

# Understanding the green economy

## An indicator-based approach applied in the Czech Republic

PaedDr. Tomáš J. HÁK, PhD.  
*Charles University in Prague, Czech Republic*  
Ing. Miloslava VESELÁ  
*The Czech Statistical Office, Czech Republic*

**Abstract:** The paper explores concepts of economic and environmental sustainability and a concept of green growth in the Czech Republic. It presents a system of selected indicators that - in order they capture not only the economic and environmental link, but also the social dimension, they are structured into five interrelated groups. According to the OECD, green growth means fostering economic growth and development, while ensuring that natural assets continue to provide their sources and environmental services on which our well-being relies. Thus green growth has the potential to address economic and environmental challenges while simultaneously paying specific attention to many of the social issues and equity concerns that can arise as a direct result of greening the economy. The necessity to consider economic, environmental, and social aspects leads directly to sustainable development that provides an important context for green growth.

## 1. Introduction

### 1.1 Sustainable development

The term “sustainable development” was coined by the IUCN’s 1980 World Conservation Strategy. Its section “Towards Sustainable Development” identifies the threats to sustainability as poverty, population pressure, social inequity and the terms of trade. In 1987 “Our Common Future” gave direction to comprehensive global solutions [1]. In Chapter 2 it says: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
- The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.”<sup>1</sup>

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<sup>1</sup> Brundtland Report, <http://www.un-documents.net/wced-ocf.htm>

This definition was somewhat extended by the Earth Summit in 1992 [2]. It produced the 40 chapters (150,000+ words) of Agenda 21. The formalization was completed by the World Summit on Sustainable Development in 2002 [3] with the notion of the three pillars – social, environmental, economic – as symbolized by the summit motto “People, Planet, Prosperity”. Finally, at the UN Conference on sustainable development (Rio+20) in June 2012 heads of states renewed their commitment to sustainable development and to ensuring the promotion of an economically, socially and environmentally sustainable future for our planet and for present and future generations. Rio Declaration [4] affirms that there are different approaches, visions, models and tools available to each country, in accordance with its national circumstances and priorities, to achieve sustainable development in its three dimensions which is an overarching goal.

The need to further mainstream sustainable development at all levels, integrating economic, social and environmental aspects and recognizing their interlinkages, so as to achieve sustainable development in all its dimensions, is fully acknowledged. In this regard, green economy is considered in the context of sustainable development and poverty eradication as one of the important tools available for achieving sustainable development and that could provide options for policymaking (but should not be a rigid set of rules). Despite the term has become so widespread and well-known at present that we may take it as common sense, the question appears: How and where do green growth and green economy fit in the overarching concept of sustainable development? If a major challenge is reconciling the competing economic development aspirations of rich and poor countries in a world economy that is facing increasing climate change, energy insecurity and ecological scarcity, is green growth and green economy more economic or environmental issue? Or both and it is just a good example of sustainability as a multidimensional but integrated concept?

### *1.2. Economic sustainability*

The economists focus on various kinds of “capital” (man-made, natural, human, social) that should be sustained [5]. Another approach is based on the Goodland-Ledec specification of sustainable development [6]. Sustainable development means the use of renewable natural resources in a manner that does not eliminate or degrade them or otherwise diminish their usefulness for future generation. Furthermore, it implies using non-renewable (exhaustible) mineral resources in a way which does not unnecessarily preclude easy access to them by future generations. Finally, it requires a sufficiently slow-rate of depletion of non-renewable energy resources to ensure the high probability of an orderly societal transition to renewable resources. This definition focuses primarily on the physical aspects of sustainable development. Other approaches focus on optimal resource

management, suggesting, for example, the definition by Markandya and Pearce [7]. Sustainability might be redefined so that the use of resources today should not reduce real incomes in the future because sustainability requires that the conditions necessary for equal access to the resource base be met for each generation. Or “Natural resources and the environment constitute the ultimate foundation upon which all future economic activity must be construed. From this, it follows that future economic progress will be increasingly dependent on the sustained integrity of the resource and environmental base.” [8].

### *1.3. Environmental sustainability*

Sustainable development used to be more or less understood as social and economic development that should be environmentally sustainable. Originally, the term “environmentally responsible development” was used [9]. Subsequently, “environmentally sustainable development” was employed [10]. Finally, the concept of “environmental sustainability” was developed [11].

According to Goodland, environmental sustainability “seeks to improve human welfare by protecting the sources of raw materials used for human needs and ensuring that the sinks for human wastes are not exceeded, in order to prevent harm to humans”. Goodland's conceptualization of environmental sustainability fits into the resource-limited ecological economic framework of “limits to growth”. Holdren, Daily and Ehrlich [12] define environmental sustainability by focusing on its biogeophysical aspects. Biophysical sustainability means maintaining or improving the integrity of the life supporting systems of the Earth. Sustaining the biosphere with adequate provisions for maximizing future options includes enabling current and future generations to achieve economic and social improvement within a framework of cultural diversity while maintaining (a) biological diversity and (b) the biogeochemical integrity of the biosphere by means of conservation and proper use of air, water, and land resources.

An important contribution to the concept of environmental sustainability was made by the OECD Environmental Strategy for the First Decade of the 21st Century [13]. The Strategy defines four specific criteria for environmental sustainability: regeneration (renewable resources shall be used efficiently and their use shall not be permitted to exceed their long-term rates of natural regeneration), substitutability (non-renewable resources shall be used efficiently and their use limited to levels which can be offset by substitution with renewable resources or other forms of capital), assimilation (releases of hazardous or polluting substances into the environment shall not exceed their assimilative capacity) and avoiding irreversibility.

Further development of the concept was aided by the Millennium Ecosystem Assessment Project [14]. The ecosystem and nature's services are jointly linked to human well-being because it depends on them. To secure well-being, it is essential to maintain the ecosystem and nature's services at an appropriate standard. In other words, environmental sustainability may be defined as maintaining nature's services at a suitable level. Pointing out the indivisible connection between these services and human well-being, and indicating the many concrete expressions of this relationship is the fundamental contribution of the Millennium Ecosystem Assessment Project.

Given the current financial and economic crisis, the economic aspects of development are under close scrutiny. The economic crisis shows how essential economic growth of a country is for policy and the public. It should be noted that growth has been the most important policy goal across the world for the last five decades. It is a reason, why it has been difficult to find the balance between sustainability and the economic growth of countries. Hopefully, the economic crisis could be an example of how to change the approach to economic growth and how to perceive a new economy in terms of sustainable development. An example of such an approach may be the study „Prosperity without growth?“ by Tim Jackson [15].

## **2. Green economy**

Sustainable development provides an important context for green growth. By OECD [16] the green growth has not been conceived as not a replacement for sustainable development, but rather should be considered a subset of it. It is narrower in scope, entailing an operational policy agenda that can help achieve concrete, measurable progress at the interface between the economy and the environment. It provides a strong focus on fostering the necessary conditions for innovation, investment and competition that can give rise to new sources of economic growth – consistent with resilient ecosystems. Green growth strategies need to pay specific attention to many of the social issues and equity concerns that can arise as a direct result of greening the economy – both at the national and international level. This is essential for successful implementation of green growth policies. Strategies should be implemented in parallel with initiatives centering on the broader social pillar of sustainable development. The Strategy develops an actionable policy framework that is designed to be flexible enough to be tailored to differing national circumstances and stages of development.

The definition of the green economy, as developed by the UNEP, says that it is economy that results in improved human well-being and social equity, while significantly reducing environmental hazards and ecological scarcities. In the simplest expression, the green economy can be considered as the one, which is of low carbon emissions, resource efficient, and socially inclusive. Practically

speaking, the green economy is the one the growth of which in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalyzed and supported by targeted public expenditure, policy reforms, and regulation changes. This development path should maintain, enhance, and, where necessary, rebuild natural capital as a critical economic asset and source of public benefits, especially for poor people whose livelihoods and security depend strongly on nature<sup>2</sup>.

We can find a number of other approaches. Burkart [17], for instance, defines the green economy as based on six main sectors as follows:

- Renewable energy sources (solar, wind, geothermal, marine, including waves, biogas, and fuel cells);
- Green buildings (green retrofits of buildings for improved energy and water efficiency, residential and commercial assessment; green products and materials, and LEED construction);
- Clean transportation (alternative fuels, public transport, hybrid and electric vehicles, car sharing, carpooling, and ride share programmes);
- Water management (water reclamation, greywater and rainwater systems, low-water landscaping, water purification, stormwater management);
- Waste management (recycling, municipal solid waste salvage, brownfield land remediation, superfund cleanup, sustainable packaging); and
- Land management (organic agriculture, habitat conservation and restoration; urban forestry and parks, reforestation and afforestation, and soil stabilization).

According to European Climate Forum [18] green growth will make the difference against business as usual with mutually reinforcing investments – in education, health, entertainment, housing, transport, and much more. The question is whether in the coming decade Europe will accept the challenge of increasing economic growth while reducing both unemployment and greenhouse gas emissions. Some model results show that these three goals can actually reinforce one another. Under the given assumptions, over the coming decade raising the EU's climate target from 20% to 30% can foster the following outcomes:

- increase the growth rate of the European economy by up 0.6% per year
- create up to 6 million additional jobs Europe-wide
- boost European investments from 18% to up to 22% of GDP in 2020

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<sup>2</sup> <http://www.unep.org/greeneconomy/AboutGEI/WhatIsGEI/tabid/29784/Default.aspx>

- increase European GDP in 2020 by \$2004842 bn.

### **3. Measuring green growth**

The EU's new strategy for sustainable growth and jobs, called 'Europe 2020', comes in the midst of the worst economic crisis and replaces the Lisbon Agenda, adopted in 2000, which largely failed to turn the EU into "the world's most dynamic knowledge-based economy by 2010". The new agenda puts innovation and green growth at the heart of its blueprint for competitiveness and proposes tighter monitoring of national reform programmes, one of the greatest weaknesses of the Lisbon Strategy. The new strategy defines five 'headline targets' that would need to be adapted at national level in order to reflect national differences:

1. Raising the employment rate of the population aged 20-64 from the current 69% to 75%.
2. Raising the investment in R&D to 3% of the EU's GDP.
3. Meeting the EU's climate change and energy objective for 2020 to cut greenhouse gas emission by 20% and source 20% of its energy needs from renewable sources.
4. Reducing the share of early school leavers from the current 15% to under 10% and making sure that at least 40% of youngsters have a degree or diploma.
5. Reducing the number of Europeans living below the poverty line by 25%, lifting 20 million out of poverty from the current 80 million.

Green growth obviously has several dimensions; by its very nature, such a process is not easily captured by a single indicator, therefore a small set of measures will be needed. The ambition is pragmatic: green growth indicators are seen as markers or milestones on a path of greening growth and of seizing new economic opportunities.

The work on statistics for the green economy should be build on existing environmental initiatives such as the EU Sustainable Development Strategy and related SD Indicators, Strategy Europe 2020, activities which follow the work of the Measuring Progress of Societies, Beyond GDP effort etc. OECD (Towards Green Growth: Monitoring Progress. OECD Indicators) has used a practical and pragmatic way of integrating economic and environmental policies by developing a framework, definitions and comparable data to measure progress towards green growth. The main purpose of the conceptual framework is to organise thinking about indicators and to identify relevant, succinct and measurable statistics. The framework is not an alternative to international guidelines on which the underlying data series should be based, in particular the System of Integrated Environmental and Economic Accounting (SEEA) [19]. Rather the conceptual framework has to build on definitions and accounting conventions such as those provided by the SEEA.

### 3.1. Measuring green growth in the Czech Republic

There is neither one common prescription for implementing strategies for green growth, nor for its monitoring. To trace the development of the Czech economy towards green growth [21], we have adopted the OECD indicator framework. In order to capture not only the economic and environmental link, but also the social dimension, the report “Green Growth in the Czech Republic” structures the selected indicators into five interrelated groups of indicators:

- Sustainability and equity;
- Environmental and resource productivity;
- Natural asset base;
- Environmental quality of life;
- Policy responses and economic opportunities.

Figure 1: Conceptual scheme of green growth monitoring

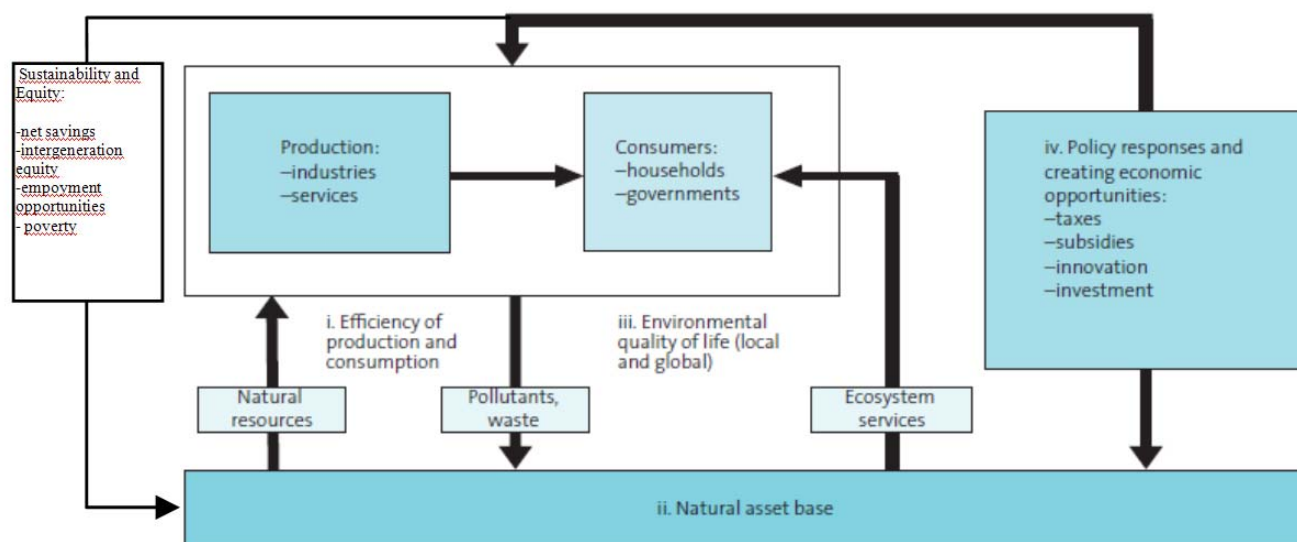


Figure 1 shows how these groups of indicators interrelate. Economic production and growth depend on the environment for inputs of natural resources such as energy, water and basic materials, but also use it as a sink for outputs in the form of waste and emissions. Therefore, environmental efficiency is a central consideration of green growth. In addition to monitoring the relationship between the environmental burden and economic growth, it is equally important to ensure that the burden does not exceed nature’s carrying capacity, to prevent irreversible quality losses of natural assets. It is in the interest of an economy’s long-term stability to ensure it retains a healthy balance with its natural resource base. The natural asset base is monitored by way of stocks and flows of both renewable and non-renewable assets. As well as being a provider of resources and an absorber

of pollution, the environment also provides ecosystem services such as recreation. Also, a less polluted local environment leads to a healthier population. There is thus a direct link between the environment and the population's quality of life. A shift to green growth not only requires policy responses, it also opens up new opportunities. Governments can choose between several policy instruments such as taxes, subsidies and regulation to steer development in a preferred direction. These measures also have potential to create new opportunities for economic activities that may generate new jobs and stimulate economic growth. Finally, green growth strategies need to pay specific attention to many of the social issues and equity concerns that can arise as a direct result of greening the economy – both at the national and international level.

The OECD has identified thirty indicators to monitor green growth [20]. The current Czech study has selected 27 of these based on relevance for the Czech situation and data availability. Most indicators are derived from the data and indicators systems of the Czech Statistical Office while other indicators come from a variety of sources. The following table sums up the main results.

Indicator name	Evaluation of trend	International comparison
<b>I. Sustainability and equity</b>		
Genuine savings (Adjusted net savings)	+/-	+/-
Employment rate of older workers:		
- men	-	+/-
- women	+	-
At-risk-of-poverty rate by gender	+/-	+
Age index and dependency index		
- Old age index	-	+/-
- Economic dependency index	+	+
<b>II. Environmental and resource productivity</b>		
Production-based greenhouse gas productivity	+	-
Consumption-based greenhouse gas emissions	+/-	+
Energy productivity	+	-
Renewable energy sources	+	+/-
Material productivity	+	-
Waste treatment	+	+
Nutrient balances and agricultural output		
- nitrogen	+/-	-
- phosphorus	+	+
Water use productivity	+	+
<b>III. Natural asset base</b>		
Coal extraction and reserves	-	n.a.
Forest growing stock volume	+	+
Renewable water resources	+/-	+
Structure of land cover change		
- Urban areas and infrastructure	-	+/-
- Agricultural land, pastures and meadows	+	+
- Semi-natural habitats	-	+/-
Wild bird index		
- All common birds	-	+/-



- Farmland birds	-	+/-
- Forest birds	+	+/-
<b>IV. Environmental quality of life</b>		
Health risks from air pollution		
- population exposed to PM <sub>10</sub>	+/-	n.a.
- population exposed to NO <sub>2</sub>	+/-	n.a.
Life expectancy at birth		
- life expectancy (men and women)	+	-
- healthy life expectancy (men and women)	+/-	-
Population connected to sewage treatment and public water supply		
- sewerage water connection	+	-
- public water supply	+	+
<b>V. Economic opportunities and policy responses</b>		
Educational attainment: population over 15 years		
- upper secondary	+	+
- tertiary	+	-
Green patents: Share of Clean energy technologies (CET)	n.a.	-
Green jobs	+/-	+/-
Environmental protection expenditure:		
- Environmental protection investment	+/-	n.a.
Environmental non-investment expenditure	+	n.a.
Share of environmental taxes	+/-	+/-
Expenditures on technological R&D	+	-
Energy prices: Electricity and heat	-	n.a.

Note:

+ refers to positive trend (approximation to goals); values at the level of leading states

+/- refers to variable or stable values, but without development in the direction of goals; values at the average level of comparable states

- refers to negative trend (distant from goals); values close to the last states

#### 4. Conclusions

The Czech economy has been developing and growing over the past two decades. National policies recognize however that economic growth has also had harmful side effects. The impacts of a fossil fuel-based economy and the subsequent exploitation of natural resources, which enable economic growth, may be critical limits to the growth in future. Recognizing these new challenges, the Czech Republic adopted the Strategy for Sustainable Development in 2004. The Strategy defines the principal (strategic) goals, as well as partial goals and instruments, formulated so as to eliminate imbalances in relations between the economic, environmental and social pillars of sustainability. They are designed to achieve the best attainable quality of life for the present generation and create conditions for a high quality of life for future generations. The recently updated Strategy (called Strategic Framework for Sustainable Development in the Czech Republic) defines five priorities:

- Society, people and health;
- The economy and innovation;
- Regional development;
- Landscape, ecosystems and biodiversity;

- A stable and secure society.

The Strategy does not explicitly contain the green growth concept although that and sustainable development interrelate. A sustainable economy is based on an increase in income, employment, public health and a secure society, which is driven by investments and innovations reducing carbon emissions and pollution, whereby enhancing resource efficiency, and preserving biodiversity and ecosystem services. Thus, this conception is fully in compliance with the conclusions of the Ministerial Council Meeting of the OECD which committed itself to a green growth strategy in 2009, as well as to other concepts (e.g. UNEP's Green Economy).

According to the OECD, green growth means fostering economic growth and development, while ensuring that natural assets continue to provide their sources and environmental services on which our well-being relies. Thus green growth has the potential to address economic and environmental challenges while simultaneously paying specific attention to many of the social issues and equity concerns that can arise as a direct result of greening the economy. The necessity to consider economic, environmental, and social aspects leads directly to sustainable development that provides an important context for green growth. Thus green growth has not been conceived as a replacement for sustainable development, but rather should be considered as a subset of it. In practical terms, green growth is an engine for the green economy (more commonly called sustainable economy in the Czech Republic).

## 5. Literature

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