

# **The impact of the global megatrends upon the Swedish environmental goals**

**-An analysis linking global, regional and local level with focus on resource scarcity in Northern Europe**

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## **A collaboration within the network *Forward Looking Information and Services* (EIONET-FLIS)**

- Joint report between between SEPA and UBA Germany (forthcomming 2013)
- This project is a spin off from "Article 5-FLIS at regional and national level, task 1 – Drives and Trends" (contract 3534/b2011/EEA54586)

# Purpose

- To illustrate how the national environmental policies in Sweden connect to global megatrends as well as the EU regional policies on resource efficient Europe 2050
- To analyze to what extent the so-called *Global Megatrends* influence and impact the possibilities of Sweden to fulfill the *Swedish Generation Goal* in the near and long term, towards sustainable development

## Basic questions

- What are the influences of the Global Megatrends onto the Swedish Generation Goal?
- How does the EU proposal on Resource efficient Europe 2050 influence the fulfilment of the Swedish environmental objectives?

# Main tasks

## 1. What did we do?

- Link the European goals and objectives for roadmap for a resource efficiency Europe to the national environmental goals of Sweden and connect to the so called Global Megatrends

## 2. Why did we do it?

- To understand how to connect the Global megatrends and National environmental goals
- To understand the driving forces and feedbacks and impacts over time
- To understand leverage points for desired change

## Boundaries and method

- **Boundaries:** Resource use and energy production on a national and regional level
  - The EU roadmap for (“A resource efficient Europe”- COM (2011) 571 final), was used as a point of departure for the EU regional strategies
- **Method:** *Qualitative System Dynamic* approach using Causal Loop Diagram (CLD) method was used to construct generic models for the case study and for the EU level
- **Tool:** Consideo Modeler



# European Environmental Agency- SOER 2010

## Global megatrends

The megatrends are based upon STEEP

### *Social*

Increasing global divergence in population trends.....

Living in an urban world.....

Disease burdens and the risk of new pandemics.....

### *Technological*

Accelerating technological change: racing into the unknown.....

### *Economical*

Continued economic growth.....

From a uni-polar to a multi-polar world.....

Intensified global competition for resources.....

### *Environmental*

Decreasing stocks of natural resources.....

Increasingly severe consequences of climate change.....

Increasing environmental pollution load.....

### *Political*

Environmental regulation and governance: increasing fragmentation and convergence....

## THE EUROPEAN ENVIRONMENT

STATE AND OUTLOOK 2010

ASSESSMENT OF GLOBAL MEGATRENDS

European Environment Agency 

# Basic questions and system boundaries

- What are the influences of the Global Megatrends onto the Swedish Generation Goal?
- How does the EU proposal on Resource efficient Europe 2050 influence the fulfilment of the Swedish environmental objectives?
- What are the converging and diverting effects upon Sweden work for fulfilling the environmental goals as well as fulfilling the resource efficiency in EU?

## Boundaries

- The system boundaries are around resource use and energy production on a national level focused on Northern Europe
- The EU roadmap for (“A resource efficient Europe”- COM (2011) 571 final), was used as a point of departure for the EU regional strategies
- Different literature sources were used to construct generic models for the case study and for the EU level

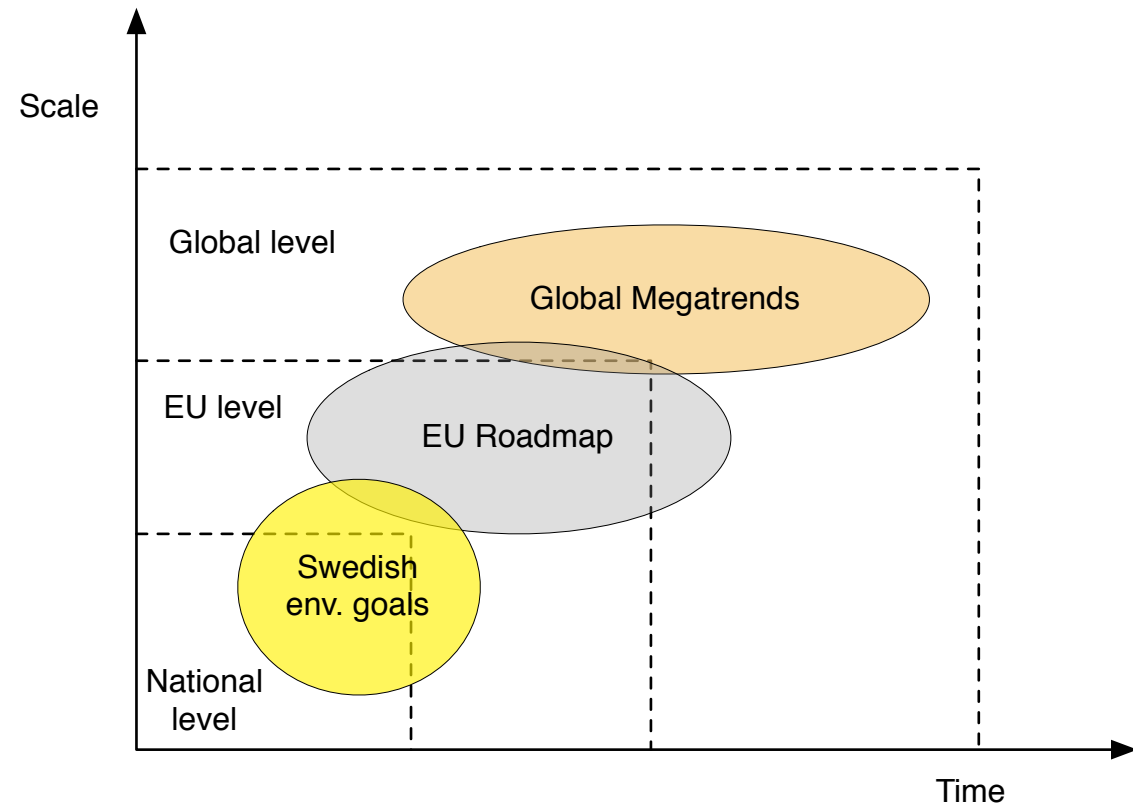
# The Generation Goal Indents

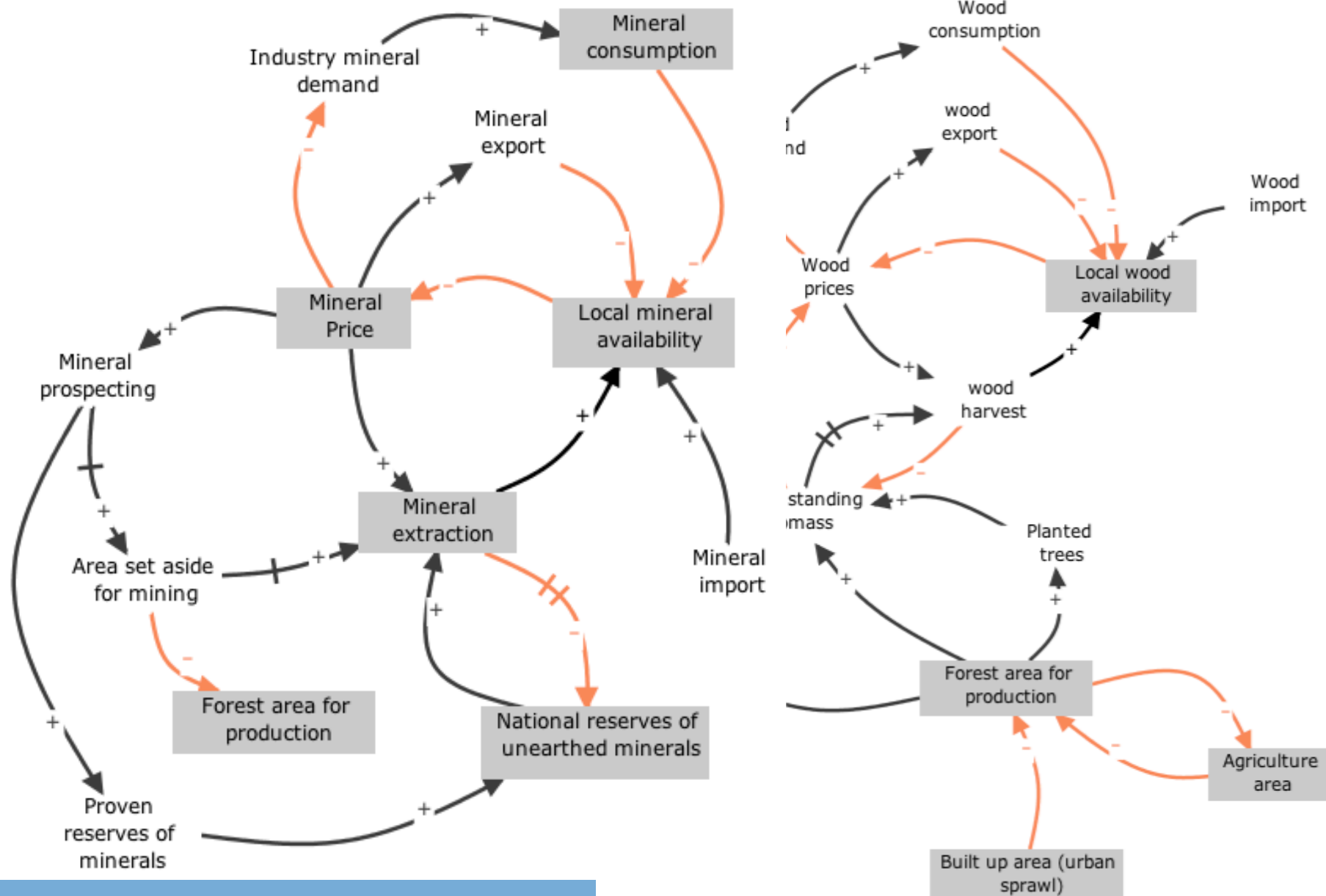
1. **Ecosystems have recovered**, or are on the way to recovery, and their long-term capacity to generate ecosystem services is assured.
2. **Biodiversity and the natural and cultural environment** are conserved, promoted and used sustainably.
3. **Human health** is subject to a minimum of adverse impacts from factors in the environment, at the same time as the positive impact of the environment on human health is promoted.
4. **Materials cycles** are resource-efficient and as far as possible free from dangerous substances.
5. **Natural resources** are managed sustainably.
6. **The share of renewable energy** increases and use of energy is efficient, with minimal impact on the environment.
7. **Patterns of consumption** of goods and services cause the least possible problems for the environment and human health.



# Linking different scales

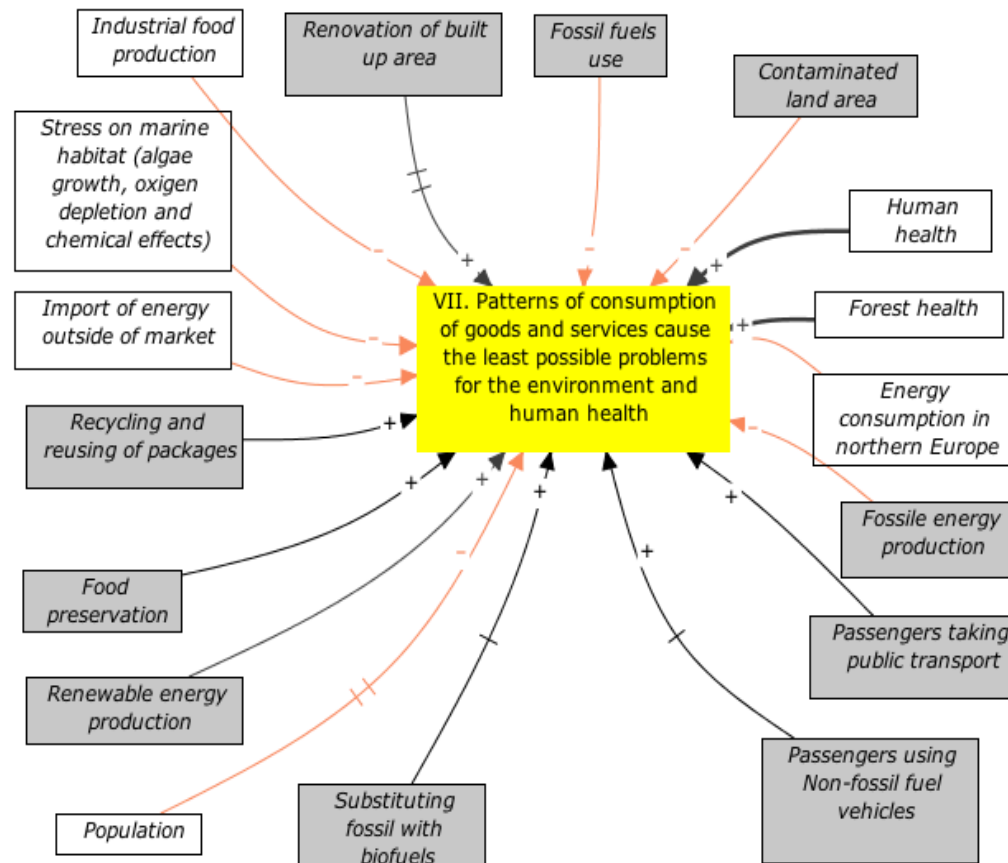
- We need understand
  - driving forces and feedback loops
  - actors and external forces that influence locally and globally

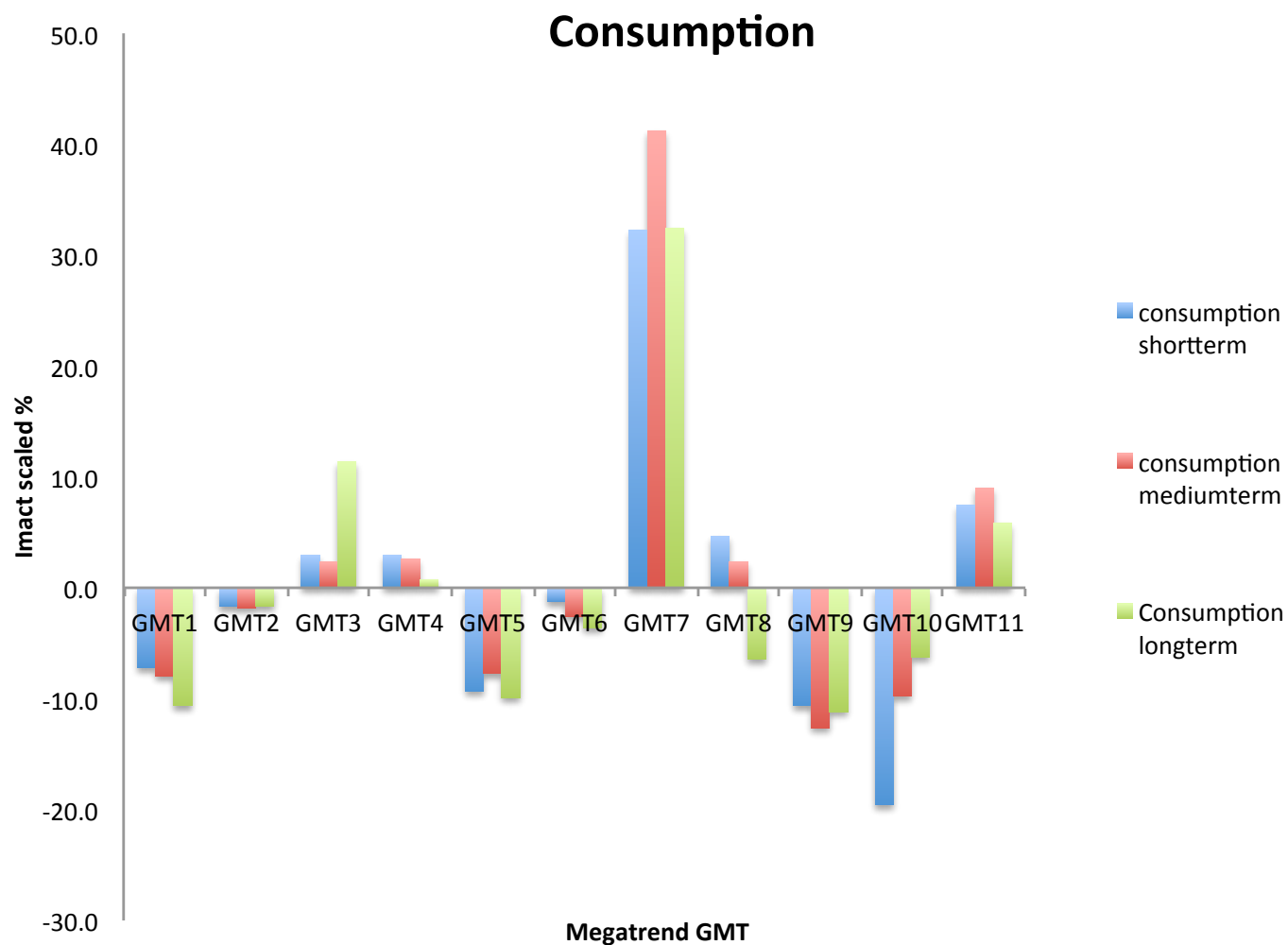




# Results

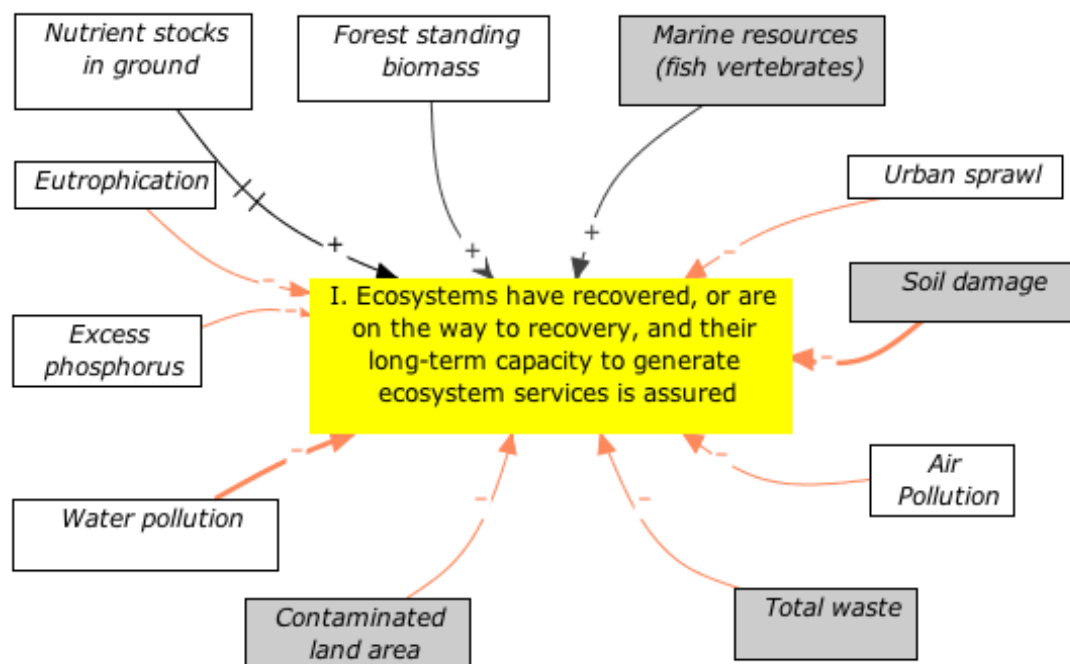
# GG – Consumption

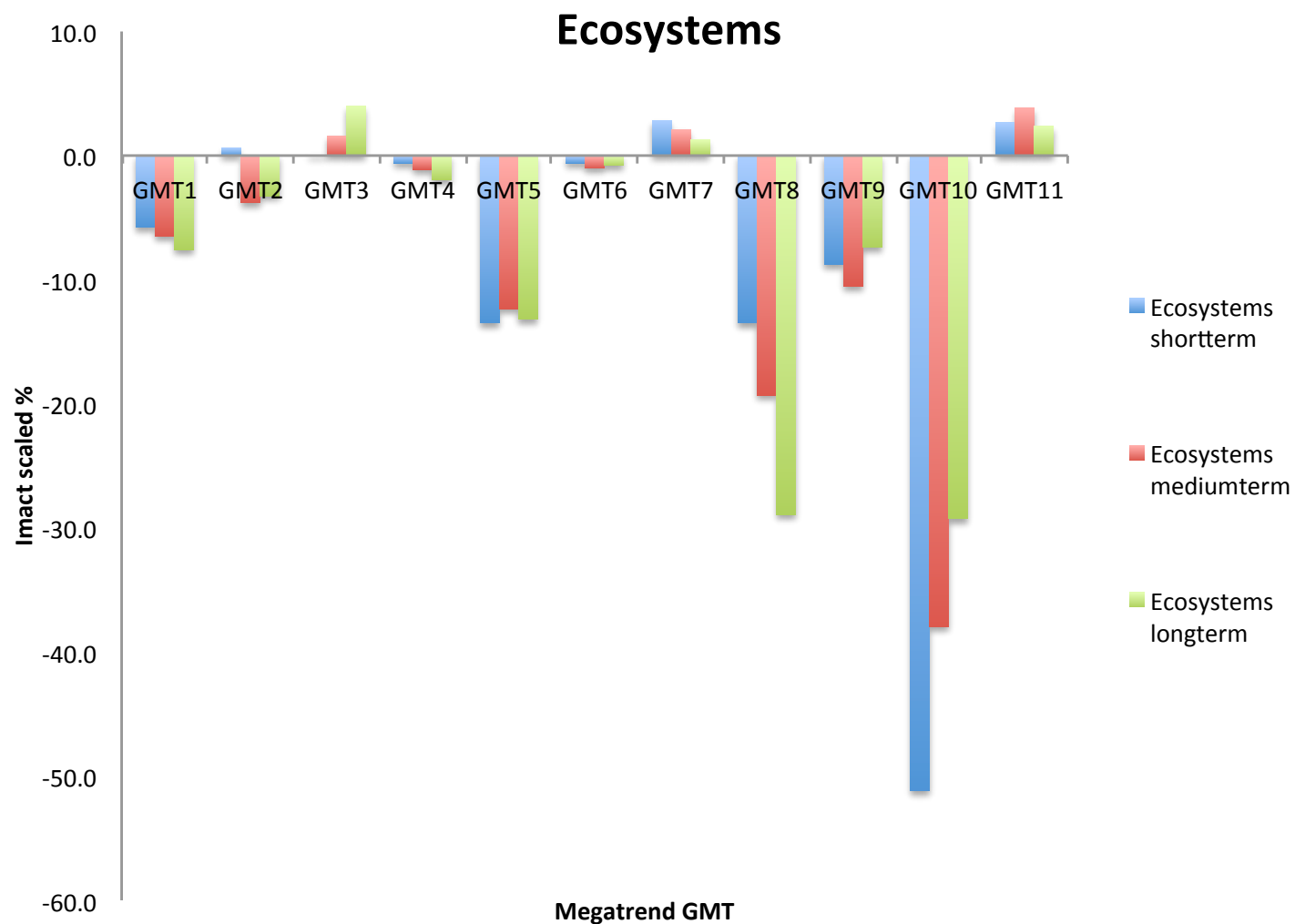




- GMT 1- Increasing global divergence in population trends
- GMT 2- Living in an urban world
- GMT 3- Disease burdens and risk of new pandemics
- GMT 4- Accelerating technological change
- GMT 5- Continued economic growth
- GMT 6- From unipolar to a multipolar world
- GMT 7- Intensified global competition for resources
- GMT 8- Decreasing stocks of natural resources
- GMT 9- Increasingly severe consequences of climate change
- GMT 10- Increasing environmental pollution load
- GMT 11- Environmental regulation and governance

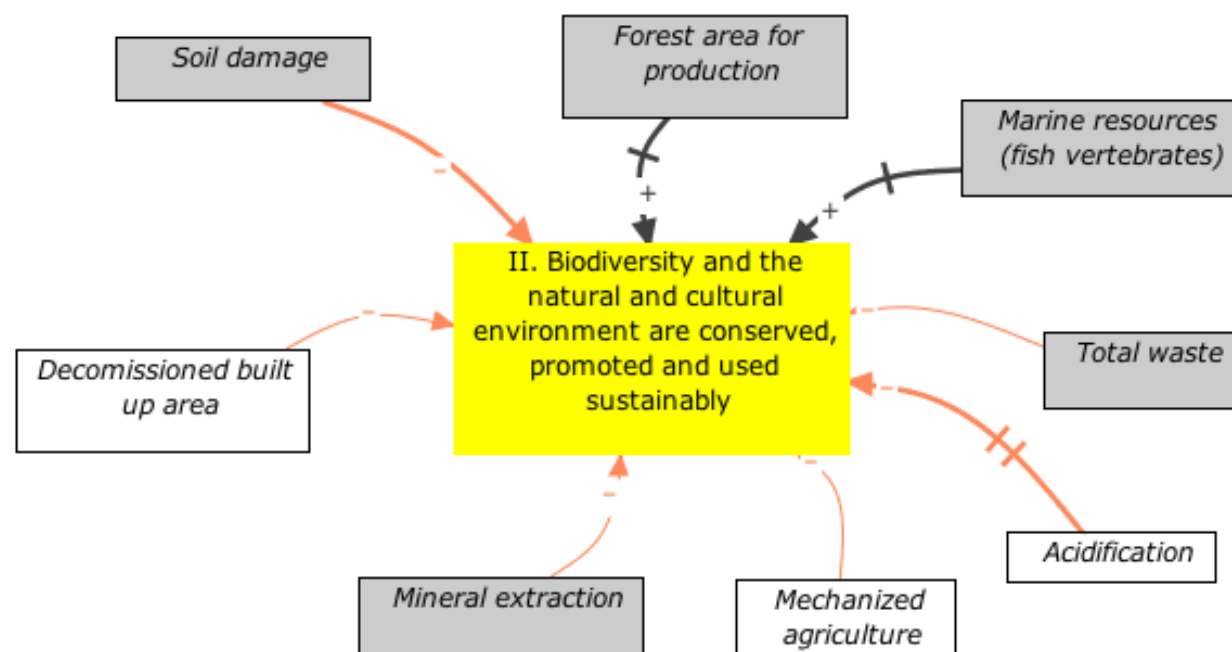
# GG – Ecosystems



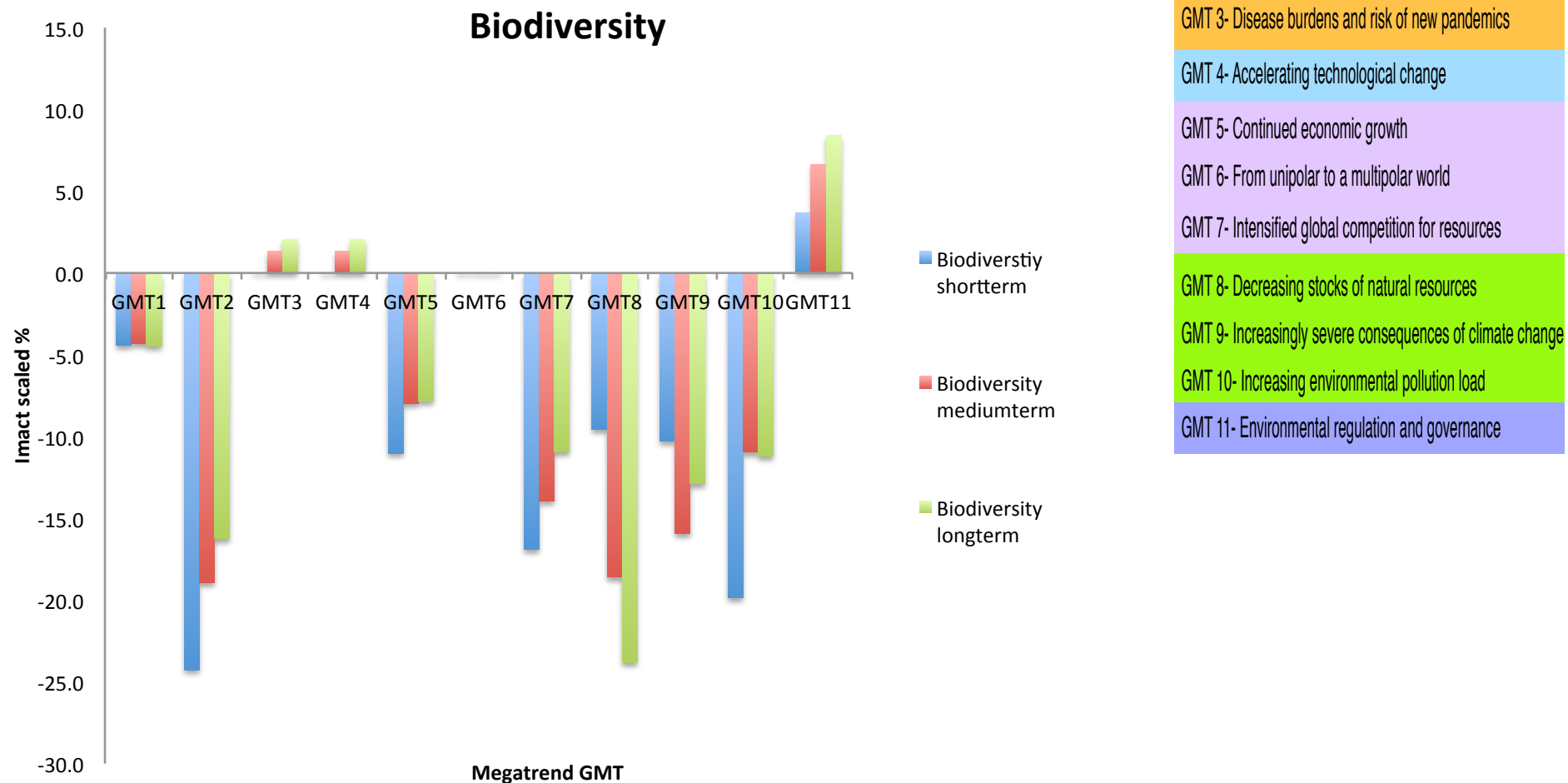


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## GG – Human Health

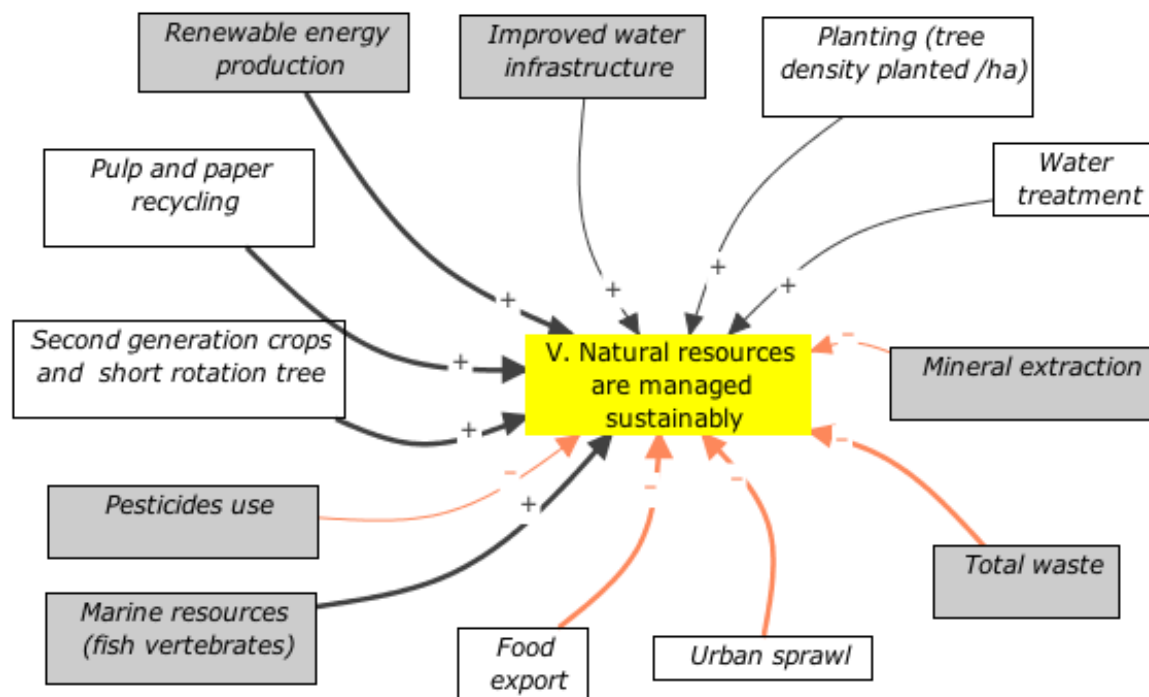


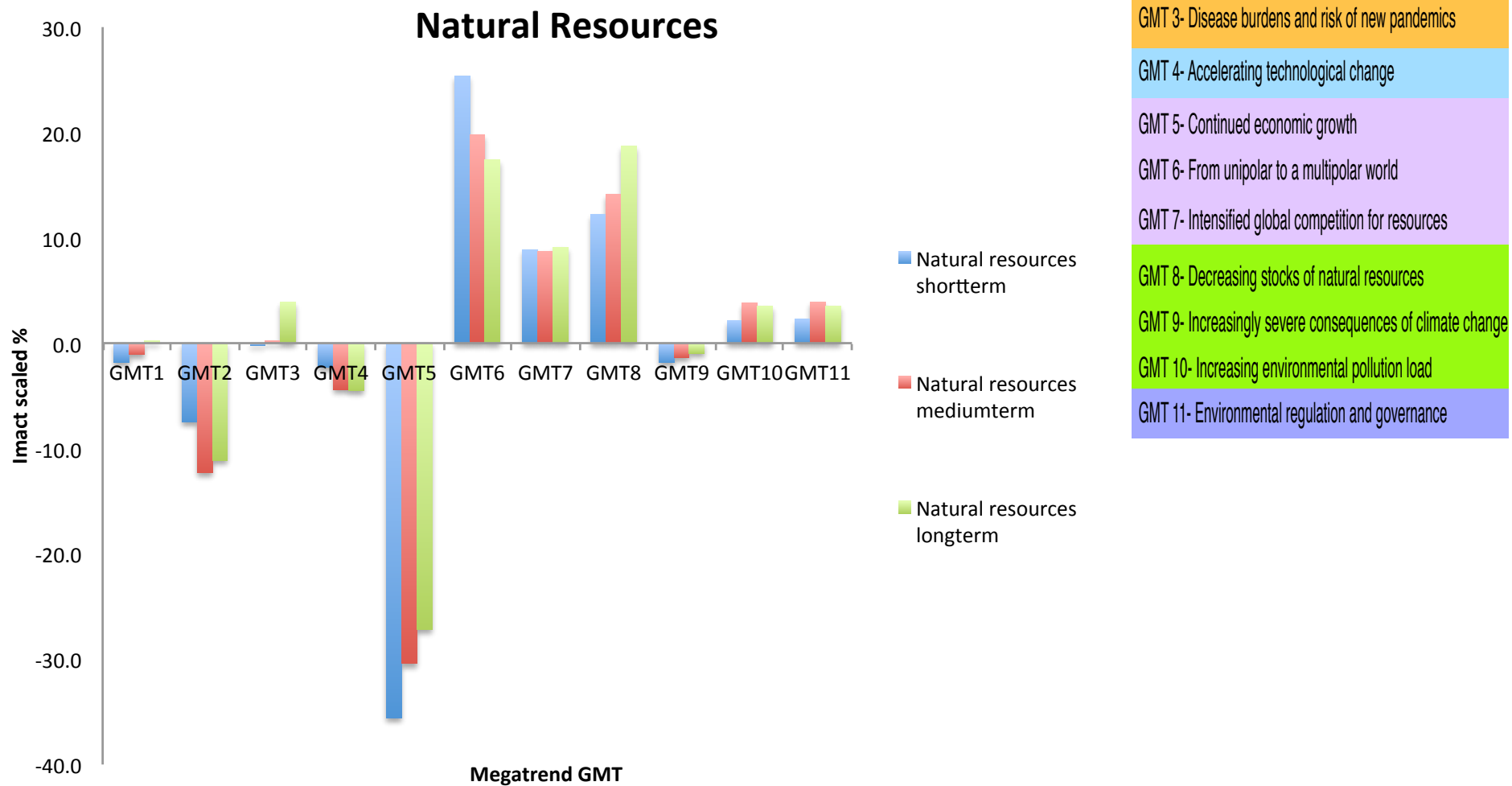




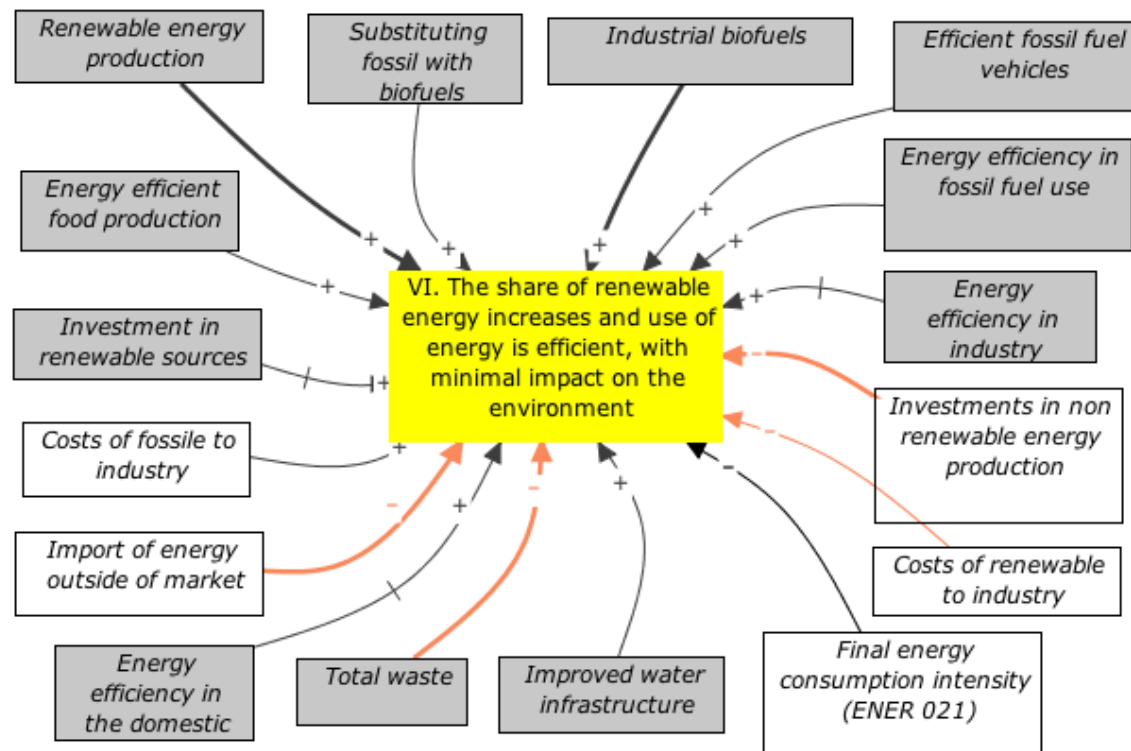
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## GG – Natural Resources

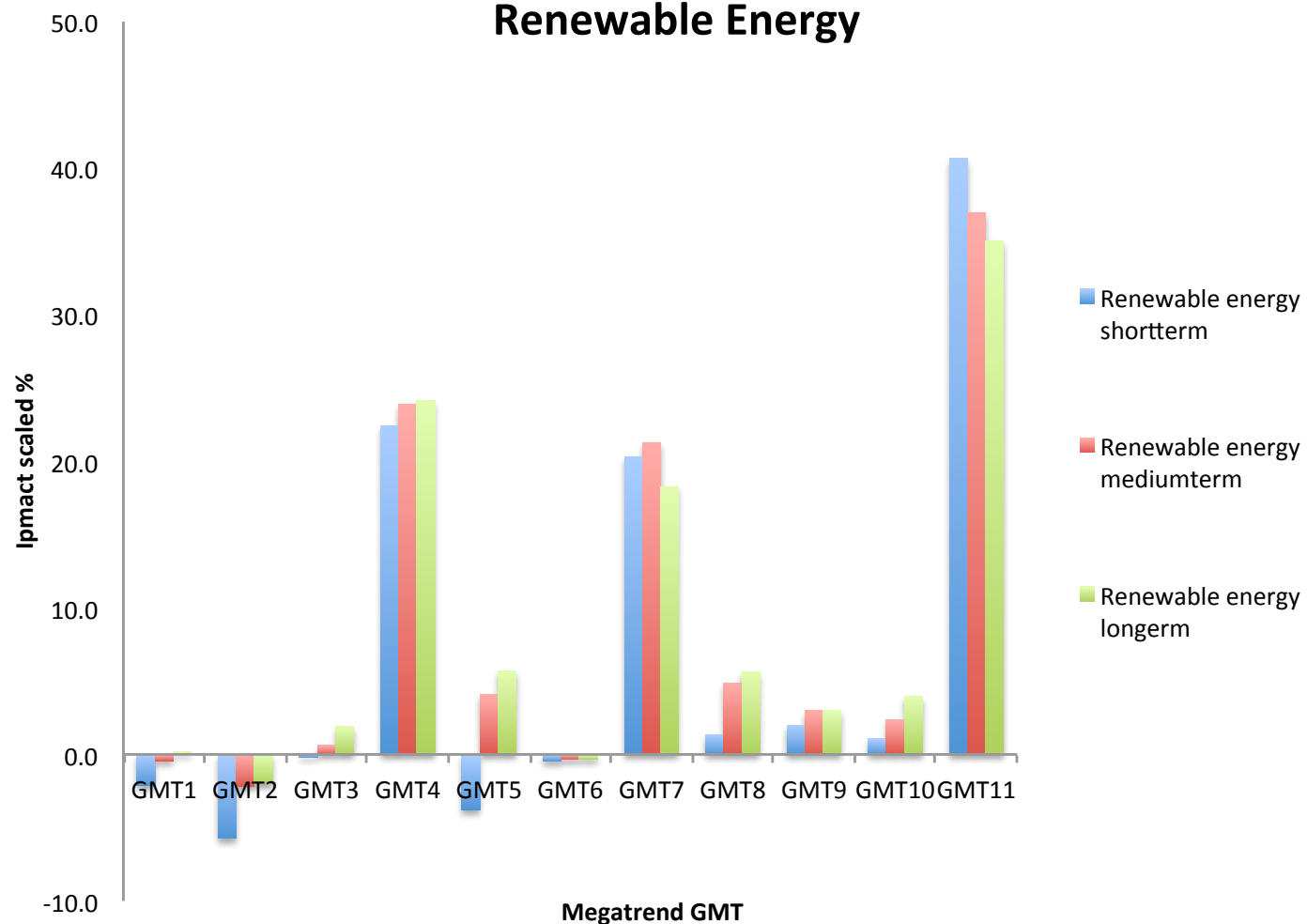




# GG – Renewable Energy

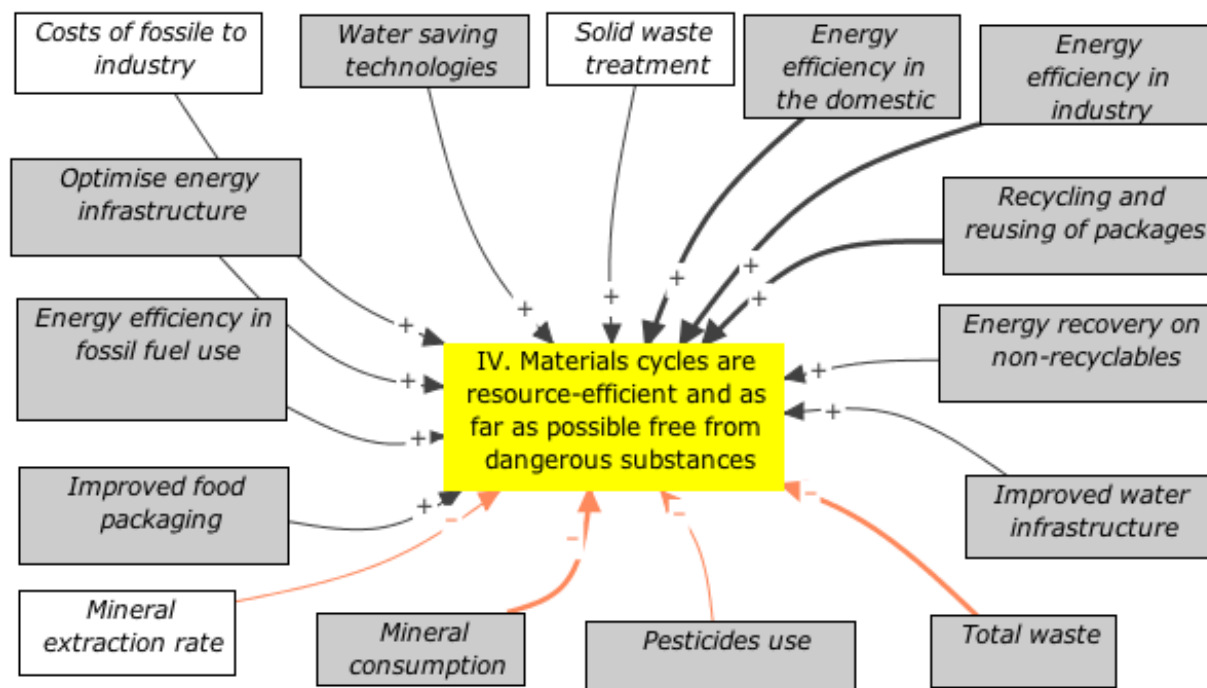


## Renewable Energy

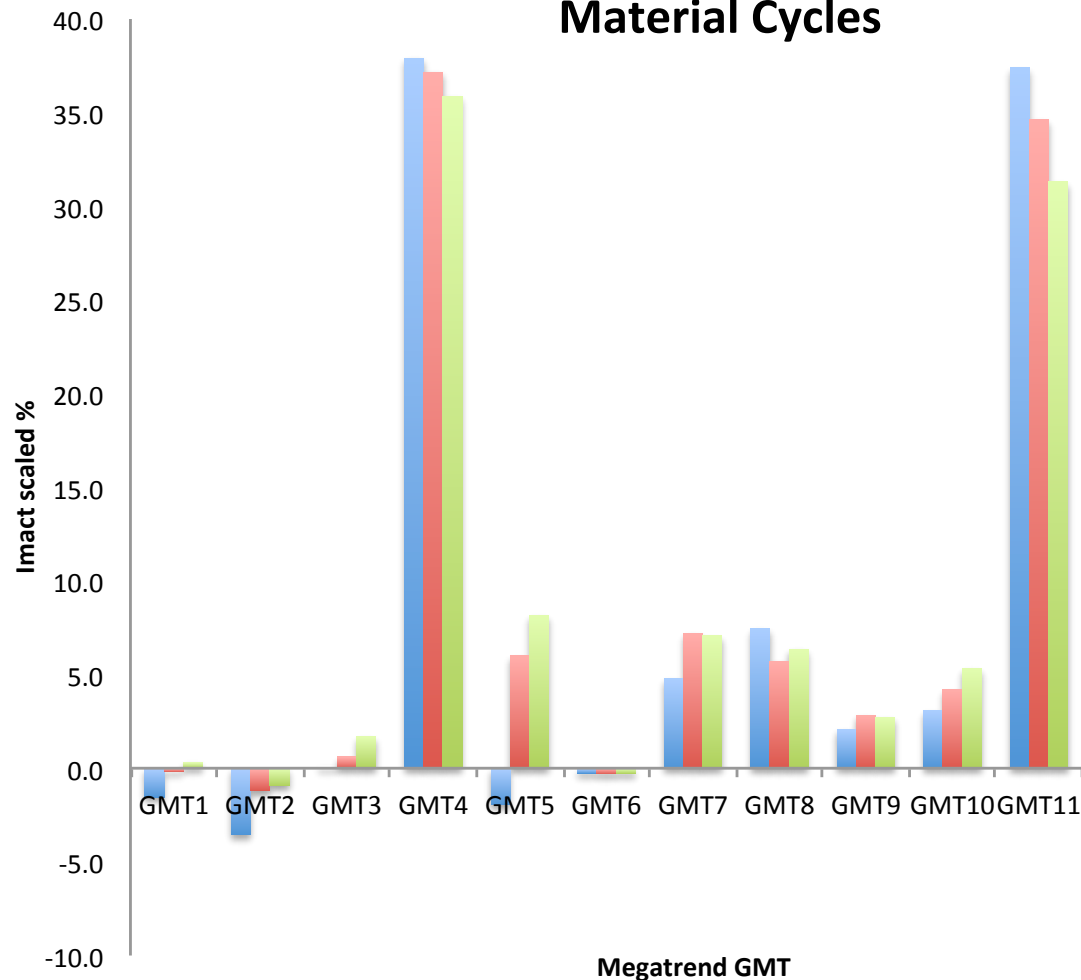


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## GG – Material Cycles

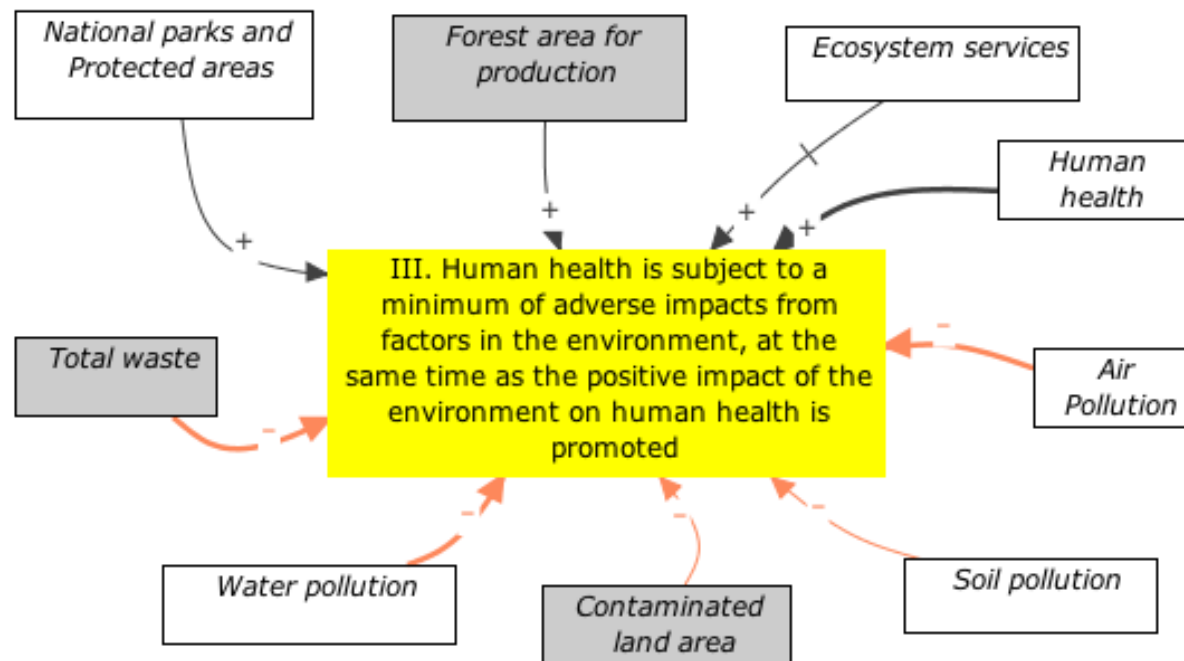


## Material Cycles



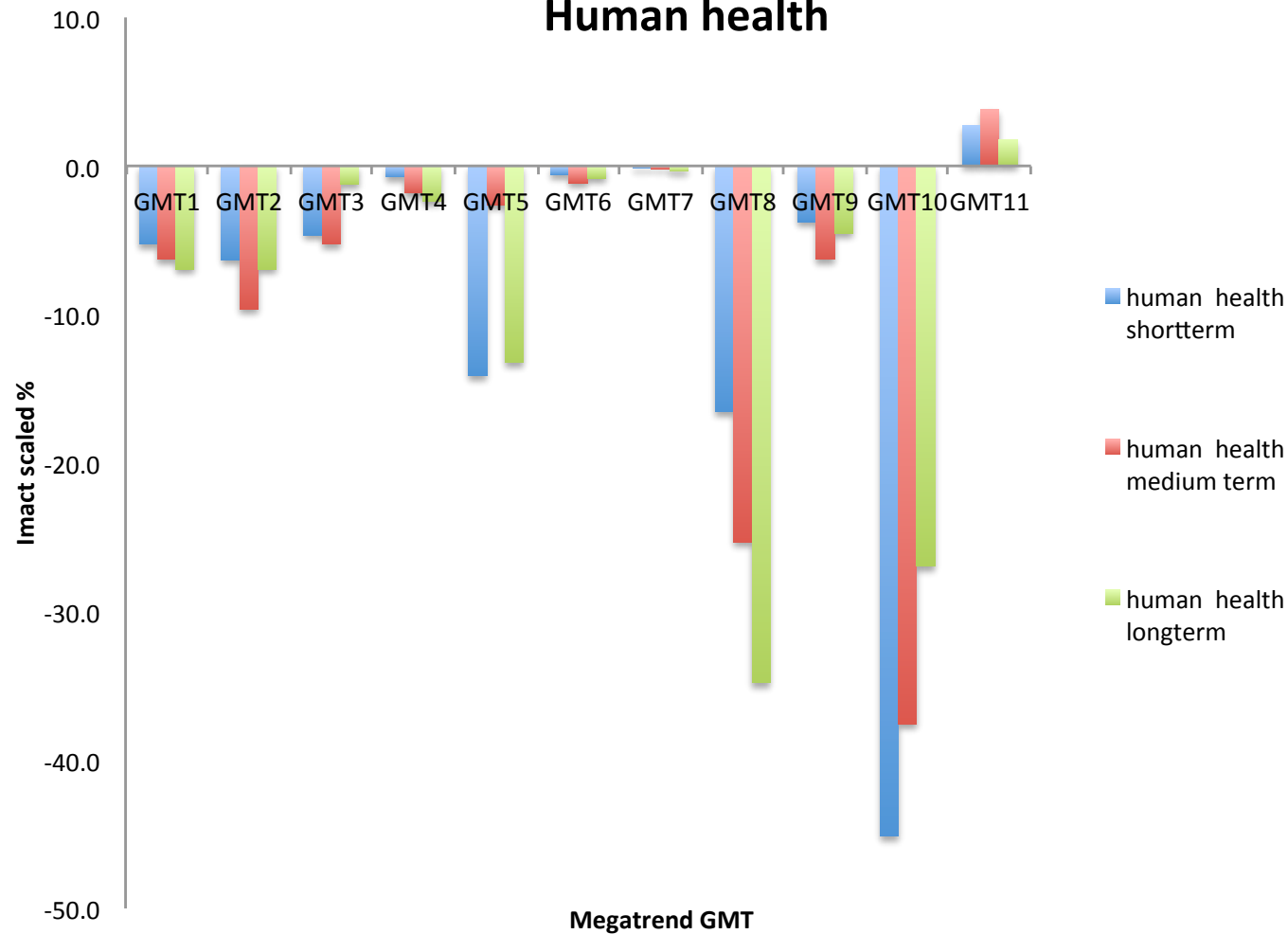
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## GG – Human Health





## Human health



GMT 1- Increasing global divergence in population trends

GMT 2- Living in an urban world

GMT 3- Disease burdens and risk of new pandemics

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GMT 6- From unipolar to a multipolar world

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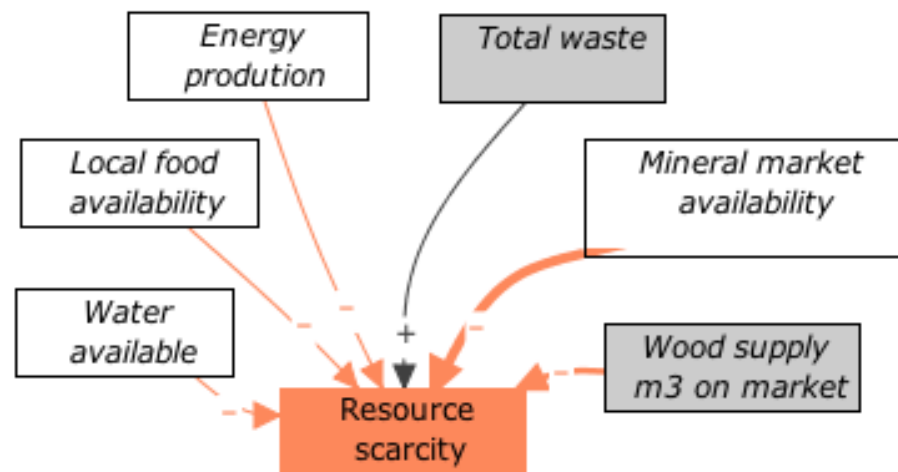
GMT 8- Decreasing stocks of natural resources

GMT 9- Increasingly severe consequences of climate change

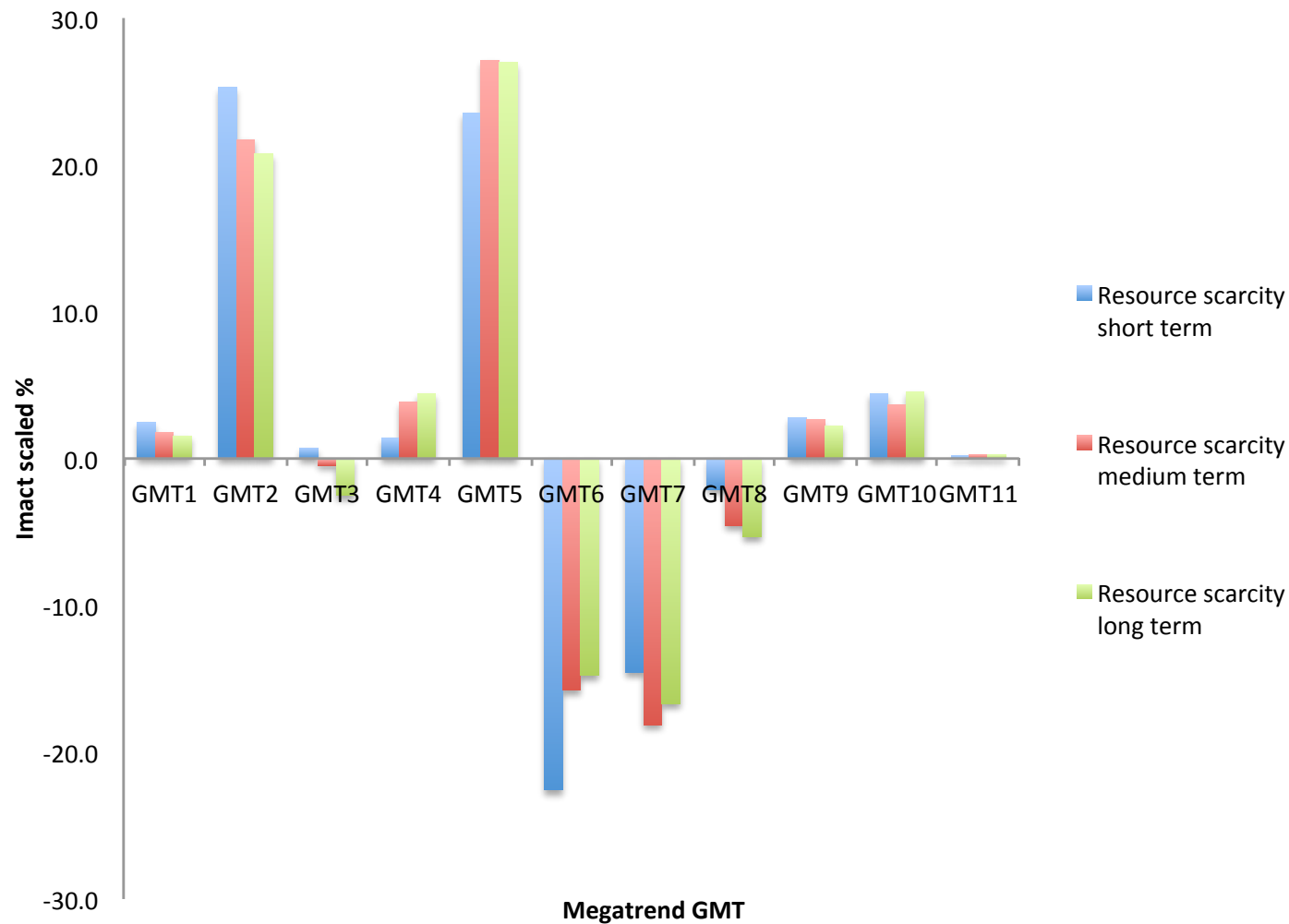
GMT 10- Increasing environmental pollution load

GMT 11- Environmental regulation and governance

## Impact upon Resource Scarcity on regional level



# Impact upon Resource Scarcity on regional level



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	Consumption	Ecosystems	Material Cycles	Renewable Energy	Biodiversity	Human Health	Natural Resources	Resource Scarcity
GMT 1- Increasing global divergence in population trends	-1	-1				-1		
GMT 2- Living in an urban world					1	-1	-1	2
GMT 3- Disease burdens and risk of new pandemics	-1							
GMT 4- Accelerating technological change			3	2				
GMT 5- Continued economic growth	-1	-1	1			-1	-3	3
GMT 6- From unipolar to multipolar world							2	-1
GMT 7- Intensified global competition for resources	3		1	2	2		1	-2
GMT 8- Decreasing stocks of natural resources		-2	1		-2	-2	1	
GMT 9- Increasing severe consequences of climate change	-1	-1			-1	-1		
GMT 10- Increasing environmental pollution load	-1	-3			-1	-3		
GMT 11- Environmental regulation and governance	1		3	3	1			

3
2
1

Strong positive  
medium positive  
weak positive

-1
-2
-3

weak negative  
medium negative  
Strong negative

## Importance of indents in relation to EU roadmap

- Gives a good overview of how goals and objectives are connected in causal relationship and how changes in one area affects other areas
- Shows what the attractors (GMT vice) are that influence the development of the indents
- Shows how items in the EU roadmap are connected to the Swedish Generation goal
- Gives an indication how important the question on resource scarcity is in relation to the different indents and GMTs
- Helps us sort out what factors are important in related areas connected to the environmental goals



# What does it say in relation to methodology?- lessons learned

- Robust for testing ideas and relationships
- Facilitates deep understanding of complex relationships between the different environmental goals and its connection to the different scales
- Excellent way to understand and harvest key indicators from the environmental goals
- Risks:
  - Problem of over interpreting the results if one is not knowledgeable of the system
  - “*garbage in – garbage out*” principles applies in relation to model quality

## Concluding remarks on method

- The methodology is sound
- Very powerful analysis capabilities
- The method exposes some limitations of current system boundaries of current GMTs
- Gives a good overview of how goals and objectives are connected in causal relationship and their interaction in local and global perspective
- Easy to identify where indicators should connect, as drivers or state