



University: University of Pécs  
Country: Hungary

### 13.2 Low-carbon energy use

#### 13.2.1 Low-carbon energy tracking

Measure the amount of low carbon energy used across the university

The University of Pécs launched its **Green University Program** in 2016. The mission of the program is the encouragement of all innovations, good practices, initiatives and local policies regarding environmental sustainability; and furthermore, to shape and strengthen ecological awareness by the means of science and education. The university aspires to mitigate its carbon footprint and **supports technologies, services and consumer habits that reduce the use of natural resources, realizing decarbonisation goals.**

UP has consciously formulated its mitigation efforts, which are in line with the decarbonisation goals of the ‘Second National Climate Change Strategy’. The first main step of the University’s decarbonisation strategy is to exchange fossil fuels with renewable energy resources. The ratio of renewable energy resources used by the UP has been constantly increasing since 2016. More than 50% of the entire energy usage of the University is covered by renewable sources, of which **biomass** has the largest proportion, followed by **geothermal** and **solar energy**.

The following table contains the energy usage data (in GJ) of the University of Pécs, in 2024.

Energy usage, University of Pécs, 2024	GJ	GJ
<b>Electricity</b>		118 540
<b>Gas</b>		51 022
Bio diesel	0.5	
Clean biomass	158 569	
Solar power	7 161	
Geothermal	3 547	
Combine Heat and Power	679	
<b>Total Low-carbon Energy Usage</b>	<b>169 956</b>	
<b>Total Energy Usage</b>		<b>339 518</b>
<b>The ratio of renewable energy production divided by total energy usage per year</b>	<b>50.05%</b>	

Evidence:

- **Bio diesel**

The following table contains the data of the university’s bio-diesel pick-up truck

License plate number	Type of vehicle	Car make	Model	Vehicle propellant	Usage
<b>AE GJ 481</b>	pick-up truck	Toyota	ANIP HILUX	bio diesel	0.5 GJ



• Clean biomass

Picture extract from the table containing the clean biomass/district heating usage on the UP campus sites:

2.5. (3) Clean biomass: District Heating Usage of the University of Pécs - 2024																			
I.3. Number of campus site	FM-code of campus site	Name of campus site	Address of use of campus site	January	February	March	April	May	June	July	August	September	October	November	December	Sum	Sum	Sum (Clean biomass)	
				GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	GJ	kWh	kWh
1.	AKTH	Akác campus site	1. Akác Street, 2. Arnyas Road, Pécs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2.	ALTH	Alkotmány Street campus site	38. Alkotmány Street, Pécs	250	123	102	53	0	0	0	0	0	0	70	189	241	1 027	285 280	261 944
3.	APTH	Apáca campus site	8. Apáca Street; 3., 5. Vörösmarty Street,	235	118	105	42	7	0	0	0	0	43	127	164	840	233 332	214 246	
4.	BATH	Bajnok Street campus site	1. Bajnok Street; 7. József Attila Street,	714	487	497	420	87	58	72	84	179	414	734	872	4 619	1 282 982	1 178 035	
5.	BETH	Berek Street campus site	15. Berek Street, Pécs	309	169	144	84	14	2	1	1	2	92	256	317	1 389	385 703	354 153	
6.	BOTH	Boszorkány campus site	2., 2/2., -, 5104/2 HRSZ, Boszorkány Street; 42. Damjanich Street, Pécs	1083	849	751	363	147	86	53	59	123	439	1126	1113	6 192	1 719 969	1 579 276	
7.	BMTH	Breuer Marcell campus site	2., 2/B Breuer Marcell Promenade, Pécs	407	250	218	112	66	35	24	20	63	123	314	326	1 957	543 727	499 250	
8.	DATH	Damjanich campus site	30. Damjanich Street, Pécs	802	174	146	82	34	14	11	9	21	100	247	284	1 425	395 739	363 368	
9.	DOTH	Dohány Street campus site	5. Dohány Street, Pécs	223	122	108	68	22	8	7	7	8	70	165	204	1 012	281 230	258 225	
10.	EDTH	Édesanyák campus site	13-17. Édesanyák Road, 3/1. Rodostó Street, Pécs	1750	1134	1108	718	212	138	125	117	94	924	1459	1734	9 513	2 642 657	2 426 488	
11.	HATH	Hajnóczy József Street campus	37-39. Hajnóczy József Street, Pécs	224	176	162	63	17	5	0	3	11	130	189	214	1 194	331 625	304 498	
12.	IFTH	Ifjúság Road campus site	6., 6/A., 6/B., 4906 HRSZ, 4911 HRSZ, 2900 HRSZ, Ifjúság Road; 2., 2/D, 2/E, 2/F, 2/G Pácsirta Street; 1/A, 1/C, 1/D Fekete Street,	3903	2279	2137	1460	333	240	73	152	154	1688	3171	3773	19 365	5 379 185	4 939 167	
13.	JHTH	Jakabhegyi Road campus site	8. Jakabhegyi Road, Pécs	385	253	227	152	87	54	33	0	86	172	346	393	2 188	607 838	558 117	
14.	JITH	József Attila Street campus site	1. József Attila Street, Pécs	40	24	22	0	14	0	0	0	0	0	0	0	100	27 831	25 555	
15.	JUTH	Jurisics Miklós Street campus site	16. Jurisics Miklós Street, Pécs	335	200	189	126	51	21	18	16	21	122	259	328	1 687	468 604	430 272	
16.	KMTH	Mátvás Király campus site	15. Mátvás Király Street, Pécs	74	34	28	15	0	0	0	0	0	14	52	70	286	79 552	73 045	
17.	MSTH	Mária Street campus site	5-7. Mária Street, Pécs	106	51	42	24	0	0	0	0	0	26	74	98	421	116 943	107 377	
18.	MUTH	Munkácsy Mihály Street campus	2. Munkácsy Mihály Street, Pécs	538	369	353	260	37	31	27	26	50	298	440	509	2 939	816 443	749 658	
19.	NYTH	Nyar Street campus site	8. Nyár Street, Pécs	233	140	96	35	0	0	0	0	0	41	0	29	574	159 346	146 311	
20.	OZTH	Óz Street campus site	2. Óz Street, Pécs	359	175	140	74	15	7	4	4	8	80	265	341	1 474	409 325	375 843	
21.	PATH	Pácsirta campus site	1., 2917/2 HRSZ, 2917/3 HRSZ Pácsirta Street, 6.; 6/A Jakabhegyi Road; 20., 34.	774	463	421	286	177	131	112	130	245	534	1054	1249	5 577	1 549 285	1 422 553	
22.	RATH	Rákóczi (AJK-KTK) campus site	80. Rákóczi Road; 1. Square 48, Pécs	826	439	355	199	57	15	13	13	15	221	603	761	3 517	976 988	897 071	
23.	RKTH	Rákóczi Road campus site	2., 2/A Rákóczi Road; 1. Garay Street, 4144 HRSZ Erreth Lajos Street, Pécs	3028	1973	1799	1235	263	205	187	179	568	1443	2476	2817	16 171	4 492 035	4 124 586	
24.	RETH	Rét Street campus site	2. Rét Street, Pécs	773	397	363	230	12	8	6	6	104	263	571	697	3 430	952 724	874 791	
25.	RUTH	Rökös street campus site	2. Rökös Street, Pécs	738	430	372	143	24	0	0	0	0	348	625	728	3 408	946 808	869 359	
26.	RSTH	4. Rökös street campus site	4. Rökös Street, Pécs	240	140	121	46	8	0	0	0	0	113	203	237	1 108	307 741	282 568	
27.	SNTH	Stadion Street campus site	2. Street Stadion, Pécs	160	90	84	75	28	12	11	0	15	46	203	236	960	266 605	244 797	
28.	SKTH	Szántó Kovács János Street campus site	1/A, 1/B, 1/D Szántó Kovács János Street, Pécs	1481	964	812	480	187	112	48	49	198	691	1219	1399	7 640	2 122 314	1 948 709	
29.	SETH	Szepesy Street campus site	11-3. Szepesy Street; 6. Janus Pannonius Street, Pécs	236	159	143	20	0	0	0	0	0	134	210	252	1 154	320 575	294 352	
30.	SZTH	Riget Road campus site	12., 12/1. Sziget Road; 1., 5., 7. Honvéd Street; 2. Kurt Street, 13. Ifjúság Road, Pécs	8026	5166	4726	2778	667	526	400	397	826	1894	3635	4509	33 549	9 319 158	8 556 851	
31.	SGTH	SZVEI - Magyarúrói campus site	14., 14/A, 14/B Magyarúrói Street; 33. Felsőmakár, Pécs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
32.	PPTH	RIVE - Pázmány Péter campus	4., 50849 HRSZ Pázmány Péter Street, Pécs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
33.	SOTH	RIVE - Szentmiklós vineyard campus site	1., 1/A., 0115/1 HRSZ, 0115/2 HRSZ, 0115/4 HRSZ, 0115/5 HRSZ, 0115/6 HRSZ, 0115/7 HRSZ, 0115/8 HRSZ, 0115/9 HRSZ, 0115/10 HRSZ, 0115/12 HRSZ Szentmiklós vineyard, 1. Research vineyard, Pécs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
34.	TZTH	Tüzér street campus site	1. Tüzér Street, Pécs	151	113	93	63	32	19	18	18	19	72	107	136	842	233 819	214 692	
35.	UNTH	Universitas campus site	2/A. Universitas Street, Pécs	136	80	44	8	7	6	6	5	13	12	112	137	566	157 344	144 473	
36.	URTH	Úrói campus site	2/A. Úrói fasor, Pécs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
37.	VATH	Vasvári Street campus site	4. Vasvári Pál Street, Pécs	283	167	142	91	11	8	7	6	8	114	225	261	1 322	367 339	337 291	
38.	VEH	Veress Endre street campus	15. Veress Endre Street, Pécs	668	337	265	154	21	8	6	6	11	183	507	641	2 805	779 234	715 493	
39.	VOTH	Vörösmarty campus site	4. Vörösmarty Street, Pécs	267	121	106	61	1	0	0	0	0	36	185	153	930	258 377	237 242	
40.	ZSTH	Zsolnáy campus site	16., 37. Zsolnáy Vilmos Street; 23. Major Street, Pécs	766	403	303	139	5	0	0	0	0	246	550	605	3 017	838 162	769 601	
41.	KATH	Kaposvár campus site	14/b. Szent Imre Street, Kaposvár	871	507	442	185	38	29	23	22	33	43	25	35	2 251	625 283	574 135	
42.	KPTH	Kaposvár SZÉSZ campus site	14/d. Szent Imre Street, Kaposvár	0	0	0	0	0	0	0	0	0	0	193	156	348	96 692	88 783	
43.	ÓRTH	Orfú campus site	6. Kalaphegyi Street, Orfú	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
44.	SMTH	Szekszárd - Mátvás Király Street campus site	3-5. Mátvás Király Street, Szekszárd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
45.	SATH	Szekszárd - Petőfi Sándor Street campus site	1., 2723 HRSZ Petőfi Sándor Street, Szekszárd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
46.	SRTH	Szekszárd - Rákóczi campus site	1. Rákóczi Street, Szekszárd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
47.	SSTH	Szekszárd - Szent-Györgyi Albert campus site	10. Szent-Györgyi Albert Street, Szekszárd	117	73	59	19	11	9	2	1	3	54	150	106	603	167 557	153 851	
48.	SDTH	Szombathely - Dózsa György campus site	13. Dózsa György Street, Szombathely	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
49.	SITH	Szombathely - Jókai Mór campus site	14. Jókai Mór Street, Szombathely	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
50.	ZATH	Zalaegerszeg - Landorhegy 23 campus site	23. Landorhegy Street, Zalaegerszeg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
51.	ZLTH	Zalaegerszeg - Landorhegy 33 campus site	33. Landorhegy Street, Zalaegerszeg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
52.	HRTH	Harkány campus site	1. Zsigmondy Promenade, Harkány	261	221	98	51	39	37	32	34	48	110	218	243	1 392	386 748	355 112	
53.	KOTH	Komló campus site	1. Maljális Square, Komló	551	486	416	278	78	56	55	50	148	314	616	548	3 598	999 351	917 604	
54.	MOTH	Mohács campus site	7. Szepesy Square, Mohács	1620	1411	951	518	280	172	145	145	233	684	1369	1579	9 107	2 529 742	2 322 810	
55.	SLTH	Siklós campus site	6. Baross Gábor Street, Siklós	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
56.	STTH	Szigetvár campus site	7. Szent István Housing Estate, Szigetvár	1924	1785	1002	843	371	172	161	157	268	996	1673	1842	11 195	3 109 667	2 855 296	
				35365	23052	19694	12054	3459	2224	1683	1715	3577	13396	26140	30335	172 694	47 970 860	44 046 844	

Total biomass energy:

44 046 844 kWh

1 GJ\*277,78=1 kWh

91,82% of district heating energy comes from biomass:

<https://www.petav.hu/storage/files/Primerenergia%20%C3%A1talak%C3%ADt%C3%A1s%20%20%C3%A9nyez%C5%B1.pdf>

• Solar power:

Data on the solar panels operating at UP sites, data from Solarweb remote monitoring system and local measurement register data for ASIA-Net power plants

Building CAFM-code	[kWh]	GJ
AHET	42 758	154
BEIS	37 390	135
BMUK	57 465	207
DAFO	89 670	323
EDHO	66 574	240
JHKO	75 274	271





MOAT	125 400	451
OZDA	73 391	264
PPFO	7 343	26
REHA	24 804	89
RKKO	41 822	151
4144	104 626	377
SEGO	15 326	55
SEGI-SETO	57 387	207
SEKO	17 062	61
SEAE	46 688	168
STKO	748 941	2 696
SIBK	42 657	154
SIBF	13 338	48
SIMA	44 709	161
SIOT	83 841	302
SIGH	15 352	55
SIKA	71 673	258
TZFO	30 568	110
VEBA	55 217	199
<b>SUM (kWh)</b>	<b>1 989 277</b>	<b>7 161</b>



• **Geothermal energy:**

Energy produced from geothermal sources during the operation of Szentágotthai Research Center in 2024:  
3 547 GJ (985 230 kWh)



• **Combine Heat and Power**

<p><u>Janus Pannonius Clinical Block</u></p> <ul style="list-style-type: none"> <li>• Calculated daily hot water consumption: 25 m<sup>3</sup>/day</li> <li>• Built-in collector power: 145 kW</li> <li>• Built-in collector surface: 207,46 m<sup>2</sup></li> <li>• District heating savings (2024): 576 GJ (160 000 kWh)</li> </ul>	<p><u>Institute of Oncotherapy:</u></p> <ul style="list-style-type: none"> <li>• Calculated daily hot water consumption: 11 m<sup>3</sup>/day</li> <li>• Built-in collector power: 27,6 kW</li> <li>• Built-in collector surface: 46 m<sup>2</sup></li> <li>• District heating savings (2024): 103 GJ (28 520 kWh)</li> </ul>
<p><b>Total district heating savings (2024): 679 GJ (188 520 kWh)</b></p>	



- Usage/consumption monitoring

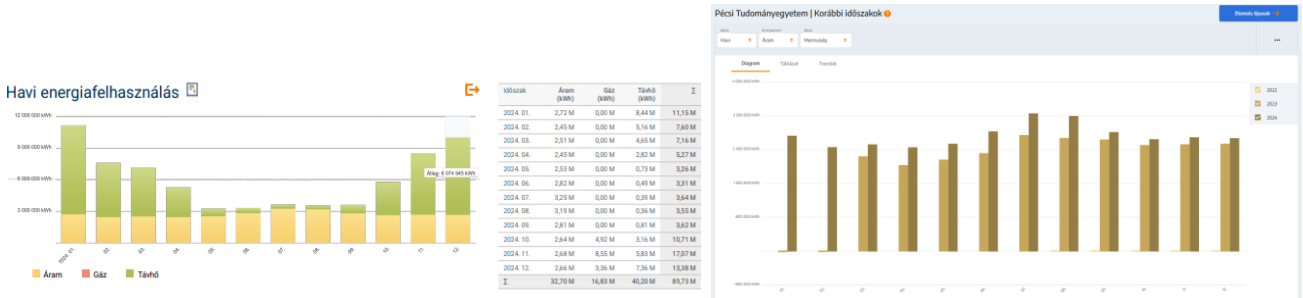
The **Building Management Systems** ensure the continuous monitoring of heat and electricity consumption in our buildings.

An **Energy Management Software** has been purchased to track the energy consumption of the UP sites, the energy production of its solar panels, and the associated expenses – in real time.

The Energy Management Software used by UP is a modern, up-to-date, Hungarian-developed online solution that provides support for energy efficiency management. The primary goal of the software is to identify energy saving opportunities on university campuses. It allows energy consumption to be monitored, providing up-to-date information on every aspect and moment of operation.

Several analyses are available to identify savings potential, based on data from energy bills, time series data from service providers, sub-metering, and manual entry. For example: transparent systematization of energy bills, detailed analysis of service provider time series data, identification and highlighting of energy saving opportunities revealed by sub-metering, preparation of energy consumption and financial reports, weekly and monthly operating reports, monthly and annual solar panel reports.

The following photo extracts show examples of the analyses and reports generated by the energy management software:



Monthly breakdown of the energy consumption of the UP, Comparative analysis with the usage of the previous year(s)

As a new feature the **software is also capable of CO<sub>2</sub> emissions analysis**

CO<sub>2</sub> emissions analysis can be used to determine and analyse CO<sub>2</sub> emissions for a selected period based on the energy consumption shown on service provider bills. The reports are made in diagrams and tables, and they can be generated to the entire university or just to sites as well.



CO<sub>2</sub> emissions analysis in a diagram,

**Pécsi Tudományegyetem | CO<sub>2</sub>-kibocsátás elemzés**

Hónap	Áram (t)	Gáz (t)	Távhő (t)	Összesen
2024. 01.	1 237,25	-	637,27	1 854,52
2024. 02.	1 114,39	-	377,31	1 491,7
2024. 03.	1 144,04	-	339,36	1 483,4
2024. 04.	1 102,7	-	204,7	1 317,4
2024. 05.	1 150,91	-	56,31	1 207,22
2024. 06.	1 284	-	36,83	1 320,83
2024. 07.	1 478,22	-	28,94	1 507,16
2024. 08.	1 440,95	-	25,49	1 466,44
2024. 09.	1 276,94	-	63,38	1 338,32
2024. 10.	1 199,56	1 460,01	228,77	2 888,44
2024. 11.	1 220,65	2 539,33	429,66	4 189,64
2024. 12.	1 211,07	999,34	535,97	2 746,38
<b>Összesen</b>	<b>14 879,68</b>	<b>4 998,78</b>	<b>2 942,99</b>	<b>22 821,45</b>

CO<sub>2</sub> emissions data in a table