National Bank of the Republic of North Macedonia

Financial Stability and Macroprudential Policy Department

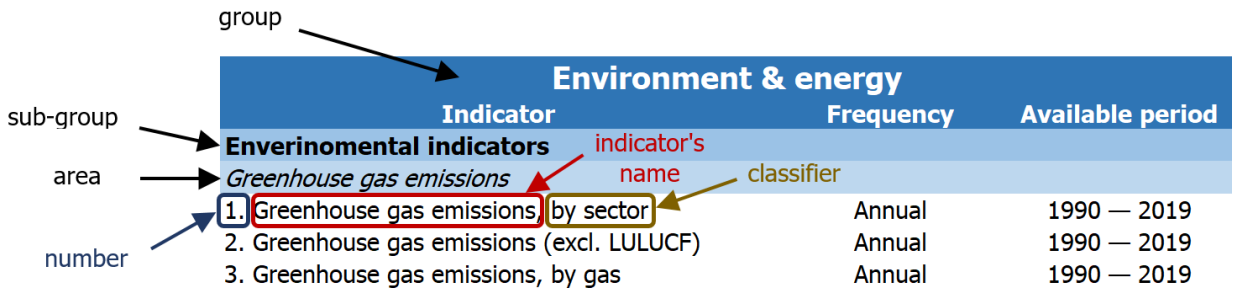
Methodological guide to the Green Dashboard

November 2024

1. Introduction

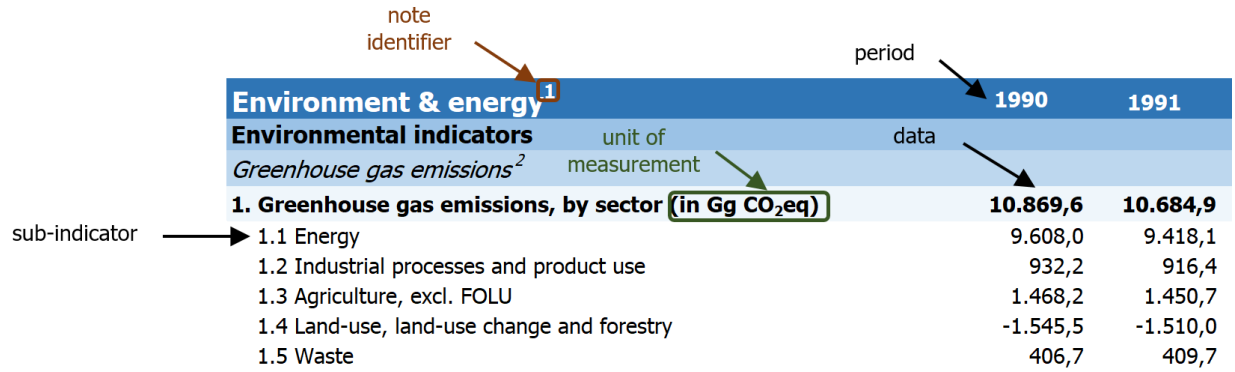
The Methodological guide to the Green Dashboard includes notes related to its content with the goal of correctly using the data for the indicators. The Dashboard consists of three group of indicators: 1) Environment & energy, 2) Climate risks and 3) Green finance.

The first sheet titled Outline of indicators contains a tabular overview of the indicators classified into groups, sub-groups and areas, as well as information on the frequency and the period for which data are available for each indicator. The description of each indicator contains a number, name and a classifier (if granular data for sub-indicators are available).



Environment & energy		
Indicator	**Frequency**	**Available period**
Enverinomental indicators		
Greenhouse gas emissions		
1. Greenhouse gas emissions, by sector	Annual	1990 — 2019
2. Greenhouse gas emissions (excl. LULUCF)	Annual	1990 — 2019
3. Greenhouse gas emissions, by gas	Annual	1990 — 2019

The sheets titled Environment & energy, Climate risks and Green finance present the data for the indicators divided into the three groups. The description of each indicator from the sheet titled Outline of indicators is expanded with a unit of measurement in brackets. Indicators for which granular data are available have sub-indicators that are enumerated with second-level numbers. Data for every indicator by period are shown in the same row as the description, beginning from the earliest and ending to the latest period for which data are available. At the end of the table, the data sources and notes that are cited from the note identifiers are listed.



Environment & energy [1]		1990	1991
Environmental indicators			
Greenhouse gas emissions [2]			
1. Greenhouse gas emissions, by sector	**(in Gg CO_2eq)**	**10.869,6**	**10.684,9**
1.1 Energy		9.608,0	9.418,1
1.2 Industrial processes and product use		932,2	916,4
1.3 Agriculture, excl. FOLU		1.468,2	1.450,7
1.4 Land-use, land-use change and forestry		-1.545,5	-1.510,0
1.5 Waste		406,7	409,7

The last sheet titled Abbreviations lists the abbreviations used in the Dashboard with respective interpretations, divided by chemical symbols, currencies, unit measures and other abbreviations.

2. Outline of indicators

Methodological notes on the more complex indicators from each group separately are given in turn.

2.1. Environment & energy

Indicators in the Environment & energy group are divided into three sub-groups: 1) Environmental indicators, 2) Energy indicators и 3) Other policy-related indicators

Environmental indicators

- *Greenhouse gas emissions*[1] represents the total amount of emitted greenhouse gases in the atmosphere on national level.

- *International trade in low carbon technology products* is the total value of traded low carbon technology products with other countries. Low carbon technology products[2] produce less pollution than their traditional energy counterparts, and plays a vital role in the transition to a low carbon economy. Low carbon technologies include mechanics like wind turbines, solar panels, biomass systems and carbon capture equipment.

Energy indicators[3]

- *Primary energy production* represents the total amount of produced energy on national level.

- *Net import of* energy is the difference between the imported and exported amounts of energy.

- *Primary renewable energy production* is the total amount of produced energy from renewable sources, which is the difference between the primary energy production and the primary energy production from solid fuels.

- *Gross national electricity consumption* is the sum of net electricity import and gross national electricity production.

- *Gross final consumption of energy* contains energy commodities delivered for energy purposes to final consumers, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission. For calculating the indicator with normalized values in gross final consumption of electricity, weighted values of generated hydropower are used in order to balance the effects from climatic variations.

- *Gross final consumption of energy from renewable sources* is calculated as the sum of: gross final consumption of electricity from renewable energy sources, gross final consumption of energy from renewable sources for heating and cooling; and gross final consumption of energy from renewable sources in transport.

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[1] Greenhouse gases shall be those gaseous constituents of the atmosphere, natural and anthropogenic (human-related), which absorb and emit radiation at certain wavelengths within the spectrum of thermal infrared radiation emitted from the Earth's surface, from the atmosphere and from the clouds. This radiation causes a "greenhouse" effect. The main greenhouse gases in the Earth's atmosphere are: water vapour (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4) and ozone (O_3).

[2] Definition was taken from the International Monetary Fund.

[3] Definitions were taken from the State Statistical Office.

- *Energy dependency* is produced as ratio between the net-import of energy and the gross inland consumption[4].

- *Energy intensity* represents the ratio between the gross inland consumption of energy and the gross domestic product (GDP) in euros with reference year 2005.

- *Electricity price* includes the energy and supply costs, transmission costs and distribution costs. Energy and supply costs include: price of procurement of electricity in the country or from import, supplied energy costs, costs for organisation and management of the electricity market, balancing energy costs and other supply costs.

- *Natural gas price* includes the energy and supply costs, transmission costs and distribution costs. Energy and supply costs include: price of procurement of natural gas in the country or from import, supplied energy costs and other supply costs.

Other policy-related indicators

- *Environmental taxes* include energy taxes, transport taxes, pollution taxes and resource taxes. Value added tax is excluded from the calculations.

    - Energy taxes (including motor fuel) include taxes on energy production and on energy commodities that are used for stationary or transport purposes. Taxes on bio-fuel and other energy forms from renewable sources are included under this category, as well as taxes on energy commodities stocks.

    - Transport taxes (excluding motor fuel) include mainly taxes concerning ownership and use of motor vehicles. This category also includes taxes on other transport means (e.g. aircraft, boats and ships, etc.) and transport services. A large part of the taxes are one-off taxes on imports, sales of transport equipment, etc.

    - Pollution taxes include taxes on measured/estimated emissions to air and to water, solid waste management, noise, etc. Excluded from this category is CO2 emission tax, which is covered by the category Energy taxes.

    - Resource taxes include taxes on extraction/exploitation of natural resources (water, forests, wildlife) that lead to depreciation of natural capital.

- *Fossil fuel subsidies*[2] are intended to protect consumers by keeping prices low. They are decomposed into explicit and implicit subsidies.

    - Explicit subsidies occur when the retail price is below a fuel's supply cost. For a non-tradable product (e.g. electricity), the supply cost is the domestic production cost, inclusive of any costs to deliver the energy to the consumer, such as distribution costs and margins. In contrast, for an internationally tradable product (e.g. oil), the supply cost is the opportunity cost of consuming the product domestically rather than selling

[4] Gross inland consumption is the quantity of energy consumed in the country and represents a sum of total primary production, net import and stock changes.

it abroad plus any costs to deliver the energy to the consumer. Explicit subsidies also include direct support to producers, such as accelerated depreciation, but these are relatively small.

– Implicit subsidies occur when the retail price fails to include external costs, inclusive of the standard consumption tax. External costs include contributions to climate change through greenhouse gas emissions, local health damages (primarily premature deaths) through the release of harmful local pollutants like fine particulates, and traffic congestion and accident externalities associated with the use of road fuels. Getting energy prices right involves reflecting these adverse effects on society in prices and applying general consumption taxes when fuels are consumed by households.

2.2. Climate risks

Indicators in the Climate risks group are divided into three sub-groups: 1) Climate risk-related indicators in the financial sector, 2) Climate change adaptation indicators and 3) Other climate-related indicators.

Climate risk-related indicators in the financial sector

– *Bank exposure to physical risk* represents the bank credit exposure on loans to individuals and companies, loans to individuals and companies that are collateralised with a real estate, and the number of bank operating units by regions.

– *Bank exposure to transition risk* represents the bank credit exposure on loans to companies in the Climate Policy Relevant Sectors.

Climate change adaptation indicators

– *INFORM Risk Index*[5] is a composite indicator that consists of a multitude of factors contributing to the risk for humanitarian crises and disasters. The index includes three dimensions: Hazard & Exposure, Vulnerability and Lack of coping capacity. Index value ranges on a scale from 0 (lowest degree of risk) to 10 (highest degree of risk). *Climate-driven INFORM Risk* is an adaptation of the INFORM Risk Index, adjusted by International Monetary Fund staff to distill and centralize on climate-driven risks.

– *ND-GAIN Index*[6] is a composite indicator that consists of more than 40 individual indicators to measure climate change adaptation. The index includes two dimensions: Vulnerability and Readiness. Index value ranges on a scale from 0 (lowest vulnerability/lowest readiness) to 1 (highest vulnerability/highest readiness).

Other climate-related indicators

[5] More details on the methodology for the index can be found in the methodological guide available in *INFORM Index for Risk Management: Concept and Methodology Version 2017* on the official website of the index.
[6] More details on the methodology for the index can be found in *University of Notre Dame Global Adaptation Initiative: Country Index Technical Report*.

– *Annual surface temperature change* represents the estimated change measured with respect to the average for the period 1951–1980.

– *Climate-related disasters frequency* indicates the number of occurrences of different types of natural disasters.

2.3. Green finance

Indicators in the Green finance group are divided into two sub-groups: 1) Green bond issuance and 2) Bank green loans and borrowings

Green bond issuance

– *Green bond issuance* represents the total nominal amount of green bonds issued on the primary market.

Bank green loans and borrowings

– *Green loan*[7] is a loan that is intended to improve the energy efficiency of the households and the corporate sector; loans for support of the investments in green technologies, materials and solutions; loans for support of investments in renewable energy sources, control and prevention of pollution, protection of the environment, mitigation of climate-related risks, etc.

3. Data sources

Data for the indicators are obtained from multiple sources (see Table 1).

Table 1 Overview of indicators by sources from which the data are obtained

Source	Indicator
Ministry of Environment and Physical Planning	1. Greenhouse gas emissions, by sector 2. Greenhouse gas emissions (excl. LULUCF) 3. Greenhouse gas emissions, by gas
United Nations Comtrade database	4. Total international trade in low carbon technology products, by trade flow 5. Share of exports in low carbon technology products in total export 6. Share of imports in low carbon technology products in total imports
Food and Agriculture Organization of the United Nations	7. CO_2 stocks in forests 11. Forest area 12. Share of forest area in total land area
State Statistical Office	8. Primary energy production, by source 9. Net import of energy, by source 10. Primary renewable energy production, by source 11. Share of electricity from renewable sources in total electricity production 12. Final national energy consumption in households per capita

[7] Definition was taken from the Decision on the methodology for credit risk management (Official Gazette of the Republic of North Macedonia No. 57/23).

	13. Final national electricity consumption in households per capita 14. Gross national electricity consumption per capita 15. Share of renewable energy in gross final energy consumption 16. Share of electricity from renewable sources in gross national electricity consumption 17. Energy dependency on all products 18. Energy dependency on solid fuels 19. Energy intensity 20. Electricity prices for household consumers (incl. VAT) 21. Electricity prices for non-household consumers (incl. VAT) 22. Natural gas prices for household consumers (incl. VAT) 23. Natural gas prices for non-household consumers (incl. VAT) 24. Tax revenues from environmental taxes
International Monetary Fund	25. Fuel subsidies, by source 8. INFORM Climate Change Risk Index, by dimensions 10. Annual surface temperature change
Credit Registry	1. Bank credit risk exposure to individuals, by region 2. Bank loans to individuals collateralized with real estate, by region of collateral 3. Bank credit exposure to companies, by region 4. Bank loans to companies collateralized with real estate, by region of collateral 6. Bank credit exposure to companies in Climate Policy Relevant Sectors
National Bank on the basis of data submitted by commercial banks and other sources	5. Number of bank operating units, by region 10. Share of green portfolio in N. Macedonia in total FX reserve portfolio 11. Bank green loans, by type of client 12. Green loans by large banks, by type of client 13. Green loans by medium-sized banks, by type of client 14. Green loans by small banks, by type of client 15. Share of bank green loans in total bank loans 16. Bank green borrowings, by bank size 17. Share of bank green borrowings in total bank borrowings
The International Disaster Database EM-DAT	7. Climate-related disasters frequency, by type of disaster
University of Notre Dame	9. ND-GAIN Index, by dimensions
Climate Bond Initiative	1. Green bond issuance in the world, by type of issuer 2. Green bond issuance in the world, by UoP 3. Green bond issuance in the world, by currency 4. Green bond issuance in Europe, by type of issuer 5. Green bond issuance in Europe, by UoP 6. Green bond issuance in Europe, by currency
Ministry of Finance and other bond issuers	7. Green bond issuance in N. Macedonia, by type of issuer 8. Green bond issuance in N. Macedonia, by currency 9. Share of green bond issuance in N. Macedonia in total bond issuance

4. Missing data

Cells for periods with missing data contain a dash sign ("-") or are left blank if the period is earlier than the earliest period with available data.

Environment & energy[1]	2020	2021	2022
Environmental indicators			
Greenhouse gas emissions[2]			
1. Greenhouse gas emissions, by sector (in Gg CO_2eq)	-	-	-
1.1 Energy	-	-	-
1.2 Industrial processes and product use	-	-	-
1.3 Agriculture, excl. FOLU	-	-	-
1.4 Land-use, land-use change and forestry	-	-	-
1.5 Waste	-	-	-

5. Updating data

Given that newest data on indicators from different groups are published in a different time period, the Green Dashboard is updated twice a year:

- a spring update will be made every May with data for the previous year on the indicators from the Climate risks and Green finance groups; and
- an autumn update will be made every November with data for the previous year on the indicators from the Environment & energy group.

6. Data revision

Time series data for the indicators are subject to regular revision for the most recent years.