



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



UNIDO's experience on green industrial transformation

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Industrial environmental performance is topical, both politically as well as in the public conscience

- An additional boost to the topic has been added through the pandemic under the slogan of “building back better” (BBB)
- Concepts:
 - greening/green industries,
 - resource efficient and cleaner production,
 - Green economic transformation
 - climate change/ climate resilience
 - circular economy



Mainstreaming sustainability principles into industrial policies

- **decouples economic growth from environmental damage**
=>Take less from the environment & eliminate pollutants which we put back into it
- **boosts labour and capital productivity**, thereby leading to an overall increase in total factor productivity, and benefiting the whole economy by creating new jobs and opening new business opportunities.

I4.0 & Sustainability nexus

Sustainability benefits of I4.0:

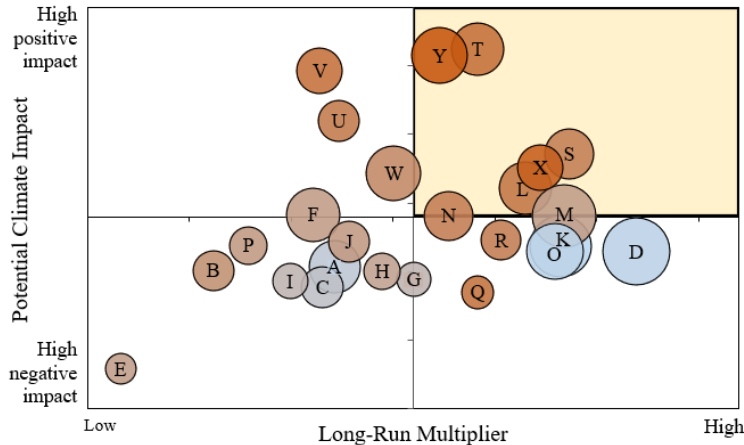
- Improving productivity, flexibility & resource efficiency
- Reduction of waste, energy consumption and overproduction
- Servitisation and stakeholders' engagement/collaboration
- Job opportunities related to IT competences
- Improvement in quality of working environment – increasing the pool of works in an inclusive way

Examples of green industrial policy instruments:

- incentives to **mainstream the introduction of tracing technologies** with details of material and processes from the initial extraction of raw materials to finished goods;
- incentives for the **introduction of resource-efficient and carbon neutral or carbon positive technologies**;
- **extended producer responsibility schemes** covering the entire supply chain and favouring business models centred around life extension, remanufacturing and the recovery of products, components and materials;
- incentives to **develop knowledge and innovation activities** and the creation of local R&D capabilities, building on skills, knowledge and inter-industry collaboration;
- support to the **development of technology hubs**, innovation clusters and fab labs that build on local and regional capabilities and provide access to training and digital technologies; and
- promotion of **eco-industrial parks** and sustainable business areas to promote physical and knowledge experience across activities and the sharing of pollution preventing and remediation infrastructure.



Investment in green infrastructure created more jobs than those in brown infrastructure in the US and the EU



- Assessment of 25 fiscal policy types:
- Policies with higher long-run economic multipliers have greater economic impact per \$ spent
- Policies with positive climate impact are likely to support efforts to achieve net-zero emissions
- Bubbles in bold are loosely defined as green policies

A	Temporary waiver of interest payments	N	Worker retraining
B	Assisted bankruptcy (super Chapter 11)	O	Targeted direct cash transfers or temporary wage increases
C	Liquidity support for large corporations	P	Rural support policies
D	Liquidity support for households, start-ups and SME's	Q	Traditional transport infrastructure investment
E	Airline bailouts	R	Project-based local infrastructure grants
F	Not for profits, education, research, health inst. bailouts	S	Connectivity infrastructure investment
G	Reduction in VAT and other goods and services taxes	T	Clean energy infrastructure investment
H	Income tax cuts	U	Buildings upgrades (energy efficiency)
I	Business tax deferrals	V	Green spaces and natural infrastructure investment
J	Business tax relief for strategic and structural adj.	W	Disaster preparedness, capacity building
K	Direct provision of basic needs	X	General R&D spending
L	Education investment	Y	Clean R&D spending
M	Healthcare investment		



Recommendation of policy items that are well-placed to contribute to achieving economic and climate goals

- **Clean physical infrastructure investment** in the form of renewable energy assets, storage (including hydrogen), grid modernisation and carbon capture and storage (CCS) technology;
- **Building efficiency spending for renovations and retrofits** including improved insulation, heating and domestic energy storage systems;
- **Investment in education and training** to address immediate unemployment from Covid-19 and structural shifts from decarbonisation;
- **Natural capital investment** for ecosystem resilience and regeneration including restoration of carbon-rich habitats and climate-friendly agriculture
- **Clean R&D spending:** Fostering innovation that builds on enduring behaviour changes. Continued technological and process innovation will be critical to achieving climate and other sustainability goals.
- **Improving resilience of supply chains, including through increased adherence to circular economy principles:** ensuring through stimulus packages, that local supply chains do genuinely improve resilience and reduce environmental impacts, including by improving resource efficiency and increasing circularity of supply chains.



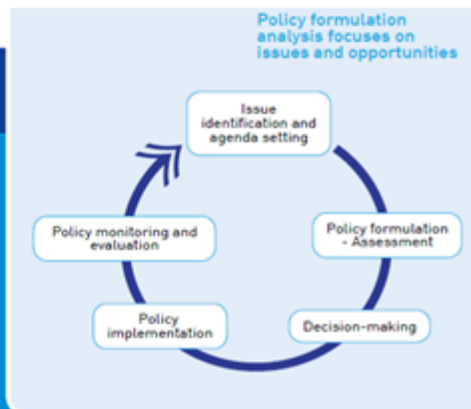
How to mainstream sustainability principles into industrial policies?

KEY STEPS: INDICATORS FOR ISSUE IDENTIFICATION

1. Identify potentially worrying trends;
2. Assess the issue and its relation to the natural environment;
3. Analyse more fully the underlying causes of the issue of concern; and
4. Analyse more fully how the issue impacts society, the economy and the environment.

Illustrative issues and related indicators:

cross-cutting thematic priorities	Possible issues of concern	Indicators
Climate change	<ul style="list-style-type: none"> • Country contribution to anthropogenic climate change • Increased frequency/intensity of storm surges 	<ul style="list-style-type: none"> • Greenhouse gas emissions (Kt of CO₂ equivalent/year) • Rainfall (mm/year) and evaporation • Storm-related damages (US\$/year)
Ecosystem management	<ul style="list-style-type: none"> • Deforestation • Loss of critical ecosystem services 	<ul style="list-style-type: none"> • Forest cover (ha) • Extent of land and marine conservation areas (ha)
Resource efficiency	<ul style="list-style-type: none"> • Falling groundwater tables • Low efficiency of non-renewable energy sources 	<ul style="list-style-type: none"> • Water intensity or productivity (m³/US\$) • Coal consumption intensity (tonnes/GDP)
Chemicals and waste management	<ul style="list-style-type: none"> • Air pollution • Soil contamination 	<ul style="list-style-type: none"> • Sulphur oxide (SO_x) emissions (Kg/yWr) • Waste recycling and reuse (%) • Toxic heavy metal concentration, e.g., Hg, Cd, Pb, Cr. (mg/kg)





Overview of the OECD Sustainable Manufacturing Indicators



Inputs



Operations



Products

Alternative method 2 – choose the sector & dig deeper

	O1 Water intensity	P1 Recycled/reused content
	O2 Energy intensity	P2 Recyclability
	O3 Renewable proportion of energy	P3 Renewable materials content
	O4 Greenhouse gas intensity	P4 Non-renewable materials intensity
I1 Non-renewable materials intensity	O5 Residuals intensity	P5 Restricted substances content
I2 Restricted substances intensity	O6 Air releases intensity	P6 Energy consumption intensity
I3 Recycled/reused content	O7 Water releases intensity	P7 Greenhouse gas emissions intensity
	O8 Proportion of natural land	

