Introduction

This report summarizes the discussions and recommendations resulting from a workshop conducted by the OECD on behalf of the Committee on Statistics of Kazakhstan in Astana, Kazakhstan from June 23-24, 2016. The workshop focused on the experience of the Committee on Statistics in the compilation of pilot green growth indicators for Kazakhstan based on the concepts and methods in the OECD green growth indicators framework. The OECD was represented by Mr. Robert Smith of Midsummer Analytics, Ottawa, Canada, international environment-economy consultant, and by Ms. Mikaela Rambali, Policy Analyst and Mr. Krzysztof Michalak, Senior Programme Manager of the OECD Environment Directorate.

The purpose of the Green Growth Indicator Workshop was to review the concepts, methods and initial results of the pilot implementation of the OECD’s green growth indicator set in Kazakhstan. The indicators included in each of the five principle blocks of the OECD’s framework were discussed:

- Block 1 - Environmental and resource productivity
- Block 2 – Natural Asset Base
- Block 3 – Environmental Quality of Life
- Block 4 – Economic Opportunities and Political Response Measures
- Block 5 – Socio-economic Context and Characteristics of Growth

The OECD’s findings and recommendations based on the workshop discussions are presented below, beginning with overall comments on the work accomplished to date in Kazakhstan and requirements to complete the work. This is followed by findings and recommendations related to each of the green growth indicators presented during the workshop.

Overall comments on the pilot green growth indicator implementation in Kazakhstan

In general, the efforts to date by the Committee on Statistics to implement green growth indicators in Kazakhstan are impressive, though some of the positive aspects of the pilot implementation of

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1 See: [http://www.oecd.org/greengrowth/greengrowthindicators.htm](http://www.oecd.org/greengrowth/greengrowthindicators.htm)
environmental accounts in Kazakhstan are missing. In addition, shortcomings requiring attention were noted in a number of the indicators. More specifically, the following points may be made.

- **Strong team with the right people involved but not enough sharing of the workload** – The team of professionals identified to work on implementation of green growth indicators within the Committee on Statistics possesses the necessary knowledge, skills and interest to accomplish the task. The team comprises members from the national accounts, from energy statistics and from environmental statistics. This breadth is well suited to the scope of the indicators. At the same time, it appears that most of the statistical effort to compile the indicators is being carried by one team member (Acet Nakipbekov), meaning that the skills and knowledge of other team members may not be applied as fully as they might be in the project.

- **No clear project plan** – Unlike in the case of the pilot environmental accounts implementation, no project plan for green growth indicator implementation was presented. It may be that a project plan exists but was not presented during the workshop. If a plan does not exist, it is recommended that one be formulated.

- **Good cooperation across work units** – Despite the fact (noted above) that most of the statistical effort appears to be falling on one team member, there was evidence during the workshop of positive working relations among the work units of the Committee on Statistics involved in the project. Such relations are another key to success for the project and the team members are encouraged to maintain this valuable feature of the project.

- **Ambitious goals** – The project goals are ambitious both in terms of the number of indicators to be implemented and the timeframe for completion of the pilot implementation. The project team is to be congratulated for setting such goals. At the same time, it bears mentioning that ambitious goals require commitment of adequate resources if success is to be assured. The question of resourcing of the project was not discussed during the workshop, so it is impossible to comment here whether resourcing is adequate or not. Based on experience elsewhere, the level of effort required to implement green growth indicators of the scope planned in Kazakhstan is 0.25 to 0.5 person years depending on how much data development is required.

- **Commitment to follow OECD framework is appropriate** – The Government of Kazakhstan’s commitment to the use of the OECD framework for the development of green growth indicators is appropriate and consistent with the general goal of international comparability of official statistics. Indicators compiled according to this framework are useful not only for tracking progress towards green growth as understood by the OECD, but also for measuring progress towards achievement of United Nations Sustainable Development Goals and Kazakhstan’s national green growth policy. At the same time, it is worth noting that the

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2 See the accompanying report on the SEEA implementation workshop held prior to this workshop.
OECD methodologies are complex (and even not possible) in some instances and will not always be feasible as starting points for implementation in Kazakhstan. In those cases (which are noted in the detailed comments given in next section), it is recommended that the indicators be dropped from the Kazakhstan set or implemented in a simplified form.

It is also worth noting that the OECD already collects data on Kazakhstan in its Green Growth Indicators database that may be helpful to the Committee on Statistics in carrying out the pilot implementation.3

- **Indicator set is essentially complete** – Further to the above point, the Committee on Statistics has succeeded in compiling pilot versions of essentially all OECD green growth indicators that are both feasible and relevant for Kazakhstan today. With just a few exceptions (as noted in the next section), there are no indicators missing from the pilot Kazakhstan set that should be added. Therefore, Kazakhstan should focus its efforts on finalization of the existing pilot set of indicators (with the changes recommended in the next section).

- **Pilot indicators represent a good first effort but considerable work remains to perfect them** – The pilot indicators reviewed during the workshop all represent good first efforts. At the same time, they all require additional work to address shortcomings (see the next section for details). The shortcomings mainly relate to weaknesses in the basic data available to implement the pilot indicators and, in certain instances, failure to apply the concepts and methods established by the OECD (e.g., the concept of demand-based CO₂ emissions). The following actions are recommended to address these shortcomings:
  
  - **Continue analysis of basic data to identify and correct weaknesses** – A number of instances (outlined in the next section) were identified where weaknesses in underlying data (e.g., gaps in coverage) appear to be preventing proper implementation of the pilot indicators. Further analysis is required to identify these weaknesses and assess their impact on pilot indicator implementation. A decision will be required on the means of addressing each weakness. Possible approaches include 1) accepting the weakness and documenting it when the indicators are published; 2) eliminating the weakness by modifying the data (e.g., filling gaps with modelled or interpolated data); 3) avoiding the weakness by changing the scope of the indicator (e.g., publishing an indicator at the level of the nation rather than for regions).
  
  - **Review OECD indicator concepts/methods and ensure their proper application in the pilot indicators** – Staff working on pilot indicator implementation should further review the relevant OECD indicator concepts/methods and ensure they are properly

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applied in the pilot accounts. In particular, the following concepts/methods should be reviewed to ensure proper application:

- **GDP measures** – All indicators that include GDP as either a numerator or a denominator must be calculated using GDP measured in constant prices in both Kazakh tenge and US dollars. The US dollar-based GDP measure used should be the World Bank’s estimates of Kazakh GDP measured in 2011 “international dollars”, which are based on the concept of purchasing power parity.⁴

- **Variables common to more than one indicator must be consistent** – Variables that are used in more than one indicator (e.g., area of agricultural land) must be measured consistently from one indicator to the next. Units of measure used for indicators must also be consistent.

- **Further review of pilot indicators before publication would be desirable** – Once the shortcomings in the pilot indicators have been addressed, a second external review of the indicators is recommended to ensure they are sound before publication. This review could be carried out again by the OECD or by another third-party with the requisite expertise in green growth indicators.

- **Document rationale, concepts, methods and data sources** – When the indicators are published, they should be accompanied with clear documentation of the rationale, concepts, sources and methods underlying them. Specifically, each indicator should be supported by: 1) a brief justification/rationale for inclusion of the indicator based on its policy relevance; 2) a description of the concepts and methods used in the compilation of the indicator⁵; and 3) a listing of the data sources used in compilation; 4) the name of the agency responsible for compiling the indicator; 5) and the scope of the indicator (temporal, geographic and sectoral).

### Findings and recommendation on specific indicators

#### Block #1 - Environmental and resource productivity

- **CO₂ productivity based on production**
  - GDP should be measured in constant prices rather than current prices.
  - Two versions of the indicator should be compiled – one using GDP measured in constant tenge and the other using GDP measured in constant international dollars as published by the World Bank.

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⁵ The concepts and methods underlying the indicators can be found at: [http://stats.oecd.org/wbos/fileview2.aspx?IDFile=7b6a88e4-f997-4b73-8ed0-902c58c83bd6](http://stats.oecd.org/wbos/fileview2.aspx?IDFile=7b6a88e4-f997-4b73-8ed0-902c58c83bd6).
It should be noted that a version of this indicator is available for Kazakhstan beginning in 1990 from the OECD green growth indicator database using International Energy Agency data for CO2 emissions from fuel combustion. See: “Green Growth Indicators”, OECD Environment Statistics [http://dx.doi.org/10.1787/data-00665-en](http://dx.doi.org/10.1787/data-00665-en).

**Recommendation** – Retain this indicator with changes as noted above.

- **CO₂ productivity based on demand**
  - The indicator as measured does not correspond to the definition of demand-based CO₂ productivity, which is the emission associated with total energy use in Kazakhstan minus the emissions associated with energy use required to produce Kazakhstan’s exports plus the emissions associated with energy use required to produce Kazakhstan’s imports.
  - Compilation of this indicator requires use of an environmentally-modified input-output model. Such a model does not exist at the moment for Kazakhstan, though it may be possible to create one using data from Kazakhstan’s pilot air emissions account for greenhouse gases and the input-output tables compiled by the Kazakh Committee on Statistics. The feasibility of this could not be evaluated during the workshop.
  - **Recommendation** – Drop this indicator until the feasibility of developing an environmentally-modified input-output model for Kazakhstan can be investigated.

- **Energy efficiency**
  - Constant price GDP should not be measured using market exchange rates, as these are not a reliable measure of the actual output of the Kazakh economy.
  - Two versions of the indicator should be compiled – one using GDP measured in constant tenge and the other using GDP measured in constant international dollars as published by the World Bank.
  - The indicator should be labelled “energy productivity” in English to be consistent with OECD guidelines and with the earlier indicators of CO₂ productivity.
  - **Recommendation** – Retain this indicator with changes as noted above.

- **Energy consumption**
  - Constant price GDP should not be measured using market exchange rates, as these are not a reliable measure of the actual output of the Kazakh economy. Rather, it should be measured in terms of purchasing power-adjusted “international dollars”.
  - Two versions of the indicator should be compiled – one using GDP measured in constant tenge and the other using GDP measured in constant international dollars as published by the World Bank.
  - The indicator should be labelled “energy intensity” in English to be consistent with OECD guidelines and with the earlier indicators of CO₂ productivity.

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6 The OECD has a model it uses to compile demand-based estimates of CO₂ productivity for member states. Unfortunately, results from this model are not available for Kazakhstan. Further information on CO₂ emissions embodied in international trade can be found at: [http://stats.oecd.org/Index.aspx?DataSetCode=IO_GHG_2015](http://stats.oecd.org/Index.aspx?DataSetCode=IO_GHG_2015) and [http://www.oecd.org/sti/ind/carbondioxideemissionsembodiedininternationaltrade.htm](http://www.oecd.org/sti/ind/carbondioxideemissionsembodiedininternationaltrade.htm).
The indicator should be compiled by industrial branch to be consistent with OECD guidelines. The units of measure should be TOE/thousand 2011 international dollars (for the US-based version of the indicator); for the tenge-based version, it should be TOE/million 20XX tenge (where XX is the year for which constant price GDP is currently measured in Kazakhstan).

**Recommendation** – Retain this indicator with changes as noted above.

- **Share of electricity produced from renewable energy sources (RES) in the total volume of produced electricity**
  - The figure of 0.3% as the share of electricity produced from renewable sources is far too low. Data from the International Energy Agency suggest that the value should be closer to 8%. It seems that hydroelectric power generation has not been fully taken into account.
  - The indicator should be broken down by technology (geothermal, solar, wind, hydro, biofuels and waste).
  - **Recommendation** – Retain this indicator but use data from the International Energy Agency to calculate it.

- **The intensity of waste generation and level of recycling**
  - GDP should be measured in constant prices rather than current prices.
  - Two versions of the indicator should be compiled – one using GDP measured in constant tenge and the other using GDP measured in constant international dollars as published by the World Bank.
  - The relative quantities of hazardous and municipal wastes generated is surprising. Normally, hazardous wastes would not be expected to be almost 250 times greater than municipal wastes. The underlying data for the indicator should be reviewed to ensure there are no errors in measurement. It is important to be as precise as possible in defining hazardous waste and its recycling.
  - **Recommendation** – Retain this indicator with changes as noted above.

- **The application of mineral and organic fertilizers**
  - The acronym for hectares” in English is “ha” not “ga”.
  - There is an inconsistency between the area of agricultural land reported in this indicator and that reported in the indicator of soil resources. Here, the area of agricultural land (which must be cropland) is reported as 21,2 million hectares in 2014, whereas it is reported as 222143,3 thousand hectares (222,1 million hectares) in the soil resources indicator.

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8 “Industrial branch” can be either broad groupings of industries (e.g., “manufacturing industries”) or a detailed listing of all industries in the economy depending on the detail available in Kazakhstan’s energy use data.

9 It is worth noting that the OECD guidelines are not, themselves, consistent. It is not clear, for example, why the OECD recommends that “energy productivity” be measured at the level of the whole economy and “energy intensity” be measured at the level of industrial branches. Nor is it clear why there is not consistency between the OECD’s recommended CO2 indicators and its recommended energy indicators.

The acronym “t” is used for both “tonne” and “tenge” – this could cause confusion. It is recommended not to use “t” to represent tenge.

**Recommendation** – Retain this indicator with changes as noted above.

- **Productivity of water resources**
  - GDP should be measured in constant prices rather than current prices.
  - Two versions of the indicator should be compiled – one using GDP measured in constant tenge and the other using GDP measured in constant international dollars as published by the World Bank.
  - It is not clear why the figures are reported as 0,00 for some branches. If this is because no water use data are available for these branches, the figures should be reported as “not available”.
  - There appears to be a problem with the data for the construction industry in 2014, as water productivity fell by half in that year.
  - What is meant by “industry” in line 2?
  - There appears to be a problem with the data for the public administration and defense industry for 2012, as water productivity increased greatly relative to other years.
  - **Recommendation** – Retain this indicator with changes as noted above.

**Block #2 – Natural Asset Base**

- **Renewable freshwater resources**
  - The difference between the estimated volume of precipitation and the estimated renewable freshwater resources is larger than expected. Though Kazakhstan is a relatively dry country, such a large difference between precipitation and renewable resources may not be reasonable and could be the result of an error in the underlying data or methods.
  - During the workshop, a suggestion was made that groundwater resources could be added to this indicator. On reflection, doing so would be incorrect, as renewable freshwater resources already includes the flow of resources from groundwater.
  - To be consistent with OECD guidelines, the indicator should be presented as total water abstraction as a share of 1) total renewable freshwater resources and 2) internal freshwater resources. If data on total water abstraction are available for Kazakhstan, the indicator should be presented in this manner.
  - **Recommendation** – Retain this indicator as is after reviewing and correcting any error in the estimate and with the changes as noted above.

- **Forest resources**

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11 In addition to the pilot indicators discussed during the workshop, the Committee on Statistics could consider compiling an indicator of commercial fish harvest by lake from both wild fish stocks and aquaculture.

12 This indicator is very similar to the suggest approach to water asset accounting (based on Statistics Canada’s work on “water yield”) that was discussed during the SEEE training workshop.
It is important that the data used to compile this indicator are consistent with the definitions established by the UN Food and Agriculture Organisation in its Global Forest Resource Assessment.\(^13\)

The labels in this indicator require clarification. It is unclear what the difference between “forest resources” (line 1) and “lands under forests” (line 2). Also, the label of line 4 must be made consistent with the terminology used in lines 1 and 2. The revised label for line 4 must make it clear that what is measured is the share of forestland as a percentage of total national land area.

The data for line 3 suggest an unrealistic trend in standing timber volume, with a significant drop from 2011 to 2012 and then a significant rise in 2013. Review of the source data used to compile this indicator is required.

Recommendation – Retain this indicator with changes as noted above.

### Land resources
- Consistent units of measure should be used in the upper and lower parts of the table. Suggest using thousand hectares for both.
- There is an apparent inconsistency between this indicator and the previous one (Forest resources). This indicator suggests forestland amounts to about 23 million hectares whereas the previous indicator suggests it amounts to about 29 million hectares. The reason for this discrepancy should be identified and the two indicators should be made consistent.
- The label for line 2 should be modified to read “Cropland” or “Farmland used for crops”.
- The heading “confiscation of land by sectors” would be better translated as “land use for industrial purposes”.

Recommendation – Retain this indicator with changes as noted above.

### Soil resources
- The label for line 1 should be modified to read “Total area of agricultural land”.

Recommendation – Retain this indicator with the change as noted above.

### Tendencies in change and dissemination of specific species
- The title of this indicator would be better translated as “Trends in endangered species”.
- The headings in this table should be consistent with the terminology used in the IUCN Red List (i.e., “critically endangered”, “endangered”, “vulnerable”, “near threatened”, “least concern”).\(^14\)
- The data used in the indicator should be drawn from the official Kazakhstan Red List.
- Bird and plants should be included in the indicator along with mammals.

Recommendation – Retain this indicator with changes as noted above.

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• **Concentration of ground-level ozone in the cities**
  o The units of measure for this indicator should be parts per million (ppm) to be consistent with international practice in the measurement of ground-level ozone. Dobson units are used for the measurement of stratospheric ozone rather than ground-level ozone.
  o In addition to ozone, this indicator should measure small particulate matter (PM$_{2.5}$), which can be derived from satellite-based measurements. The population exposure can be calculated by taking the weighted average value of PM$_{2.5}$ for grid cells present in each region with the weight given by the estimated population count in each cell. If data from satellite-based measurement are not available, the indicator could be calculated based on ground-based measurements according to a methodology proposed by UNECE.\(^\text{15}\)
  o Note that the OECD now includes Kazakhstan in its OECD GGI database, indicators on human exposure to fine particles (PM$_{2.5}$): [http://dotstat.oecd.org/Index.aspx?DataSetCode=EXP_PM2_5](http://dotstat.oecd.org/Index.aspx?DataSetCode=EXP_PM2_5)
  o **Recommendation** – Retain this indicator with changes as noted above.

• **Quantity of natural disasters and amount of damage from natural disasters**
  o Ideally, the cost of damages from disasters should be measured in constant price terms. If constant price damages are not available, they could be estimated by adjusting current price estimates for inflation using the consumer price index.
  o The cost of damages could be presented as a share of GDP to put it into the broader economic context.
  o If possible, the disasters should be broken down by type (see, for example, [http://www.emdat.be/classification](http://www.emdat.be/classification)).
  o To be consistent with OECD guidelines, the indicator should also show the population at risk to natural disasters.
  o **Recommendation** – Retain this indicator with changes as noted above.

• **The population having access to services of the sewerage**
  o The indicator should be broken down by level of treatment: no treatment; primary treatment (filtering); secondary treatment (filtering and biological); tertiary (filtering, biological and chemical).
  o Ideally, total population living in urban centres should be considered as the denominator rather than total population of the country. Rural people would not be expected to have access to public sewerage systems.
  o It is important to maintain consistency between this indicator and the indicators associated with UN Sustainable Development Goal #6 to the greatest extent possible.\(^\text{16}\)
  o **Recommendation** – Retain this indicator with changes as noted above.

• **The population having steady access to safe drinking water**
  o The labels for line 2 and line 3 should use consistent terminology. Both should refer to those “connected to a public water supply system”.


As with the previous indicator, total population living in urban centres should be considered as the denominator rather than total population of the country. Rural people would not be expected to have access to public water supply systems.

**Block #4 – Economic Opportunities and Political Response Measures**<sup>17</sup>

- **All types of research and developmental works (RDW) in the sphere of business**
  - The indicator as currently measured is not relevant to green growth as it does not cover R&D expenditures related to the environment.
  - **Recommendation** – Unless the indicator can be revised to measure green-growth related R&D (or energy-related R&D as defined in the International Energy Agency’s questionnaire on this topic), it should be dropped.

- **The number of the issued certificates, licenses, patents in the field of environmental protection**
  - Ideally, the indicator should be broken down by industrial branch.
  - It may be possible to make use of OECD data on patents in the compilation of this indicator.<sup>18</sup>
  - **Recommendation** – Retain this indicator with changes as noted above.

- **Number of enterprises with environmental innovations**
  - The indicator should show the number of enterprises with environmental innovations as a share of all enterprises. Ideally, it should be broken down by industrial branch.
  - It is important to be as clear as possible with respect to the definition of “environmental innovation”.<sup>19</sup>
  - **Recommendation** - Retain this indicator with changes as noted above.

- **The investments directed to environmental protection**
  - Ideally, the indicator should be broken down by industrial branch and should be shown as a share of total investments.
  - There may be a possibility of adding information on climate change-related ODA using the OECD DAC data; in particular, a forthcoming publication specific to Kazakhstan<sup>20</sup>
  - **Recommendation** – Retain this indicator with changes as noted above.

- **Ecological taxation**
  - No comments on this indicator.
  - **Recommendation** – Retain this indicator as is.

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<sup>17</sup> The indicators in Block 4 may be compiled according to the methods for the OECD green growth indicators or according to the methods laid out in the OECD database on instruments used for environmental policy (http://www.oecd.org/env/policies/database). An example of the output from the data on environmental policy instruments can be found at: http://dotstat.oecd.org/Index.aspx?DataSetCode=ENV_ENVPOLICY.

<sup>18</sup> See: http://dx.doi.org/10.1787/data-00665-en.


• Establishment of the prices of energy
  o Ideally, the indicator would show energy prices for different types of customers (large industrial, small industrial, commercial, household).
  o The tax portion of tariffs should be reported separately.
  o Recommendation – Retain this indicator with changes as noted above.

• Establishment of the prices of water use and payback
  o Ideally, the indicator would show energy prices for different types of customers (large industrial, small industrial, commercial, household).
  o The tax portion of tariffs should be reported separately.
  o Refer to IEA sources in the OECD GGI database documentation.
  o Recommendation – Retain this indicator with changes as noted above.

Block #5 – Socio-economic context and characteristics of growth

• Growth and structure of GDP
  o This indicator should be measured in constant prices.
  o Recommendation – Retain this indicator with the change noted above.

• Gross disposable income
  o This indicator should be measured in constant prices.
  o Recommendation – Retain this indicator with the change noted above.

• Indexes of labor productivity
  o The unit of measure should be “Index (20XX = 100)” where XX is the base year for the productivity index.
  o Recommendation – Retain this indicator with the change noted above.

• Average labor costs in trade
  o The indicator as measured does not correspond to the OECD’s definition of trade-weighted unit labour costs, which are unit labour costs (average labour cost per unit of output) weighted using a double-weighting approach that takes into consideration the structure of competition in both import and export markets.  
  o Recommendation – Retain this indicator with the change noted above.

• The relative importance of trade
  o This indicator should be measured in constant prices.
  o Two versions of the indicator should be compiled – one using GDP measured in constant tenge and the other using GDP measured in constant international dollars as published by the World Bank.
  o Recommendation – Retain this indicator with the changes noted above.

• Consumer price index

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The unit of measure should be “Index (20XX = 100)” where XX is the base year for the productivity index.

- **Recommendation** – Retain this indicator with the change noted above.

- **Prices of enterprises-producers of food, crude oil, minerals, ores and metals**
  - This indicator should be measured in constant prices.
  - The title in English should be “Producer prices of food, crude oil, minerals, ores and metals”.
  - **Recommendation** – Retain this indicator with the change noted above.

- **Employment**
  - This indicator should be broken down by industrial branch.
  - **Recommendation** – Retain this indicator with the change noted above.

- **Unemployment**
  - No comment on this indicator.
  - **Recommendation** – Retain this indicator as is.

- **Growth, structure and population density**
  - Population density should be measured per square kilometre rather than square metre.
  - **Recommendation** – Retain this indicator with the change noted above.

- **Life expectancy**
  - No comment on this indicator.
  - **Recommendation** – Retain this indicator as is.

- **Income inequality: GINI Coefficient**
  - No comment on this indicator.
  - **Recommendation** – Retain this indicator as is.

- **Access to education**
  - No comment on this indicator.
  - **Recommendation** – Retain this indicator as is.