International Energy Agency

Weather data to support energy analysis

Comprehensive weather data for energy modelling & analysis

June 2021

IEA and CMCC Weather for Energy Tracker

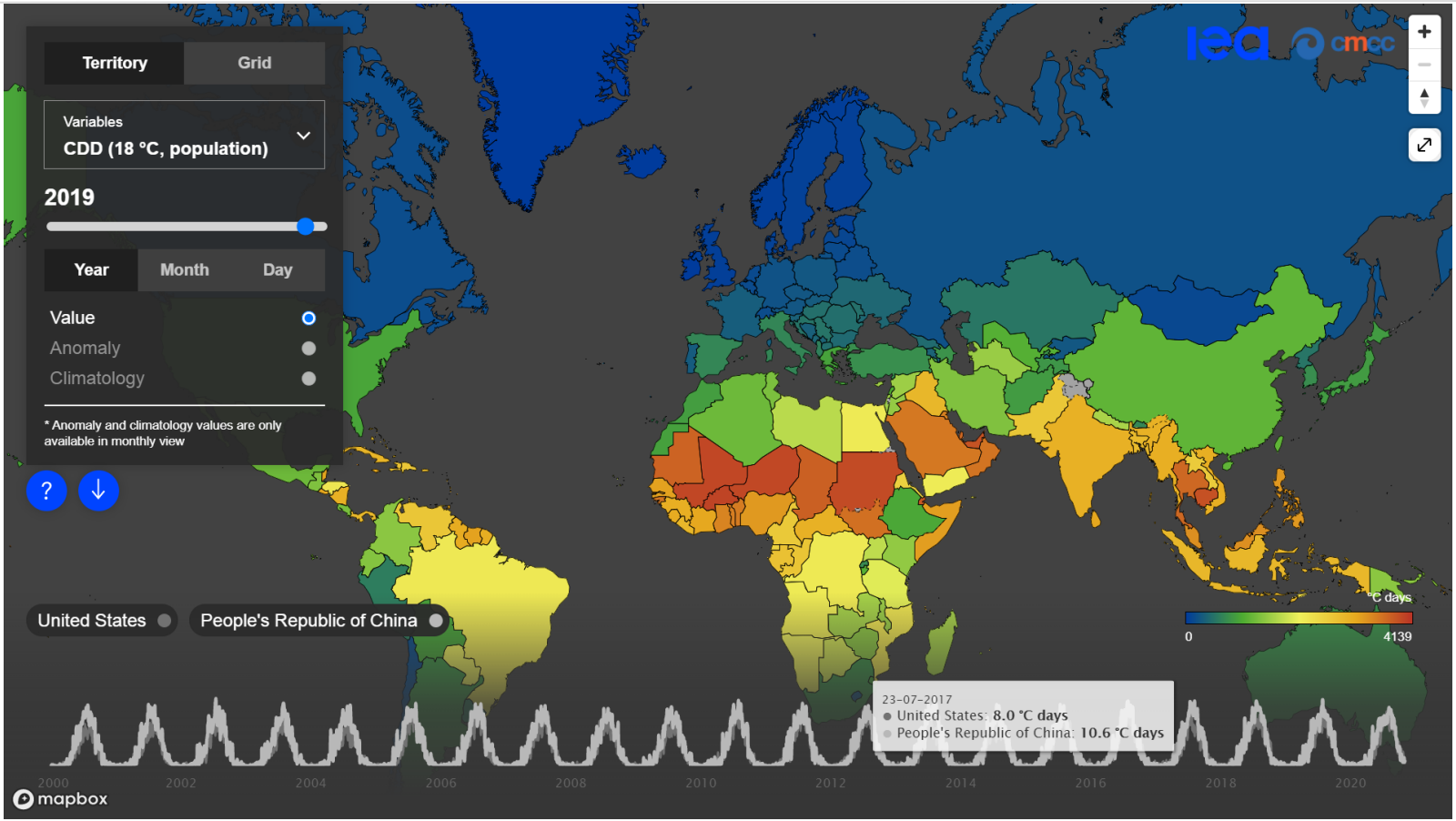
- Free platform showcasing global data on weather-related variables useful to understand, analyse and model the energy sector.
- Given the strong interlinkage between energy generation and demand with weather variables, reliable, consistent and easily accessible data on an expanded portfolio of weather variables, e.g. temperatures, degree days, solar radiation, precipitation, are becoming more and more important. We believe that this product will help statisticians, researchers, modellers and analysts around the world, as well as a broader audience interested in the energy sector.
- Developed by the IEA in collaboration with Fondazione Euro-Mediterraneo sui Cambiamenti Climatici (CMCC) database.
- Primary weather variables extracted from Copernicus Climate Change Service information (2021).
- Updated every six months

iea.org/articles/weather-for-energy-tracker

Content

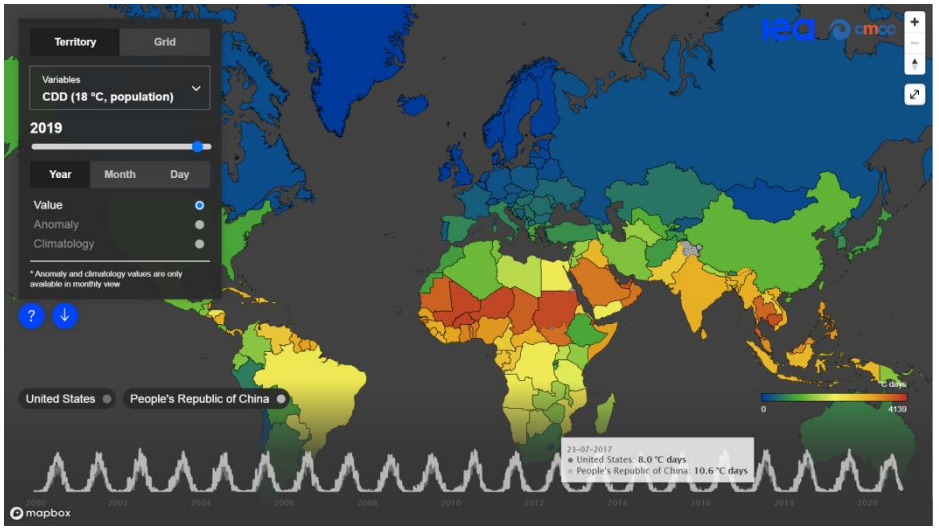
- 50+ primary weather variables and derived indicators (temperature, precipitation, heating degree days, wind capacity factor…)
- Grid, country and subnational levels.
- Daily/monthly/yearly resolution.
- Time series span from 2000 to latest available month
- Includes monthly climatologies and anomalies
- Comprises 3 free tools to access the data:
  - Interactive map
  - Interactive excel file
  - Data repository

Interactive map



Interactive map

- Grid map:
  - yearly and monthly data for 20 indicators
  - Meshing as fine as 0.25 degree by latitude and longitude (resolution under 30 km)
- Territory and subnational map:
  - Yearly, monthly and daily data for 19 indicators
  - Available for over 200 countries, and subnational indicators for six countries
- Quick graph can be plotted by selecting two countries
- Data from territory map can be retrieved in CSV format by clicking the ↓ button.



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Interactive excel file

- Excel file to easily access monthly data for selected variables, averaged at country level for over 200 countries.

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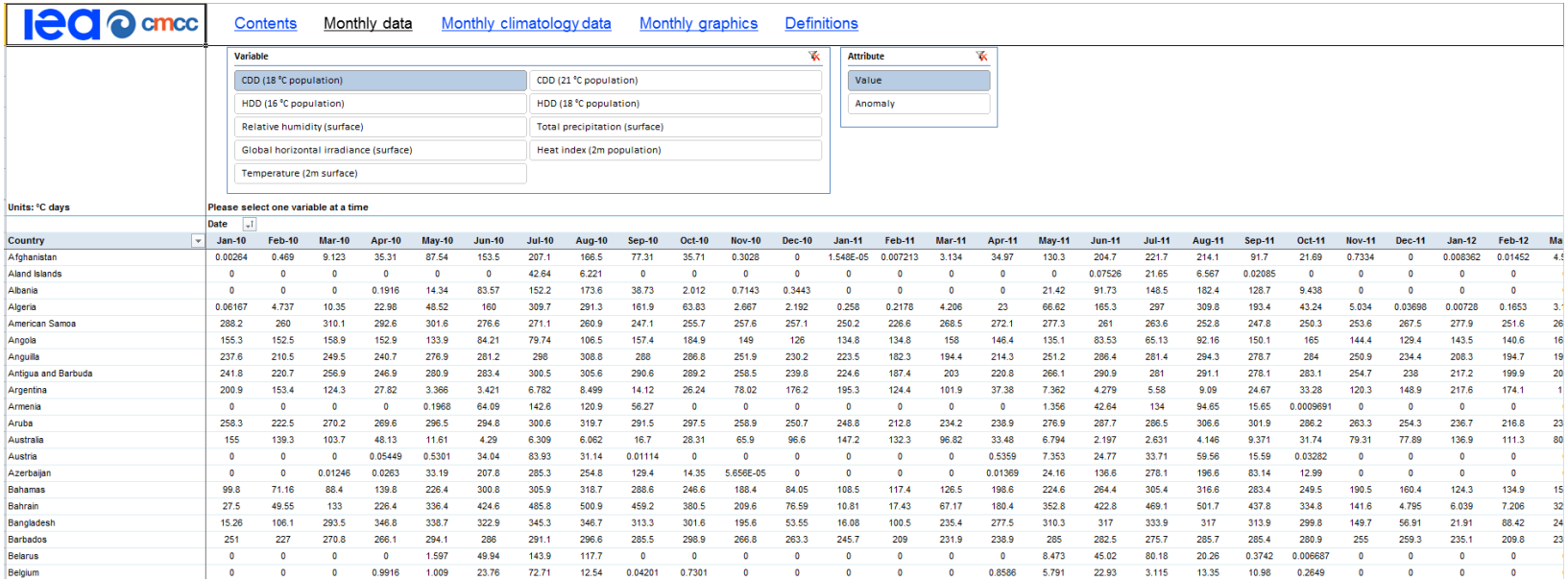

iea cmcc | Contents | Monthly data | Monthly climatology data | Monthly graphics | Definitions

Variable: CDD (18 °C population) | CDD (21 °C population) | HDD (16 °C population) | HDD (18 °C population) | Relative humidity (surface) | Total precipitation (surface) | Global horizontal irradiance (surface) | Heat index (2m population) | Temperature (2m surface)

Attribute: Value | Anomaly

Units: °C days

Please select one variable at a time

Date

Country	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Ma
Afghanistan	0.00264	0.469	9.123	35.31	87.54	153.5	207.1	166.5	77.31	35.71	0.3028	0	1.548E-05	0.007213	3.134	34.97	130.3	204.7	221.7	214.1	91.7	21.69	0.7334	0	0.008362	0.01452	4.5
Aland Islands	0	0	0	0	0	0	42.64	6.221	0	0	0	0	0	0	0	0	0	0.07526	21.65	6.567	0.02085	0	0	0	0	0	
Albania	0	0	0	0.1916	14.34	83.57	152.2	173.6	38.73	2.012	0.7143	0.3443	0	0	0	0	21.42	91.73	148.5	182.4	128.7	9.438	0	0	0	0	
Algeria	0.06167	4.737	10.35	22.98	48.52	160	309.7	291.3	161.9	63.83	2.667	2.192	0.258	0.2178	4.206	23	66.62	165.3	297	309.8	193.4	43.24	5.034	0.03698	0.00728	0.1653	3.1
American Samoa	288.2	260	310.1	292.6	301.6	276.6	271.1	260.9	247.1	255.7	257.6	257.1	250.2	226.6	268.5	272.1	277.3	261	263.6	252.8	247.8	250.3	253.6	267.5	277.9	251.6	26
Angola	155.3	152.5	158.9	152.9	133.9	84.21	79.74	106.5	157.4	184.9	149	126	134.8	134.8	158	146.4	135.1	83.53	65.13	92.16	150.1	165	144.4	129.4	143.5	140.6	16
Anguilla	237.6	210.5	249.5	240.7	276.9	281.2	298	308.8	288	286.8	251.9	230.2	223.5	182.3	194.4	214.3	251.2	286.4	281.4	294.3	278.7	284	250.9	234.4	208.3	194.7	19
Antigua and Barbuda	241.8	220.7	256.9	246.9	280.9	283.4	300.5	305.6	290.6	289.2	258.5	239.8	224.6	187.4	203	220.8	266.1	290.9	281	291.1	278.1	283.1	254.7	238	217.2	199.9	20
Argentina	200.9	153.4	124.3	27.82	3.366	3.421	6.782	8.499	14.12	26.24	78.02	176.2	195.3	124.4	101.9	37.38	7.362	4.279	5.58	9.09	24.67	33.28	120.3	148.9	217.6	174.1	1
Armenia	0	0	0	0	0.1968	64.09	142.6	120.9	56.27	0	0	0	0	0	0	0	1.356	42.64	134	94.65	15.65	0.0009691	0	0	0	0	
Aruba	258.3	222.5	270.2	269.6	296.5	294.8	300.6	319.7	291.5	297.5	258.9	250.7	248.8	212.8	234.2	238.9	276.9	287.7	286.5	306.6	301.9	286.2	263.3	254.3	236.7	216.8	23
Australia	155	139.3	103.7	48.13	11.61	4.29	6.309	6.062	16.7	28.31	65.9	96.6	147.2	132.3	96.82	33.48	6.794	2.197	2.631	4.146	9.371	31.74	79.31	77.89	136.9	111.3	80
Austria	0	0	0	0.05449	0.5301	34.04	83.93	31.14	0.01114	0	0	0	0	0	0	0.5359	7.353	24.77	33.71	59.56	15.59	0.03282	0	0	0	0	
Azerbaijan	0	0	0.01246	0.0263	33.19	207.8	285.3	254.8	129.4	14.35	5.656E-05	0	0	0	0	0.01369	24.16	136.6	278.1	196.6	83.14	12.99	0	0	0	0	
Bahamas	99.8	71.16	88.4	139.8	226.4	300.8	305.9	318.7	288.6	246.6	188.4	84.05	108.5	117.4	126.5	198.6	224.6	264.4	305.4	316.6	283.4	249.5	190.5	160.4	124.3	134.9	15
Bahrain	27.5	49.55	133	226.4	336.4	424.6	485.8	500.9	459.2	380.5	209.6	76.59	10.81	17.43	67.17	180.4	352.8	422.8	469.1	501.7	437.8	334.8	141.6	4.795	6.039	7.206	32
Bangladesh	15.26	106.1	293.5	346.8	338.7	322.9	345.3	346.7	313.3	301.6	195.6	53.55	16.08	100.5	235.4	277.5	310.3	317	333.9	317	313.9	299.8	149.7	56.91	21.91	88.42	24
Barbados	251	227	270.8	266.1	294.1	286	291.1	296.6	285.5	298.9	266.8	263.3	245.7	209	231.9	238.9	285	282.5	275.7	285.7	285.4	280.9	255	259.3	235.1	209.8	23
Belarus	0	0	0	0	1.597	49.94	143.9	117.7	0	0	0	0	0	0	0	0	8.473	45.02	80.18	20.26	0.3742	0.006687	0	0	0	0	
Belgium	0	0	0	0.9916	1.009	23.76	72.71	12.54	0.04201	0.7301	0	0	0	0	0	0.8586	5.791	22.93	3.115	13.35	10.98	0.2649	0	0	0	0	

Data repository

- Includes the full dataset in NetCDF format
- Grid level:
  - Monthly averages, anomalies and climatologies for 51 indicators
- National and subnational:
  - Monthly and daily averages for 50 indicators

weatherforenergydata.iea.org/

Potential uses

- Track change in climate indicators
- Track extreme weather events
- Modelling of variable renewables production, heating and cooling needs, electricity demand corrected by weather…
- Capacity power design
- Etc.

For more details on methodology and content, please refer to the User Guide

Please address any question to EMISSIONS@iea.org

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