Table S1. List of Irish data centres calculated mass flow rate of circulating air, the resulting volumetric flow rate of air available to a vertical farm at ideal temperatures, and the ideal size of the vertical farm depending on this flow rate.

Code	Waste heat energy (kJ)	Waste heat energy per area ($J.m^{-2}$)	Mass flow rate ($kg.s^{-1}$)	Volumetric flow rate of air in data centre ($m^3.s^{-1}$)	Ideal size of vertical farm (m^2)
I1	15750	760.23	1627.72	1,352.29	6,049.71
I2	3600	322.92	372.05	309.09	1,382.79
I3	1440	140.91	148.82	123.64	553.12
I4	8100	726.56	837.11	695.46	3,111.28
I5	5175	618.93	534.82	444.32	1,987.76
I6	4500	403.66	465.06	386.37	1,728.49
I7	4500	562.50	465.06	386.37	1,728.49
I8	15750	1,093.75	1627.72	1,352.29	6,049.71
I9	3150	246.15	325.54	270.46	1,209.94
I10	8100	1,350.01	837.11	695.46	3,111.28
I11	2124	190.73	219.51	182.37	815.85
I12	4536	429.87	468.78	389.46	1,742.32
I13	4536	429.87	468.78	389.46	1,742.32
I14	48600	565.11	5022.69	4,172.78	18,667.69
I15	36000	1,250.00	3720.51	3,090.95	13,827.92
I16	2070	892.25	213.93	177.73	795.11
I17	8100	686.52	837.11	695.46	3,111.28
I18	3600	568.87	372.05	309.09	1,382.79
I19	9000	417.57	930.13	772.74	3,456.98
I20	10800	664.29	1116.15	927.28	4,148.38
I21	10800	675.87	1116.15	927.28	4,148.38
I22	10800	675.87	1116.15	927.28	4,148.38
I23	10800	675.87	1116.15	927.28	4,148.38
I24	10800	675.87	1116.15	927.28	4,148.38
I25	10800	675.87	1116.15	927.28	4,148.38
I26	14400	513.08	1488.20	1,236.38	5,531.17
I27	14400	511.21	1488.20	1,236.38	5,531.17
I28	21150	413.92	2185.80	1,815.93	8,123.90
I29	10530	374.07	1088.25	904.10	4,044.67
I30	207	92.07	21.39	17.77	79.51
I31	315	506.97	32.55	27.05	120.99
I32	27000	899.77	2790.38	2,318.21	10,370.94
Min	207	92.07	21.39	17.77	79.51
Max	48600	1,350.01	5022.69	4,172.78	18,667.69
I_{AV}	**10670**	**594.10**	**1102.70**	**916.10**	**4,098.36**

Table S2. List of London data centres calculated mass flow rate of circulating air, the resulting volumetric flow rate of air available to a vertical farm at ideal temperatures, and the ideal size of the vertical farm depending on this flow rate.

Code	Waste heat energy (kJ)	Waste heat energy per area ($J.m^{-2}$)	mass flow rate ($kg.s^{-1}$)	Volumetric flow rate of air in data centre ($m^3.s^{-1}$)	Ideal size of vertical farm (m^2)
L1	6075	1,089.85	627.84	521.60	5,296.99
L2	6075	1,089.85	627.84	521.60	5,296.99
L3	1215	217.97	125.57	104.32	1,059.40
L4	1350	121.09	139.52	115.91	1,177.11
L5	1800	734.68	186.03	154.55	1,569.48
L6	1125	635.23	116.27	96.59	980.92
L7	5400	609.14	558.08	463.64	4,708.43
L8	3600	775.00	372.05	309.09	3,138.96
L9	1800	968.75	186.03	154.55	1,569.48
L10	3600	150.00	372.05	309.09	3,138.96
L11	243	300.37	25.11	20.86	211.88
L12	1782	456.93	184.17	153.00	1,553.78
L13	5400	422.90	558.08	463.64	4,708.43
L14	9450	358.70	976.63	811.37	8,239.76
L15	13050	4,500.00	1348.68	1,120.47	11,378.72
L16	675	807.29	69.76	57.96	588.55
L17	900	605.47	93.01	77.27	784.74
L18	225	40.36	23.25	19.32	196.18
L19	225	220.17	23.25	19.32	196.18
L20	225	24.22	23.25	19.32	196.18
L21	4725	423.83	488.32	405.69	4,119.88
L22	6075	984.71	627.84	521.60	5,296.99
L23	4500	908.93	465.06	386.37	3,923.70
L24	4500	908.93	465.06	386.37	3,923.70
L25	4320	510.99	446.46	370.91	3,766.75
L26	4320	51.10	446.46	370.91	3,766.75
L27	450	231.60	46.51	38.64	392.37
Min	225	24.22	23.25	19.32	196.18
Max	13050	4,500.00	1348.68	1,120.47	11,378.72
L_{AV}	**3448.33**	**672.15**	**356.38**	**296.07**	**3,006.71**

Table S3. Irish [left] and London [right] based data centres' potential cooling effect of transpiration, and heating effect of the electronics of vertical farm contributing a net negative amount of energy, cooling the vertical farm to 15.19° C.

Net energy savings of Irish data centres				Net energy savings of London-based data centres			
Code	**Cooling energy of transpiration (kW)**	**Heating effect of vertical farm waste energy (kW)**	**Energy savings (kW)**	**Code**	**Cooling energy of transpiration (kW)**	**Heating effect of vertical farm waste energy (kW)**	**Energy savings (kW)**
I1	7,670.23	571.20	355.12	L1	6,715.88	500.13	310.93
I2	1,753.20	130.56	81.17	L2	6,715.88	500.13	310.93
I3	701.28	52.22	32.47	L3	1,343.18	100.03	62.19
I4	3,944.69	293.76	182.63	L4	1,492.42	111.14	69.10
I5	2,520.22	187.68	116.68	L5	1,989.89	148.19	92.13
I6	2,191.50	163.20	101.46	L6	1,243.68	92.62	57.58
I7	2,191.50	163.20	101.46	L7	5,969.67	444.56	276.39
I8	7,670.23	571.20	355.12	L8	3,979.78	296.37	184.26
I9	1,534.05	114.24	71.02	L9	1,989.89	148.19	92.13
I10	3,944.69	293.76	182.63	L10	3,979.78	296.37	184.26
I11	1,034.39	77.03	47.89	L11	268.64	20.01	12.44
I12	2,209.03	164.51	102.27	L12	1,969.99	146.71	91.21
I13	2,209.03	164.51	102.27	L13	5,969.67	444.56	276.39
I14	23,668.1	1,762.57	1,095.79	L14	10,446.9	777.98	483.67
I15	17,531.9	1,305.60	811.70	L15	14,426.7	1,074.36	667.93
I16	1,008.09	75.07	46.67	L16	746.21	55.57	34.55
I17	3,944.69	293.76	182.63	L17	994.94	74.09	46.06
I18	1,753.20	130.56	81.17	L18	248.74	18.52	11.52
I19	4,382.99	326.40	202.92	L19	248.74	18.52	11.52
I20-25	5,259.59	391.68	243.51	L20	248.74	18.52	11.52
I26	7,012.78	522.24	324.68	L21	5,223.46	388.99	241.84
I27	7,012.78	522.24	324.68	L22	6,715.88	500.13	310.93
I28	10,300.	767.04	476.87	L23	4,974.72	370.47	230.32
I29	5,128.10	381.89	237.42	L24	4,974.72	370.47	230.32
I30	100.81	7.51	4.67	L25	4,775.74	355.65	221.11
I31	153.40	11.42	7.10	L26	4,775.74	355.65	221.11
I32	13,148.9	979.20	608.77	L27	497.47	37.05	23.03
Min	100.81	7.51	4.67	Min	248.74	18.52	11.52
Max	23,668.1	1,762.57	1,095.79	Max	14,426.7	1,074.36	667.93
I_{AV}	**5,196.17**	**386.96**	**240.57**	L_{AV}	**3,812.11**	**283.89**	**176.49**

Table S4. Scenario 2 data for Irish data centres to predict ideal size of vertical farm.

Code	Usable waste heat energy (kJ)	Mass flow rate ($kg.s^{-1}$)	Mass flow rate of external air into vertical farm ($kg.s^{-1}$)	Volumetric flow rate of air into vertical farm ($m^3.s^{-1}$)	Volumetric flow rate of air into vertical farm per square meter of data centre ($m^3.s^{-1}.m^{-2}$)	Ideal size of vertical farm (m^2)	Energy savings (kW)
I1	8663	1627.72	660.76	555.03	0.027	1387.59	81.45
I2	1980	372.05	151.03	126.86	0.011	317.16	18.62
I3	792	148.82	60.41	50.75	0.005	126.86	7.45
I4	4455	837.11	339.82	285.45	0.026	713.62	41.89
I5	2846	534.82	217.11	182.37	0.022	455.92	26.76
I6	2475	465.06	188.79	158.58	0.014	396.45	23.27
I7	2475	465.06	188.79	158.58	0.020	396.45	23.27
I8	8663	1627.72	660.76	555.03	0.039	1387.59	81.45
I9	1733	325.54	132.15	111.01	0.009	277.52	16.29
I10	4455	837.11	339.82	285.45	0.048	713.62	41.89
I11	1168	219.51	89.11	74.85	0.007	187.13	10.98
I12	2495	468.78	190.30	159.85	0.015	399.62	23.46
I13	2495	468.78	190.30	159.85	0.015	399.62	23.46
I14	26730	5022.69	2,038.90	1,712.68	0.020	4281.69	251.34
I15	19800	3720.51	1,510.30	1,268.65	0.044	3171.62	186.17
I16	1139	213.93	86.84	72.95	0.031	182.37	10.71
I17	4455	837.11	339.82	285.45	0.024	713.62	41.89
I18	1980	372.05	151.03	126.86	0.020	317.16	18.62
I19	4950	930.13	377.57	317.16	0.015	792.91	46.54
I20-25	5940	1116.15	453.09	380.59	0.023	951.49	55.85
I26	7920	1488.20	604.12	507.46	0.018	1268.65	74.47
I27	7920	1488.20	604.12	507.46	0.018	1268.65	74.47
I28	11633	2185.80	887.30	745.33	0.015	1863.33	109.38
I29	5792	1088.25	441.76	371.08	0.013	927.70	54.46
I30	114	21.39	8.68	7.29	0.003	18.24	1.07
I31	173	32.55	13.22	11.10	0.018	27.75	1.63
I32	14850	2790.38	1,132.72	951.49	0.032	2378.72	139.63
Min	114	21.39	8.68	7.29	0.003	18.24	1.07
Max	26730	5022.69	2,038.90	1,712.68	0.048	4281.69	251.34
I_{AV}	**5868**	**1,102.70**	**447.626**	**376.01**	**0.021**	**940.015**	**55.179**

Table S5. Scenario 2 data for London data centres to predict ideal size of vertical farm.

Code	Usable waste heat energy (kJ)	Mass flow rate ($kg.s^{-1}$)	Mass flow rate of external air into vertical farm ($kg.s^{-1}$)	Volumetric flow rate of air into vertical farm ($m^3.s^{-1}$)	Volumetric flow rate of air into vertical farm per square meter of data centre ($m^3.s^{-1}.m^{-2}$)	Ideal size of vertical farm (m^2)	Energy savings (kW)
L1	3,341.25	627.84	988.54	830.37	0.149	2075.92	121.86
L2	3,341.25	627.84	988.54	830.37	0.149	2075.92	121.86
L3	668.25	125.57	197.71	166.07	0.030	415.18	24.37
L4	742.50	139.52	219.67	184.53	0.017	461.32	27.08
L5	990.00	186.03	292.90	246.04	0.100	615.09	36.11
L6	618.75	116.27	183.06	153.77	0.087	384.43	22.57
L7	2,970.00	558.08	878.70	738.11	0.083	1845.27	108.32
L8	1,980.00	372.05	585.80	492.07	0.106	1230.18	72.21
L9	990.00	186.03	292.90	246.04	0.132	615.09	36.11
L10	1,980.00	372.05	585.80	492.07	0.021	1230.18	72.21
L11	133.65	25.11	39.54	33.21	0.041	83.04	4.87
L12	980.10	184.17	289.97	243.58	0.062	608.94	35.74
L13	2,970.00	558.08	878.70	738.11	0.058	1845.27	108.32
L14	5,197.50	976.63	1,537.72	1,291.69	0.049	3229.22	189.55
L15	7177.50	1348.68	2,123.52	1,783.76	0.615	4459.39	261.77
L16	371.25	69.76	109.84	92.26	0.110	230.66	13.54
L17	495.00	93.01	146.45	123.02	0.083	307.54	18.05
L18	123.75	23.25	36.61	30.75	0.006	76.89	4.51
L19	123.75	23.25	36.61	30.75	0.030	76.89	4.51
L20	123.75	23.25	36.61	30.75	0.003	76.89	4.51
L21	2,598.75	488.32	768.86	645.84	0.058	1614.61	94.78
L22	3,341.25	627.84	988.54	830.37	0.135	2075.92	121.86
L23	2,475.00	465.06	732.25	615.09	0.124	1537.72	90.26
L24	2,475.00	465.06	732.25	615.09	0.124	1537.72	90.26
L25	2,376.00	446.46	702.96	590.49	0.070	1476.21	86.65
L26	2,376.00	446.46	702.96	590.49	0.007	1476.21	86.65
L27	247.50	46.51	73.22	61.51	0.032	153.77	9.03
Min	123.75	23.25	36.61	30.75	0.003	76.89	4.51
Max	7,177.50	1,348.68	2,123.52	1,783.76	0.615	4459.39	261.77
L_{AV}	**1,896.58**	**356.38**	**561.12**	**471.34**	**0.09**	**1178.35**	**69.17**

Table S6. The number of calories and portions of fruit or vegetables a vertical farm can provide compared to the same land area using traditional farming methods for Irish data centres in Scenario 1.

Code	People who can obtain daily calories (Vertical Farm)	People who can obtain daily calories (Field)	People who can obtain 7 portions of fruit or veg (Vertical Farm)	People who can obtain 7 portions of fruit or veg (Field)
I1	91	29	86	32
I2	21	7	20	7
I3	8	3	8	3
I4	47	15	44	17
I5	30	9	28	11
I6	26	8	24	9
I7	26	8	24	9
I8	91	29	86	32
I9	18	6	17	6
I10	47	15	44	17
I11	12	4	12	4
I12	26	8	25	9
I13	26	8	25	9
I14	280	88	264	99
I15	207	65	196	73
I16	12	4	11	4
I17	47	15	44	17
I18	21	7	20	7
I19	52	16	49	18
I20-25	62	20	59	22
I26	83	26	78	29
I27	83	26	78	29
I28	122	38	115	43
I29	61	19	57	21
I30	1	0	1	0
I31	2	1	2	1
I32	155	49	147	55
Min	1	0	1	0
Max	280	88	264	99
I_{AV}	**61**	**19**	**58**	**22**

Table S7. The number of calories and portions of fruit or vegetables a vertical farm can provide compared to the same land area using traditional farming methods for London data centres in Scenario 1.

Code	People who can obtain daily calories (Vertical Farm)	People who can obtain daily calories (Field)	People who can obtain 7 portions of fruit or veg (Vertical Farm)	People who can obtain 7 portions of fruit or veg (Field)
L1	79	25	75	28
L2	79	25	75	28
L3	16	5	15	6
L4	18	6	17	6
L5	24	7	22	8
L6	15	5	14	5
L7	71	22	67	25
L8	47	15	44	17
L9	24	7	22	8
L10	47	15	44	17
L11	3	1	3	1
L12	23	7	22	8
L13	71	22	67	25
L14	124	39	117	44
L15	171	54	161	60
L16	9	3	8	3
L17	12	4	11	4
L18	3	1	3	1
L19	3	1	3	1
L20	3	1	3	1
L21	62	19	58	22
L22	79	25	75	28
L23	59	19	56	21
L24	59	19	56	21
L25	56	18	53	20
L26	56	18	53	20
L27	6	2	6	2
Min	3	1	3	1
Max	171	54	161	60
L_{AV}	**45**	**14**	**43**	**16**

Table S8. The number of calories and portions of fruit or vegetables a vertical farm can provide compared to the same land area using traditional farming methods for Irish data centres in Scenario 2.

Code	People who can obtain daily calories (Vertical Farm)	People who can obtain daily calories (Field)	People who can obtain 7 portions of fruit or veg (Vertical Farm)	People who can obtain 7 portions of fruit or veg (Field)
I1	21	7	20	7
I2	5	1	4	2
I3	2	1	2	1
I4	11	3	10	4
I5	7	2	6	2
I6	6	2	6	2
I7	6	2	6	2
I8	21	7	20	7
I9	4	1	4	1
I10	11	3	10	4
I11	3	1	3	1
I12	6	2	6	2
I13	6	2	6	2
I14	64	20	61	23
I15	48	15	45	17
I16	3	1	3	1
I17	11	3	10	4
I18	5	1	4	2
I19	12	4	11	4
I20-25	14	4	13	5
I26	19	6	18	7
I27	19	6	18	7
I28	28	9	26	10
I29	14	4	13	5
I30	0	0	0	0
I31	0	0	0	0
I32	36	11	34	13
Min	0	0	0	0
Max	64	20	61	23
I_{AV}	**14**	**4**	**13**	**5**

Table S9. The number of calories and portions of fruit or vegetables a vertical farm can provide compared to the same land area using traditional farming methods for London data centres in Scenario 2.

Code	People who can obtain daily calories (Vertical Farm)	People who can obtain daily calories (Field)	People who can obtain 7 portions of fruit or veg (Vertical Farm)	People who can obtain 7 portions of fruit or veg (Field)
L1	31	10	29	11
L2	31	10	29	11
L3	6	2	6	2
L4	7	2	7	2
L5	9	3	9	3
L6	6	2	5	2
L7	28	9	26	10
L8	18	6	17	7
L9	9	3	9	3
L10	18	6	17	7
L11	1	0	1	0
L12	9	3	9	3
L13	28	9	26	10
L14	48	15	46	17
L15	67	21	63	24
L16	3	1	3	1
L17	5	1	4	2
L18	1	0	1	0
L19	1	0	1	0
L20	1	0	1	0
L21	24	8	23	9
L22	31	10	29	11
L23	23	7	22	8
L24	23	7	22	8
L25	22	7	21	8
L26	22	7	21	8
L27	2	1	2	1
Min	1	0	1	0
Max	67	21	63	24
L_{AV}	**18**	**6**	**17**	**6**