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REGIONAL TRAINING ON THE PRODUCTION AND USE OF WASTE AND CIRCULAR ECONOMY STATISTICS AND INDICATORS

SESSION 4: STATISTICS AND INDICATORS ON WASTE GENERATION AND WASTE COMPOSITION

20-21 June 2024, Vienna International Centre (VIC), Vienna

STATISTICS AND INDICATORS ON WASTE GENERATION AND WASTE COMPOSITION

In this presentation

- **Municipal waste**
  - Municipal waste generation / Municipal waste generated per capita
  - Municipal waste composition
- **Total waste**
  - Total waste generation / Total waste generation per capita
  - Total waste generation intensity per unit of GDP

MUNICIPAL WASTE

MUNICIPAL WASTE GENERATION / INTENSITY PER CAPITA

- **Definition**

A-Total amount of municipal waste generated in a country per year
B-Total amount of municipal waste generated in a country per capita per year

  - Calculation
    - A-The sum of the amount of MW collected (in mass units) plus the estimated amount of municipal waste from areas not served by a MW collection service
    - B-Total amount (in mass units) of MW generated divided by the resident population of the country
    - Units: metric tonnes; kg per inhabitant; percent change
    - Should cover waste from households and similar waste from other sources
    - Can be broken down by type of waste → composition
    - Can be presented with indicators on MW composition and destination
    - Trends can be presented with trends in private final consumption expenditure

- **Purpose and use**
    - Is closely linked to the level of economic development and private consumption.
    - Informs urban planning resource management/allocation, environmental protection and CE policies
    - Basis for developing MW management plans (collection; treatment) and assessing performance
    - Informs decision-making for investments in MW management activities and infrastructure
    - Helps monitor the results of waste reduction and CE efforts and progress towards national targets

MUNICIPAL WASTE GENERATION / INTENSITY PER CAPITA

- **Data quality and measurement issues**
  - Waste generation can be wrongly interpreted as equivalent to waste management
    - e.g. it happens that a country reports the same value for “waste collected” and “waste generated”
  - Data on amounts generated can differ across countries and over time due to:
    - Incomplete coverage of MW and changes in coverage over time
    - Different definitions and change in definitions and measurement methods over time
  - City data used as proxy for national data (in countries with low collection rates in rural areas)
  - Differences depending on
    - whether all non-household sources are covered (i.e. household like waste from other enterprises, institutions, municipal services)
    - whether all types of waste are covered (e.g. bulky waste)
    - whether all types of collection covered: collected by or on behalf of municipalities or also collected by the private sector under national EPR schemes
    - Whether uncollected amounts of waste are accounted for

MUNICIPAL WASTE COMPOSITION

- **Definition**

Composition of MW collected by type of material

  - Calculation
    - Proportion (in %) of different materials in total amount of MW collected (e.g. metals, glass, plastic, paper, textiles, bio-waste, food, …)
    - Unit: metric tonnes, percent; percent change
    - Should cover all MW collected (household and non-household sources)
    - Should distinguish between MW collected separately and mixed MW
    - Could be complemented with a composition measure at the point of disposal

- **Purpose and use**
  - Complements indicators on MW generation and generation intensity per capita
  - Informs about required treatment capacities
  - Helps identify untapped sources of recoverable materials in mixed municipal waste
  - Trends over time help monitor the achievement of reduction targets for specific waste streams

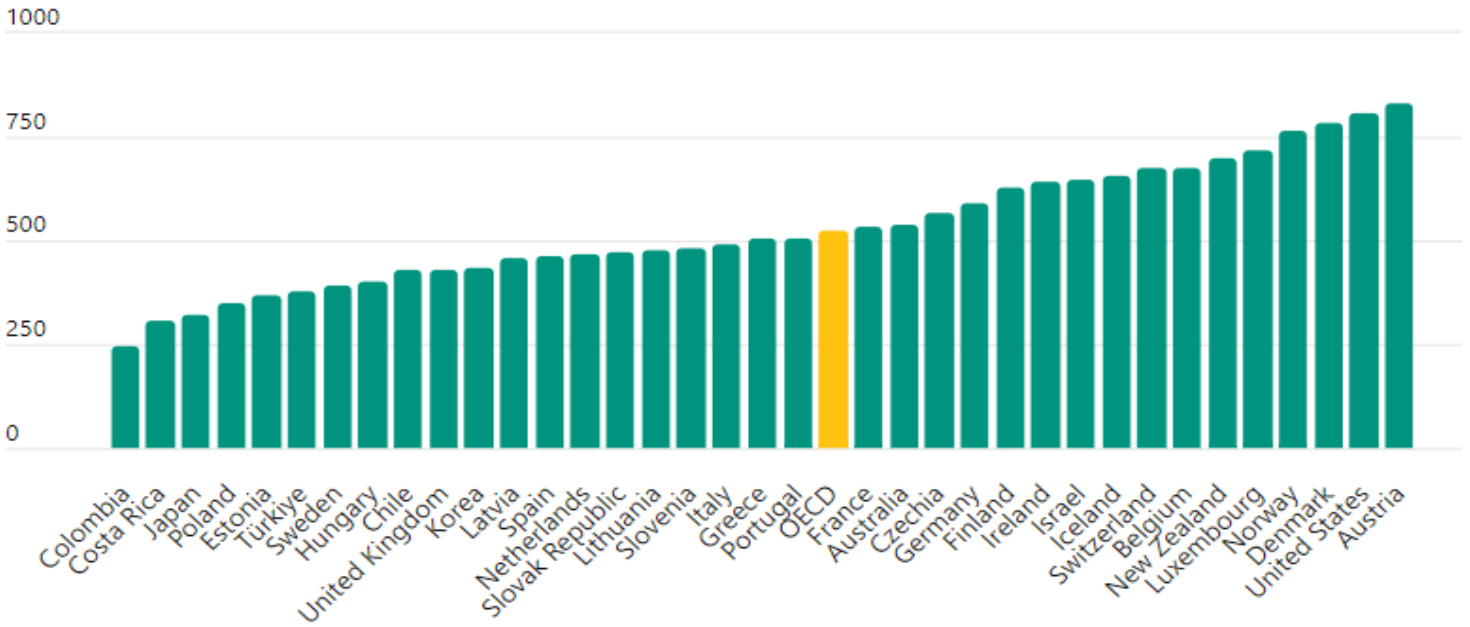
- **Data quality and measurement issues**
  - Little comparable data on the composition of municipal waste
  - Composition of MW usually determined from the physical analysis of waste samples
  - No harmonised standard for sampling and analysis

MUNICIPAL WASTE – OECD ENVIRONMENT AT A GLANCE

AA Cite as

Municipal waste generated per person

Kilogrammes per person, 2022 or latest available year



Note: Data prior to 2018 are not shown. Country notes.

Source: OECD, "Waste: Municipal waste", OECD Environment Statistics (database), https://doi.org/10.1787/data-00601-en.

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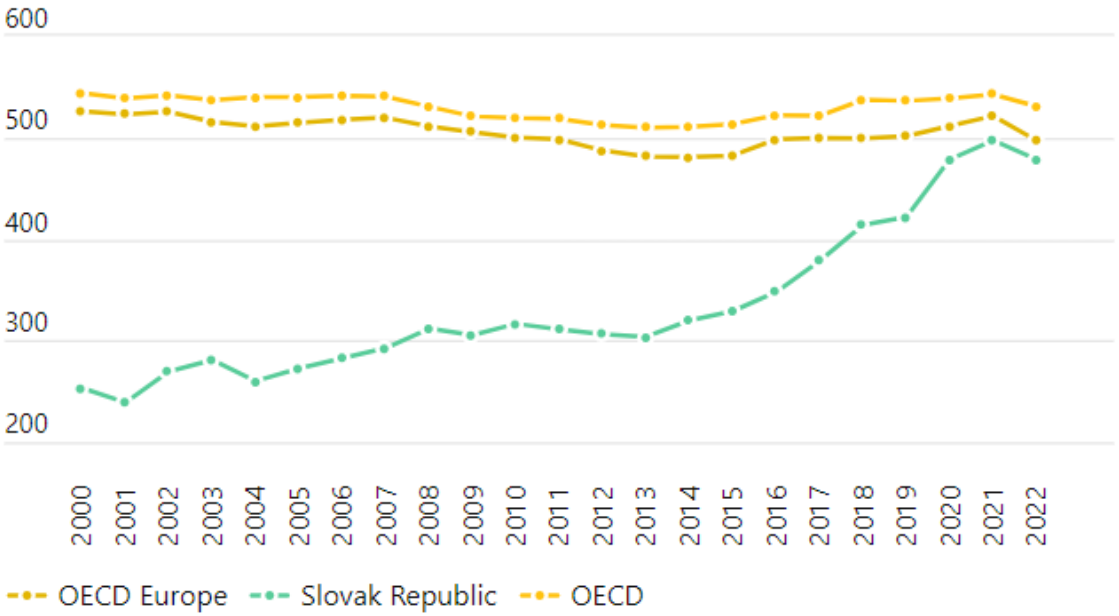
MUNICIPAL WASTE – OECD ENVIRONMENT AT A GLANCE COUNTRY PROFILES

Municipal waste

Municipal waste generation intensity

Kilogramme per person

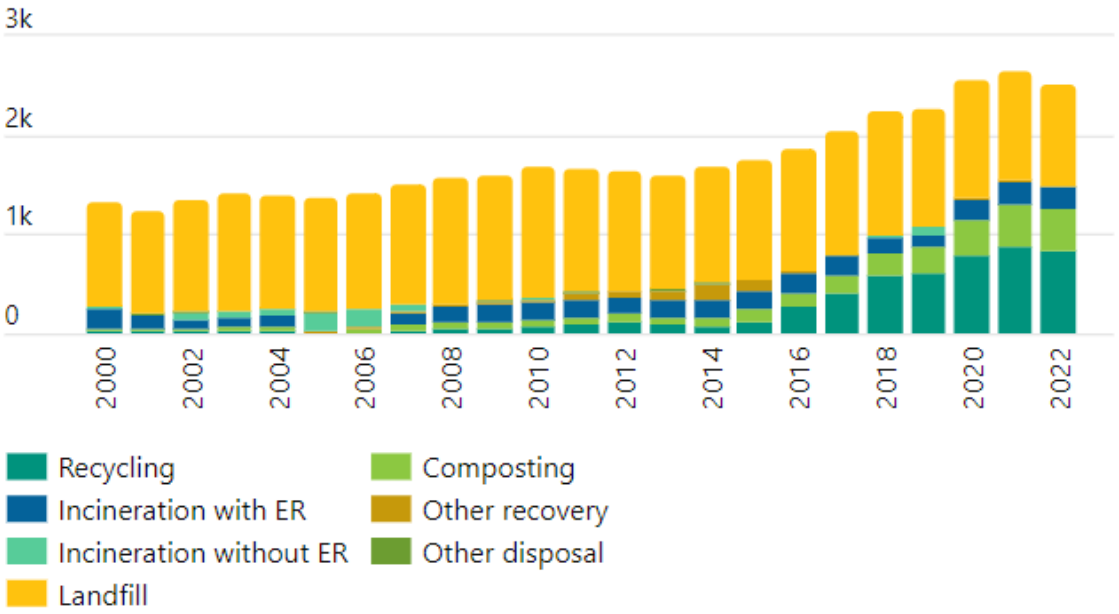


Note: Country notes.

Source: OECD, "Waste - Municipal waste: generation and treatment", OECD Environment Statistics (database), https://doi.org/10.1787/data-00601-en

Municipal waste treatment operations

Thousand tonnes



Note: ER = energy recovery, Country notes.

Source: OECD, "Waste - Municipal waste: generation and treatment", OECD Environment Statistics (database), https://doi.org/10.1787/data-00601-en

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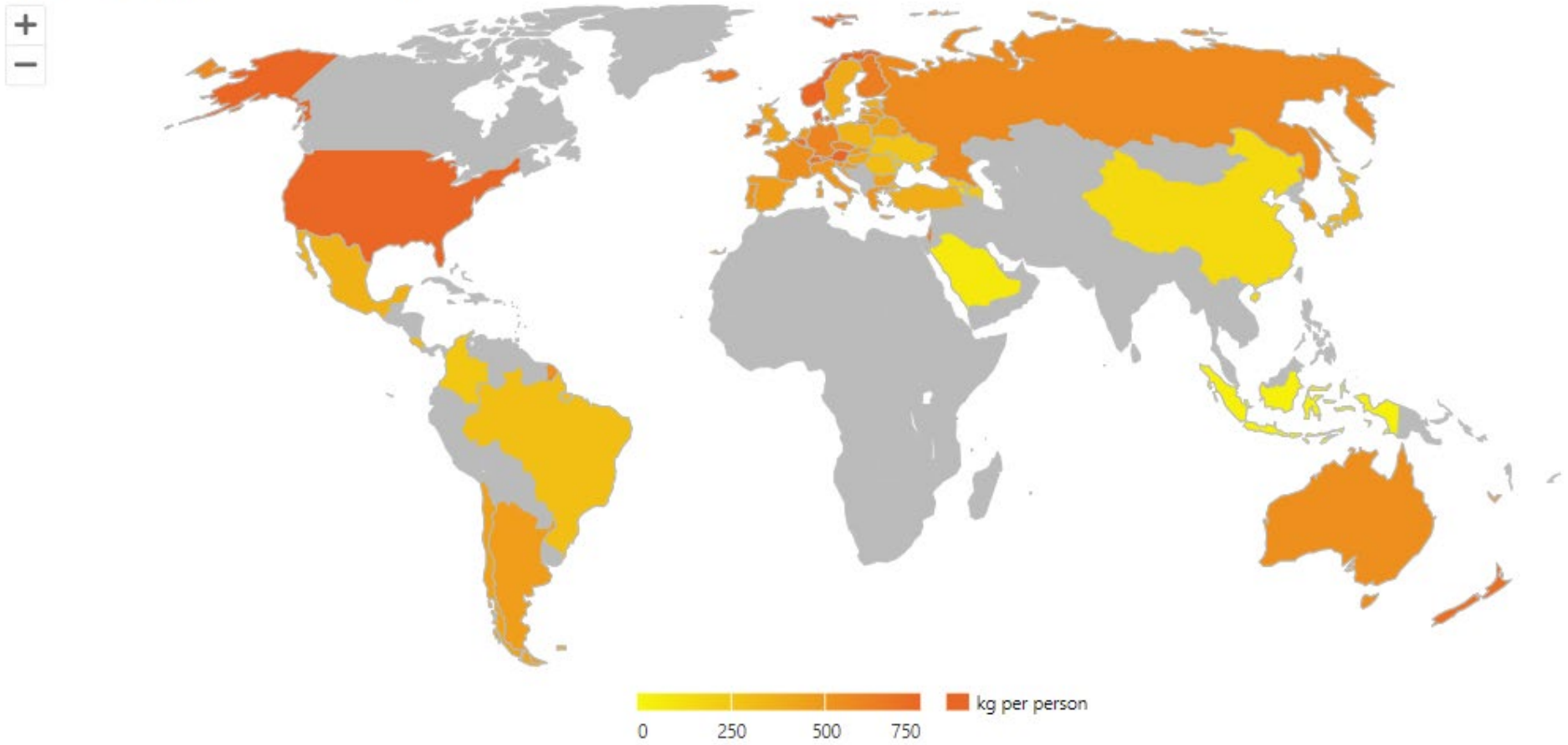
MUNICIPAL WASTE – OECD ENVIRONMENT AT A GLANCE

Municipal waste generated per person

Kilogrammes per person, 2022 or latest available year



Note: Data prior to 2018 are not shown. Country notes.

Source: OECD, "Waste: Municipal waste", OECD Environment Statistics (database), https://doi.org/10.1787/data-00601-en.

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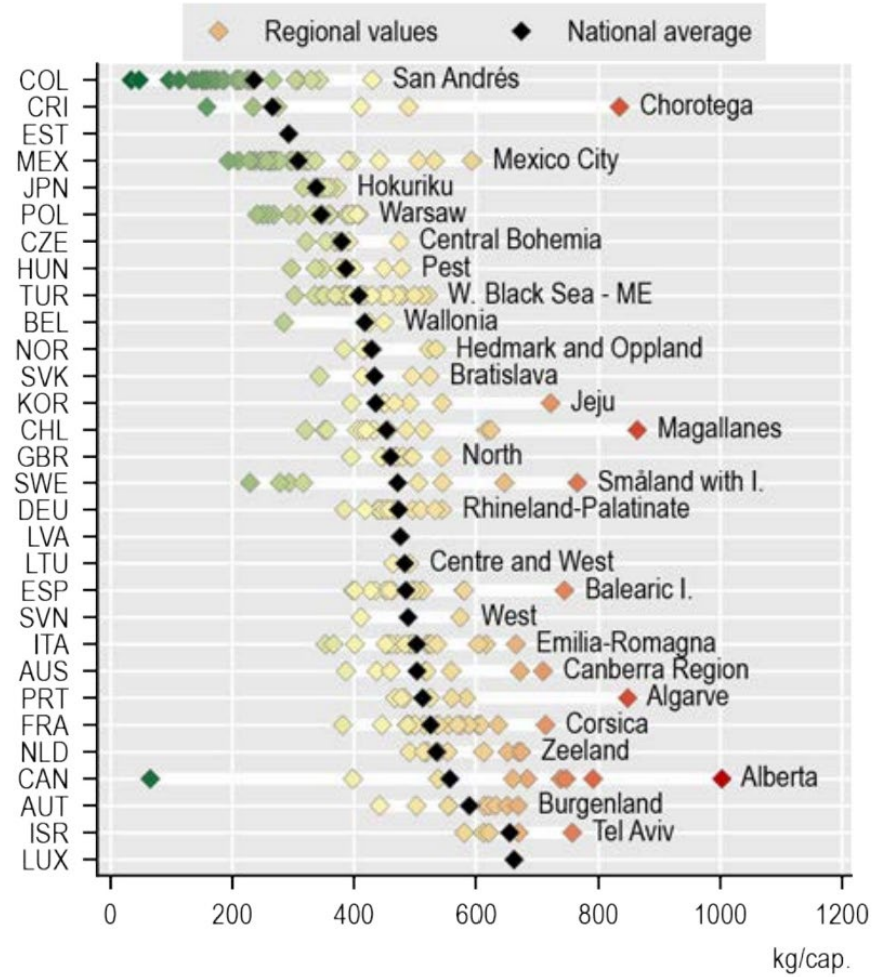
MUNICIPAL WASTE – OECD REGIONS AND CITIES AT A GLANCE

2.12. Municipal waste per capita

Municipal waste volume per capita, OECD large regions (TL2), 2020



OECD Regions and Cities at a Glance 2022 | en | OECD

TOTAL WASTE

TOTAL WASTE GENERATION / INTENSITY PER CAPITA

- **Definition**

Total amount of waste generated by all production and consumption activities

  - Calculation
    - Sum of the amount of waste (in mass units) generated by economic activities and by households
    - Units of measure: metric tonnes; kg/capita; percent change
    - Can be broken down by waste category and by economic activity (ISIC/NACE)

- **Purpose and use**
    - Is closely linked to the level and structure of economic activity in a country and reflects society's production and consumption patterns
    - Informs national waste management planning; helps identify the required treatment capacities
    - Trends over time reflect the results of waste reduction and CE efforts.

  When broken down by industry
    - Helps identify activity sectors that play an important role in pathways to a resource efficient circular economy
    - Can be presented as part of sector profiles together with data from the SNA and the sequence of SEEA accounts, such as economic activity data (e.g. industry output, value added, operating surplus, employment), information on economic instruments (e.g. taxes, subsidies)

TOTAL WASTE GENERATION / INTENSITY PER CAPITA

- **Data quality and measurement issues**
  - Incomplete coverage of activity sectors, e.g. agriculture, forestry & fishing
  - Differences due to the inclusion or exclusion of certain types of waste, e.g. mineral waste:
    - The weight of total waste generated is mainly driven by mineral waste from construction & demolition and from mining activities, and the latter widely varies significantly across countries
    - The inclusion or exclusion of major mineral waste affects international comparability
  - Other differences
    - Primary versus secondary waste (from ISIC 38)
    - Differences in measurement methods for waste sludges: dry weight (recommended) versus wet weight
  - Breakdown by activity sector
    - Misallocation of waste from economic activities that is removed by municipal waste collection → should be allocated to the respective sector of generation
  - No or inconsistent time series

TOTAL WASTE GENERATION (EUROSTAT)

= 2 153 950 000 t in 2020

- Waste (env_was)
  - Waste generation a
    - Generation of
    - Treatment of
    - Management
    - Management
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    - Management
  - Waste streams (env
    - Food waste a
    - Trade in wast
    - Packaging wa
    - Recycling rate
    - Consumption
    - Waste electric (from 2018 on
    - Waste electric
    - Sales and col
    - Recycling of b
    - End-of-life vel
    - End-of-life vel
    - Transboundar
    - Municipal waste by waste management operations (env_wasmun)

Generation of waste by waste category, hazardousness and NACE Rev. 2 activity (online data code: env_wasgen)
Source of data: Eurostat

Settings: Default presentation

Table | Line | Bar | Map

GEO / TIME	2010	2012	2014	2016	2018	2020
European Union - 27 countries (from 2020)	2 212 900 000	2 242 540 000	2 243 790 000	2 258 910 000	2 338 230 000	2 153 950 000
European Union - 28 countries (2013-2020)	2 454 710 000	2 483 800 000	2 506 780 000	2 530 980 000	2 620 400 000	:
Belgium	61 345 803	53 839 470	57 965 392	63 152 384	68 187 479	68 061 590
Bulgaria	167 396 268	161 252 166	179 677 011	120 508 475	129 751 823	116 387 350
Czechia	23 757 566	23 171 358	23 394 956	25 381 426	37 847 614 (b)	38 486 186
Denmark	16 217 736	16 713 822	20 808 843	20 981 931	21 445 206	20 135 564
Germany	363 544 995	368 022 172	387 504 241	400 071 672	405 523 624	401 156 266
Estonia	19 000 195	21 992 343	21 804 040	24 277 879	23 185 581	16 170 358
Ireland	19 807 586	12 713 021	15 166 830	15 251 689	13 986 757	16 192 033
Greece	70 432 705	72 328 280	69 758 868	72 332 353	45 240 333	28 358 897 (p)
Spain	137 518 902	118 561 669	110 518 494	128 958 523	137 822 935	105 624 359
France	355 081 245	344 440 922	324 462 969	322 685 297	343 307 326	310 373 987
Croatia	3 157 672	3 611 678	3 724 563	5 366 953	5 543 310	6 003 760
Italy	158 627 618	154 427 046	157 870 348	163 827 838	172 502 773	174 887 620
Cyprus	2 372 750	1 875 308	1 978 699	2 467 042	2 302 144	2 221 809
Latvia	1 498 200	2 309 581	2 621 495	1 909 631	1 773 726	2 852 792
Lithuania	5 578 134	5 678 751	6 200 450	6 674 238	7 080 538	6 695 731
Luxembourg	10 441 469	8 397 228	7 072 758	10 020 519	9 014 397	9 215 222
Hungary	16 735 423	16 310 151	16 650 639	15 938 077	18 369 585	17 150 400
Malta	1 352 994	1 456 213	1 672 810	1 951 928	2 507 070	3 528 663
Netherlands	121 145 468	121 194 466	132 362 297	141 024 020	145 245 469	125 138 771
Austria	46 799 579	48 045 089	55 868 298	61 225 037	65 666 128	68 906 034
Poland	158 661 957	162 382 959	179 179 899	182 005 677	175 473 691	170 233 670
Portugal	13 640 079	13 359 517	14 368 003	14 739 135	15 894 873 (b)	16 601 514
Romania	201 432 951	249 354 926	176 607 415	177 562 905	203 017 193	141 364 457
Slovenia	5 986 106	4 546 506	4 686 417	5 494 362	8 220 679	7 518 375
Slovakia	9 384 112	8 425 384	8 862 778	10 606 966	12 401 870	12 775 926
Finland	104 336 944	91 824 193	95 969 888	122 869 183	128 251 735	116 082 531
Sweden	117 645 185	156 306 504	167 026 886	141 625 718	138 667 585	151 823 910
Iceland	510 941	529 351	815 148	1 067 319	1 293 511	1 060 903
Liechtenstein	312 180	466 547	569 067	502 581	437 823	542 691
Norway	9 432 997	10 721 599	10 614 914	11 131 594	14 137 718	14 040 663
United Kingdom	241 808 706	241 506 743	262 992 726	272 064 636	282 393 639	:
Bosnia and Herzegovina	:	4 456 556	5 540 772	6 127 022	6 747 605	6 753 458
Montenegro	:	1 014 139	1 092 741	1 132 587	1 222 758	1 246 833
North Macedonia	2 327 590	8 472 343	2 186 612	1 424 859	1 140 253	1 484 596
Albania	:	:	:	:	:	:
Serbia	33 615 918	55 002 570	49 128 311 (b)	48 965 314	51 102 914	58 637 622
Türkiye	63 540 624	67 383 777	73 075 119	75 534 641	97 294 071	107 608 312
Kosovo*	:	1 166 619	1 039 803	2 855 990	2 961 225	2 592 828

Regional Training - Session 4: Statistics and indicators on waste generation and waste composition

TOTAL WASTE GENERATION BY ECONOMIC ACTIVITY (EUROSTAT)

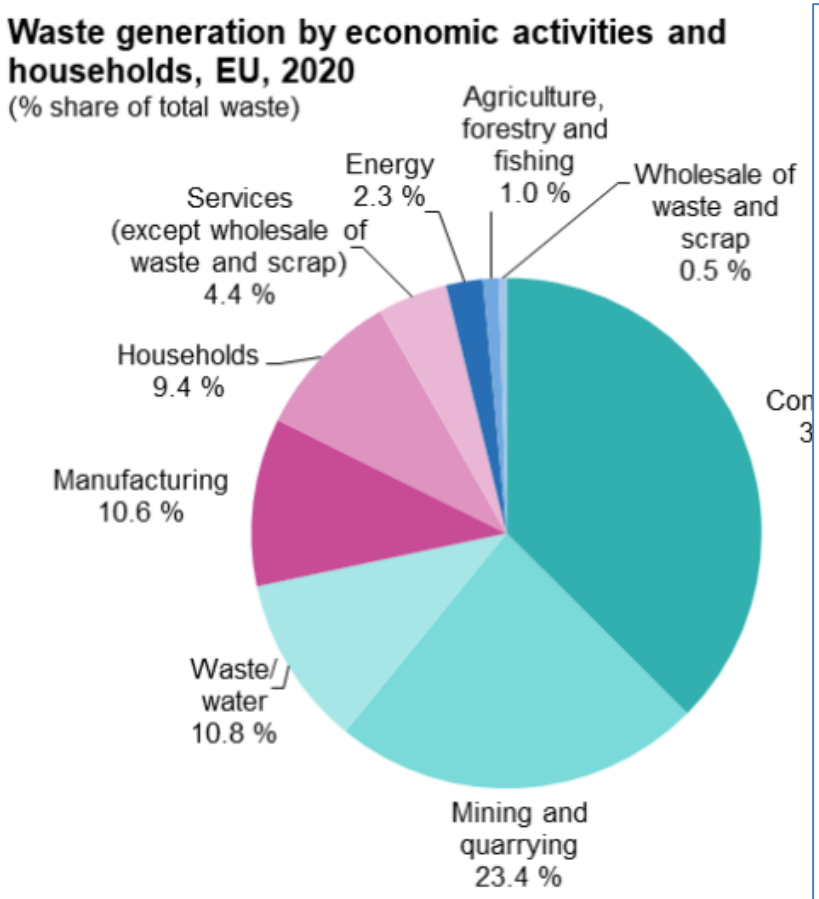


Table 1: Waste generation by economic activities and households, 2020

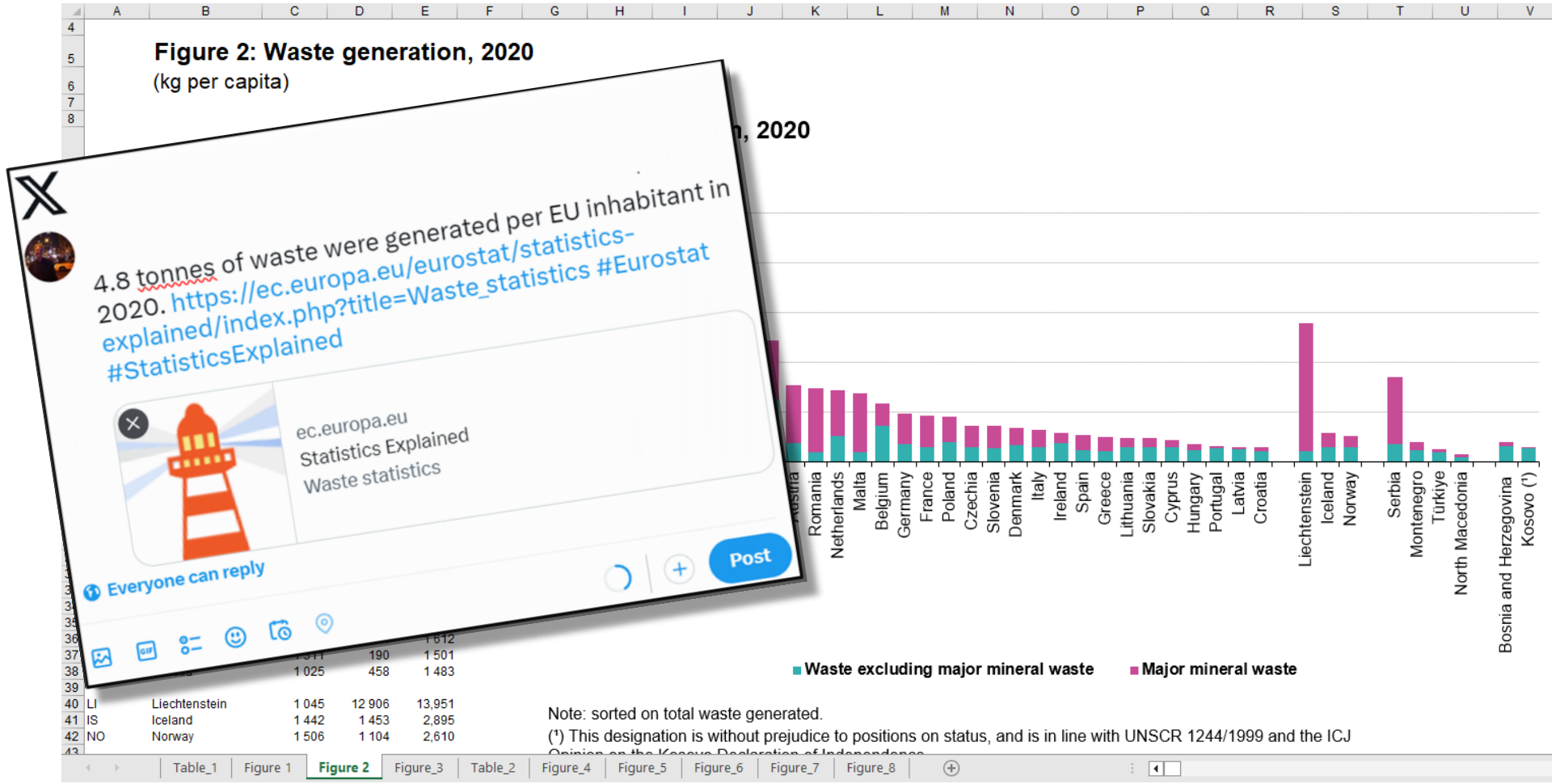
(% share of total waste)

	Mining and quarrying	Manufacturing	Energy	Waste/water	Construction and demolition	Other economic activities	Households
EU	23.4	10.6	2.3	10.8	37.5	5.9	9.4
Belgium	0.0	20.9	1.5	31.4	30.5	7.9	7.8
Bulgaria	81.6	4.2	5.2	2.9	1.6	2.5	2.0
Czechia	0.3	12.1	1.1	15.5	42.9	12.2	15.9
Denmark	0.1	5.4	3.9	7.5	54.8	10.3	18.0
Germany	1.3	13.7	2.0	12.0	56.3	5.1	9.6
Estonia	15.2	24.6	35.0	4.6	9.8	7.4	3.4
Ireland	9.4	22.4	1.0	12.6	32.6	10.1	12.0
Greece	31.7	11.1	5.3	11.4	19.1	5.5	15.9
Spain	2.3	12.4	0.8	20.8	30.8	11.5	21.3
France	0.1	6.0	0.3	8.1	68.5	6.3	10.8
Croatia	11.6	7.5	1.1	16.3	23.8	19.5	20.2
Italy	0.8	15.2	0.9	24.6	37.8	4.1	16.6
Cyprus	6.9	9.5	0.1	6.6	50.2	9.8	17.0
Latvia	0.0	17.0	4.1	33.7	9.7	12.9	22.6
Lithuania	1.0	32.7	2.3	18.4	8.3	16.3	20.9
Luxembourg	1.1	6.5	0.3	3.5	82.1	4.2	2.2
Hungary	0.8	15.2	11.4	12.1	25.4	7.5	27.6
Malta	1.1	0.9	0.0	2.5	85.3	4.7	5.6
Netherlands	0.1	10.6	0.4	7.4	65.4	8.7	7.4
Austria	0.1	7.5	0.6	3.5	76.5	5.2	6.7
Poland	36.6	16.1	6.6	13.4	13.0	6.6	7.8
Portugal	0.1	17.8	1.3	22.9	10.7	15.4	31.8
Romania	84.3	4.6	3.1	2.0	0.9	2.2	3.0
Slovenia	0.1	17.9	12.1	3.8	6.3	51.4	8.4
Slovakia	1.6	24.0	5.5	8.9	9.0	32.5	18.5
Finland	75.1	8.2	0.8	1.0	11.8	1.0	2.1
Sweden	76.5	3.1	1.2	4.5	9.3	2.3	3.1
Iceland	0.0	24.2	0.0	2.0	3.6	31.0	39.2
Liechtenstein	0.0	1.1	0.0	0.3	92.5	0.1	6.0
Norway	1.3	13.6	1.6	8.0	44.2	12.9	18.4
Montenegro	25.3	2.5	29.0	0.3	13.8	10.5	18.5
North Macedonia	35.1	35.0	0.5	17.9	3.8	7.7	0.0
Serbia	78.0	1.9	13.5	1.1	1.2	0.9	3.5
Türkiye	25.6	19.2	22.6	0.3	0.0	5.8	26.5
Bosnia and Herzegovina	11.3	27.3	46.3	0.0	1.3	0.4	13.4
Kosovo (*)	19.9	9.4	52.5	0.3	0.2	3.1	14.6

(*) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: env_wasgen)

TOTAL WASTE GENERATION PER CAPITA (EUROSTAT)



TOTAL WASTE GENERATION INTENSITY PER UNIT OF GDP

- **Definition**

Total amount of waste generated by all production and consumption activities in a country per unit of GDP

  - Calculation
    - Sum of the amounts of waste (in mass unit) generated by economic activities and by households divided by GDP at PPP at constant prices
    - Unit of measure: kg/1000 USD or EUR; percent change
    - Can be broken down by economic activity (ISIC) and by waste category

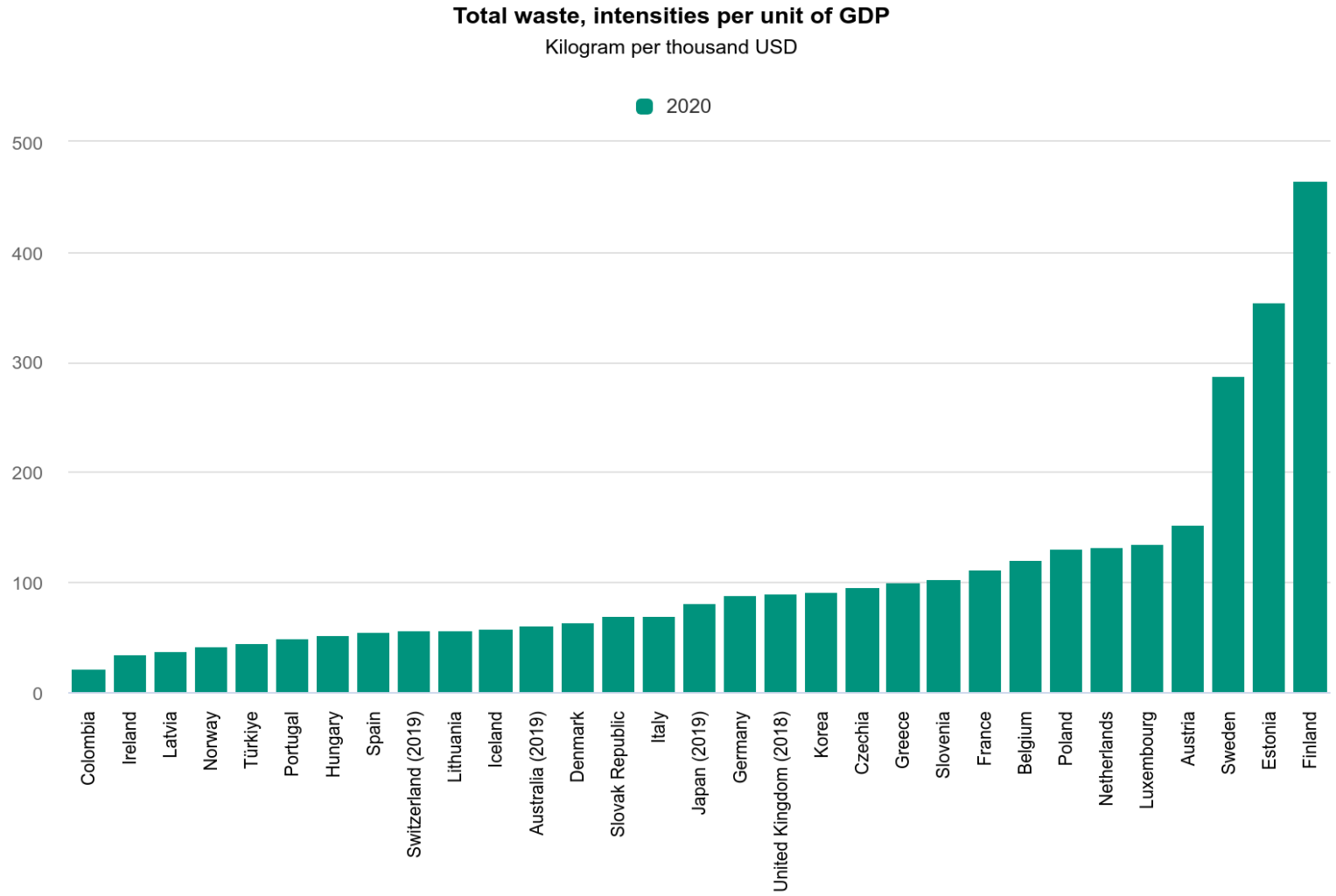
- **Purpose and use**
    - Intensity ratios facilitate the comparison of generation levels across countries
    - Trends over time help monitor the economy's efficiency in decoupling waste generation from output.
    - The indicator is part of the EU Circular Economy Monitoring Framework

TOTAL WASTE GENERATION INTENSITY PER UNIT OF GDP

- **Data quality and measurement issues**
  - Incomplete coverage of activity sectors, e.g. Agriculture, forestry & fishing
    → misalignment between numerator and denominator
  - Inclusion or exclusion of certain types of waste, e.g. mineral waste:
    - The weight of total waste generated is mainly driven by mineral waste from construction & demolition and from mining activities, and the latter widely varies significantly across countries
    - The inclusion or exclusion of major mineral waste affects international comparability
    - In the EU major mineral wastes are excluded from the calculation for better comparability
  - Primary versus secondary waste (from ISIC 38)
  - Differences in measurement methods for waste sludges: dry weight (recommended) versus wet weight
  - No or inconsistent time series

See Eurostat metadata:
https://ec.europa.eu/eurostat/cache/metadata/en/cei_pc032_esmsip2.htm

WASTE GENERATION INTENSITY PER UNIT OF GDP (OECD ENVIRONMENT AT A GLANCE)



Indicator values are dependent on countries' economic structure.

High values are driven by amounts of waste from mining activities, including oil shale exploitation.

Hence the importance of documenting the data and of showing a breakdown: mineral and non-mineral, data availability permitting

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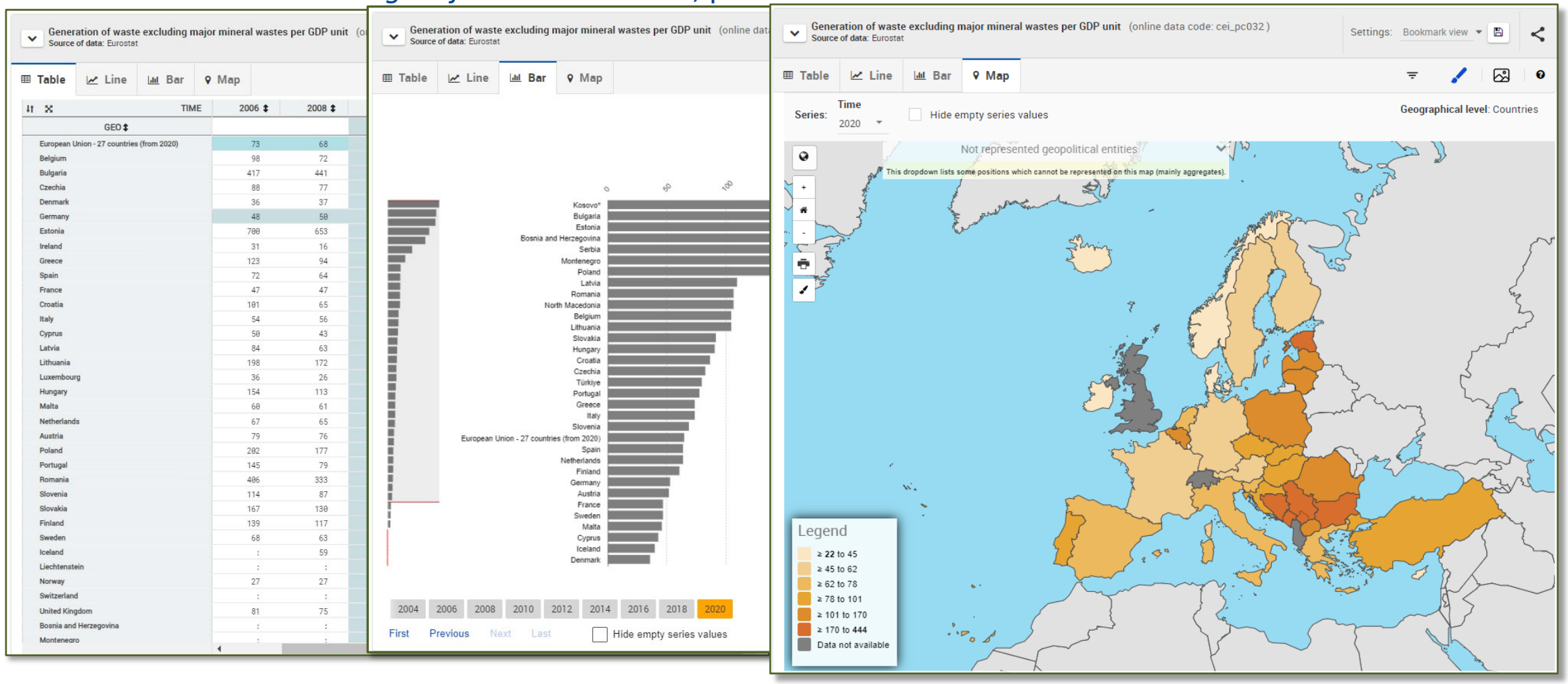
WASTE GENERATION INTENSITY PER UNIT OF GDP (EUROSTAT)

Generation of waste *excluding major mineral wastes*, per GDP unit



WASTE GENERATION AND GDP (EEA)

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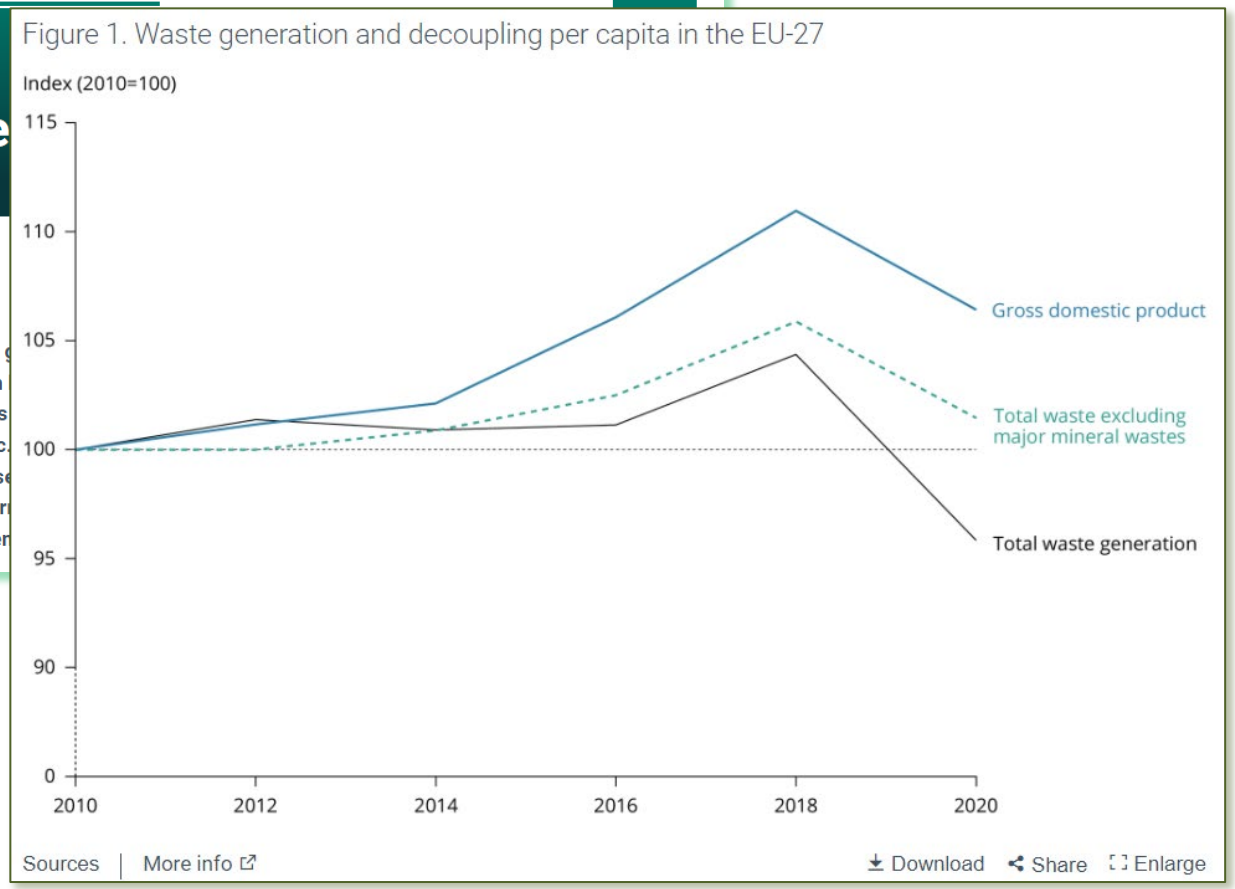
Waste generation in Europe

Published 28 Jun 2023

Analysis and data > Indicators > Waste generation in Europe

Between 2010 and 2020, total per capita waste g
signficantly decrease its total waste generation
progress towards this. However, the decrease is
the EU economy due to the COVID-19 pandemic.
growth relatively closely. It therefore does not se
decrease by 2030 in context of the current retur
be required to sustain the decrease in waste ger



https://www.eea.europa.eu/en/analysis/indicators/waste-generation-and-decoupling-in-europe

REGIONAL TRAINING ON THE PRODUCTION AND USE OF WASTE AND CIRCULAR ECONOMY STATISTICS AND INDICATORS

Thank you !

Working Group on Environmental Monitoring and Assessment

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https://unece.org/environmental-policy/events/regional-training-production-and-use-waste-and-circular-economy