

Environmental Goods and Services in Trade

- case study Finland, on a new assessment framework and EGS list

TESSD informal working group meetings, 29.10



Suomen ympäristökeskus
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Objective of the study

The objective of the study was:

- To form a broad and sufficiently deep overview of what is Finnish companies' supply of climate, circular economy, and environmental products
- To find out what kind of trade barriers Finnish companies face in various export markets.
- For these purposes to answer to the following research questions:
 - ✓ **What are environmental products?**
 - ✓ What is Finland's supply of environmental products?
 - ✓ In which products and sectors are Finnish companies specialized?
 - ✓ What types of customs duties and trade barriers apply to these products?
 - ✓ In which markets are trade barriers located?

Contents of this presentation

1. Objective of the study
2. Starting points
 - environment
 - economy
 - primary areas of technology response
3. Key observations
4. Methodology and data
 - quantitative analysis
 - qualitative analysis
5. Some of the main results
 - EPMAP-framework
 - EGF124'-list of Environmental Goods
 - Results from quantitative analysis
 - Results from qualitative analysis
6. Conclusions and recommendations





Starting points

- The EGS-listings are important tools to understand the extent, role and importance of EGS in the world economy and national economies, especially in upcoming decades when the world community **is compelled** to solve the Triple Planetary Crisis of Climate Change, Loss of biodiversity and Pollution as well as other environmental challenges.
- This review considers all aspects of the Planetary Triple Crisis, as well as other most prevalent environmental problems identified in the relevant literature
- Special attention should be paid to those environmental problems, for which planetary or regional boundaries have been transgressed
- Short summary of major areas of technology response are included in the report

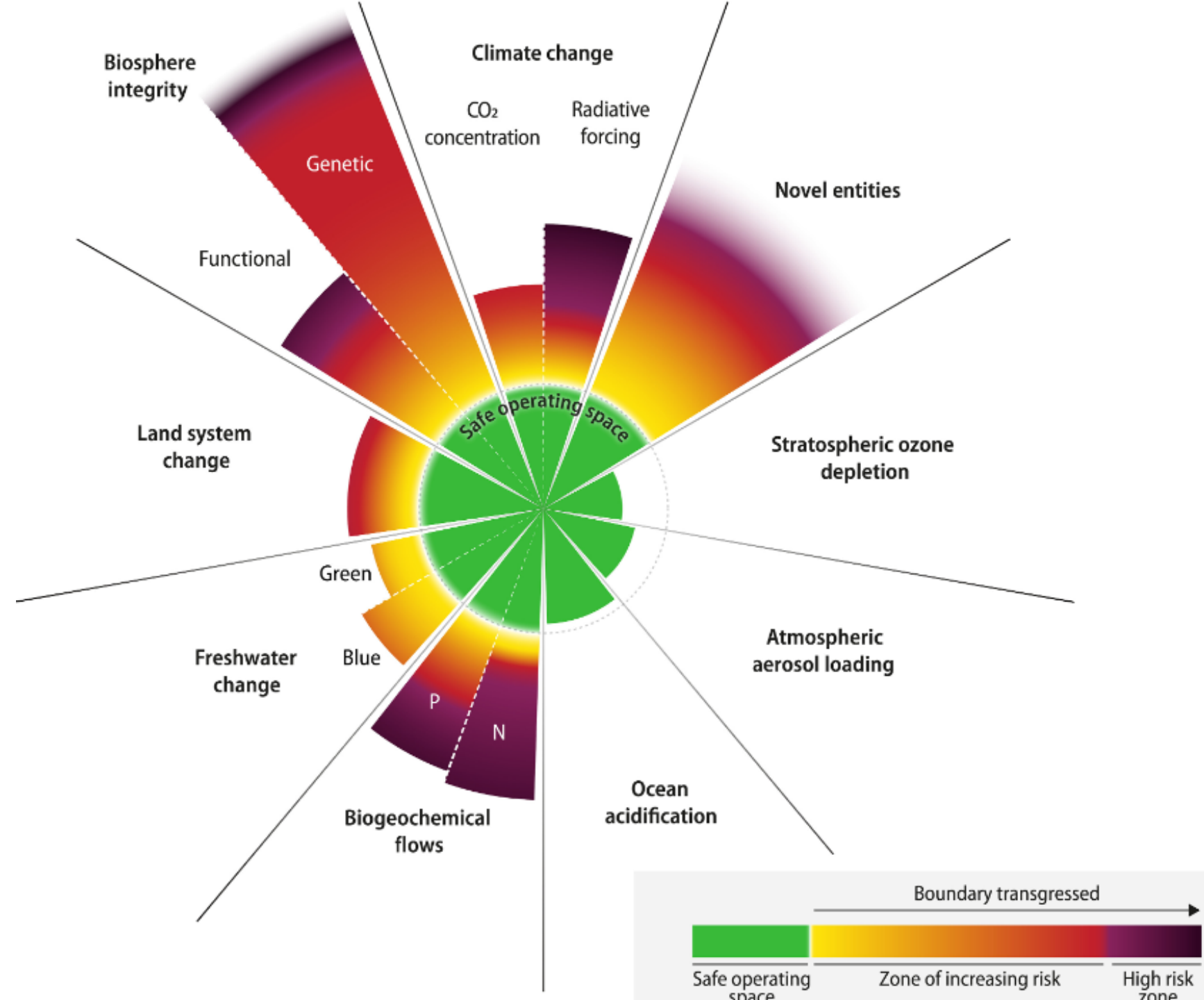


Environmental boundaries and some other key concepts



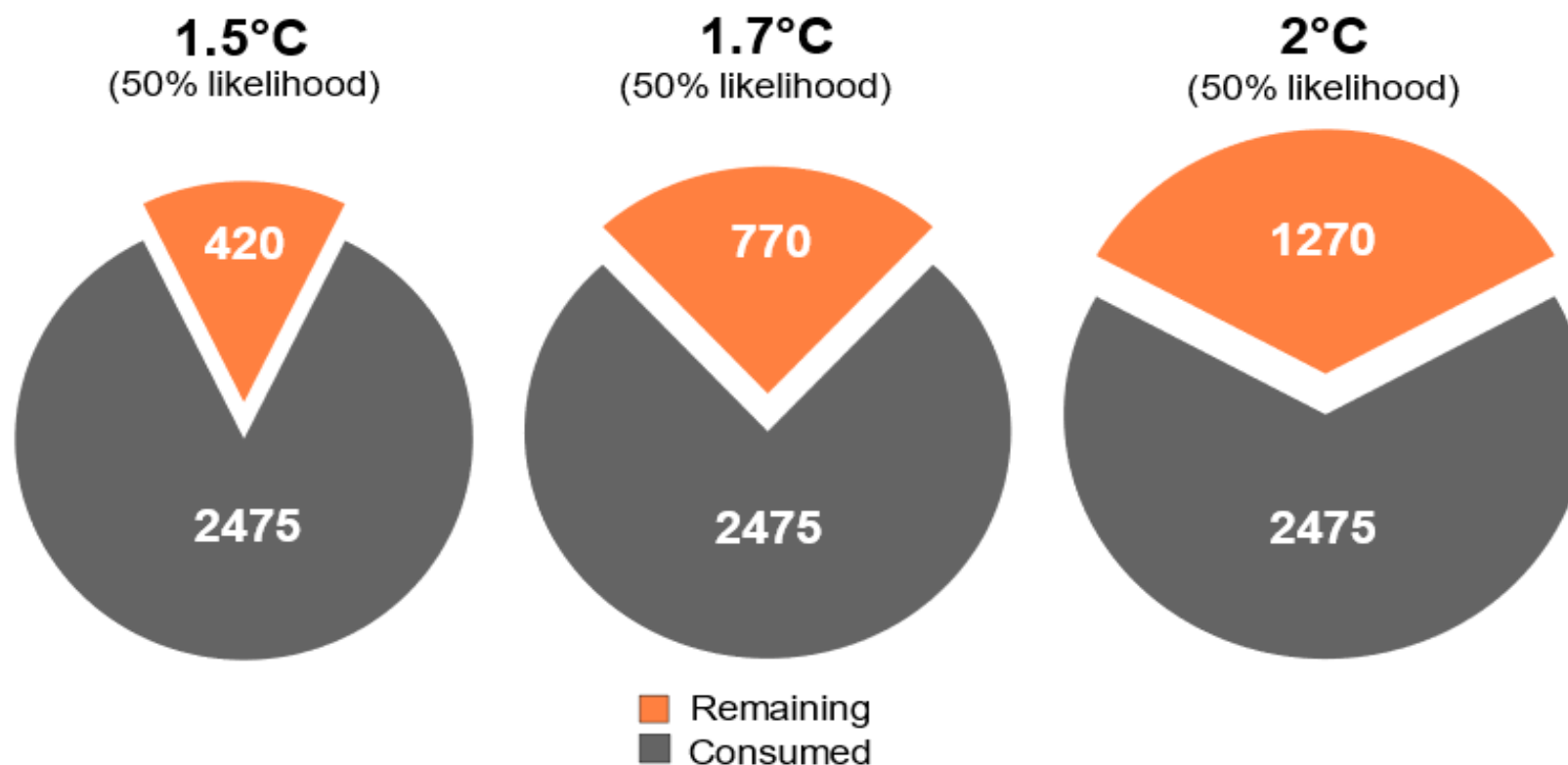
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Transgressing planetary boundaries



Transgressing planetary boundaries

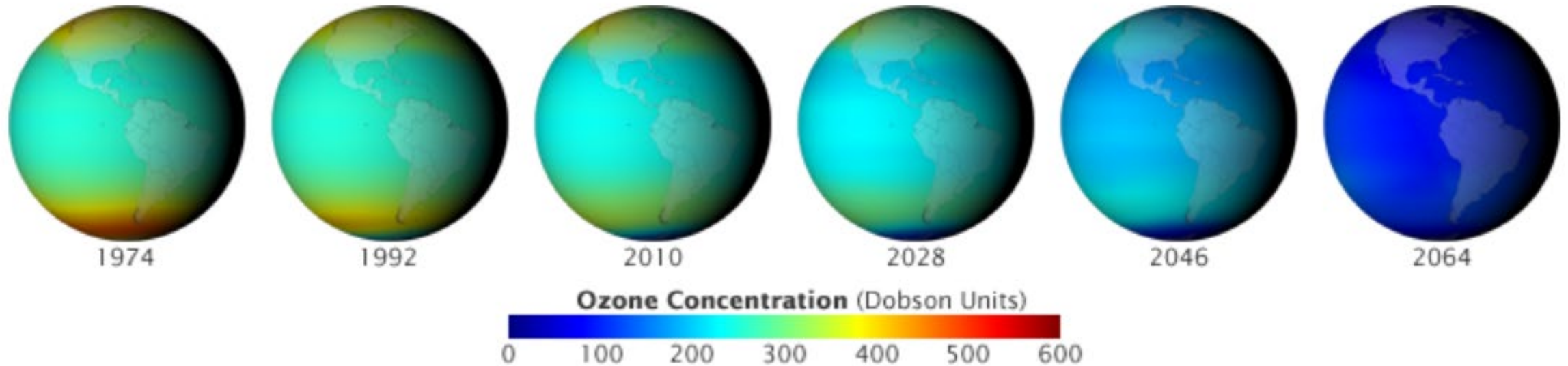
The remaining carbon budget to limit global warming to 1.5°C, 1.7°C and 2°C is 420 GtCO₂, 770 GtCO₂, and 1270 GtCO₂ respectively, equivalent to 11, 20 and 32 years from 2022. 2475 GtCO₂ have been emitted since 1750



Quantities are subject to [additional] uncertainties e.g., future mitigation choices of non-CO₂ emissions
Source: IPCC AR6 WG1; [Friedlingstein et al 2021](#); [Global Carbon Budget 2021](#)



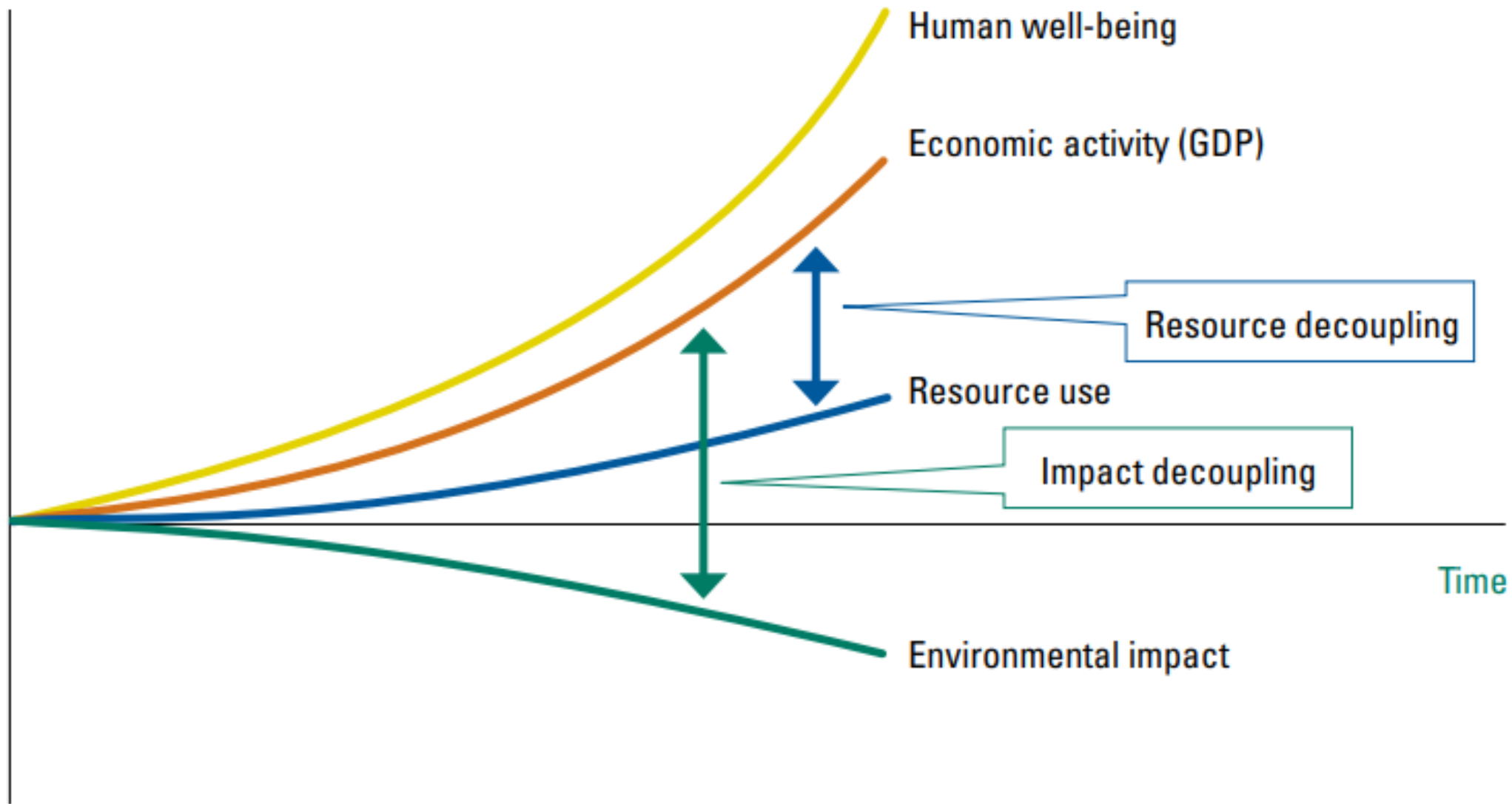
The World avoided-scenario



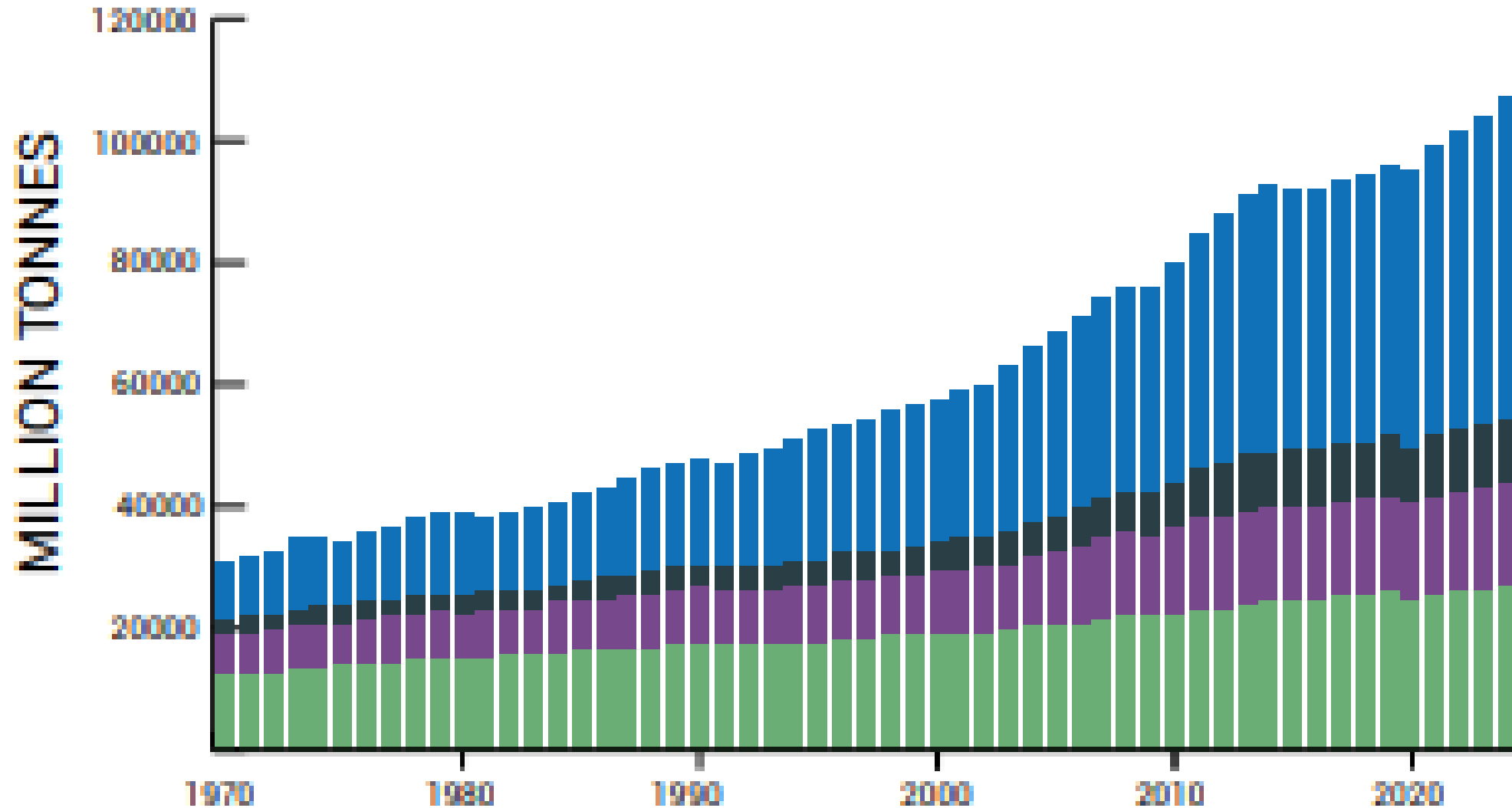
With continued production of CFCs, ozone levels worldwide would have dropped to dangerously low levels. (NASA **images** by the GSFC Scientific Visualization Studio.)



Different concepts of de-coupling



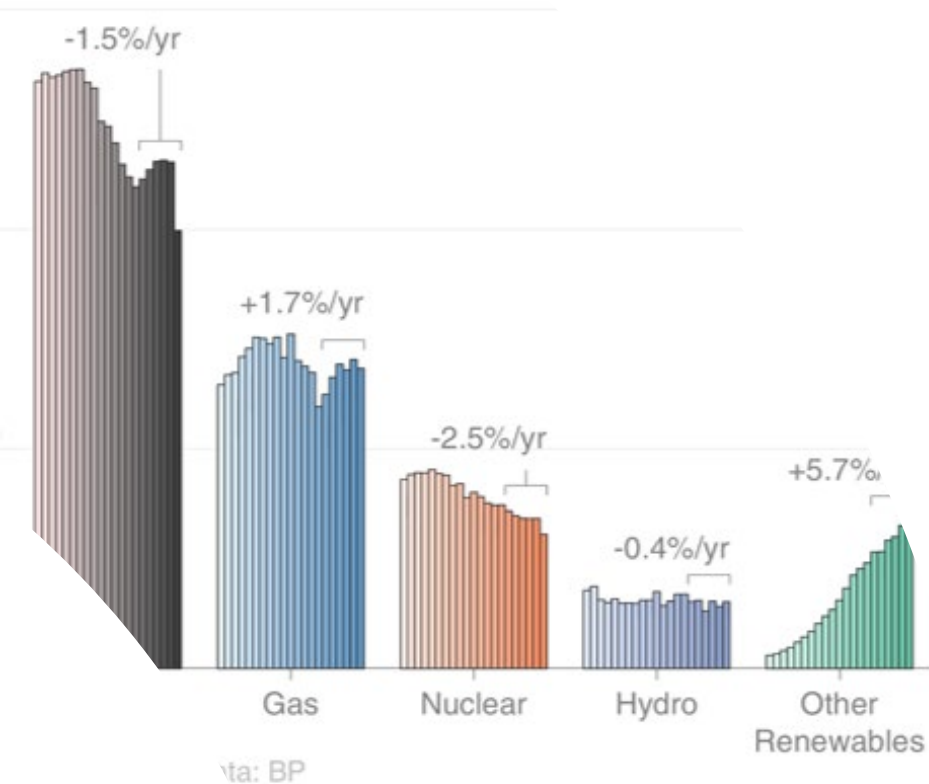
Material usage is still growing





l and g
growing str

energy consumption in Eu
n rates from 2015–2020



Importance of EGS for EU's economy

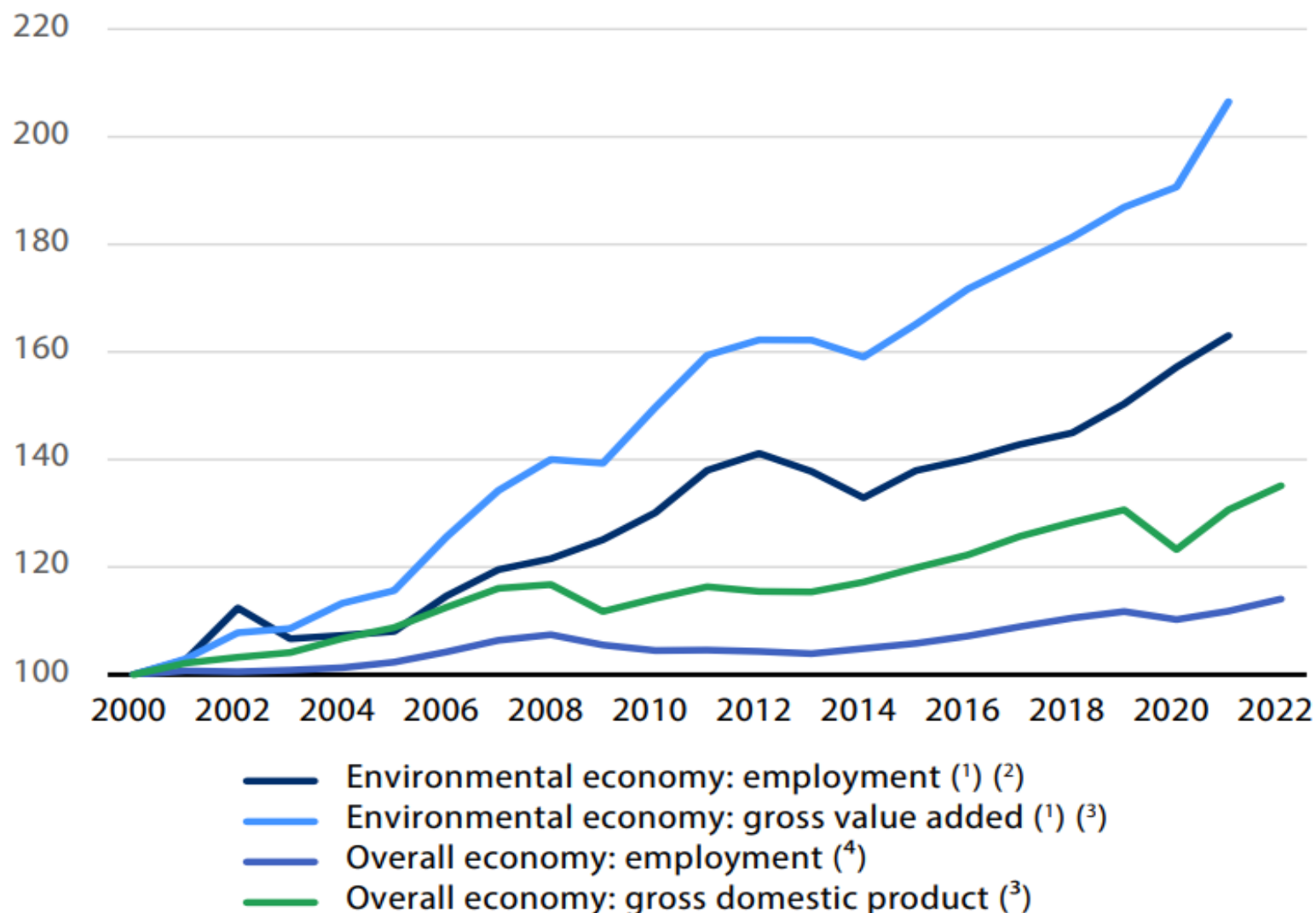


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Environmental economy grows quicker



Figure 1. Development of key indicators for the environmental economy and the overall economy, EU, 2000–2022. (Index with a base year of 2000 = 100).





Green technologies and solutions

Three areas of response in mitigating and solving the Triple Planetary Crisis



Technologies for energy transition

- Renewable energy
- Hydrogen technology
- Heat pumps
- Energy storage technologies
- Transmission and transport of electricity and energy carriers

Circular economy products and services

- Dematerialization
- Resource efficiency

Nature-based solutions (NbS)

- Sustainable forestry services, organic agriculture
- Maintaining and enhancing ecosystem services
- Natural water retention, ecosystem-based disaster risk reduction, green roofs, urban green infrastructure, biofilters, rain gardens



Green Energy Transition

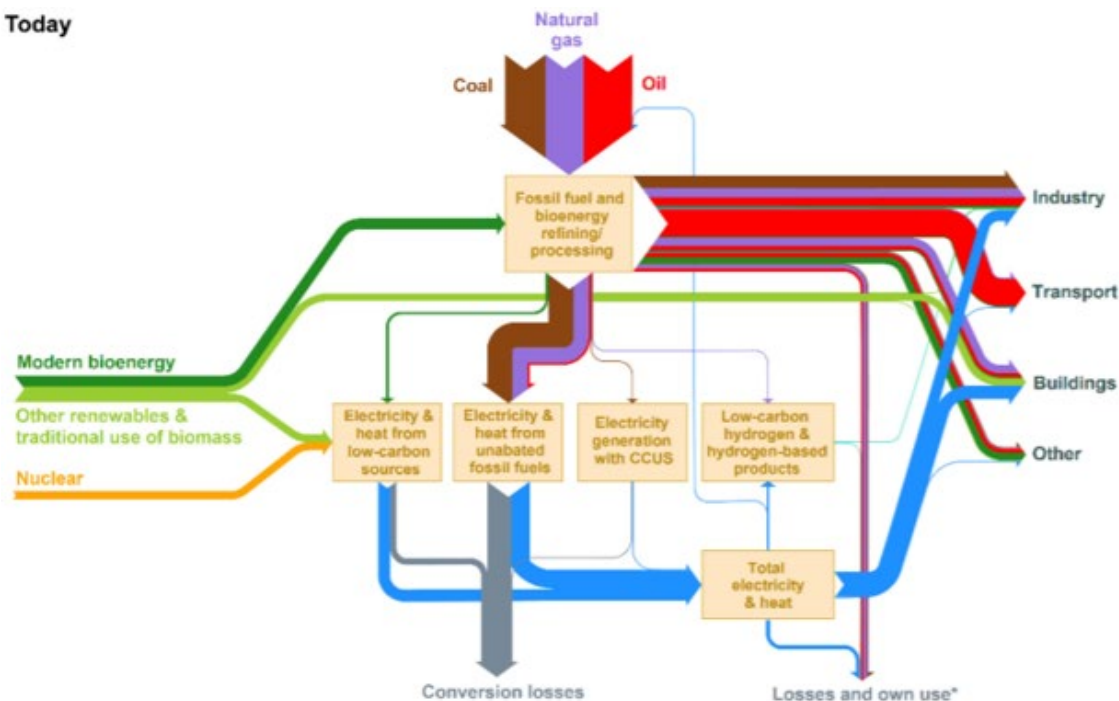
NZE 2050



IEA. All rights reserved.

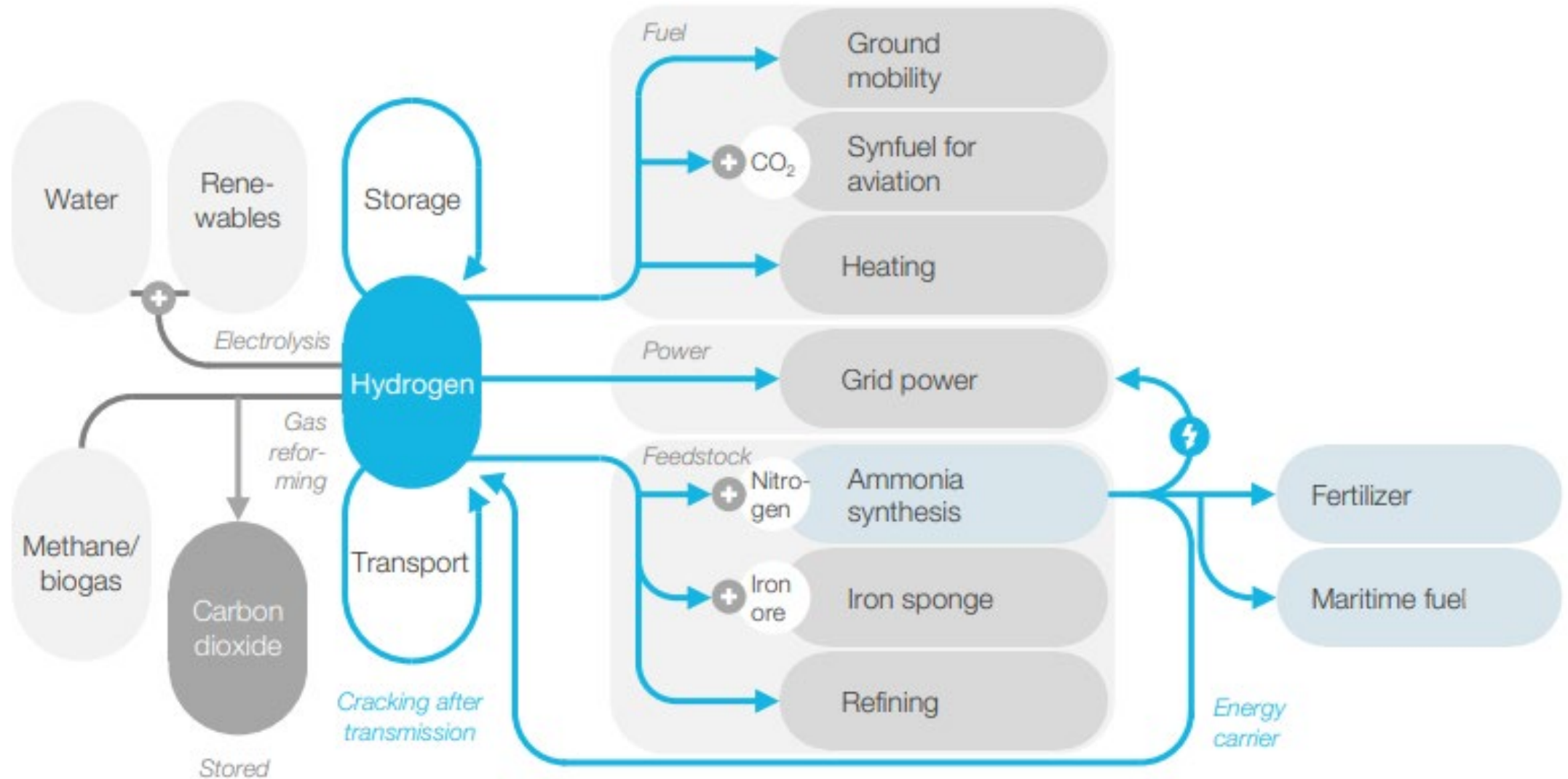
Transformative changes in the energy system occur on the path to net zero emissions

Today

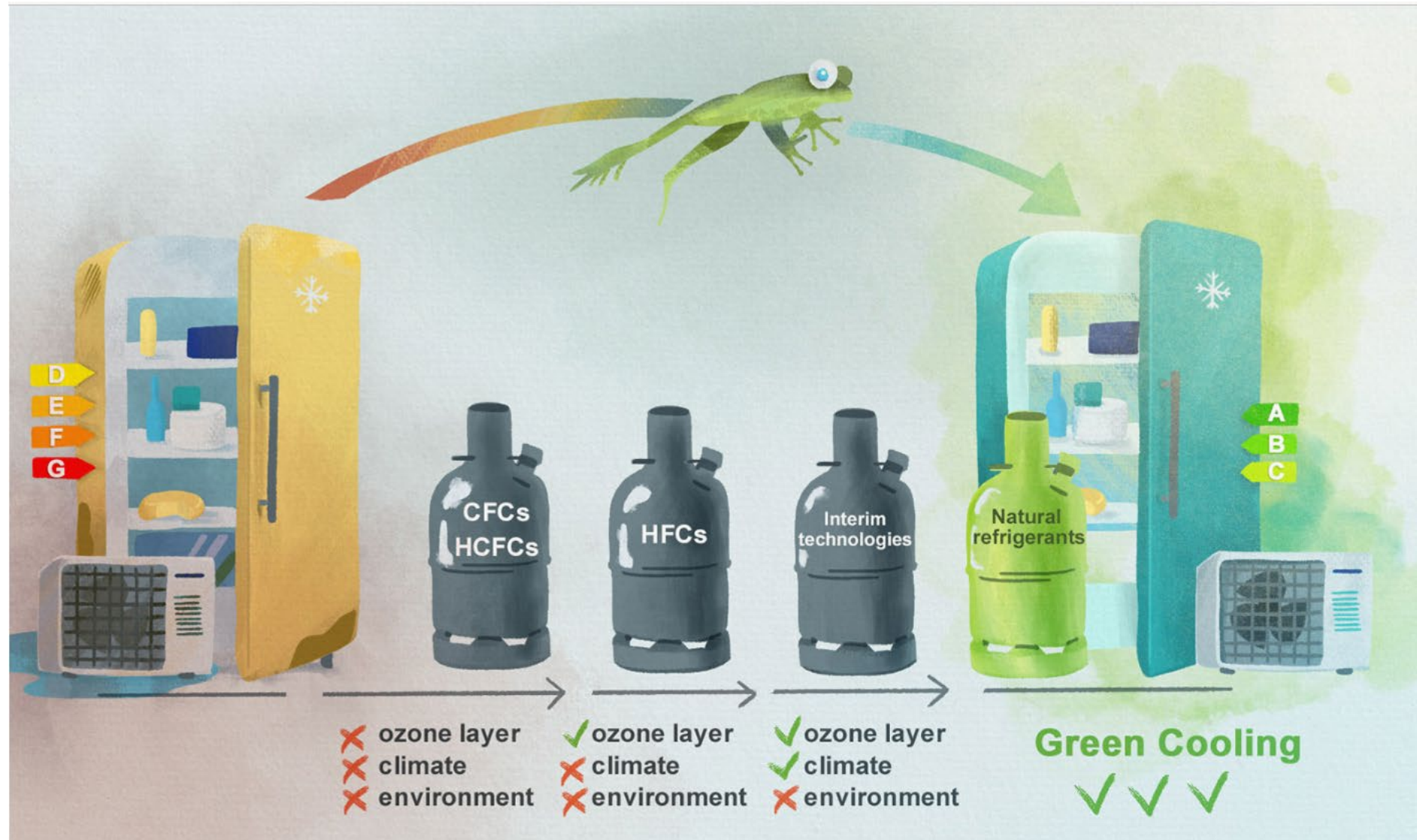


Picture source:
International Energy
Agency (IEA)

Hydrogen economy



Heat pumps and cooling with natural refrigerants



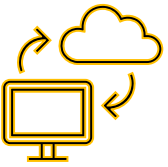
Picture
source: GIZ

Key observations



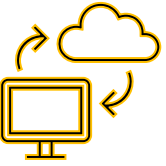
- Earlier EGS-listings have become outdated due to advancements in environmental sciences, more stringent environmental regulation and greener technologies
- The trade negotiations within the World Trade Organization have collapsed due to lack of agreed framework and criteria for EGS
- Stagnation in WTO trade negotiations on EGS may have been caused, at least partly by national trade interests, which easily muddle otherwise objective outcome. Therefore science-based general assessment framework for EGS is needed
- Despite the economic importance of environmental goods and services (EGS), international consensus on green product criteria is lacking and classification statistics are incomplete. This may lead to underestimation of the value of environmental economies to societies and global economic development
- Customs codes do not support follow-up of progress in environmental economy

Methodology and data (quantitative analysis)



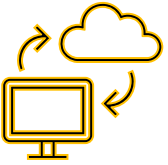
- Initially, we examined the environmental friendliness criteria for products and services found in the literature and classifications based on these criteria. We also investigated how these criteria and classifications evolved over time.
- Based on this evaluation, we proposed a new theoretical framework (EPMAP) and a set of criteria.
- We used recent listings on EGS as source material to define EGFI24's list of Environmental Goods and used it for quantitative analysis on production and international trade on these products.
- Quantitative and/or qualitative analysis were made of environmental product offerings, firm performance in the Finnish manufacturing sector

Methodology (quantitative analysis)



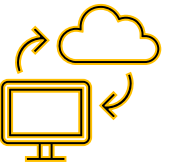
- The identification of environmental goods within the Prodcom dataset was facilitated by a green product list developed within this project (EGFI 24'-list), which is categorized according to the 6-digit Harmonized System (HS) code. Statistics Finland provides a crosswalk table to map these HS codes to their corresponding Prodcom codes
- As Prodcom codes are linked to the NACE classification system, this integration enabled us to categorize each environmental product into a 4-digit industry. This allowed us to identify Finland's green leaders, that is, industries that specialize in the production of environmental products, and to analyze the shares of green product production within each industry in Finland.
- For firm-level analysis, we merged the Prodcom production data (focusing on environmental products identified through the HS code list) with the Business Register data using firm ID codes. This merged dataset allowed us to compare the performance of firms that produce environmental products with those that produce other goods.

Methodology, (quantitative analysis)



- To assess Finland's relative specialization in the production of environmental products compared to other EU countries, we used the Symmetric Revealed Comparative Advantage (SRCA) index (Laursen and Engedal, 1995), which builds upon traditional RCA, but considers both a country's production of environmental products and its overall production profile relative to the EU27 total.
- We analyzed and described Finnish and global trade in environmental goods as determined in this study elsewhere and the tariffs and other trade barriers these products face in the global market. For that purpose UN Comtrade annual data for countries' imports at the Harmonized System (2012) six-digit product level for the years 2012–2022. We also used Customs Finland data to review the most recent development in 2023 in Finnish imports and exports
- For analyzing NTMs, we employed the green product list, which represents a subset of all products. We then compared the average number of NTMs applied to green products versus the entire product spectrum.

Methodology, (qualitative analysis)



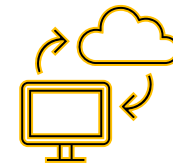
- One part of the project's data collection was a survey directed towards companies, complemented by detailed interviews.
- The aim was to assess the types of energy transition, circular economy, and EGS produced by Finnish companies as well as to identify potential trade barriers affecting the export of these products.
- The survey also sought information on government measures that facilitated product exports and those that had the opposite effect.
- Simultaneously, suggestions regarding actions to promote the export of EGS were gathered.
- The responses from companies are highly valuable in identifying bottlenecks in export markets and easing trade barriers, especially in international trade negotiations
- The survey was conducted in an open online format, comprising seven questions, with the guarantee of maintaining the confidentiality of respondents' answers. Initially, it was sent to 103 companies identified through the previous study The survey was conducted using Webropol software.
- A total of 27 responses were received from 14 different types of industries, with total turnover of 45,5 billion Euros, ranging from start up's to very large enterprises. The response rate of the survey was 26%, which was achieved through personal contact and several phone calls.

Some of the main results

- We created a draft generalized EPMAF -framework, which can be useful in efforts to find agreeable methodology to define EGS-listings.
- Green product list (EGFI 24'-list) of Environmental goods was developed using inclusion and exclusion criteria for source EGS-listings.
- Finnish companies have a slight comparative advantage in EGS, but Finland has not yet used its full potential in producing and exporting EGS.
- The Energy transition, Circular economy and Nature based Solutions are seen as vehicles to promote sustainability transformation and to benefit from it.
- Especially hydrogen economy, clean energy production and energy storage technologies are believed to have great opportunities for Finnish industries to attain sustainable economic growth and employment.
- The interviewed Finnish companies and sectoral industrial organizations have generally positive attitude towards the new environmental programs and legislation of the EU and see their role as active contributors in mitigation of Triple Planetary crisis



EPMAP-framework

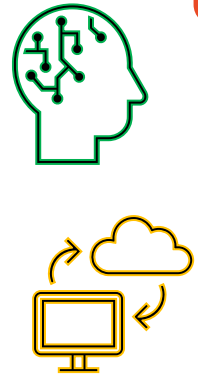


It is obvious that some products are less harmful to the environment than others, but the ways in which mitigation takes place through products and services fall under distinct categories, depending on how they operate in the mitigation of environmental problems.

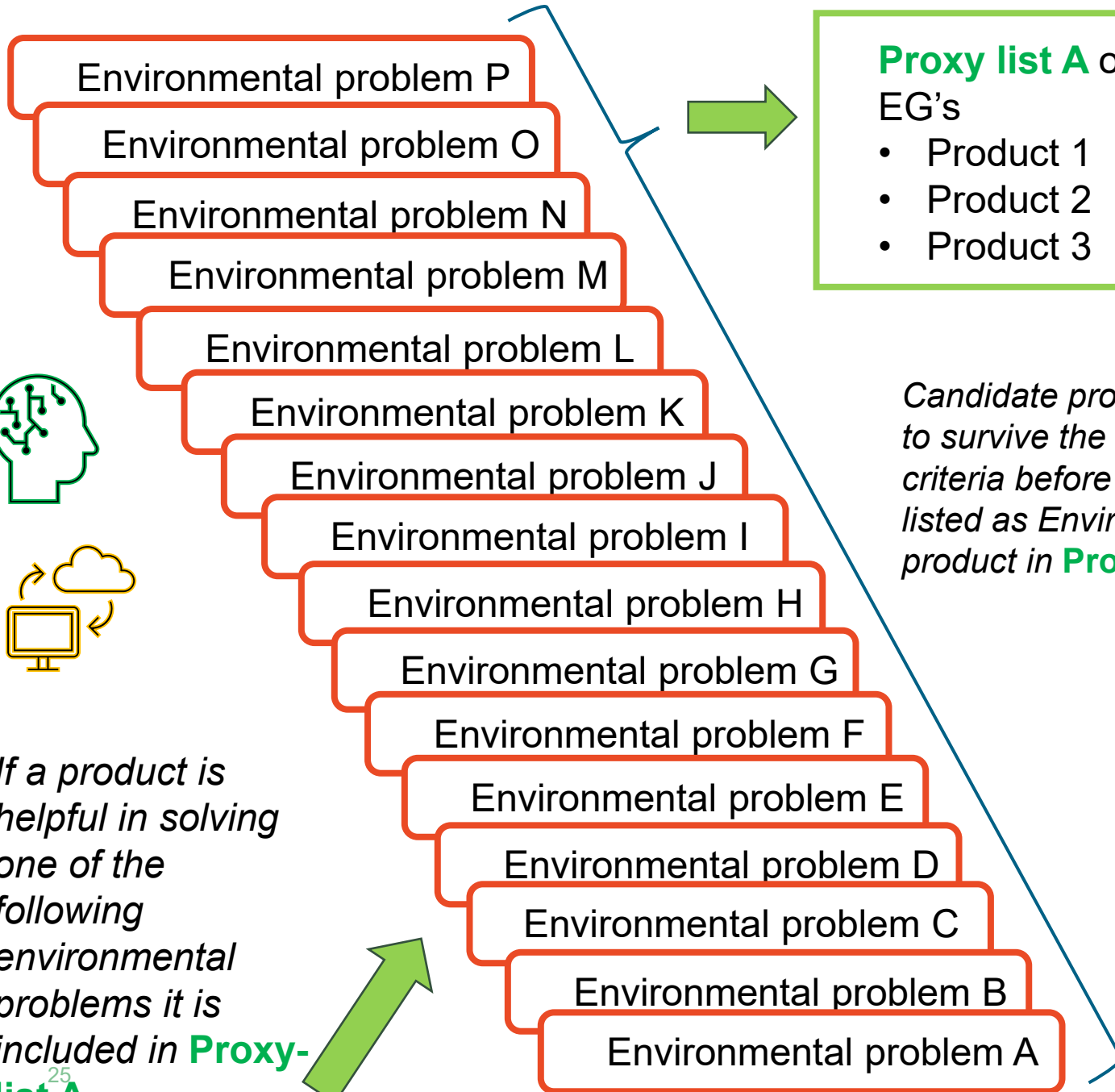
In this study, we categorized products by mitigation type to understand what kind of additional conditions or requirements need to be addressed later in the process of defining EG's.

Mitigation types for goods to QUALIFY as Environmental product:

- Disruption products
- Decarbonization products
- Dematerialization products
- Environmentally preferred
- Products for Environmental measurements, monitoring, and research



If a product is helpful in solving one of the following environmental problems it is included in **Proxy-list A**

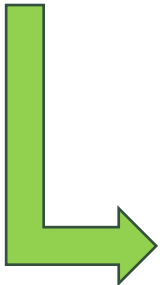


Proxy list A of EG's

- Product 1
- Product 2
- Product 3

*Candidate product needs to survive the exclusion criteria before getting listed as Environmental product in **Proxy list B***

Exclusion criteria by type	Action
Substance banned or restricted in MEA's	Omitted
Causes significant harm to other environmental problems or production of which causes more emissions than defined in the EU BAT ref documents	Omitted DNHS – criteria,
If product is not reusable, repairable, recyclable or regenerateable	Omitted
If natural resources are not used sustainably	Omitted , reliable eco-labels
Products, which can be used to maintain fossil economy	Omitted



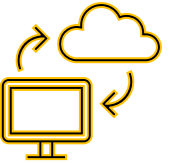
Proxy list B of EG's

- Product 1
- Product 2
- Product 3

Type of mitigation	Proxy list B survival still need to survive criteria for sufficient Extent
Decarbonization	Included if it binds CO2 from atmosphere more than it releases throughout it's life-cycle
Dematerialization	Included
Environmentally Preferred Product (compared to average reference product in reference year)	For products using energy the highest level of MEPS should be used as a minimum, reference value. The Energy performance of a product should be better than highest MEPS threshold to qualify as EG. If For energy consuming products the threshold should be related to the longevity of the product – the longer product is expected to serve, the more stringent thresholds should be applied, including in public and private procurement Each EPP, should enable absolute decoupling. In case of environmental problems, in which planetary boundaries are transgressed, only disruptive products can be considered as EG's.
Disruptive products (Planetary Boundaries)	Included
R & D related to one of the problems	Included



List of Environmental Goods



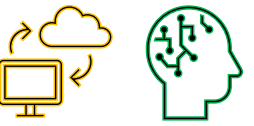
for which:

- **Specific customs code are defined for**
- **Preferential status is given in international trade to facilitate Sustainability transition**
- **Reduced tariffs are applied, Barriers to Trade tackled**
- **Public Procurement is allocated to**



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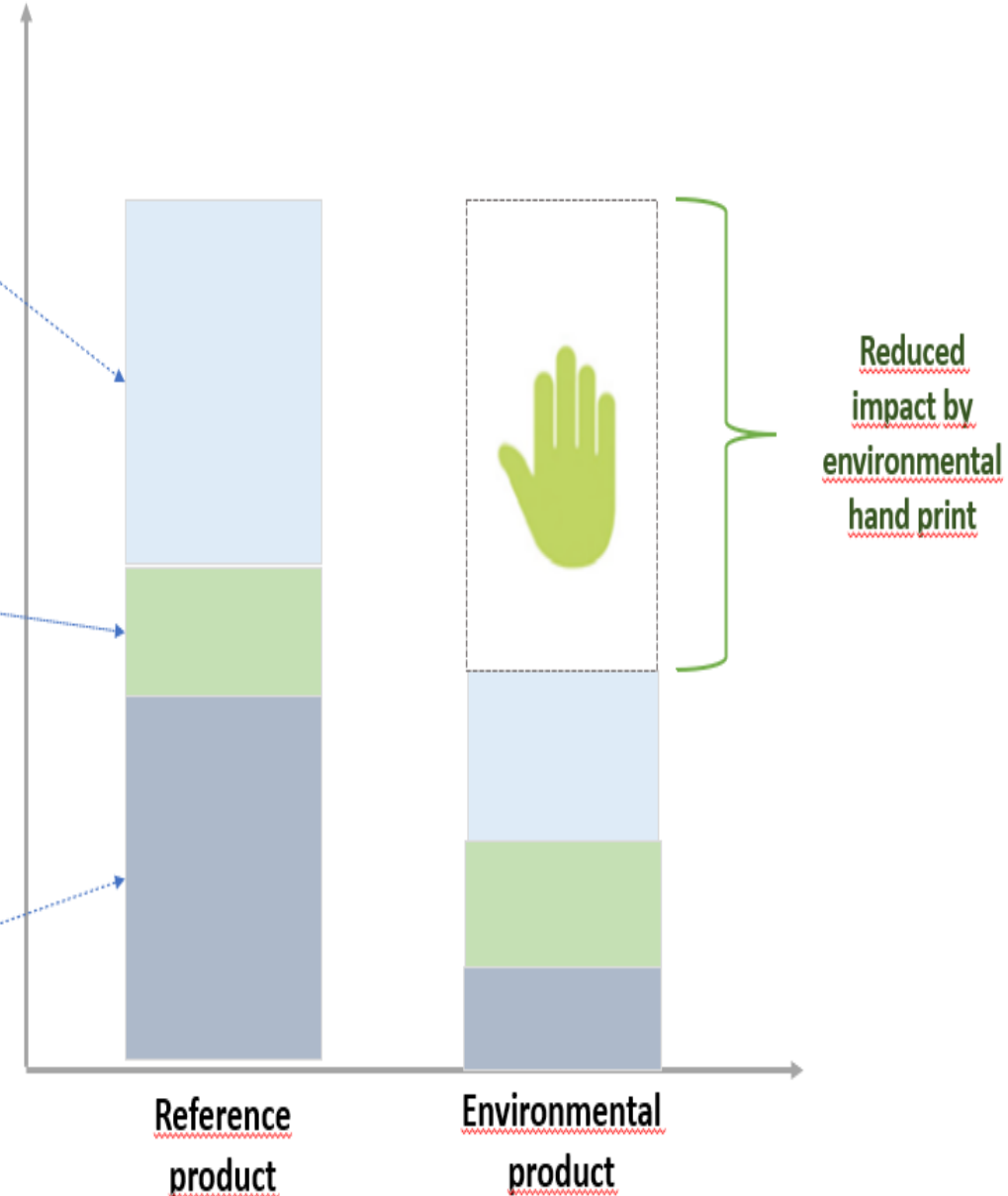
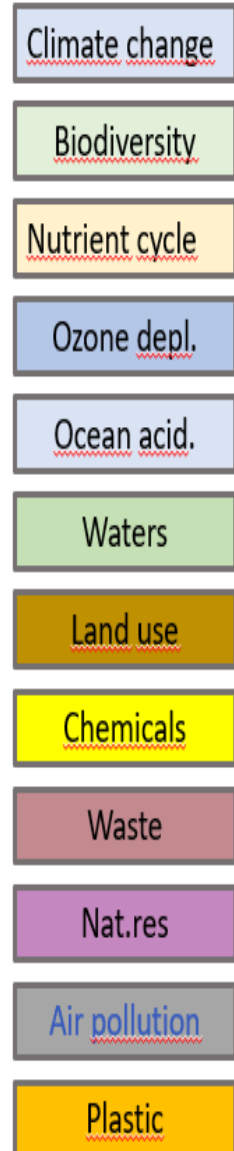
List of Environmental Goods



for which:

- Specific customs code are defined for
- Preferential status is given in international trade to facilitate Sustainability transition
- Reduced tariffs are applied, Barriers to Trade tackled
- ²⁷ Public Procurement is allocated to

Environmental problems



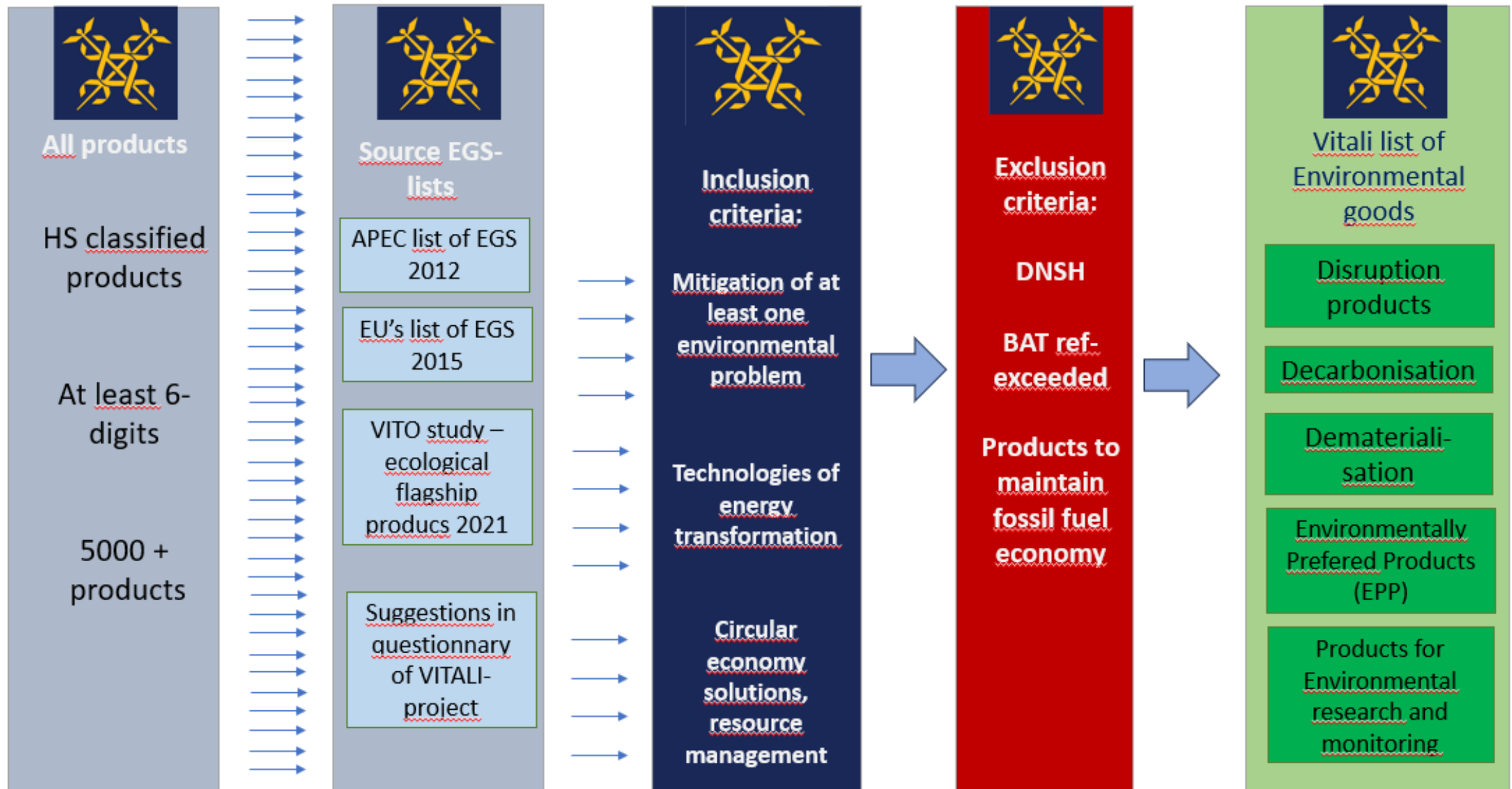
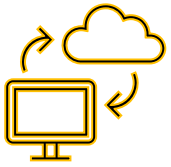


EGFI24'-list of Environmental Goods

- It is obvious that some products are less harmful to the environment than others, but the ways in which mitigation takes place through products and services fall under distinct categories, depending on how they operate in the mitigation of environmental problems.
- We identified 134 Environmental products through screening existing recent EGS-listings and results of our own studies by screening these lists through inclusion and exclusion criteria
- In this study, we categorized products by mitigation type to understand what kind of additional conditions or requirements need to be addressed later in the process of defining EG's.
- Mitigation types for goods to QUALIFY as Environmental product:
 - Disruption products
 - Decarbonization products
 - Dematerialization products
 - Environmentally preferred
 - Products for Environmental measurements, monitoring, and research

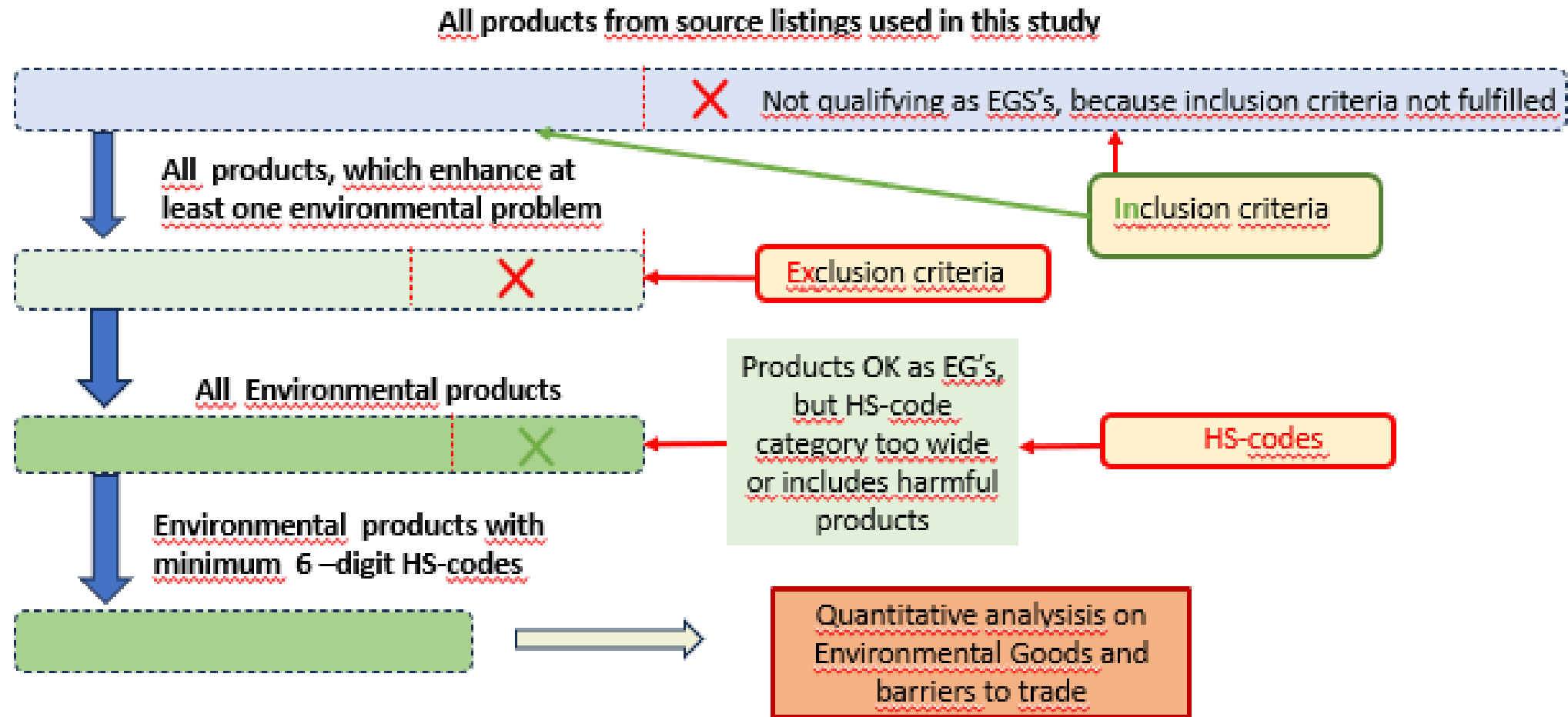
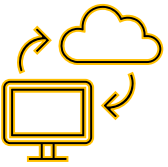


EGFI24'-list (list of environmental goods)





EGFI24'-list (list of environmental goods)





Results from quantitative analysis

- Finland's share of the production of environmental products (6–8%) is moderate compared with some other EU countries (Denmark: 13–18%, Germany: 7–9%, Sweden: 6–10%), suggesting room for growth in this expanding market.
- Although lacking a strong comparative advantage, Finland's recent involvement in the environmental product sector indicates its potential for future development.
- The production of environmental products is concentrated in several key industries, with metal structures and measuring instruments leading the way.
- Although established leaders maintain their positions, dynamism exists among emerging players. Shifting the green production share across industries further suggests potential adjustments in focus within certain industries.
- Firms specializing in environmental products tend to be larger and experience sustained improvements in value added, sales, and employment when expanding their green product portfolios. However, discontinuing these products may offer temporary benefits, which diminish over time.



Results from quantitative analysis, continued

- The average effective tariff in world trade was approximately 1.4% in 2022 and 0.9% in Finnish exports. The averages have been in slow decline. These calculations include the intra-EU trade.
- Average weighted tariffs in 2022 were slightly less than 2% in Finnish exports to the USA, about 4% in exports to China, less than 10% in exports to India, and over 7% in exports to Brazil.
- The weighted average tariff for environmental goods was lower than the average in total goods exports to the United States and higher in exports to China and Brazil. The effective tariffs in India seem to have been rising over time. These results are affected by the annual product composition of the Finnish exports to these countries
- The majority of NTMs fall under technical barriers, specifically taking the form of either sanitary and phytosanitary measures (SPS) or technical barriers to trade (TBT).
- Conversely, the United States demonstrates a pronounced preference for Sanitary and phytosanitary (SPS) measures. These measures are applied across all product categories, with a particular focus on Chemicals and chemical products within our dataset. Although China also employs similar measures, their scale is comparatively smaller. Additionally, both countries implemented limited quantity restrictions in 2016
- Several distinctive features emerge in the use of NTMs when comparing green product policies with other product categories. Notably, the motor vehicles, trailers, and semi-trailers industry products experience significantly fewer NTMs. Similarly, the chemicals and chemical products category exhibit fewer NTMs compared to the overall industry average
- While the green product markets exhibit a higher prevalence of NTMs, this does not necessarily imply a hindrance to international trade. Instead, our findings suggest that the measures implemented in these sectors have either facilitated trade or, at the very least, have not significantly curtailed trade growth.



Results from qualitative analysis

- In total, the companies reported 57 EGS in the survey. In the interviews, this list was complemented with a large number of innovative new products or product groups. Some of them are in the pilot phase, but many are already in production.
- Generally, tariff levels were not considered a limiting factor, especially for technology companies that had no complaints about high tariffs, which fits well with the results of the quantitative analysis on western markets.
- Most companies perceive trade barriers as a result of disparities in legislation, regulations, and standards in destination countries. Perceived barriers vary from industry to industry and between large and small companies.
- Differences in end-of-waste (EOW) definitions were considered as Barrier to Trade, as well as unclarity in customs classifications, and the volume of documents required for exports.
- In the interviews, respondent companies elaborated barriers to trade along the same lines as in the survey, but in a more detailed manner.
- Several companies felt that in the non-tariff barriers in the US market, the differences in required standards between different states formed a challenge for exporters, as it was difficult to obtain information and understand the particulars of different requirements.
- The absence of a universally recognized definition of EGS poses a clear risk of market distortion through politically driven definitions.



Results from qualitative analysis, continued

- The survey's objective was also to grasp the role that companies perceive themselves as having in the ongoing and forthcoming green transition. The responses indicated that companies largely felt integral to the green transition and viewed their role as significant. Some companies anticipate a growing role in the future, while others view themselves as pioneers or supporters of green transition. However, being a pioneer is acknowledged as challenging; it is not always an easy path.
- In the survey, Finnish companies perceived their role, in most cases, to be a significant in green transition. Companies also considered their market situation to be good and believed that the market was growing. In some firm's cases, the size of the market was commented to be "huge" or "almost limitless."

Conclusions and recommendations,



- Green products and services have demonstrated a substantial impact on GDP increase and employment within the EU compared with conventional products
- Based on a literature review, survey, and interviews, it seems obvious that a global response to the Triple Planetary Crisis is emerging with increasing financing, and Finnish companies are eager to be part of the upcoming profound transformation.
- Recent advancements in the Multilateral Environmental Agreements pave the way to national legislations and programs, which in turn obligate companies to comply with new requirements and encourage investments in green transition.
- Companies believe that the market for sustainable solutions is growing, but many companies keep the investment decisions in waiting room due to several reasons, such as high interest rates, wars and political instability

Conclusions and recommendations

(practical actions needed)



- New system of enumerated environmental customs codes needs urgently to be established for Environmental Goods and Services in the EU by DG TAXUD and globally by the WCO
- For that purpose, a system to define EGS objectively, based on environmental sciences is needed, but it is to be noted that such a system requires sufficient resources and further development of methodologies and international co-operation between parties.
- In a dynamic environment with new results in environmental science, technology development, emerging regulations, and assessment methodologies, it is wise to increasingly adopt forward-looking, disruptive, decarbonizing and dematerialization technologies and solutions to ensure the longevity of investments.
- In a long run, when the comparison to define EGS is not anymore question of green technologies versus fossil fuel - based products and/or non-circular solutions, it is essential to have capabilities to define how green is green enough, to resort to such EGS, which can perform sufficient absolute decoupling of economic growth from environmental impacts of products and services, including their life cycle and value chain

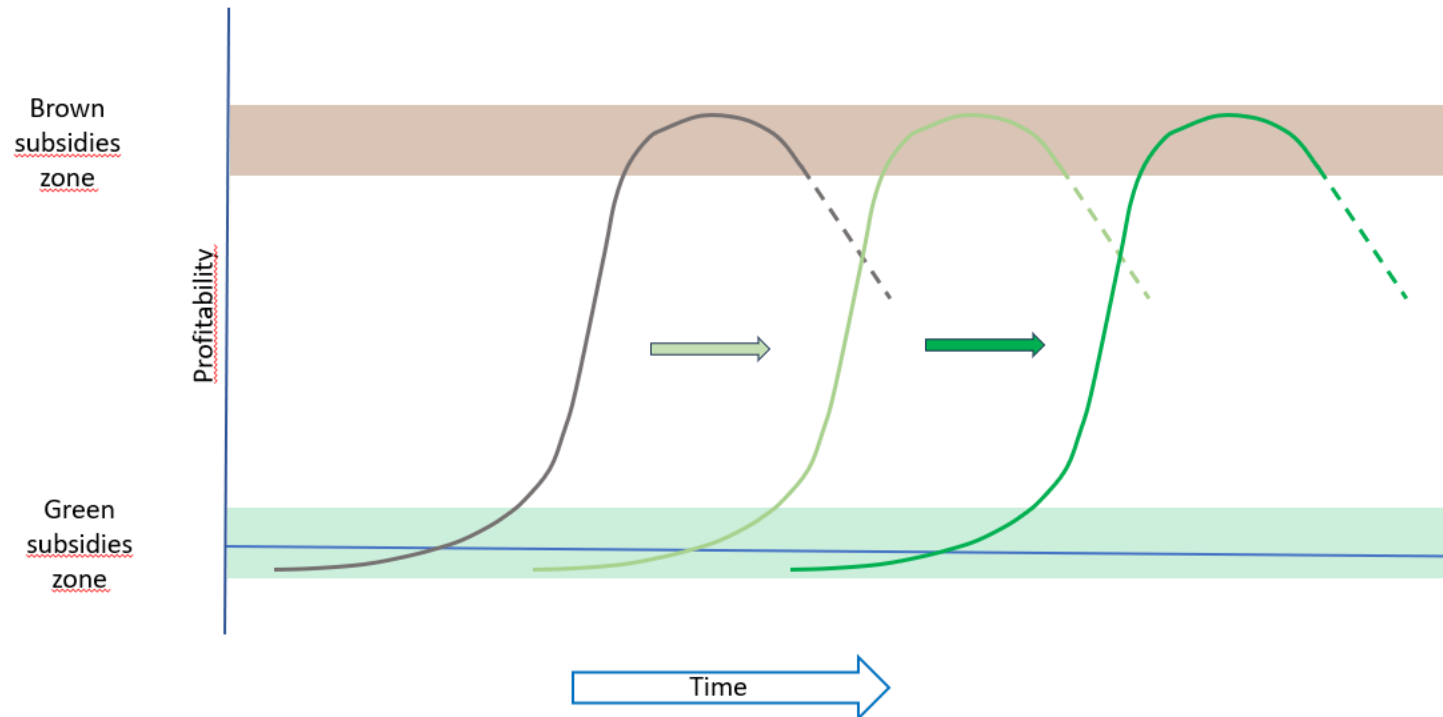
Conclusions and recommendations, continued



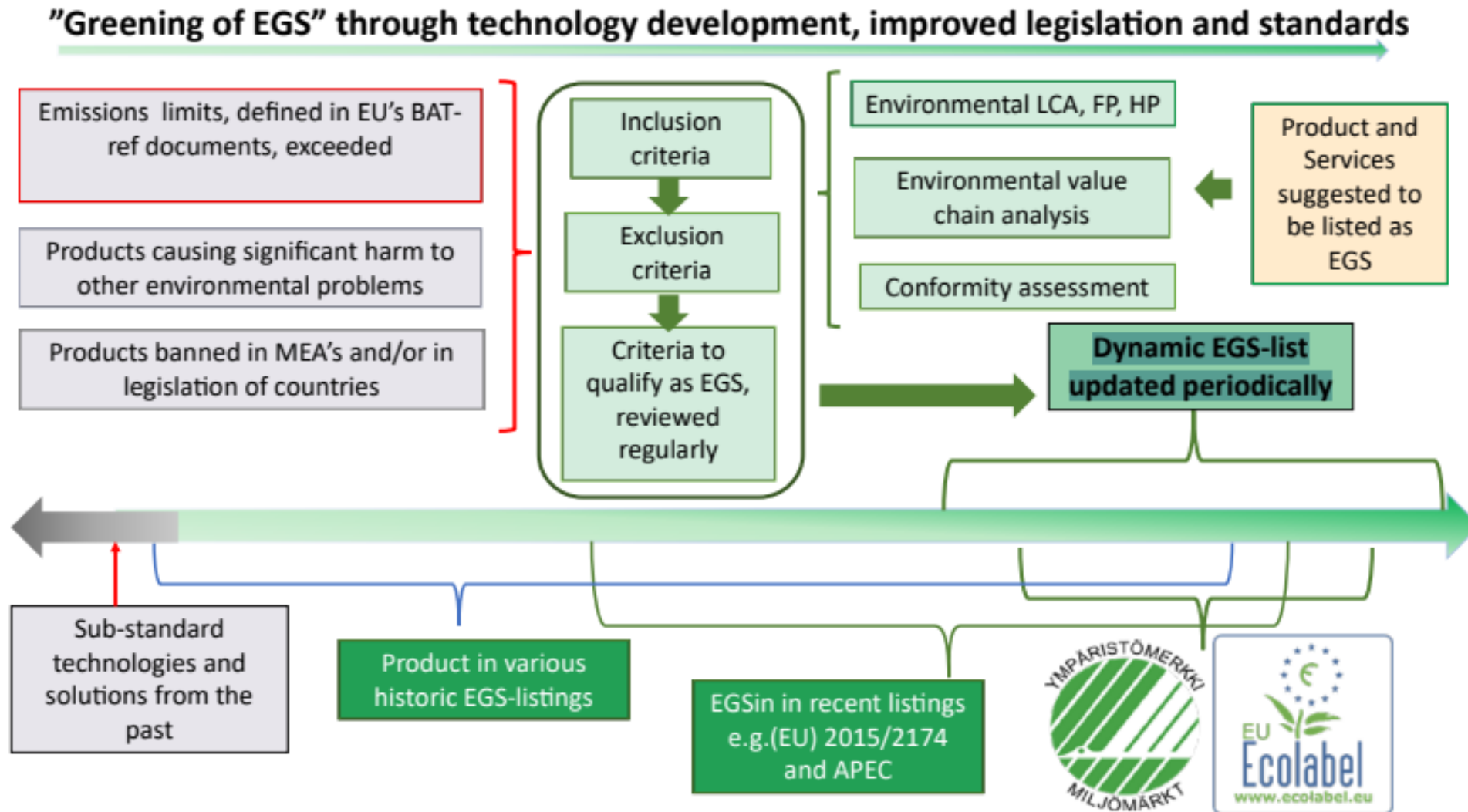
- As new results from environmental sciences emerge, environmental regulations change and technologies develop, a dynamic system to update EGS-listings periodically is needed in EU level and internationally
- Periodically updated EGS-listings should serve practical purposes, e.g:
 - *Preferential status to be given in international trade to facilitate Sustainability transition through reduced tariffs, lowered/tackled barriers to trade*
 - *Allocation of (Green) Public Procurement to EGS, including consumer products with trustworthy eco-labels (facilitated by the new EU legislation)*
 - *Investments in companies, which manufacture or provide services on EGS*

Conclusions and recommendations, continued

- Policy implications and future research should focus on supporting the growth and specialization of environmental products.
- This includes facilitating access to finance, supporting R&D activities, creating platforms for international collaboration, and addressing challenges posed by non-tariff measures (NTMs), when there are market failures, such as detrimental focus to preserving (brown) subsidies, instead of subsidies to facilitate green growth.
- Eventually the great majority of products and services will need to be green to keep the planet within “safe operating space” – not to transgress the planetary boundaries.



Dynamic EGS-list, to be updated periodically



The report can be found from here:

Finnish Environment Institute > Environmental Goods and Services
in Trade (VITALI) (syke.fi)



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Thank you for your attention

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