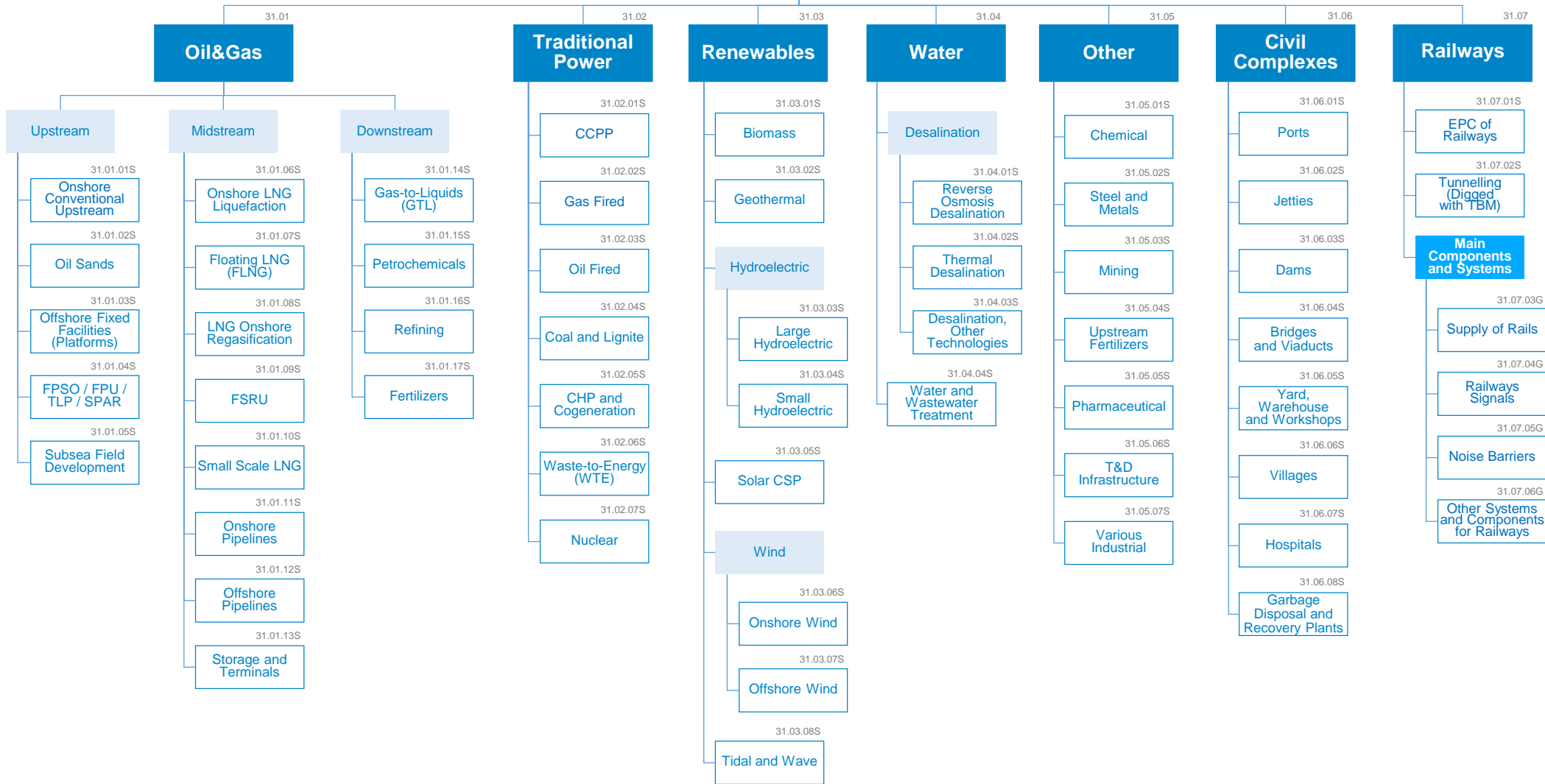


Engineering, Procurement and Construction



Engineering, Procurement and Construction

Engineering, Procurement, and Construction (EPC) is a particular form of contracting arrangement used in some industries where the EPC Contractor is made responsible for all the activities from design, procurement, construction, to commissioning and handover of the project to the End-User or Owner.

MAIN RATIONALES BEHIND THE STANDARD CATEGORIZATION

EPC / EPCI of Oil&Gas Plants

- This Family includes also EPCI Contractors (Engineering, Procurement, Construction and Installation), e.g. related to the Offshore Shallow Water Platform, FPSO / FPU / TLP / SPAR, Onshore Wind and Offshore Wind

In terms of description of each segment in the Oil&Gas industry:

- Upstream Onshore Conventional: Oil and Gas treatment facilities for conventional onshore developments. Oil gathering and separation systems and gas treatment and fractionation plants constitute the bulk of this segment; but EOR systems (such as gas injection) are also present, alongside similar brownfield projects aiming at extending the life of ageing fields.
- Oil Sands: There are mainly two kinds of projects in this segment. Very large mining projects, and smaller SAGD recovery projects. While the former is self-explanatory, the latter relies on the injection of steam in the tar reservoir in order to facilitate extraction.
- Offshore Shallow Water: Traditional offshore developments composed of topsides mounted on jackets anchored to the seabed. Alongside larger manned platforms, there are smaller unmanned wellhead platforms. Decommissioning projects are increasingly important in regions such as the North Sea.
- FPSO/FPO/TLP/SPAR: Surface facilities for deep-water development projects. FPSO's tend to be transformed from oil tankers, but purpose built vessels are all but infrequent. TLPs and SPARs differ in their mooring systems, and are closer in concept to traditional offshore developments, even though relying on subsea field developments.
- Subsea Field Development: Subsea facilities for deep-water developments. Subsea production systems (SPS) tied back to a platform of FPSO through flowlines, risers and umbilical. Tiebacks to existing platforms are increasingly popular for cost reasons.
- LNG Onshore Liquefaction Plant: Liquefied Natural Gas (LNG) production facility. Built in coastal locations to allow mooring of LNG carriers, these plants require, alongside liquefaction trains, jetties and other marine structures. Barge based plants are also an option, for cost reasons.
- Floating LNG (FLNG): Deployed directly on offshore fields, these plants are comparable to FPSOs in their concept. Due to costs and conceptual development reasons, they are not widespread yet.
- LNG Onshore Regasification: Liquefied Natural Gas (LNG) receiving facility. Built in coastal locations to allow mooring of LNG carriers, these plants require, alongside regasification trains, jetties and other marine structures. It is not infrequent to see storage facilities integrated with the plant.

- FSRU: Floating version of a regasification plant. Often leased, for cost reasons, and moored for connection to the national gas grid. Sometimes built as a complement to a gas fired power project.
- Onshore Pipeline: Pipeline transporting gas, crude or products: onshore sections. Frequent scope of works include substitution or revamping of compression stations for gas pipelines, but greenfield projects are far more common.
- Offshore Pipeline: Pipeline transporting gas, crude or products: offshore sections. Highly specialised scope of work. Brownfield projects (i.e. pipe replacement) are still rare.
- Storage and Terminals Broad segment including all facilities aimed at storing and receiving crude and products. Alongside oil tank farms, we find LNG storage tanks and underground gas storage facilities.
- Gas-to-Liquid (GTL): Facilities aimed at the production of synfuel from natural gas. Heavily penalised by current energy prices.
- Petrochemical: Broad segment including all facilities for the production of chemicals derived from crude and gas. Two broad categories: aromatics and olefins. Olefins (such as ethylene, propylene and derivatives) constitute the largest group. Brownfield projects aimed at revamping existing plants constitute a substantial portion of the projects in this segment.
- Refining: Alongside greenfield refinery developments, it includes all the modernisation projects aimed at meeting increasingly stricter clean fuels regulations. Expansions of existing plants are also popular, combined with upgrade projects or on a standalone basis.
- Fertilizers: Ammonia, Urea or combined plants. Revamping projects of existing facilities are also frequent. The latest developments often include production capabilities for diesel exhaust fuel additives (DEF).

- CHP / Cogeneration: Simultaneous production of electricity with the recovery and utilisation of heat. Typically embedded close to the user to avoid excessive distribution losses.
- Waste-to-Energy (WTE): Process of generating energy in the form of electricity and/or heat from the primary treatment of waste.

EPC of Renewable Power Plants

- Biomass: Biogas is a mixture of biomethane and CO2 and small amounts of other gases. It is created by anaerobic digestion of organic wastes.
- Solar CSP: Conversion of sunlight into electricity through concentrated solar power (CSP).
- Geothermal: Conversion of thermal energy stored in the Earth into electricity.
- Hydroelectric: Production of electrical power through the use of the gravitational force of falling or flowing water.

EPC of Other Industrial Plants

Regarding the other industries:

- Fertilizers "Upstream": Potash, Phosphate, Nitric Acid, Sulfuric Acid and Ammonium Nitrate Plants.

EPC of Civil Complexes

- "Ports" includes Wharves and Defence Works

EPC of Railways

- "Engineering of Railways and Rail Mass Transport" is considered under the "Engineering Services" (Group 30)

EPC of Traditional Power Plants

In terms of description of each segment in the Power industry:

- CCGT: Uses both a gas and a steam turbine together to produce up to 50% more electricity than a traditional simple-cycle plant.
- Coal/Lignite: Power plants that use coal to turn water into steam and drive a turbine.
- Gas Fired: Simple-cycle or open cycle gas turbine plants, have lower thermal efficiency.
- Oil Fired: Power plants or thermal power stations that use fuel oil as their primary energy source.