



DYNAMIX

Decoupling growth from resource use
and its environmental impacts

Comparative analysis of resource efficiency policies

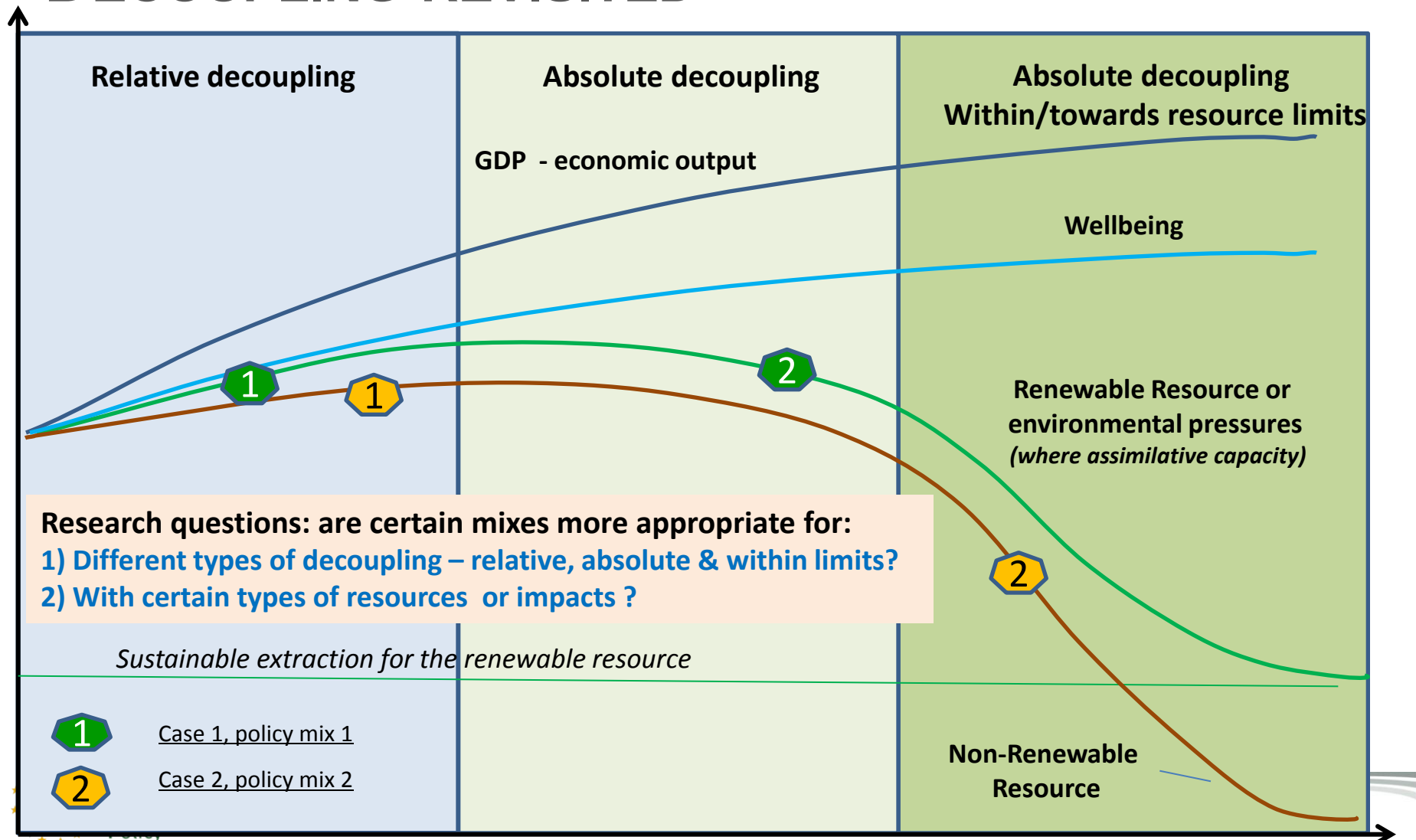
Policy instrument mixes driving decoupling

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PRESENTATION STRUCTURE

- Decoupling: revisited and in the DYNAMIX context
- The evidence base: What decoupling has been achieved to-date?
- Preliminary results from comparative analysis
- What we do next
- What you do next

DECOUPLING REVISITED



DYNAMIX CONTEXT: DECOUPLING INSIGHTS

- **National level:** e.g. GDP vs statistics on material inputs (renewable/non-renewable, biotic/abiotic), waste production / pollution, or impacts (state of environment, natural capital stocks, health)
- **Sector/industry level:**
 - e.g. forestry sector added value and Mt of wood harvest
 - e.g. chemicals inputs vs value of production or tonnes of production
- **Site level, installation and even production process level**
 - E.g. output or added value vs material inputs, waste, pollution, impacts

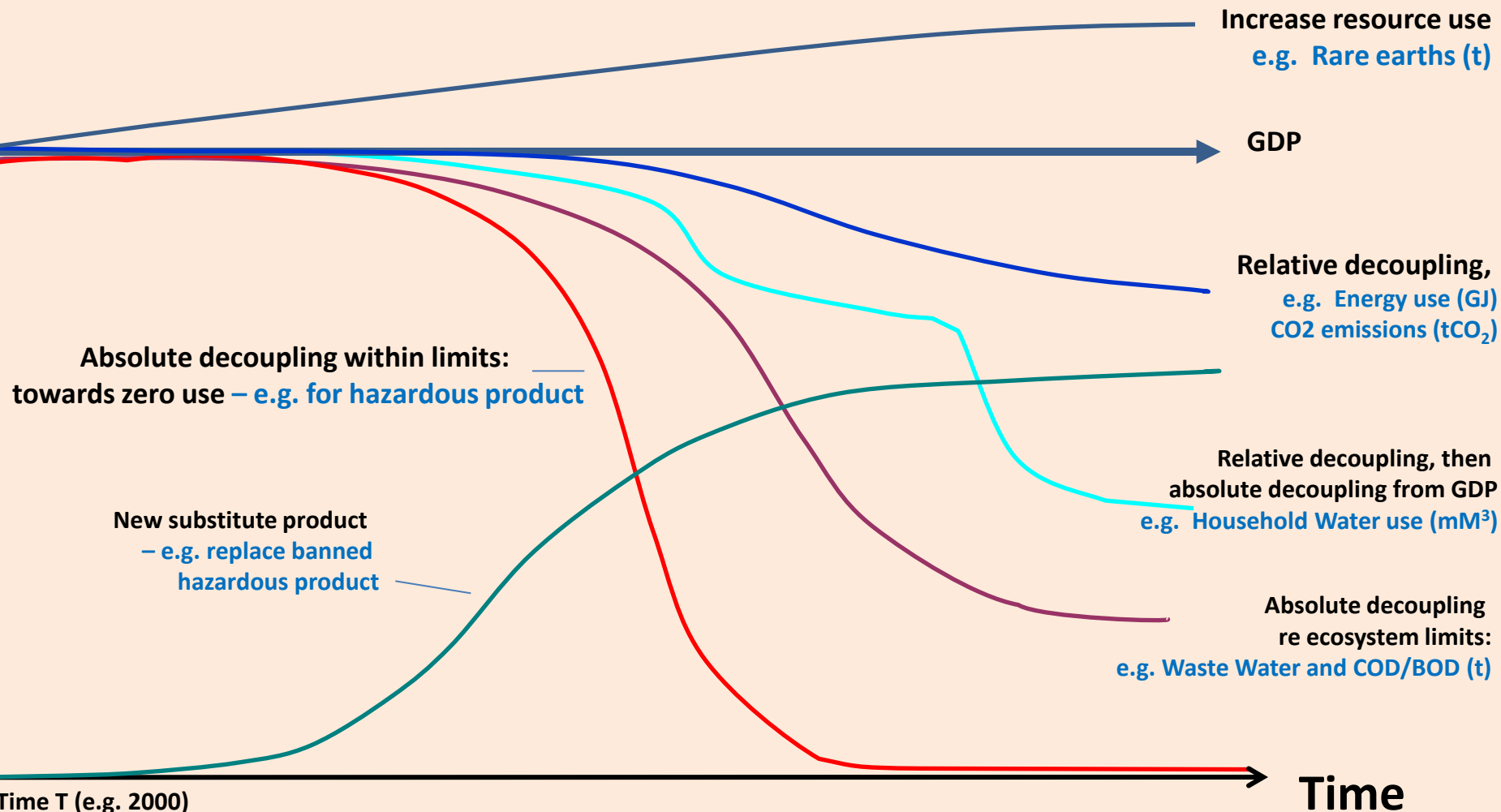
RESOURCE EFFICIENCY : DIFFERENT DECOUPLING PATHWAYS

PROGRESS OVER TIME

Indicators: (indexed to 2000)

Care needed when interpreting domestic indicators and decoupling given the role of imports.

e.g. direct imports (e.g. wood), embedded materials, embedded energy and CO₂ (e.g. in steel imports), embedded water (e.g. in meat imports) and product rucksacks/impacts (e.g. on biodiversity loss, land use)



CASE STUDIES: WHAT RESOURCES WERE TARGETED?

Renewable resources

- Sustainable use of **forests and wood** in Finland and world wide
- Sustainable levels of **fish** catch in Iceland

Mineral/metal (non-renewable) resources

- More efficient use of **aggregates** in the UK
- A sustainable **material** cycle society in Japan

Land

- Conserving **rural land** in England
- Reducing **land sealing** in Germany

Environmental media

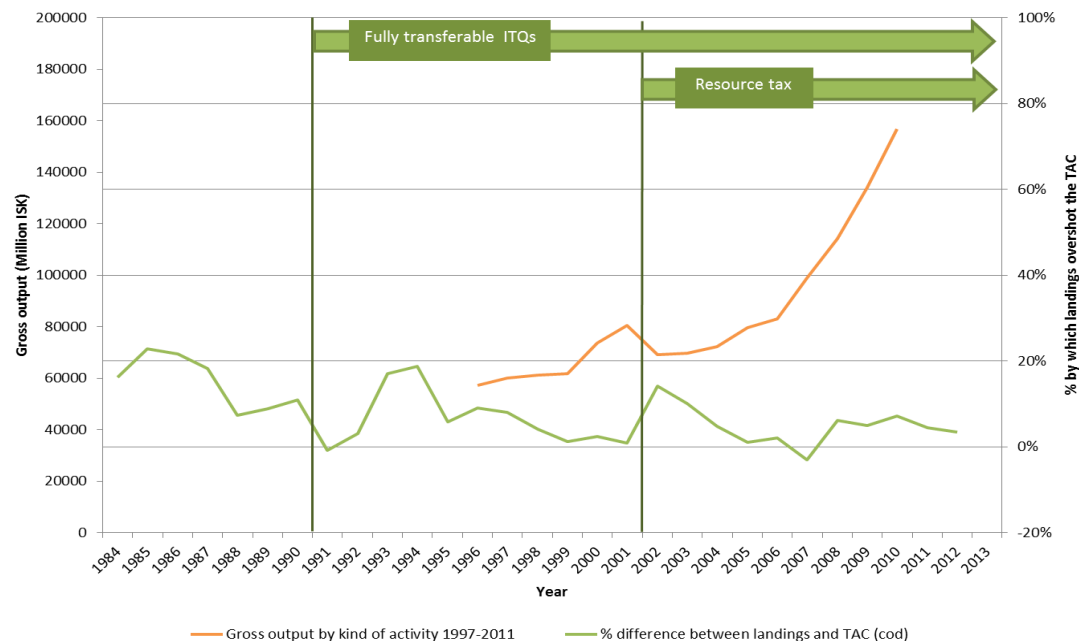
- Reducing **transport CO2 emissions** in Spain
- A **fossil fuel-free energy** system by 2050 in Denmark
- Reducing **fossil fuels** use in Sweden
- Reducing **fertiliser use** in Denmark
- Reducing **PVC and phthalates** use in Denmark
- Increasing **industrial energy efficiency** in Portugal

Waste prevention

- Reducing **municipal waste** at the local level in Slovakia
- Preventing **food waste** in the UK
- Reducing **plastic bag** use in the UK and Ireland

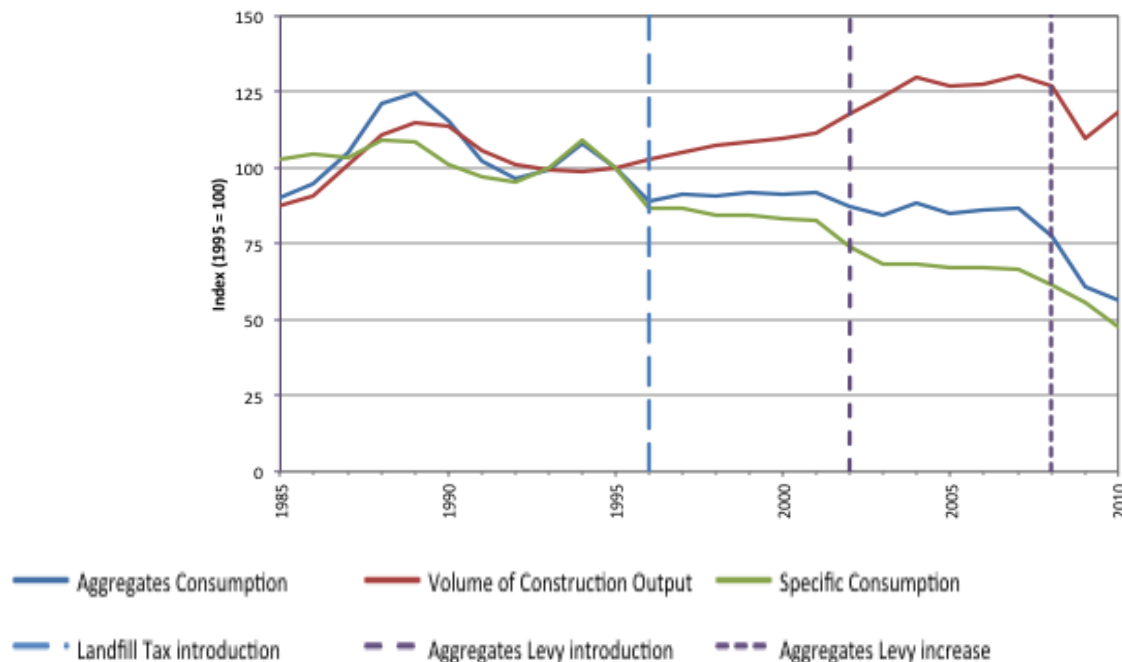
RENEWABLE RESOURCES

- Finnish wood and Icelandic fish policy mix objectives: **absolute decoupling** (deforestation and forest degradation, and MSY while maintaining population size)
- Wood: complex picture for different forestry product uses, but overall wood fuel imports growing – **no decoupling**
- Fish: **absolute decoupling** since 2002
- **TACs and ITQs** greatly improved sectoral efficiency (and improved fish stocks), a **ban** on discards and other **technical measures**, and latterly a **resource tax**
- **Mandatory requirements** key: introduction of **responsibility/rights** of fishers helped to stimulate behavioural change; sustainable forestry management (**local forest management plans**)



MINERALS/METALS (NON-RENEWABLE RESOURCES)

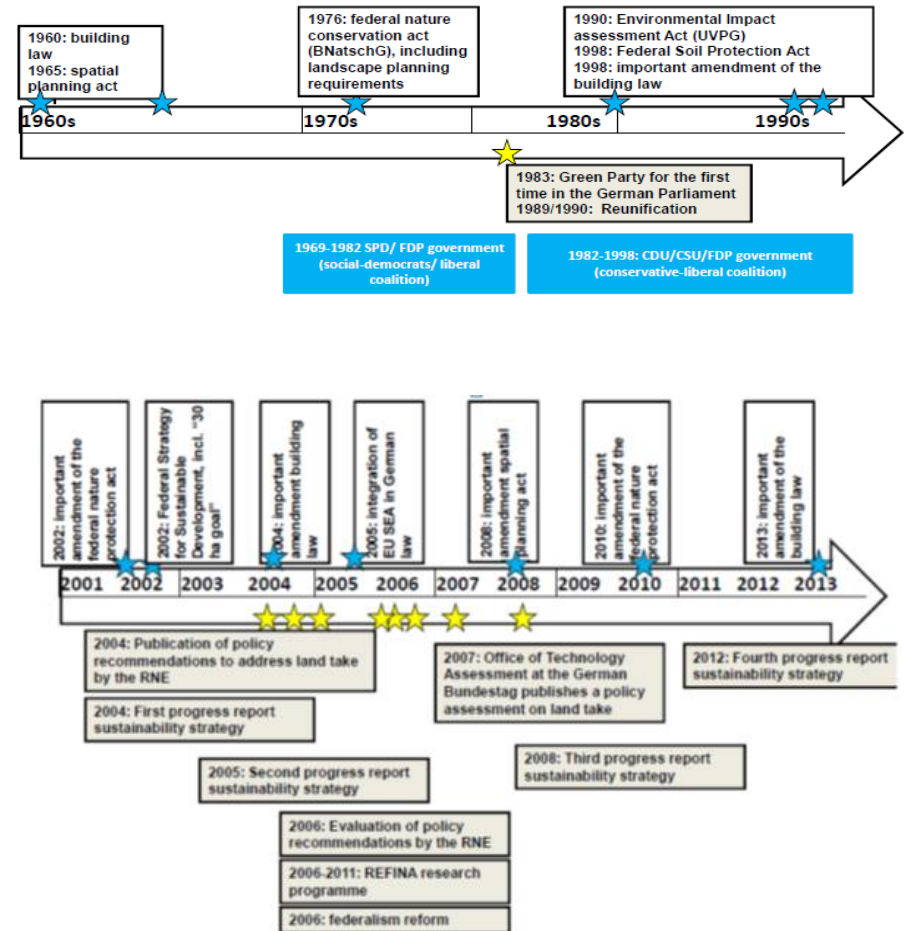
- UK aggregates and Japanese metals objectives: **undefined decoupling** (targets for Japan from 2008)
- Both achieved **absolute decoupling** (although Japan for material use, not specifically critical metals)
- UK aggregates: **combination of instruments targeted at both supply and disposal** (aggregates tax, landfill tax)
- Japan metals: **subsidies** (R&D, innovation) and **public awareness-raising campaigns**
- **Society-wide** approach in Japan (including multi-sectorial), whereas **sectoral** approach in UK



Source: Idoine, N. E., T. Bide, and T. J. Brown. 2012. *United Kingdom Minerals Yearbook 2011*, Nottingham, British Geological Survey

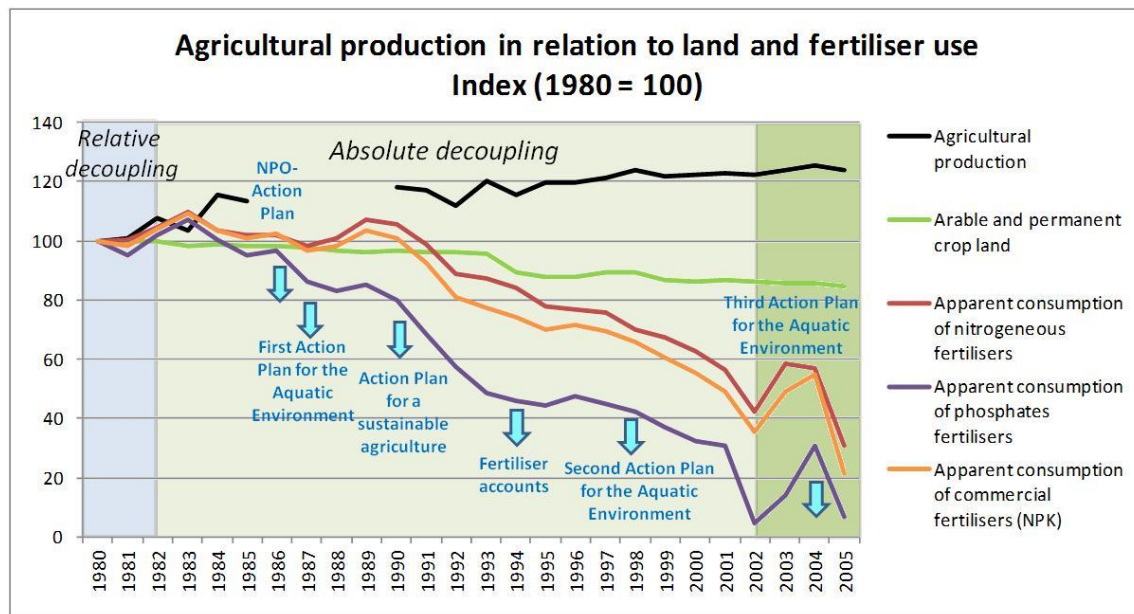
LAND

- UK: various objectives to ensure efficient and sustainable use of rural land (**undefined decoupling objective**)
- Germany: objective of reduced additional land take (national target: 30ha/day) – **absolute decoupling** as was 120ha/day in 1993
- UK: **relative decoupling**, Germany: **no decoupling**
- UK instruments: **regulatory and planning instruments** of most importance, supported by **property rights and quotas**, and **information** (identification of brownfield sites, and 'no-go' areas)



ENVIRONMENTAL MEDIA

- Various objectives: from **relative** to (future) **absolute decoupling**
- Portugal and Spain CO₂: **relative decoupling**
- Danish CO₂: **absolute decoupling**
- Swedish CO₂: from **relative** to **absolute to no decoupling**
- Danish fertiliser: **absolute decoupling**
- **Regulation and taxation** helped achieve better performance (DK vs ES, PT). **Investment, funding, analysis for future transformation.**
- Danish fertiliser: national policy targets, **farm fertiliser accounts, farm-level interventions** (links to funding)

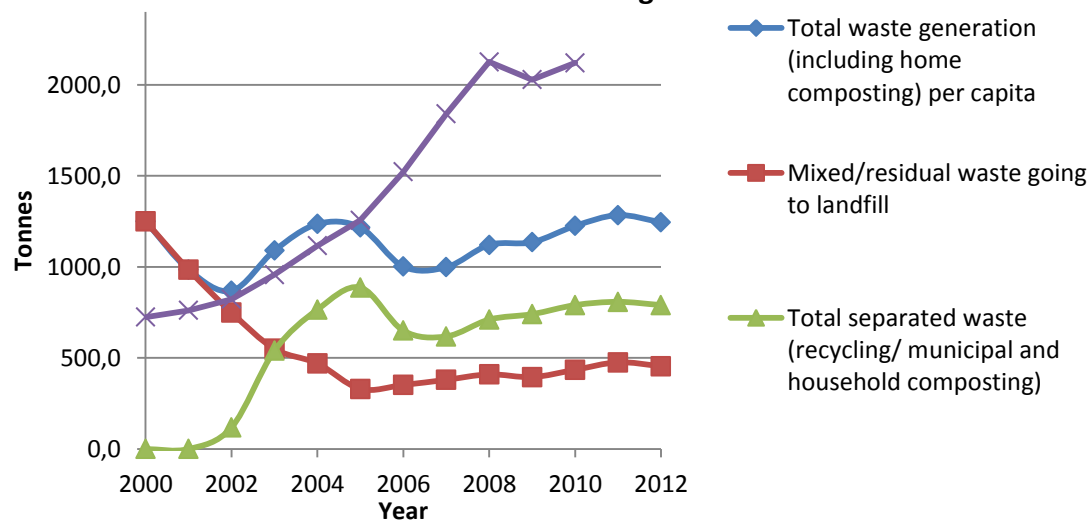


Source: OECD Environmental Data. Compendium 2008. Agriculture.

WASTE PREVENTION

- Objectives on reduction of waste levels: **no defined decoupling**
- Slovakia 'zero waste': **relative decoupling** of waste to landfill and of total waste generation
- UK food waste: no decoupling to relative decoupling (data issues)
- Ireland/UK plastic bags: **relative?** (UK: 45%) to **absolute decoupling** (Ireland: 90%)
- The **use of taxes/charges** across all the case studies, to effect behavioural change (including increases in tax/charge when effects weakening)
- Awareness-raising campaigns**, to enlighten, engage, and empower the public

Regional GDP vs Waste generation and management in Palarikovo and surroundings



Source: Authors' computation based on data provided by Palàrikovo Municipality (2013)

PRELIMINARY INSIGHTS - INFORMATION

- **Information** as an instrument is critical part of policy mixes for all levels of decoupling
 - To identify **problem levels, solution needs, instrument design** (ambition levels), review/monitoring for **evaluation and amendments** (new instruments, revised instruments)
 - To ensure **transparency, accountability and credibility**: e.g. for agriculture and fisheries subsidies (Withana et al., 2012)
 - To **raise awareness** and **help behaviour change**: labelling and supply chain pressure (e.g. legal wood imports); labelling and consumer demand (e.g. FSC/MSC/Ecolabelled products)

PRELIMINARY INSIGHTS – MBIs

- **Market based instruments** have proven valuable drivers for relative decoupling but on their own cannot lead to absolute decoupling within limits
 - E.g. ETR and impacts on CO₂ emissions and energy use in (Withana et al., 2013)
 - Exception to the rule: of ITQs
 - Exception to the rule: PES at local level: Vittel case (ten Brink et al., 2011)
- MBIs can lead to important levels of **information provision** – e.g. emissions, responses / elasticities

Carbon & energy taxes and impacts

In **Denmark** total CO₂ emissions decreased by 24 per cent between 1990 and 2001, with Danish industry reducing its CO₂ emissions by 25 per cent per produced unit from 1993 to 2000.

In **Sweden**, average 2008-11 emissions were 12.6 per cent lower than 1990 levels.

In **Finland** energy and carbon taxes were found to have reduced carbon emissions by over seven per cent in 1990-1998.

PRELIMINARY INSIGHTS – RESPONSIBILITY/RIGHTS

- **Most policy mixes include mandatory requirements** clearly setting out what needs to be done (banned or encouraged activities, levels not to be exceeded) and allocating specific responsibility (farm, company, installation).
- **Identifying rights and responsibilities** at individual level helps to ensure **higher engagement in achieving results**
- **Collaborative approaches** appear to work better, especially when partners' specific capacities are optimised (e.g. Danish wind turbine secretariat)
- Denmark's extensive use of '**agreements**' (cross-governmental, government-industry, central-local government) helps to achieve **synergistic benefits**, while also ensuring **political stability** and **regulatory certainty**

PRELIMINARY INSIGHTS – ABSOLUTE DECOUPLING

- Absolute decoupling is only possible with either **radical innovation, radical consumer demand shifts** or **regulation requiring bans**
 - E.g. SO₂/NO_x emissions from power stations – regulation
 - E.g. Ozone depleting substances – regulation
- Absolute decoupling demands that **limits be identified, targets be set accordingly, and the selection and fine tuning (amending) of instruments** in light of the targets
 - E.g. Fisheries quotas and science on sustainable fisheries yields
 - E.g. Emissions to water and eutrophication impacts
 - E.g. Pay as you throw schemes / landfill tax levels

WHAT DO WE DO NEXT?

- Further analysis of the case studies
- ‘light’ analysis of other policy mixes, to provide further evidence, to give examples of success where this doesn’t exist in the case studies (e.g. waste)
- Scanning of 15 case studies across a range of different issues + wider literature search
- Finalising comparative analysis for end November 2013
- Case study summary report and comparative analysis made publicly available by end November 2013
- Comparative analysis feeding into scenarios + policy mixes and ex-ante assessment

RANGE OF ISSUES FOR SCANNING?

- Did substitution play a role in the policy mix?
- Did bans play a role (or even the prospect of one)?
- Did public information instruments play a key role, or did they contribute to success?
- Were targets set, did they relate to thresholds (limits)
- Was a review of the policy mix included in its design
- Did the policy mix aim at changing the resource price, if so through which channels
- (complemented by needs from WP4 & 5)

WHAT DO YOU DO NEXT?

- **Q1:** Can you provide some other potential case examples of resource decoupling and what policy mixes have driven change?
- **Q2:** What other issues should the team focus on for the scanning across the 15 case (and wider literature)?
- **Q3:** What policy mix choice would you see as appropriate for achieving absolute decoupling respecting environmental limits in the following areas :
 - Non renewable resources: fossil fuels and other mineral resources
 - Renewable resources:
 - Land
 - Environmental media: waste and wider pollution

THANK YOU!

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