UN environment

Findings of the sixth Global Environment Outlook

Briefing to UBA, March 22, 2019

Pierre Boileau

Thanks to funders and partners

- Not possible to conduct a project of this size without significant contributions from funders and partners
- We had contributions of expertise and time from many authors.
- Their institutions also allowed them time away from their main activities to assist us.

GEO-6 Funders

Producing an assessment of this scale requires many generous contributions. The following organizations provided funding directly or indirectly to the sixth *Global Environment Outlook*: The Government of Norway, the European Union, the Governments of Italy, Singapore, China, Mexico, Switzerland, Denmark, Egypt and Thailand. Together with UN Environment's Environment Fund and Regular Budget, these contributions allowed for the production of GEO-6 and its accompanying Summary for Policymakers, as well as subsequent outreach activities.

GEO-6 Partners

GEO-6 also benefited from the generous contributions of several partners, including: GRID-Arendal, World Conservation Monitoring Centre (WCMC), The Centre for Environment and Development in the Arab Region and Europe (CEDARE), The Big Earth Data Science Engineering Program (CASEarth), the European Space Agency (ESA), the Netherlands Environmental Assessment Agency (PBL), the Freie Universität Berlin and the Massachusetts Institute of Technology (MIT).

How we got here

Main report

- 146 authors, 78 members of advisory bodies
- 41 review editors
- From more than 70 countries
- 301 UN reviewers
- More thank 1,000 technical reviewers
- 364 Intergovernmental reviewers
- 5 review periods, 2 of which were intergovernmental reviews

Summary for Policymakers

- Negotiated in January, 2019
- 95 countries, 250 participants, 4 days
- 37 page summary plus ‘Key Messages’

Drivers of Environmental Change

- **Population** - 9-10 billion people by 2050
- **Demographics** - older in richer countries, younger in poorer countries
- **Urbanization** - 6-7 billion living in cities by 2050, 2-3 billion of those living in informal settlements
- **Economic development** – needed to eradicate poverty, end hunger, but increases consumption and extraction of resources
- **Technological change** – can improve agricultural productivity for example, but creates more waste and toxins.
- **Climate change** – already a 1 degree Celsius increase. We are committed to increases in sea-level rise, more frequent droughts, more severe weather events.

State of the Environment: Air

- **Air Pollution** – 6-7 million premature deaths now, projected to be 4.5-7 million in 2050
- **Greenhouse Gases** – Policies to reduce GHG emissions can produce health benefits (reduce air pollution). Financial savings from these health benefits could be double the cost of climate policies.
- **Ozone depleting substances** – still some effort needed to repair the ozone hole.
- **Persistent and hazardous pollutants** –efforts still needed, for example, to address mercury emissions which have substantial health effects
- **Short-lived climate pollutants** – easier to control and mitigate and would have more immediate positive effects.

State of the Environment: Biodiversity

- **In crisis** - We might be observing the sixth mass extinction in the earth's history
- **Nature's contribution to people** – 70 per cent of poor people rely on natural resources for their livelihoods
- **Species decline** – a 60 per cent decline in the Living Planet Index between 1970 and 2014.
- **Ecosystem decline** – 10 out of 14 terrestrial habitats showed a decrease in vegetation productivity between 2000 and 2013.
- **Marine biodiversity** – global fish stocks overexploitation increased from 10 per cent in 1975 to 33 per cent in 2015.
- **Genetic diversity** – crop genetic diversity being conserved for enhancing productivity, nutritional content and resilience.

State of the Environment: Oceans and Coasts

- **Corral Reefs** – bleaching events are now occurring at 6-year intervals, while recovery normally takes 10 years.
- **Fisheries and aquaculture** – These support between 58-120 million livelihoods and generated US$362 billion in revenue in 2016.
- **Nutrition** – fish provide over 3 billion people with 20 per cent of their dietary protein.
- **Sustainable fisheries** – unsustainability of wild fisheries is growing (see biodiversity) and aquaculture has important environmental and health impacts.
- **Marine plastics** – 8 million tons of plastic enter the oceans each year through mismanagement of domestic waste in coastal areas.

State of the Environment: Land and Soil

- **Food production** – Is the primary use of land. We will need 50 percent more food to feed the 10 billion people on the planet in 2050
- **Monoculture crops** – Have helped increase productivity but lead to environmental degradation, biodiversity and nutrition loss.
- **Animal protein** – 77 percent of agricultural land is used for meat production.
- **Food waste** – About 1/3 of food is wasted each year.
- **Deforestation** – The deforestation rate has dropped to 6.5 million ha/yr with planted forests increasing to 3.2 million ha/yr.
- **Urbanization** – Urban settlements have grown by about 2.5 times since 1975, accounting for 7.6 per cent of land use in 2015.

State of the Environment: Freshwater

- **Public good and risk multiplier** – affecting human and ecosystem health through pollution and climate change.
- **Disease** – 1.4 billion people die from pathogen-polluted drinking water and 2.3 billion do not have access to safe sanitation.
- **Antibiotic and antimicrobial resistance** – are projected to be a major cause of death in 2050.
- **Freshwater ecosystems** – 40 per cent of global wetlands were lost between 1997 and 2011, with associated 81 per cent decline in freshwater species population.
- **Water use efficiency** – can be dramatically increased by the agriculture, industrial and mining sectors.

Impacts from human activities: Crosscutting

- **Human health** – 9 million premature deaths due to environmental pollution in 2015. Mainly indoor and outdoor air pollution, but also water pollution and sanitation.
- **Environmental disasters** – Affected more than 3 billion people between 2005 and 2015
- **Energy** –1.2 billion people don't have access to electricity and 2.7 billion still use traditional fuels for cooking and heating.
- **Chemicals** – More than 100,000 chemicals in use with chemical pollution now a global threat.
- **Waste and wastewater** – urban waste generation is about 7-10 billion tons/yr, but the waste market is now generating US$410 billion of revenue per year.

Figure 11.1: Conceptual outline of policy effectiveness analysis

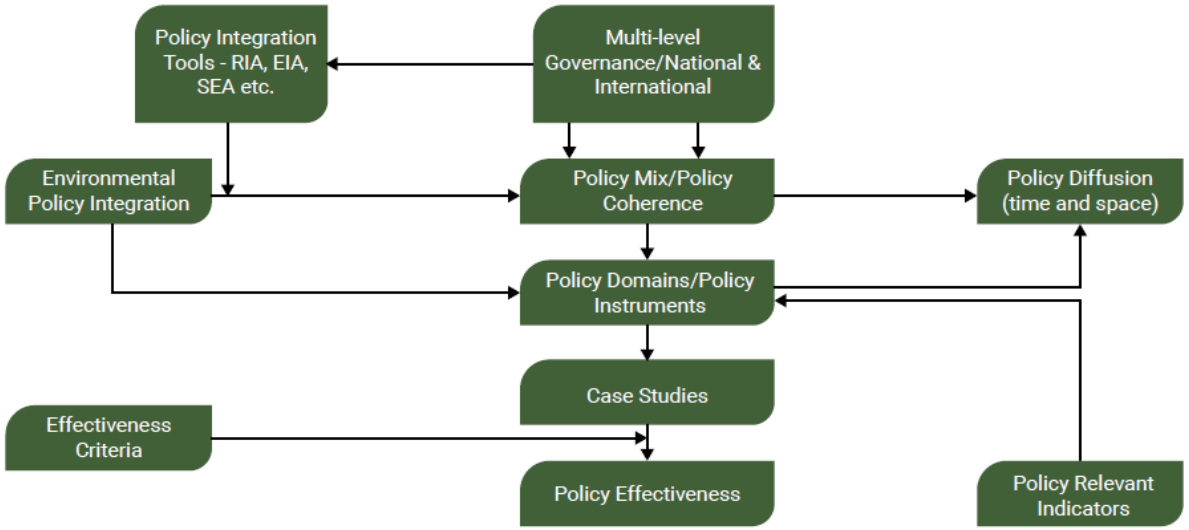
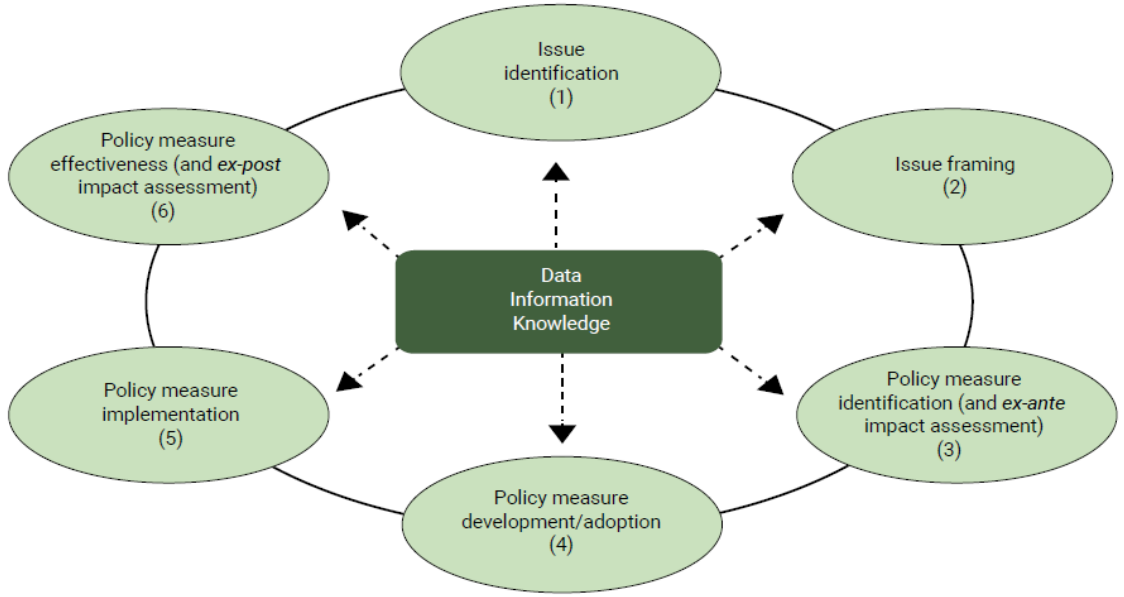


Figure 11.2: The policy cycle



Source: European Environment Agency [EEA] (2006)

Effectiveness of environmental policies

- **Policy design** – at least as important as policy choice when measuring effectiveness.
- **Effectiveness** – Not enough information is available to assess effectiveness, so policies may not reach their full potential.
- **Diffusion** –successful policies are used as role models for adoption in other countries.
- **Integration** – adding environmental concerns to other sectors of policymaking increases effectiveness.
- **Efforts are insufficient** – existing policies insufficient to address the backlog of environmental problems.
- **Systemic approaches** – transformative change by reconfiguring basic social and production systems and structures is needed.

Outlook for the future

- **Environmental dimension of SDGs and IAEGs** – not expected to be achieved under current policy scenarios.
- **All environmental areas are affected** – from climate change to biodiversity loss to water scarcity, land degradation and ocean acidification.
- **Urgent action needed now** – failure to act now will lead to ongoing and potentially irreversible impacts on the environment and human health.

Figure SPM.8. Projected global trends in target achievement for selected Sustainable Development Goals and internationally agreed environmental goals

Human development indicators			Environmental indicators		
Related Sustainable Development Goals	Target	Projection	Related Sustainable Development Goals	Target	Projection
2	2.1 End hunger		6	6.3 Improve water quality 6.4 Reduce water scarcity	
3	3.2 End preventable deaths of children under 5		11	11.6 Improve air quality in cities	
6	6.1 Achieve universal access to safe drinking water 6.2 Universal access to adequate sanitation		13	13 Limit global warming	
7	7.1 Achieve universal access to modern energy services		14	14.1 Reduce marine nutrient pollution 14.3 Minimize ocean acidification 14.4 Sustainably manage ocean resources	
			15	15.2 Achieve land degradation neutrality 15.5 Halt biodiversity loss	

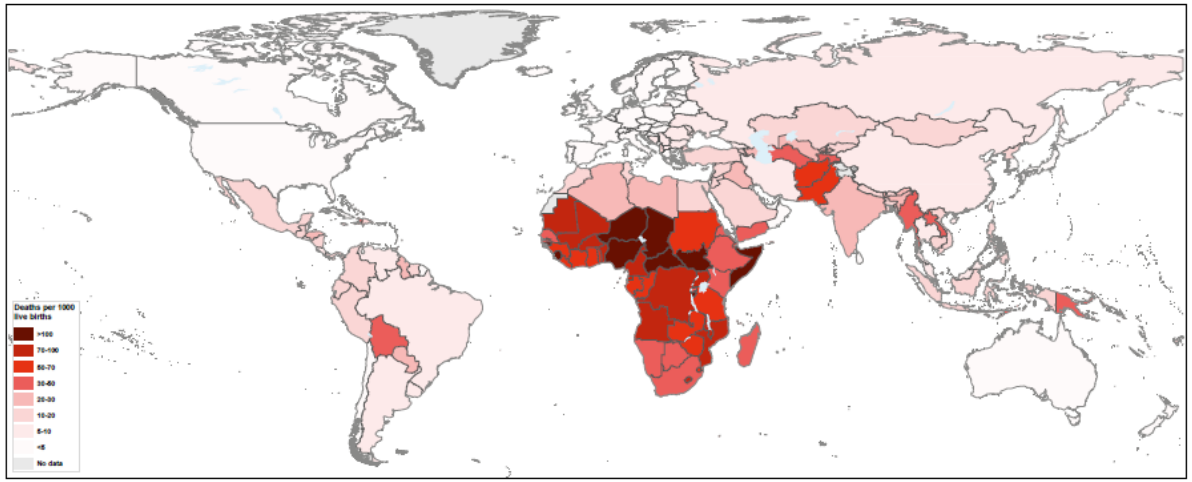
Legend

On track to achieve target (under bbusiness-as-usual scenarios target is projected to be achieved)

Progress towards target, but at an insufficient rate (unless effort is increased, target is projected not to be achieved)

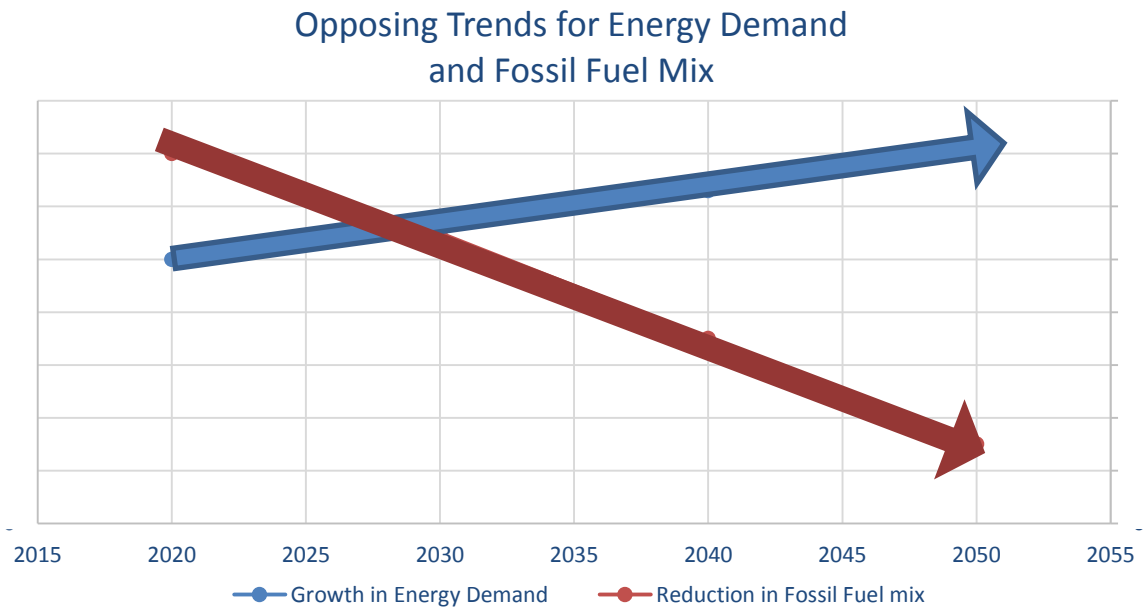
Moving away from target (the trend is projected to be worse, rather than better)

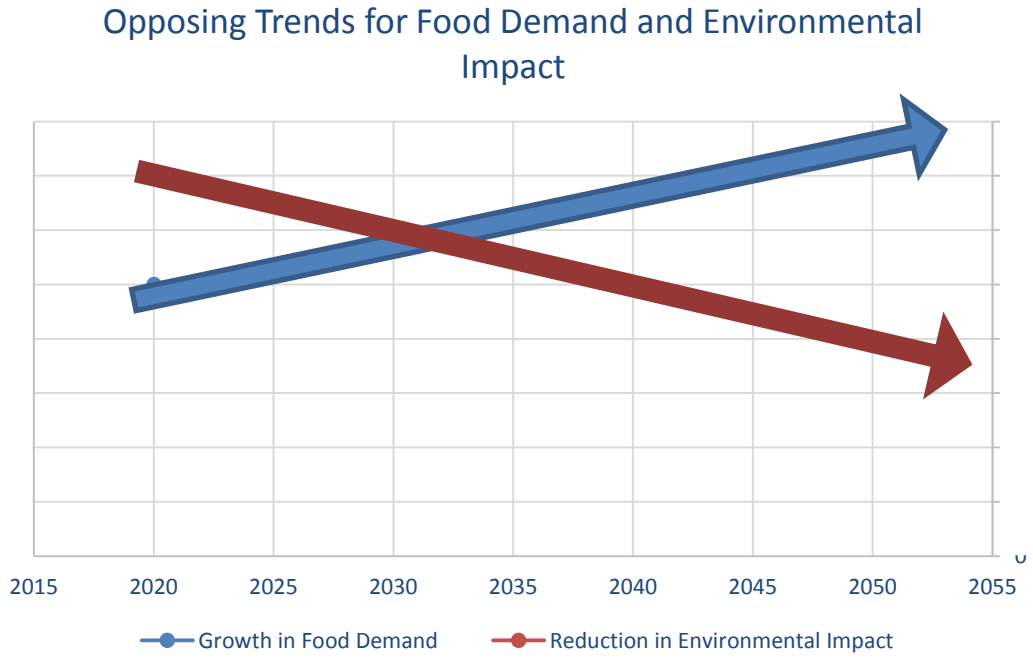
Figure 21.11: Projected under-five mortality rate in 2030



Source: Moyer and Hedden (2018).

GEO GLOBAL ENVIRONMENT OUTLOOK | HEALTHY PLANET HEALTHY PEOPLE





Changing the path we are on

- **Pathways exist** – need to achieve sustainable consumption and production for energy, food and water.
- **Incremental policies will not be sufficient** – a mix of social and technological innovations facilitated by policy cooperation from local to international scales.
- **More synergies than tradeoffs exist** – achieving climate targets will help achieve air pollution and human health goals.
- **Some tradeoffs still exist** – mostly on land-based climate change mitigation (e.g. bioenergy and agricultural intensification).
- **Policy integration and coherence are needed** – systems approach can help achieve these.

Participatory approaches

- **Ideas and small scale projects already exist** – Through workshops and crowd-sourcing, innovation can be found.
- **Participation in development of policy approaches improves their effectiveness** – Engagement is strengthened and local issues are addressed.
- **Bottom-up initiatives can help refine our understanding of the future** – Current models consider broad megatrends. These can be refined with bottom-up information.
- **Both social and technical innovations are needed** – participatory approaches can understand how to implement these systemic approaches.

Figure 23.9: Heat map of Climate CoLab proposals showing pairings of measures/interventions and SDGs

Cluster	Measure category	No poverty (1)	Zero hunger (2)	Good health and well-being (3)	Quality education (4)	Gender equality (5)	Clean water and sanitation (6)	Affordable and clean energy (7)	Decent work and economic growth (8)	Industry, innovation and infrastructure (9)	Reduced inequalities (10)	Sustainable cities and communities (11)	Responsible consumption and production (12)	Climate action (13)	Life below water (14)	Life on land (15)	Peace, justice and strong institutions (16)	Partnership for the goals (17)
Energy, Climate and Air	Energy access	2	2	2	1	1	2	4	2	2	1	0	1	4	1	1	0	2
	Behavioural change (transport and households)	3	3	3	1	2	2	4	3	3	2	3	3	5	3	3	2	4
	End-use electrification	1	1	1	0	0	2	2	1	1	0	1	0	1	1	1	0	0
	Low/zero emission technologies (non-biomass)	3	4	4	1	2	3	5	4	2	2	2	0	5	1	2	1	3
	Bioenergy (with and without CCS)	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0
	Improve energy efficiency	2	2	2	1	1	2	1	2	1	1	2	0	3	1	1	0	1
	Negative emission technologies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Air pollution control	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Non-CO_2 emission reduction	0	1	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0
Agriculture, Food, Land and Biodiversity	Reduce food waste	2	2	2	1	2	1	1	1	1	1	2	1	2	1	1	1	2
	Yield improvement	3	3	2	0	2	1	0	1	1	1	1	1	3	0	1	0	2
	Nutrition management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Food access	7	10	10	4	6	4	6	8	3	5	4	6	10	3	6	2	8
	Diet change	0	1	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0
	Manage soil carbon loss	3	3	2	1	2	3	1	1	1	1	2	1	3	1	1	1	2
	Minimize land damage	5	8	8	3	6	7	6	7	5	5	4	6	10	4	7	3	6
	Land ownership	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Protection of terrestrial ecosystems	3	5	5	2	3	5	4	4	3	2	3	5	6	3	5	1	3
	Land-use planning	1	2	2	1	0	1	0	0	1	0	0	1	2	0	1	0	1
	Forest management	2	3	2	1	1	4	3	2	1	0	1	3	4	2	3	0	1
Human Well-being	Poverty alleviation	8	9	9	3	3	5	5	7	4	4	3	5	10	3	5	1	5
	Child/ maternal healthcare	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Education	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Freshwater and Oceans	Improve water-use efficiency	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
	Blue carbon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WASH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Wastewater treatment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Water quality standards	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Desalination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Integrated water resource management	1	3	3	2	3	2	2	3	0	2	2	0	3	0	1	1	3
	Sustainable fisheries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ocean regulation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Protection of marine ecosystems	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Other	Monitoring and reporting	1	1	2	1	0	2	1	1	2	1	1	1	2	0	1	2	2
	Circular economy	3	3	5	1	3	1	1	1	2	2	4	4	4	1	2	1	2
	Sharing economy	2	2	2	1	1	1	1	1	1	1	1	1	2	1	1	1	2
	Plastics and consumer waste reduction	2	1	3	0	2	1	0	0	1	1	4	4	4	1	3	0	2
	Awareness and skills building	7	8	8	5	7	7	7	8	5	7	9	7	13	5	7	5	6
	Gender equality	5	6	7	2	7	3	3										
	Smart cities for sustainability	0	0	0	0	0	0	0										
	Ecosystem restoration	1	1	1	0	0	1	1										
	Effective governance	0	0	0	0	0	0	0										

Numbers indicate the count of proposals coded with the specific pairing of intervention (row) and SDG (column). 'Other' is described more in Section 23.11

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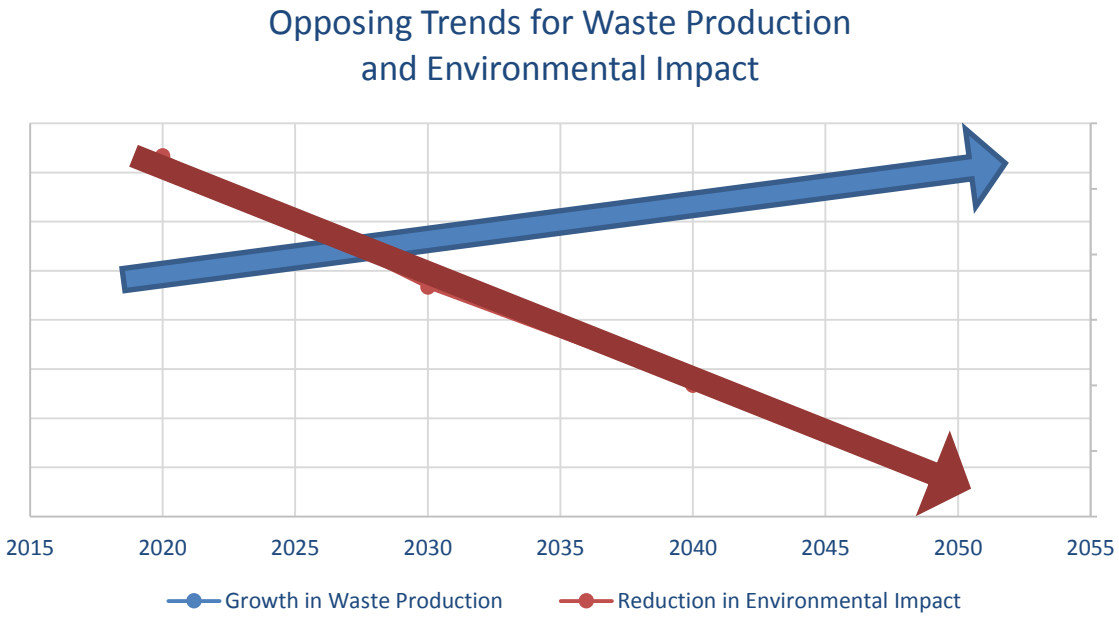

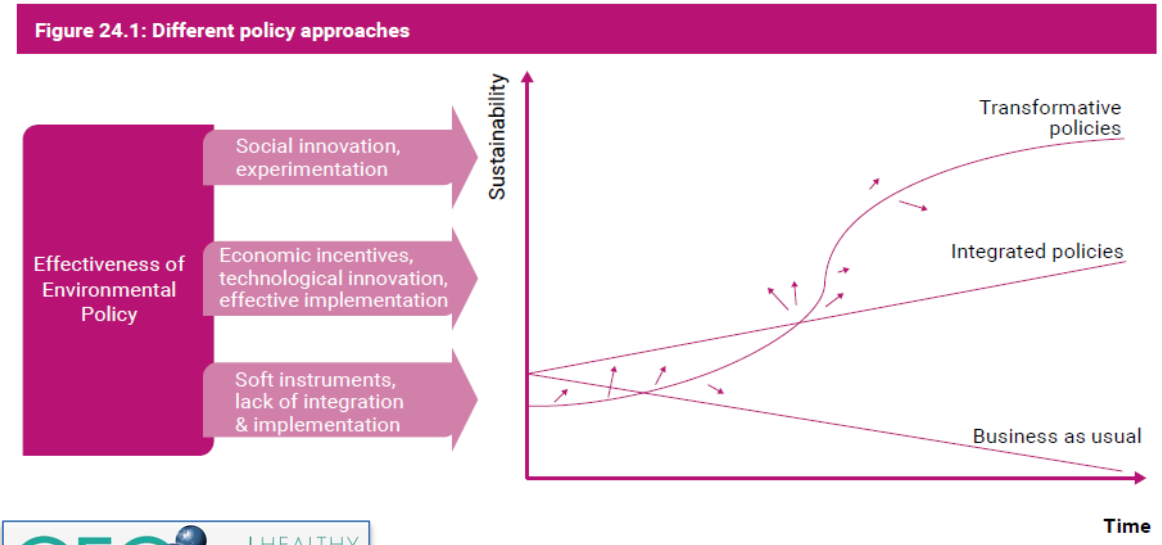

The way forward

- **Healthy planet is a foundation for supporting all life forms** – but, we have transformed earth's natural systems and disrupted self-regulatory mechanisms and life-support systems.
- **Human health is now affected at a significant scale** – through exposure to harmful pollutants and reduced access to ecosystem services.
- **Policy innovation** – can help guide the transformative change that is needed.
- **Systemic innovation** – the key to socioeconomic development towards a sustainable world.
- **Transformative change** – is a disruptive process that goes beyond incremental improvement, but can be achieved.

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Norwegian Ministry of Climate and Environment

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Ministry of the Environment and Water Resources

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Thank you – Danke

Contact: Pierre.Boileau@un.org

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