Roberta Pignatelli (with the contribution of Hans-Martin Füssel and Sergio Castellari)
Sixth Meeting of the Expert Group on Environment Statistics
UN DESA Statistics Division - New York, 21-23 May 2019

Regional work on climate change at the EEA

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Summary

I. EEA role
II. From data to knowledge
III. EEA indicators on climate change

I) EEA: 25 years of information and knowledge in support of European environmental policies

- The **European Environment Agency** (EEA) is an agency of the European Union (EU), whose task is to provide sound, independent information on the environment
- The EEA aims to support sustainable development by helping to achieve significant and measurable improvement in Europe's environment, through the provision of **timely, targeted, relevant and reliable information** to policymaking agents and the public

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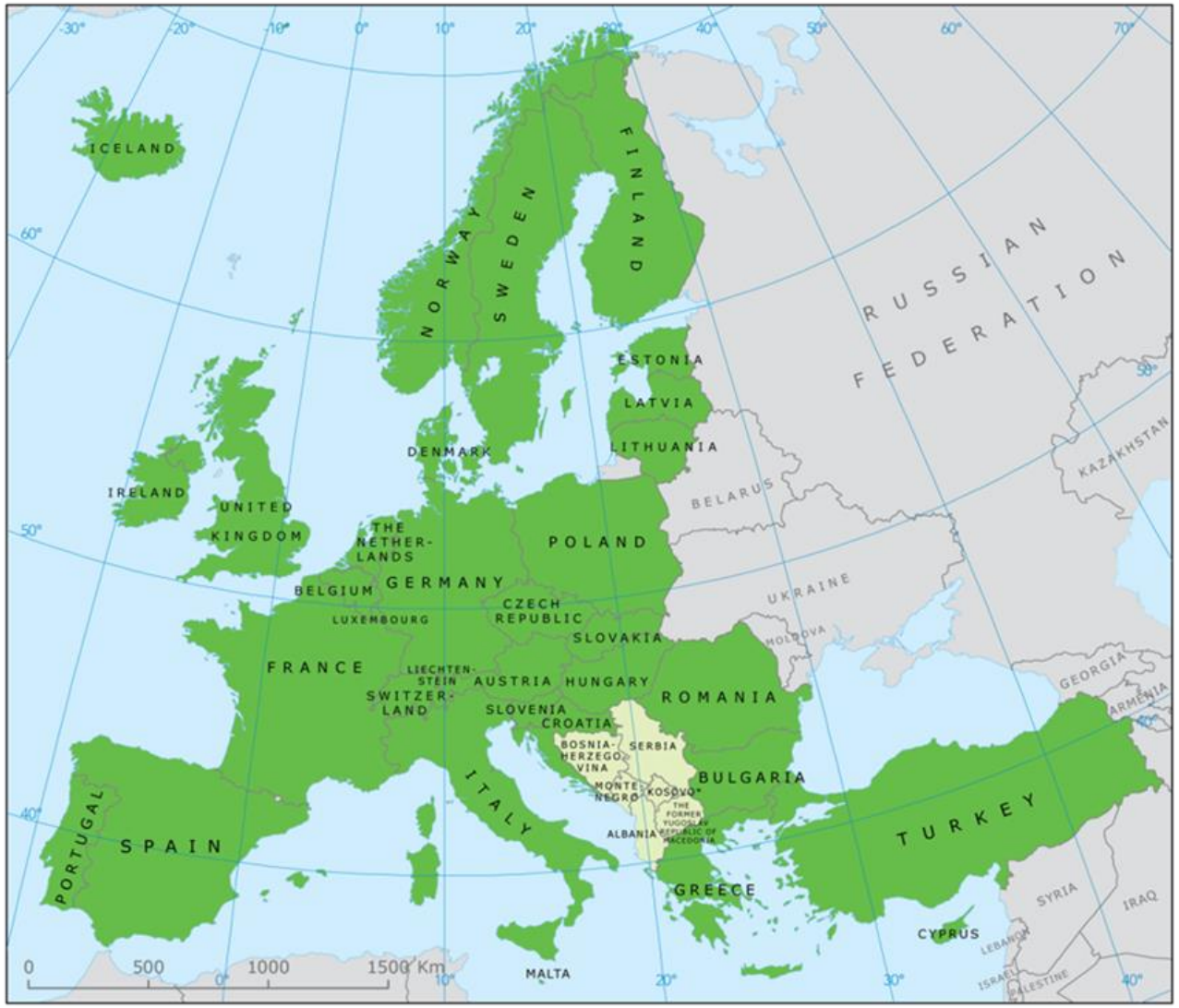
I) EEA member and cooperating countries



EEA coverage

Member countries

Cooperating countries

*Kosovo under UNSCR 1244/99

- EEA composition:
  - 33 member countries
    (28 EU member states + Iceland, Liechtenstein, Norway, Switzerland, Turkey)
  - 6 cooperating countries
    (West Balkan countries)

- The EEA also engages in international cooperation beyond its own member and cooperating countries

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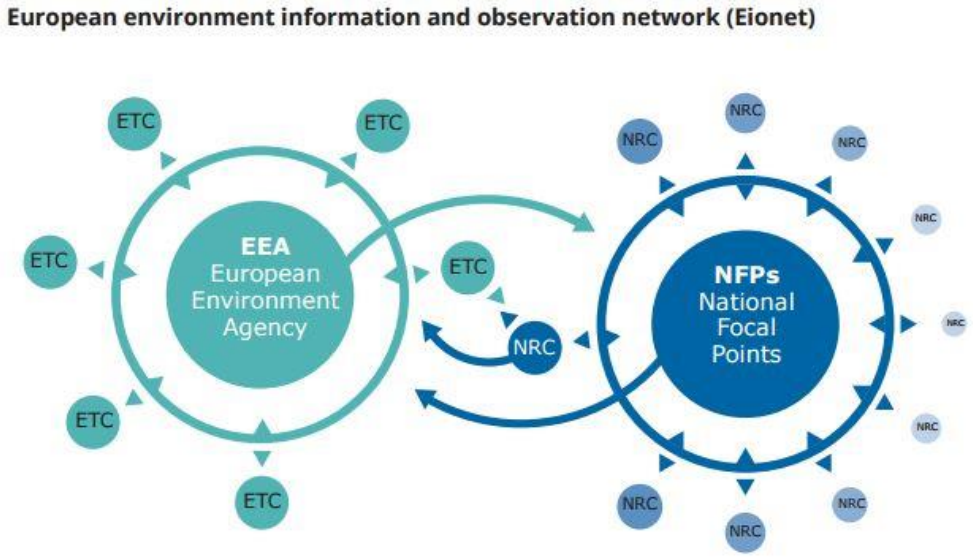
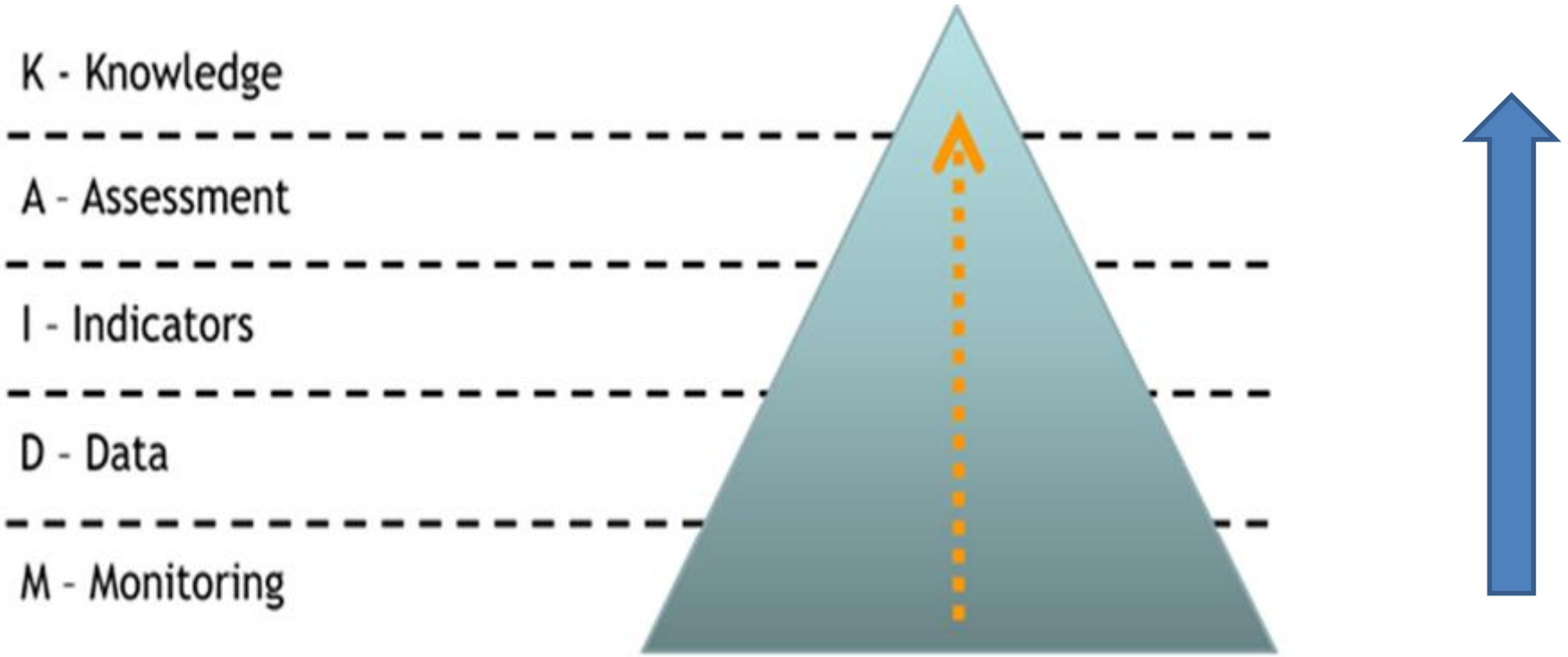
I) The EIONET Network

- The European environment information and observation network (Eionet) is a partnership network of the EEA and its member and cooperating countries
- The EEA is responsible for developing Eionet and coordinating its activities
- National Focal Points (NFPs) coordinate networks of National Reference Centres (NRCs)
- Eionet also covers 7 European Topic Centres (ETCs)

  -> incl. on Climate change mitigation and energy and Climate change impacts, vulnerability and adaptation



II) M-D-I-A-K: From monitoring to knowledge



II) MDIAK – Monitoring

- Copernicus is a EU Programme aimed at developing European Information Services based on satellite Earth Observation and *in situ* (non space) data analyses

- This initiative is headed by the European Commission in partnership with the European Space Agency (ESA) and the EEA

- Copernicus comprises 3 components: a service component, a space component and an *in situ* component ⟵ coordinated by the EEA

- Services:
  - Copernicus Atmosphere Monitoring Service (CAMS)
  - Copernicus Marine Environment Monitoring Service (CMEMS)
  - Copernicus Land Monitoring Service (CLMS) ⟵ coordinated by the EEA
  - Copernicus Climate Change Service (C3S)
  - Copernicus Security Service
  - Copernicus Emergency Management Service (EMS)

II) MDIAK – Data

- Through Eionet, the EEA brings together environmental information from countries concentrating on the delivery of timely, nationally validated, high-quality data

- Eionet **core data flows =** a subset of 18 existing key data flows reported by EEA member and cooperating countries using the Reportnet tool, which are used by the EEA for its main assessments, products and services

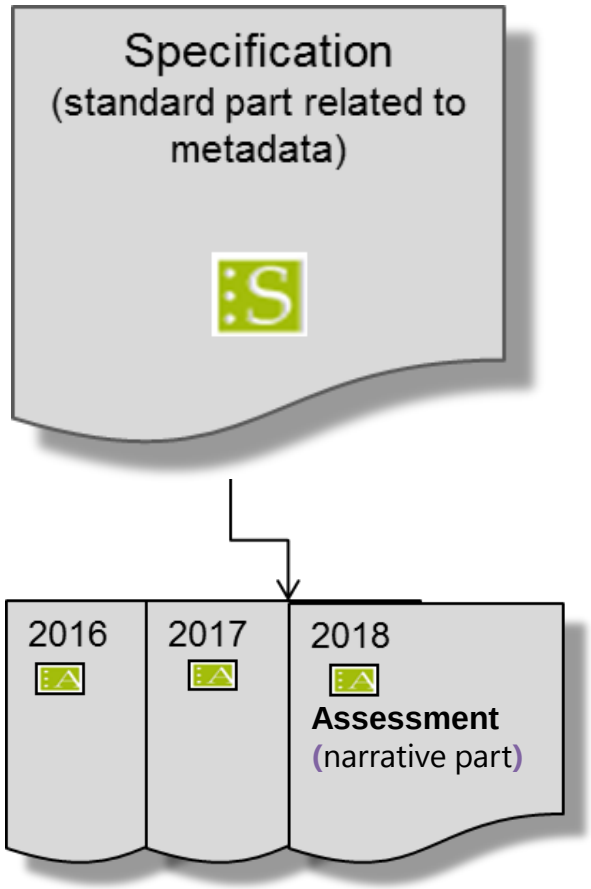
- The core data flows include the **Greenhouse gas inventories**

II) MDIAK – EEA indicators: the concept

- Definitions (consistent with the UN FDES):
  - measure used to illustrate and communicate complex environmental phenomena simply, including trends and progress over time (***EEA Core set of indicators***, 2005)
  - graphs and underlying data accompanied by interpretation and analysis in the form of a policy-relevant assessment (***Digest of EEA indicators***, 2014)

- EEA indicators are designed to answer key policy questions and support all phases of environmental policy making

- Structure:
  - Specification: standard part related to metadata
  - Assessment: more narrative part, updated when new data become available



II) MDIAK – EEA indicators: an overview

Primary topic	Indicators
Climate change adaptation	**34**
Biodiversity – Ecosystems	24
Water and marine environment	15
Transport	13
Energy	9
Air pollution	6
Climate change mitigation	**6**
Resource efficiency and waste	5
Land use	4
Industry	2
Sustainability transitions	2
Environment and health	1
Soil	1
TOTAL	**122**

- The EEA currently maintains 121 indicators, available on the EEA website (EEA indicators) but also in the Eurostat website (Environmental Indicator Catalogue)

- They mostly focus on climate change adaptation (28%) and biodiversity (20%)

- Geo coverage: EU (66%), EEA (40%)
- Frequency: yearly (40%), 2-6 years (60%)
- Country benchmarking: 35%
- Presence of maps: 37%

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II) MDIAK – EEA indicators: classification

Focus/type	Driving forces	Pressure	State	Impact	Response	Total
A: Descriptive indicators *(What is happening?)*	14	24	20	32	6	96
B: Performance indicators *(Are we reaching targets?)*	1	5	3	0	1	10
C: Efficiency indicators *(Are we improving?)*	2	3	0	0	3	8
D: Policy effectiveness indicators **(***Are measures working?)*	1	2	1	0	4	8
E: Total welfare indicators *(Are we on the whole better off?)*	0	0	0	0	0	0
Total	**18**	**34**	**24**	**32**	**14**	**122**

- Most EEA indicators (79%) are descriptive
- In relation to the D-P-S-I-R, they are especially of pressure (28%) and impact (26%)

II) MDIAK – EEA indicators: use of Copernicus data

Indicator codes	Indicator names	Copernicus services
CSI005/AIR004	Exposure of ecosystems to acidification, eutrophication and ozone	CAMS
CSI014/LSI001	Land take	CLMS
CSI046/CLIM013	Sea surface temperature	CMEMS
CSI053/CLIM010	Arctic and Baltic Sea ice	CMEMS
CSI054/LSI004	Landscape fragmentation pressure from urban and transport infrastructure expansion	CLMS
LSI002	Imperviousness and imperviousness change	CLMS
LSI008	Land recycling and densification	CLMS
SEBI004	Ecosystem coverage	CLMS
SEBI013	Fragmentation of natural and semi-natural areas	CLMS

CAMS = C. Atmosphere Monitoring Service; CLMS = C. Land Monitoring Service; CMEMS = C. Marine Environment Monitoring Service

9 EEA indicators use Copernicus data, while other 31 indicators may use it in the future

II) MDIAK – EEA indicators: international activities

EUROSTAT	• Supply of environment indicators to: European Catalogue of Environmental Indicators; Monitoring the Europe 2020 strategy (incl. Resource Efficiency); EU SDG indicator set • Participation in: Sustainable Development and Europe 2020 Indicators Working Group; SDG-related reporting of the DGs Working Group • Thematic collaboration
UNECE	• Participation in: Expert Forum for producers and users of climate change-related statistics; Joint Task Force on Environment Indicators; Steering Group on climate change-related statistics; Working Group on Environmental Monitoring and Assessment; Environment for Europe
UNSD	• Participation in: Expert Group on Environment Statistics; Inter-Agency Expert Group on SDG Indicators

Plus: cooperation and capacity building activities on indicators, with the partner countries of the European Neighbourhood in the Eastern and Southern regions

II) MDIAK – Indicators to monitor European policies

- The EEA's *Environment indicator report 2018* provides an overview of EU progress towards the three priority objectives of the 7th Environment Action Programme, related to natural capital, low-carbon economy and citizens' health respectively
- For the first one the picture is negative, while for the other two is mixed

-> **Based on 16 EEA indicators**

Living well, within the limits of our planet

7th Environment Action Programme

'**In 2050, we live well, within the planet's ecological limits.**

Our prosperity and healthy environment stem from an innovative, **circular economy** where nothing is wasted and where natural resources are managed sustainably, and **biodiversity is protected**, valued and restored in ways that enhance our society's resilience.

Our **low-carbon growth** has long been decoupled from resource use, setting the pace for a global safe and sustainable society.'

Source: 7th Environment Action Programme, European Commission, 2013

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II) MDIAK – Indicators to monitor European policies

- Sustainable development lies at the core of the EU, as set out in the Treaties -> The EU was one of the leading forces behind the UN 2030 Agenda and has fully committed itself to its implementation

- ***Sustainable development in the European Union*** is the Eurostat's Monitoring report on progress towards the SDGs in an EU context, based on an EU SDG indicator set composed of 100 indicators structured along the 17 SDGs

    - **The EEA contributes with 20 indicators**

II) MDIAK – State and outlook of Europe's environment

1995 

5th EAP (1993-2002) Towards sustainability

1999 

Support to final evaluation of 5th EAP, framing 6th EAP

2005 

Support to mid-term evaluation of 6th EAP

2010 

Support to final evaluation of 6th EAP (2002-2012), framing of 7th EAP

2015 

7th EAP (2013-2020) Living well within the limits of our planet

2020 

Support the framing of a possible 8th EAP

- Flagship report published every 5 years
- Increased complexity of problem definition, analysis and response
- Problem focused -> solution oriented

The SOER2020 will be launched in Brussels on 3-4 December 2019

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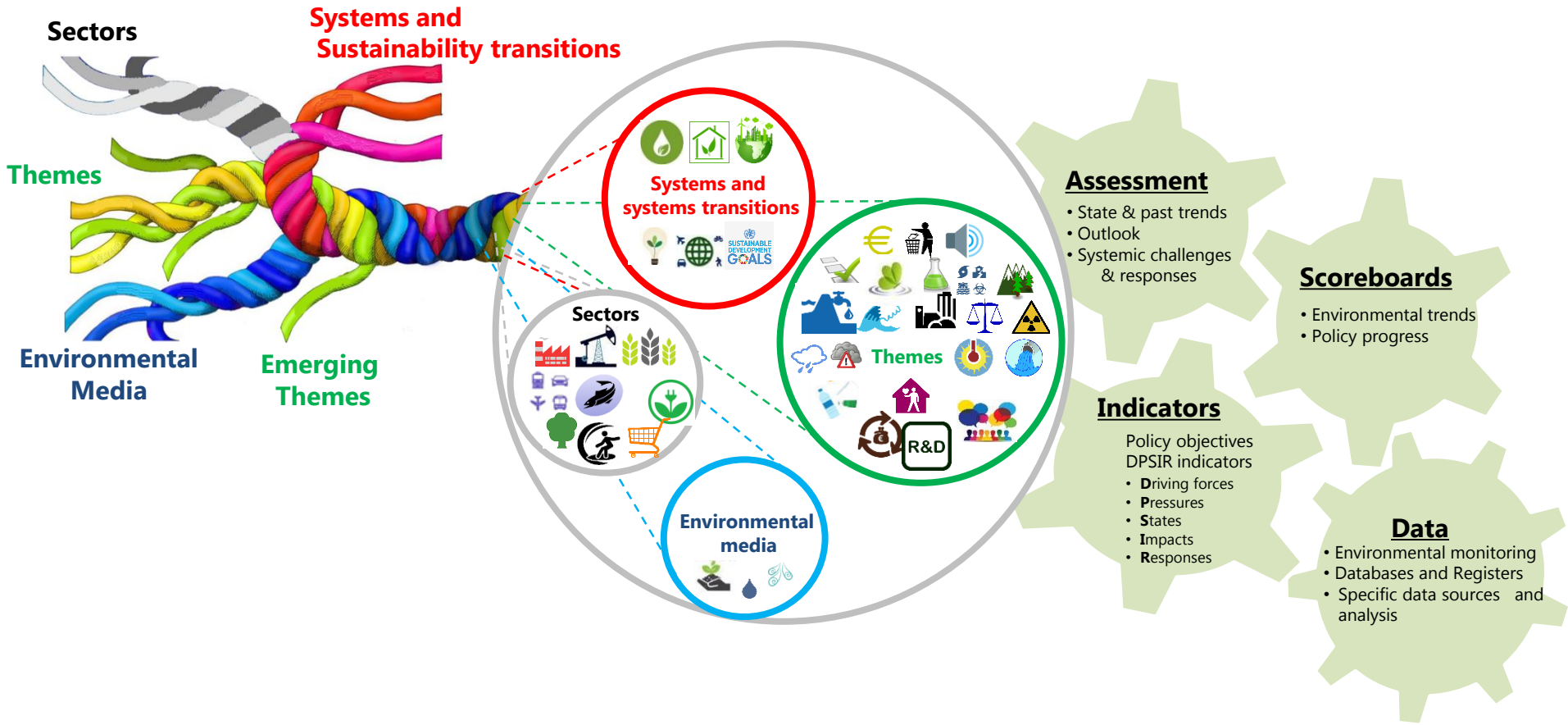

Advances in national state of the environment reporting

Effectual indicators and robust evidence base

- emerging themes e.g. circular economy, (micro) plastics
- long term systemic challenges and monitoring of sustainability transitions
- new data sources: e.g. participatory solutions, big data, citizen science, remote sensing, environmental DNA

Open and accessible knowledge

- emphasis on digital information and digital channels including open data and models
- interactive data visualization and story telling
- innovative communication and outreach

Innovative assessments

- integrative concepts like SDGs', planetary boundaries
- pathways for long term systemic challenges and sustainability transitions
- linking knowledge to action (multi scale, multi actor) and incorporate participatory solutions

II) MDIAK -> From knowledge to action!

- The state of the environment reports at national level are an increasingly important tool for environmental policy and 22 EEA member countries plan to publish a new edition in 2019-2020
- Despite some variations, one can distinguish two types of reports: indicator-based reports and integrated environmental assessments
- The challenge for the new generation of reports is to provide effective indicators and a solid evidence base for emerging environmental issues (circular economy, micro plastics, etc.) as well as incorporating integrative concepts like SDGs
- The move towards integrated reporting of sustainability requires new knowledge of transition paths towards sustainability, monitoring of these transitions and **linking knowledge to action**, by identifying participatory solutions involving both civil society and the government

III) EEA indicators on climate change

- The EEA maintains 44 indicators on climate change:
  - 9 on CC mitigation
  - 35 on CC adaptation

Frequency	Indicators
1 year	10 (23%)
2-4 years	33 (75%)
5 years	1 (2%)

Geo coverage	Indicators
EEA/EU coverage	28 (64% of the total)
Country benchmarking	3 (7% of the total)
Maps	26 (59% of the total)

Last update	Indicators
2018-2019	9 (20%)
2016-2017	32 (73%)
Before 2016	3 (7%)

III) EEA indicators on climate change mitigation

- Atmospheric greenhouse gas concentrations
- Average CO2 emissions from newly registered motor vehicles
- Emissions and supply of fluorinated greenhouse gases
- Production and consumption of ozone-depleting substances
- Soil organic carbon
- Total greenhouse gas emission trends and projections

Plus (as secondary topic):

- Passenger and freight transport demand
- Impact of climate change on bird population
- Greenhouse gas emissions from transport

III) EEA indicators on climate change adaptation

Agrophenology; Arctic and Baltic Sea ice; Crop water demand; Distribution shifts of marine species; Distribution shifts of plant and animal species; Economic losses from climate-related extremes in Europe; Extreme temperatures and health; Floods and health; Forest composition and distribution; Forest fires; Glaciers; Global and European sea-level rise; Global and European temperature; Greenland and Antarctic ice sheets; Growing season for agricultural crops; Hail; Heating and cooling degree days; Heavy precipitation; Mean precipitation; Meteorological and hydrological droughts; Ocean acidification; Ocean heat content; Ocean oxygen content; Phenology of plant and animal species; River floods; River flow; Sea surface temperature; Snow cover; Soil moisture; Vector-borne diseases; Water- and food-borne diseases; Water temperature; Water-limited crop yield; Wind storms

+ Air pollution due to ozone: health impacts and effects of CC

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III) The EEA report on CC, impacts and vulnerability

- Every 4 years the EEA publishes a report on ‘Climate change, impacts and vulnerability in Europe’

- The report presents a primarily indicator-based assessment of past and projected climate change. It also looks at the observed and projected impacts of climate change, society's associated vulnerability to these impacts and the risks they pose to European ecosystems and society.

- The fourth report was published in 2017

https://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016

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III) The EEA CCIV report: CLIM indicators by theme

Climate	Global and European temperature; Mean precipitation; Heavy precipitation; Wind storms; Glaciers; Snow cover; Greenland ice sheet; Arctic and Baltic Sea ice; Permafrost; Lake and river ice
Marine ecosystems	Distribution shift of marine species; Phenology of marine species; Ocean acidification; Ocean heat content; Sea surface temperature; Global and European sea-level rise
Freshwaters	River flow; River flow drought; Water temperature; River floods
Terrestrial ecosystems, soil & forest	Distribution and abundance of animal species; Distribution of plant species; Plant and fungi; Species interactions; Animal phenology; Forest growth; Forest fires; Soil erosion; Soil organic carbon; Soil moisture
Damages	Economic losses from climate-related events
Human health	Extreme temperatures and health; Floods and health; Vector-borne diseases; Water and food-borne diseases
Agriculture	Growing season for agricultural crops; Agrophenology; Water-limited crop productivity; Irrigation water requirement
Energy, Transport, Tourism	Heating and cooling degree days
Atmosphere	Atmospheric GHG concentrations; Effects of climate change: Air pollution due to ozone and health impacts; Total GHG emission trends and projections; Progress to GHG emission targets; Production, sales and emissions of fluorinated GHG (F-gases); Production and consumption of ozone-depleting substances

Contacts

Thanks for your attention!

European Environment Agency: https://www.eea.europa.eu/

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