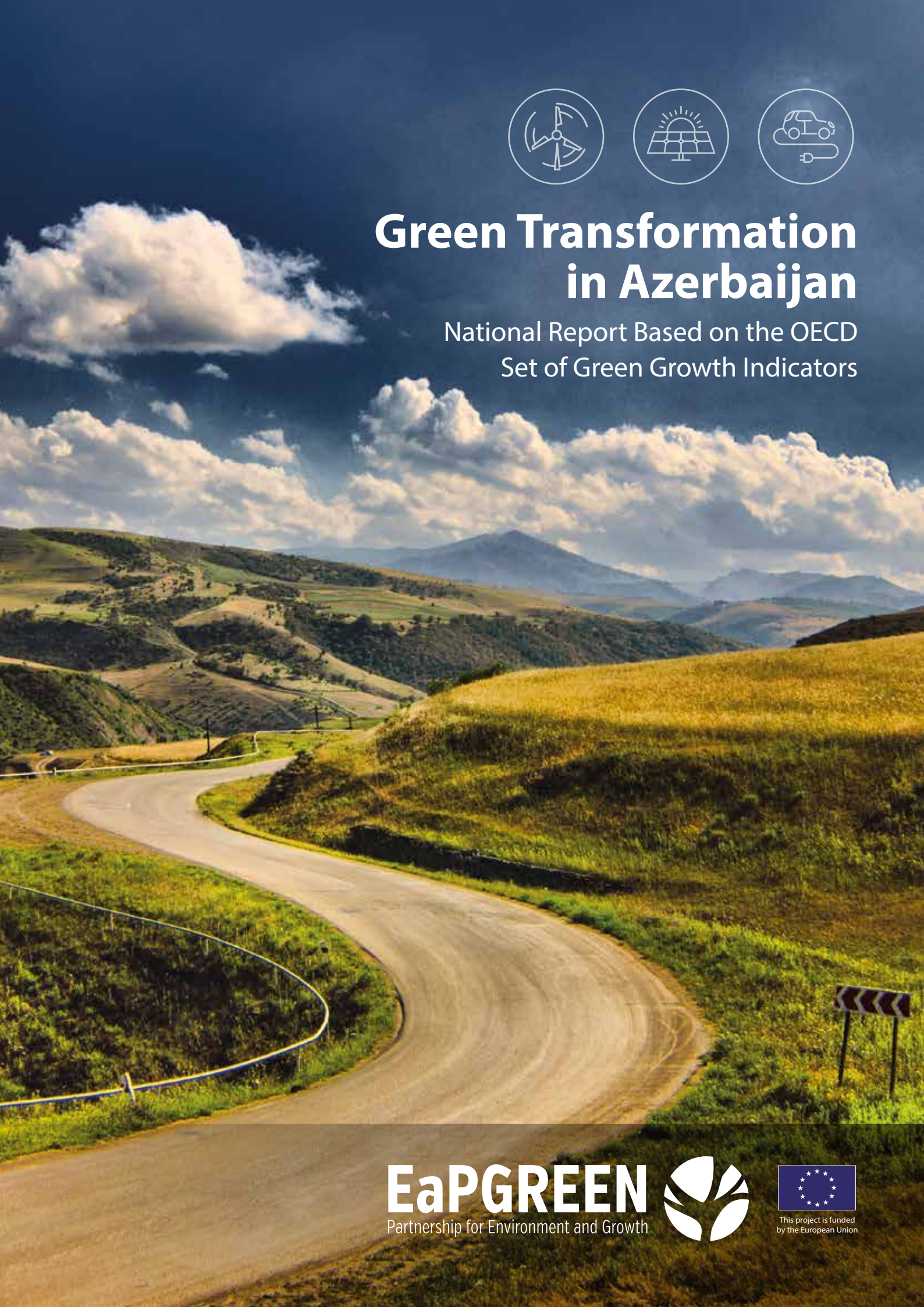

Green Transformation in Azerbaijan

National Report Based on the OECD Set of Green Growth Indicators

EaPGREEN
Partnership for Environment and Growth

This project is funded by the European Union

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OECD
BETTER POLICIES FOR BETTER LIVES

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UN environment

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Foreword

Azerbaijan is in the process of redefining its medium-term development strategy by supporting private sector development and improving the enabling environment. In December 2016, it launched a strategic roadmap for development of the national economy and 11 key sectors, with medium and long-term goals for reforms and sustainable development. Several policy documents setting ambitious targets and creating a framework to encourage investment in low-carbon, climate-resilient development were elaborated.

Responding to a need for appropriate indicators to monitor progress in meeting commitments and ambitious policy targets, a workshop on green growth indicators (GGIs) was organised on 19 May 2016 in Baku to discuss the current progress in greening the economy and the relevance of establishing a green growth measurement framework in Azerbaijan. The participants included representatives from the Ministry of Economy, Ministry of Ecology and Natural Resources and the State Statistical Committee, agreed to proceed with the creation of a working group on GGIs to further define and implement GGIs in the country.

In November 2016, an inter-agency working group was established by the Ministry of Economy. It consisted of representatives from the Ministry of Economy, the State Committee of Statistics, Ministry of Ecology and Natural Resources, State Agency for Renewable and Alternative Energy, State Oil Company of Azerbaijan Republic (SOCAR), Clean City JSC, Ministry of Health, Azerbaijan National Academy of Sciences, Ministry of Agriculture, Irrigation and Water Management of Azerbaijan JSC, Ministry of Energy, AzerEnergy JSC, AzerWater JSC, State Committee for Standardisation and the RESP non-governmental organisation.

The main purpose of the working group was to guide, oversee and agree on the set of GGIs based on existing data, and to identify those indicators for which data flows should be established; to oversee the preparation of a GGI-based report that will show progress and trends towards greening the economy of Azerbaijan; and to disseminate and communicate project results to key stakeholders in Azerbaijan, to ensure the regular revision, update and use of green growth indicators.

This report was drafted to support the work of the working group. It was developed based on methodological approaches of the OECD, which was included in the following reports: *Towards Green Growth: Monitoring Progress*, *OECD Indicators* (OECD, 2011[1]); *Green Growth Indicators 2014* (OECD, 2014[2]); *OECD Green Growth Studies 2013-2018* (OECD, 2018[3]); *Measuring the Green Transformation of the Economy: Guide for EU Eastern Partnership Countries* (OECD, 2016[4]). This report also takes account of the recommendations made at the workshops on measuring green growth held in Baku, Azerbaijan, in December 2016 and April 2017.

The report was prepared by Mr. Orkhan Kazimov and Mr. Robert Smith, consultants to the OECD, in collaboration with the members of the working group on GGIs and relevant stakeholders. The project was co-ordinated by Ms. Mikaela Rambali with inputs from Mr. Krzysztof Michalak and Ms. Irina Belkahia from the OECD Secretariat. Support from all members of the working group on green growth indicators is gratefully acknowledged.

This report is based on information and data gathered from the openly available sources.

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Abbreviations

ANAS	Azerbaijan National Academy of Sciences
AZN	Azerbaijani manat
CIS	Commonwealth of Independent States
CO_2	Carbon dioxide
EGS	Environmental goods and services
GDP	Gross domestic product
GGI	Green growth indicators
GNI	Gross national income
GVA	Gross value added
HA	Hectare
IEA	International Energy Agency
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contribution
IWMA	Irrigation and Water Management of Azerbaijan JSC
OECD	Organisation of Economic Co-operation and Development
PPP	Purchasing power parity
R&D	Research and development
SCS	State Committee of Statistics (of Azerbaijan)
SOCAR	State Oil Company of Azerbaijan Republic
TOE	Tons of oil equivalent
TPES	Total primary energy supply
USD	United States dollar
WB	World Bank

Executive summary

Recognising its vital dependency on one sector, Azerbaijan aims to diversify its economy and follow a path of green growth. Along with other Eastern Partnership (EaP) countries of the European Union, Azerbaijan committed itself to the goal of a transition towards a green economy in the 2011, 2013 and 2017 Declarations of the "Eastern Partnership" Summits and in other international fora. More recently Azerbaijan launched a strategic roadmap for development of the national economy and 11 key sectors, with medium and long-term goals for reforms and sustainable development. It also developed several policy documents setting ambitious targets and creating a framework to encourage investment in low-carbon, climate-resilient development were elaborated.

To meet these commitments and ambitious policy targets, Azerbaijan needs policies founded on a good understanding of what determines green growth. This requires appropriate indicators to monitor progress.

To track progress in aligning economic and environmental priorities, the OECD developed a measurement framework, consisting of 26 green growth indicators and combined into four groups: 1) productivity in the use of environmental assets and natural resources; 2) the natural assets base; 3) the environmental dimensions of quality of life; 4) policy responses and economic opportunities.

Given that there is no "one-size-fits-all" approach, the list of proposed indicators was kept flexible, to allow countries to adapt the list to the national context. Each country faces different challenges and opportunities, so many factors need to be taken into consideration, such as political and socio-economic context, institutional settings, level of development, resource endowments and specific environmental issues.

This overview report is an attempt to propose a selection of the OECD green growth indicators that are relevant for Azerbaijan and that can help Azerbaijan monitor progress towards green growth in meeting the policy targets and commitments made at national and international fora.

Some of the key messages that emerged from the analysis include:

- **Political will**: Wide recognition across the government and among different stakeholders that green and growth should go hand in hand, and a high-level commitment to pursuing a path of green growth.
- **Inter-ministerial co-ordination**: The working group on green growth indicators was a useful mechanism for opening the dialogue across the government and for engaging relevant stakeholders, to share information and discuss progress. The working group should continue meeting annually to discuss progress towards green growth.
- **Policy-integration**: This preliminary work on green growth indicators (GGIs) aims to serve as background and a starting point for follow-up development of green growth policies in Azerbaijan. It provides a base on which policy makers may assess their policies. The working group should consider how best to integrate green growth measurement in the governmental agenda.

- **Flexibility**: The proposed set of indicators is neither exhaustive nor final. It serves as a starting point, and may be further modified as the national context evolves and as new data become available.
- **Data collection**: Some indicators require further work for data collection. This work is in progress, and the proposed set of indicators should be further refined as data become available.

This report is structured as follows:

- **Chapter 1** provides a short introduction to the green economy concept and an overview of a set of green growth indicators developed by the OECD;
- **Chapter 2** gives an economic overview of Azerbaijan and its commitment to green economy;
- **Chapter 3** presents a selection of the green growth indicators proposed by the working group and key trends in Azerbaijan;
- **Chapter 4** looks at the remaining gaps, ways forward and draws key messages from the analysis.

1. The green growth concept and OECD set of indicators

Green growth means encouraging economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this, it must catalyse the investment and innovation that will underpin growth and give rise to new economic opportunities (OECD, 2011[5]).

Green growth is needed because risks to development are rising, as growth continues to erode natural capital. The cost of inaction may be significant: 33% of the world's population could be affected by water scarcity by 2025, and 10% of biodiversity could be lost by 2030 (OECD, 2011[6]).

To monitor progress, raise awareness and identify opportunities and risks, the OECD developed an approach to assess progress towards green growth. Developed in 2011, it explores links between the economy, the natural asset base and policy actions. It allows for monitoring of progress towards four main objectives: establishing a low-carbon, resource-efficient economy; maintaining the natural asset base; improving people's quality of life; and implementing appropriate policy to realise the economic opportunities of green growth (OECD, 2011[1]).

The OECD measurement framework identifies 26 indicators (see Annex A) to capture the main features of green growth and monitor progress in four main areas: *i)* the environmental and resource productivity of the economy; *ii)* the natural asset base; *iii)* the environmental dimension of quality of life; and *iv)* economic opportunities and policy responses. Indicators on socio-economic context complete the picture.

(1) **The socio-economic context and the characteristics of growth:** This group of indicators provides important background information. It helps track the effects of green growth policies and measures on growth and development. It also links the green growth indicators to social goals, such as poverty reduction, social equity and inclusion.

(2) **The environmental and resource productivity of the economy:** These indicators capture the efficiency with which economic activities – both production and consumption – use energy, other natural resources and environmental services. The indicators in this group reflect key aspects of the transition to a low-carbon, resource-efficient economy: carbon and energy productivity – output generated per unit of CO_2 emitted or total primary energy supplied resource productivity – output generated per unit of natural resources, or materials used and multi-factor productivity adjusted for the use of natural resources and environmental services.

Most resource productivity indicators are production-based, accounting for the environmental flows directly "used" or "generated" by domestic production and consumption. They are complemented by demand-based indicators that account for environmental flows "used" or "generated" by domestic final demand (the "footprint" approach). Demand-based indicators include environmental flows that are embodied in imports, and deduct the environmental flows embodied in exports. The resulting indicators provide insights into the net (direct and indirect) environmental flows resulting from household and government consumption and investment (final domestic demand).

(3) **The natural asset base:** These indicators reflect whether the natural asset base is being kept intact and within sustainable thresholds in terms of quantity, quality or value.

Ideally, they should help identify risks to future growth arising from a declining or degraded natural asset base. Progress can be monitored by tracking stocks of natural resources and other environmental assets, along with flows of environmental services: the availability and quality of renewable natural resource stocks, including freshwater, forest and fish resources; the availability and accessibility of non-renewable natural resource stocks, in particular mineral resources, including metals, industrial minerals and fossil energy carriers; biological diversity and ecosystems, including species and habitat diversity; as well as the productivity of land and soil resources.

(4) **The environmental dimension of quality of life:** These indicators reflect how environmental conditions and environmental risks interact with the quality of life and well-being of people. They also point out how the amenity services of natural capital support well-being. Further, they can show the extent to which income growth is accompanied (or not) by a rise in overall well-being: human exposure to pollution and environmental risks (natural disasters, technological and chemical risks), the associated effects on human health and on quality of life, and the related health costs and impacts on human capital and on labour productivity; public access to environmental services and amenities, characterising the level and type of access of different groups of people to environmental services, such as clean water, sanitation, green space or public transport. They can be complemented by information on people's perceptions about the quality of the environment they live in.

(5) **Economic opportunities and policy responses:** These indicators aim to capture the economic opportunities associated with green growth (e.g. markets for environmentally related products and associated employment). They monitor policy measures to promote the transition to green growth and to remove barriers to that transition (e.g. taxes and subsidies related to environmental issues, or innovation policy). These indicators can help assess the effectiveness of policy in delivering green growth. First, they include technology and innovation, which are important drivers of growth and productivity in general and also of green growth, in particular investment and financing, that facilitate the uptake and dissemination of technology and knowledge, and help meet development and environmental objectives. Second, production of environmental goods and services that reflect an important, albeit partial, aspect of the economic opportunities that arise in a greener economy. Third, prices, taxes and transfers that provide signals to producers and consumers and help internalise negative environmental externalities. These are complemented by indicators on regulation and on management approaches on education, training and skills development (OECD, 2017[7]).

The list of indicators has been kept flexible, as there is no "one-size-fits-all" approach and not all indicators are equally relevant to all countries. Each country can make its own selection and adapt it to its specific national context.

2. Azerbaijan: economic outlook and commitments to green growth

2.1. Economic outlook

After many years of growth supported by oil revenues, the Azerbaijani economy suffered a blow in 2015 after a fall in oil prices. The economy shrank by 3.8% in 2016, and continued to contract in 2017 by an estimated 1.3%, with significant reduction in economic output in industry (mining and refineries), oil production and construction. Services continue to expand, however (OECD, 2018[8]).

The contraction of the economy resulted, consequently, in devaluations of the manat against the dollar and high inflation. In February 2015 and December 2015, Azerbaijan announced devaluations of the manat, reducing its value by 35% and 50%, respectively. More than two thirds of foreign currency reserves in 2015 were used to support the manat before shifting to a managed floating exchange rate. The devaluation aimed to restore some of Azerbaijan's lost trade competitiveness after the recent devaluations or depreciations in the currencies of Azerbaijan's neighbours and major non-energy trading partners, although many of Azerbaijan's regional competitors have also gone through devaluations themselves (OECD, 2018[8]).

Annualised inflation (which had been between 2% and 4%) jumped rapidly following the devaluation in December 2015, to about 13% to 14%, where it has remained since. Interest rates were raised to 15% to calm down the inflation. The Central Bank has indicated its intention to reduce inflation to about 6% in 2018 and a return to moderate growth of 1% in 2018 (OECD, 2018[8]).

Despite the economic contraction, the level of capital investments in the economy has been on the rise since 2017. This most likely reflects new investments in the oil and gas sector (OECD, 2018[8]).

2.2. Paths to green economy: commitments by Azerbaijan

Recognising its vital dependency on one sector, Azerbaijan aims to diversify its economy and follow a path of green growth.

Along with the Eastern Partnership (EaP) countries, Azerbaijan committed itself to the goal of a transition towards a green economy in the 2011, 2013 and 2017 Declarations of the "Eastern Partnership" Summits and in other international fora.

As part of the Environment for Europe (EfE) process, Azerbaijan made a voluntary commitment in 2017 in the form of green economy actions under "Batumi Initiative on Green Economy (BIG-E) Actions by Azerbaijan" till 2030, aiming to contribute to sustainable development goals and to the implementation of the national state programmes of Azerbaijan. In particular, Azerbaijan committed to improve the measurement and valuation of natural capital; promote the internalisation of negative externalities and the sustainable use of natural capital; enhance ecosystems and ecosystem services as part of ecological infrastructure; shift consumer behaviour towards sustainable consumption patterns; promote green and fair trade; increase green and decent jobs, while developing the necessary human capital; improve access to services, healthy living and well-being; and promote public participation and education for sustainable development (Government of Azerbaijan, 2017[9]).

At the national level, Azerbaijan is in the process of redefining its medium-term development strategy by supporting private sector development and improving the enabling environment. In December 2016, it launched a strategic roadmap for development of the national economy and 11 key sectors, with medium and long-term goals for reforms and sustainable development. There is also a focus on regional connectivity, transit and trade (e.g. Baku–Tbilisi–Kars and the Trans-Anatolian Natural Gas Pipeline (TANAP) and Trans-Adriatic Pipeline (TAP) (OECD, 2018[8]).

The government of Azerbaijan has prepared several policy documents setting ambitious targets and creating a framework to encourage investment in low-carbon, climate-resilient development.

- Azerbaijan 2020 highlights the possible impact of climate change on the country's society and economy, and the importance of preparing necessary policy measures. It also states that the amounts of energy and CO_2 used to produce one unit of gross domestic product (GDP) should be in line with the appropriate OECD member country benchmarks by 2020.
- Azerbaijan's Intended Nationally Determined Contribution (INDC) outlines some of the priority sectors in mitigation. These priorities include residential and commercial buildings, fugitive gas from the oil and gas sector, and the transport sector.
- The Strategy of Development of Renewable and Alternative Energy Sources in 2012-2020 aims to increase the share of electricity consumed to 20% by 2020, with a total of 9.7% of total energy consumption to be met by renewable energy sources (OECD, 2018[8])

Table 2.1 summarises the main environmental policy measures in Azerbaijan.

Table 2.1. Summary of main environmental policy measures in Azerbaijan

Policy	Description
Azerbaijan 2020: Look to the Future	Approved in 2012 by President Ilham Aliyev. Azerbaijan 2020 highlights the possible impact of climate change on the country's society and economy, and the importance of preparing necessary policy measures. It also states that the amount of energy used to produce one unit of GDP as well as the amount of CO_2 will need to be in line with the appropriate indicators of OECD member countries towards 2020.
Action Plan on improvement of the ecological situation and efficient use of natural resources for 2015-2020	The Plan highlights the importance of developing, amongst other things: i) the National Adaptation Plan (NAP), and ii) nationally appropriate mitigation action (NAMA) that incorporates elements relating to measurement, reporting and verification (MRV) systems.
State Strategy on Use of Alternative and Renewable Energy Sources (2012-2020)	This strategy was prepared to promote development of a range of renewable energy sources in the country. The measures to be taken include: determination of main directions towards 2020 on electric and thermal power production from alternative and renewable sources; enforcement of legislative frameworks; incentive measures (e.g. feed-in-tariffs and direct subsidies); implementation of projects on alternative and renewable energy development.
State Programme for the Socio-economic Development of the Regions of Azerbaijan for the period 2014-2018	This State Programme is effectively the country's national sustainable development strategy, although its primary focus is poverty reduction.
Law on Protection of Atmospheric Air	The legal framework for establishment of regulations for air pollution and emissions and defines the responsibilities of different agencies to elaborate standards and thresholds for air pollution.
Law of the Azerbaijan Republic on Utilisation of Energy Resources	The law determines the main direction of the implementation mechanism of the legal, economic and social basis of the State policy related to energy resource utilisation and regulates the relation between the State and legal entities in this sphere.

Law on "Energy"	This law pertains to all areas in the energy sector and materials and products used in the production of energy. It states the objectives of the state energy policies. It contains requirements for the efficient use of energy and also has provisions for the obligations with respect to environmental protection, health and safety.
Action Plan for Energy Efficiency and Reduction of Losses and Technological Consumption of Energy Sector Enterprises, regardless of Ownership Form	This decree assigns the Ministry of Fuel and Energy (later renamed the Ministry of Industry and Energy) to oversee the four tasks outlined in the decree. Two of the tasks involve metering and the reduction of technical losses.

Source: OECD (2018), *Scaling Up Green Investment and Finance in Azerbaijan*, OECD Publishing, Paris.

To meet these commitments and ambitious policy targets, Azerbaijan needs policies founded on a good understanding of what determines green growth. This will require appropriate indicators to monitor progress.

3. Selected green growth indicators in national context

3.1. Creation of the Working Group

To discuss the current progress in greening the economy and the relevance of establishing a green growth measurement framework in Azerbaijan, a workshop on "Green Growth Measurement in Azerbaijan" was organised on 19 May 2016 in Baku.

The participants, including representatives from the Ministry of Economy and Industry, the Ministry of Ecology and Natural Resources and the State Statistical Committee, agreed to proceed with the creation of an Inter-Ministerial Working Group on Green Growth Indicators (WGGGI) to further define and establish green growth indicators in the country.

The mandate of the working group was to identify and develop green growth indicators that can be used to assess progress towards green growth of Azerbaijan's economy.

The main purpose of the WGGGI was 1) to guide, oversee and agree on the set of green growth indicators based on existing data and identify those indicators for which data flows should be established; 2) oversee the preparation of a GGI-based report that will show progress and trends towards greening the economy of Azerbaijan; and 3) disseminate and communicate project results to key stakeholders in Azerbaijan, to ensure the regular revision, update and use of green growth indicators.

The working group was led by the Ministry of Economy in close co-operation with the Ministry of the Environment, the State Statistical Committee, the State Agency on Alternative and Renewable Energy and other relevant stakeholders.

The first meeting of the working group took place on 12 December 2016, to discuss the choice of green growth indicators. The second meeting of the working group, on 20 April 2017, was dedicated to initial findings for each of the selected green growth indicators.

3.2. Adaptation of green growth indicators to Azerbaijan

This section presents a selection of the proposed green growth indicators relevant for Azerbaijan that were chosen by the working group for monitoring progress towards economy in Azerbaijan. The relevance of the proposed indicators was discussed at the working group meetings. Other indicators can be considered for addition to this list.

It follows the structure suggested by the OECD: 1) the indicators on environmental and resource productivity of the economy; 2) the indicators on the natural asset base; 3) the indicators on environmental dimension of quality of life; 4) the indicators on economic opportunities and policy responses.

1. **Social and economic context:**
   - GDP per capita
   - GDP by sector
   - Import and export
   - Labour productivity
   - Level of labour participation of the working-age population
   - Unemployment rate
   - Educational attainment by level

- Life expectancy at birth
- Population density

2. Environmental and resource efficiency of the economy:

- CO_2 productivity
- Energy intensity
- Total final consumption of energy by sector
- Renewable energy production
- Share of renewable energy in total primary energy
- Mineral and organic fertilisers per hectare of arable land
- Volume of water losses in production and distribution
- Water losses in irrigation and agriculture
- Production of household solid wastes
- Production of industrial hazardous wastes
- Water productivity

3. Natural asset base:

- Freshwater abstraction
- Water stress
- Water consumption
- Forest area and volume
- Extraction (oil, gas, mineral)
- Proven reserves (oil, gas, mineral)
- Land use
- Share of farmland subject to erosion
- Area of contamination and remediation of land
- Species in danger of extinction (mammals, birds, fish, plants)
- Share of specially protected areas of nature of the overall country territory
- Fishing
- Fisheries (share of fish stocks within safe biological limits, on the global scale)

4. Environmental dimension of quality of life:

- Population-weighted exposures to $PM_{2.5}$
- Share of population with improved sanitary connections
- Proportion of population using safely managed drinking water services
- Municipal sewage treatment

5. Economic opportunities and policy responses:

- Government financing of research and development (R&D) in energy and environmental protection
- Share of fixed capital investment for environmental protection and natural resource efficiency in total investment
- Environmental charges, fees and fines
- Share of environmental tourism in GDP and number of environmental tourists
- Environment-related foreign direct investment
- Number of small- and medium-sized enterprises operating in the environmental goods and services sector
- Employment in the environmental goods and services sector.

3.3. Social and economic context

Green growth indicators build on the interaction between economic growth and the environment. Indicators on the socio-economic context provide important background information, particularly on economic growth, productivity and competitiveness. They also track key features of the labour market that are important in sustaining job creation and facilitating labour market adjustments, and with information on demography, health, education and income inequality.

Such information is useful to track the effects of green growth policies on growth, to establish links to social concerns such as poverty reduction, social equity and inclusion, to interpret GGIs in the light of national socio-economic circumstances, and complement them with additional details. For example, data on environmental pressures are rarely available by industrial activity, and consistent measures that combine environmental and economic information can only be constructed at the level of the entire economy. In such cases, it is important to supplement the economy-wide indicator with information on countries' industrial structure (OECD, 2016[4]).

To assess Azerbaijan's progress towards green growth, the following *Social and Economic Indicators* have been selected:

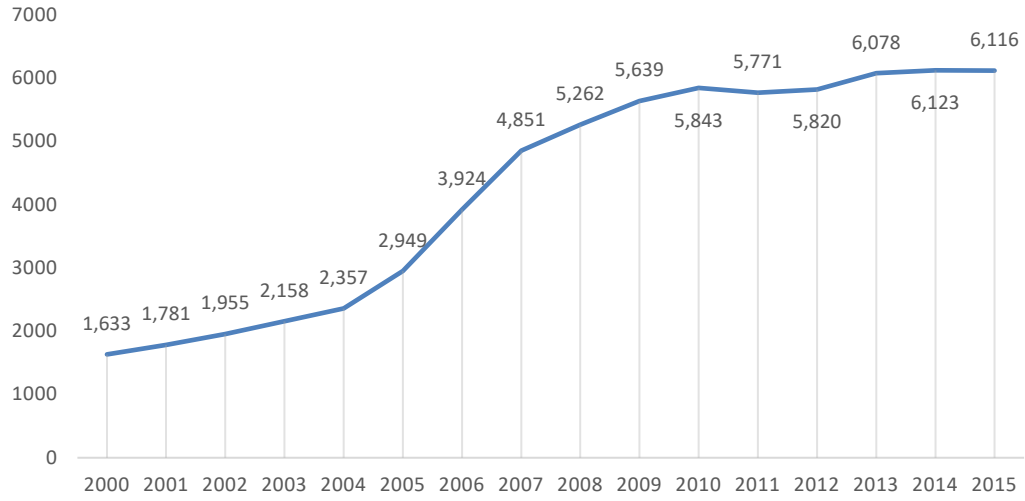
- GDP per capita
- GDP by sector
- Imports and exports
- Labour productivity
- Level of labour participation of the working-age population
- Unemployment rate
- Educational attainment by level
- Life expectancy at birth
- Population density

3.3.1. GDP per capita

Definition: GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy, plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.[1]

Relevance for green growth: Gross domestic product is one of the main macroeconomic indicators that provide a general overview of the economy of a given country. For the purposes of international analysis, GDP per capita allows for direct comparison of one country to another and shows the relative performance of the countries.

Figure 3.1. GDP per capita, constant 2010 USD



Source: World Bank (World Development Indicators), 2016.

Overall trend in Azerbaijan: After its steep increase in the 2000s, GDP per capita in Azerbaijan seemingly reached a plateau in 2010s. The trend of this indicator coincides with the overall reach of the oil extraction peak of the country.

At present, the Azerbaijani government is actively engaged in policy making with the aim of diversifying the economy. The Strategic Road Map for the Prospects of the National Economy of the Republic of Azerbaijan was approved by the President on 6 December 2016. It sets out strategic goals in main sectors of the economy for 2025 and beyond.

By 2025, the goal is for foreign direct investment in non-oil to reach 4% of non-oil GDP, for non-oil export to reach USD 450 per capita; 150 000 new jobs to be created in trade and industry sector, and the proportion of transfers from the State Oil Company to be as low as 15% of the state budget.

In addition to the main Strategic Road Map, the following 11 sectorial Strategic Road Maps have been approved by the President:

- Strategic Road Map for the development of the oil and gas industry;
- Strategic Road Map for the manufacture and processing of agricultural products;
- Strategic Road Map for the manufacture of small and medium entrepreneurship-level consumer goods;
- Strategic Road Map for the development of heavy industry and machinery;
- Strategic Road Map for the development of the specialised tourism industry;
- Strategic Road Map for the development of logistics and trade;
- Strategic Road Map for the development of affordable housing provision;
- Strategic Road Map for the development of vocational education and training;
- Strategic Road Map for the development of financial services;

- Strategic Road Map for the development of communication and information technologies;
- Strategic Road Map for the development of utilities (electricity and thermal energy, water and gas supply) (Azerbaijan State News Agency, 2016[10]).

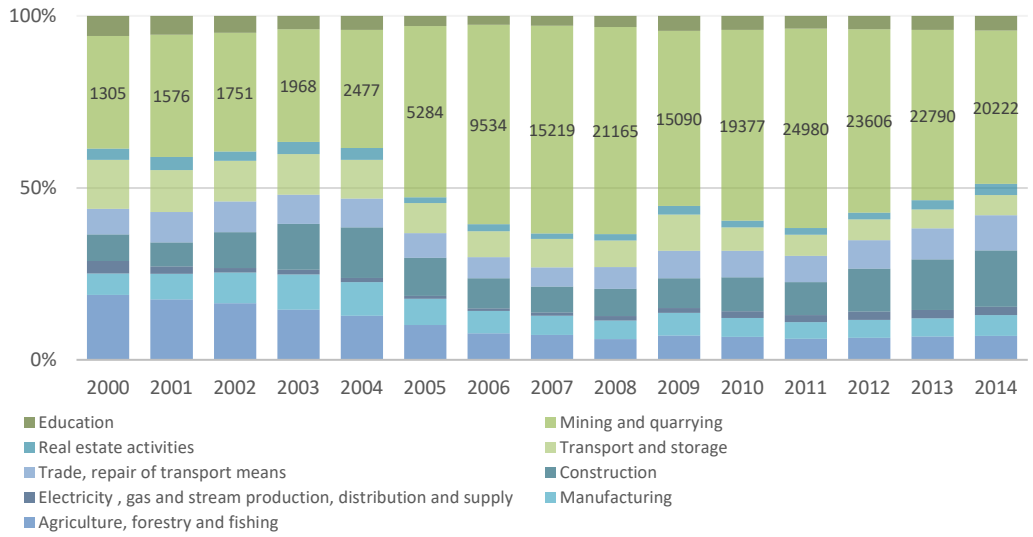
According to the Strategic Road Map for the Prospects of the National Economy, approximately AZN 27 billion of public and private investment will be required to reach the strategic goals outlined in these Strategic Road Maps.

3.3.2. GDP by sector

Definition: The indicator "real GDP broken by major economic sectors" shows how different sectors contribute to GDP and how their contribution has changed over time. Some initial conclusions may be drawn as to what the interdependencies are between the sectors and the impact of the relative state policies.

Relevance for green growth: GDP by sector indicator shows, although at an aggregate level, a possible shift towards less environmentally harmful activities. It can also provide numbers for assessing how the transition to green growth affects the distribution of generation of value added.

Figure 3.2. GDP by sector, %



Source: State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: Figure 3.2 shows that the largest contributor to the country's GDP is the mining and quarrying sector (oil and natural gas, metal ores, stone, sand, gravel, salt, etc.). Although this sector has experienced its greatest setback in the past five years, it is still of major importance in the economy.

The second and third largest sectors in the economy are construction and trade, repair of means of transport sectors, both, to some extent, oil export-driven sectors. Following these are agriculture and manufacturing. The manufacturing sector, the central focus of many recent policies, has been showing steady growth.

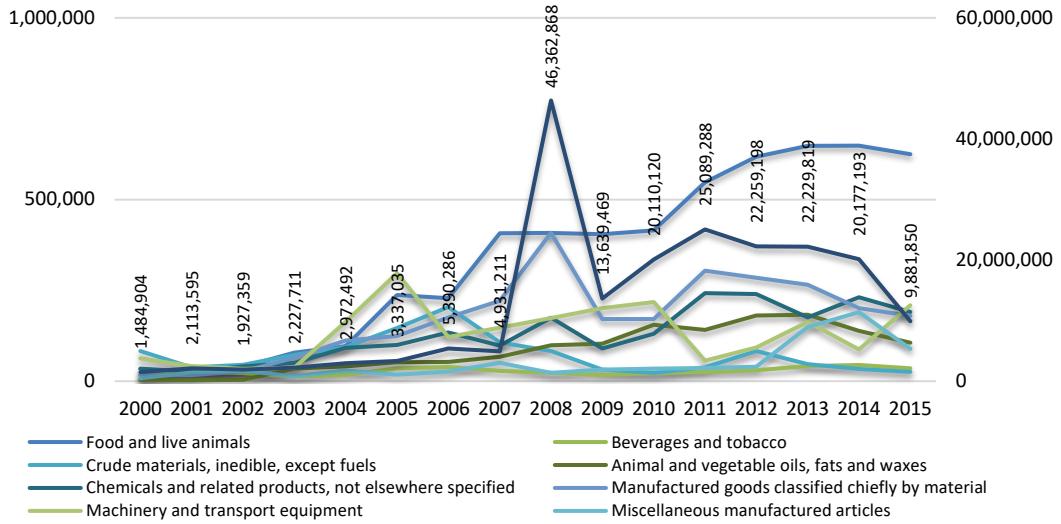
A set of policies (Strategic Road Maps) that have linked industrial development and the greening of the economy have selected manufacturing as a solid candidate for a leading sector of the economy in the near future.

3.3.3. Import and export

Definition: Import and export are functions of international trade, where goods and services produced in one country are shipped/delivered to other countries for sale or trade. The higher the value of export operations of a given country compared to its import operations, the better balance of trade that country enjoys.

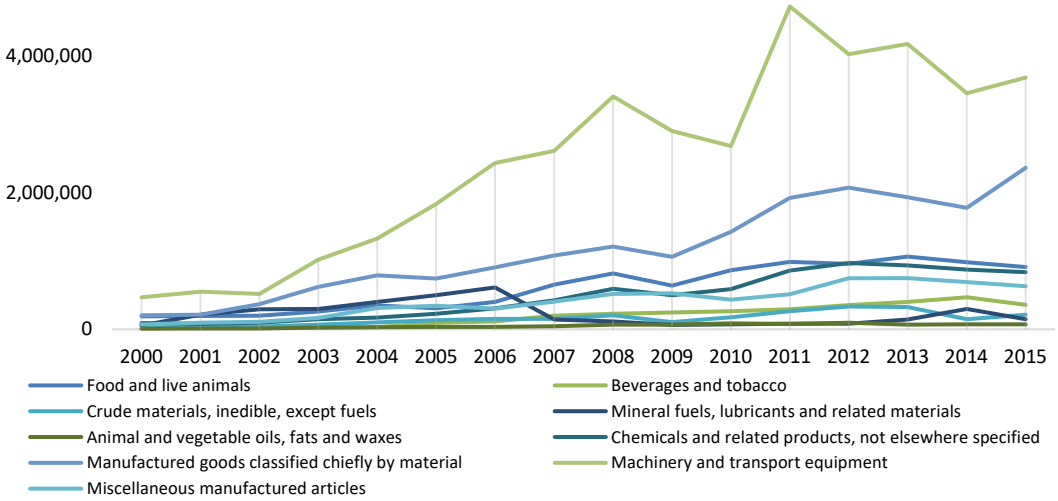
Relevance for green growth: Coupled with GDP growth and GDP sector development, import and export figures shed light on a country's export potential.

Figure 3.3. Exports, thousand USD



Source: State Committee of Statistics of Azerbaijan, 2016.

Figure 3.4. Imports, thousand USD



Source: State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: Azerbaijan's level of imports has been steadily growing, whereas the development of exports has experienced more volatility. Nonetheless, the trends of the last five years show signs of smoother and more coherent growth, which may be the result of export diversification policies actively implemented by the Government.

According to the Strategic Roadmap on the Perspectives of the National Economy, per capita imports in 2015 were equal to USD 1 000, set off by USD 1 500 in exports. However, 90% of the exports were oil and gas products. The Roadmap anticipates increasing non-oil exports per capita (USD 170 in 2015) to at least USD 450 by 2025.

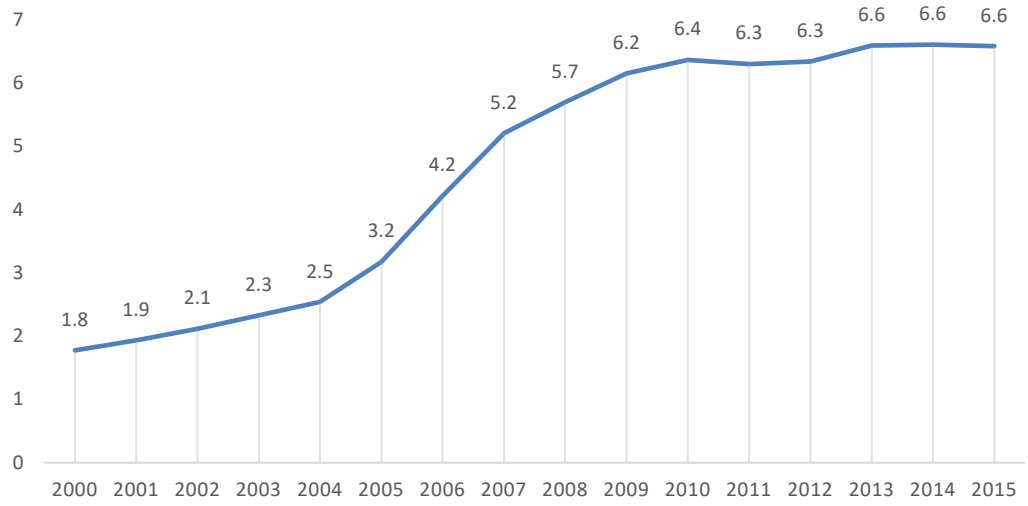
3.3.4. Labour productivity

Definition: Labour productivity is calculated by dividing GDP in constant prices by the amount of hours worked by the employed population. It plays an important role in the growth of production and national income.

Relevance for green growth: This indicator is one of the main representations of economic growth. Labour productivity measures how efficiently labour input is combined with other factors of production and used in the production process.

It only partially reflects the productivity of labour in terms of the personal capacity of workers or the intensity of their effort. The ratio between the output measure and the labour input depends to a large degree on the presence and/or use of other inputs (e.g. capital, intermediate inputs, technical, organisational and efficiency change, economies of scale).[2]

Figure 3.5. Labour productivity, GDP in constant USD per hour



Source: Calculated using data of State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: Labour productivity closely follows the GDP per capita rates over the same period. After the fall of the Soviet Union and downtrend of the 1990s, one of the main characteristics of the economic recovery that followed was the gradual dismantling of the Soviet technological base and its replacement by Western technology and managerial practices. The influx of oil investment in 2000s has expedited this process, and labour productivity has grown threefold.

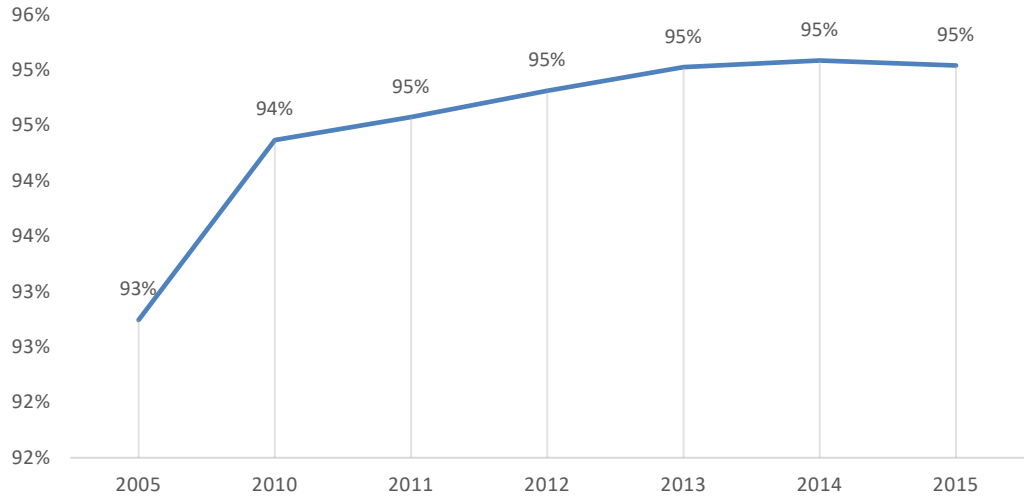
However, since this process was so extensive, that is capital-intensive, scope remains for increasing the overall efficiency of labour productivity through improved organisation or technical change.

3.3.5. Level of labour participation of working-age population

Definition: This indicator represents share of the working-age population actively engaged in the labour market (that is, working or looking for work). The working age population refers to people aged 15 to 70.

Relevance for green growth: This figure provides an indication of the size of the supply of labour available to engage in the production of goods and services relative to the population of working age.

Figure 3.6. Level of labour participation of working-age population, %



Source: Calculated using data of State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: Azerbaijan has a high labour force participation rate that closely follows GDP growth. At the same time, employee turnover, which was relatively low, has been increasing for the past six years, from 3.7% to 5.2%. Sectors with the most visible increase of employee turnover are construction, tourism and catering, finance, scientific and technical services and the civil service (Table 3.1).

Table 3.1. General employee turnover, %

	2010	2011	2012	2013	2014	2015
General employee turnover	**3.7%**	**3.4%**	**2.6%**	**3.8%**	**4.2%**	**5.2%**
Agriculture, forestry and fisheries	0.2%	0.3%	0.2%	0.3%	0.3%	0.3%
Mining	12.3%	10.4%	7.1%	9.7%	21.3%	9.8%
Manufacturing	14.5%	9.9%	8.2%	7.7%	9.3%	11.5%
Electricity, gas and steam production	64.7%	18.0%	11.9%	14.9%	21.9%	47.7%
Water distribution and waste management	14.8%	22.3%	10.0%	15.8%	11.1%	14.5%
Construction	8.7%	7.0%	7.4%	11.0%	10.6%	13.5%
Trade and transport vehicles repair	3.2%	3.7%	1.8%	6.5%	5.4%	9.0%
Transport and storage services	9.8%	5.0%	3.7%	4.1%	7.6%	6.6%
Tourism and catering	5.4%	4.4%	3.6%	12.1%	13.7%	16.1%
ITC	6.4%	5.0%	3.2%	4.4%	5.7%	5.0%
Finance	9.4%	14.5%	10.1%	10.5%	13.4%	19.4%
Scientific and technical services	7.9%	12.3%	8.6%	12.2%	15.4%	17.3%
Civil service, social protection	0.8%	0.9%	1.6%	2.3%	2.5%	2.8%
Education	1.7%	4.8%	3.0%	2.7%	2.6%	2.5%
Other services	1.4%	1.4%	1.5%	2.2%	1.9%	2.3%

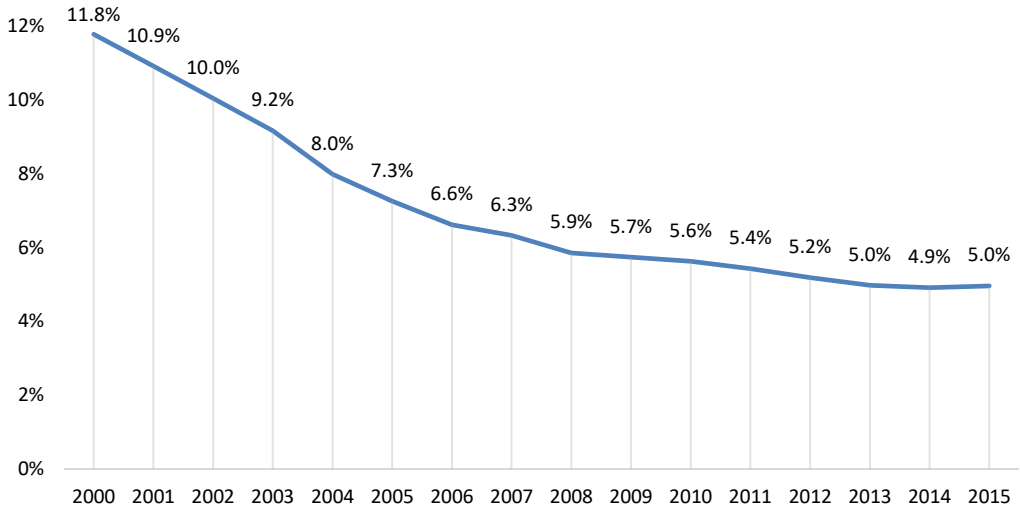
Source: Calculated using data of State Committee of Statistics, 2016.

3.3.6. Unemployment rate

Definition: The unemployment rate is a ratio of the unemployed population to the economically active population. Unemployed people are those who report that they are without work, that they are available for work and that they have taken active steps to find work in the last four weeks.[3]

Relevance for green growth: This is one of the most carefully scrutinised indicators in terms of measurement of economic prosperity and of success of economic policies.

Figure 3.7. Unemployment rate, %



Source: State Committee of Statistics, 2016.

Table 3.2. Education level of unemployed persons

Unemployment *thousand persons*	Education level					
	Higher education	Secondary vocational education	Initial vocational education	Full secondary education (11 grades)	Secondary education (8 grades)	Primary education
243.7	37.6	31.4	10.1	129.8	33.2	1.6
100%	15.4%	12.9%	4.1%	53.3%	13.6%	0.7%

Source: State Committee of Statistics, 2016.

Overall trend in Azerbaijan: Azerbaijan has successfully initiated several state programmes aimed at tackling unemployment issues. Scope remains, however, for improvement in this field, if not quantitively, then perhaps qualitatively. The highest rates of unemployment (53.3%) are among those with full secondary education.

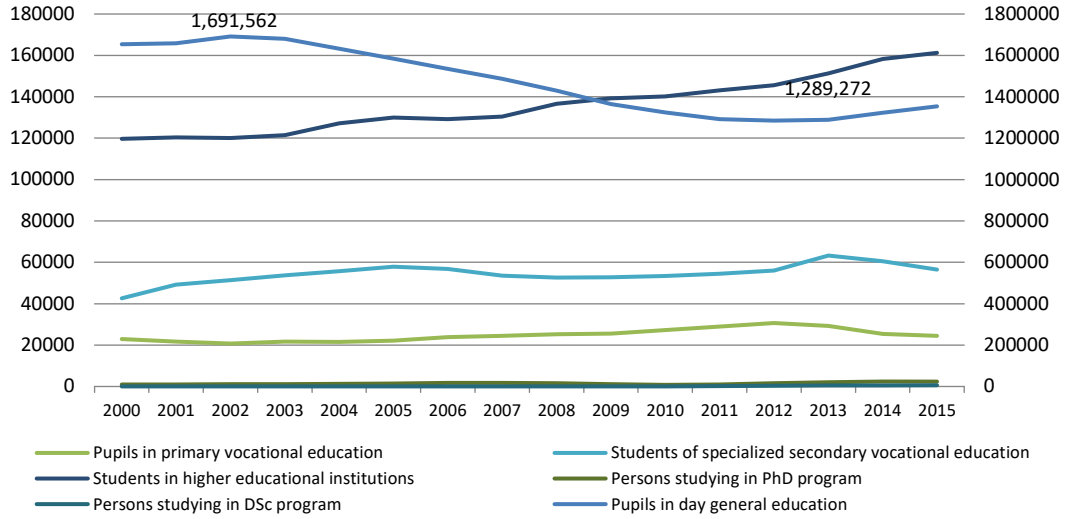
In terms of labour market demand, these potential employees score worse than those with tertiary education and with vocational skills. Azerbaijan's Government is now focusing on attracting a greater number of youth to vocational education.

3.3.7. Educational attainment by level

Definition: Educational attainment by level shows the percentage of the population who have attained high school, undergraduate and postgraduate levels of education.

Relevance for green growth: Education is one of the key drivers of economic development. A shift from low-tech to intermediate and high-tech industries demands high-quality education and skills, a high school attendance of population, and a well-developed R&D system.

Figure 3.8. Educational attainment by level



Source: State Committee of Statistics of Azerbaijan, 2016.

Table 3.3. Number of students studying in higher education institutions in CIS countries

Students studying in higher education institutions in CIS countries *(per 10 000 inhabitants)*								
Azerbaijan	Belarus	Armenia	Kazakhstan	Kyrgyzstan	Moldova	Russia	Tajikistan	Ukraine
168	354	322	260	346	230	325	206	322

Source: State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: Although the number of students in tertiary education is on the rise, the country lags behind the CIS countries in this respect. Vocational education is one of Azerbaijan's priorities, given the gap between the number of graduates from secondary education and the number of those receiving vocational education.

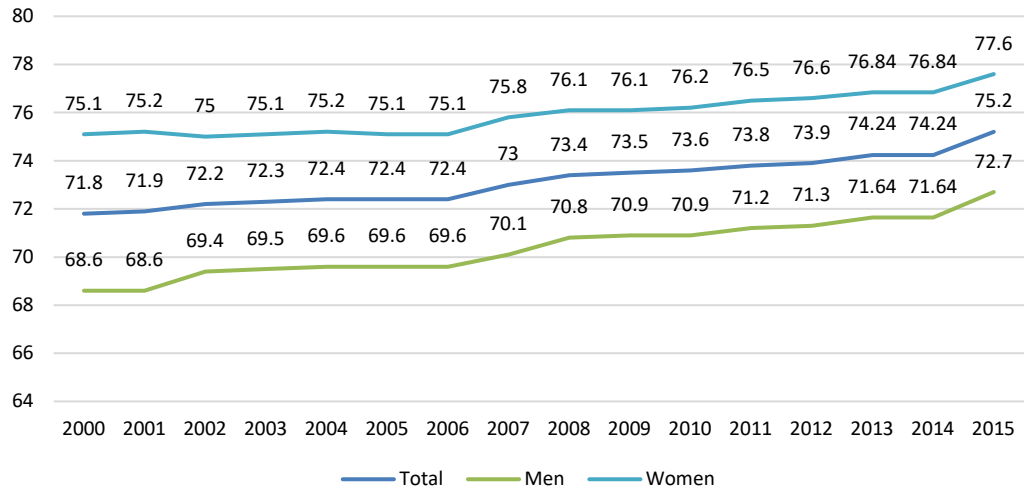
3.3.8. Life expectancy at birth

Definition: Life expectancy at birth is defined as the length of time, on average, a newborn can expect to live if current death rates do not change. The actual age-specific death rate of any birth cohort cannot be known in advance. If rates are falling, actual life spans will be higher than life expectancy calculated using current death rates.[4]

Relevance for green growth: Life expectancy at birth is one of the main indicators of the quality of life and a good measure of policy-making success. It potentially represents a

combination of health, education, job opportunities and other aspects of socio-economic well-being of a country.

Figure 3.9. Life expectancy at birth, years



Source: State Committee of Statistics of Azerbaijan, 2016.

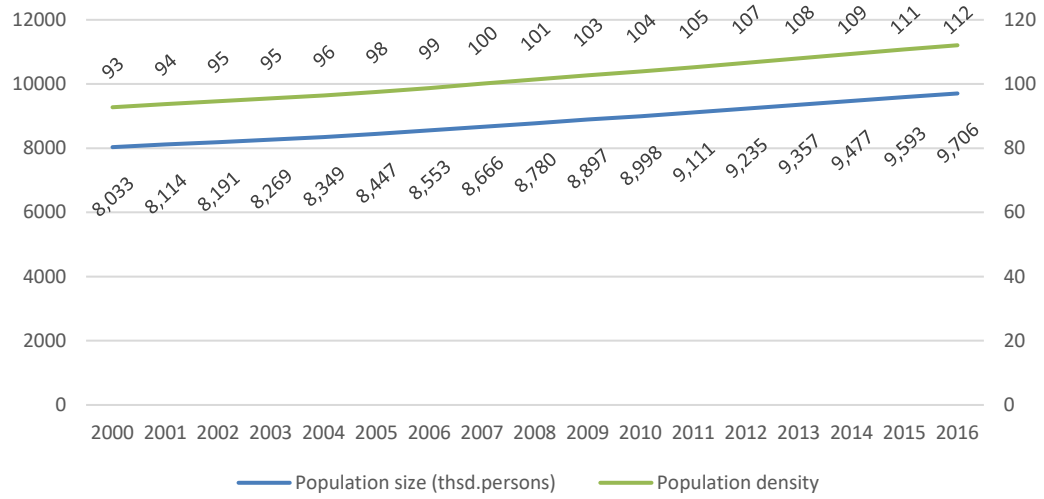
Overall trend in Azerbaijan: Life expectancy has been steadily increasing for the past 15 years, and shows no signs of slowing down. Life expectancy for men shows greater growth (at 4.1 years compared to 2.5 years for women over the period), which could be interpreted as an incremental improvement of economic conditions and social protection of the population.

3.3.9. Population density

Definition: The number of people living in one square kilometre of territory. The indicator is calculated by dividing the total number of the permanent population by the area of the territory.

Relevance for green growth: Increased urbanisation and density of population has positive effects, such as higher income and consumption, lower energy use and fewer greenhouse gas emissions per person. However, rising population density of population should be accompanied by a solid foundation of rural and urban planning. It may otherwise result in negative effects (e.g. traffic congestion and higher greenhouse gas emissions; hotter city centres with increased energy consumption for air conditioning, etc.).

Figure 3.10. Population density



Source: State Committee of Statistics of Azerbaijan, 2017.

Overall trend in Azerbaijan: The population of Azerbaijan and its density has been steadily growing over the past years (by 21 percent in the period 2000 to 2016). The Government has carried out a substantial number of infrastructure projects throughout the country and in cities. Given the needs of a growing population, the State Committee for Urban Development developed the Greater Baku Regional Development Plan in 2013, which is now being revised by the Government. At the same time, Regional Development Plans for other cities are being developed.

3.4. Environmental and resource efficiency of the economy

A central element of green growth is the environmental and resource efficiency of production and consumption, and how this changes with time, place and across sectors. Understanding these trends, together with the underlying factors, is an essential part of monitoring the transition to green growth.

Progress toward green growth can be monitored by relating the use of environmental services in production to the output generated. Environmental services include natural resources and materials, including energy, and pollutants and other residuals, with their implied use of environmental services. These are functional attributes of natural ecosystems, such as land, water and air, that are beneficial for humankind. Tracking trends in decoupling of inputs to production from economic and sectorial growth is an important focus of monitoring (OECD, 2016[4]).

To assess Azerbaijan's progress towards green growth, the following *Environmental and Resource Efficiency Indicators* have been selected:

- CO_2 productivity (GDP per unit of CO_2 emissions)
- Energy intensity (TPES per unit of GDP)
- Total final consumption of energy
- Renewable energy production

- Share of renewable energy in total primary energy supply
- Mineral fertilisers per hectare of arable land
- Organic fertilisers per hectare of arable land
- Volume of water losses in production and distribution
- Water losses in irrigation and agriculture
- Production of household solid waste (total and per capita)
- Production of industrial hazardous wastes
- Water productivity.

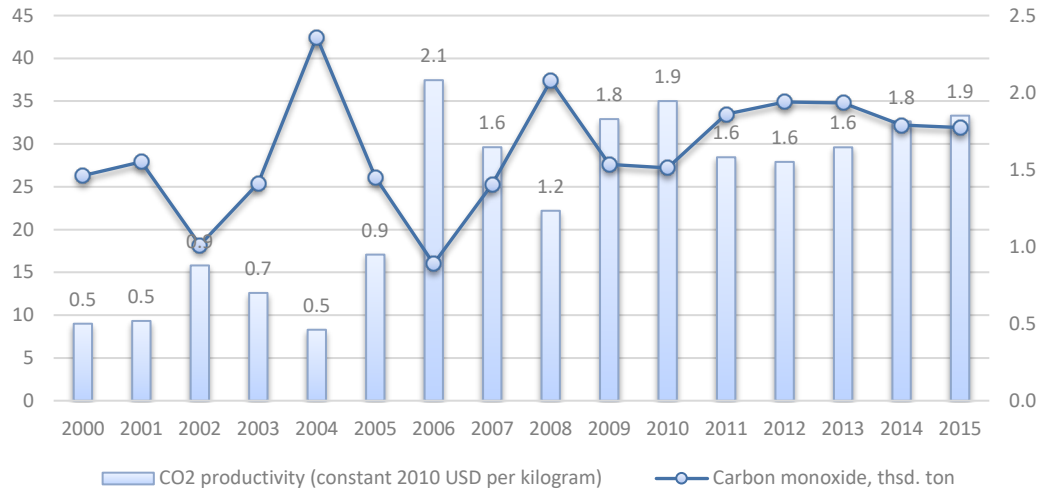
3.4.1. CO_2 productivity

Definition: CO_2 productivity reflects the economic value generated (GDP in constant prices) per unit of CO_2 emitted.

Relevance to green growth: CO_2 is considered the primary greenhouse gas emitted by human activities. Although carbon dioxide has always been present in the atmosphere, human activities are changing the natural carbon cycle and putting additional pressure on natural sinks (like forests) that remove CO_2 from the atmosphere. Human activities such as cement production, deforestation, as well as the burning of fossil fuels like coal, oil and natural gas are the main sources of CO_2 emissions.

Measuring CO_2 productivity provides information on the overall efficiency of a country's economy, since the main contributors of CO_2 emission are fossil fuels (oil, natural gas and coal) for energy and transport.

Figure 3.11. CO_2 productivity, constant 2010 USD per kilogramme



Source: Calculated using data of State Committee of Statistics of Azerbaijan and WB, 2016.

Overall trend in Azerbaijan: Carbon dioxide (CO_2) accounts for about half of greenhouse gas emissions in Azerbaijan. CO_2 productivity increased by more than three times in 2000

and 2010, and has since stabilised at this level. This is largely due to a slower increase of CO_2 emissions compared to the increase of GDP.

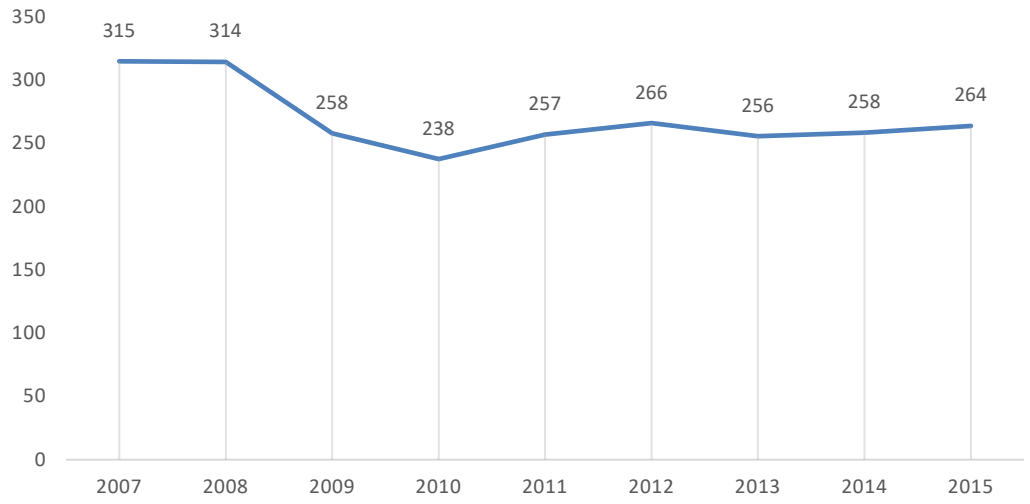
3.4.2. Energy intensity

Definition: The total primary energy supply (TPES) of a country is defined as energy produced within the country, plus energy imports from other countries, minus energy exports, minus international marine and aviation bunker fuel, then plus or minus stock changes.

The energy intensity indicator is expressed as TPES per unit of GDP in constant prices (TOE per thousand 2010 USD).

Relevance to green growth: Energy intensity measures how many units of primary energy are needed to generate national revenue. This is one of the main indicators for measuring the efficiency of a country's energy output. Thus, a high level of energy intensity reflects the level of energy supply needed to generate one unit of GDP. On the other hand, if there is a low level of energy intensity, the probability of a labour-intensive economy is high. The structure of economy's energy supply and the intensity of its use are key determinants of the sustainability of economic growth.

Figure 3.12. Energy intensity, kg of oil equivalent per USD 1 000 of GDP



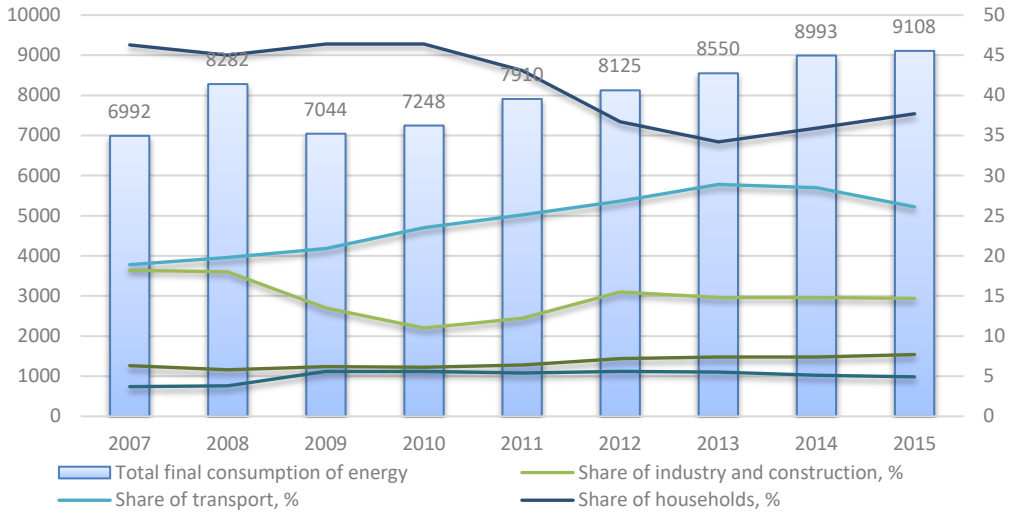
Source: Calculated using data of State Committee of Statistics and WB, 2016.

3.4.3. Total final consumption of energy by sector

Definition: This indicator represents energy delivered to the final consumers by sector. Primary energy that is transformed into other forms of energy and energy products consumed for non-energy purposes are not included. Final consumption represents all energy used by industry, transport, households, etc.

Relevance to green growth: Reducing energy intensity requires not only increasing energy efficiency but reducing energy use. Reaching environmental and climate policy objectives requires a moderation of energy consumption, to reduce energy use in absolute terms, not only in proportion to output.

Figure 3.13. Energy final consumption, thousand TOE



Source: State Committee of Statistics of Azerbaijan, 2016.

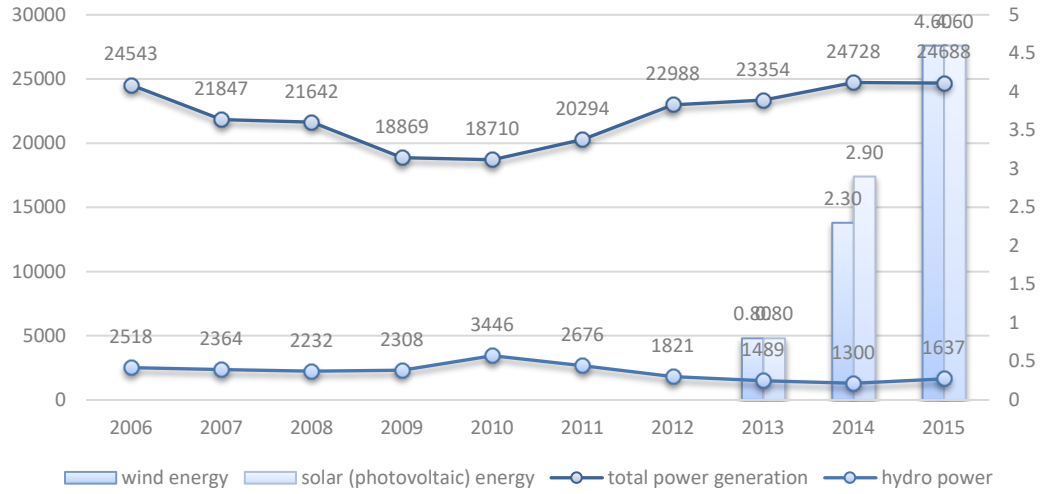
Overall trend in Azerbaijan: Households, transport and industry consume almost 50% of total energy consumption in Azerbaijan. Figure 3.13 shows that major changes are also occurring in these three sectors. Although the global economic crisis affected the industry, and it made a recovery, it has not reached its levels before the crisis, and has seemingly reached a plateau. Additional analysis on the causes of the rise in the percentage of transport energy consumption provides some insight for relative policy making, since transport is a major source of pollution.

3.4.4. Renewable energy production

Definition: Renewable energy represents renewable energy sources in electricity generation. Renewables include wind power, solar power (thermal, photovoltaic), hydroelectric power, tidal/wave/ocean power, geothermal energy, biofuels and the renewable part of waste.[5]

Relevance to green growth: The use of renewable energy has many potential benefits, including a reduction in greenhouse gas emissions, the diversification of energy supplies and a reduced dependency on fossil fuel markets (in particular, oil and gas). The growth of renewable energy sources may also have the potential to stimulate employment by generating jobs in new green technologies.

Figure 3.14. Renewable energy, million kW hour



Source: State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: Renewable energy accounted for 7% of total electricity generation in 2015, compared to 6% in 2013. Wind and solar power generation are relatively new forms of electricity production for Azerbaijan and are on the list of the Government's priorities.

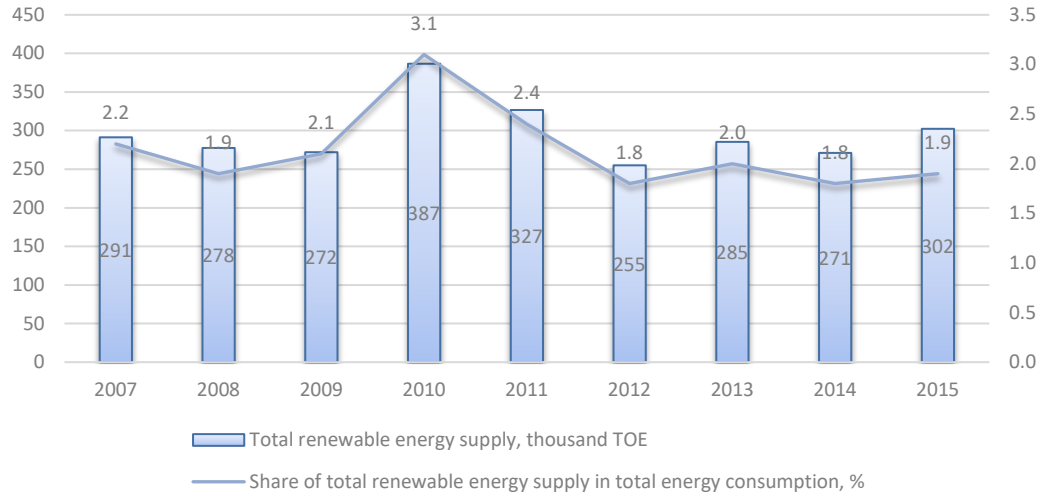
Since 2000, total investment in this sector by the State Agency for Renewable and Alternative Energy has reached AZN 800 million (AZN 64 million in 2014).[6] The rate of development is promising, even though, by comparison to traditional hydropower generation, the numbers are modest.

3.4.5. Share of renewable energy in total primary energy

Definition: Renewable electricity is calculated as a share of renewables in total primary energy supply. Renewables include hydro, geothermal, solar (thermal and PV), wind and tide/wave/ocean energy, as well as combustible renewables (solid biomass, liquid biomass, biogas) and waste (renewable municipal waste).

Relevance to green growth: Renewable energy plays a pivotal role in building sustainability in the economy of any given country. Once the relatively costly technology and infrastructure are in place, it can potentially become an economical source of energy.

Figure 3.15. Renewable energy supply



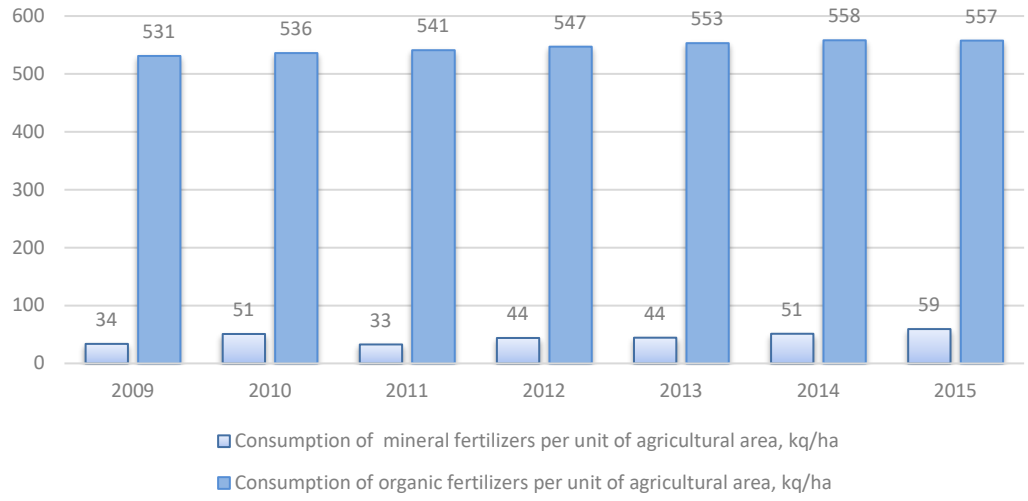
Source: State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: Azerbaijan has invested a sizeable amount of resources in renewable energy infrastructure. Still, the share of renewable energy in total primary energy has not increased in the past several years, and has remained stable, at 2%. Additional policies are likely be implemented in the near future to increase the percentage appreciably.

3.4.6. Mineral and organic fertilisers per hectare of arable land

Relevance to green growth: This indicator offers an opportunity to evaluate the environmental impact of fertilisers. A high concentration of biogenic substances in land results in pollution on surface and underground waters, as well as the migration of biogenic substances that may affect other environmental components.

Figure 3.16. Consumption of mineral and organic fertilisers, kq/ha



Source: State Committee of Statistics of Azerbaijan, 2016.

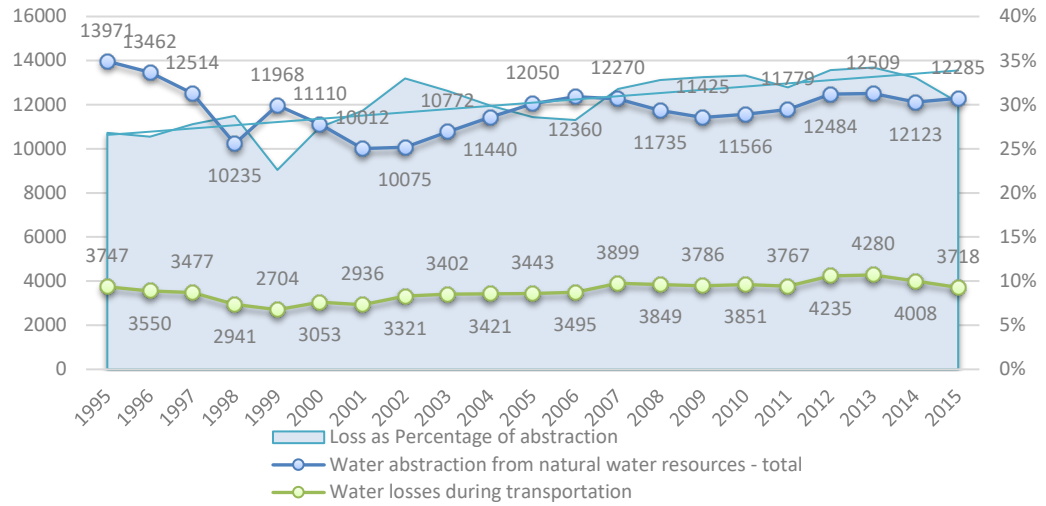
Overall trend in Azerbaijan: Consumption of mineral fertilisers in Azerbaijan is comparable to that of some other CIS countries (in 2014, Ukraine: 45 kg; Moldova: 40 kg) and far behind other developed countries (UK: 243 kg; Japan: 241 kg; US: 137 kg) or even CIS countries (Belarus: 215 kg; Georgia: 151 kg; Uzbekistan: 220 kg).

3.4.7. Volume of water losses in production and distribution

Definition: The volume of water lost in water production and distribution during transport from intake point to usage point is calculated as the difference between the volume of water taken and the volume of water used by consumers. It represents the volume of water lost as a result of filtering, leakage, vaporisation, accident, etc.

Relevance to green growth: High levels of water losses put additional pressure on natural water resources, including renewable water resources, by extending the hydrological cycle. Water losses are also detrimental to the financial viability of water utilities, as well to the quality of water itself.

Figure 3.17. Water losses during transport, million m^3



Source: State Committee of Statistics of Azerbaijan, 2016.

Overall trend in Azerbaijan: For the past 20 years, transportation water losses have had an upward tendency (from 27% of total water abstraction in 1995 to 33% in 2013).

3.4.8. Water losses in irrigation and agriculture

Definition: The volume of water lost as the result of filtering, leakage, vaporisation, accident, etc., during irrigation and usage for agricultural needs.

Relevance to green growth: Water losses in irrigation and agriculture are part of general water losses and as such put additional pressure on natural water resources, including renewable water resources, by extending the hydrological cycle. They also worsen agricultural water productivity (amount of agricultural product yielded per unit of water spent on irrigation and agriculture).

Overall trend in Azerbaijan: According to information from the Irrigation and Water Management of Azerbaijan JSC, water losses in irrigation and agriculture in the past five years have been around 30% of total water used for irrigation.

Since 2012, the National Water Strategy is being developed under the UNECE-World Health Organization Regional Office for Europe (WHO/Europe) Protocol on Water and Health. Once the Strategy is finalised, it will be used for adoption of the key principles of integrated water resources management, followed by relevant changes in the legislation to bring it into line with the EU Water Framework Directive.

At the sixth meeting of the Steering Committee of the National Policy Dialogue in the water sector of Azerbaijan held on 26 April 2017, the National Work Plan for 2016-2020 was recommended for adoption. Among other things, Work Plan anticipated recasting the National Water Strategy and the development of the National Water Action Programme.

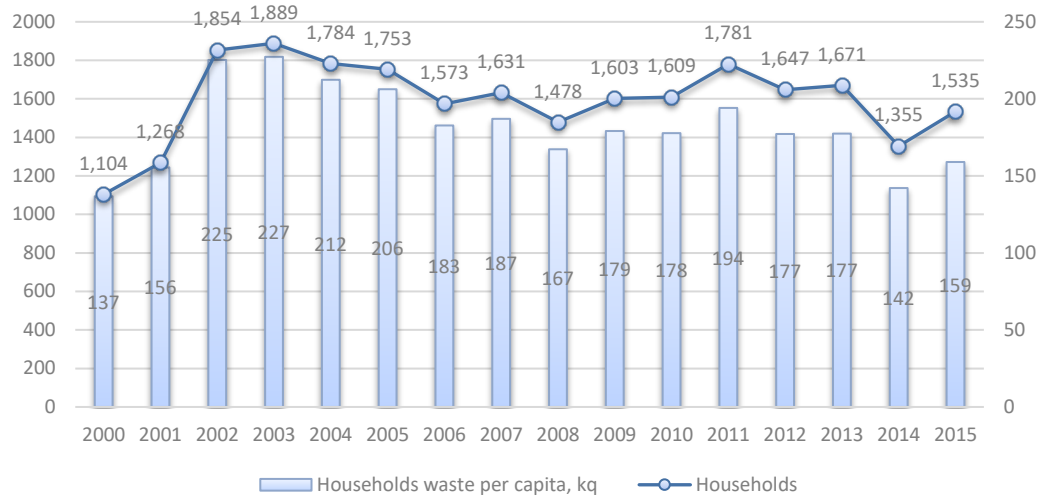
The draft version of the National Water Strategy targets a drastic (70%) reduction of the water losses in irrigation by 2029 through infrastructure development (reconstruction of irrigation system, computerisation and automation, introduction of water protection zones, etc.).

3.4.9. Production of household solid waste

Definition: Household (municipal) waste covers waste from households, including bulky waste, similar waste from commerce and trade, office buildings, institutions and small businesses, as well as yard and garden waste, street sweepings, the contents of litter containers, and market cleansing waste, if managed as household waste.[7] The definition of solid waste is not limited to wastes that are physically solid. Many solid wastes are liquid, semi-solid or contain gaseous material.[8]

Relevance to green growth: Household solid waste is a source of methane gas emission, through decomposition of waste at landfills. This process contributes to the greenhouse gas effect and climate change. Human activities generate waste according to their consumption and production patterns. A reduction of waste can indicate a step towards less material-intensive production patterns.

Figure 3.18. Household solid waste, thousand tons



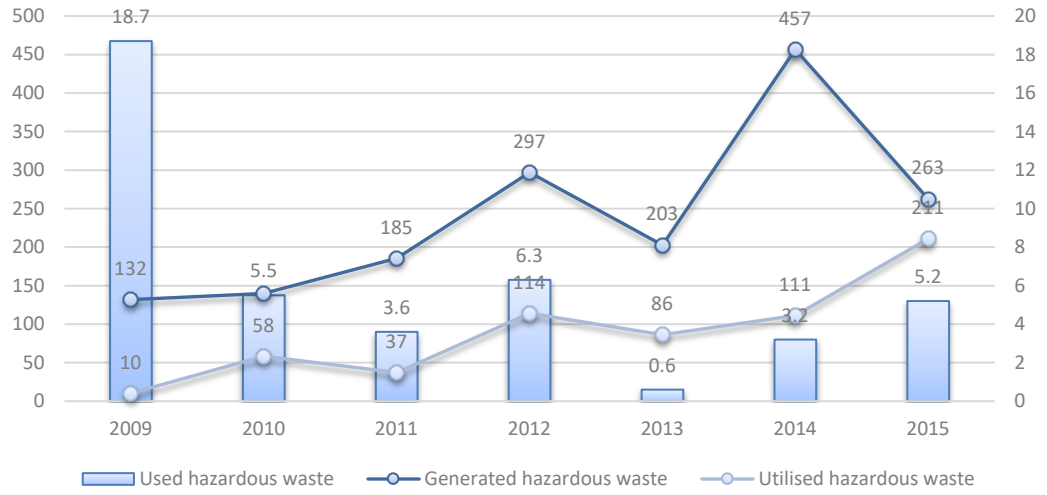
Source: State Committee of Statistics of Azerbaijan, 2016.

3.4.10. Production of industrial hazardous wastes

Definition: Hazardous waste is waste that poses substantial threats to the environment and to human health. Production of industrial hazardous wastes is measured in total quantities and per capita.

Relevance to green growth: Hazardous wastes pose a greater risk to the environment and human health than non-hazardous wastes. Hazardous waste levels are relatively low compared to general waste. However, as the main source of hazardous waste is industry, it is important to establish policies that contribute to industrial development, while providing tools to minimise hazardous waste generation.

Figure 3.19. Hazardous wastes, thousand ton



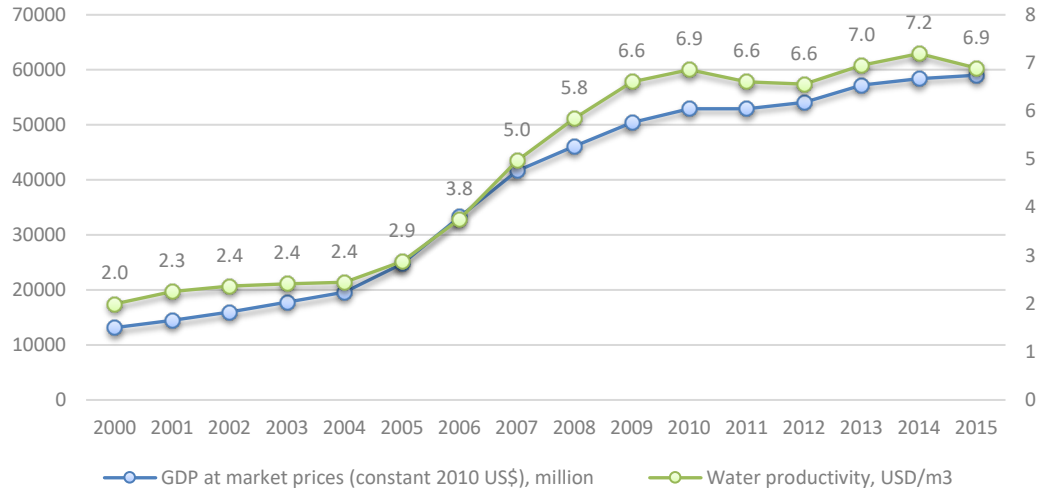
Source: State Committee of Statistics of Azerbaijan, 2016.

3.4.11. Water productivity

Definition: Water productivity is calculated as GDP in constant prices divided by annual total water withdrawal.[9]

Relevance to green growth: Water productivity indicates how much economic output is produced per cubic metre of fresh water abstracted (in EUR per m^3 or USD per m^3). It serves as a measure of the efficiency of water use.[10] Water productivity gains can result from improved infrastructure (less leakage) and structural changes in the economy (towards less water-intensive industries).

Figure 3.20. Water productivity, USD/m^3



Source: Calculated using data of State Committee of Statistics and WB, 2016.

3.5. Natural asset base

Natural resources are a major foundation of economic activity and human welfare. Their stocks are part of the natural capital and they provide raw materials, energy carriers, water, air, land and soil. They support the provision of environmental and social services that are necessary to develop human and social capital. The extraction and consumption of resources affects the quality of life and well-being of current and future generations.

Natural resources differ in their physical characteristics, abundance and value to countries or regions. Their efficient management and sustainable use are key to economic growth and environmental quality. The aim is to optimise the net benefits from resource use within the context of economic development by 1) ensuring adequate supplies of renewable and non-renewable resources to support economic activities and economic growth; 2) managing environmental impacts associated with extracting and processing natural resources, to minimise adverse effects on environmental quality and human health; 3) preventing natural resource degradation and depletion; and 4) maintaining non-commercial environmental services.

Progress can be monitored by examining stocks of natural resources and of other environmental assets along with flows of environmental services, and by using indicators

that reflect the extent to which the asset base is being maintained, in terms of quantity, quality or value (OECD, 2016[4]).

To assess Azerbaijan's progress towards green growth, the following *Natural Asset Base Indicators* have been selected:

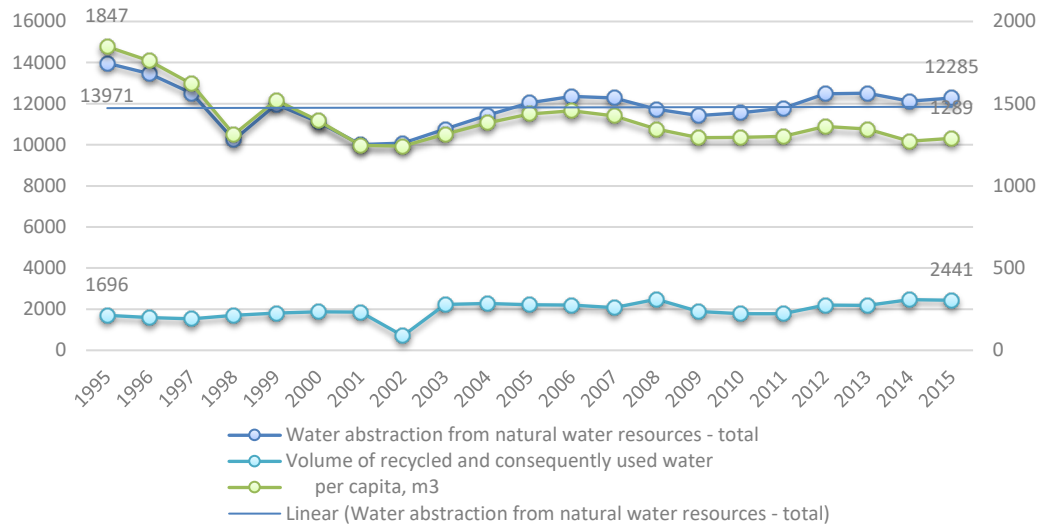
- Fresh water abstraction
- Water stress
- Water consumption
- Forest area and volume
- Extraction (oil, gas, mineral)
- Proven reserves (oil, gas, mineral)
- Land se
- Share of farmland subject to erosion
- Area of contaminated and remediation of land
- Species under danger of extinction (mammals, birds, fish, plant)
- Share of specially protected areas of nature in the overall country territory
- Fishing
- Fisheries

3.5.1. Freshwater abstraction

Definition: Freshwater abstraction covers volume of fresh water taken from underground and surface sources and determined by water counter indicators, on the basis of approved methodology. Volume of fresh water taken from underground sources is calculated in general taking into account all underground waters and wells.

Relevance to green growth: High levels of water abstraction put additional pressure on natural water resources, including renewable water resources, by extending the hydrological cycle.

Figure 3.21. Water abstraction, million m^3



Source: State Committee of Statistics of Azerbaijan, 2016.

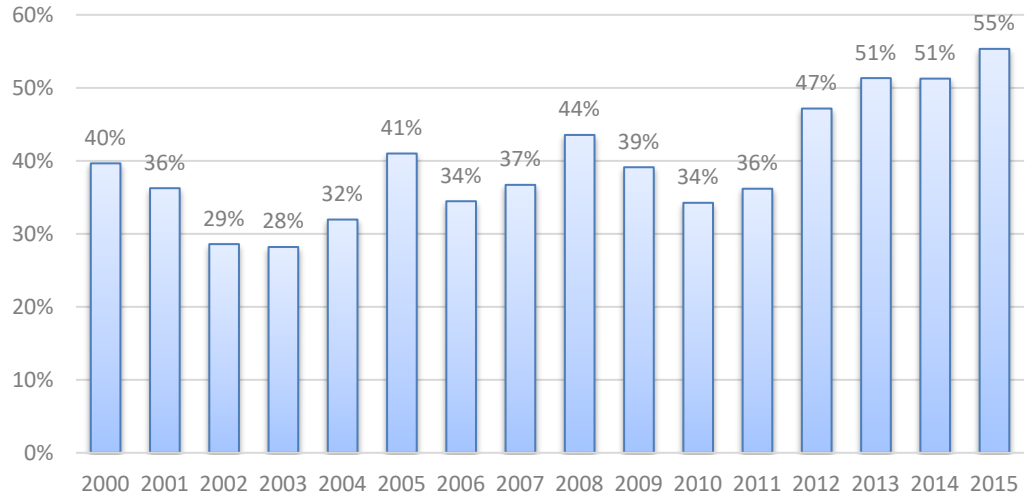
3.5.2. Water stress

Definition: The ratio of freshwater abstraction to the average (several years) volume of total available renewable surface and underground fresh water resources. The intensity of freshwater resource use (or water stress), expressed as gross abstraction from groundwater or surface water bodies in the percentage of total available renewable freshwater resources (including transboundary inflows) and in the percentage of internal freshwater resources (precipitation minus evaporation). There are five levels of water stress: low (less than 10%), low to medium (10%-20%), medium to high (20%-40%), high (40%-80%), and extremely high (more than 80%).

Relevance to green growth: Freshwater resources are of major environmental and economic importance. Their distribution varies widely among and within countries. Pressures on water resources are exerted by overexploitation, as well as by degradation of environmental quality.

Water stress occurs when the demand for water exceeds the available amount during a certain period, or when poor quality restricts its use. Water stress causes deterioration of fresh water resources in terms of quantity (aquifer over-exploitation, dry rivers, etc.) and quality (eutrophication, organic matter pollution, saline intrusion, etc.).[11]

Figure 3.22. Water stress, %



Source: Calculated using data of State Committee of Statistics, 2016.

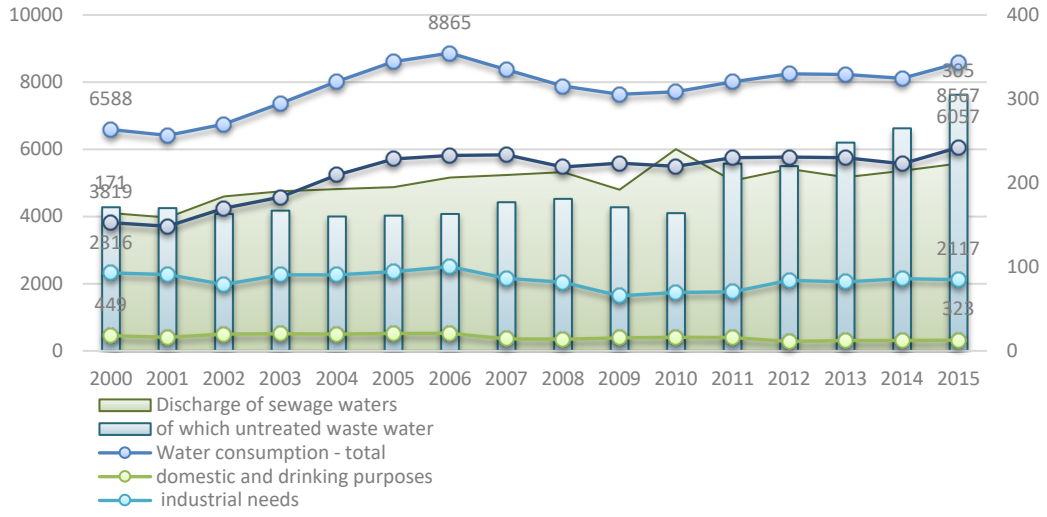
Overall trend in Azerbaijan: In the last 15 years, Azerbaijan has had a high level of water stress, and could potentially move towards a dangerously high level.

3.5.3. Water consumption

Definition: Water consumption is quantity of water used during the year for various needs broken down by sector: industry, household, irrigation, water supply for agriculture and other needs.

Relevance to green growth: Water consumption is closely related to water loss, water productivity, and water stress indicators. All of these indicators are important for environmental protection and ultimately, quality of life.

Figure 3.23. Water consumption, million m^3



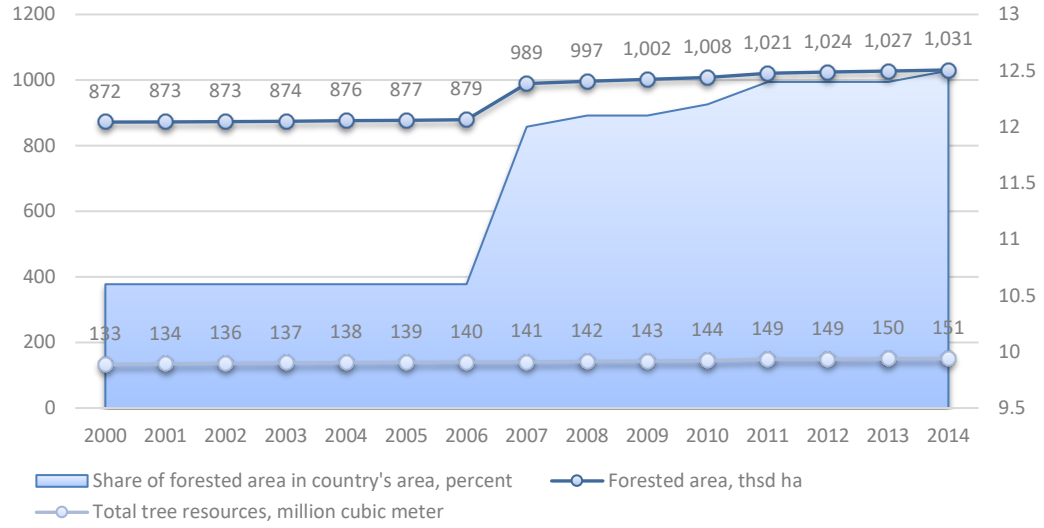
Source: State Committee of Statistics of Azerbaijan, 2016.

3.5.4. Forest area and volume

Definition: Forest area is land under natural or planted stands of trees of at least 5 metres in situ, whether productive or not, and excludes tree stands in agricultural production systems (for example, in fruit plantations and agroforestry systems) and trees in urban parks and gardens.[12] Forest volume is an estimation of trees' volume (in m^3) of forest area.

Relevance to green growth: Forests are among the most diverse and widespread ecosystems on earth, and have many functions. They provide timber and other products; have cultural value; deliver recreational benefits and ecosystem services, including regulation of soil, air and water; are reservoirs for biodiversity; and commonly act as carbon sinks. Forests are playing a vital role (with oceans) in absorbing carbon dioxide (CO_2) from the atmosphere and in producing oxygen. Forests are also important to the world´s climate, because they influence rain formation.

Figure 3.24. Forest area and volume



Source: State Committee of Statistics of Azerbaijan, 2016.

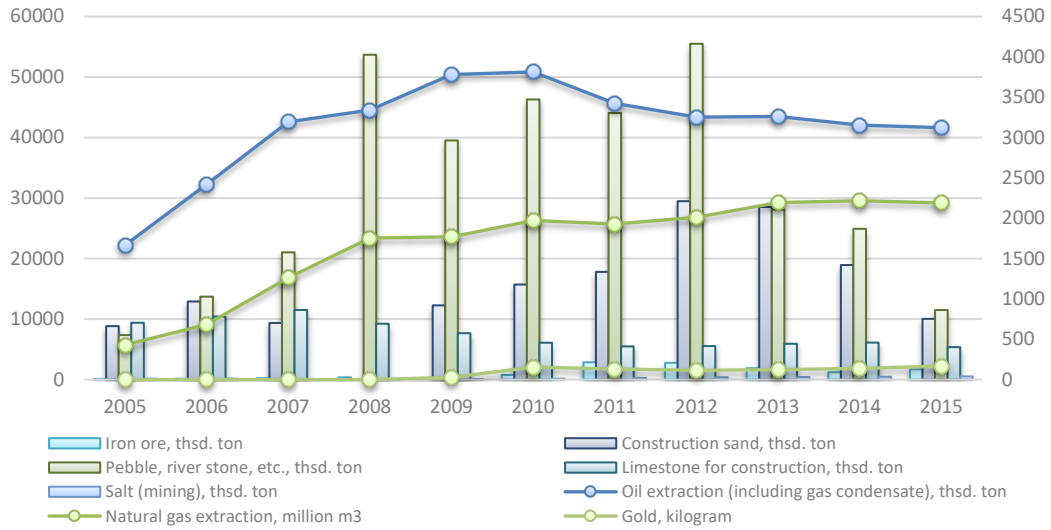
Overall trend in Azerbaijan: Forest area and volumes have been steadily rising in the country for the last 15 years. There are 41 forestries operating at present and around 10 000 hectares of forest funds are being reforested every year, through sowing and planting and support of natural renovation of forests (i.e. around 2.5 million seedlings are planted in specially allocated growing areas). The budget allocated to forestry is also increasing (from AZN 3.7 million in 2005 to AZN 12 million in 2015).

3.5.5. Extraction (oil, gas, mineral)

Definition: Mining is the extraction of valuable minerals or other geological materials from the earth, usually from an ore body, lode, vein, seam, reef or placer deposits.

Relevance to green growth: As natural resources are non-renewable, there is a need to find alternative energy sources and to increase productive usage of minerals to generate growth for long-term sustainability.

Figure 3.25. Extraction (oil, gas, mineral)



Source: State Committee of Statistics of Azerbaijan, 2016.

3.5.6. Proven reserves (oil, gas, mineral)

Definition: Proven reserves are such estimated quantities of mineral deposits, at a specific date, that analysis of geologic engineering data demonstrates, with reasonable certainty, to be recoverable in the future under the same economic and operational conditions.[13]

Relevance to green growth: Knowing proven reserves and current extraction figures, it is possible to forecast the longevity of resources. Long-term sustainable and environmentally friendly development relies on balanced usage of natural resources.

Overall trend in Azerbaijan:

Oil reserves	2.2-2.7 billion tons
Natural gas reserves	225 billion m^3
Estimated gas reserves	1.5-7.0 trillion m^3
Iron ore	246 million tons
Zinc ore	3.6 million tons
Gold	10 tons
Silver	4 200 tons
Limestone for construction	295.8 million tons

Source: Natural resources of Azerbaijan (in Russian): http://worldofscience.ru/geografija-mira/21-geografija-azerbajdzhana/503-prirodnye-resursy-azerbajdzhana.html and http://www.azerbaijan.az/portal/Nature/Geostructure/geostructure_02_r.html.

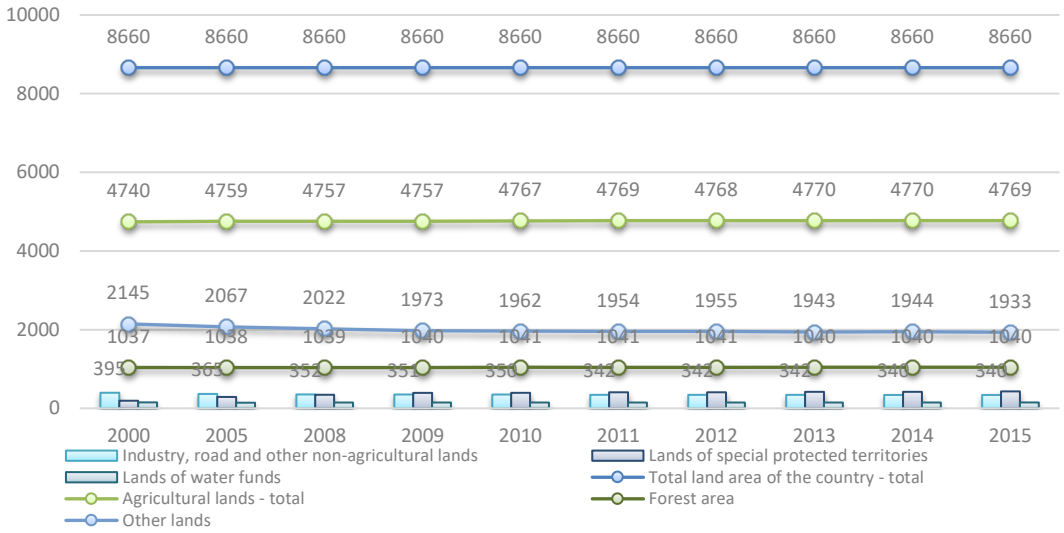
3.5.7. Land use

Definition: Land use is the area of all land within the borders of the country broken down by cover type. “Land cover” refers to the physical surface characteristics of land, such as the type of vegetation or the presence of artificial structures. “Land use” describes the economic and social functions of land to meet demands for food, fibre, shelter and natural resources.

Relevance to green growth: Land resources are the main component of the natural environment and an important part of natural assets. Land plays an important role in in

biomass and mass production, in protection of biological diversity and the productivity of an ecosystem.

Figure 3.26. Land fund distribution, thousand ha



Source: State Committee of Statistics of Azerbaijan, 2016.

3.5.8. Share of farmland subject to erosion

Definition: Share of all farmland that is at risk of erosion, broken down by risk category (low, medium, high).

Relevance to green growth: Fertile land is one of the basic factors of any given ecosystem. Prevention of erosion is important for protection of biodiversity.

Table 3.4. Irrigated and salination areas by region, ha

Name of Region	Irrigated area, ha	Salination area, ha
Kürdemir	33 200	21 674
Zardab	38 954	28 675
Ucar	66 307	51 800
Göyçay	20 295	20 083
Saatlı	54 425	69 122
Sabirabad	67 212	56 172
Salyan	45 193	45 193
Hacıgabul	33 982	14 404
Neftchala	14 412	14 412
Bilasuvar	15 138	12 425
Xachmaz	4 530	4 530
Shabran	7 250	7 250
Agcabadi	80 000	57 100
Qobustan	96 453	22 203
Imishlı	117 385	117 385
Beylagan	84 000	37 799
Agsu	9 600	9 600
Agdash	18 435	18 435
Barda	1 141	1 141

Yevlakh	11 046	11 046
Jalilabad	8 487	8 487
Siyazan	23 465	23 465
Füzuli	915	915
TOTAL	**851 825**	**653 316**

Source: Ministry of Ecology and Natural Resources, Baku, Azerbaijan.

Overall trend in Azerbaijan: According to research institutes in Azerbaijan, 36.4% of the territory is subject to erosion. Of this figure, 14.1% is land with low displacement, 10.7% with medium displacement and 11.6% with high displacement of upper layer of soil.

Depending on the natural physical parameters of the land and climate, and human influence, different areas of the country have varying levels of erosion. Thus, in Mil-Karabakh 30.8% of the land, in Guba-Xachmaz 48.2%, in Absheron 40.3%, in Nakhchıvan 70.7%, in Shirvan 27.7%, Sheki-Zagatala 55.7%, and in Karabagh 59.3% of land is subject to erosion.[14]

Salinisation of soils is also being monitored by the Ministry of Ecology and Natural Resources. According to research conducted in 2017 in 23 regions of the country, of 851 000 hectares of irrigated land, 653 000 hectares are subject to different levels of salination (Table 3.4).

3.5.9. Area of contaminated and remediation of land

Definition: Total area of land considered contaminated broken down by type (urban, industrial land, farmland, forestland and other land).

Relevance to green growth: Contaminated land can pose significant threats to the environment and potential risks to the people using the land. The economic implications of land contamination can also be substantial and long-lasting.

Overall trend in Azerbaijan: In 2006, the Ministry of Ecology and Natural Resources conducted a study on contaminated land. According to this study there were approximately 10 000 m^3 of land contaminated by oil products. Every year, SOCAR assigns a special budget for remediation of oil contaminated land. The three-year results of this activity is as follows:

Table 3.5. Remediated land, ha

	Remediated land, ha			
Name of enterprise	**2014**	**2015**	**2016**	**TOTAL**
SOCAR	95.6	71.8	44.8	212.3
including				
Azneft Production Union	23.3	10.4	19.7	53.4
Surakhani Oil Operation Company	13.6	9.0	3.5	26.1
Binaqadi Oil Operation Company	9.2	3.842	16.7	29.7
AzGerneft LTD	18.9	20.58	0.37	39.8
Bahar Energy Operation Company	12.5	–	–	12.5
Balakhani Oil Operation Company	14.2	24.5	3.7	42.4
Salyan Oil Operation Company	0.6	0.5	–	1.1
Qobustan Operation Company	1.4	0.0318	0.25	1.65
Shirvan Oil Joint Venture	0.05	0.0376	0.22	0.3
Neftchala Operation Company	1.9	2.9	0.4	5.3

Source: State Oil Company of Azerbaijan Republic.

3.5.10. Species in danger of extinction (mammals, birds, fish, plants)

Definition: Species in danger of extinction are determined on the basis of the number of rare animal and plant species or those in danger of extinction and protected by law. It refers to critically endangered, endangered and vulnerable species, i.e. those plants and animals that are in danger of extinction or soon likely to be.

Relevance to green growth: This indicator is critical for the protection of greater species diversity, since biodiversity ensures natural sustainability for all life forms. Biodiversity helps ecosystems to be more resilient in the face of a variety of disasters.

Overall trend in Azerbaijan: The first edition of the Red Book of plants and animals of the Azerbaijan Soviet Socialist Republic was published in 1989. That edition included 140 species of Azerbaijan flora and 108 species of fauna, as well as species in danger of extinction.

The second updated edition of the Red Book of Azerbaijan was published in 2013.[15] It covers 300 plant species (266 high and 20 primary), 14 mushroom species and 223 animal species (1 species of Oligochaeta, 1 species of Crustacea, 1 species of Mollusca, 71 species of Insecta, 6 species of Amphibia, 14 species of Reptilia, 9 species of Pisces, 72 species of Aves, 42 species of Mammalia).[16]

This work has been conveyed according to "The National Strategy and Action Plan on Protection and Sustainable Use of the Biodiversity" approved by the Decree of the President of Republic of Azerbaijan on 24 March 2006.

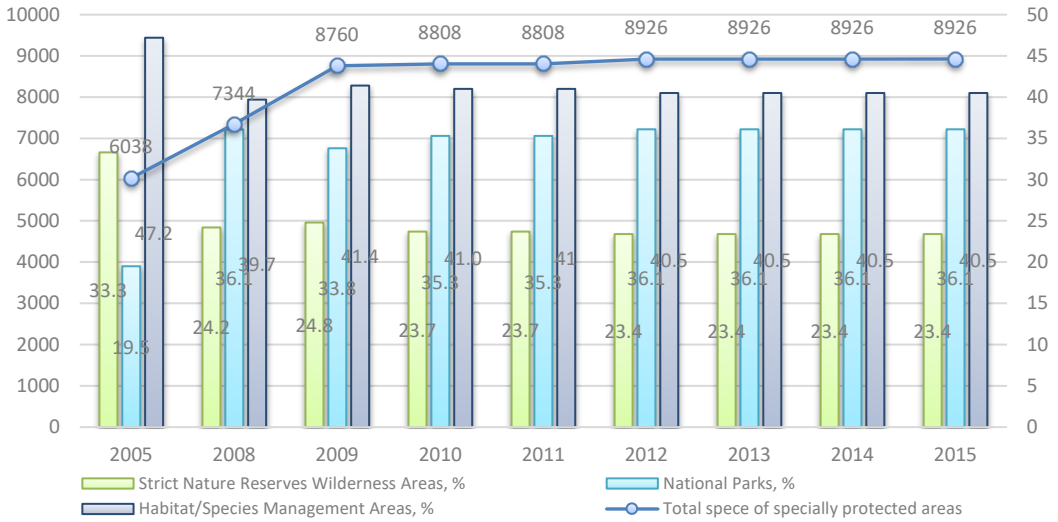
3.5.11. Share of specially protected areas of nature in overall territory

Definition: Share of specially protected areas of nature in overall territory is calculated as the relation of total area of reserves, national parks and closed territories broken down by International Union for Conservation of Nature protected area category in relation to overall country territory.

Relevance to green growth: Specially protected areas of nature consist of complexes of ecological, science, cultural, aesthetic and health importance, habitat of rare animal species and plants and those in danger of extinction, land wholly, partially, permanently or

temporarily extracted from the industrial cycle, water areas and atmosphere. They represent state natural reserves, national parks and closed territories.

Figure 3.27. Specially protected areas, km²



Source: State Committee of Statistics of Azerbaijan, 2016.

3.5.12. Fishing

Definition: Fishing is nominal (live weight) fish hunt in fresh, salt and sea waters, broken down by species. Fishing of shellfish, mussels and other marine animals is included.

Relevance to green growth: Fishing is an important economic sector that depends on renewable fish resources.

Table 3.6. Total quantity of caught fish, ton

	2006	2007	2008	2009	2010	2011	2012	2013	2014
ton	**21 430**	**20 599**	**20 908**	**45 088**	**45 315**	**47 025**	**57 667**	**50 960**	**50 067**
including:									
fish caught by fisheries	110	122	144	137	123	125.9	115	113	100
lake and pond fish caught	-	-	39	183	361	338.1	321	335	318
fishing on quota	3 976	2 943	1 517	1 202	1 082	1061	910	794	881
all fish species caught by natural persons	17 344	17 534	19 208	43 566	43 749	45 500	56 321	49 718	48 768

Source: State Committee of Statistics of Azerbaijan, 2016.

Table 3.7. Fish species caught by quota, ton

ton	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL	9 003	3 976	2 943	1 409	1 123	1 082	1061	910	794	881	566
including:											
bream	63	66	75	76	72	56	72	64	59	46	22
sazan	17	20	17	16	9	9	6	14	7	22	21
crusian	3	13	10	20	19	12	5	5	5	3	4
carp	33	32	48	58	39	34	59	62	72	52	54
omul	18	20	46	50	41	54	82	80	117	162	116
chub	2	2	2	4	1	3	1	2	2	2	0.2
pike	8	5	3	4	1	-	-	1	-	-	-
grey mullet	15	21	62	35	40	62	139	125	125	157	78
catfish	4	3	4	7	8	4	4	4	4	4	1
pike perah	41	39	25	27	27	20	30	28	26	9	2
bullethead	2	1	1	-	-	1	-	-	-	-	-
sturgeon	85	-	67	65	-	2	-	2.4	-	-	-
herring	60	-	-	-	-	90	152	126	150	247	118
sprat	8 637	3 667	2 450	1 020	839	708	485	372	206	164	138
karasol	2	4	7	9	5	6	7	12	5	3	4
royal fish	5	5	10	16	18	14	19	13	17	10	4
other fish species	8	10	18	2	4	7	-	-	-	-	4

Source: State Committee of Statistics of Azerbaijan, 2016.

3.5.13. Fisheries share of fish stocks within safe biological limits (on global scale)

Definition: The percentage of fish stocks within safe biological limits, with maximum biological productivity. This indicator determines biological status of fish stocks and is used in global and regional evaluation.

Relevance to green growth: Fish resources play a key role in the human food supply and aquatic ecosystems. In many countries, fisheries make an important contribution to sustainable incomes and employment opportunities. The main concerns relate to the impact of human activities on fish stocks and habitats in marine waters and fresh water, and to the consequences for biodiversity and for the fish supply for human consumption and other uses (FAO, 2016[11]).

Overall trend in Azerbaijan: This indicator is suggested for further development, since no information was available from the open sources or the working group members.

3.6. Environmental dimension of quality of life

Environmental outcomes are important determinants of human health and well-being. They demonstrate that growth in production and income may not always be accompanied by a rise in well-being. Degraded environmental quality can result from and cause unsustainable development patterns. It can have substantial economic and social consequences, from increased health costs and lower labour productivity to reduced agricultural output, impaired ecosystem functions and a generally lower quality of life.

Environmental conditions affect the quality of life in various ways. They affect human health through air and water pollution and exposure to hazardous substances and noise, as

well as through indirect effects from climate change, transformations in water cycles, biodiversity loss and natural disasters that affect the health of ecosystems and damage people's property and life. People also benefit from environmental services, such as access to clean water and nature, and their choices are influenced by environmental amenities.

The main aspects of importance to green growth include:

- Human exposure to pollution and environmental risks, the associated effects on human health and on quality of life, and the related health costs and impacts on human capital.
- Public access to environmental services and amenities, or the level and type of access various groups have to environmental services such as clean water, sanitation, green spaces and public transport.

Indicators on exposure to natural or industrial risks and related economic losses are not yet fully measurable and require further specification.

To assess Azerbaijan's progress towards green growth, the following *Environmental Dimension of Quality of Life Indicators* have been selected:

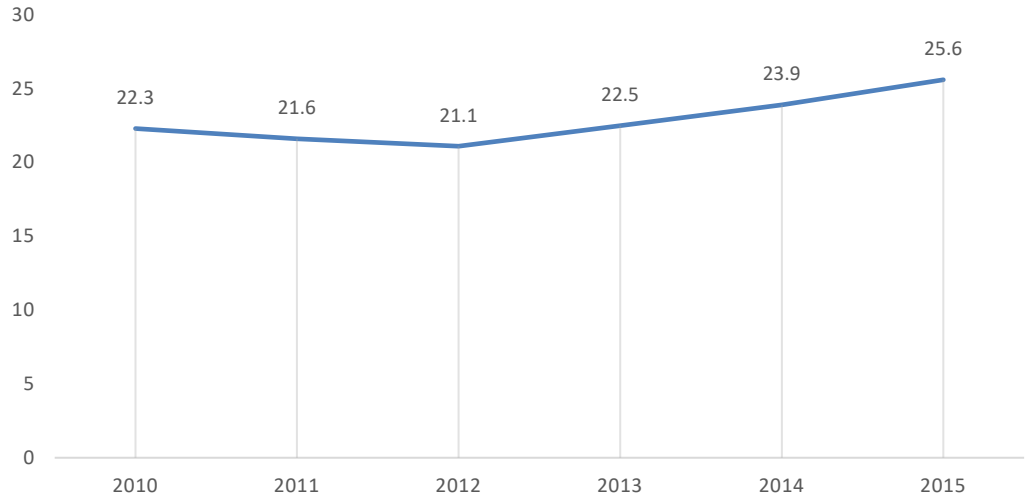
- Population-weighted exposures to $PM_{2.5}$
- Share of population with improved sanitary connections
- Proportion of population using safely managed drinking water services
- Municipal sewage treatment

3.6.1. Population-weighted exposures to $PM_{2.5}$

Definition: Population-weighted exposure to ambient $PM_{2.5}$ pollution is defined as the average level of exposure of a nation's population to concentrations of suspended particles measuring less than 2.5 microns in aerodynamic diameter, which are capable of penetrating deep into the respiratory tract and causing severe health damage. Exposure is calculated by weighting mean annual concentrations of $PM_{2.5}$ by population in both urban and rural areas.[17]

Relevance to green growth: $PM_{2.5}$ pollution easily breaches human biological barriers and poses great health risks. Exposure to $PM_{2.5}$ reduces the life expectancy of the population by about 8.6 months on average.[18]

Figure 3.28. $PM_{2.5}$ air pollution, mean annual exposure, microgrammes per m^3



Source: World Bank (World Development Indicators), 2016.

Overall trend in Azerbaijan: In Azerbaijan, national legislation does not currently define limit values for the concentrations of particulates (PM_{10} and $PM_{2.5}$) or ozone in ambient air, the pollutants considered to cause a majority of negative health impacts globally.

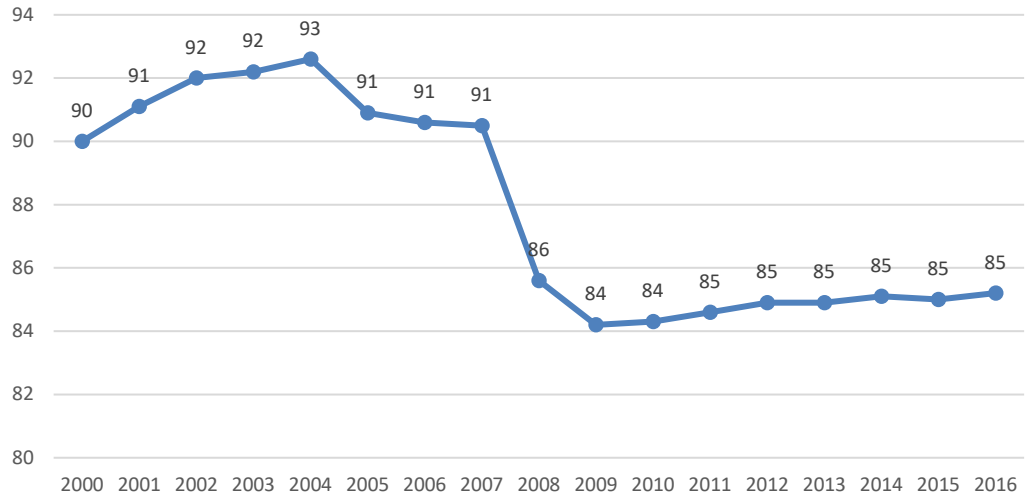
The EU-funded Twinning project "Upgrading the National Environmental Monitoring System (NEMS) of Azerbaijan on the basis of EU best practices" supports the Ministry of Ecology and Natural Resources of Azerbaijan in modernising the environmental monitoring systems. These are currently outdated, since they are mostly based on Soviet-era technologies and methodology. Based on the outcome of this project, Azerbaijan might modernise the air quality monitoring network and establish $PM_{2.5}$ measurements in other parts of the country.

3.6.2. Share of population with improved sanitary facilities

Definition: The percentage of the population using improved sanitation facilities. Improved sanitation includes sanitation facilities that hygienically separate human excreta from human contact (dug toilets connected to sewerage, waste-pit toilets being ventilated, washed toilets, bio toilets, etc. are related to improved sanitary facilities).[19]

Relevance to green growth: Improved sanitation helps reduce the risk of diarrhoea, reducing the spread of intestinal worms, reducing the severity and impact of malnutrition, and increasing the potential recovery of water, renewable energy and nutrients from faecal waste.[20]

Figure 3.29. Percentage of apartments with sewage, %



Source: State Committee of Statistics of Azerbaijan, 2017.

Overall trend in Azerbaijan: According to the Draft of the National Water Strategy of Azerbaijan (2016). "There are a great number of problems in water supply and sewage systems. There is a pressing need for actions in order to offset the problems of the shortage of water, and an inadequate water supply network, especially in the rural areas".

The strategy states that Baku's sewerage system covers only 72% of the population and that only 50% of water is being treated. In other regions of the country, sewage system coverage drops to 32%. Many of the 16 sewage treatment facilites in rural areas are partially or completely out of service. The Draft pledges to have:

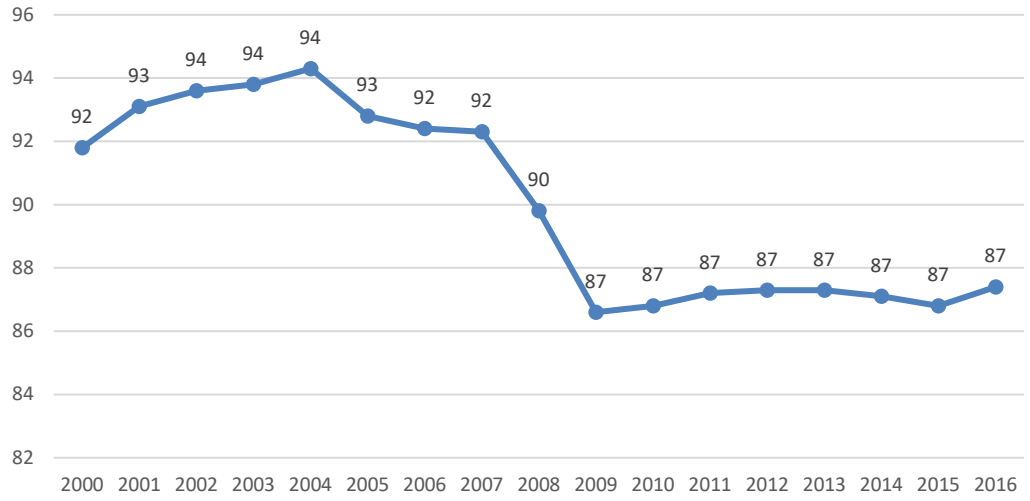
- 60% country sewage coverage by 2023;
- 80% country sewage coverage by 2029;
- 100% country sewage coverage by 2035.

3.6.3. Proportion of population using safely managed drinking water services

Definition: The percentage of the population using safely managed drinking water services. Safely managed drinking water is water from an improved water source, which is located on premises, available when needed and free of faecal and priority contamination.[21]

Relevance to green growth: This indicator is one of the new 2030 Sustainable Development Goals. It is differentiated from other means of access to water in one major respect. Compared to surface water, such as rivers, lakes and ponds (no service) and other unimproved sources that do not protect against contamination (unimproved), safely managed drinking water protects against contamination.

Figure 3.30. Percentage of apartments with safe water supply, %



Source: State Committee of Statistics of Azerbaijan, 2017.

Overall trend in Azerbaijan: According to the Draft of the National Water Strategy of Azerbaijan (2016), the country's present water safety is as follows:

- Baku: 95%
- Sumqayit and Ganja: 95%
- Small cities: 83%
- Rural areas: 11%

The Draft pledges to have:

- 100% country water supply by 2029;
- 100% country high quality water supply by 2035.

3.6.4. Municipal sewage treatment

Definition: The percentage of households connected to sewers by level of water treatment (no treatment, primary treatment, secondary treatment and tertiary treatment). Primary treatment of polluted water includes physical and (or) chemical process aimed at removal of solid particles in water. Secondary treatment includes biological processes that remove at least 70%-75% of biochemical and chemical contaminants. Tertiary treatment includes removal of nitrogen and phosphorus as well as other pollutants.

Relevance to green growth: Better municipal sewage treatment improves human well-being, but also creates new market and job opportunities in treatment facilities.

Overall trend in Azerbaijan: This indicator is suggested for further development, as no information was available from the open sources or the working group members.

3.7. Economic opportunities and policy responses

Governments play a key role in encouraging green growth, by: creating conditions that stimulate greener production and consumption through economic and other policy instruments; encouraging co-operation and sharing of good practices among enterprises; developing and promoting use of new technology and innovation; and increasing policy coherence. The main challenge is to use environmental protection as a source of growth, international competitiveness, trade and jobs.

Businesses play an important role in adopting greener management approaches and new business models, developing and using new technologies, carrying out R&D and gathering the information needed to make purchasing choices that reduce the environmental impact of consumption.

The main issues of importance to green growth that are dealt with in this section are:

- technology and innovation, which are important drivers of growth and productivity in general, and of green growth in particular. They are important for managing natural resources and raw materials and minimising pollution. Innovation can spur new markets, contribute to job creation, support shifts towards new management methods and facilitate the adoption of co-operative approaches and the diffusion of knowledge.
- production of environmental goods and services, which are an important aspect of the economic opportunities that arise in a greener economy.
- international financial flows to facilitate uptake and dissemination of technology and knowledge, encourage cross-country exchange of knowledge and help meet development and environmental objectives.
- prices, taxes and transfers, which provide important signals to producers and consumers. They serve as tools to internalise externalities and influence market participants to adopt more environmentally friendly behaviour.

Ideally, these indicators should be complemented by indicators on regulation, training and skill development. However, such indicators have yet to be developed, since they are limited by the availability of data and comparability of regulatory measures across countries. Moreover, the set contains indicators on international financial flows, which would have to be reformulated to be relevant to the national contexts in EaP countries.

To assess Azerbaijan's progress towards green growth, the following *Economic Opportunities and Policies Indicators* have been selected:

- financing by government of R&D in energy and environment protection;
- share of fixed capital investment for environment protection and natural resource efficiency in total investment;
- environmental charges, fees and fines;
- share of environmental tourism in GDP and number of environmental tourists;
- environment-related foreign direct investment;
- number of small- and medium-sized enterprises operating in the environmental goods and services sector;

- employment in the environmental goods and services sector.

3.7.1. Financing by government of R&D in energy and environmental protection

Definition: The budget allocation information related to research and development (R&D) in energy efficiency or renewable energy and environment protection corresponds with "List of analysis and comparison of research budget and programmes".

Relevance to green growth: Innovation is a key driver of productivity and economic growth. Innovation can help achieve environmental objectives at lower costs. This may also lead to the creation of new business opportunities and markets.

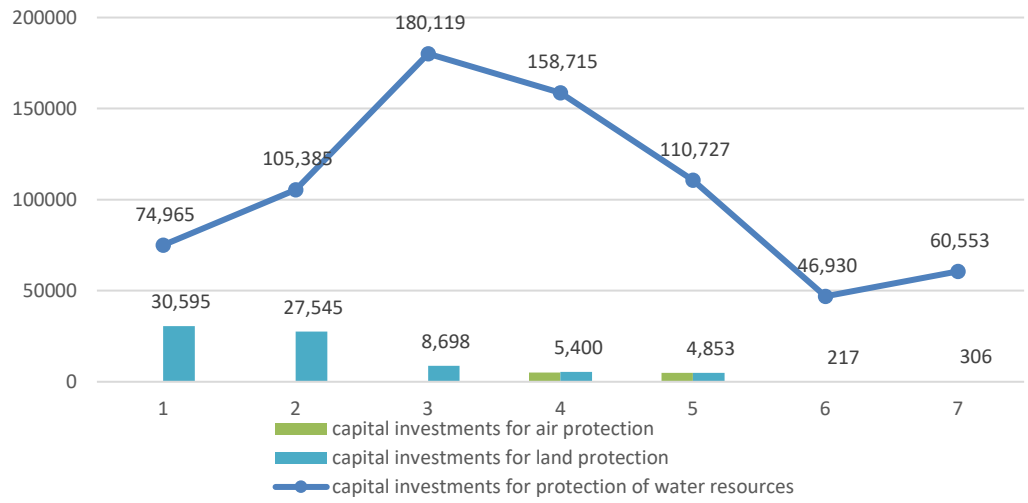
Overall trend in Azerbaijan: This indicator is suggested for further development, since no information was available from the open sources or the working group members.

3.7.2. Share of fixed capital investment for environment protection and natural resource efficiency in total investment

Definition: Ratio of investments in fixed assets aimed at construction of buildings and facilities related to environmental protection and efficient usage of natural resources.

Relevance to green growth: Along with expenditure on research on environmental protection, capital investment for environmental protection and resource efficiency is one of the policy measures that helps to reduce society's ecological footprint.

Figure 3.31. Capital investment for environment protection, thousand USD



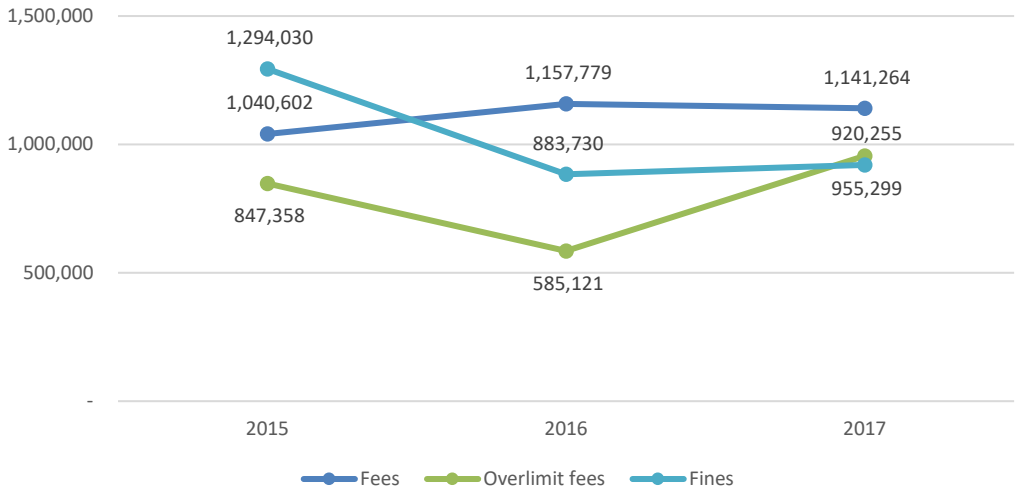
Source: State Committee of Statistics of Azerbaijan, 2017.

3.7.3. Environmental charges, fees and fines

Definition: Number and value of payments made by enterprises for charges, fees and fines related to the use of the environment (payments for polluting the air, payments for polluting water resources, payments for waste placement).

Relevance to green growth: A system of fees and changes on the one hand incentivise more environmentally friendly behaviour of manufacturing enterprises, and on the other, generate government revenues that can be channelled into environmental protection.

Figure 3.32. Environmental charges, fees and fines



Source: Ministry of Ecology and Natural Resources.

Overall trend in Azerbaijan: There are three types of financial payments being used, according to the Decision of the Cabinet of Ministers dated 1992. Fees are being charged for pollution within limits, over-limit fees for pollution beyond the normal allowances and fines for pollution that is not allowed by the Decision or any other environmental normative act. Since these limits and fees were established 25 years ago, the Ministry of Ecology and Natural Resources is in the process of drafting new guidance on limits and fees that are more in line with international standards and the present state of the country's environment.

3.7.4. Share of environmental tourism in GDP and number of environmental tourists

Definition: The value added of environmental tourism as a share of total tourism value added. An environmental tourist is a person seeking temporary accommodation in the country (from 24 hours to 12 months), aiming to visit natural sites.

Relevance to green growth: Generates revenues for and from environmental conservation.

Overall trend in Azerbaijan: This indicator is suggested for further development, as no information was available from the open sources or working group members.

3.7.5. Environment-related foreign direct investment

Definition: Share of foreign direct investment in the environmental goods and services sector.

Relevance to green growth: Drives and mobilises investments in cleaner technologies and infrastructure.

Overall trend in Azerbaijan: This indicator is suggested for further development, as no information was available from the open sources or the working group members.

3.7.6. Number of small- and medium-sized enterprises operating in the environmental goods and services sector

Definition: The number of small- (fewer than 50 employees) and medium-sized (from 50 to 250 employees) operating in the environmental goods and services sector.

Overall trend in Azerbaijan: This indicator is suggested for further development, since no information was available from the open sources or the working group members.

3.7.7. Employment in the environmental goods and services sector

Definition: Number of persons employed in the environmental goods and services sector, broken down by age and gender.

Overall trend in Azerbaijan: This indicator is suggested for further development, since no information was available from the open sources or the working group members.

4. Key messages and ways forward

The report aims to serve as background and a starting point for follow-up development of green growth policies in Azerbaijan. The proposed set of indicators is neither exhaustive nor final. It may be further refined as data become available.

Key messages

Some of the key messages that emerged from the analysis include:

- **Political will**: There is wide recognition across the government and among different stakeholders that green and growth should go hand in hand and a high-level commitment has been made to pursuing green growth.
- **Inter-ministerial co-ordination**: The working group on green growth indicators was a useful mechanism for opening the dialogue across the government and engaging relevant stakeholders, sharing information and discussing progress. The working group should continue to meet annually to discuss progress towards green growth.
- **Policy integration**: This preliminary work on GGIs aims to serve as background and as a starting point for follow-up development of green growth policies in Azerbaijan. It provides a basis for policy makers to assess their decisions. The working group should consider how best to integrate green growth measurement in the governmental agenda.
- **Flexibility**: The proposed set of indicators is neither exhaustive nor final. It is rather a starting point that may be further modified as the national context evolves and as new data become available;
- **Data collection**: Some indicators require further work for data collection. This work is in progress, and the proposed set of indicators should be further refined as data become available.

Indicators suggested for further development

The following indicators were suggested for further development, since no information was available from the open sources or the working group members:

- fish stocks and fisheries
- municipal sewage treatment
- financing by government of R&D in energy and environment protection
- share of environmental tourism in GDP and number of environmental tourists
- environment-related foreign direct investment
- number of small- and medium-sized enterprises operating in the environmental goods and services sector
- employment in the environmental goods and services sector.

Endnotes

[1] World Bank national accounts data, and OECD National Accounts data files.

[2] OECD data, https://data.oecd.org/lprdty/gdp-per-hour-worked.htm#indicator-chart.

[3] OECD data, https://data.oecd.org/unemp/unemployment-rate.htm.

[4] OECD data, https://data.oecd.org/healthstat/life-expectancy-at-birth.htm.

[5] Eurostat, http://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics.

[6] http://www.azerbaijan-news.az/index.php?mod=3&id=67345.

[7] OECD, https://data.oecd.org/waste/municipal-waste.htm.

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[9] World Bank, http://data.worldbank.org/indicator/ER.GDP.FWTL.M3.KD?locations=AZ.

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[13] OECD Glossary, https://stats.oecd.org/glossary/detail.asp?ID=2187.

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Annex A. The OECD set of green growth indicators

The list of indicators is flexible and should be considered as a starting point, so that the choice of indicators can be adapted to the context in the individual country. A balance needs to be struck between the desire to be exhaustive and the need for simplicity. Not all issues of importance to green growth can be measured in quantitative terms, and not all indicators proposed here are equally relevant to every country. The list, which has been reviewed by OECD member countries, is neither exhaustive nor final; indeed, it will require the context of other OECD indicators to acquire its full significance. It may be modified as the discussion evolves and as new data become available (OECD, 2017[7]).

Table A A.1. The OECD set of green growth indicators

Group/Theme	Proposed indicators
The socio-economic context and characteristics of growth	
Economic growth, productivity and competitiveness	**Economic growth and structure** • GDP growth and structure • Net disposable income (or net national income)
	Productivity and trade • Labour productivity • Multi-factor productivity • Trade-weighted unit labour costs • Relative importance of trade: (exports + imports)/GDP
	Inflation and commodity prices • Consumer Price Index • Prices of food; crude oil; minerals, ores and metals
Labour market, education and income	**Labour markets** • Labour force participation • Unemployment rate
	Socio-demographic patterns • Population growth, structure and density • Life expectancy: years of healthy life at birth • Income inequality: Gini coefficient • Educational attainment: level of and access to education
The environmental and resource productivity of the economy	
Carbon and energy productivity	**1. CO_2 productivity** 1.1. Production-based CO_2 productivity GDP per unit of energy-related CO_2 emitted 1.2. Demand-based CO_2 productivity Real income per unit of energy-related CO_2 embodied in final demand
	2. Energy productivity 2.1. Energy productivity GDP per unit of TPES 2.2. Energy intensity by sector (manufacturing, transport, households, services) 2.3. Share of renewable energy sources in TPES, in electricity production
Resource productivity	**3. Material productivity (non-energy)** 3.1. Demand-based material productivity (comprehensive measure; original units in physical terms) Real income per unit of materials embodied in final demand, materials mix

	3.2. Production-based (domestic) material productivity GDP per unit of materials consumed, materials mix • Biotic materials (food, other biomass) • Abiotic materials (metallic minerals, industrial minerals) 3.3. Waste generation intensity and recovery ratios by sector, per unit of GDP or value added, per capita 3.4. Nutrient flows and balances (N, P) • Nutrient balances in agriculture (N, P) per agricultural land area and change in agricultural output
	4. Water productivity Value added per unit of water consumed, by sector (for agriculture: irrigation water per hectare irrigated)
Multi-factor productivity	**5. Environmentally adjusted multi-factor productivity** (comprehensive measure; original units in monetary terms)
The natural asset base	
Natural resource stocks	**6. Index of natural resources** Comprehensive measure expressed in monetary terms
Renewable stocks	**7. Freshwater resources** Available renewable natural resources (groundwater, surface water) and related abstraction rates (national, territorial) **8. Forest resources** Area and volume of forests; stock changes over time **9. Fish resources** Proportion of fish stocks within safe biological limits (global)
Non-renewable stocks	**10. Mineral resources** Available (global) stocks or reserves of selected minerals: metallic minerals, industrial minerals, fossil fuels, critical raw materials; and related extraction rates
Biodiversity and ecosystems	**11. Land resources** Land cover conversions and cover changes from natural state to artificial state • Land use: state and changes **12. Soil resources** Degree of topsoil losses on agricultural land, on other land • Agricultural land area affected by water erosion, by class of erosion **13. Wildlife resources (to be further refined)** • Trends in farmland or forest bird populations or in breeding bird populations • Species threat status, in percentage of species assessed or known • Trends in species abundance
The environmental dimension of quality of life	
Environmental health and risks	**14. Environmentally induced health problems and related costs** (e.g. years of healthy life lost as a result of degraded environmental conditions) • Population exposure to air pollution and the related health risks and costs **15. Exposure to natural or industrial risks and related economic losses**
Environmental services and amenities	**16. Access to sewage treatment and drinking water** 16.1. Population connected to sewage treatment (at least secondary, in relation to optimal connection rate) 16.2. Population with sustainable access to safe drinking water
Economic opportunities and policy responses	
Technology and innovation	**17. Research and development expenditure that is significant for green growth** • Renewable energy sources (% of energy-related R&D) • Environmental technology (% of total R&D, by type)

	• All-purpose business R&D (% of total R&D) **18. Patents of importance to green growth** (% of a country's patent families worldwide) • Environment-related and total patents • Structure of environment-related patents **19. Environment-related innovation in all sectors**
Environmental goods and service	**20. Production of environmental goods and services (EGS)** • Gross value added in the EGS sector (% of GDP) • Employment in the EGS sector (% of total employment) • To be complemented by: Environmentally related expenditure (level and structure)
International financial flows	**21. International financial flows of importance to green growth** % of total flows and % of gross national income (GNI) 21.1 Official development assistance 21.2 Carbon market financing 21.3 Foreign direct investment
Prices and transfers	**22. Environmentally related taxation and subsidies** • Level of environmentally related tax revenue (% of GDP, % of total tax revenues; in relation to labour-related taxes) • Structure of environmentally related taxes (by type of tax base) • Level of environmentally related subsidies **23. Energy pricing** (share of taxes in end-use prices) **24. Water pricing and cost recovery (to be developed)**
Regulations and management approaches	**25. *Indicators to be developed***
Training and skill development	**26. *Indicators to be developed***

Source: OECD (2017), *Green Growth Indicators 2017*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264268586-en.

Green Transformation in Azerbaijan

National Report Based on the OECD Set of Green Growth Indicators

To help countries to monitor progress in achieving economic growth and development, while preventing costly environmental damage and inefficient resource use, the OECD developed a measurement framework that consists of 26 green growth indicators. This set of indicators has been kept flexible enough so that countries can adapt it to their national context.

The OECD set of indicators was already applied in the Czech Republic, Denmark, Germany, Korea, the Netherlands, Slovakia, Slovenia, pilot-tested in six Latin American countries and is now being extended to the Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine).

The report proposes a selection of green growth indicators to help the government of Azerbaijan to monitor progress towards green growth. The indicators were chosen by the Inter-Ministerial Working Group on Green Growth Indicators.

This report has been prepared within the framework of the project on "Greening Economies in the Eastern Neighbourhood" (EaP GREEN) funded by the European Union and implemented by the OECD in partnership with UN Environment, UNECE and UNIDO.

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