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Brussels

WAREG
European Water Regulators

EFRWS 2025

REGULATING FOR RESILIENCE:
SECURING EUROPE'S WATER FUTURE

Introduction of common performance indicators among European WSS authorities

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DIRECTIVE (EU) 2020/2184 (recast):

- ❑ Assessment of water leakage levels / potential for improvements in water leakage reduction - infrastructural leakage index (ILI) or another appropriate method.
- ❑ Assessment of relevant public health, environmental, technical and economic aspects
- ❑ Cover at least WSOs supplying at least 10 000 m3 per day or serving at least 50 000 people.

DIRECTIVE (EU) 2024/3019 (recast):

- ❑ Monitoring discharges from urban wastewater WWTPs;
- ❑ Monitoring amounts, composition and destination of sludge;
- ❑ Monitoring GHGs, including at least CO2, N2O, CH4, emitted from urban WWTPs of 10 000 p. e. and above;
- ❑ Monitoring energy used and produced by the owners / operators of urban WWTPs treating a load of 10 000 p. e. and above;
- ❑ Performing energy audits of urban WWTPs and collecting systems, achieving energy neutrality.

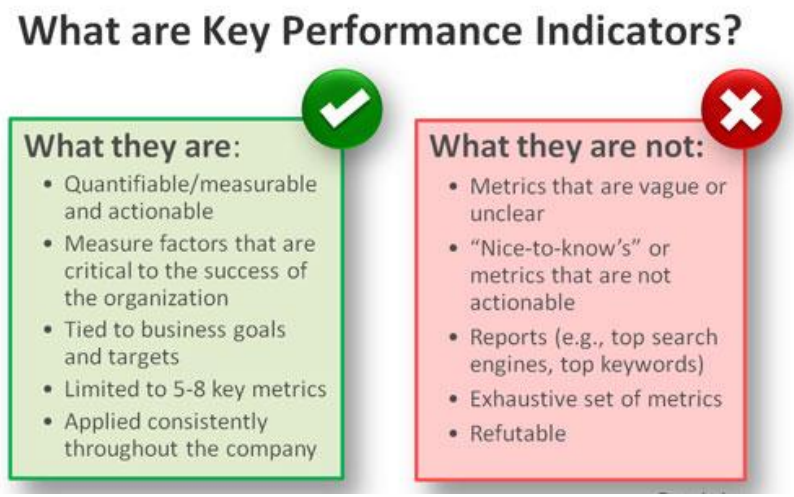
BOTH:

- ❑ Risk assessment and risk management: catchment areas for abstraction water points ↔ water supply systems ↔ domestic distribution systems ↔ receiving groundwater / surface water body
- ❑ Information to the public: quality of water intended for human consumption ↔ compliance of the collection and treatment of urban wastewater ↔ household consumption ↔ operator ownership structure ↔ overall performance of water system / loads treated in WWTPs ↔ cost and price structures for W and WW ↔ risk assessment of water system / investment plans for WW infrastructure ↔ consumer complaints ↔ etc…

Key Performance Indicators (KPIs)

- Essentially systematic and consistent ways of **measuring an organization's performance / efficiency** against their strategic objectives and targets AND others in the same industry AND set targets by legislation / regulator;
- Provide detailed information and quantitative analysis which permit organizations to make **sound business decisions** and **monitor their progress** AND permit **comparison** of an organization's performance against its peers;
- **Used by regulatory bodies** to analyse and review organization's performance AND benchmark AND measure **progress (☺)** or **regress (☹)** against set **targets** AND potentially link it to tariff setting mechanisms.

Various performance indicators and benchmarking platforms exist in the water industry, with lack of consistency in the definitions, descriptions, application and methodologies and approaches. These are designed with different objectives and are not free of access.



KPIs	Metrics
All KPIs are Metrics	All Metrics are not KPIs
KPIs give a holistic view of the performance of different functions in your organization	Metrics give you a picture of how different individual activities rolled out within the functions are progressing
KPIs tell you where exactly your teams stand with respect to the overall business goals	Individual Metrics do not give any insights on their own
Examples: Pre-sales KPIs, Email Marketing KPIs, Customer Success KPIs	Examples: Open Rate, Conversations in the last 2 weeks, Deals lost last quarter

Benchmarking challenges

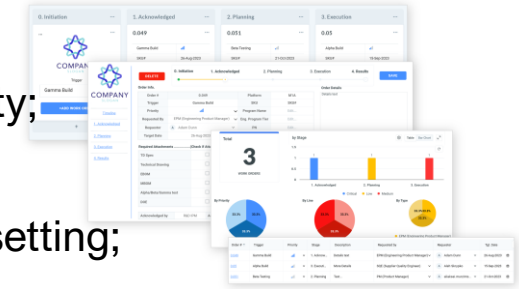
National level:

- Data is generated **inside** companies;
- Difficult / impossible to **verify** with external sources;
- Reporting can be **manipulated or mistaken** either on purpose or unintentionally;
- **Insufficient** regulatory powers / capacity / budget / independence to check, inspect, validate and verify reported data from WS operators;
- Lack of **support** from external authorities during the regulatory overview (asset owner, operator`s owner, others).
- More and more regulators issue specific requirements for WSOs internal information systems, in order to improve reliability of reported information

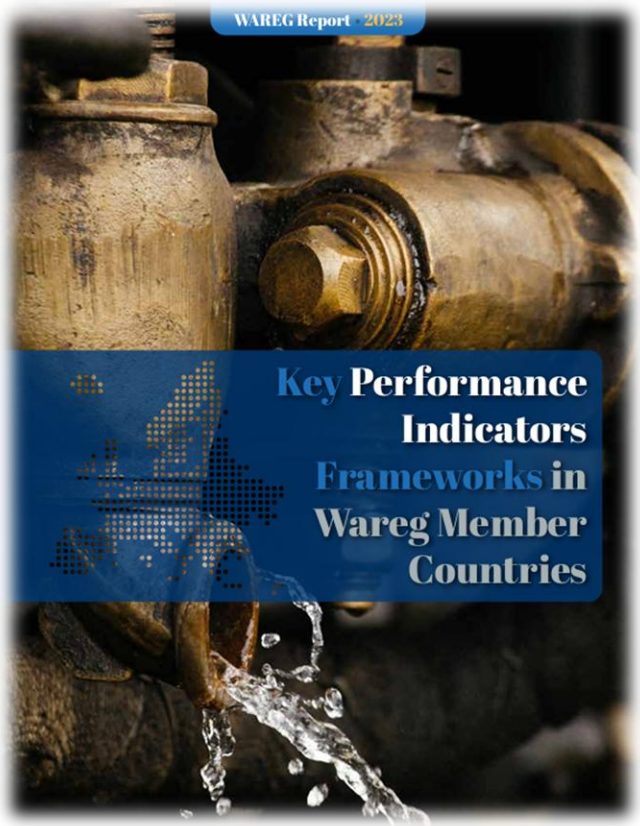
International level:

Significant differences between WAREG members:

- Scope of competences;
- Data collection process;
- Data validation and verification;
- Setting KPIs targets to operators;
- Assessing data quality and reliability;
- Monitoring performance;
- Reflection of KPIs levels into tariff setting;
- Powers to approve business plans;
- Powers to issue/revoke license to the operator;
- Methodologies, definitions and units of KPIs in usage;



Benchmarking challenges



KPIs CATEGORY	KPIs SUB-CATEGORY	NUMBER OF KPIs	SHARE
Service coverage	Water coverage	19	4,5%
	Sewer coverage	17	4.0%
	WW treatment coverage	6	1,4%
	New connections	7	1,6%
Service quality	Water quality	23	5,4%
	Water continuity and bursts	29	6,8%
	Water pressure	2	0,5%
	Sewerage flooding and bursts	20	4,7%
	Complaints and communication	25	5,9%
Environment	WW quality	21	4.9%
	WW discharge	4	0.9%
	Sludge	8	1,9%
Asset efficiency	Asset Management	33	7,8%
	Asset capacity	24	5,6%
	Electricity	31	7,3%
	Non-Revenue Water	30	7,1%
Economic efficiency	Meters and reading	12	2,8%
	Billing and consumption	9	2,1%
	Debt collection	11	2,6%
	Affordability	4	0.9%
	Cost unit/coverage/efficiency	45	10,6%
	Personnel	39	9,2%
	Revenue and profit	6	1,4%
TOTAL		**425**	**100,0%**

ASSET MANAGEMENT KPIs (10 members)

- Level of pipe rehabilitation / replacement / renewal (17 KPIs);
- New asset (4 KPIs);
- Asset inspection / monitoring (3 KPIs);
- Infrastructure asset management (2 KPIs);

Water service continuity (13 KPIs): Per zone / properties / individual interruptions / days restricted / customers affected / etc…

Bursts on water network (12 KPIs): +/- hidden leaks; +/- length of service connections; different units…

Non-Revenue [illegible]Pls); m3/km/d (6 K[illegible]

Real losses: [illegible]nn/d (3 KPIs)

Infrastructure Leakage Index (3 KPIs)

Energy efficiency kWh/m3 water supply (8 KPIs) **/** collected wastewater (3 KPIs) / treated wastewater (6 KPIs)

Level of electricity produced from own sources (biogas, solar power) used for water and wastewater services in kWh/kWh (4 KPIs)

Other: energy consumption and greenhouse gas emissions (2 KPIs); energy costs (2 KPIs); bought energy (2 KPIs**).**

ASSET CAPACITY KPIs (10 members)
Water/wastewater capacity (tanks / treatment plants (7 KPIs)
Treatment plants / reservoirs – new / upgraded / overloaded (5 KPIs);
Collected / treated / infiltration / reuse (10 KPIs)

WAREG Common Indicators - concept

- Analysed 425 indicators demonstrate **differences** not only in the types and categories of the indicators used, but also **contrasts and distinctions** in the methodologies used to calculate similar KPIs (like those for monitoring water loss and network bursts).
- It would be efficient to proceed with certain categories that are with **similar** methodologies and are applied by **as many** WAREG members and/or such indicators that WAREG members have **collected** required information, and **can calculate** national level.

Suggested methodology provides briefly the following concept:

- Common indicators methodology, including formula and methodology for calculation, description of variables, units of variables and of the indicator;
- Sources of information for calculation;
- Estimation reliability of data for variables, and respectively for calculated KPI level.

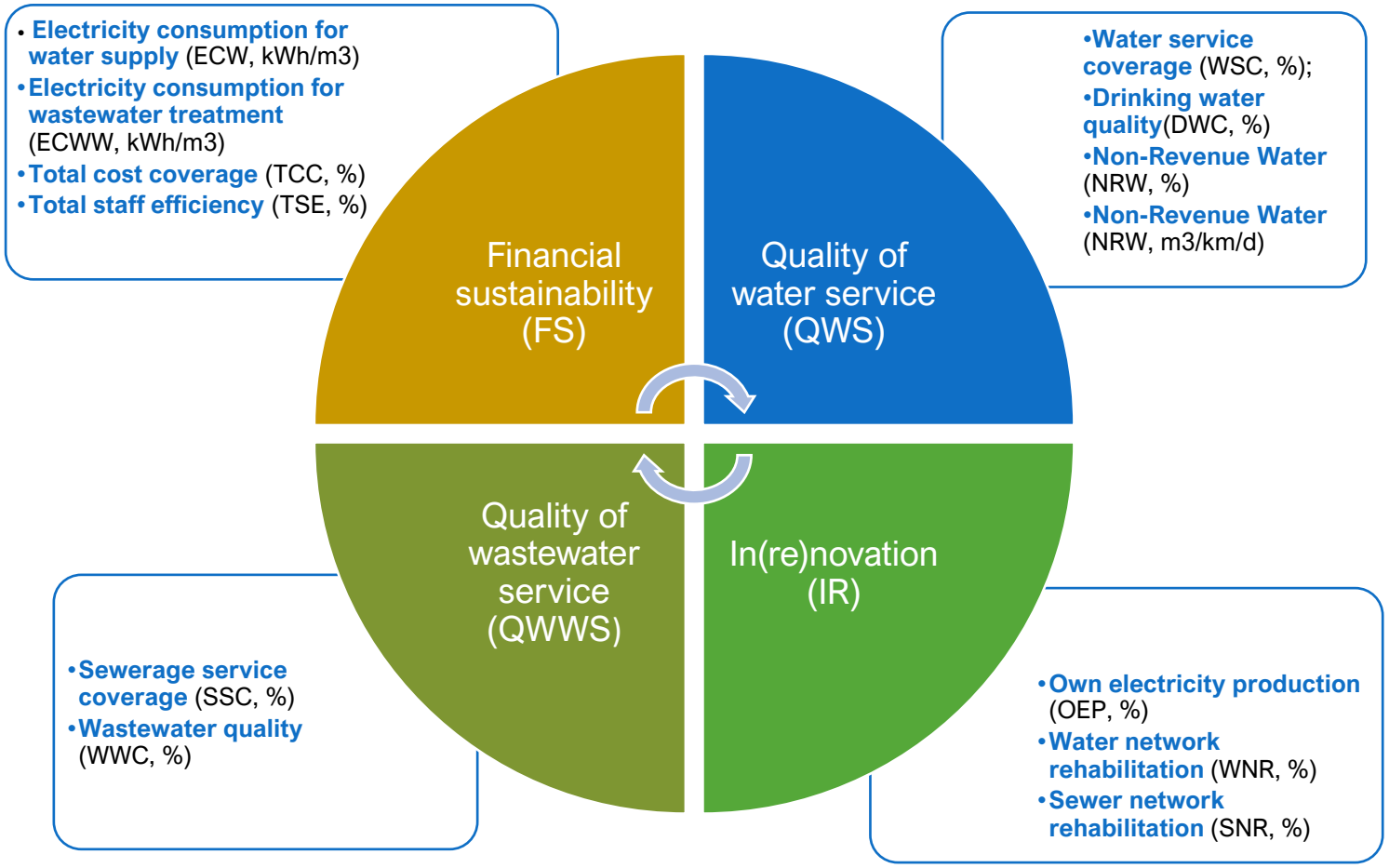
Suggested approach:
WAREG members can calculate on national level the following indicator:
(NRW) Non-Revenue Water in % with the following formula and sources of data:

$$NRW\ (\%) = \frac{(NRW)System\ input - Billed\ Authorized\ Consumption\ (m3)}{(SY)\ System\ Input\ (m3)}$$

Data sources:
NRW – information is provided from data bases (water volumes, billing systems, else) of regulated water providers;
SY – information is provided from data bases (water volumes) of regulated water providers (*all water abstracted from water sources);*

Data reliability (1 – high, 2 – medium, 3 – low):
Variables are reported from different sources with different data reliability.
Therefore, data reliability should be assessed for each variable, and for final KPI level.

WAREG Common Indicators



Suggested list of categories:

- ❑ **Service coverage;**
- ❑ **Water quality;**
- ❑ **Network renewal;**
- ❑ **Non-Revenue Water;**
- ❑ **Electricity consumption;**
- ❑ **Cost coverage and efficiency**

Suggested list of KPIs:

- ❑ **Water service coverage** (WSC, %);
- ❑ **Sewerage service coverage** (SSC, %)
- ❑ **Drinking water quality** (DWC, %)
- ❑ **Wastewater quality** (WWC, %)
- ❑ **Water network rehabilitation** (WNR, %)
- ❑ **Sewer network rehabilitation** (SNR, %)
- ❑ **Non-Revenue Water** (NRW, %)
- ❑ **Non-Revenue Water** (NRW, m3/km/d)
- ❑ **Electricity consumption for water supply** (ECW, kWh/m3)
- ❑ **Electricity consumption for wastewater** treatment (ECWW, kWh/m3)
- ❑ **Own electricity production** (OEP, %)
- ❑ **Total cost coverage** (TCC, %)
- ❑ **Total staff efficiency** (TSE, %)

WAREG Common Indicators

2023 data		
TPws	Total number of population that receives public water supply	Number
TPc	Total number of population in the country	Number
WSC	**Water Service Coverage**	**%**
TPs	Total number of population connected to public sewerage	Number
TPc	Total number of population in the country	Number
SSC	**Sewerage Service Coverage**	%
DWTSc / DWTAc	Number of samples / Number of analysis of drinking water that are in compliance with legal standards	Number
DWTS / DWTA	Total number of samples / Total number of analysis of drinking water	Number
DWQ	**Drinking water quality**	%
WWTSc / WWTAc	Number of samples / Number of analysis of wastewater that are in compliance with legal standards	Number
WWTS / WWTA	Total number of samples / Total number of analysis of wastewater	Number
WWC	**Wastewater quality**	%
WNRa	Annual length of reconstructed water network	km
WNt	Total water network	km
WNR	**Water Network Rehabilitation**	%
SNRa	Annual length of reconstructed sewer network	km
SNt	Total sewer network	km
SNR	**Sewer Network Rehabilitation**	**%**
SY	System input	m³
BAC	Billed authorized consumption	m³
NRW	Non-revenue water	m³
WNt	Total water network	km
NRW	**Non-revenue water**	**%**
NRW	**Non-revenue water**	**m³/km/d**

2023 data		
ECw	Electricity consumption for water supply	kWh
SY	System input	m³
ECW	**Electricity consumption for Water Supply**	kWh/m³
Ecww	Electricity consumption for wastewater treatment	kWh
WWe	Sum of wastewater volumes at all WWTPs entries	m³
ECWW	**Electricity consumption for Wastewater treatment**	**kWh/m³**
EPr	Own production of electricity, used for regulated activities	kWh
ECt	Total electricity consumption for regulated activities	kWh
OEP	**Own electricity production**	**%**
TRC	Total costs for regulated WSS services	Eur
TRR	Total revenues from regulated WSS services	Eur
TCC	**Total cost coverage**	**%**
TSr	Total number of staff for regulated activities	Number
TPc	Total number of population in the country	Number
TSE	**Total staff efficiency**	**%**

WAREG European Water Regulators

WORKING GROUP

WAREG Common Key Performance Indicators

Legend

Note	Official KPI	Data reliability	Calculation	Comment on KPI	Comment variables
Fill data only in yellow color cells	Yes - used by the member with this methodology No - not used by the member, or not with this methodology	1 - High 2 - Medium 3 - Low	Yes - KPI calculated according to this methodology No - calculated with different data	Comment only for KPIs answered with No on column F	Comment only for variables answered with No on column K

Area	Variable	Definition	Unit	Guidance	Official KPI	Data reliability	2021	2022	2023	Calculation	Comment on KPI	Comment variables
WATER SERVICE COVERAGE	TPws	Total number of population, that receives public water supply	Number	Information from WSOs billing systems. Estimated number of people billed for water service	Yes	3	6 926 178	6 646 257	6 486 550	Yes		
	TPc	Total number of population in the country	Number	Information from national statistics		1	6 948 177	6 674 167	6 512 443			
SEWERAGE SERVICE COVERAGE	TPs	Total number of population connected to public sewerage	Number	Information from WSOs billing systems. Estimated number of people billed for sewer service	Yes	3	5 073 867	4 819 593	4 702 079	Yes		
	TPc	Total number of population in the country	Number	Information from national statistics		1	6 948 177	6 674 167	6 512 443			0
DRINKING WATER QUALITY	DWTSc / DWTAc	Number of samples / Number of analysis of drinking water that are in compliance with legal standards	Number	Information from WSOs internal database - all samples / analysis conducted during reported year that are in compliance with legal standards	No	2	363 711	357 271	358 249	Yes	EWRC monitors drinking water quality in separate for large and small water zones, not total like this one	Number of analysis
	DWTS / DWTA	Total number of samples / Total number of analysis of drinking water	Number	Information from WSOs internal database - all samples / analysis conducted during reported year		2	366 950	360 441	362 793			Number of analysis
WASTEWATER QUALITY	WWTSc / WWTAc	Number of samples / Number of analysis of wastewater that are in compliance with legal standards	Number	Information from WSOs internal database - all samples conducted during reported year that are in compliance with legal standards	Yes	2	7 257	7 003	6 989	Yes		Number of samples
	WWTS / WWTA	Total number of samples / Total number of analysisof wastewater	Number	Information from WSOs internal database - all samples conducted during reported year		2	8 254	7 870	7 849			Number of samples
mbers could present data for samples or analysis, for calculation of the respective KPI												
WATER NETWORK REHABILITATION	WNRa	Annual lenth ofreconstructed water network	km	Information from WSOs internal database - total length of watermains that were reconstructed, replaced, rehabilitated, excluding length of service connections and network extension	Yes	2	510	451	541	No		Rehabilitated water network only by the WS operators, not entire rehabilitated network
	WNt	Total water network	km	Information from WSOs internal database - total length of watermains in servicve, excluding length of service connections		2	73 511	74 126	74 477			
SEWER NETWORK REHABILITATION	SNRa	Annual lenth ofreconstructed sewer network	km	Information from WSOs internal database - total length of sewers that were reconstructed, replaced, rehabilitated, excluding length of service connections and network extension	No						EWRC does not collect data for sewerage rehabilitation, and does not monitor it through KPI	No such data is collected by EWRC
	SNt	Total sewer network	km	Information from WSOs internal database - total length of sewers in servicve, excluding length of service connections		2	12 476	12 469	12 609			
NON-REVENUE WATER	SY	System input	m^3	Information from WSOs internal database - all water abstracted from water sources during the reported year		2	825 426 188	845 427 191	841 143 807			
	BAC	Billed authorized consumption	m^3	Information from WSOs biling system - all water billed to customers during the reported year		2	331 898 904	329 916 738	331 256 568			
	NRW	Non-revenue water	m^3	Difference between SY and BAC	Yes	2	493 403 147	515 693 435	506 460 827	Yes		

Data collection

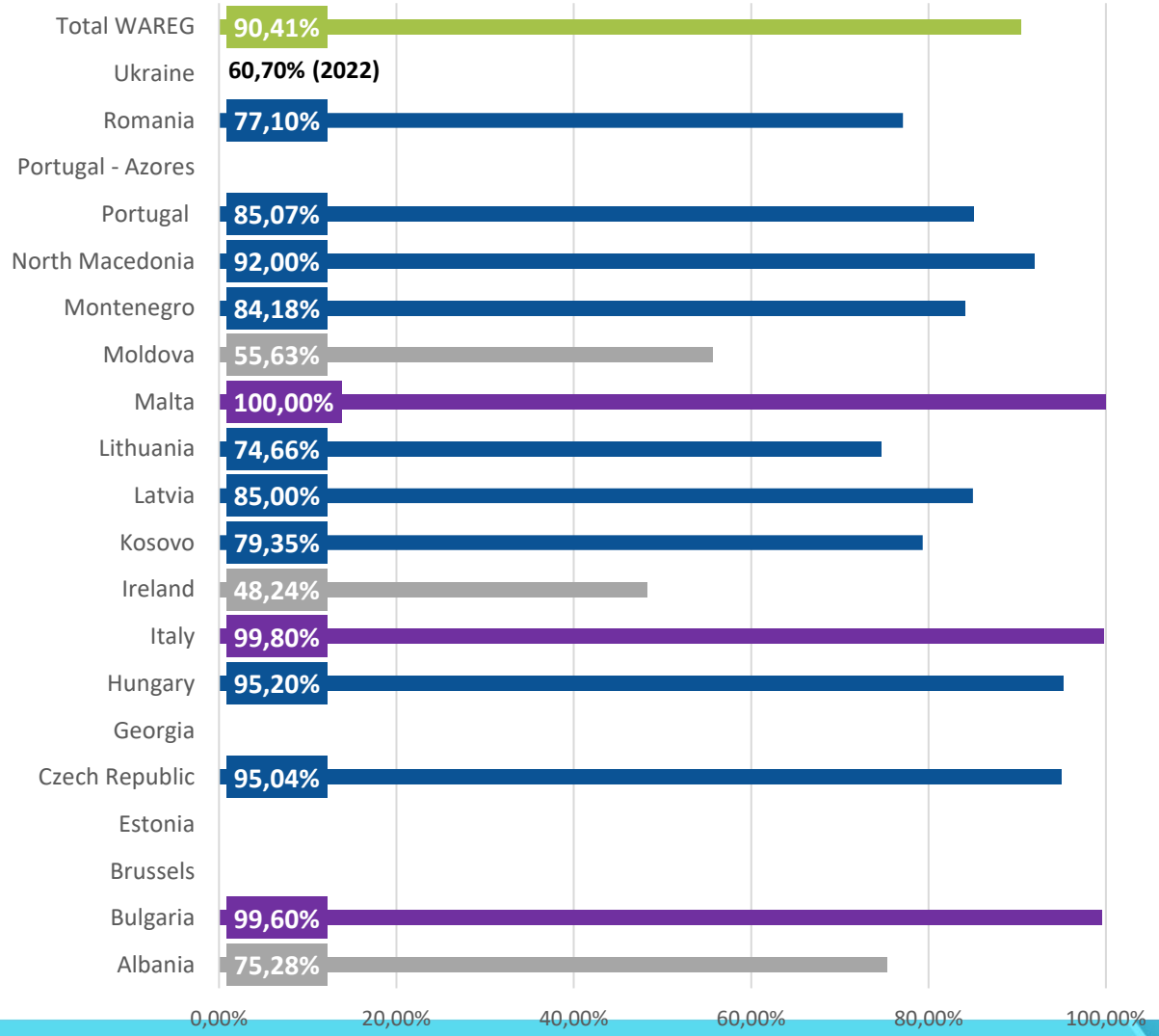
20 Members:

- ❑ Albania
- ❑ Bulgaria
- ❑ Brussels
- ❑ Estonia
- ❑ Czech republic
- ❑ Georgia
- ❑ Hungary
- ❑ Italy
- ❑ Ireland
- ❑ Kosovo
- ❑ Latvia
- ❑ Lithuania
- ❑ Malta
- ❑ Moldova
- ❑ Montenegro
- ❑ North Macedonia
- ❑ Portugal
- ❑ Portugal – Azores
- ❑ Romania
- ❑ Ukraine

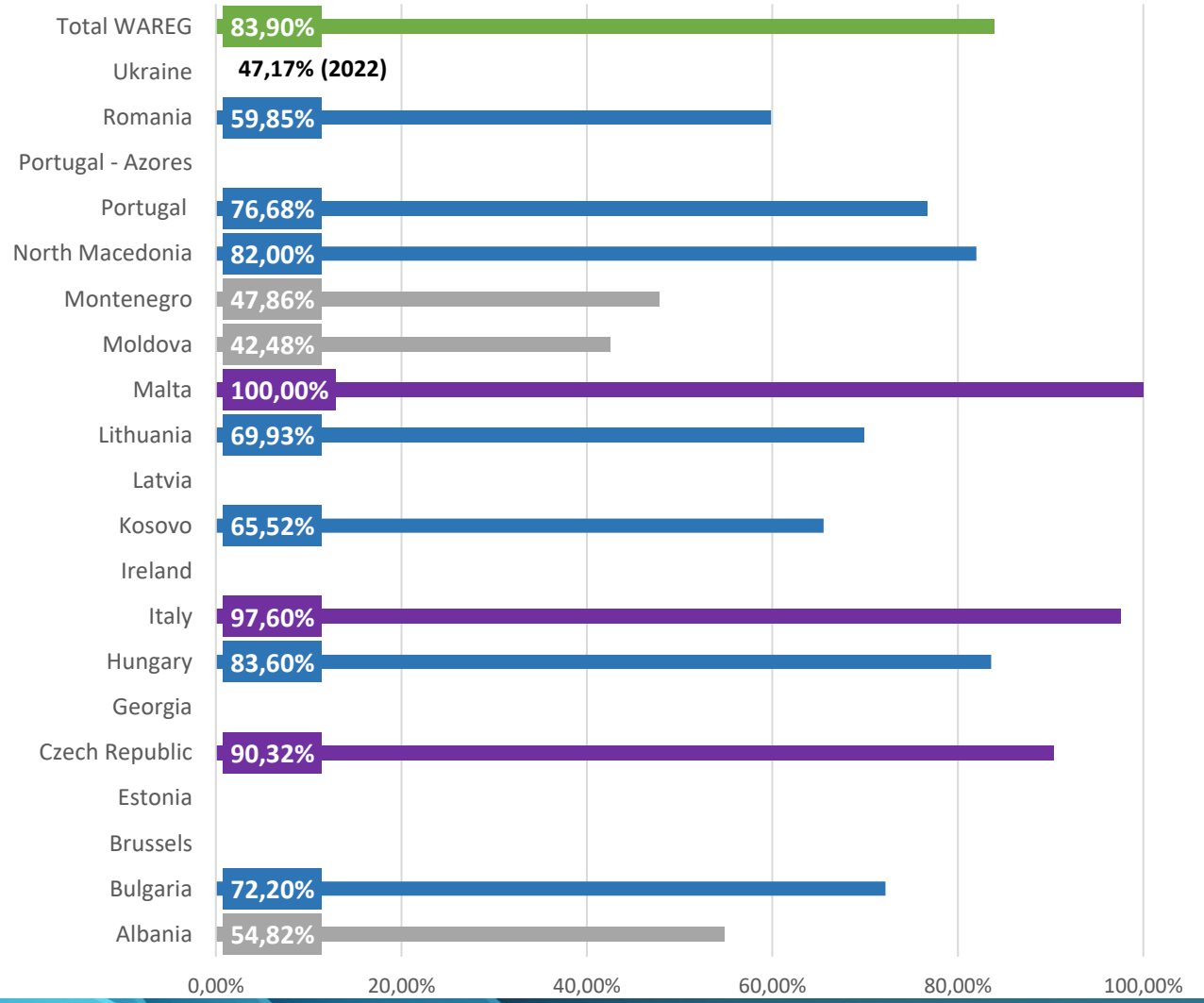
Data results

2023 data				Total WAREG	Countries KPIs calculated	KPIs *	KPI min	KPI max
WSC	Water Service Coverage	↑	%	90,41%	15	*4*	48,24%	100,00%
SSC	Sewerage Service Coverage	↑	%	83,90%	13	*3*	42,48%	100,00%
DWQ	Drinking water quality	↑	%	96,57%	13	*2*	75,88%	100,00%
WWC	Wastewater quality	↑	%	90,15%	7	*2*	27,72%	98,48%
WNR	Water Network Rehabilitation	↑	%	1,05%	8	*3*	0,41%	2,16%
SNR	Sewer Network Rehabilitation	↑	%	0,58%	6	*3*	0,03%	0,97%
NRW	Non-revenue water	↓	%	43,77%	18	*2*	6,09%	68,59%
NRW	Non-revenue water	↓	$m^3/km/d$	12,74	18	*3*	0,003	59,44
ECW	Electricity consumption for Water Supply	↓	kWh/m^3	0,62	14	*2*	0,18	3,38
ECWW	Electricity consumption for Wastewater treatment	↓	kWh/m^3	0,42	11	*3*	0,23	0,69
OEP	Own electricity production	↑	%	7,83%	9	*1*	0,11%	17,04%
TCC	Total cost coverage	↑	%	105,12%	16	*4*	57,07%	156,02%
TSE	Total staff efficiency	↓	%	0,17%	14	*7*	0,05%	0,36%

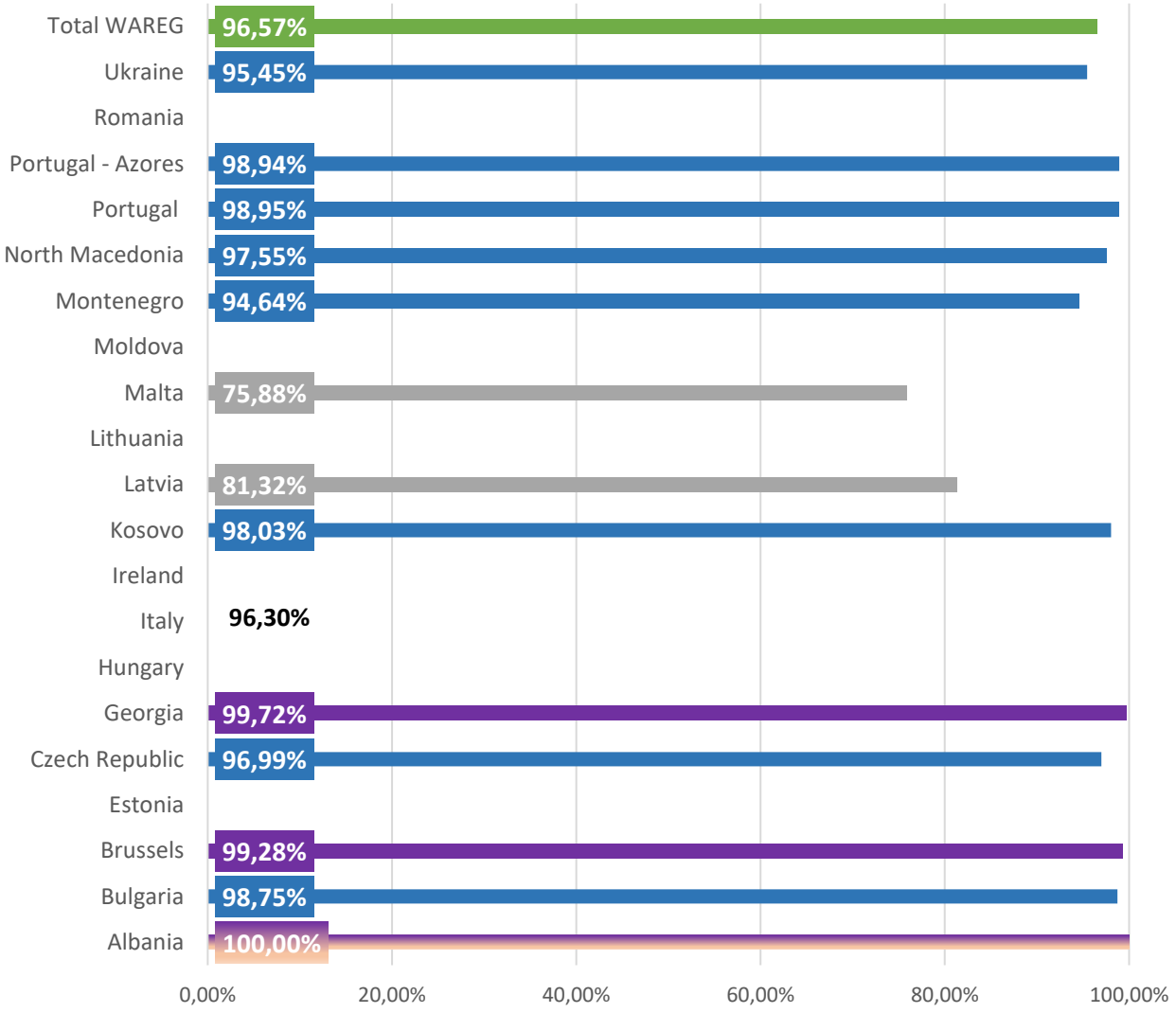
Water Service Coverage (WSC) - 15 KPIs calculated, 4*



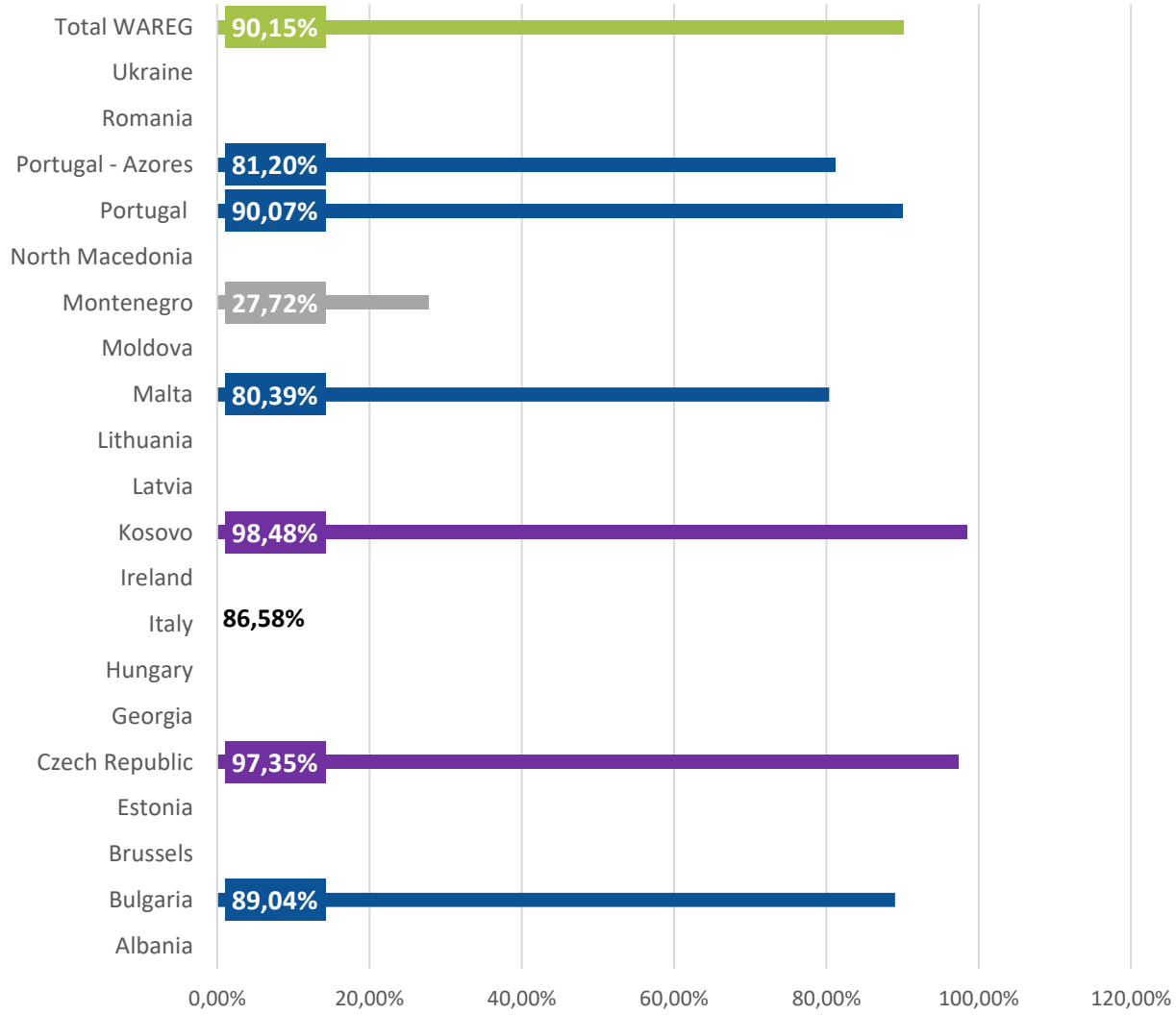
Sewer Service Coverage (SSC) - 13 KPIs, 3*



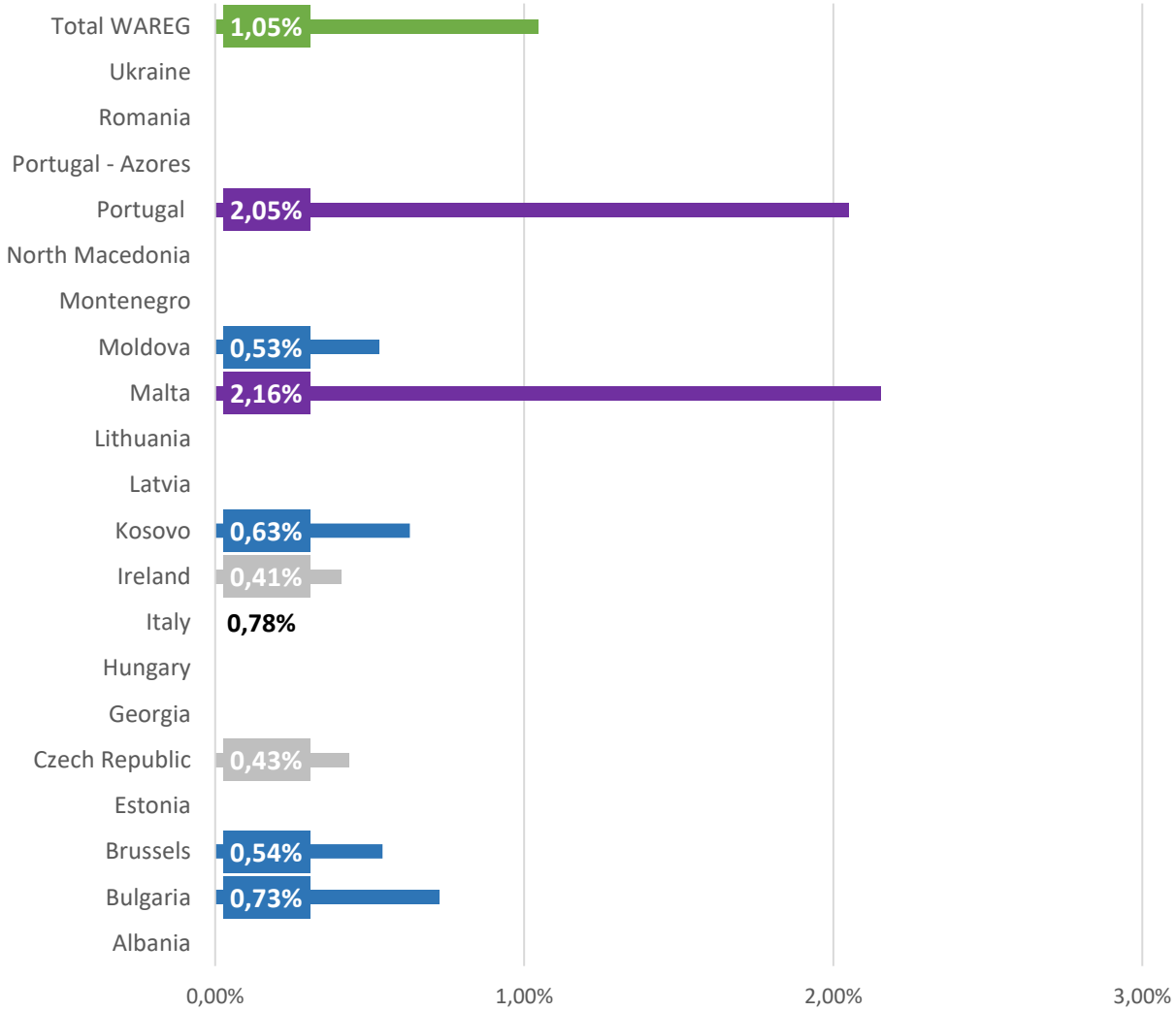
Dinking Water Quality (DWQ) - 13 KPIs, 2*



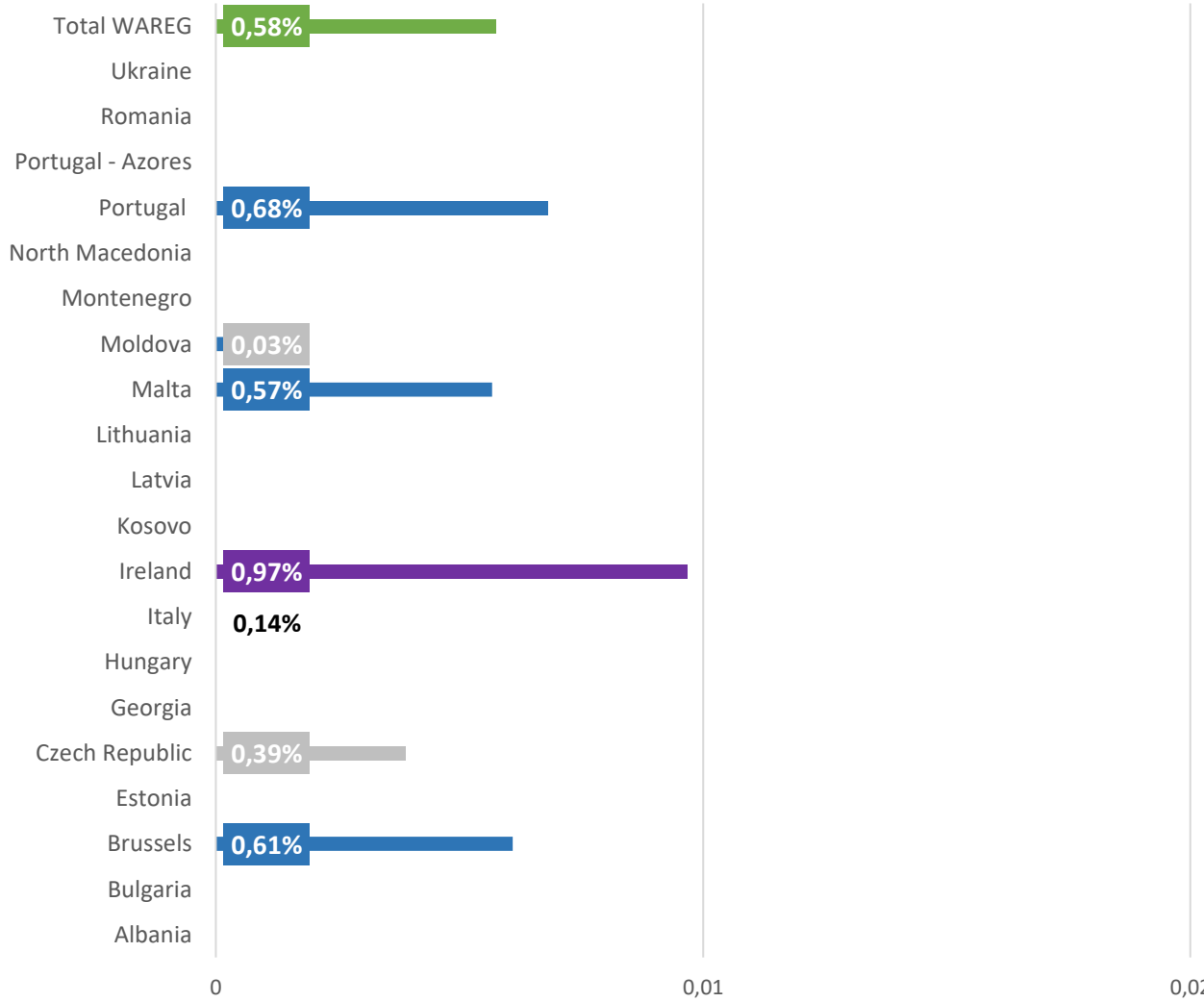
WasteWater Quality (WWQ) - 7 KPIs, 2*



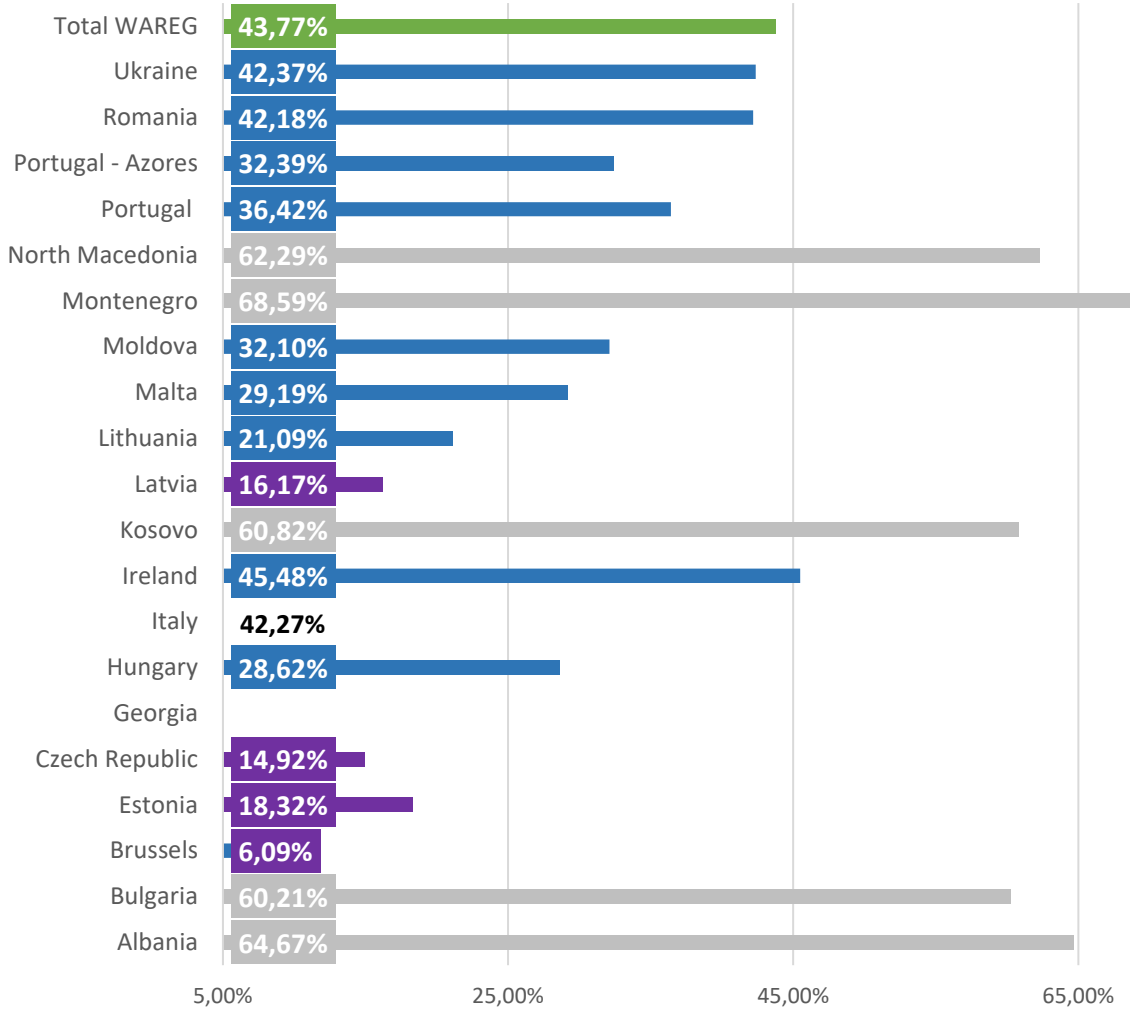
Water Network Rehabilitation (WNR) - 8 KPIs, 3*



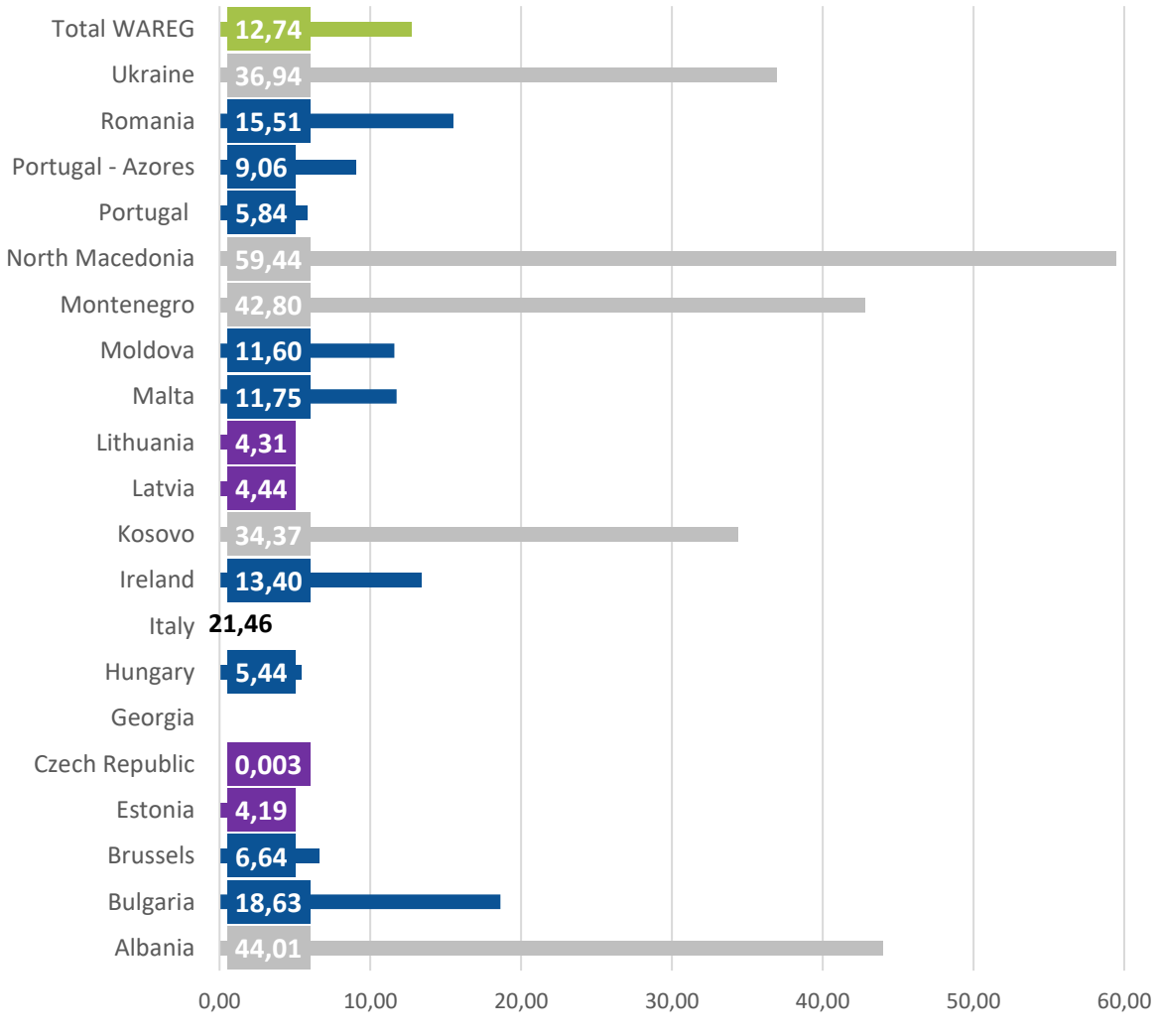
Sewer Network Rehabilitation (SNR) - 6 KPIs, 3*

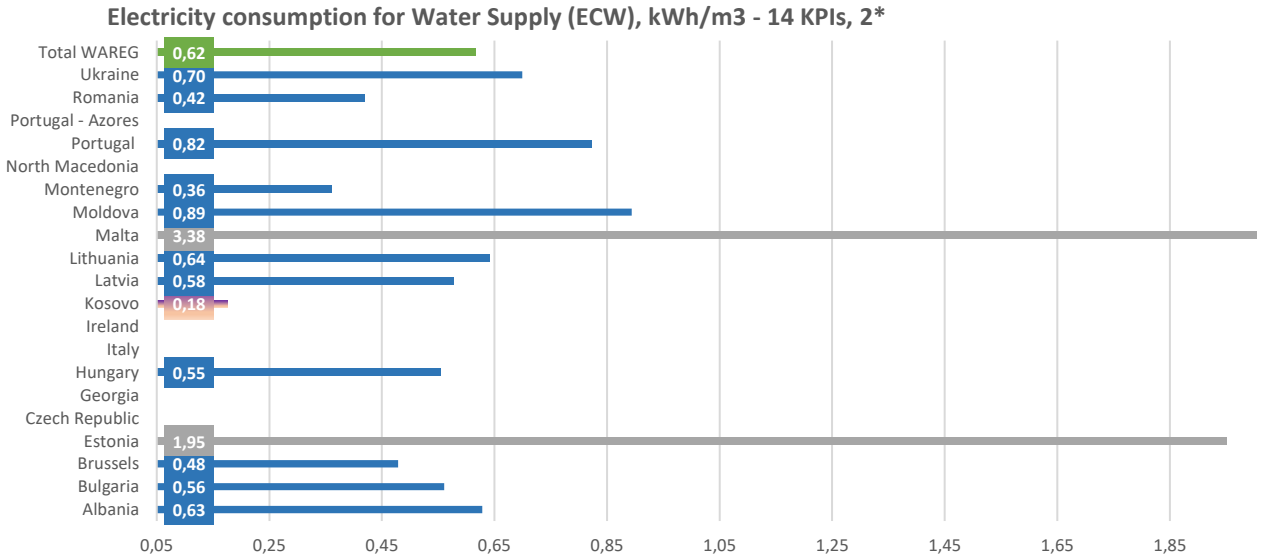


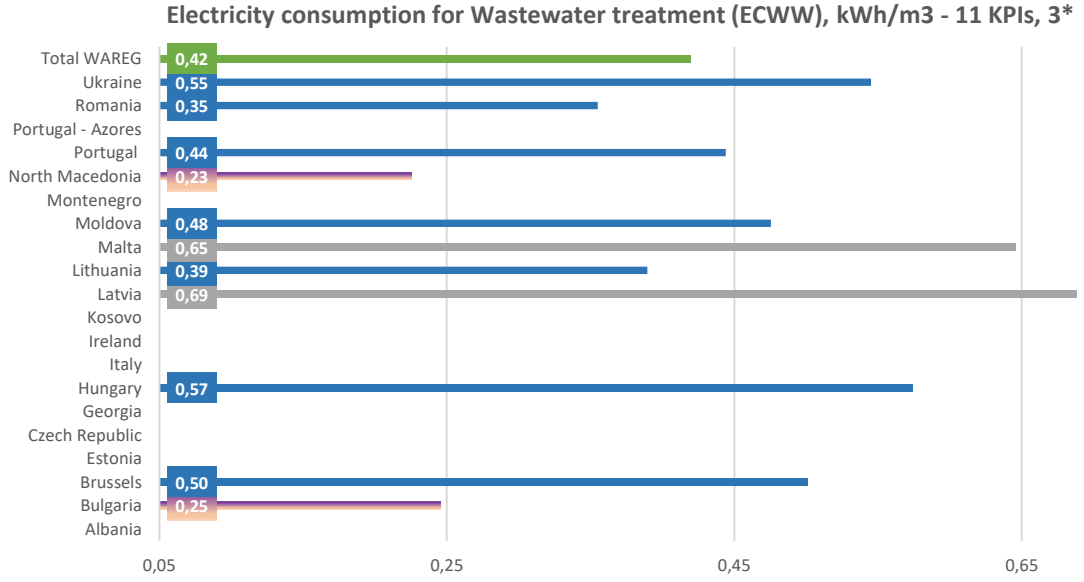
Non-Revenue Water,% (NRW) - 18 KPIs, 2*

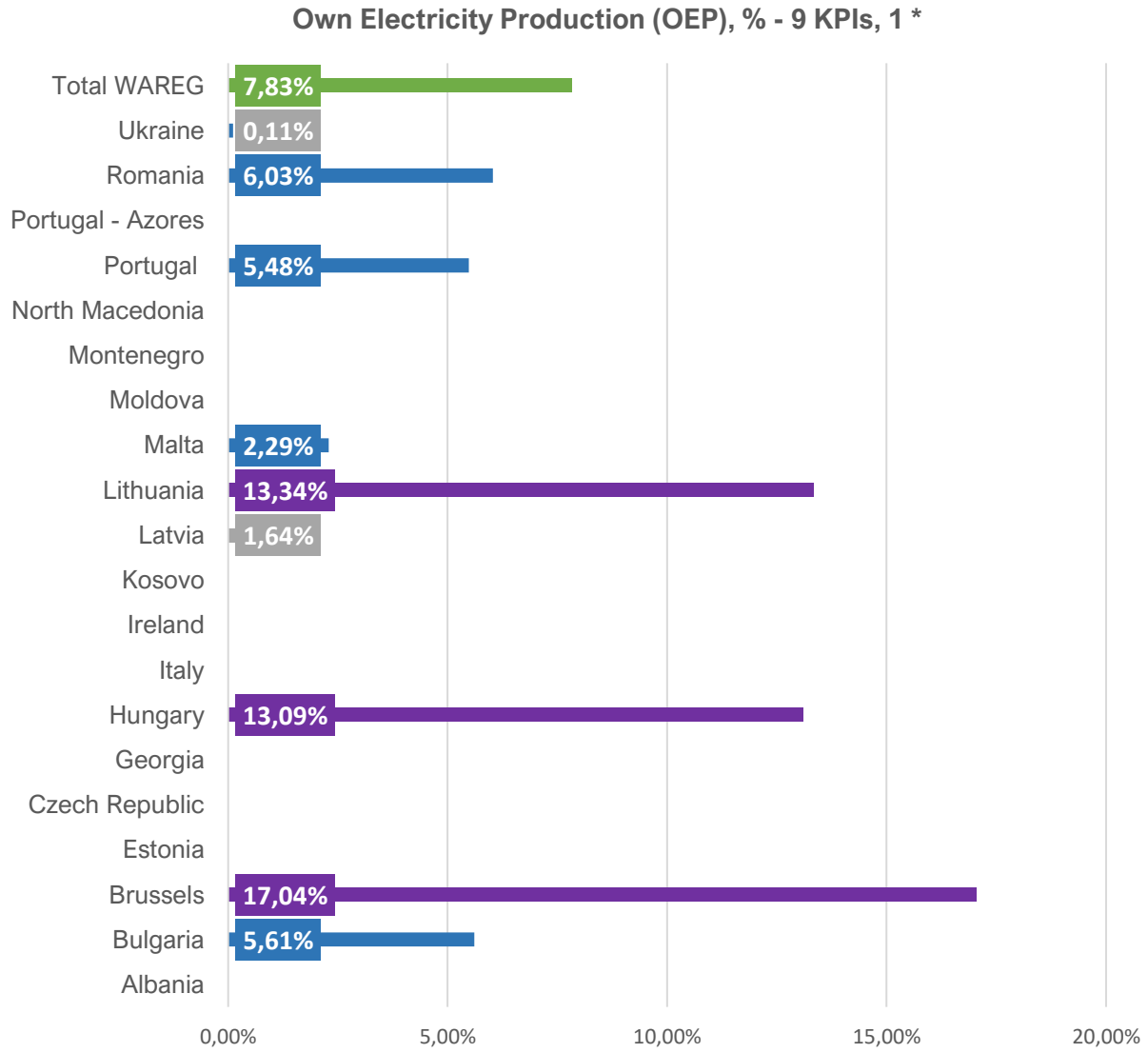


Non-Revenue Water,m3/km/d (NRW) - 18 KPIs, 3*

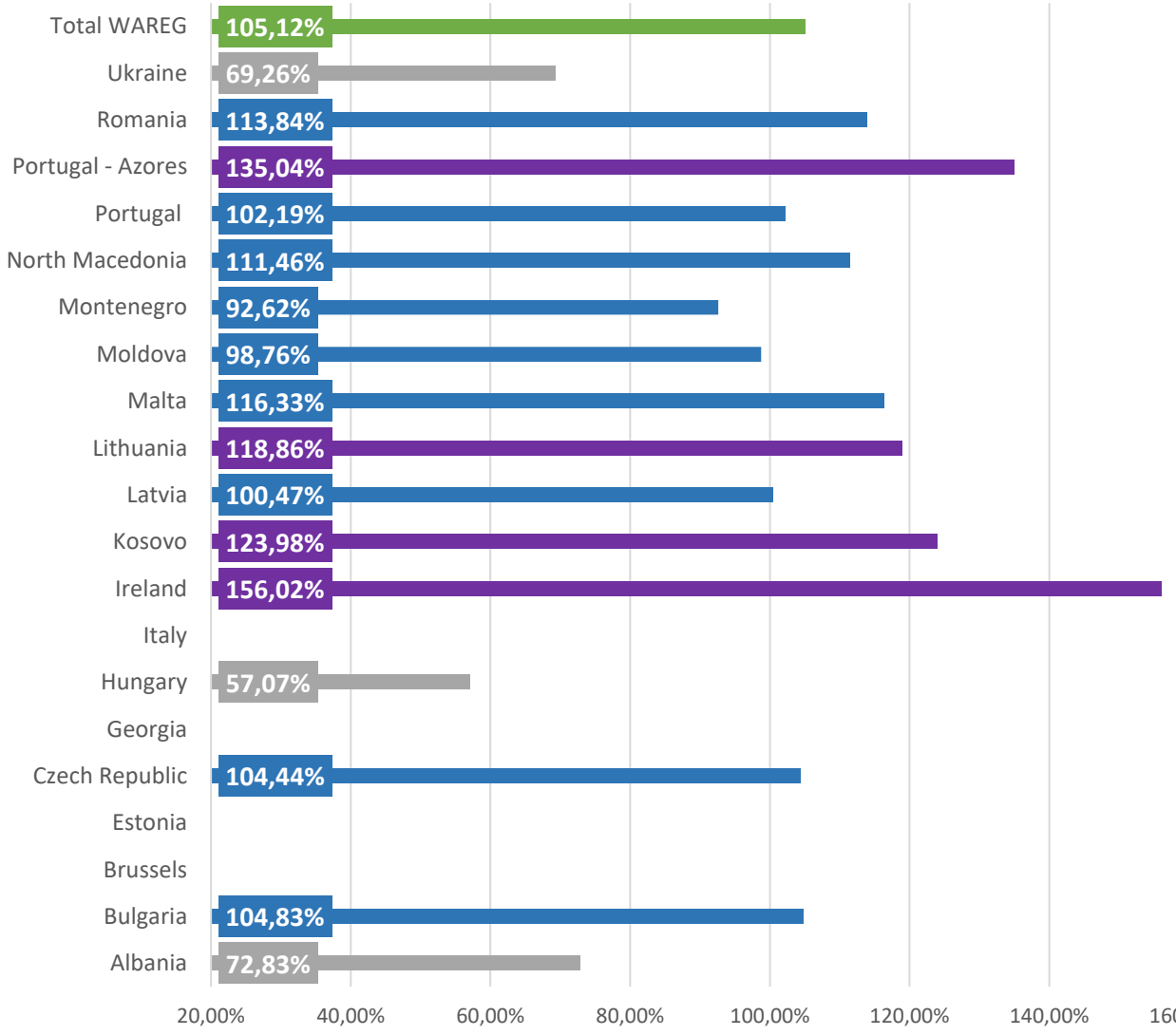



Electricity consumption for Water Supply (ECW), kWh/m3 - 14 KPIs, 2*
Total WAREG 0,62
Ukraine 0,70
Romania 0,42
Portugal - Azores
Portugal 0,82
North Macedonia
Montenegro 0,36
Moldova 0,89
Malta 3,38
Lithuania 0,64
Latvia 0,58
Kosovo 0,18
Ireland
Italy
Hungary 0,55
Georgia
Czech Republic
Estonia 1,95
Brussels 0,48
Bulgaria 0,56
Albania 0,63
0,05 0,25 0,45 0,65 0,85 1,05 1,25 1,45 1,65 1,85

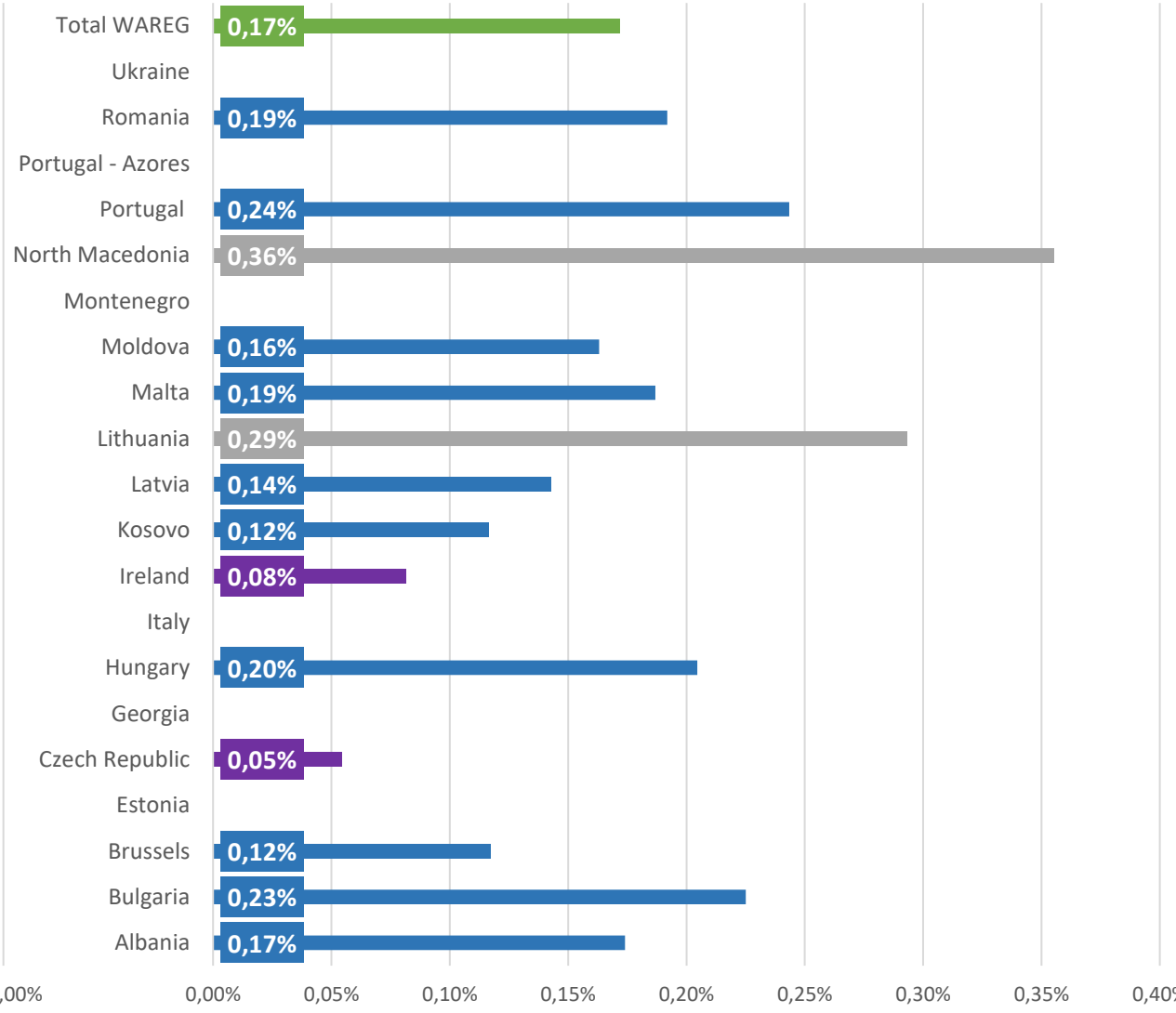

Electricity consumption for Wastewater treatment (ECWW), kWh/m3 - 11 KPIs, 3*
Total WAREG 0,42
Ukraine 0,55
Romania 0,35
Portugal - Azores
Portugal 0,44
North Macedonia 0,23
Montenegro
Moldova 0,48
Malta 0,65
Lithuania 0,39
Latvia 0,69
Kosovo
Ireland
Italy
Hungary 0,57
Georgia
Czech Republic
Estonia
Brussels 0,50
Bulgaria 0,25
Albania
0,05 0,25 0,45 0,65


Own Electricity Production (OEP), % - 9 KPIs, 1 *
Total WAREG 7,83%
Ukraine 0,11%
Romania 6,03%
Portugal - Azores
Portugal 5,48%
North Macedonia
Montenegro
Moldova
Malta 2,29%
Lithuania 13,34%
Latvia 1,64%
Kosovo
Ireland
Italy
Hungary 13,09%
Georgia
Czech Republic
Estonia
Brussels 17,04%
Bulgaria 5,61%
Albania
0,00% 5,00% 10,00% 15,00% 20,00%

Total Cost Coverage (TCC), % - 16 KPIs, 4 *



Total Staff Efficiency (TSE), % - 14 KPIs, 7 *



Conclusions

Introduction of common KPIs is **difficult process:**

- ❑ Authorities not always have **whole / right** data required to calculate indicators following the methodology:
- ❑ Data is available but is assessed with **lowest data quality / data reliability.**
- ❑ Data is available but is not allowed for **publishing**.

✓ **Service coverage**:
number of population ↔ number of households ↔ number of households with effective service;

✓ **Water / wastewater quality**:
lack of data for number of samples/analysis ↔ limited for calculating compliance;

✓ **Network rehabilitation:**
lack of data for rehabilitated networks ↔ data provided from some of regulated WSOs ↔ different methodologies (rehabilitated / cleaned ↔ limited period of time;

✓ **Non-Revenue Water**:
different approaches of IWA water balance;

✓ **Energy consumption for W/WW:**
lack of data for energy consumption ↔ lack of data for whole W / WW service;

✓ **Economic and staff efficiency**:
lack of data for OPEX / CAPEX / number of staff.

THANK YOU FOR YOUR ATTENTION!

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