

## Appendix 2 – Tables

**Table 1.** Natural gas, electricity, and water consumption data for Davutpaşa Campus

	Natural gas consumption		Electricity consumption		Water consumption	
	(m <sup>3</sup> )		(kWh)		(m <sup>3</sup> )	
	2019	2020	2019	2020	2019	2020
January	119,757.356	113,927.000	1072,549.8	963,233.1	11,928.00	16,183
February	108,079.050	191,284.000	957,230.1	937,751.4	12,325.00	15,697.00
March	108,030.437	190,741.000	971,554.5	756,771.3	12,723.00	17,643.00
April	141,028.155	80,870.000	855,696.6	499,346.1	29,100.00	16,670.00
May	74,881.906	2,847.000	798,668.1	380,238.3	19,409.00	35,273.00
June	33,431.305	128,494.000	873,664.2	472,932.9	25,996	46,564.00
July	5,060.000	37,783.000	1027,423.8	544,886.1	32,583.00	34,397.00
August	980	396	890,451.9	548,363.7	35,039.00	38,871.00
September	467.000	446.000	881,343.9	521,495.1	27,833.00	43,346.00
October	675	131	789,622.2	508,785.3	26,958.00	51,664.00
November	609.000	1,354.000	767,079.9	607,006.8	34,357.00	38,871.00
December	233,946.350	74,595.000	942,760.8	626,550.3	30,657.50	35,273.00
<b>Total</b>	<b>826,945.56</b>	<b>822,868.00</b>	<b>10,828,045.8</b>	<b>7,367,360.40</b>	<b>298,908.50</b>	<b>390,452.00</b>

**Table 2.** Carbon footprint values due to electricity consumption of Davutpaşa Campus in 2019

2019	Electricity consumption (kWh)	Emission factor (DEFRA 2016) (kg CO <sub>2</sub> /kWh)	Emission factor (TUIK 2012) (kg CO <sub>2</sub> /kWh)	Emission value (DEFRA 2016) (kg CO <sub>2</sub> )	Emission value (TUIK 2012) (kg CO <sub>2</sub> )	Carbon footprint (DEFRA 2016) (t CO <sub>2e</sub> )	Carbon footprint (TUIK 2012) (t CO <sub>2e</sub> )
January	1,072,549.8	0.472	0.68	506,243.5	729,333.9	506.2435	729.3339
February	957,230.1	0.472	0.68	451,812.6	650,916.5	451.8126	650.9165
March	971,554.5	0.472	0.68	458,573.7	660,657.1	458.5737	660.6571
April	855,696.6	0.472	0.68	403,888.8	581,873.7	403.8888	581.8737
May	798,668.1	0.472	0.68	376,971.3	543,094.3	376.9713	543.0943
June	873,664.2	0.472	0.68	412,369.5	594,091.7	412.3695	594.0917
July	1,027,423.8	0.472	0.68	484,944	698,648.2	484.944	698.6482
August	890,451.9	0.472	0.68	420,293.3	605,507.3	420.2933	605.5073
September	881,343.9	0.472	0.68	415,994.3	599,313.9	415.9943	599.3139
October	789,622.2	0.472	0.68	372,701.7	536,943.1	372.7017	536.9431
November	767,079.9	0.472	0.68	362,061.7	521,614.3	362.0617	521.6143
December	942,760.8	0.472	0.68	444,983.1	641,077.3	444.9831	641.0773
<b>Total</b>	<b>10,828,045.8</b>	<b>0.472</b>	<b>0.68</b>	<b>5,110,838</b>	<b>7,363,071</b>	<b>5110.838</b>	<b>7363.071</b>

**Table 3.** Carbon footprint values due to electricity consumption of Davutpaşa Campus in 2020

2020	Electricity consumption (kWh)	Emission factor (DEFRA 2016) (kg CO <sub>2</sub> /kWh)	Emission factor (TUIK 2012) (kg CO <sub>2</sub> /kWh)	Emission value (DEFRA 2016) (kg CO <sub>2</sub> )	Emission value (TUIK 2012) (kg CO <sub>2</sub> )	Carbon footprint (DEFRA 2016) (t CO <sub>2e</sub> )	Carbon footprint (TUIK 2012) (t CO <sub>2e</sub> )
January	963,233.1	0.472	0.68	454,646	654,998.5	454.646	654.9985
February	937,751.4	0.472	0.68	442,618.7	637,671	442.6187	637.671
March	756,771.3	0.472	0.68	357,196.1	514,604.5	357.1961	514.6045
April	499,346.1	0.472	0.68	235,691.4	339,555.3	235.6914	339.5553
May	380,238.3	0.472	0.68	179,472.5	258,562	179.4725	258.562
June	472,932.9	0.472	0.68	223,224.3	321,594.4	223.2243	321.5944
July	544,886.1	0.472	0.68	257,186.2	370,522.5	257.1862	370.5225
August	548,363.7	0.472	0.68	258,827.7	372,887.3	258.8277	372.8873
September	521,495.1	0.472	0.68	246,145.7	354,616.7	246.1457	354.6167
October	508,785.3	0.472	0.68	240,146.7	345,974	240.1467	345.974
November	607,006.8	0.472	0.68	286,507.2	412,764.6	286.5072	412.7646
December	626,550.3	0.472	0.68	295,731.7	426,054.2	295.7312	426.0542
<b>Total</b>	<b>7,367,360.4</b>	<b>0.472</b>	<b>0.68</b>	<b>3,477,394.2</b>	<b>5,009,805</b>	<b>3,477.394</b>	<b>5,009.805</b>

**Table 4.** Emission amounts due to natural gas consumption of Davutpaşa Campus in 2019

2019	Natural gas consumption (m <sup>3</sup> )	t N <sub>2</sub> O (emission factor:0.00017)	t CH <sub>4</sub> (emission factor: 1.88496)	t CO <sub>2</sub> (emission factor: 1.88500)	t CO <sub>2e</sub> (emission factor: 1.88500)
January	119,757.356	0.020359	225.7378	225.7426	225.7426
February	108,079.050	0.018373	203.7247	203.729	203.729
March	108,030.437	0.018365	203.6331	203.6374	203.6374
April	141,028.155	0.023975	265.8324	265.8381	265.8381
May	74,881.906	0.01273	141.1494	141.1524	141.1524
June	33,431.305	0.005683	63.01667	63.01801	63.01801
July	5,060.000	0.00086	9.537898	9.5381	9.5381
August	980	0.000167	1.847261	1.8473	1.8473
September	467,000	7.94E-05	0.880276	0.880295	0.880295
October	675	0.000115	1.272348	1.272375	1.272375
November	609,000	0.000104	1.147941	1.147965	1.147965
December	233,946.350	0.039771	440.9795	440.9889	440.9889
<b>Total</b>	<b>826,945.56</b>	<b>0.140581</b>	<b>1558.759</b>	<b>1558.792</b>	<b>1558.792</b>

**Table 5.** Emission amounts due to natural gas consumption of Davutpaşa Campus in 2020

2020	Natural gas consumption (m <sup>3</sup> )	t N <sub>2</sub> O (emission factor:0.00017)	t CH <sub>4</sub> (emission factor: 1.88496)	t CO <sub>2</sub> (emission factor: 1.88500)	t CO <sub>2e</sub> (emission factor: 1.88500)
January	113,927.000	0.019368	214.7478	214.7524	214.7524
February	191,284.000	0.032518	360.5627	360.5703	360.5703
March	190,741.000	0.032426	359.5392	359.5468	359.5468
April	80,870.000	0.013748	152.4367	152.44	152.44
May	2,847.000	0.000484	5.366481	5.366595	5.366595
June	128,494.000	0.021844	242.2061	242.2112	242.2112
July	37,783.000	0.006423	71.21944	71.22096	71.22096
August	396	6.73E-05	0.746444	0.74646	0.74646
September	446.000	7.58E-05	0.840692	0.84071	0.84071
October	131	2.23E-05	0.24693	0.246935	0.246935
November	1,354.000	0.00023	2.552236	2.55229	2.55229
December	74,595.000	0.012681	140.6086	140.6116	140.6116
<b>Total</b>	<b>822,868.00</b>	<b>0.139888</b>	<b>1551.073</b>	<b>1551.106</b>	<b>1551.106</b>

**Table 6.** Carbon footprint values due to natural gas consumption of Davutpaşa Campus in 2019  
(Eggleston et al. 2006)

2019	Natural gas consumption (m <sup>3</sup> )	Natural gas amount (GJ)	Emission amount (kg)	Emission amount (t)
January	119,757.356	4,512.601	253,156.9	253.1569
February	108,079.050	4,072.548	228,470	228.47
March	108,030.437	4,070.717	228,367.2	228.3672
April	141,028.155	5,314.11	298,121.6	298.1216
May	74,881.906	2,821.64	158,294	158.294
June	33,431.305	1,259.732	70,670.95	70.67095
July	5,060.000	190.6669	10,696.41	10.69641
August	980	36.92758	2,071.637	2.071637
September	467.000	17.59712	987.1985	0.987199
October	675	25.43481	1,426.893	1.426893
November	609.000	22.94785	1,287.374	1.287374
December	233,946.350	8,815.379	494,542.8	494.5428
<b>Total</b>	<b>826,945.56</b>	<b>31,160.3</b>	<b>1,748,093</b>	<b>1,748.093</b>

**Table 7.** Carbon footprint values due to natural gas consumption of Davutpaşa Campus in 2020 (Eggleston et al. 2006)

2020	Natural gas consumption (m <sup>3</sup> )	Natural gas amount (GJ)	Emission amount (kg)	Emission amount (t)
January	113,927.000	4,292.906	240,832	240.832
February	191,284.000	7,207.811	404,358.2	404.3582
March	190,741.000	7,187.35	403,210.3	403.2103
April	80.870.000	3,047.279	170,952.3	170.9523
May	2,847.000	107.2784	6,018.317	6.018317
June	128,494.000	4,841.808	271,625.4	271.6254
July	37,783.000	1,423.709	79,870.06	79.87006
August	396	14.92176	837.1105	0.837111
September	446.000	16.80582	942.8062	0.942806
October	131	4.936237	276.9229	0.276923
November	1,354.000	51.02034	2,862.241	2.862241
December	74,595.000	2,810.829	157,687.5	157.6875
<b>Total</b>	822,868.00	31,006.65	1,739,473	1,739.473

**Table 8.** Carbon footprint values due to water consumption of Davutpaşa Campus in 2019

2019	Water consumption (m <sup>3</sup> )	Water consumption (L)	Emission factor	Emission amount (kg CO <sub>2e</sub> )	Emission amount (t CO <sub>2e</sub> )
January	11,928.00	11928000	0.0014	16,699.2	16.6992
February	12,325.00	12325000	0.0014	17,255	17.255
March	12,723.00	12723000	0.0014	17,812.2	17.8122
April	29,100.00	29100000	0.0014	40,740	40.74
May	19,409.00	19409000	0.0014	27,172.6	27.1726
June	25,996	25996000	0.0014	36,394.4	36.3944
July	32,583.00	32583000	0.0014	45,616.2	45.6162
August	35,039.00	35039000	0.0014	49,054.6	49.0546
September	27,833.00	27833000	0.0014	38,966.2	38.9662
October	26,958.00	26958000	0.0014	37,741.2	37.7412
November	34,357.00	34357000	0.0014	48,099.8	48.0998
December	30,657.50	30657500	0.0014	42,920.5	42.9205
<b>Total</b>	<b>298,908.50</b>	<b>2.99E+08</b>	<b>0.0014</b>	<b>418,471.9</b>	<b>418.4719</b>



**Table 9.** Carbon footprint values due to water consumption of Davutpaşa Campus in 2020

2020	Water consumption (m <sup>3</sup> )	Water consumption (L)	Emission factor	Emission amount (kg CO <sub>2e</sub> )	Emission amount (t CO <sub>2e</sub> )
January	16,183	16183000	0.0014	22656.2	22.6562
February	15,697.00	15697000	0.0014	21975.8	21.9758
March	17,643.00	17643000	0.0014	24700.2	24.7002
April	16,670.00	16670000	0.0014	23338	23.338
May	35,273.00	35273000	0.0014	49382.2	49.3822
June	46,564.00	46564000	0.0014	65189.6	65.1896
July	34,397.00	34397000	0.0014	48155.8	48.1558
August	38,871.00	38871000	0.0014	54419.4	54.4194
September	43,346.00	43346000	0.0014	60684.4	60.6844
October	51,664.00	51664000	0.0014	72329.6	72.3296
November	38,871.00	38871000	0.0014	54419.4	54.4194
December	35,273.00	35273000	0.0014	49382.2	49.3822
<b>Total</b>	<b>390,452.00</b>	<b>3.9E+08</b>	<b>0.0014</b>	<b>546632.8</b>	<b>546.6328</b>

**Table 10.** The amounts of food consumed and associated emission factors

<b>Year</b>	<b>Bread, (kg) (emission factor:0.84 kg CO<sub>2</sub>/kg bread)</b>	<b>Vegetables, (kg) (emission factor:0.25 kg CO<sub>2</sub>/kg vegetables)</b>	<b>Fish, (kg) (emission factor:3.30 kg CO<sub>2</sub>/kg fish)</b>	<b>Red meat, (kg) (emission factor:23.97 kg CO<sub>2</sub>/kg red meat)</b>	<b>Chicken, (kg) (emission factor:2.82 kg CO<sub>2</sub>/kg chicken)</b>
2018	80900	224,705	2289	45,850.70	56,974.14
2019	92200	310,808	2843	60,605.65	76,387.54
2020	4800	15,510	169,25	13,782.81	24,144.90

**Table 11.** Annual CO<sub>2</sub> emission amounts (kg CO<sub>2e</sub>)

<b>Year</b>	<b>Bread</b>	<b>Vegetables</b>	<b>Fish</b>	<b>Red meat</b>	<b>Chicken</b>
2018	67956	56176.25	7553.7	1099024.5	160666.68
2019	77448	77702	9381.9	1452701.85	215411.34
2020	4032	3877.5	558.525	330354.54	68086.08

**Table 12.** The emission values of the Rectorate's vehicle fleet

Rank	Vehicle type	Fuel type	Current km	Monthly average km	Engine volume	Weight	CO <sub>2e</sub> (t)	CO <sub>2</sub> (t)	CH <sub>4</sub> (t)	N <sub>2</sub> O (t)
1	Automobile	Diesel	283,280	990	1968	2110	2.67	2.65	0.00012	0.023
2	Automobile	Diesel	321,460	900	1968	2110	2.43	2.41	0.00011	0.021
3	Automobile	Diesel	322,689	950	1968	2170	2.56	2.54	0.00011	0.021
4	Automobile	Diesel	119,335	900	1598	2070	2.43	2.41	0.00011	0.021
5	Automobile	Diesel	210,275	450	1461	945	0.96	0.95	0.000054	0.01
6	Automobile	Diesel	250,000	400	1461	945	0.85	0.84	0.000048	0.009
7	Automobile	Diesel	230,782	450	1461	945	0.96	0.95	0.000054	0.01
8	Automobile	Diesel	235,516	400	1461	945	0.85	0.84	0.000048	0.009
9	Automobile	Diesel	240,000	425	1461	945	0.9	0.89	0.000051	0.0097
10	Automobile	Diesel	311,000	435	1461	945	0.93	0.92	0.000052	0.0099
11	Automobile	Diesel	266,050	440	1461	945	0.94	0.93	0.000052	0.01
12	Automobile	Diesel	258,008	950	1461	1170	2.02	2	0.00011	0.021
13	Automobile	Diesel	320,486	900	1968	2170	2.43	2.41	0.00011	0.021
14	Automobile	Diesel	42,545	250	1600	985	0.6	0.59	0.001	0.0015
15	Minibus	Diesel	250,888	400	2402	3300	1.368	1.36	0.00008	0.0086
16	Minibus	Diesel	196,681	425	2402	3300	1.45	1.44	0.00008	0.0092
17	Minibus	Diesel	251,500	450	2402	3300	1.54	1.53	0.00008	0.0097
18	Minibus	Diesel	415,241	430	2.5 T	2004	1.47	1.46	0.00008	0.0093
19	Minibus	Diesel	160,157	200	2461	2025	0.68	0.67	0.00004	0.0043
20	Pickup	Diesel	366,532	400	1461	1860	1.37	1.36	0.00008	0.0086
21	Pickup	Diesel	69,305	350	2771	3500	1.2	1.19	0.00007	0.0076
22	Pickup	Diesel	134,201	340	4334	3500	1.16	1.15	0.00007	0.0073
23	Pickup	Diesel	94,645	500	2143	3050	1.71	1.7	0.00009	0.0108
24	Pickup	Diesel	130,829	350	2402	3300	1.2	1.19	0.00007	0.0076
25	Pickup	Diesel	239,568	250	-	2300	0.86	0.85	0.00005	0.0054
26	Bus	Diesel	262,254	400	5193	6936	2.49	2.46	0.00008	0.0086
27	Bus	Diesel	168,663	300	5193	6936	1.87	1.84	0.00006	0.0064
28	Bus	Diesel	134,837	320	4570	5292	1.99	1.96	0.00006	0.0069
29	Bus	Diesel	130,791	330	4570	5292	2.06	2.02	0.00006	0.0071

**Table 13.** The transportation-related emissions of Davutpaşa Campus

2019 (t CO <sub>2e</sub> )		2020 (t CO <sub>2e</sub> )	
Rectorate's vehicle fleet	69.95	Rectorate's vehicle fleet	11.66
Personal vehicles of the staff	2673.9	Personal vehicles of the staff	445.652
Staff services	347.628	Staff services	57.938
Ring buses	233.9	Ring buses	39.88
Personal vehicles of the students	612.36	Personal vehicles of the students	136.1
Public buses	29.6	Public buses	6.57
Transportation of the students	2313.9	Transportation of the students	514.2
<b>Total emission</b>	<b>6281.24</b>	<b>Total emission</b>	<b>1211.97</b>

**Table 14.** The total emission values of the Davutpaşa Campus

Emission values	2019 (t CO <sub>2</sub> )	2020 (t CO <sub>2</sub> )
The emissions due to electricity consumption	5110.84	3477.4
The emissions due to natural gas consumption	1558.8	1551.1
The emissions due to water consumption	418.5	546.6
The emissions due to food consumption	1832.6	406.9
The emissions due to domestic wastes	52.4	20.96
The transportation-related emissions	6281.24	1211.97
<b>Total emission</b>	<b>15254.4</b>	<b>7214.97</b>

**Table 15.** Comparison with studies conducted in other universities in Turkey

University	Number of Students and Staff	Emission value (t CO <sub>2e</sub> /y)	Reference	Method
METU (2000-2014)	26500 students	56036.5 (2014)	(Turanlı 2015)	IPCC (2006)
Sakarya University, Esentepe Campus (2015)	79708 students 2018 staff	12330.73	(Sreng and Yiğit 2017)	IPCC (2006)
Manisa Celal Bayar University (2016)	46525 students 2968 staff	8953.906	(Binboğa and Ünal 2018)	IPCC (2006)
Çankırı Karatekin University (2017)	12856 students 1241 staff	5633.13	(Üreden 2019)	IPCC (2006)
Çanakkale 18 Mart University, Terzioğlu Campus (2016)	23285 students 2232 staff	10122.154	(Özçelik 2017)	IPCC (2006) /DEFRA (2016)
YTU Davutpaşa Campus (2019-2020)	34138 students 2386 staff	15244.4 (2019) 7213.3 (2020)	This study	IPCC (2006)/ DEFRA (2016)