

D.T3.1.3. FUA-LEVEL SELF-ASSESSMENTS ON BACKGROUND CONDITIONS RELATED TO CIRCULAR WATER USE

Turin FUA

Version 1
02/2020





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A. CLIMATE, ENVIRONMENT AND POPULATION

A1) POPULATION

1) Population living in the FUA in 2018 [inh.]

In 2018 the FUA's population was 1.784.753.

☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data:

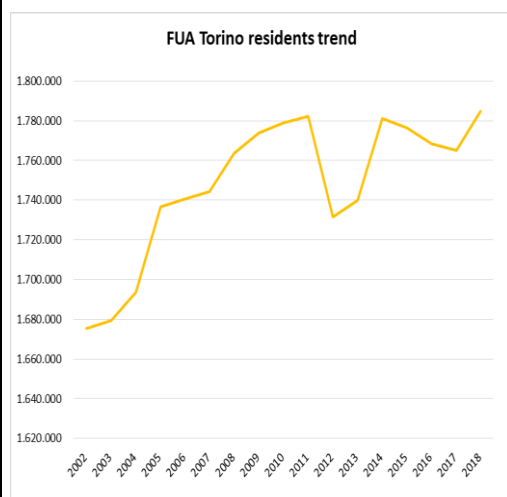
https://www.google.it/publicdata/explore?ds=g0io3het07c3h_&met_y=pop&idm=municipality:001002&hl=it&dl=it#i=1&ctype=1&strail=false&bcs=d&nslm=h&met_y=pop&scale_y=lin&ind_y=false&rdim=country&idm=municipality:001272&ifdim=country&tstart=1011481200000&tend=1516402800000&hl=it&dl=it&ind=false

2) Population change in the last 20 years in the FUA [inh.]

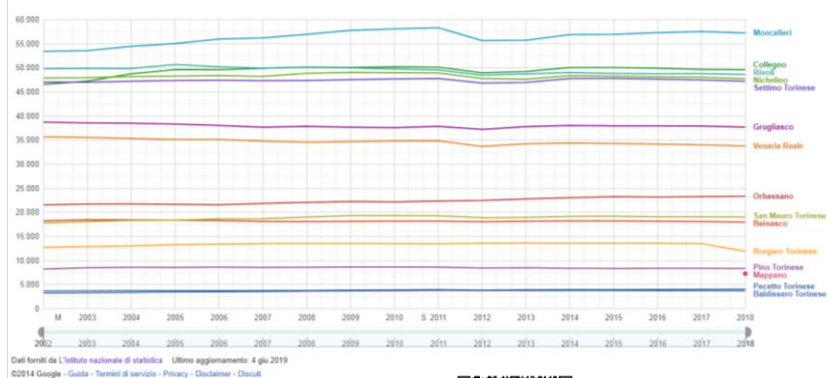
Table:

FUA TORINO	RESIDENTIAL 1° GENNAIO - ANNO																
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
FUA - TORINO	1.675.419	1.679.301	1.693.682	1.736.813	1.740.577	1.744.470	1.763.812	1.773.885	1.778.987	1.782.158	1.731.400	1.740.036	1.780.988	1.776.462	1.768.465	1.765.147	1.784.754

Chart:



Municipalities bordering the City of Turin



Trend of the population
of the City of Turin and
to generate other graphs

☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of

https://www.google.it/publicdata/explore?ds=g0io3het07c3h_&met_y=pop&idm=municipality:001002&hl=it&dl=it#i=1&ctype=1&strail=false&bcs=d&nslm=h&met_y=pop&scale_y=lin&ind_y=false&rdim=country&idm=municipality:001272&ifdim=country&tstart=1011481200000&tend=1516402800000&hl=it&dl=it&ind=false

data:



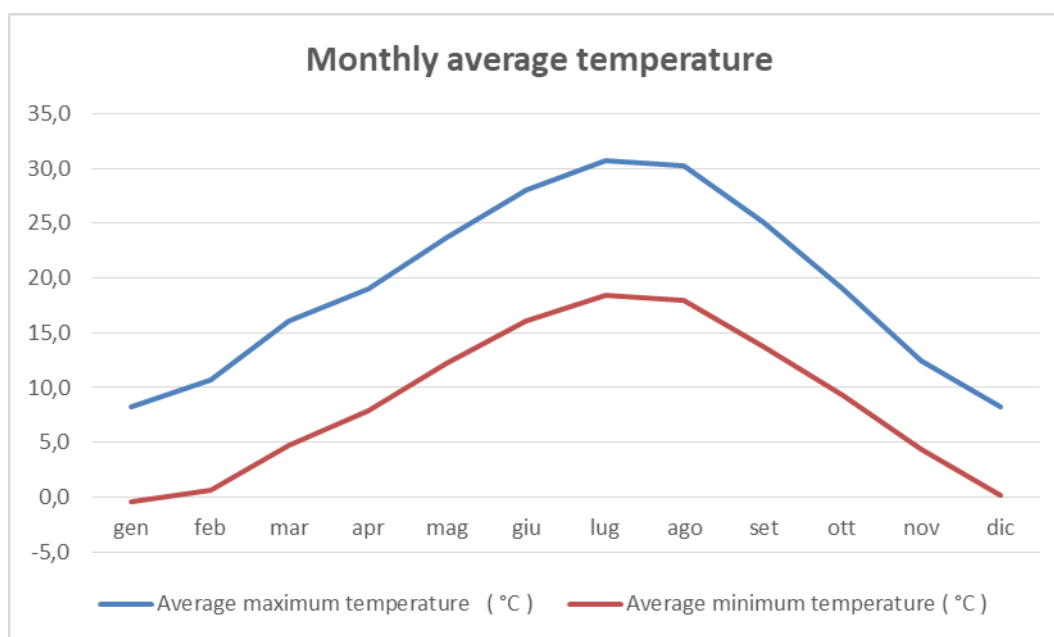
A2) CLIMATE

3) Monthly average temperature (max and min) [°C]

Table:

	gen	feb	mar	apr	mag	giu	lug	ago	set	ott	nov	dic
Average maximum temperature (°C)	8,2	10,7	16,1	19,0	23,7	28,0	30,7	30,2	25,1	19,1	12,5	8,3
Average minimum temperature (°C)	-0,4	0,7	4,7	7,9	12,2	16,1	18,4	18,0	13,8	9,3	4,3	0,2

Chart:



☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data:

Arpa Piemonte

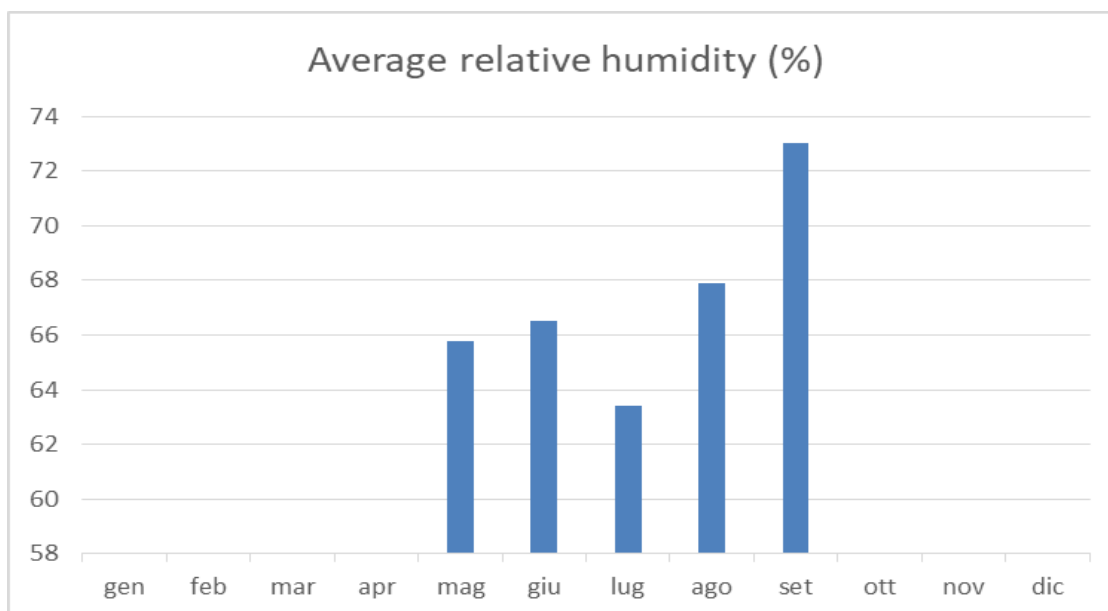


4) Average relative humidity in summer months [%]

Table:

	gen	feb	mar	apr	mag	giu	lug	ago	set	ott	nov	dic
average relative humidity (%)					66	67	63	68	73			

Chart:



☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data:

Arpa Piemonte



A3) SEALING SOIL

5) FUA total area [km²]

FUA total area: 1.701,357 Km²

Map:



☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data:

Cartography of the territory

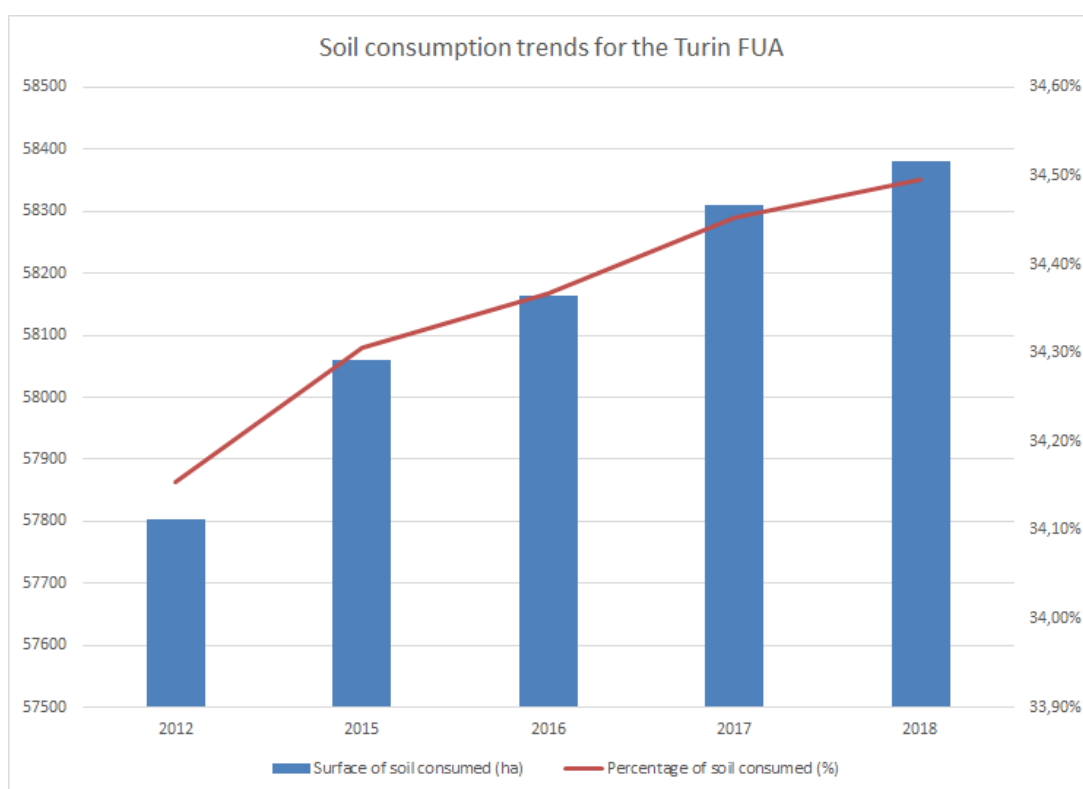


7) Time series of the percentage of sealed soil [%]

Table:

Soil consumption trends for the Turin FUA		
Years	Surface of soil consumed (ha)	Percentage of soil consumed (%)
2012	57803,13	34,15%
2015	58061,25	34,31%
2016	58164,87	34,37%
2017	58310,03	34,45%
2018	58381,67	34,50%

Chart:



☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data:ISPRA annual report



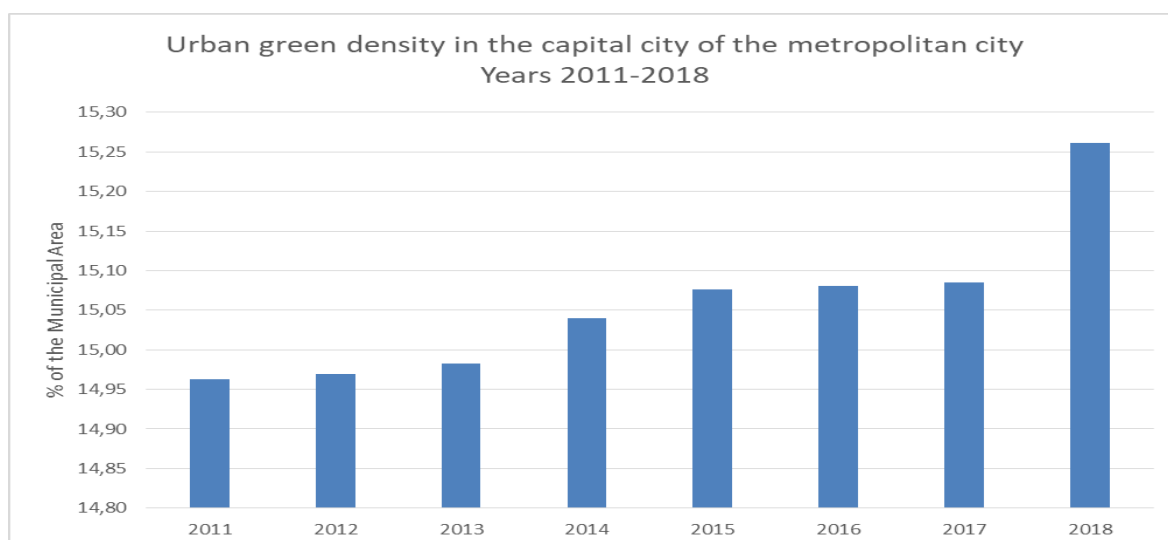
Parks and gardens: about 12.733.000 m² Flower beds: approximately 2.700 m² Urban gardens and agricultural areas: 1.968.237 m² Municipally managed forest: 1.636.000 m² Total wooded areas: 7.925.186 m² Play areas: n. 277 (updated September 2015) Dog areas: n. 54 (update June 2016) Urban arboreal heritage: about 110.000 specimens Hilly tree heritage: over 50.000 specimens Protected areas at European level (Natura 2000 network) + Natural Areas Protected by regional legislation in the municipal area (both public and private property): 5.913.500 m²	
☐ Measured at FUA level ☒ Estimated at FUA level	Estimate procedure and hypotheses: Source of data: the data contained in the databases of the City of Turin and the Metropolitan City were used.

10) Time series of the percentage of green spaces within urbanized areas [%]

Table:

Urban green density in the capital city of the metropolitan city Years 2011-2018								
	2011	2012	2013	2014	2015	2016	2017	2018
% of the Municipal Area	14,96	14,97	14,98	15,04	15,08	15,08	15,09	15,26

Chart



☒ Measured at city of Turin level ☐ Estimated at FUA level	Estimate procedure and hypotheses: Source of data: ISTAT environmental database
--	---

B. WATER RESOURCES

B1) ANNUAL PRECIPITATION

11) Average annual precipitation [mm]	
Average annual precipitation: 927 mm	
☐ Measured at FUA level ☒ Estimated at FUA level	Estimate procedure and hypotheses: Source of data: Arpa Piemonte. Average of the annual average rainfall from 1990 to 2019.

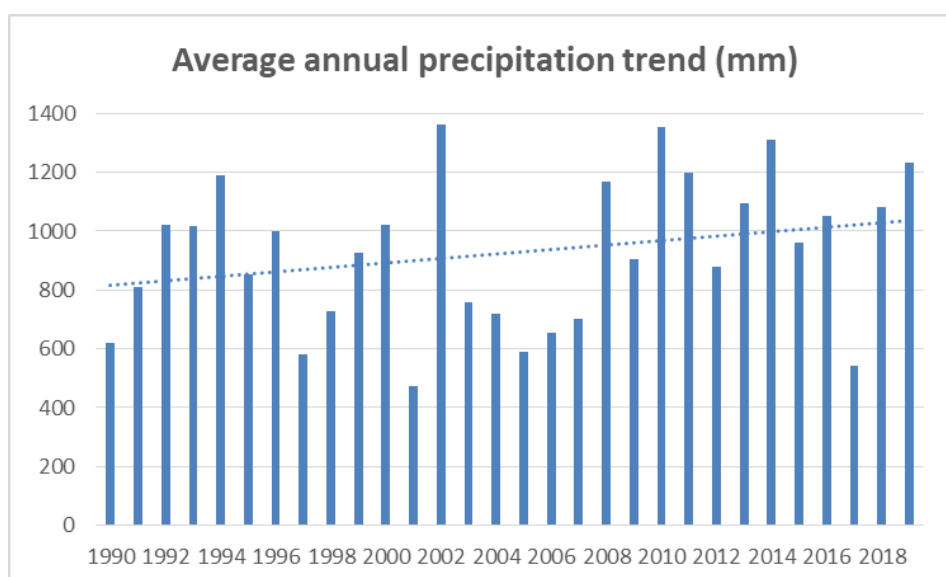
12) Monthly precipitation [mm]																																						
Table:																																						
	gen	feb	mar	apr	mag	giu	lug	ago	set	ott	nov	dic																										
Average monthly rainfall (mm)	40	43	59	91	124	102	73	83	77	81	106	48																										
Chart:																																						
Average monthly rainfall (mm) <table><thead><tr><th>Month</th><th>gen</th><th>feb</th><th>mar</th><th>apr</th><th>mag</th><th>giu</th><th>lug</th><th>ago</th><th>set</th><th>ott</th><th>nov</th><th>dic</th></tr></thead><tbody><tr><td>Average monthly rainfall (mm)</td><td>40</td><td>43</td><td>59</td><td>91</td><td>124</td><td>102</td><td>73</td><td>83</td><td>77</td><td>81</td><td>106</td><td>48</td></tr></tbody></table>													Month	gen	feb	mar	apr	mag	giu	lug	ago	set	ott	nov	dic	Average monthly rainfall (mm)	40	43	59	91	124	102	73	83	77	81	106	48
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Average monthly rainfall (mm)	40	43	59	91	124	102	73	83	77	81	106	48																										
☒ Measured at FUA level					Estimate procedure and hypotheses: Source of data: Arpa Piemonte																																	
☐ Estimated at FUA level																																						

13) Trend of annual precipitation [mm]

Table:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Average annual precipitation (mm)	622	810	1021	1019	1191	853	1000	582	726	928
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Average annual precipitation (mm)	1021	474	1361	756	719	591	655	704	1166	904
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average annual precipitation (mm)	1352	1196	881	1096	1309	962	1054	544	1080	1231

Chart:



☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data:

Arpa Piemonte



B2) RIVER, CHANNELS AND LAKES

14) List of main rivers and channels within the FUA, and their flow rate (average 2018 and monthly flow 2018) [-]

Water body name	Flow rate [m³/s]
Chisola	4,28
Malone	5,78
Viana	1,27
Meletta	0,43
Noce	0,52
Oitana	1,69
Sangone	4,25
Po (Torino)	94,39
Stura di Lanzo	25,59
Sessi	0,63
T. Messa	0,96
Dora Riparia	24,83
Casternone	1,10
Orco	26,28
Canale Cavour	87,60
Banna	0,79
Ceronda	2,78
Bendola	0,91
Torto di Roletto	0,50

15) Synthetic water quality evaluation (ecological and chemical status) for each of the rivers and channels identified (include quantitative parameters, if available) [-]

Water body name	Water quality
Chisola	Chemical status: good Ecological status (SQA): adequate
Malone	Chemical status: good Ecological status (SQA): good
Viana	Chemical status: good Ecological status (SQA): very good



Meletta	-
Noce	-
Oitana	-
Sangone	Chemical status: good Ecological status (SQA): good
Po (Torino)	Chemical status: good Ecological status (SQA): adequate
Stura di Lanzo	Chemical status: not good Ecological status (SQA): good
Sessi	-
T. Messa	Chemical status: not good Ecological status (SQA): good
Dora Riparia	Chemical status: good Ecological status (SQA): very good
Casternone	-
Orco	-
Canale Cavour	-
Banna	Chemical status: good Ecological status (SQA): adequate
Ceronda	Chemical status: good Ecological status (SQA): very good
Bendola	-
Torto di Roletto	-

**16) List of main lakes and reservoirs within the FUA, an their water storage
(average 2018 and monthly variation 2018) [-]**

Water body name	Water storage [m³]
Lago grande di Avigliana	16.200.000
Lago piccolo di Avigliana	4.500.000



17) Synthetic water quality evaluation (ecological and chemical status) for each of the main lakes and reservoirs identified (include quantitative parameters, if available) [-]

Water body name	Water quality
Lago grande di Avigliana	Chemical status: good Ecological status (SQA): very good
Lago piccolo di Avigliana	Chemical status: good Ecological status (SQA): very good

B3) GROUND WATER

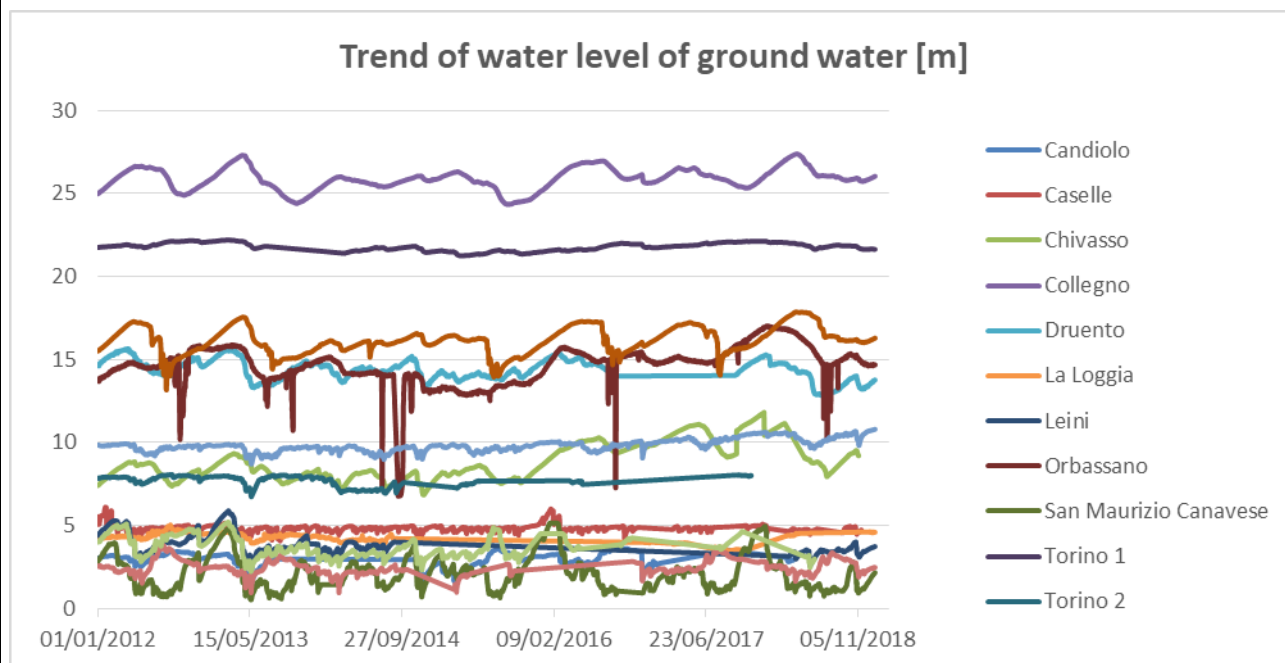
18) Trend of water level of ground water [m]

Table:

	Trend of water level of ground water [m]						
	2012	2013	2014	2015	2016	2017	2018
Candiolo	3,13	2,69	2,22	2,82	3,10	3,16	2,90
Caselle Torinese	4,90	4,80	4,79	4,83	4,93	4,87	4,74
Chivasso	8,19	8,39	7,77	8,06	9,73	10,51	9,65
Collegno	25,83	25,74	25,73	25,38	26,27	25,96	26,34
Druento	14,79	14,49	14,34	14,08	14,84	14,71	13,86
La loggia	4,44	4,37	4,14	N.A.	3,99	3,70	4,49
Leini 1	4,22	4,04	3,64	N.A.	N.A.	N.A.	3,41
Leini 2	4,97	4,80	4,18	N.A.	N.A.	N.A.	N.A.
Orbassano	14,62	14,73	13,75	13,31	15,10	15,35	15,56
San Maurizio Canavese	2,13	2,21	2,12	2,25	2,48	2,28	1,72
Torino 1	21,95	22,03	21,63	21,44	21,74	21,96	21,86
Torino 2	7,86	7,86	7,28	7,50	7,63	8,01	N.A.
Venaria	15,98	15,97	16,01	15,63	16,35	16,31	16,83
Verolengo	9,70	9,58	9,52	9,69	9,82	10,19	10,34
Virle Piemonte	2,65	2,47	2,15	2,02	2,41	2,71	2,51
Volpiano	4,20	3,71	3,26	3,53	3,90	4,02	2,91



Chart:



C. INFRASTRUCTURES

C1) WATER DISTRIBUTION SYSTEM - POPULATION WITH ACCESS TO FRESH WATER

19) Percentage of population with access to the water supply network [%]	
Percentage of population with access to the water supply network: 100%	
☒ Measured at FUA level ☐ Estimated at FUA level	Estimate procedure and hypotheses: Source of data: SMAT Torino

20) What kind of water purification/treatment are in use, what is planned? [-]
Description for the entire area managed by SMAT: Over the years, SMAT has built drinking water plants for almost all types of pollutants, namely: • pollutants of natural origin: arsenic, iron, manganese, ammonia, sulphates, odorous substances, natural organic substances, microorganisms such as algae, bacteria, protozoa; • anthropogenic pollutants: nitrates, organic micropollutants such as chlorinated compounds, aromatic compounds, pesticides and related metabolites. 93 drinking water plants are currently in operation (some plants simultaneously remove several pollutants) which can be classified, in relation to the complexity of the process adopted, in categories A1, A2 and A3 on the basis of Legislative Decree 152/2006 and subsequent amendments. The processes adopted by SMAT to guarantee the quality of the water supplied to users are as follows: aeration, chemical oxidation with chlorine, chlorine dioxide or ozone, clarification and precipitation, filtration on sand or on exchange resins, reverse osmosis, ultrafiltration, adsorption on activated carbon and other materials, disinfection with hypochlorite, chlorine dioxide and ultraviolet. Almost all the water withdrawn by SMAT for drinking purposes is subjected to at least disinfection treatment to maintain the microbiological quality in the distribution networks. This process occurs mostly through the use of sodium hypochlorite and, in some cases, chlorine dioxide or ultraviolet (UV) radiation. About a third of the water withdrawn must also undergo drinking water treatment for the removal of chemical pollutants. For groundwater, other types of processes have been added to traditional sand and activated carbon filtration systems in recent years: among the main innovations in the field of water treatments we mention the use of granular ferric hydroxide for the removal of arsenic, while for surface waters the adoption of membrane treatments, which are preferable also in consideration of the effects on the quality of the resources expected due to climate change.



21) Tap water quality - lab test results

In annex n ° 1 are reported all the results of the laboratory analyzes for the quality of drinking water for each municipality of the FUA.

☒ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

SMAT Torino and other water service operators.

C2) WATER DISTRIBUTION SYSTEM LOSS

22) Percentage of loss in the water supply network [%]

The index of **real losses** in distribution is 24,97% in the City of Turin.

☐ Measured at FUA level

☒ Estimated at city of Turin level

Estimate procedure and hypotheses:

Source of data:

SMAT Torino – year 2018

C3) DUAL WATER DISTRIBUTION SYSTEM

23) Description of eventual dual system water supply network within the FUA [-]

System not present.

☐ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

C4) FIRST FLUSH RAINWATER COLLECTION

24) Qualitative description of the first flush rainwater collection technique implemented, if any [-]

Art.8 bis of the Environmental Energy Annex to the City of Turin Building Regulations stipulates that for new construction and major renovations it is mandatory to store and reuse for irrigation purposes of meteoric waters, in the minimum measure of 10 litres of accumulation per sqm of green areas.

With the Regional Law N.1/R of 20/02/2006, specific treatment and delivery of first-time water relating to certain production activities is provided in the public sewer.

Is your description representative of the entire FUA? Please give a short explanation.

The Regional Law N.1/R of 20/02/2006 involves the whole FUA.



The Environmental Energy Annex concerns only the City of Turin.

C5) WASTEWATER COLLECTION

25) Percentage of households and percentage of industries, connected to the wastewater collection network [%]

In 2018 the extent of the sewerage network per inhabitant served (meters per inhabitant) which, at least indicatively, measures the collection capacity of civil and industrial waste, remained stable compared to the previous year. However, it is believed that it may grow in the next years, in relation to the works envisaged in the investment plan; on the other hand, its possible contraction can be traced back to the rationalization of the purification infrastructures on the territory.



☐ Measured at FUA level

☒ Estimated at city of Turin level

Estimate procedure and hypotheses:

Source of data:

SMAT Torino sustainability report – year 2018

C6) DUAL WASTEWATER COLLECTION SYSTEM

26) Description of eventual dual system wastewater collection network within the FUA [-]

The sewage system is the complex of works with which part of the rainwater (white) and domestic and industrial (black) wastewater are treated.

In order to optimize the treatment of waste water, these are divided into two separate dedicated networks; in this way the dilution of black water (which makes the purification processes more expensive) and unnecessarily "dirty" rainwater (which by its nature is little polluted and requires simpler treatments) is avoided. For this reason, SMAT, in recent years, foresees the separation of the two types of network for new sewage constructions and for the remaking of the older ones.

SMAT manages a sewer development of 9.526 kilometers of municipal networks, white, black and mixed, corresponding to 4.2 meters per inhabitant served

☐ Measured at FUA level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data: SMAT Torino



C7) WASTEWATER TREATMENT PLANTS

27) List of wastewater treatment plants and their population equivalent capacity compared to the actual population [-]

Class	Municipality of location of the plant	Plant name	Municipalities served	Total treated load (ab.eq.)
> 150.000 ab.eq.	Castiglione T.se	Po Sangone	Beinasco, Borgaro T.se, Bruino, Cambiano (parziale), Candiolo, Caselle T.se, Castiglione T.se (parziale), Chieri (Pessione), Cinzano, Druento, Gassino, Givoletto, Grugliasco, La Cassa (parziale), La Loggia, Leini, Moncalieri, Nichelino, Orbassano, Pianezza (parziale), Piobesi T.se, Piossasco, Poirino, Rivalba, Rivalta, Robassomero, S. Benigno C.se (parziale), S. Francesco al Campo, S. Gillio, S. Maurizio C.se (parziale), S. Mauro T.se, S. Raffaele Cimena, Sangano, Santena, Sciolze, Settimo T.se, Torino, Trana, Trofarello, Venaria Reale, Villastellone, Vinovo, Volpiano.	1.931.129
	Collegno	C.I.D.I.U.	Collegno, Druento (parziale), Grugliasco, Reano, Rivoli, Villarbasce.	168.246
15.000<ab.eq.<150.000	Rosta	Rosta	Almese, Avigliana, Borgone di Susa, Bruzolo, Bussoleno, Buttigliera Alta, Caprie, Chianocco, Chiusa S. Michele, Condove, Mattie, Meana di Susa, Mompantero, Rosta, Rubiana, S. Didero, S. Giorio, Sant'Ambrogio, Sant'Antonino, Susa, Vaie, Venaus, Villar Dora, Villar Focchiardo.	84.729
	Pinerolo	Porte	Inverso Pinasca, Perosa Argentina, Pinasca, Pinerolo, Pomaretto, Porte, S. Germano Chisone, Villar Perosa.	91.722
	Chieri	Fontaneto	Andezeno, Baldissero T.se, Chieri (parziale), Marentino (parziale), Montaldo T.se, Pavarolo, Pino T.se.	54.135
	Feletto	Feletto-Rivarolo	Agliè, Bairo, Baldissero C.se (area PIP), Bosconero (fraz. Mastri), Castellamonte, Ciconio, Favria, Feletto, Lusigliè, Oglianico, Ozegna, Pertusio, Rivarolo C.se, Salassa, S. Giorgio C.se, S. Giusto C.se, S. Ponso, Torre C.se, Valperga (parziale).	54.820
	Pianezza	Pianezza	Alpignano, Caselette, La Cassa (parziale), Pianezza (parziale), Rivoli (parziale), Val della Torre	53.176
	S.Maurizio C.se	Ceretta-S.Maurizio C.se	Ciriè, S. Carlo C.se, S. Francesco al Campo (parziale), S. Maurizio C.se (parziale).	38.611
	Chivasso	Arianasso	Castagneto Po, Chivasso.	28.487
	Carmagnola	Ceis	Carmagnola.	27.778
	Ivrea	Ivrea est	Albiano d'Ivrea Burolo, Cascinette d'Ivrea, Chiaverano, Ivrea (est).	24.899
	Giaveno	Coccarda	Coazze, Giaveno (parziale), Valgioie.	22.350
	Cavour	Castellazzo	Angrogna, Cavour (parziale), Garzigliana (parziale), Luserna S. Giovanni, Torre Pellice (parziale).	19.277
	Nole	Loc. Battitore	Balangero, Grosso (parziale), Mathi, Nole, Villanova C.se.	17.583



	Valperga	Rivarotta– Gallena	Borgiallo, Canischio, Cuornè, Pont C.se (parziale), S. Colombano Belmonte, Valperga (parziale).	17.472
	Mazzè	Caluso – Mazzè	Barone C.se, Caluso, Mazzè, Montalenghe, Orio C.se.	16.568
10.000<ab.eq. <15.000	Oulx	Gad	Oulx, Sauze d'Oulx.	13.213
☒ Measured at FUA level ☐ Estimated at FUA level		Estimate procedure and hypotheses: Source of data: SMAT Torino		

28) What kind of wastewater treatment is realised, what is planned? [-]	
In recent years, numerous small purification plants have been decommissioned which, due to their size and technology, could not allow high purification yields, with the transfer of waste water to the centralized plant of Castiglione Torinese or to other plants with greater treatment potential. In particular, in 2018 small purifiers were dismissed in the Municipalities of Foglizzo, San Carlo, La Cassa, Front, Viù, Ingria and Rubiana.	
☒ Measured at FUA level ☐ Estimated at FUA level	Estimate procedure and hypotheses: Source of data: SMAT Torino

C8) TREATED EFFLUENT

29) Annual volume of waste water treated by the wastewater plants [m ³]	
Water treated by the Castiglione T.se plant: 227.498 million mc Water treated by the Collegno plant: 13.632 million mc Water treated by other plants: 116.566 million mc.	
☒ Measured at Metropolitan City of Turin level ☐ Estimated at FUA level	Estimate procedure and hypotheses: Source of data: SMAT Torino – year 2018



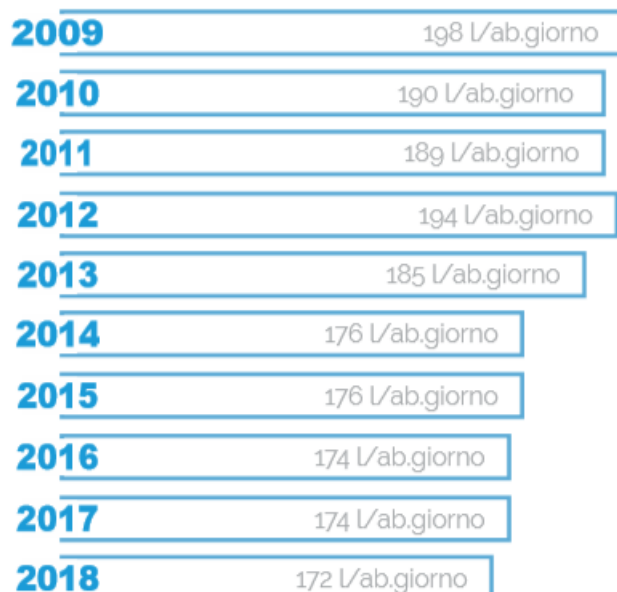
D. WATER CONSUMPTION

D1) FRESHWATER EXTRACTED

30) Annual volume of freshwater extracted from the ground, surface water, other sources. (Specify sources) [m ³]	
Most of the water withdrawn from the environment is of underground origin, i.e. from wells and springs (overall about 82%). Only 17,7% is of superficial origin (rivers, streams, rii). Water produced from wells: 71% Water produced from surface withdrawals: 17,7 % Water produced from springs: 11,3%.	
☒ Measured at Metropolitan City of Turin level ☐ Estimated at FUA level	Estimate procedure and hypotheses: Source of data: SMAT Torino – year 2018

D2) FRESHWATER USED/CONSUMED BY POPULATION

31) Daily volume of freshwater used by each person for civil uses [l/day per capital]
In 2018, the water supplied by SMAT was 177,2 million cubic meters in total, of which almost 79,12% was used for domestic use. Considering that the residents of the municipalities served by SMAT are 2.247.449, an average of 171 l of drinking water per person for civil use was consumed per day in the Metropolitan city of Turin.



☐ Measured at FUA level

☒ Estimated at Metropolitan City of Turin level

Estimate procedure and hypotheses:

Source of data:

SMAT Torino – year 2018

32) Consumption of bottled water for drinking purposes [l/day per capita]

Starting from national considerations, it has been estimated that for 2018 in the FUA the annual water consumption was equal to: 290.000.000 of 1,5-liter bottles (approximately 0,66 liter/day per capita).

☐ Measured at FUA level

☒ Estimated at FUA level

Estimate procedure and hypotheses:

It was considered that in Italy the production of bottled water was equal to 14.800 million liters and that the average per capita consumption was equal to 244 liters.

It has been estimated that 44% of the population uses tap water and that in 2018 the water distributed in the FUA by the SMAT water houses was approximately 106934 liters.

33) Initiatives to reduce consumption of bottled water [-]

175 water points have been installed in the Metropolitan City of Turin.

The water points are designed to support the consumption of tap water for food purposes and allow the supply of "zero kilometers", natural, sparkling water at room temperature or refrigerated. Preferably located in gardens, squares and places of great aggregation, they also represent an opportunity to redevelop the spaces that host them. It's estimated that a water point, with a normal draw of about 4,000 liters of water per day, allows savings of about 1 million plastic bottles per year.

<https://www.smatorino.it/punti-acqua/>



Please specify which municipalities within the FUA are involved in these initiatives.

Airasca, Almese, Avigliana, Baldissero Torinese, Beinasco, Borgaro Torinese, Brandizzo, Buttigliera Alta, Cafasse, Cambiano, Cantalupa, Caprie, Caselette, Castagneto Po, Castagnole Piemonte, Castiglione Torinese, Chieri, Chivasso, Cinzano, Collegno, Cumiana, Druento, Foglizzo, Front, Grugliasco, Leini, Lombardore, Mappano, Marentino, Moncalieri, Montaldo Torinese, Nichelino, None, Orbassano, Pavarolo, Pecetto Torinese, Pianezza, Piossasco, Rivalba, Rivarossa, Rivoli, Robassomero, Rosta, San Benigno Canavese, San Francesco al Campo, San Gillio, San Maurizio Canavese, San Mauro Torinese, San Raffaele Cimena, San Sebastiano da Po, Sangano, Sciolze, Settimo Torinese, Torino, Torrazza Piemonte, Trana, Trofarello, Val della Torre, Venaria Reale, Villarbasse, Volpiano.

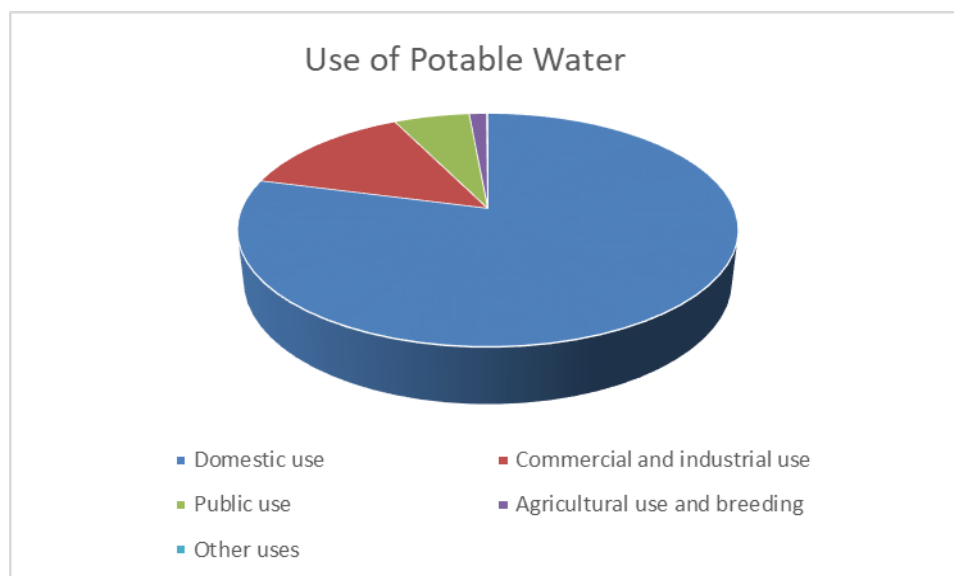
D3) WATER USE SHARES (CIVIL, INDUSTRY, AGRICULTURE, ...)

34) Percentages of water used by the civil, industry, and agriculture sectors [%]

Table

Use of Potable Water	
Domestic use	79,12%
Commercial and industrial use	13,61%
Public use	5,83%
Agricultural use and breeding	1,35%
Other uses	0,09%

Chart



☒ Measured at Metropolitan City
of Turin level

☐ Estimated at FUA level

Estimate procedure and hypotheses:

Source of data:

SMAT Torino – year 2018



D4) WATER STRESS INDICATOR

35) Class of water stress of the FUA according to Falkenmark Indicator (water availability per capita per year within the FUA) [-]

Falkenmark Indicator: based on the measure of water availability per capita per year within the FUA.

Index (m ³ /capita/year)	Class
>1,700	No stress
1,000 – 1,700	Stress
500 – 1,000	Scarcity
< 500	Absolute scarcity

Falkenmark indicator: water availability (m³) per capita per year

From PTA Regione Piemonte, 422 l / day are available in the Turin ATO₃ for the integrated water service (about 154 m³ / inhabitant / year). But it does not consider potential availability (water balance) .WI + index for basins and sub-basins has been calculated in the revision of the PTA

☐ Measured at FUA level

Estimate procedure and hypotheses:

Source of data:

☒ Estimated at Metropolitan City of Turin level

SMAT Torino – year 2018

D5) WATER MANAGEMENT COMPANIES

36) List of the private/public companies that manage the anthropic water cycle (extraction, sanitation, distribution, collection, depuration) [-]

Companies	Area served	Public/private	Function
SMAT Torino S.p.A.	84 Municipalities	Private companies owned by the municipalities served.	Integrated water service manager
Società per la condotta di acque potabili in Alpignano s.r.l.	1 Municipality: Alpignano	Private companies owned by the municipality served.	Integrated water service manager
Consorzio Comuni acquedotto Monferrato	2 Municipalities: Monteu da Po Lauriano	Public	Integrated water service manager
Municipality of Vallo Torinese	1 Municipality: Vallo Torinese	Public	Integrated water service manager
Municipality of Varisella	1 Municipality: Varisella	Public	Integrated water service manager

Is the list complete at FUA level?

Yes.



E. CLIMATE CHANGE

E1) ISSUES ARISING DUE TO CLIMATE CHANGE

37) Description of the issues, if any, raised by climate change (e.g. floods, high temperature, water scarcity, ...) [-]

In 2018 Arpa Piemonte prepared the climate vulnerability analysis for Turin. The study highlights the rapidity with which local weather events are responding to global warming and indicates the forecast trend for the coming years.

From this analysis it emerges that in the city environment the main climatic risks identified are heat waves and intense precipitation events.

In parallel, the possible impacts were assessed, caused by the greater intensity and frequency of extreme events, on various areas: quality of life, socio-economic system, health, air quality, urban green, transport infrastructures, industrial processes, management of rainwater, etc.

In the FUA context, the risk associated with drought and the scarcity of water resources should not be underestimated.

The specific climatic challenges for the city concern the need to make the city fresher and livable even during a heat wave event and the city safer and able to manage the waters during extreme meteoric events.

F. RULES, LAWS AND GOOD PRACTICES

F1) PRICING SYSTEM FOR WATER

38) Pricing system for different water uses (e.g. Irrigation, Civil, Industrial) [€/m³]

The tariff system of the integrated water service (Drinking water + sewerage) updated to 2018 is shown in attachment n.2.

The tariffs are partly fixed and partly variable according to actual consumption and types of users.

Is the pricing system described above valid for the entire FUA? Please specify

The tariff system is defined by ATO3-Torino (Turin authority) and it is valid for the entire FUA.



F2) RESTRICTION IN WATER USE

39) Description of restrictions in water use, if any [-]
During the summer, on the occasion of prolonged periods of drought, on the indication of the manager of the integrated water service, the Municipalities affected by water scarcity issues specific ordinances to prohibit the consumption of drinking water for uses other than human consumption.
Are the restrictions described above valid for the entire FUA? Please specify This type of restriction occurs punctually where water scarcity occurs.

F3) LEGISLATION ABOUT DUAL WATER DISTRIBUTION SYSTEM

40) Description of the legislation about dual water distribution system, if any [-]
Not available
Is the legislation described above valid for the entire FUA? Please specify

F4) LEGISLATION ABOUT WATER REUSE

41) Description of the legislation about water reuse, if any [-]
Not available
Is the legislation described above valid for the entire FUA? Please specify

F5) LEGISLATION ABOUT FIRST FLUSH RAINWATER COLLECTION (e.g. streets)

42) Description of the legislation about first rainwater collection, if any [-]
With the Regional Law N.1/R of 20/02/2006, specific treatment and delivery of first-time water relating to certain production activities is provided in the public sewer.
Is the legislation described above valid for the entire FUA? Please specify The Regional Law N.1/R of 20/02/2006 involves the whole FUA.

F6) RULES FOR GREEN SPACES IRRIGATION

43) Description of the rules about urban green spaces irrigation, if any [-]
Art.8 bis of the Environmental Energy Annex to the City of Turin Building Regulations stipulates that for new construction and major



renovations it is mandatory to store and reuse for irrigation purposes of meteoric waters, in the minimum measure of 10 litres of accumulation per sqm of green areas.

Are the rules described above valid for the entire FUA? Please specify

The Environmental Energy Annex concerns only the City of Turin

F7) DIFFUSION OF WATER SAVING GOOD PRACTICES

44) List of good practices in place for water saving [-]

Water houses

Since 2009, the Turin area has hosted several Water Points or "water houses", systems for distributing natural, sparkling water at room or chilled temperature to the public (the supply of chilled natural water is free of charge), made to support the consumption of tap water for food purposes and which allow the supply of "zero kilometer" network water.

<https://www.smatorino.it/punti-acqua/>

Central Registry Fountain

In April 2019, a fountain was installed at the offices of the Central Registry of Turin for the free distribution of water, for employees and users. The initiative is part of "Urban Wins", a European project that aims to reduce the production of waste in the city.

<https://www.urbanwins.eu/>

Green Public Procurement

Since 2004 the City of Turin has joined the A.P.E. (Acquisti Pubblici Ecologici) which provides specific procedures for the purchase of goods and services that take into account, in addition to monetary costs, also the environmental impacts that these can generate over the life cycle. The A.P.E. outlines the environmental criteria divided between minimum technical specifications and evaluation criteria of the most economically advantageous offer or guidelines to be followed for green purchases by product / service category.

<http://www.comune.torino.it/ambiente/ape/index.shtml>

Sustainability in school canteens

In school canteens the meat is completely traced and comes from farms that comply with a specification that provides that the entire production cycle takes place in Italy. Also most of the fruit and vegetable products are produced with organic method or with the integrated production method, i.e. an agricultural production system with low environmental impact, they are entirely Piedmontese (cultivated, packaged and distributed in Piedmont).

The use of locally sourced products, i.e. supplies close to direct producers, favors forms of cooperation between the growers themselves, allows you to limit the intermediate steps, also educates the knowledge of typical products, guarantees freshness and seasonality of the products, offers a guarantee quality and food safety, ultimately reducing pollution levels in support of the environment. The remaining fruit and vegetables must come from organic crops, that is, they must be grown without using pesticides, from the supply chain.

The water comes entirely from the city distribution network, allowing significant savings in plastic and energy.

<http://www.comune.torino.it/servizieducativi/ristorazione scolastica/index.html>

Project "Growing in the City" - Climate change

Within the "Growing in the City" project, a series of meetings have been included, proposed by the Environment Area of the Municipality of Turin, addressed to primary school children in the city on the topic of climate change and sustainable lifestyles. The in-depth themes also touch, through the quiz game aimed at students, the topic of access to water and daily consumption and simple solutions are provided on saving water in our routine.

<http://www.comune.torino.it/crescere-in-citta/scuole-primarie/citta-torino-altri-servizi/il-clima-cambia-siamo-tutti-responsabili/>

Sustainable tourism

The Environment Department of the City of Turin in collaboration with the Culture and Tourism Department Turin has launched a project to promote and develop sustainable tourism in the city, with the creation of a specific dedicated section on the Turismo Torino website. Even tourism can in fact have a heavy environmental impact on the urban ecosystem. The experience of other cities, especially in Northern Europe, shows that green tourism triggers a positive economic return for hotels, restaurants and services.

<http://www.comune.torino.it/ambiente/turismosost/index.shtml>

EU Ecolabel for accommodation

The City of Turin promotes the diffusion of the EU Ecolabel certification for the "accommodation service". European Ecolabel is the ecolabel to guarantee that a structure intended for tourist accommodation is managed with the utmost attention for environmental protection.

<http://www.comune.torino.it/ambiente/turismosost/ecolabeleuropeo/index.shtml>

Sustainable events

In order to pursue the objectives of utmost care in the preservation of the environment, of attention to sustainable development and



attention to other global challenges, first of all to climate change, the city of Turin intends to obtain certification of the sustainable management system, according to the UNI ISO 20121: 2013 standard for public events organized by the Municipality, such as the Turin Jazz Festival, ToDays, Torino Estate Reale and Mito Settembre Musica.

Torino Plastic free Challenge

The City of Turin adheres to the "Plastic free challenge" campaign launched by the Ministry of the Environment and gives some guidelines for sharing its objectives. With this campaign, the ministry intends to free its offices from disposable plastic by activating some good practices in its offices and inviting other administrations and institutions to do the same.

<https://www.minambiente.it/content/plastic-free-challenge>

Ecosystem services

The City of Turin is committed to getting to know its greenery better, and in particular the value generated for the community by the natural capital present in the city. For this purpose, an activity is underway to carry out a fact-finding study that:

- map the green of the city, highlighting its ecosystem functions, present or to be increased;
- identify the value generated;
- establishes how to increase its ecological value;
- establishes how to preserve it in urban planning transformations.

Smart Tree project

The city of Turin has launched the Smart Tree project, intended as a virtuous container and chain of good environmental practices related to the "tree" theme, which entail the compensation of large events (events, concerts, conferences, etc.) or large construction sites through the planting of trees in the city.

http://www.comune.torino.it/ucstampa/2014/article_553.shtml

My office is sustainable

The City of Turin has drawn up a small Guide to the Environmentally Friendly Office, in the belief that, without renouncing the comfort to which we are accustomed, we can all modify some wrong behaviors, often involuntary or due to the lack of correct information, but which if correctly implemented they will certainly contribute to improving the quality of work and life in our offices.

http://www.comune.torino.it/ambiente/bm~doc/2016_ilmioufficiostenibile-e-2.pdf

Use of NBS in urbanization works

In recent years, the City of Turin has carried out various experiments in the context of urbanization works with the aim of not losing the permeability of the soil and maximizing the collection and use of rainwater. Building solutions with green cover were also created.