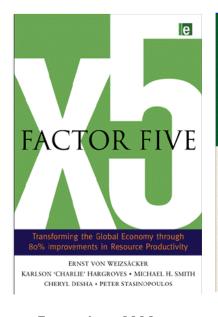






One suggestive answer to that challenge:
A factor of five in the increase of resource productivity
could pull or push most countries into sustainability!









December, 2009

March, 2010

October, 2010

Factor Five is a book documenting that technologies and policies are available for a five fold improvement!

Similar approach: Building the Blue Economy

10 years, 100 innovations, 100 million jobsy



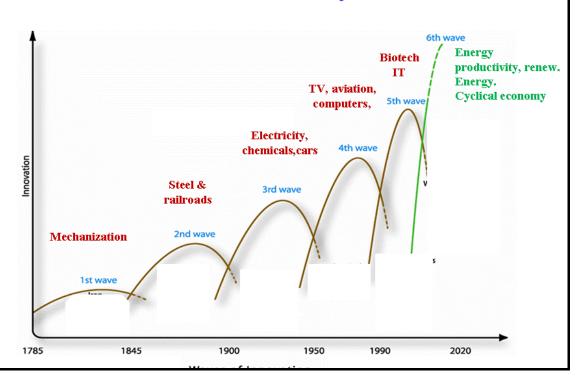


- by Gunter Pauli. From over 2.000 innovations, he selected 100 that are published on a weekly basis at www.blue.economy



PE 475.089

In other words: a Green Kondratiev Cycle, after five brown Cycles.



Superefficient cars

Amory Lovins' "Hyper-car", or "Revolution": 1,5 l/100km

Today's fleet 6-12 I/100km



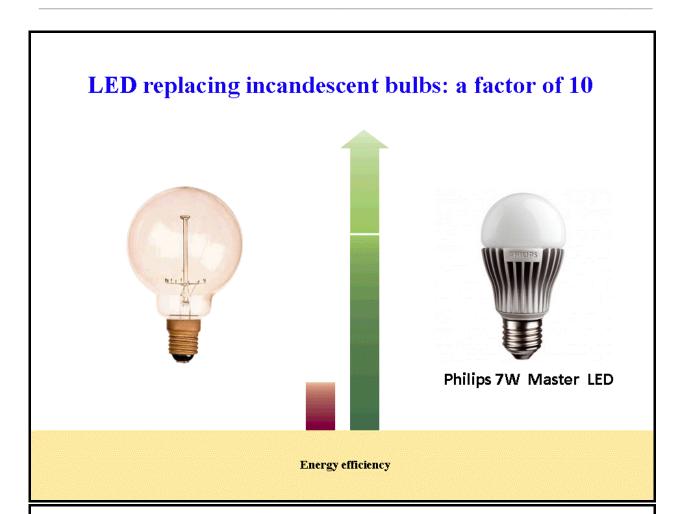


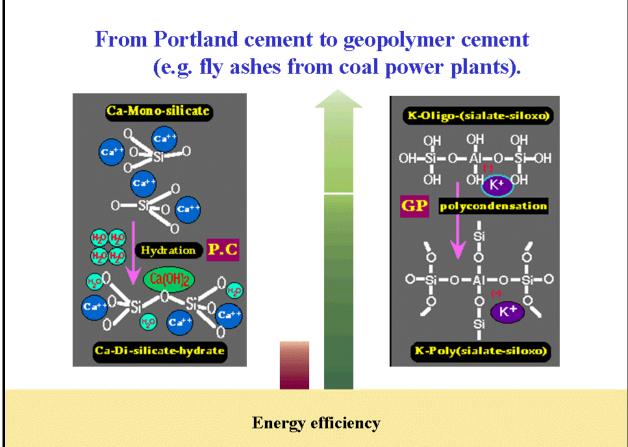
"Passive houses": a factor of ten more heat efficient











From 12 lane highways to bicycle centered cities



Atlanta



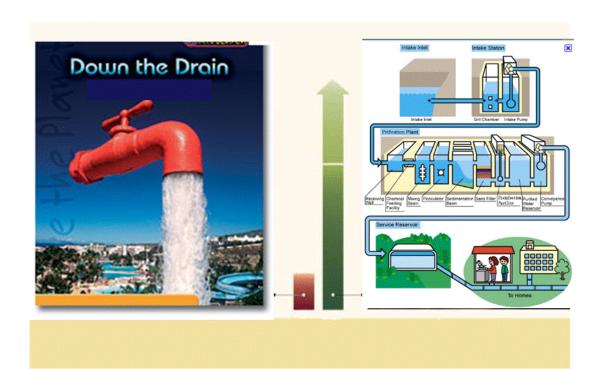
Copenhagen

From endless business travel to telepresence meetings

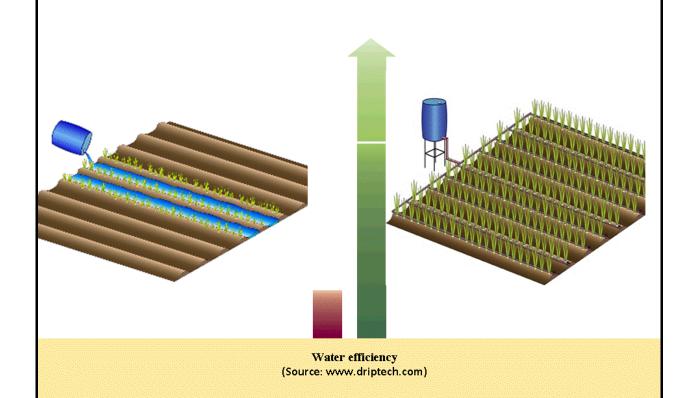




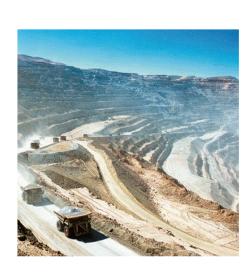
From using water once to purifying (recycling) it

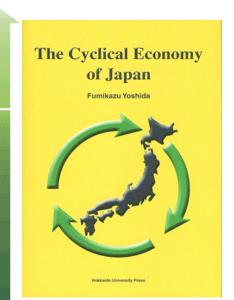


From flood irrigation to advanced drip irrigation



From excessive mining to the Cyclical Economy





Urban mining becoming popular in Europe and East Asia





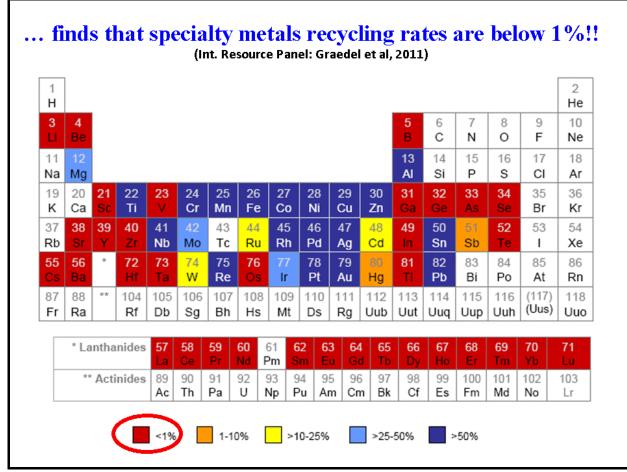
A ton of ore from a gold mine yields about 5 grams of gold, but a ton of cell phones can yield up to 150 grams of gold.



The 2011 Report by the International Resource Panel, on recycling rates of metals.







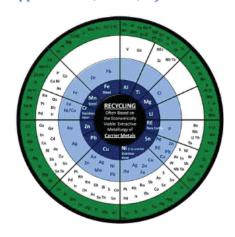
A new report is in the pipeline on recycling opportunities and technologies.

Metal Recycling

Opportunities, Limits, Infrastructure







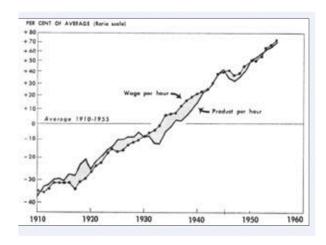
Contributors

Markus Reuter (Outotec/Uni. Melbourne – Lead Author), Helmut Antrekowitsch (Leoben, AUT), Jürgen Antrekowitsch (Leoben, AUT), Diran Apelian (WPI, USA), Bo Bjorkman (Luleå, S), Bart Blanpain (Leuven, B), Françoise Bodenan (BRGM, F), Mieke Campforts (Umicore, B), Bernd Friedrich (Aachen, G), Stefan Gössling-Reisemann (Uni Bremen, Germany), Daniel Froelich (Chambéry, F), Christian Hagelüken (Umicore, B), Kart Heisen (Aalto, Fin), Tom Jones

Let us now go a step further. Let us reconsider "productivity".

Labour productivity increased twentyfold since 1850. After learning about the Factor Five opportunities, we should now aim at resource productivity to increase fivefold in 40 years and perhaps tenfold in 100 years!

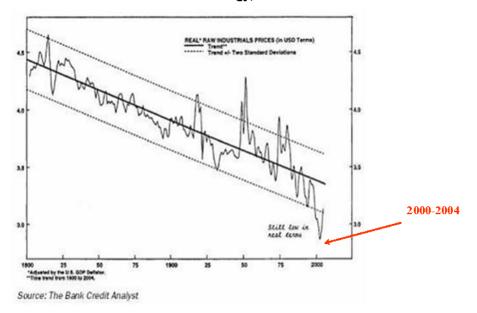
Which was the driving force to spur labour productivity? It was rising wages. And what allowed wages to rise? It was rising labour productivity!



This is a fifty years time-window from the United States

Resource prices, conversely, were falling over 200 years, encouraging a wasteful use of resources.

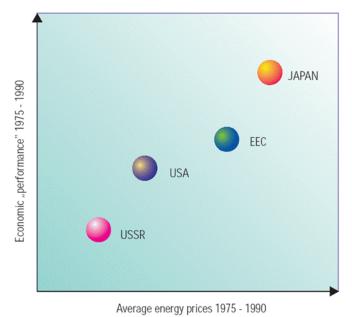
Prices of industrial commodities & energy, in constant dollars



What I am proposing, therefore, is a political decision to artificially raise energy and other resource prices in parallel with documented efficiency increases, so that average expenses for energy services would remain stable. (Some ,,life-line" low prices can be accepted for the poor.)

High energy prices need not hurt the economy.

Japan blossomed during the 15 years of highest energy prices. (This period was also the origin of TQM!)



One lesson from this is: pioneers need not wait for the slow ones.

Who would win, who would lose? (1. inside countries)

Winning: IT, generally high tech; crafts; science; education; green businesses; railroads; maintenance; culture;

Losing: lorries, aircraft industry, heavy industry, development of urban sprawl. wasteful consumers.

Who would win, who would lose? (2. among countries)

Winning: Europe, East Asia, developing countries poor in natural resources. That is some 90% of the world population!

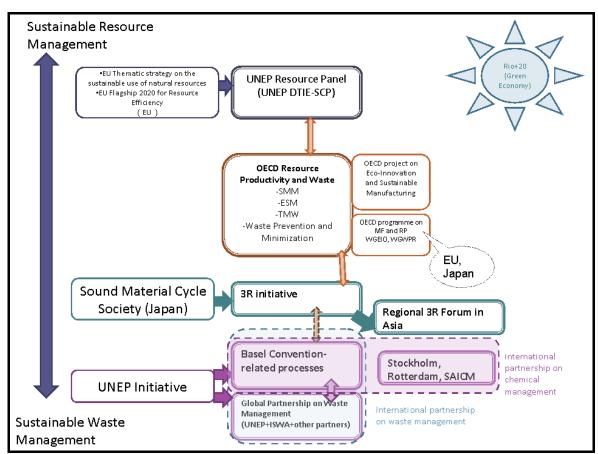
Losing: USA, Canada, Australia, Russia, commodity exporting developing countries.

I foresee, at the horizon, an alliance of the winners: Europe, Asia, Oceania and much of Africa and Latin America, on

- real climate policy;
- ecological price policies;
- developing the 21st century technologies & habits.

Dr. Yasuhiko Hotta, IGES, Resource Efficiency Policies in Japan



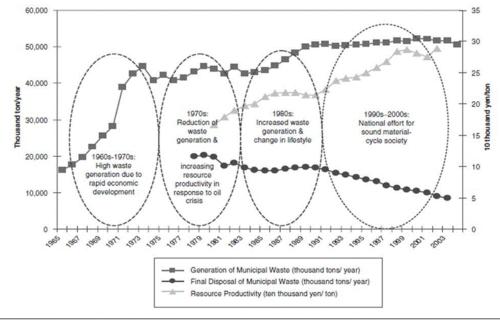


1 **Overview**

- Increasing eco-efficiency (both energy and resource efficiency) has been a key motivation of Japan's environmental and sustainable strategy.
- This is based on its successful experience in preventing pollution and achieving energy efficiency in the 1970s.
- Through the concept of Sound Material-Cycle Society, the idea of increasing efficiency and productivity was highlighted in Japan's waste management and recycling policies in the 1990s.
- Since 2003, Japan has introduced MFA-based indicators to monitor the progress in its national effort for establishing Sound Material-Cycle Society.

3

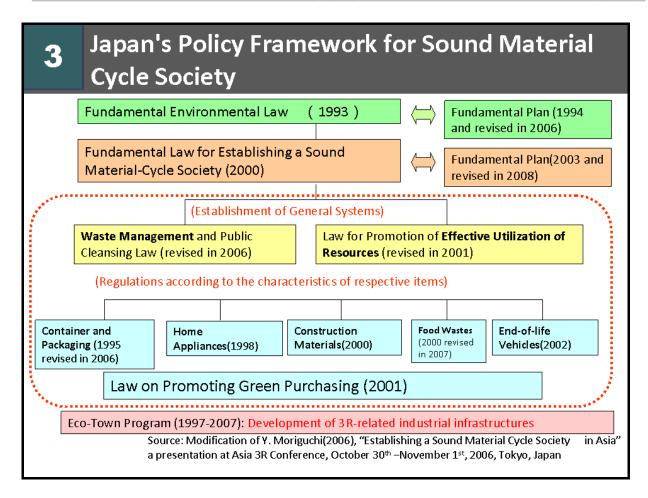
Waste Disposal and Resource Productivity in Japan (1965-2004)



Source: Compiled by authors. Data on generation of municipal waste, final disposal of municipal waste, and resource productivity are based on Ministry of

the Environment of Japan's Kankyo Toukei Shu (Environmental Statistics Database; http://www.env.go.jp/doc/toukei/index.html).

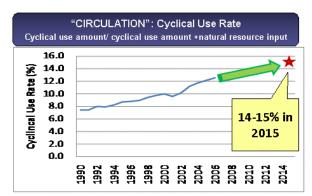
Source: Hotta et. al. (2008), "Policy Considerations for Establishing an Environmentally Sound Regional Material Flow in East Asia". Journal of Environment & Development, Mar2008, Vol. 17 Issue 1. p26-50

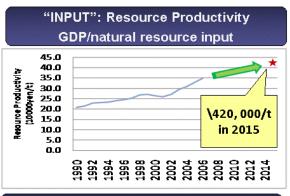


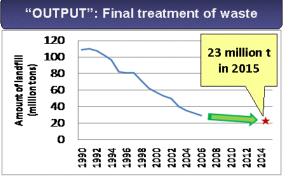


Monitoring Progress of Japan's ource Efficiency Policy

- Monitoring progress in policy implementation is an essential part.
- Japan introduced MFA-based indicators and policy targets for 2010 in 2003 to monitor the progress of 3R implementation at macro-level.
- Based on the progress, Japan revised its fundamental plan in 2008 and set new targets for 2015. Third revision is expected in 2013.







The 2nd Fundamental Plan for Sound Material Cycle Society (2008-2013)

Characteristics

- "Sound Material Cycle Society" (waste and resource efficiency)
 Plus: "Low Carbon Society" (climate and energy efficiency) and
 "Society in Harmony with Nature" (bio-diversity and country land-scape)
- 2. "Regional" resource circulation: Environmentally sound resource circulation at appropriate geographic and economic scale
- 3. Expansion of "Indicators": Quantitative targets and additional indicators
- 4. International Sound Material Cycle Society: International collaboration with East and Southeast Asia (Regional 3R Forum in Asia), Contribution to international research on resource efficiency/productivity (in collaboration with OECD, UNEP)

T Example of Policies: 3R Initiative and Regional 3R Forum in Asia G8 Sea Island Summit: 3R Initiative was agreed upon

Ministerial Meeting on the 3R
Initiative (Tokyo)

Senior Officials Meeting on the 3R

Bangladesh, Cambodia) until 2009

Asia 3R Conference (Tokyo)

2nd Senior Officials Meeting on the 3R Initiative (Bonn, Germany)

Initiative (Tokyo)

2007

2008

2009

2011

2012

- 2nd Asia 3R Conference (Tokyo)

G8 Environmental Ministers Meeting(Kobe, Japan) Kobe 3R Action Plan

East Asia Summit Environmental Ministers Meeting (Hanoi) : Proposal of Regional 3R Forum was acknowledged.

G8 Toyako Summit (Japan)

Kobe 3R Action Plan was endorsed

Asia 3R High-level Seminar(Tokyo)

United Nations CSD Inter-sessional Meeting "International Experts Meeting on Extension of Waste Management Service to Developing Countries"(Tokyo)

Inaugural meeting of the Regional 3R Forum in Asia(Tokyo): Tokyo 3R Statement was agreed upon.

CSD (UN Commission on Sustainable Development) Intersessional Conference on Building Partnerships for Moving towards Zero Waste (Tokyo) 2nd Regional 3R Forum in Asia (KL, Malaysia)

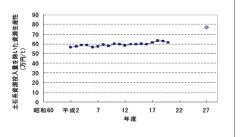
3rd Regional 3R Forum in Asia (Singapore): "Recommendations of the Singapore Forum on the 3Rs in Achieving a Resource Efficient Society in Asia" was endorsed and submitted to RIO+20 Process as an input from Singaporean Government

3rd Regional 3R Forum in Asia (Hanoi, Viet Nam)

8 Example of Policy Development on Recycling and Resource Efficiency in Asia

and Resource Linciency in Asia	
China	Circular Economy Promotion Law (enacted in January 2009) Advancement of a circular economy has been established as a major policy task of the People's Republic of China Rules on the Administration of the Recovery and Disposal of Discarded Electronic and Electrical Products (promulgated in 2009, effective in 2011) ii) The management of waste electronic products was tightened Eco-Areas Around 50 areas (provinces, cities, towns) have been designated as model Eco-Areas. And 20 model cities have been designated for the promotion of a local level circular economy (as of February 2011)
Korea	Green Growth National Strategy Korea sets Green Growth as its national strategy. "Mitigation of Climate Change and Energy Independence", "Creation of New Engine of Economic Growth", and "Improvement of Quality of Life and Enhancement of International Standing" Extended producer responsibility system Raise the recycling rate of used products (waste home appliances, end-of-life vehicles) covered by the EPR system. Volume-based municipal waste charges Per capita solid waste generation declined 26% in the 13 years from 1994 to 2007.
Thailand	Take-back program for used products Take-back started for containers and packaging, used lead-acid batteries, mobile phones and batteries for them, in cooperation with the manufacturers and retailers. Take-back of fluorescent lamps also in place through cooperation from Japan's JETRO. Initiation of a recycling-oriented society 3R implemented in more than 200 communities. In some communities, a 30 - 50% reduction or more in waste generation was achieved.
	Industries Waste Exchange Program Over 450 firms registered by 2005.
Viet Nam	3R National Strategy (approved by the Prime Minister) Targets for the year 2020: 30% recycling of collected waste; separation-at-source rates = 30% for households and 70% for firms
Taiwan	Resource Recycling Fund Currently, ad valorem fees are collected from firms for 14 kinds of recyclable products and are pooled in the Fund. Recycling operators and treatment contractors become entitled to a subsidy from the Fund if they conform to the environmental and quality standards. The Fund is also used to adjust for any volatility in the recycling market.

Possible points to be included for the 9 next revision (2013: the 3rd Plan)



Resource Productivity without sands, stones and gravels is stabilized. Considering possible future resource scarcity, need to focus more on sustainable resource management.

Source: MOEJ (2010), "Results of the 3™ Review of the Progress of the 2™ Fundamental Plan of Sound Material Cycle Society"
Available from: http://www.env.go.jp/p

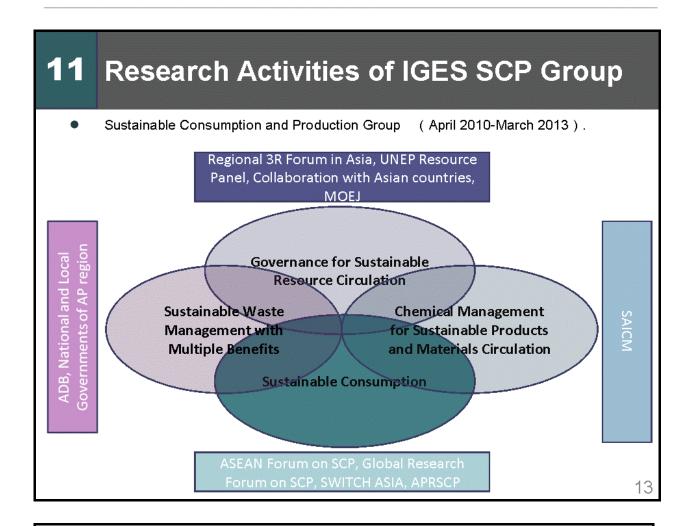
Mid-long term goals: More shift to sustainable resource management

- -Control of natural resource consumption and reduction of environmental impact
- -Activities focusing on "quality" rather than "quantity" of resource circulation
- -Sound material cycle society contributing to local prosperity
- "Quality" recycling:
- -Improved recovery system of precious metals from used products
- -"Vertical" recycling (product to product)
- Promotion of recycling businesses outside of Japan
- Response to the "disaster" and safety issues
- •International collaboration: domestic recycling of hazardous wastes and import of difficult to treat recyclables from other countries
- More emphasis in reuse and reduction

Source: M. Kimura (2011), ""Activities of Japanese Government for Sustainable Resource Management, presented at Global Environmental Seminar: Sustainable Resource Management —Latest Report on Metal Recycling from UNEP Resource Panel.

10 Observation and Conclusion

- Increasing **Eco-efficiency** (both energy and resource) has been a key emphasis of Japan's sustainable/environmental strategy (including most recent ones).
- 2. **Sound Material Cycle Society Policy** represents such emphasis in resource efficiency approach in waste management and recycling policies at national level.
- Good practices of Sound Material Cycle Society Policy were inclusion of different stakeholders, although not in an extensive manner, from its planning as well as constant review of progress and revisions of target/policy goal setting.
- Also, infrastructure/industrial facility-development (eco-town) was linked with policy implementation.
- 5. Japan emphasizes international collaboration with developing Asia.
- Anticipating future resource scarcity, Japan would move its emphasis more into sustainable resource management. MOEJ and METI would be key players in central government...



Thank you very much for your kind attention!

For the activities of SCP Group of IGES, please visit

http://www.iges.or.jp/

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Dr. Per Sandberg, Accenture, WBCSD Vision 2050



High performance. Delivered.

Workshop on Resource efficiency: challenges and best practices

European Parliament, Brussels, 31 January 2012

Dr Per Sandberg

Accenture Management Consulting

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WBCSD Vision 2050 sorts out the future – and gives a business view on the role of business in helping us get a sustainable world

- Three key questions:
 - What does a sustainable world look like?
 - How can we realize it?
 - What are the roles business can play in ensuring more rapid progress toward that world?



A platform for strategic dialogue:

Identifying gaps to 2050 mega Trends & Issues

Developing a pathway mega Outcomes

Quantifying market potential mega Opportunities











































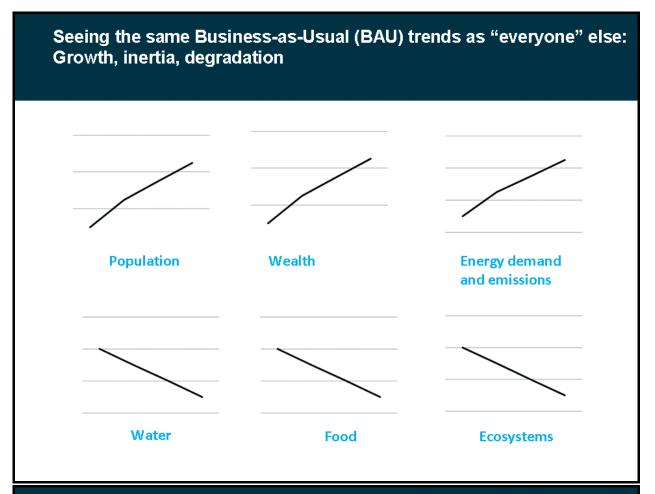


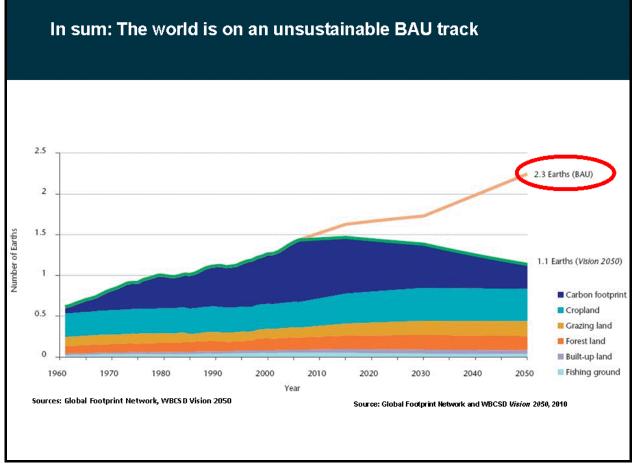


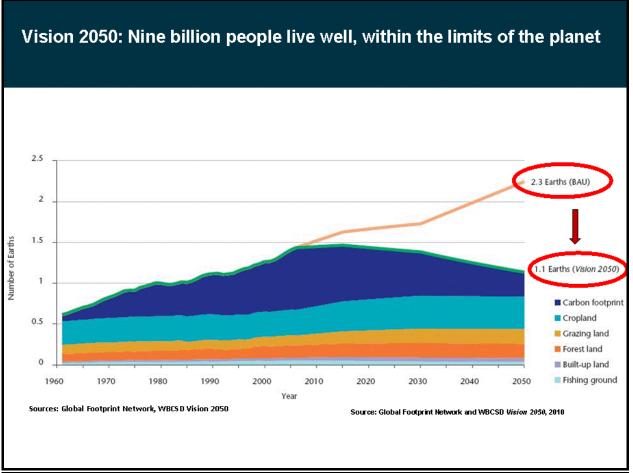


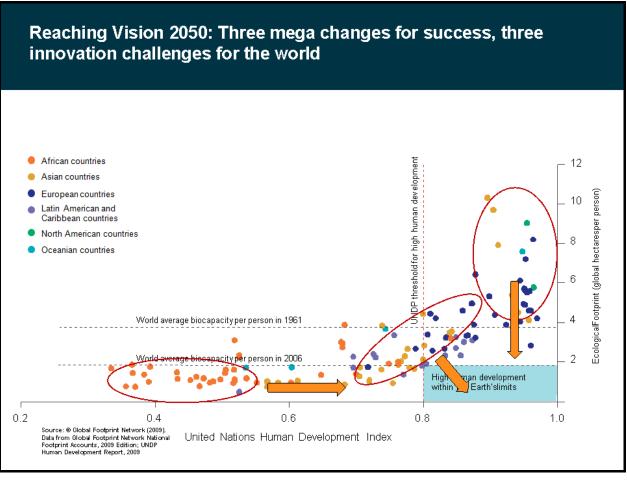
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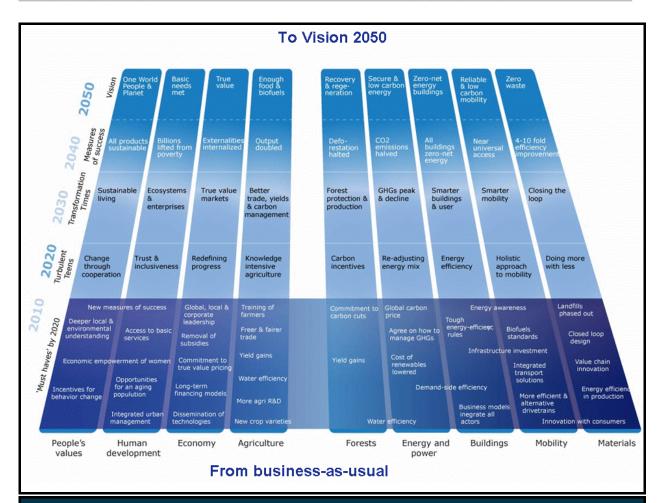












Key Solutions & Enablers for reaching Vision 2050

Collaboration

Build complex coalitions, co-innovation

Sustainable Innovation by All Means

Technology, business models, financing, lifestyles, policy... combined

Resource Efficient & Inclusive Business

Double energy and agricultural output, halve CO2, 4-10 fold increase in water & material efficiency, include billions of people in market

True Costs

Internalize true cost of carbon, water & other ecosystem services in market signals

Summing up

- 1. There will be tremendous change
- 2. Global challenges will become the key strategic drivers for business development, innovation and growth
- 3. Opportunities abound for those who see sustainability as strategic necessity and implement it
- 4. The needed resource efficiency improvements will require "sustainable innovation by all means"
- 5. Technology and innovation leaders are likely to be rewarded, but also need to do "normal business" right to succeed
- 6. CSR is being rethought to be more strategic and about generating shared value

Further Information

per.r.sandberg@accenture.com

+47 48261451

WBCSD Vision 2050 report:

www.wbcsd.org

UN Global Compact – Accenture CEO Study:

www.accenture.com/sustainability

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Dr. Michael Warhurst, Friends of the Earth, Policies for Resource Efficiency



Policies for Resource Efficiency

Dr Michael Warhurst,
Resources & Consumption Programme
Friends of the Earth Europe
January 2012

1



Introduction

- Europe depends on imported resources from a wide range of countries around the world
- The scale of our consumption has major environmental and social impacts
 - These imports also cost us a lot of money
- · This is widely accepted
 - The problem is establishing what polices are needed to deal with it
- Friends of the Earth has been working to develop a policy framework – starting by establishing what resources we actually use....
 - Not just materials (the tonnes we import), but what other resources this import involves...



What is our resource use?

- We started an investigation, with partners in Austria (Sustainable Europe Research Institute)
 - Key assumptions: we must include our use of resources from everywhere in the world, but the system must be reliable and achievable.
- We came up with four aspects of our resource use that it was crucial for us to measure
 - Our overall use of materials (both biological & mineral)
 - Our land footprint the actual area of land needed
 - Our water footprint the water needed for our consumption
 - Our carbon footprint the climate emissions, wherever they happen in the world.
 - See our briefing for a simple introduction [1]

3



(1) Material resources



- Europe is particularly dependent on imported materials [2]
- Yet the EU landfills or burns over €5 billion worth of recyclable material every year [3]



(2) Water

- Many imported goods particularly from agriculture – require water in their production
- This 'Water Footprint' [WF] from imported products can be more significant than water use within a country, e.g.:
 - "62% of the total UK WF is accounted for by water from other nations" [4]
- In some areas water availability isn't all that important – but in many places it is.

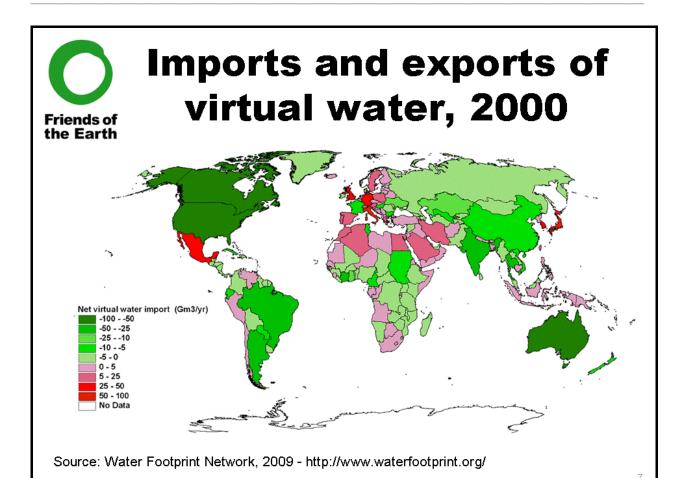
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It's not just what's in the cup...



Source: Water Footprint Network, 2009 - http://www.waterfootprint.org/



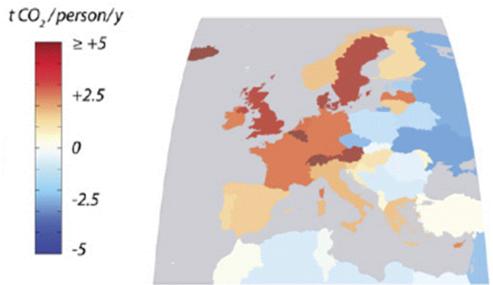
Friends of the Earth

(3) Carbon footprint

- What climate emissions is a European responsible for?
 - Kyoto: Just those resulting from activities in their country
 - Carbon footprint: Kyoto + those emitted in the production of products they consume from abroad
- It makes a big difference.....



European changes in CO2 emissions when imports added

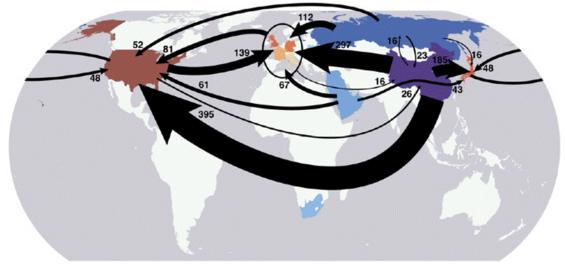


(Davis and Caldeira, 2010 [5])

8



Main global fluxes of carbon in goods



Largest interregional fluxes of emissions embodied in trade (Mt CO2 y-1) from dominant net exporting countries (blue) to the dominant net importing countries (red). (Davis and Caldera, 2010 [5])



(4) Land

'Buy land, they're not making it any more' Mark Twain

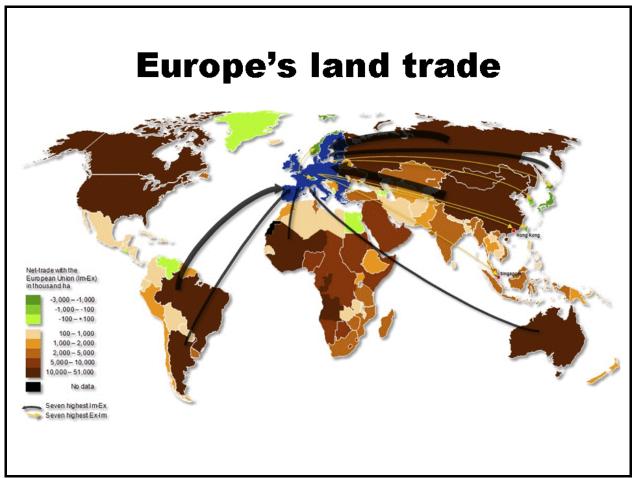
- European consumption depends on land outside Europe for e.g.
 - Producing food and feed for livestock in Europe
 - Producing textiles, minerals, fuels etc
- If we use more land, what and who were on it before?

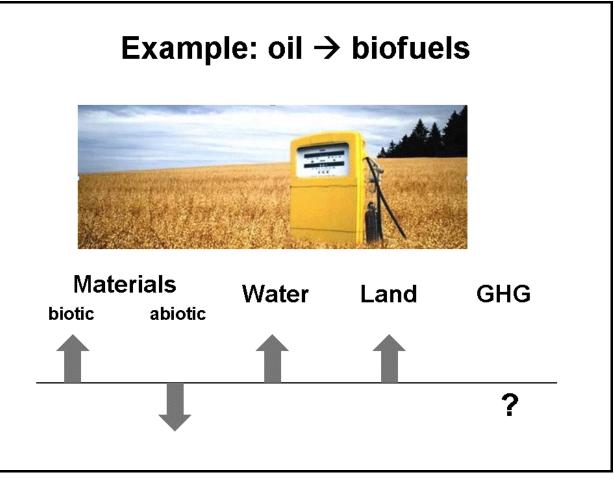
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Europe's land footprint

- We published a new report in 2011, looking at Europe's 'Land Footprint' [6]
- The results:
 - 60% of the land that the EU uses comes from outside the EU
 - The EU average land consumption is 1.3 hectares per capita, while countries such as China and India use less than 0.4 hectares per capita.
 - e.g. Germany & the UK have the 3rd & 4th highest land import in the world, around 80 million hectares each
 - More than 3x the surface area of the UK.







The global context

- Despite efforts to increase resource efficiency in Europe, our resource use continues to increase
 - Increases in efficiency are outweighed by increases in consumption
 - Other developed economies are showing similar patterns
- Resource use is increasing rapidly in several less developed economies – notably India and China
- Future improvements in quality of life in other developing economies – something we should be aiming for – will also increase resource use
- Global population is still increasing
- > Global resource use is increasing rapidly



Conclusions

- Friends of the Earth is focusing on getting the EU to (i) measure and (ii) reduce our resource use.
- To achieve this, the EU needs to:
 - Standardise the resource use indicators, and ensure that the data is available to calculate them (e.g. trade data)
 - Ensure that policies are impact assessed with these indicators (e.g. renewable energy), and that the resource efficiency performance of countries is assessed (e.g. in EU 2020 process)
 - Create new policies to increase resource efficiency phasing out residual waste, making products resource efficient
- For more information:
 - http://www.foeeurope.org/resources



References

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- "Overconsumption? Our use of the world's natural resources", Friends of the Earth Europe/Sustainable Europe Research Institute, September 2009: http://www.foeeurope.org/publications/2009/Overconsumption Sep09.pdf
- 3. "Gone to waste: the valuable resources that European countries bury and burn", Friends of the Earth, October 2009:
 - http://www.foe.co.uk/resource/reports/gone_to_waste.pdf
- 4. Chapagain, A., & Orr, S. (2008). UK Water Footprint: the impact of the UK's food and fibre consumption on global water resources.

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 http://www.foeeurope.org/publications/2011/Europe_Global_Land_Demand_Oct11.pdf

 Briefing:
 - http://www.foeeurope.org/publications/2011/Briefing_Europe_Global_Land_Demand_Oct11.pdf

Bernard Lanfranchi, Veolia Environnement, **Examples** of best

practices for addressing resource scarcity

European Parliament Workshop on Resource Efficiency Brussels - 31 January 2012

> **Examples of best practices** for addressing resource scarcity

> > Bernard Lanfranchi European Affairs Department





SUMMARY

- The Veolia group
- Introductory purpose
- Example 1: bioplastics recovered from wastewater
- Example 2: energy recovered from data centers
- Example 3: biofuels recovered from used food oils
- Conclusion



Introductory purpose

0

Our attitude towards resources has notably changed since economists:

Thomas Malthus (1798)

"The power of population is indefinitely greater than the power in the earth to produce subsistence for man"



and



Jean-Baptiste Say (1803)

"Natural resources are inexhaustible, because otherwise we would not get them for free. As they cannot be multiplied nor exhausted, they are not subject to economics"

Bio-plastics recovered from wastewater at Aquiris wastewater treatment plant (North Brussels)

 Wastewater is normally seen as waste, whose pollutants are extracted in consecutive steps

but

Wastewater can instead be looked at as a resource

- Wastewater sludges contain green carbon which can be converted into PHA (*), an ingredient of bioplastics
- PHA is already industrially produced from sugar or starch, and is biodegradable
- Research and innovation has been carried out for 10 years by Veolia to produce PHA from wastewater sludge



(*) Polyhydroxyalkanoate





Bio-plastics recovered from wastewater at Aquiris wastewater treatment plant (North Brussels)

- This research led to a pilot installation, set up in the Aquiris plant
- The process is based on naturally present bacteria, which convert into polymer the polluted sludge they feed on



- The needs of the outlet (plastics industry) were taken into account from the beginning
- The obtained bio-plastic is "greener" than those usually produced from croplands



Energy recovered from data centers at Val d'Europe (France)

- Data (treatment) centers are made of computer systems which need to be constantly cooled
- They generate an important heat flow, that is usually wasted at the cooling system outflow
- In Val d'Europe the heat recovered by the cooling system is transferred, via a heat exchanger, to a district heating network





Energy recovered from data centers at Val d'Europe (France)

- When completed this network will ensure the heating needs and hot water supply of the neighbouring district: 600.000 m² of (offices, shops, hotels...) buildings
- This recovered energy will substitute fossil fuels, thus allowing primary energy savings and reduction of CO₂ emissions
- Avoidance of 5.400 ton CO₂ / year (i.e. 2.600 equivalent avoided cars / year)





Used cooking oil converted into biodiesel at the Limay plant (France)

- Used oils
 - A waste generated by agro-food industry, restaurants, households
 - An under-tapped resource: a high proportion of these oils is still not properly collected or treated
- The Sarp Industries (Veolia group) Limay plant converts used oils into 2nd generation (not competing with food-crop sourced) biodiesel
- Biodiesel is further incorporated (in 30% or 7% proportion) to diesel oil
 - B30 (contains 30% biodiesel): for town/business fleets
 - B7 (contains 7% biodiesel): for distribution networks
- Plant capacity: 45.000 ton/year

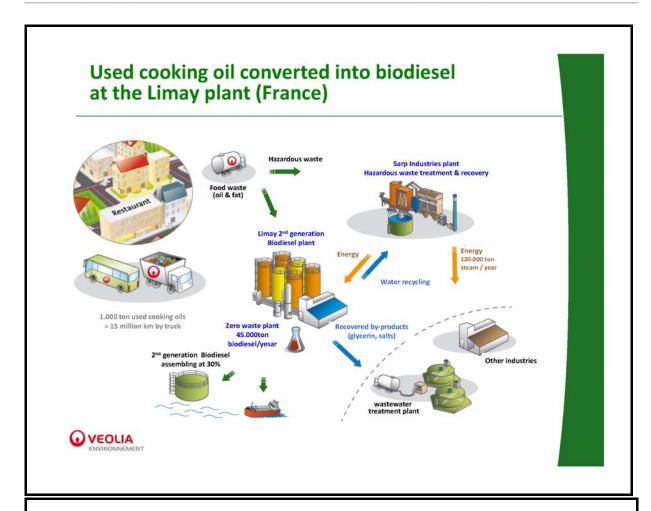


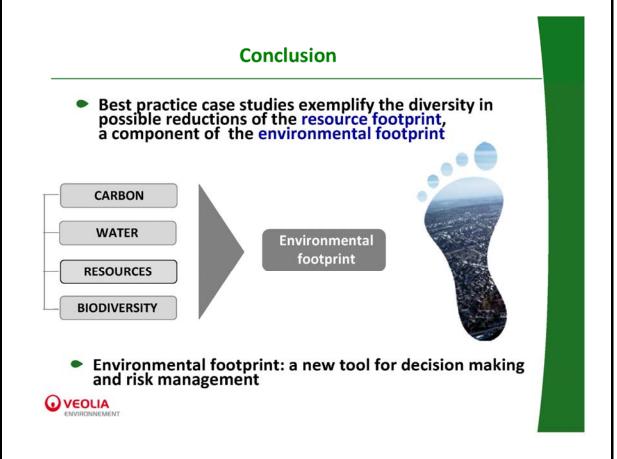


Used cooking oil converted into biodiesel at the Limay plant (France)

- Combined benefits of this resource recovery process
 - 100% recovery of used oils
 - Production of a renewable resource
 - 92% reduction of greenhouse gas
 - The plant is "zero waste"
- Adjacent hazardous waste treatment plant provides for
 - 100% of used oil plant energy needs (through recovered heat from hazardous waste incineration)
 - Treatment/recycling of effluents → no waste







Michal Miedzinski, Technopolis, Eco-innovation challenge: turning costs into benefits for all?



Eco-innovation challenge: turning costs into benefits for all?

Brussels, 31 January 2012

Michal Miedzinski Coordinator, Eco-Innovation Observatory Senior consultant, Technopolis Group





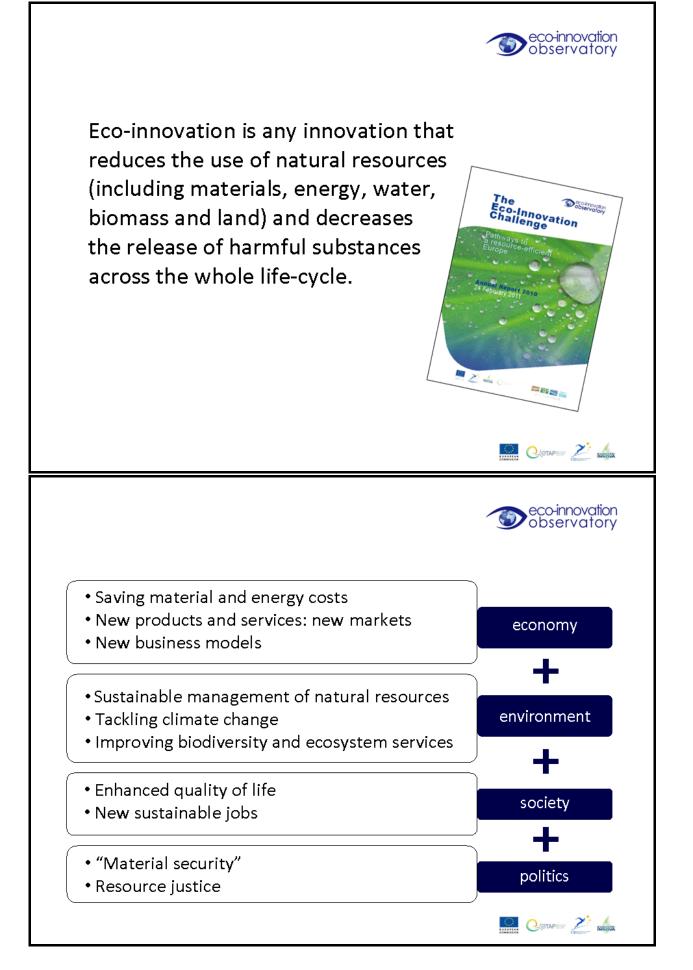






What is eco-innovation?







- 1) to further improve the resource productivity
- 2) to ensure that eco-innovations and their benefits are widely diffused in economy and society

productivity



3) to ensure that the improved productivity is not offset by the growth in the absolute consumption of natural resources

sufficiency







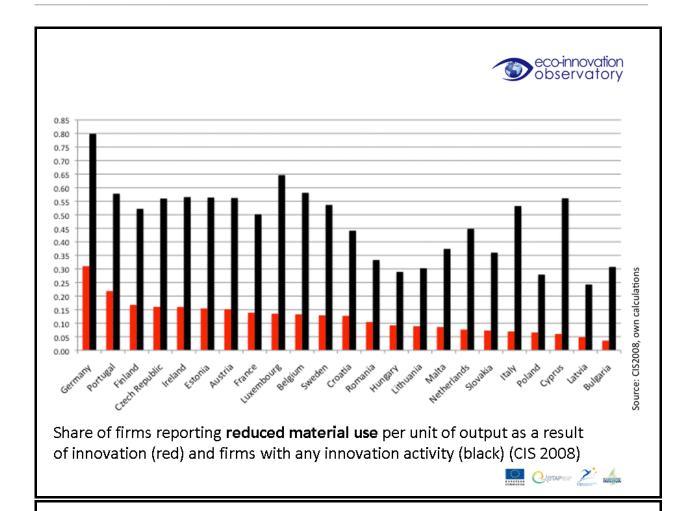


Eco-innovation performance in EU: an untapped potential











DEFRA (UK): £23bn could be saved in 2009 in the UK by making simple changes to use resources more efficiently. Savings opportunities with a payback greater than one year estimated at £33bn. This gives a total opportunity of around £55bn (Oakdene Hollins 2011)

DEMEA (German Material Efficiency Agency) estimated about €200,000 of potential savings per company with an investment of under €10,000 in nearly half of the companies covered by the scheme (DEMEA 2010)

NISP – National Industrial Symbiosis Programme (UK): €982m saved and €1027m in additional sales created in the period April 2005-March 2011; €9 in direct receipts for every €1 invested in NISP (NISP Economic Valuation Report, Manchester Economics 2011)



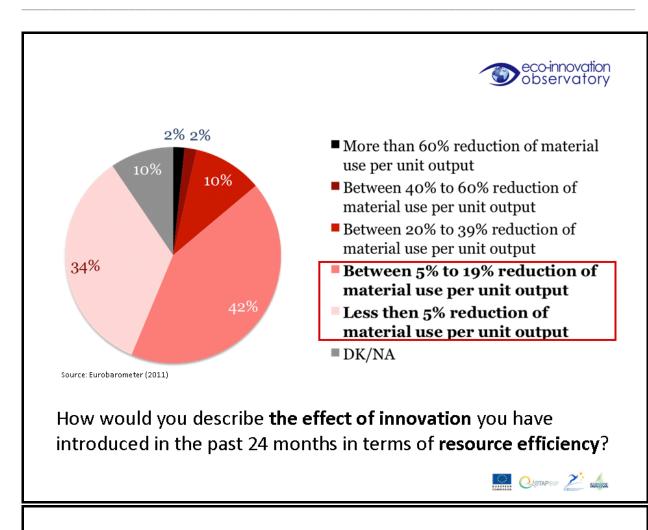


Transition: are we on the right track?





45% of companies in EU in manufacturing, construction, agriculture, water supply and food services have introduced at least one eco-innovation in the past two years (Eurobarometer 2011)





Concluding remarks





- Strong environmental AND business case for eco-innovation
 - Growing evidence that investment in material efficiency eco-innovation leads to the reduction of material and energy cost of companies
 - SMEs can benefit from relatively higher savings than big companies (see upcoming EIO report)
- Eco-innovation activity is relatively widespread in the European companies

but...





- Majority of EU companies do not eco-innovate
- Most eco-innovators declare only incremental material efficiency improvements
- The current eco-innovation performance falls short to reach the objective of absolute decoupling environmental impacts from economic growth
- There is a high diversity of eco-innovation performance and potentials in between EU countries and sectors





The Eco-Innovation Observatory



eco-innovation observatory

Our resources:

- Reports and briefs
- **EU27 country profiles**
- Database with on-line charts and maps
- 150+ good practice examples
- Glossary
- Surveys

briefs, and databases.

Visit our website to get access to our reports,

www.eco-innovation.eu





Thank you

Contact:

Michal Miedzinski

Email: michal.miedzinski@technopolis-group.com







Dr. Christian Hagelücken, Umicore, Improving the recycling of materials - a key contribution to resource efficiency



Improving the recycling of metals - a key contribution to resource efficiency









DIRECTORATE-GENERAL FOR INTERNAL POLICIE



The "urban mine deposits" in our EoL products

- often higher metal concentrations than in mining ores

Mining ≈5 g/t gold (Au) in ore similar for PGM (Pt, Pd, Rh, ...)



factor 40



≈ 200 g/t Au & 80 g/t Pd in PC motherboards*, ≈300 g/t Au & ≈ 100 g/t Pd in cell phone handsets* ≈2000 g/t PGM in autocatalysts (ceramic monolith)



& more





* plus many additional metals

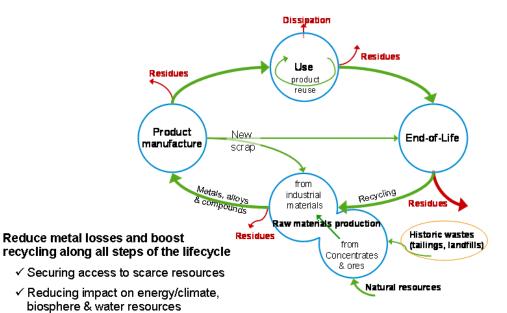
Close the loop - mining & recycling to be set up as a truly complementary system

EP workshop on Resource Efficiency, Brussels, Jan. 31, 2012



Consensus on benefits of the circular economy

- One man's trash is another ones treasure

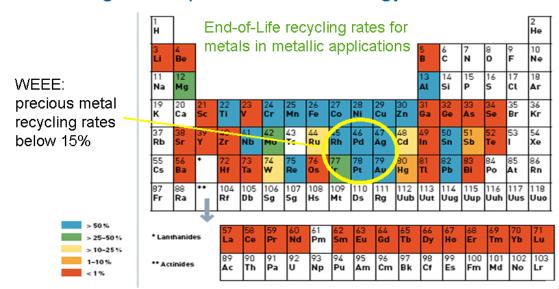


✓ Inducing innovation & creating jobs

EP workshop on Resource Efficiency, Brussels, Jan. 31, 2012



In spite all efforts – still far away from closing the loop for most technology metals



Source: UNEP (2011) Recycling Rates of Metals – A Status Report, A Report of the Working Group on the Global Flows to the International Resource Panel- Graedel, T.E.: Alwood, J.; Birat, J.-P.; Buchert, M.; Hagelüken, C.; Reck, B.K.; Sibley, S.F.; Sonnemann, C.

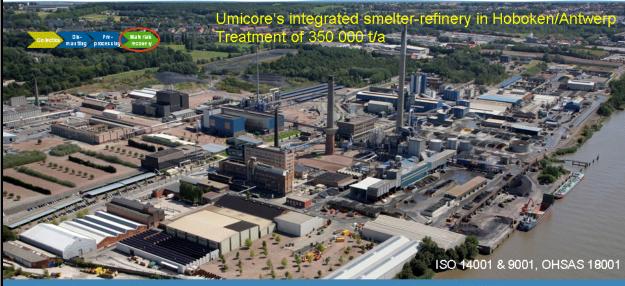


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Success of innovative technology

Much is possible already today





- **Recovery of 20 metals** from WEEE, catalysts, batteries, smelter by-products etc. Au, Ag, Pt, Pd, Rh, Ru, Ir, Cu, Pb, Ni, Sn, Bi, Se, Te, Sb, As, In (from universal process). Co, (Li, REE); Ga (from specialised processes)
- Value of precious metals enables co-recovery of specialty metals ('paying metals')
- High energy efficiency by smart mix of materials and sophisticated technology
- High metal yields, minimal emissions & final waste



Much more needs to be done (1)

- relevant materials don't reach best suited processes











- · Legislative support & ambitious targets
- · Awareness & infrastructure
- New business models (leasing, deposit fund systems ...)
- Better data (inventory of the urban mine)

Feed into & keep within appropriate recycling channels

- · Measure & monitor material flows down to final process
- · Smart tracing technology to prevent illegal exports
- · Combined stakeholder responsibility along the chain
- · Process certification to ensure use of BAT processes

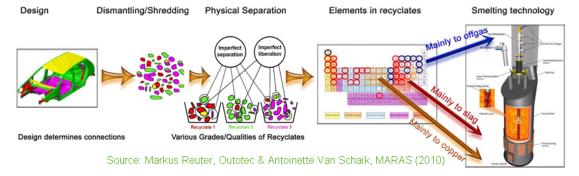


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Much more needs to be done (2)

- recycle better in a systemic approach



Product manufacturing

manual/mechanical preprocessing

metallurgy

Material composition & type of connections

Accessibility removal of relevant parts (e.g. catalysts, batteries, circuit boards, magnets) Quality of mechanical liberation & sorting
→ to what extent can technology metals be directed into target output?

Quality of metallurgy, thermodynamic & economic limits

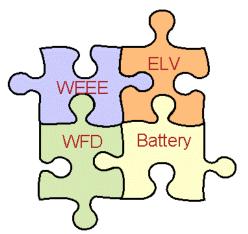
Challenge: REE, Ge, Ga, In, Ta, ...

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- ensure consistent & complimentary policies

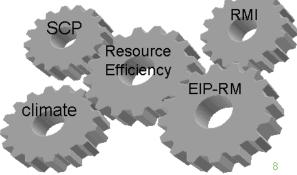


- Create appropriate & consistent legal framework, adapt when needed (example WEEE recast)
- > Ensure stringent enforcement!
- Support R&D funding & innovative pilot plants to address the grand challenges (interdisciplinary & systemic approaches)
- Build ETPs in a synergetic, complementary way
- Start EIP on Raw Materials as key vehicle for securing RM access and recycling



- ⇒ don't waste metals
- don't waste time, let's move with the frontrunners

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IP/A/ENVI/WS/2011-13 96 PE 475.089



What needs to be done?

- Collect more & better
 - ⇒ ambitious targets, own category for small ITC, business models, campaigning, labels, public procurement ...
- Prevent dubious/illegal exports
 - ⇒ monitoring, close loophole, certification of recycling chains, stringent controls, severe penalties, ...
- 3. Ensure smart recycling
 - quality more important than quantity (plant certification, transparency of flows, ...)
 - ⇒ holistic optimisation of recycling <u>chain</u>, focus on interface management & product design
- Develop innovative processes for difficult material mixes (REE, Li, In, Ga,...)
 - ⇒ R&D funding, European cooperation (RMI; planned EU Innovation Partnership on RM)
- 5. Improve data basis
 - composition, "stocks & flows" of secondary raw materials
- 6. Create legislative support for recycling of technology metals
 - adapt waste directives; create incentives for recycling of critical metals
- 7. Enhance (university) education (interdisciplinary approach beyond engineering)

Securing high quality recycling is a cornerstone in resource efficiency and will create growth & jobs in the EU.

An appropriate policy framework is essential for success.

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9



background information



Contact: Christian Hagelüken

E-mail: christian.hagelueken@eu.umicore.com

Website: www.preciousmetals.umicore.com; www.umicore.com



Minute content per unit but volumes count Example: Metal use in electronics

Global sales 2010

a) Mobile phones

1600 million units/ year X250mg Ag ≈ 400 t Ag 38t Au X 24 mg Au≈ X 9mg Pd≈ 14t Pd X 9 g Cu≈14,000t Cu 1300 million Li-Ion batteries

X 3.8 gCo ≈ 6100t Co

b) PCs & laptops

350 Million units/year X1000mg Ag≈ 350 t Ag X220mg Au≈ 77t Au X 80mg Pd≈ 28t Pd X~500 g Cu≈175,000 t Cu ~180 million Li-ion batteries

X 65 gCo ≈ 11,700t Co

a+b) Urban mine

Mine production / share Ag:22,200 t/a ▶ 3% Au:2,500 t/a ► 5% Pd: 200 t/a ▶21% Cu: 16Mt/a ▶<1%

Co:88,000 t/a



- Cumulated global sales of mobile phones until 2010: 10 Billion devices
- · Other electronic devices, cars etc. add even more to these figures
- Containing many other technology metals → significant total demand
- Intrinsic value per mobile phone ~ 1 € ⇒ little economic recycling incentive per unit, but volume counts!

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World mine production, EEE demand and % application relative to mine production for a number of critical elements

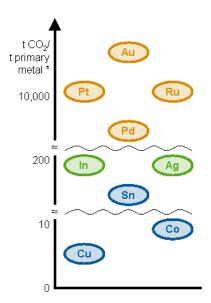
Important EEE metals		World mine production	EEE demand	EEE demand <i>I</i> mine production	Metal price	Value of EEE use	Source, data year
		t/a	t/a		\$/kg	billion \$	
Silver	Ag	22,200	7,554	34%	\$649	\$4,90	GFMS, 2010
Gold	Au	2,500	327	13%	\$39.443	\$12,90	GFMS, 2010
Palladium	Pd	229	44	19%	\$16.948	\$0,74	JM, 2011
Platinum	Pt	188	7	4%	\$51.811	\$0,37	JM, 2011
Ruthenium	Ru	29	21	72%	\$5.069	\$0,11	JM, 2011
Copper	Cu	16,200,00	7,174,000	44%	\$8	\$54,08	GFMS, 2010
Tin	Sn	261,000	129,708	50%	\$20	\$2,65	ITRI, RESOLVE, 2010
Antimony	Sb	135,000	67,500	50%	\$9	\$0,61	Adroit, 2010
Cobalt	Со	88,000	16,470	19%	\$45	\$0,75	CDI, 2010
Bismuth	Bi	7,600	1,216	16%	\$20	\$0,02	MCP, 2011
Selenium	Se	2,260	185	8%	\$82	\$0,02	Naumov, STDA, 2010
Indium	ln	574	717	125%	\$566	\$0,41	Roskill, Metal Pages, 2010
Values exceeding	. 1∩0% ma	v aviet dua to racvo	due to recycling. Metal prices from Metal Bulletin.			\$77,56	

Values exceeding 100% may exist due to recycling. Metal prices from Metal Bulletin, Mine production from USGS (Ru from JM), sources indicated in table for EEE volumes

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Potential carbon footprint of selected elements in WEEE



Metals used in EEE	Demand for EEE	Primary production intensity	CO ₂ emissions	Source, data year
	t/a	t CO ₂ /t metal	Mt/a	
Gold	327	16.991	5,56	GFMS, 2010
Platinum	8	13.954	0,11	JM, 2011
Ruthenium	16	13.954	0,22	JM, 2011
Palladium	30	9.380	0,28	JM, 2011
Silver	4.917	144	0,71	GFMS, 2010
Indium	717	142	0,10	Roskill, Metal Pages 2010
Tin	129.708	16	2,09	ITRI, RESOLVE, 2010
Cobalt	16.470	8	0,13	CDI, 2010
Copper	7.174.000	3	24,39	GFMS, 2010
CI	o total (Mt/a	100000000000000000000000000000000000000	33.58	

*CO2 impact data from ecoinvdent 2.0, EMPH/ETH

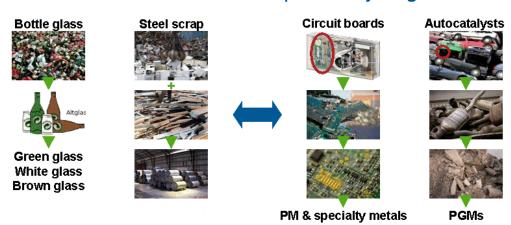
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13



Technology metals need smart recycling

- mass focussed traditional European recycling does not fit



- · "Mono-substance" materials without hazards
- Trace elements remain part of alloys/glass
 - Recycling focus on mass & costs
- "Poly-substance" materials, incl. hazardous elements
- . Complex components as part of complex products

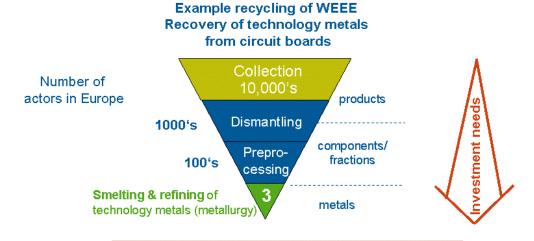
Focus on trace elements & value

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Recycling needs a chain, not a single process

- system approach is crucial



Total efficiency is determined by weakest step in the chain Make sure that critical fractions reach these plants

Example: $30\% \times 90\% \times 60\% \times 95\% = 15\%$

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15

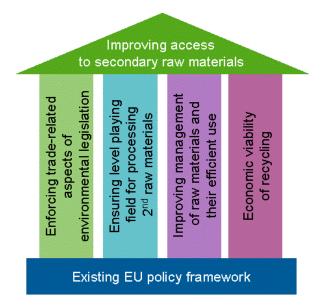
Improving supply security by closing the loop - a crucial complimentary approach to mining

- From waste to secondary resources
- High potential especially for technology metals/critical metals
 (⇒ currently significant deficits)
- Deposits are available in our courtyard; for secondary RM there is ...
 - · No need for raw materials diplomacy or RM partnerships
 - · No need for time & cost intensive exploration & mine development
 - Quick access principally possible, enables higher geopolitical independence
- Advantage metal recycling: no quality degradation/ "downcycling", recycled metals have identical physical-chemical properties as primary ones – and same prices
- No benefit of incentivising use of recycled metals in products once they are recycled they will be used "automatically"
 - Minimum recycled content of metals might rather be misused for "greenwashing" (does e.g. recycled jewellery gold really make a computer greener?)
- Instead: Ensure that products are collected at end-of-life and that from these technology metals really are recovered efficiently.
 - incentivise collection/closed loop business models and high quality recycling!

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RMI: Eurometaux Proposals



10 concrete proposals under 4 pillars:

(1): Trade aspects

- Customs identification of second hand goods
- Improved enforcement of Waste Shipment Regulation
- End-of-Waste

(2) Level playing field

- Certification scheme to ensure access to secondary RM
- Facilitate & encourage the reshipping of complex materials to BATrecycling plants in Europe

(3) Improved EoL management

- Promote the Efficient Collection and Recycling of Rechargeable Batteries
- · The eco-leasing concept
- · Better recycling data
- · Research on recyclability

(4) Economic viability of recycling

Download:

www.oeko.de/publikationen/forschungsberichte/studien/dok/657.php?id=&dokid=1069&anzeige=det&lTitel1=&lAutor1=&lSchlagw1=&sortieren=&dokid=1069

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17

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Umicore – a materials technology company

strategic recycling approach to secure metals supply



application know-how

themistry material science metallurgy

recycling

- Focus on clean technology
- 14.500 employees
- 10 Bn. € turnover
- 70 industrial locations globally
- •Ø 50% of metal needs from recycling

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DIRECTORATE-GENERAL FOR INTERNAL POLICIES



Role

Policy departments are research units that provide specialised advice to committees, inter-parliamentary delegations and other parliamentary bodies.

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