Towards EU climate neutrality
Progress, policy gaps and opportunities

Annex I: Sources and details for the assessment of progress

Assessment Report 2024

European Scientific Advisory Board on Climate Change

Contents

Annex I - Sources and details for the assessment of progress

Indicator	Historic progress Source	2030 benchmark		2050 benchmark	
		source	type	source	type
O1: overall GHG emission reductions	EU GHG inventory, 2022 based on proxy data	European Climate Law	legal objective	European Climate Law	legal objective
O2: primary and final energy consumption	Eurostat (nrg_bal_c)	Energy Efficiency Directive	legal objective	CTP MIX scenario	EC scenario output
O3: % of fossils in EU gross inland energy consumption	Eurostat (nrg_bal_c)	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
E1: energy supply GHG emissions	EU GHG inventory, 2022 based on proxy data	FF55 MIX scenario	EC scenario output	ACP4A 1.5LIFE and 1.5 TECH scenario	EC scenario output
E2a: share of fossils in the electricity mix	Eurostat (nrg_bal_c)	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
E2b: share of fossils in the electricity mix	Eurostat (nrg_bal_c)	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
E3: average electricity GHG intensity	EEA data	FF55 MIX scenario	EC scenario output	ACP4A 1.5LIFE and 1.5TECH scenario	EC scenario output
E4a: solar PV deployment	Eurostat (nrg_inf_epcrw)	FF55 MIX scenario, REPowerEU	EC scenario output	CTP MIX scenario	EC scenario output
E4b: onshore wind energy deployment	Eurostat (nrg_inf_epcrw)	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
E4c: offshore wind energy deployment	Eurostat (nrg_inf_epcrw)	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
E5: electrification rate	Eurostat (nrg_bal_c)	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
E6: energy-related methane emissions	EU GHG inventory	FF55 MIX scenario	EC scenario output	ACP4A 1.5LIFE scenario	EC scenario output
I1: industry GHG emissions	EU GHG inventory, EU ETS data for cement	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output

Indicator	Historic progress	2030 benchmark		2050 benchmark	
	Source	*source*	*type*	*source*	*type*
I2a: steel use	Eurofer for production and use, Eurostat (DS-059268) for trade	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
I2b: cement use	Eurofer for production and use, Eurostat (DS-059268) for trade	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
I2c: chemicals use	Eurostat for production and trade, use estimated by the Advisory Board	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
I3: Circular Material Use Rate	EEA	8th EAP	policy objective	*no benchmark*	*no benchmark*
I4a: GHG intensity steel	Eurofer for production, EU GHG inventories for emissions	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
I4b: GHG intensity cement	Cembureau for production, EU ETS data for GHG emissions	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
I4c: GHG intensity chemicals	Eurostat for production, EU ETS data for GHG emissions	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
I5: final energy use	Eurostat (nrg_bal_c)	FF55 MIX scenario, REPowerEU	EC scenario output	CTP MIX scenario	EC scenario output
I6a: % of fossils in final energy consumption	Eurostat (nrg_bal_c)	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
I6b: % of renewables in final energy consumption	Eurostat (nrg_bal_c)	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
I6c: % of electricity in final energy consumption	Eurostat (nrg_bal_c)	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
I7a: low-carbon projects in steel	Green Steel Tracker	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
I7b: low-carbon projects in cement	Cembureau	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*

| Indicator | Historic progress | 2030 benchmark | | 2050 benchmark | |
	Source	source	type	source	type
I7c: low-carbon projects in chemicals	CEFIC	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
T1: transport GHG emissions	EU GHG inventory, 2022 based on proxy data	FF55 MIX scenario	EC scenario output	Sustainable and smart mobility strategy	proposed objective
T2a: Passenger transport demand	Eurostat Statistical Pocketbook 2022	FF55 MIX scenario	EC scenario output	ACP4A 1.5TECH and 1.5LIFE scenario	EC scenario output
T2b: Freight transport demand	Eurostat Statistical Pocketbook 2022	FF55 MIX scenario	EC scenario output	ACP4A 1.5TECH and 1.5LIFE scenario	EC scenario output
T3a: % of cars in passenger transport	Eurostat Statistical Pocketbook 2022	FF55 MIX scenario	EC scenario output	ACP4A 1.5TECH and 1.5LIFE scenario	EC scenario output
T3b: % of lorries in freight transport	Eurostat Statistical Pocketbook 2022	FF55 MIX scenario	EC scenario output	ACP4A 1.5TECH and 1.5LIFE scenario	EC scenario output
T3c: aviation passenger transport	Eurostat Statistical Pocketbook 2022	FF55 MIX scenario	EC scenario output	ACP4A 1.5TECH and 1.5LIFE scenario	EC scenario output
T3d: high-speed rail passenger transport	Eurostat Statistical Pocketbook 2022	Sustainable and smart mobility strategy	proposed objective	Sustainable and smart mobility strategy	proposed objective
T3e: rail freight transport	Eurostat Statistical Pocketbook 2022	Sustainable and smart mobility strategy	proposed objective	Sustainable and smart mobility strategy	proposed objective
T3f: IWW freight transport	Eurostat Statistical Pocketbook 2022	Sustainable and smart mobility strategy	proposed objective	Sustainable and smart mobility strategy	proposed objective

Indicator	Historic progress	2030 benchmark		2050 benchmark	
	Source	source	type	source	type
T4a: CO$_2$ intensity new passenger cars	EEA	CO$_2$ performance standards cars and vans	Legal objective	CO$_2$ performance standards cars and vans	Legal objective
T4b: CO$_2$ intensity new vans	EEA	CO$_2$ performance standards cars and vans	Legal objective	CO$_2$ performance standards cars and vans	Legal objective
T5a: % of ZEVs in new cars	EEA	CO$_2$ performance standards cars and vans (2035 target)	Legal objective	CO$_2$ performance standards cars and vans (2035 target)	Legal objective
T5b: % of ZEVs in new vans	EEA	CO$_2$ performance standards cars and vans (2035 target)	Legal objective	CO$_2$ performance standards cars and vans (2035 target)	Legal objective
T5c: # of ZEVs in lorries fleet	Alternative Fuels Observatory	Sustainable and smart mobility strategy	proposed objective	*no benchmark*	*no benchmark*
T6a: % of fossil fuels in transport FEC	Eurostat (nrg_bal_c)	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
T6b: % of 1st gen biofuels in transport FEC	SHARES, Eurostat	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
B1: building GHG emissions	EU GHG inventory, 2022 based on proxy data	FF55 MIX scenario	EC scenario output	ACP4A 1.5LIFE	EC scenario output
B2a: residential buildings final energy use	Eurostat (nrg_bal_c)	FF55 scenarios/REPowerEU	EC scenario output	CTP MIX scenario	EC scenario output
B2b: tertiary buildings final energy use	Eurostat (nrg_bal_c)	FF55 scenarios/REPowerEU	EC scenario output	CTP MIX scenario	EC scenario output
B3a: Type 1 renovation rate residential	CTP impact assessment	CTP MIX scenario	EC scenario output	*no benchmark*	*no benchmark*
B3b: Type 1 renovation rate tertiary	CTP impact assessment	CTP MIX scenario	EC scenario output	*no benchmark*	*no benchmark*

| Indicator | Historic progress | 2030 benchmark | | 2050 benchmark | |
	Source	source	type	source	type
B4a: residential built surface areas	European Building Stock Observatory, Odyssee database	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
B4b: tertiary built surface areas	European Building Stock Observatory, Odyssee database	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
B5a: % of fossils in residential energy use	Eurostat (nrg_bal_c)	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
B5b: % of fossils in tertiary energy use	Eurostat (nrg_bal_c)	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
B6: heat pump stock	EHPA	REPowerEU	proposed objective	*no benchmark*	*no benchmark*
A1: agriculture GHG emissions	EU GHG inventory, 2022 based on proxy data	FF55 MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
A2a: bovine meat GHG intensity	GHG emissions based on EU GHG inventories, production based on FAOSTAT	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
A2b: dairy GHG intensity	GHG emissions based on EU GHG inventories, production based on FAOSTAT	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
A2c: pig meat GHG intensity	GHG emissions based on EU GHG inventories, production based on FAOSTAT	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
A3a: total fertiliser use	EU GHG inventories	Farm to Fork Strategy	proposed objective	*no benchmark*	*no benchmark*
A3b: nitrogen use efficiency		Farm to Fork Strategy	proposed objective	*no benchmark*	*no benchmark*
A4a: total bovine meat production	FAOSTAT	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
A4b: total dairy production	FAOSTAT	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
A4c: total pig meat production	FAOSTAT	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*

Indicator	Historic progress	2030 benchmark		2050 benchmark	
	Source	source	type	source	type
A5a: bovine meat consumption	FAOSTAT	*no benchmark*	*no benchmark*	ACP4A 1.5 (diet 5)	EC scenario output
A5b: dairy consumption	FAOSTAT	*no benchmark*	*no benchmark*	ACP4A 1.5 (diet 5)	EC scenario output
A5c: pig meat consumption	FAOSTAT	*no benchmark*	*no benchmark*	ACP4A 1.5 (diet 5)	EC scenario output
A6: food waste	Eurostat (env_wasfw)	Farm to Fork Strategy	proposed objective	*no benchmark*	*no benchmark*
A7: agricultural feedstock use for biofuels	JRC MTO commodity flows	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
L1: overall net emissions	EU GHG inventory, 2022 based on proxy data	LULUCF Regulation	legal objective	LULUCF Regulation IA	EC scenario output
L2a: land-use change: forests	EU GHG inventory	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
L2b: land-use change: wetlands	EU GHG inventory	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
L3: gross deforestation	EU GHG inventory	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
L4: gross afforestation	EU GHG inventory	*no benchmark*	*no benchmark*	*no benchmark*	*no benchmark*
L5: net land take	EU GHG inventory	*no benchmark*	*no benchmark*	7th EAP	proposed objective
L6: forest carbon sink	EU GHG inventory	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
L7: emissions from non-forest lands	EU GHG inventory	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output
L8: bioenergy use	Eurostat (nrg_bal_c)	CTP MIX scenario	EC scenario output	CTP MIX scenario	EC scenario output

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