



MERCOM
CAPITAL GROUP

LEADING GLOBAL LARGE-SCALE SOLAR PV DEVELOPERS

July 2022 - June 2023

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Methodology and Definitions

Definitions:

Operational Capacity: Solar projects that are commissioned and currently in operational status

Under Construction: Projects that have a signed power purchase agreement (PPA) and where construction has begun

Awarded (Contracted): Projects that have signed off-takers but have yet to start construction

Large-Scale Projects (Utility-Scale): Projects sized at one (1) megawatt (MW) or more

PPA (Power Purchase Agreement): A contract to purchase power at a set rate over a predetermined time period

Research Methodology:

This report includes a ranking of global solar developers based on operating, under-construction, and PPA-awarded (contracted) large-scale solar projects of one megawatt or more across multiple countries. To qualify for this ranking, developers must have projects in at least two countries. All data included in this report was accurate as of June 30, 2023. All figures are in AC. In few instances, numbers have been converted from DC to AC.

Mercom analysts utilized both primary and secondary research to compile this report. The key component of Mercom's analysis is primary research gained from phone and e-mail interviews with company representatives. Additional analysis includes secondary research conducted by Mercom analysts. For the two companies that chose not to provide their data directly to Mercom, Mercom relied on the company's latest public information.

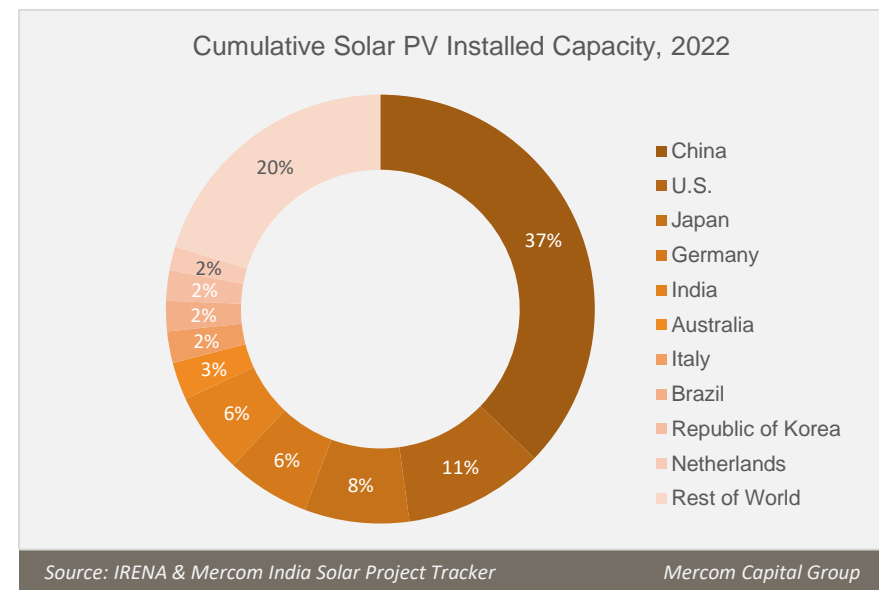
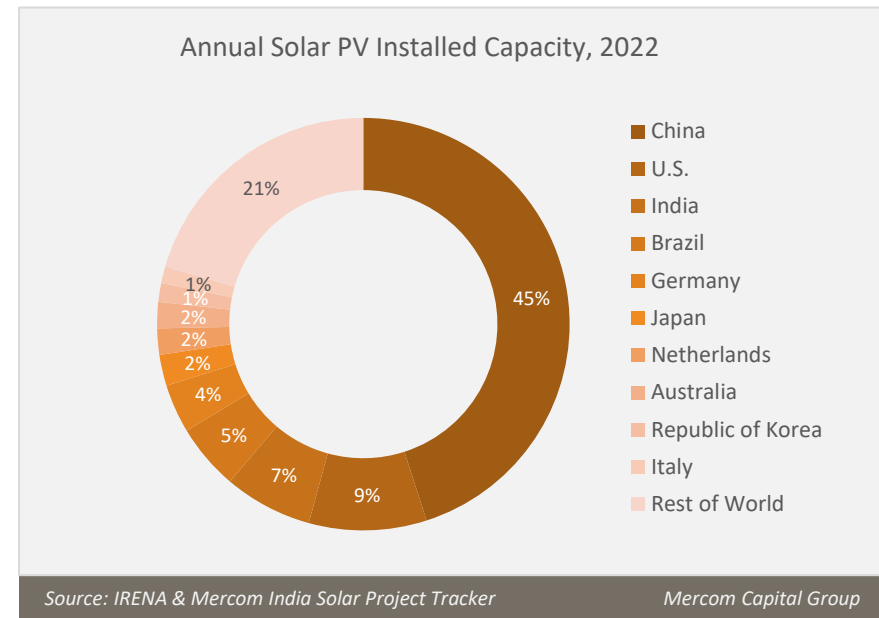
GLOBAL SOLAR MARKET

Global Market Overview

Top 10 Global Solar Markets

- The global solar photovoltaics (PV) market had a banner year in 2022 with an estimated 191 gigawatts (GW) installed, a 22.1% increase year-over-year (YoY).
- China led capacity additions, with 86 GW installed. Installations were up 62.4% compared to nearly 53 GW in 2021 and added significantly to the worldwide growth in solar installations.
- The U.S. installed the second-highest solar energy capacity in 2022 with 17.6 GW. Installations fell 8.3% compared to over 19 GW in the prior year due to module supply uncertainty caused by the Anti-Circumvention Investigation and the Uyghur Forced Labor Protection Act. The Inflation Reduction Act, expected to provide an industry boost, was enacted in August 2022, though the effects weren't immediately evident.
- India witnessed the third-highest capacity additions with over 13 GW in 2022. Installations were up 29% YoY. Much of the increase can be attributed to delayed projects with supply chain issues due to COVID-19 in the prior year.
- Brazil and Germany rounded out the top five with 9.9 GW and 7.3 GW of capacity additions respectively, in 2022. The top five markets combined accounted for over 70% of solar capacity installed in 2022.
- The war in Ukraine compelled countries in Europe to develop aggressive solar energy goals and move quickly toward energy independence. In July 2022, Germany set a target of 215 GW by 2030; France set a new target of 100 GW by 2050, and the U.K. increased its solar target to 70 GW by 2035.
- At the end of 2022, cumulative installed solar PV capacity surpassed 1 TW to reach an estimated 1,054 GW. China, the U.S., and Japan accounted for nearly 56% of capacity.

Note: Annual installation numbers are based on available data as of December 2022, considering that IRENA and most other global solar associations have released data only until 2022.



Key Takeaways

- France-based TotalEnergies emerged as the top large-scale solar developer based on operational, under-construction, and awarded (contracted) projects. Adani Green Energy and Brookfield Renewable Partners came in second and third, respectively. Enel Green Power and Lightsource bp rounded off the list of top five developers in 2022.
- The top developers include several renewable energy arms of industrial and power conglomerates, subsidiaries of asset management companies, and pure-play renewable and solar companies. These developers are headquartered in the United Kingdom, Canada, the United States, India, Italy, Germany, France, and Spain.
- The top 10 developers accounted for nearly 145 GW of operational, under-construction, and awarded (contracted) solar projects. Of this, 49.5 GW of projects were operational, 29.1 GW were under construction, and 66.2 GW were in their pipelines (contracted).
- The majority of solar project portfolios by the top large-scale developers were located in North America.
- Asia Pacific was the other leading geography for the total operational, under-construction, and awarded (contracted) project capacities of the top developers worldwide.
- The top ten project developers acquired 5.8 GW of large-scale solar projects to bolster their portfolios while divesting 2.4 GWs.

TOP 10 LARGE-SCALE SOLAR PV DEVELOPERS BY TOTAL CAPACITY

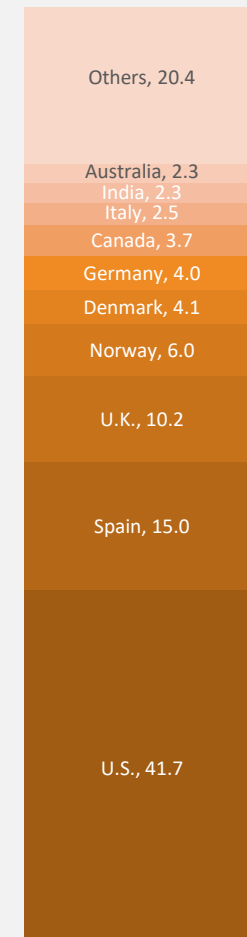
1	TotalEnergies
2	Adani Green Energy
3	Brookfield Renewable Partners
4	Enel Green Power
5	Lightsource bp
6	AES Renewables
7	EDF Renewables
8	Invenergy
9	Iberdrola
10	ib vogt

Source: Mercom Capital Group

Key Takeaways

- Developers continued to expand their capacities in developed markets such as the U.S. , which saw the highest number of project acquisitions with nearly 42 GW. Utility-scale projects led installations in the U.S. market.
- Between July 2022 and June 2023 (reporting period), over 112 GW of projects changed hands worldwide, with almost 82% of the project acquisitions in the top 10 global markets.
- Countries in Europe (Spain, the U.K., Norway, Denmark, Germany, Italy, and others) witnessed the highest project acquisitions, accounting for more than 45% (50.8 GW) of the total.
- In North America, the U.S. and Canada, came in a close second, accounting for nearly 42% (46.7 GW) of the projects that changed hands during the reporting period.
- In the Asia Pacific, including India, Australia, and a few other countries, project acquisitions accounted for over 6% during the reporting period.
- Countries in Latin America witnessed the fourth-highest amount of project acquisitions, accounting for 3.3%.
- According to Mercom, 60.6 GW of projects changed hands during 1H 2023. Acquisition activity was up 18% compared to 51.6 GW in the second half of 2022.

Large-Scale Solar Project Acquisitions, By Country, July 2022 – June 2023, GW



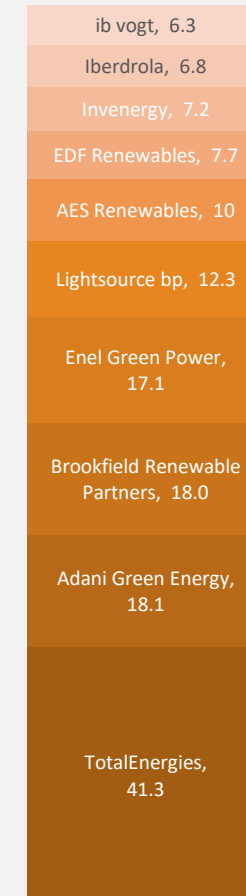
Source: Mercom Capital Group

Top Global Large-Scale Solar Developers by Total Capacity

Total large-scale solar PV capacity (operational plus development pipeline)

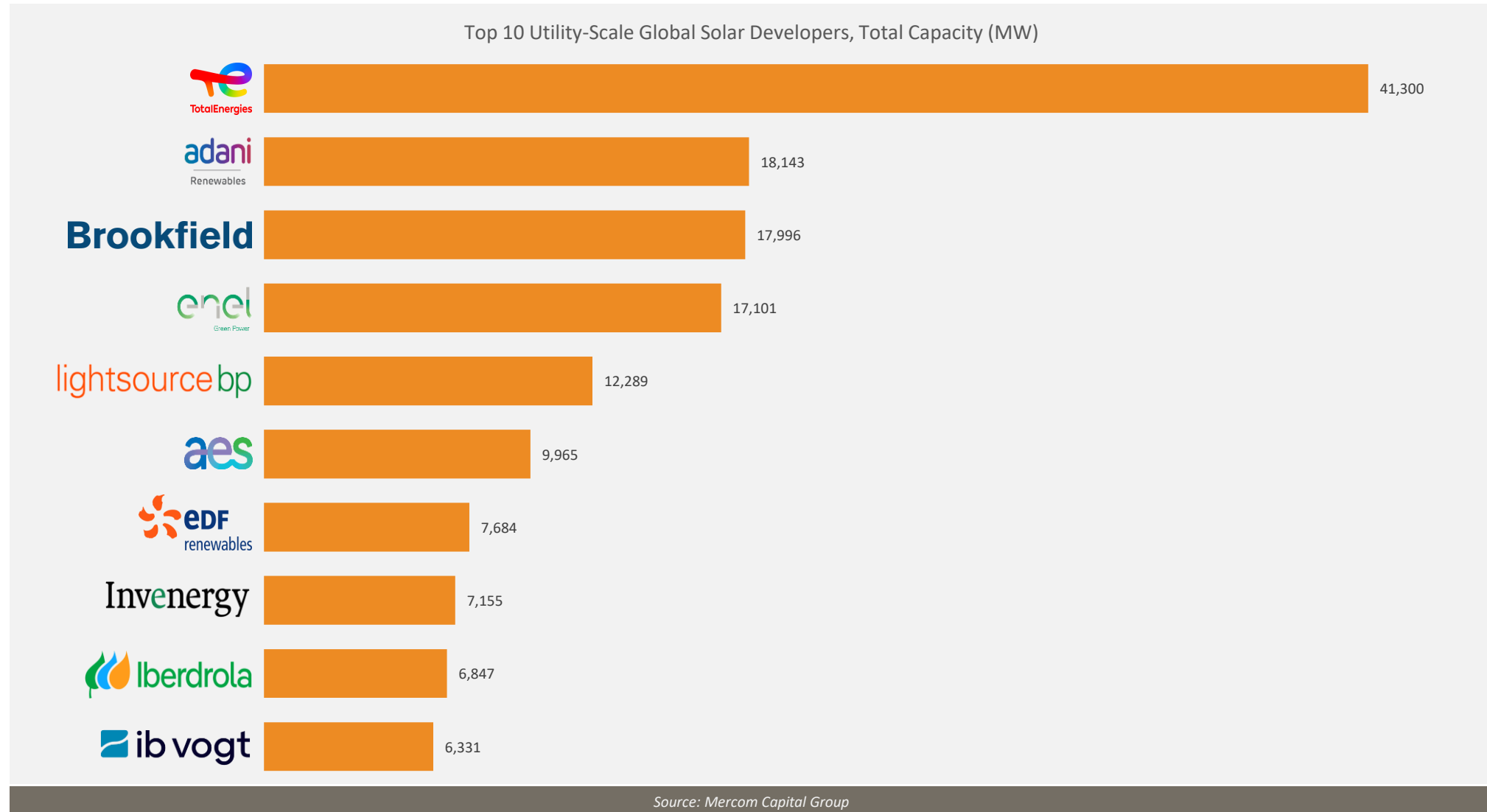
- TotalEnergies was the top global solar developer with 12 GW of projects in operation, 3.8 GW under construction, and 25.5 GW of projects awarded, with a combined total of 41.3 GW.
- Adani Green Energy came in second with a total capacity of 18.1 GW, followed by Brookfield Renewable Partners with 18 GW.
- Among the top global solar developers, six were based in Europe, three in North America, and one was headquartered in South Asia.
- In addition to TotalEnergies, Europe-based developers Enel Green Power, Lightsource bp, EDF Renewables, Iberdrola, and ib vogt were among the top 10 large-scale global solar developers, with total capacities of 17.1 GW, 12.3 GW, 7.7 GW, 6.8 GW, and 6.3 GW, respectively.
- In addition to Brookfield Renewable Partners, North America-based developers AES Renewables and Invenery made it on the top 10 list with 10 GW and 7.2 GW, respectively.
- The combined operational, under-construction, and awarded capacities of the top 10 developers reached nearly 145 GW.

Top Utility Scale Global Solar Developers Market, Total Capacity (GW)



Source: Mercom Capital Group

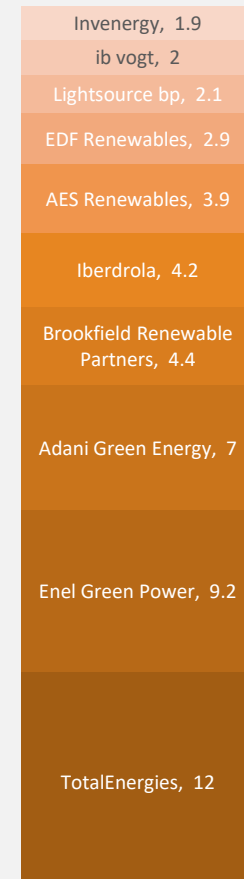
Top Global Large-Scale Solar Developers by Total Capacity



Top Global Large-Scale Solar Developers by Operational Capacity

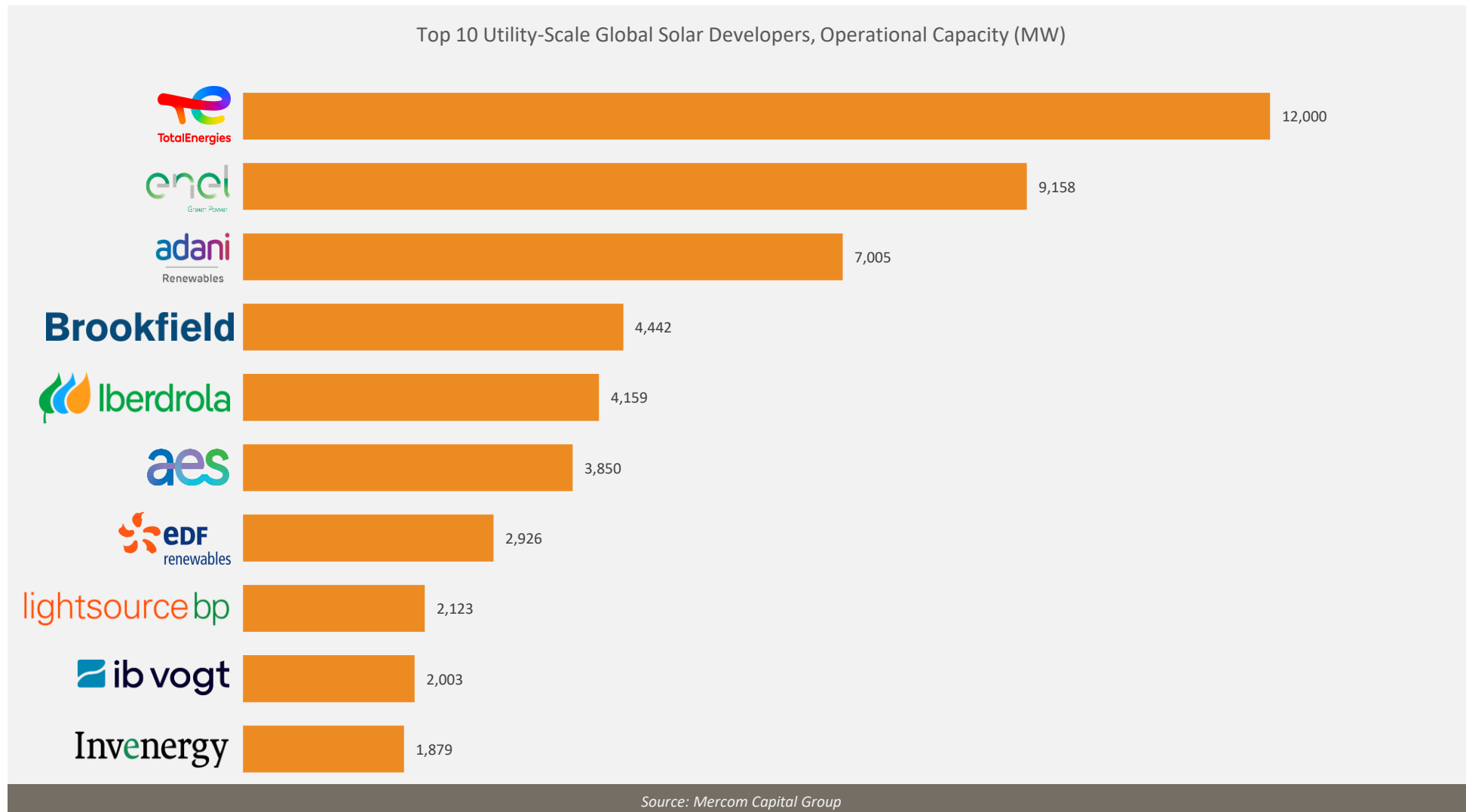
- The top developer with the largest operational utility-scale solar capacity was TotalEnergies, with 12 GW. A significant share of the company's operational capacity comes from its 50% stake in Clearway Energy Group, its 49% stake in Casa dos Ventos, and its 20% stake in Adani Green Energy.
- Enel Green Power was the second-largest developer with 9.2 GW.
- Adani Green Energy came in third with 7 GW, which includes the solar portion of its wind-solar hybrid power portfolio of 2.1 GW as of May 2023.
- Brookfield Renewable Partners, followed by Iberdrola, AES Renewables, EDF Renewables, Lightsource bp, ib vogt, and Invenery were the other top developers.
- The top 10 developers combined held 49.5 GW of operational large-scale solar projects.
- TotalEnergies, Brookfield Renewable Partners, AES, EDF Renewables, and Lightsource bp have committed to net zero emissions by 2050 as part of their corporate strategy.
- Iberdrola and Enel Green aim to achieve net zero emissions by 2040 and Adani Green Energy by 2070.
- TotalEnergies, Iberdrola, ib vogt, and Invenery made it to this year's top ten list for the first time, in first, fifth, ninth, and tenth positions. Except for Invenery, these companies are all headquartered in Europe.

Top Utility Scale Global Solar Developers Market, Operational Capacity (GW)



Source: Mercom Capital Group

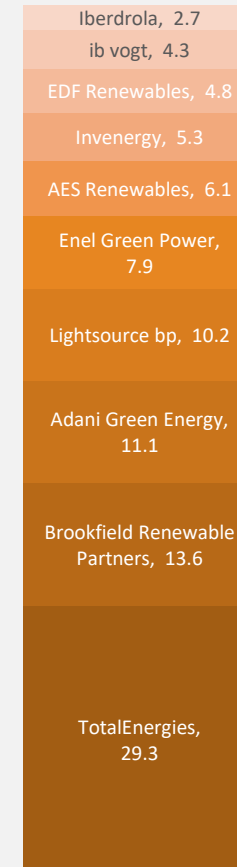
Top Global Large-Scale Solar Developers by Operational Capacity



Top Global Large-Scale Solar Developers by Under-Construction and Awarded (Contracted) Capacity

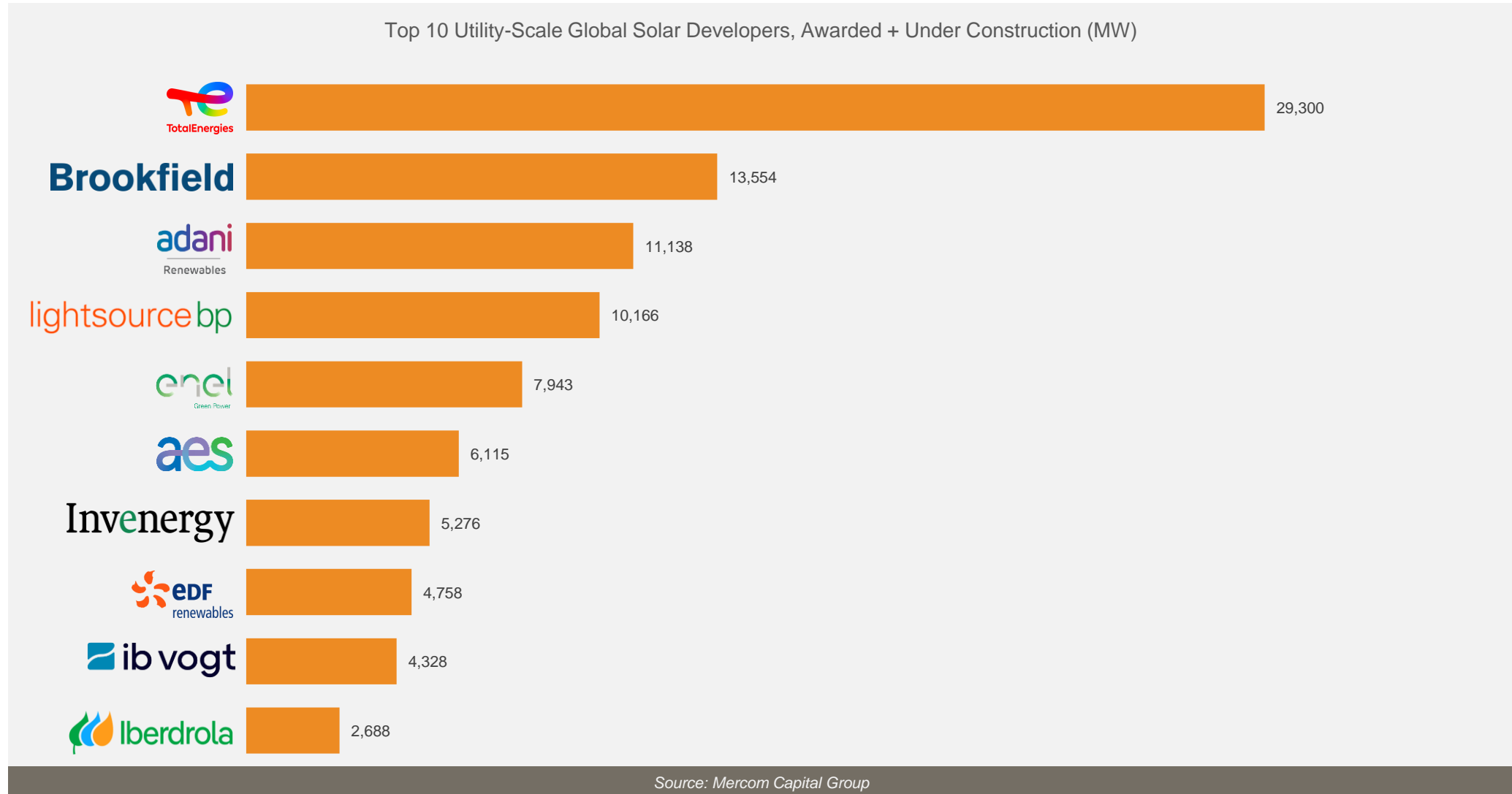
- The top 10 global large-scale solar developers accounted for 102 GW of under-construction and awarded (PPA-contracted) capacity.
- TotalEnergies topped the list with 29.3 GW of capacity under construction and awarded. Brookfield Renewable Partners had the second-largest capacity with 13.6 GW, followed by Adani Green Energy.
- A large part of TotalEnergies' portfolio was from its 50% stake in Clearway Energy Group, its 49% stake in Casa dos Ventos, and its 20% stake in Adani Green Energy,
- Adani Green Energy had the highest capacity under construction, with about 9.2 GW located completely in Asia Pacific. Enel Green and TotalEnergies had 4.3 GW and 3.8 GW projects under construction.
- TotalEnergies had the largest development pipeline of about 25.5 GW of awarded (PPA-contracted) projects, followed by Brookfield Renewable Partners and Lightsource bp with 13.6 GW and 8.3 GW respectively.
- ib vogt, Enel Green Power, Invenery, and AES Renewables each had over 3.5 GW of projects awarded pending construction.
- Increased urgency to meet the renewable energy targets and focus on net zero initiatives resulted in a significant number of projects in the pipeline.

Top Utility Scale Global Solar Developers Market, Under Construction and Awarded Capacity (GW)



Source: Mercom Capital Group

Top Global Large-Scale Solar Developers by Under-Construction and Awarded (Contracted) Capacity



PROFILES: TOP 10 GLOBAL LARGE-SCALE SOLAR DEVELOPERS



Headquarters: La Défense, France

Global Presence: Africa, Americas, APAC, Europe, and Middle East

Offerings and Capabilities: Renewable Energy, Power Generation, Oil & Gas Exploration & Production, Petroleum Refining & Chemicals, Marketing and Supply of Oil Products & Services, Low-Carbon Fuels, and New Energies

Project Portfolio: Operational Capacity: 12,000 MW; Under Construction: 3,800 MW; Awarded: 25,500 MW

Business Overview: TotalEnergies produces and distributes fossil fuels, natural gas, and electricity. The company operates under four business lines – low-carbon electricity, natural gas, petroleum products, and new low-carbon energies. The ‘low-carbon electricity’ business line involves power generation from natural gas, solar, wind, and battery energy storage sources.

The company aims to reduce the emissions from its operations (scope 1) and energy or electricity sourced (scope 2) to 38 metric tons (MT) of carbon dioxide equivalent by 2025. The company also aims to reduce emissions from its oil activities where the production sources are not owned or controlled by it (scope 3). TotalEnergies aims to reduce its scope 3 emissions from its oil operation by 40% by 2030 and 30% by 2025.

Notable Developments:

1. In June 2023, TotalEnergies signed a strategic collaboration agreement with Gentari Renewables to jointly develop a 100 MW Pleasant Hills Solar Project to supply power to Roma fields’ gas production and processing facilities in Queensland, Australia.
2. In March 2023, TotalEnergies entered the Polish market by acquiring six solar projects under development totaling 200 MW.
3. In October 2022, Total Energies and Casa dos Ventos, a renewable energy developer in Brazil, entered into a joint venture to develop 1.6 GW of solar projects within the advanced stage of development (commissioning within five years). The venture also includes 700 MW of wind projects in operation and 3.8 GW under various stages of development.



- Solar PV Awarded (MW)
- Solar PV Under-Construction (MW)
- Solar PV Operational (MW)



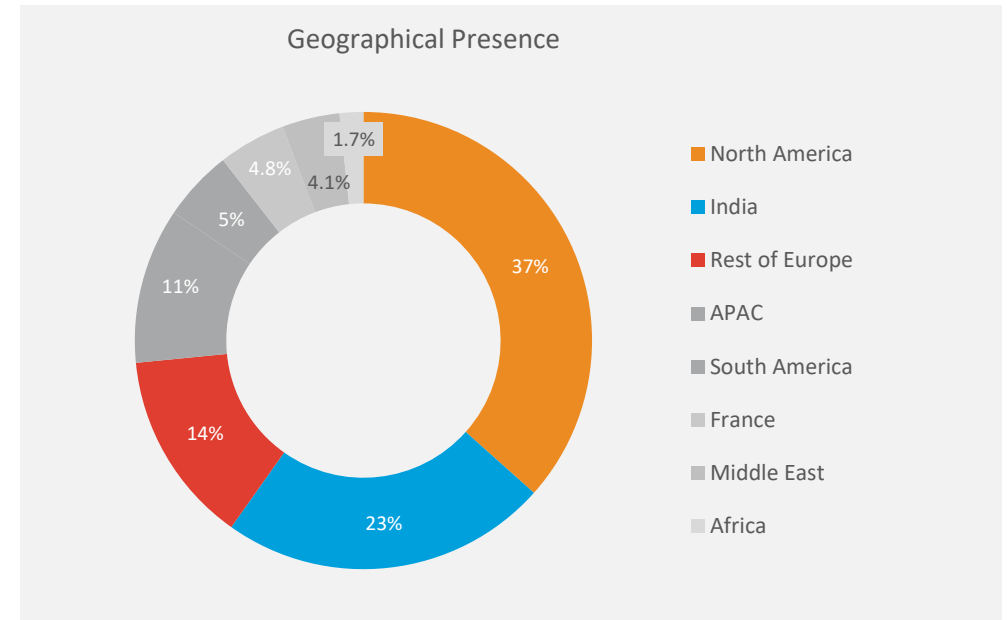
Geographical Presence:

The company has solar PV projects across France, India, the Middle East, the Americas, Africa, and other countries in Asia Pacific and Europe.

Al Kharsaah in Qatar is the largest large-scale solar PV project of TotalEnergies, with an installed capacity of 800 MW_{DC}.

Pipeline Description:

TotalEnergies’ pipeline includes 3,800 MW of projects under construction and 25,500 MW in the pre-construction stage as of June 2023. The company’s pipeline solar projects are primarily located in North America, with 40.5%. European countries (except for France) and India accounted for 18.9% and 15.8% of the company’s projects under construction and in pre-construction stages.



Note: The chart represents the project capacity breakdown for each region

Business Overview: Incorporated in 1988, Adani Enterprises manages its renewable portfolio through its subsidiary Adani Green Energy. It has one of the largest global renewable portfolio of 20.4 GW, including operating, under-construction, awarded, and assets under acquisition catering to investment-grade counterparties. The company develops, builds, owns, operates, and maintains utility-scale solar and wind projects. Adani Green supplies power to NTPC and various state distribution companies (DISCOMs). The company has signed a UN-Energy Compact committing to develop and operate a renewable energy generation capacity of 25 GW by 2025 and 45 GW by 2030.

Notable Developments:

1. In March 2023, Adani Green Energy announced that its operating renewables capacity surpassed 8 GW. The company’s operating wind-solar hybrid project portfolio crossed 2.1 GW in March 2023. During the month, the company also received an investment of ₹5.5 billion (~\$0.77 billion) from GQG partners, a U.K.-based investment firm.
2. In December 2022, Adani Green Energy received a zero waste to landfill certification for 100% of its operating capacity by Intertek. The certification validates effective waste management and a land diversion rate of 99% across the company’s operating projects.



■ Solar PV Awarded (MW)
■ Solar PV Under-Construction (MW)
■ Solar PV Operational (MW)

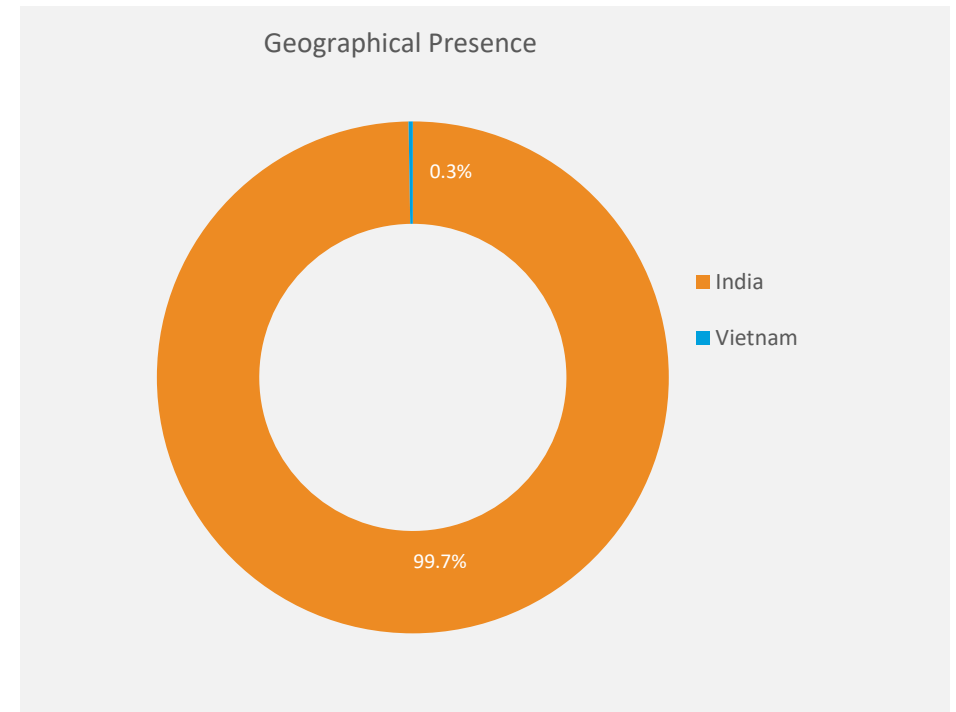
Geographical Presence: The company has solar PV projects in Vietnam and India.

Some of the large-scale solar PV projects:

1. Kamuthi Solar Park, India (648 MW)
2. Jaisalmer, Rajasthan India (600 MW)
3. Karnataka, India (350 MW)
4. Bhadla Phase III Solar Park, India (300 MW)
5. Rajasthan NTPC ISTS Project, India (300 MW)

Pipeline Description:

Adani's solar pipeline includes 9,239 MW projects under construction and 1,899 MW in pre-construction phase as of June 2023. The company's solar project pipeline is entirely located in India. Under the manufacturing-linked project development tender floated by the Solar Energy Corporation of India, Adani is set to develop 8 GW of solar projects (four tranches of 2 GW each) between October 2023 and October 2026.



Note: The chart represents the project capacity breakdown for each region

Brookfield

Headquarters: Ontario, Canada

Global Presence: North America, South America, Europe, and Asia Pacific

Offerings and Capabilities: Renewable Power Generation

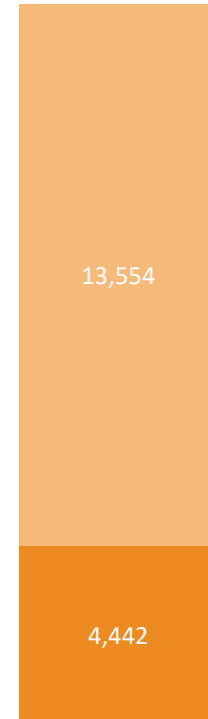
Project Portfolio: Operational Capacity: 4,442 MW; Awarded: 13,554 MW

Business Overview: Brookfield Renewable Partners is a renewable energy developer and part of Brookfield Asset Management, which is focused on real estate, renewable power and transition, infrastructure, private equity, credit, and insurance solutions.

Brookfield Renewable's operational capacity mix includes hydropower, wind, solar, storage, and other (cogeneration and biomass) sources. According to its Q2 2023 report, the company's portfolio has 25,900 MW of generation capacity as of June 2023, with facilities in North America, South America, Europe, and Asia Pacific.

Notable Developments:

1. In June 2023, Brookfield Renewable Partners and its institutional partners agreed to acquire Duke Energy Renewable. The company had a portfolio of 5.9 GW of operating and under construction wind, solar, and storage projects in the U.S. at the time. During the month, Brookfield Renewable Partner and its institutional partners acquired a 55% equity stake in CleanMax Enviro Energy, an India-based renewable energy developer, for \$360 million.
2. In September 2022, Brookfield Renewable Partners agreed to acquire Scout Clean Energy and closed the acquisition of Standard Solar. Scout Clean Energy's portfolio, at the time of the announcement, included 1.2 GW of installed wind energy projects and a pipeline of more than 22 GW of wind, solar, and storage projects across 24 states in the U.S. Standard Solar had 500 MW of operating and under construction solar projects with a project development pipeline of almost 2 GW.



■ Solar PV Awarded (MW)
■ Solar PV Operational (MW)

Brookfield

Geographical Presence:

The company has developed, engineered, constructed, and managed large grid-connected PV projects worldwide, including in the U.S., U.K., Brazil, China, India, and other countries.

Some of their grid-connected solar projects include:

1. Janaúba, Brazil (1,200 MW)
2. Mount Signal, U.S. (266 MW)
3. CAP, Chile (101.6 MW)
4. Regulus Solar, U.S. (81.6 MW)

Pipeline Description:

Brookfield Renewable Partners' solar pipeline includes 13,554 MW of projects under the pre-construction phase as of June 2023. Most of their projects in the pipeline are in North America, followed by Europe and Asia Pacific.



Headquarter: Rome, Italy

Global Presence: Italy, Spain, Greece, U.S., Mexico, Brazil, Chile, Peru, Colombia, Australia, and South Africa, among others

Offerings and Capabilities: Renewable Power Generation

Project Portfolio: Operational Capacity: 9,158 MW*; Under Construction: 4,362 MW*; Awarded: 3,581 MW*

Business Overview: Enel Green Power is a subsidiary of Enel Group, developing green energy projects globally. It has operations in 26 countries across five continents. The company has developed and is operating renewable energy projects in Europe, the Americas, Asia, Africa, and Oceania. Enel's 2023-2025 Strategic Plan is to add 21 GW of renewable energy capacity by 2025 to take its total operational capacity to 75 GW (including 4 GW of battery energy storage). As of June 2023, the company's cumulative renewable energy installations had reached 54.2 GW.

Notable Developments:

1. In May 2023, the National Electricity Coordinator of Chile approved the 162.8 MW Valle del Sol solar power project in María Elena, Antofagasta.
2. In March 2023, Enel Green Power started constructing its 170 MW Tarquinia solar power project in Viterbo, Latium, Italy. It was expected to be Enel's largest agrivoltaic project in Italy. During the month, the company also began constructing its 99 MW El Manzano solar power project with battery energy storage in Tiltil, Chacabuco, Santiago, Chile.
3. In February 2023, the country's National Electricity Coordinator approved Enel Green Power's 375 MW Campos del Sol solar power project in Atacama, Chile, for injecting electricity into the power grid.
4. In January 2023, Enel Green Power commissioned a 256 MW extension of the São Gonçalo solar project. With the addition, the project's total installed capacity reached 864 MW.

**Note: Estimated capacities based on Enel's public releases and reports*



- Solar PV Awarded (MW)
- Solar PV Under-Construction (MW)
- Solar PV Operational (MW)

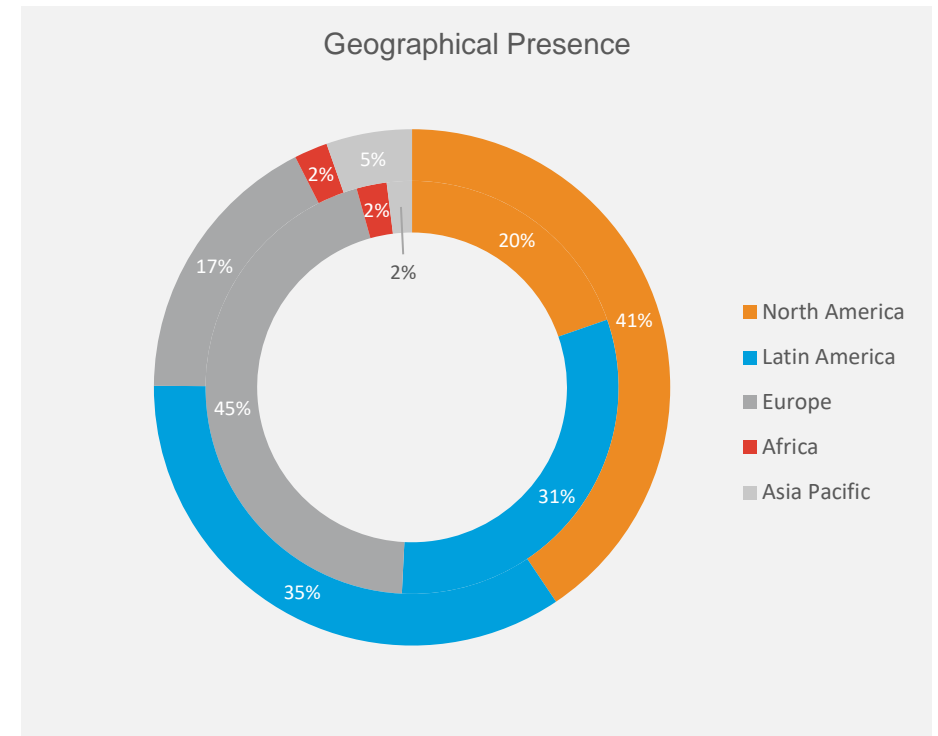


Global Presence: The company has solar PV projects in the U.S., Chile, Spain, Brazil, Colombia, Australia, India, Italy, South Africa, Peru, Mexico, Greece, Panama and Zambia. As of June 2023, Enel had 262 solar projects in its portfolio of over 17 GW spread across North America, Central America, South America, Africa, Europe, Asia, and Oceania.

Some of their large-scale utility solar projects include:

1. São Gonçalo, Brazil (864 MW)
2. Roadrunner Solar, U.S. (413 MW)
3. Bungala, Australia (275.0 MW)
4. Blue Jay Solar, U.S. (225 MW)
5. Magdalena II, Mexico (219.5 MW)

Pipeline Description: Enel Green Power’s pipeline includes 4,362 MW of solar projects under construction and 3,581 MW of projects under the pre-construction phase as of June 2023.



Note: The inner circle represents the breakdown of the number of projects, and the outer circle represents the capacity size breakdown for each region.



Headquarters: London, United Kingdom

Global Presence: Asia Pacific, Americas, Europe, Middle East and Africa

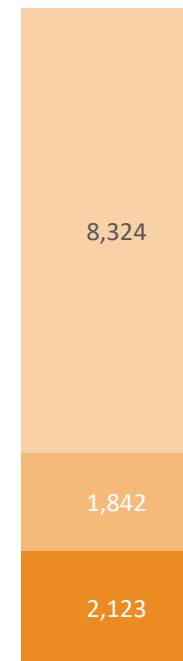
Offerings and Capabilities: Solar Power Generation, Development, Asset Management, O&M Services, Financing

Project Portfolio: Operational Capacity: 2,123 MW; Under Construction: 1,842 MW; Awarded: 8,324 MW

Business Overview: Lightsource Renewable Energy was renamed Lightsource bp after the acquisition of a 43% stake by bp in 2017. The stake was increased to 50% in December 2019. Alongside its expertise in solar power generation and corporate PPAs, the company provides funding, development, asset management, and O&M services in the solar sector. For India, Lightsource bp exclusively operates through EverSource Capital (JV of Lightsource bp and Everstone Capital).

Notable Developments:

1. In May 2023, Lightsource bp commissioned a 152.5 MW Bellflower solar project in Henry and Rush counties of Georgia and Indiana. Verizon has entered into a virtual power purchase agreement with Lightsource bp for the energy generated from the project.
2. In April 2023, Lightsource bp and Siemens entered a Volume Frame Agreement to supply solar inverter stations to Lightsource bp's solar projects over the next two years. Per the agreement, Siemens will provide 850 MW of inverters with an option to supply an additional 200 MW.
3. In March 2023, Lightsource bp received environmental approval for over 1.6 GW solar projects across Seville, Córdoba Zaragoza, Toledo, and Valladolid provinces of Spain. The construction could involve an investment of €1.2 billion (~\$1.3 billion).
4. In February 2023, Lightsource bp placed a 4 GW module supply order with First Solar to deliver thin film solar modules between 2026 and 2028.



- Solar PV Awarded (MW)
- Solar PV Under-Construction (MW)
- Solar PV Operational (MW)

Geographical Presence:

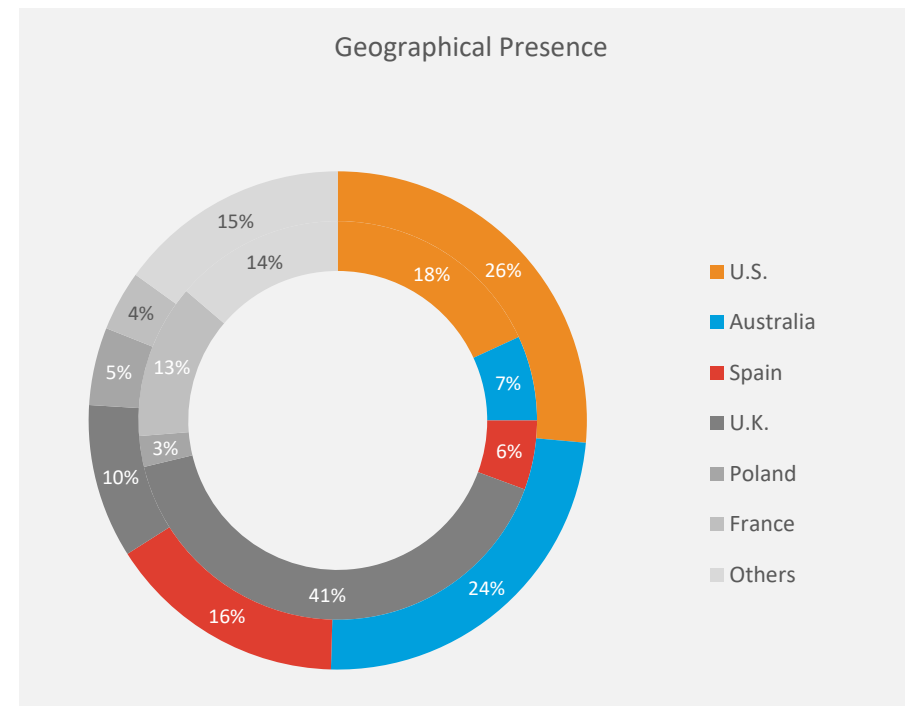
The company has solar PV projects in countries across the U.S., Australia, Spain, U.K., Poland, France, Italy, Portugal, Greece and several other countries.

Some of the company's large-scale solar PV projects include:

1. Sun Mountain, U.S. (200 MW)
2. Impact Solar, U.S. (198 MW)
3. Vendimia, Spain (205.8 MW)
4. Wellington, Australia (166.7 MW)

Pipeline Description:

Lightsource bp's solar pipeline includes 1,842 MW of projects under construction and 8,324 MW in the pre-construction phase. In March 2023, Lightsource bp set up a new base and local team in Germany. The company aims to support the government's solar installation target of 215 GW from 66 GW as of March 2023. Most of its pipeline projects are in the Australia, U.S., and Spain.



Note: The inner circle represents the breakdown of the number of projects, and the outer circle represents the capacity size breakdown for each region.



Headquarters: Virginia, U.S.

Global Presence: U.S., Chile, Argentina, Brazil, Bulgaria, Netherlands, El Salvador, Dominican Republic, Mexico, Colombia, Panama, Vietnam, and Jordan

Offerings and Capabilities: Transmission & Distribution; Thermal and Renewable Power Generation, Development and Construction

Project Portfolio: Operational Capacity: 3,850 MW; Under Construction: 2,591 MW; Awarded: 3,524 MW

Business Overview:

AES is a global power company with a diverse portfolio of renewable and thermal power generation and distribution businesses. The company operates under two business lines - generation and utilities. AES owns and operates a generation portfolio of 32,683 MW, diversified by fuel type. Of the total generation capacity, 47% is sourced from renewables, including hydropower, solar, wind, energy storage, biomass, and landfill gas. In May 2023, the company outlined its long-term strategy, which includes adding 25 GW to 30 GW of solar, wind, and energy storage projects by 2027.

Notable Developments:

1. In June 2023, the AES announced the acquisition of the 2 GW Bellefield solar and energy storage project. The project includes two phases, each with 500 MW of solar and four hours of battery energy storage. The project's phase one has a 15-year PPA with AES' existing corporate customer. The company expects to contract an additional 1 GW of solar and storage in phase two by the end of 2023. The project's two phases will likely be completed in 2025 and 2026.
2. In January 2023, AES Colombia and Ecopetrol, an oil and gas company based in Bogota, Colombia, inaugurated the 22 MW Brisas solar project in Huila, Colombia. Ecopetrol has signed a 15-year PPA with AES Colombia to supply power from the project.



- Solar PV Awarded (MW)
- Solar PV Under-Construction (MW)
- Solar PV Operational (MW)



Geographical Presence:

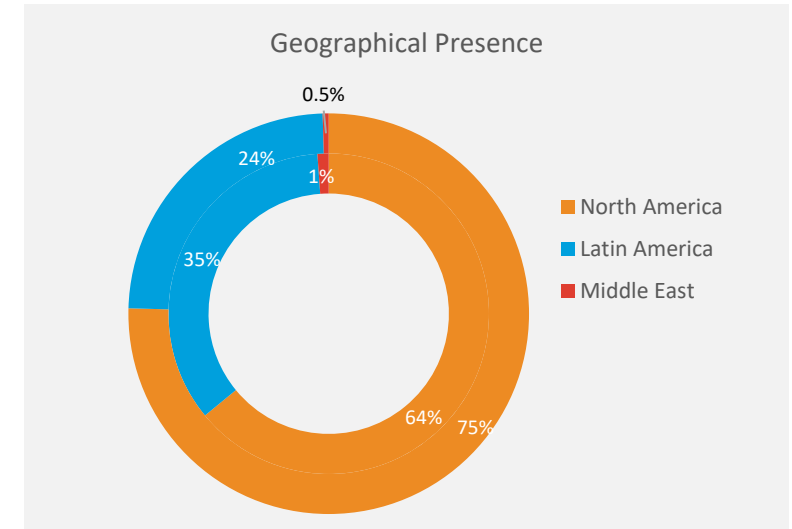
The company has solar PV projects in the U.S., Chile, Brazil, El Salvador, the Dominican Republic, Mexico, Jordan, Colombia, and Panama.

Some of the company’s large-scale solar PV projects include:

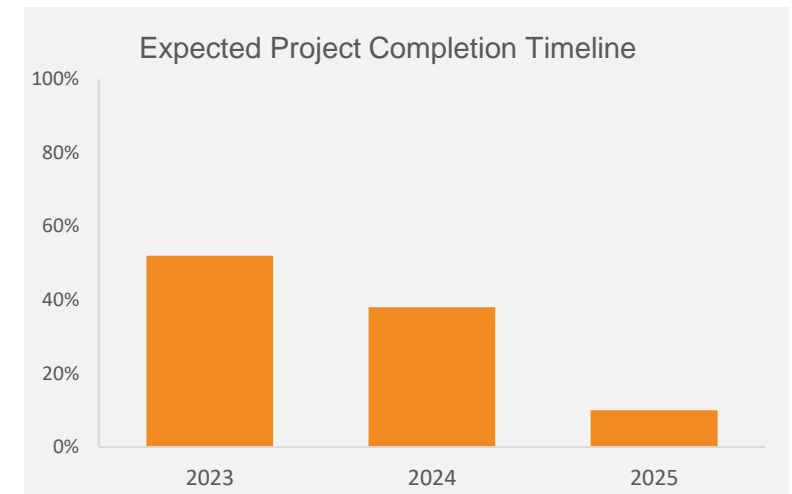
1. Highlander, U.S. (485 MW)
2. Andes 2b, Chile (180 MW)
3. Skipjack, U.S. (175 MW)
4. Guaimbê, Brazil (150 MW)

Pipeline Description:

The AES solar pipeline includes 2,591 MW of projects under construction and 3,524 MW under the pre-construction phase as of June 2023. Bellefield solar project is among the largest in the company’s pipeline. Around 52% of the AES’ under-construction solar projects are expected to be completed by the end of 2023, 38% by 2024, and the rest by 2025.



Note: The inner circle represents the breakdown of the number of projects, and the outer circle represents the capacity size breakdown for each region.





Headquarters: Paris La Défense, France

Global Presence: North America, and other parts of Europe and the world

Offerings and Capabilities: Project Development, Construction, Asset Management, and O&M

Project Portfolio: Operational Capacity: 2,926 MW; Under Construction: 2,195 MW; Awarded: 2,563 MW

Business Overview:

EDF Group's EDF Renewables primarily develops, builds, and operates grid-connected solar and wind energy projects in over 20 countries. The company is engaged in the development, construction, asset management, and operation and maintenance of renewable energy projects. EDF Renewables also develops, builds, and operates solar microgrid projects. The company helps governments, utilities, corporations, industries, municipalities, cooperatives, education and non-profit institutions, and property managers meet their renewable energy needs and targets.

Notable Developments:

1. In June 2023, EDF Group commissioned the 15 MW Lazer floating solar project in Hautes-Alpes, France.
2. In March 2023, EDF Renewables and Grand Port Maritime de Bordeaux signed an agreement to add a 40 MW solar project at the Verdon-sur-Mer port terminal in Gironde, France. During the month, the company also announced the acquisition of 17 solar projects totaling 407 MW in Germany from MEC Group, a project developer based in Düsseldorf.
3. In February 2023, EDF Renewables and L'Oréal Group signed a corporate power purchase agreement for two solar projects totaling 21 MW. The projects are expected to be commissioned by Q3 2024 and Q2 2025.
4. In August 2022, EDF Renewables announced the opening of crowdfunding via the WiSEED platform to construct an 11.4 MW Moulon de Blé solar power project in Bouches-du-Rhône, France.

Note: An AC/DC conversion factor of 1.3 has been used to arrive at the MW capacities mentioned in this slide



- Solar PV Awarded (MW)
- Solar PV Under Construction (MW)
- Solar PV Operational (MW)



Geographical Presence:

The company has solar PV projects in North America, Latin America, Asia, the Middle East, Africa, France, and other parts of Europe.

Some of their large-scale solar PV projects include:

1. Palen, U.S. (457 MW)
2. Pirapora, Brazil (307 MW)
3. SECI III, India (300 MW)
4. Switch, U.S. (234 MW)
5. Big Beau, U.S. (165 MW)

Pipeline Description:

EDF Renewable's pipeline includes 2,195 MW of solar projects under construction and 2,563 MW in the pre-construction stage as of June 2023. Its pipeline projects are in the U.S., South Africa, U.K., and India

Invenergy

Headquarters: Chicago, U.S.

Global Presence: Canada, El Salvador, Japan, Mexico, Poland, U.S., U.K., and Uruguay

Offerings and Capabilities: Solar Project Development, EPC Services, Asset Management, O&M Services, Balance of Plant Management and Maintenance, and Energy Management

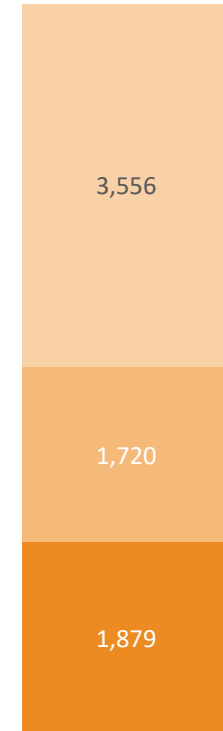
Project Portfolio: Operational Capacity: 1,879 MW; Under Construction: 1,720 MW; Awarded: 3,556 MW

Business Overview:

Invenergy develops, builds, and operates renewables and natural gas-based power generation projects worldwide. The company also builds and operates transmission, clean water, and green hydrogen projects. Invenergy's power generation portfolio totaled 31 GW as of June 2023. The company's portfolio included 202 wind, solar, natural gas, and energy storage-based projects. Of these, 158 projects are already commissioned, 16 are under construction, and 27 have been contracted for power purchase and are in the pre-construction stage.

Notable Developments:

1. In January 2023, Invenergy and CORE Electric Cooperative announced a 20-year partnership for wholesale power supply of 400 MW of solar and wind energy and 100 MW of battery energy storage projects. The renewable energy capacity included in the partnership is backed by 300 MW of existing natural gas-based power generation capacity.
2. In September 2022, Reactivate, a joint venture between Invenergy and impact investment platform Lafayette Square, announced the completion of its first transaction to develop an Illinois Solar For All (ILSFA) solar project portfolio in partnership with Trajectory Energy Partners, a solar developer. Under the ILSFA program, the company aims to generate more than 5 MW solar projects across Illinois.



- Solar PV Awarded (MW)
- Solar PV Under-Construction (MW)
- Solar PV Operational (MW)

Invenergy

Geographical Presence:

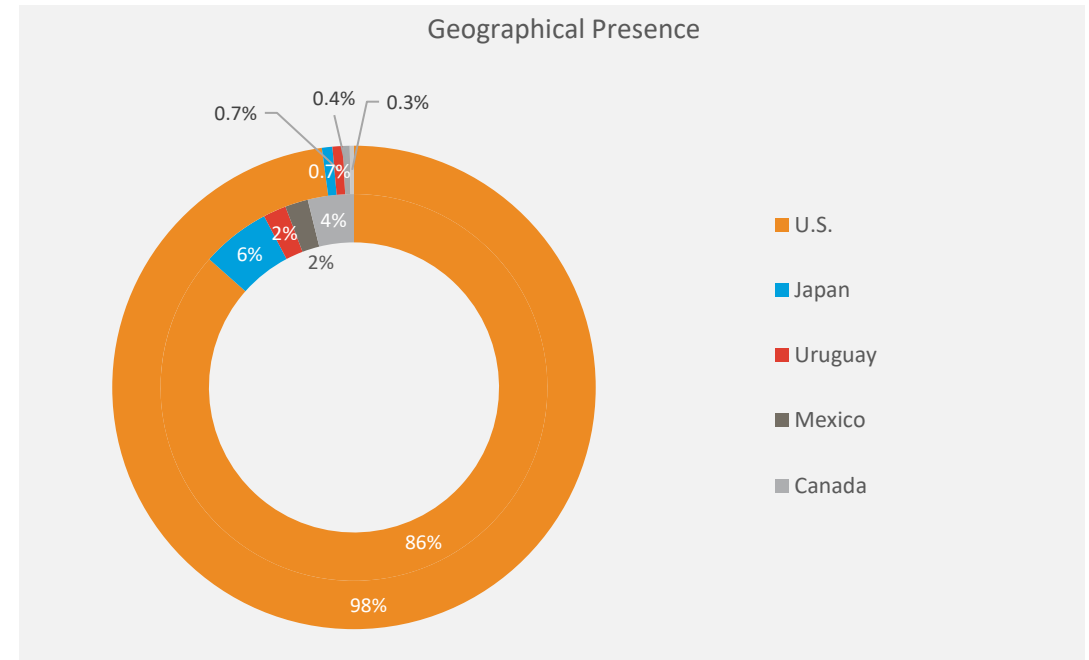
The company has solar PV projects in the U.S., Japan, Uruguay, Mexico, and Canada.

Some of their large-scale solar PV projects include:

1. Samson I & II, U.S. (500 MW)
2. Calhoun, U.S. (200 MW)
3. Southern Oak, U.S. (160 MW)
4. Hardin I, U.S. (150 MW)

Pipeline Description:

Invenergy's pipeline includes 1,720 MW of projects under construction and 3,556 MW in pre-construction as of June 2023. Samon Solar Project in Texas, U.S., is the company's largest project in the pipeline. Except for 610 MW under Samson solar project, 18% of the company's pipeline will likely be completed in 2023, 37% in 2024, 41% in 2025, and 4% in 2026.



Note: The inner circle represents the breakdown of the number of projects, and the outer circle represents the capacity size breakdown for each region.



Headquarters: Bilbao, Spain

Global Presence: U.K., U.S., Brazil, South Africa, Qatar, Greece, Romania, Italy, Hungary, Germany, France, Belgium, Portugal, and Algeria

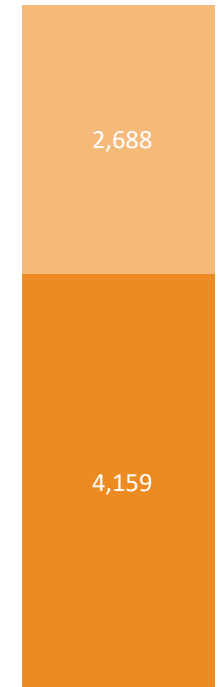
Offerings and Capabilities: Power Generation from wind (onshore and offshore), solar, and hydro energy sources, green hydrogen production, and solutions for smart grid, electric vehicle charging, rooftop solar, and few others

Project Portfolio: Operational Capacity: 4,159 MW; Under Construction: 2,688 MW

Business Overview: Iberdrola develops, builds, owns, and operates wind, solar, and hydropower projects. The company also supplies natural gas to homes and businesses. The company additionally offers solutions for rooftop solar, energy efficiency for residential, commercial, and industrial consumers, and electric vehicle charging. In April 2023, the company joined the United Nations Global Compact program to further improve the supply chain and vendors' sustainability.

Notable Developments:

1. In June 2023, Iberdrola secured a €1 billion (~₹1.07 billion) loan from the European Investment Bank (EIB) to co-finance the construction of 19 solar and three onshore wind energy projects totaling 2.2 GW.
2. In April 2023, Avangrid, part of Iberdrola Group, announced the commissioning of the 162 MW Pachwaywit Fields solar power project in Gilliam, Oregon, U.S. During the month, the company also announced that it was building 41 MW and 33 MW solar power projects in the wind power complex in Burgos, Italy.
3. In January 2023, Iberdrola signed an alliance with Norges Bank Investment Management to invest in nearly 1.3 GW of new renewable energy projects, 80% of which is expected to be solar. The projects are valued at around €1.2 billion (~\$1.3 billion).
4. In August 2022, Iberdrola commissioned the 590 MW Francisco Pizarro solar project in Extremadura, Spain. Companies including Danone, Bayer, and PepsiCo have signed agreements to purchase the electric power generated from the project.



■ Solar PV Under Construction (MW)
■ Solar PV Operational (MW)



Geographical Presence:

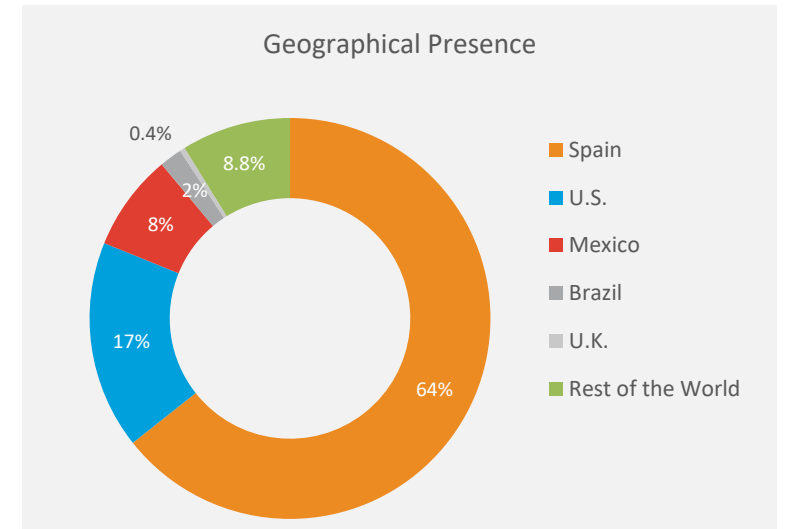
The company has solar PV projects in Spain, the U.S., Mexico, Brazil, the U.K., and several other countries.

Some of the company’s large-scale solar PV projects include:

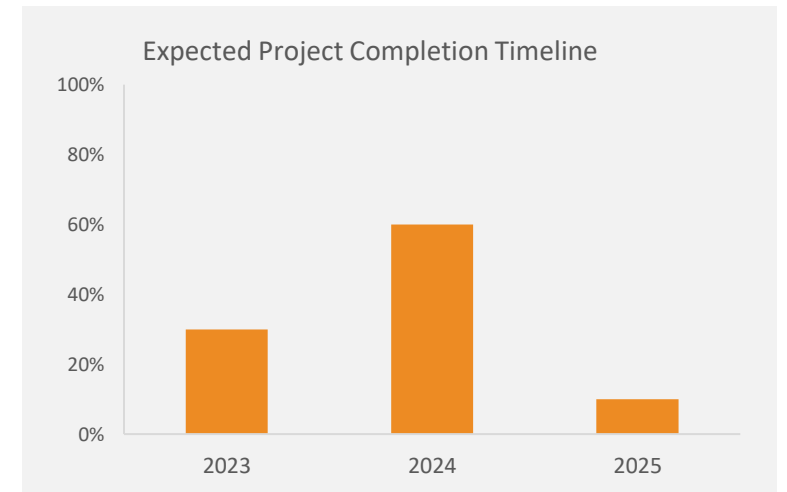
1. Francisco Pizarro, Spain (590 MW)
2. Santiago, Mexico (232 MW)
3. Lund Hill, U.S. (194 MW)

Pipeline Description:

Iberdrola’s solar pipeline includes 2,688 MW of projects under construction. The company’s pipeline projects are in Spain, the U.S., the U.K., and several other countries across the globe. Over 65% of Iberdrola’s solar project pipeline is in Spain, and nearly 60% is scheduled for completion in 2024.



Note: The chart represents the project capacity breakdown for each region





Headquarters: Berlin, Germany

Global Presence: Netherlands, U.K., Poland, Egypt, India, Germany, France and several other countries

Offerings and Capabilities: Project Development, Financing and PPAs, EPC, O&M, and Asset Management Project Portfolio:

Operational Capacity: 2,003 MW; Under Construction: 624 MW; Awarded: 3,704 MW

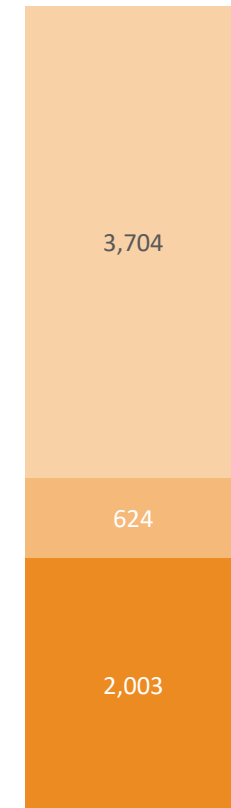
Business Overview:

ib vogt is a Germany-based solar energy company that develops, owns, and operates projects worldwide. The company also offers wind-solar and wind-solar-battery energy storage hybrid energy solutions. ib vogt's additional services for solar and hybrid energy projects include EPC, O&M, asset management, and project financing.

The company's development pipeline includes over 41 GW of contracted and uncontracted solar photovoltaic, hybrid energy, and a few standalone battery energy storage projects across Europe, Asia Pacific, North America, Latin America, Africa, Australia, and India. In November 2022, ib vogt became a signatory to the UN Global Compact, which is expected to further boost its operations' carbon neutrality.

Notable Developments:

1. In February 2023, ib vogt started constructing 55 MW and 48 MW solar energy projects in the U.K. The projects are co-located with 50 MW and 40 MW battery energy storage projects.
2. In November 2022, ib vogt started constructing a 124 MW solar project in Zamora, Spain. The company has signed a 12-year power purchase agreement with Google for the power generated from the project.
3. In August 2022, ib vogt secured construction financing for a 112 MW solar project in Lublin, Poland, from BayernLB and Siemens Financial Services. The company has signed an agreement with Next Kraftwerke to trade solar energy at the Polish exchange TGE.



- Solar PV Awarded (MW)
- Solar PV Under-Construction (MW)
- Solar PV Operational (MW)

Geographical Presence:

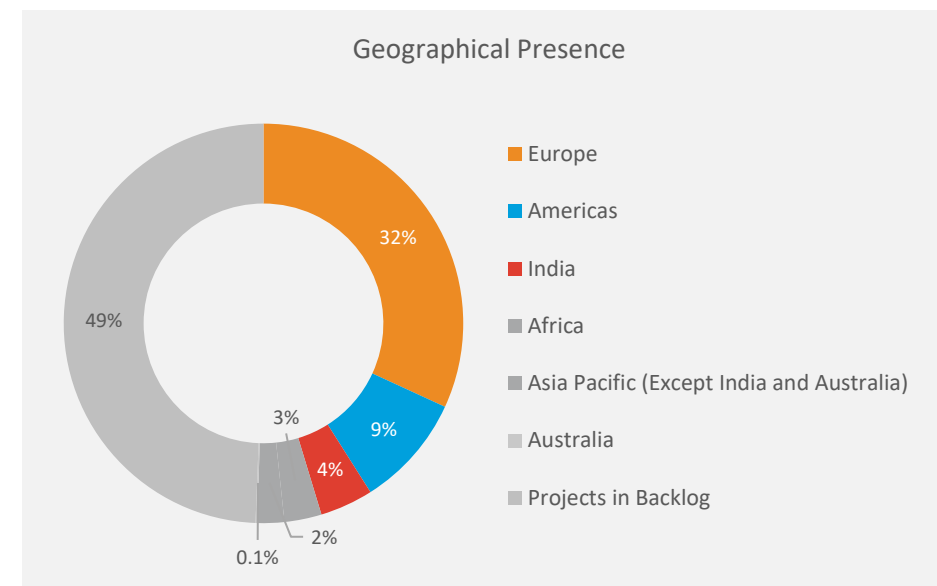
The company has solar PV projects in Europe, India, Asia Pacific (except India and Australia), Africa, North and Latin America, and Australia.

Some of the large-scale solar PV projects include:

1. Dorhout Mees, Netherlands (120 MW)
2. Vloeivelden, Netherlands (97 MW)
3. Bhagwanpur, India (60 MW)
4. North Devon, U.K. (50 MW)

Pipeline Description:

ib vogt's pipeline includes 624 MW projects under construction and 3,704 MW in the pre-construction stage as of June 2023. The company's pipeline includes projects in the U.K., Spain, the U.S., and several other countries.



Note: The chart represents the project capacity breakdown for each region

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