

Eco-Innovation Policies: Concepts, Best Practices and Monitoring

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Structure

1. Introduction and main message
2. Economic and ecological concepts of eco-innovation policy
3. Definition and Measurement: Best Practices of Monitoring and Reporting
4. Conclusions and research needs

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1. Take Home Message

During the first decade of the century
eco-innovation research and policy have co-evolved
from an idea and vision
to a very segmented area
of research and policy making

Probable reason: Eco-innovation is seen by most as a win-win-
strategy helping the environment and economy, thus leading to
sustainable development

Is that always the case?

No, but more often than in any other strategy reaching for
sustainable development

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2. Economic and ecological concepts of eco-innovation policy

Eco-innovation Policy

- Many firms, researchers, stakeholders, ministries involved:
 - Environment, Research, Enterprise, Energy, Transport etc.
-
- Co-ordination of policies better idea than integration
 - No super-ministry of eco-innovation
 - Responsibility typically at the level of the ministries, for a certain initiative one ministry takes the lead

Policy integration vs. Co-ordination

Integration:

New Super-
Ministry of
Research,
Economics and
Environment

Maybe something like
METI in Japan?

Co-ordination:

Ministries of Research,
Economics and
Environment work together

Role:

Research: Basic, long term research

Economics: Short term technologies

Environment: Environmental Policies

Best Practice EU: Three DGs and an Agency running the calls for (short term)projects

DG Research	DG Enterprise	DG Environment
Framework Programme	Innovation Policy	Environmental Policy
Executive Agency for Eco-Innovation		
Running the eco-innovation programme in the CIP (Competitiveness and Innovation Programme), e.g. call for projects		

Chinas Double Top Down Eco-Innovation Low Carbon Policy Approach

General Plan (NDRC as Co-ordinator))

Lead: National Development and Reform Commission (NDRC)

Key Responsibilities:

Ministry of State Science and Technology (MOST): Public Private Partnerships

Chinese Academy of Science (CAS): Basic and Applied Research

Ministry of State Environmental Protection (MEP)

Ministry of Industry and Information Technology (MIIT): Industry Innovation Programmes

China Meteorological Administration (CMA)

Implementation:

Autonomous provinces, first movers such as Zhejiang

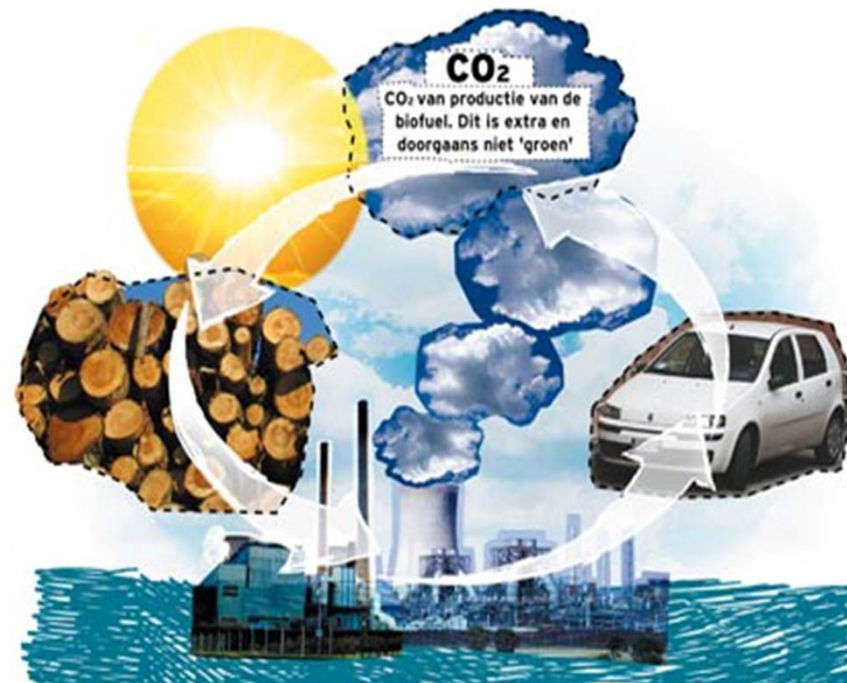
Best Bractice Germany: Masterplan Environmental Technologies

- Part of the German Hightech-Strategy
- Joint initiative from German ministries of research and environment
- Goals:
 - Strenghten leading postion on world market for environmental technologies
 - link innovation- and environmental policy
 - develop new markets for environmental technologies

Includes:

- Measures for technology support and diffusion
- Meaures for internationalisation and qualification
- Support of SMEs
- Cross-cutting measures

Most important in any approach:
Alienation of actors with common visions and targets
Best Practice: EU 20-20-20 targets, or Transition Management in the Netherlands:
Oriented at long term policy targets:
Clean & Efficient 2007-2010
But also e.g. G-20 Meetings and Shanghai Expo vision are important



Targets (2020)

- 30% CO₂-reduction
- 20% renewable energy
- 2% annual energy efficiency increase

2. Economic and ecological concepts of eco-innovation policy

- Strategies for eco-innovation depend on your underlying concept. i.e. your way of thinking!

Different economic perspectives exist:

Neoclassical economic concept

- Eco-innovation is seen as a problem of „double externality“ (Rennings, 2000), i.e. negative external environmental effects of pollution and positive environmental spillovers of innovation
- The goal of eco-innovation policy is to correct market failure:
 - e.g. incomplete information by eco-labels
 - e.g. internalize external effects by emissions trading
 - e.g. positive spillovers from innovation by subsidies for basic research
 - and by protecting intellectual property rights

2. Economic and ecological concepts of eco-innovation policy

Evolutionary economics concept

- Systems approach: how to get from system A to system B?
- Regime Shift: how to get from an unsustainable system (e.g. fossil fuels) to a sustainable one (e.g. based on renewables)
 - Lock-in effects of existing technological trajectories have to be overcome
 - Eco-innovation policy should support experiments, manage new niches and help to scale them up to the mass market

2. Economic and ecological concepts of eco-innovation policy

Concepts from Industrial Ecology

- Environmental problems seen as a problem of industrial metabolism
 - Material flows and material cycles have to be reduced to maintain a sustainable level
- a. Life Cycle Assessment: Product assessment from cradle to grave, development of eco-efficiency indicators
- b. Material Flow Accounting, develops macro-level indicators for resource efficiency

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3. Definition and Measurement: Best Practices of Monitoring and Reporting

Definition used in the EU-Project
„Measuring Environmental Innovation“ (MEI):

“Eco-innovation is the production, application or exploitation of a good, service, production process, organisational structure, or management or business method that is novel to the firm or user and which results, throughout its life cycle, in a reduction of environmental risk, pollution and the negative impacts of resources use (including energy use) compared to relevant alternatives”.

(Kemp und Pearson, 2008, Final report MEI project about measuring eco-innovation. www.merit.unu.edu/MEI).

Definition highlights:

- Novelty (for firm)
Different from : novelty for market, world
Radicalness of innovation
- Emphasis on results (in contrast to motivation)
- Compared to relevant (i.e. conventional) alternatives, e.g. energy saving light bulbs compared to conventional bulbs

Methods of Monitoring

Definition is oriented at Oslo-Manual from empirical innovation research

OECD/Eurostat (2005):

- Includes technical process- and product innovations
- as well as organisational innovations

Main monitoring methods still are (see MEI):

- Innovation Surveys (e.g. CIS –Community Innovation Survey)
- Patent analysis
- Bibliometric methods
- Until 2010 no regular monitoring activity
But: Eco-innovation observatory set up in EU CIP-Programme
- Now online: <http://www.eco-innovation.eu>



A Cerro Tololo Sky (Chile)
Credit: Roger Smith, AURA, NOAO, NSF

What is the Eco-Innovation Observatory?

■ Objective

- to provide analysis on eco-innovation and liaise with related initiatives

■ Activities

- to collect and analyse data on future market and technology trends;
- to publish an annual report on the selected market segments of eco-innovation in the European Union;
- to provide “market and technology intelligence” for SMEs and innovation support providers;
- to recommend how to deliver SME specific eco-innovation information.

■ Duration: 3 years

- EIO is extending the definition of eco-innovation from a neo-classical one (Oslo Manual) to an even broader one including the evolutionary approach (systems innovation), life cycle approach (eco-efficiency) and material efficiency (resource efficiency)



ecoinnovation



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The Eco-Innovation Observatory approaches eco-innovation, "any innovation that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle", as a pervasive phenomenon present in all economic sectors and, therefore, relevant for all types of innovation and sectors.

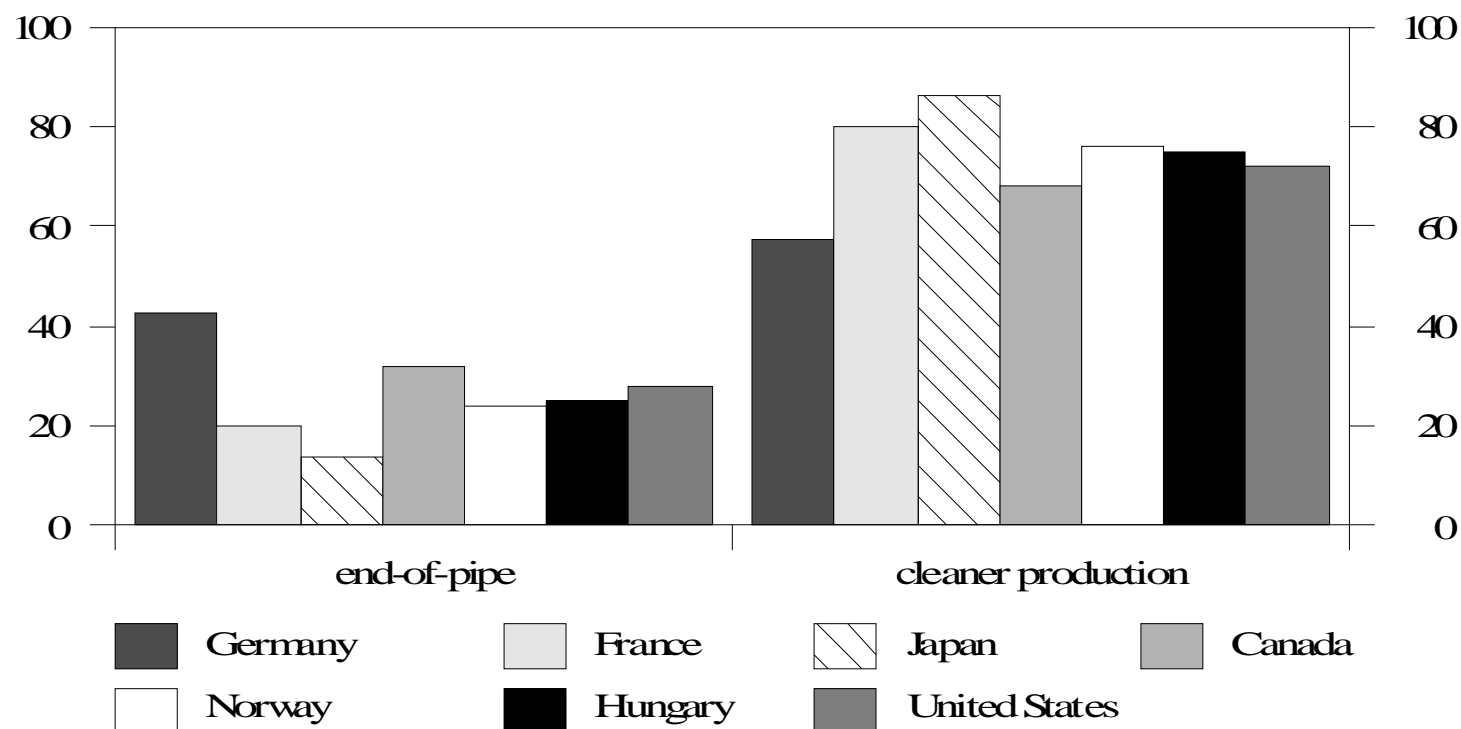
Accepting such an approach has important



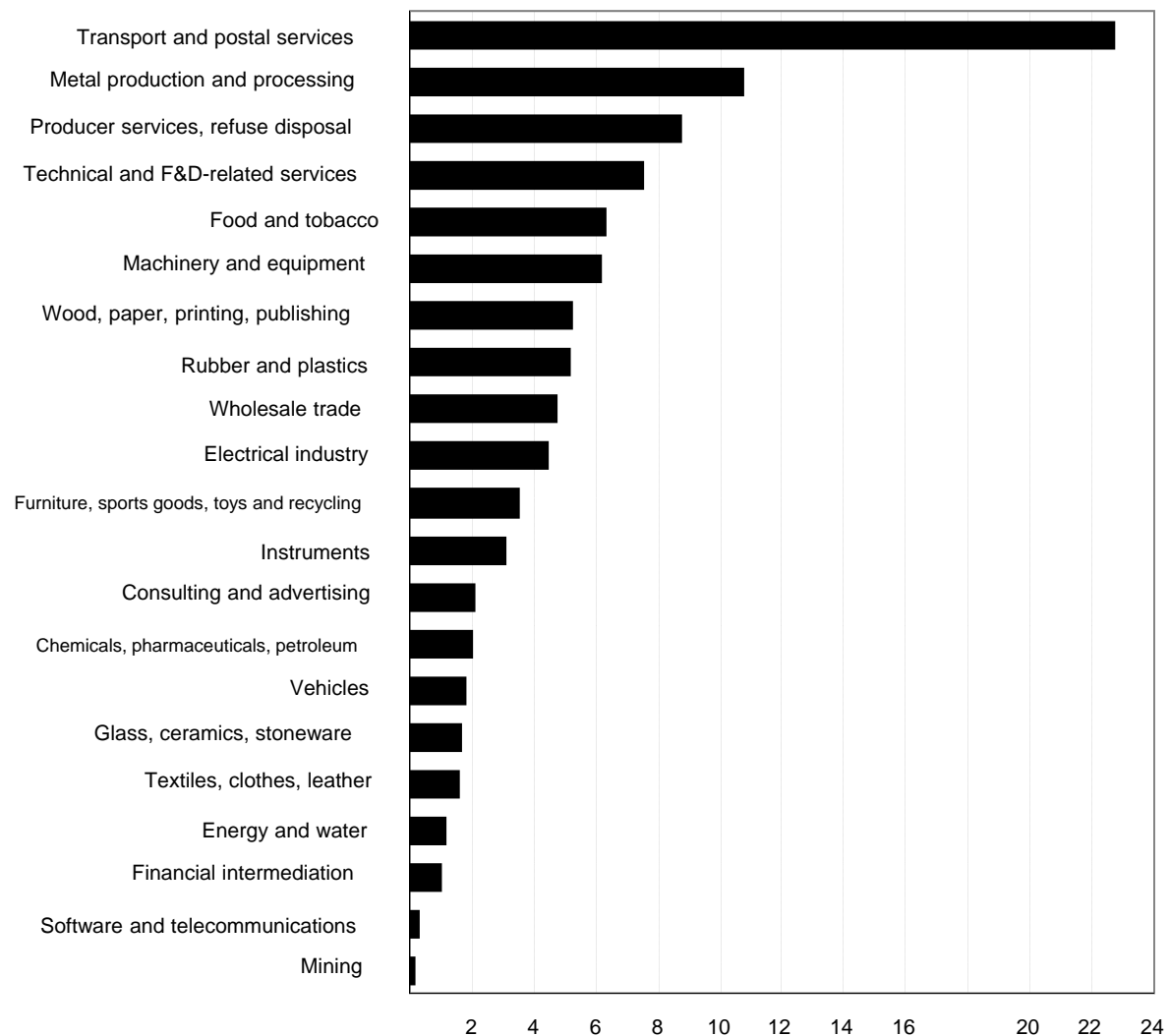
Some more Best Practices of Reporting The OECD survey 2003

Figure 2: Choice of Environmental Technologies in Seven OECD Countries

In %

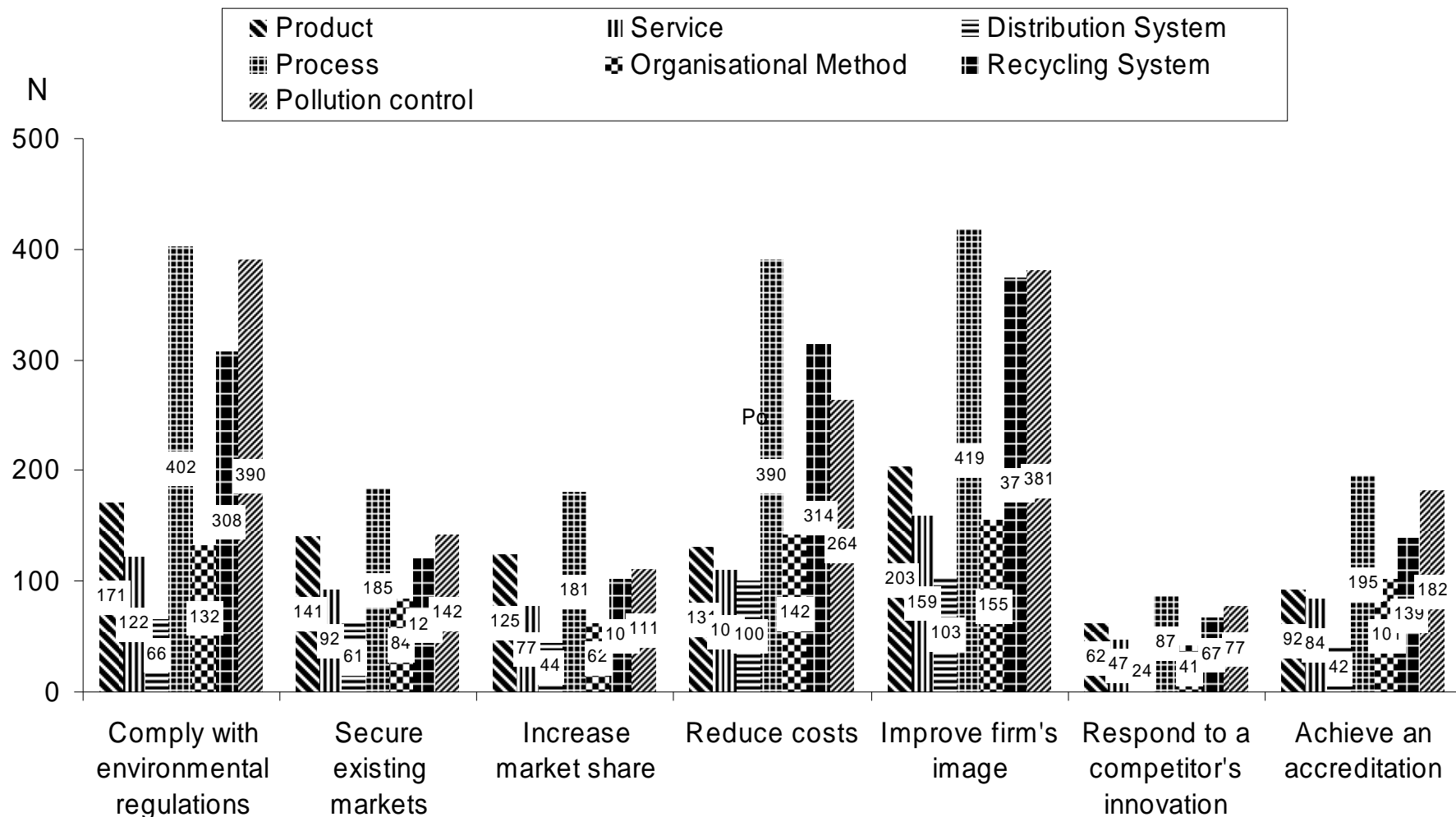


Distribution of "environmentally efficient innovators" by industry in Germany 2004



Sector as a percentage of all firms who in 2002-2004 introduced new products and/or processes which had significant effects on cuts in material or energy costs per unit/procedure. Note: Firms having at least 5 employees in the sectors 10-41, 51- 60-67, 72-74, 90 in Germany. All figures are extrapolated to the total firm population in Germany. Source: ZEW, Mannheim Innovation Panel, Survey 2005

IMPRESS survey 2000: Determinants of environmental innovations in 5 European countries



Employment Impacts of Environmental Innovations

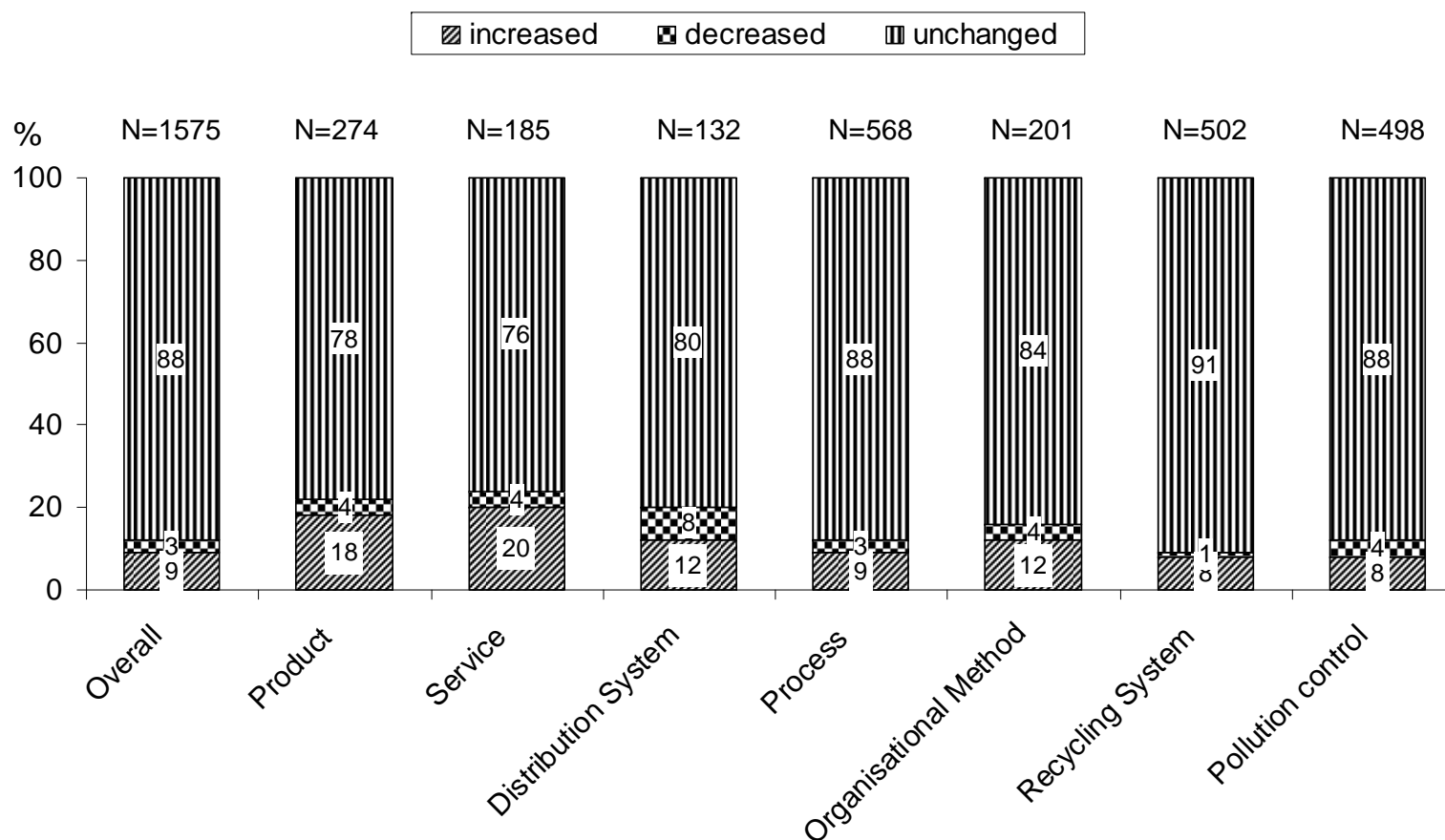
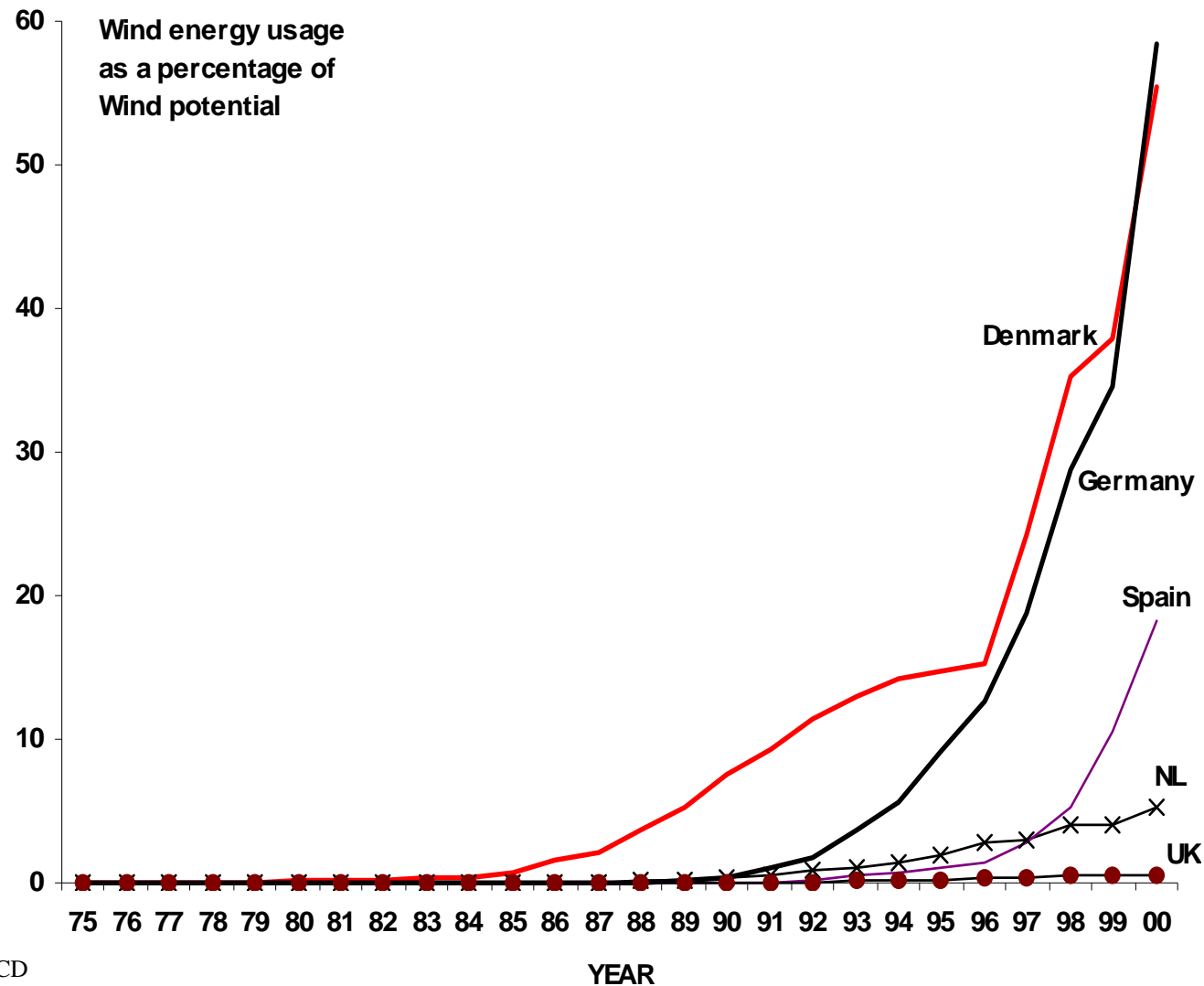


Figure : Employment effects of eco-innovations in 5 EU countries (Rennings/Zwick, 2002)

The Process: Invention - Market Introduction - Diffusion

Diffusion of wind energy: depends crucially on regulation



Quelle:OECD

Important for good practice: eco-innovation is not only about eco-industries

- Concept should not be reduced to producers of environmental-friendly goods and services (Eco-industries, EGS)
- Every firm is a potential eco-innovator
- Even every customer
- Not a best practice: Do not only report on eco-industries!

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1. Eco-innovation has become segmented area of research and policy making
2. Not all win-win-options, cost-efficiency mainly criterion in neoclassical concepts
3. Best practices depend on your way of thinking about eco-innovation
4. Best practices of eco-innovation policy are:
 - Observatory following diverse concepts
 - Innovation Policy: Transition management, Lead market initiative
 - Environmental Policy: Emissions Trading, Feed in-Tariffs, Eco-Labels, Top Runner
5. Research: A lot of conceptual, methodological and empirical research has to be done

Important to have in mind

- Innovation policy and environmental policy are complementary, can not be replaced by each other
- Regarding comparison of environmental policy instrument:
 - You can stimulate innovation with several instruments (e.g. subsidies, emissions trading)
 - What is more important for innovation is the policy style, i.e. that environmental policy is ambitious and has long-term targets
- Regulation advantage!
- Efficient instruments such as emissions trading will fail if there are no underlying ambitious targets
- However, core-instrument of environmental policy such as emissions trading or feed-in tariffs very important

Thanks for your attention!

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