

HIGH LEVEL GROUP REFLECTING ON FUTURE COHESION POLICY

MEETING NO. 8 - 15TH FEBRUARY 2011

VENUE: EUROPEAN COMMISSION

OUTCOME INDICATORS – COMPLEMENTARY NOTE 2*

This document has been prepared by Fabrizio Barca and Philip McCann as the basis for a discussion with experts as part of a general reflection process on the future of cohesion policy. It does not prejudge in any way the final position of DG Regional Policy or the Commission on these questions

Outcome Indicators for the Thematic priorities addressing the Europe 2020 Objective “Meeting climate change and energy objectives”. Examples

1. Principles

One of the five objectives of Europe 2020 is: *Meeting climate change and energy objectives*. The issues surrounding the complex interactions between environmental phenomena and other social and economic phenomena require us to develop indicators capable of capturing both at a broad level and also at a specific level the major features of these interactions.

The required outcome indicators for Operational Programmes (and Partnership Contracts) and projects that reduce energy use and environmental impact, and thus contribute to sustainable development, ideally span both physical as well as behavioural outcomes. Examples of physical outcomes include changes in fuel purchases by households and the associated reductions in emissions, such as of SO₂, NO_x and particulates, as well as greenhouse gases. Behavioural changes include a shift among transport modes, such as from personal passenger vehicles to public transportation.

Judging whether the physical and behavioural outcomes indeed contribute to sustainability, however, requires a broader set of indicators. In keeping with the example of Operational Programmes and projects that promote public transportation, households may indeed make the shift, purchase less fuels, emit fewer pollutants from transportation, perhaps even get rid off their car entirely. The resulting savings then may be used for the purchase of energy-intensive products, leading to an increase in fuel use and emissions that often remains unaccounted. Such re-bound effects are hard to capture, yet may need to be traced for a comprehensive assessment of Operational Programmes and projects that promote sustainable development.

The outcome indicators suggested in the examples presented here often cannot be judged as standalone indices. However, as is typical for environmental issues, these individual outcome indicators capture different aspects and dimensions of a very complex and multi-faceted phenomena. Therefore, appropriate groups of such outcome indicators would allow us to present a real sense of the nature of the processes of change which are operating and the extent to which these are responding to policy interventions. Moreover, many of these outcome indicators can be produced using a variety of conventional techniques at relatively low cost.

* The note accompanies the discussion paper “Outcome indicators and targets. Towards a performance oriented EU cohesion policy”.

2. Regional typology

In the light of these considerations, developing Cohesion Policy interventions capable of promoting *sustainable growth* requires us to think about how environmental phenomena are manifested differently in different types of regions. From this perspective, the choice has been made in this note to consider four broad typologies of regions, namely *rural* regions, *rural near urban* regions, *urban* regions, and *urban-coastal* regions. In each case, the interactions between growth and environment are specific to the types of places.

3. Data

Many data are readily available for building outcome indicators for Operational programmes and projects that support in all sectors a shift towards a low-carbon, resource efficient and climate resilient economy and the expansion of renewable sources. Some of them are listed in the examples included in the accompanying tables. Additional data may be generated by the Operational Programmes and projects themselves, such as through bespoke surveys, metering e.g. of electricity generation, transmission, distribution and use; or the monitoring of transit ridership through ticket purchases and use.

Additional methods for data collection that are widely used, though not necessarily yet in the service of outcome indicator development, include aerial photography, remote sensing and thermal imagery. These provide information for the establishment of baseline data and the assessment of land use changes or even energy use. Furthermore, each Operational Programme and project may be perceived as a case study in its own right, generating valuable data that can be collected through monitoring, surveys, or case analysis. In this way EU Cohesion Policy itself can become a source of comprehensive and wide-ranging data on the relationship between sustainability and all other social and economic dimensions of growth.

4. The logic of the table

The choice of outcome indicators depends on the specific policy through which the improvement of innovation and research is pursued, and on the objective of such policy.

In the table below examples are provided of outcome indicators for four Thematic Priorities belonging to the EU2020 objective “Meeting climate change and energy objectives”. The priorities are:

1. *Supporting in all sectors the shift towards a low-carbon, resource-efficient and climate resilient economy, and promoting renewable resources.*
2. *Upgrading Europe’s energy network.*
3. *Promoting sustainable transport.*
4. *Correcting and preventing unsustainable use of resources.*

The thematic priority n.1 embraces two Thematic Priorities presented by the European Commission in the informal document “Thematic concentration for cohesion policy post 2013”. The others correspond to the Priorities of that document. Adjustments would obviously be needed if the classification were to be changed, but the logic of the exercise would be the same.

In the tables, the examples of outcome indicators are presented according to:

- the specific policy/objective through which each Thematic Priority is pursued;
- the typology of region (as sketched in section 2);
- whether they refer to Operational Programmes (and Partnership Contract) or to individual projects.

5. Data sources

The data sources which can be accessed or the techniques which can be employed to provide the required data are as follows:

- *Supporting in all sectors the shift towards a low-carbon, resource efficient and climate resilient economy, and promoting renewable sources.* The data for this Thematic Priority is largely to be generated within the projects or Operational Programmes through surveys and metering e.g. of electricity generation, transmission, distribution and use. Data on population, number of households and number of firms will be needed to calculate normalized (i.e. per capita, per household, per firm) figures.
- *Upgrading Europe's energy network.* The data for this Thematic Priority can be generated through assessments of grid capacity to deliver power demand and measurements of grid reliability by observing the extent and duration of power supply disruptions. Similarly, information on trading volumes, available from grid operators, fuel delivery companies, and regulatory agencies can be used to indicate changes in the performance of energy networks.
- *Promoting sustainable transport.* The data for this Thematic Priority can be generated by means of project-based surveys, case studies, metering, and monitoring. GIS Geographic Information Systems data layers (or similar tools, such as Google Earth) which can be used for the calculation of distances between population centroids and places of activity (schools, shops, etc.). Aerial photography, remote sensing and thermal imagery for establishment of base line data and assessment of land use changes are also standard techniques. Monitoring can be used for gauging air quality and emissions, water quality and emissions. Monitoring can also be used for assessing transit ridership through ticket purchases and use. Finally, data collection from hospitals can be employed and sorted by classification codes of ailments.
- *Promoting innovative and sustainable use of natural and cultural resources.* The data for this Thematic Priority can be acquired in the same techniques as above.

6. Relevant Regional statistics

The tables are supplemented by a list of regional statistics that could be of use in describing the context in which cohesion policy takes place:

- § Average speed of travel by commuters
- § Average time spent in car, on rail, bus, etc. per commuter per year
- § Energy consumption per capita
- § Energy consumption per employee
- § Energy consumption total

- § Household and business annual transport fuel expenditures
- § Per capita vehicle km traveled with public transport relative to private, motorized transport
- § Supply interruptions (e.g. areal coverage of power lost during extreme events, service loss in minutes per customer per year, economic loss from supply interruption)
- § Trading volume (per day, per year, during extreme events such as heat waves etc), across jurisdictions (such as states, countries, grid operators)

EUROPE 2020 OBJECTIVE “MEETING CLIMATE CHANGE AND ENERGY”. EXAMPLES.

I. Examples for Rural Regions

Thematic Priorities and Policies	Operational Programme level	Project level
<p>1. Supporting in all sectors the shift towards a low-carbon, resource efficient and climate resilient economy promoting renewable sources</p> <p>Fostering transition to renewable energy</p>	<ul style="list-style-type: none"> • Share of renewables in the energy mix • Percent biofuels (fuel crops, wood) that are managed sustainably [i.e. whose energy return exceeds the energy used in their growth, processing and transport]. • Cross-border purchases of energy • Energy self-sufficiency [measured as a percentage of energy demand relative to total energy supply minus imports plus exports within an area of interest] • Percentage selfgeneration by agriculture, industry • GHG emissions (total, per capita, per employee) • Percentage of manure and other agricultural bi-products used for energy conversion • Percentage of industrial and household wastes used for energy conversion • Percent of manure and other agricultural bi-products used for energy conversion • Percentage of industrial and household wastes used for energy conversion 	
<p>Fostering energy efficiency</p>	<ul style="list-style-type: none"> • Cross-border purchases of energy • Energy self-sufficiency [measured as a percentage of energy demand relative to total energy supply minus (imports plus exports) within an area/region of interest] • Percentage selfgeneration by agriculture, industry 	

	<ul style="list-style-type: none"> • GHG emissions (total, per capita, per employee) • Percentage self-generation by industry • Percentage of households on district heating 	
2. Upgrading Europe's energy networks Fostering energy efficiency	<ul style="list-style-type: none"> • Supply interruptions (e.g. areal coverage of power lost during extreme events, service loss in minutes per customer per year, economic loss from supply interruption) 	
Fostering grid interconnection	<ul style="list-style-type: none"> • Trading volume (per day, per year, during extreme events such as heat waves etc), across jurisdictions (such as states, countries, grid operators) 	
3. Promoting sustainable transport Promoting non-motorized transport options	<ul style="list-style-type: none"> • Average distance of schools, shops, churches, places of employment from population centroid • Household and business annual transport fuel expenditures 	
Promoting public transportation	<ul style="list-style-type: none"> • Per capita vehicle km travelled with public transport relative to private motorised transport • Average speed of travel by commuters • Average time spent in car, on rail, bus, etc per commuter per year 	
4. Correcting and preventing unsustainable use of resources Increase reuse and recycling of materials	<ul style="list-style-type: none"> • Percentage of agricultural and forestry wastes reused as fertilizers (on farms, or sold) • Nutrient loading into surface and ground water • Number of newly adopted green chemistry-based processes in agriculture related activities 	
Protection of land and water bodies	<ul style="list-style-type: none"> • Percentage of land not used for agriculture, settlements, etc. • Species diversity in water bodies • Nutrient loading (BOD) of water bodies • Metals content, arsenic concentrations, etc. of water bodies, soils 	

	<ul style="list-style-type: none"> • Percentage of waste water treated in tertiary, quaternary treatment processes • Percent of households on public water supply
Promotion of clean air	<ul style="list-style-type: none"> • Ambient concentrations of SOX, NOX, PM, and other air pollutants • Number of days on which ambient air quality standards [such as NOx, Sox, VOCs, and PM10] are surpassed • Hospitalization rates for respiratory ailments (codings, classifications and numbers available from official health statistics)
Promotion of scenic beauty	<ul style="list-style-type: none"> • Night time light pollution (density of pixels from nighttime images per area of interest) • Minimum distance of major motorways from parks, lakes
Fostering smart, sustainable land use practices	<ul style="list-style-type: none"> • Land cover change • Percent growth in decorative (e.g. roadside) and carbon-sequestering forestry and tree clusters [These are changes in the natural stock of sequestered carbon, as embedded in trees. Land cover mapping is available to identify areas covered by tree over 5 metres tall, and estimates of the volume of tree stocks by tree categories are sufficient to estimate how much they stock in carbon] • Change in the use of high persistence pesticides [High persistence pesticides are listed and their use is monitored by the quantities of active principle used by year] • Number of official traceability and low-mileage food certification programs
5. Promoting innovative and sustainable use of natural and cultural resources	
Promote use of natural and cultural resources for tourism and education	<ul style="list-style-type: none"> • Number of visitors to natural and cultural resources (UNESCO world heritage and similar listings and sites)
Protection of sensitive areas	<ul style="list-style-type: none"> • Percent undeveloped shoreline and other ecologically sensitive places (places with high numbers of species on endangered or threatened species lists, places with high soil erosion rates, and habitats classified as fragile, such as wetlands, coastal marshes etc). • Percentage change in the sea areas dedicated to fish sanctuaries, no-fishing zones and marine parks

Promotion of cultural resources	<ul style="list-style-type: none"> • Percentage extension and development of environmental monitoring systems (species inventories, contaminant detection, systems disturbance)
	<ul style="list-style-type: none"> • Number of organizations and active membership of non-profit, charitable and voluntary organizations focused on cultural and heritage issues by type and role (source: local government registers) • Number of civil society organizations routinely consulted by local government and actively engaged in governance roles in local and regional community initiatives (source: local government registers) • Importance given to role of civil society organizations in cultural and heritage decision-making (source: local case studies) • Numbers and levels of participation in local public historical, cultural and artistic events (source: local government registers)

II. Examples for Rural near Urban Regions

Thematic Priorities and Policy	Operational Programme level	Project level
<p>1. Supporting in all sectors the shift towards a low-carbon, resource efficient and climate resilient economy promoting renewable sources</p> <p>Fostering transition to renewable energy</p>	<ul style="list-style-type: none"> • Share of renewables in the energy mix • Cross-border purchases of energy • Energy self-sufficiency [measured as a percentage of energy demand relative to total energy supply minus imports plus exports within an area/region of interest] • Percent biofuels (fuel crops, wood) that are managed sustainably (i.e. whose energy return exceeds the energy used in their growth, processing and transport). • Percentage of manure and other agricultural bi-products used for energy conversion • Percentage of industrial and household wastes used for energy conversion • Percentage self-generation by agriculture, industry • GHG emissions (total, per capita, per employee) • Net supply of renewably generated energy to urban area • Share of local renewables in the energy mix • Cross-border purchases of energy • Energy self-sufficiency • Percent biofuels (fuel crops, wood) that are managed sustainably • Percentage of manure and other agricultural bi-products used for energy conversion • Percentage of industrial and household wastes used for energy conversion 	

<p>Fostering end use energy efficiency</p>	<ul style="list-style-type: none"> • Percentage self-generation by agriculture, industry • GHG emissions (total, per capita, per employee) • Net supply of renewably generated energy to urban area 	
<p>2. Upgrading Europe’s energy networks</p> <p>Fostering end use energy efficiency</p> <p>Cohesion Policy Thematic Priority: Upgrading Europe’s energy networks</p> <p>Fostering grid interconnection</p>	<ul style="list-style-type: none"> • Supply interruptions (e.g. areal coverage of power lost during extreme events, service loss in minutes per customer per year, economic loss from supply interruption) 	<ul style="list-style-type: none"> • Trading volume (per day, per year, during extreme events such as heat waves etc), across jurisdictions (such as states, countries, grid operators)
<p>3. Promoting sustainable transport</p> <p>Promote non-motorized transport options</p> <p>Promote public transportation</p>	<ul style="list-style-type: none"> • Average distance of schools, shops, churches, places of employment from population centroid • Household and business annual transport fuel expenditures 	<ul style="list-style-type: none"> • Per capita vehicle km travelled with public transport relative to private motorised transport • Average speed of travel by commuters • Average time spent in car, on rail, bus, etc per commuter per year • Percentage of car ownership

<p>4. Correcting and preventing unsustainable use of resources</p> <p>Increase reuse and recycling of materials</p>	<ul style="list-style-type: none"> • Percentage of agricultural and forestry wastes reused as fertilizers (on farms, or sold) • Nutrient loading into surface and ground water • Number of newly adopted green chemistry-based processes in agriculture related activities <ul style="list-style-type: none"> • Nutrient loading into surface and ground water • Recycle content of manufactured products
<p>Protection of land and water bodies</p> <p>Promotion of clean air</p> <p>Promotion of scenic beauty</p> <p>Fostering smart, sustainable land use practices</p>	<ul style="list-style-type: none"> • Percentage of land not used for agriculture, settlements, etc. • Percentage parkland • Percentage impervious surface • Species diversity • Nutrient loading (BOD) of water bodies • Metals content, arsenic concentrations, etc. of water bodies, soils • Percentage of waste water treated in tertiary, quaternary treatment processes • Percent of households on public water supply <ul style="list-style-type: none"> • Ambient concentrations of SOX, NOX, PM, and other air pollutants • Number of days on which air quality standards [such as for NOx, SOx, VOCs, and PM10s] surpassed • Hospitalization rates for respiratory ailments (codings, classifications and numbers available from official health statistics) <ul style="list-style-type: none"> • Night time light pollution (density of pixels from nighttime images per unit area) • Minimum distance of major motorways from parks, lakes • Night time light pollution • Minimum distance of major motorways from parks, lakes <ul style="list-style-type: none"> • Land cover change • Smart growth indices • Population density • Land cover change

	<ul style="list-style-type: none"> • Percent growth in decorative (e.g. roadside) and carbon-sequestering forestry and tree clusters [These are changes in the natural stock of sequestered carbon, as embedded in trees. Land cover mapping is available to identify areas covered by tree over 5 metres tall, and estimates of the volume of tree stocks by tree categories are sufficient to estimate how much they stock in carbon] • Change in the use of high persistence pesticides [High persistence pesticides are listed and their use is monitored by the quantities of active principle used by year] • Number of official traceability and low-mileage food certification programs • Percentage of undeveloped shoreline
<p>5. Promoting innovative and sustainable use of natural and cultural resources</p> <p>Promote use of natural and cultural resources for tourism and education</p>	<ul style="list-style-type: none"> • Employment in outdoor recreation, cultural heritage sites, and other related businesses • Number of visitors to natural and cultural resources (UNESCO world heritage and similar listings and sites) • Investment for/cost of maintenance and upkeep of cultural resources
<p>Protection of sensitive areas</p>	<ul style="list-style-type: none"> • Percent undeveloped shoreline and other ecologically sensitive places (Places with a high number of species on endangered or threatened species lists, places with high soil erosion rates, and habitats classified as fragile, such as wetlands, coastal marshes etc). • Employment in restoration and rehabilitation of ecologically sensitive places • Percentage change in the sea areas dedicated to fish sanctuaries, no-fishing zones and marine parks • Percentage extension and development of environmental monitoring systems (species inventories, contaminant detection, systems disturbance)
<p>Promotion of cultural resources</p>	<ul style="list-style-type: none"> • Number of organizations and active membership of non-profit, charitable and voluntary organizations focused on cultural and heritage issues by type and role (source: local government registers) • Number of civil society organizations routinely consulted by local government and actively engaged in governance roles in local and regional community initiatives (source: local government registers) • Importance given to role of civil society organizations in cultural and heritage decision-making (source: local case studies)

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| | <ul style="list-style-type: none">• Numbers and levels of participation in local public historical, cultural and artistic events (source: local government registers) |
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III. Examples for Urban Regions

Thematic Priorities and Policies	Operational Programme level	Project level
<p>1. Supporting in all sectors the shift towards a low-carbon, resource efficient and climate resilient economy promoting renewable sources</p> <p>Fostering transition to renewable energy</p>	<ul style="list-style-type: none"> • Share of renewables in the energy mix • Cross-border purchases of energy • Energy self-sufficiency [measured as a percentage of energy demand relative to total energy supply minus (imports plus exports) within an area/region of interest]. • Percentage self-generation by industry • GHG emissions (total, per capita, per employee) • Percentage of waste products used for energy conversion (relative to percentage recycled and landfilled) • Percentage of households on district heating • Installed capacity of solar (per unit area, per capita) • Percentage of rooftops covered by solar • Net supply of renewably generated energy to urban area 	
<p>Fostering end use energy efficiency</p>	<ul style="list-style-type: none"> • Share of renewables in the energy mix • Cross-border purchases of energy • Energy self-sufficiency [measured as a percentage of energy demand relative to total energy supply minus imports plus exports within an area/region of interest]. • Percentage self-generation by industry • GHG emissions (total, per capita, per employee) • Percentage of waste products used for energy conversion (relative to percentage recycled and landfilled) • Percentage of households on district heating • Installed capacity of solar (per unit area, per capita) 	

	<ul style="list-style-type: none"> Percentage of rooftops covered by solar Net supply of renewably generated energy to urban area 	
2. Upgrading Europe's energy networks Fostering end use energy efficiency Fostering grid interconnection	<ul style="list-style-type: none"> Supply interruptions (e.g. areal coverage of power lost during extreme events, service loss in minutes per customer per year, economic loss from supply interruption) 	
	<ul style="list-style-type: none"> Trading volume (per day, per year, during extreme events such as heat waves etc), across jurisdictions (such as states, countries, grid operators)Average distance of schools, shops, churches, places of employment from population centroid 	
3. Promoting sustainable transport Promote non-motorized transport options Promote public transportation	<ul style="list-style-type: none"> Average distance of schools, shops, churches, places of employment from population centroid Household and business annual transport fuel expenditures 	
	<ul style="list-style-type: none"> Per capita vehicle km travelled with public transport relative to private motorized transport Average speed of travel by commuters Average time spent in car, on rail, bus, etc per commuter per year Percentage of car ownership 	
4. Correcting and preventing unsustainable use of resources Increase reuse and recycling of materials Protection of land and water bodies		
	<ul style="list-style-type: none"> Percentage of agricultural and forestry wastes reused as fertilizers (on farms, or sold) Nutrient loading into surface and ground water Number of newly adopted green chemistry-based processes in agriculture related activities 	<ul style="list-style-type: none"> Nutrient loading into surface and ground water Recycle content of manufactured products
	<ul style="list-style-type: none"> Percentage of land not used for agriculture, settlements, etc. Percentage parkland 	

<p>Promotion of clean air</p>	<ul style="list-style-type: none"> • Percentage impervious surface • Species diversity • Nutrient loading (BOD) of water bodies • Metals content, arsenic concentrations, etc. of water bodies, soils • Percentage of waste water treated in tertiary, quaternary treatment processes
<p>Promotion of clean air</p>	<ul style="list-style-type: none"> • Ambient concentrations of SOX, NOX, PM, and other air pollutants • Number of days on which air quality standards (such as for NOx, SOx, VOCs and PM10) are surpassed • Hospitalization rates for respiratory ailments (codings, classifications and numbers available from official health statistics)
<p>Fostering smart, sustainable land use practices</p>	<ul style="list-style-type: none"> • Land cover change • Smart (compact) growth indices • Population density • Land cover change • Percent growth in decorative (e.g. roadside) and carbon-sequestering forestry and tree clusters [These are changes in the natural stock of sequestered carbon, as embedded in trees. Land cover mapping is available to identify areas covered by tree over 5 metres tall, and estimates of the volume of tree stocks by tree categories are sufficient to estimate how much they stock in carbon] • Change in the use of high persistence pesticides [High persistence pesticides are listed and their use is monitored by the quantities of active principle used by year] • Number of official traceability and low-mileage food certification programs • Percentage of undeveloped shoreline
<p>5. Promoting innovative and sustainable use of natural and cultural resources</p> <p>Promote use of natural and cultural resources for tourism and education</p>	<ul style="list-style-type: none"> • Employment in outdoor recreation, cultural heritage sites, and other related businesses • Number of visitors to natural and cultural resources (UNESCO world heritage and similar listings and sites) • Investment for/cost of maintenance and upkeep of cultural resources

Promotion of cultural resources

- Number of organizations and active membership of non-profit, charitable and voluntary organizations focused on cultural and heritage issues by type and role (source: local government registers)
- Number of civil society organizations routinely consulted by local government and actively engaged in governance roles in local and regional community initiatives (source: local government registers)
- Importance given to role of civil society organizations in cultural and heritage decision-making (source: local case studies)
- Numbers and levels of participation in local public historical, cultural and artistic events (source: local government registers)

IV. Urban – Coastal Regions

Thematic Priorities and policies	Operational Programme level	Project level
<p>1. Supporting in all sectors the shift towards a low-carbon, resource efficient and climate resilient economy promoting renewable sources</p> <p>Fostering transition to renewable energy</p>	<ul style="list-style-type: none"> • Share of renewables in the energy mix • Cross-border purchases of energy • Energy self-sufficiency (measured as a percentage of energy demand relative to total energy supply minus imports plus exports within an area/region of interest). • Percentage self-generation by industry • GHG emissions (total, per capita, per employee) • Percentage selfgeneration by aquaculture, primary industry • Percentage of waste products used for energy conversion (relative to percentage recycled and landfilled) • Percentage of households on district heating • Installed capacity of solar (per unit area, per capita) • Percentage of rooftops covered by solar • Percentage of industrial and household wastes used for energy conversion • Net supply of renewably generated energy to urban area 	
<p>Fostering end use energy efficiency</p>	<ul style="list-style-type: none"> • Share of local renewables in the energy mix • Cross-border purchases of energy • Energy self-sufficiency (measured as a percentage of energy demand relative to total supply minus importans plus exports within an area/region of interest). • Percentage self-generation by industry • GHG emissions (total, per capita, per employee) • Percentage of waste products used for energy conversion (relative to percentage recycled and landfilled) 	

	<ul style="list-style-type: none"> • Percentage of households on district heating • Installed capacity of solar (per unit area, per capita) • Percentage of rooftops covered by solar • Net supply of renewably generated energy to urban area
2. Upgrading Europe's energy networks Fostering end use energy efficiency	<ul style="list-style-type: none"> • Supply interruptions (e.g. areal coverage of power lost during extreme events, service loss in minutes per customer per year, economic loss from supply interruption)
Fostering grid interconnection	<ul style="list-style-type: none"> • Trading volume (per day, per year, during extreme events such as heat waves etc), across jurisdictions (such as states, countries, grid operators)
3. Promoting sustainable transport Promote non-motorized transport options	<ul style="list-style-type: none"> • Average distance of schools, shops, churches, places of employment from population centroid • Household and business annual transport fuel expenditures
Promote public transportation	<ul style="list-style-type: none"> • Per capita vehicle km travelled with public transport relative to private motorised transport • Average speed of travel by commuters • Average time spent in car, on rail, bus, etc per commuter per year • Percentage of car ownership

<p>4. Correcting and preventing unsustainable use of resources</p> <p>Increase reuse and recycling of materials</p> <p>Protection of land and water bodies</p> <p>Promotion of clean air</p> <p>Promotion of scenic beauty</p> <p>Fostering smart, sustainable land use practices</p>	<table border="1"> <tr> <td data-bbox="647 295 1339 507"> <ul style="list-style-type: none"> • Percentage of agricultural and forestry wastes reused as fertilizers (on farms, or sold) • Nutrient loading into surface and ground water • Number of newly adopted green chemistry-based processes in agriculture related activities </td> <td data-bbox="1339 295 2038 507"> <ul style="list-style-type: none"> • Nutrient loading into surface and ground water • Recycle content of manufactured products </td> </tr> <tr> <td colspan="2" data-bbox="647 507 2038 837"> <ul style="list-style-type: none"> · Percentage of land not used for agriculture, settlements, etc. · Percentage parkland · Percentage impervious surface · Species diversity · Nutrient loading (BOD) of water bodies · Metals content, arsenic concentrations, etc. of water bodies, soils · Percentage of waste water treated in tertiary, quaternary treatment processes · Presence of no-take and no-fishing marine reserves </td> </tr> <tr> <td colspan="2" data-bbox="647 837 2038 1053"> <ul style="list-style-type: none"> · Ambient concentrations of SOX, NOX, PM, and other air pollutants · Number of days on which air quality standards [such as for NOx, SOx, VOCs, and PM10] are surpassed · Hospitalization rates for respiratory ailments (codings, classifications and numbers available from official health statistics) </td> </tr> <tr> <td colspan="2" data-bbox="647 1053 2038 1125"> <ul style="list-style-type: none"> · Integration of coastal development in the existing natural landscape </td> </tr> <tr> <td colspan="2" data-bbox="647 1125 2038 1437"> <ul style="list-style-type: none"> · Land cover change · Smart (compact) growth indices · Population density · Percent growth in decorative (e.g. roadside) and carbon-sequestering forestry and tree clusters [These are changes in the natural stock of sequestered carbon, as embedded in trees. Land cover mapping is available to identify areas covered by tree over 5 metres tall, and estimates of the volume of tree stocks by tree categories are sufficient to estimate how much they stock in carbon] </td> </tr> </table>	<ul style="list-style-type: none"> • Percentage of agricultural and forestry wastes reused as fertilizers (on farms, or sold) • Nutrient loading into surface and ground water • Number of newly adopted green chemistry-based processes in agriculture related activities 	<ul style="list-style-type: none"> • Nutrient loading into surface and ground water • Recycle content of manufactured products 	<ul style="list-style-type: none"> · Percentage of land not used for agriculture, settlements, etc. · Percentage parkland · Percentage impervious surface · Species diversity · Nutrient loading (BOD) of water bodies · Metals content, arsenic concentrations, etc. of water bodies, soils · Percentage of waste water treated in tertiary, quaternary treatment processes · Presence of no-take and no-fishing marine reserves 		<ul style="list-style-type: none"> · Ambient concentrations of SOX, NOX, PM, and other air pollutants · Number of days on which air quality standards [such as for NOx, SOx, VOCs, and PM10] are surpassed · Hospitalization rates for respiratory ailments (codings, classifications and numbers available from official health statistics) 		<ul style="list-style-type: none"> · Integration of coastal development in the existing natural landscape 		<ul style="list-style-type: none"> · Land cover change · Smart (compact) growth indices · Population density · Percent growth in decorative (e.g. roadside) and carbon-sequestering forestry and tree clusters [These are changes in the natural stock of sequestered carbon, as embedded in trees. Land cover mapping is available to identify areas covered by tree over 5 metres tall, and estimates of the volume of tree stocks by tree categories are sufficient to estimate how much they stock in carbon] 	
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<ul style="list-style-type: none"> · Ambient concentrations of SOX, NOX, PM, and other air pollutants · Number of days on which air quality standards [such as for NOx, SOx, VOCs, and PM10] are surpassed · Hospitalization rates for respiratory ailments (codings, classifications and numbers available from official health statistics) 											
<ul style="list-style-type: none"> · Integration of coastal development in the existing natural landscape 											
<ul style="list-style-type: none"> · Land cover change · Smart (compact) growth indices · Population density · Percent growth in decorative (e.g. roadside) and carbon-sequestering forestry and tree clusters [These are changes in the natural stock of sequestered carbon, as embedded in trees. Land cover mapping is available to identify areas covered by tree over 5 metres tall, and estimates of the volume of tree stocks by tree categories are sufficient to estimate how much they stock in carbon] 											

	<ul style="list-style-type: none"> · Change in the use of high persistence pesticides [High persistence pesticides are listed and their use is monitored by the quantities of active principle used by year] · Number of official traceability and low-mileage food certification programs · Percentage of undeveloped shoreline
<p>5. Promoting innovative and sustainable use of natural and cultural resources</p> <p>Promote use of natural and cultural resources for tourism and education</p> <p>Protection of sensitive areas</p> <p>Promotion of cultural resources</p>	<ul style="list-style-type: none"> • Employment in outdoor recreation, cultural heritage sites, and other related businesses • Number of visitors to natural and cultural resources (UNESCO world heritage and similar listings and sites) • Investment for/cost of maintenance and upkeep of cultural resources • <ul style="list-style-type: none"> • Percent undeveloped shoreline and other ecologically sensitive places [Places with high number of species on endangered or threatened species lists, places with high soil erosion rates, and habitats classified as fragile, such as wetlands, coastal marshes, etc] • Employment in restoration and rehabilitation of ecologically sensitive places • Percentage change in the sea areas dedicated to fish sanctuaries, no-fishing zones and marine parks <ul style="list-style-type: none"> • Number of organizations and active membership of non-profit, charitable and voluntary organizations focused on cultural and heritage issues by type and role (source: local government registers) • Number of civil society organizations routinely consulted by local government and actively engaged in governance roles in local and regional community initiatives (source: local government registers) • Importance given to role of civil society organizations in cultural and heritage decision-making (source: local case studies) • Numbers and levels of participation in local public historical, cultural and artistic events (source: local government registers)