



## DATA DEFINITIONS



## WELCOME

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### 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.

## CONTENTS

---

- 3 Disclaimer
  - 4 What and where do we track
  - 4 How and when do we track
- 

## DOWNSTREAM DATA

---

- 5 Refining and Petrochemicals
  - 7 Liquefied Natural Gas (LNG)
  - 8 Hydrogen
  - 11 Carbon Capture Storage
- 

## MIDSTREAM DATA

---

- 13 US oil pipelines
  - 14 US gas pipelines
  - 15 US products pipelines (GEI Mapping only)
  - 16 Global oil pipelines
  - 17 Global gas pipelines
  - 18 Global hydrogen pipelines
- 

## GEOGRAPHY

---

- 19 Regions and countries
- 

## CONTACT

---

- 20 Useful contacts
- 

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### DISCLAIMER

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#### IMPORTANT PLEASE READ

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## DATA DEFINITIONS

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### WHAT AND WHERE DO WE TRACK

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#### Downstream

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

**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.

**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.

#### Midstream

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

### HOW AND WHEN DO WE TRACK

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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.

## DATA DEFINITIONS

### 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.

<b>Object ID</b>	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.
<b>Report Link</b>	Quick link to a pinpointed location of the project in the system.		
<b>Project Name</b>	Name of the project itself. This can be a specific unit at an overall complex.		
<b>Plant Name</b>	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.
<b>Capacity</b>	Peak capacity that the project is designed for, such as barrels per day (b/d), MMt/y (Millions of tons per year), etc.		
<b>Estimated Startup</b>	Year that the project is being anticipated to begin production.	<b>Expansion Type</b>	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.
<b>\$ MM capital</b>	Given cost associated with the project.	<b>Project Scope</b>	Brief description of the project and its design. It is designed to explain what the project is and what it designed to do.
<b>Project Region</b>	The region of the world the project is in, such as Asia/Pacific, Europe, Canada, Latin America, Africa, Middle East, and the United States.	<b>Background</b>	Brief history of the project, especially if it is being developed on an older facility and its history in the area.
<b>State or Country<sup>1</sup></b>	The State or Country the project is in, dependent upon the region.	<b>Financials</b>	History and description of the cost figures and final investment decision on a project.
<b>Project Type</b>	Gas, Petrochemical, or Refining.	<b>Timeline</b>	Chronological history of events at the project, such as changes in status or a statement around government approval, among other events.
<b>Status Code Description</b>	Current status of the project, identified as Proposed, Planning, Under Construction, or on Hold.	<b>Locality</b>	City level location of the project.
		<b>X</b>	Latitude for the project.
		<b>Y</b>	Longitude for the project.
<b>STATUS DEFINITIONS</b>			
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).		

<sup>1</sup> See Geography page 19

## 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

## DATA DEFINITIONS

### 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.

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.	<b>Start Date</b>	When the project started.
<b>Type</b>	Import (Regasification) or Export (Liquefaction) project.	<b>Owner/Operator</b>	Name of owner and/or operator of the project.
<b>Region<sup>1</sup></b>	Which geographical region project is located.	<b>Project Shareholders</b>	Shareholders and participants in the project.
<b>Country<sup>1</sup></b>	Specific country.	<b>Latitude</b>	Latitude for the project.
<b>Project</b>	Name of the project.	<b>Longitude</b>	Longitude for the project.
<b>Location</b>	Whether the project is onshore or offshore.	<b>Project Capacity</b>	Capacity of the project in million tonnes per year (m t/y).
<b>Status</b>	This is the current status of the project, identified as Operating, Under Construction, Planned, Proposed or Non operational.	<b>No. of Trains</b>	Number of process trains at the project (Export only).
		<b>Process Method</b>	Process methods at the project (Export only).
		<b>Origin of gas / Destination of LNG</b>	Origin of the source gas for export plants or destination of LNG to import terminals.
		<b>Storage capacity</b>	Storage capacity at the project in thousand cubic metres ('000cm).
		<b>Comments</b>	Project comments and updates.
		<b>Capex</b>	Project capital expenditure in US\$ millions (\$MM).
		<b>Contact</b>	Name of contact.
		<b>Job Title</b>	Job position held.
		<b>Telephone</b>	Contact telephone number.
		<b>Email</b>	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
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 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.

<sup>1</sup> See Geography page 19

### DOWNSTREAM DATA | HYDROGEN

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

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.	If Brown hydrogen is combined with CCS it is then considered to be 'Blue' hydrogen.
<b>Project Name</b>	Name of the project.	<b>Black hydrogen</b> 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.
<b>Description/Scope</b>	Full description or scope of the project.	If Black hydrogen is combined with CCS it is then considered to be 'Blue' hydrogen.
<b>Owner/Operator</b>	Name of owner and/or operator of the project.	Hydrogen production via electricity
<b>Shareholders/Participants</b>	Shareholders and participants in the project.	<b>Green hydrogen</b> is produced using renewable energy / electricity.
<b>Contact Name</b>	Includes Name, Title, Company email and telephone.	<b>Purple or Pink hydrogen</b> is produced using nuclear energy / electricity.
<b>Status</b>	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.	<b>Yellow hydrogen</b> is produced from mixed-origin grid energy.
<b>Hydrogen Type</b>	Hydrogen production via fossil fuels <b>Blue hydrogen</b> 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). <b>Turquoise hydrogen</b> 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. <b>Grey hydrogen</b> 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. <b>Brown hydrogen</b> 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 and hydrogen.	Hydrogen as a energy vector <b>Industrial</b> Metal working (alloying), glass production, in electronics industry and applications in electricity generation. <b>Transportation</b> Heavy duty vehicles, cars, and buses <b>Research</b> Projects looking into the development of hydrogen applications and deployment



## DATA DEFINITIONS

### 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 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.

#### Sub-Status

Additional stage of the project.

#### Start Date

Year when the project started.

#### Capex

Project capital expenditure in millions.

#### Currency

Currency in which the Capex has been reported.

#### Comments

Project comments and updates.

#### Region<sup>1</sup>

Which geographical region project is located.

#### Country<sup>1</sup>

Specific country.

#### Location

City level location of the project.

#### Latitude

Latitude for the project.

#### Longitude

Longitude for the project.

#### Estimated Normalised capacity

#### Production Capacity (MW)

Estimated normalised hydrogen production capacity in MW H<sub>2</sub> output (HHV) is included for Power-to-X (PtX) projects

#### H<sub>2</sub> per hour (Nm<sup>3</sup>)

Production capacity in Nm<sup>3</sup> H<sub>2</sub>/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/nm<sup>3</sup> H<sub>2</sub>/hour
- PEM: 0.0047 MW/nm<sup>3</sup> H<sub>2</sub>/hour
- SOEC: 0.0038 MW/nm<sup>3</sup> H<sub>2</sub>/hour
- Unknown PtX: 0.0045 MW/nm<sup>3</sup> H<sub>2</sub>/hour (equivalent to 50 kWh/kg H<sub>2</sub>).

#### CO<sub>2</sub> Capture (Tonnes)

Production from fossil fuels with CO<sub>2</sub> 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 CO<sub>2</sub> capture rate for the whole facility. For example, a steam methane reformer (SMR) with a capacity of 100 ktH<sub>2</sub>/yr and CO<sub>2</sub> capture capacity equal to 60% of the CO<sub>2</sub> output of the SMR would be considered to have capacity to produce 60 ktH<sub>2</sub>/yr of

<sup>1</sup> See Geography page 19

## DOWNSTREAM DATA | HYDROGEN

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

zero carbon hydrogen and 40 ktH<sub>2</sub>/yr of hydrogen with the CO<sub>2</sub> intensity of the SMR without CO<sub>2</sub> capture. The assumptions for specific emissions are:

Natural gas fuelled plants<sup>2</sup>: 0.9105 kg CO<sub>2</sub>/nm<sup>3</sup> H<sub>2</sub> and continuous operation (capacity factor of 1).  
Coal fuelled plants<sup>3</sup>: 1.9075 kg CO<sub>2</sub>/nm<sup>3</sup> H<sub>2</sub> and continuous operation (capacity factor of 1).

**Capacity note:** It has not been possible to make definitive judgements of the sources of electricity or the fate of captured CO<sub>2</sub> 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 CO<sub>2</sub> intensities across their supply chains in practice, all have the potential to be low-carbon.

**End-use product**  
Synthetic methane (CH<sub>4</sub>)  
Hydrogen in molecular form (H<sub>2</sub>)  
Carbon Dioxide (CO<sub>2</sub>)  
Ammonia (NH<sub>3</sub>)

**Hydrogen, Methane or Synfuels end user**  
**Power** Supply of electricity to the electricity grid with a gas turbine of fuel cell.

**Grid injection**  
**Mobility**  
**Industrial heating**

**Heat/power (CHP)**  
**Domestic heat**  
**Chemicals**

Injection in natural gas or pure hydrogen grids.  
Used vehicles (road, off-road, rail, maritime or aviation).  
Industrial applications such as refineries, steel plants or high temperature heat.  
Heat and power via CHPs, for example in fuel cells or turbines.  
Direct use in building for water and space heating.  
Production of (intermediate) chemicals, such as methanol, ammonia (for fertiliser or chemical products) or final chemical products.

<sup>2</sup> California Air Resources Board, 2018

<sup>3</sup> 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.

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.	<b>CCS Hub</b>	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.
<b>Project Name</b>	Name of the project.	<b>Carbon Capture and Storage</b>	
<b>Description/Scope</b>	Full description or scope of the project.	<b>CO2 Capture (Tonnes):</b>	Production from various industries with CO2 capture. This is an annualised production figure in tonnes.
<b>Owner/Operator</b>	Name of owner and/or operator of the project.	<b>Capture type:</b>	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.
<b>Shareholders/Participants</b>	Shareholders and participants in the project.	<b>Storage type:</b>	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.
<b>Types</b>	Types of projects include:  <b>Pilot Project:</b> 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.  <b>CC Project:</b> Project that has Carbon Capture only.  <b>CCS Project:</b> Project that has Carbon Capture and Storage.  <b>CCUS Project:</b> Project that has Carbon Capture Utilization and Storage.  <b>CCU Project:</b> Project that has Carbon Capture and Use.  <b>CCS Hubs:</b> A location for a group of projects that are in the carbon chain.  <b>CO2 Pipelines:</b> Projects that include pipelines transporting CO2.  <b>Storage:</b> 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.

<b>Storage type:</b>	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.	<b>Sub-Status</b>	Additional stage of the project.
		<b>Start Date</b>	Year when the project started.
		<b>End Date:</b>	Year when the project concluded or closed.
		<b>Capex:</b>	Project capital expenditure in millions.
		<b>Currency:</b>	Currency in which the Capex has been reported.
		<b>Comments:</b>	Project comments and updates.
<b>Industry:</b>	Which industry is providing the feedstock CO2	<b>Region<sup>1</sup>:</b>	Which geographical region project is located.
<b>Technology:</b>	Technologies employed to capture the CO2 from the feedstock industry	<b>Country<sup>1</sup>:</b>	Specific country.
		<b>Location:</b>	City level location of the project.
		<b>Latitude:</b>	Latitude for the project.
		<b>Longitude:</b>	Longitude for the project.
<b>Status:</b>	This is the status of the project, identified as Operating, Under Construction, Planned, Proposed, or Non-operational.	<b>Contact name:</b>	Name of primary contact
		<b>Contact role:</b>	Job title.
		<b>Contact company:</b>	Company name
		<b>Contact email:</b>	Email address.
		<b>Contact telephone:</b>	Telephone number.
		<b>Contact website:</b>	Company or project website.

#### STATUS DEFINITIONS

Operating CCUS	Project that is currently built and producing/using CCS or
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.

<sup>1</sup> See Geography page 19

## 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.

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.	<b>Project</b>	Name of the project.
<b>Pipeline Type</b>	Intrastate: Pipelines held within a US state, Interstate: Pipelines between US states, Transboundary: Pipelines that enter or depart the US. Principle fuel carried.	<b>Owner/Operator</b>	Name of owner and/or operator of the project.
<b>Fuel Type</b>	Which geographical region project is located	<b>Shareholders/Participants</b>	Shareholders and participants in the project.
<b>Region<sup>1</sup></b>	Specific country.	<b>Description/Scope</b>	Full description or scope of the project.
<b>Country<sup>1</sup></b>	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.	<b>Length</b>	Pipeline length in miles.
<b>Status</b>		<b>Diameter</b>	Pipeline diameter in inches (may list multiple sizes).
		<b>Capacity</b>	Capacity of the pipeline in thousand barrels per day (Thousand b/d).
		<b>Background Information</b>	Supplementary information.
		<b>Comments</b>	Project comments and updates.
		<b>Contact name</b>	Name of contact.
		<b>Job Title</b>	Job position held.
		<b>Company name</b>	Name of company.
		<b>Telephone</b>	Contact telephone number.
		<b>Email</b>	Contact email address.
		<b>Website</b>	Company website.
		<b>Start Date</b>	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.

<sup>1</sup> See Geography page 19

## 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.

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.
<b>Pipeline Type</b>	Intrastate: Pipelines held within a US state, Interstate: Pipelines between US states, Transboundary: Pipelines that enter or depart the US. Principle fuel carried.
<b>Fuel Type</b>	Which geographical region project is located.
<b>Region<sup>1</sup></b>	Specific country.
<b>Country<sup>1</sup></b>	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.
<b>Status</b>	

#### 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.

<b>Project Name</b>	Name of the project.
<b>Owner/Operator</b>	Name of owner and/or operator of the project.
<b>Shareholders/Participants</b>	Shareholders and participants in the project.
<b>Description/Scope</b>	Full description or scope of the project.
<b>Length</b>	Pipeline length in miles.
<b>Permitting authority</b>	Agency which approved the pipeline.
<b>Filings</b>	Official documentation filed for the pipeline.
<b>Background Information</b>	Supplementary information.
<b>Linked Projects</b>	Other projects linked directly to the pipeline.
<b>Comments</b>	Project comments and updates.
<b>Contact name</b>	Name of contact.
<b>Company name</b>	Name of company.
<b>Telephone</b>	Contact telephone number.
<b>Email</b>	Contact email address.
<b>Website</b>	Company website.
<b>Capacity</b>	Capacity of the pipeline in million cubic feet per day (Million cf/d).

<sup>1</sup> See Geography page 19

## 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.

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.	<b>Project Name</b>	Name of the project.
<b>Commodity</b>	Principle fuel carried.	<b>Operator</b>	Name of owner and/or operator of the project.
<b>Region<sup>1</sup></b>	Which geographical region project is located	<b>Shareholders</b>	Shareholders and participants in the project.
<b>Country<sup>1</sup></b>	Specific country.	<b>Scope</b>	Full description or scope of the project.
<b>Pipeline Type</b>	Intrastate: Pipelines held within a US state, Interstate: Pipelines between US states, Transboundary: Pipelines that enter or depart the US.	<b>Length</b>	Pipeline length in miles.
<b>Status</b>	This is the current status of the project, identified as Operating, Under Construction, or Planned.	<b>Diameter</b>	Pipeline diameter in inches (may list multiple sizes).
		<b>Capacity</b>	Capacity of the pipeline in thousand barrels per day (Thousand b/d).
		<b>Background</b>	Supplementary information.
		<b>Linked Projects</b>	Other projects linked directly to the pipeline.
		<b>Comments</b>	Project comments and updates.
		<b>Contact</b>	Name of contact.
		<b>Position</b>	Job position held.
		<b>Company Name</b>	Name of company.
		<b>Telephone</b>	Contact telephone number.
		<b>Email</b>	Contact email address.
		<b>Website</b>	Company website.
		<b>Start Date</b>	Year when the project started.
		<b>Capex</b>	Project capital expenditure in US\$ millions (\$MM).

#### 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.

<sup>1</sup> See Geography page 19

## 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.

<p><b>Object ID</b></p> <p><b>Region<sup>1</sup></b></p> <p><b>Country<sup>1</sup></b></p> <p><b>Fuel Type</b></p> <p><b>Status</b></p>	<p>Automatically generated, unique identification number assigned to each project.</p> <p>Which geographical region project is located.</p> <p>Specific country.</p> <p>Principle fuel carried.</p> <p>This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.</p>	<p><b>Pipeline Type</b></p>	<p>National: Pipelines held within a single country, International: Pipelines that cross country borders, Transboundary: Pipelines that enter or depart the a country.</p>
<p><b>STATUS DEFINITIONS</b></p> <p>Operating</p> <p>Under Construction</p> <p>Planned</p> <p>Non Operational</p>	<p>Project that is currently built and flowing commercial quantities of fuel</p> <p>Project that has had all the necessary approvals and has started construction.</p> <p>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.</p> <p>Project that has been cancelled, shelved, abandoned or has stopped its progress due to a number of possible internal or external factors.</p>	<p><b>Project Name</b></p> <p><b>Operator</b></p> <p><b>Origin/Start point</b></p> <p><b>Destination/End point</b></p> <p><b>Length</b></p> <p><b>Diameter</b></p> <p><b>Email</b></p> <p><b>Capacity</b></p> <p><b>Scope</b></p> <p><b>Contact</b></p> <p><b>Position</b></p> <p><b>Company name</b></p> <p><b>Telephone</b></p> <p><b>Website</b></p> <p><b>Start Date</b></p>	<p>Name of the project.</p> <p>Name of owner and/or operator of the project.</p> <p>Location where the pipeline commences.</p> <p>Location where the pipeline concludes.</p> <p>Pipeline length in miles.</p> <p>Pipeline diameter in inches.</p> <p>Contact email address.</p> <p>Capacity of the pipeline in million barrels per day (mbpd).</p> <p>Full description or scope of the project.</p> <p>Name of contact.</p> <p>Job position held.</p> <p>Name of company.</p> <p>Contact telephone number.</p> <p>Company website.</p> <p>Year when the project started.</p>

<sup>1</sup> See Geography page 19



## 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.

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.
<b>Fuel Type</b>	Principle fuel carried.
<b>Status</b>	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.

#### 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.

<b>Region<sup>1</sup></b>	Which geographical region project is located.
<b>Country<sup>1</sup></b>	Specific country.
<b>Pipeline Type</b>	National: Pipelines held within a single country, International: Pipelines that cross country borders.
<b>Project Name</b>	Name of the project.
<b>Owner/Operator</b>	Name of owner and/or operator of the project.
<b>Shareholders/Participants</b>	Shareholders and participants in the project.
<b>Length</b>	Pipeline length in miles.
<b>Diameter</b>	Pipeline diameter in inches.
<b>Description/Scope</b>	Full description or scope of the project.
<b>Origin/Start point</b>	Location where the pipeline commences.
<b>Destination/End point</b>	Location where the pipeline concludes.
<b>Comments</b>	Project comments and updates.
<b>Contact Name</b>	Name of contact.
<b>Job Title</b>	Job position held.
<b>Company name</b>	Name of company.
<b>Telephone</b>	Contact telephone number.
<b>Email</b>	Contact email address.
<b>Website</b>	Company website.
<b>Start Date</b>	Year when the project started.
<b>Capacity as reported</b>	Capacity as reported by the project operator
<b>Capacity</b>	Capacity of the pipeline in million cubic feet per day (Million cf/d).

<sup>1</sup> See Geography page 19

## DATA DEFINITIONS

### MIDSTREAM DATA | GLOBAL HYDROGEN PIPELINES

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

<b>Object ID</b>	Automatically generated, unique identification number assigned to each project.
<b>Fuel Type</b>	Principle fuel carried.
<b>Status</b>	This is the current status of the project, identified as Operating, Under Construction, Planned, or Non operational.
<b>STATUS DEFINITIONS</b>	
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.
<b>Sub-status</b>	Adding additional information to the specific status. (EPC, FEED, FID etc.)

<b>Region<sup>1</sup></b>	Which geographical region project is located.
<b>Country<sup>1</sup></b>	Specific country.
<b>Pipeline Type</b>	National: Pipelines held within a single country, International: Pipelines that cross country borders.
<b>Project Name</b>	Name of the project.
<b>Owner/Operator</b>	Name of owner and/or operator of the project.
<b>Shareholders/Participants</b>	Shareholders and participants in the project.
<b>Length</b>	Pipeline length in miles.
<b>Diameter</b>	Pipeline diameter in inches.
<b>Description/Scope</b>	Full description or scope of the project.
<b>Origin/Start point</b>	Location where the pipeline commences.
<b>Destination/End point</b>	Location where the pipeline concludes.
<b>Comments</b>	Project comments and updates.
<b>Contact Name</b>	Name of contact.
<b>Job Title</b>	Job position held.
<b>Company name</b>	Name of company.
<b>Telephone</b>	Contact telephone number.
<b>Email</b>	Contact email address.
<b>Website</b>	Company website.
<b>Start Date</b>	Year when the project started.
<b>Capacity as reported</b>	Capacity as reported by the project operator
<b>Capacity</b>	Capacity of the pipeline in million cubic feet per day (Million cf/d).

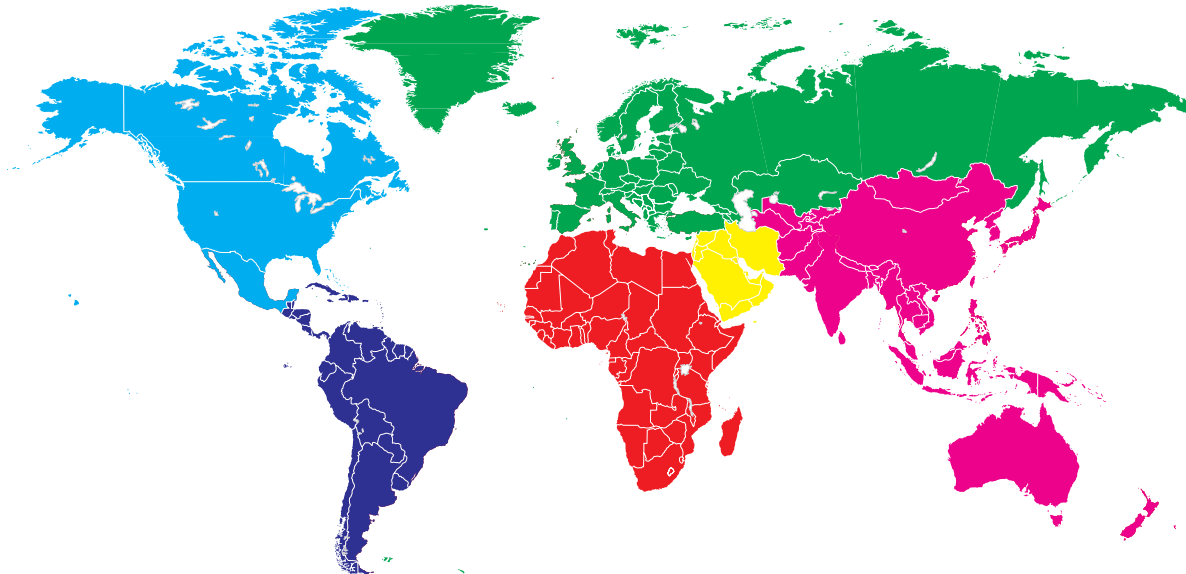
<sup>1</sup> See Geography page 19

# DATA DEFINITIONS

## GEOGRAPHY

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

<p><b>North America</b></p> <ul style="list-style-type: none"> <li>Canada</li> <li>United States</li> <li>Mexico</li> <li>The Bahamas</li> <li>Bermuda</li> </ul> <p><b>Cent. &amp; South America</b></p> <ul style="list-style-type: none"> <li>Anguilla</li> <li>Antigua and Barbuda</li> <li>Archipelago of San Andres, Providencia and Santa Catalina</li> <li>Argentina</li> <li>Aruba</li> <li>Barbados</li> <li>Bolivia</li> <li>Bonaire</li> <li>Brazil</li> <li>British Virgin Islands</li> <li>Cayman Islands</li> <li>Chile</li> <li>Colombia</li> <li>Costa Rica</li> <li>Cuba</li> <li>Curaçao</li> <li>Dominica</li> <li>Dominican Republic</li> <li>Ecuador</li> <li>El Salvador</li> <li>French Guiana</li> <li>Grenada</li> <li>Guadeloupe</li> <li>Guatemala</li> <li>Guyana</li> <li>Haiti</li> <li>Honduras</li> <li>Jamaica</li> <li>Martinique</li> <li>Montserrat</li> <li>Navassa Island</li> <li>Nicaragua</li> <li>Nueva Esparta</li> <li>Panama</li> <li>Paraguay</li> <li>Peru</li> <li>Puerto Rico</li> <li>Saba</li> <li>Saint Kitts and Nevis</li> </ul>	<ul style="list-style-type: none"> <li>Saint Lucia</li> <li>Saint Vincent and the Grenadines</li> <li>Sint Eustatius</li> <li>Sint Maarten</li> <li>Saint Barthelemy</li> <li>St Martin</li> <li>Suriname</li> <li>The Bahamas</li> <li>Trinidad and Tobago</li> <li>Turks and Caicos Islands</li> <li>United States Virgin Islands</li> <li>Uruguay</li> <li>Venezuela</li> </ul> <p><b>Europe</b></p> <ul style="list-style-type: none"> <li>Albania</li> <li>Andorra</li> <li>Armenia</li> <li>Austria</li> <li>Azerbaijan</li> <li>Belarus</li> <li>Belgium</li> </ul>	<ul style="list-style-type: none"> <li>Bosnia and Herzegovina</li> <li>Bulgaria</li> <li>Croatia</li> <li>Cyprus</li> <li>Czechia</li> <li>Denmark</li> <li>Estonia</li> <li>Finland</li> <li>France</li> <li>Georgia</li> <li>Germany</li> <li>Greece</li> <li>Hungary</li> <li>Iceland</li> <li>Ireland</li> <li>Italy</li> <li>Kazakhstan</li> <li>Latvia</li> <li>Liechtenstein</li> <li>Lithuania</li> <li>Luxembourg</li> <li>Malta</li> <li>Moldova</li> </ul>	<ul style="list-style-type: none"> <li>Monaco</li> <li>Montenegro</li> <li>Netherlands</li> <li>North Macedonia</li> <li>Norway</li> <li>Poland</li> <li>Portugal</li> <li>Romania</li> <li>Russian Federation</li> <li>San Marino</li> <li>Serbia</li> <li>Slovakia</li> <li>Slovenia</li> <li>Spain</li> <li>Sweden</li> <li>Switzerland</li> <li>Turkey</li> <li>Ukraine</li> <li>United Kingdom</li> <li>Vatican City</li> </ul>	<p><b>Africa</b></p> <ul style="list-style-type: none"> <li>Algeria</li> <li>Angola</li> <li>Netherlands</li> <li>Benin</li> <li>Botswana</li> <li>Burkina Faso</li> <li>Burundi</li> <li>Cameroon</li> <li>Canary Islands (Spain)</li> <li>Cape Verde</li> <li>Central African Republic</li> <li>Ceuta (Spain)</li> <li>Chad</li> <li>Comoros</li> <li>Democratic Republic of the Congo</li> <li>Congo</li> <li>Djibouti</li> <li>Egypt</li> <li>Equatorial Guinea</li> <li>Eritrea</li> <li>Eswatini</li> <li>Ethiopia</li> <li>Gabon</li> </ul>	<ul style="list-style-type: none"> <li>Ghana</li> <li>Guinea</li> <li>Guinea-Bissau</li> <li>Ivory Coast [Cote d'Ivoire]</li> <li>Kenya</li> <li>Lesotho</li> <li>Liberia</li> <li>Libya</li> <li>Madagascar</li> <li>Madeira (Portugal)</li> <li>Malawi</li> <li>Mali</li> <li>Mauritania</li> <li>Mauritius</li> <li>Mayotte (France)</li> <li>Melilla (Spain)</li> <li>Morocco</li> <li>Mozambique</li> <li>Namibia</li> <li>Niger</li> <li>Nigeria</li> <li>Republic of the Congo</li> <li>Reunion (France)</li> </ul>	<ul style="list-style-type: none"> <li>Rwanda</li> <li>Saint Helena, Ascension and Tristan da Cunha (United Kingdom)</li> <li>Sao Tome and Principe</li> <li>Senegal</li> <li>Seychelles</li> <li>Sierra Leone</li> <li>Somalia</li> <li>Somaliland</li> <li>South Africa</li> <li>South Sudan</li> <li>Sudan</li> <li>Tanzania</li> <li>The Gambia</li> <li>Togo</li> <li>Tunisia</li> <li>Uganda</li> <li>Western Sahara</li> <li>Zambia</li> <li>Zimbabwe</li> </ul>	<p><b>Middle East</b></p> <ul style="list-style-type: none"> <li>Bahrain</li> <li>Iran</li> <li>Iraq</li> <li>Israel</li> <li>Jordan</li> <li>Kuwait</li> <li>Lebanon</li> <li>Oman</li> <li>Palestine</li> <li>Qatar</li> <li>Saudi Arabia</li> <li>Syria</li> <li>United Arab Emirates</li> <li>Yemen</li> </ul> <p><b>Asia Pacific</b></p> <ul style="list-style-type: none"> <li>Afghanistan</li> <li>Bangladesh</li> <li>Bhutan</li> <li>Brunei</li> <li>Cambodia</li> <li>China (PRC)</li> <li>East Timor [Timor-Leste]</li> <li>India</li> <li>Indonesia</li> <li>Japan</li> <li>Kyrgyzstan</li> <li>Laos</li> <li>Malaysia</li> <li>Maldives</li> <li>Mongolia</li> <li>Myanmar</li> <li>Nepal</li> <li>North Korea</li> <li>Pakistan</li> <li>Philippines</li> <li>Singapore</li> <li>South Korea</li> <li>Sri Lanka</li> <li>Syria</li> <li>Taiwan (ROC)</li> <li>Tajikistan</li> <li>Thailand</li> <li>Turkmenistan</li> <li>Uzbekistan</li> <li>Vietnam</li> </ul>
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- North America
- Cent. & South America
- Europe\*
- Africa
- Middle East
- Asia Pacific

\* Alternatively called Eurasia

### CONTACTS

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

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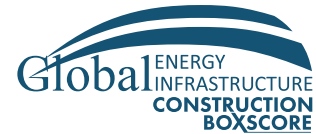
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