



DYNAMIX

Decoupling growth from resource use
and its environmental impacts

DYNAMIX – Dynamic policy mixes for absolute decoupling of economic growth from EU resource use and environmental impacts

Why focus on mixes of policy Instruments for resource efficiency? *An introduction*

Webinar on Policy Mixes for Resource Efficiency

11th of June 2015

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

<https://twitter.com/EUResources>



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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DYNAMIX & POLFREE – BRIEF OVERVIEW

	DYNAMIX	POLFREE
<u>Funder</u>	European Commission, DG R&I (FP7)	
<u>Duration</u>	09/2012 – 03/2016	10/2012 – 03/2016
<u>Partners</u>	<p>Ecologic Institute BIO by deloitte Institute for Structural Research (IBS) Institute for European Environmental Policy (IEEP) Swedish Environment Research Institute (IVL) Fondazione Eni Enrico Mattei (FEEM) Policy Studies Institute (PSI) Research Institute for Managing Sustainability (WIMAS) Warsaw Institute for Economic Studies (WISE)</p>	<p>UCL Energy Institute Netherlands Organization for Applied Scientific Research (TNO) International Centre for Integrated Assessment and Sustainable Development (ICIS) / University of Maastricht Institute of Economic Structures Research (GWS mbH) SERI Sustainability Research and Communication, Ltd. Potsdam Institute for Climate Impact Research (PIK) International Synergies Limited Wuppertal Institute</p>

12.06.2015

EEA Webinar on Policy Mixes

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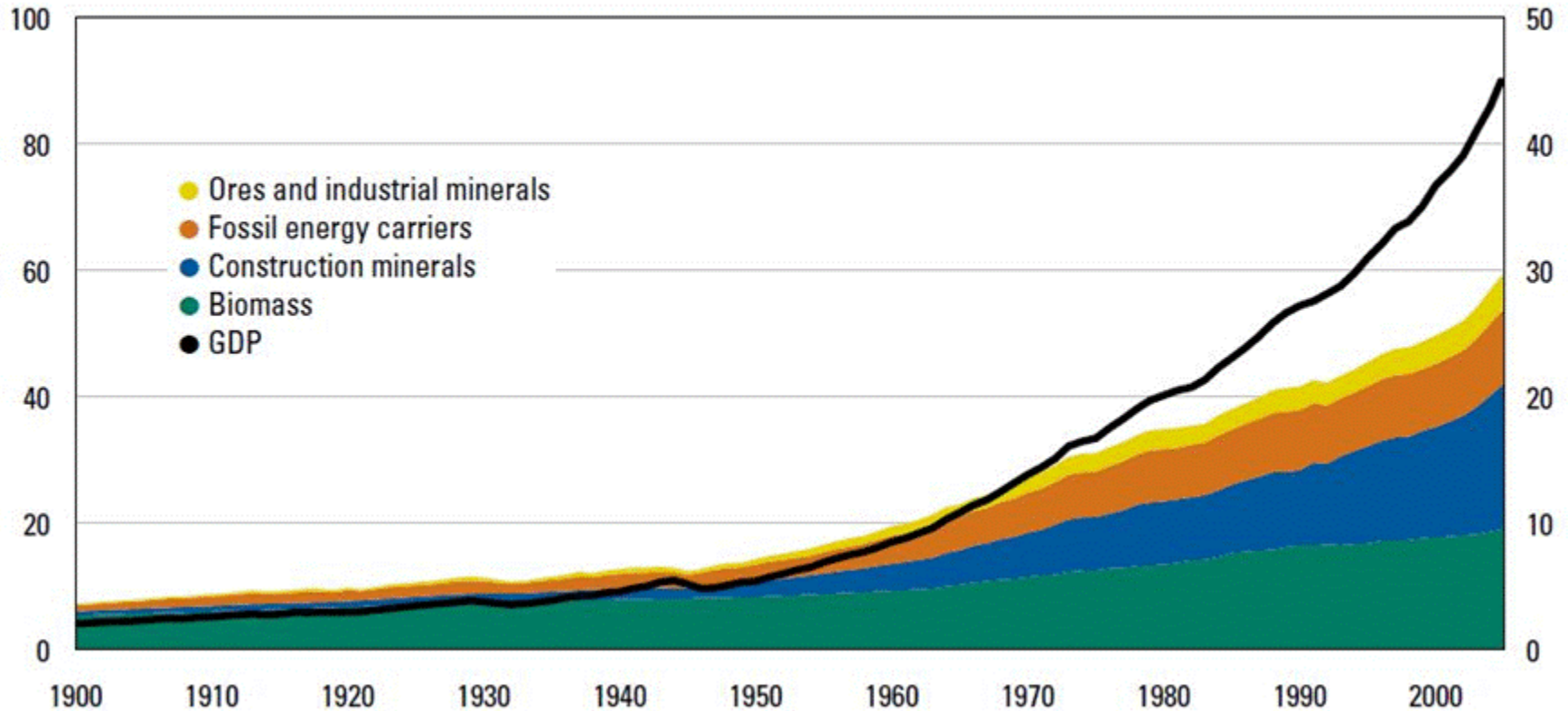
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BACKGROUND – GLOBAL RESOURCE USE

Material extraction
Billion tons

GDP
trillion (10¹²) international dollars



Global Material Extraction in billion tonnes, 1900 – 2005; Krausmann et al. 2009



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BACKGROUND – PLANETARY BOUNDARIES

- Beyond zone of uncertainty (high risk)
- In zone of uncertainty (increasing risk)
- Below boundary (safe)
- Boundary not yet quantified

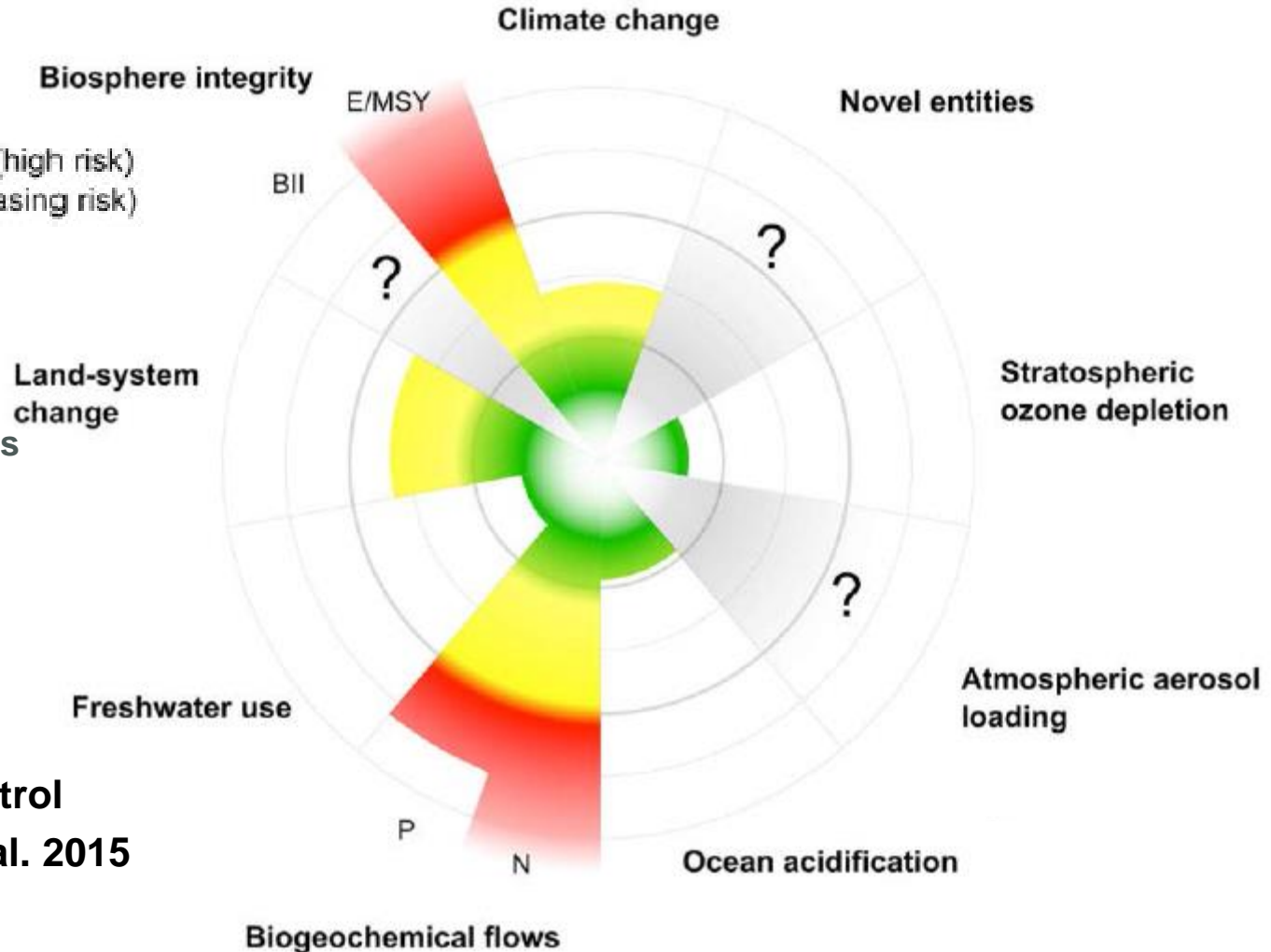
BII = Biodiversity Intactness Index

E/MSY = extinctions per million species-years

P = Phosphorus

N = Nitrogen

Current status of control variables; Steffen et al. 2015



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PROJECT OBJECTIVES

DYNAMIX aims to

- identify main drivers of (in)efficient resource use
- learn from past successful/failing resource policies
- identify promising policy mixes supporting absolute decoupling
- assess their effectiveness and sustainability ex-ante for medium-term (2030) / long-term (2050)



WHY POLICY MIXES?

- Complex, interdependent and large-scale environmental problems
- Multitude of actors along international value chains
- Experiences of unintended (negative) side effects
- Increasingly interwoven policy targets in many policy areas
- Complex multi-actor and multi-level governance systems

=> Tinbergen Rule „Optimal ratio of the number of tools to targets is 1:1“
(1952) (still) hardly matches reality

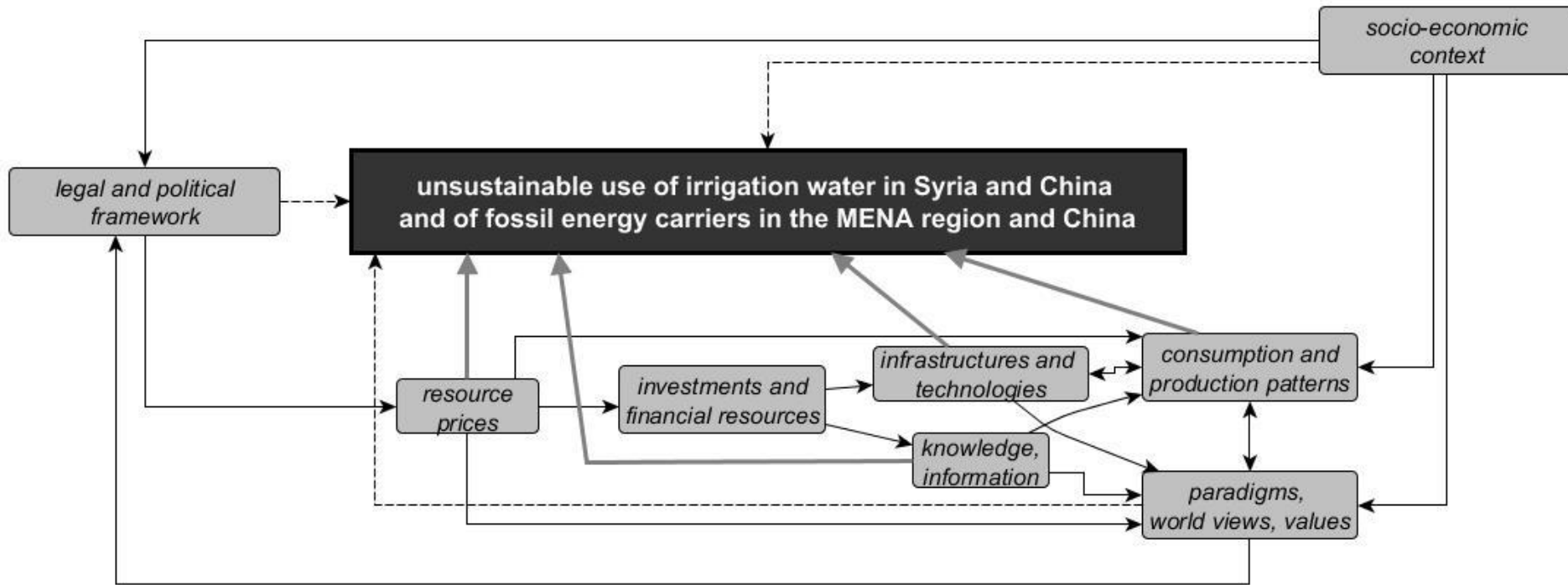


WHERE TO START? IDENTIFYING INTERVENTION POINTS

- Relevant drivers – “any natural or human-induced factor that directly or indirectly influences the efficient (or inefficient) use of resources” (*MEA 2005*)
- Relevant barriers – factors that obstruct or impede sustainability changes



DRIVERS AS INTERVENTION POINTS



direct effects (grey solid arrows) —————>

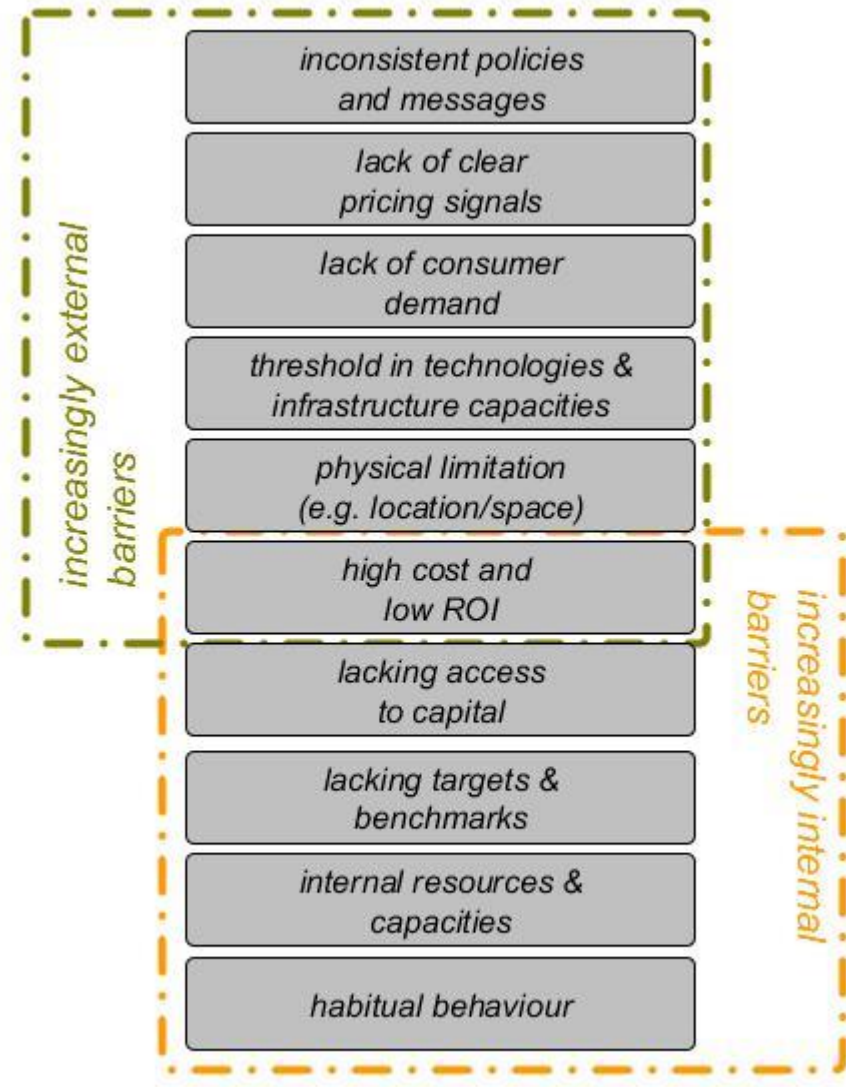
indirect effects (black dashed arrows) - - - - ->

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



BARRIERS AS INTERVENTION POINTS

Barriers for improving business resource efficiency

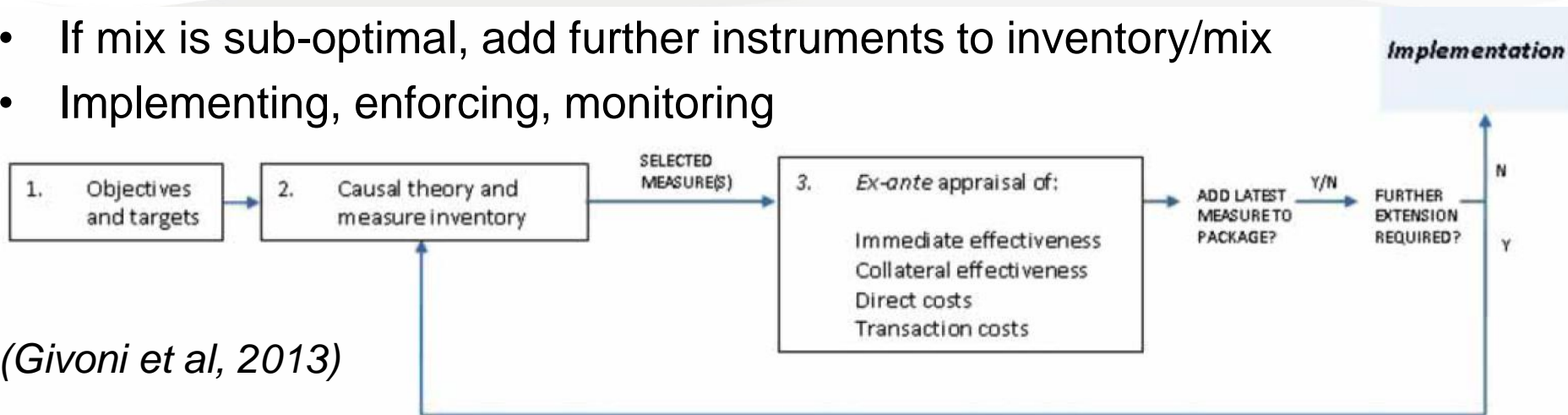


adapted from AMEC and BIO (2013)



CONCEPTUALISING POLICY MIXES

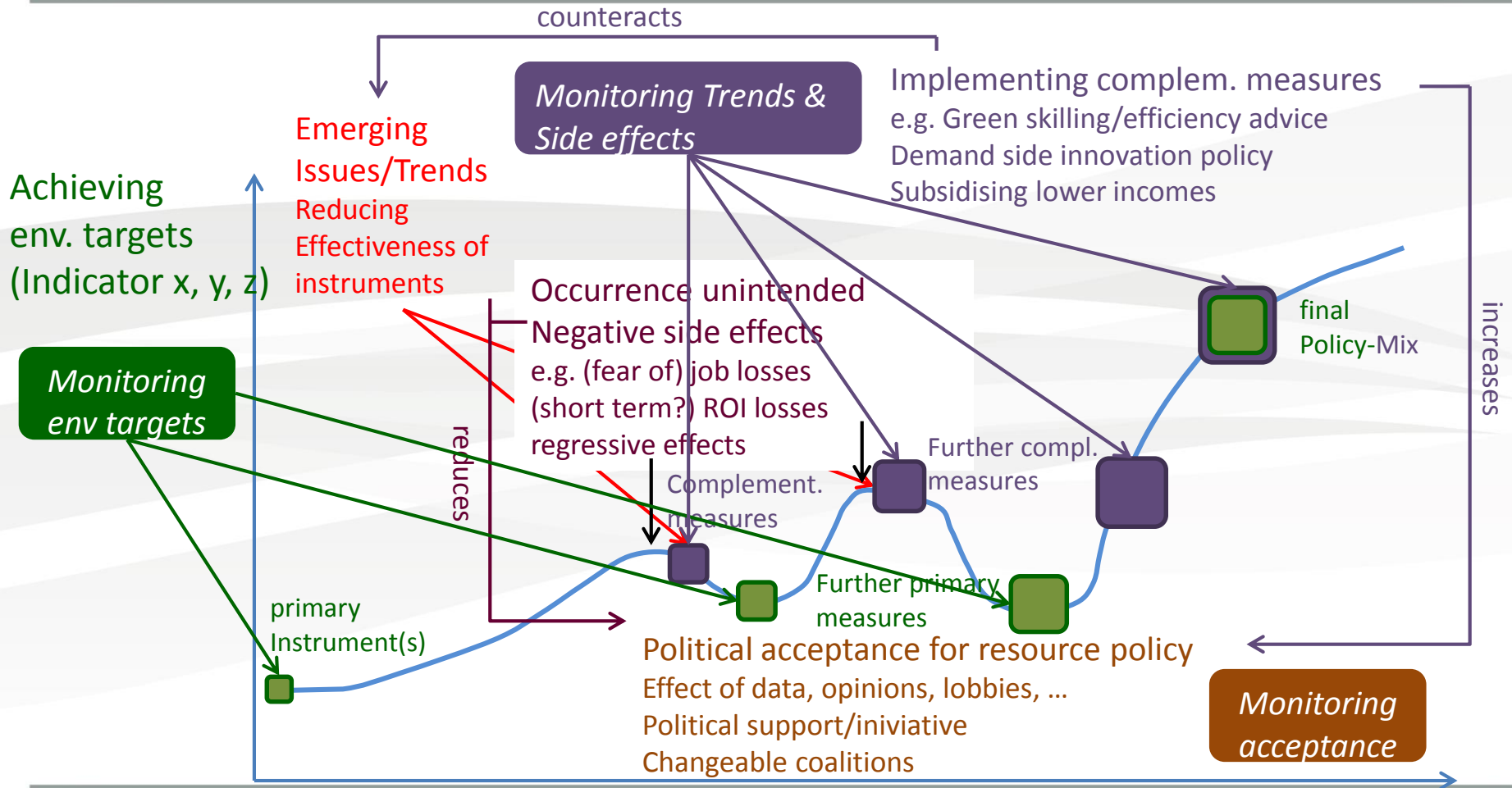
- Definition of objectives and setting of targets
- Elaborating a causal theory/heuristic for problem solving and inventorising potentially relevant instruments => measure inventory
- Selecting promising measures and ex-ante appraisal (anticipation, mental models, Scenarios, modelling and simulation, etc.) of effectiveness, direct and transaction costs
- If mix is sub-optimal, add further instruments to inventory/mix
- Implementing, enforcing, monitoring



(Givoni et al, 2013)



POLICY MIXES – SEQUENCING & ROADMAPMING



Policy mixes for RE

- What kind of policy framework is needed to boost resource efficiency in Europe and leads to total reduction of both primary resource use and global environmental burdens?
- a policy-mix that (a) optimises synergies and addresses trade-offs between different areas and policies and (b) stimulates pro-active approaches by business in potential lead markets.



RE Policy mix case studies

Identification of key topics for RE, based on the POLFREE vision for Europe 2050 and intensive discussions with stakeholders:

- 1) Minimization of food waste losses alongside the value chain
- 2) Zero energy and material efficient buildings
- 3) Mobility
- 4) Electricity production and distribution
- 5) Industrial symbiosis network
- 6) Product Service Systems
- 7) Ecodesign Product Standards for a Circular Economy
- 8) Phasing out EHS
- 9) Internalization of costs

RE Policy mix case studies

The transition towards a Circular Economy – expectations could not be higher: e.g. annual cost savings of more than 500 Mio. Euro (EMF 2013).

The concept of policy mixes helps to identify key obstacles and trade-offs:

Consistency:

- Waste prevention vs recycling as job motor
- Closing material loops vs incineration

Coherence: Europe as a recycling society vs national waste authority

Credibility: The ups and downs of the Circular Economy Package

RE Policy mix case studies

If resource efficiency and the circular economy are win-win concepts, why don't we see faster progress?

- The more ambitious an instrument, the lower the immediate profitability for the actors involved
- Trade-off between the predictability of an instrument and its flexibility
- Trade-off between the level of specificity of an instrument and its depth, the level of inclusions of up- and down stream actors

RE Policy mix case studies

- (1) Setting incentives for a more resource efficient product design by ***individual responsibility of producers***
 - (2) Specific ***eco-design requirements*** that make reuse and repair of products economically viable
 - (3) Establishment of ***waste targets that focus on the production of high quality secondary resources – recycled content quota***
- Policy mix is not just picking the right instruments, it is the ***“art of timing, combining, and sequencing instruments to meet multiple goals amidst changing circumstances”*** (Sterner & Coria 2012)



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THANK YOU VERY MUCH!

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If Needed for questions

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CONCEPTUALISING POLICY MIXES

- Policy instrument – „a tool or technique used by government in order to achieve a policy goal “ (*Howlett 2005*)
- Policy mix – adaptive, time-dynamic combination of mutually supportive (non-conflicting) policy instruments (instrument mix) and institutional actors at different levels of government aiming at achieving various policy goals while at the same time maximising synergetic effects and minimising unintended negative side effects (*own def., based on del Rio & Howlett 2013*)
- A policy mix is much more than an instrument mix => politics, policy processes, strategic and long-term orientation
- Hence much more difficult to design, to implement and to evaluate



POLICY MIXES – COHERENCE & CONSISTENCY

- 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**
- Attempt best fit between instruments and targets (horizontal fit), but also with institutional framework (vertical fit) => **seek and exploit synergies**
- Consistency and coherence of policy mixes (*Rogge and Reichardt 2013*)
 - **Consistency = absence of contradictions/conflicts**
 - **Coherence = ensuring synergetic effects and positive interactions**



PRIMARY TYPE	PRIMARY PURPOSE		
	Technology push	Demand pull	Systemic
Economic instruments	<i>RD&D* grants and loans, tax incentives, state equity assistance</i>	<i>Subsidies, feed-in tariffs, trading systems, taxes, levies, deposit-refund-systems, public procurement, export credit guarantees</i>	<i>Tax and subsidy reforms, infrastructure provision</i>
Regulation	<i>Patent law, intellectual property rights</i>	<i>Technology / performance standards, prohibition of products / practices, application constraints</i>	<i>Market design, grid access guarantee, priority feed-in, environmental liability law</i>
Information	<i>Professional training and qualification, entrepreneurship training, scientific workshops</i>	<i>Training on new technologies, rating and labelling programs, public information campaigns</i>	<i>Education system, thematic meetings, public debates, cooperative RD&D* programs, clusters</i>

* RD&D = Research, development and demonstration

Source: Own elaboration (based on del Río González, 2009a, Edler and Georghiou, 2007, Hemmelskamp, 1999b, IEA, 2011b, Mowery, 1995, Rammer, 2009, Rennings et al., 2008, Smits and Kuhlmann, 2004, Sterner, 2000, Wieczorek and Hekkert, 2012)

(Rogge and Reichardt 2013)

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(Howlett and Rayner 2007) **Principal Governing Resource Used**

Nodality Authority Treasure Organization

<p>Substantive</p> <p>General Purpose of Instrument Use</p>	<p>Advice Training Reporting Registration</p>	<p>Regulation Self-Regulation Licences Census-taking</p>	<p>Grants User Charges Loans Tax Credits Polling</p>	<p>Administration Public Enterprises Policing Consultants Record-Keeping</p>
<p>Procedural</p>	<p>Information provision/ withdrawal</p>	<p>Treaties Advisory committees/ commissions</p>	<p>Interest group funding/ creation</p>	<p>Conferences Commissions of Inquiry Government Re-organizations</p>

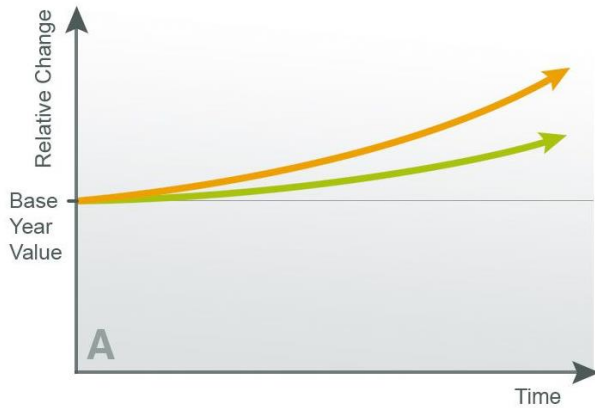
Source: Adapted from Christopher Hood, *The Tools of Government* (Chatham: Chatham House, 1986). 124-125 and Howlett, Michael. "Managing the "Hollow State": Procedural Policy Instruments and Modern Governance." *Canadian Public Administration*. 43, no. 4 (2000): 412-431.



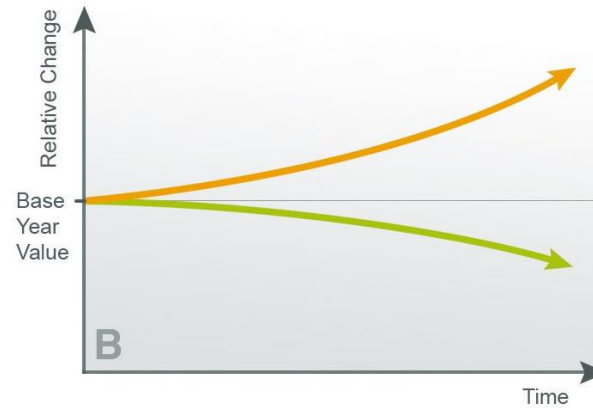
ABSOLUTE DECOUPLING

Conventional Decoupling

Relative Decoupling

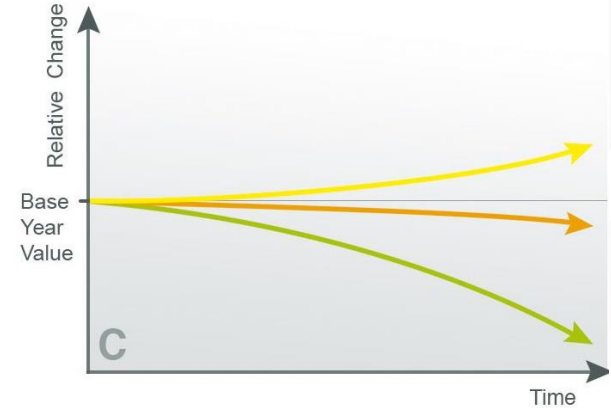


Absolute Decoupling



Reframing Decoupling

Absolute Decoupling of Resource Use from Wellbeing



Ecologic Institute 2013

dynamix-project.eu



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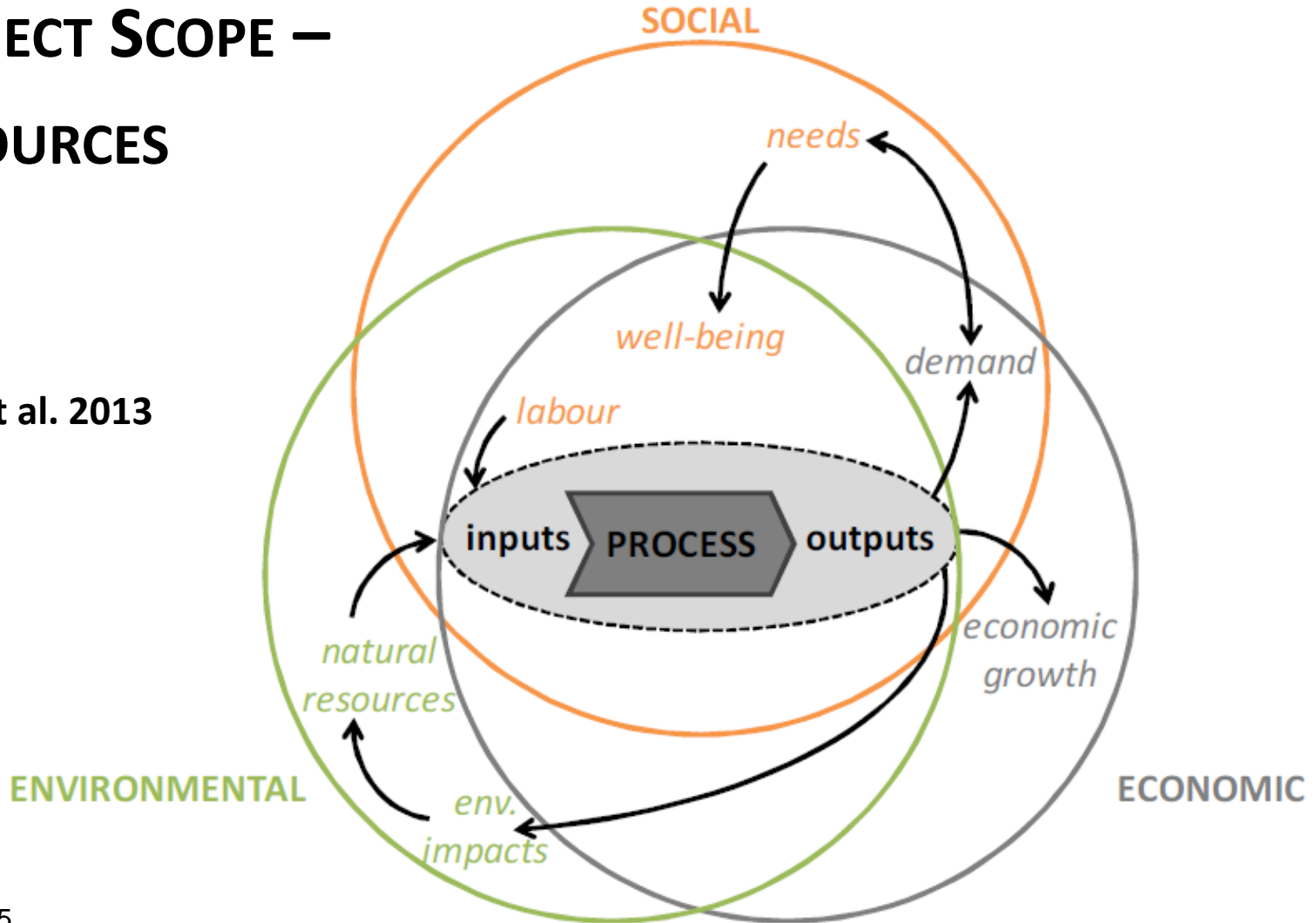


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PROJECT SCOPE – RESOURCES

Tan et al. 2013



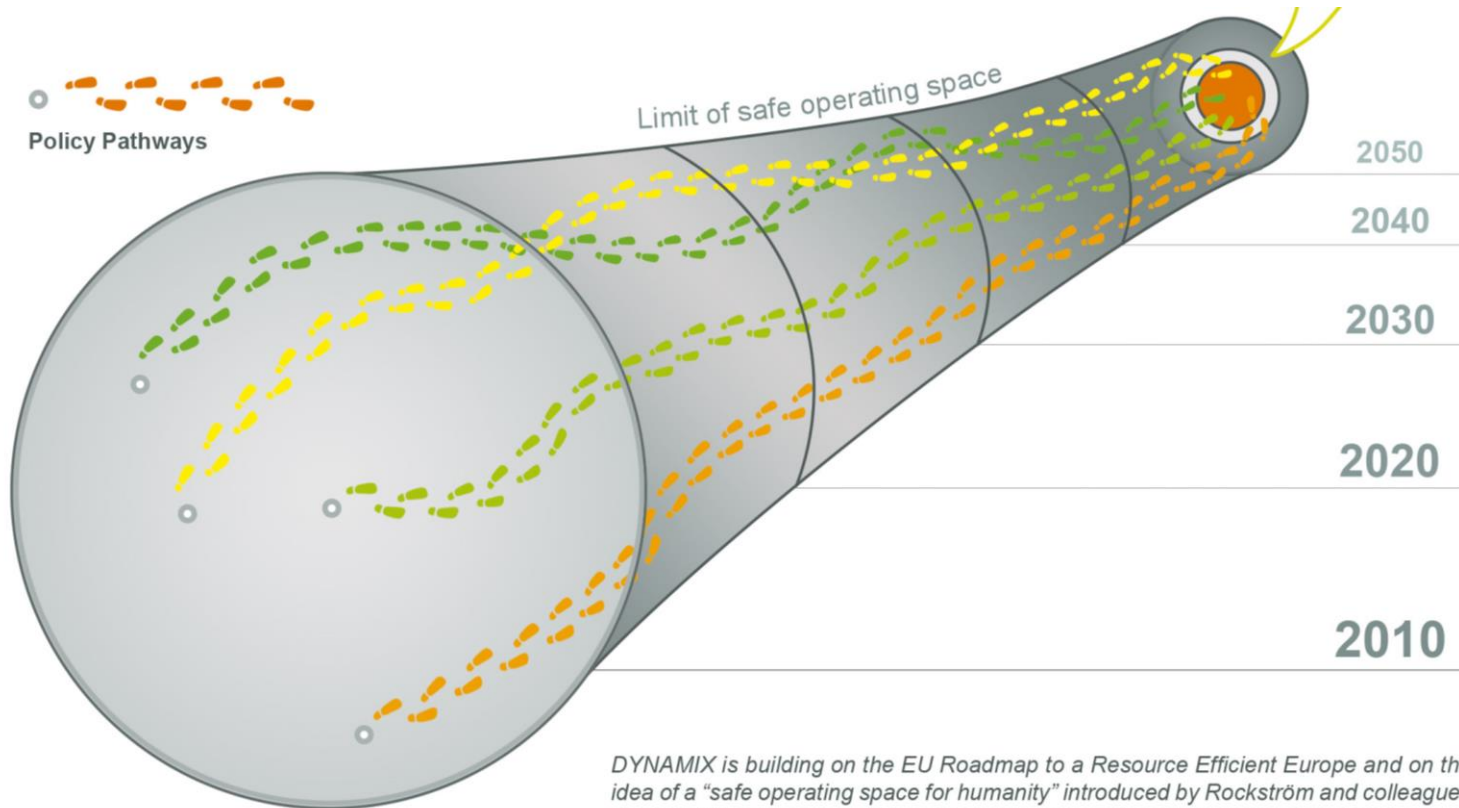
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ASSESSMENT BENCHMARKS – KEY TARGETS



DYNAMIX is building on the EU Roadmap to a Resource Efficient Europe and on the idea of a "safe operating space for humanity" introduced by Rockström and colleagues in 2009. Visualisation is adapted from Leppänen et al. 2012 (SPREAD project).



ASSESSMENT BENCHMARKS – KEY TARGETS

Key targets 2050:

- **Greenhouse gas emissions:** 2 t CO₂-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.

→ Qualitative ex-ante assessment
→ Qualitative ex-ante assessment
of environmental, economic, social,
legal, and public acceptance impacts
of policy mixes for land/agriculture,
metals and overarching

2050



DYNAMIX POLICY MIXES – BRIEF OVERVIEW

Land policy mix	Metals policy mix	Overarching policy mix
<ul style="list-style-type: none"> - Reduce the global agricultural land use due to EU consumption - Decrease environmental impacts of agricultural activities, in the EU and globally 	<ul style="list-style-type: none"> - Reduce the use of virgin metals by 80%. - No significant increase in the use of other resources or environmental impacts. 	<ul style="list-style-type: none"> - Support high levels of quality of life of European citizens - Reduce impacts associated with average household consumption
Regulation for Land Use Change VAT on meat products Strengthened pesticide reduction targets	Materials Tax Product Standards Increased spending on research and development	Circular Economy Tax Trio EU-wide feebate schemes Boosting Extended Producer Responsibility

2050 policy mix targets

selected instruments of policy mix

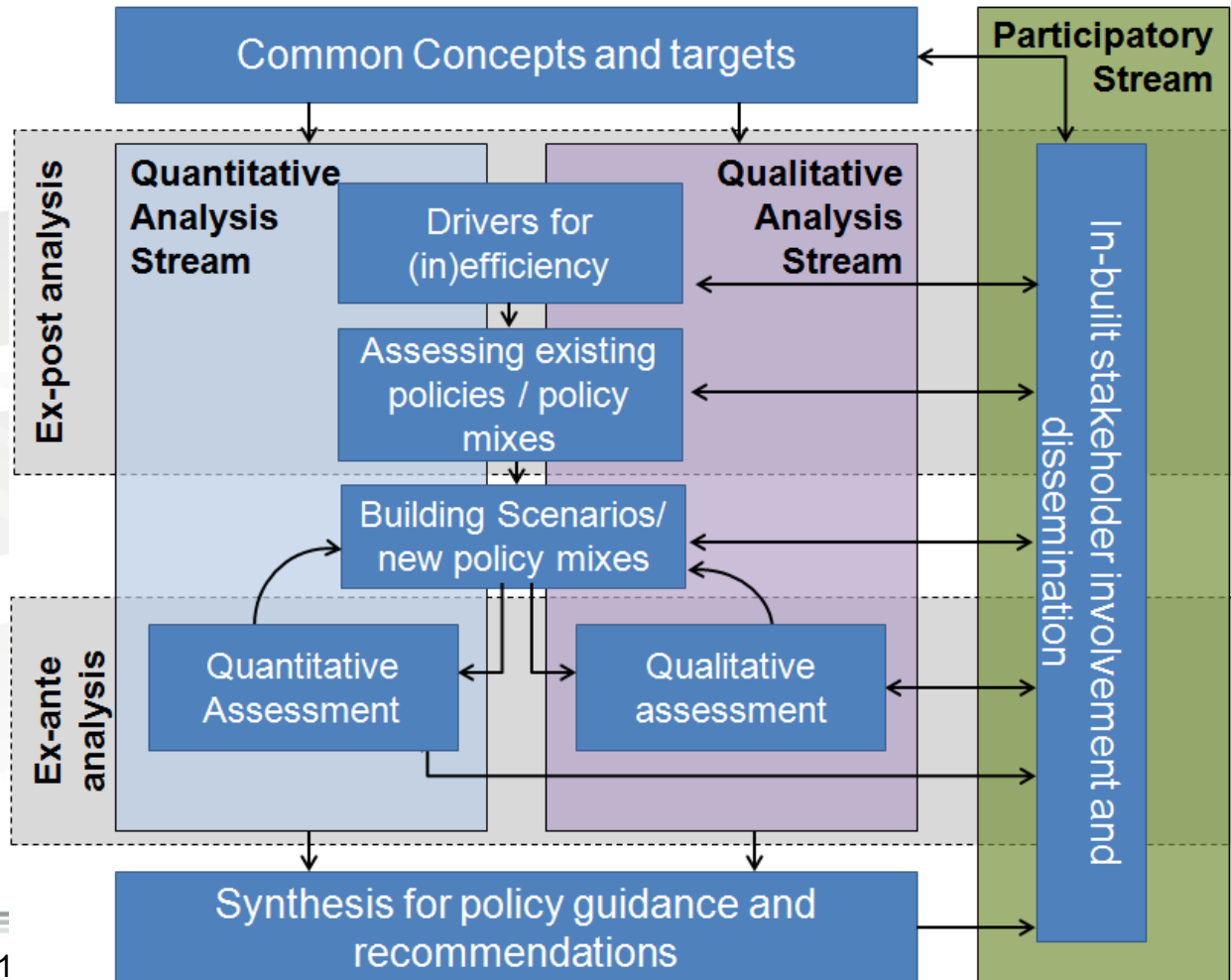
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PROJECT LOGIC



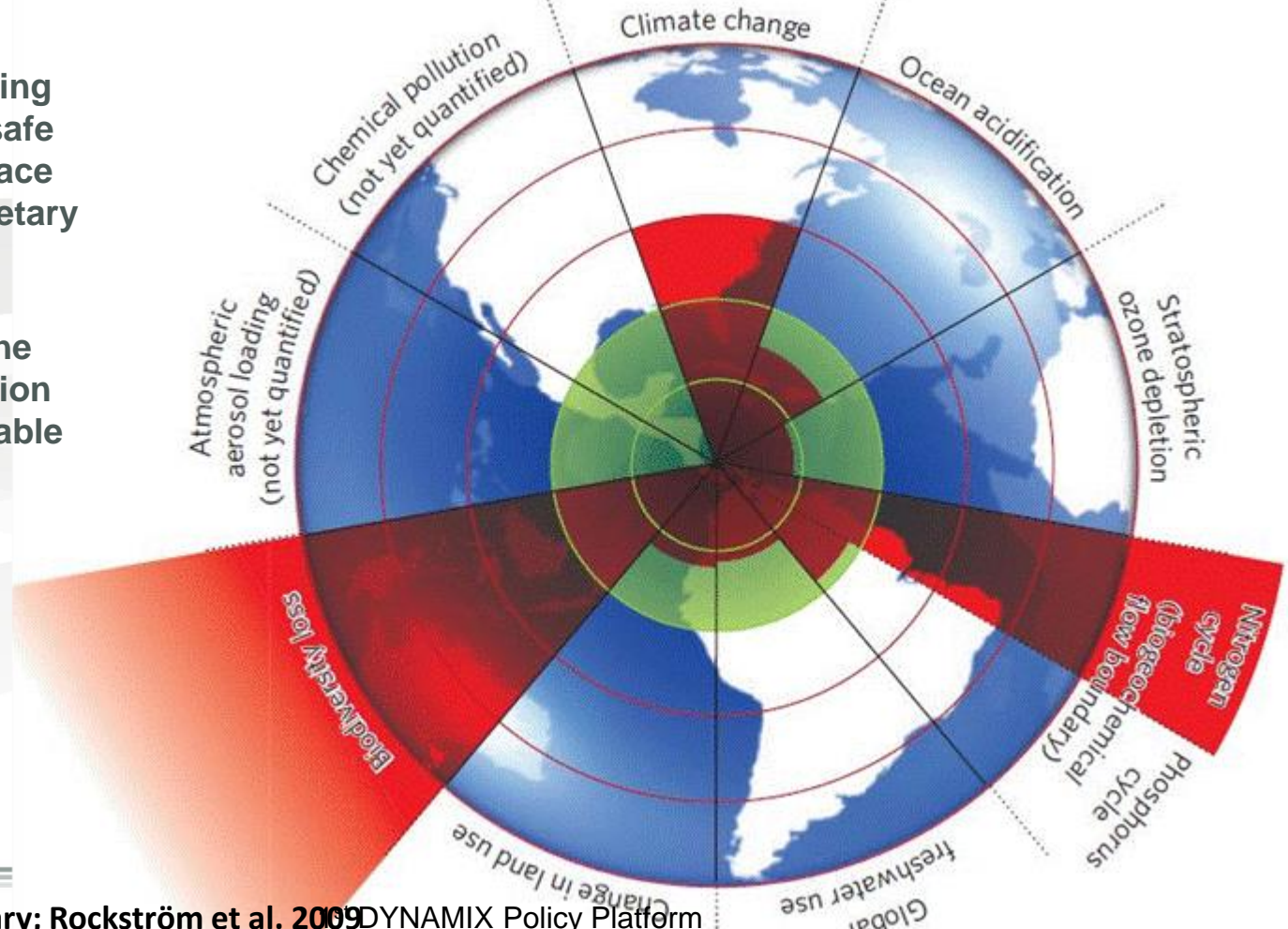
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BACKGROUND – PLANETARY BOUNDARIES

inner green shading = proposed safe operating space for nine planetary systems

red wedges = estimate of the current position for each variable



Beyond the boundary; Rockström et al. 2009 DYNAMIX Policy Platform





(Koca 2014)

