



Ecologic Institute
Science and Policy
for a Sustainable World



Measuring progress towards climate neutrality

Climate Recon 2050 – Virtual expert conversation

16 December 2021

Eike Karola Velten
Ecologic Institute

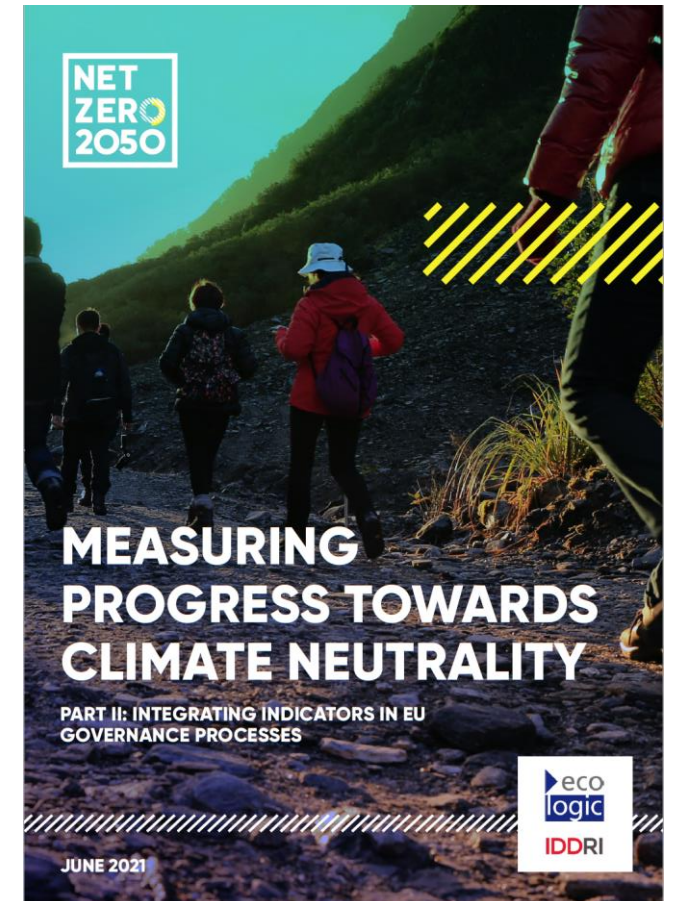
Measuring progress towards climate neutrality



A net zero indicator
framework for planning and
reporting

&

Integrating net zero
indicators into existing
policy processes





ASSESSING STRUCTURAL CHANGE THROUGH NET ZERO INDICATORS



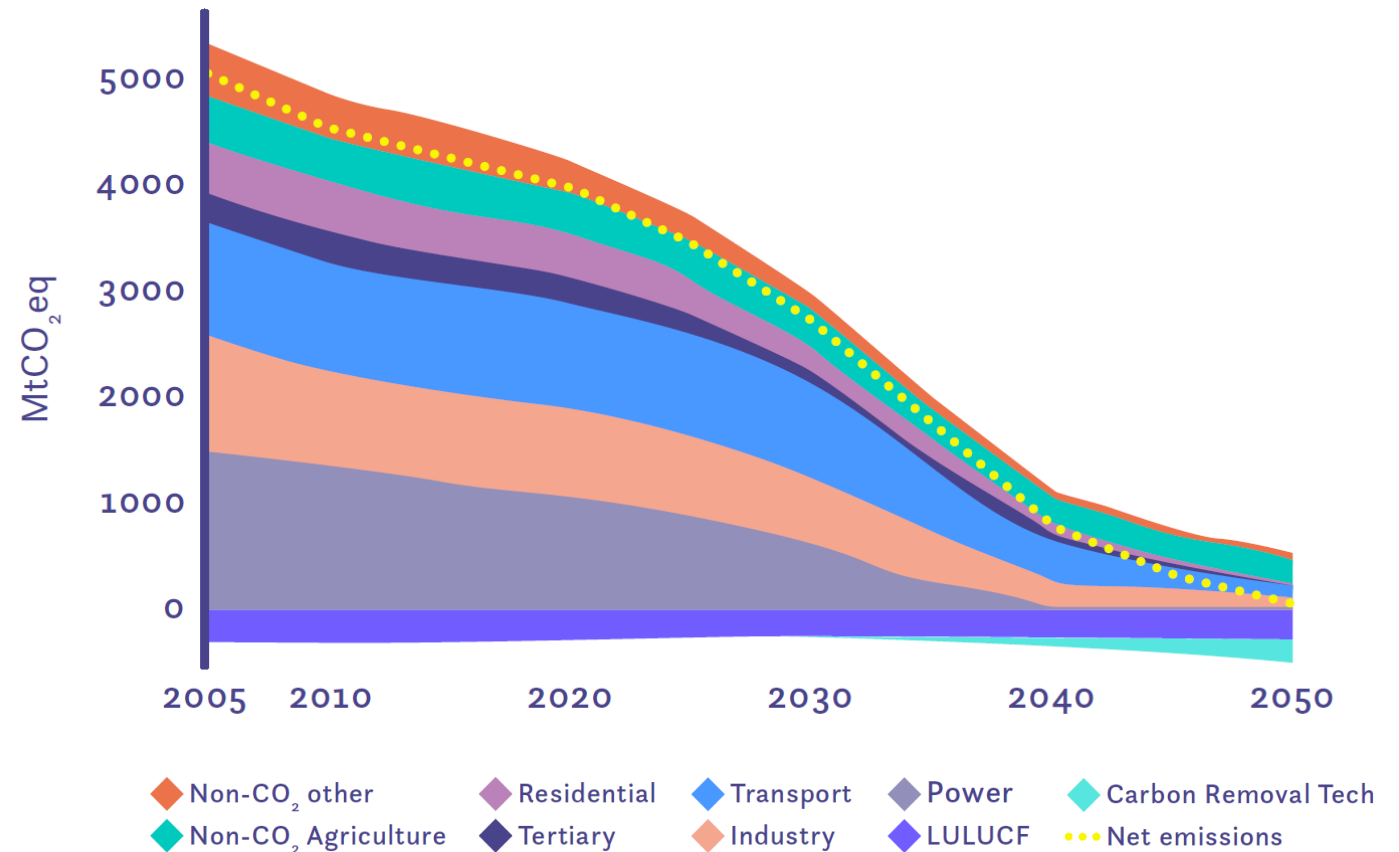
Why a monitoring framework and indicators?

Measuring progress towards long-term climate targets needs new monitoring systems

- **to keep track of current progress towards short and long-term objectives**
- **to understand where (more) action is required**
- **to address barriers and push enablers for change**
- **to improve its long-term vision**

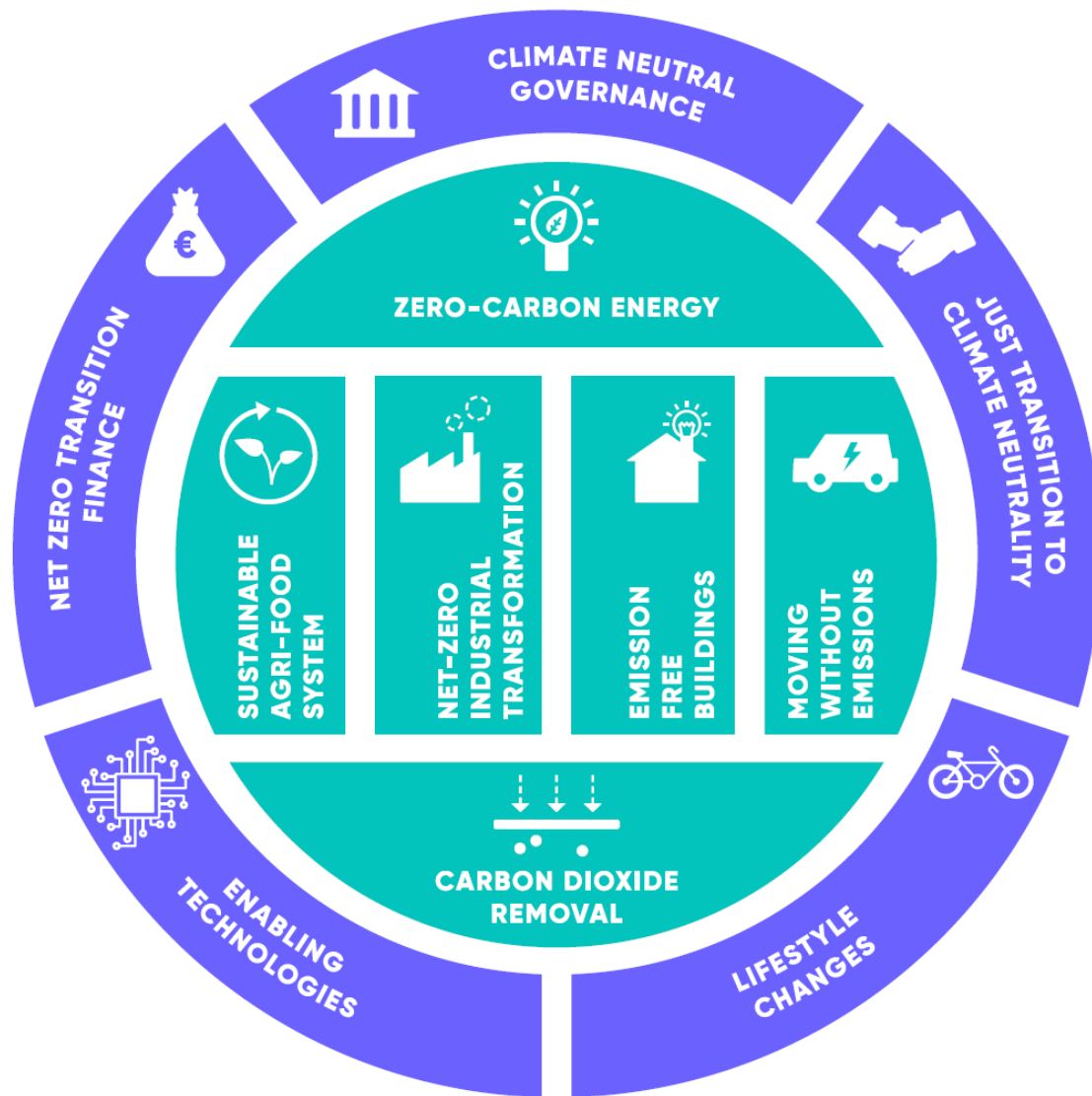
What constitutes a climate neutral future?

EU pathways to climate neutrality in 2050



Source: COM (2018): A clean planet for all

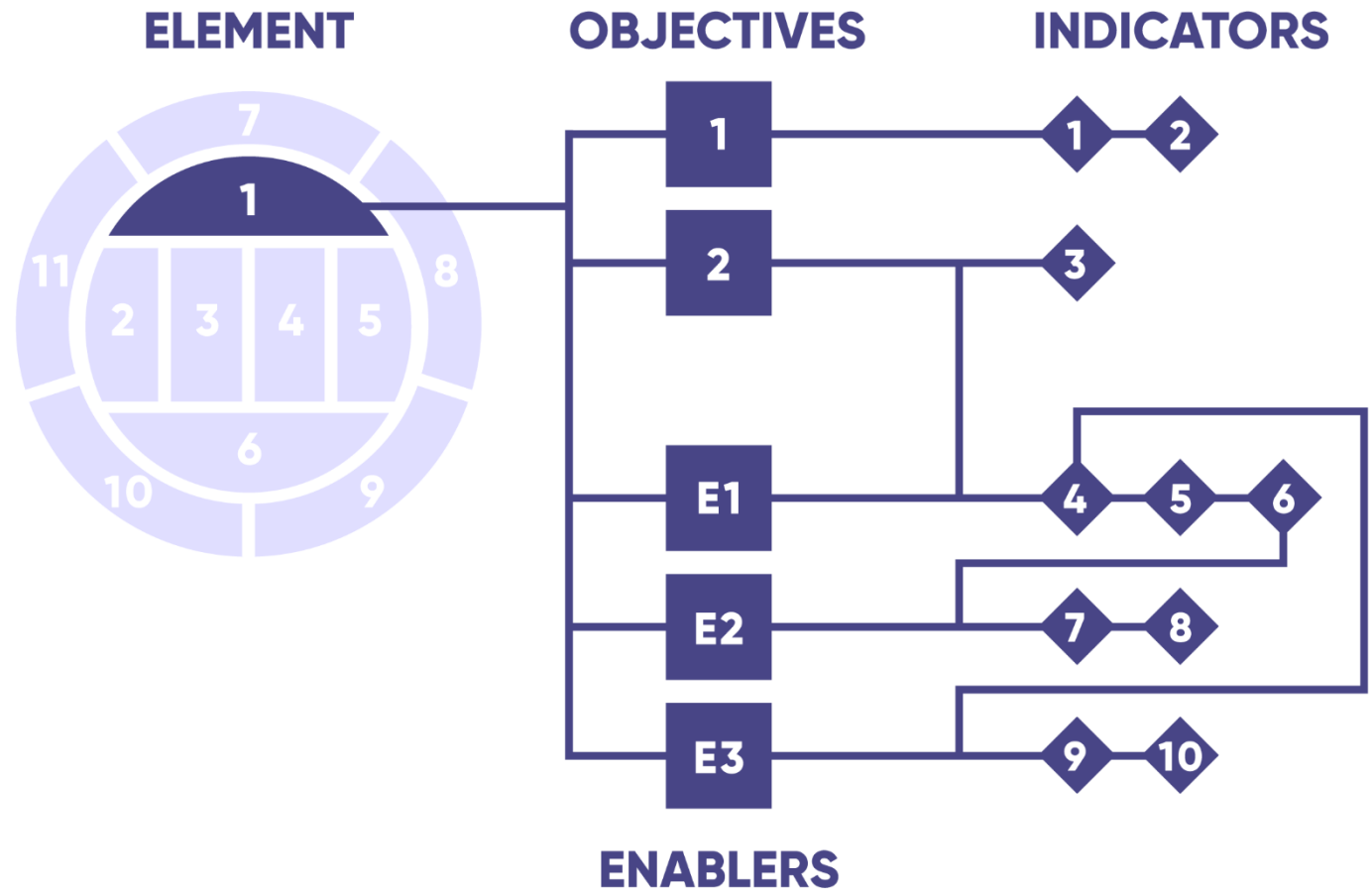
Sectoral and horizontal elements



Source: own presentation; visuals by Nobel Studio

Our concept to derive indicators

Progress measurement in elements uses indicators for objectives and enablers



Source: own presentation; visuals by Nobel Studio

Zero Carbon Energy



Describes progress towards switching to a net zero emissions energy system by 2050

Objectives:

- 1: Share of renewables (32% by 2030; min. 74% by 2050)
- 2: Carbon dioxide capture and storage (74 to 120 Mt CO₂eq by 2050)
- 3: Emissions from electricity generation (max 34.0 Mt CO₂eq by 2050)
- 4: Electrification of the energy system (~53% of FEC in 2050)

Enablers:

- 1: Supporting regulatory frameworks
- 2: Infrastructure to enable a secure transition
- 3: Reducing total energy consumption

Zero Carbon Energy



REFERS TO	NAME OF INDICATOR [UNIT]	DATA SOURCE	SOURCE FOR TARGET VALUES
Objectives	Share of renewable energies in gross final energy consumption (incl. sub-indicators for electricity, transport and heating & cooling) [%]	Eurostat ^[26]	2030: RED; 2050: EU LTS
	CO₂ emissions from energy generation captured and used or stored [t CO ₂]	No data yet. GHG inventory (crf. 1.C) ^[27]	EU LTS
	Carbon intensity of electricity generation [g CO ₂ e/kWh]	EEA ^[28]	2030: EEA ^[29]
	Electrification of the economy (incl. sub-indicators for sectors) [%]	Eurostat ^[30]	EU LTS
Enabler 1 on supporting regulatory frameworks	Support mechanisms for renewables (incl. sub-indicators for electricity generation, transport, heating & cooling) [N° of MS; scale]	RES legal (database on policies; no scoring) ^[31]	Not available
	Additional energy related investment (with sub-indicators for power grid, power plants and boilers, new fuels) [EUR]	NECP (some years/ MS) ^[32] , Bloomberg ^[33] (some MS)	EU LTS
	Share of EU financial support for zero carbon energy (EU budget and other programmes) [%]	EU budget ^[34]	Climate mainstreaming target but not available for 2050
	Public money going to fossil-fuels (fossil fuel subsidies) [EUR]	OECD ^[35]	E.g. G20 commitment ^[36]
	Price on carbon (with sub-indicators for different sectors/sources) [EUR/tCO ₂ eq]	EU ETS price ^[37] ; Carbon taxes ^[38] , Effective carbon rates for some countries ^[39]	Not available

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Zero Carbon Energy



REFERS TO	NAME OF INDICATOR [UNIT]	DATA SOURCE	SOURCE FOR TARGET VALUES
Enabler 1 on supporting regulatory frameworks <i>Continued</i>	Share of households' expenditure on housing fuels for average and poor households [%]	Eurostat ^[40]	Not available
	Differences in electricity prices for industry in the EU and globally [EUR/MWh]	Eurostat ^[41]	Not available
	Levelised costs for emerging technologies (incl. e.g. battery storage, carbon capture [EUR/tCO ₂] and hydrogen [EUR/kgH])	Individual studies ^[42] , IEA (single study) ^[43]	Not available
Enabler 2 on infrastructure to enable a secure transition	Curtailement of electricity generation capacities [hours]	ENSOE ^[44] ; available for some countries	Not available
	Infrastructure additions (incl. cross-border capacities) for electricity and gas networks [km; MW]	Possibly ENSO-E ^[45] ; ENSO-G ^[46]	Electricity: 2040 in TYNDP ^[47]
	Storage capacities for energy (for electricity, heat, gas) [TJ or m ³]	Single studies	EU LTS
	Average outage duration for each customer (SAIDI) for electricity and gas [min]	CEER ^[48] ENSOE ^[49] ;	Not available
Enabler 3 on reduced energy consumption	Primary and final energy consumption (incl. sub-indicators for final energy per fuel type, per sector) [% change to 2005 and/or PJ]	Eurostat ^[50]	EU LTS

Source: own presentation

Net zero transition finance



Describes progress towards net zero compatible financial system and investments flows

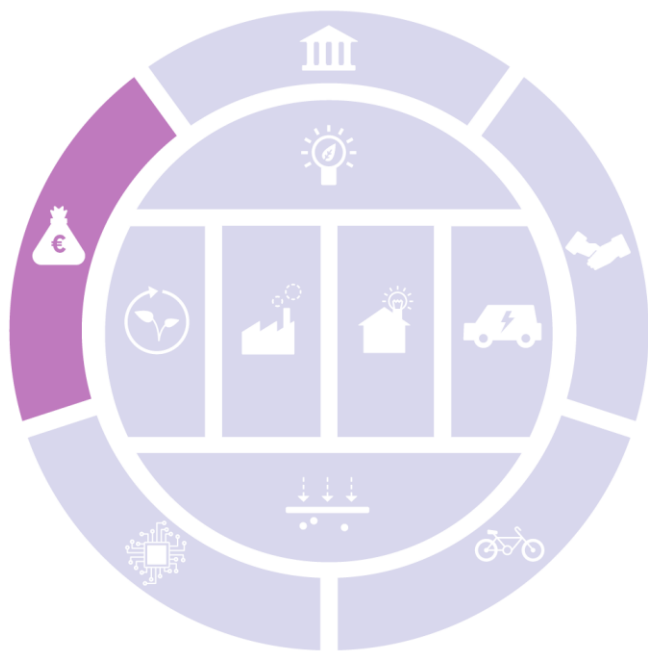
Objectives:

- 1: Additional investments (vs baseline) in the EU energy sector (EUR 63 - 114 bn/yr from 2021-2030; EUR 176 - 290 bn/yr from 2031 to 2050)
- 2: Sustainable investment targets (100% for all economic activities by 2050)

Enablers:

- 1: Orient public funds towards the transition
- 2: Enabling regulatory framework
- 3: Align the financial system with climate

Net zero transition finance







REFERS TO...	NAME OF INDICATOR [UNIT]	DATA SOURCE	SOURCE FOR 2050 TARGET VALUES
Objectives and targets	Total amount of sustainable and unsustainable investments in all economic sectors [EUR]	Not available might be built on the EU taxonomy ^[231]	LTS
	Investment gap [EUR]	Not available	LTS
	Share of sustainable and unsustainable investments in EU/MS GDP [%]	Not available might be built on the EU taxonomy ^[232]	LTS
Enabler 1 on orienting public funds towards the transition	Share of public funds dedicated to climate action in EU and MS budget [% of overall funding]	European Commission ^[233]	2021-2027: 25 % 2050: not available
	Share of public funds detrimental to climate action in EU and MS budget [% of overall funding]	Not available	Not available
Enabler 2 on enabling regulatory framework	Average cost of capital for sustainable investments	Not available	Not available
	Share of environmental tax revenue of public revenue (i.e. total tax and social contributions revenue) [%]	Eurostat ^[234]	COM analysis for the Roadmap Resource Efficient Europe Part II ^[235]
Enabler 3 on aligning the financial system with climate	Share of financial market assets labelled as Green / consistent with EU taxonomy (loans, primary market transactions, secondary market portfolios) [%]	Not available	Not available
	Coverage of banking stress tests considering climate risks [% of overall bank assets]	Not available	Not available

Progress measurement – an illustration

Approach derived from the EU SDG-Monitoring:

- Based on the compound annual growth rate
- Comparison of actual trend and required development over a given period

RANGE FOR QUANTIFIED TARGET VALUE	RANGE FOR DESCRIPTIVE TARGET VALUE	CLASSIFICATION	
Trend is at least 95 % of the required change	Trend is > 1 % in the right direction	In line with net zero emissions objective	4 
Trend is 60 % - < 95 % of the required change	Trend is 0 % - 1 % in the right direction	Progressive but insufficient for net zero emissions objective	3 
Trend is 0 % - < 60 % of the required change	Trend is 0 % - 1 % in the wrong direction	Not supporting the net zero emissions objective	2 
Trend is below 0 % of the required change	Trend is > 1 % in the wrong direction	Opposing the net zero emissions objective	1 

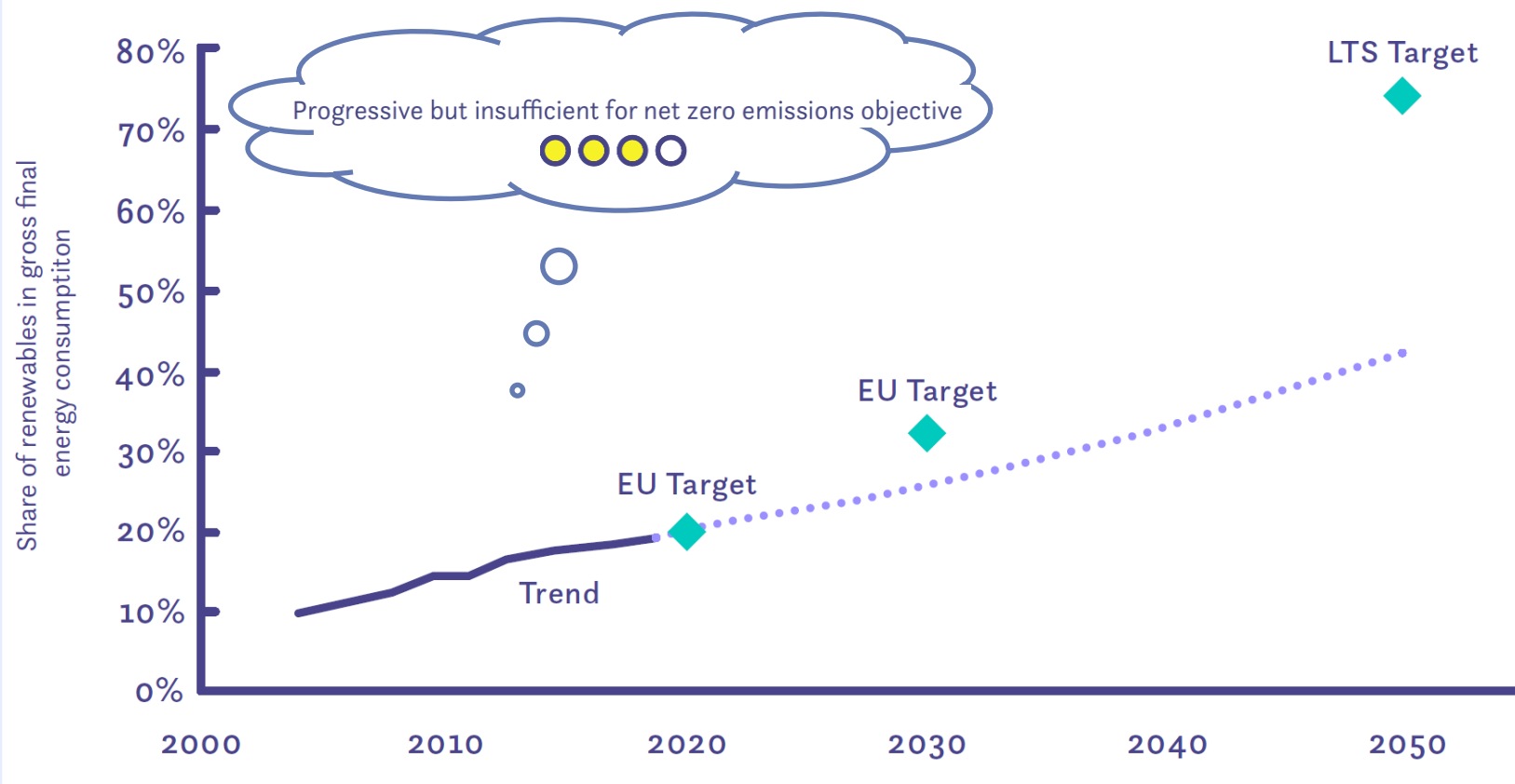
- Also allows for composite values of single indicators and for an element as a whole

Zero Carbon Energy



Illustrative progress measurement:

Progress towards the deployment of renewables



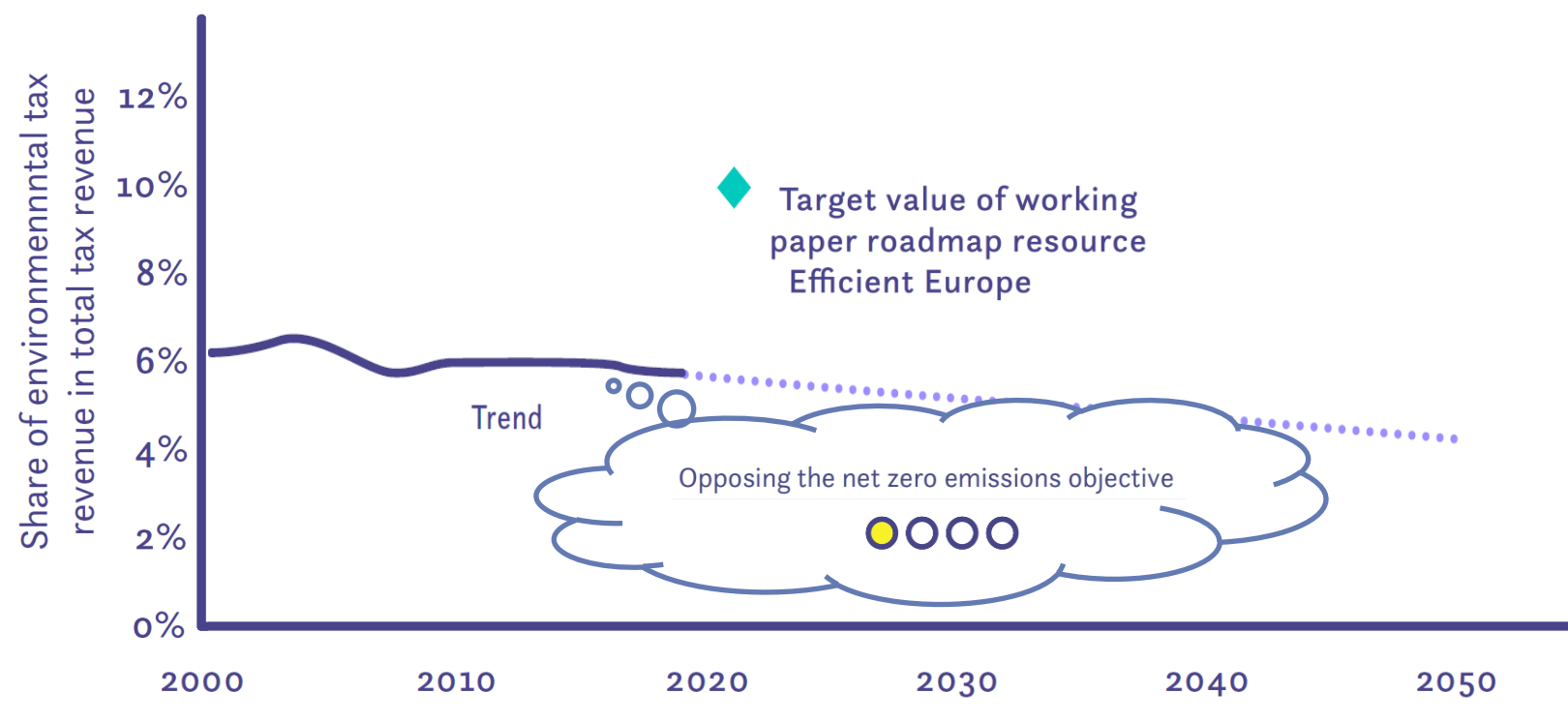
Source: own presentation based on data from Eurostat and target values from RED and LTS. The trend is 64% of the required change to meet the 2030 and 60% to reach the 2050 target value.

Net zero transition finance



Illustrative progress measurement:

Progress on an increased share of environmental tax revenue



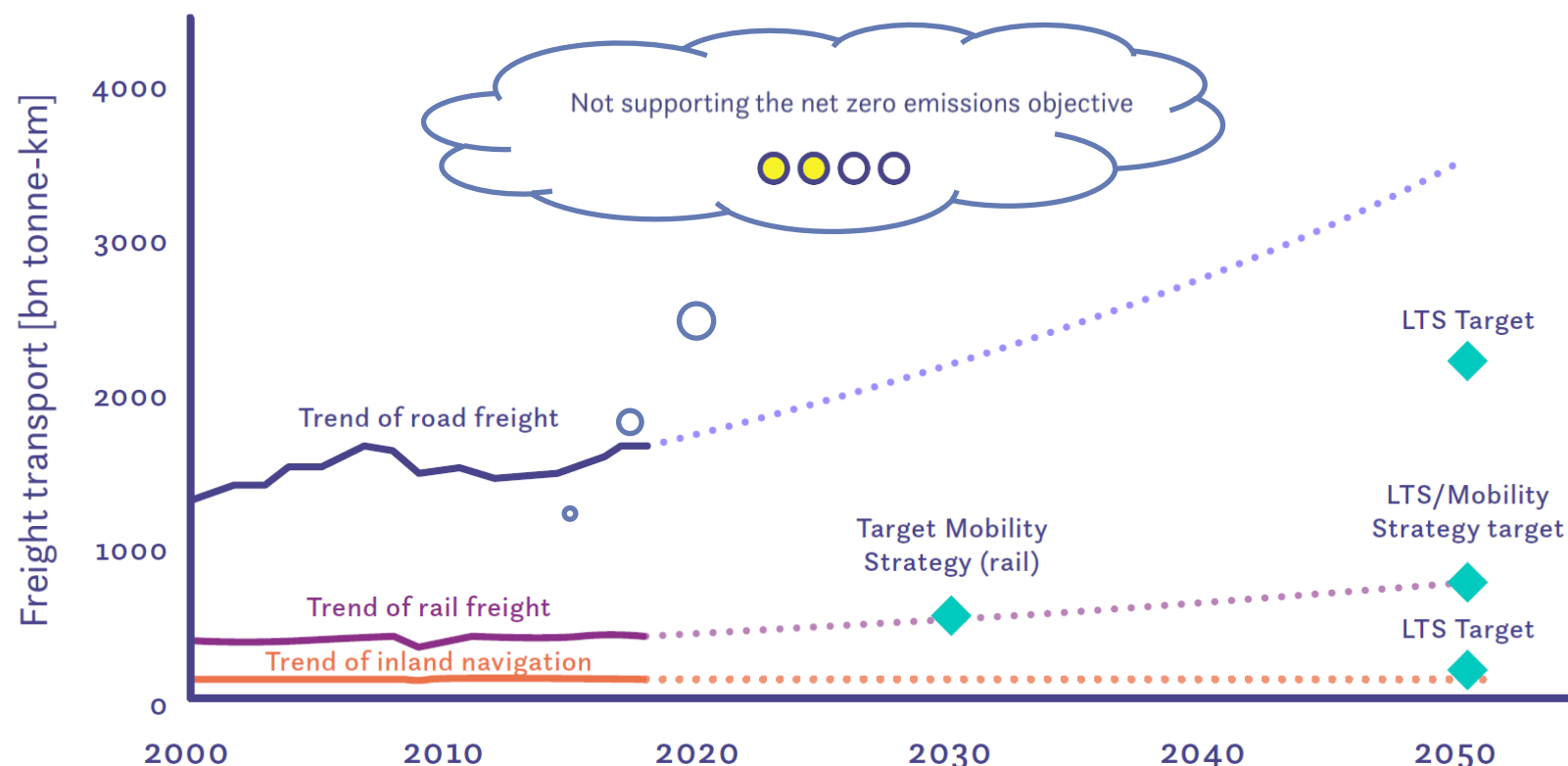
Source: own presentation based on Eurostat data and target value from COM working paper: Analysis associated with the Resource Efficiency Roadmap. The trend is -10 % of the required change to reach the 2020 target value and 0.8% in the wrong direction.

Moving w/o emissions



Illustrative progress measurement:

Progress on the modal shift in freight transport



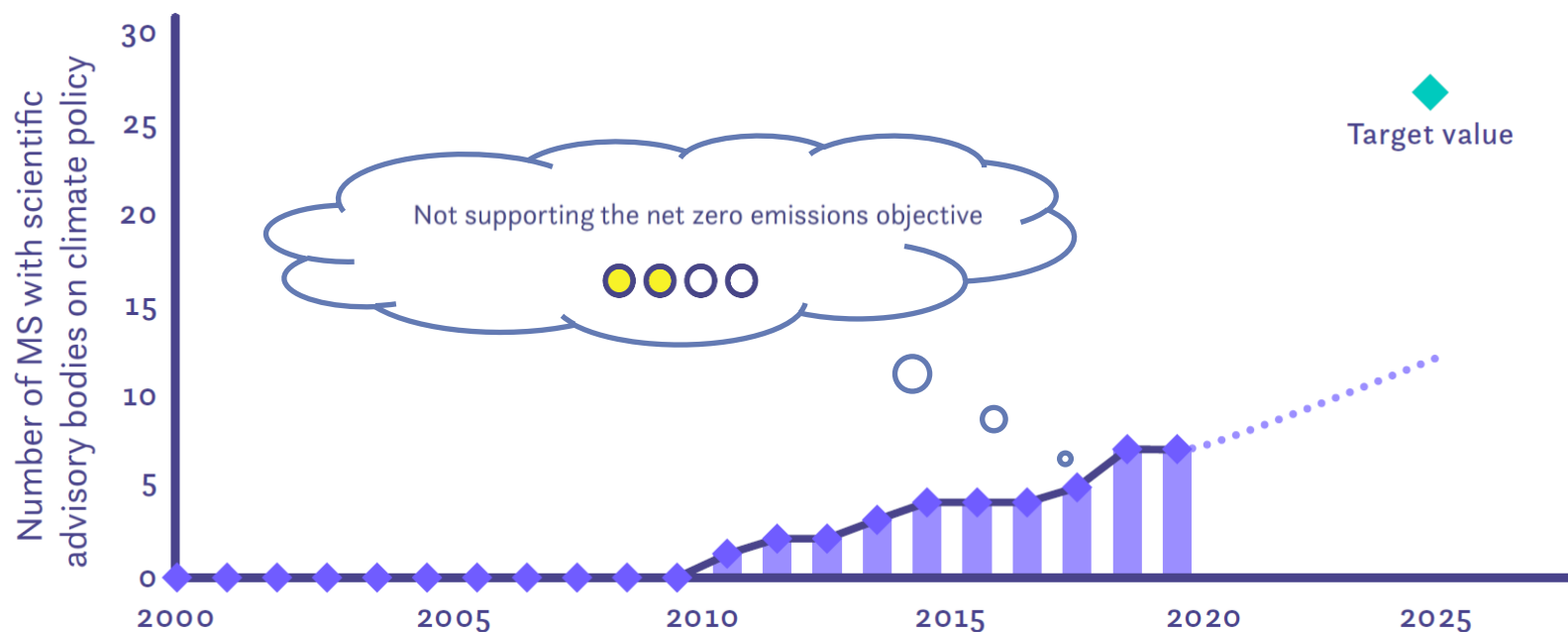
Source: own presentation based on data from Eurostat (EU 28) using data on inland waterways for domestic navigation and 2050 target values from the LTS. The trend is -18 % (road), 100 % (rail), -339 % (inland waterways) of the required change to reach the 2050 target.

Climate neutral Governance



Illustrative progress measurement:

Progress in MS in establishing a scientific advisory body for climate policy



Source: own presentation based on an evaluation of national governance systems, only counting advisory bodies still in use. Target value is based on expert judgement. The trend is 56 % of the required change to reach the 2025 target.

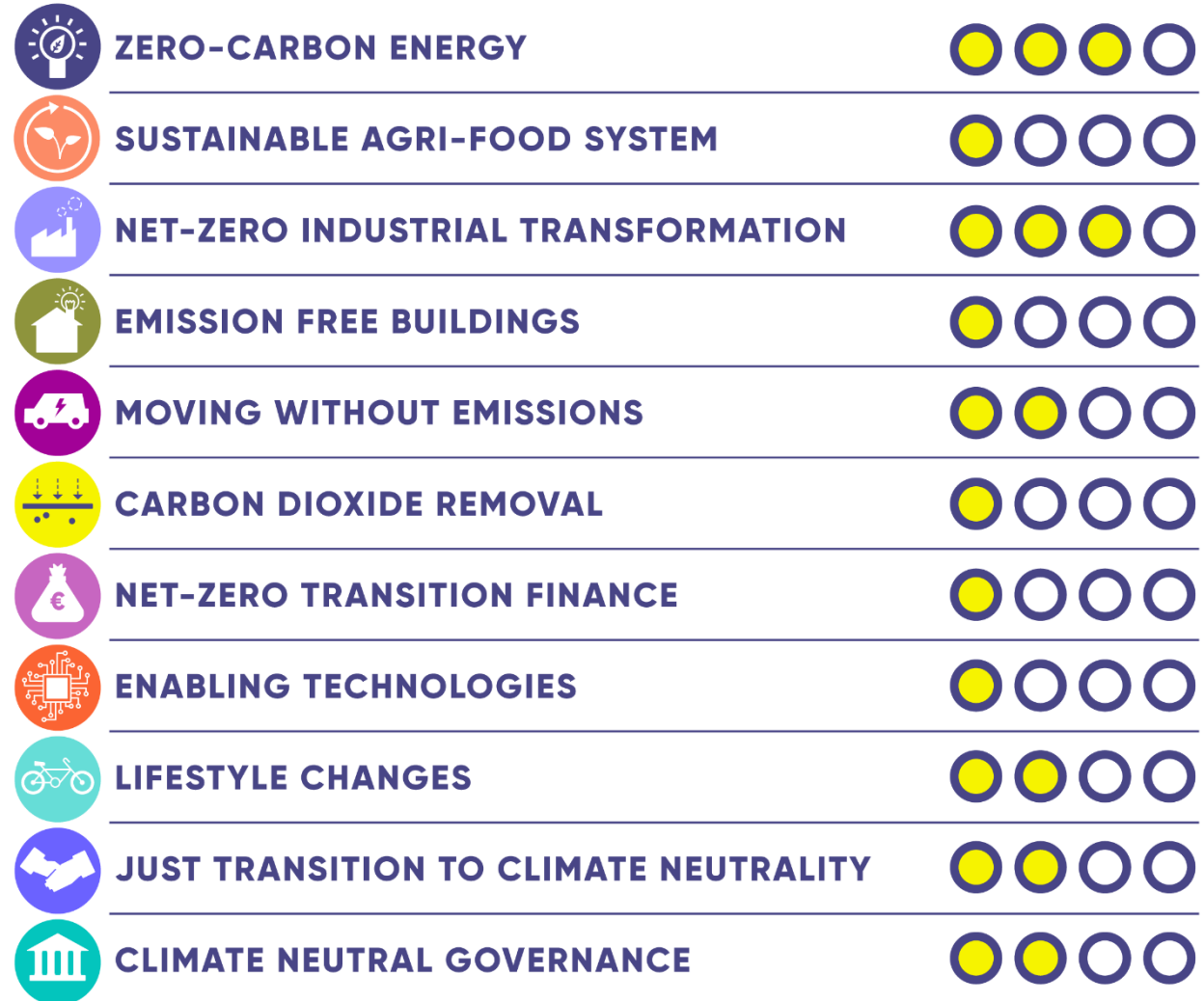
A scoreboard – an example

based on single
indicators for each
element

CLASSIFICATION

- In line with net zero emissions objective
- Progressive but insufficient for net zero emissions objective
- Not supporting the net zero emissions objective
- Opposing the net zero emissions objective

Progress towards net zero emissions in the elements



Source: own presentation based on single indicators for each element.

Conclusions

What it needs:

- **Harmonisation and centralisation of existing data**
- **New data in specific elements**
- **Target setting in specific elements**

This indicator framework can help to:

- **Improve reporting to inform about overall progress as well as on specific enablers**
- **Improve planning to get a better vision for the long-term**



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**European
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Foundation**

A series of overlapping, semi-transparent geometric shapes in shades of grey and blue, located on the left side of the slide.

Thank you for listening!