Linesight

Middle East Handbook 2019

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Welcome to the Linesight Middle East Handbook 2019.

Each year, we bring together all the important indices and trends in construction to give you the most comprehensive industry overview possible.

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*Updated September 2019

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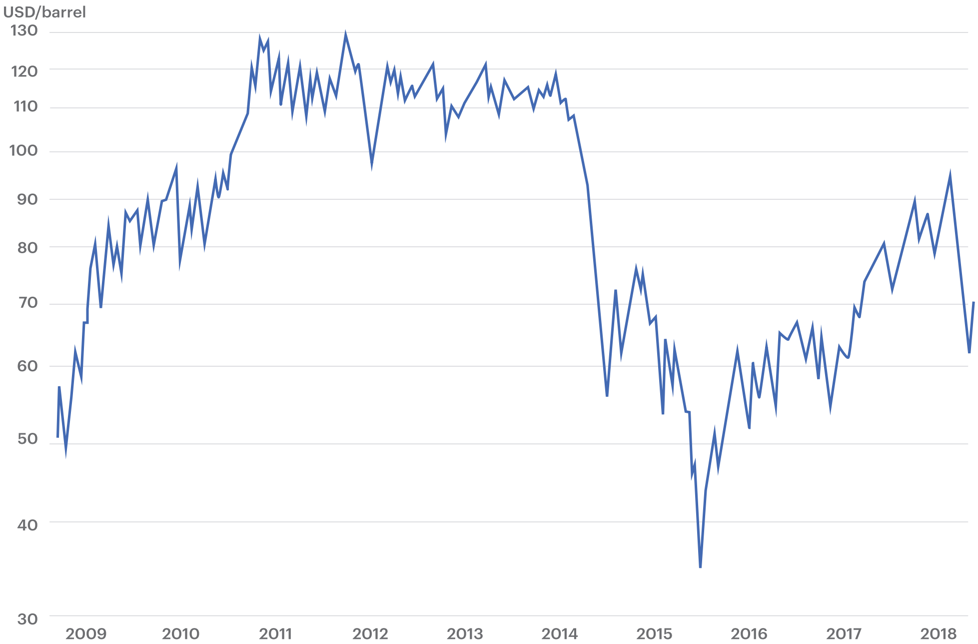
While there are a number of common factors influencing all economies in the Middle East to various extents, the diversity in the region's construction industry makes it difficult to draw broad conclusions and forecasts.

Unsurprisingly, oil prices continue to have a significant impact on growth, along with geopolitical tensions, global trade tensions, and global macroeconomic performance as a whole. Despite sluggish growth in the region over the last few years, GDP in GCC countries is expected to improve slightly, reaching 2.1% in 2019, up from 2% in 2018, supported by higher oil prices, a slower pace of fiscal consolidation and the implementation of public investment projects. These recently revised figures from the International Monetary Fund (IMF) are below the previous forecasts of 2.4% for 2018 and 3% for 2019. Since hitting a ten-year low in January 2016, oil prices have improved considerably, rising from below US$30 per barrel to around US$85 in October 2018, before falling back to US$50 per barrel in January 2019. This growth has been supported by extended production cuts by both OPEC and non-OPEC oil producers, along with global oil supply disruptions, particularly in Venezuela and Iran. Most government budgets have now been adjusted to consider between US$50 to US$60 per barrel the average. Needless to say, higher oil prices will provide regional governments with an opportunity to peruse strategic projects and appraise some of the previously proposed austerity measures, which in turn will support growth. With that said, as the future of oil prices faces significant uncertainty, so too does the growth outlook for oil exporters.

Brent crude oil prices



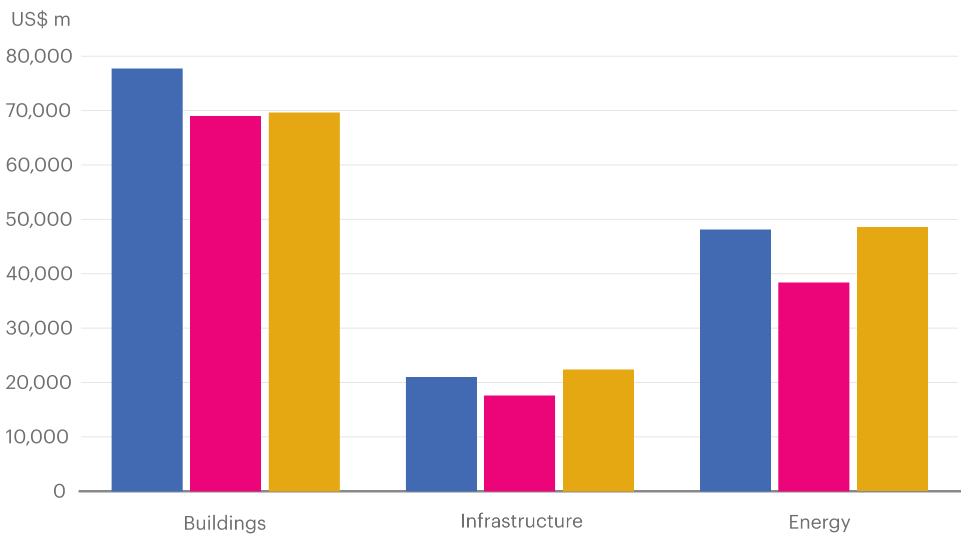
Source: *macrotrends.net*

Subdued economic performance in the region in previous years has resulted in ambitious fiscal consolidation measures being implemented, including cutbacks on capital expenditure and benefits to public sector employees, reform of energy and water subsidies, the introduction of land taxes, and the introduction of VAT at 5%. It now appears, however, that governments are softening their stance on cutbacks, having ap expansionary budgets for 2018 and 2019, with a particular focus on developing the non-oil economy and public infrastructure. These strategic goals are key components of regional National Development Plans, such as " 'Saudi Vison 2030' and 'Qatar National Vison 2030', and are further supported by major regional events, such as Expo 2020 in Dubai and the FIFA World Cup 2022 in Qatar. Additionally, to help stimulate growth, further emphasis has been placed on improving the business environment, with a range of measures being implemented across the GCC states. Measures implemented include new insolvency laws, visa reforms, reduced time and cost for building permits, the streamlining of electricity connections for new plots, and moves towards making it easier to start a new business.

Bolstered by strengthening oil prices, increased government spending and a slower pace of fiscal consolidation, economic growth in the GCC states is expected to have rebounded to 2.4% in 2018, and to reach 3% in 2019 after hitting an eight-year low of 0.4% in 2017, according to the IMF. As part of its Regional Economic Outlook, the IMF has revised the UAE's expected economic growth downwards from the October 2018 forecasts, projecting 2.8% real GDP growth for 2019 compared to the earlier forecast of 3.6%, compared to 2.9% in 2018 and 0.8% in 2017. According to the latest IMF projections, the UAE economy grew by a lower-than-expected 1.7% in 2018, against the October forecast of 2.9%. In 2020, the UAE is projected to grow by 3.3% in 2020, supported by a strong non-oil growth for the year at 4%. Similarly, Saudi Arabia is following a positive trend, with a forecast of 2.4% in 2019, compared to 2.2% and 0.9% in the previous two years.

Construction activity plays a significant role in regional economic development. A whitepaper published by Ventures Onsite estimates that in 2019, construction contract awards for building works will reach $69 billion followed by energy projects at $38bn and infrastructure at $17bn. This represents an 11% increase across the board when compared to 2018, largely due to growth in the energy and infrastructure sectors. Similar to previous years, the UAE, Saudi Arabia and Qatar will remain the top three markets in the GCC construction industry.

GCC contractor awards by type



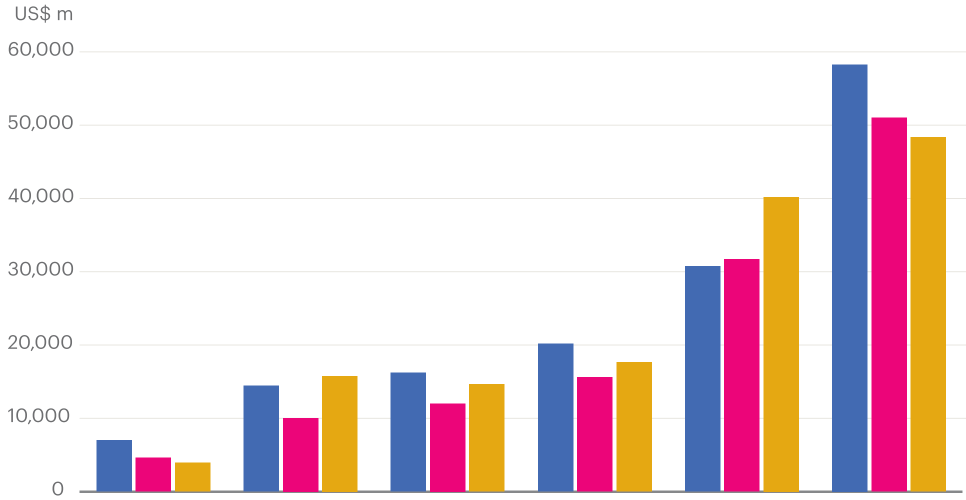
Year	Building (US$ m)	Infrastructure (US$ m)	Energy (US$ m)
2017	77,728	21,006	48,172
2018	69,023	17,601	38,372
2019	69,682	22,357	48,546

Source: *Ventures ONSITE Project Intelligence Platform*

This growth is partially attributable to increased GCC government budgets in 2018, for sectors such as infrastructure, healthcare and education. In addition, GCC governments are also making remarkable investments in the tourism and hospitality sectors, as well as leisure attractions. Projects include airport developments, such as the further development of Al Maktoum Airport in Dubai, seaport developments, including the Dubai Harbor Project, and metro developments, such as the Bahrain Rapid Transport Network, which is estimated at a cost US$8 billion across all phases.

Whilst the UAE remains the leader in the GCC construction industry, Saudi Arabia is beginning to close the gap. Project awards in Saudi Arabia are expected to increase from US$31 million in 2018 to US$40 million in 2019, compared to a forecasted reduction of US$2.6 million in the UAE to US$48 million. Meanwhile, contract awards in Bahrain are expected to contract from US$4.6 million to US$3.9 million in 2019, while Qatar, Oman and Kuwait, although much smaller markets, are forecasted to expand also.

GCC construction contractor award by industry



Year	Bahrain	Kuwait	Oman	Qatar	KSA	UAE
2017	6,993	14,439	16,235	20,193	30,766	58,280
2018	4,615	10,037	12,027	15,606	31,696	51,015
2019	3,945	15,783	14,655	17,660	40,187	48,355

Source: *Ventures ONSITE Project Intelligence Platform*

With growth forecasts beginning to move upwards once more, there is a risk that previously subdued markets such as Saudi Arabia could face capacity issues, particularly for prestigious projects necessitating international tier one contractors. The exodus of an estimated 800,000 expats from Saudi Arabia in the past 12 to 18 months could compound capacity issues, if demand rises considerably. On the other hand, a capacity gap would present an opportunity for UAE-focused companies to weather a potential slowdown by becoming more active in the Saudi market. In some respects, this is already taking place. Despite a somewhat positive outlook for the region as a whole, it remains to be seen if the dynamic influences of oil prices, trade wars, geopolitical tensions and macroeconomics will convene to spur on industry growth.

Exchange rates

Country	Currency	Symbol	Conversion from $	
Bahrain	Bahraini Dinar	BHD	1 USD =	0.38
United Arab Emirates	Emirati Dirham	AED	1 USD =	3.67
Saudi Arabia	Saudi Riyal	SAR	1 USD =	3.75
Kuwait	Kuwaiti Dinar	KWD	1 USD =	0.30
Qatar	Qatari Riyal	QAR	1 USD =	3.64
Oman	Omani Rial	OMR	1 USD =	0.38

Note: *Figures are based on September 2019*
Source: *IMF*

1. Kingdom of Saudi Arabia Market Review*

With an estimated GDP of over US$683.8 million in 2017, Saudi Arabia is one of the largest economies in the Middle East.

GDP of US$183.5 billion was reported within the first quarter of 2018, forecasting an estimated overall increase of 2.2% by the end of 2018, primarily due to a recovery in oil production and public spending. Macroeconomic reports suggest GDP will slow, maintaining an average of 2% in 2019.

Non-oil revenue recorded a 48% increase from the same period last year, totaling US$56.25 billion, with the fastest growth coming from taxes on goods and services. The Kingdom is also working on a number of economic reforms, most notably within the 'Vision 2030' - Saudi Arabia's ambitious social and economic reform plan set to diversify its oil-reliant economy away from its dependency on finite natural resources. As part of this initiative, Saudi Arabia is attempting to become a hub for tourism and other service industries, with large infrastructure projects such as the US$500 billion NEOM project. Born from the ambition of 'Vision 2030', this project targets the creation of a vibrant society and a thriving economy. Construction is due to commence in 2019, with initial plans including hotels, airports, residential areas and a causeway linking Saudi Arabia with Egypt. NEOM is attracting overwhelming interest from foreign investors and is likely to result in vast opportunities for companies working within the construction industry.

The Kingdom plans to spend US$1.1 trillion on infrastructure projects alone in the next 20 years. Whilst work continues on Jeddah and Riyadh airports, as well as the Metro system, work is due to begin on significant projects fundamental to 'Vision 2030'. The projects include various shopping malls and major redevelopments, such as Al Ruwaid Redevelopment located in Jeddah and New Jeddah Downtown, known as the Corniche of Jeddah.

The Initial Public Offering (IPO) of one of the world's largest companies by revenue, state-run Saudi Aramco was put on hold in 2018, with much of the ambitious economic and social plan to diversify the Saudi economy now set to rely on the Public Investment Fund (PIF) as an orchestrator of economic growth. Reports suggest that the IPO will go ahead in late 2020 or early 2021, with HH Prince Mohammed Bin Salman reportedly stating in an interview with Bloomberg that the IPO has been estimated to reach above US$2 trillion.

The International Monetary Fund (IMF) projects 2.9% non-oil GDP growth for Saudi Arabia in 2019, as Government spending and confidence increase. However, real GDP growth is projected to slow to 1.9%, as real oil growth slows to 0.7%, according to the Executive Board of the IMF. The increase in fuel and utility prices, the introduction of expat levies leading to a higher cost of living, and a decrease in expat workers, all have the potential to have a negative effect on the economy. However, with a high level of investment within the Kingdom leading to a large number of construction projects coming onstream, Saudi Arabia is likely to become the leading construction market in the GCC, paving the way for new opportunities and business growth.

The Kingdom plans to spend US$1.1 trillion on infrastructure projects alone in the next 20 years.

2. Linesight average Kingdom of Saudi Arabia Construction costs 2019

	Cost range US/m2		Unit	MEP incl. @	
	from	to		from %	to %
Commercial/office sector					
Developer standard/investment offices					
Low rise - medium rise */**	1,200	1,420	per sq.m.	28%	30%
Medium rise - high rise */**	1,375	1,680	per sq.m.	28%	30%
Owner occupier standard offices					
Low rise - medium rise	1,520	1,630	per sq.m.	30%	32%
Medium rise - high rise	1,680	1,935	per sq.m.	30%	32%
Residential sector					
Medium quality - villa units	1,050	1,400	per sq.m.	25%	30%
Medium quality - high rise	1,300	1,540	per sq.m.	25%	30%
High quality - low rise aparts	1,390	1,740	per sq.m.	25%	30%
High quality - high rise	1,550	1,900	per sq.m.	25%	30%
Hotel and leisure/Retail sector					
Regional shopping centre *	1,420	1,680	per sq.m.	35%	40%
Budget/3 star ***	1,500	1,820	per sq.m.	22%	25%
5 star ***	2,650	3,100	per sq.m.	28%	32%
5 star resort ***	3,000	3,420	per sq.m.	25%	30%
Health sector ****					
District general hospital	2,500	2,850	per sq.m.	35%	40%
Manufacturing sector					
Light industrial	640	815	per sq.m.	25%	30%
Heavy industrial	740	920	per sq.m.	25%	30%
Parking					
Podium car parking	580	730	per sq.m.	15%	24%
Basement car parking	730	830	per sq.m.	15%	29%

Notes:
i *All subject to site specifics, design and specification*
ii *All exclude Land Acquisition Costs, External Works Costs & Professional Fees*
iii ** Base Index @ 100 = UAE; Index calculated on average of stated cost range*
iv *** Shell & Core Only; with public areas finished*

Source: *Linesight*

3. Main contractors and design firms

3.1. Kingdom of Saudi Arabia main contractors*

Al Arrab Trading & Contracting
Al Habtoor Leighton Group
Al Latifia Trading and Contracting Co.
Six Construct
El Seif Engineering & Construction
TAV Construction
Consolidated Contractors Company
Samsung C&T Engineering & Construction
BIC
Salini Impregilo
Arabtec Construction
J&P (Overseas) Ltd.
Saudi Bin Laden Group
Shapoorji Pallonji International
Absal Paul

Source: *Linesight*

3.2. Kingdom of Saudi Arabia design firms

Arcadis
Benoy
Jacobs
Gensler
Meinhardt
HOK
Skidmore, Owings and Merrill
Saudi Arabian Parsons Ltd. (SAPL) Saudi Diyar
Woods Bagot
Worley Parsons
Zaha Hadid Architects

Source: *Linesight*

4. UAE Market Review*

In its recent update, the International Monetary Fund (IMF) has revised the UAE's economic growth outlook downwards from its October 2018 forecasts.

For 2019, its Regional Economic Outlook has projected 2.8% real GDP growth, compared to the earlier forecast of 3.6%. According to the latest IMF projections, the UAE economy grew by 1.7% in 2018, against the October forecast of 2.9%. Growth of 3.3% is projected for 2020, supported by strong non-oil growth at 4% . "Expo 2020-related spending in Dubai and Abu Dhabi's fiscal stimulus are expected to support near-term growth in the UAE," according to Jihad Azour, the IMF's Mideast and Central Asia department director.

Low oil prices mean that the construction industry in the UAE has continued to face uncertainty over the last year, negatively impacting Government revenue and affecting investment decisions. This has a significant impact on the market, particularly in Dubai, leading to developers focusing on more affordable options across all segments of real estate. Affordability is becoming increasingly important, as rents continue to fall across both the Commercial and Residential sectors, averaging an 11% drop in 2018. This has also impacted the retail market, with several brands vacating underperforming stores. Hotels operators are continuing to expand the price-sensitive, midscale segment, in order to meet the current demand ahead of the UAE's hosting of the Expo in 2020.

The outlook for 2019 is positive, with an upswing in Government spending. The UAE 2019 fiscal budget is the largest in the country's history, standing at US$15.5 billion, with infrastructure investment for the upcoming Expo 2020. The planned schemes for 2019 will cater to the need to develop and upgrade the UAE's infrastructure, and continue its growth as a preferred destination for business, entrepreneurship and tourism.

Revenue projections for 2019 indicate Dubai's ongoing diversification, and according to the Director General of the Department of Finance, "do not rely on oil revenues, which account for only 8% of total projected revenues for the fiscal year 2019". Non-tax revenue accounts for 64% of the total projections, with the remainder coming from tax (25%) and government investment (3%). The UAE's main contributor to this economic diversity is tourism, with its status as a global travel and logistics hub underpinned by the presence of major airlines across seven international airports, in addition to seaports such as Jebel Ali port in Dubai and KIZAD in Abu Dhabi.

In addition to the Expo 2020 project, other large-scale developments that are currently underway include Dubai Hill Estate, Dubai Creek Harbour and Beachfront Mina Seyahi. Community and public-orientated developments that have been recently delivered, such as The Beach at Jumeirah Beach Residence, Le Mer Jumeirah, City Walk and Box Park, are proving successful and adding to the vibrancy of Dubai. Other notable ongoing projects in the Emirates include Dubai South/Dubai World Central, Downtown Dubai, Palm Island Deira, Mohammed bin Rashid (MBR) City, Abu Dhabi Hyperloop (targeting 2019 for commencement of construction), Museum of the Future, and Royal Atlantis Hotel, amongst others.

The UAE 2019 fiscal budget is the largest in the country's history, standing at US$15.5 billion.

5. Linesight average UAE Construction costs 2019

	Cost range US/m2		Unit	MEP incl. @	
	from	to		from %	to %
Commercial/office sector					
Developer standard/investment offices					
Low rise - medium rise */**	1,200	1,500	per sq.m.	28%	30%
Medium rise - high rise */**	1,430	1,870	per sq.m.	28%	30%
Owner occupier standard offices					
Low rise - medium rise	1,525	1,630	per sq.m.	30%	32%
Medium rise - high rise	1,680	1,940	per sq.m.	30%	32%
Residential sector					
Medium quality - villa units	1,100	1,400	per sq.m.	25%	30%
Medium quality - high rise	1,300	1,550	per sq.m.	25%	30%
High quality - low rise aparts	1,390	1,750	per sq.m.	25%	30%
High quality - high rise	1,550	1,855	per sq.m.	25%	30%
Hotel and leisure/Retail sector					
Regional shopping centre *	1,420	1,680	per sq.m.	35%	40%
Budget/3 star ***	1,650	1,850	per sq.m.	22%	25%
5 star ***	2,700	3,250	per sq.m.	28%	32%
5 star resort ***	3,000	3,500	per sq.m.	25%	30%
Health sector ******					
District general hospital	2,540	3,000	per sq.m.	35%	40%
Manufacturing sector					
Light industrial	680	820	per sq.m.	25%	30%
Heavy industrial	800	950	per sq.m.	25%	30%
Parking					
Podium car parking	625	850	per sq.m.	15%	24%
Basement car parking	750	860	per sq.m.	15%	29%

Notes:
i *All subject to site specifics, design and specification*
ii *All exclude Land Acquisition Costs, External Works Costs & Professional Fees*
iii *Base Index @ 100 = UAE; Index calculated on average of stated cost range*
iv *** Shell & Core Only; with public areas finished*

Source: *Linesight*

6. Main contractors and design firms

6.1. UAE main contractors*

AL JABER ENGINEERING AND CONSTRUCTION (ALEC)
Airolink
AF Construction
Al Naboodah
Arabian Construction Company
ASGC
BAM International
Multiplex
China State Construction
Consolidated Contractors International Company
Dubai Contracting Company
Dubai Civil Engineering
ECC
BIC
Khansaheb Civil Engineering
BESIX
Samsung C&T Engineering & Construction
Salini Impregilo
Laing O'Rourke
TAV Construction
Shapoorji Pallonji International
Robert Construction

Source: *Linesight*

6.2. UAE design firms

Aedas
Aecom
Arcadis
Atkins
Archgroup
Arif and Bintoak
Arup
Benoy
BSBG
Buro Happold
Jacobs
Foster and Partners
Gensler
Godwin Austen Johnson
HOK
KEO International Consultants
Killa Design
Khatib & Alami
Kling Consult
Norr Group
Perkins+Will
Skidmore, Owings and Merrill
Worley Parsons
Woods Bagot
WSP

Source: *Linesight*

7. Kuwait Market Review

The IMF estimates that Kuwait's GDP has reached US$141 billion in 2018, and is expected to grow by 2.2% in 2019.

The unemployment rate remains low, at around 2.1%. Although 60% of the country's GDP comes from exporting oil, Kuwait is actively reducing its reliance on oil, with growth in non-oil activities forecasted to increase by 3% in 2019. Relatively low interest rates are also expected to have a favorable effect on GDP growth.

Unlike Saudi and UAE, Kuwait has postponed VAT implementation to 2021 following a parliament vote. The rescheduling is believed to be due to domestic and political oppositions, the potential negative impact on consumer spending, and the technical challenges involved in a new tax reform.

In construction, project awards had only reached US$5.28 billion up to December 2018, which was less than half of the US$13.2 billion projected at the beginning of last year. This was also estimated to be significantly below the average of the last five years, which is mainly attributable to delays with the implementation of megaprojects, such as the KAPP Al-Zour North IWPP and the KIPIC petrochemical complex. Construction of the Subbiya link of the Sheikh Jaber Al Ahmad Al Sabah Causeway is moving at a steady pace and is on track for completion. Other significant projects underway include the world's tallest judicial building and the South Al Mutlaa City Major Infrastructure Works Package Contract 2. The Government has also announced investment plans of US$160 billion to develop its islands over the next 20 years, which is expected to create 200,000 jobs and generate annual revenues of US$40 billion dollars.

With pressure increasing from parliament and the State Audit Bureau (SAB) as a result of the setbacks, and given the critical role key projects play in Kuwait's five-year development plan (FY2015/16-2019/20) and 'Vision 2035', awards are projected to pick up this 2019. Under these plans, the Government aims to increase the country's revenue fourfold, going from US$43.6 billion in 2017 to US$164 billion by 2035. This strategy is focusing on the development of transport infrastructure, commercial buildings, healthcare infrastructure, industrial facilities, water distillation facilities and renewable energy projects.

Private investment is expected to play a larger role in Kuwait's power projects for the foreseeable future. In July, the Kuwait Authority for Private Partnerships Projects (KAPP) announced it was accepting expressions of interest from private firms for the construction of two power and water desalination plants.

Looking at geopolitical factors, the severing of ties with Qatar is affecting many of the GCC countries, with Kuwait playing a mediating role between Qatar and the Saudi-led boycotters since the outbreak of the crisis in 2017. So far, the dispute has had no major implications on construction activity in Kuwait.

Ultimately, as is the case with other GCC states, Kuwait is continuing to implement changes and diversify its economy through increased expenditure on infrastructure, improvements in legislation and making the market more attractive for short and long investments.

Kuwait is actively reducing its reliance on oil, with growth in non-oil activities forecasted to increase by 3% in 2019.

8. Linesight average Kuwaiti Construction costs 2019

	Cost range US/m2		Unit	MEP incl. @	
	from	to		from %	to %
Commercial/office sector					
Developer standard/investment offices					
Low rise - medium rise */**	930	1,200	per sq.m.	28%	30%
Medium rise - high rise */**	1,350	1,700	per sq.m.	28%	30%
Owner occupier standard offices					
Low rise - medium rise	1,500	1,620	per sq.m.	30%	32%
Medium rise - high rise	1,640	1,920	per sq.m.	30%	32%
Residential sector					
Medium quality - villa units	1,050	1,310	per sq.m.	25%	30%
Medium quality - high rise	1,220	1,550	per sq.m.	25%	30%
High quality - low rise aparts	1,350	1,670	per sq.m.	25%	30%
High quality - high rise	1,450	1,820	per sq.m.	25%	30%
Hotel and leisure/Retail sector					
Regional shopping centre *	1,410	1,760	per sq.m.	35%	40%
Budget/3 star ***	1,470	1,950	per sq.m.	22%	25%
5 star ***	2,450	3,100	per sq.m.	28%	32%
5 star resort ***	3,150	3,550	per sq.m.	25%	30%
Health sector ******					
District general hospital	2,450	2,920	per sq.m.	35%	40%
Manufacturing sector					
Light industrial	560	720	per sq.m.	25%	30%
Heavy industrial	750	890	per sq.m.	25%	30%
Parking					
Podium car parking	600	720	per sq.m.	15%	24%
Basement car parking	750	890	per sq.m.	15%	29%

Notes:
i *All subject to site specifics, design and specification*
ii *All exclude Land Acquisition Costs, External Works Costs & Professional Fees*
* *Shell & Core Only; with public areas finished*
** *Excl. Super High Rise (Low/Medium = up to 15; High Rise +15; Super High Rise +45 Storeys)*
*** *Incl. FF&E; Excl. OS&E*
**** *Excl. Medical Equipment*
*****Excl. VAT*

Source: *Linesight*

9. Main contractors and design firms

9.1. Kuwait main contractors

Mushrif Trading and Contracting
Kharafi International
IMCO Engineering and Construction Company W L L
Combined Group Contracting
Al Hani Group
Al Ghanim International
Kuwait Construction Processing Company (KCPC)
Al Mulla Group (Engineering Division)
Al Ahliyya Contracting Group
Consolidated Contracting Company (CCC)
HOT Engineering & Construction Co.-KSCC (HOTECC)
Marafie Group

Source: *Linesight*

9.2. Kuwait design firms

KEO International Consultants
Option One International W.L.L
Dar SSH International Consultants
Almurshed-Design
Dourwaza Engineering (DE)
Gulf Consult
AGi Architects
Kayan Middle East
Dar Al-Dowailah Engineering Consultants and Construction Managers
Bonyan Design
Pace Architecture, Engineering, Design and Planning
SMEC

Source: *Linesight*

7. Oman Market Review

Over the past 18 months, the Sultanate of Oman has emerged as one of the most interesting markets in the region, offering good business opportunities for contractors, consultants and investors across a range of industries.

The IMF has predicted that Oman will become the fastest growing economy in the GCC region next year. It has also revised the 2019 growth forecast for Oman from 4.1% projected in its April 2018 World Economic Outlook report. The IMF expects Oman's economy to grow by 1.9% this year. This is largely attributable to increased oil prices, which stood at US$52.13 per barrel as of mid-January 2019.

Moreover, following on from the signed GCC VAT Framework Agreement in 2017, the Sultanate of Oman is aiming to implement the 5% VAT regime from September 2019. On the other hand, it was reported that the implementation date is still flexible, depending on the wider economic circumstances, as highlighted during a meeting held by the Oman Chamber of Commerce and Industry last September 2018. The launch of the consumption tax, such as VAT, as well as other taxes and excise taxes, will help the GCC states diversify their revenues from oil duties, which have fallen sharply with the volatility of oil prices. This diversification will support the Sultanate of Oman in its efforts to enhance its fiscal management program. It is worth noting, however, that the government has also indicated that many essential foodstuffs will be subjected to a zero VAT rate, which may also be applicable for public transport and real estate.

With about US$177 billion worth of projects planned or underway, the Sultanate of Oman has a substantial pipeline of projects, which are needed to support Muscat's aims at diversification into logistics, tourism and manufacturing, as well as improving public services and infrastructure.

The Omani Ministry of Manpower is very serious about Omanization, which was enacted by the Government in 1988, and allows Oman to be self-reliant by decreasing dependency on expatriates. In 1993, the time of the first Omani census, more than a quarter of those living in Oman were expatriates. Since then, however, many have left. Professional trades, such as banking, leasing, insurance, hospitality and tourism, retail and transportation are almost closed to non-Omanis, with the Omanization ratio for some of these sectors standing above 90%.

Current major projects include the Duqm Special Economic Zone, which was valued at US$30 billion; the Duqm New Town, valued at US$20 billion; the Oman National railway, valued at US$15 billion; and the Madinat Al Irfan 'City for the Future', currently estimated at US$13 billion, constituting one of Oman's largest urban development projects at 4.9 million sq.m. and scheduled for delivery in 2023.

Moreover, following on from the signed GCC VAT Framework Agreement in 2017, the Sultanate of Oman is aiming to implement the 5% VAT regime from September 2019.

8. Linesight average Omani Construction costs 2019

	Cost range US/m2		Unit	MEP incl. @	
	from	to		from %	to %
Commercial/office sector					
Developer standard/investment offices					
Low rise - medium rise */**	730	910	per sq.m.	28%	30%
Medium rise - high rise */**	930	1,160	per sq.m.	28%	30%
Owner occupier standard offices					
Low rise - medium rise	1,460	1,590	per sq.m.	30%	32%
Medium rise - high rise	1,610	1,810	per sq.m.	30%	32%
Residential sector					
Medium quality - villa units	830	1,020	per sq.m.	25%	30%
Medium quality - high rise	950	1,210	per sq.m.	25%	30%
High quality - low rise aparts	1,200	1,350	per sq.m.	25%	30%
High quality - high rise	1,430	1,600	per sq.m.	25%	30%
Hotel and leisure/Retail sector					
Regional shopping centre *	800	1,020	per sq.m.	35%	40%
Budget/3 star ***	1,220	1,520	per sq.m.	22%	25%
5 star ***	1,950	2,430	per sq.m.	28%	32%
5 star resort ***	2,500	3,100	per sq.m.	25%	30%
Health sector ******					
District general hospital	2,360	2,570	per sq.m.	35%	40%
Manufacturing sector					
Light industrial	540	660	per sq.m.	25%	30%
Heavy industrial	580	730	per sq.m.	25%	30%
Parking					
Podium car parking	510	620	per sq.m.	15%	24%
Basement car parking	720	810	per sq.m.	15%	29%

Notes:
i *All subject to site specifics, design and specification*
ii *All exclude Land Acquisition Costs, External Works Costs & Professional Fees*
* *Shell & Core Only; with public areas finished*
** *Excl. Super High Rise (Low/Medium = up to 15; High Rise +15; Super High Rise +45 Storeys)*
*** *Incl. FF&E; Excl. OS&E*
**** *Excl. Medical Equipment*
*****Excl. VAT*

Source: *Linesight*

9. Main contractors and design firms

9.1. Oman main contractors

Galfar Engineering and Contracting
Towell Construction and Company LLC
Special Technical Service LLC
Strabag Oman
Al Hassan Engineering Company
Al Turki Enterprises LLC (ATE)
Larsen & Toubro (Oman) LLC
Oman Shapoorji Constriction Co. (OSCO)
Consolidated Contractors Co. Oman LLC

Source: *Linesight*

9.2. Oman design firms

WS Atkins International & Co. LLC
SSH
Mott Macdonald
AECOM
Parson International
BuroHappold Engineering
Courduff Oman
Khatib And Alami

Source: *Linesight*

10. Bahrain Market Review*

The Kingdom of Bahrain is considered as the smallest economy in the GCC, but has continued its trend of progression in 2018.

Its economy grew by 1.8% in 2018, and in its latest Regional Economic Outlook, the International Monetary Fund (IMF) expects it to maintain the same pace this year, which is a downward revision from its last forecast. As of early September, the Central Bank of Bahrain's governor put the expected growth figure for 2019 at 2-2.5%. This will largely be funded by the introduction of VAT at 5% and an increase in revenue from oil due to increased prices. It is also thought that a further 14% reduction in public spending will be required to bring the public finances into order, which will have the effect of reducing consumer sentiment and private investment.

These economic austerity measures come largely as a condition of an aid package from Bahrain's GCC neighbors, particularly Saudi Arabia, Kuwait and the UAE, who between them have invested US$10 billion in the form of loans, grants and deposits. This investment is further to the existing GCC Development Fund, which from 2011 to 2018 has tendered projects to the value of US$5.1 billion in Bahrain.

The Bahraini construction market remains buoyant, with housing, tourism projects and infrastructure projects all contributing to the sector. Ongoing government-funded infrastructure projects include the new US$1.1 billion terminal building at Bahrain International Airport, a 1500MW power station, the expansion of the Alba Aluminium production facility, new Muharraq bridge and the widely anticipated Bahrain Metro Rail system. The Metro project will be one of the largest PPP projects to be undertaken in Bahrain, at a value of US$1.5 to 2 billion for 114km of monorail, tram and light rail interlinked systems.

On the private investment side, reclaimed lands such as Diyar Al Muharraq, Bahrain Bay and Al Madeena Al Shamaliya continue to introduce large-scale projects to the island's construction sector. The recent award of the Marassi Galleria Mall and Entertainment Centre and the accompanying Vida Residences on the eastern side of Diya Al Muharraq is one of the largest contract awards of 2018. The Hospitality sector continues to grow in Bahrain as tourist numbers are increasing year-on-year. Further investment is expected in this sector, with the development of the Al Sahel resort, the Address Hotel and Residence at Diyar al Muharraq, the Hilton Hotel at Bahrain Bay, as well as hotel developments at Financial Harbour and Bahrain Marina. In the Retail sector, the Marassi Galleria Mall, Seef Mall Hamala and Dilmunia Mall, along with planned extensions to City Centre Mall and The Avenues, are all exciting projects due to come online in 2019.

Bahrain continues to perform well in attracting direct foreign investment, with the construction of three data centers for a leading global web service provider and the completion of the Mondelez food manufacturing facility. This is further indication of the country's standing as a business friendly environment within the MENA region.

The country experienced growth of 2.8% to the end of Q3 in 2018. This growth in output is expected to decelerate to 2.6% in 2019, as the government undertakes fiscal reforms and introduces taxes in order to correct the fiscal deficit, which currently stands at 6.9% of GDP.

11. Linesight average Bahraini Construction costs 2019

	Cost range US/m2		Unit	MEP incl. @	
Commercial/office sector	from	to		from %	to %
Developer standard/investment offices					
Low rise - medium rise */**	880	1,285	per sq.m.	28%	30%
Medium rise - high rise */**	1,150	1,550	per sq.m.	28%	30%
Owner occupier standard offices					
Low rise - medium rise	1,500	1,630	per sq.m.	30%	32%
Medium rise - high rise	1,600	1,880	per sq.m.	30%	32%
Residential sector					
Medium quality - villa units	900	1,230	per sq.m.	25%	30%
Medium quality - high rise	1,045	1,385	per sq.m.	25%	30%
High quality - low rise aparts	1,320	1,540	per sq.m.	25%	30%
High quality - high rise	1,475	1,805	per sq.m.	25%	30%
Hotel and leisure/Retail sector					
Regional shopping centre *	980	1,495	per sq.m.	35%	40%
Budget/3 star ***	1,325	1,700	per sq.m.	22%	25%
5 star ***	2,880	3,050	per sq.m.	28%	32%
5 star resort ***	2,850	3,330	per sq.m.	25%	30%
Health sector ****					
District general hospital	2,430	2,710	per sq.m.	35%	40%
Manufacturing sector					
Light industrial	600	775	per sq.m.	25%	30%
Heavy industrial	720	900	per sq.m.	25%	30%
Parking					
Podium car parking	550	700	per sq.m.	15%	24%
Basement car parking	720	820	per sq.m.	15%	29%

Notes:
i All subject to site specifics, design and specification
ii All exclude Land Acquisition Costs, External Works Costs & Professional Fees

** Base Index @ 100 = UAE; Index calculated on average of stated cost range*
*** Shell & Core Only; with public areas finished*

Source: *Linesight*

12. Main contractors and design firms

12.1. Bahrain main contractors*

Absal Paul
Al Moayyed Contracting
Arabtec Construction
Bahrain Motors Co.
Cebarco
Chapo
KMC
Kooheji
Mohammad Jalal Contracting
Nass Construction
Poullaides
Six Construct
Terna

Source: *Linesight*

12.2. Bahrain design firms

Atkins
Benoy
Byrne Looby
COWI
DWP
EMGA
KEO International Consultants
Mott MacDonald
MSCEB
SSH
Worley Parsons

Source: *Linesight*

REVIEW & OUTLOOK:

Global Insights

Global Market Review

Trade dispute between the world's two largest economies has the global economy holding its breath in anticipation of the outcome.

Although the deadline has recently been extended, the potential outcome in the current US-China trade dispute continues to cast a shadow over global economic prospects. The IMF has reduced its global growth projection for 2019 by 0.2 percentage points since its projection in October 2018. When asked what had changed since October at the World Economic Forum Annual meeting in Davos, Christine Lagarde (Managing Director of the IMF) responded that it is the level of risk and the acceleration of the pace at which risks are materialising.

The reduction to 3.5% growth in 2019, is largely due to weaker performances in Europe and Asia, specifically relating to trade tariffs between the US and China, and Brexit. However, as Lagarde points out, it is still growth, albeit a little more modest than previously predicted.

US set to break record despite slowdown

The strong performance of the US economy is expected to continue in 2019. The financial results for 2018 were delayed due to the partial government shut down in January, however figures show that significant growth in the first three quarters were balanced by a significant slow-down in the fourth quarter.

Commentators are expressing the view that the beneficial impact of tax reforms introduced by the Trump administrations are fading. Nevertheless, the economy is in a strong position and the Federal Reserve has indicated that it intends to implement moderate rate hikes in 2019 and 2020, in order to keep the economy from overheating amid rising inflation and a rapid decline in unemployment. If the current expansion in the US economy continues past July 2019, it will have broken the previous record of a decade of expansion, which was set by the tech boom in the 1990s.

The US appears to be on track for this by avoiding overheating and financial imbalances - the classic causes of recessions. President Trump is determined to follow through on his campaign promise to end unfair practices with trading partners - late in 2018 he reached agreement on the replacement of the NAFTA, now known as the USMCA (United States-Mexico-Canada Agreement). Earlier in 2018, he turned his attention to China, citing unfair trade practices and theft of intellectual property. China then made a counterattack, and hence we have a trade war on our hands.

China to increase public spending

The Chinese economy, the second largest in the world, is expected to slow down further in 2019. The Government had been implementing a plan to reduce debt and risky lending. However, in response to the trade war, they are switching policy and tending towards a stimulus package of more fiscal spending, reducing the amount of money the bank needs to hold in reserve at the central bank and thus freeing up money for additional lending; building a resilient domestic market and stabilising economic growth and monetary easing in order to enhance growth.

Europe still in flux

In Europe, uncertainty around Brexit still dominates. Business investment and domestic consumption in the UK is likely to remain subdued while the issue of Brexit is unresolved. A no-deal Brexit will likely cause a serious economic shock, while leaving the EU with a deal could result in a boost in investment and consumer sentiment, which has been subdued for the last number of years. Germany, the largest economy in the eurozone, is dealing with a softening of private consumption, and introduction of new automobile fuel emission standards have resulted in a weak industrial production.

Meanwhile, France is dealing with 'Gilet Jaunes' or the 'Yellow Vest' movement, and after 10 weeks the protests are finally showing signs of receding. However, what was previously viewed as an unorganised movement is morphing and changing, and the final shape it takes could be of political concern. In Italy, weak domestic demand and higher borrowing costs together with concerns about sovereign and financial risks have dampened domestic demand.

Ireland is set to see continued strong growth, which will shield it somewhat from the slowdown in the global economy. However, labour shortages, pressure on public services and rising prices caused by this strong growth present major challenges for Government and businesses alike. The outlook is overshadowed by the prospect of a hard Brexit, which would negatively impact on Ireland's growth, with rural Ireland being particularly impacted.

The GCC continues to diversify

Oil prices have been volatile thanks to swings in supply, and OPEC has agreed to cut production with a view to returning prices to US$70 a barrel later in 2019. However, the GCC economy continues to improve, with a period of increasing interest rates and the prospect of stable oil prices. In particular, Saudi Arabia continues with its diversification plans as part of its 'Vision 2030' plan. And while the geopolitical situation remains a concern, improved economic dynamics are offsetting these concerns.

The governments continue their drive to reduce the economies' dependency on oil prices, and thus we have seen a trend of mergers and acquisitions, particularly in the banking sector. These M&As are seen as an opportunity to improve economies of scale and scope, and to improve market share in the global markets.

The governments are also focusing on continuing to attract foreign direct investment, which is stimulating economic growth and boosting investor confidence in the region. The UAE has made some significant investments in technology, and in particular renewable energy, with the ambition to have 44% of its energy requirements provided through renewable resources by 2050.

Its investment in infrastructure continues, as it prepares for Expo 2020, which is providing a stimulus for the regional construction industry. While FDI investment in the UAE is expected to significantly increase with recent investment law provisions, relaxation of visa rules and other business-friendly reforms also appear poised to both attract qualified foreign workers. However, Egypt is expected to be the region's top performer in 2019, followed by Iraq. Iran will contract again in 2019 as US sanctions continue.

In Israel domestic demand should continue to support economic growth this year. Private consumption will likely benefit from a lower tax burden and still-favourable financial conditions. New gas and oil-related projects are expected to boost fixed investment growth. On the other hand, regional tensions remain a key downside risk and cloud the outlook.

The Chinese economy, the second largest in the world, is expected to slow down further in 2019.

Asia Pacific remains robust

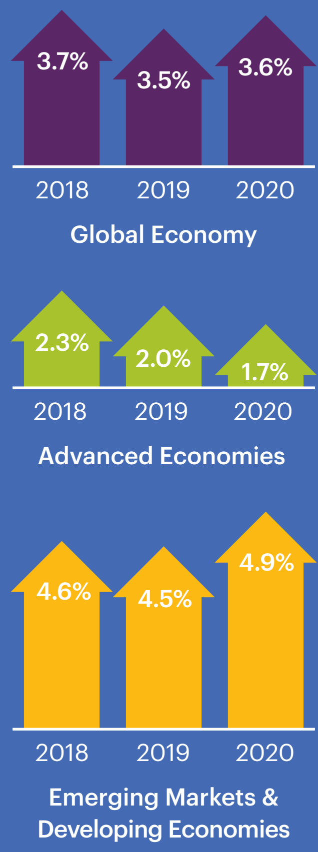
A recent press release by the Singapore's Ministry of Trade and Investment noted that its economy is, like many other global economies, expected to slow in 2019. The manufacturing sector, in particular electronics and precision engineering, is experiencing difficulties due to weakening global demand for semiconductors and associated equipment. While other sectors, such as wholesale trade, transportation and storage finance and insurance are expecting to moderate in growth, in line with the global economy. The information and communications, health and social services sectors are expected to remain resilient due to demand for IT and digital solutions. The construction industry is expected to see a pick-up after three consecutive years of contraction. Politically, there is speculation that general elections will be held this year to take advantage of the still-strong domestic growth and heightened public morale following bicentennial commemorations.

Remarkably, the Australian economy has gone 27 years without a recession. While there are risks to the economy, it is expected that business investment, rising exports of commodities and Government spending will likely offset the contracting housing sector, subdued consumer spending and devastating drought.

Employment growth is strong, as the Australians consistently add more jobs than needed to accommodate the growth of the working-age population, resulting in reduced unemployment rates and participation rates increasing to the highest level on record. In addition to increased production capacity from LNG plants, the Australian resource sector is also seeing increased activity from the Chinese in response to the US tariffs, in iron ore and coal particularly, though this cannot be relied upon in the longer term. Thus, growth in 2019 should be moderate.

Kim Hegarty
Associate Director

Growth projections



Source: *International Monetary Fund*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GLOBAL INSIGHT

How is sustainability impacting the built environment?

Sustainability is the process of maintaining change in a balanced environment, in which the use of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony, and enhance both current and future potential to meet human needs and aspirations.

For many in the field, sustainability is defined in terms of three interconnected domains or pillars: environment, economy and society. Economy and society are constrained by environmental limits.

Sustainable building (aka green construction or green building) refers to both a structure and the application of processes that are environmentally responsible and resource-efficient through a building's life cycle. This extends from planning to design, construction, operation, maintenance, renovation and demolition.

There are several associated built environment goals; to design future projects to minimize energy and water consumption, as well as wastewater production; incorporate sustainable design principles into capital investment decisions; base capital investment decisions on life cycle cost, including the cost of known future expenditures.

Positive impacts

Sustainability in buildings refers to their ability to be environmentally responsible throughout their life cycle, from planning and design through to operation and maintenance.

It is based on energy use, water use, indoor environmental quality, material selection and the building's effect on the site, while also addressing the impact on human health and the environment. It does this by:

1. Reducing waste, pollution and degradation of the environment
2. Efficiently using energy and water, along with other resources
3. Protecting occupant health and productivity

Ultimately, and intuitively, a greener and more efficient design and operation has less impact on the environment, as well as minimizing harmful effects on human health and the environment.

Beyond new developments, existing buildings need to be upgraded to be more energy efficient and use renewable energy sources to lower greenhouse gas emission.

The economic and social benefits associated with green building, as listed below, are also significant.

Economic benefits:

- Reducing operating costs
- Improving occupants' productivity
- Creating market for green products

Social benefits:

- Improving quality of life
- Minimizing strain on local environment
- Improving occupants' health and comfort
- Promote a better planet
- Sustain environment without disrupting natural habitat

LEED and WELL certification:

LEED is the most widely used green building rating system in the world, with a LEED-certified building offering considerable cost savings to owners, in terms of maintenance costs over the building's life cycle. LEED sustainability standards for design have now become a part of architectural design on a standard level, leading to the next level of occupant wellbeing, with the new WELL Building Standards.

WELL is a performance-based system for measuring, certifying and monitoring features of the built environment that impact human health and well-being through seven concepts: air, water, nourishment, light, fitness, comfort and mind. The below seven concepts are pillars upon which sustainability relates to the human side of a building:

- Air - achieve optimal indoor air quality to support the health and well-being of building occupants. This promotes strategies to remove airborne contaminants, and promote pollution prevention and air purification.

- Water - optimize the quality of water available to building occupants and promote accessibility. This encourages strategies to ensure water is safe, clean and easily accessible through filtration, treatment and strategic placement.

- Nourishment - encourage healthier eating habits and food cultures that lead to better health. This includes availability and promotion of healthy food choices.

- Light - minimize disruptions to the circadian rhythms of building occupants, enhance productivity, and improve physical energy and mood levels. This is done by implementing strategies for better illumination, by providing criteria for window performance and design, light output and control, and appropriate visual activity.

Sustainability in buildings refers to their ability to be environmentally responsible throughout their life cycle, from planning and design through to operation and maintenance.

- Fitness - encourage integration of physical activity into the everyday life of building occupants bu utilizing building design, accommodating fitness regiments, and providing the space and opportunity for an active lifestyle.

- Comfort - design of an environment that is distraction free, productive, and comfortable for the occupants, by promoting strategies to meet accessibility design standards, providing comfortable furnishings and workstations, controlling acoustics and thermal conditions, and reducing known discomforts.

- Mind - support the mental and emotional health and well-being of the occupants, by providing regular feedback and knowledge to them about their indoor environment. This is done through design elements, relaxation spaces, and health treatment and benefits

In addition, innovation is a key consideration, in terms of promoting the continuous advancement of WELL and allowing project teams to achieve higher certification levels. There are five innovation features that each count as an optimization for any of the project types.

In summary, the age-old adage that the smallest changes can make a big impact rings true in the case of sustainability – the seemingly small measures implemented in green building processes are making all the difference. However, the importance of education, training, and the encouragement of occupant to implement best management practices for optimal sustainability cannot be underestimated.

Frances Graham,
Project Director

WELL is a performance-based system for measuring, certifying and monitoring features of the built environment that impact human health and well-being through seven concepts: air, water, nourishment, light, fitness, comfort and mind.

GLOBAL INSIGHT

How capital projects are responding to Life Sciences market trends

Global healthcare spending continues to increase dramatically and is projected to reach in excess of US$10 trillion by 2022.

This investment is driven in large part by the global increase in life expectancy, improved access to medicines and the growth of non-communicable diseases - most prominently cancer, heart disease and diabetes.

Contrary to popular perception, the Life Sciences sector covers a lot more than just pharmaceuticals. Beyond the top-tier pharmaceutical firms we all hear about, the core Life Sciences subsectors include medicine manufacturing, electromedical apparatus manufacturing, medical equipment and supplies manufacturing, and biological and chemical research and development.

In this diverse and highly-specialised group, one thing these businesses have in common is major capital requirements. Here are five trends that are shaping today's Life Sciences sector — and how they're affecting associated capital projects.

Cost is key

The life sciences industry as a whole continues to experience mounting pricing pressures, increasing access to drugs globally, growth in new innovations and therapies, and uncertain trade policies.

These forces are causing the industry to become more cost-focused. This increased focus is particularly evident in the industry's capital investments, which tend to be much more targeted than they were just a few years ago. For instance, the rush to build more factories has been replaced by a more patient approach, wherein companies are waiting until they have a new product that has gone through all phases of clinical trials and all levels of regulation before they commit to building a new facility.

Outsourcing non-core responsibilities

The outsourcing of key responsibilities is also becoming more common. For example, many life sciences companies have capital projects planned all over the world, meaning they will be spending a tremendous amount of capital over the next few years. However, these companies are simultaneously re-thinking their role in project delivery, choosing to focus more on the core operations of researching, manufacturing and selling their products. So, while their construction is increasing in number and size of projects their staffing is actually going down. This trend is most obviously manifested in the smaller in-house engineering and construction staffs we see today.

That doesn't mean that life sciences companies are eliminating their in-house capital management personnel entirely. Rather, many companies are moving to a hybrid execution model, leveraging a combination of internal and external resources. Overall though, the trend is clearly towards outsourcing project management responsibilities.

Expanding regulations

Regulations in the manufacturing of pharmaceutical products will continue to rise, as global regulators share information across borders and the entire industry relentlessly pursues product safety.

People are ingesting what is being manufactured, and the facility, its equipment, products and even the air quality in the rooms have got to be safe. Meeting these requirements means going through extensive testing and documentation. The process of commissioning and qualifying a facility to demonstrate safety and compliance to governmental regulatory agencies is already time- and resource-intensive, and as regulations continue to increase, so will this phase of a project.

New drugs and biologics

Another trend is heavy investment on behalf of many pharmaceutical companies in the research, development and manufacturing of biologics and other new cancer drugs.

Spending on new cancer drugs alone is expected to grow by more than 50% over the next few years, and the production of biologics, in particular — drugs that are derived in some way from living organisms, and have revolutionized the treatment of many cancers and chronic conditions such as multiple sclerosis, arthritis and rheumatoid arthritis, Crohn's disease and other auto-immune diseases — is expected to skyrocket over the coming several years.

Companies are waiting until they have a new product that has gone through all phases of clinical trials and all levels of regulation before they commit to building a new facility.

However, biologics and cancer treatments are expensive and time-consuming to research, test and produce, often taking many years and billions of dollars of investment before they hit the market.

Industry consolidation

Mergers and acquisitions continue to dominate headlines in the Life Sciences sector, with big pharma hunting for the next generation of medicines against declining returns on R&D.

There has already been a large amount of consolidation in the industry, and experts are projecting that the larger mergers are likely to settle down. Consolidation among mid-sized manufacturers, however, especially among companies looking to take the lead in next-generation therapies or acquire producers that complement the company's core, will be the trend.

The life sciences industry continues to adapt and evolve to market conditions, a growing global population, increased regulations, stiff competition and various cost pressures. In this complex and dynamic industry, capital projects are a microcosm of healthcare's broader challenges.

Nigel Barnes,
Director

Jeff Peragallo,
Director

Mergers and acquisitions continue to dominate headlines in the Life Sciences sector, with big pharma hunting for the next generation of medicines against declining returns on R&D.

GLOBAL INSIGHT

How to build a data centre and keep the lights on

Data centres have gone from being almost hardly noticed to one of the most important pieces of infrastructure in the global digital economy. They host everything from financial records to Netflix movies.

As a result, data centres have become a multibillion-dollar industry, precisely because their role is so important. Designing, building and supporting data centres requires strategic planning and careful construction in order to keep clients' mission-critical data secure and available 24/7 - regardless of what it is.

There are many factors which must be addressed when designing and building a data centre. For starters, it's all about power - finding it and managing it.

Finding the power

Data centres require an incredible amount of electricity to operate and this electricity often requires the direct intervention of regional utilities in order to work. Energy infrastructure needs to be shifted, power lines need to be run and redundancies need to be established. The most secure data centres have two separate feeds from utilities, so that if something happens to one of the lines — like an unexpected squirrel attack — the centre doesn't immediately lose all of its functionality.

Coordinating that takes a lot of effort and often the clout of a large corporation in order to get anywhere. But even the big players need to check the policies of utilities and local governments in any area in which they are planning on building a data centre; they do this to ensure they will be able to establish those inputs. Because without that redundancy, data centres can be vulnerable to power outages that could result in not only the loss of critical customer data but also any negative impact on the brand of the data centre owner.

The price and availability of that power are also incredibly important considerations because a data centre is going to be a large draw at all times. With a significant amount of power going into computing, and even more going into cooling computers down, it's no surprise that data centres are using more than 1.8% of the power of the entire United States. Again, companies planning data centres need to work with local governments and utilities for subsidies and deals that can make that energy easier to afford.

Keeping the lights on

Much of the support infrastructure in data centres is focused on making sure that their power cannot be interrupted. Uninterruptible Power Supplies (UPS) -powerful batteries that can provide power almost instantaneously- are critical for this effort.

They ensure that during an emergency any power loss is returned in milliseconds, instead of seconds or minutes that could result in the loss of data or functionality for thousands of computer systems. But most UPS systems don't serve as back-up power for long. In other words, they simply don't have the kind of power storage capacity that it takes to power a data centre for more than a matter of minutes. In order to keep data centres fully running without utility power, data centre operators usually turn to large diesel-powered generators, stocked with 24-48 hour of fuel at all times.

All of this redundancy is required because of the incredible amount of energy that data centres use. But the other key factor in a data centre's success is the efficiency with which that energy is used. That starts with the organisational strategy used for cooling.

Staying cool

Data centres are carefully planned structures. Every square foot needs to contribute to the wider goals of powerful and efficient computing.

You can't just slam server racks together because their placement needs to fit in with the cooling system used to prevent overheating.

Data centres run hot, and today's advances in High-Performance Computing (HPC) mean that they are using as much as five times more energy than they used to. This makes a cooling solution one of the most important decisions that a data centre operator has to make.

By far the most common data centre cooling method involves airflow, using HVAC systems to control and lower the temperature as efficiently as possible.

In order to keep data centres fully running without utility power, data centre operators usually turn to large diesel-powered generators, stocked with 24-48 hour of fuel at all times.

Rise of liquid cooling

While liquid cooling has historically been the domain of enterprise mainframes and academic supercomputers, it is being deployed more and more in data centres. More demanding workloads driven by mobile, social media, AI and the IoT are leading to increased power demands. As such, data centre managers are scrambling to find more efficient alternatives to air-based cooling systems.

The liquid cooling approach can be hundreds of times more efficient and use significantly less power than typical HVAC cooling systems. But the data centre market is still waiting for some missing pieces of the puzzle, including industry standards for liquid-cooling solutions and an easy way for air-cooling data centres to make the transition without having to manage two cooling systems at once. Still, as the growing need for more efficient cooling shows no signs of slowing, liquid cooling will likely become the norm in years to come.

Building a data centre is about executing an extremely complex plan, with input from experts in wide-ranging fields. Firms thinking about building their own data centre should consult with experts who have dealt with their specific difficulties before to ensure that all of these core areas can be built without incident.

Modern data centres are planned down to the last wire on Building Information Management (BIM) applications and similar software, so that the outcome is as guaranteed as possible before the first wall is erected. Data centres are key arteries of the digital economy, funneling the data of the modern economy between consumers, companies, governments and citizens. That takes a lot of energy!

Eoin Byrne,
Associate

> **The data centre market is still waiting for some missing pieces of the puzzle, including industry standards for liquid-cooling solutions andan easy way for air-cooling data centres to make the transition without having to manage two cooling systems at once.**

GLOBAL INSIGHT

Workplaces of the future

The commercial environment has been transformed from the office-based workplace of the past to the more open and collaborative space we see today. And now, we are beginning to see another transformation.

According to Gensler, the workplace of the future requires a profound change in how design supports its varied forms, meaning the design industry will have to set aside its old ways to look at the working environment holistically.

There are significant changes happening in the workplace, with a younger workforce, surge in innovation-driven businesses, global transition towards working across geographic and demographic markets, and economic and cultural shifts are becoming the new norm.

The new generation of workers is looking for work spaces suited to conversation among a few people, and for a balance between focus and the need to interact. There is a need now for the office workspace to be reshaped to interact with the community, and for smarter spaces that attract young, creative people.

Redefining standards in space utilisation

Soaring real estate costs are driving higher density and greater utilisation of space. Many large companies are now forming global standards of office spaces, that are essentially a kit of parts to be adapted to different locations, such as tech hubs, easily configured offices, open-bench workstation neighbourhoods, and open network team areas.

According to the Ted Moudis & Associates 2018 workplace report, the square footage per person is staying the same; however, the number of offices has decreased, and the number of alternative seating continues to rise.

A strong focus on amenities and well-being

Companies are placing more value on creating alternative space for focus, meetings and amenities for employees. There is an increasing amount of space being dedicated to mental and physical well-being for their staff. This amenities focus is driving activity in the workplace and encouraging movement throughout the space. The Internet of Things is allowing integration and accessibility of technologies across multiple platforms, to facilitate agility.

Design that supports mental and physical restorative opportunities throughout the day to improve morale and increase productivity is a must. Companies are now more focused on creating spaces that reflect the brand and philosophy of the company.

Working from home

Working from home is a perennial debate - some companies embrace it and some abhor it. In 2013, Yahoo banned employees from working from home, stating "some of the best decisions and insights come from the hallway and cafeteria discussions, meeting new people, and impromptu team meetings". Speed and quality are often sacrificed when we work from home. Richard Branson from Virgin responded, "it was a backward step in an age when remote working is easier and more effective than ever". Google noted that as few as possible people work remotely, noting that "there is something magical about sharing meals, spending time together and noodling ideas".

Working from home is more common among full-time workers over 55, and those with dependent children. It encourages employees' work/life balance cutting down on commuting time. Although there is the fear that not being seen in the office may cut down on promotion opportunities, pay increases and lower performance evaluations. And so, the debate goes on, with no clear winner. Although, with the pressure on higher density, the greater utilisation of space and AI innovation, perhaps the pro-working-from-home lobby may win out in the end.

Private space versus open-space interactivity

The pursuit of efficiency is leading firms which were office-heavy to opt for a more shared, open, team-based workspace, and with paper disappearing, libraries, records and administrative functions are being consolidated to reduce the footprint. Support spaces are being consolidated to allow more space for amenities. Activity-based work environments provide new amenities and a wider range of workspace types, while reducing the total area of occupancy. The forecast is that there will be an increase in semi-enclosed and small focus rooms, less executive suites, an increase in USF (usable square footage) per work seat in activity-based work environments, and an increase in both employer and building-provided amenity and wellness spaces.

According to the Ted Moudis & Associates 2018 workplace report, the square footage per person is staying the same; however, the number of offices has decreased, and the number of alternative seating continues to rise.

More visibility and transparency with open perimeters, transparent walls and low partitions are the new norm, providing a more inviting and connected environment. Informal collaboration spaces and alternative settings are helping to provide privacy zones in place of private offices.

Employees are sitting in open spaces with greater choices of where and how to work, including benching and sit-to-stand desks. On the other hand, there is a growing number of people and companies who are now thinking that the old days of the private office was not so wrong after all, allowing the closing of the door to avoid interruptions. Open office space has taken that decision away from people, and even with headphones, it is tough to avoid distractions.

Ultimately, people are different. They come in at different times, have diverse requirements, socialise at different times and have their most productive hours at different times. So, what is the solution?

There are several ways of making the environment fit all tastes, with WorkDesign Magazine proposing the following key considerations for the workplace of the future:

- Flexibility is paramount
- Technology is the ultimate enabler
- Everything is connected, with fast, smart and integrated networks
- Personalization is prioritised
- Environmental threats necessitate change – Buildings & transportation need to reduce impact on environment and change to adapt to global landscape.

In summary, the workplaces of the future are a work in progress, with no shortage of ideas. It will be a rollercoaster ride to see what the future holds, but it is an exciting time to be involved in the commercial fit-out world.

Damien Coffey,
Director

More visibility and transparency with open perimeters, transparent walls and low partitions are the new norm, providing a more inviting and connected environment.

What we do

Our services are tailored for your project, delivering maximum efficiency from inception to completion. We specialise in key areas, to provide faster project delivery, greater cost efficiency and maximum value.

Project Management
Delivering project success through strategic planning and stringent controls.

Cost Management
Ensuring better value for money at every stage of the construction process.

Program Management
Managing a network of projects simultaneously in order to deliver program success.

Project Controls
Controlling every aspect of a project to ensure maximum performance and long-term success.

Procurement
Adopting the most appropriate strategy to suit both public and private sectors.

Supply Chain Management
Providing efficient logistic strategies to streamline the delivery of equipment and services.

Health and Safety
Assuring compliance, and providing design teams and clients with expert advice and independent review.

Consultancy
Providing professional, hands-on advice and guidance throughout every stage of your project.

Planning and Scheduling
Controlling every aspect of a project to ensure maximum performance leads to long-term success.

Our values

Over the years we have developed a way of working that ensures quality and consistency in how we operate. Our five core values inform what we do and how we do it:

Partnership
We are focused on our clients' goals and work closely with them to achieve the best possible results. We believe in collaboration. When we share our experiences and combine our expertise, we can achieve great things.

Progress
We believe in always moving things forward and finding better ways of working. We're not just focused on what we do but also on what we can achieve. We are driven by success – for our clients, our partners and each other.

Integrity
We are fair, open and ethical in everything we do. We challenge things we believe to be wrong and are open to being challenged by others. We take pride in the quality, accuracy and independence of our work.

Resourcefulness

We work around the world, in diverse sectors and for clients with distinct ambitions. This requires us to act effectively and creatively in new and complicated situations. We rely on our individual and collective abilities to resolve any challenges we may face.

Long-term view

We believe in working sustainably, and so we build enduring relationships with our clients and partners. We work together in a way that is respectful and considerate of each other and the wider society in which we live.

Our culture

Our **bold ambition, honesty** and **confidence to deliver,** together with our commitment to cultivating **meaningful relationships** is what sets us apart.

Our distinctive culture has always played a key role in our success. As a business we want to be intentional in maintaining and working within the principles of our distinctive culture.

Own and empower

We have a highly developed sense of responsibility for identifying problems, finding solutions and executing with excellence. As individuals and teams, we are free (and encouraged) to exercise our judgement to reach our goals.

Connect for good

We are team players, collaborating globally and locally to deliver exceptional results. We encourage and nurture relational rather than transactional business relationships, continuously building a totally inclusive working environment.

Embrace clarity

Our emphasis is on direct communication - our preference is always face-to-face, or to pick up the phone. We express ourselves clearly, honestly and effectively in our communication. We are pro-active in inviting and providing actionable feedback.

Lead by example

We believe in mentoring as a way to strengthen and develop ourselves and provide the resources, environment and flexibility required. We practice 'reverse mentoring' between junior and senior employees - every single person in Linesight has something to teach.

Bold ambition

We continuously develop our global team, with a shared drive and ambition to deliver exceptional results. We believe success is winning unreserved recommendations for exceptional work and impact. We always work with an eye on the future, whilst delivering on our commitments and objectives.

2018 A year in review

JANUARY

We launched our Purpose Built Student Accommodation (PBSA) Report at a private symposium in Dublin.

FEBRUARY

Patrick Ryan, Managing Director USA East Region, joined the panel at the Enterprise Ireland Leadership 4 Growth Programme, at the Consulate General of Ireland in New York.

MARCH

Celebrating International Women's Day across the globe. Our colleagues in Dubai showing their creative side!

JULY

Paul Brady took part in the Etape Du Tour, an annual amateur race on one stage of the Tour de France.

AUGUST

Richard Joyce, Managing Director, Linesight Ireland, celebrated 30 years in Linesight!

SEPTEMBER

14 members of the Linesight team from around the globe took on the formidable 700km Paris2Nice cycle, in aid of the Irish Youth Foundation.

APRIL

Shay Dahan, Director of our Israel operations, ran 500km across Israel in eight days to raise funds for Krembo Wings, a youth movement for children with special needs.

MAY

Des O'Broin became the fifth member of the Linesight team to be appointed President of the Society of Chartered Surveyors Ireland (SCSI).

JUNE

The appointment of our new Country Director for India coincides with the opening of our new office in Mumbai.

OCTOBER

Linesight teams from Dublin, New York and Singapore took on the Run in the Dark challenge in aid of the Mark Pollock Trust.

NOVEMBER

We marked the launch of our Build-to-rent (BTR) research report, with a breakfast briefing in Dublin that drew in over 70 high-profile industry stakeholders.

DECEMBER

A number of our colleagues celebrated passing the APC to become Chartered Quantity Surveyors.

Working with you wherever you are

With staff located across Europe, MENA, Asia Pacific and the USA, our reach is truly global. We have delivered projects in over 40 countries and are always exploring new areas of opportunity. We offer first-class consultancy on major projects across 13 specialist sectors, and we have developed a broad portfolio of innovative projects in every region.

- Commercial Development
- Commercial Fit-Out
- Data Centres
- Education
- Food and Beverage
- Healthcare
- High-Tech Industrial
- Hospitality
- Life Sciences
- Residential
- Retail
- Student Accommodation
- Transportation and Infrastructure

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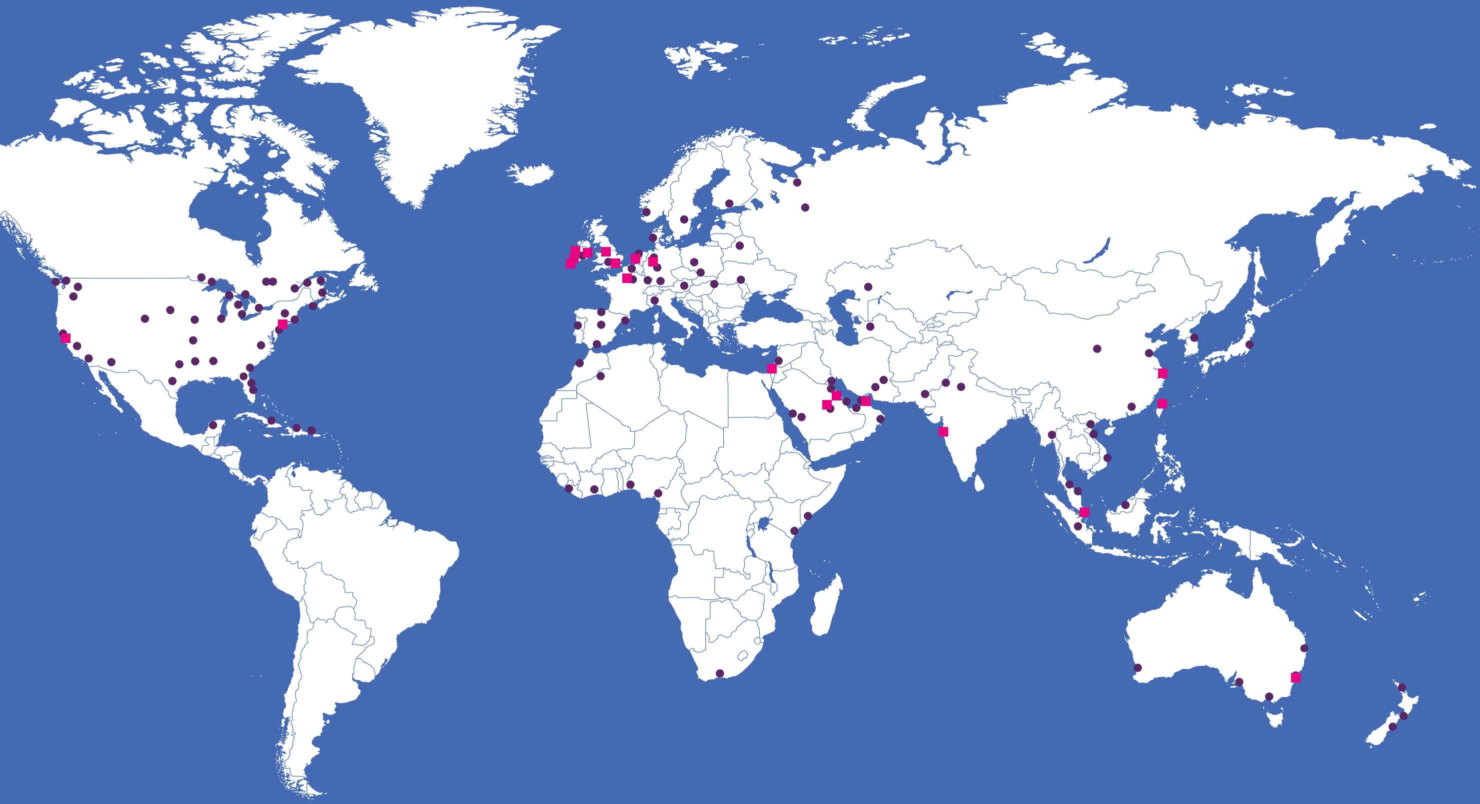

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Acknowledgements

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