



ENGINEERING, PROCUREMENT, AND CONSTRUCTION (EPC)

Market analysis with country focus on Russia

March 2021

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COVID-19 impact

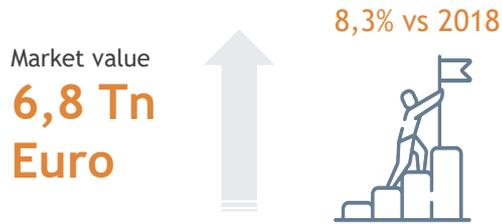
Trends and innovations



EXECUTIVE SUMMARY

Among top EPC contractors, South Korean companies lead the global market with total revenue of 43,4 Bn Euro in 2019

Global EPC market in 2019¹



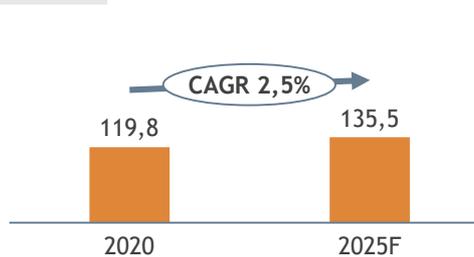
North America leads the market



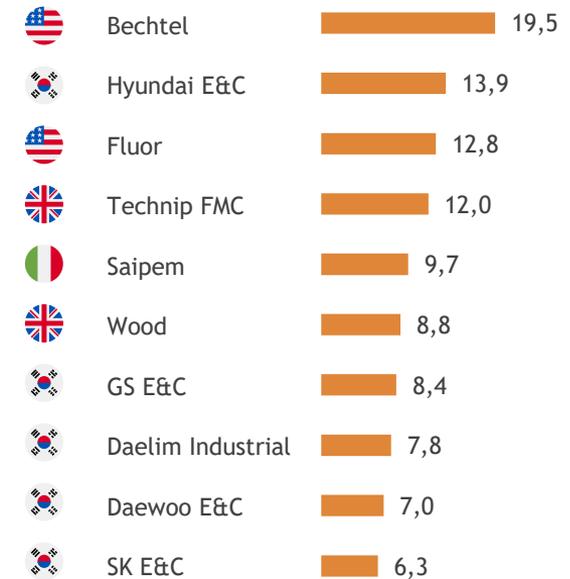
Global Oil & Gas EPC market, Bn Euro



Global solar EPC market, Bn Euro

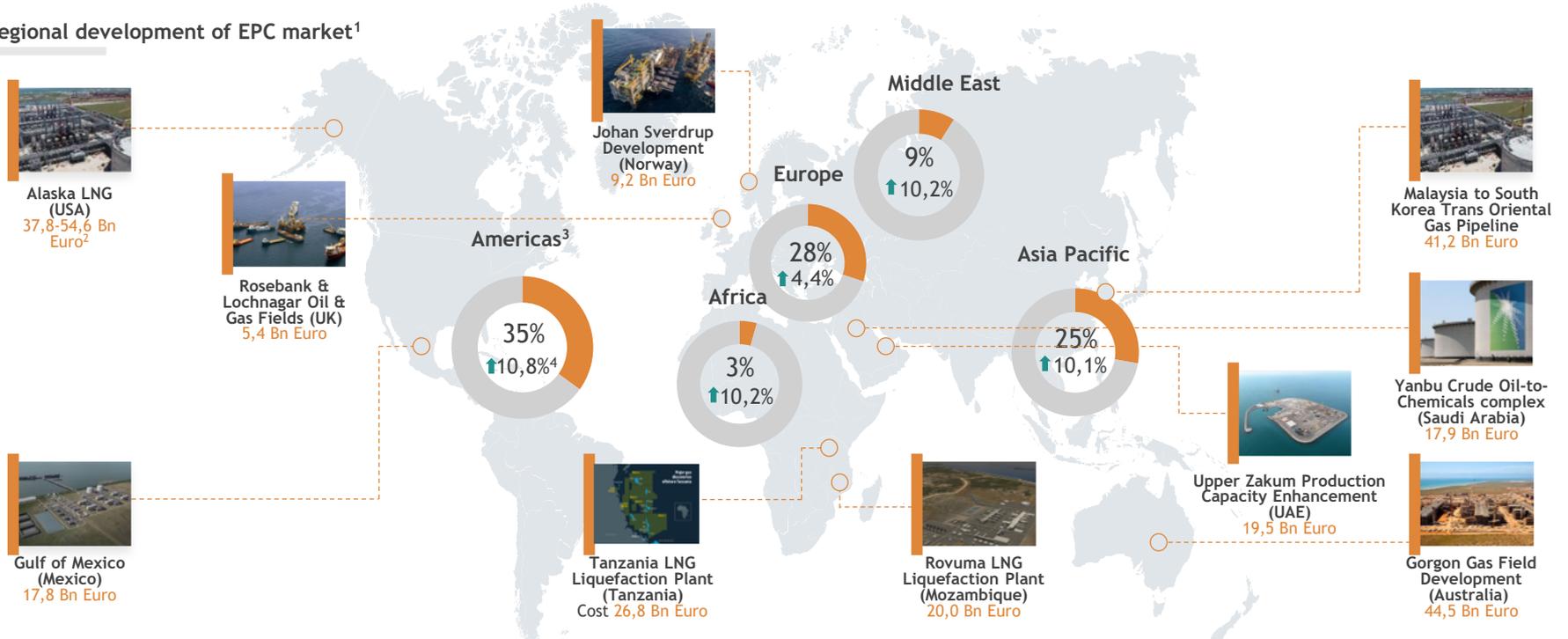


Top EPC contractors by revenue in 2019, Bn Euro



The Americas is the leading region in the EPC market globally and is expected to grow the fastest in construction

Regional development of EPC market¹



Source: Nesfircroft website; Global Data website; Media overview

Notes: (1) Selected EPC projects; (2) Estimated cost of the project; (3) Share of the region in the global EPC market as of 2019; (4) Expected growth of construction market, CAGR 2019-2024

The EPC market in Russia is led by contractors focusing on Oil & Gas as well as on infrastructure projects

Russian Oil & Gas EPC market overview



CAGR <1%

forecasted market growth, 2020-2025



8,6%

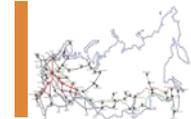
decrease in oil production in 2020



6,2%

decrease in gas production in 2020

Selected EPC projects in Russia



Moscow – Kazan Highspeed Railway
-19,0 Bn Euro¹



Power of Siberia pipeline
-12,4 Bn Euro



Second Ring of the Moscow Metro
-5,6 Bn Euro



Vostochny Cosmodrome
-3,4 Bn Euro



Adler – Krasnaya Polyana rail / road line
-3,2 Bn Euro

Leading EPC contractors in Russia

Foundation year	Company	Revenue in 2019, Bn Euro ²
1972	NIPIgaz	3,5
1973	Atomstroyexport	3,2
2011	Mosinzhpriekt	2,7
2008	Stroygasmontazh	2,7
1990	Stroytransneftegaz	2,3
1930	Mostotrest	2,0
1996	Velesstroy	1,8
1994	VAD	1,2
2006	Roszheldorproject	0,7
1965	PETON	0,3

Source: Companies' websites; Forbes website; Media overview

6 Notes: (1) Estimated cost of the project; (2) Numbers are converted from RUB to Euro due to the exchange rate by ECB

The COVID-19 pandemic is forcing to follow new non-technical and technical trends in the EPC industry

Risks connected to the COVID-19 crisis across different EPC contract phases:

E Engineering

- ▶ Workforce disruption and inefficiencies
- ▶ Delays in delivery of engineering works
- ▶ Longer response time

P Procurement

- ▶ Supply chain disruptions
- ▶ Increase of the costs of supplies, goods, and materials
- ▶ Transportation disruptions

C Construction

- ▶ Inability to bring the workforce to the site
- ▶ Redefining HSE¹ approach to on-site activities
- ▶ Delays in issuing permits or providing approvals

Non-technological trends in the EPC industry



Safety



Project delays and disruptions



Drop in non-residential building starts



Transformation and vertical integration



Supply chain diversification



Consolidation and partnership

Technical trends in the EPC industry



Building information modelling



Green building



Artificial Intelligence



Wearable devices



Efficient-improving technology



Robotic process automation



Modular construction



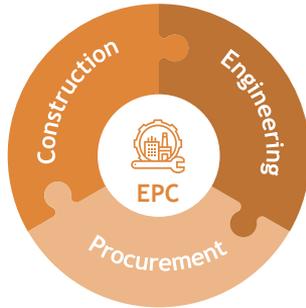
Smart contracts

Source: Kinstellar – EPC Projects in the era of the global pandemic. Practical guide to approach your EPC Contracts during the COVID-19 crisis – [2020]; Dodge Data & Analytics; Media overview

EPC MARKET GLOBAL OVERVIEW

EPC companies provide complex service solutions according to the peculiarities of the industry they serve

EPC¹ market

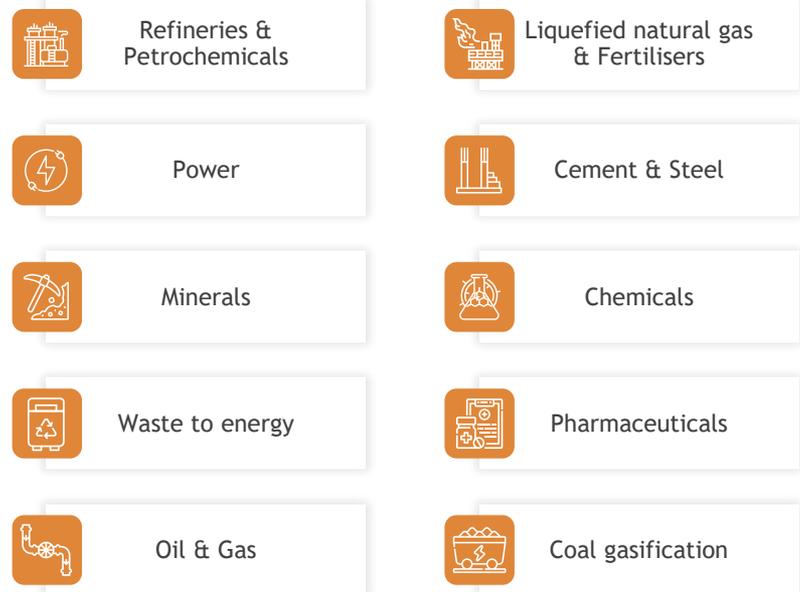


Engineering – a full range of engineering works on the preparation of project documentation and its approval by the regulatory authorities. At this stage, the contractor is engaged in all project activities and the preparation of working documentation

Procurement – the selection and purchase of building materials, tools, and equipment for all the necessary work at a facility

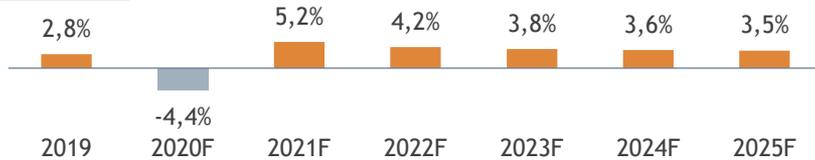
Construction – the actual construction, that is a full range of construction, installation, and commissioning works at a facility

Industries and segments that are served by EPC companies



In 2021, the global economy is forecasted to recover after the crisis caused by COVID-19, showing the growth of 5,2%

Global real GDP growth¹⁻³



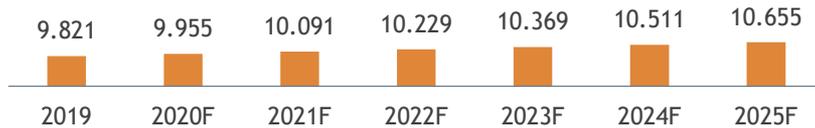
- ▶ In 2020, global real GDP dropped significantly, being affected by the COVID-19 pandemic
- ▶ Vaccination campaigns and active vaccine production, concerned health policies, and government financial support are expected to lift global GDP by 5,2 % in 2021 after a decrease of 4,4% in 2020

World population, billion people¹



- ▶ During 2019-2025, the global population is forecasted to increase with a CAGR of 1,0% and will reach 10,9 billion people in 2100 with a growth rate of close to zero
- ▶ By 2025, the urban population is forecasted to account for 58% of total population

Global final energy consumption, Mtoe^{4,5}



- ▶ In 2019, oil took 31% in total energy consumption by energy source, coal – 26%, followed by gas – 23%
- ▶ Asia Pacific is the leader in terms of final energy consumption – 44% of global consumption or 4.380 Mtoe in 2020, where China comprises almost 75% of regional consumption

Source: IMF – World Economic Outlook Update – [October 2020]; Enerdata – Global Energy Statistical Yearbook – [2020]; Wordometer website; Enerdata – EnerOutlook 2050

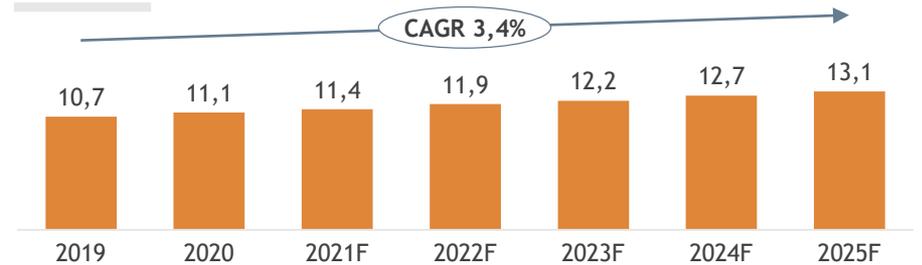
Notes: (1) Based on the IMF forecasts as of October 2020; (2) Annual percent change; (3) Average exchange rate for 2020 was used for 2021-2025; (4) Million tonnes of oil equivalent; (5) Projections for 2021-2024 are provided based on CAGR for 2020-2025

North America is leading the global EPC market, yet the Asia Pacific region is confidently strengthening its position

EPC market in July 2019 by region, Tn Euro¹



Construction industry spending worldwide, Tn Euro¹



In 2019, North America has traditionally dominated the global EPC market. However, the current market equilibrium is shifting toward Asia Pacific (mainly in Oil & Gas EPC) due to the following reasons:



rising offshore Oil & Gas discovery



expansion of natural gas pipeline



increasing trade of liquid natural gas



growing demand for refined products and petrochemicals in China and India

Six out of 15 leaders on the EPC market are South Korean contractors, taking 40% of Top-15 companies' revenue

Top-15 global EPC contractors in 2019



Country	Company	Revenue in 2019, Bn Euro ¹	Employees
USA	Bechtel	19,5	55.000
KOR	Hyundai E&C	13,9	5.759
USA	Fluor	12,8	53.349
UK	Technip FMC	12,0	37.000
ITA	Saipem	9,7	35.000
UK	Wood	8,8	55.000
KOR	GS E&C	8,4	6.831
KOR	Daelim Industrial	7,8	7.523
KOR	Daewoo E&C	7,0	6.211
KOR	SK E&C	6,3	3.337
KOR	Samsung Engineering	5,1	5.566
USA	KBR	5,0	28.000
ESP	Tecnicas Reunidas	5,0	9.461
UK	Petrofac	4,9	11.500
GER	Bilfinger	4,6	35.905

Source: Yahoo Finance – 15 Largest EPC Companies in the World – [December 2020]

12 Notes: (1) Numbers are converted from USD to Euro due to the average annual exchange rate by ECB

Selected projects of the largest EPC contractors show continuous companies' involvement in Oil & Gas projects

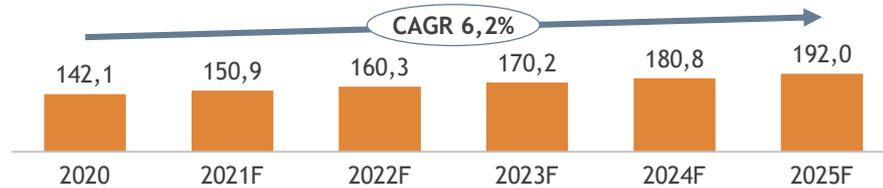
Project	Company	Country	Project cost	Date	Description
Full Fibre deployment	Bechtel	 UK	1,6 Bn Euro ¹	September 2020	CityFibre, the UK's third national digital infrastructure platform, appointed Bechtel to support a major acceleration in its full fibre rollout. By the end of 2021, it is anticipated that network construction will be underway in 100+ towns and cities across the UK.
Marjan Development Programme	Hyundai E&C	 Saudi Arabia	2,4 Bn Euro ²	July 2019	Hyundai E&C signed contracts with Saudi Aramco to execute Package 6 and Package 12 of the Marjan Development Programme. Under the contracts, Hyundai E&C builds an onshore gas and crude-processing plant, as well as utility facilities for an offshore plant.
Air Force Contract Augmentation Program V	Fluor	 USA	5,9 Bn Euro ^{2,3}	May 2020	Air Force Installation Contracting Center awarded Fluor a position on the Air Force Contract Augmentation Program V (AFCAP V) for eight years. AFCAP V task orders are aimed to provide base life support services, construction, and commodities support to the Air Force and other Department of Defence and federal agencies.
North Field East Project	Joint venture of Chiyoda and Technip Energies	 Qatar	23,8 Bn Euro ¹	February 2021	Qatar Petroleum took a final investment decision for the North Field East project with a capacity of 33 Mmtpa ⁴ . Expected to become the largest LNG project in the world, the facility will boost the LNG production capacity of Qatar from 77 to 110 Mmtpa. The production is expected to start in Q4 2025.
Iraq Crude Oil Export Expansion Project	Petrofac	 Iraq	N/A	May 2020	Petrofac secured a further six-month contract with Basra Oil Company (BOC) for its long-standing Iraq Crude Oil Export Expansion Project. The facility is one of the largest export terminals in the Gulf and handles around 50% of Iraq's crude oil exports. In August 2018, Petrofac won a contract by BOC for the expansion of the Central Processing Facility.

Source: Companies' websites

Notes: (1) Number is converted from GBP to Euro due to the average exchange rate by ECB; (2) Numbers are converted from USD to Euro due to the average exchange rate by ECB; (3) Combined value should not exceed 5,9 Bn Euro during the contract; (4) Million metric tonnes per annum

In 2020, the USA and China were the largest markets and took almost 50% share of the global Oil & Gas EPC market

Global Oil & Gas EPC market, Bn Euro¹



Oil & Gas EPC by sectors in 2020

38,7% Upstream 30,5% Midstream 30,8% Downstream

- ▶ The biggest markets in 2020 were the USA and China (29,5% and 18,0%)
- ▶ Japan and Canada are expected to grow at a CAGR of 6,0% and 4,7%
- ▶ Germany is forecasted to grow at a 4,8% CAGR, while the rest of the European market will reach 37,7 Bn USD by the year 2027
- ▶ Market drivers include the declining operating costs of Oil & Gas, downstream sector expansion, and rising demand for LNG infrastructure
- ▶ A surge in the alternate mode of transportation is likely to reduce the investments in the development of pipeline infrastructure

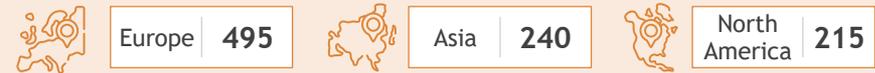
Number of global Oil & Gas contracts



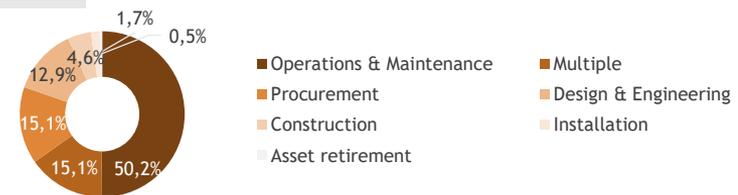
Oil & Gas contract value, Bn Euro



Oil & Gas contracts by region in Q3 2020



Oil & Gas contracts by scope in Q3 2020

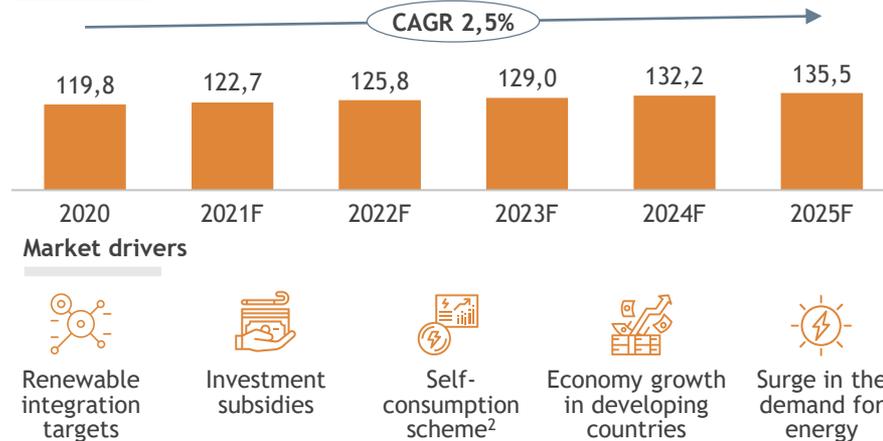


Source: Global Data website; GlobeNewswire website; Mordor Intelligence website

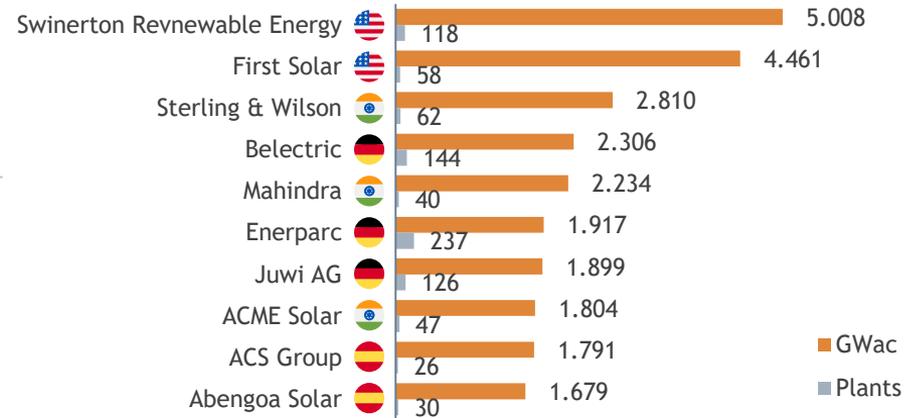
14 Notes: (1) Numbers are converted from USD to Euro due to the average exchange rate by ECB

The US, European, and Indian companies continue to dominate in the list of leading solar EPC contractors

Global solar EPC market, Bn Euro¹



Top solar EPC contractors by cumulative GWac³ installed by Q3 2020



- ▶ The Asia Pacific solar EPC market has witnessed growth due to favourable regulatory changes and rising renewable investments across the region
- ▶ The solar EPC market in Europe is to grow on account of inclination towards the adoption of sustainable technologies across the energy mix
- ▶ The US solar EPC market is predicted to grow to 12,3 Bn Euro by 2025 due to the financial encouragement of sustainable energy sources installation

- ▶ Spanish ACS Group, which is building Europe's largest 850-MWp⁴ project in Escatron, has been added to the Top-10 list
- ▶ Other European companies in the Top-30 list are Scatec from Norway, Greece's Biosar, Metka-EGN, BayWa r.e. from Germany, British RES Group, and Spain's Gransolar and Elmya (also involved in the Escatron project)

Source: Dataintelo website; Media overview

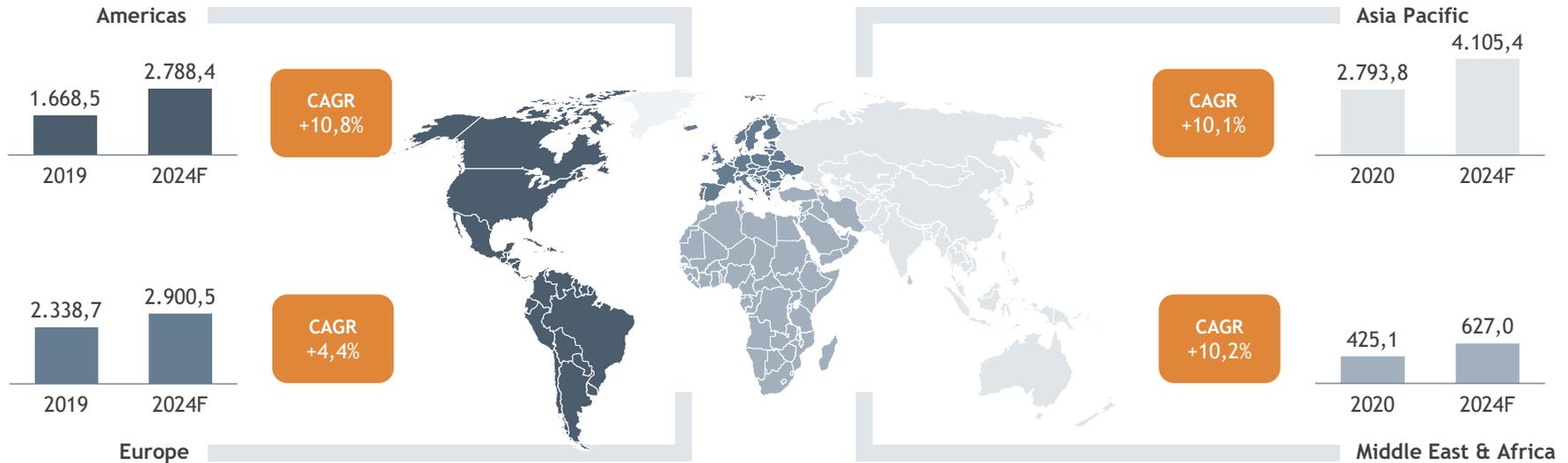
Notes: (1) Numbers are converted from USD to Euro due to the average exchange rate by ECB; (2) Self-consumption of PV renewable energy is the economic model, in which the building uses PV electricity for its own electrical needs, thus acting as both producer and consumer. In this model, the PV-generated energy is consumed instantaneously as it is being produced; (3) Gigawatt alternating current; (4) Mega Watt peak



EPC MARKET REGIONAL OVERVIEW

Across regions, APAC has the largest construction market and will grow fast along with the Americas and ME & Africa

Construction market size and forecasted growth across regions, Bn Euro¹



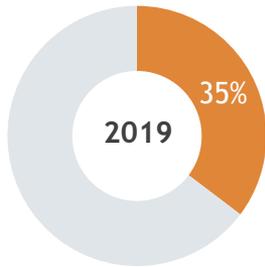
- ▶ The global construction market, as a significant segment in the EPC equation, is forecasted to grow fast across almost all regions
- ▶ Europe has the second-largest construction market size after APAC but is expected to grow at the lowest pace

Source: GlobeNewswire website; PR Newswire website; Mordor Intelligence website; Business Wire website; Compassion International website

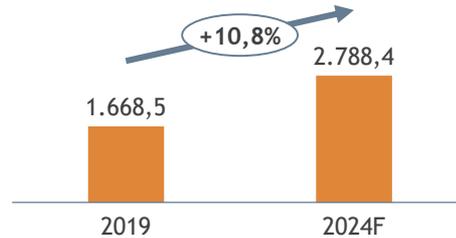
17 Notes: (1) Numbers are converted from USD to Euro due to the average annual exchange rate by ECB

The Americas is leading in the global EPC market with a 35% share and is to grow the fastest in construction

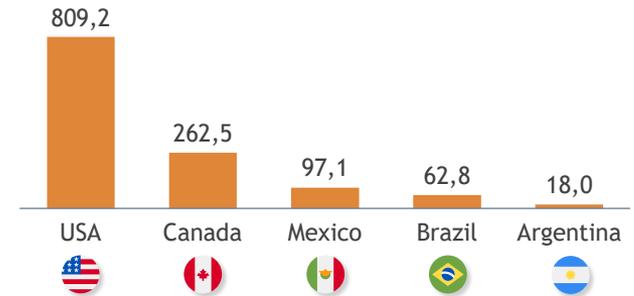
Share of the region in the global EPC market value



Construction market size and forecasted growth in the region, Bn Euro¹



Construction market in selected countries in 2019, Bn Euro



Key insights

- ▶ North America holds the leading share in the global EPC market owing to the use of automated systems supported by technology for end-to-end completion of engineering projects
- ▶ The exploitation of shale reserve has caused an increase in demand for EPC services, led by the USA and followed by Canada
- ▶ Brazil is one of the key markets for deep-water oil & gas projects. The Brazilian oil & gas market is driven by successful regulatory changes and improving financials

Gulf of Mexico and Alaska LNG are the largest Oil & Gas EPC projects in the Americas region with over 20 Bn Euro costs

Company	Origin	Founded in	Revenue, 2019 ¹	Selected projects
 Novonor	Brazil	1981	22,9 Bn Euro	Arena Corinthians, the soccer stadium located in Brazil, São Paulo
 Bechtel	USA	1898	19,5 Bn Euro	Hoover Dam, Dulles Airport Silver Line expansion in Nevada, USA
 Fluor	USA	1912	17,1 Bn Euro	800-mile Trans-Alaska Pipeline System in Alaska, USA
 Camargo Correa	Brazil	1939	9,8 Bn Euro	Itaipu, the second largest hydroelectric plant of the world in Brazil and Paraguay
 CB&I ²	USA	1889	5,9 Bn Euro	Yankee Stadium Subway Station in New York, USA

Selected largest Oil & Gas EPC projects in the region



Alaska LNG (USA)
Costs: **37,8-54,6 Bn Euro**

The Alaska LNG Mega-project might bring the world's biggest natural gas growth. The project includes a full LNG liquefaction plant, a storage and shipping terminal, a 1.287 km pipeline running from the North Slope to the facility, and a gas treatment plant. The location of the project is an industrial town of Nikiski, on Alaska's Kenai Peninsula, in the USA.



Gulf of Mexico (Mexico)
Costs: **17,8¹ Bn Euro**

The Oil & Gas sector in North America is leading the global EPC market with the USA being the major player in the region because of the Shale Revolution and increasing exploration and production activities in the Gulf of Mexico. Louisiana is most likely to benefit foremost with six out of ten projects being constructed within the state. However, the single largest project will be in Alaska, where up to 13.500 jobs will potentially be created between 2019-2025.

Source: Statista website; GlobeNewswire website; PR Newswire website; Nesfircroft website; Media overview

19 Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Chicago Bridge & Iron Company

With ~30% of the global EPC market, Europe will have the lowest construction growth, led by the UK and Germany



Key insights

- ▶ In the European EPC market, the public sector is the most important EPC client group. In particular, the public sector has to deal with reaching the CO₂ reduction targets and needs to take relevant measures and define strategies
- ▶ Capacity additions in the region are limited, given the region's feedstock disadvantage and mature demand end-markets. However, some major chemical companies are considering expanding their base chemical capacities in Europe
- ▶ The major countries of Europe – Germany, France, Italy, and the UK – have struggled with COVID-19 since mid-March. Construction work has now gradually resumed on many construction sites across Europe

Source: Statista website; GlobeNewswire website; PR Newswire website; Mordor Intelligence website; Business Wire website; Compassion International website

20 Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB

© BDO



Most major EPC companies in Europe have been engaged in a number of Oil & Gas EPC projects in the Middle East

Company	Origin	Founded in	Revenue, 2019 ¹	Selected projects
 Saipem	Italy	1957	8,5 Bn Euro	In 2018, was awarded onshore E&C contracts, in five countries, including Saudi Arabia and Iraq
 Petrofac	UK	1981	4,9 Bn Euro	Completed over 200 EPC projects worldwide in over 30 years ²
 Tecnicas Reunidas	Spain	1959	4,6 Bn Euro	Integrated Gas Development Expansion Project Package 3 in Abu Dhabi
 Bilfinger	Germany	1880	4,3 Bn Euro	Was awarded a series of EPC contracts by Abu Dhabi National Oil Company in 2019
 Buhlmann Group	Germany	1945	0,5 Bn Euro	Russia TP347H – welding construction for tube furnace

Selected EPC projects in the region



Johan Sverdrup Development (Norway)
Costs: **9,2 Bn Euro**

The Johan Sverdrup field is one of the largest oil fields on the Norwegian continental shelf, with expected resources of 2,1-3,1 billion barrels of oil equivalent. Located 160 km west of Stavanger, the development has two major discoveries – Avaldsnes and Aldous Major South.



Rosebank & Lochnagar Oil & Gas Fields (UK)
Costs: **5,4 Bn Euro**

Rosebank & Lochnagar Oil & Gas Fields is considered to be one of the biggest prospects in the UK Continental Shelf, with an expected 530 millions of barrels of recoverable oil. The project is still under planning. In January 2019, Equinor purchased Chevron's 40% stake in the field, to take over as operator. The company claims that the first oil is expected in 2026.

Source: Statista website; GlobeNewswire website; PR Newswire website; Nesfircroft website

Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Example of projects:

21 Turkstream Gas Pipeline, Hollandse Kust Zuid (HKZ) offshore grid connection, Well Operator for Hurricane Energy

China, Japan, and India are the largest markets in APAC and account for 65% of the region's construction market



Key insights

- ▶ In Asia Pacific, investment in the construction industry will be driven by government spending in the infrastructure sector
- ▶ China, Japan, and India are the largest construction markets in the region with a combined share of 65% of the total in Asia Pacific. Philippines and India are set to witness the fastest growth of the construction market in 2020-2024 (CAGR 18,2% and 15,9%, respectively). The slowest growth is expected in Australia
- ▶ China's geographical proximity with ASEAN nations is helping the country expand its overseas infrastructure financing with the establishment of the Asian Infrastructure Investment Bank. China also adopted the Belt and Road Initiative – a plan to invest in 70 countries and international organisations by 2049

Source: Statista website; GlobeNewswire website; Yahoo news; Research and Markets website

Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Numbers are converted from local currencies to Euro due to the exchange rate by ECB

South Korean EPC contractors are leading by revenue in the Asia Pacific region, with Hyundai E&C being the largest

Company	Origin	Founded in	Revenue, 2019 ¹	Selected projects
 Hyundai E&C	South Korea	1947	13,9 Bn Euro	Yeosu New North Port Construction Project, Yeosu, South Korea
 GS E&C	South Korea	1969	8,4 Bn Euro	Zakarpattia solar power projects, Zakarpattia, Ukraine
 Daelim Industrial	South Korea	1939	7,8 Bn Euro	Heavy-feed petrochemical complex in Daesan, South Korea
 Daewoo E&C	South Korea	1973	7,0 Bn Euro	Wolseong Nuclear Power Plant, Gyeongju, South Korea
 SK E&C	South Korea	1977	6,3 Bn Euro	Turkey Eurasia Tunnel, Istanbul, Turkey

Selected largest Oil & Gas EPC projects in the region



Gorgon Gas Field Development (Australia)
Costs: **44,5 Bn Euro¹**

The Gorgon Gas Field is one of the world's largest LNG projects and the largest single resource project in Australia. Gorgon is located on Barrow Island and consists of a three-train 15,6 million tonnes per annum LNG² facility and a domestic gas plant with the capacity to supply 300 terajoules of gas per day to Western Australia. The project contributed to the creation of >60.000 direct and indirect full-time equivalent jobs.



Malaysia to South Korea Trans Oriental Gas Pipeline
Costs: **41,2 Bn Euro¹**

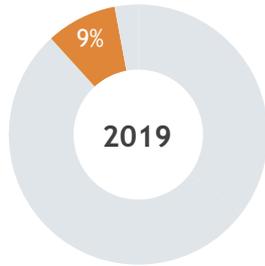
The Malaysia to South Korea Trans Oriental Gas Pipeline project involves the construction of a 4.000 km offshore natural gas pipeline split in two phases. Phase one includes the construction of a 2.500 km pipeline from Malaysia to North Vietnam and phase two covers the construction of another 1.500 km pipeline from China to the coast of South Korea.

Source: Companies' annual reports; Statista website; Global Data website; Yahoo Finance – 15 Largest EPC Companies in the World – [December 2020]; Media overview

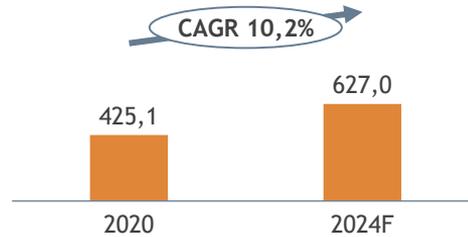
23 Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Liquefied natural gas

In 2020, the UAE construction market was the largest in the Middle East region, followed by Saudi Arabia

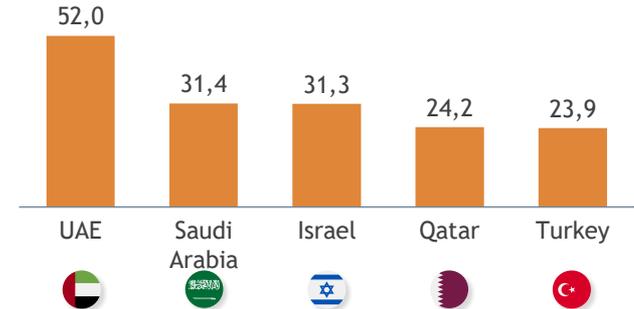
Share of the region in the global EPC market value



Construction market size and forecasted growth in the Middle East & Africa, Bn Euro¹



Construction market in selected countries in 2020, Bn Euro²



Key insights

- ▶ The region's dependence on oil plays a major role in economic activity and will have a significant impact on the pace of post-pandemic recovery
- ▶ GCC³ governments are making remarkable investments in the tourism and hospitality sectors, as well as leisure attractions, which leads to EPC mega-projects
- ▶ Whilst the UAE has historically been the market leader in the GCC construction market, Saudi Arabia, which has been active in pursuing both social and economic reform, has launched a variety of mega-projects, including the Red Sea Project, Qiddiya Entertainment City, Project NEOM, and Diriyah Gate, which have a combined value of 466,5 Bn Euro

Source: Statista website; GlobeNewswire website; Research and Markets website

Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Numbers are converted from local currencies to Euro due to the exchange rate by ECB and Yahoo Finance; (3) The Cooperation Council for the Arab States of the Gulf is a union consisting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE

The largest Oil & Gas EPC projects in the Middle East region are located in the UAE and Saudi Arabia

Company	Origin	Founded in	Revenue, 2019 ¹	Selected projects
 Orascom Construction	UAE	1956	2,8 Bn Euro	Damietta LNG Train, Damietta, Egypt
 Tekfen Holding	Turkey	1956	2,3 Bn Euro	Kharampur Gas Pipeline Project, Yamalo-Nenets Autonomous Okrug, Russia
 Arabtec Holding	UAE	1975	1,9 Bn Euro	UAE Pavilion at Expo 2020, Dubai, UAE
 Electra	Israel	1945	1,8 Bn Euro	Infrastructure for the Distribution of Natural Gas in the Negev and the South, Israel
 ENKA	Turkey	1957	1,7 Bn Euro	Sakhalin I&II Onshore Processing Facilities Projects, Sakhalin Island, Russia

Selected largest Oil & Gas EPC projects in the region



Upper Zakum – Production Capacity Enhancement (UAE)
Costs: **19,5 Bn Euro¹**

The Upper Zakum field is located off the coast of Abu Dhabi. The field is estimated to hold approximately 50 billion barrels of oil equivalent. Zakum Development Company started a three-phase capacity enhancement process to increase production from 500.000 b/d² to approximately 750.000 b/d, using four artificial islands as platforms for drilling, processing, and distribution.



Yanbu Crude Oil-to-Chemicals complex (Saudi Arabia)
Costs: **17,9 Bn Euro¹**

The Yanbu Crude Oil-To-Chemicals complex will produce chemicals and base oils directly from 20 million tonnes per annum of crude oil. Approximately 9 million tonnes per annum of chemicals and base oils are expected to be produced, including 2,8 million tonnes per annum of ethylene, propylene, butadiene, benzene, toluene, and xylene. The project includes the construction of a full oil refinery, three crackers, and downstream processing facilities.

Source: Companies' annual reports; Statista website; Nesfircroft website; Media overview

25 Note: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Barrels per day

© BDO

Africa has the lowest share of the global EPC market, with Egypt in the lead by the number of construction projects



Key insights

- ▶ In terms of construction projects, East Africa is the leader with 139 recorded projects. North Africa accounts for the largest share of projects (31,5%) by value
- ▶ Egypt has the highest number of projects in Africa – 46 (9,5% of projects on the continent) as well as the most projects by value (17% of the continent's value), edging out South Africa and Nigeria, respectively
- ▶ The transport sector has 186 projects in Africa (22,7% of total project value), followed by power & energy projects with a share of 24,4% of the total project value in Africa

Source: Statista website; GlobeNewswire website; Research and Markets website
 Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Numbers are converted from local currencies to Euro due to the exchange rate by ECB and Yahoo Finance

Tanzania LNG Liquefaction Plant near Lindi town is the largest Oil & Gas EPC project in the African region

Company	Origin	Founded in	Revenue, 2019	Selected projects
 Wilson Bayly Holmes	South Africa	1970	2,5 Bn Euro ¹	Ressano Garcia Gas-Fired Power Station, Ressano Garcia, Mozambique
 Julius Berger Nigeria	Nigeria	1970	0,7 Bn Euro ²	Escravos Gas-to-Liquids Plant, Escravos, Nigeria
 Stefanutti Stocks	South Africa	1971	0,6 Bn Euro ¹	New Kissy Oil Jetty, Freetown, Sierra Leone
 Raubex Group	South Africa	1974	0,6 Bn Euro ¹	Cornelis River Dam Project, Engineering and design EBoP ³ of a 102 MW Wind farm, Warden, South Africa
 Arbico Group	Nigeria	1958	0,02 Bn Euro ²	Coleman Factory Development, Sagamu, Nigeria

Selected largest Oil & Gas EPC projects in the region



Tanzania LNG Liquefaction Plant (Tanzania)
Cost **26,8 Bn Euro¹**

The Tanzania LNG Liquefaction Plant Project involves the construction of an LNG liquefaction facility spanning 5.119 acres in Likong'o Village, outside the town of Lindi. It is expected that Tanzania's proven natural gas reserves will total 57,0 trillion cubic feet, with a further 29,5 trillion cubic feet located far offshore. It is planned to construct two LNG trains, each with a capacity of 5 million tonnes per annum. The project might involve up to five LNG trains in total.



Rovuma LNG Liquefaction Plant (Mozambique)
Cost **20,0 Bn Euro¹**

The initial phase of the Rovuma LNG project will develop the Mamba reservoirs in Area 4. The project involves a plan to develop part of the reserves that straddle Area 1 and additional reserves. It is expected that each train will output 8,2 million tonnes of LNG per year, with the facility due to operate for at least 30 years.

Source: Companies' annual reports; Statista website; Media overview

Notes: (1) Numbers are converted from ZAR to Euro due to the exchange rate by ECB; (2) Numbers are converted from NGN to Euro due to the exchange rate by ECB; (3) Electrical Balance of Plant

Across regions, North America and Asia Pacific will drive the global market growth the most in the upcoming future

North America

North America will remain a prominent regional market with the largest share in EPC owing to an increasing number of oil & gas projects in the region. Rich reserves of oil & gas in Canada and the USA are attracting investment from exploration and production companies, contributing thus to the regional growth.

South America

Brazil is one of the key markets for deepwater oil & gas projects in the region. The Brazilian oil & gas market is driven by successful regulatory changes and improving financials. The country's government is aiming at two MMb/d of additional oil production by 2027, mostly from deepwater areas.

Europe

Europe accounts for a considerable share of the global oil & gas EPC market. An increase in spending on refurbishment and modernisation of existing refinery facilities to meet the domestic demand for low sulphur containing petroleum products is anticipated to drive the oil & gas EPC market in the region.

Asia Pacific

The Asia Pacific region is expected to be the largest market for EPC contracts in the downstream sector, mainly due to the rising demand for refined products and petrochemicals. China and India are expected to add a considerable quantity to the regional refining capacity in the coming years.

Middle East & Africa

Construction activity plays a significant role in regional economic development in the Gulf Co-operation Council (GCC) region. The growth of the sector in the region is generally supported by governments' commitments to increase spending in the sector. Saudi Arabia and the UAE hold the majority of regional projects.



Mega-projects, new contract models, and digitalisation are long-term trends that will shape the EPC market agenda

	Mega-projects	Mega-projects are EPC projects with a volume of >0,5 Bn Euro. Increases in project volumes imply that guarantees to hedge project risks are rising. Mega-projects enable sharing the financial burden between project stakeholders. The complexity of modern technology is also a reason for the greater partnership.
	Manage contractual models	Performance-based contracting (PBC) and pay-per-use are important new contractual models. In these models' concept, the client pays for services on a time and material basis. Differences in new models come in the form of payment, usage of KPI-defined earnings dependence.
	Raise efficiency through digitalisation	Progress in technology, IT, production technology will enable projects to be completed on the levels inconceivable in the past (3D printing, AI algorithms, data analytics, etc.)
	China's role as an innovator	China has become the second-largest investor in research and development after the USA. The level of Chinese investment in R&D offers potential for further growth. China is ahead of many countries in terms of innovation efficiency.
	Financial solutions	Looking for new sources of financing is a new challenge most projects are dealing with. A high number of infrastructure projects are put for tender by public sector institutions, which seek alternative sources of financing necessary in times of high debt levels.



COUNTRY FOCUS: RUSSIA

The Russian EPC market is closely linked and affected by the oil & gas industry in the region and globally

The Russian EPC market is highly dependent on the oil & gas sector, which is one of the key contributors to the country's economy. Oil & gas companies often rely on EPC contractors for projects that require skilled labour and fine-tuned project management. However, in 2020 the oil & gas industry faced significant challenges and, in turn, had an effect on the EPC market.



14 %
of global oil & gas
production



8,6%
decrease in oil
production in 2020



<1% CAGR projected
on the Oil & Gas EPC
market for 2020-2025



6,2%
decrease in gas
production in 2020

- ▶ 2020 was the first year since 2008 that the country saw a drop in petroleum production. The decrease was partly explained by the previous year's agreement with OPEC to cut production due to the decreased demand in the world that had been seriously hit by the pandemic
- ▶ On the other hand, previously, in 2018, Russia was one of the key players on the global oil & gas market, it exported 243 bcm of gas through pipelines. The country also exported 24 bcm of LNG; in comparison, Norway exported 6,6 bcm of LNG
- ▶ Furthermore, in 2019, the Russian oil & gas EPC market witnessed strong growth, mainly due to a number of vital projects, such as Nord Stream-2, Arctic LNG, and Baltic LNG EPC. The gas transportation and processing industry was the dominant driver for this market
- ▶ The Nord Stream-2 project had been boosting the EPC market in Russia, however, only until 2018, when representatives of the USA and Poland announced opposition to the construction of the pipeline. Later, in 2019, the USA imposed new sanctions against companies building Nord Stream-2, which struck the Russian EPC market
- ▶ Moreover, the US sanctions and restrictions on collaboration with Russia are likely to affect the country's oil & gas market even further and, therefore, could have a negative impact on the EPC market in the region

Key insights

- ▶ The significance of the Russian region for the oil & gas industry worldwide has been contributing to the boost of a number of vital projects in the industry, including Nord Stream-2, and driving the EPC market of the region
- ▶ Increasing investments in the petrochemical industry and further efforts to increase oil & gas production are likely to propel EPC activities in the future
- ▶ The sensitivity of the oil & gas industry to political issues, especially sanctions imposition, could negatively affect the industry and the EPC market

Leading EPC contractors in Russia focus on Oil & Gas EPC projects that they execute for energy company Gazprom

Company	Founded in	Revenue, 2019 ¹	Selected projects
 NIPIGAS	1972	3,5 Bn Euro	Amur Gas Processing Plant, Integrated Natural Gas Processing and Liquefaction Plant in Ust-Luga, ZapSibNeftekhim
 Atomstroyexport	1973	3,2 Bn Euro	Kursk Nuclear Power Plant, El Dabaa Nuclear Power Plant (Egypt), Akkuyu Nükleer Santrali (Turkey)
 Mosinzhproekt	2011	2,7 Bn Euro	Luzhniki Stadium, Zaryadye Park
 Stroygasmontazh	2008	2,7 Bn Euro	Crimean Bridge, Nord Stream-2, Southern Corridor
 Stroytransneftegaz	1990	2,3 Bn Euro	South Stream Gas Pipeline, Amur Gas Processing Plant, Chayandinskoye field
 Mostotrest	1930	2,0 Bn Euro	Highway Moscow- Petersburg, Platov airport in Rostov, runway in Nizhny Novgorod
 Velesstroy	1996	1,8 Bn Euro	Pipeline systems Eastern Siberia, Baltic pipeline system, Investment project Zapolyarie
 VAD	1994	1,2 Bn Euro	Northern section of Saint-Petersburg road, Tavrida road in Crimea, Bypass of Vologda
 Roszheldorproject	2006	0,7 Bn Euro	Passenger traffic on the Moscow Central Circle, railway infrastructure of the Eastern polygon, railway access to the ports of the Azov and Black Sea basin
 Technological Engineering Holding PETON	1965	0,3 Bn Euro	Amur Gas Processing Plant, Surgut Condensate Stabilisation Plant, Astrakhan GPP

Source: Companies' websites; Forbes website

32 Notes: (1) Numbers are converted from RUB to Euro due to the exchange rate by ECB

Moscow – Kazan Highspeed Railway is expected to be the largest project, however, the construction was not started

Project	Company	Project cost ¹	Date	Description
Moscow – Kazan Highspeed Railway	The project is on hold and the company is not yet known	19,0 Bn Euro	2024-2026	The Moscow-Kazan High-Speed Railway is a planned 772-km long high-speed railway line connecting the two major cities of Moscow and Kazan. At the moment, the project has been postponed due to high costs and unconfirmed passenger traffic.
Power of Siberia pipeline	Stroytransgaz, Neftegazstroy, Stroygazmontazh	12,4 Bn Euro	December 2019	Power of Siberia (Sila Sibiri), also known as China-Russia East-Route Natural Gas pipeline, is a Gazprom-operated pipeline in Eastern Siberia that transports natural gas from Yakutia to Primorsky Krai and China. Deliveries to China started on 2 December 2019.
Second Ring of the Moscow Metro	Mosinzhproekt and others	5,6 Bn Euro	2017-2023	By the fall of 2020, metro builders have already laid more than 3/4 of the ring: the western section is 60% ready, it will be completed in 2021. In 2022, the northeastern section will be completely ready – the most difficult from the point of view of construction. The start of a full-fledged circular movement is planned for 2023.
Vostochny Cosmodrome	Production and Construction Association Kazan	3,4 Bn Euro	2011-2030	Vostochny Cosmodrome is a Russian spaceport (still partly under construction) in the Amur Oblast, in the Russian Far East. It is intended to reduce Russia's dependency on the Baikonur Cosmodrome in Kazakhstan. The first launch took place on 28 April 2016. As of January 2021, six launch attempts have been made with five successes.
Adler – Krasnaya Polyana rail / road line	Transyuzhstroy, SK MOST Group	3,2 Bn Euro	2009-2013	Adler – Krasnaya Polyana is a combined high-speed road and railroad 48,2 km long, built for the 2014 Winter Olympics. It was the most expensive project built in the lead-up to the 2014 Winter Olympics in Sochi.



COVID-19 IMPACT

EPC sector was hit hard by the crisis in regions, especially South America and the Middle East, yet signs of recovery are looming

COVID-19 impact heatmap

Canada

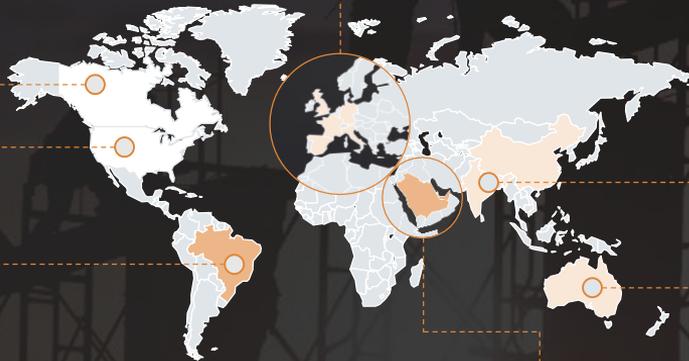
After the immediate COVID-19 shock the demand for EPC infrastructure projects supported by large government investments is gradually increasing.

USA

Some EPC projects have been delayed, and some cancelled due to COVID-19, but overall the EPC sector in the USA is in its 'recover stage'.

Brazil

The construction industry has shrunk by -6% in 2020 and the construction output is not expected to return to the pre-COVID-19 level until 2023 even if the nation's government puts its infrastructure spending plans ahead.



France, Germany, Italy, Spain, and the UK

The European market has experienced a significant decrease in EPC sector activity in the first half of 2020, yet, the sector is recovering now. The demand is mainly driven by public sector bodies.

Low impact Moderate impact High impact

China, India

The infrastructure construction activity is expected to grow at a -6% CAGR through 2024. COVID-19 posed some obstacles to these forecasts, but the medium-term outlook remains robust due to significant government investments to kickstart economic growth.

Australia

In Australia, the construction industry remains resilient and essential, although COVID-19 has disrupted construction activity and reduced productivity. Overall, in 2021, after recovery, higher volumes in the EPC sector are anticipated.

UAE, Saudi Arabia, Qatar

The construction industry in the Gulf Co-operation Council (GCC) has suffered greatly last year. Around 550 projects worth over 54 Bn Euro¹ were postponed, delayed, or cancelled due to COVID-19, mostly in Saudi Arabia and the UAE.

Source: PwC – COVID-19: What it means for engineering and construction – [2020]; Asian Infrastructure Investment Bank – Impact of COVID-19 on the EPC sector in Asia: Outlook remains robust for the infrastructure sector – [2020]; Media overview

Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB

The crisis posed many challenges on each of EPC contract phases, and mitigating the risks is crucial for recovery

COVID-19 has raised different exposures on different phases of the EPC contracts. Mitigating the risks posed by COVID-19 for EPC projects is not only complex and difficult due to the unpredictability of the situation, but requires a careful and coordinated assessment of the current and the forthcoming period to ensure successful risks management and efficient solutions implementation.

Risks connected to the COVID-19 crisis across different EPC contract phases:

Design & Engineering Phase

- ▶ Workforce disruption and inefficiencies due to home-office working of engineers
- ▶ Delay in delivery of engineering works by the EPC Contractor
- ▶ Longer response times by the EPC Project Owner
- ▶ Knock-on effect of the delays accumulated during the design and engineering phase to the procurement phase

Procurement Phase

- ▶ Supply chain disruption due to inability of suppliers to deliver, partly or entirely
- ▶ Increase of the costs of supplies, goods, and materials
- ▶ Transportation disruption as routes become closed down by public authority or government intervention
- ▶ Difficulties with replacing suppliers and / or finding new transportation routes

Construction Phase

- ▶ Workforce disruption potentially arising from several factors including an inability to bring the workforce to the site
- ▶ Revisiting Health, Safety & Environment (HSE) policies and redefining the best HSE approach to on-site activities
- ▶ Delays due to numerous factors, including lack of workforce, impairment of transportation of equipment, etc.
- ▶ Delays of the public authorities in issuing permits, or providing approvals / consents

Source: Kinstellar – EPC Projects in the era of the global pandemic. Practical guide to approach your EPC Contracts during the COVID-19 crisis – [2020]

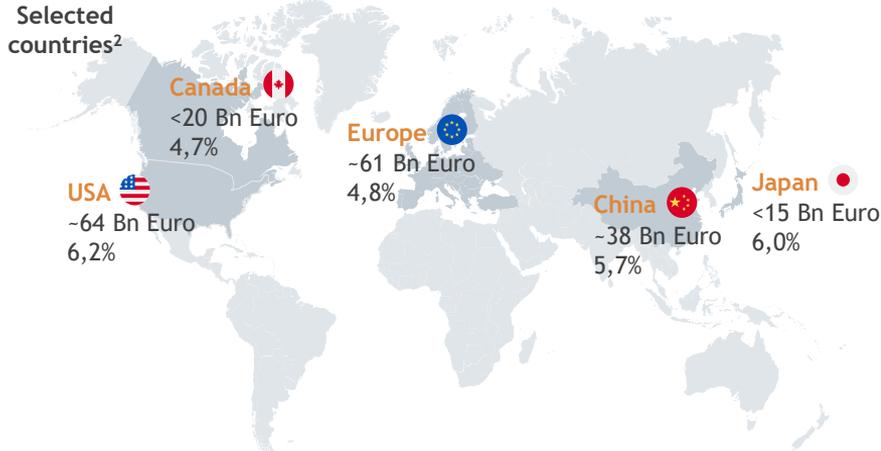
The EPC sector is gradually recovering but will experience transformations to drive the expected future growth

Looking into the future, the EPC sector is expected to start recovering gradually in 2021 driven mainly by economic recovery supported with governmental increased spending. Yet, a number of structural changes will emerge in the sector to enable its adaptation to the new post-COVID 19 normal.

Forecasted market size and growth for Oil & Gas EPC

World	Market size at 216 Bn Euro ¹ in 2020	6,2% CAGR 2020-2027
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Selected countries²



Source: Research and Markets; Statista website; Media overview

Notes: (1) Numbers are converted from USD to Euro due to the exchange rate by ECB; (2) Size estimations per country were done based on the following assumptions: 1) For the USA, based on the US share in 2020 (29,5%); 2) For Europe, based on the region's share in the EPC 2019 market

37 data (28,2%); 3) For Canada and Japan, based on ratio of the countries to the US and Chinese construction markets in 2019, respectively

Future trends in the E&C market

1. **Uptick in public and commercial spending** will likely improve the E&C market outlook for 2021
2. **Connected construction and modularisation** may address long-term costs and margin issues
3. **Digital investments** will be the key for E&C companies differentiation (e.g., by identification of ecosystem of partners)
4. E&C companies are expected to target new business models, incl. **public-private partnerships, M&As, and alliances**
5. E&C companies will respond to **new trends in work, workforce, and workplace norms**, incl. upskilling employees in digital transformation, engaging with external ecosystem, developing in-house programmes, etc.

The background of the slide is a blurred industrial scene. On the left, there is a warm, brownish-orange glow. On the right, a dark blue robotic arm is visible, extending upwards. The overall image is out of focus, emphasizing a sense of motion and technology.

TRENDS AND INNOVATIONS

Go green initiatives and the COVID-19 pandemic are forming new trends shaping the EPC industry in 2021

Safety

Safety was always a concern, but in the COVID-19 environment it rises to the top. Enhanced protocols will include the expected things (e.g. masks, hand sanitisers), and specific to construction (e.g. the passing around of tools, sharing of gloves and hard hats).

Transformation and vertical integration

A retrofit will be used to improve energy efficiency and reduce CO₂ emissions in conventional power plants. Vertical integration along the value chain will be used to increase the share of petrochemicals in power plants (doubling to 20% by 2034).

Project delays and disruptions

It is expected that spending on non-residential buildings will decline in 2021 and the drop-off could be dramatic. As government debt at every level increases, spending on infrastructure projects will almost certainly be delayed.



Supply chain diversification

New contracts will likely put more emphasis on escalation clauses to cover unforeseen cost increases, and current contracts may be similarly revised.

Drop in non-residential building starts

Non-residential building starts are down in 2020 (31% decrease from June to July). However, at the same time, residential starts were up 22,6%, the largest share of which were projects with over 10 K Euro budget.

Consolidation and partnership

More EPC companies are expected to target different business models (such as partnership to complement their expertise). It may also include EPC companies embracing public-private partnerships (PPP).

The implementation of digital technologies is becoming the core enabler of future success in the EPC industry

Key digital trends to watch in 2021



Building information modelling (BIM)

BIM offers lots of benefits for EPC companies, which makes resource management more accessible, enables enhanced collaboration, and helps people stay in touch throughout the project.



Efficiency-improving technology

Innovations that can improve efficiency in construction:

- ▶ Drones
- ▶ AR and VR
- ▶ 3D printing



Green building

It includes both the technology to lower a building's carbon footprint and the use of resources and building models to reduce environmental damages.



Robotic process automation (RPA)

RPA has the potential to improve business processes given the complex engineering design work, large-scale planning for procurement, and scheduling for on-site activities.



Artificial Intelligence

AI uses vast information in order to speed up the time it takes to process the data and make the building process more effective.



Modular construction

Modular construction and pre-fab building, which were already steadily on the rise, should see a huge boost in interest in the post-pandemic era.



Wearable devices

Wearable innovations aim to increase safety and they will immediately alert others if a person falls or has a high temperature.

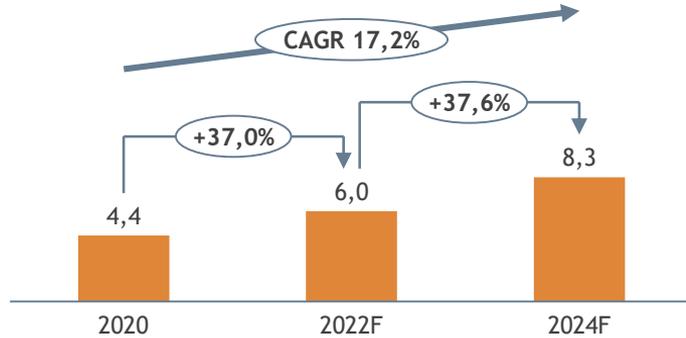


Smart contracts

Smart contracts offer all organisations in the project a shared system to do business, allowing them to buy, track and pay for services.

BIM is linking people, technology, and processes to improve outcomes in the building and construction industry

Building information modelling (BIM) market, Bn Euro



Projected growth by region (CAGR 2020-2024)

North America
14,0%

Europe
13,5%

Asia Pacific
16,7%

Role of BIM in EPC:

- ▶ It refers to the process of designing, building, and operating a building collaboratively using a single coherent system of 3D models rather than separate design drawings
- ▶ BIM incorporates people and technology to streamline time as well as cost and improve efficiency in builds including skyscrapers, hospitals, offices, and residential buildings

Critical issues of BIM:

- ▶ The financial barrier to invest in developing digital capabilities, particularly for small- and medium-sized enterprises
- ▶ The lack of widespread expertise to implement and use BIM



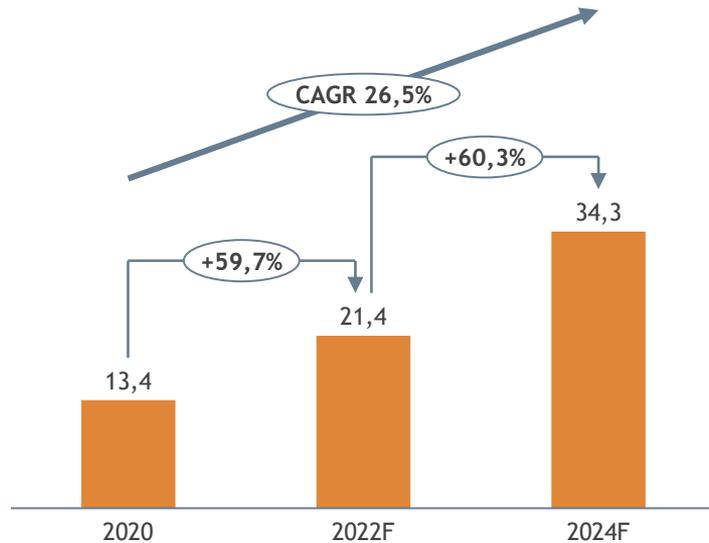
BIM may be beneficial for EPC companies and it reduces challenges such as timings, schedules, availability of materials, and right specialist teams.

Source: Mordor Intelligence website; Research and Markets website; Markets and Markets website

41 Notes: (1) Numbers are converted from USD to Euro due to the average exchange rate by ECB

3D printing is changing the global construction industry providing an innovative and cost-effective solution

Global 3D printing products and services market, Bn Euro¹



Role of 3D printing in the EPC market:

- ▶ 3D printing is a cost-effective solution being viewed as an affordable option for building homes for the disadvantaged social-economic strata
- ▶ 3D printing helps designers simply build a home in a matter of hours, which saves time and resources

Critical issues of 3D printing:

- ▶ How to integrate 3D printing with other building components
- ▶ How to make 3D printing products faster and even more cost-effective



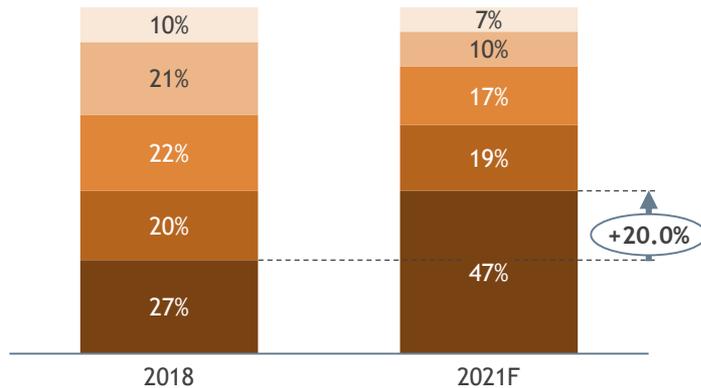
3D printing could revolutionise the industry by reducing the number of workers. Safety will be improved, and productivity will increase due to 3D printing capacity to work 24/7.

Source: Statista website; Media overview

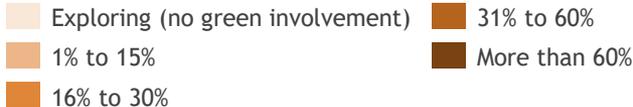
42 Notes: (1) Numbers are converted from USD to Euro due to the average exchange rate by ECB

Green building aims to eliminate the negative impact on the environment during the construction process

Level of companies' involvement in green projects



Share of green projects:



Key drivers of green building activity:

- ▶ Governments' vested interest stimulates green project initiatives and drives construction
- ▶ Various fiscal benefits for construction companies that go green

Benefits of green building for companies and consumers:

- ▶ Lower operating costs
- ▶ Improved occupants well-being
- ▶ Documentation providing quality assurance
- ▶ Increased productivity
- ▶ Flexibility of design



It is expected that almost half of companies will have over 60% of their projects as green building projects by 2021. This will represent a 20% rise from 2018.

Glossary (1/3)

Term	Description
AI	Artificial Intelligence
AFCAP V	Air Force Contract Augmentation Program V
APAC	Asia Pacific region
AR	Augmented Reality
ASEAN	Association of Southeast Asian Nations
BIM	Building information modelling
b/d	Barrels per day
CAGR	Compound annual growth rate
CB&I	Chicago Bridge & Iron Company
CO ₂	Carbon dioxide

Glossary (2/3)

Term	Description
COVID-19	Coronavirus disease 2019
CX	Customer experience
EBoP	Electrical Balance of Plant
EPC	Engineering, Procurement, and Construction
E&C	Engineering & Construction
ECB	European Central Bank
GCC	The Cooperation Council for the Arab States of the Gulf is a union consisting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE
GDP	Gross Domestic Product
GWac	Gigawatt alternating current
HSE	Health, Safety & Environment

Glossary (3/3)

Term	Description
KPI	Key performance indicator
LNG	Liquefied natural gas
M&A	Mergers and acquisitions
MMbbl	One million barrels
Mmtpa	Million metric tonnes per annum
Mtoe	Million tonnes of oil equivalent
MWp	Mega Watt peak
OPEC	The Organisation of the Petroleum Exporting Countries
PPP	Public-private partnership
R&D	Research and development
RPA	Robotic process automation
VR	Virtual Reality

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nicolai.kiskalt@bdo.de

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