

US Large-Scale Solar Photovoltaic Database Summary

Version: USPVDB V2.0

Release Date: August 7, 2024

I. ACRONYMS:

LBNL	Lawrence Berkeley National Laboratory
USGS	United States Geological Survey
EIA	Energy Information Administration
EPA	Environmental Protection Agency
NREL	National Renewable Energy Laboratory
PV	Photovoltaic
USPVDB	United States Large-Scale Photovoltaics Database

II. ABOUT THE DATABASE:

In 2020, LBNL and USGS began collaborating on development of the USPVDB to create an accurate, comprehensive, and publicly accessible national large-scale PV database of large-scale PV facilities that includes estimates of the total footprint (i.e., facility size based on array boundaries) of each facility. This work builds on expertise developed through the creation and maintenance of the U.S. Wind Turbine Database (USWTDB) since 2016.

The data may be used by government agencies, scientists, private companies, and other stakeholders for a variety of analyses. Examples include operational impact analyses related to the role of solar energy in the U.S. electric grid, interactions between PV facilities and the natural environment, and investments in PV infrastructure.

The database combines datasets from the U.S. EIA, the Environmental Protection Agency (EPA) and the National Renewable Energy Laboratory (NREL). The locations and array boundaries of all facilities were visually verified and digitized to within 10 meters using high-resolution aerial imagery.

III. DATA SOURCES:

Data were added, compiled, and updated in this edition of the USPVDB using the following sources:

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|--|-------------------------------|
| ● EIA Form 860 Final – Schedule 3 – Solar Data | Release Date: September, 2023 |
| ● EIA Form 860 Monthly Release | Release Date: November, 2023 |
| ● USGS Visual Verification (satellite imagery) | Date: June, 2024 |
| ● EPA RE-Powering Matrix (coordinates added) | Date: January, 2024 |
| ● InSPIRE Agrivoltaics Map | Date: January, 2024 |

IV. VARIABLE CHANGES OR ADDITIONS:

No new variables were added in this version.

V. VARIABLE NAMES AND DEFINITIONS:

Variable list and definitions can be found in the codebook that accompanies this release.

VI. SUMMARY OF DATASET AND CHANGES THIS QUARTER:

This edition of the USPVDB contains **4,185** large-scale solar photovoltaic facilities distributed across 47 U.S. States and the District of Columbia.

Changes and updates to the database this quarter include the following:

- Addition of 495 facility records.
- Removed 9 facility records. Removals include:
 - 2 facilities determined to be under the capacity threshold of 1MW.
 - 7 facilities determined to be a technology other than photovoltaic.
- A total of 5,684 attribute changes were made. These include:
 - 62 “multi_poly” updates.
 - 1 “p_county” update.
 - 1 “p_name” update.
 - 7 “p_pwr_reg” updates.
 - 262 “p_axis” updates.
 - 124 “p_battery” updates.
 - 105 “p_type” updates.
 - 243 “p_agrivolt” updates.
 - 2 “p_img_date” updates.
 - 3,678 “p_zscore” updates.
 - 1,022 “xlong” updates.
 - 177 “ylat” updates.
 - 235 “p_area” updates.

NUMBER OF LARGE-SCALE PV FACILITIES BY STATE:

The USPVDB currently includes facilities from 47 U.S. states, plus the District of Columbia. Table 1 reports the number of facilities in each of these states for the current release (V2) as well as the previous annual release (V1) for comparison. The changes by state reported in Table 2 may be due to facilities added to the dataset (via EIA data) and/or erroneous facilities removed from the dataset.

Table 1: Summary of Large-Scale PV Facilities by State



State	V2	V1	Change
AL	10	8	2
AR	15	12	3
AZ	69	67	2
CA	540	475	65
CO	123	96	27
CT	48	39	9
DC	2	2	0
DE	13	11	2
FL	123	84	39
GA	111	88	23
HI	25	23	2
IA	12	9	3
ID	11	9	2
IL	96	80	16
IN	77	70	7
KS	7	6	1
KY	6	4	2
LA	2	2	0
MA	397	382	15
MD	70	67	3
ME	27	10	17
MI	29	27	2
MN	414	390	24
MO	22	19	3

State	V2	V1	Change
MS	9	6	3
MT	8	6	2
NC	678	651	27
NE	8	8	0
NH	1	1	0
NJ	155	148	7
NM	72	64	8
NV	42	40	2
NY	296	232	64
OH	32	30	2
OK	10	10	0
OR	110	100	10
PA	34	29	5
RI	40	37	3
SC	105	86	19
SD	1	1	0
TN	20	15	5
TX	114	97	17
UT	39	33	6
VA	69	51	18
VT	47	43	4
WA	4	2	2
WI	41	28	13
WY	1	1	0
TOTAL	4,185	3,699	486

VII. CONFIDENCE IN FACILITY DIGITIZATION:

The level of confidence¹ in facility digitization, which encompasses confidence in both location (i.e., latitude/longitude coordinates) and array shape and size, remains very high, thanks to the visual verification efforts of the team. Currently, 3,946 (94.3%) facilities have high digitization confidence, and only 2.1% of facilities have low location confidence. 100% of the facilities in this dataset have been visually examined using satellite imagery. Digitization confidence of points is summarized in Table 2.

Table 2: Level of confidence in PV facility digitization

Location Confidence	V2		V1	
	Freq.	Percent	Freq.	Percent
(4) High	3,946	94.3%	3,531	95.5%
(3) Medium/High	24	0.6%	20	0.5%
(2) Low/Medium	136	3.3%	77	2.1%
(1) Low	79	1.9%	71	1.9%
Total	4,185	100%	3,699	100%

¹**Digitization confidence:** Level of confidence in site location and representativeness of polygon from 1 to 4. A lower value represents a lower confidence.

1— Multiphase facility or multiple EIA records with identical location. Single polygon used to represent multiple facilities indistinguishable from one another; attributes may not reflect full scope of facilities.

2— Multiple polygons created, but EIA records are unclear; attributes may not reflect full scope of facilities.

3— Polygon reflects only a part of the facility due to poor image quality; area of polygon may not reflect the full size of array(s).

4— Facility polygons created with high confidence.