

WATER INTAKE OF PANEL OF SUPPLIERS MONITORED

To raise awareness along the supply chain of the importance of safeguarding water resources, the Sustainability Planning & Reporting Unit, with the support of the Procurement and Logistics function, asked a panel of suppliers, for the first time in 2020 and on an experimental basis, to also provide data on water intake, divided by process and civil uses. **33 suppliers** out of 79 suppliers invited to re-

plied to the section on water resources, corresponding 40% of the total expenditure of the Acea Group for procurements of goods, services and labour. Water intake by suppliers in 2020 equalled 14,344 m³, divided into 9,543 m³ for industrial uses and 4,802 m³ for civil uses. The intention is to proceed with this activity, monitoring data and continuing to raise awareness around the issue.

Discharges of water intake occur within **authorised** and **closely controlled processes**. For example, at the **Terni waste-to-energy plant**, residual water from production processes is **first treated by internal treatment plants**, before being discharged into public sewerage. Water used in the waste-to-energy process at the San Vittore del Lazio plant, instead, is collected and stored in special underground tanks and disposed of as waste, as it may contain components that make it unsuitable for normal discharge.

Discharge into surface water bodies occurs only under exceptional circumstances, i.e. in the event of rainwater in excess of the first 5 mm of water from each rainfall event that is greater than the quantities reused internally, and in 2020 there were no such

events. Wastewater from toilet facilities of production lines and offices are collected in septic tanks and subsequently sent for disposal. Sewage from the headquarters is instead collected and transferred in an “Imhoff tank” with a sub-irrigation system for clarified material into the soil, which came into operation in 2020. Water intake for industrial uses in activities connected to the integrated water service, and in particular water treatment, **undergoes the same treatment as waters transported via public sewerage**, i.e. it is retreated at the head of the treatment plant and sent to the locations described in the section *Sewerage service and treatment system*, in the chapter *Water segment*. All civil water intake from the aqueduct ends up directly in the public sewer system.

EMISSIONS



CONTINUOUS ANALYSIS OF WASTE-TO-ENERGY EMISSIONS: **values of pollutants significantly lower than legal limits**



improvement in intensity index for emissions (SCOPE 2) FROM NETWORK LOSSES AGAINST TOTAL ELECTRICITY DISTRIBUTED: 0.0093 t/MWh

ATMOSPHERIC EMISSIONS

Atmospheric emissions from Acea plants are constantly monitored. Plants are managed according to the UNI EN ISO 14001 and UNI EN ISO 45001/OHSAS 18001:2007 standards. Waste-to-energy plants are also **registered under the European EMAS III scheme**, extended until 2021.

With regard to the most significant macro-pollutants connected with the main production processes of Acea Ambiente and Acea Produzione plants, see the summary data in table no. 67. Data, monitored through Continuous Emissions Monitoring Systems (CEMSs), is in line with the values for previous years, with the exception of SO_x emissions, which increased due to a greater concentration in the pulper waste sent for combustion. The values are nevertheless very low.

TABLE NO. 67 – ENVIRONMENTAL INDICATORS: CO₂ EMISSIONS, GREENHOUSE GAS INTENSITY INDICES AND VEHICLE EMISSIONS (2018-2020)

	2018	2019	2020
emissions	(t)		
CO	6.38	7.02	8.34
NO _x	189.40	188.19	190.67
SO _x	0.16	0.33	0.90
particles (particulate matter)	0.50	0.60	0.60

NOTE The emissions refer to the plants of Acea Ambiente – waste-to-energy and Acea Produzione.

In detail, in the **waste-to-energy plants**, monitoring is carried out by means of fixed and mobile stations that **sample and analyse the fumes coming out of the chimneys, measuring**

concentrations for numerous parameters that are periodically checked by internal personnel and certified by qualified external laboratories. Again in 2020, the **values of the main**

pollutants were also **significantly below the legal limits** (see table no. 68).

Specifically, at the **San Vittore del Lazio plant**, 2020 saw the performance of surveys of odorous emissions, monitoring of

diffuse and fugitive emissions and a biomonitoring campaign with use of bees as bioindicator insects (see info. box *150,000 bees for biomonitoring of environmental quality*, in the chapter *Environmental sustainability and the primary challenges*).

TABLE NO. 68 – CONCENTRATIONS OF ATMOSPHERIC EMISSIONS – SAN VITTORE DEL LAZIO AND TERNI WASTE-TO-ENERGY PLANTS (2018-2020)

pollutant	u. m.	San Vittore del Lazio plant (*)				Terni plant (**)			
		scope of reference (**)	2018	2019	2020	scope of reference (**)	2018	2019	2020
HCl	mg/Nm ³	8	0.184	0.151	0.145	8	4.499	3.580	3.807
NO _x	mg/Nm ³	70	28.273	29.652	29.925	180	140.157	128.650	125.989
SO ₂	mg/Nm ³	40	0.006	0.003	0.086	25	0.194	0.430	0.969
HF	mg/Nm ³	1	0.021	0.023	0.020	1	0.084	0.080	0.00
CO	mg/Nm ³	40	1.320	0.803	0.604	25	1.084	1.140	1.057
total particles (particulate)	mg/Nm ³	3	0.006	0.007	0.010	25	0.705	0.790	0.763
PAH (polycyclic aromatic hydrocarbons)	mg/Nm ³	0.01	0.00002	0.00001	0.0000	0.01	0.0001	0.0000	0.0000
dioxins and furans (PCDD + PCDF)	ng/Nm ³	0.1	0.0065	0.0074	0.0094	0.1	< 0.001	0.0087	0.0000
heavy metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V)	mg/Nm ³	0.5	0.0253	0.0387	0.0246	0.3	0.204	0.033	0.03

(*) The analysis of PAH, dioxins and furans and heavy metals and their composites are four-monthly and discontinuous. The "<" symbol identifies the concentration values that are equal to or below the thresholds that the devices used by the laboratory are capable of measuring.

(**) Reference parameters, Legislative Decree no. 46/2014, 2000/76/EC and AIA, are separate for each waste-to-energy plant.

NOTE For San Vittore del Lazio, over the years the recorded concentrations of the parameters HCl, SO₂, dust and HF were close to the instrument's detection limit. Therefore, in these measurement areas deviations are to be considered insignificant for absolute changes in concentrations and masses.

Monitoring carried out on installations at risk¹³⁵ has shown the **absence of emissions** in significant quantities **of substances responsible for reducing the ozone layer** (for consumption see the section *Resources used*, in the chapter *Environmental accounts*).

GREENHOUSE-GAS EMISSIONS

Acea quantifies its CO₂ emissions by **monitoring and evaluating the carbon footprint of the individual macro production processes** according to the guidelines of the GHG protocol¹³⁶ which requires

reporting in the categories of **direct (Scope 1)** and **indirect (Scope 2 and Scope 3)**.

Direct Scope 1 emissions **mainly come from the Group's two waste-to-energy plants** and the **thermoelectric power stations**. Of these plants, three are subject to the **Emission Trading Scheme (ETS)** (the waste-to-energy plant in Terni and the thermoelectric plants in Montemartini and Tor di Valle). The allowances assigned under the NAP (National Allocation Plan) framework, compared to the actual emissions registered in the three-year period 2018-2020, are shown in table no. 69.

TABLE NO. 69 – CO₂ EMISSION ALLOWANCES AS PER THE NATIONAL ALLOCATION PLAN (NAP) AND ACTUAL EMISSIONS BY PLANT (2018-2020)

plant	2018		2019		2020	
	assigned by NAP	actual	assigned by NAP	actual	assigned by NAP	actual
Tor di Valle (*)	5,805	42,281	4,775	46,993	3,782	46,097 (**)
Montemartini	0	607	0	1,513	0	1,546
Terni waste-to-energy plant	0	114,328	0	99,281	0	116,708 (**)

(*) As with previous years, in 2020 the applicable legislative framework allowed the Tor di Valle plant to benefit from free of charge emission allowances (3,782 t) as it serves a district-heating network. The 2019 figures for actual emissions have been restated with the certified figures.

(**) Estimated emissions, pending certification by the responsible body.

Scope 1 emissions also include those deriving from certain processes of plants in the Environment segment (composting, treatment and disposal of liquid waste), from drying at treatment plants, from vehicles of Company fleets (petrol and diesel vehi-

cles), from leaks of sulphur hexafluoride (SF₆) that may arise at Areti plants, from combustion processes for heating of premises and offices and from leaks of freon gases from air-conditioning units.

¹³⁵ This is primarily air conditioning equipment using refrigerant gases subject to the 1987 Montreal protocol, particularly chlorofluorocarbons.

¹³⁶ See www.ghgprotocol.org for more information.

The figure for CO₂ output from the waste-to-energy plants in 2020 **increased** (see table no. 70). This is primarily attributable to the **decrease in the biodegradable fraction of waste** for both the San Vittore del Lazio and Terni plants (from 51% and 47% in 2019 to approximately 42% for both plants).

Scope 2 greenhouse-gas emissions deriving from electricity consumption in 2020 decreased, and this is attributable to a **reduction in network losses** of approximately 9% (see table no. 70). For all the details on energy-efficiency actions and consequent reductions in CO₂ emissions, see the section *Energy saving* in the chapter *The use of materials, energy and water*.

Scope 3 emissions include those reported deriving from the sale of gas, from the purchase of goods, services and labour, from employee commuting and from work travel (see table no. 70).

In 2020, **emissions for commuting and business travel were greatly reduced due to the restrictions caused by the Covid-19 pandemic**, which **limited movements** and led to **quick switchover to remote working for the majority of employees**.

Scope 3 emissions for purchase of goods, services and labour are calculated using monitoring data for energy-consumption outside the Group, requested from a **representative panel of suppliers** using a questionnaire (see the section *Energy consumption outside the Group*). This is in addition to energy data (primarily consumption of combustible fuels, electricity and vehicle fuel) emissions for this Scope 3 category also include emissions of refrigerant gases at supplier premises.

INTENSITY INDICES FOR GREENHOUSE GAS EMISSIONS

Scope 2 carbon dioxide emissions, deriving from leaks on electricity distribution networks, relative to total electricity distributed, is one of the intensity indices for greenhouse gas emissions monitored. This index has **improved further**, changing from 0.0112 t/MWh in 2019 to **0.0095 t/MWh** in 2020, in line with the **continuous decrease in relative leaks** on the network (technical leaks/distributed electricity) (see table no. 70).

TABLE NO. 70 – ENVIRONMENTAL INDICATORS: CO₂ EMISSIONS, GREENHOUSE GAS INTENSITY INDICES AND VEHICLE EMISSIONS (2018-2020)

CO₂ EMISSIONS

SCOPE 1 EMISSIONS

FROM ENERGY PRODUCTION PLANTS

	u. m.	2018	2019	2020
CO ₂ emissions from Acea Produzione thermoelectric power stations ^(*)	t	42,888	48,506	47,643
CO ₂ emissions from Acea Ambiente waste-to-energy plants ^(*)	t	307,395	280,504	336,133

FROM WASTE MANAGEMENT, ENERGY DISTRIBUTION, HEATING PLANTS AND VEHICLE FLEET

CO ₂ emissions from waste-management plants ^(**)	t	1,396	1,484	1,567
CO ₂ emissions from water plant dryers ^(***)	t	4,300	5,972	6,371
CO ₂ emissions from heating ^(****)	t	848	914	850
CO ₂ emissions from vehicle fleet	t	10,416	9,309	9,449
CO ₂ emissions from Areti plants (from SF ₆) ^(****)	t	11,233	9,682	8,695
CO ₂ emissions from refrigerants (HCFCs) ^(****)	t	46	0	1
TOTAL SCOPE 1 EMISSIONS ^(*****)	t	378,522	356,371	410,709

SCOPE 2 EMISSIONS

Location-based Scope 2 emissions (market based) ^(*****)	t	359,752 (234,180)	375,494 (257,594)	353,207 (255,066)
of which CO ₂ emissions from network leaks	t	120,450	118,824	91,746

SCOPE 3 EMISSIONS

CO ₂ emissions deriving from the purchase of goods/services and works ^(*****)	t	22,805	22,303	11,642
CO ₂ emissions from commuting	t	4,088	7,060	1,937
CO ₂ emissions from business travel	t	160	288	46
CO ₂ emissions from volumes of gas sold	t	252,987	275,580	326,250

TABLE NO. 70 – ENVIRONMENTAL INDICATORS: CO₂ EMISSIONS, GREENHOUSE GAS INTENSITY INDICES AND VEHICLE EMISSIONS (2018-2020) (continued)

INTENSITY INDICES FOR GREENHOUSE GAS EMISSIONS

intensity indices of the GHG emissions	u. m.	2018	2019	2020
CO ₂ emissions (Scope 1 + Scope 2)/Acea Group added value	(t/k€)	679.1	601.1	564.5
Scope 1 CO ₂ emissions/gross production (*****)	(g/kWh)	361.7	357.8	418.9
Scope 2 CO ₂ emissions deriving from losses on the electricity distribution network/distributed GWh	(t/MWh)	0.0113	0.0112	0.0095

- (*) The 2019 figures for the Tor di Valle and Terni Plants have been corrected after the ETS certification, while the 2020 figure is estimated pending certification by a third-party body.
- (**) The figure includes the emissions of the ancillary services of the waste-to-energy plants, not strictly related to the production of electricity, of Acque Industriali, and non-biogenic emissions from the combustion of biogas produced on site.
- (***) The figures for 2018 and 2019 have been restated to include AdF and to align the figures with the items in the *Environmental Accounts*.
- (****) These are the tonnes of equivalent CO₂ corresponding to the emissions of insulating SF₆ present in Areti's HV equipment (1 t of SF₆ equates to 23,500 t of CO₂, *GHG Protocol-5th Assessment Report – AR5*).
- (*****) In 2019 and 2020, the replenishment of HCFC fluids in the Group's plants was so small that it did not lead to significant CO₂ emissions.
- (*****) Considering the entire Group, the total Scope 1 emissions for the three-year period are as follows: 379,859 t, 357,710 t and 412,035 t.
- (*****) The indirect emissions (Scope 2) include all the Companies within the NFD scope. The figures for 2018 and 2019 have been restated for the inclusion of AdF. As an emission factor per unit of electricity consumed (t CO₂/MWh), for the location-based calculation the value of 0.336 was used for 2020 (0.36 for the previous two-year period), as per Terna's "International Comparisons" document (2019 data). For the calculation of Scope 2 emissions using the market-based method, the residual mix coefficients are the following for 2018, 2019 and 2020, respectively: 0.476 t/MWh, 0.487 t/MWh and 0.466 (Source: AIB document "European Residual Mixes 2019"). Also including the Companies Umbra Acque, AdF, Publiacqua and Acque (outside the NFD scope), for the sole proprietary share quota of Acea, for the three-year period 2018-2020, location-based CO₂ emissions are equal to 403,772 t, 419,578 t and 392,575 t respectively, whereas for the market-based emissions they are equal to 291,041 t, 316,749 t and 309,117 t.
- (*****) This value, estimated, refers to suppliers of goods, services and works. The 2020 figure is broken down as follows: 9,713 tonnes of CO₂ for suppliers of services and works and 1,928.7 tonnes of CO₂ for suppliers of goods. The decrease compared to the previous two-year period is attributable to the different composition of the panel of suppliers included for the calculation, and to restrictions and stoppages due to the pandemic.
- (*****) Scope 1 emissions included in this index are those from power generation plants. The increase in 2020 is attributable to waste-to-energy processing, due to a drop in the biodegradable fraction of waste at both the San Vittore del Lazio and Terni plants.
- NOTE** Emission factors for Scope 1 emissions are taken from the standard parameters – ISPRA data 2019, DEFRA 2020 and *GHG Protocol-5th Assessment Report-AR5*.