



DYNAMIX

Decoupling growth from resource use
and its environmental impacts

<http://dynamix-project.eu/>

Policy mixes for resource efficiency: new solutions, new challenges?

Martin Hirschnitz-Garbers - *Ecologic Institute, Berlin*

Joint Final DYNAMIX & POLFREE Conference
15/16 February 2016



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 308674.



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POLICY MIXES AS A NEEDED RESPONSE

- Wicked environmental problems with diverse root causes
 - Multitude of actors along international value chains
 - Challenges of unintended (negative) side effects of policies
- => Complex multi-actor and multi-level governance systems

⇒ Need to consider different instruments, objectives and political processes

⇒ Going beyond Tinbergen Rule „Optimal ratio of the number of tools to targets is 1:1“ (1952)

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WHAT IS A POLICY MIX?

- “An adaptive, time-dynamic combination of mutually supportive (maximising synergies and minimising conflicts) policy instruments that is able to achieve set policy objectives in changing contexts and avoids/mitigates negative side-effects.” (*own def., informed by del Rio & Howlett 2013*)
- Much more than an instrument mix => political processes, strategic and long-term orientation, vertical/horizontal integration
- Actual policy mixing therefore is => an “*art of timing, combining, and sequencing instruments to meet multiple goals amidst changing circumstances*” (Sternier & Coria 2012: 262)
- When designing a policy mix important to consider => institutional context and political processes at different levels of government

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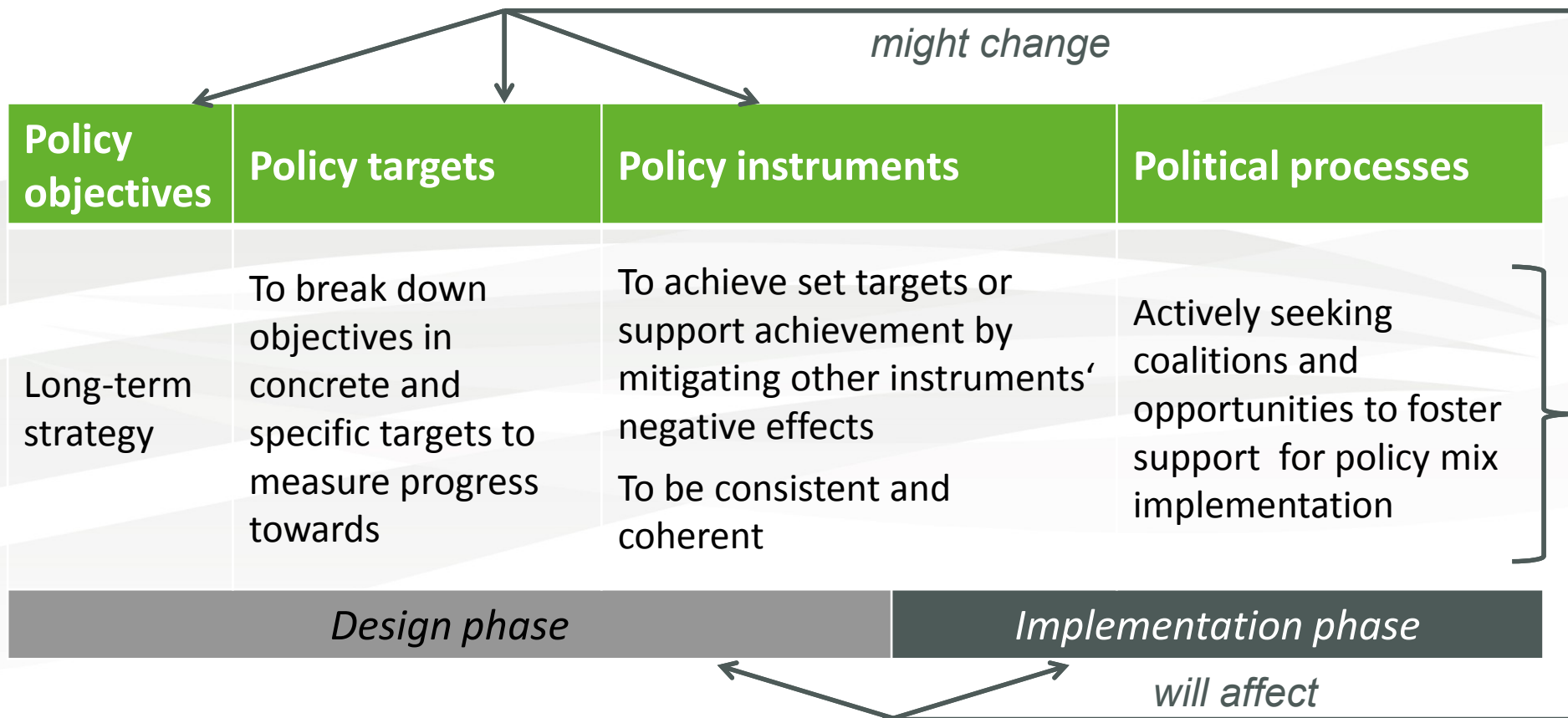
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POLICY MIXES – CONSISTENCY & COHERENCE

- Consistency and coherence of policy mixes (*Rogge and Reichardt 2013*)
 - Weak consistency = absence of contradictions/conflicts
 - Strong consistency = ensuring synergetic effects and positive interactions
 - Coherence = political processes supportive of policy mix implementation
- Make use of primary and supportive instruments
 - Primary: great potential to achieve policy mix objectives/targets; should be as little controversial as possible
 - Supportive: high potential to mitigate unintended side-effects of primary instruments, hence fostering acceptance and feasibility

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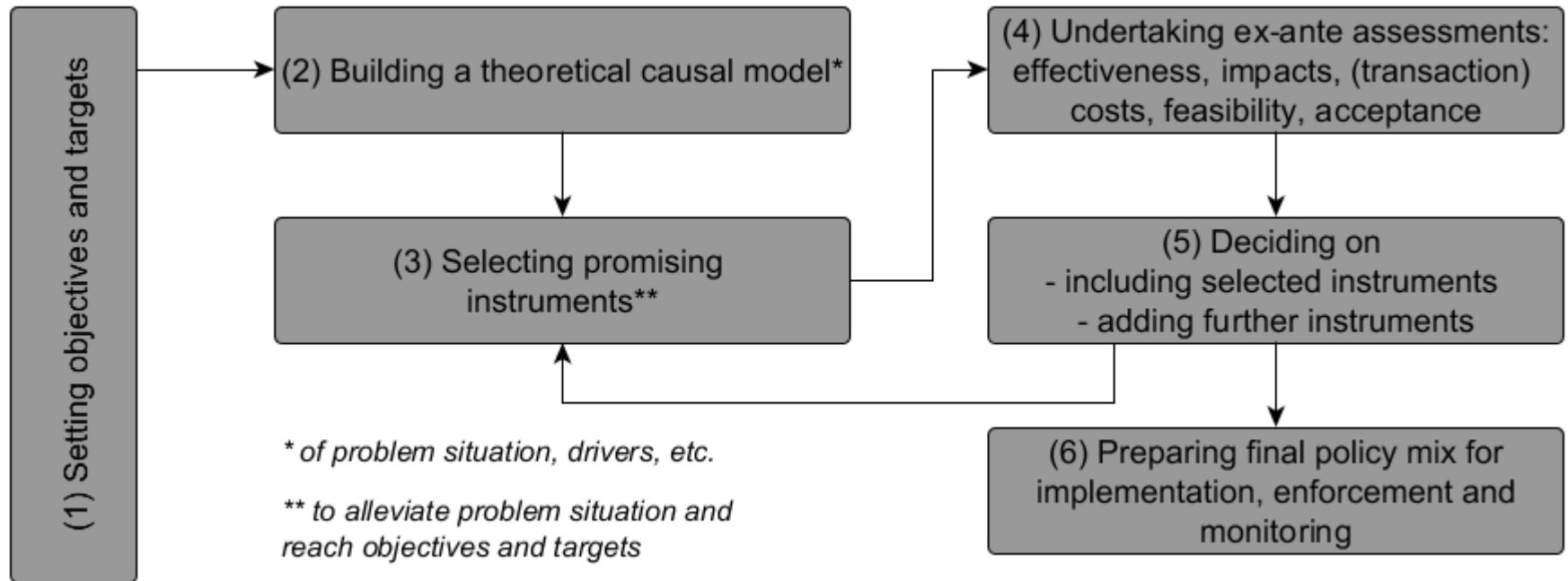
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CONCEPTUALISING POLICY MIXES



Ekvall et al. (submitted); adapted from Givoni et al, 2013

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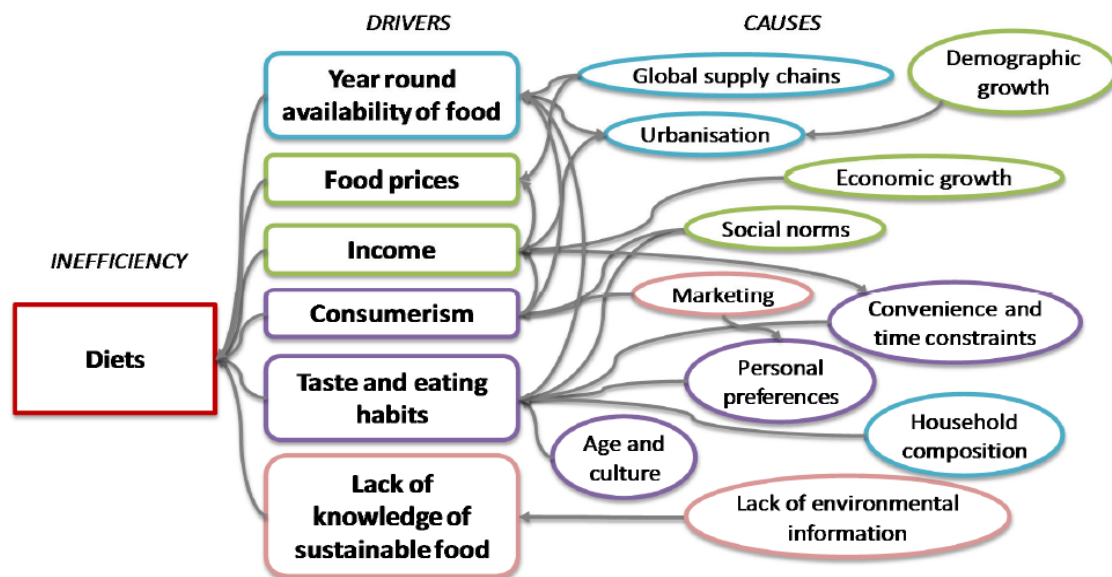
SETTING OBJECTIVES/TARGETS AND CAUSAL MODEL

(1) Targets

Key targets 2050:

- **Greenhouse gas emissions:** 2 t CO_{2-eq} / capita.
- **Metals:** reducing consumption of virgin metals by 80%.
- **Land use:** zero net demand of non-EU arable land.
- **Nutrients:** reducing nitrogen and phosphorus surpluses.
- **Fresh water:** no water scarcity in any region.

(2) Causal model - drivers



Drivers and causes to unsustainable diets
and food choices; Tan et al. 2013



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(3) POLICY MIX OBJECTIVES AND PROMISING INSTRUMENTS

Land policy mix	Metals policy mix	Overarching policy mix
- Reduce the global agricultural land use due to EU consumption - Decrease environmental impacts of agricultural activities (EU / globally)	- Reduce the use of virgin metals by 80%. - No significant increase in use of other resources or environmental impacts	- Support high levels of quality of life of EU citizens - Reduce impacts associated with average household consumption
Regulation for LULUC VAT on meat products Strengthened pesticide reduction targets	Materials Tax Technical Requirements Increased spending on R&D	Circular Economy Tax Trio EU-wide feebate schemes Boosting Extended Producer Responsibility

2050 policy mix targets

selected instruments of policy mix

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(4) EX-ANTE ASSESSMENTS AND (5) REVISIONS

- Qualitative analysis
 - Quantitative economic and physical/environmental modelling
- => Presentations by Martin Nesbit (IEEP) and Andrea Bigano (FEEM)

=> Lessons learnt from assessment used as pointers for revision of policy mixes

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POLICY MIXES AS A SOLUTION

- Potential to avoid policy layering: unplanned mixes by stacking new targets and instruments on top of existing ones without conscious, overarching design => **risk of conflicting and contradictory measures and targets**
- Potential to achieve best fit between instruments and targets (horizontal fit), but also with institutional framework (vertical fit) => **seek and exploit synergies**

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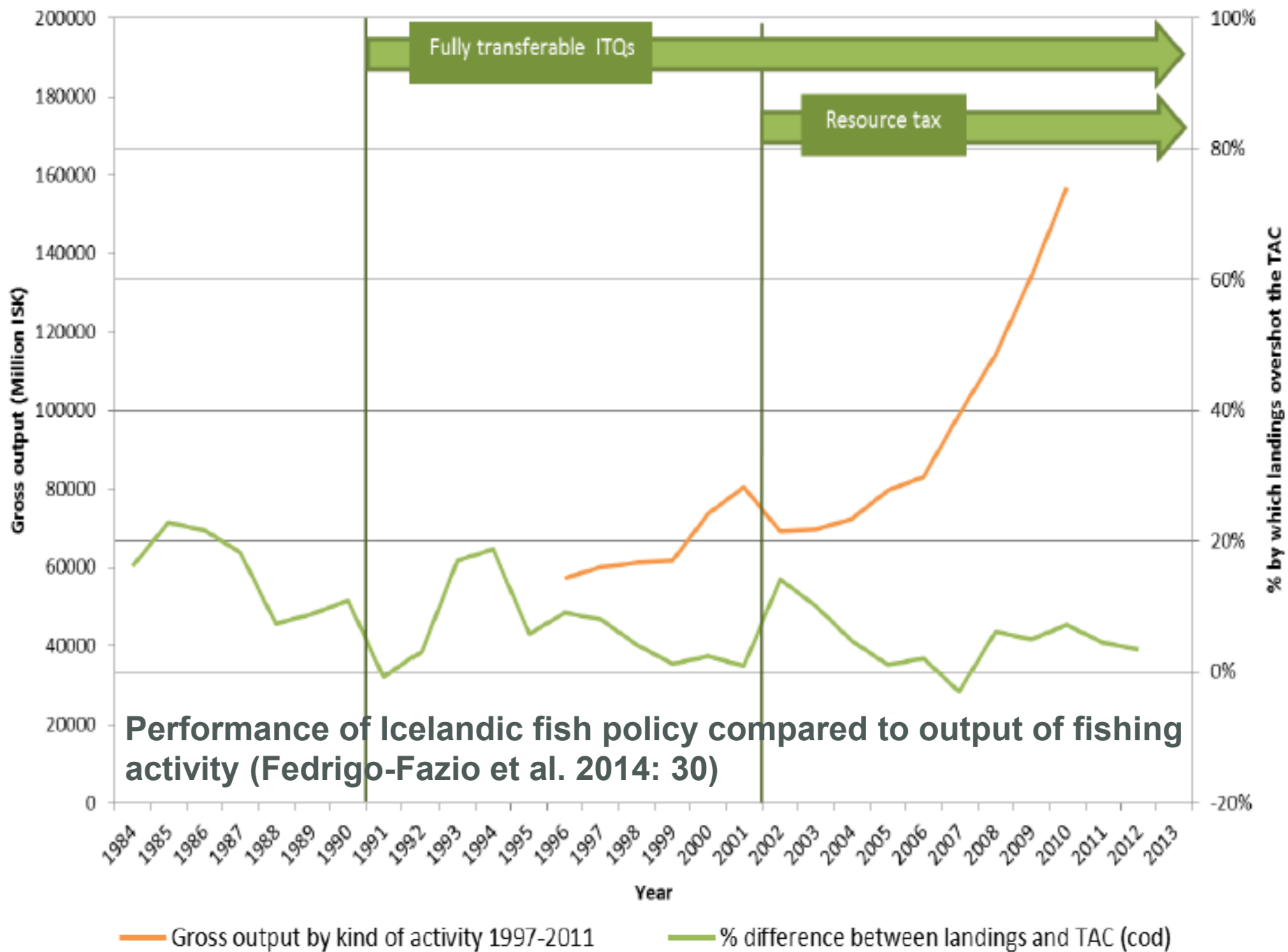
POLICY MIXES – CHALLENGES TO SOLUTIONS

- DYNAMIX: rather theoretical scientific exercise (steps 1-4/5) – **difficulties to focus on assessing political processes (5-6) beyond Policy Platforms**
- Rather feasible to design scientifically, but not easy to robustly assess
 - Cumulative effects,
 - Actual ex-ante side-effects (beyond GDP / sectoral changes)
 - Effects of mitigating measures
 - Time sequencing due to uncertainties as to effects, feasibility, actor constellations and windows of opportunity, strategies beyond terms in office
- Difficult transfer from science to policy making (evidence-informed policy making)

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POLICY MIXES – CHALLENGES TO SOLUTIONS

- Close monitoring and policy consistency needed: long-term, stable policy framework more important than whether the policy is supportive or not
- Governance challenges of roadmapping and implementing policy mixes consistently over time in changing political contexts (e.g. elections)
- Hence much more difficult to design, to implement and to evaluate
- **Pro-active, more strategic policy packaging depends on successful cross-departmental, multi-layered and polycentric governance**

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THANK YOU VERY MUCH!

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WRF 2015 – Scientific Session 16 – 14/10/2015



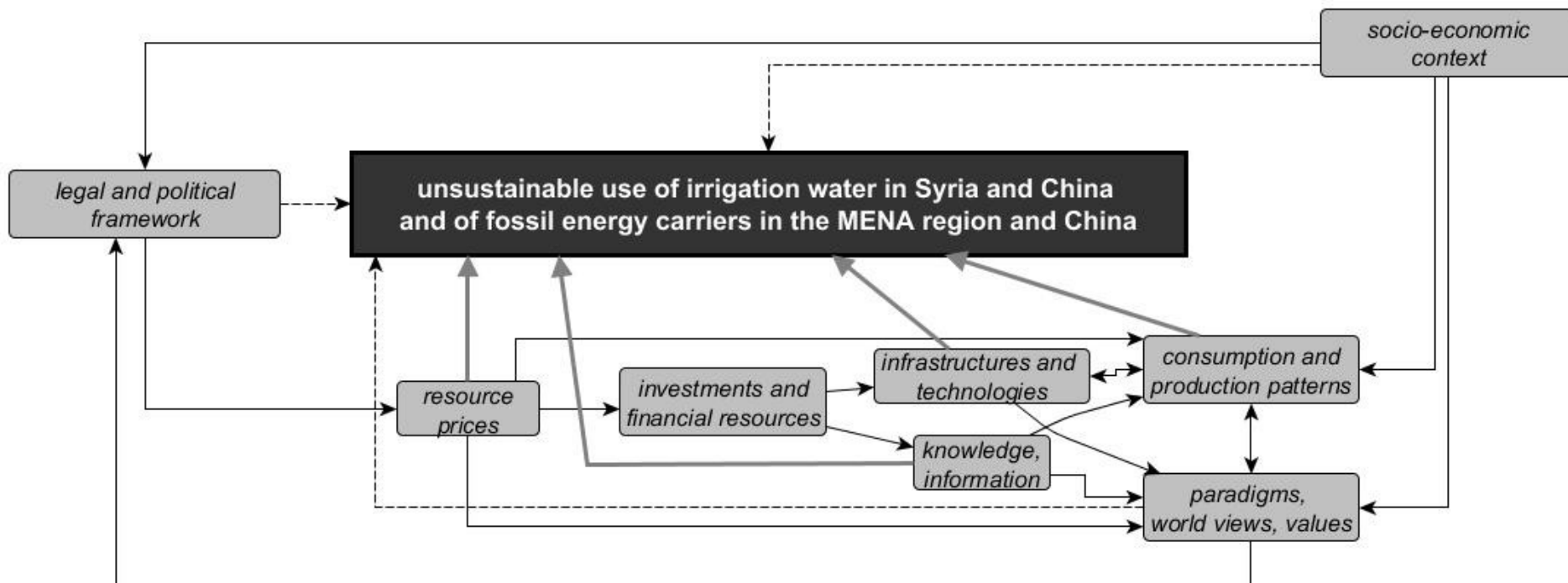
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WHERE TO START? DRIVERS AS INTERVENTION POINTS



direct effects (grey solid arrows)

indirect effects (black dashed arrows)

(based on *Hirschnitz-Garbers et al. 2015*)

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EXAMPLES FOR „REAL WORLD“ POLICY MIXES

In the case of the Icelandic policy mix meant to “promote exploitable marine fish stocks conservation and efficient utilisation”, the policy mix achieved **absolute decoupling within resource limits** (or sustainable exploitation of fisheries resources while at the same time enabling the fishing sector to become highly profitable). Before the introduction of the **ITQ system**, profitability of the fisheries sector was poor (see section 5) (Amason 2008, Gissurarson 2000). It is fair to say that ITQs turned around the sector, increasing its efficiency by reducing fishing effort and fishing capital, rebuilding fish stocks, raising the quality of the landed catch and improving coordination between supply of landings and market demand (Amason 2008).

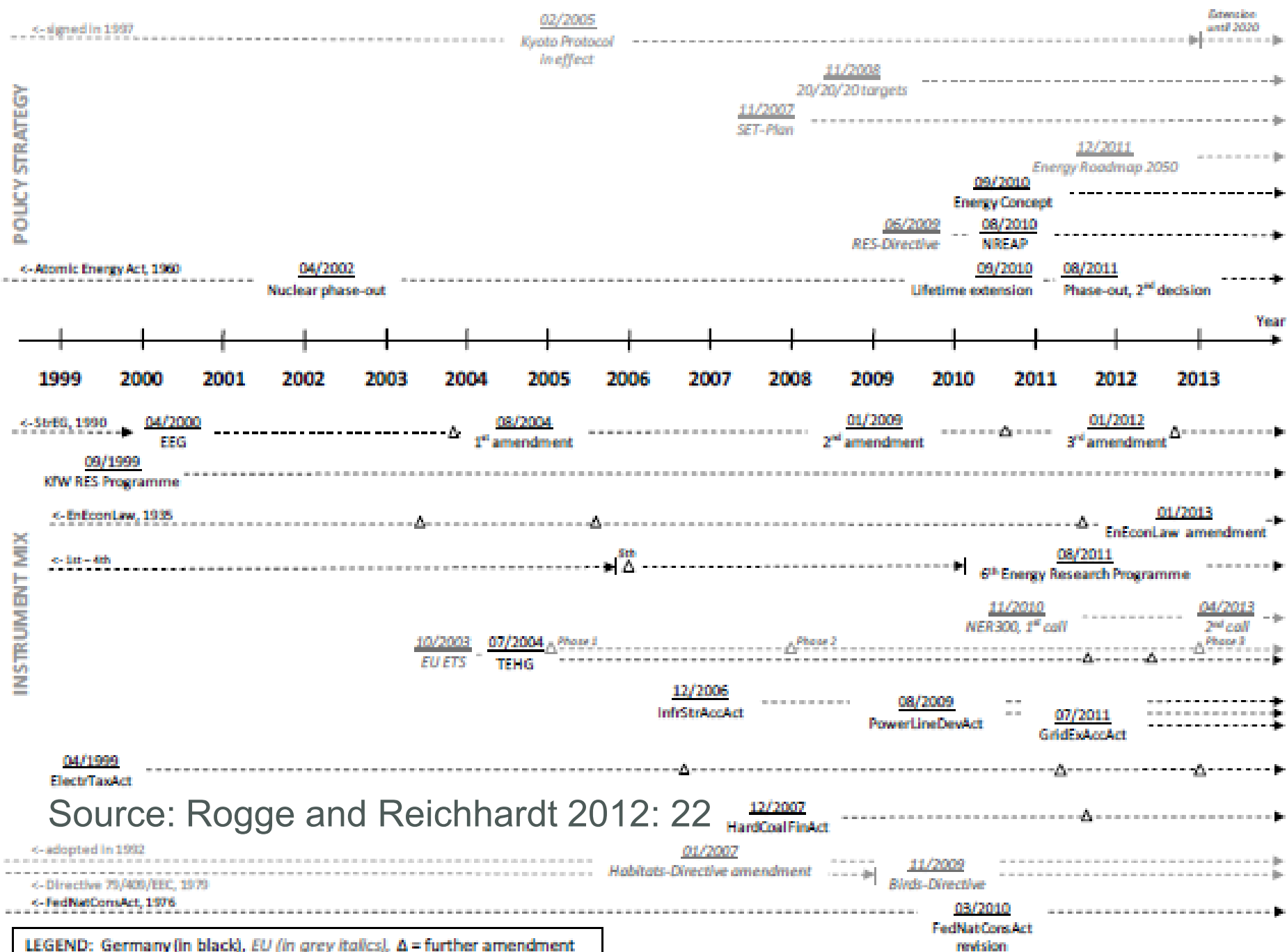
The data on stocks shows that since the introduction of the **ITQ system** there has been steady improvements in their state. The **herring stock** has rebuilt steadily since the collapse in the late 1960s, and cod stocks have had a steady increase in the fishable biomass from 1992-2012 (from 1992’s 550 thousand tonnes to around 1.2 million tonnes in 2012) – see Figure 5. 2013 International Council for the Exploration of the Sea advice states that the spawning stock of Icelandic cod is increasing and “is higher than has been observed over the last five decades”. In addition, the percentage of the fish stock removed each year by fishing (i.e. fishing mortality) has declined significantly since the early 2000’s and is presently at a historical low.

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Development of the elements of the policy mix for renewables in Germany over time²⁹



Source: Rogge and Reichhardt 2012: 22



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EX

Figure 4: Explanation of the elements of the policy mix for renewables in Germany (policy strategy and instrument mix) listed in Figure 1

POLICY STRATEGY

- Kyoto Protocol** - International treaty with binding obligations to reduce greenhouse gas emissions for participating industrialised countries (DE: -21% by 2012, compared to 1990) and flexible mechanisms (International emission trading, Clean Development Mechanism, Joint Implementation).
- 20/20/20 targets** - Targets: 1) 20% RES in EU energy consumption by 2020
2) 20% improvement in EU energy efficiency by 2020
3) 20% GHG emissions reduction in EU by 2020 (compared to 1990)
- SET-Plan** - Target: Accelerate innovation in cutting-edge European low carbon energy technologies, enhance the coordination of national and European research and innovation efforts
- Launch of Industry-led European Industrial Initiatives (EII); Initiatives exist for different RES (e.g. European Wind Initiative/ EWI)
- Energy Roadmap 2050** - Target: 80-95% GHG emissions reduction in Germany by 2050 (compared to 1990)
- Energy Concept** - Targets: 1) 35% RES in Germany's energy consumption by 2020
2) 30-40% GHG emissions reduction in Germany by 2020 (compared to 1990)
- RES-Directive / NREAP** - The RES-Directive requires each Member State to adopt a national renewable energy action plan (NREAP). These plans are to set out Member States' national targets for the share of energy from renewable sources consumed in transport, electricity, and heating and cooling in 2020 and adequate measures to achieve these targets.
- Atomic Energy Act** - The phase out strategy from 2002 was terminated in 2010. This lifetime extension was revoked again in 2011 after the Fukushima Incident. Until 2022 the remaining nuclear power plants will gradually be shut down.

INSTRUMENT MIX

- EEG** - The Renewable Energy Act (EEG) replaced the Electricity Feed-In Act (StEG) from 1990. It contains feed-in tariffs for all renewable energy sources and is a key instrument of the Energiewende.
- KfW RES-Programme** - The KfW Renewable Energy Programme offers advantageous terms on loans for renewable energy power plants (solar, wind, hydro, biomass).
- EnEconLaw** - The Energy Economy Law (EniWG) sets the fundamental framework conditions for energy supply in Germany.
- Energy Research Programme** - The 6th Energy Research Programme funds R&D measures in energy efficiency, renewable energies and nuclear power (permanent disposal, fusion technology)
- NER 300** - The New Entrants' Reserve (NER 300) uses 300 mio allowances of the EU ETS to support renewable energy and CCS projects in the EU.
- EU ETS / TEHG** - The EU Emission Trading System (EU ETS) is a cap-and-trade system for greenhouse gas emissions for large emitters in the energy and industry sectors, with a pilot phase 2005-07, and subsequent trading phases 2008-12, 2013-2020, ... The TEHG is the implementation of the EU ETS into German legislation, for each trading period concretized by the ZUG 2007 and ZUG 2012.
- InfraStrAccAct/ PowerLineDevAct/ GridExAccAct** - The Infrastructure Planning Acceleration Act (InfraStrPlanV/BeschG), the Power Line Development Act (EnLAG) and the Grid Expansion Acceleration Act (NABEG) complement existing legislation and accelerate the grid expansion in Germany, which is required to integrate large quantities of renewable energy into the grid.
- ElectrTacAct** - The Electricity Tax Act (StromStG) is a consumption tax on electricity. Direct consumption of electricity from renewable energy sources with a capacity below 2 MW is tax-exempt.
- HardCoalFinAct** - The Hard Coal Financing Act (SteinkohleFinG) regulates the subsidies for hard coal extraction in Germany. These are lowered gradually and are phased out in 2018.
- Habitats- / Birds-Directive** - The Habitats-Directive and the Birds-Directive ensure wildlife and nature conservation in the EU. They restrict the land-use for energy production in certain areas. The Birds-Directive replaces the Directive 79/409/EEC on the conservation of wild birds from 1979.
- FedNatConsAct** - The Federal Nature Conservation Act (BNatSchG), among other things, defines several types of protected areas in Germany, including Natura 2000 sites.

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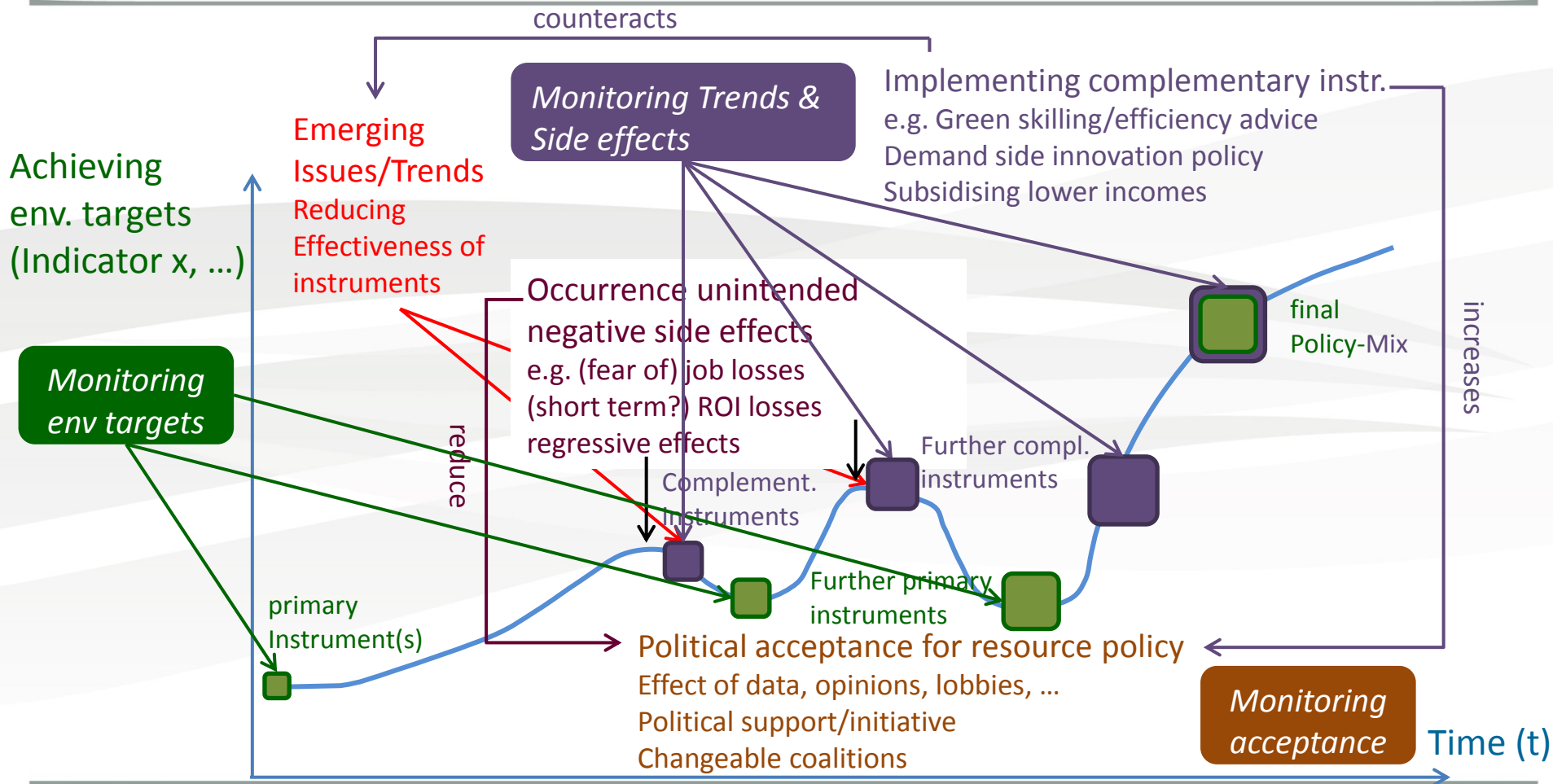
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POLICY MIXES – SEQUENCING & ROADMAPPING



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