

Green Industry: A key pillar of a Green Economy

Policy Brief

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1. Introduction

There is general agreement that industrial growth is needed in developing countries to alleviate poverty, deliver goods and services, create jobs, and raise living standards (Reinert, 2007; Chang, 2008). Furthermore, for developing countries, economic and social development is considered to be an essential requirement for improved environmental protection (Dasgupta, 2011). Many developing and transition countries are currently in a phase of rapid industrial growth, with still more on the verge of embarking upon such a path (Giljum et al., 2010; Behrens et al., 2007).

However, it is increasingly clear that our current systems of production and consumption are escalating the risks connected to rapid resource depletion, degradation of ecosystems, and the threat of climate change with potentially irreversible consequences (Stamm, 2009). Pollution, intensified competition for scarce resources and climate change may also intensify already worrying trends, such as desertification, further loss of biodiversity, sea-level rise, more frequent severe weather events and shortages of freshwater, leading, in the worst scenario, to resource-related conflicts and wide-scale migration (UNIDO, 2008). However, despite growing recognition of these issues and risks, resource use, pollution and degradation of the environment have increased in absolute terms (United Nations Millennium Ecosystem Assessment, 2005).

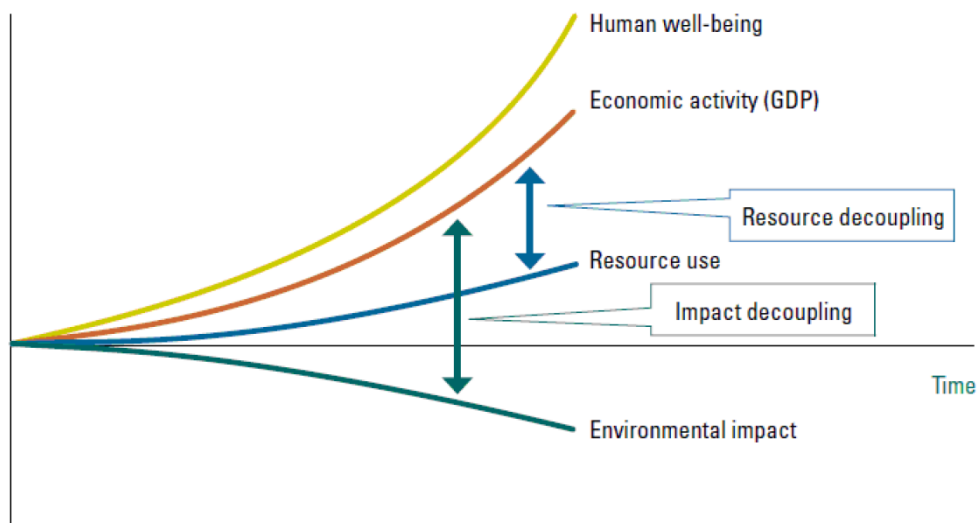


Figure 1: Decoupling economic growth from the use of resources and environmental burdens.

There is increasing consensus that the only way to ensure sustained growth is to decouple economic growth from resource use and pollution (Stamm, 2009; Yumkella, 2010; von Weizsäcker et al., 2009; Cropper, 2008). Decoupling typically refers to the

ability of an economy to grow without corresponding increases pressures on the environment¹. Decoupling can be either absolute or relative. Relative decoupling happens when for instance resource use increases, but the increase is less than economic growth. Absolute decoupling means that resource use is stable or decreases while economic growth increases (Stamm et al., 2009).

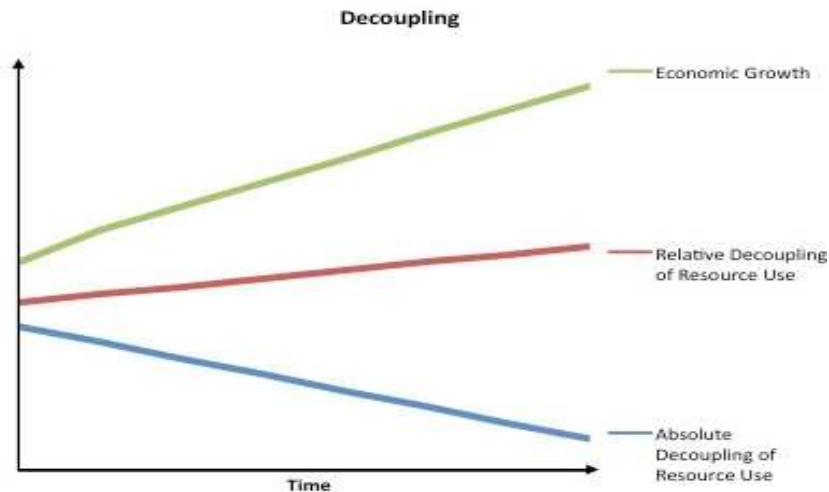


Figure 2: Relative and absolute decoupling.

However, despite some progress made in this area, so far no country in the world has achieved a sustainable situation where high resource productivity and high levels of social and human development are combined with low per capita resource consumption (SERI et al., 2010).

Perhaps the explanation for this failure is that sufficient attention has not been placed on the role of industry, particularly on manufacturing. In response, UNIDO has developed the Green Industry initiative to foster the positive role of industries towards

¹ For more information on decoupling see e.g.

- Azar, C. Holmberg J., Karlsson, S. (2002): Decoupling – past trends and prospects for the future, Göteborg: Chalmers University of Technology, Göteborg University. [<http://www.sou.gov.se/mvb/pdf/decoupling.pdf>].
- OECD (2002). Indicators to measure decoupling of environmental pressure from economic growth. <http://www.oecd.org/dataoecd/0/52/1933638.pdf>
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- von Weizsäcker, E., Hargroves, K., Smith, M., Desha, C. and Stasinopoulos, P. (2009) Factor 5: Transforming the Global Economy through 80% Increase in Resource Productivity, Earthscan, UK and Droemer, Germany

sustainable development. It focuses on enabling developing countries to achieve equitable economic growth that does not harm the environment and the climate through the creation of conditions for allowing industries to make significant cuts pollution and resource use and provide decent jobs.

Furthermore, the initiative also sets out to help these countries take advantage of the opportunities associated with more sustainable industrial development and the growing global demand for green solutions. The initiative was launched in 2009 during the International Conference on Green Industry in Asia² and has since been mainstreamed into UNIDO's projects and activities (UNIDO, 2010). This initiative is highly relevant for the achievement of the sustainable development objectives that are now on the forefront of the international agenda.

2. Green Industry as a sectoral approach to Green Economy

Designing a Green Economy in the context of sustainable development and poverty eradication is one of the central themes of the UN Conference on Sustainable Development (Rio+20) in 2012. Green Economy is a new model for economic development aimed at achieving improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2011).

Green Industry approaches contribute to decoupling growth from resource use and pollution by greening industries and stimulating the creation of environmental technology and service providers i.e. businesses ranging from small-scale re-cycling operations to the renewable energy technology companies. Green Industry leads to the creation of new green jobs, new business ventures, and drives technology development and innovation. It is, thereby, an effective point of entry and a driving force towards a Green Economy and provides a sectoral approach for a global transition to a green economy in manufacturing and associated sectors.

Furthermore, Green Industry approaches enable industries to decrease resource (energy, materials and water) use. It enables firms to take extended responsibility for their operations and products, and decrease environmental burdens, while at the same

² The International Conference on Green Industry in Asia, held in Manila, Philippines, from 9 to 11 September and co-organized by UNIDO and the Government of the Philippines, the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Environment Programme (UNEP). Senior government officials from 21 countries in the region unanimously adopted the Manila Declaration on Green Industry in Asia and Framework of Action, which calls upon governments, the private sector and international organizations to collaborate in fostering the development of green industry. UNIDO follow-up to the Conference includes the drafting of national green industry strategies and the preparation of national eco-efficiency profiles and of a green industry policy package.



time, saving money, increasing revenues and gaining a competitive advantage. Green industry is also fundamental to improving protection of humans and the environment from harmful substances and fostering sound management of chemicals. In addition, it promotes the development of inherently safer chemical substitutes and non-chemical based alternative processes. Deep cuts in pollution, including GHG emissions, require comprehensive changes in how products and services are produced.

3. Green Industry: Gearing up towards sustainable consumption and production

Green Industry is a prerequisite for moving towards sustainable consumption and production (SCP). SCP has been defined as “the production and consumption of services and products that respond to basic needs and bring a better quality of life, while minimizing use of natural resources and toxic materials as well as the generation of wastes and pollutants over the whole life-cycle of the product or service, so as not to jeopardize the needs of future generations” (UNEP, 2002). Green Industry approaches create conditions needed for industries to work proactively towards greening their operations and creating products and services that enable sustainable consumption. While consumer behaviour, choices and lifestyles are crucial factors, SCP can only be achieved if industries take an active role in minimizing resource use along with the negative impacts (including the elimination of hazardous substances and decreasing pollution and waste) throughout the life-cycles of products and services. This includes the design of products that are more sustainable (have enhanced durability, require less resources during use, are easier to reuse or recycle, or cause less damage to the environment and climate when they are discarded).

Furthermore, Green Industry is central to progressing towards sustainable development particularly with regard to enhancing environmental protection, mitigating climate change and alleviating poverty through stimulating productive activities and job creation. Green Industry fosters the ability of businesses to take a leading role in developing and applying safe, resource efficient, low carbon and climate resilient technologies, products, services, processes and approaches.

4. UNIDO Green Industry initiative

Green Industry is a two-pronged strategy to decouple resource use and pollution from industrial development and promote the growth of sustainable productive sectors and entrepreneurship in developing and transitioning countries. By definition, green industry is:



- **Greening of industries** - ensuring that all industries, regardless of sector, size or location, continuously improve their environmental performance. This includes commitment to, and actions aimed at reducing, the environmental impacts of processes and products by using resources more efficiently; phasing out toxic substances; substituting fossil fuels with renewable energy sources; improving occupational health and safety; taking increased producer responsibility and reducing risks to the environment, climate and people.
- **Creating green industries** - stimulating the development and creation of industries that provide environmental goods and services.

Green industry is a growing and diverse sector that covers all types of services and technologies aimed at contributing to reducing negative environmental impacts or addressing the consequences of various forms of pollution. This includes material recovery, recycling companies, waste management and treatment companies, as well as companies that transport waste. Further examples include engineering companies that specialize in wastewater treatment, air pollution control and waste treatment equipment, as well as companies that provide monitoring, measuring and analysis services. Green industries also encompass environmental and energy consultants, in addition to the providers of integrated solutions, for example, energy service companies (ESCOS) that offer design, implementation of energy saving projects, energy conservation, energy infrastructure outsourcing, power generation, energy supply, and risk management. Green industries also include companies that manufacture and install renewable energy equipment and companies that develop and produce clean technologies.

This dual approach promotes sustainable patterns of production and consumption, i.e. patterns that are resource- and energy efficient, low-carbon, low-waste, non-polluting, safe, and which produce products that are responsibly managed throughout their lifecycle.

5. Vision and Goals of the Green Industry initiative

UNIDO's primary vision is to ensure that developing and transition countries attain their respective targets for sustainable industrial development. In order to achieve this, there is a need for fundamental changes in the way countries produce and



consume. Through the Green Industry initiative, UNIDO focuses on the need for and value of approaches that target industry and promote more equitable access to the knowledge, technologies and production processes that are needed for achieving sustainable industrial development in these countries. In general, the initiative goals are: providing technical support and assistance to incorporate concepts, tools and methodologies of green industry; supporting bilateral, regional and international cooperation in the development and transfer of cleaner production technologies and practices; strengthening the economic and trade competitiveness of green industries; and actively engaging in partnerships, between and among governments, the private sectors, research institutions and civil society to green their industries.

More specifically, the UNIDO Green Industry initiative will work to:

1. **Incorporate Sustainable Production in industrial policies and strategies** and related development plans, including through improvements of the business environment and supportive market and fiscal, trade, technology and training policies in 25 developing and transition countries by 2016 and expanding this to 75 in 2021;
2. **Enhance and expand the availability of advisory services** so that by 2016, 25% of SMEs in programme countries have access to appropriate services for implementation of Sustainable Production and increase this availability to at least 50% by 2021;
3. **Support national learning and innovation hubs** that bring together business sector, academia and knowledge sector, and government for collaborative development and realization of sustainability pathways for transformation of priority sectors through (applied) research, technology development, teaching and training, in 15 developing and transition countries in 2016, expanding to 30 countries by 2021;
4. **Realize replicable models for Sustainable Production**, including for (1) climate resilient solutions that combine mitigation of industrial GHG emissions with adaptation of industry to the likely impacts of climate change; (2) eco-industrial parks with enhanced uptake of Environmentally Sound Technologies by industries individually and collectively. This could aim to include 20 and 10 countries in 2016 respectively for eco-industrial parks and climate resilient production, expanding to 50 and 20 countries by 2021; and
5. **Encourage and support absolute resource use reductions in developed countries and relative decoupling in developing countries** so that the impact of global natural resources use are kept within safe ecological limits. This includes



providing solutions to decouple economic growth from the rate of natural resource consumption through an increase in resource efficiency, to ensure that resource consumption would not increase to three times its current level by 2050³.

The key messages of the UNIDO Green Industry initiative are presented in Annex 1.

6. Conclusions

There are significant opportunities for utilizing the *Green Industry* approach to assist developing and transition countries to deal with pressing social concerns, while at the same time ensuring that these countries can grow sustainably. It is critical that the technologies, practices and production methods deployed in these countries are sustainable. If the current window of opportunity for integrating sustainable production approaches and technologies in the necessary industrial upgrading and development in these countries is missed, then these countries will face high costs and losses in the future due the need to clean up pollution and replace technological bases, missed business opportunities, resource scarcity, depleted ecosystems, and the inability to compete on the global market.

³ This refers to a scenario analysis on from UNEP International Resource Panel. (2011) *Decoupling natural resource use and environmental impacts from economic growth*. This analysis projects that resource consumption will increase to three times its current level by 2050, resulting in an annual consumption of 140 billion tons of minerals, ores, fossil fuels and biomass.

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Annex 1

Green Industry The UNIDO Flagship Initiative for Rio+20 Key Messages

1. **The UN Conference on Sustainable Development (Rio+20)**, to be held in Rio de Janeiro in 2012, presents a unique opportunity to re-confirm our commitment to sustainable development and its three dimensions as the guiding principles of the development process. We must not miss the chance to make sure we have a shared and common understanding of this concept and what it means to improve the lives of ordinary people in developing countries and countries with economies in transition. It is also an **important opportunity for developing a balanced understanding and action-orientated agenda** for sustainable development
2. While sustainable development was originally conceptualized to encompass three pillars, over the past two decades more weight has been placed on the environmental dimension. Care should be taken to maintain the original balance and give the economic and social dimensions of sustainable development equal weight. The two themes of Rio +20 – **Green Economy in the context of poverty reduction and Institutional Framework for sustainable development** – represent what we believe is a concrete attempt to find this balance, which is absolutely essential if sustainable development is to connect with the lives of ordinary people in the poorest countries and be a real force of widespread poverty reduction.
3. However, **sustainable development cannot be achieved without sustainable industrial development**. No country has achieved developed status without the development of its industrial sector. Industry matters for development. It is the vehicle for widespread structural change, job creation and income generation, and therefore the means to improve the quality of life of ordinary people and combat poverty.
4. Green growth and Green economy must form the foundations of the future, but they are not ‘one -size fits all concepts’. Rather, they must be owned and moulded by individual countries according to their own development needs and priorities. **Green industry has been shown to work in the real world and in difficult development contexts, and is applicable, relevant and affordable for a wide range of countries**. Green industry is a call for inclusive growth and



development. It is especially a call for inclusive globalization. We must not ignore this call in Rio. There are too many in this world who have so little and deserve so much more. Green industry matters for them as their main path to sustainable prosperity.

5. **Enduring economic and social development requires accelerated and widespread industrialization, as the only proven means of lifting people out of poverty**, delivering the required goods and services, creating wealth and employment, and raising standards of living. For this reason the growth of the industrial sector is an indispensable priority for developing countries seeking to create jobs and raise standards of living.

6. **Growth and technological modernization of the economy are closely associated with the industrial activities of economy.** In this sense, the industrial sector - and manufacturing in particular - is the **“engine of growth”**. Time and again countries around the world have demonstrated that industrialization is a major factor behind structural change, economic development and poverty eradication.

7. Industry accounts for more than 30 per cent of global electricity use, 20 per cent of direct greenhouse gas emissions, over a quarter of primary resource extraction and 22 per cent of water consumption (ranging from 10 % for low- and middle-income countries to 60 % for high-income countries, due to rapid industrial development).⁴ Global material consumption is projected to triple from 50 to 160 billion tonnes per year by 2050. **Sustainable development urgently requires a widespread greening of industrialization.** Moreover, many countries already face severe environmental degradation and resource depletion, which undermines the potential opportunities for sustainable development. It is therefore increasingly acknowledged that **sustained growth is only possible with decoupling of economic growth from increased resource use and environmental impacts.**

8. In response to this challenge, UNIDO has **launched the *Green Industry Initiative***, which aims at building national capacities for accelerating green growth of the manufacturing and related sectors within an appropriate industrial policy framework. It provides the international community and national governments with a platform for fostering the positive role of industry in achieving sustainable development. UNIDO’s *Green Industry Initiative* aims at transforming the industrial sector in the following ways: employing resources efficient processes and technologies, and; increasing the share of green goods, jobs and services in the economy. As such, it calls for:

⁴ UN World Water Development Report (2003)



- **Greening of Industries** – ensuring that all industries, regardless of sector, size and location, continuously improve their environmental performance and resource productivity. This includes a commitment to, and actions for, reducing the adverse environmental impacts of industrial processes and products by using resources more efficiently; transforming industrial energy systems towards greater sustainability by expanding renewable energy sources; phasing out toxic substances; and improving occupational health and safety at industrial level.
 - **Creating Green Industries** – stimulating the development and creation of industries that deliver environmental goods and services. Green industry is a rapidly expanding and diverse sector that covers all types of services and technologies that (directly or indirectly) help to reduce negative environmental impacts and resource consumption. This includes material recovery, recycling, waste treatment and management, as well as the provision of environmental and energy consulting and services, such as energy service companies (ESCOs) and companies that provide monitoring, measuring and analysis services.
9. Green Economy provides a new paradigm for economic growth and development, which is friendly to the earth's ecosystems and can also contribute to poverty reduction. **Green Industry**, as defined and developed by UNIDO, is an **integral part of the Green Economy** agenda and provides a **sectoral approach** for a global transition to green growth and development in the manufacturing and associated sectors. Green industry operationalizes sustainable development which has become the guiding paradigm for the United Nations during the past two decades.
10. **The benefits of the Green industry approach include:**
- a) A **decoupling of growth from resource use** and pollution;
 - b) The creation of **new jobs and business ventures**, and the promotion of **technology transfer and innovation**;
 - c) Enabling industry to **improve the efficiency of resource use** (including energy, materials and water);
 - d) A reduction of the environmental impacts of industrial production, coupled with a reduction of production costs and an enhanced **competitive advantage**;
 - e) Improved **protection of human health and the environment**;
 - f) Promotion of **sound management of chemicals**, and;
 - g) Support for the development of safer chemical substitutes and innovative and inherently safe products and technologies.
11. **Green Industry is at the core of sustainable development** as it combines poverty reduction through productive activities and job creation with an increase in the



environmental sustainability of industrial activity. Green industry equips businesses to take a leading role in developing and applying safe, resource efficient and climate-resilient technologies and processes.

12. **The UNIDO Green Industry initiative is designed to support developing countries and transition economies in particular, in order to enable them to benefit from the opportunities associated with sustainable industrial development and the growing global demand for greener products and services.** It promotes sustainable patterns of production and consumption, i.e. patterns that bring quality of life to consumers and are resource and energy efficient, low-carbon, low waste, non-polluting and safe, and which produce products that are responsibly managed through their lifecycles.

13. It is therefore critical that the technologies, practices and production methods deployed in these countries are sustainable and that the current window of opportunity for their deployment is not missed.

14. **The objective of the UNIDO Green Industry initiative** is to assist developing countries to re-consider their industrial development trajectories and to integrate their developmental and environmental concerns. Green Industry provides a viable alternative to the outdated paradigm that industrial growth can precede environmental protection (i.e. “industrialize now – clean up later”). Green Industry is about industrializing in a manner that contributes to solving today’s most pressing social concerns without further aggravating the environmental problems of tomorrow.

15. **The UNIDO Green Industry Initiative calls for the implementation of the following goals:**

- **Developed countries** must achieve **an absolute decoupling⁵** of natural resource use and the environmental impacts of economic growth and industrial development – i.e. they must drastically increase the resource productivity of their economies.
- **Developing countries** must be supported by developed countries to achieve a **relative decoupling⁶** of natural resource consumption from economic growth and industrialization. Developed countries should support developing countries

⁵ Absolute decoupling occurs when the environmental pressures are stable or decreasing while economic growth continues to increase.

⁶ Relative decoupling occurs when environmental pressures are continuing, but at a lesser rate than the economic variable.



in achieving a reduction from the current levels of resource intensity by providing financial and technology transfer support for green industry programmes and projects.

16. **Developed countries could set a dual target** for global reduction in resource consumption which will include domestic action and technological and financial support (including public and market-linked financing) for developing countries' efforts to increase the resource efficiency of their economic growth and industrialization processes.

17. The **UNIDO Green Industry initiative will work to:**

- **Incorporate green industry in industrial policy-making** and related development plans and strategies, such as improvements of the business environment and supportive market frameworks and fiscal, trade, technology and training policies;
- **Enhance and expand the availability of advisory services** for small and medium enterprises (SMEs) to support the greening of industries and the establishment of new green industries;
- **Develop and support national learning and innovation hubs** that bring together the business community, academia and the public sector for the collaborative development and realization of sustainable pathways for the transformation of priority sectors through research, technology development and training;
- **Develop and implement replicable models for green industry**, including those that support climate-resilient solutions by combining the mitigation of industrial GHG emissions with the adaptation of industry to the impacts of climate change, and those that support the adaptation and adoption of the environmentally sound technologies (EST), e.g. **eco-industrial parks**.
- **Develop Roadmaps and National Implementation Plans (NIPs)** for reducing resource intensity and decoupling natural resource use from industrial production in the context of the national transition to green industry

18. **Pilot projects and readiness assessment activities should start immediately.** Public funding is the most appropriate source for preparatory activities and early action.