

# Monitoring green growth in the Netherlands - Best practices for a broader international scale

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## Abstract

Green growth captures the relations between the economy, environment and its effect on the general quality of life. It also measures the policy tools needed to guide the transition towards a greener economical growth model and economic opportunities that arise during this transition. Green growth can be perceived as a path towards a sustainable development. Most of the Dutch green growth indicators are readily available from the current statistical programme. They predominantly come from the system of economic and environmental accounting (SEEA), environment statistics, and innovation and technology statistics. The notion of greening the economy receives great interest on several levels, e.g. international institutions, national policy makers and the general public. Therefore, Statistics Netherlands communicates green growth using several media, such as hard-copy publications, but also interactive infographics on the internet.

## 1. **Introduction**

Economic growth brings benefits, such as welfare, but also some unwanted side effects. There are multiple reasons to look at the nexus of the environment and economy. Non-renewable resources such as fossil fuels and some metals are becoming increasingly scarce, and renewable stocks, such as fish, are vulnerable to over-exploitation. This might hamper future growth. In addition, there is substantial scientific evidence that the quality of our environment degrades to a critical level. Global boundaries such as the concentration of greenhouse gasses in the atmosphere, water extraction and biodiversity losses have exceeded their tipping points [1,2]. There is increasing international acknowledgement that action is required [3-6].

As a result of these concerns, the notion of ‘greening the economy’ is receiving more and more attention from policy and decision makers. Green economy was one of the central themes on the Rio+20 conference in June 2012. According the declaration of Rio+20, “a green economy in the context of sustainable development and poverty eradication is considered as one of the important tools available for obtaining sustainable development” [5, par. 56]. Consequently, a sound measurement framework is required to guide policy decisions and to evaluate current policies with respect to greening growth. This poses several challenges on the statistical community with regard to definition and delineation, monitoring framework, indicator selection, data availability, international comparability, and dissemination.

In this paper, we report on the national experiences in measuring green growth in the Netherlands. First the main concepts of green growth/ green economy are discussed and how these relate and differ from the concepts of sustainable development. Next, the main data sources and some practical considerations related to the selection and interpretation of indicators for green growth for the Netherlands is discussed. Finally, we will present how the results are disseminated.

## 2. **How to measure green growth**

### 2.1 *What is green growth?*

The concept of “greening the economy” is still relatively new. Recently, there have been two important initiatives that have focused on the economical and ecological nexus of sustainability,

namely the green growth strategy of the OECD [6] and green economy of UNEP [7]. Although both initiatives broadly encompass the same topics, there are some conceptual differences.

According to the definition formulated by the OECD [6], green growth is about fostering economic growth and development while ensuring that the quality and quantity of natural assets can continue to provide the environmental services on which our well-being relies. It is also about fostering investment, competition and innovation which will underpin sustained growth and give rise to new economic opportunities. Based on this definition, the OECD has also developed an underlying measurement framework for green growth [8].

UNEP defines a green economy as one that results in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities” [7]. In a green economy, growth in income and employment are 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. The main difference between the OECD green growth initiative and UNEP’s green economy is that UNEP also specifically addresses the social dimension by looking specifically at poverty reduction and social equity, while the OECD informs policy makers for developing economies specifically via the green growth initiative [9].

The green economy initiative of UNEP lacks at this moment an underlying measurement framework. For this reason, Statistics Netherlands has chosen to use the OECD framework to measure green growth. However, we acknowledge that in the future the social dimension may also be added to the green growth framework.

## 2.2 *Conceptual framework for Green Growth*

According to the measurement framework for green growth of the OECD, the indicators are grouped into four themes: environmental and resource productivity of the economy, the natural asset base, the environmental quality of life and policy responses and economic opportunities [8].

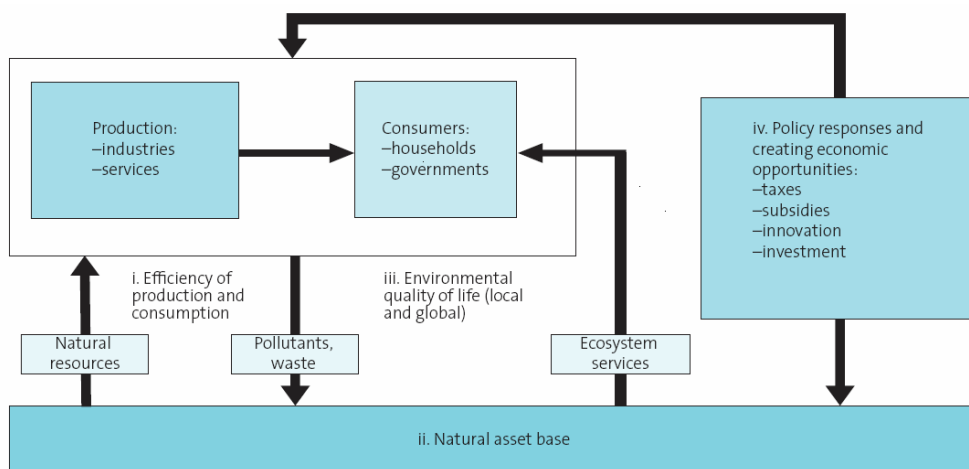
Figure 1 shows how these groups of indicators interrelate. Economic production needs natural resources from the environment, such as energy, water, biomass, ores and other resources. The environment is also used as a sink to absorb emissions and waste. Therefore, *environmental efficiency (for instance greenhouse gas emissions / economic growth)* and its evolution over time are central measures of green growth. Due to globalizing supply chains, ‘footprint’ type

indicators are essential to capture the worldwide environmental pressure resulting from national consumption requirements.

Next, it is just as important to determine whether the environmental pressure does not lead to irreversible damages. This is measured in the natural asset base, preferable in terms of quantity and quality of the stocks. The natural asset base is monitored by evaluation the stocks of the natural resources that are directly used for economic activities, including renewable assets, like timber, and non-renewable assets such as fossil energy reserves. In addition, also ecosystem related indicators are included. Due to the complexity to measure services that eco-systems provide to the economy, only indirect parameters are measured, such as land use changes and changes in biodiversity. The link between the environment and the population's *quality of life* is captured in the third set of indicators, and deals primarily on local environmental issues such as population exposure to pollution.

The shift to green growth requires different policy responses dependant on the specific country's circumstances. In general, governments can choose between several policy instruments such as taxes, subsidies and regulations. Finally, the transition towards a green growth also creates new opportunities economic activities that may generate new jobs and stimulate economic growth. These last two aspects are measured by indicators for policy responses and economic opportunities.

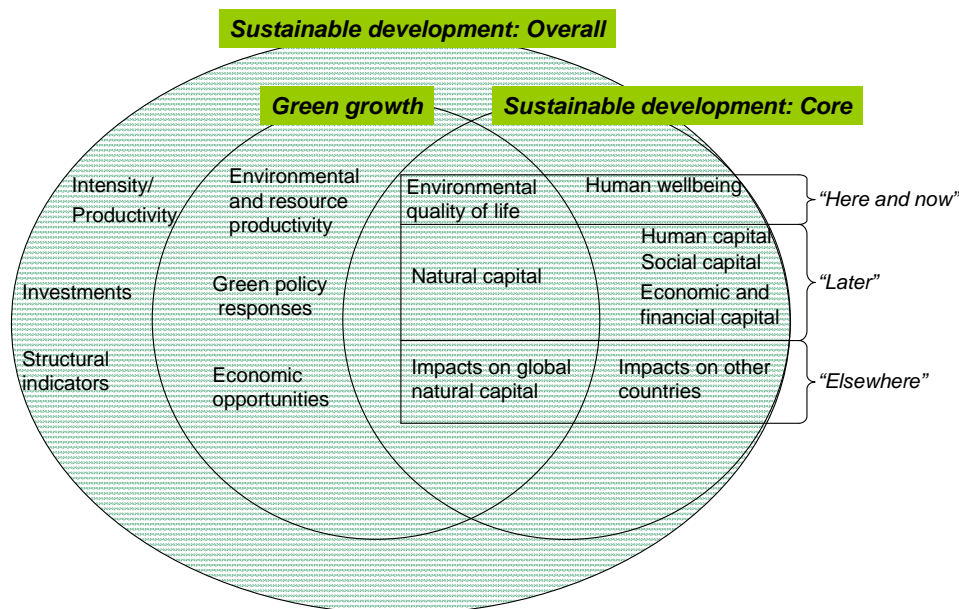
Figure 1. Conceptual scheme of green growth indicators [10].



### 2.3 Green growth in relation to sustainable development

Sustainable development and green growth / economy are sometimes regarded to be the same. Although their goal may be similar, namely preserving sufficient natural resources and protecting the environment for future generations, there are some clear differences. The main point is that the core of sustainable development, i.e. the pursuit of welfare, now and in the future, and green growth partially overlap on the green aspects, namely with respect to environmental quality of life, natural capital and impacts on global natural capital (see Figure 2). Both measurement frameworks also specifically focus on certain issues that are not addressed by the other, namely general human well being, human and social capital for the core of sustainable development, and environmental and resource productivity, green policy responses and economic opportunities for green growth.. In an overarching view, green growth and the core measurement of sustainable development are conceptually not conflicting and can be regarded to be part of the broader domain of sustainability, as is illustrated in Figure 2.

Figure 2: Simplified representation showing the relation between green growth and sustainable development.



### **3. Monitoring green growth in the Netherlands**

In the Netherlands, green growth is high on the policy agenda. The Dutch government wants to make society more sustainable and simultaneously strengthen the economy [11]. Greening the economy is not a threat but may offer entrepreneurs growth opportunities. By implementing sustainable solutions, Dutch companies may increase human well being and strengthen their competitive position. In order to monitor and evaluate its policies, the Dutch government has asked Statistics Netherlands to develop monitoring frameworks for in the area of sustainability and green growth.

Since a couple of years, Statistics Netherlands publishes in cooperation with several national assessment agencies the sustainability monitor [12]. In addition, in May 2011 Statistics Netherlands published its first Green growth report [10]. This report presented an overview of the state of green growth in the Netherlands, using the indicator framework as developed by the OECD [8]. In 2012, the indicator set was revised and an infographic was been developed for the website of Statistics Netherlands to disseminate the results for green growth.

#### *3.1 Data sources*

Data sources for the Dutch green growth indicators originate from several different data sources. Many indicators are derived from the System of Environmental-Economic Accounting (SEEA) which provides a good measurement framework for green growth, as it integrates economic and environmental statistics [13]. Particularly indicators for environmental efficiency, policy instruments and economic opportunities can be derived from SEEA. Other indicators come from a variety of statistics, including environmental statistics, energy statistics, and innovation and technology statistics. Only a few indicators are obtained from sources outside Statistics Netherlands.

Data for international benchmarking was derived from a number of sources, of which the OECD and Eurostat were the most important. It was found that at this moment, for a lot of indicators international harmonized data is not available. Implementation of SEEA and further harmonization of basic statistics on a more global scale may contribute to improve comparability of the indicators for green growth.

### 3.2 *Indicator selection*

The point of departure for the Dutch green growth indicator framework is the list developed by the OECD [8]. In 2012 a revised set of 35 indicators was selected (see annex 1), based on the following criteria :

*A) Relevance for the Dutch situation.* Not all indicators from the OECD list are relevant for the Dutch situation. For instance, the OECD indicator access to sewage treatment and sanitation is not relevant for the Netherlands, as all households have access to these amenities. Accordingly, this indicator was omitted. In addition, some indicators are added to the list, while they are absent on the OECD list. They were assessed as highly relevant for the Netherlands, for example indicators on water quality.

*B) Coverage.* All themes of green growth must be covered sufficiently by indicators. Particularly, a number of new indicators have been sought for the third theme of environmental quality of life.

*C) Interpretability.* Indicators should be clearly interpretable in relation to green growth.

*D) Data quality.* Indicators should meet the general standards for quality, namely analytical soundness and measurability.

*E) Consistency with other indicator sets.* Where possible, consistency with indicators of the Dutch Sustainability Monitor should be achieved.

### 3.3 *Scoring of the indicators*

An important aspect of measuring green growth is the assessment of the indicators. The scores are based on their evaluation of their trends with regard to greening growth. It is important to stress that these scores do not convey the speed of greening economical growth. For example, in case the share of renewable energy rises or the recycling percentage of waste increases, it is scored as “green”. If the trend is neutral, such as a stable exposure to air pollution, the indicator is assessed as yellow. If the trend deteriorates, such as a declining biodiversity or decreasing energy reserves, the indicator is assessed to be red.

In the Dutch publication on green growth in 2011, the themes were also evaluated with respect to policy goals [10]. The outcomes of those policy assessments were published by the national

environmental assessment agency for some indicators. This provided more insight on greening growth, such that the trend may look good, but policy targets are not reached. It also shows areas where policy targets could potentially be formulated.

The scores for environmental efficiency indicators are based on the relation between environmental pressure and the economic growth. When the economic growth is higher than the increase of the environmental indicator in a given period, it is called decoupling. Decoupling can be either absolute or relative. Absolute decoupling occurs when the environmentally relevant variable is stable or decreasing and has been assigned a positive score. Decoupling is said to be relative when the growth rate of the environmentally relevant variable is positive, but less than the growth rate of the economic variable. Relative decoupling is assigned a neutral score. No decoupling is scored as negative.

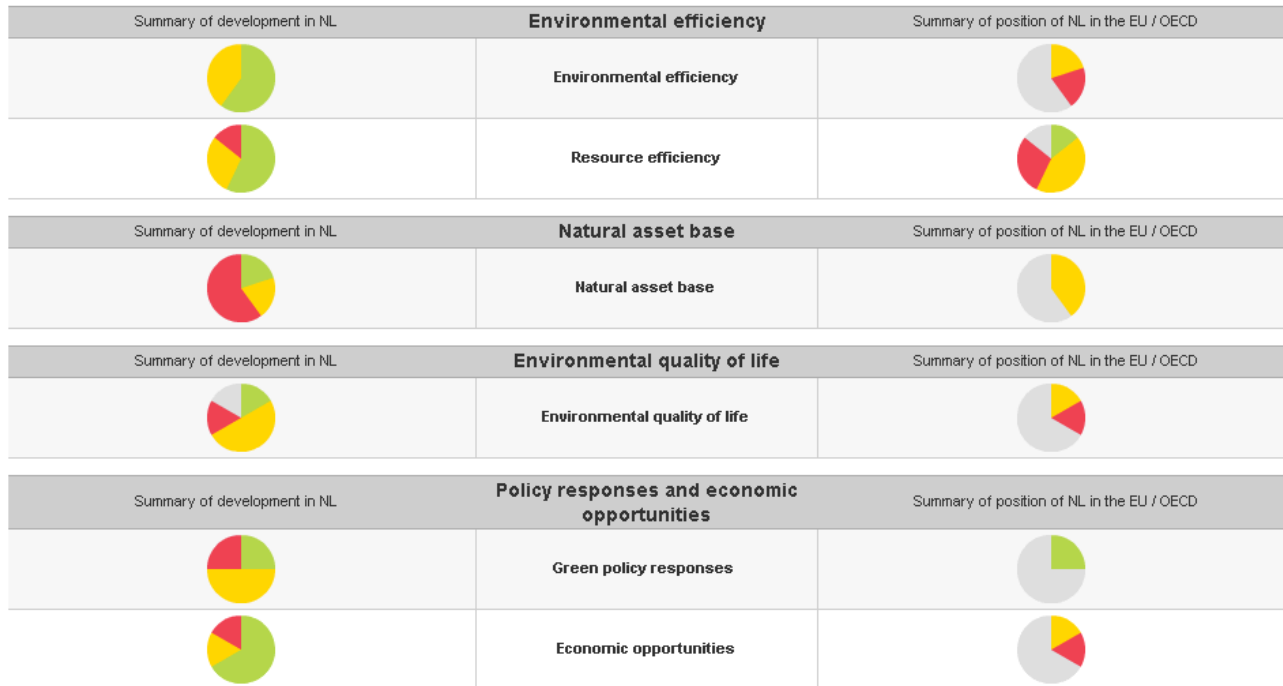
### *3.4 Dissemination*

Dissemination and publication of the green growth indicators is very important. In addition to the report on green growth that was published in 2011, Statistics Netherlands has developed an interactive infographic in 2012 to inform policy makers but also the general public on the status of green growth in the Netherlands [14]. This infographic is an interactive tool which enables the user to find the detailed information that is required.

The infographic consists of two parts (Figure 3). In the left column the infographic illustrates the development of green growth using a number of indicators presented in four dashboards which represent the four themes of green growth (environmental efficiency, the natural asset base, the environmental quality of life and policy responses and economic opportunities). The circles illustrate the trends on the basis of the indicators of the theme to which they belong. Red means the trend is negative, yellow means neutral, green indicates a positive development. By clicking on the themes the user can show the graphs of individual indicators for that theme, view the actual data of the indicators and read some background information related to the green growth and the interpretation of the indicators. For some indicators information on industries is available, which can also be shown. In the right column the indicators are compared for different countries from the OECD (international benchmarking). Here, the Netherlands is scored with respect to the other countries. Indicators are scored grey when no data is (yet) available.



Figure 3: Dutch infographic on green growth



#### 4. Conclusions

The idea of ‘greening the economy’ lately has received a lot of interest of policy makers, both on a national and international level. Globalisation influences many economic and social aspects of our society, which in turn influence the pressures that are exerted on environmental systems. Greening the economy thus is important not only on a national but also on an international scale. A sound measurement framework is needed for effective policy making. The conceptual framework for green growth developed by the OECD is an excellent starting point both for NSO’s to build their own national green growth monitoring systems as well as for international benchmarking.

However, there are still some statistical challenges with respect to definition, data availability and indicator interpretation. Conceptually, green growth is in correspondence with sustainable development. Both also acknowledge similar threads to society. Despite this, there are some different aspects. Most notably, green growth focuses on the nexus of the environment and economy and addresses specifically green policy indicators and economic opportunities that arise from green growth. Accordingly, both monitoring frameworks can be compiled, but it is very

important to communicate the differences. Green growth can be monitored using statistical information that is generally available from existing sources. Limited data availability on an international level makes international benchmarking very difficult. The further implementation of SEEA and further expansion and harmonization of basic statistics would be an important step in that direction.

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**Annex 1: List of indicators for the Dutch green growth framework. The OECD indicators refer to the list of OECD green growth indicators [8].**

<b>Green growth themes</b>	<b>Indicators</b>	<b>OECD indicator</b>
	<b>1.1 Environmental intensity (efficiency)</b>	
	1 Production based GHG	1.1
	2 Consumption-based GHG emissions	1.2
	3 Emissions heavy metals to water	-
	4 Nutrient surpluses agriculture	3.3
	5 Waste	3.2
<b>1.Environmental efficiency</b>	<b>1.2 Resource efficiency</b>	
	6 Net energy use	2.1 / 2.2
	7 Renewable energy	2.3
	8 Groundwater use	4
	9 Domestic metal consumption	3.1
	10 Domestic mineral consumption	3.2
	11 Domestic biomass consumption	3.3
	12 Waste recycling	3.2
	<b>2. Natural asset base</b>	
<b>2. Natural asset base</b>	13 Stocks of standing timber	7
	14 Stocks of fish	8
	15 Energy reserves	9
	16 Farm bird index	10
	17 Land conversion into built-up land	12
	<b>3. Environmental quality of life</b>	
<b>3. Environmental quality of life</b>	18 Urban exposure to particulates	13
	19 Chemical quality surfacewater	-
	20 Ecological quality surfacewater	-
	21 Nitrate concentration in groundwater	-
	22 Level of concern	-
	23 Willingness to pay	-
	<b>4.1 Green policy responses</b>	
<b>4. Policy responses and economic opportunities</b>	24 Share of green taxes	21
	25 Implicit tax rate for energy	(22)
	26 Environmental transfers / subsidies	24+
	27 Mitigation expenditure government	-
	28 Environmental expenditure	24+
	<b>4.2 Economic opportunities</b>	
	29 Green patents	17
	30 Government outlays for green R&D	16
	31 Environmental investments	24+
	32 Employment renewable energysector	(19)
	33 Employment (EGSS)	19.2
	34 Value added EGSS	19.1