



DATA DEFINITIONS



Gulf Energy[®]

WELCOME

Welcome to the Global Energy Infrastructure and Global Energy Infrastructure Mapping Data Definitions.

Project data and market intelligence is consolidated in the Global Energy Infrastructure (GEI) and Global Energy Infrastructure Mapping (GEI Mapping) sites for easy access. This sites carries project data and the latest news for refining, petrochemicals, LNG, oil and gas pipelines, Carbon Capture Storage, and hydrogen. All data covers the global marketplace.

All data is updated on a continuous basis, and includes status, scope, project description, and other essential data. GEI and GEI Mapping data is used by the world's largest energy companies and suppliers to track projects around the world. Used by both business development and market analysts, a comprehensive view and intelligence of the global energy market gives users an advantage in winning new business and understanding trends in important market segments.

The documents defines what each dataset contains and provides detailed information about each information column.

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DISCLAIMER

IMPORTANT PLEASE READ

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WHAT AND WHERE DO WE TRACK

Downstream

Refining & Petrochemicals: All projects globally regardless of capacity or current status, including expansions and modernization projects.

Hydrogen: All projects globally regardless of capacity or current status, including production facilities, research facilities, demonstration plants, as well as industrial and transportation applications.

Carbon Capture Storage: All projects globally regardless of capacity or current status, including production facilities, research facilities, demonstration plants, as well as industrial and transportation applications.

LNG: All projects globally involved in the international trade of LNG (this excludes peak-shaving plants), with a minimum status of speculative. Editorial judgement is taken where multiple location options are put forward for a single project.

Midstream

Pipelines: All projects globally with a pipeline diameter no less than 8" for crude oil, oil products, natural gas and condensate, with a minimum status of planned. Editorial judgement is taken where multiple route options are put forward for a single project.

Renewables (GEI Mapping only)

Solar: All utility-scale projects (PV & CSP), considered to be 50MW installed capacity and above, globally regardless of current status. Exceptions are made in some regions where a smaller capacity may still be considered a significant project for the resource (Eg. Africa)

Wind: All utility-scale projects (onshore & offshore), considered to be 50MW installed capacity and above, globally regardless of current status.

Ocean: All projects globally (Wave & Tidal) regardless of capacity or current status, including demonstration plants and pilot projects.

HOW AND WHEN DO WE TRACK

Research is carried out by teams located in Houston, London and Philippines.

All data is collected from a variety of original sources, including company websites, annual reports, press releases, and social media posts.

Care is taken to verify the data as thoroughly as possible.

Our aim is to revisit all projects on a quarterly basis to maintain the credibility of the data.

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DOWNSTREAM DATA | REFINING AND PETROCHEMICALS

Below are the column descriptions for the data in the Refining and Petrochemicals feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.	Proposed	Project that has gone past the stage of being a feasibility study, then any one of the following: Project that has been put forward but not received local or national government approval; project that has been put forward but not received any firm financial backing; or project that has been put forward but has no HOA or LOI associated.
Report Link	Quick link to a pinpointed location of the project in the system.		
Project Name	Name of the project itself. This can be a specific unit at an overall complex.		
Plant Name	Name of the overall complex, sometimes housing numerous projects (defined under Project Name).	Hold	Project that has not been shelved or abandoned but has stopped its progress due to a number of possible internal or external factors.
Capacity	Peak capacity that the project is designed for, such as barrels per day (b/d), MMT/y (Millions of tons per year), etc.		
Estimated Startup	Year that the project is being anticipated to begin production.	Expansion Type	Descriptor that shares additional data such as if the project is an expansion of an existing project, a revamp/modernization project, a bottleneck project, etc.
\$ MM capital	Given cost associated with the project.	Project Scope	Brief description of the project and its design. It is designed to explain what the project is and what it designed to do.
Project Region	The region of the world the project is in, such as Asia/Pacific, Europe, Canada, Latin America, Africa, Middle East, and the United States.	Background	Brief history of the project, especially if it is being developed on an older facility and its history in the area.
State or Country¹	The State or Country the project is in, dependent upon the region.	Financials	History and description of the cost figures and final investment decision on a project.
Project Type	Gas, Petrochemical, or Refining.	Timeline	Chronological history of events at the project, such as changes in status or a statement around government approval, among other events.
Status Code Description	Current status of the project, identified as Proposed, Planning, Under Construction, or on Hold.	Locality	City level location of the project.
		X	Latitude for the project.
		Y	Longitude for the project.
STATUS DEFINITIONS			
Under construction	Project that has had all the necessary approvals and has started construction.		
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing (includes FEED & Engineering).		

¹See Geography page 21

DATA DEFINITIONS

DOWNSTREAM DATA | REFINING AND PETROCHEMICALS

Contact details for Refining and Petrochemicals.

The below fields are the contact information details for the **Engineering Company** involved in the project, when available.

Engineering Contact 1	Company Name
Engineering Contact 1	Region Name
Engineering Contact 1	Type
Engineering Contact 1	Company Notes
Engineering Contact 1	Contract Type
Engineering Contact 1	Contact Name
Engineering Contact 1	Job Title
Engineering Contact 1	Phone
Engineering Contact 1	City
Engineering Contact 1	State
Engineering Contact 1	Country
Engineering Contact 1	Email
Engineering Contact 1	Company Site

The below fields are the contact information details for the **Licensor Company** involved in the project, when available.

Licensor Contact 1	Company Name
Licensor Contact 1	Region Name
Licensor Contact 1	Type
Licensor Contact 1	Company Notes
Licensor Contact 1	Contract Type
Licensor Contact 1	Contact Name
Licensor Contact 1	Job Title
Licensor Contact 1	Phone
Licensor Contact 1	City
Licensor Contact 1	State
Licensor Contact 1	Country
Licensor Contact 1	Email
Licensor Contact 1	Company Site

The below fields are the contact information details for the **Construction Company** involved in the project, when available.

Constructor Contact 1	Company Name
Constructor Contact 1	Region Name
Constructor Contact 1	Type
Constructor Contact 1	Company Notes
Constructor Contact 1	Contract Type
Constructor Contact 1	Contact Name
Constructor Contact 1	Job Title
Constructor Contact 1	Phone
Constructor Contact 1	City
Constructor Contact 1	State
Constructor Contact 1	Country
Constructor Contact 1	Email
Constructor Contact 1	Company Site

The below fields are the contact information details for the **Operating Company** at the project. There will always be an operating company attached to a project.

Operating Company Contact 1	Company Name
Operating Company Contact 1	Region Name
Operating Company Contact 1	Type
Operating Company Contact 1	Company Notes
Operating Company Contact 1	Contract Type
Operating Company Contact 1	Contact Name
Operating Company Contact 1	Job Title
Operating Company Contact 1	Phone
Operating Company Contact 1	City
Operating Company Contact 1	State
Operating Company Contact 1	Country
Operating Company Contact 1	Email
Operating Company Contact 1	Company Site

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DOWNSTREAM DATA | LIQUEFIED NATURAL GAS (LNG)

Below are the column descriptions for the data in the LNG feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.	Start Date	When the project started.
Type	Import (Regasification) or Export (Liquefaction) project.	Owner/Operator	Name of owner and/or operator of the project.
Region¹	Which geographical region project is located.	Project Shareholders	Shareholders and participants in the project.
Country¹	Specific country.	Latitude	Latitude for the project.
Project	Name of the project.	Longitude	Longitude for the project.
Location	Whether the project is onshore or offshore.	Project Capacity	Capacity of the project in million tonnes per year (m t/y).
Status	This is the current status of the project, identified as Operating, Under Construction, Planned, Speculative or Non operational.	No. of Trains	Number of process trains at the project (Export only).
		Process Method	Process methods at the project (Export only).
		Origin of gas / Destination of LNG	Origin of the source gas for export plants or destination of LNG to import terminals.
		Storage capacity	Storage capacity at the project in thousand cubic metres ('000cm).
		Comments	Project comments and updates.
		Capex	Project capital expenditure in USS millions (SMM).
		Contact	Name of contact.
		Job Title	Job position held.
		Telephone	Contact telephone number.
		Email	Contact email address.
STATUS DEFINITIONS			
Operating	Project that is currently built and producing/receiving LNG for the market.		
Under construction	Project that has had all the necessary approvals and has started construction		
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to deliver LNG to a third party/receive LNG from a third party		
Speculative	Project that has gone past the stage of being a feasibility study, then any one of the following: Project that has been put forward but not received local or national government approval; project that has been put forward but not received any firm financial backing; or project that has been put forward but has no HOA or LOI to deliver LNG to a third party/receive LNG from a third party		
Non Operational	Project that has been cancelled, shelved, abandoned or has stopped its progress due to a number of possible internal or external factors.		

¹See Geography page 21

DOWNSTREAM DATA | HYDROGEN

Below are the column descriptions for the data in the Hydrogen feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.
Project Name	Name of the project.
Description/Scope	Full description or scope of the project.
Owner/Operator	Name of owner and/or operator of the project.
Shareholders/Participants	Shareholders and participants in the project.
Contact Name	Includes Name, Title, Company email and telephone.
Status	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.
Hydrogen Type	<p>Hydrogen production via fossil fuels</p> <p>Blue hydrogen is produced when natural gas is split into hydrogen and CO2 by Steam Methane Reforming (SMR) or Auto Thermal Reforming (ATR), for example, and the CO2 is captured and then stored. The 'capturing' is done through a process called Carbon capture and storage (CCS) or Carbon capture, utilisation, and storage (CCS).</p> <p>Turquoise hydrogen Hydrogen produced from natural gas using pyrolysis technology In which Natural gas is passed through, for example, a reactor containing molten metal to facilitate a reaction that releases hydrogen gas as well as solid carbon.</p> <p>Grey hydrogen has been produced for many years. It is a similar process to blue hydrogen using SMR or ATR to split natural gas into Hydrogen and CO2, although the CO2 is not captured and is released into the atmosphere.</p> <p>Brown hydrogen is created through brown coal (Lignite) gasification. Hydrogen is produced by first reacting coal with oxygen and steam under high pressures and temperatures to form synthesis gas, a mixture consisting primarily of carbon monoxide</p>

and hydrogen. If Brown hydrogen is combined with CCS it is then considered to be 'Blue' hydrogen.

Black hydrogen is created through black coal (Bituminous) gasification. Hydrogen is produced by first reacting coal with oxygen and steam under high pressures and temperatures to form synthesis gas, a mixture consisting primarily of carbon monoxide and hydrogen. If Black hydrogen is combined with CCS it is then considered to be 'Blue' hydrogen.

Hydrogen production via electricity

Green hydrogen is produced using renewable energy / electricity.

Purple or Pink hydrogen is produced using nuclear energy / electricity.

Yellow hydrogen is produced from mixed-origin grid energy.

Hydrogen as a energy vector

Industrial Metal working (alloying), glass production, in electronics industry and applications in electricity generation.

Transportation Heavy duty vehicles, cars, and buses

Research Projects looking into the development of hydrogen applications and deployment

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DOWNSTREAM DATA | HYDROGEN

Below are the column descriptions for the data in the Hydrogen feature layer in both Global Energy Infrastructure and GEI Mapping.

Technology Group

Thermal processes for hydrogen production typically involve steam reforming, a high-temperature process in which steam reacts with a hydrocarbon fuel to produce hydrogen. Many hydrocarbon fuels can be reformed to produce hydrogen, including natural gas, diesel, renewable liquid fuels, gasified coal, or gasified biomass.

Electrolytic - Water can be separated into oxygen and hydrogen through a process called electrolysis. Electrolytic processes take place in an electrolyser, which functions much like a fuel cell in reverse. Instead of using the energy of a hydrogen molecule like a fuel cell, an electrolyser creates hydrogen from water molecules.

Technology Type Type of technology used in hydrogen projects.
Technology Abbreviation Abbreviation of Technology Type above.
Status Current status of the project, identified as Operating, Under Construction, Planned, or Proposed.

STATUS DEFINITIONS

Operating Project that is currently built and producing/using hydrogen.
Under Construction Project that has had all the necessary approvals and has started construction.
Planned Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to produce/use hydrogen.
Proposed Project that has gone past the stage of being a feasibility study, then any one of the following: Project that has been put forward but not received local or national government

Sub-Status
Start Date
Capex
Currency
Comments
Region¹
Country¹
Location
Latitude
Longitude

approval; project that has been put forward but not received any firm financial backing; or project that has been put forward but has no HOA or LOI to produce/use hydrogen.
 Additional stage of the project.
 Year when the project started.
 Project capital expenditure in millions.
 Currency in which the Capex has been reported.
 Project comments and updates.
 Which geographical region project is located.
 Specific country.
 City level location of the project.
 Latitude for the project.
 Longitude for the project.

Estimated Normalised capacity

Production Capacity (MW) Estimated normalised hydrogen production capacity in MW. H output (HHV) is included for Power-to-X (PtX) projects

H2 per hour (Nm³) Production capacity in Nm³ H/hour as quoted by the project is used. If not specified, for PtX projects this is estimated using electrolyser power ratings. The assumed conversion factors are:
 ALK: 0.0046 MW/nm³ H/hour
 PEM: 0.0047 MW/nm³ H/hour
 SOEC: 0.0038 MW/nm³ H/hour
 Unknown PtX: 0.0045 MW/nm³ H/hour (equivalent to 50 kWh/kg H).

¹ See Geography page 21

DOWNSTREAM DATA | HYDROGEN

Below are the column descriptions for the data in the Hydrogen feature layer in both Global Energy Infrastructure and GEI Mapping.

<p>CO2 Capture (Tonnes) Production from fossil fuels with CO capture, an estimate of the amount of “zero carbon” hydrogen capacity is derived for simplicity. This is equivalent to the hydrogen production capacity multiplied by the CO2 capture rate for the whole facility. For example, a steam methane reformer (SMR) with a capacity of 100 ktH2/yr and CO2 capture capacity equal to 60% of the CO2 output of the SMR would be considered to have capacity to produce 60 ktH2/yr of zero carbon hydrogen and 40 ktH2/yr of hydrogen with the CO2 intensity of the SMR without CO2 capture. The assumptions for specific emissions are:</p> <p style="margin-left: 40px;">Natural gas fuelled plants²: 0.9105 kg CO/nm³ H and continuous operation (capacity factor of 1). Coal fuelled plants³: 1.9075 kg CO/nm³ H and continuous operation (capacity factor of 1).</p>	<p>End-use product</p> <ul style="list-style-type: none"> Synthetic methane (CH4) Hydrogen in molecular form (H2) Carbon Dioxide (CO2) Ammonia (NH3) <p>Hydrogen, Methane or Synfuels end user</p> <p>Power Supply of electricity to the electricity grid with a gas turbine or fuel cell.</p> <p>Grid injection Injection in natural gas or pure hydrogen grids.</p> <p>Mobility Used vehicles (road, off-road, rail, maritime or aviation).</p> <p>Industrial heating Industrial applications such as refineries, steel plants or high temperature heat.</p> <p>Heat/power (CHP) Heat and power via CHPs, for example in fuel cells or turbines.</p> <p>Domestic heat Direct use in building for water and space heating.</p> <p>Chemicals Production of (intermediate) chemicals, such as methanol, ammonia (for fertiliser or chemical products) or final chemical products.</p>
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Capacity note: It has not been possible to make definitive judgements of the sources of electricity or the fate of captured CO2 for all of the projects (i.e. whether or not it is all permanently geologically stored or equivalent). While they are likely to have widely varying CO2 intensities across their supply chains in practice, all have the potential to be low-carbon.

² California Air Resources Board, 2018

³ Orhan and Alper, 2014; adjusted for hydrogen production only

DOWNSTREAM DATA | CARBON CAPTURE STORAGE

Below are the column descriptions for the data in the Carbon Capture Storage feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.	CCS Hub	If a project is part of a wider group of projects that form a hub or cluster, the name of the cluster is labelled here.
Project Name	Name of the project.	Carbon Capture and Storage	
Description/Scope	Full description or scope of the project.	CO2 Capture (Tonnes):	Production from various industries with CO capture. This is an annualised production figure in tonnes.
Owner/Operator	Name of owner and/or operator of the project.	Capture type:	The process of separating and enriching CO2 generated from the use of fossil energy in the chemical, power, steel, cement, and other industries; it is usually divided into post-combustion capture, pre-combustion capture, and oxyfuel combustion capture.
Shareholders/Participants	Shareholders and participants in the project.	Storage type:	4 main groups of utilization and storage are: Geological utilization: The process of injecting CO2 into the ground for energy production. It is mainly used to enhance the recovery of resources such as petroleum, geothermal, deep saline water in the formation, and uranium ore. Chemical utilization: Chemical conversion is the main approach to convert CO2 and co-reactants into target products. It excludes the traditional chemical approach that uses CO2 to generate products but re-releases CO2 after being consumed (e.g., urea production). Biological utilization: In this category, CO2 is used to facilitate biomass synthesis. The main products are food and feed, biofertilizers, chemicals and biofuels, and gas fertilizers.
Types	Types of projects include: Pilot Project: A pilot program, also called a feasibility study or experimental trial, is a small-scale, short-term experiment that helps an organization learn how a large-scale project might work in practice. CC Project: Project that has Carbon Capture only. CCS Project: Project that has Carbon Capture and Storage. CCUS Project: Project that has Carbon Capture Utilization and Storage. CCU Project: Project that has Carbon Capture and Use. CCS Hubs: A location for a group of projects that are in the carbon chain. CO2 Pipelines: Projects that include pipelines transporting CO2. Storage: Project that has Carbon Storage only.		

DATA DEFINITIONS

DOWNSTREAM DATA | CARBON CAPTURE STORAGE

Below are the column descriptions for the data in the Carbon Capture Storage feature layer in both Global Energy Infrastructure and GEI Mapping.

Storage type:	continued.. Geological storage: The captured CO2 is stored in the geological structure through engineering techniques to achieve long-term isolation from the atmosphere. It is mainly divided into onshore saline aquifer storage, offshore geological storage, and depleted oil and gas field storage.	Sub-Status	Additional stage of the project.
		Start Date	Year when the project started.
		End Date:	Year when the project concluded or closed.
		Capex:	Project capital expenditure in millions.
		Currency:	Currency in which the Capex has been reported.
Industry:	Which industry is providing the feedstock CO2	Comments:	Project comments and updates.
Technology:	Technologies employed to capture the CO2 from the feedstock industry	Region¹:	Which geographical region project is located.
		Country¹:	Specific country.
		Location:	City level location of the project.
		Latitude:	Latitude for the project.
Status:	This is the status of the project, identified as Operating, Under Construction, Planned, Proposed, or Non-operational.	Longitude:	Longitude for the project.

STATUS DEFINITIONS

Operating	Project that is currently built and producing/using CCS or CCUS
Under Construction	Project that has had all the necessary approvals and has started construction
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to produce/use CCS or CCUS.
Proposed	Project that has gone past the stage of being a feasibility study, then any one of the following: Project that has been put forward but not received local or national government approval; project that has been put forward but not received any firm financial backing; or project that has been put forward but has no HOA or LOI to produce/use CCS or CCUS.

Contact name:	Name of primary contact
Contact role:	Job title.
Contact company:	Company name
Contact email:	Email address.
Contact telephone:	Telephone number.
Contact website:	Company or project website.

¹See Geography page 21

DATA DEFINITIONS

MIDSTREAM DATA | US OIL PIPELINES

Below are the column descriptions for the data in the US Oil Pipelines feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.	Project	Name of the project.
Pipeline Type	Intrastate: Pipelines held within a US state, Interstate: Pipelines between US states, Transboundary: Pipelines that enter or depart the US. Principle fuel carried.	Owner/Operator	Name of owner and/or operator of the project.
Fuel Type	Which geographical region project is located	Shareholders/Participants	Shareholders and participants in the project.
Region¹	Specific country.	Description/Scope	Full description or scope of the project.
Country¹	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.	Length	Pipeline length in miles.
Status		Diameter	Pipeline diameter in inches (may list multiple sizes).
		Capacity	Capacity of the pipeline in thousand barrels per day (Thousand b/d).
		Background Information	Supplementary information.
		Comments	Project comments and updates.
		Contact name	Name of contact.
		Job Title	Job position held.
		Company name	Name of company.
		Telephone	Contact telephone number.
		Email	Contact email address.
		Website	Company website.
		Start Date	Year when the project started.

STATUS DEFINITIONS

Operating	Project that is currently built and flowing commercial quantities of fuel
Under Construction	Project that has had all the necessary approvals and has started construction.
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to deliver commercial quantities of fuel.
Non Operational	Project that has been cancelled, shelved, abandoned or has stopped its progress due to a number of possible internal or external factors.

¹ See Geography page 21

DATA DEFINITIONS

MIDSTREAM DATA | US GAS PIPELINES

Below are the column descriptions for the data in the US Gas Pipelines feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.	Project Name	Name of the project.
Pipeline Type	Intrastate: Pipelines held within a US state, Interstate: Pipelines between US states, Transboundary: Pipelines that enter or depart the US. Principle fuel carried.	Owner/Operator	Name of owner and/or operator of the project.
Fuel Type	Which geographical region project is located.	Shareholders/Participants	Shareholders and participants in the project.
Region¹	Specific country.	Description/Scope	Full description or scope of the project.
Country¹	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.	Length	Pipeline length in miles.
Status		Permitting authority	Agency which approved the pipeline.
		Filings	Official documentation filed for the pipeline.
		Background Information	Supplementary information.
		Linked Projects	Other projects linked directly to the pipeline.
		Comments	Project comments and updates.
		Contact name	Name of contact.
		Company name	Name of company.
		Telephone	Contact telephone number.
		Email	Contact email address.
		Website	Company website.
		Capacity	Capacity of the pipeline in million cubic feet per day (Million cf/d).

STATUS DEFINITIONS

Operating	Project that is currently built and flowing commercial quantities of fuel
Under Construction	Project that has had all the necessary approvals and has started construction.
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to deliver commercial quantities of fuel.
Non Operational	Project that has been cancelled, shelved, abandoned or has stopped its progress due to a number of possible internal or external factors.

¹ See Geography page 21

DATA DEFINITIONS

MIDSTREAM DATA | US PRODUCTS PIPELINES (GEI MAPPING ONLY)

Below are the column descriptions for the data in the US Products Pipelines feature layer in GEI Mapping only.

Object ID	Automatically generated, unique identification number assigned to each project.	Project Name	Name of the project.
Commodity	Principle fuel carried.	Operator	Name of owner and/or operator of the project.
Region¹	Which geographical region project is located	Shareholders	Shareholders and participants in the project.
Country¹	Specific country.	Scope	Full description or scope of the project.
Pipeline Type	Intrastate: Pipelines held within a US state, Interstate: Pipelines between US states, Transboundary: Pipelines that enter or depart the US.	Length	Pipeline length in miles.
Status	This is the current status of the project, identified as Operating, Under Construction, or Planned.	Diameter	Pipeline diameter in inches (may list multiple sizes).
		Capacity	Capacity of the pipeline in thousand barrels per day (Thousand b/d).
		Background	Supplementary information.
		Linked Projects	Other projects linked directly to the pipeline.
		Comments	Project comments and updates.
		Contact	Name of contact.
		Position	Job position held.
		Company Name	Name of company.
		Telephone	Contact telephone number.
		Email	Contact email address.
		Website	Company website.
		Start Date	Year when the project started.
		Capex	Project capital expenditure in US\$ millions (SMM).

STATUS DEFINITIONS

Operating	Project that is currently built and flowing commercial quantities of fuel
Under Construction	Project that has had all the necessary approvals and has started construction.
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to deliver commercial quantities of fuel.

¹ See Geography page 21

DATA DEFINITIONS

MIDSTREAM DATA | GLOBAL OIL PIPELINES

Below are the column descriptions for the data in the Global Oil Pipelines feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.	Pipeline Type	National: Pipelines held within a single country, International: Pipelines that cross country borders, Transboundary: Pipelines that enter or depart the a country.
Region¹	Which geographical region project is located.	Project Name	Name of the project.
Country¹	Specific country.	Operator	Name of owner and/or operator of the project.
Fuel Type	Principle fuel carried.	Origin/Start point	Location where the pipeline commences.
Status	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.	Destination/End point	Location where the pipeline concludes.
STATUS DEFINITIONS		Length	Pipeline length in miles.
Operating	Project that is currently built and flowing commercial quantities of fuel	Diameter	Pipeline diameter in inches.
Under Construction	Project that has had all the necessary approvals and has started construction.	Email	Contact email address.
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to deliver commercial quantities of fuel.	Capacity	Capacity of the pipeline in million barrels per day (mbpd).
Non Operational	Project that has been cancelled, shelved, abandoned or has stopped its progress due to a number of possible internal or external factors.	Scope	Full description or scope of the project.
		Contact	Name of contact.
		Position	Job position held.
		Company name	Name of company.
		Telephone	Contact telephone number.
		Website	Company website.
		Start Date	Year when the project started.

¹ See Geography page 21

DATA DEFINITIONS

MIDSTREAM DATA | GLOBAL GAS PIPELINES

Below are the column descriptions for the data in the Global Gas Pipelines feature layer in both Global Energy Infrastructure and GEI Mapping.

Object ID	Automatically generated, unique identification number assigned to each project.	Region¹	Which geographical region project is located.
Fuel Type	Principle fuel carried.	Country¹	Specific country.
Status	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.	Pipeline Type	National: Pipelines held within a single country, International: Pipelines that cross country borders.
STATUS DEFINITIONS		Project Name	Name of the project.
Operating	Project that is currently built and flowing commercial quantities of fuel	Owner/Operator	Name of owner and/or operator of the project.
Under Construction	Project that has had all the necessary approvals and has started construction.	Shareholders/Participants	Shareholders and participants in the project.
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to deliver commercial quantities of fuel.	Length	Pipeline length in miles.
Non Operational	Project that has been cancelled, shelved, abandoned or has stopped its progress due to a number of possible internal or external factors.	Diameter	Pipeline diameter in inches.
		Description/Scope	Full description or scope of the project.
		Origin/Start point	Location where the pipeline commences.
		Destination/End point	Location where the pipeline concludes.
		Comments	Project comments and updates.
		Contact Name	Name of contact.
		Job Title	Job position held.
		Company name	Name of company.
		Telephone	Contact telephone number.
		Email	Contact email address.
		Website	Company website.
		Start Date	Year when the project started.
		Capacity as reported	Capacity as reported by the project operator
		Capacity	Capacity of the pipeline in million cubic feet per day (Million cf/d).

¹ See Geography page 21

DATA DEFINITIONS

RENEWABLES | SOLAR (GEI MAPPING ONLY)

Below are the column descriptions for the data in the Solar feature layer in GEI Mapping only.

Object ID	Automatically generated, unique identification number assigned to each project.	Start Date	Year when the project started.
Project Name	Name of the project.	Project Cost	Project capital expenditure in US\$ millions (\$MM).
Process Type	Type of technology group used.	Region¹	Which geographical region project is located.
Technology Type	Specific technology type used.	Country¹	Specific country.
Number of Units	Number of solar units used or deployed.	Location	City level location of the project.
Installed Capacity	Capacity of the project in megawatts (MW).	Description/Scope	Full description or scope of the project.
Acreage	Amount of land space used for the project in square kilometres (square km).	Owner/Operator	Name of owner and/or operator of the project.
Status	This is the current status of the project, identified as Operating, Under Construction, Planned, or Proposed.	Shareholders/Participants	Shareholders and participants in the project.
		Comments	Project comments and updates.
		Latitude	Latitude for the project.
		Longitude	Longitude for the project.

STATUS DEFINITIONS

Operating	Solar park that is currently built and generating electricity for the market.
Under Construction	Solar park that has had all the necessary approvals and has started construction.
Planned	Any one of the following: Solar park that has received all necessary approvals but has not started construction; solar park that has received approval from local or national government; solar park that has received firm financial backing; or solar park that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to generate electricity.
Proposed	Solar park that has gone past the stage of being a feasibility study, then any one of the following: Solar park that has been put forward but not received local or national government approval; solar park that has been put forward but not received any firm financial backing; or solar park that has been put forward but has no HOA or LOI to generate electricity.

¹ See Geography page 21

DATA DEFINITIONS

RENEWABLES | WIND (GEI MAPPING ONLY)

Below are the column descriptions for the data in the Wind feature layer in GEI Mapping only.

Object ID	Automatically generated, unique identification number assigned to each project.	Start Date	Year when the project started.
Project Name	Name of the project.	Cost	Project capital expenditure in US\$ millions (\$MM).
Process Type	Type of technology group used.	Region¹	Which geographical region project is located.
Number of Units	Number of solar units used or deployed.	Country¹	Specific country.
Installed Capacity	Capacity of the project in megawatts (MW).	Location	City level location of the project.
Acreage	Amount of land space used for the project in square kilometres (square km).	Description/Scope	Full description or scope of the project.
Status	This is the current status of the project, identified as Operating, Under Construction, Planned, or Proposed.	Owner/Operator	Name of owner and/or operator of the project.
		Shareholders/Participants	Shareholders and participants in the project.
		Comments	Project comments and updates.
		Latitude	Latitude for the project.
		Longitude	Longitude for the project.

STATUS DEFINITIONS

Operating	Wind-farm that is currently built and generating electricity for the market.
Under Construction	Wind-farm that has had all the necessary approvals and has started construction.
Planned	Any one of the following: Wind-farm that has received all necessary approvals but has not started construction; wind-farm that has received approval from local or national government; wind-farm that has received firm financial backing; or wind-farm that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to generate electricity.
Proposed feasibility has national been put forward farm that generate	Wind-farm that has gone past the stage of being a study, then any one of the following: Wind-farm that has been put forward but not received local or national government approval; wind-farm that has been put forward but not received any firm financial backing; or wind-farm that has been put forward but has no HOA or LOI to generate electricity.

¹ See Geography page 21

DATA DEFINITIONS

RENEWABLES | OCEANS (GEI MAPPING ONLY)

Below are the column descriptions for the data in the Oceans feature layer in GEI Mapping only.

Object ID	Automatically generated, unique identification number assigned to each project.	Start Date	Year when the project started.
Project Name	Name of the project.	Project Cost	Project capital expenditure in US\$ millions (\$MM).
Process Type	Type of technology group used (Wave or Tidal).	Region¹	Which geographical region project is located.
Technology Type	Specific technology type used.	Country¹	Specific country.
Number of Turbines	Number of turbines used or deployed.	Location	City level location of the project.
Installed Capacity	Capacity of the project in megawatts (MW).	Description/Scope	Full description or scope of the project.
Acreage	Amount of land space used for the project in square kilometres (square km).	Owner/Operator	Name of owner and/or operator of the project.
Status	This is the current status of the project, identified as Operating, Under Construction, Planned, or Proposed.	Shareholders/Participants	Shareholders and participants in the project.
		Comments	Project comments and updates.
		Latitude	Latitude for the project.
		Longitude	Longitude for the project.

STATUS DEFINITIONS

Operating	Project that is currently built and generating electricity for the market.
Under Construction	Project that has had all the necessary approvals and has started construction.
Planned	Any one of the following: Project that has received all necessary approvals but has not started construction; project that has received approval from local or national government; project that has received firm financial backing; or project that has had Heads of Agreement (HOA) or Letter of Intent (LOI) to generate electricity.
Non operational	Project that has been cancelled, shelved, abandoned or has stopped its progress due to a number of possible internal or external factors.

¹ See Geography page 21

DATA DEFINITIONS

GEOGRAPHY

The countries in the GEI Data Center and Energy Web Atlas fall into the following regions

North America

Canada
United States
Mexico
The Bahamas
Bermuda

Cent. & South America

Anguilla
Antigua and Barbuda
Archipelago of San Andres, Providencia and Santa Catalina
Argentina
Aruba
Barbados
Bolivia
Bonaire
Brazil
British Virgin Islands
Cayman Islands
Chile
Colombia
Costa Rica
Cuba
Curaçao
Dominica
Dominican Republic
Ecuador
El Salvador
French Guiana
Grenada
Guadeloupe
Guatemala
Guyana
Haiti
Haiti
Honduras
Jamaica
Martinique
Montserrat
Navassa Island
Nicaragua
Nueva Esparta
Panama
Paraguay
Peru
Puerto Rico
Saba
Saint Kitts and Nevis

Saint Lucia
Saint Vincent and the Grenadines
Sint Eustatius
Sint Maarten
Saint Barthelemy
St Martin
Suriname
The Bahamas
Trinidad and Tobago
Turks and Caicos Islands
United States Virgin Islands
Uruguay
Venezuela

Europe

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium

Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Italy
Kazakhstan
Latvia
Liechtenstein
Lithuania
Luxembourg
Malta
Moldova

Monaco
Montenegro
Netherlands
North Macedonia
Norway
Poland
Portugal
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
Ukraine
United Kingdom
Vatican City

Africa

Algeria
Angola
Benin
Botswana
Burkina Faso
Burundi
Cameroon
Canary Islands (Spain)
Cape Verde
Central African Republic
Ceuta (Spain)
Chad
Comoros
Democratic Republic of the Congo
Djibouti
Egypt
Equatorial Guinea
Eritrea
Eswatini
Ethiopia
Gabon

Ghana
Guinea
Guinea-Bissau
Ivory Coast [Cote d'Ivoire]
Kenya
Lesotho
Liberia
Libya
Madagascar
Madeira (Portugal)
Malawi
Mali
Mauritania
Mauritius
Mayotte (France)
Melilla (Spain)
Morocco
Mozambique
Namibia
Niger
Nigeria
Republic of the Congo
Reunion (France)

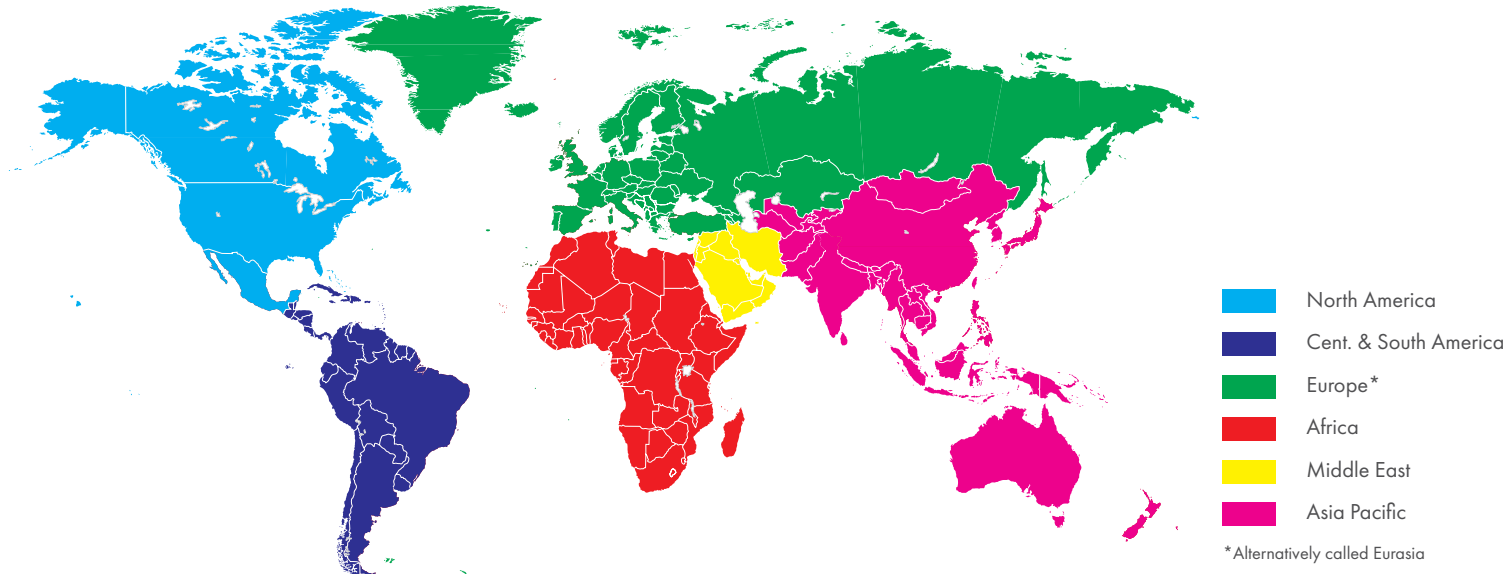
Rwanda
Saint Helena, Ascension and Tristan da Cunha (United Kingdom)
Sao Tome and Principe
Senegal
Seychelles
Sierra Leone
Somalia
Somaliland
South Africa
South Sudan
Sudan
Tanzania
The Gambia
Togo
Tunisia
Uganda
Western Sahara
Zambia
Zimbabwe

Middle East

Bahrain
Iran
Iraq
Israel
Jordan
Kuwait
Lebanon
Oman
Palestine
Qatar
Saudi Arabia
Syria
United Arab Emirates
Yemen

Asia Pacific

Afghanistan
Bangladesh
Bhutan
Brunei
Cambodia
China (PRC)
East Timor [Timor-Leste]
India
Indonesia
Japan
Kyrgyzstan
Laos
Malaysia
Maldives
Mongolia
Myanmar
Nepal
North Korea
Pakistan
Philippines
Singapore
South Korea
Sri Lanka
Syria
Taiwan (ROC)
Tajikistan
Thailand
Turkmenistan
Uzbekistan
Vietnam



CONTACTS

If you are experiencing technical difficulties or have questions about the mapping application, please contact us for assistance.

Peregrine Bush

Senior Director, Data and Technology
peregrine.bush@gulfenergyinfo.com

Thad Pittman

Senior Research Analyst
thad.pittman@gulfenergyinfo.com

Zuzanna Jurek

Research Analyst - Hydrogen / CCS
zuzanna.jurek@gulfenergyinfo.com

Seth Haskell

Research Analyst - LNG / Pipelines
seth.haskell@gulfenergyinfo.com

If you would like to purchase additional licenses for this product, please contact:

Ed Bramwell

ed.bramwell@gulfenergyinfo.com
+44 (0)20 3793 9705



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