

# Oslo climate page 1

Statistics for NOR\_Oslo.Fornebu.014880\_IWEC

Location -- OSLO/FORNEBU - NOR

{N 59° 54'} {E 10° 37'} {GMT +1.0 Hours}

Elevation -- 17m above sea level

Standard Pressure at Elevation -- 101121Pa

Data Source -- IWEC Data

WMO Station 014880

- Using Design Conditions from "Climate Design Data 2009 ASHRAE Handbook"

- If the design condition source is ASHRAE, the design conditions are carefully generated
- from a period of record (typically 30 years) to be representative of that location and
- be suitable for use in heating/cooling load calculations. If the source is not ASHRAE,
- please consult the referenced source for the reasoning behind the data.

Design Stat	ColdestMonth	DB996	DB990	DP996	HR_DP996	DB_DP996	DP990	HR_DP990	DB_DP990	WS004c	DB_WS004c				
WS010c	DB_WS010c	WS_DB996	WD_DB996												
Units	{}	{°C}	{°C}	{}	{°C}	{°C}	{m/s}	{°C}	{m/s}	{°C}	{deg}				
Heating	1	-17.2	-14.5	-19.9	0.6	-16	-17	0.8	-12.9	10.6	5.4	9.4	4.2	0.8	0

  

Design Stat	HottestMonth	DBR	DB004	WB_DB004	DB010	WB_DB010	DB020	WB_DB020	WB004	DB_WB004	WB010	DB_WB010							
WB020	DB_WB020	WS_DB004	WD_DB004	DP004	HR_DP004	DB_DP004	DP010	HR_DP010	DB_DP010	DP020	HR_DP020								
DB_DP020	EN004	DB_EN004	EN010	DB_EN010	EN020	DB_EN020	#Hrs_8-4_&_DB-12.8/20.6												
Units	{}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{m/s}	{deg}	{°C}	{}	{°C}				
{°C}	{}	{°C}	{°C}	{}	{°C}	{kJ/kg}	{°C}	{kJ/kg}	{°C}	{}									
Cooling	7	8.8	26.8	17.8	25	17	23.2	15.9	19.2	24.1	18.2	23.1	17.1	21.6	3.2	170	17.7	12.7	20.6
	16.2	11.5	19.4	15.2	10.8	18.5	54.5	23.7	51.2	23.1	48.1	21.3	894						

  

Design Stat	WS010	WS025	WS050	WBmax	DBmin_mean	DBmax_mean	DBmin_stddev	DBmax_stddev	DBmin05years	DBmax05years	DBmin10years					
DBmax10years	DBmin20years	DBmax20years	DBmin50years	DBmax50years												
Units	{m/s}	{m/s}	{m/s}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}					
Extremes	8.5	7.3	6.4	24.3	-18.7	29.5	4.2	2.7	-21.7	31.4	-24.2	33	-26.5	34.5	-29.6	36.4

- Monthly Statistics for Dry Bulb temperatures °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	4.9	10.7	13.8	21.3	22.6	26.5	28.2	25.0	20.3	14.7	9.2	8.7
Day:Hour	5:13	4:13	31:16	24:16	27:16	20:16	31:16	21:16	2:16	2:13	23:22	4:19
Minimum	-13.5	-9.9	-12.5	-3.1	2.6	5.1	8.1	8.2	-1.6	-2.4	-6.2	-17.0
Day:Hour	15:22	2:07	7:07	18:04	4:04	6:04	1:04	26:04	27:04	25:01	19:04	31:04
Daily Avg	-3.8	-0.9	0.9	4.6	11.9	14.7	17.5	16.5	11.0	6.7	1.8	-1.6

- Maximum Dry Bulb temperature of 28.2°C on Jul 31
- Minimum Dry Bulb temperature of -17.0°C on Dec 31

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### - Average Hourly Statistics for Dry Bulb temperatures °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
0:01- 1:00	-5.1	-2.1	-0.8	2.7	8.8	11.9	14.8	14.5	9.0	5.1	1.6	-1.6	
1:01- 2:00	-5.1	-2.2	-1.0	2.4	8.3	11.4	14.3	14.1	8.8	5.1	1.4	-1.6	
2:01- 3:00	-5.1	-2.2	-1.3	2.0	7.8	11.0	13.9	13.7	8.5	5.1	1.2	-1.7	
3:01- 4:00	-5.1	-2.3	-1.6	1.7	7.4	10.6	13.4	13.4	8.2	5.0	1.1	-1.8	
4:01- 5:00	-4.9	-2.2	-1.8	1.7	8.0	11.3	14.1	13.6	8.2	5.0	0.9	-1.8	
5:01- 6:00	-4.8	-2.2	-2.0	1.8	8.6	12.0	14.7	13.8	8.2	4.9	0.8	-1.8	
6:01- 7:00	-4.6	-2.2	-2.2	1.9	9.2	12.8	15.5	14.0	8.3	4.9	0.6	-1.8	
7:01- 8:00	-4.4	-1.9	-1.3	2.8	10.4	13.6	16.3	15.1	9.4	5.5	0.9	-1.7	
8:01- 9:00	-4.2	-1.6	-0.4	3.7	11.5	14.5	17.1	16.1	10.4	6.2	1.1	-1.7	
9:01-10:00		-3.9	-1.3	0.5	4.7	12.5	15.4	17.9	17.1	11.5	6.8	1.3	-1.6
10:01-11:00		-3.4	-0.6	1.5	5.4	13.3	16.1	18.5	17.7	12.2	7.4	1.9	-1.4
11:01-12:00		-2.9	0.2	2.5	6.2	14.0	16.8	19.2	18.4	13.0	8.0	2.4	-1.3
12:01-13:00		-2.4	0.9	3.5	7.0	14.8	17.5	19.8	19.0	13.8	8.5	2.9	-1.1
13:01-14:00		-2.3	1.2	3.8	7.3	15.1	17.7	20.1	19.3	14.0	8.8	2.9	-1.2
14:01-15:00		-2.1	1.4	4.0	7.7	15.3	17.8	20.4	19.6	14.3	9.1	2.9	-1.2
15:01-16:00		-2.0	1.6	4.3	8.0	15.6	18.0	20.7	19.8	14.5	9.4	2.8	-1.3
16:01-17:00		-2.4	1.0	3.8	7.6	15.4	17.7	20.5	19.5	13.9	8.8	2.6	-1.4
17:01-18:00		-2.7	0.4	3.3	7.1	15.2	17.4	20.3	19.1	13.3	8.2	2.3	-1.5
18:01-19:00		-3.1	-0.3	2.8	6.7	14.9	17.1	20.1	18.7	12.7	7.6	2.1	-1.6
19:01-20:00		-3.5	-0.6	2.1	5.9	13.9	16.2	19.3	17.8	11.9	7.1	2.0	-1.7
20:01-21:00		-3.8	-0.9	1.4	5.0	12.8	15.3	18.4	16.8	11.2	6.7	1.9	-1.8
21:01-22:00		-4.2	-1.3	0.8	4.2	11.8	14.5	17.5	15.8	10.5	6.3	1.8	-1.9
22:01-23:00		-4.4	-1.6	0.3	3.7	10.8	13.5	16.7	15.3	9.9	5.8	1.7	-2.0
23:01-24:00		-4.6	-1.8	-0.1	3.2	9.9	12.7	15.9	14.8	9.4	5.4	1.6	-2.0
Max Hour		16	16	16	16	16	16	16	16	16	16	13	13
Min Hour		1	4	7	4	4	4	4	4	4	7	7	24

### - Monthly Statistics for Extreme temperatures °C

#Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max >= 32												
Max <= 0	20	8	3								4	14
Min <= 0	30	26	23	14					2	5	20	24
Min <=-18												

### - Monthly Statistics for Dew Point temperatures °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	3.2	2.8	7.4	8.0	14.0	14.3	18.9	17.0	13.4	10.3	7.8	6.8
Day:Hour	20:19	3:22	29:16	24:16	28:19	23:19	20:19	1:20	12:19	1:13	23:17	5:19
Minimum	-14.5	-14.8	-14.8	-12.0	-7.7	-6.4	0.1	-0.2	-3.3	-13.8	-7.7	-18.4
Day:Hour	16:07	5:17	18:23	8:24	1:03	17:13	5:07	24:19	20:21	3:17	25:03	31:04
Daily Avg	-4.7	-3.8	-4.4	-2.1	3.7	7.3	11.1	11.1	5.6	2.8	-0.2	-5.4

- Maximum Dew Point temperature of 18.9°C on Jul 20

- Minimum Dew Point temperature of -18.4°C on Dec 31

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### - Monthly Statistics for Relative Humidity %

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Maximum		100	100	100	99	96	98	99	100	98	100	100	100
Day:Hour		2:23	9:09	2:01	7:07	16:20	2:19	15:05	16:01	2:04	1:06	30:19	9:11
Minimum		50	25	23	21	16	16	27	26	31	15	38	18
Day:Hour		21:12	5:17	18:17	9:15	30:17	17:13	26:19	24:16	15:13	3:15	24:17	2:08
Daily Avg 94		81	69	65	61	64	69	73	71	79	88	76	

### - Average Hourly Relative Humidity %

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
0:01- 1:00	96	87	79	73	74	78	78	84	80	85	88	77	
1:01- 2:00	97	88	79	73	75	79	80	85	81	86	88	76	
2:01- 3:00	97	89	79	74	77	79	82	86	83	86	89	76	
3:01- 4:00	96	90	79	77	79	80	84	86	84	87	89	76	
4:01- 5:00	96	89	79	76	76	78	82	85	84	87	90	76	
5:01- 6:00	95	88	80	77	74	76	80	84	84	88	90	75	
6:01- 7:00	95	87	81	78	72	73	77	83	84	89	91	75	
7:01- 8:00	94	86	77	73	66	68	74	78	79	86	90	75	
8:01- 9:00	94	84	73	69	61	63	70	74	75	84	90	75	
9:01-10:00		93	83	71	67	57	59	67	70	71	82	90	76
10:01-11:00		93	79	66	62	54	56	64	67	67	79	88	76
11:01-12:00		92	76	62	58	51	54	62	65	64	76	86	75
12:01-13:00		91	73	59	57	49	52	60	62	60	73	85	76
13:01-14:00		90	71	56	53	48	52	59	61	59	71	84	76
14:01-15:00		89	70	55	51	47	52	59	59	57	69	84	76
15:01-16:00		89	70	56	51	47	52	58	57	56	67	84	76
16:01-17:00		90	72	56	51	47	54	58	59	57	69	85	77
17:01-18:00		91	75	58	53	48	55	58	60	60	72	86	77
18:01-19:00		92	79	61	56	49	57	59	62	62	75	88	78
19:01-20:00		93	80	64	58	53	60	61	67	65	76	88	77
20:01-21:00		94	82	68	62	57	63	64	71	69	78	88	76
21:01-22:00		95	85	74	67	62	65	67	77	73	79	89	76
22:01-23:00		96	85	75	67	66	70	70	79	75	81	88	77
23:01-24:00		96	86	77	69	70	74	74	81	78	83	88	77
Max Hour		3	4	7	7	4	4	4	4	5	7	7	19
Min Hour		16	15	15	16	16	15	16	16	16	16	15	6

### - Monthly Indicators for Precipitation/Moisture (kPa)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0.5	0.5	0.5	0.5	0.8	1.0	1.4	1.3	0.9	0.8	0.6	0.5

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### - Monthly Statistics for Wind Chill/Heat Index temperatures °C \*\*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Minimum WC	-17	-21	-21	-14	-13	-4	6	5	11	-2	-5	-10	-23
Day:Hour	15:22	21:01	12:10	3:01	1:22	4:10	1:06	18:04	21:10	4:08	11:01	22:22	
Average WC	-4	-4	-4	-2	0	4	7	6	11	5	3	0	-5
Avg Del WC	3	4	4	4	4	3	2	3	-1	3	3	3	5
# Hours WC	196	288	361	411	411	148	17	6	1	144	359	236	541
Maximum HI								29					
Day:Hour							31:16						
Average HI								28					
Avg Del HI								1					
# Hours HI								4					

### - \*\*WindChill/HeatIndex Temps -- statistics...only those different from Air Temps

### - Monthly Wind Direction % {N=0 or 360,E=90,S=180,W=270}

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
North	32	34	39	30	35	26	18	28	34	22	39	35
NorthEast	8	5	5	9	13	4	7	11	16	8	14	14
East	5	4	4	5	8	4	6	6	8	7	5	6
SouthEast	3	6	6	2	7	6	4	7	7	7	6	6
South	6	11	15	12	20	39	29	28	10	28	4	12
SouthWest	12	14	7	10	6	2	10	7	7	10	6	5
West	23	16	13	15	5	7	16	8	6	13	15	10
NorthWest	11	11	11	16	6	12	10	6	12	6	11	11

### - Monthly Statistics for Wind Speed m/s

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Maximum	7.7	10.3	8.7	11.8	7.7	8.7	15.9	10.3	9.8	12.3	9.3	12.3	
Day:Hour		9:10	3:22	18:19	2:13	25:13	29:13	14:04	30:13	20:16	3:13	24:01	6:01
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Day:Hour		1:07	1:22	2:04	4:10	1:07	1:04	4:01	1:19	2:07	1:10	1:01	3:01
Daily Avg	1.2	2.0	2.1	2.6	2.3	2.8	2.5	2.3	2.6	2.7	1.4	3.0	

- Maximum Wind Speed of 15.9 m/s on Jul 14

- Minimum Wind Speed of 0.0 m/s on Jan 1



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### - Monthly Calculated "undisturbed" Ground Temperatures\*\* °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.5 m	-3.0	-1.2	2.4	5.7	12.0	15.3	16.2	14.5	10.7	5.8	1.0	-2.1
2.0 m	-0.5	0.0	2.0	4.2	9.0	12.1	13.7	13.3	11.1	7.8	4.0	1.0
4.0 m	2.1	1.8	2.7	3.9	7.1	9.5	11.1	11.5	10.5	8.5	6.0	3.7

- \*\*These ground temperatures should NOT BE USED in the GroundTemperatures object to compute building floor losses.

- The temperatures for 0.5 m depth can be used for GroundTemperatures:Surface.

- The temperatures for 4.0 m depth can be used for GroundTemperatures:Deep.

- Calculations use a standard soil diffusivity of 2.3225760E-03 {m\*\*2/day}

### - Monthly Heating/Cooling Degree Days/Hours

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HDD base 10C		428	304	282	167	29	0	0	0	23	104	247	360
HDD base 18C		676	528	530	402	189	105	37	51	209	350	487	608
CDD base 10C		0	0	0	5	88	141	232	203	54	2	0	0
CDD base 18C		0	0	0	0	0	6	21	6	0	0	0	0
CDH base 20C		0	0	0	5	55	138	417	200	0	0	0	0
CDH base 23C		0	0	0	0	0	42	72	21	0	0	0	0
CDH base 27C		0	0	0	0	0	0	2	0	0	0	0	0

- 724 annual cooling degree-days (10°C baseline)

- 1942 annual heating degree-days (10°C baseline)

- 33 annual cooling degree-days (18°C baseline)

- 4171 annual heating degree-days (18°C baseline)

### - Climate type "Dfb" (Köppen classification)\*\*

- Moist continental (warm summer, cold winter, no dry season, lat. 30-60°N)

- \*\*Note that the Köppen classification shown here is derived algorithmically from the source weather data.

- It may not be indicative of the long term climate for this location.

### - Climate type "6A" (ASHRAE Standards 90.1-2004 and 90.2-2004 Climate Zone)\*\*

- Cold - Humid, Probable Köppen classification=Dfa/Dfb, Humid Continental (Warm Summer/Cool Summer)

- \*\*Note that the ASHRAE classification shown here is derived algorithmically from the source weather data.

- It may not be indicative of the long term climate for this location.

### - Typical/Extreme Period Determination

#### - Summer is Jun:Aug

Extreme Summer Week (nearest maximum temperature for summer)

Extreme Hot Week Period selected: Jul 27:Aug 2, Maximum Temp= 28.20°C, Deviation=| 8.340|°C

Typical Summer Week (nearest average temperature for summer)

Typical Week Period selected: Aug 3:Aug 9, Average Temp= 16.26°C, Deviation=| 0.005|°C

#### - Winter is Dec:Feb

Extreme Winter Week (nearest minimum temperature for winter)

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Extreme Cold Week Period selected: Jan 13:Jan 19, Minimum Temp= -17.00°C, Deviation=| 9.398|°C

Typical Winter Week (nearest average temperature for winter)

Typical Week Period selected: Feb 17:Feb 23, Average Temp= -2.13°C, Deviation=| 0.435|°C

- Autumn is Sep:Nov

Typical Autumn Week (nearest average temperature for autumn)

Typical Week Period selected: Oct 27:Nov 2, Average Temp= 6.51°C, Deviation=| 0.185|°C

- Spring is Mar:May

Typical Spring Week (nearest average temperature for spring)

Typical Week Period selected: Mar 29:Apr 4, Average Temp= 5.82°C, Deviation=| 0.996|°C