

Greener Industries for Growing Economies: Insights from the Experts

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30 OCTOBER 2018



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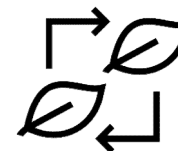
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2018

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Annual Conference

OECD, Paris
27-29 November



2ND GLOBAL FORUM ON GREEN ECONOMY LEARNING

26-27 November 2018

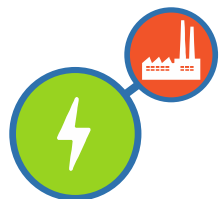
OECD Conference Center, Paris, France



GREEN ECONOMY: NEW CHALLENGES, NEW SKILLS

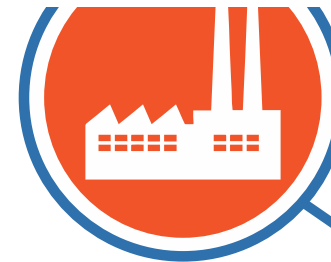
Forum for institutions that train professionals involved in policy design and implementation





Green Investment Delivers Growth

Key findings of GGGI's green investment modelling



THE ECONOMIC, SOCIAL AND ENVIRONMENTAL IMPACTS OF GREENING THE INDUSTRIAL SECTOR IN CAMBODIA

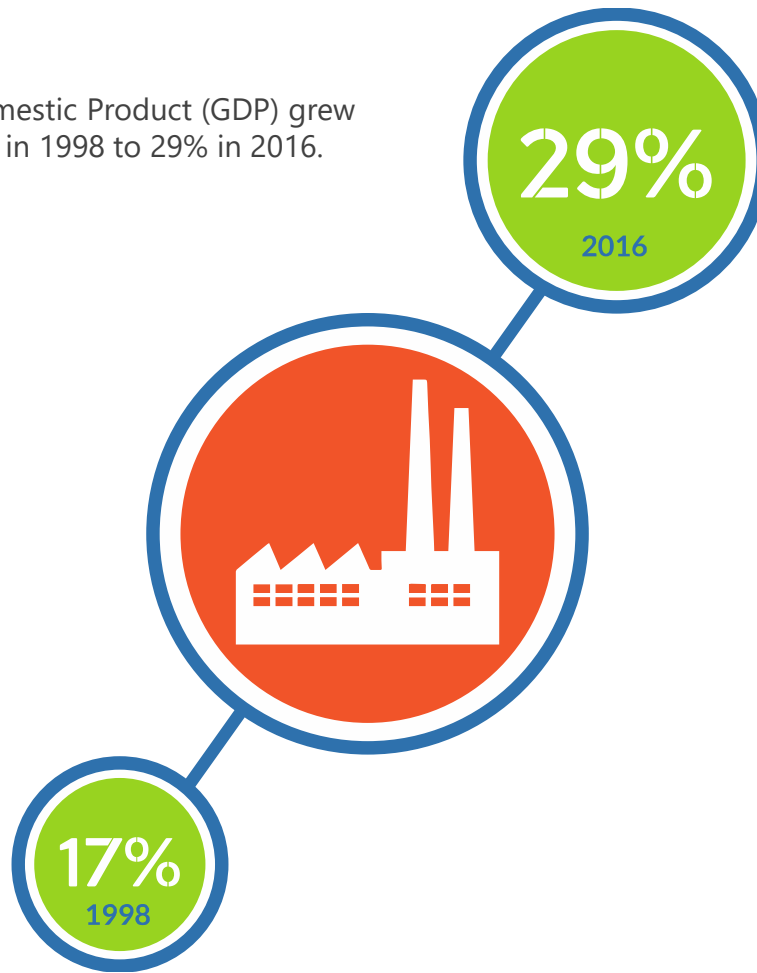
Key findings of GGGI's
green industry scenario

Presented by Dr. Andrea M. Bassi
October 30, 2018



Global
Green Growth
Institute

Gross Domestic Product (GDP) grew from 17% in 1998 to 29% in 2016.



The industrial sector in Cambodia is a driver of economic growth, job creation, and poverty reduction.

For Cambodia to continue to diversify and expand its economy, new ways must be found to increase productivity and access more premium markets.

In the Industrial Development Policy 2015-2025, the Royal Government of Cambodia envisages a modernization of Cambodia's industrial structure from a labor-intensive industry to a skill-based industry, integrating local businesses into global and regional supply chains.

GGGI's economic modelling asserts greening the industrial sector is a way of doing this:

Investment in resource efficient technology can foster economic growth, while yielding social and environmental benefits.

Using integrated System Dynamics (SD) modeling, GGGI analyzed the potential impact of resource efficient technology in four industrial subsectors: food processing, bricks manufacturing, garment manufacturing, and electronics manufacturing under a so-called 'Green Industry' scenario.

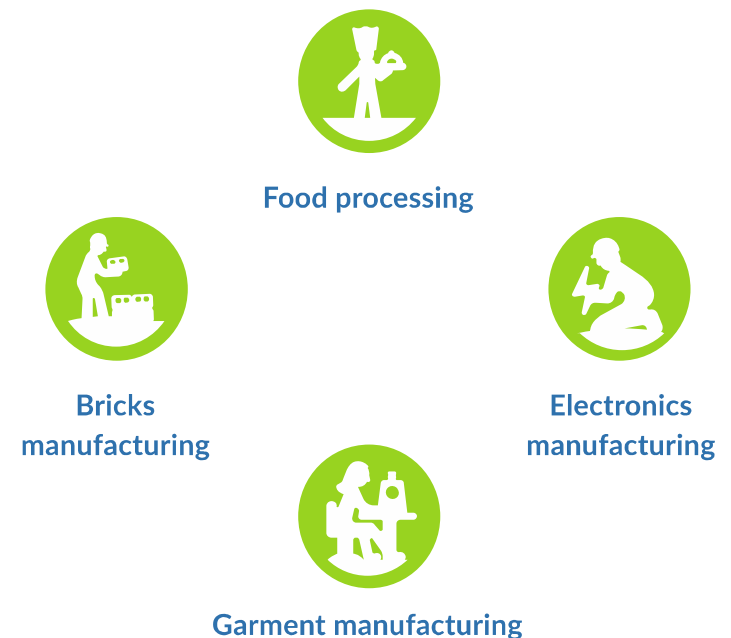


What is the Green Industry scenario?

The Green Industry scenario was created to quantify the potential outcomes of green investments in four subsectors.

Interventions focus on:

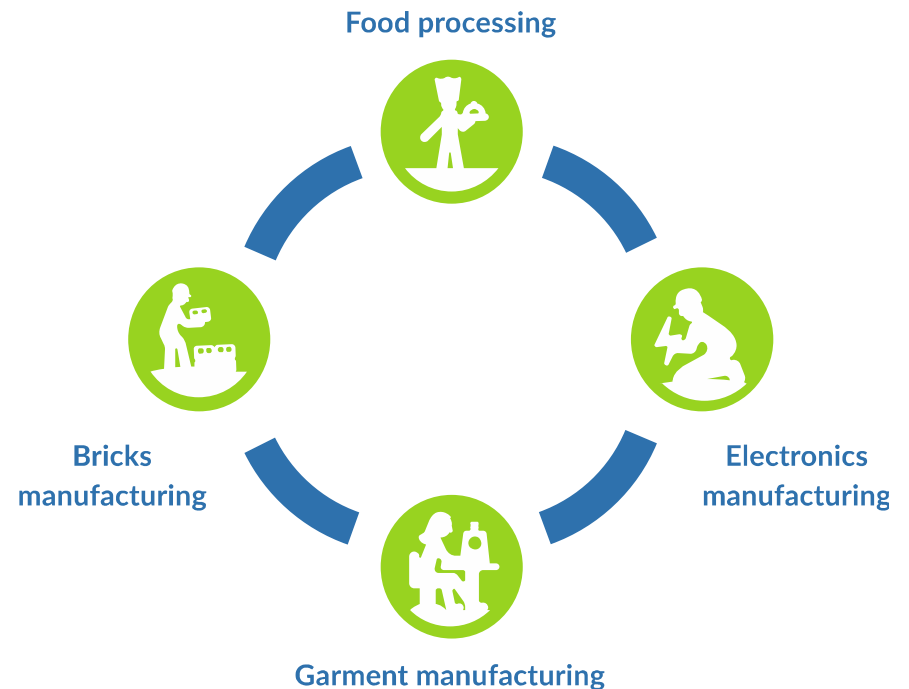
- Exports
- Labor intensity
- Energy efficiency and fuel switching
- Water efficiency
- Material efficiency
- Wastewater treatment
- Renewable energy

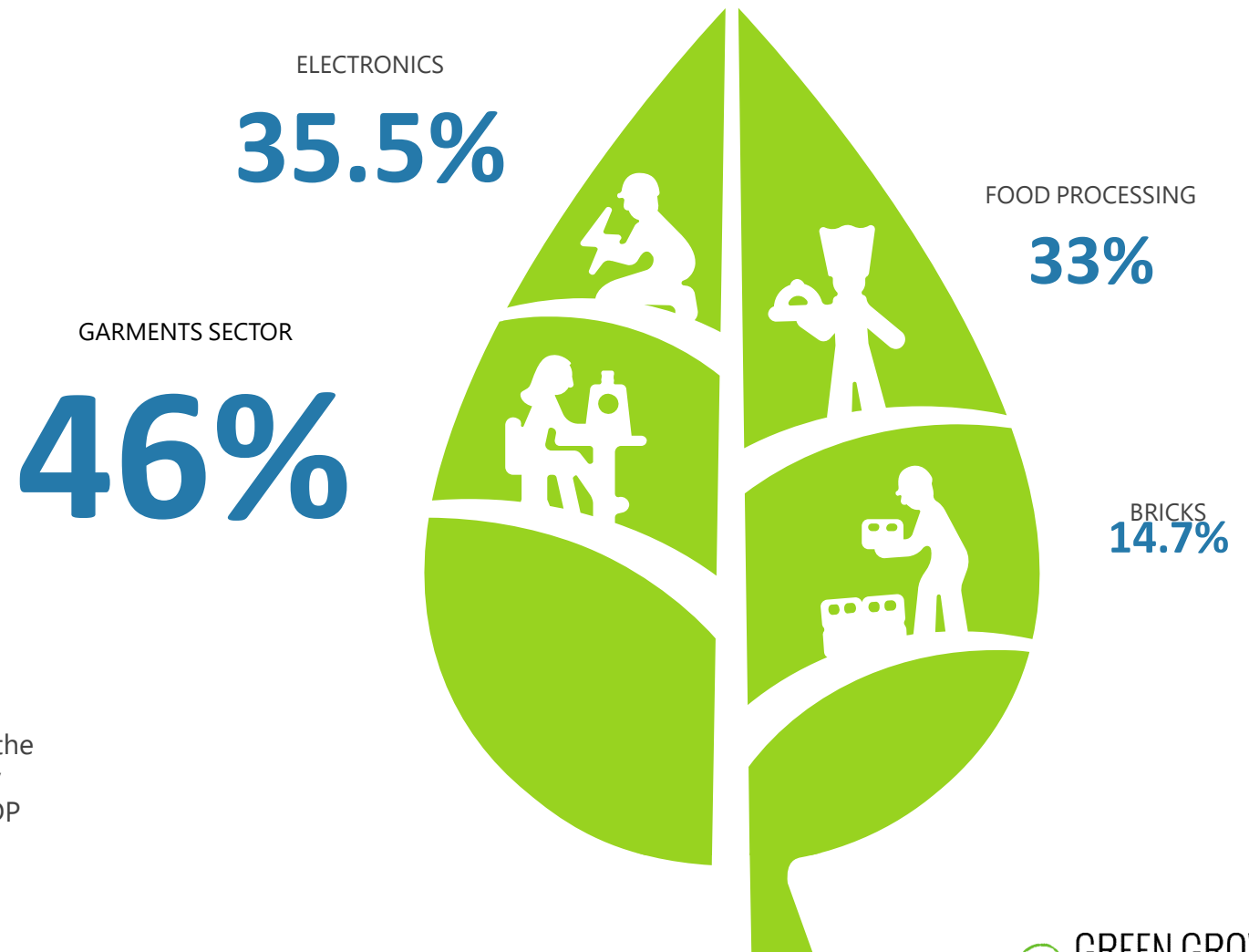


These subsectors were selected based on their economic significance, their reliance on natural resources and climate vulnerability, and their potential competitiveness.

Several scenarios were simulated to assess the possible contribution to economic growth, job creation, and GHG emissions reduction of a green transition in these four industrial sectors.

They were identified and defined with the support of local stakeholders, involving the private sector, government representatives, academia, and civil society. With lower resource consumption, leading to reduced costs and higher sectoral GDP, productivity increases for all subsectors in the GI scenario.





This scenario demonstrates that the introduction of green technology can lead to an increase in real GDP of USD 2.7 billion by 2030:

+512.000 jobs

-3.37M tons GHG

Greening these industrial sub-sectors can create 512,000 additional jobs and reduce Greenhouse gas (GHG) emissions by 3.37 million tons, with 17% reduction in the garment sector and a 30% reduction in electronics.

Greening Boost productivity

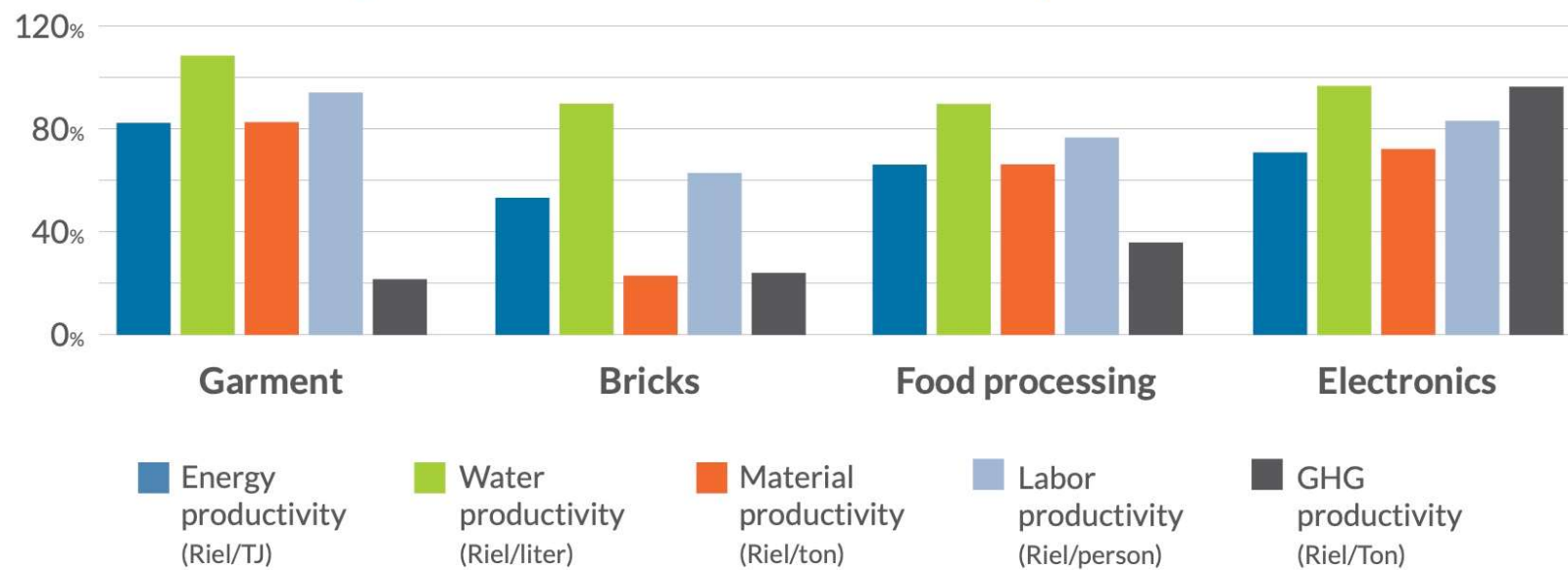
The analysis shows that resource efficient technologies are an attractive investment for business owners, with a short payback time, significant avoided cost and a high return on investment.

Productivity values depend on the resource intensity and cost structure of the sub-sector



1. Productivity in the model is estimated by dividing GDP by production inputs (materials, labor, energy, and water) and productivity is also calculated in relation to GHG emissions.

Productivity increase (GI vs BAU) by sub-sector

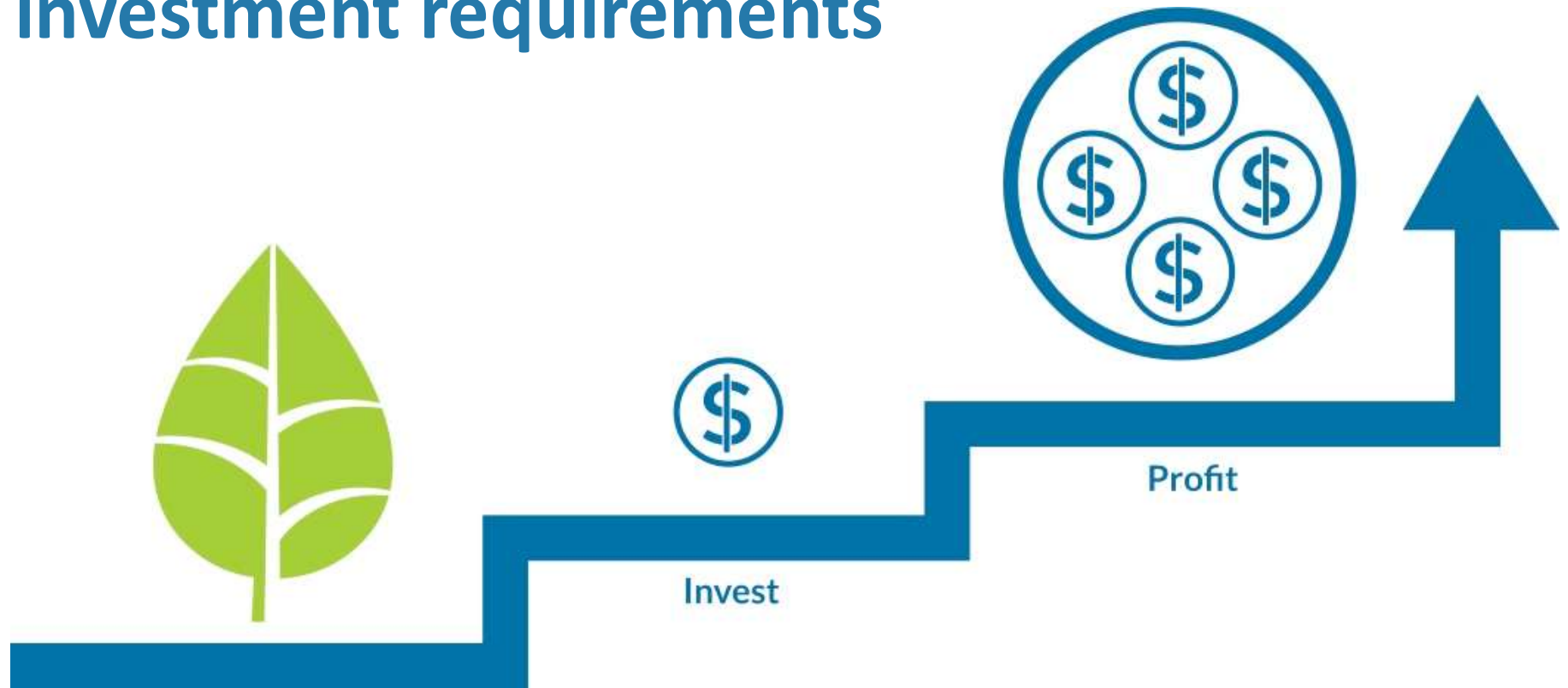




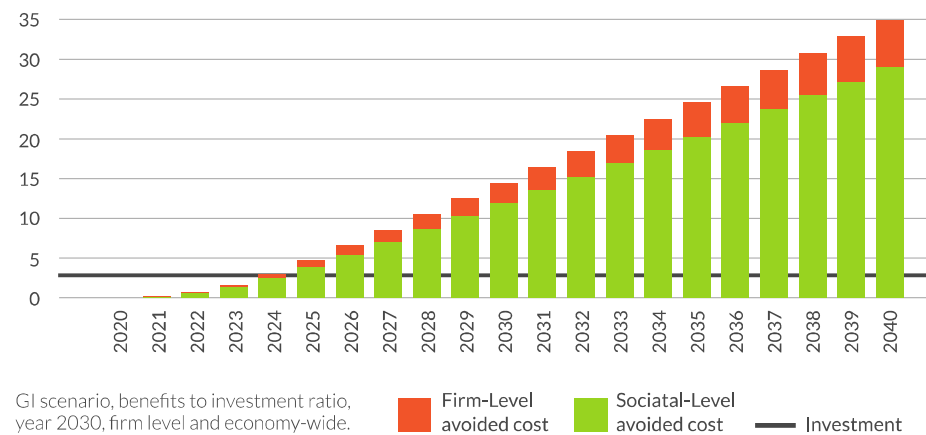
Results show potential cost reductions in all four sub-sectors, particularly largest for food processing.

Resource efficient technology can significantly reduce production costs and increase profit.

Avoided costs outweigh investment requirements



Comparing investments to avoided costs USD (Billions)



Under the GI scenario, while the investment required totals USD 4.24 Bn by 2030 (or 2% of GDP over the next 10 years), the benefits reach USD 28.49 Bn.

The benefits are 6.7 times larger than the investment required and generate positive returns.

Making this happen

The analysis shows that resource efficient technologies are an attractive investment for business owners, with a short payback time, significant avoided cost and a high return on investment.



Thank you for your attention



Green Industry (GI) Scenario: Assumed Targets

Scenario	Value
Exports (EX)	5% increase each year (above baseline). <ul style="list-style-type: none"> • Garment: 5% per year • Bricks: no change • Food processing: 2.5% per year • Electronics: 5% per year
Labor intensity (LI)	labor intensity declines by 3% per year (above baseline) between 2020 and 2025
Energy efficiency (EE) and Energy efficiency with fuel switching (EE-FS)	energy efficiency improves by 20% in 2025. (i.e. 20% above BAU by 2025)
Water efficiency (WE)	water efficiency improves by 30% in 2025 (i.e. 30% above BAU by 2025)
Material efficiency (ME)	material efficiency improves by 20% in 2025 <ul style="list-style-type: none"> • with the exception of brick manufacturing
Wastewater treatment (WWT)	100% of wastewater is treated by 2025
Renewable energy (RE)	on-site renewable energy (excluding hydropower) to represent 15% of electricity consumption by 2025

Policies for a green transformation in developing countries

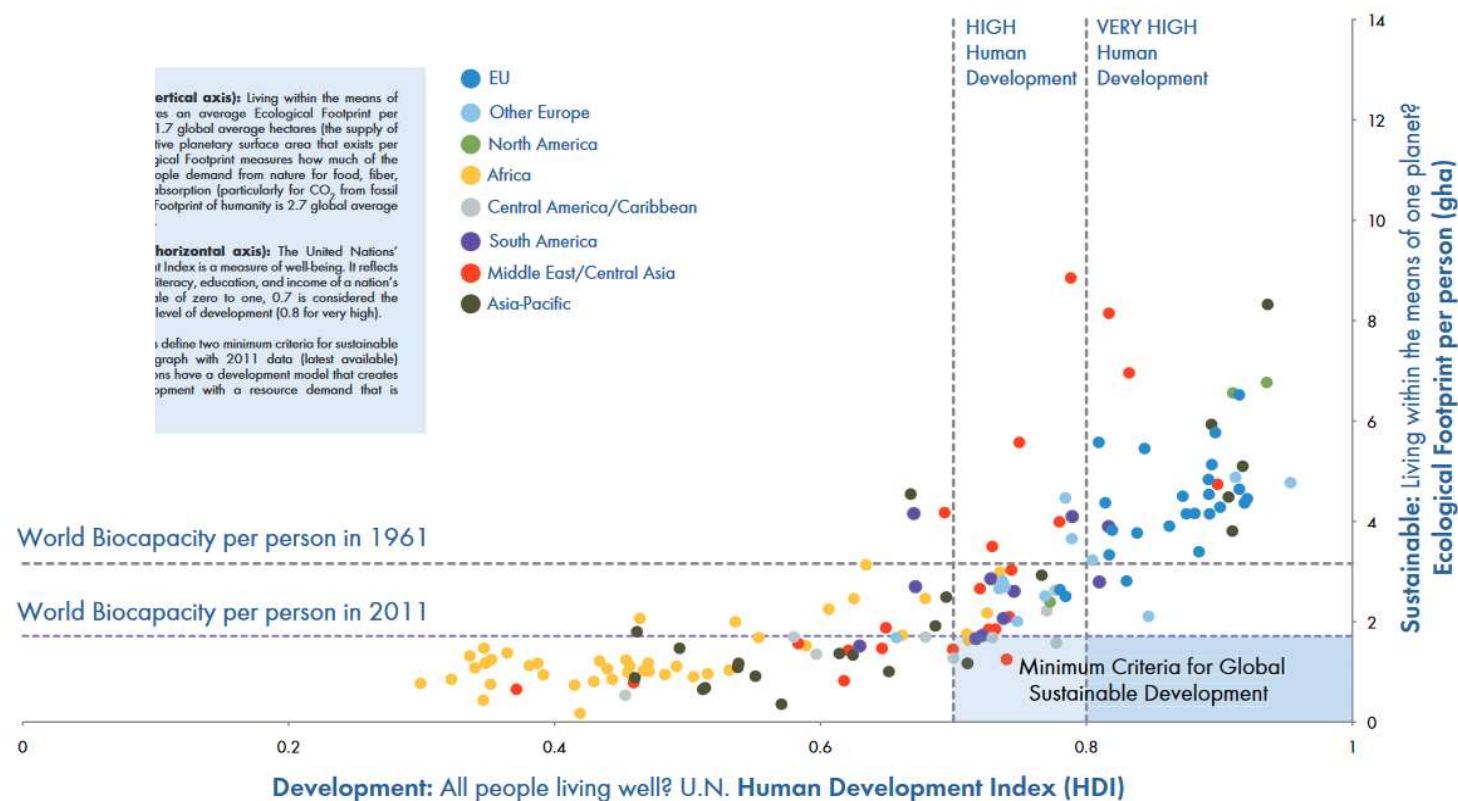
Tilman Altenburg,
German Development Institute (DIE)



The Challenge: Productivity-enhancing structural change with green transformation



Human Development Index & Ecological Footprint per person for nations



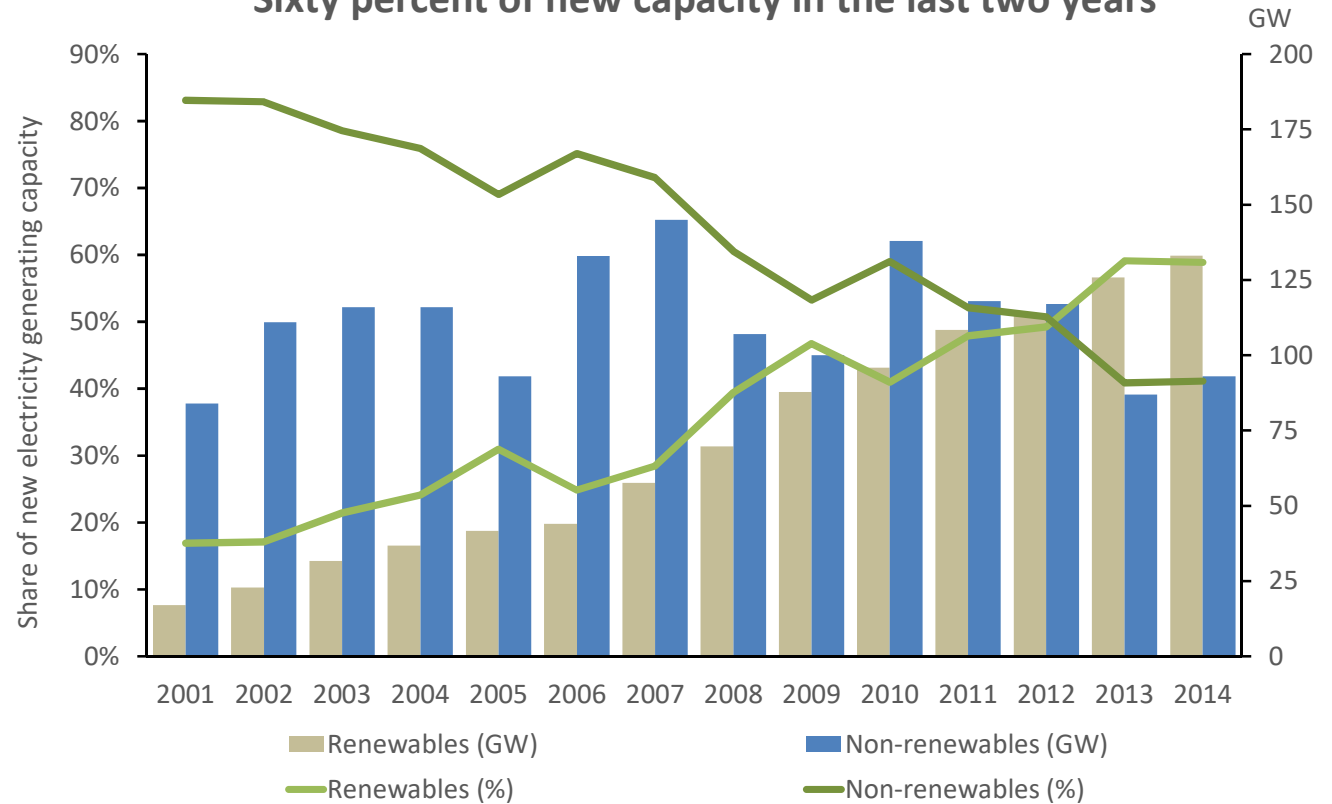
Source: Global Footprint Network



Energy sector

Electric power: Radical
change in new investments

Sixty percent of new capacity in the last two years



Source: IRENA (2016)

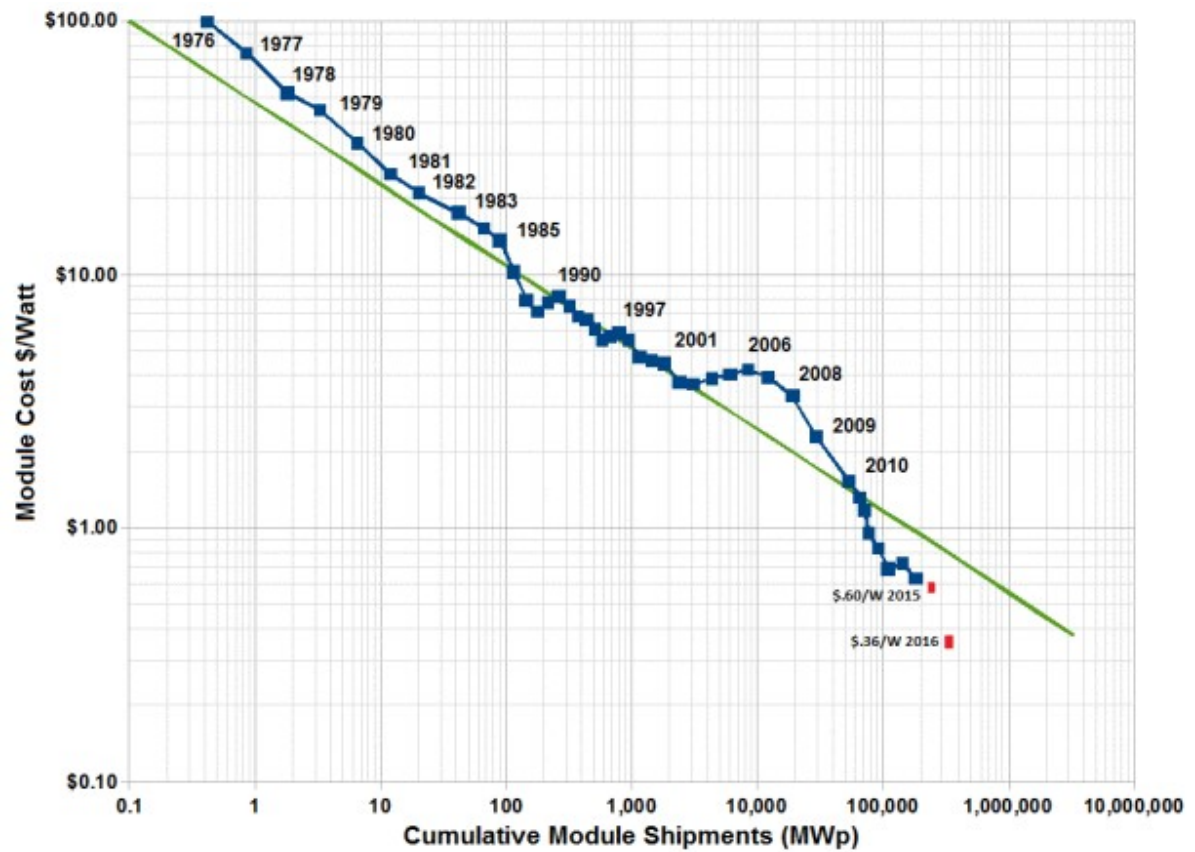
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Altenburg, 10/01/2018



Swanson's law (here: PV module cost)

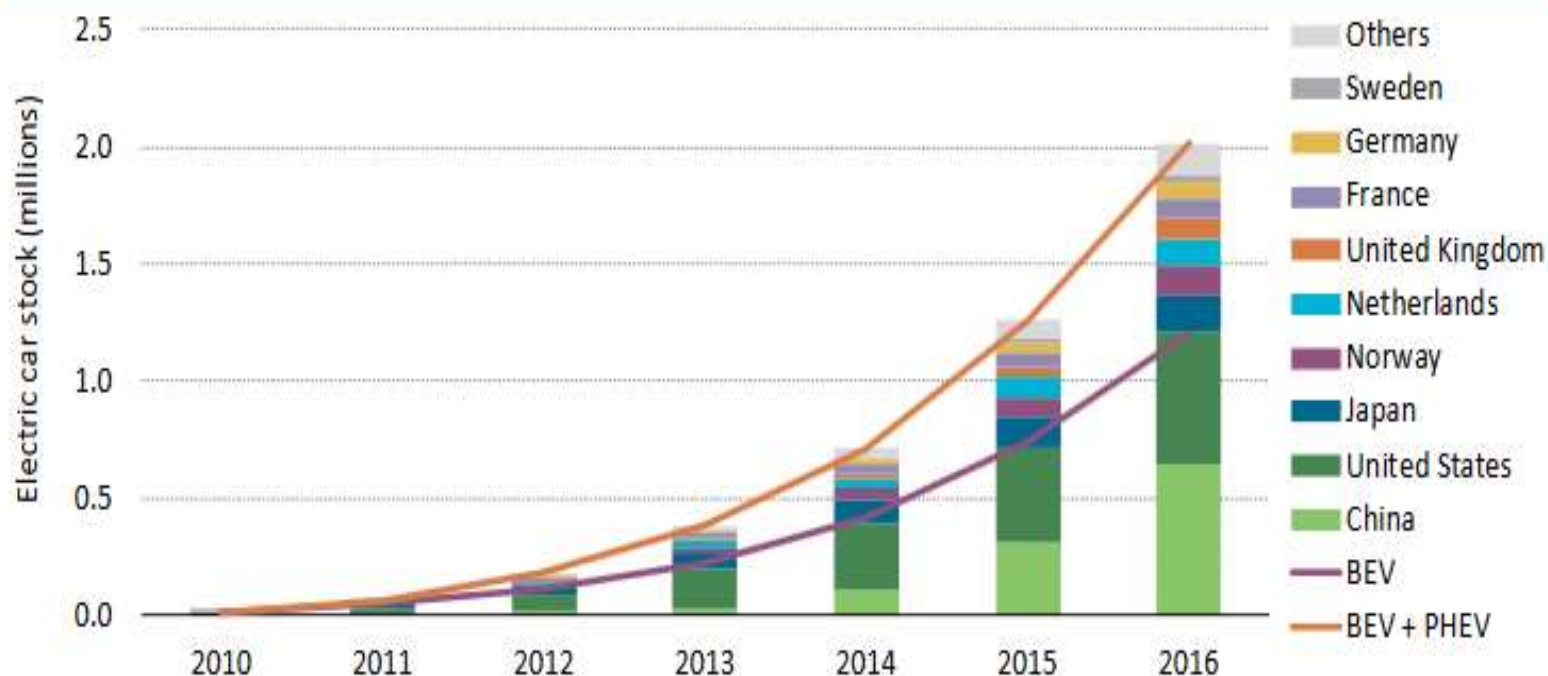


Source: John Fitzgerald Weaver, electrek 2017



Transport sector transformation taking off

Figure 1 • Evolution of the global electric car stock, 2010-16



Source: IEA



Industrial policy

... set of measures governments use to influence a country's economic structure in the pursuit of a desired objective

Key elements: facilitate stakeholder dialogues, create consensus on development pathways; adapt regulatory frameworks, set incentives to overcome market failures; make economies “future-proof”

- The world economy is shifting away from a world run on fossil fuels and resource depletion ...

⇒ **Smart industrial policy is about anticipating future markets and adapting to them**



Many principles the same. Compared to “business-as-usual” IP,
Green IP needs to cope with **six additional challenges**:



1. **Focus on internalising environmental costs: taxes / cap & trade**

- Key element!! Sufficient according to economic theory – but political economy challenges; price increases insufficient to kick-start technological revolutions => Additional subsidies & regulation needed

2. **Ex-ante distinction between “good” and “bad” technologies**

- Proactive **phasing out** of polluting technologies, **phasing-in** using graded standards, incentives for early adopters etc.

3. **Urgency to act (avoid overstepping earth’s bio-capacity)**

- **Acceleration / big push** as a key principle! R&D missions for key technologies (energy storage; smart grids; second generation biomass ...)



4. Increased uncertainty / long time horizons

- Time horizon of transformation not in sync with economic & political planning horizons
=> Societal agreement on long-term roadmaps and credible policy commitments



5. Additional policy interfaces

- Policy coordination among **multiple** interest groups

6. Dealing with Global Commons

- Some environmental goods = Climate, oceans, biodiversity = global commons; align national with multilateral approaches

In sum:

Deeper market failure + entrenched societal values involved + unprecedented urgency
=> **stronger role for governments**



Economic improvements generally rank higher on Government's (and voters) agenda than environmental sustainability

=> Need to demonstrate economic co-benefits of greening

1. Deterioration of environmental resources undermines economic base
2. Health costs & other welfare losses due to pollution = 6.2% global GDP
3. Fiscal benefits: eliminating fossil-fuel subsidies would free 4% of global GDP in revenues (Coady et al. 2017);
taxing environmental “bads” increases revenues;
less vulnerability to oil price shocks;
access to international green funds ...
4. Jobs: Green sectors & technologies may be more labour-intensive: organic agriculture, circular economy, renewables
5. Avoids switching costs





6. Enhanced competitiveness, e.g.

- Product differentiation through green labels (organic food labels, eco-textiles)
- Productivity improvements > than costs of environmental protection (resource-saving)
- Development of new green products (solar panels, filters)
- Knowledge spillovers: Clean patents get ~ 43% more citations than dirty patents & cited by more prominent patents (Dechezleprêtre et al. 2014)





Solar and wind energy Morocco

Morocco strongly pushes wind and solar energy generation.

Economic co-benefits:

- Improving trade balance and reducing vulnerability from oil price shocks (ten years ago, 99% of energy needs from imported fossil fuels)
- Improving energy access
- Jobs: e.g. installation & maintenance of solar home systems
- Technological learning (engineering training, new S&T programmes)
- Creating locational advantages for energy-intensive industries (wind project bids as low as 0.03 USD)





Electric vehicles in China

China is the world's largest automobile market, the largest market for electric vehicles and has the most ambitious support programme worldwide.

Aims: **reduce urban air pollution** and **leapfrog into next generation of automobile technology**

Economic co-benefits:

- Reducing urban air pollution (1.4 trillion US\$ estimated losses to outdoor air pollution in China in 2010 (OECD 2014))
- Market development & technological achievements:
 1. Highway-capable electric passenger cars and buses: 330,000 vehicles in 2015, largest fleet worldwide
 2. Low-speed EV: extremely simple affordable vehicles, not allowed on highways: 600,000 sold in Shandong
 3. Electric two-wheelers: 200 to 230 million circulating, rising exports
 4. Batteries: 200 battery manufacturers operating, most not yet internationally competitive, but lithium module





**For more detailed policy analyses and
examples see report:**

<http://www.un-page.org/greenindustrialpolicy>

Thank you for your attention!

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SUSTAINABLE DEVELOPMENT GOAL 9
INDUSTRY, INNOVATION AND INFRASTRUCTURE

Practitioner's Guide to Strategic Green Industrial Policy

Green Growth Knowledge Platform webinar
30 October, 2018

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Industrial Development Officer
Department of Environment

United Nations Industrial Development Organization

INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT



WWW.UNIDO.ORG

 **GREEN GROWTH**
Knowledge Platform



Contents

❖ Part One

- Conceptual framework of Strategic Green Industrial Policy (SGIP)

(Publication outline, Green Industry, SGIP, Principles of SGIP)

❖ Part Two

- Phases of SGIP development

(Six phases of policy development)

❖ Part Three

- Tools in developing SGIP

(Multiple tools, conclusion)





PRACTITIONER'S GUIDE TO STRATEGIC GREEN INDUSTRIAL POLICY



Summary:

- Designed as a practical, policy manual with relevant information describing the methodology and tools required for the planning and the implementation of a green industrial policy strategy along the various stages of the policy cycle.
 - Main report
 - Supplement

Aim:

- Practical advice on the evolving concept of Strategic Green Industrial Policy (SGIP) for policy practitioners. The guide details tools that can be applied to what some industrial policymakers may consider to be relatively under-explored territory.
- Ease the economic transition by providing detailed guidance, highlighting a number of changes that are relatively easy to implement.

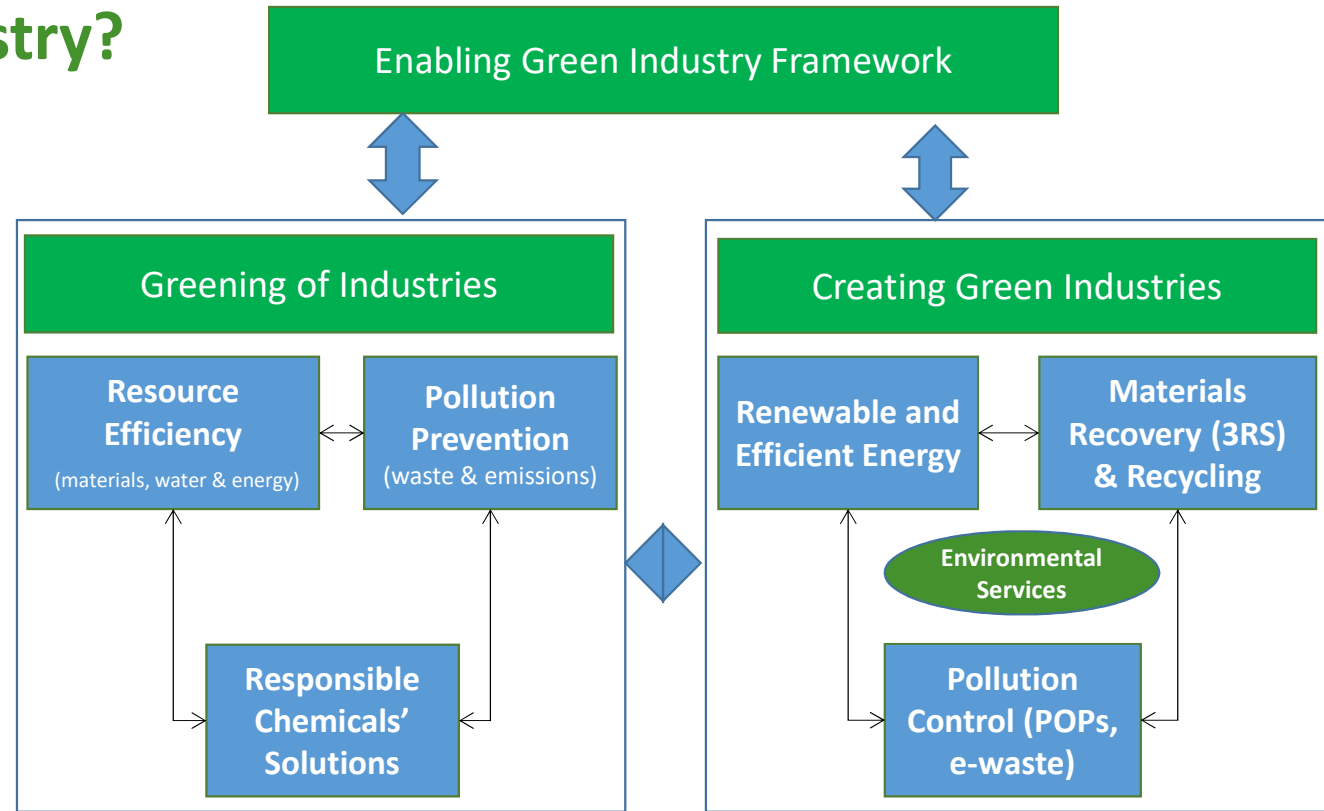
Intended audience:

- Policy practitioners, researchers.





What is Green Industry?





What is Strategic Green Industrial Policy (SGIP)?

Green industrial policy is an industrial policy that is meant to trigger and facilitate structural changes as entailed, or required, both to respond to environmental conditions or situations, and to develop a green, circular economy (UNIDO, 2016)

Why is SGIP needed?

- To cope with the tremendous changes in the ways humans interact with their environment & stretching the limits of sustainability
- To mitigate the externalities from manufacturing and consumption of consumer products

Conceptual framework

SGIP is meant to embed the manufacturing industry in a green economy concept.

SGIP implies a “leapfrogging” of the traditionally linear path of industrialization

SGIP acknowledges that the manufacturing industry cannot be viewed in isolation from other policies and sectors.

SGIP puts gender mainstreaming into forefront





Why Strategic ?

Strategic due to its underlying guiding principles

Principle 1

Departure from the present unsustainable to sustainable path

Principle 2

The Principle of Partnership > maximum diversity > minimum conflict

Principle 3

Environment cannot afford trial and error. So conscious strategic choices are required

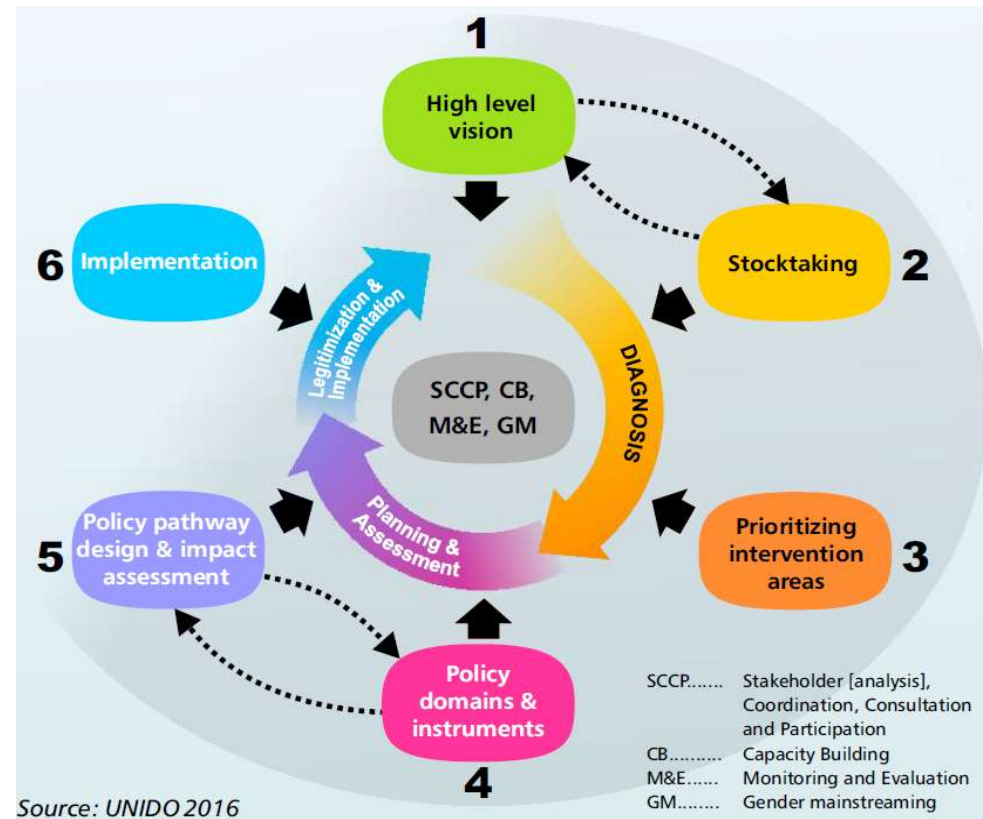
Principle 4

Strategic choices must conform with general system principles and ecosystem principles





Phases of SGIP development





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Identifying stakeholders for SGIP



Notations

	key or primary stakeholder with low influence
	key or primary stakeholder with high influence
	veto player
	secondary stakeholder
	Solid lines symbolise close relationship in terms of information exchange, frequency of contact, overlap of interests, coordination, mutual trust, etc.
	Dotted lines symbolise weak or informal relationships. The question mark is added where the nature of the relationship is not yet clear.
	Double lines symbolise alliances and cooperation that are formalised contractually or institutionally.
	Arrows symbolise the direction of dominant relationships
	Lines crossed by a bolt of lightning symbolise relationships marked by tension, conflicting interests or other forms of conflict.
	Cross lines symbolise relationships that have been interrupted or damaged.



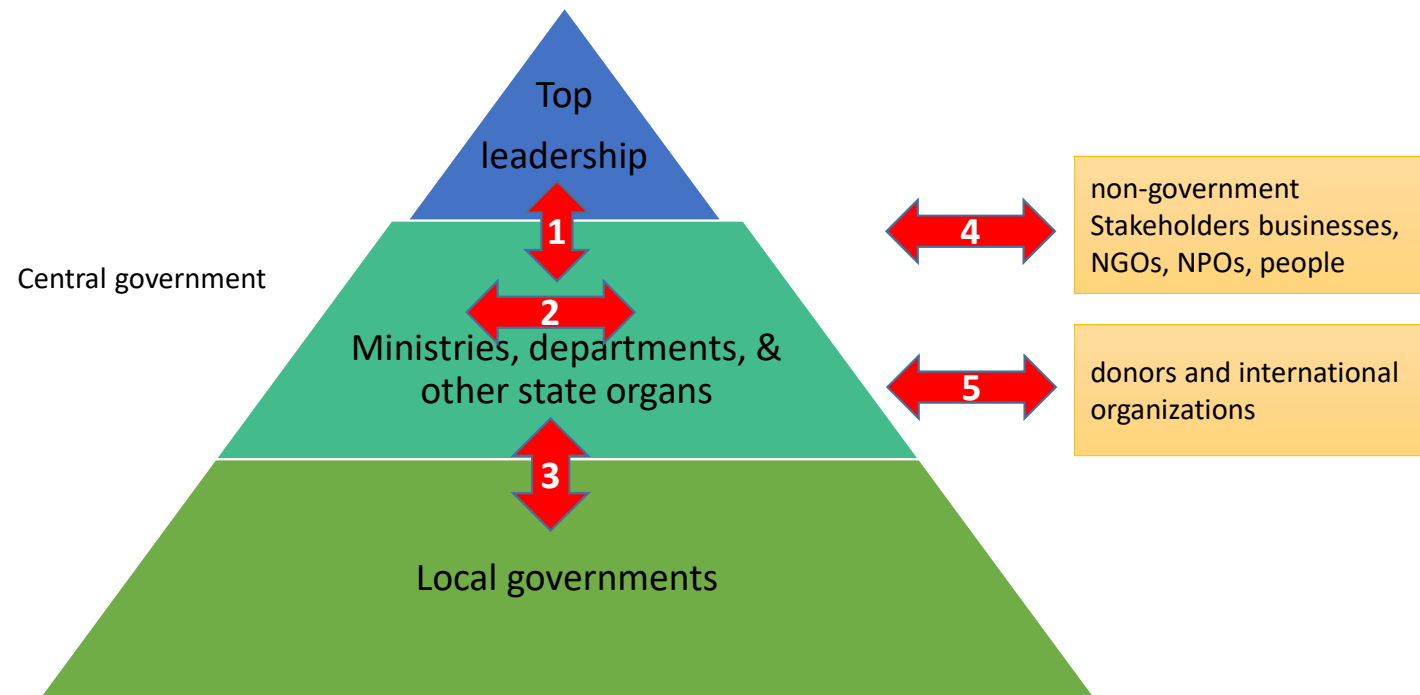


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Stakeholder coordination for Industrial Policy



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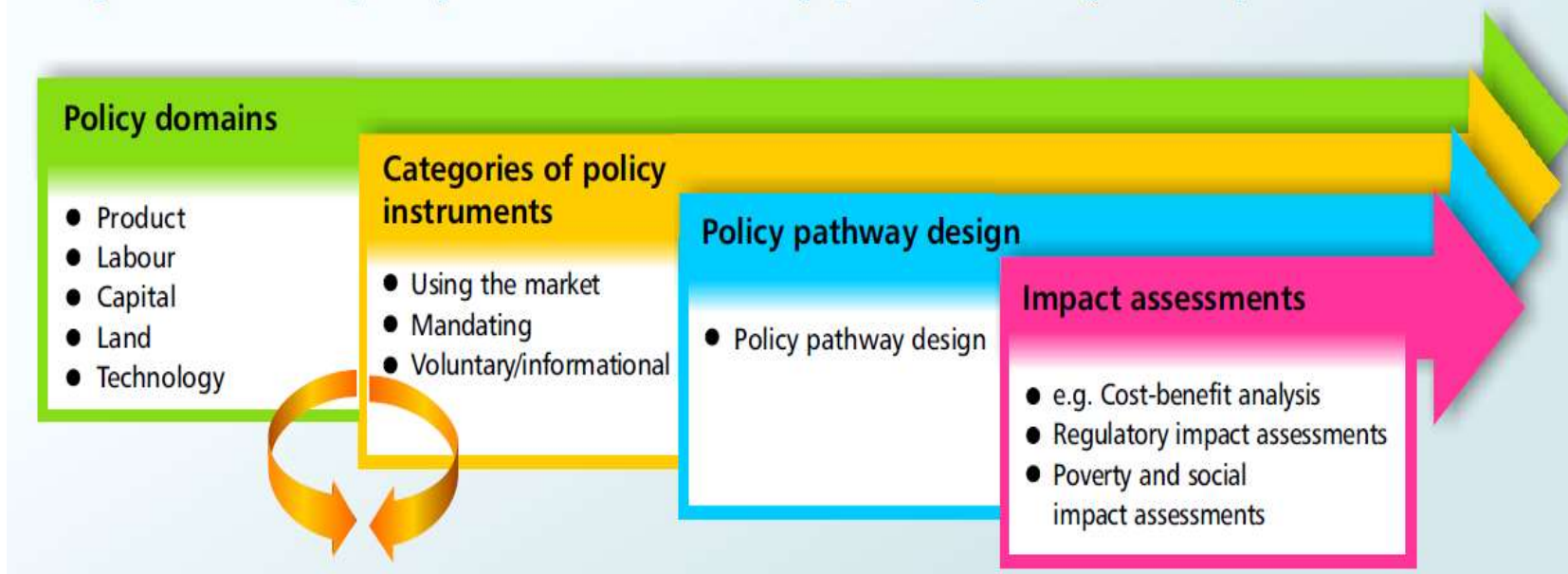
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Elements to consider when selecting policy domains and policy instruments

Policy domains & policy instruments: Policy pathway design & impact assessments



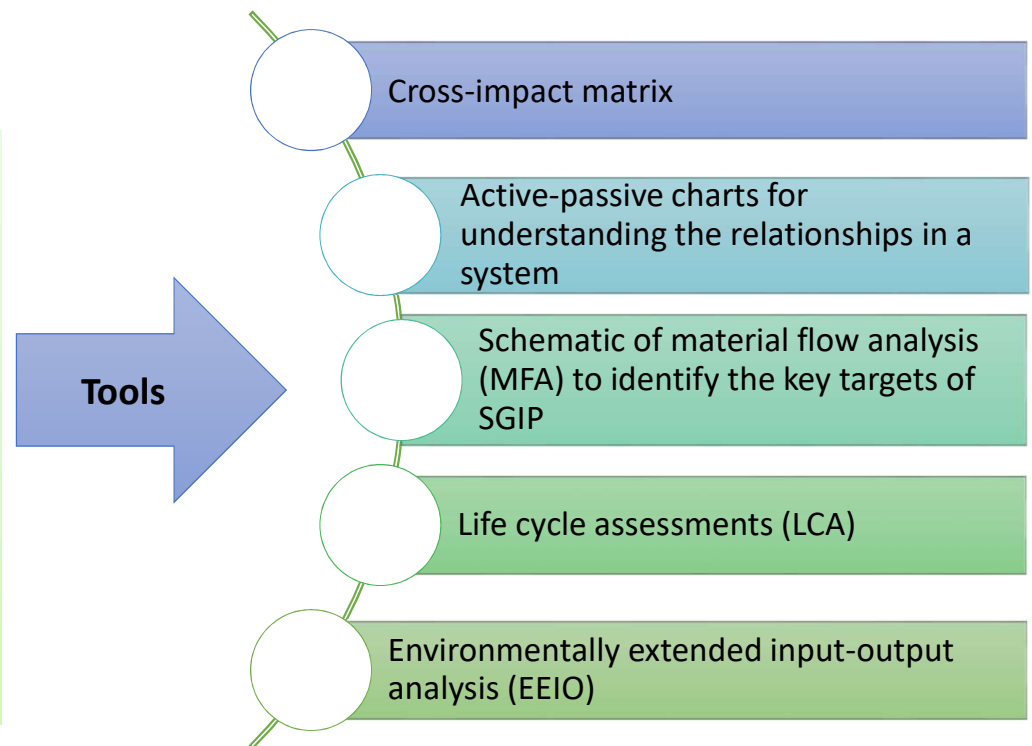


Tools in developing SGIP

Multiple-criteria decision analysis (MCDA) for understanding potential trade-offs between subsectors

		Economic impact	
		positive	negative
Near ecosystem, environmental, or social constraints?	yes	"growth with care"	"double trouble"
	no	"green growth"	"strong medicine"

Source: Based on UNIDO, 2015a, p. 64, fig.21.





Conclusions

- SGIP is an emerging concept that involves a significant amount of input from a diversity of disciplines and stakeholders representing a wide spectrum of interests.
- Greening will require multiple interventions to be developed and agreed upon by affected stakeholders.
- The task is ambitious, but it is very necessary in the context of complex global challenges such as climate change.
- The guide can be used to gain practical information on SGIP but also to acquire detailed guidelines and tools that can be applied to green industrial policy development.



“ What are key first steps towards the development and implementation of green industry policies? ”

Q&A

“ How does greening industry affect competitiveness at the national, sectoral and enterprise level? ”

“ How can policymakers overcome sociopolitical challenges to greening industry, particularly in the developing country context? ”

“ How can green industry help alleviate poverty? ”

Closing Remarks

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**Thank you for joining today's webinar on
“Greener Industries for Growing Economies:
Insights from the Experts”**

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