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COVID-19 Outbreak Impacts Analysis on Infrastructural Industries of Oman





HM FORMS COMMITTEE TO ADDRESS ECONOMIC IMPACT OF COVID-19

His Majesty Sultan Haitham bin Tarik on Sunday ordered the formation of a committee to address the economic impact of the COVID-19 pandemic. The committee, headed by the Minister of Interior and the Chairman of the Supreme Committee, will set an appropriate mechanism to ensure the speedy return of economic activities and accelerated economic growth.

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“The publication of this report is permitted upon citing”

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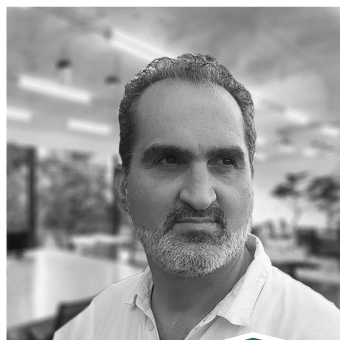
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1 Introduction

1.1 *General Introduction*

World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020. In its message, it balanced the certainty that the coronavirus (SARS-CoV-2) will inevitably spread to all parts of the world, with the observation that governments, businesses, and individuals still have substantial ability to change the disease's trajectory. In this note, we describe emerging archetypes of epidemic progressions; outline two scenarios for the pandemic and its economic effects; and observe some of the ways that business can improve on its early responses.

The coronavirus outbreak is first and foremost a human tragedy, affecting hundreds of thousands of people. It is also having a growing impact on the **global economy**. This report is intended to provide business leaders with a perspective on the evolving situation and implications for their companies. The outbreak is moving quickly, and some of the perspectives in this article may fall rapidly out of date. This article reflects our perspective as of June 7, 2020. We will update it regularly as the outbreak evolves.

The pandemic continues to expand. More than 190 countries and territories have reported cases of COVID-19 till date, the disease caused by the coronavirus (SARS-CoV-2). Case growth has accelerated to more than 6,500,000 cases and more than 390,000 deaths as of June 7, 2020. Some geographies have a handful of cases, others with early community transmission have a few hundred, and those with uncontrolled, widespread transmission have tens of thousands. Governments have launched unprecedented public-health and economic responses. The situation evolves by the day.

In this report, it is going to show the impact of this Pandemic on infrastructure of Sultanate of Oman and present some suggestion that help authorities to face with problem and change some of the threats to opportunities.

1.2 *Trading in the world*

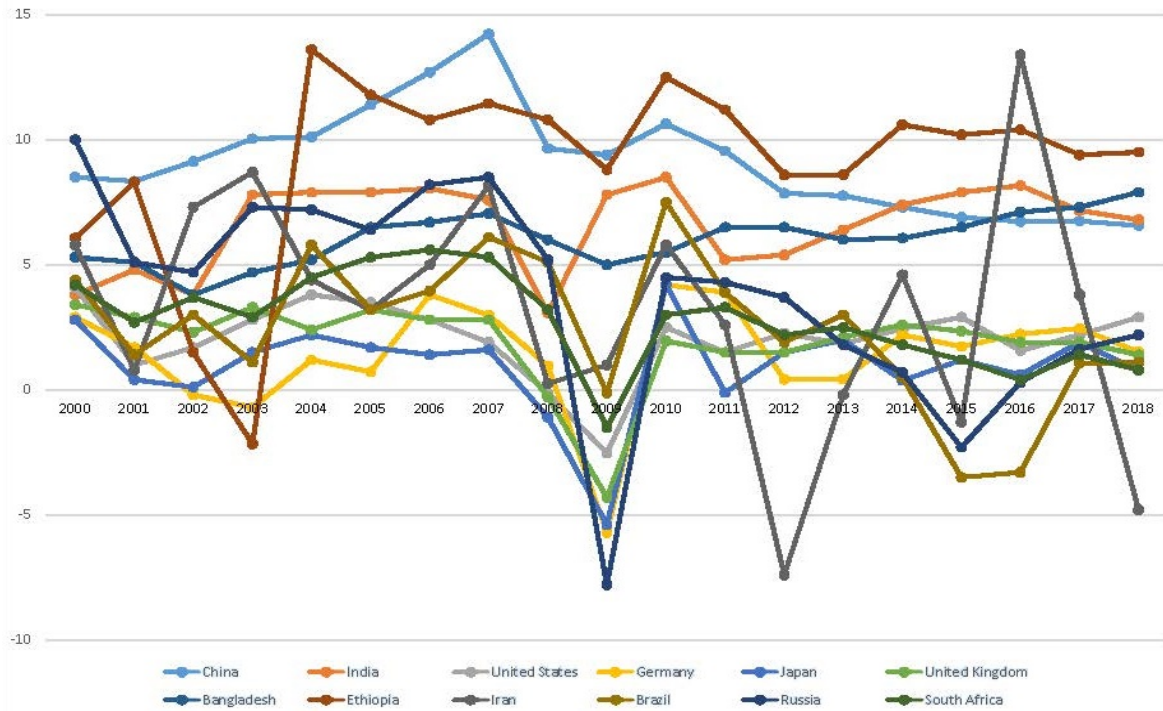
Since early 2000 Globalization was selected as the main strategy to guarantee sustainable development around the world. While there were some scientist who were against this strategy and believed that different cultures and habits never let this process could be continued and in the best case 5-6 different civilization colonies could be created that later on would create major conflicts against each other, Globalization continued and supported by most of international firms and governments.

World wide web and internet was a good driving force for this process and since this novel technology created a virtual environment that everybody could search, select, purchase and communicate, there were no doubt that world village would be in hand in a very near future.

European Union (**EU**), The Economic Cooperation Organization(**ECO**), The Asia-Pacific Economic Cooperation (**APEC**) , Gulf Cooperation Council (**GCC**), World Trade Organization , G7 , The Shanghai Cooperation Organization (**SCO**), and etc. have been modified, developed or established to support this process and so many legislation processes defined and approved by these regulating bodies

Following figure shows the outcomes of this process from economical points of view. It can be seen while the GDP growth of developed countries decreased or remained constant, the ones of the countries in transition increased and touched amazing high value for several continuous years.

GDP Growth Annual Rate (%) - 5 Top Economy + BRICS Countries + Emerging Economies in Asia & Africa + Bangladesh



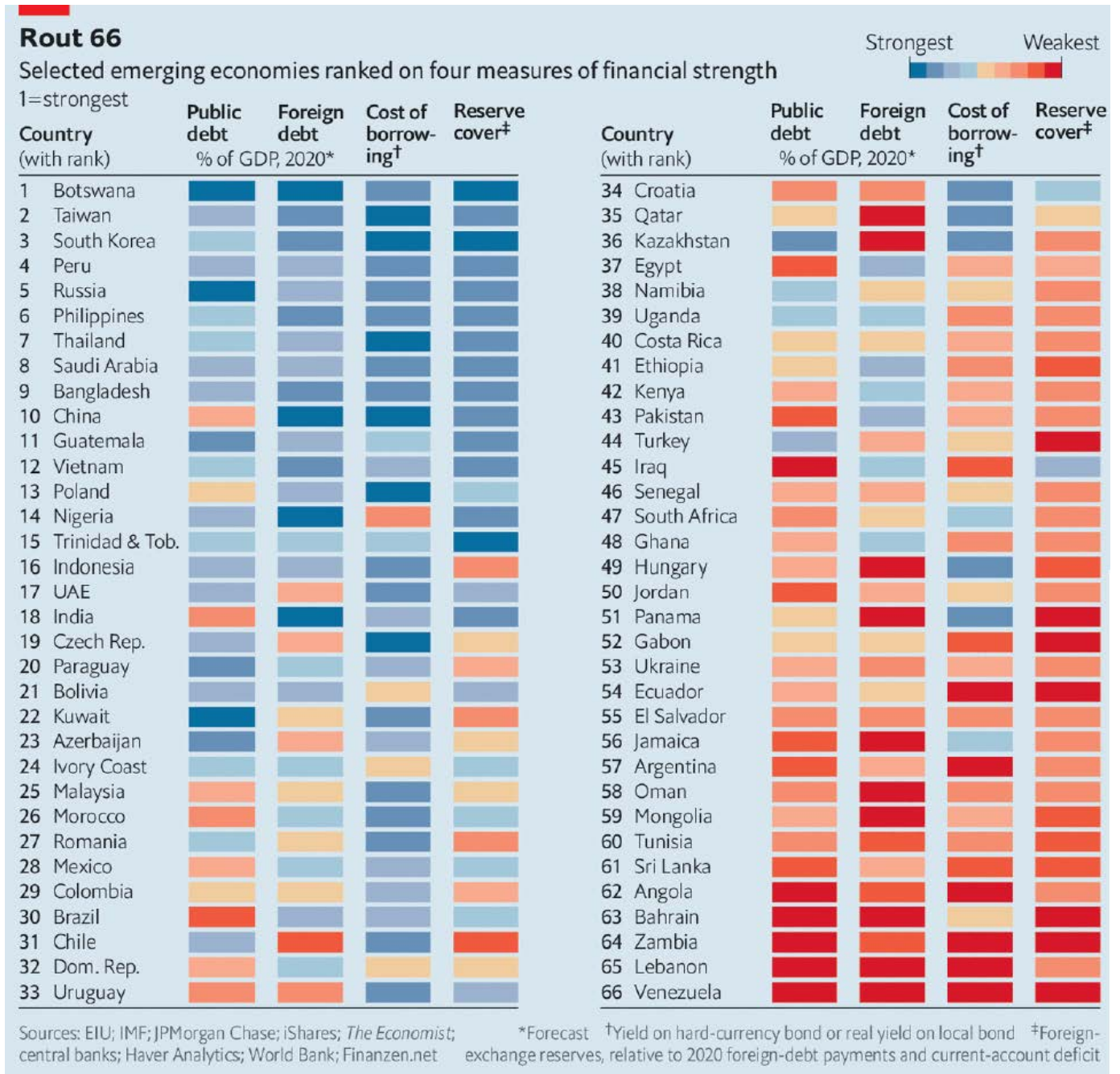
It means that while most of funds, technologies and supports come from developed countries the economic advantages are mostly goes to the countries in transition

It can be considered as one of the main reasons that countries like Great Britain or United States of America decided to change their strategic approaches and focused more on localization instead of globalization, and albeit faced with some objections from some international firms and organizations.

Spreading of Covid19 all around the world, now create an environment that some citizens support more the anti-globalization idea, because of their concerns about their health and security. As the consequence it can be supposed that the globalization continuation will be faced with a major obstacle and many countries will change their strategies to focus more on their local potential and move more into localization and put some restrict for international cooperation. Albeit with some exempt that includes Environment and ICT, energy

Since Covid19 locked down caused interruption in economical transactions, it will be clear that those countries with more reserves, and less debts could support this critical situation than those with less reserves and more debts.

Following figure shows the ranking of 66 countries by the economist journal based on 4 important indicators: Public debts, foreign debts, cost of borrowing and reserve cover. It can be seen that Sultanate of Oman is in the row of 58, which means that the country is not in a good position based on these indicators and need to organize special task forces and working groups to modify and re-plan their money and economical strategies.



The Economist

1.3 Scenarios of Economic crisis and economic shocks

As per past experiences, facing graphs show, how 2008 global financial crisis had impact on GDPs of different developed countries, vast studying followed by economists and three different shapes or models in terms of crisis progression and recovery observed by different economies and countries,

when a crisis happens in a country, three different scenarios and impacts on their GDPs are “V” shape, “U” shape and “L” shape, according to the crisis volume and its depth the impact on GDP growth will be one of the above-mentioned shapes,

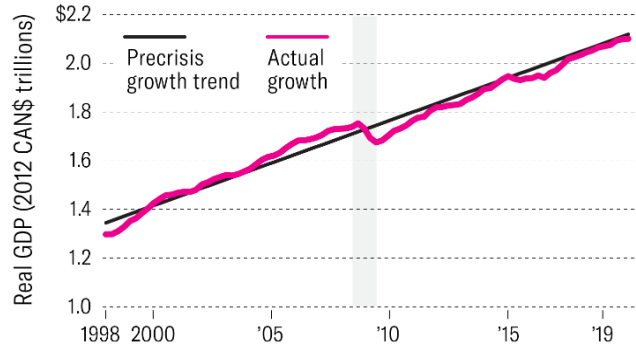
opposite Graphs illustrated how 2008 global financial crisis delivered recessions in three sample countries, yet followed vastly different shapes in terms of shock progression and recovery.

when a crisis will undoubtedly cause a significant disruption to an organization, a business continuity plan can help minimize the disruption.

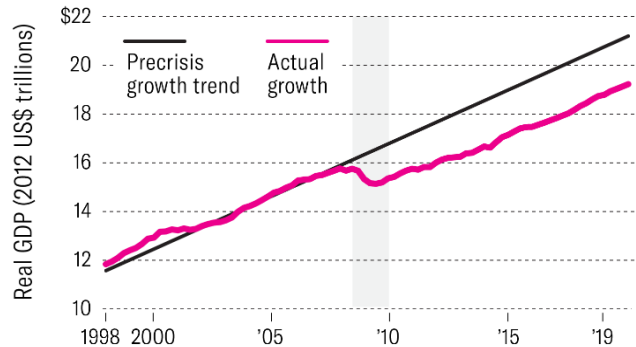
Economic Shock: 3 Examples

The concept of a recession is binary and blunt. The bigger-scenario question revolves around the shape of the shock and its structural legacy. To illustrate, consider how the 2008 global financial crisis delivered recessions in three sample countries, yet followed vastly different shapes in terms of shock progression and recovery.

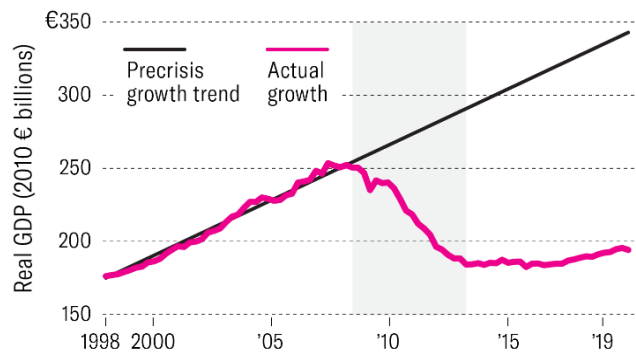
V-shaped (Canada)



U-shaped (United States)



L-shaped (Greece)



Source: Statistics Canada, NBER, BEA, Hellenic Statistical Authority, BCG Center for Macroeconomics Analysis

1.4 Scenarios of Health System response:

McKinsey & Company predicted three different scenarios for Corona virus spread and public health responses and its impacts of GDP growth of countries:










- a. Rapid and effective control of various spread,** Strong public health response succeeds in controlling spread in each country within 2-3 months
- b. Effective response, but (regional) virus resurgence,** Public health response initially succeeds but measures are not efficient to prevent viral resurgence so social distancing continues (regionally) for several months,
- c. Broad failure of public health interventions,** Public health response fails to control the spread of the virus for an extended period of time (e.g. until vaccines are available)

According to public health responses to the COVID -19 spread, the GDP growth of the countries will be Impacted and in optimistic condition it will be “V” shape and if other scenarios happen such as moderate condition it could be “U” shape and if it is going to be worsening then GDP growth will be either “W” or “L” shape in the worst cases, so that there would not be any chance to recover the economic conditions to be same as pre- crisis growth trend. Based on these figures the word GDP growth can decrease from 30 to 70 percent based on the severity of the pandemic

Current as of April 3, 2020

Scenarios for the economic impact of the COVID-19 crisis

GDP impact of COVID-19 spread, public health response, and economic policies

<p>Virus spread and public health response</p> <p>Effectiveness of the public health response in controlling the spread and human impact of COVID-19</p>	<p>Rapid and effective control of virus spread</p> <p>Strong public health response succeeds in controlling spread in each country within 2-3 months</p>	<p>B1</p> <p>Virus contained, but sector damage; lower long-term trend growth</p> 	<p>A3</p> <p>Virus contained, slow recovery</p> <p>Virus Contained</p> 	<p>A4</p> <p>Virus contained; strong growth rebound</p> 
	<p>Effective response, but (regional) virus resurgence</p> <p>Public health response initially succeeds but measures are not sufficient to prevent viral resurgence so social distancing continues (regionally) for several months</p>	<p>B2</p> <p>Virus resurgence; slow long-term growth</p> 	<p>A1</p> <p>Virus resurgence; slow long-term growth</p> <p>Muted World Recovery</p> 	<p>A2</p> <p>Virus resurgence; return to trend growth</p> <p>Strong World Rebound</p> 
	<p>Broad failure of public health interventions</p> <p>Public health response fails to control the spread of the virus for an extended period of time (e.g., until vaccines are available)</p>	<p>B3</p> <p>Pandemic escalation; prolonged downturn without economic recovery</p> 	<p>B4</p> <p>Pandemic escalation; slow progression towards economic recovery</p> 	<p>B5</p> <p>Pandemic escalation; delayed but full economic recovery</p> 

Ineffective interventions

Self-reinforcing recession dynamics kick-in; widespread bankruptcies and credit defaults; potential banking crisis

Partially effective interventions

Policy responses partially offset economic damage; banking crisis is avoided; recovery levels muted

Highly effective interventions

Strong policy responses prevent structural damage; recovery to pre-crisis fundamentals and momentum

Knock-on effects and economic policy response

Speed and strength of recovery depends on whether policy moves can mitigate self-reinforcing recessionary dynamics (e.g., corporate defaults, credit crunch)

Source: "Safeguarding our lives and our livelihoods: The imperative of our time," available online at <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/safeguarding-our-lives-and-our-livelihoods-the-imperative-of-our-time>; date of access: Mar 31* 2020

McKinsey & Company 20

1.5 *Crisis Management & General Perspectives*

Crisis management is a situation-based management system that includes clear roles and responsibilities and process related organizational requirements company-wide. The response shall include action in the following areas:

- Crisis prevention,
- Crisis assessment,
- Crisis handling and crisis termination.

The aim of crisis management is to be well prepared for crisis, ensure a rapid and adequate response to the crisis, maintaining clear lines of reporting and communication in the event of crisis and agreeing rules for crisis termination.

The techniques of crisis management include a number of consequent steps from the understanding of the influence of the crisis on the corporation to preventing, alleviating, and overcoming the different types of crisis. Crisis management consists of different aspects including:

- Methods used to respond to both the reality and perception of crisis.
- Establishing metrics to define what scenarios constitute a crisis and should consequently trigger the necessary response mechanisms.
- Communication that occurs within the response phase of emergency-management scenarios.

Crisis-management methods of a business or an organization are called a crisis-management plan.

A **crises mindset** requires the ability to think of the worst-case scenario while simultaneously suggesting numerous solutions.

1.6 *Crisis Management Strategy*

Crisis management strategy (CMS) is corporate development strategy designed primarily to prevent crisis for follow-up company advancement. Thus, CMS is synthesis of strategic management. It includes projection of the future based on ongoing monitoring of business internal and external environment, as well as selection and implementation of crisis prevention strategy and operating management. This is including current status control based on ongoing monitoring of the internal and external environment, as well as crisis-coping strategy selection and implementation.

1.7 *Crisis Management Model*

Successfully managing a crisis requires an understanding of how to handle a crisis – beginning with before they occur.

There are 3 phases in any Crisis Management as shown below:

1. The diagnosis of the impending trouble or the danger signals.
2. Choosing appropriate Turnaround Strategy.
3. Implementation of the change process and its monitoring

1.8 Crisis as Opportunity

There is an idea that every crisis is an opportunity to showcase an institution's character, its commitment to its brand promise and its institutional values. To address such shareholder impact, management must move from a mindset that manages crisis to one that generates crisis leadership. Research shows that organizational contributory factors affect the tendency of executives to adopt an effective "crisis as opportunity" mindset. Since pressure is both a precipitator and consequence of crisis, leaders who perform well under pressure can effectively guide the organization through such crisis.

In fact most executives focus on communications and public relations as a reactive strategy. While the company's reputation with shareholders, financial well-being, and survival are all at stake, potential damage to reputation can result from the actual management of the crisis issue. Additionally, companies may stagnate as their risk management group identifies whether a crisis is sufficiently "statistically significant". Crisis leadership, on the other hand, immediately addresses both the damage and implications for the company's present and future conditions, as well as opportunities for improvement.

1.9 Oman Stock Market

The MSM 30 Index is a major stock market index which tracks the performance of 30 most profitable companies traded in the Muscat Securities Market. It is a capitalization-weighted index. The MSM 30 Index has a base value of OMR1000 as of June 1, 1990.

The MSM TOP 30 decreased 459 points or 11.49% since the beginning of 2020, according to trading on a contract for difference (CFD) that tracks this benchmark index from Oman.



Oman Stock Market Value in the last 10 years

Under the condition of COVID-19 outbreak and as per McKinsey prediction GDP growth of all countries will be impacted and in terms of recovery it will be following "V", "U" or "L" shape scenarios, this COVID-19 pandemic and some other political issues between Russia and Saudi Arabia caused the oil price fall down , which will be a huge impact for those countries who are depending

on oil export revenue, so that if we consider “U” shape scenario recovery for Oman GDP growth after the outbreak crisis, as a moderate prediction then the government should revise its plan for providing budget and make new decision for future plans,

Although Omani government has made a good strategy to diversify its revenue resources since years back, however expedition of the plan can help to the country to overcome with the conditions in case of the crisis prolonged.

To overcome with the COVID-19 and Oil price crisis, the government should consider that the Oman Market will be easier than before the crisis conditions for those investors who are interested to invest in Oman Market.

1.10 Oman Crude Oil Production

Crude Oil Production in Oman decreased to 970 BBL/D/1K in December from 972 BBL/D/1K in November of 2019.



SOURCE: TRADINGECONOMICS.COM | U.S. ENERGY INFORMATION ADMINISTRATION

Oman Crude Oil Production in the last 10 years

Under the condition of COVID-19 outbreak and as per McKinsey predictions on GDP growth recovery, many of the oil consumers are battling with COVID-19 outbreak, hence many of their cities and industries have been under lockdown conditions, many flight have been canceled all over the world and oil price has fallen down dramatically, in this regard Oman crude oil customers may ask for lesser price, which will cause lesser revenue for the country,

Sticking with long term mutual agreements between Oil producers and customers might be helpful in this condition,

Ministry of Oil and Gas should prepare a masterplan for decreasing cost of Oil production through using new method and technologies for producing Oil,

Renewable energy projects will not move fast as per the previous plan, Investors will not be interested to invest on this sector because of the oil price is very low and fossil fuels energies will be

more preferable to customers, in this regard the government should follow with a supportive plan to recover developing renewable energy such as solar and wind power plant projects,

1.11 *Oman Exports*

Oman’s economy is highly dependent on exports of oil (62 percent of total exports) and liquefied natural gas (8 percent). Other exports include chemicals, plastics and rubber products. Main export partners are: China (30 percent of total exports), South Korea (11 percent), United Arab Emirates (10.7 percent) and Japan (10.5 percent). Others include: India, United States and Thailand and etc.

Exports in Oman increased to 1284.90 OMR Million in December from 1198.90 OMR Million in November of 2019.



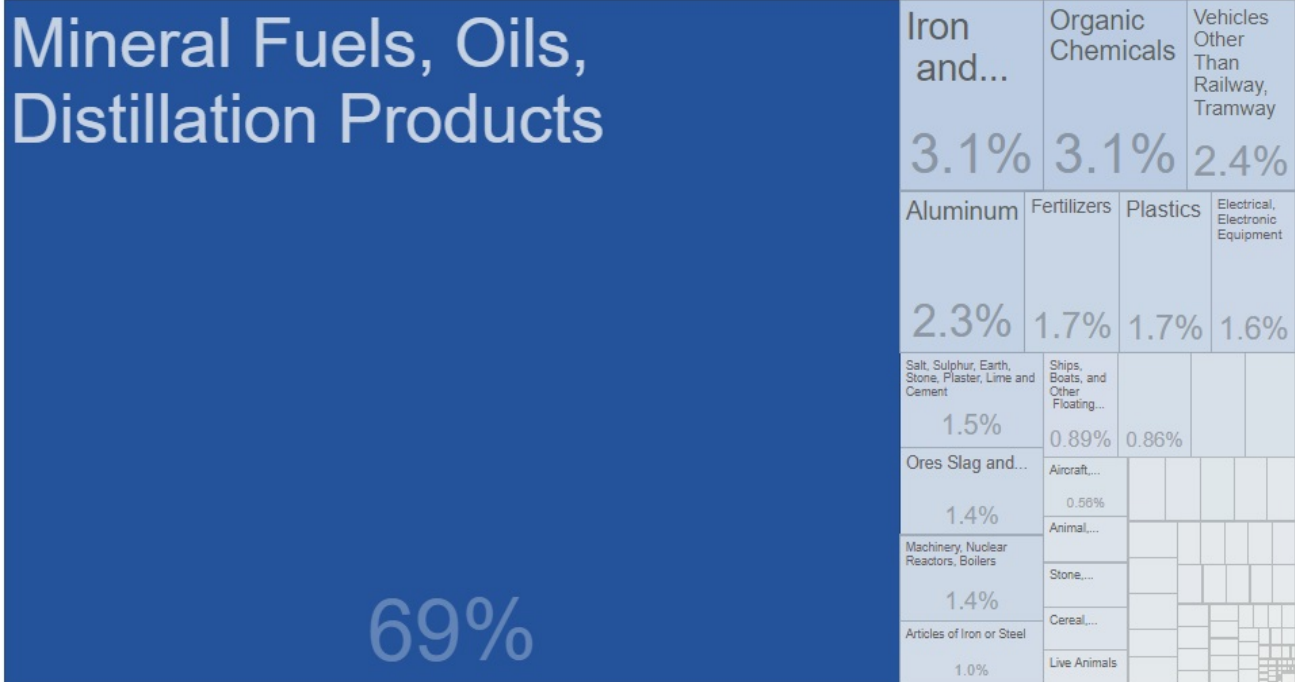
Oman Exports Value (OMR Million) in the last 10 years

Under the condition of COVID-19 outbreak, countries will be under lockdown conditions and customers will be trying to minimize their consumption, whilst many airlines have already canceled and suspended their flights, so that the country may not be able to meet its goals on exporting goods and productions, which will be causing reduction in revenue,

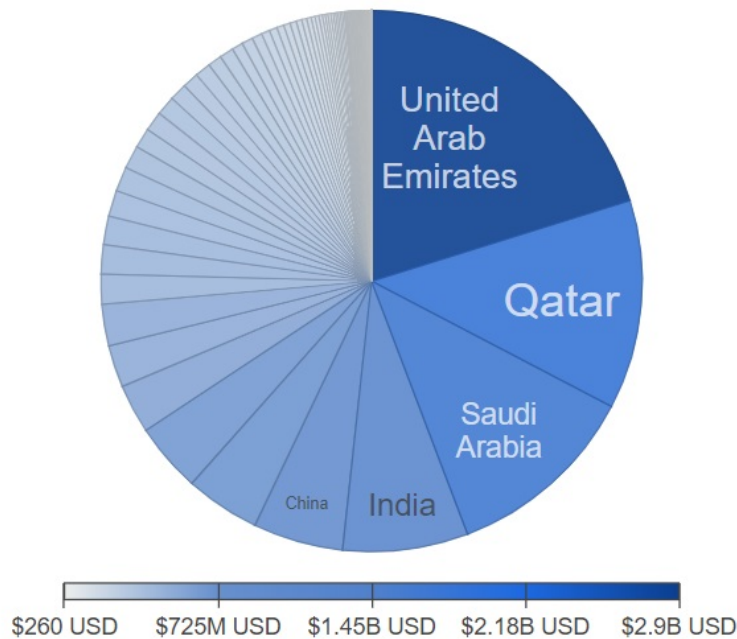
Hence companies should keep searching for new customers worldwide and they need to improve quality of their production and services to compete with those who are in the market,

Furthermore, the country should prepare a plan to go with some strategical productions such as food, fishery and etc.

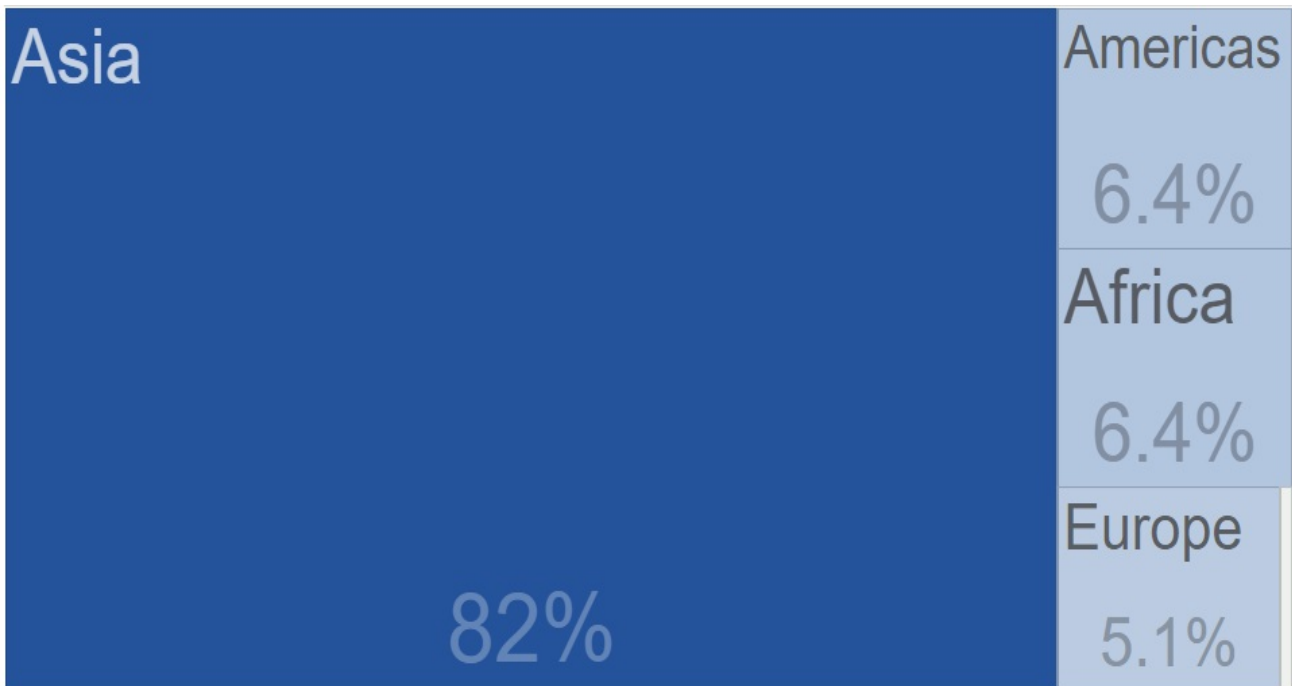
Developing agricultural, poultry and handcrafts industries can be considered as one of the ways of extending exports and increasing revenue of the country, Exporting and swapping energy can be considered as another way of increasing Oman revenue, Expedition of expansion and development of economical free zones, can facilitate exports and imports of the country, so it will be recommended to recover revenue of the country.



Oman Exports by Category



Oman Exports by Country



Oman Exports by Continent

1.12 *Oman Imports*

Oman main imports are: transport equipment (24 percent of total imports); electrical machinery and mechanical appliances and parts (18 percent); mineral products (14 percent) and base metals and articles thereof (13 percent). Main import partners are: United Arab Emirates (27 percent of total imports), Japan (13 percent) and the United States (6 percent). Others include: Saudi Arabia, India, China and Germany.

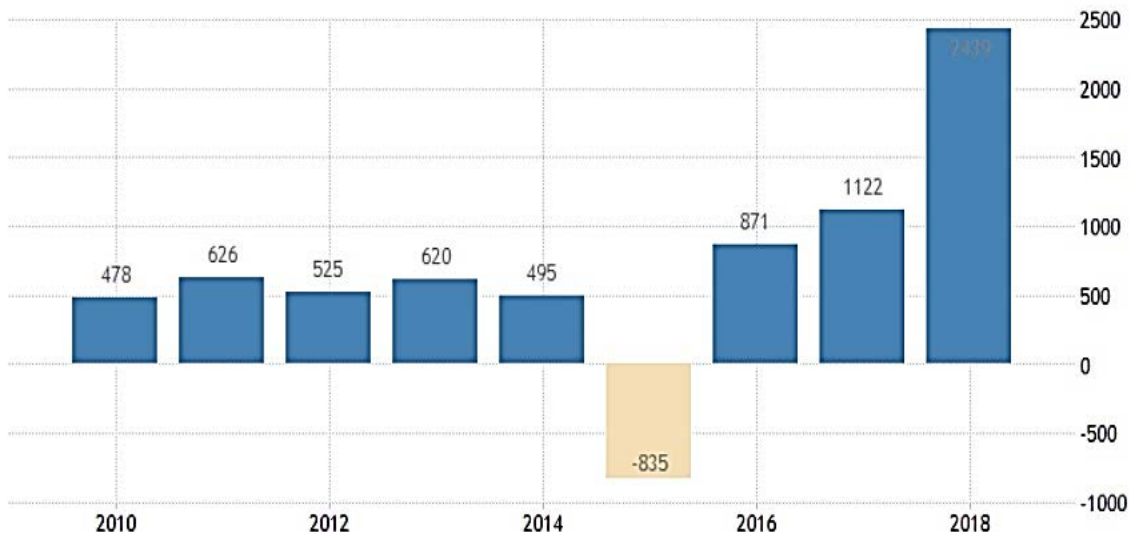
Imports in Oman increased to 819.70 OMR Million in December from 656.40 OMR Million in November of 2019.

Almost all import partners of Oman have been battling with the COVID-19 outbreak since the beginning of the outbreak, so that it might be as threat for the country while Oman is importing some strategical goods and materials from outside, whereas the country has huge amount of capacity to produce them as homemade productions,

In this circumstance it is recommended that new consideration will be required to revise imports and exports plan by respected authorities.

1.13 Oman Foreign Direct Investment

Foreign Direct Investment in Oman increased by 2439 OMR Million in 2018.



SOURCE: TRADINGECONOMICS.COM | CENTRAL BANK OF OMAN

Oman Foreign Direct Investment

Foreign investment is very vital for each and every country, but in current condition with COVID-19 outbreak, most of the investors will be more conservative, they must do more study on the condition and they must wait for the result of health system responses to the COVID-19 outbreak,

Many of companies have lost their values because of the new situation so that investors might be interested to buy some share of the companies as an investment,

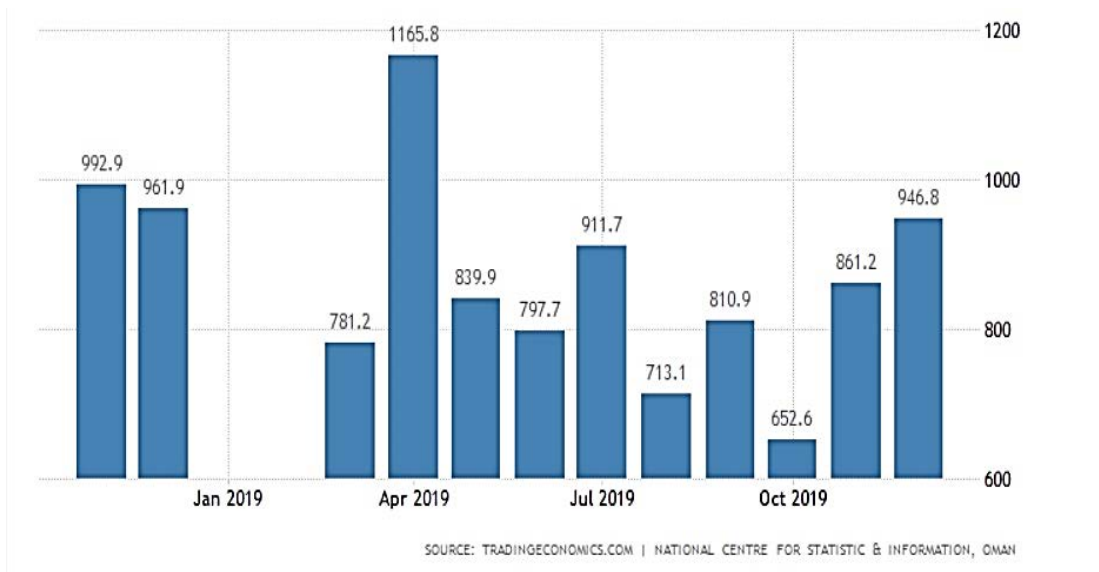
Some investors might have been interested to come to Oman before COVID-19 outbreak, however after this condition they might be no longer interested to come, lower oil price caused that many projects have lost their value, so that those project would not be preferable to investors, in this case the respected authorities of Oman shall start negotiation to convince investors to come and stay in the market,

Needless to be mentioned that the investor interest should be guaranteed by the government and the respected authorities,

Foreign investments will bring progress and prosperity for the country and will improve the rate of employments in the country, it will create new job opportunities so that will help the country to grow faster.

1.14 Oman Government Revenues

Government Revenues in Oman increased to 946.80 OMR Million in December from 861.20 OMR Million in November of 2019.



Oman Government Revenues Value in the last year

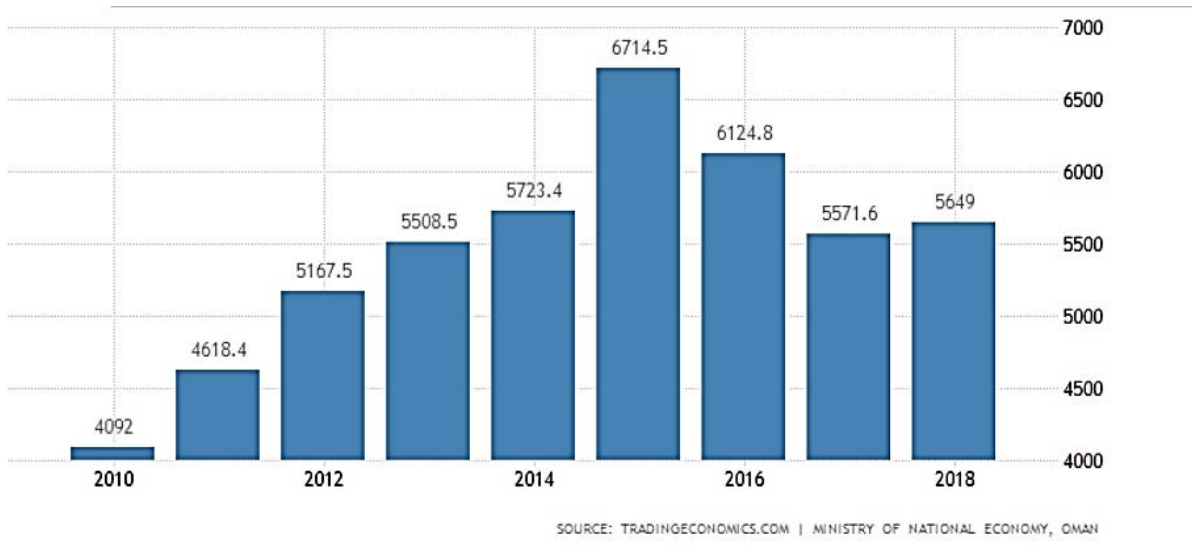
As per the above graph shows that Oman experienced increment in its revenue on December 2019, compare to November 2019, however this increment was before COVID-19 pandemic and before oil price crisis also,

Under the new conditions of COVID-19 pandemic, and since oil price has plunged and most of the budget in Oman will be provided through oil, there would be some decrement in the government revenue,

Since the oil crisis is predicted to prolongs, diversification on resources of the government revenue, such as agricultural, fishery industries and mineral and raw materials exports could be an effective policy/actions which may come into consideration to recover some decrements in the government revenue.

1.15 *Oman Government Spending*

Government Spending in Oman increased to 5649 OMR Million in 2018 from 5571.60 OMR Million in 2017.



Oman Government Spending Value in the last 10 years

As per new COVID-19 conditions, it is time for saving money and cutting unnecessary costs, since revenue of the government will be decreased, making prioritization on projects and plans which are going on at the moment is so crucial, although some future development plans should be slow down for now and those plans could be done by future,

Companies might not be able to receive their invoices on time, although they should pay salary to their employees, also they should try to save money and find some ways to cut costs, this condition would be hard for all, governmental supports will be required to save companies and authorities and their assets and staffs.

1.16 Exchange and Money Market

The Money and Foreign Exchange Markets Are Key Components of the Financial System, Money markets are the financial markets where short-term financial assets are bought and sold. By definition, the financial assets, such as stocks and bonds that are traded in these markets will mature in one year or less. Over a billion dollars in transactions take place in these markets on a daily basis. Financial institutions, corporations, governments, are active in the money markets as they adjust their short-term portfolios.

Foreign exchange markets facilitate the trade of one foreign currency for another. Most exchanges are made in bank deposits and involve U.S. dollars.

COVID-19 outbreak and oil crisis are impacting exchange and money market adversely, some currencies might lose their value because of the Health system responses to the COVID -19 conditions, some countries have been taking strict measures so they could control the conditions but some countries are experiencing difficult conditions because of the weakness points of health system to deal with the current crisis,

People may lose their trust on exchanging and banking system of the countries, because of the failure of those countries in controlling the conditions,

Thanks to Oman government which has been taking serious and effective actions since the beginning of the Pandemic, so that controlling the condition is predictable in the country, however Oil price crisis is a challenging item which need to be taken into consideration from different perspectives,

As per different scenarios which is going to be happened most likely in Oman because of the oil price crisis, different advises should be provided to be taken into consideration by the government and by companies in Oman,

In this regard investment on some particular shares in stock market might be profitable to the country,

Medicine, pharmaceutical and hygienic industries will be more proactive after the COVID-19 outbreak condition, so that more investment will goes to these industries and their share in the stock market, hence it can be considered as one of opportunities to increase revenue of the countries and companies and to diversify revenue resources of those countries who are more relying on crude Oil export revenue.

Demand on medical Insurances and another type of insurances will be increased after COVID-19 outbreak conditions, so that it is going to be one of the area of investment for countries , hence expanding activities and more investment on this sector will create many opportunities for the government and will provide many opportunities for Oman labors market as well,

2 Energy Section

Energy sector in sultanate of Oman is the most important sector in this country. The revenue of the country as well as all of development plan completely depends on this sector. Any delay in construction or bad operation in existing facilities in this sector can cause major effects on the economy of the country and people satisfaction.

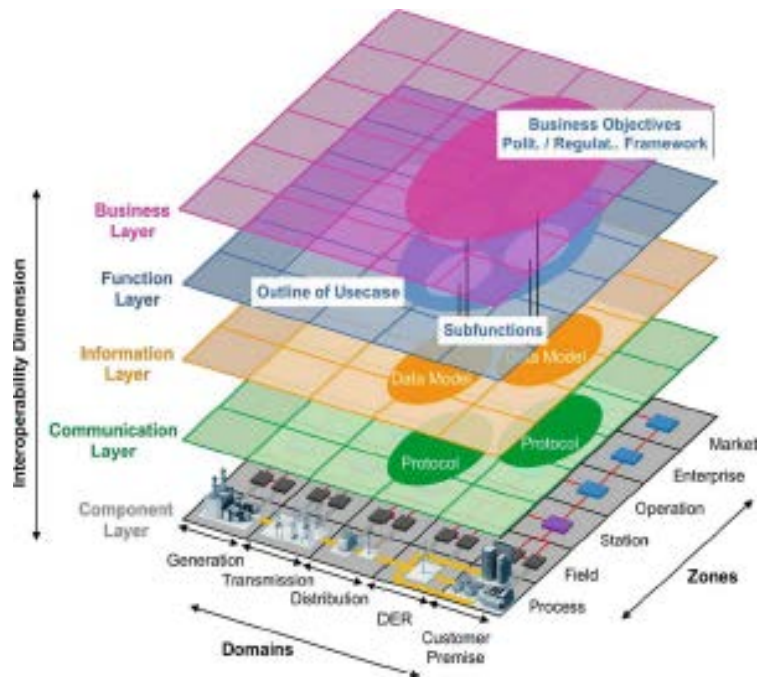
Unfortunately, this sector not only in Oman but also all around the world is a very expensive industry that surprisingly is far from latest digitalization and ICT technologies. Means that oil, gas and power industry are those sectors that ranked last in using digitalization technologies!!

As the consequence the physical interaction in this sector is very high and also the operation and maintenance cost are very high as well

The following figure shows various layers, zones and domains in power system network. While there were many efforts in costumer side to benefit AI advantages, in O&M sections, no matter where we are: generation, Transmission or distribution there is a long way to pass and it is what Covid19 completely showed us

Operation and maintenance in the power system still is based on preventive maintenance which needs to change to the predictive maintenance and this needs change in the specification of the

equipment’s to enable data centers to receive data remotely and by deploying diagnostic software, predict the future and if needed do the correction action.



2.1 Gas Sector

There is no doubt that the world has entered a global economic recession as a result of the COVID-19 pandemic. Every recession lowers energy use, and this one may be a whopper. The 2008 financial crisis, and the great recession that followed, had a pronounced negative impact on the oil and gas sector, sending the price of a barrel of crude oil from about \$150 to \$35 in only a few months.

Saudis had initiated another oil war with Russia and the United States a few weeks ago as the coronavirus pandemic was emerging.

According to IHS Markit, United States oil production will bear the largest impacts in 2020-2021, and could fall by several million barrels per day over the next year. They point to a possible build-up of the most extreme global oil supply surplus ever recorded, ranging from 800 million to 1.3 billion barrels in the first six months of 2020.

Last year, the United States used about 142.23 billion gallons (3.39 billion barrels) of gasoline and about 35 billion gallons of diesel. Airlines consumed about 18 billion gallons of jet fuel.

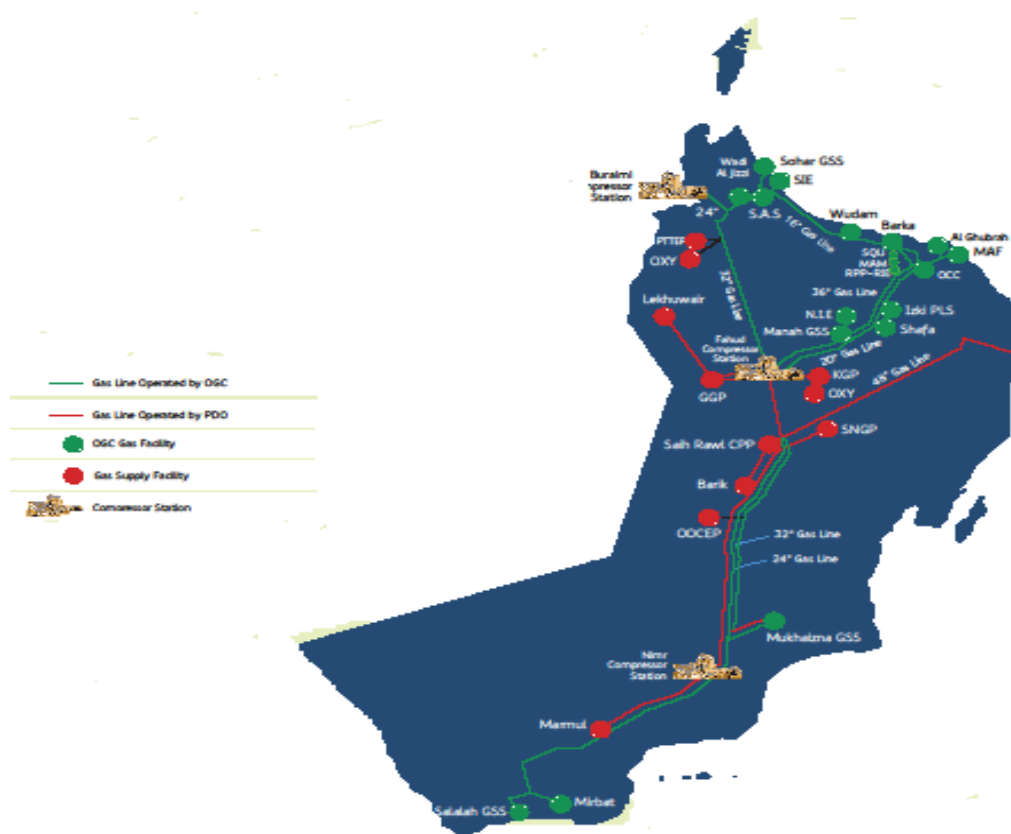
The airline industry is devastated so we can assume most of that consumption will stop during this crisis. Assuming long-haulers won’t stop shipments too much because they are essential, diesel may not drop too much. But gasoline will drop dramatically as we all hunker down, work from home, stop recreational travel, and shutter all restaurants and sporting events. By considering the infected virus, the operation and maintenance of plant will be affected because of the government bands. Also, the construction of new projects will be delayed accordingly due to crisis condition.

Natural gas is a very important source of energy. Natural gas is a by-product of oil drilling and coal mining, but it can also be harvested independently from natural gas fields.

The natural hydrocarbon gas supply chain is a set of stages through which natural gas passes, from being found in the field until it reaches the final consumer. The gas supply chain consists of different production and processing stages depending on the developed gas business intent, nature of the produced gas fields and whether the natural gas is transported in gaseous or liquid form.

2.1.1 Oman Gas Co. (OGC) as a Midstream Company

Oman Gas Company (OGC) is a mid-stream company established in the year 2000. OGC as a midstream firm is engaged in the natural gas transportation and distribution activities through the developed gas transportation facilities (GTF) and gas supply stations supplying specification gas to the consumers. In addition, the GTF includes Gas Boosting Stations, Gas Limiting Stations, Fiscal Metering Stations and Block Valve Stations. The OGC network in across Oman was shown below:

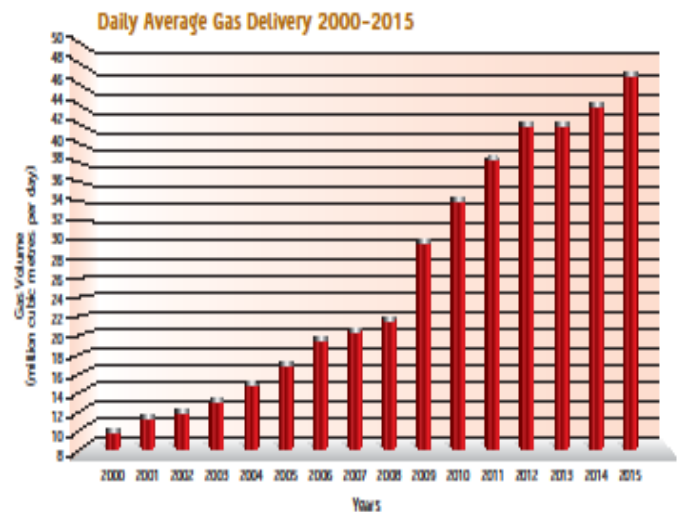
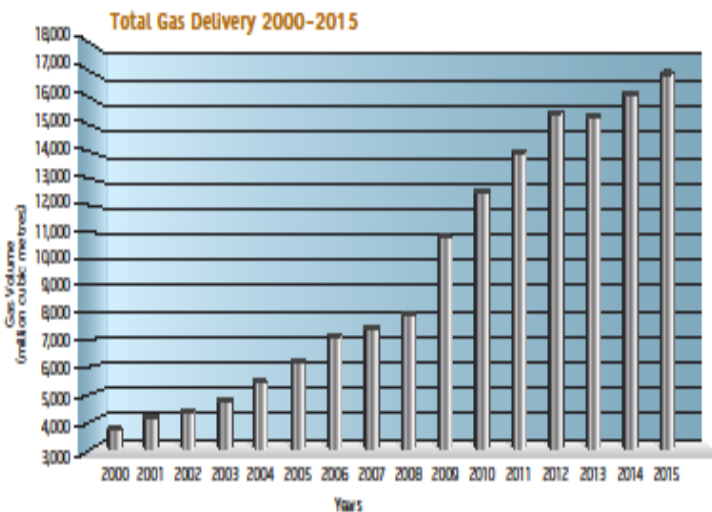


2.1.2 Demand for Natural Gas

OGC is an active participant in the nation’s growth story and has made it an integral part of its journey - be it through the first gas export made by OGC to UAE (the first ever between two GCC countries), construction of the Sohar Pressure Reduction Terminal with 5 streams which nearly doubled the gas delivery capabilities of OGC. OGC has delivered 17.24 billion standard cubic meters of natural gas to 38 customers with an increase of 6.5% compared to the last year a daily average supply of 44.33

million standard cubic meters in 2018. OGC has successfully executed various projects such as Manah Gas Supply Station de-bottlenecking phase 1, Engineering, Procurement and Construction of Sohar Gas Supply Station 32” Inlet Header Bypass Stream, Salalah 32” pipeline logistics and Interconnection from Fahud Compressor Station to PDO 28” Interlink line phase.

OGC constructed A’Duqm gas pipeline project, Salalah LPG extraction project and management of Orpic’s NGL extraction project at Fahud are all strategic in nature and are aimed at maximizing the value chain of the natural gas industry. Working in accordance with the new restructuring, OGC has taken a strategic approach to develop the Salalah Liquefied Petroleum Gas (SLPG) facility, constructed at Salalah Free Zone (SFZ). The actual gas delivered to the customers was shown in follow graphs:



2.1.3 Natural Gas requirements

2.1.3.1 Salalah LPG Extraction

It is located in Salalah, the project includes delivering 800-ton LPG per day and condensate extraction facility inclusive reroute of existing gas pipelines, new product export pipelines, and storage.

The plant will enhance the revenue for Oman Gas Company and play a crucial role in the growth journey of OGC as well as of the country as a whole. The plant will provide better value for LPG extraction from natural gas, which can be exported.

The project will give better value for LPG through export rather than utilizing it in the local market, as compared to natural gas. It provides a downstream business opportunity and support local employment.

2.1.3.2 Orpic NGL Extraction - Gas Pipeline

Liwa Plastics Industries Complex is a transformational project that will improve Orpic’s product mix and business model, maximize its profit and support the development of a downstream plastics

industry in Oman. More importantly, the project generates In-country value throughout providing local employment opportunities and supporting the local small and medium enterprises

2.1.3.3 Gas Supply to Northern Power Plants

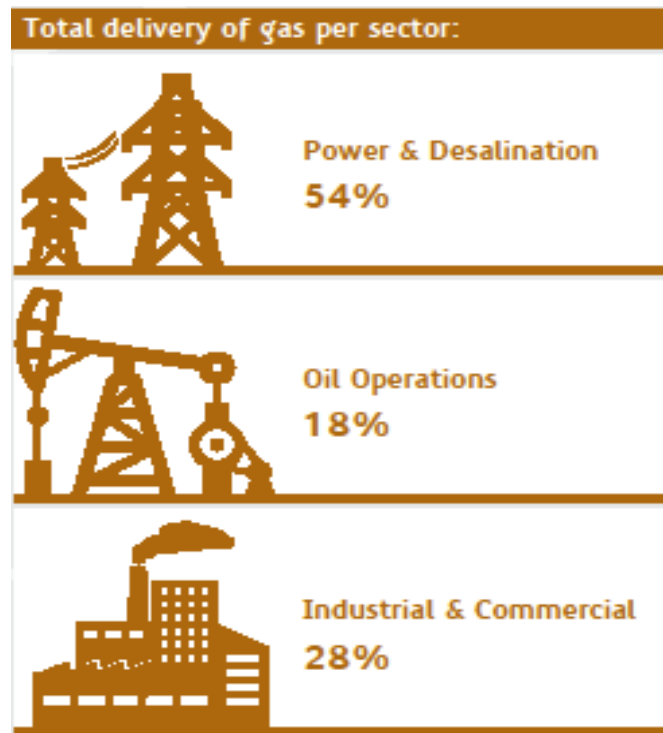
OGC takes up enhancement of existing Northern Gas Grid to supply Natural Gas to more customers. For that, the following parts of this project are being carried out:

- Installation of new 300 km 32" loop line (parallel) to the existing 32" Fahud–Sohar pipeline to satisfy the total demand of 53.4 million cubic meter per day (mmscmd).
- Modification and extension of Sohar Gas Supply Station
- Construction of New Ibri Independent Power Project (IPP) Gas Supply Station

The project is of vital importance for sustaining the new & potential industries; which will be developed in the northern part of the Sultanate; especially in Sohar Industrial Area, with the requirements of natural gas. The project will also help to maximize In-country value and improve the National Economy.

2.1.3.4 A'Duqm Gas Pipeline

The project at A'Duqm is divided into four parts. The first part is pipe supply, which includes the supply of 36" 230km pipeline as part of A'Duqm Gas supply project. The second part is the Engineering, Procurement and Construction of Pipeline consisting the construction of a 36" 230km pipeline and its ancillaries from Saih Nihyada to A'Duqm Industrial area along with Launcher, Receiver Stations and seven (7) Block Valve Stations. The third part calls for the construction of a new Gas Supply Station and its ancillaries in A'Duqm industrial area. This includes regional office, workshop, and storage yard as well as a control room. Finally, the fourth part deals with additional spur line connection facilities between the new A'Duqm Gas Supply Station and new A'Duqm Refinery. The first lot of the pipes have reached Oman, the coating of which will be done locally. The total delivery of natural gas to the different sectors was shown in follow:



2.1.4 Impact of COVID-19 on Natural Gas

Volatility has always been a challenging element of the oil and gas market but has rarely been more extreme than it is today. COVID 19-led disruptions to demand, combined with its dramatic impact on financial markets, have led to rapid price swings. The rapidly evolving COVID-19 crisis presents profound challenges for the global natural gas industry, as it does for the energy system as a whole and the economy at large. Before COVID-19, the gas industry was in the midst of four cycles or transformations, whose trajectory the crisis will alter.

First, there was a market cycle characterized by short-term oversupply, low prices, and record-level investment in future supply, which threatened to extend the current overhang into the mid-2020s. That imbalance will get starker in the short term as demand collapses and producers are forced to curtail output, but less bleak in the long term as projects underway get delayed and investment in new projects slows as companies cut spending.

Second, there was a deep structural transformation, whereby the industry edged away from rigid, long-term contracts and prices indexed to oil toward a system where prices reflect real-time fundamentals and where liquefied natural gas (LNG), in particular, responds to short-term market signals. Every crisis brings a reassessment of the structures that the gas industry puts in place to ensure stability long term contracts with minimum purchase obligations, complex pricing structures to smoothen volatility, restrictions on how much buyers and sellers can deviate from the plan, and so on. The stark supply-demand imbalance, coupled with a roller coaster in the oil market, will accelerate the usual dynamics that lead to structural change.

Third, gas was struggling to find its bearing in the energy transition, squeezed, on one side, by advocates who wished it went away quickly, and supported, on the other, by those who saw it playing

a constructive role in the transition to a low-carbon energy future. Here, the mechanics are less clear. One could see governments falling back on the fuels they know to kick start economic growth often that might mean coal. One could also see investment in renewables cut back, which could help gas. Governments might shower the industry with incentives, again to stimulate economic activity. And gas might prove more resilient than other fuels and thus boost its reputation among skeptical policymakers. It is too soon to tell how these contrasting paths play out.

And fourth, there was a geopolitical transformation that was affecting the trajectory of the other three, shaped by the rise of four large players—the United States, Russia, Qatar, and China—whose strategy preferences were due to play a disproportionate impact on the global gas market. For the suppliers (United States, Russia, and Qatar), the stark questions are, who blinks first, and what political and geopolitical tools might each leverage in this battle. For China, the big questions are, how to exploit the current downturn to renegotiate the terms of its contracted gas supplies and whether it sees an opportunity for a “gas reset.”

In other words, COVID-19 will impact a gas market that was experiencing severe pressure and was undergoing multiple deep transformations at the same time. Here are five specific ways in which COVID-19 might affect gas markets.

2.1.4.1 Gas Demand in Uncharted Territory

Gas demand will be affected in some obvious ways. Many economies will experience an economic slowdown or contraction that will hit all energy sources. We can also expect some fuel switching: gas prices have fallen but so have prices for other commodities, including carbon. While consumers are unlikely to be stimulated by low energy prices, some energy must be generated anyway, and where gas is competitive placed, we could see an uptick in demand. In 2009, the last major global recession, gas demand fell faster than energy demand overall 2 percent for gas versus 1.4 percent for energy. But 2020 will look very different than 2009. The main reason is social distancing, which adds an unknown parameter to how we think about gas demand. People consume gas and electricity at home, even though they may no longer fly or drive a car (which hits oil demand). Shutting offices, bars, stores, and restaurants might hurt gas use, in industry, some companies might shut down or reduce output, while others will work overtime to supply essential goods. In power generation, there will likely be a decline in demand, but whether gas or other energy sources are hit will vary by location.

In short, gas demand will be a function of three forces whose direction and magnitude will vary by market and sector: how much is activity falling due to GDP, how much is gas privileged or disadvantaged relative to other fuels, and how will people adapt their behavior to protect their health.

2.1.4.2 Someone Has to Cut Production

In the short term, gas prices are facing headwinds. Gas prices were already depressed, even before COVID-19 came to dim the macroeconomic environment. For much of 2019, gas analysts were

engaged in an elaborate guessing game about which supplier would cut output (no one did). The pressure on suppliers will intensify in 2020, especially as lower oil prices weaken the economics of associated gas. For many producers, prices are trending near or below marginal costs, and the logic of continuing to produce in order to lose money will eventually give way to a more rational economic behavior. Qatar has always been operationally flexible, adjusting maintenance schedules or keeping a few ships as floating storage. But yearly output has always been near its nameplate capacity, and Qatar has recently booked long-term capacity in various European terminals, evidence that it wants to be able to place cargos no matter what. Qatar faces an insurmountable contradiction in its long-term export strategy between wanting to massively increase output while defending prices. But there is nothing to suggest that Qatar will curtail production in the near term.

In short, gas faces a tough 2020 with declining demand and prices and no supplier with a clear impetus to reduce production. We can expect things to get worse for suppliers until someone blinks.

2.1.4.3 A Challenge to Operations and Construction

COVID-19 adds an operational challenge to short-term supply as well. In Australia, several companies have confronted cases where employees were feared to have contracted the virus. Some operators, including in Russia and Alaska, are adjusting shifts to minimize travel, extending the stay of employees in remote locations. Others have recalled staff from China or Iraq. And the number of incidents keeps rising. So far, these adjustments seem minor, and most companies have robust systems to ensure operations. But if infections spread, it is possible that entire facilities might have to be shut down or, at least, operate at half-speed. It is hard to assign a probability or a magnitude to this risk, but it exists, and it is real. These adjustments will impact project timetables is hard to know there is still an incentive to build projects as quickly as possible to start earning a return on investment. But safety concerns might slow things down, and projects might come online later than expected.

2.1.4.4 A Slower Investment Wave

COVID-19 means for the project pipeline is harder to gauge at this point. At a basic level, all companies are reevaluating their spending plans for 2020 and beyond. There is far less money to go around and far less ability to borrow. Moreover, the reduction in international travel and conferences means the usual churn that makes deals possible has been severed. That combination alone should mean fewer projects will get the green light in 2020.

Beyond the obvious, we can discern at least three dynamics at play. First, there has been an assumption among analysts that the market now favors companies with strong balance sheets, especially if those companies are willing to build big facilities without the long-term sales contracts that have customarily preceded these investment decisions. The smoke has yet to clear on this crisis, but equity markets are hitting big and small firms alike.

Second, governments will step in and offer concessions to companies to develop resources. In a depressed economic environment, where investment dollars make a big difference, we can expect the negotiating pendulum to swing from sovereigns to corporates.

Third, the stimulus might reach demand as well. In advanced economies, the stimulus might actually point away from gas as governments look for an opportunity to leverage the economic recovery to advance their low-carbon ambitions. We can expect power plants, pipelines, and port facilities to get an extra push. Combined with record-low prices, we might see the seeds of future gas demand being sown in 2020.

2.1.4.5 Growing Pressure for Structural Change

The gas industry is an industry of structure: long-term relationships are codified in long-term contracts that spell out, often in minute detail, what is and what is not possible. When a crisis hits, however, those structured get adjusted: price terms are renegotiated, volume limits are relaxed, rigid destination restrictions might be eased, and so on. In short, the systems that the gas industry puts in place to deal with crisis insulate it from small shocks but not big ones when a big shock happens, buyers and sellers need to affix a new equilibrium.

In today's environment, there are two pressure points. The first is China. China has become the indispensable buyer in global LNG markets, and its strategic choices reverberate across the world. Faced with an economic shock.

The other central node is Qatar. In December 2018, when Qatar said it would leave the Organization of Petroleum Exporting Countries (OPEC), I noted that: "There is one possible long-term outcome from this rift between Saudi Arabia and Qatar that could impact gas markets and LNG: their rift could become a rift between oil and gas. If Qatar were to lose faith in oil prices, it could eventually want to free LNG from its tie to oil.

2.2 Oil Sector

Global oil demand is being destroyed as the Corona Virus forces people around the world to remain indoors and avoid all unnecessary travel. Currently, between a third and a half of the world's population are in lockdown, meaning few people are driving, flying or doing much that would require the use of crude or its derivatives. (Source: Bloomberg; Author: Christopher Sell)

The ramifications for the oil market are huge, with refiners, producers and even Petro states all facing uncertain futures. The most immediate set of data from America starkly illustrated the impact. The US Energy Information Administration reported US drivers consumed the least gasoline for at least 30 years, as normal life ground to a halt.

Demand for crude could fall by 27 million barrels a day in April, according to Rystad Energy AS, while Trafigura Group estimates the current hit to consumption is around 35 million barrels a day.

Against this backdrop, the Organization of Petroleum Exporting Countries-OPEC and its allies, meeting via video conference, agreed to cut production by 10 million barrels a day.

We tend to notice the connection between Corona Virus and oil only when the energy markets collapse. But as history reveals, since the 19th century, pandemics have depended on fossil fuels to go global. The novel coronavirus and rapid spread of the Covid-19 respiratory disease is no exception. In fact, this pandemic involves oil-fueled global connectivity that dates back to the 19th century.

Most people attend only to one side of the equation that connects coronavirus and oil, to the effect rather than the cause.

In this perspective, an epidemic closes factories and grounds airline and marine transportation, slows economic growth and reduces the demand for energy. These effects result in declining oil prices and could potentially ignite price wars that collapse the stock markets. While we obsess about what it may do to our bodies and communities, as far as oil is concerned, the virus is an economic abstraction. Even when we do notice the material aspects of this process, these are usually downstream: the clearing of air pollution over Wuhan or the reduction of greenhouse gas emission resulting from economic slowdown. We have grown so justifiably concerned with climate change and so unforgivably accustomed to fossil energy that we notice it only in its absence.

Reducing both oil and the disease to little more than economic forces obfuscates another side of the equation, in which the virus is a thing in the world. Yet seen this way, tracing the coronavirus as a diagnostic marker that travels the arteries of capitalist globalization can expose the ills of the system. What transformed a local contagion in a wet market in Wuhan into a pandemic within a matter of months is a network that begins with ground transportation within the infected regions and ends with the sea and air-lines all powered by fossil fuels.

The virus now demobilizes the very system that facilitated its spread. The dizzying speed of the process, and the fact that it is still ongoing, make it hard to appreciate this, and even harder to draw conclusions. This is also exactly where past pandemics can help us think about the present and future.

Petroleum Development Oman (PDO) is the major hydrocarbon exploration and production company in the Sultanate of Oman. PDO accounts for about 70% of the country's crude oil production and nearly all of its natural gas supply. Most gas fields and processing plants are operated by PDO exclusively on behalf of the Government. The objective of the Company is to engage safely, efficiently and responsibly in the exploration, production, development, storage and transportation of hydrocarbons in the Sultanate.

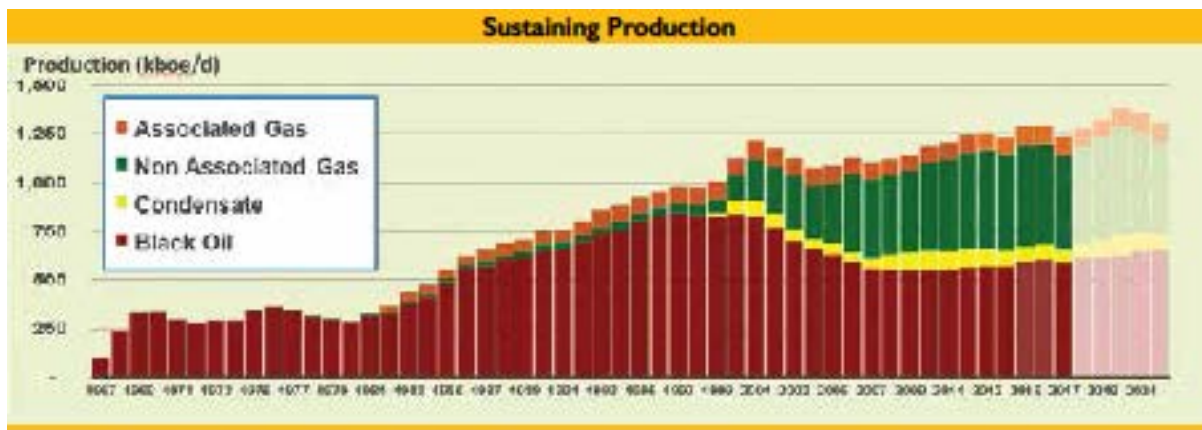
PDO is the central engine of Oman's economy and its activities and performance directly impact the fortunes and futures of a rich diversity of stakeholders, including local communities, Government, shareholders, customers, suppliers, regulatory bodies, municipal authorities, academia, non-governmental organizations, the media, and, of course, employees and contractors. The Company is owned by the Government of Oman (which has a 60% interest), the Shell Group (which has a 34%

interest), Total (which has a 4% interest) and Partex (which has a 2% interest). The first economic oil find was made in 1962, and the first oil consignment was exported in 1967. PDO operates 178 producing oil fields, 14 gas fields, 21 production stations, in excess of 10,000 active wells, more than 18,500 kilometers of pipelines and flowlines and 154 operating units in our well engineering fleet, including 46 rigs and 35 hoists.

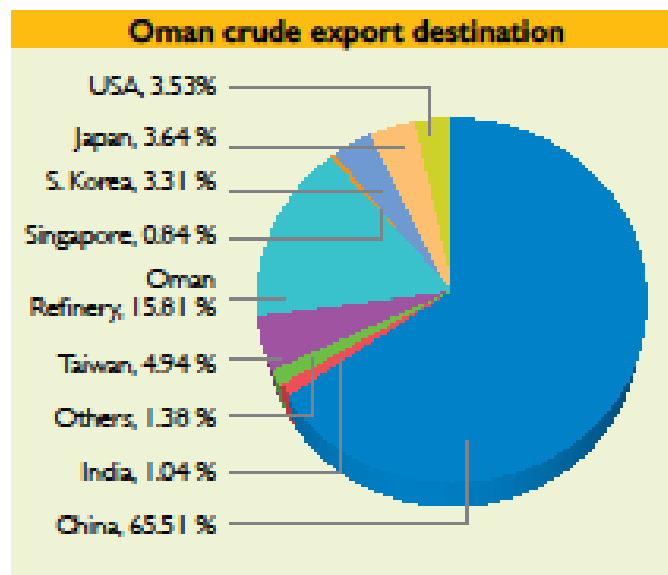
2.2.1 Oil Production

Hydrocarbon Production encompasses various activities aimed at optimizing production from existing oil and gas fields in such a way that short-term output is maximized without jeopardizing longer-term output.

With the Company fully focused on complying with government guidelines as a result of the OPEC/non- OPEC agreement, average oil production was 582,196 barrels per day (bpd), 14,000 bpd higher than the adjusted target and the Condensate production was 68,467 bpd in the last year according to follow graph.

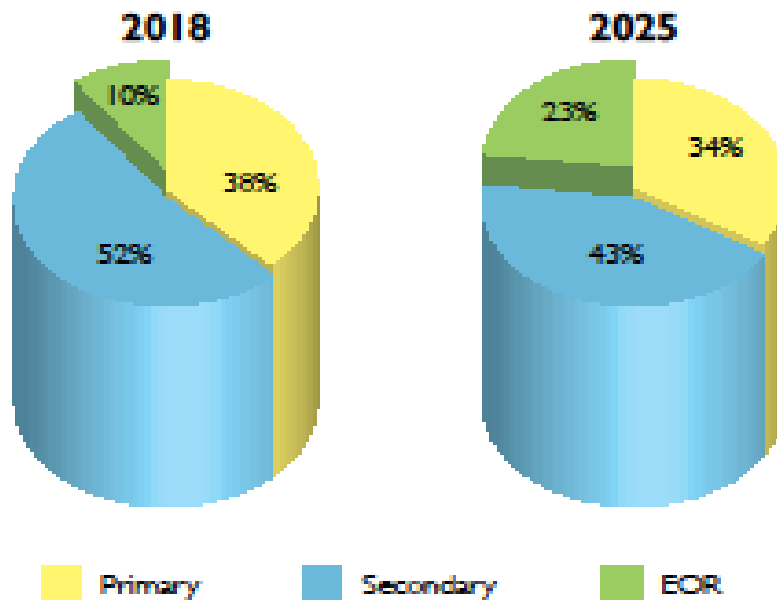


The destination of Oman Crude Oil was demonstrated in follow profile:



Despite of the challenging economic environment, PDO is continuing its journey in growing the future “Enhanced Oil Recovery” (EOR) contribution to oil production. It is anticipated that by 2025 more than 23% of PDO’s production will come from EOR projects. PDO is currently operating a range of commercial-scale EOR projects including chemical EOR, miscible gas injection (MGI) and thermal applications. Concurrently, PDO is continuing to identify novel EOR technologies that have the potential to unlock difficult hydrocarbon resources. This is being done through a series of dedicated laboratory and field-testing programs. The profile of EOR for seven years enhancement was shown in follow graph:

Enhanced Oil Recovery (EOR)



2.2.2 Renewable Energy

The renewable-energy business is expected to keep growing, though more slowly, in contrast to fossil fuel companies, which have been hammered by low oil and gas prices. A few years ago, the kind of double-digit drop in oil and gas prices the world is experiencing now because of the coronavirus pandemic might have increased the use of fossil fuels and hurt renewable energy sources like wind and solar farms.

That is not happening. In fact, renewable energy sources are set to account for nearly 21 percent of the electricity the United States uses for the first time this year, up from about 18 percent last year and 10 percent in 2010, according to one forecast published in March 2020. And while work on some solar and wind projects has been delayed by the outbreak, industry executives and analysts expect the renewable business to continue growing in 2020 and next year even as oil, gas and coal companies struggle financially or seek bankruptcy protection.

In many parts of the world, including California and Texas, wind turbines and solar panels now produce electricity more cheaply than natural gas and coal. That has made them attractive to electric utilities and investors alike. It also helps that while oil prices have been more than halved since the pandemic forced most state governments to order people to stay home, natural gas and coal prices have not dropped nearly as much.

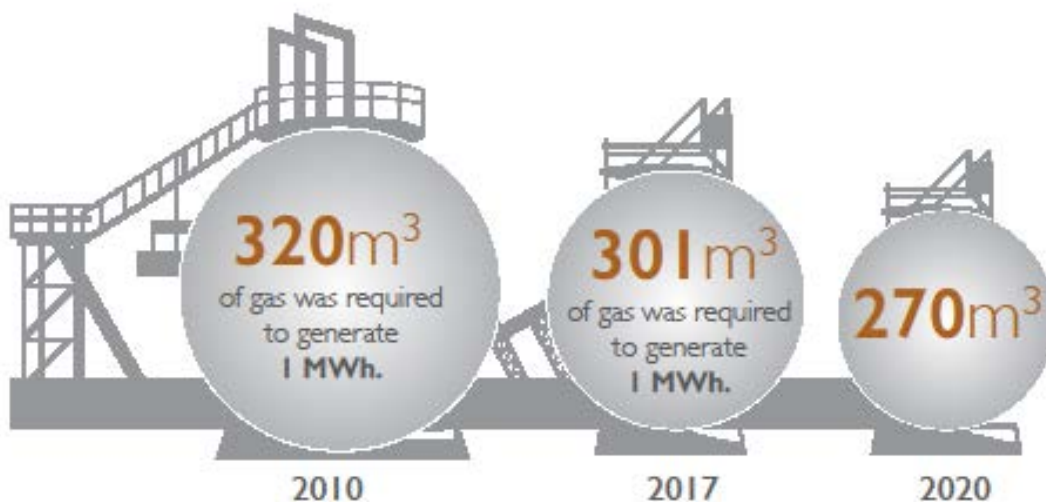
Even the decline in electricity use in recent weeks as businesses halted operations could help renewables, according to analysts at Raymond James & Associates. That’s because utilities, as revenue suffers, will try to get more electricity from wind and solar farms, which cost little to operate, and less from power plants fueled by fossil fuels.

Considering above mentioned facts we recommend to remain committed in seeking new and green technologies for energy generation to reduce the country dependence on fuel gas to generate electrical power for business needs.

The environmentally friendly move will save more than 3.1 million m³ gas a year, enough to provide electricity for almost 1,000 homes. It will also cut carbon dioxide emissions by 6,662 tons annually, the equivalent of taking more than 1,400 cars off the road or planting almost 173,000 trees.

2.2.3 Energy Efficiency

Efforts continued to enhance energy efficiency via cogeneration and waste heat recovery in Oman steam generation activities. The efficiency of the power generation has improved significantly. In 2010, 320 m³ of gas was required to generate 1 MWh. This has now fallen to 301 m³/MWh, with the aim to reduce it to 270 m³/MWh by 2020, once all the planned combined cycle gas turbine units are commissioned.



2.2.4 Impact of COVID-19 on Oil:

Economies around the world are being battered by two “black swan” events at the same time: the COVID-19 virus and the oil price war between Russia and Saudi Arabia.

Naturally, the countries of the Middle East and North Africa (MENA) are also affected, although each in different ways. Those that are net users of energy, which could have benefitted substantially from the vastly lower energy prices, are getting hit hard by COVID-19, while oil and gas producers are suffering from an all-out oil price war made worse by the steep decline in worldwide demand caused by the pandemic.

Oman has small local populations and are not dependent on industrial exports or tourism, are getting hit by both of the black swans. The country income is in free fall, while it also has to cope with COVID-19. Oman has fewer foreign workers than GCC countries but will also get hurt. Newly developed gas reserves were just coming on-line and bolstered the declining existing reserves. There was hope that the country was about to make real progress on its industrial development. Furthermore, due to the slow decline in gas and oil income in previous decades, Oman's budget and cash reserves were under stress, but showing signs of recovery. Now, however, the virus is limiting demand for Oman's liquefied natural gas (LNG) and affecting prices in East Asia, by far the largest market for Omani LNG exports. Of course, the country will likely delay or cancel many projects. So, on top of the possible health problems for its population, Oman's economy is also likely to face severe stress.

The impact of Covid-19 pandemic is particularly visible on the demand for the services industry, including the EPC projects. This segment of the oil and gas value chain is largely price-sensitive and operates on low-profit margins with a heavy dependency on materials management, supply chain, workforce management and various other economic parameters.

The ongoing or new projects across oil and gas value chain are likely to face numerous challenges in terms of project execution, planning and risk management aspect from the pandemic. Therefore, how the EPC industry is coping up Covid-19 to stay afloat is something to pay attention. It is going to be very challenging for the industry to overcome this downturn in terms of managing the workforce and cost escalations in ongoing and new projects.

As a result, many upstream and midstream EPC projects across other countries can potentially face issue during this quarter and subsequent quarters. In the affected region, some of the refinery and petrochemical projects may have been directly impacted due to Covid-19 outbreak while others due to a substantial drop in oil prices.

This is likely to cause delays and cost escalation issues for the EPC projects in hand and also affect future project pipeline, timelines and project financing. Moreover, the prevailing economic situation may not be conducive for some new projects to come on-stream in the near future.

Taken together, the two black swan events are likely to hit the MENA region very hard. The combined effect of the pandemic and the oil price war will rapidly deplete cash reserves and reduce, if not eliminate, economic growth. Furthermore, the socio-economic costs for the region's people are already high and their suffering great, and both will only get worse in the near term.

2.3 *Petrochemical Sector*

The Corona Virus pandemic has been disrupting chemicals and energy supply chains, changing demand patterns and causing a significant impact on feedstock prices. With COVID-19 lockdowns in Europe rapidly bringing the petrochemical demand into a lull, pressure on the upstream naphtha market has become two-fold. Travel restrictions and the progressive loss in demand from the petrochemical sector have added extra weight. The ethylene market was the most affected, with unprecedented low prices and discounts were heard in the market.

Polymer grade propylene has also begun to show signs of weakening fundamentals, with earlier supply tightness heard easing and spot discounts seen widening to around 6%-7% inland and 7%-9% on the coast.

Consequently, European cracker margins dropped sharply on the second half of April to hit Eur435.720/mt in the spot market and Eur834.320/mt in the contract market, and falling by Eur243.68/mt and Eur76.21/mt, respectively.

Petrochemical demand is highly correlated to population and GDP growth and the Sultanate is heavily investing in the creation of an integrated refining and petrochemicals hub. The projects/plants are a part of the nation's efforts to diversify its economy away from oil export revenues.

3 Power

3.1 Power Generation Sector

The COVID-19 has direct impacts on the power demand and generation, because human life style in world around changes due to infection of the virus. People requirements to electricity not be same as before pandemic in all countries and cultures. Also, power generation is depending to electricity consumption as well as plant availability and health and safety of O&M team which they may be exposed in affection in pandemic conditions.

By considering the infected virus, the operation and maintenance of plant may be affected because of the government bands. Also, the construction of new projects will be delayed accordingly due to crisis condition on Engineering, Procurement, project construction and commissioning activities.

Electricity power is generated in Oman by OPWP and Tanweer Company who are Nama group subsidiaries. OPWP and Tanweer are committed to achieve ambitious goals to diversify the sources of electricity generation as new solar, wind, and waste-to-energy projects will contribute 16% of electricity production by 2025.

This study will investigate the power generation in before/after pandemic.

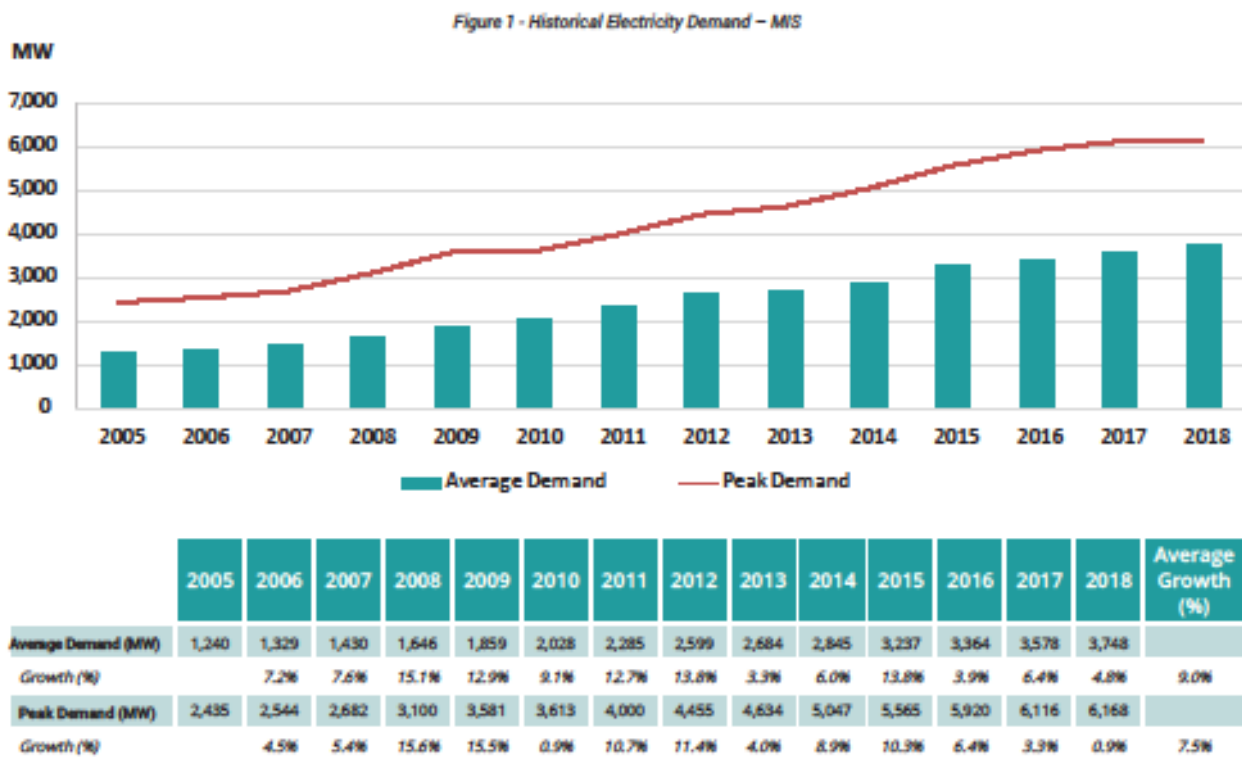
3.1.1 Demand for Electricity

In the "Main Interconnected System-MIS", peak demand is expected to continue to grow at a brisk rate, about 5% per year, from 6,168 MW in 2018 to 8,600 MW in 2025.

The MIS comprises eleven power generation facilities, owned and operated by separate companies; the 400/220/132 kV transmission grid, owned and operated by Oman Electricity Transmission Co.

(OETC); and three distribution networks, owned and operated by Muscat Electricity Distribution Co. (MEDC), Mazoon Electricity Co. (MZEC) and Majan Electricity Co. (MJEC). The three distribution network operators also act as licensed electricity suppliers, supplying existing and new electricity customers in their respective service areas. The MIS is interconnected with the power system of Petroleum Development Oman (PDO), and with the power system of the Emirate of Abu Dhabi and other Member States of the GCC Interconnection Authority via the Abu Dhabi Interconnect.

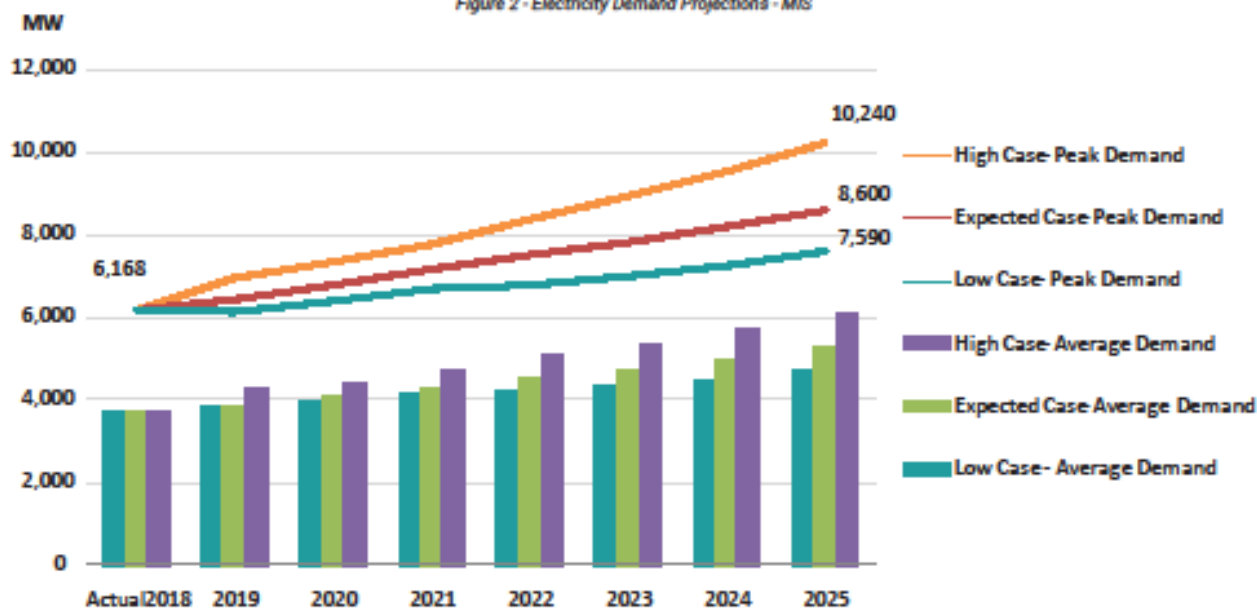
Energy consumption is expected to parallel the growth in peak demand requirements, at an annual average of 5% per year.



High and Low Case scenarios are also considered. The Low Case projects 3% annual growth in peak demand, reaching 7,590 MW in 2025, almost 1,000 MW below the Expected Case. The High Case projects 8% annual growth in peak demand at 10,240 MW by 2025, exceeding the Expected Case by almost 1,600 MW.

In the Dhofar Power System, peak demand is expected to grow at 6% per year, from 539 MW in 2018 to 827 MW in 2025. The Low Case projects 5% growth, reaching 747 MW by 2025, about 90 MW below the Expected Case. The High Case, on the other hand, projects 9% growth in peak demand, reaching 981 MW by 2025, exceeding the Expected Case by almost 150 MW.

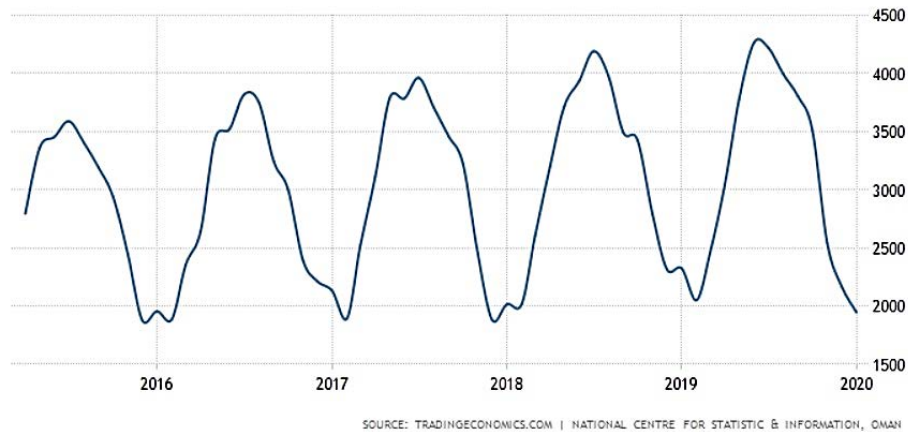
Figure 2 - Electricity Demand Projections - MIS



	Actual 2018	2019	2020	2021	2022	2023	2024	2025	Average Growth (%)
Expected Case Demand									
Average Demand (MW)	3,748	3,871	4,065	4,295	4,508	4,719	4,987	5,304	5%
Distribution Loads	3,164	3,161	3,235	3,305	3,438	3,609	3,857	4,164	4%
Directly-Connected Loads	584	710	830	990	1,070	1,110	1,130	1,140	10%
Annual Energy (TWh)	33	34	36	38	39	41	44	46	5%
Peak Demand (MW)	6,168	6,410	6,770	7,160	7,500	7,810	8,190	8,600	5%
Change from 2018-2024 Statement (MW)	-352	-590	-660	-670	-800	-860	-820	-	-
Low Case Demand									
Average Demand (MW)	3,748	3,804	3,958	4,148	4,216	4,338	4,485	4,723	3%
Distribution Loads	3,164	3,174	3,208	3,298	3,256	3,358	3,485	3,713	2%
Directly-Connected Loads	584	630	750	850	960	980	1,000	1,010	8%
Annual Energy (TWh)	33	33	35	36	37	38	39	41	3%
Peak Demand (MW)	6,168	6,140	6,400	6,680	6,790	6,970	7,230	7,590	3%
Change from 2018-2024 Statement (MW)	-352	-590	-640	-690	-930	-950	-870	-	-
High Case Demand									
Average Demand (MW)	3,748	4,314	4,412	4,740	5,081	5,389	5,714	6,090	7%
Distribution Loads	3,164	3,354	3,312	3,480	3,701	3,959	4,274	4,640	6%
Directly-Connected Loads	584	960	1,100	1,260	1,380	1,430	1,440	1,450	14%
Annual Energy (TWh)	33	38	39	42	45	47	50	53	7%
Peak Demand (MW)	6,168	6,930	7,320	7,780	8,350	8,920	9,550	10,240	8%
Change from 2018-2024 Statement (MW)	-352	-720	-870	-940	-1,060	-1,030	-960	-	-

The above-mentioned demand will not be covered by considering of Covid-19 infection. The necessity of people and plant to electricity will affect due to quarantines and travel bans and low working hours of workers.

Electricity Production in Oman decreased to 1947.30 GWH in January from 2171.10 GWH in December of 2019.



Oman Electricity Production in the last 5 years

The above Graph is referring to Oman Electricity production which is showing how much energy have been consumed during last five years, although installed Capacity in Oman was more than 7000 MW by the end of 2019, however the maximum energy consumption has not exceeded from 4400 MW since last 5 years till date,

To respond to the COVID-19 condition, Muscat city has been under lock down since 14 April 2020, and as per the latest records by Oman Electricity Transmission Company (OETC), the electrical energy consumption has been fallen down by about 200 MW during Muscat lock down,

Oman Electricity sector is quite capable to deal with COVID-19 conditions, in fact there is surplus in electrical energy sector, so that Oman can use the opportunity of exchanging power with its neighboring countries and to those who need electrical energy such as UAE,

The energy can also be swapped between countries in different seasons in this regard so that through exchanging power with neighbors, Oman can supply power to Pakistan and Yemen in future since there would be a huge demand in these countries,

In this sense Oman can use COVID-19 condition threats as opportunities through Exporting and swapping electrical energy, and it should be considered as recovery plan to respond COVID-19 pandemic Impacts to the country.

3.1.2 Power Generation Requirements

In the Main Interconnected System-MIS, the major developments include the start of the spot market in 2020, completion of the 400 kV North-South Interconnect to the Duqm Power System in 2023, the continuing push for Renewable Energy-RE projects driven by economics, and a focus on demand response. The North-South Interconnect will stimulate development of the Special Economic Zone of Ad Duqm and development of Renewable Energy-RE projects in Al Wusta.

In the Dhofar Power System, the first Dhofar Wind IPP is currently under operation. In the Duqm Power System, OPWP plans several projects to be completed in the forecast period, including (1)

wind IPPs of around 200 MW to be potentially located across multiple sites, for completion in 2023; and (2) the Duqm IPP, to provide about 600 MW of baseload supply by 2025.

3.1.3 OPWP Power Generation Resources:

OPWP has Power Purchase Agreement-PPA with so many power generators in across Oman. OPWP is committed to buy the limited electricity from generators. By the way all of the main power plants in the MIS are contractually committed to provide a specific generation capacity (in MW) upon demand, to be dispatched by the OETC, and to maintain specific availability levels. These are firm capacity contracts, also termed “contracted capacity”. OPWP also purchases power from a number of sources where the contractual arrangements do not provide a guaranteed level of capacity upon demand. They may be termed collectively as “non-firm resources”. They currently include (1) reserve-sharing arrangements with other power systems via interconnection agreements, (2) capacity exchanges/ energy purchases from industries with captive power generation facilities, where such industries use their embedded generators mainly for self-supply, and (3) renewable energy projects from intermittent sources, such as solar PV (without storage) and wind. In these cases, no specific capacity is committed to OPWP. The availability of capacity for use by OPWP at any particular time may be subject to the other party’s first use, although reserve-sharing agreements with neighboring power systems commit support during emergencies for specified periods of time. Collectively, non-firm resources provide reliability benefits to the MIS, in that capacity is generally available according to pre-arranged schedules or during contingency events, accordingly, a portion of this capacity can be considered to provide contributions towards meeting peak demand requirements.

The demand projections for the MIS have been developed on the basis of: (1) quantitative analyses of weather and macroeconomic demand drivers; (2) consultations with the electricity distribution companies and other relevant entities such as large industries; (3) historical growth trends; and (4) assessment of past forecasts against out-turns.

The projections are derived principally from scenarios of economic growth in the Sultanate, specifically to the growth trend in Gross Domestic Product (GDP). Economic growth slowed following the fall in oil prices since 2014. The oil price recently was dropped to minimum value for the first time in history. GDP declined in real terms by 0.9% in 2017. Also, the growth rates were 1.9% and 3.4% for 2018 and 2019 respectively. (6) OPWP demand scenarios reflect forecasts of Oman economic growth published by the World Bank and International Monetary Fund (IMF). OPWP assumes a long-term range for annual GDP growth from 1.8% to 3.5%, as determinants for the Low, Expected, and High Case scenarios for electricity demand projections. The projections are then aligned with analyses of distribution system demands, which are assessed on a “macro” basis by distribution company zone, and certain bulk loads that are assessed on a specific customer basis. Distribution system demand is comprised mainly of residential, service sector (including government and commercial buildings, tourism facilities), and small- to medium- scale industrial demand in all MIS regions.

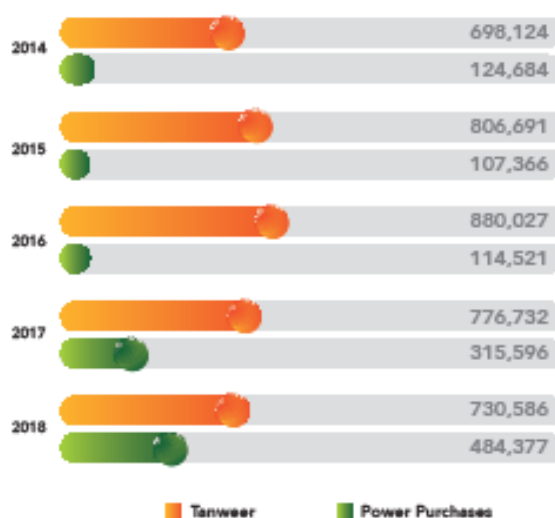
Table T - Contracted Capacities (PPAs/PWPAs) – MIS

Project Name	Contracted Capacity ^(M)	Contract Type	Project Company	Project Status	Technology	Contract Expiry
Al Kamil IPP	291 MW	PPA	Al Kamil Power Co. (SAOG)	Operational	OCGT Natural gas fired Fuel oil as back-up	2021
Barika IWPP	397 MW	PWPA	ACWA Power Barika (SAOG)	Operational	CCGT Natural gas fired Fuel oil as back-up	2021
Barika II IWPP	688 MW	PWPA	SMN Barika Power Co. (SAOC)	Operational	CCGT Natural gas fired Fuel oil as back-up	2024
Barika III IPP	766 MW	PPA	Al Suwadi Power Co. (SAOC)	Operational	CCGT Natural gas fired Fuel oil as secondary fuel and back-up	2028
Ibri IPP	1,539 MW	PPA	ADDhahrah Generating Company	Under construction	CCGT Natural gas fired Fuel oil as back-up	2034
Manah IPP	264 MW	PPA	United Power Co. (SAOG)	Operational	OCGT Natural gas fired Fuel oil as back-up	2020PM
Rusail IPP	694 MW	PPA	Rusail Power Co. (SAOC)	Operational	OCGT Natural gas fired Fuel oil as back-up	2022
Sohar IWPP	597 MW	PWPA	Sohar Power Co. (SAOG)	Operational	CCGT Natural gas fired Fuel oil as back-up	2022
Sohar II IPP	766 MW	PPA	Al Batinah Power Co. (SAOC)	Operational	CCGT Natural gas fired Fuel oil as secondary fuel and back-up	2028
Sohar III IPP	1,744 MW	PPA	Shinas Generating Co. (SAOC)	Under construction	CCGT Natural gas fired Fuel oil as back-up	2034
Sur IPP	2,018 MW	PPA	Phoenix Power Co. (SAOC)	Operational	CCGT Natural gas fired Fuel oil as back-up	2029

3.1.4 Tanweer Power Generation Resources

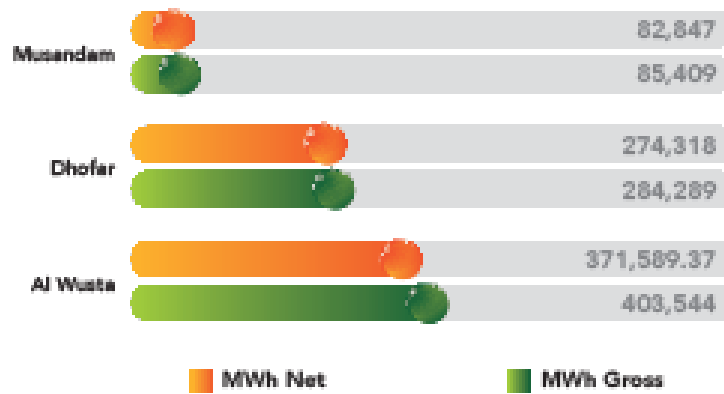
The net power sent from Tanweer power plants decreased to 730,586 MWh in 2018 from 776,732 MWh in 2017 reflecting a decrease of 6%. This was due to the commissioning of the new Tibat Independent Power Plant (IPP) in Musandam which contributed to Tanweer energy demand in 2018 (by OPWP). Follow figure shows MWh sent out from Tanweer power stations & power purchases in the last five years and it presents the detail of Tanweer’s supplied power by Tanweer’s Plants, PDO, Tibat and Al-Mazyunah (renewable PV) sources.

Figure 13: MWh Sent out from Tanweer Power Stations & Power Purchases (MWh)



The following figure portrays the regional power generation from Tanweer power stations in 2018. It can be noted that around 52% of power was generated from Al- Wusta power plants, 37% and 11% from Dhofar and Musandam power plants respectively.

Figure 15: Regional Power Generation 2018 (Tanweer power plants)



3.1.5 Resource Development Plan

OPWP continues to commit to the Fuel Diversification Policy issued by the Government by ensuring alignment with its’ resource development plan such that this plan features rapid development of renewable energy (RE) resources and implementation of OPWP’s new procurement methodology for gas-fired PPAs. The resource development plan comprises new capacity contracts, renewable energy contracts, demand response, and capacity contributions from other non-firm resources.

Planned Contracts for Guaranteed Capacity. OPWP anticipates three procurement initiatives for projects in the MIS that would provide guaranteed capacity during this 7-year period. Following table summarizes the capacity expectations from these projects.

Table 3 - Planned Contracts for Guaranteed Capacity - MIS

	2019	2020	2021	2022	2023	2024	2025
Net MW							
Manah IPP Sale/ New PPA	-	264	264	264	264	264	264
Power 2022 ^a	-	-	-	600	600	600	600
Power 2024	-	-	-	-	-	700	700
Duqm Power System - Export to MIS	-	-	-	-	-	-	497
TOTAL	-	264	264	864	864	1,564	2,061

^a Subject to the outcome of the evaluation process, the awarded capacity under Power 2022 may be in a range around 600 MW.

3.1.6 Resource for Renewed Power

In December 2017, OPWP announced a tender for a 500 MW solar PV project to be located at Ibri. This is the first in a series of renewable energy (RE) IPP tenders that are planned to achieve the Government’s target of 10% RE share of electricity generation by 2025.

OPWP’s renewable energy development plan currently comprises solar, wind, and waste-to-energy (WTE) projects. OPWP plans to procure around 2,200 MW of RE IPPs in the MIS by 2025.

Additional RE IPPs are also being planned for other systems, and are reported further in this publication. Table 4 summarizes the plan through 2025. The locations and type of RE projects will depend on approval of transmission projects and site allocations. OPWP expects to adapt the RE development plan as site acquisition and transmission development are approved and confirmed.

Table 4 - Renewable Energy Development Plan – MIS

	2019	2020	2021	2022	2023	2024	2025
	MW ^M						
Ibri II Solar IPP	-	-	-	500	500	500	500
Solar IPP 2022 ^M	-	-	-	-	500	500	500
Solar IPP 2023	-	-	-	-	-	500	500
Solar IPP 2024	-	-	-	-	-	-	500
Wind IPP 2023	-	-	-	-	-	100	100
Barka WTEIPP ^M	-	-	-	-	100	100	100
Total Capacity	-	-	0	500	1,100	1,700	2,200
Capacity Contribution	-	-	0	100	295	430	530

In 2014, Tanweer signed an agreement with Abu Dhabi Future Energy Company (Masdar) to develop Dhofar wind power project with a total installed capacity of 50MW, connected to the OETC south grid. The wind project will consist of 13 wind turbines installed (each wind turbine 3.8 MW – GE Technology). The project is located in Fatkhit (Willayat of Shaleem and Hallanyat Island).

Tanweer signed a 20-year PPA with the private investor Bahwan Aston Field for Al-Mazyunah Solar Project to purchase electricity produced from the PV plant. The plant consists of two PV technologies, Polycrystalline and Thin-film. The PV power plant contains a total of 1617 modules, 31 inverters and covers an area of 8000 m². In 2018, total energy generated reached 546 MWh.

3.1.7 Power Generation Summary

Follow figure provides a summary of OPWP’s current plans for generation capacity and resource development in the MIS for the period 2019 to 2025. The capacity indicated for each year corresponds to the quantity available as of the onset of the summer peak season in May.

Figure 4 - Capacity Contributions from Generation Resources – MIS



	2019	2020	2021	2022	2023	2024	2025
Contracted Capacity	MW						
Total Contracted Capacity	9,764	9,497	9,486	7,511	7,511	6,823	6,823
Planned Contracts for Guaranteed Capacity							
Manah IPP Sale/ New PPA	-	264	264	264	264	264	264
Power 2022	-	-	-	600	600	600	600
Power 2024	-	-	-	-	-	700	700
Duqm IPP(s) (Export to MIS)	-	-	-	-	-	-	497
Total Planned Contracts for Guaranteed Capacity	-	264	264	864	864	1,564	2,061
Capacity Contributions from RE Projects							
Renewable Energy	-	-	-	100	295	430	530
Capacity Contributions from Other Contracts							
Demand Response	-	-	30	40	50	70	100
Non-firm Contracts ^{HM}	380	380	380	380	380	380	380
Total Capacity Contributions to Peak Demand	10,144	10,141	10,169	8,995	9,106	9,267	9,994

3.1.8 Impact of COVID-19 on Power Generation

The power sector is one of the affected sectors due to the nationwide lockdown announced in many countries. The lockdown has caused electricity demand to fall as industrial electricity consumption holds a maximum share in most countries' consumption mix.

Oman government lockdown some province in Oman like Muscat to prevent the spread on Covid-19 and there is so many bans due to avoiding of this disease. These shutdowns and bans mean that companies shall do teleworking and other technologies to keep business running smoothly while employees are at home.

Recent historic levels of volatility in Oman and GCC have amplified the level of anxiety among all member of all societies.

In fact, the virus and its impact have affected the markets so much, that some analysts believe they cannot now make a forecast for the remainder of 2020. Even next years.

Consequently, power consumption, power generation will be affected. Also, construction plant will be faced with major delays in Oman and other countries due to dealing with COVID-19.

3.1.9 Impact of COVID-19 on Power Demand

Utilities also are looking at the impact of lessening demand for power from commercial and industrial (C&I) enterprises, and the possible rise in consumption from the residential sector, with schools and businesses closed and people ordered to work from home.

Due to coronavirus outbreak, considerable % drop in power demand from 3rd week of March 2020. The lockdown keeps people in their homes, with all nonessential businesses closed. As Oman officials ponder more measures to prevent the spread of the virus, beyond the closure of schools and businesses, the potential for what's known in the energy industry as "demand destruction"—something usually reserved for areas in the wake of natural disasters—could become all too real.

The full impact of the lockdown is now visible on energy consumption but electricity consumption is unlikely to fall beyond the current level. This (fall) is mainly because of industrial and commercial consumption shifting out. We are seeing the full impact. However, further consumption decline can come even from continuous process industries.

Also, the demand reduction from industries may occur because of both supply chain disruptions and the slowdown in demand itself. Both are hard to predict and may vary from sector to sector but if it happens it will be a couple of more percentage points and not beyond that.

The steep fall in energy consumption will not have a bearing on grid stability as it is easier to handle the grid in times of a fall in demand. "It is easier to balance the grid when demand is falling as only need to scale down generation. In an extreme case choose to shut down generation.

Severe fall in demand will have an impact on power distribution companies who are likely to face huge working capital issues. "Retail tariffs are structured on a variable cost basis. That means an entity pays for the quantum of energy it consumes. Fixed cost components in tariffs are fairly low. Distribution companies will face huge working capital issues which will be a serious challenge.

The electricity demand is expected to fall sharply in the coming days and as more parts of the country go under lockdown further reduction is expected.

3.1.10 Recommendations

- 1- Covid-19 causes some inconsistency and imbalance in all industries and power generation, so new rules as confronting activities should be conducted.
- 2- The growth of power generation (MW) will be affected due to infection of Covid-19 and changing of human life style. Then government shall study all changes carefully for future programming.
- 3- Oil price will be dropped more due to demand collapsing in oil consumption in the world as well as completing of oil tank capacity. The budget of new projects should be managed carefully due to provision of the required power sources.
- 4- The construction of renewable power plants should be considered as first priority due to using of less man power in operation and maintenance as well as less investment.

3.2 Distribution system in Oman

Distribution system in Oman all distribution companies including MEDC, MAJAN, Mazoon, DPC, & RAECO (Tanweer).

3.2.1 Study of substations construction status before epidemic Covid 19

3.2.1.1 Prediction for substation construction in coming years

The information in the Distribution System Capability Statement (DSCS) is published annually to fulfil MEDC regulatory obligation under Condition 32 of its Distribution and Supply License (D&SL) and Distribution planning code 4.4 of the Oman Distribution Code. With refer to Distribution System Capability Statement published; all substation planned project from 2019 till 2021 as below:

Project Stage	Zone1	Zone2	Zone3
Completed	-	-	2 ²³
Under Construction	4	6	7
Tendering	0	1	0
Design	2	0	1
Planning	-	2	4
TOTAL	6	9	13

Customer category	Number of projects	Peak Demand (MW)		
		2019	2020	2021
Residential	0	0	0	0
Government	20	10	40.6	72.9
Commercial	6	8	16	55
Industrial	2	0	0	4.8
Agriculture	0	0	0	0
Tourism	1	0	0	3.8
MOD (Defense)	1	0	0	7

Mazoon Peak Demand in MW of Corporate Projects by Customer Category expected in 2019-2021

Implementation of these plans will increase the number of 33/11kV primary substations (PSS) providing enhanced opportunities for new and increased customer connections.

Total Primary Substations to be constructed till 2021 (For MEDC & Mazoon only)	58
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3.2.2 Authority for Electricity Regulation.

With refer to AER, the electrical power consumption reduced by 13% compared to the last January 2019. The effect of the COVID-19 caused consumption reduction. While all capability statements and reports expect the opposite.



In case of the current situation continued, the investment of the current and future project incomes will reduce for this period.

As imagination, these 13% (286 GWH) is the reduction of future projects. So, the total of 58 projects for MEDC and Mazoon will be reduced to 50.

3.2.3 Recommendations:

This section is categorized in 3 general parts as follow:

3.2.3.1 Confrontation with current projects and contracts

- a. Under construction projects shall be categorized (as per progress percentage, importance,) and future finalized projects to be prioritized.
- b. All contract condition alternatives to be reviewed and verified for cost compensation or contract termination due to current situation.
- c. Finding a suitable way to inject budget to the projects for example pay the contractors part payment
- d. Proper procedure shall be placed and ignore existing long-time procedure to save the time in awarding the projects to contractors.

3.2.3.2 Confrontation with under operation projects

It is so important to consider new methods of capital management due to shortage in financial sources and necessity of network maintaining.

- a. Several scenarios proposal in crisis management for Distribution system.
- b. Efficiency improvement in Primary substations by below mentioned titles:
 - Creating an overall data base for network equipment to improve efficiency level of network and its critical components.
 - Applying asset management projects and basics to identify critical component of the network.
 - Setting a coherent and integrated system to control all equipment stock in stores.
 - The network important equipment shall be identified and their healthy to be monitored.
 - Optimization of distribution network and increasing reliability level of the network.
 - Studying and investigation on how to increase resilience of the network.
 - Applying system automation of distribution network for optimized operation and maintenance.
 - Applying artificial intelligence of distribution network for increasing customer satisfaction and defining a system for dealing with customers properly.
 - Applying artificial intelligence of the network to manage its interaction with renewable energy resources, power plants and for managing market if required,

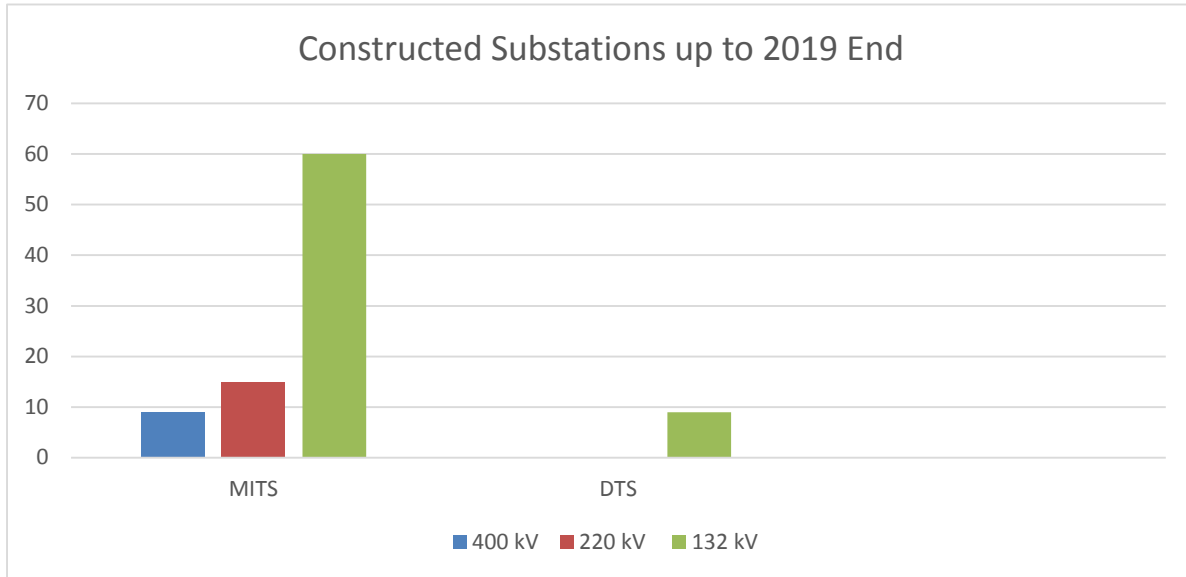
3.3 Transmission system in Oman

Transmission system in Oman includes main interconnected transmission system (MITS) and Dhofar transmission system (DTS). DTS has been transferred to OETC since 2014.

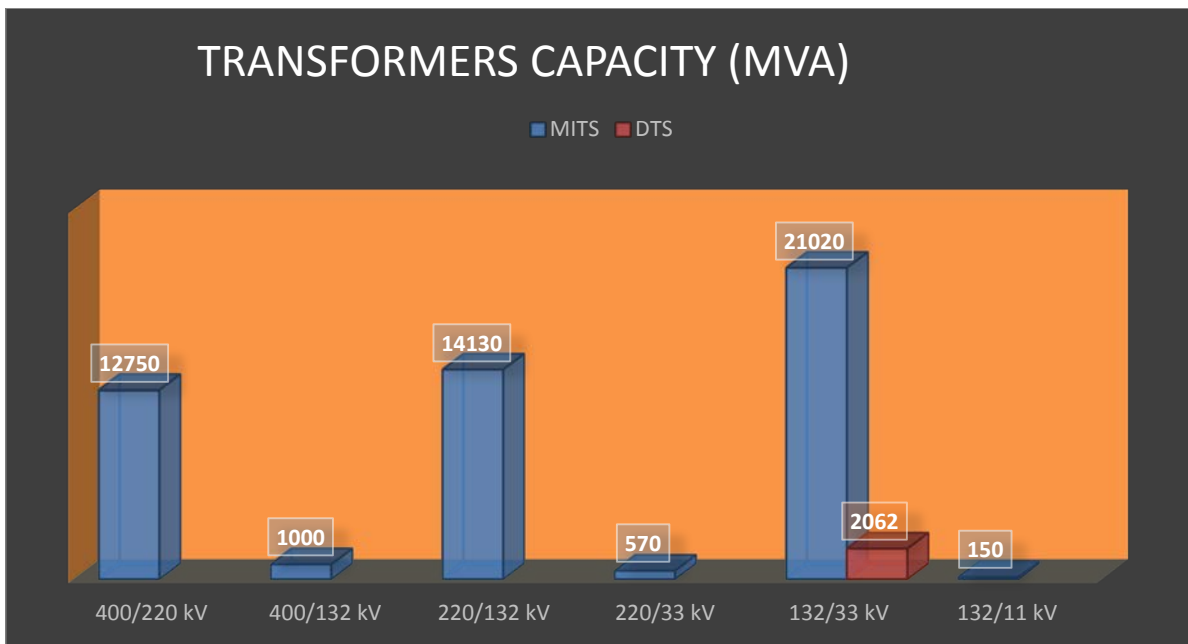
3.3.1 High voltage substations status before epidemic COVID-19

3.3.1.1 High voltage substations constructed and upgraded by the end of 2019

With refer to statistics published by Oman Electricity Transmission Company (OETC), all high voltage substation constructed at MITS and DTS up to end of 2019 are as follow:

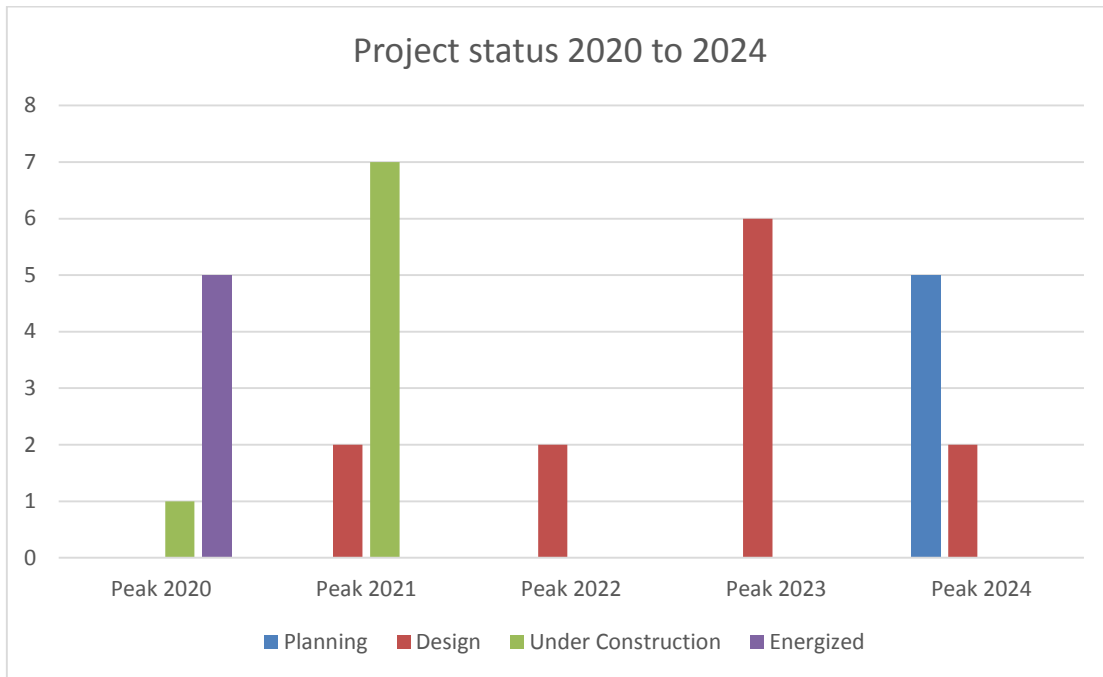


Total transformers capacity at MITS and DTS by end of 2019 is shone as below chart:

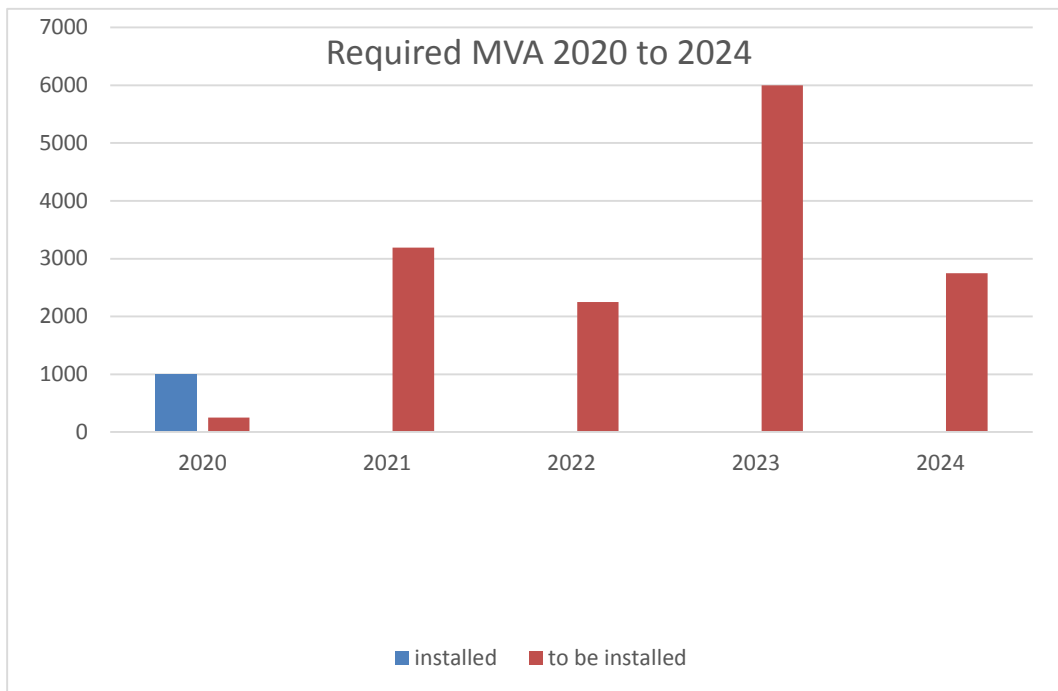


3.3.1.2 Prediction for substation construction in coming years:

With refer to statistics published by Oman Electricity Transmission Company (OETC), the number of planned projects from 2020 to 2024 is given in below chart:



It is planned by OETC to install required MVA from 2020 to 2024 to meet the peak load growth. Details are shown in below chart:



3.3.1.3 Total cost for substation construction till 2024:

With considering of projects progress status up to April 2020 and assuming that average cost for installing of each MVA high voltage substation is 43000 \$, to meet the predicted trend of substations construction is given in below table:

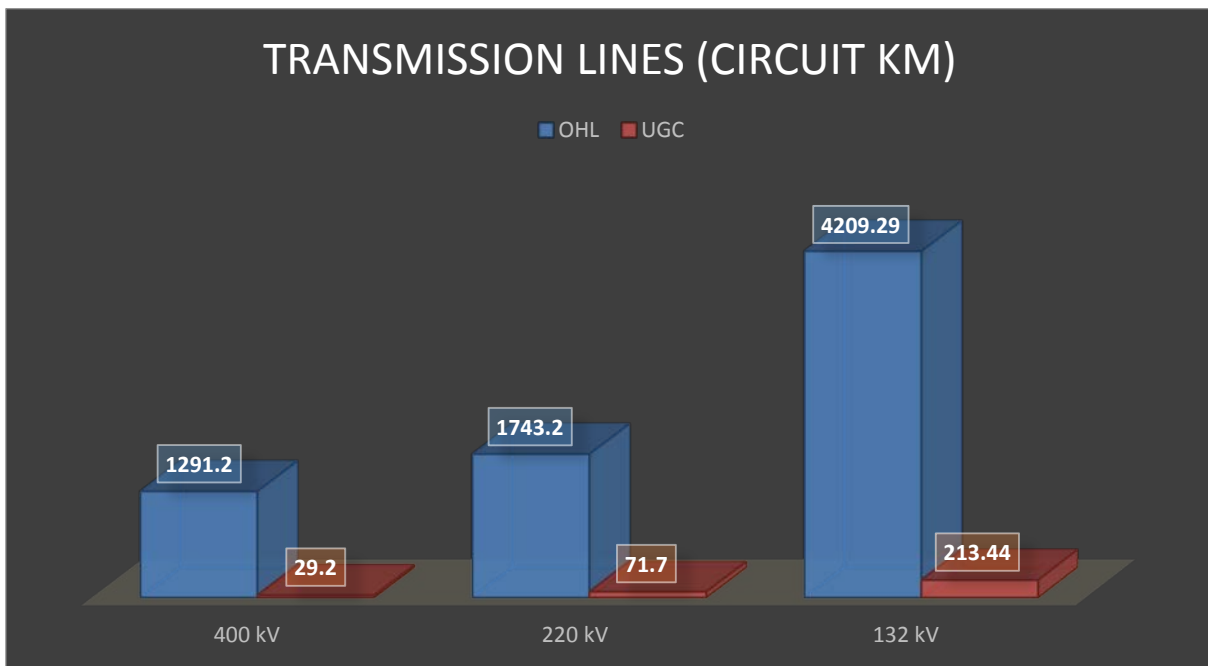
Required cost for constructing high voltage substations

Total required MVA to be constructed till 2024	14,442
Total MVA under construction	3,942
Remaining MVA	10,500
Average cost for installing each MAV \$	43,000
Required cost million dollar	451,500,000

3.3.2 *Transmission lines:*

3.3.2.1 *Transmission line status by the end of 2019*

With refer to statistics published by OETC, the total length of transmission lines in end of 2019 at MITS and DTS is as below:



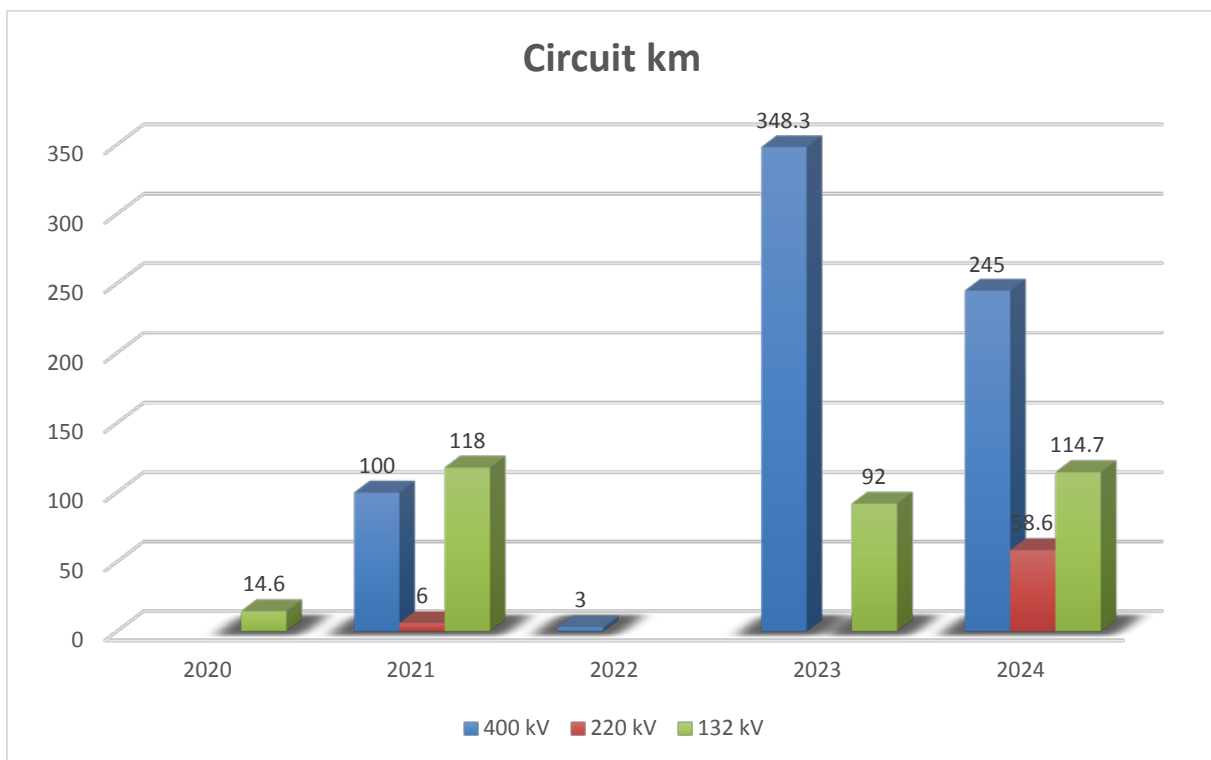
3.3.2.1.1 *Transmission lines status in future:*

In this section transmission lines status is given in 2 parts, under construction and required transmission lines.

3.3.2.1.2 *Under construction and constructed transmission lines in 2020*

Description		Line length
400 kV	Circuit km	126
220 kV	Circuit km	3.96
132 kV	Circuit km	14.6

3.3.2.1.3 Required transmission line till 2024



3.3.3 Transmission system after COVID-19:

Muscat Electricity Distribution Company (MEDC), Mazoon Electricity Company (MZEC), Majan Electricity Company (MJEC) and Dhofar Power Company (DPC), are four distribution companies. take the bulk of the power transmitted through the main grid stations to supply the Distribution system. In the near future, OETC will also transmit the power to Tanweer in order to supply some of their areas.

In addition to the four Distribution Companies, large private customers are directly connected to the transmission system. The existing private customers with 220kV and 132 kV Connections are as shown in below tables:

The existing private customers with 220kV Connections

Item	Private Costumer	Load (MW)
1	Sohar Aluminum Smelter	300
2	Jindal Shadeed Steel	304
3	liwa Plastics Industries Project	200
4	Moon Iron &Steel Co.	185
Total		989

The existing private customers with 132kV Connections

Item	Private Costumers	Load (MW)
1	Sohar Steel	100
2	Sohar Refinery	71.25
3	PDO	60
4	Omifco	42.75
5	Vale	95
6	Muscat International Airport	30
7	Al Tamman	48
8	Salalah International Airport	38
9	Oman Alum Rolling	50
10	Muscat City Desalination Company	28
11	Modern Steel	28.5
12	Muscat Steel	52.25
Total		643.75

The New private customers with 132kV Connections

Item	Private Costumer	Load (MW)
1	Salalah Methanol Company	50
2	Oman International Petrochemical Industries	75
Total		125

In current situation, OETC is managing distribution companies and private customers which were listed above. There are new customers with only 125 MW which is not a big deal for OETC and can be managed smoothly.

3.3.4 Recommendations:

This section is categorized in 3 general parts as follow:

3.3.4.1 Confrontation with current projects and contracts

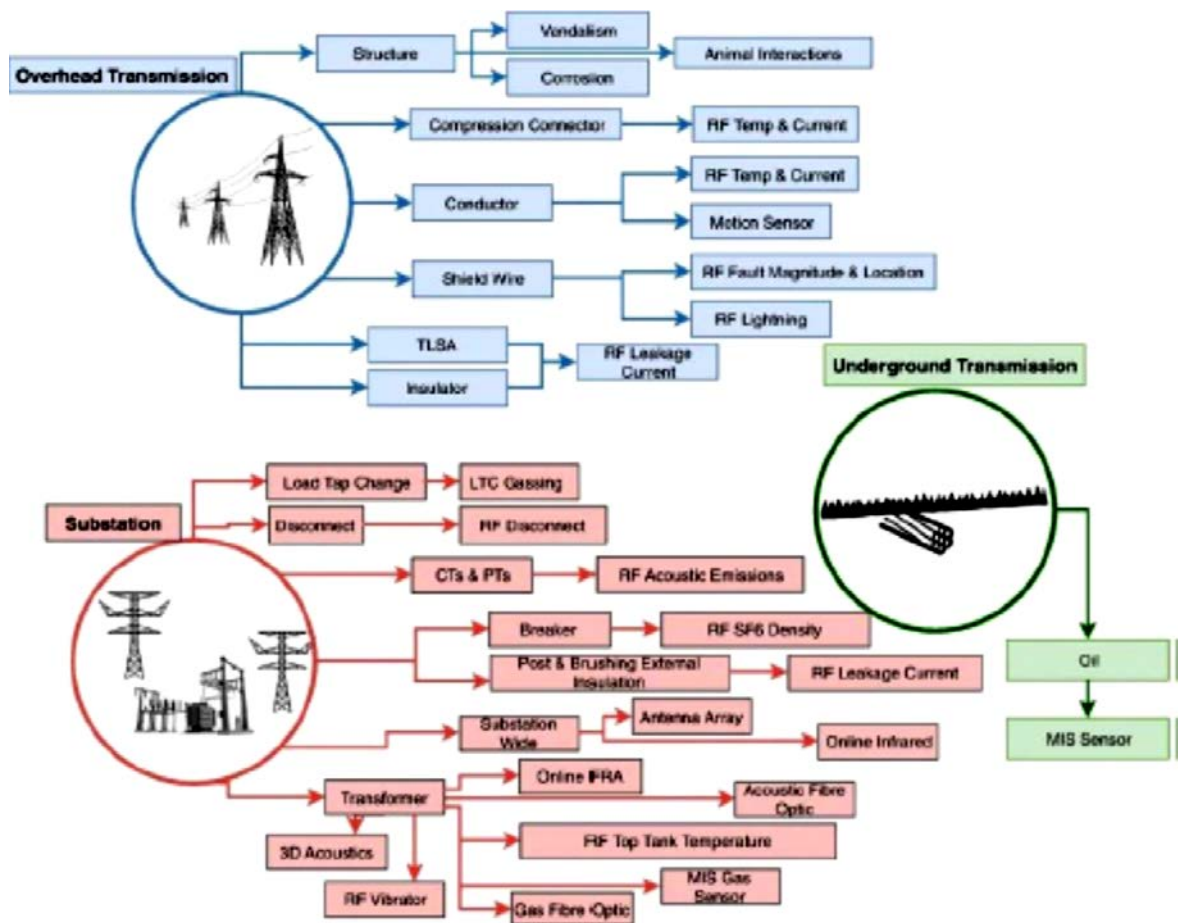
- e. Under construction projects shall be categorized (as per progress percentage, importance,) and future finalized projects to be prioritized.
- f. All contract condition alternatives to be reviewed and verified for cost compensation or contract termination due to current situation.
- g. Finding a suitable way to inject budget to the projects for example pay the contractors part payment
- h. Proper procedure shall be placed and ignore existing long-time procedure to save the time in awarding the projects to contractors.

3.3.4.2 Confrontation with under operation projects

It is so important to consider new methods of capital management due to shortage in financial sources and necessity of network maintaining.

- c. Several scenarios proposal in crisis management for transmission system.
- d. Efficiency improvement in high voltage substations and transmission lines by mentioned below titles:
 - Creating an overall data base for electrical network equipment to improve efficiency level of network components.
 - Applying asset management projects in transmission and distribution system to manage critical components of the transmission and distribution network.
 - Monitoring and controlling vital components of the electrical network.
 - Setting a coherent system to control all equipment stock in stores.

- The important network equipment shall be identified and their healthy to be monitored.
- Loss reducing can help to invest less capital in generation.
- Applying artificial intelligence systems during operation and maintenance of the electrical network which will help to replace human factor in system management and optimization of the procedures and methodologies of operation and maintenance of the network.
- This very task will help operators to save huge amount of cost and their human resources as well.



3.3.4.3 Interconnected status with other countries:

There is a 220 kV interconnection between Oman and UAE completed in 2007. The interconnection connects Mahadha Grid Station in Oman (Al wasit) to Al Oha Grid Station in Al Ain in the UAE.

With this interconnection Oman is able to import/export power from the GCCIA Grid to meet any potential generation shortfall. Oman has signed officially the agreement with the GCCIA in 2014 and became a part of the state members. In addition, with current economy downturn, investment to construct power plants is not economic for GCCIA and there is opportunity to export electricity from Oman to them.

Obviously, in terms of capacity of the installed power in the country, Oman Electricity sector is quite capable to use the opportunity of exchanging power with its neighboring countries and to those who need electrical energy such as UAE,

The energy can also be swapped between countries in different seasons through exchanging power with neighbors,

Since there would be a huge demand for electrical energy and power in countries such as Yemen after the war and Pakistan because of huge population then Oman can consider some scenarios which enabling the country to export power to these countries' either directly or indirectly through swapping energy between neighboring countries,

In this sense Oman can use COVID-19 condition threats as opportunities through Exporting and swapping electrical energy, and it should be considered as recovery plan to respond COVID-19 pandemic Impacts to the country.

4 Information Technology

Information technologies have risen to prominence as a critical determinant of economic growth, national security, and international competitiveness. The digital economy has a profound influence on the world’s trajectory and the societal well-being of ordinary citizens. It affects everything from resource allocation to income distribution and growth.

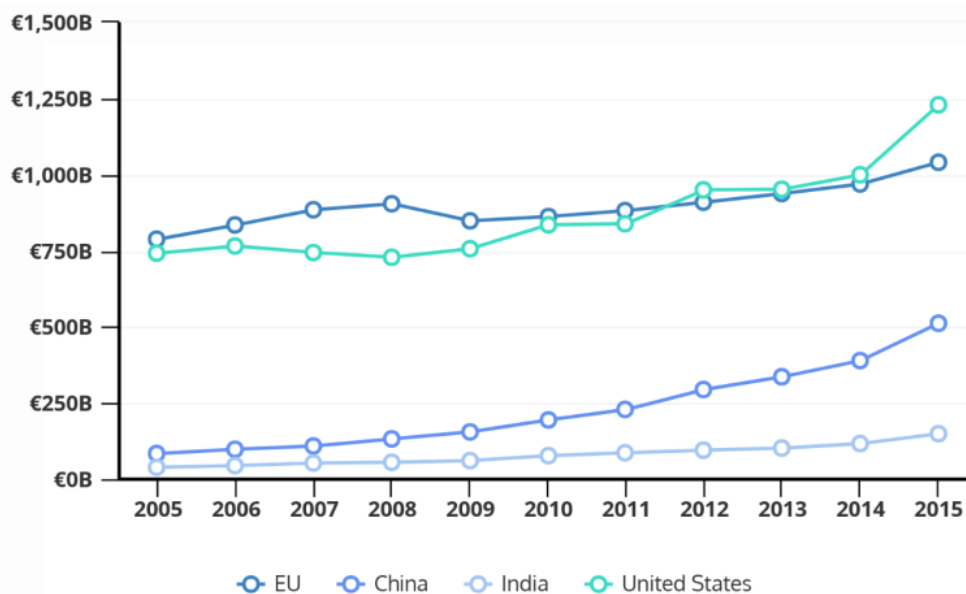
Many studies show that increased GDP growth and country-specific global competitiveness can be primarily attributed to growth rates in ICT investment.

The impact of ICT assets, measured as the value of ICT-capital services as a percentage of GDP, is instructive in assessing the ICT sector’s full growth contribution.

In addition to the demonstrated positive impact from ICT sectors on the total economy, a transformational shift has occurred from the ICT manufacturing sector to the ICT service sector.

This move from a hardware- to software-centric level of growth has been particularly pronounced in developing countries due to deeper and wider mobile-cellular networks. Moreover, the maturing mobile ecosystem has been fueled by greater accessibility among mobile internet users and the affordability of smartphones and portable devices.

IT service output of 4 economies, 2005-2015



Beyond the increasing contributions of ICT-services to GDP growth, investments in the ICT sector have significantly boosted labor productivity.

The demand for IT-based services is disproportionate across many industry verticals; however, certain sectors present appealing opportunities for revenue generation for IT service providers. Whereas aggregate IT spending is expected to rise on a global scale, growth will be unevenly distributed across key geographical markets: North America (the U.S. and Canada); the Asia-Pacific region; Europe, the Middle East, and Africa (EMEA); and Latin America.

Worldwide forecast of spending on core IT services, 2017-2019 (\$ billions)

IT Segments	2017	2017	2018	2018	2019	2019
	Spending	Growth	Spending	Growth	Spending	Growth
Data Center Systems	181	6.4%	192	6%	195	1.6%
Enterprise Software	369	10.4%	405	9.9%	439	8.3%
Devices	665	5.7%	689	3.6%	706	2.4%
IT Services	931	4.1%	987	5.9%	1,034	4.7%
Communications Services	1,392	1%	1,425	2.4%	1,442	1.2%
Overall IT	3,539	3.9%	3,699	4.5%	3,816	3.2%

Gartner (2018). Gartner Says Global IT Spending to Grow 3.2 Percent in 2019

Enterprise software is forecasted to be the predominant driver of growth in overall IT spending in 2019 at 8.3 percent, followed by IT services at 4.7 percent.

Devices, a segment driven by an increase in the average selling prices of mobile phones, will experience moderate growth (2.4 percent) in 2019, a slight downturn from 3.6 percent in 2018.

Counterintuitively, data centers and communication services will exhibit the most sluggish growth of all segments (1.6 percent and 1.2 percent, respectively) in 2019, declining sharply from the preceding year (6 percent and 2.4 percent, respectively).

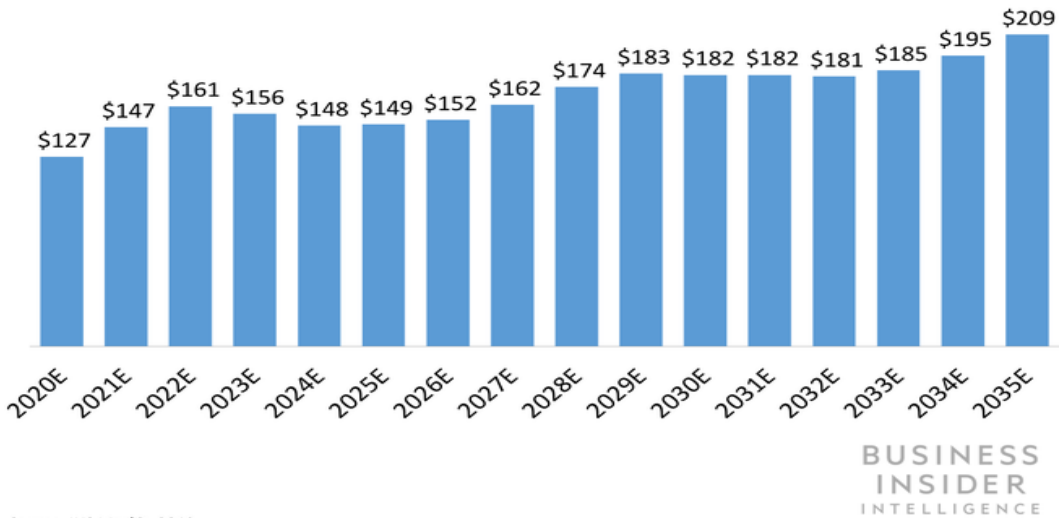
Emerging technologies such as AI, IoT, and blockchain will continue to influence the IT industry into 2022. While growth in expenditures on traditional technologies (hardware, software, services, and telecom) is expected to largely mimic the single-digit GDP growth over this period, growth in advanced technologies is anticipated to be much more prolific, stretching into the double digits and commanding an increasingly greater share of total IT spending.

Nowadays the telecommunications and consumer technology industries continue to feel the impact of the coronavirus.

The initial outbreak of the coronavirus in China disrupted global supply chains, but as the outbreak has grown into a global pandemic, the consequences have become even more far-reaching and less predictable.

5G To Contribute \$2.1 Trillion To Global Real GDP By 2035

Annual net contribution of 5G to global growth, billions



Source: IHS Markit, 2019

Mobile World Congress, a seminal conference in the telecommunications industry, was among the first in a string of industry conferences and keynotes to be canceled as part of containment efforts. And as more employees are being asked to work remotely, the industry faces the prospect of delayed initiatives and missed partnership opportunities.

But the telecommunications and technology industries have also found opportunities to help with what matters most - keeping people safe and healthy - by aiding companies that are scrambling to make videoconferencing technology more broadly available, assisting governments disseminate accurate information to citizens about the virus, and finding uses for smart city technologies to combat the pandemic.

Here are five ways we expect the coronavirus to affect the industry over the coming year:

The clearest and most immediate business impact of the coronavirus pandemic was a major disruption to supply chains.

Having originated in China, the region was hit hard as a large number of citizens contracted the disease and many were forced into quarantine. This led to partial and full shutdowns of plants and factories, some of which were being used by prominent technology companies to manufacture their goods and products. For example, Apple experienced shortages on its iPhone supply as a result of the company's primary manufacturer, Foxconn, shutting down much of its production in China.

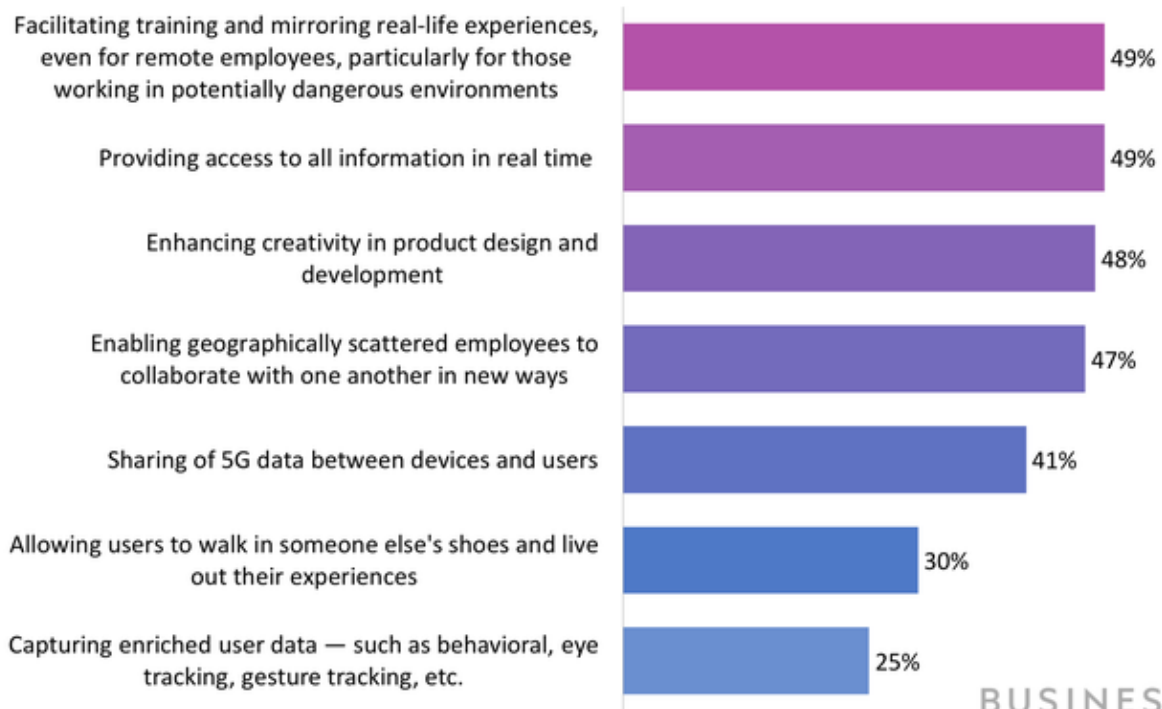
Ultimately for Apple, this will lead to a significantly reduced forecast in iPhone shipments through Q1 — by as much as 10%, according to estimates by Apple analyst Ming-Chi Kuo cited by MacRumors.

And while companies often have contingency plans, which revolve around ramping up production in a region that isn't impacted, the rapid spread of the coronavirus across the globe makes it very difficult to pinpoint which regions would be least affected. Even then, the momentum and resources of the Chinese economy will not be easily replicated — "Made in China" initiatives have seen the government invest billions in advanced manufacturing sectors including telecommunications equipment and semiconductors.

The spread of the coronavirus caused several of the most important tech conferences to be canceled, likely resulting in numerous missed partnership opportunities.

Though it is difficult to quantify the value of these chance encounters or informal network sessions, the effects will undoubtedly be felt throughout the impacted industries.

Top Workforce Development Benefits Of XR



Source: Perkins Coie, n=200 business respondents, 2019

BUSINESS
INSIDER
INTELLIGENCE

The growing need for remote interactions amid the coronavirus pandemic has highlighted a need for 5G technology, potentially accelerating adoption in the long term.

5G's lightning-fast speeds, near-instantaneous communications, and increased connection density makes it primed for remote interactions, which has become top of mind for many organizations and enterprises as caution mounts over the spread of the virus. Two key areas — telehealth and

teleconferencing — are becoming critical for enterprise operations amid the pandemic, and we think that increased dependence on these areas will help strengthen the appeal of 5G:

Telehealth: The technical superiority of the new standard empowers physicians to diagnose, treat, and operate on patients without the need to be physically near them. Given the ability of 5G to expand the reach of expertise and services offered by hospitals in this time of increased need, we expect more hospitals will look to tap into 5G to take advantage of the benefits offered by the new standard.

Teleconferencing: Many employers have increased their reliance on enterprise teleconferencing tools - such as Microsoft Teams, Google Hangouts, and Zoom - as their employees switch to remote work due to public health concerns.

We expect that employers' dependence on such tools during the coronavirus pandemic will strengthen the case for 5G connectivity in the home - and in the office as enterprises recognize the value that teleconferencing tools offer. That's because a 5G connection will be able to provide real-time and uninterrupted communication that's not possible with most wired connections today.

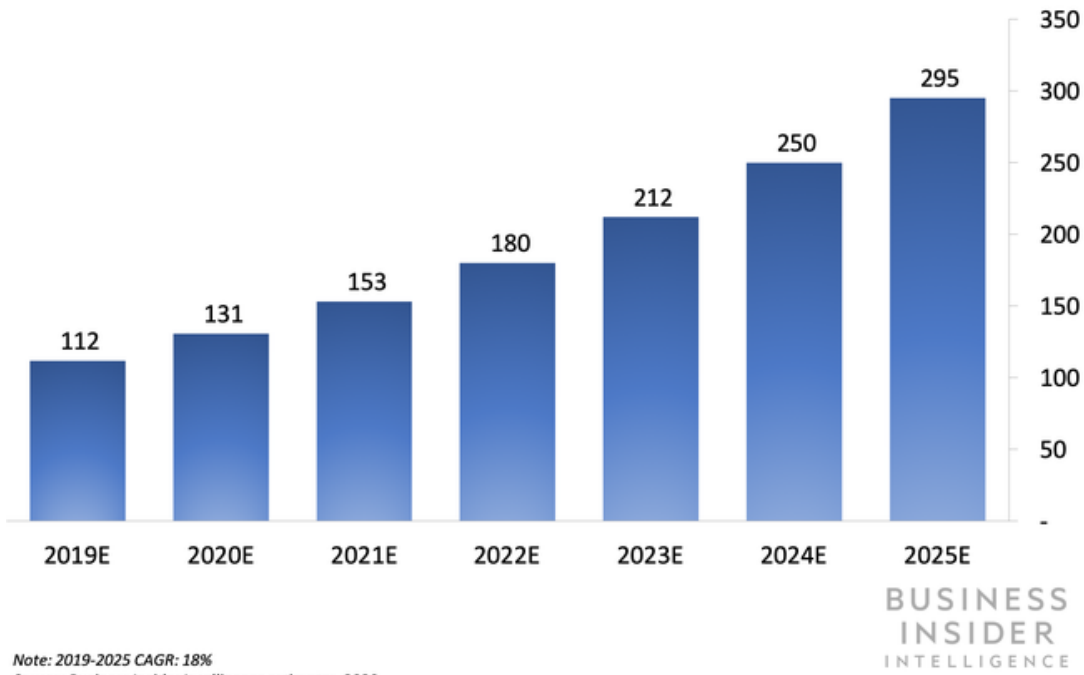
The coronavirus could highlight possible use cases for virtual reality (VR) in enterprises, boosting the technology's uptake.

The outbreaks of coronavirus have caused big tech companies like Apple, Google, and Microsoft to recommend or mandate that employees work from home. While this is the safest course of action during the pandemic, it does inhibit collaborative efforts and opportunities for hands-on training.

Companies already have been identified VR as a tool to improve employee training, but the coronavirus could prove to be the impetus for some workplaces to implement the technology.

Annual Smart City Investment

Global, billions (\$)



Investment in smart city solutions will continue to grow as the tech has proven to be a valuable tool in crisis management.

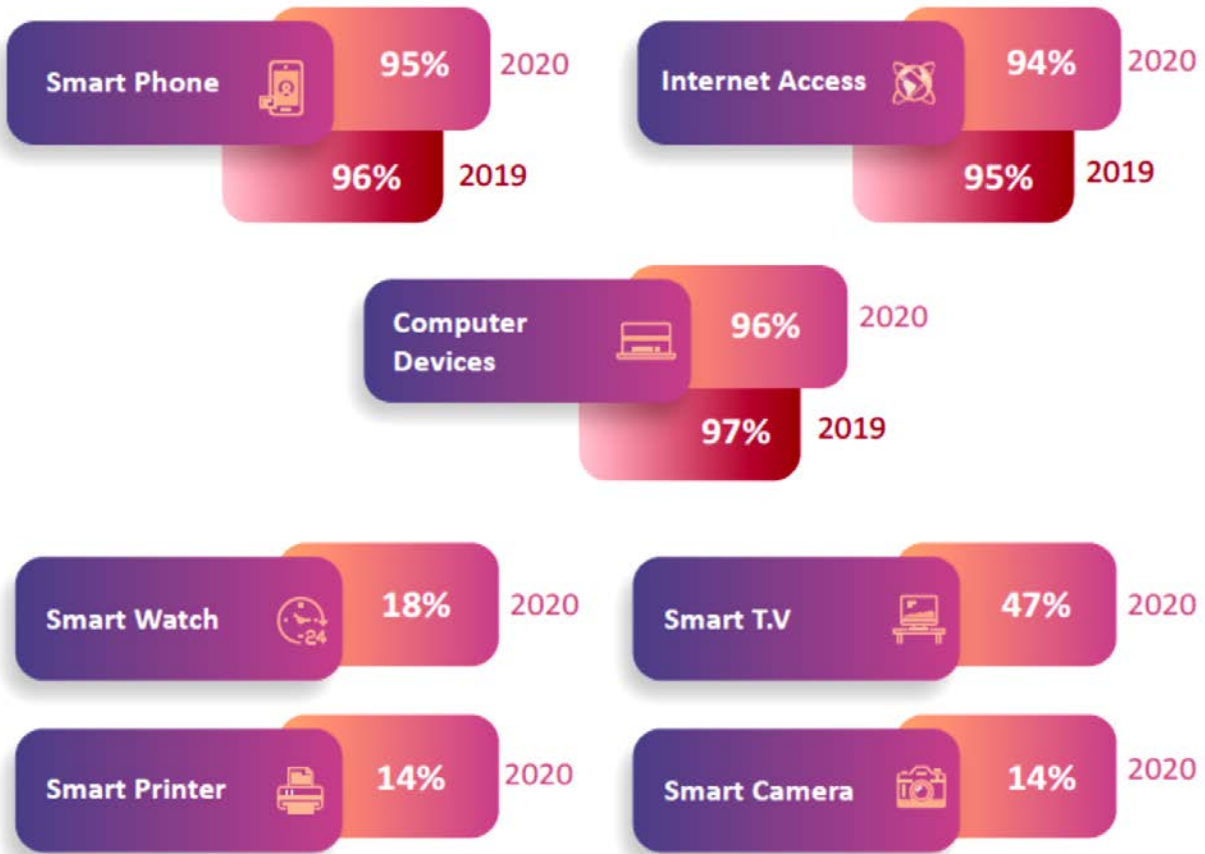
Cities around the world have utilized smart city technology in attempts to mitigate the impact of coronavirus.

Police in China are using drones with thermal sensors to identify people in public running a fever. The South Korean government developed a smartphone app that puts self-quarantined individuals in touch with caseworkers,

While these solutions are far-reaching, they all fall within the domain of smart cities, proving the space to be a worthwhile investment in a time of crisis. Most smart city solutions are intended to support the day-to-day operations of a city. But that underlying infrastructure — whether it be city-wide connectivity, surveillance systems, or citizen communication platforms — can be adapted to meet the needs of a government in a time of crisis, as the coronavirus has demonstrated.

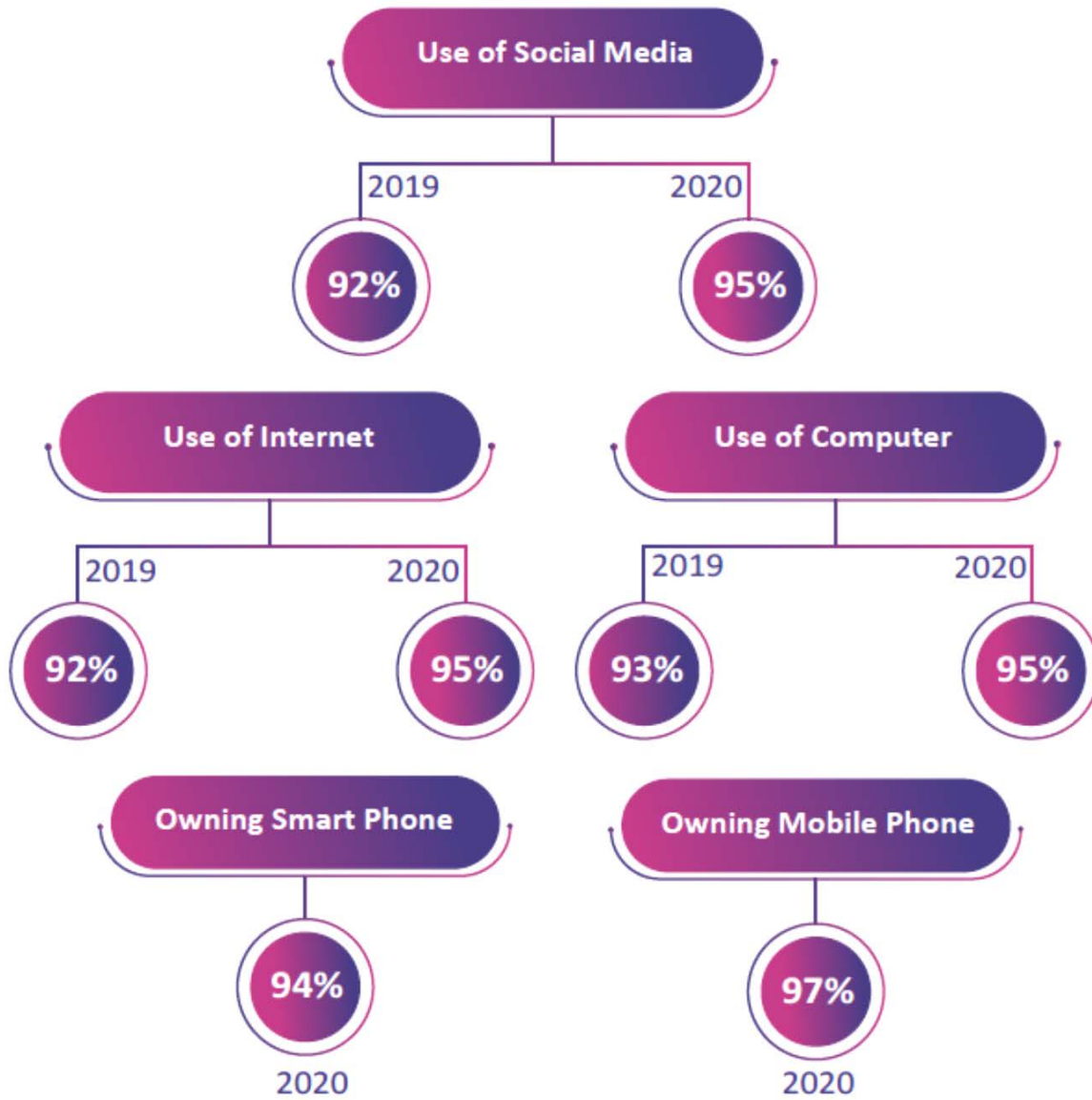
Access to ICTs by household in Oman: The most important indicators of access to information and communication technologies in the household sector are owning smartphones by households, which amounted to 95%, in addition to households’ access to the Internet, which reached 94%. The indicators of accessing and using the Internet, computer (including smartphones) witnessed a slight decrease compared to the results of the 2019 survey for each of the indicators:

Access to ICTs by Household



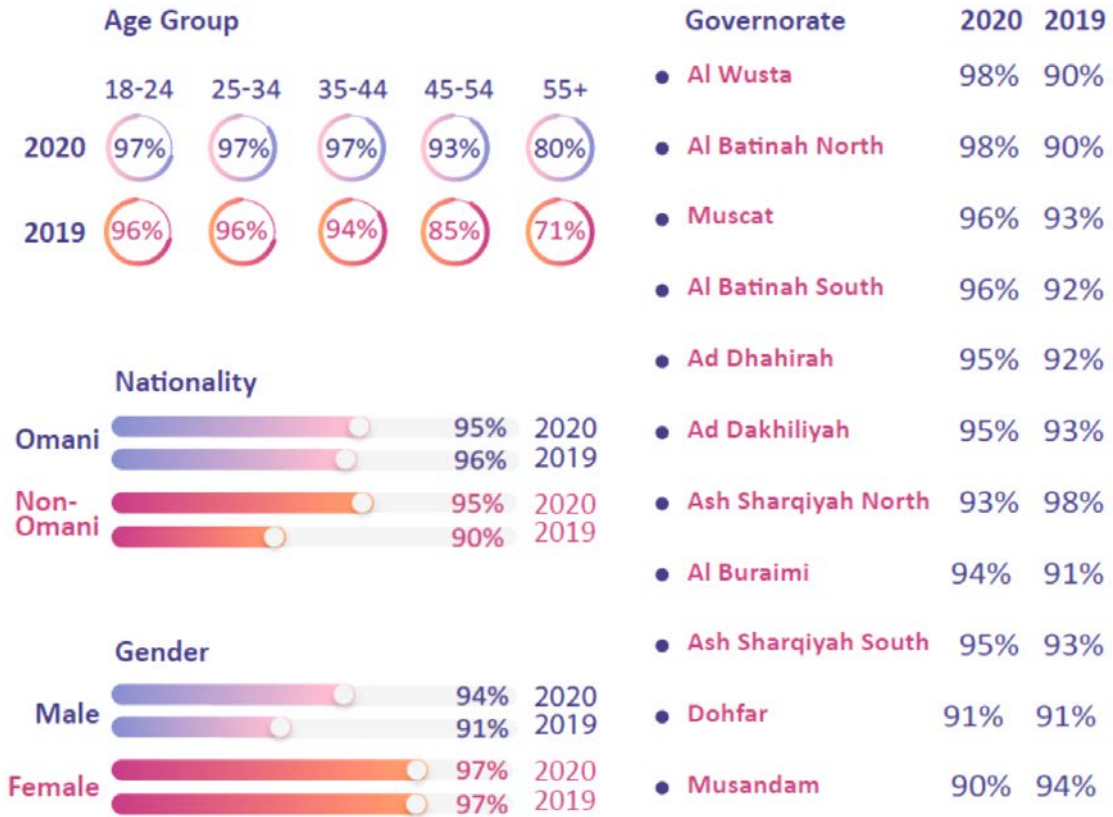
Access to and use of ICTs by Individuals: the 2020 survey results shows that the percentage of individuals owning mobile phones is 97%, while it was 94% in the previous survey on 2019. With regard to the use of information and communication technologies by individuals during the past three months, some indicators witnessed an increase compared to the results of the survey conducted last year.

Access to and Use of ICTs by Individuals



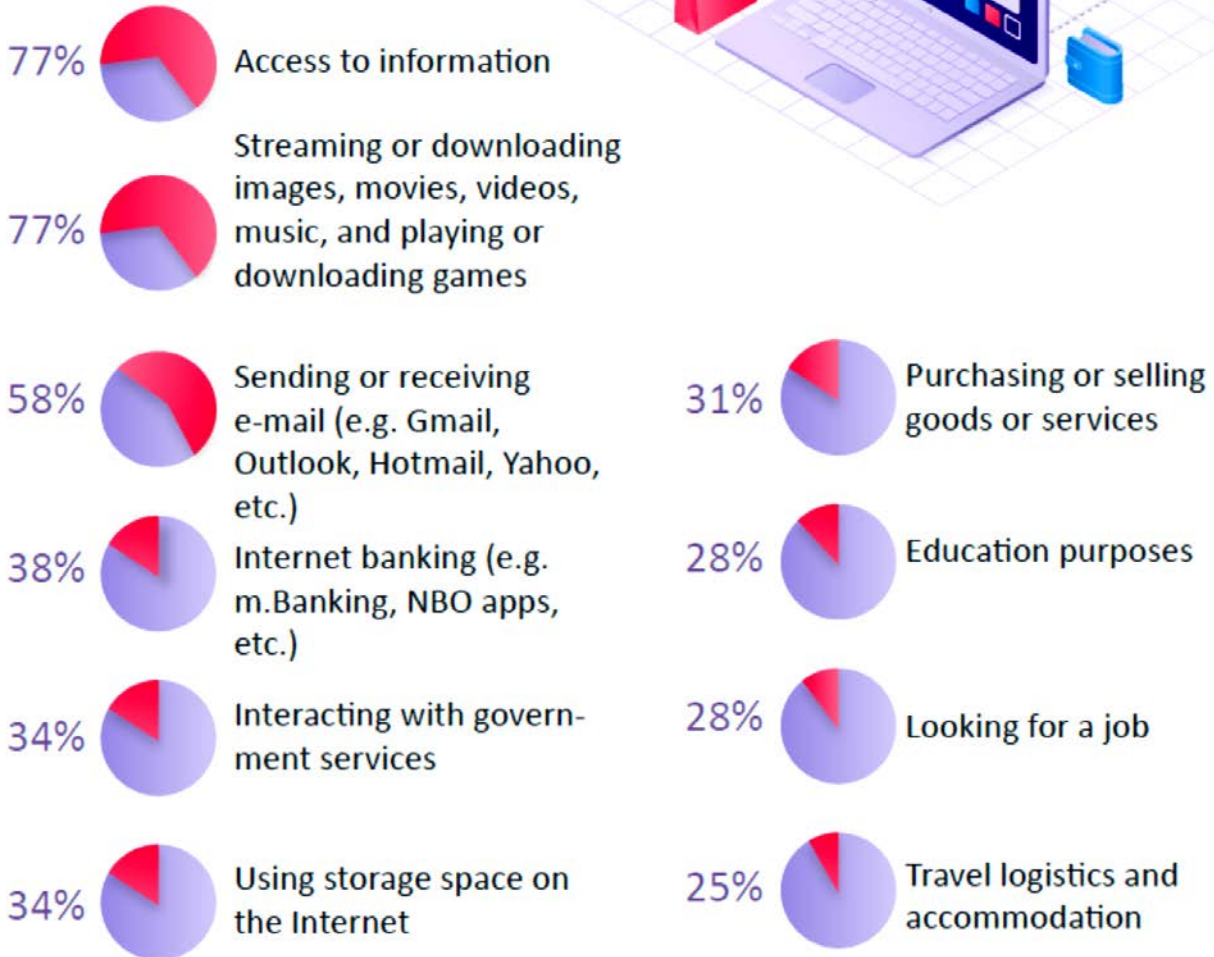
The 2020 survey results indicate that the percentage of Internet users in the sultanate of Oman increased to 95% compared to 92% in 2019.

Use of Internet by Individuals across Nationality, Gender, Age Group, Governorate; 2019-2020

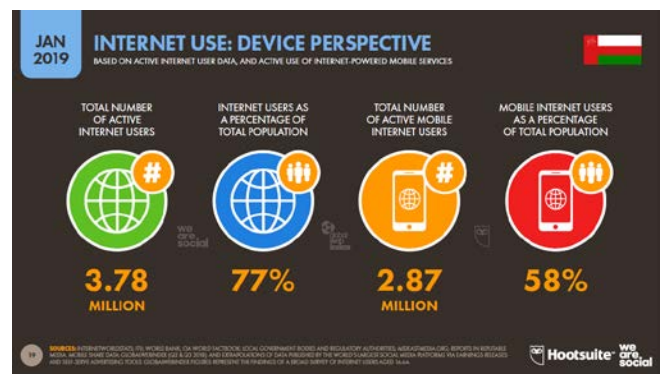
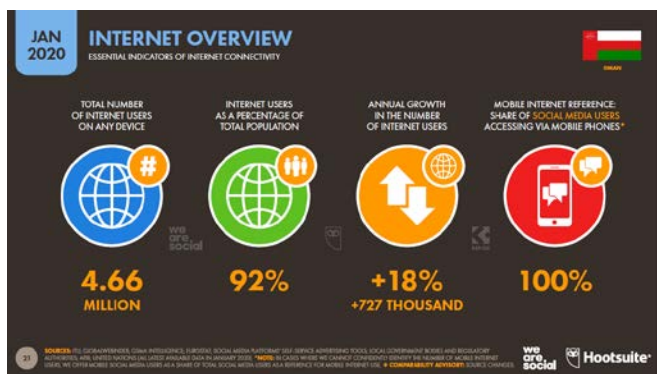


Below figure shows the most important activities that individuals perform online. The results indicate that approximately 77% of Internet users search for and down-load files, videos, pictures, electronic games and others. In addition, at the same percentage (77%) use the Internet to search for information (such as searching for information about goods, services, or health-related information, government services, reading or downloading newspapers, magazines, or e-books). The lowest percentage. of uses of the Internet appears in using internet for travel and hotel reservation and electronic services, which reached 25%.

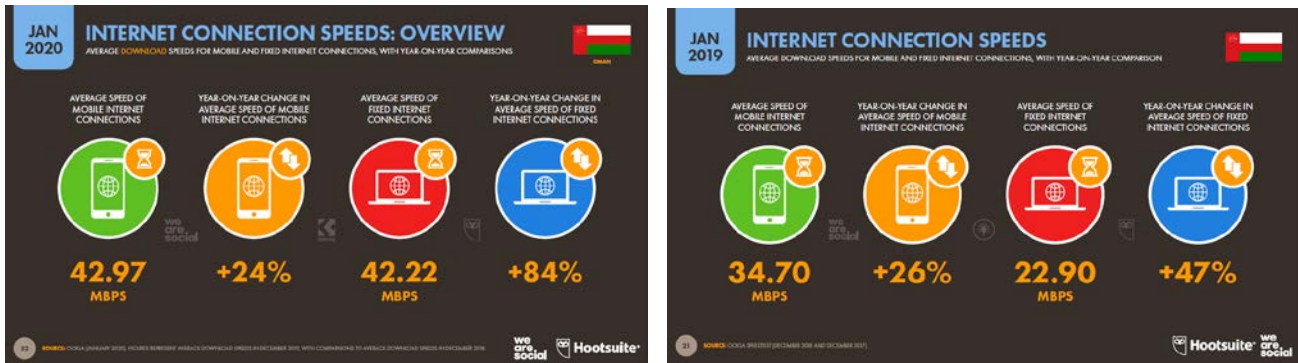
Activities Performed Online by Internet Users; 2020



Below figures show a comparison on Internet Overview in Sultanate of Oman between January 2019 and January 2020,



Below figures show a comparison on Internet Connection Speed Overview in Sultanate of Oman between January 2019 and January 2020,



Recommendations and solutions:

Because of the COVID-19 outbreak conditions, demand for using Telecommunication networks and ICT have been increased, customers have been using internet and social networks for many purposes such as access to information, down loading files, movies and etc., sending and receiving emails, internet banking, interacting with the government services and many other purposes,

Resilience and capacity of the mobile network were not suitable for the increased demand and customers are not satisfied from the services consequently,

Hence telecommunication network augmentation such as VDSL in short-term and FTTX as mid-term action plans should be considered,

in this regard the government may support private sectors, knowledge-based companies and consulting engineers to provide studies, master plans, expansion plans of the telecom network,

the government can guaranty private sector market and the private sector can provide required equipment for extension of the telecom network and implementing projects in line with extension of the network,

the government should allocate more frequency band to mobile network to increase its capacity and its resilience for the demands which have been increased by customers.

Supporting on-line services, on-line education, social media concepts, on-line services, e-government services and facilitating wide band internet access through 5G technology will help the government to deal with the crisis which is happening in telecom and ICT sector because of COVID-19 outbreak.

Investment in smart city solutions will continue to grow as the technology has proven to be a valuable tool in crisis management.

Cities around the world have utilized smart city technology in attempts to mitigate the impact of coronavirus.

While these solutions are far-reaching, they all fall within the domain of smart cities, proving the space to be a worthwhile investment in a time of crisis.

Most smart city solutions are intended to support the day-to-day operations of a city. But that underlying infrastructure — whether it be city-wide connectivity, surveillance systems, or citizen communication platforms — can be adapted to meet the needs of a government in a time of crisis, as the coronavirus has demonstrated.

The coronavirus outbreak condition could highlight possible use cases for virtual reality (VR) and augmented reality (AR) in enterprises, boosting the technology's uptake.

References:

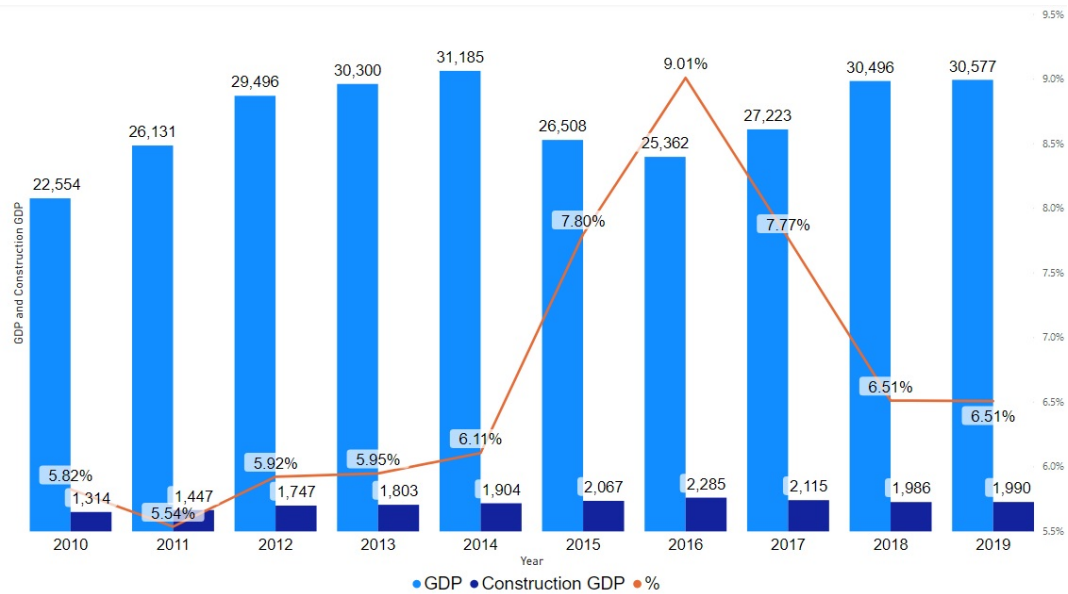
- Huawei & Oxford Economics. (2017). Digital Spillover. Measuring the true impact of the Digital Economy. Retrieved from
- Spiezia, V. (2013). ICT investments and productivity. OECD Journal: Economic Studies, (1), 199-211
- International Telecommunication Union (2018). Measuring the Information Society Report, 2018(1), 1-189.
- Worldwide IT Spending Will Reach \$2.8 Trillion in 2019 with the Strongest Growth Coming from the Healthcare Industry. (2016). Retrieved from
- International Data Corporation. (2018) IDC - Global ICT Spending - Forecast 2018 – 2022
- Business Insider Intelligence

5 Construction

5.1 *The Market Size*

As the second-largest driver of non-hydrocarbons growth and the sector that employs the greatest number of people, construction plays a key role in the development of Oman's economy. The investment in construction projects spans over aviation, shipping, logistics, and infrastructure.

In the past 10 years, the construction industry has accounts between 5.5 to 9 percent share of Oman's GDP and is the country's largest employer.



Construction GDP percentage of Total GDP in the past decade
(Figures in Million Rial Omani)

While GDP has seen a slight growth over the past four years, the trend for the construction industry has been downward, decreasing approximately 3 percent of the total GDP.

5.2 Main Concerns

While the government has supported the business environment over the past years, high Omanization requirements and stiff competition from international peer companies have been the main long-term concerns for domestic contractors.

5.3 2020 Development Plan

Spending on development projects was estimated at RO 1.3 billion in 2020 Budget, including following Key Development Projects:

- Health
 - Construction of hospitals in Salalah, Khasab and Suwaiq.
 - Rehabilitation of hospitals in Khasab and Samayil.
 - Completion of implementing a number of health centres in some wilayats.

- Water
 - Water networks projects in a number of wilayats.
 - Completion of implementing a number of underground recharge and flood protection dams in some wilayats.
 - Construction of water transmission pipeline projects such as Suhar-Ibri, Suhar-Barka and Gubrah-Seeb.
 - Completion of implementing water transmission network from Qurayat Desalination Plant.

- Transport
 - Completion of implementing air cargo terminals and aircraft maintenance hangars at Muscat International Airport and Salalah Airport.
 - Completion of Sharqiyah Expressway Project.
 - Paving of internal roads in various wilayats.
 - Completion of Adam-Thamrait Road Dualisation Project.
 - Sinaw-Mahout-Duqm Road Project.
 - Completion of Barka-Nakhl Road Dualisation Project.
 - Ibri-Yanqul Road Dualisation Project.

- Ports:
 - Bulk Liquid Berth at Duqm and Salalah ports.
 - Completion of implementing berths at Salalah Port.
 - Completion of implementing Commercial Berth at Duqm Port.
 - Completion of constructing fishing port and fisheries industrial complex at Duqm.
 - Development of Shinas Port.

- Housing
 - Completion of implementing infrastructure projects for Liwa City Housing Complex.
 - Completion of implementing compensation scheme set for the people whose houses were affected by Batinah Coastal Road Project.
 - Completion of constructing alternative housing units for the people whose houses were affected by Batinah Coastal Road Project.
 - Providing housing assistance in a number of wilayats.
 - Construction of 400 housing units in Khor Souly, Salalah.

- Education
 - Construction of a number of schools, and implementation of additional facilities for some existing schools.

- Agriculture
 - Completion of implementing integrated pest management of Dubas Bug and Red Palm Weevil Project.
 - Completion of implementing National Livestock Vaccination Project.

- Fisheries
 - Development and rehabilitation of fishing ports (Sadah, Musannah, Daba, Shuwaymiyah, Mahout, Lima and Hallaniyat).
 - Manufacturing
 - Expansion of Rusayl Industrial Estate (First Phase) and Sohar Industrial Estate.

- Sports
 - Completion of constructing Ibra and Musannah sport stadiums.

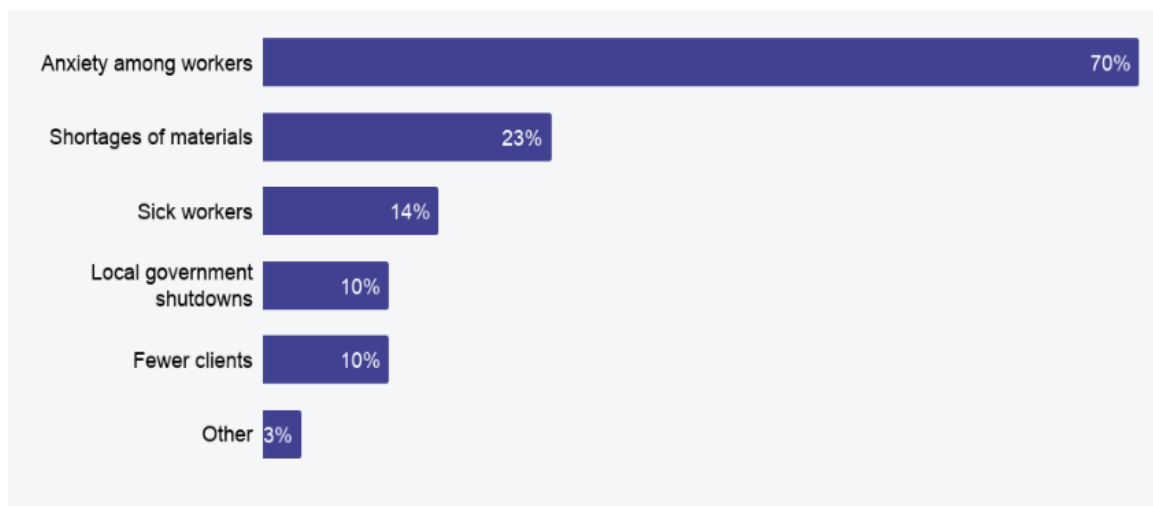
5.4 **Potential Impacts of Coronavirus & Possible Measures**

At the first glance, the potential impacts of COVID-19 on the construction industry may be the delays on the planned construction schedule, arise in any number of scenarios, including labour disruptions, critical supply chain disruptions, a delay or inability to obtain required permits and unforeseen events impacting the availability of financing. However, the size of impacts may be extended more with a deeper look into the industry. The areas that impacts will be seen includes:

5.4.1 Employee health and safety

First and foremost, companies in affected regions will be concerned with employees well-being. The good news is that the risk of transmission for those employed outside the healthcare sector is low.

In addition to physical wellness, contractors are considering mental health, too, because employers report anxiety among workers as one of the top issues brought on by the coronavirus. In an informal Construction Dive survey, 70% of respondents noted “employee anxiety” as their top concern, above material shortages and the prospect of government shutdowns.



A construction survey” how does the coronavirus affected your work?”
(based on multiple responses per person)

While there have only been a few reports of the virus directly impacting the construction workforce, it could just be a matter of time before it becomes a bigger problem. Emergency protocols within affected communities could trigger a variety of challenges. If public transportation shuts down or schools close, many employees may find it difficult or impossible to show up for work.

One of the biggest risks opposing a construction project may be that Factory workers, construction workers, supervisors and managers could all end up quarantined and not be available to work.

Possible Measures:

The organization has developed a Toolbox Talk for its members to use to discuss the issue with their crews. The chapter's primary advice to contractors is to remind teams to use good hygiene including frequent hand-washing, covering coughs and avoiding touching your face.

5.4.2 *Material delays*

Governmental containment efforts and quarantines have slowed or shut down factories in dozens of many countries, leading to forecasts of a sharp falloff in required construction materials. For contractors that rely on overseas-made goods or materials, this could mean higher material costs and potentially slower project completions.

Possible Measures:

Clients and contractors should aggressively seek out alternative domestic suppliers or in countries that haven't been negatively impacted by major supply chain interruptions.

5.4.3 *Clients and lenders*

One of the most devastating consequences of the virus could be that it frightens clients and lenders, especially firms that work in highly impacted segments like hospitality. The financing may decrease for new jobs and owners may put projects on hold until the uncertainty passes.

Despite of historically low interest rates making it the perfect time to finance a project, there has already been a pullback in construction financing and a greater focus on risk mitigation and conservative plans.

Possible Measures:

Insurance policies can help mitigate the effects of shutdowns and delays and construction pros across the country need to check their policies to see what types of situations are covered. There are possible avenues for coverage such as workers compensation for outbreak of sickness or disease, trade disruption insurance for contractors with international supply chains and travel insurance to protect firms whose employees travel frequently for business.

5.4.4 *Quarantines and travel bans*

To help prevent the spread of the virus, many countries have shut down businesses. Construction companies across the world also are considering how they will react to an outbreak near one of their jobsites or offices. Construction companies have put in place rigorous travel guidance for employees by implementing a ban on international business travel across the globe.

Possible Measures:

These shutdowns and bans mean that companies will need to turn to teleworking and other technologies to keep business running smoothly while employees are at home.

5.4.5 *Legal issues*

While the coronavirus pandemic was unforeseeable, contractors may still be contractually responsible for delays or cost overruns on current projects. Both contractors and owners will be reviewing contracts to see what contractual rights and duties exist in light of the conditions caused by the virus' spread. There are many terms that will be relevant to those discussions,

including the various contractual terms relating to the contractor's schedules, substantial completion, delays, damages and other contractual provisions.

Possible Measures:

Lawyers recommend knowing exactly what is in each contract, and taking special note of any force majeure provisions that allow work to be suspended or terminated when certain extenuating circumstances arise. Whether something qualifies as a force majeure event will vary by jurisdiction and contract.

5.4.6 Global uncertainty

Recent historic levels of volatility in the stock market and oil disputes in the Middle East have amplified the level of anxiety among all member of all societies.

In fact, the virus and its impact have affected the markets so much, that some analysts believe they cannot now make a forecast for the remainder of 2020.

6 Engineering

Since the 2008 financial crisis, the consulting industry has seen exponential growth. The market value of consulting is estimated at \$ 160 billion. The coronavirus has pushed the clients delaying their projects as well as canceling future plans. This has become a massive blow for the consulting industry as revenues are diminishing.

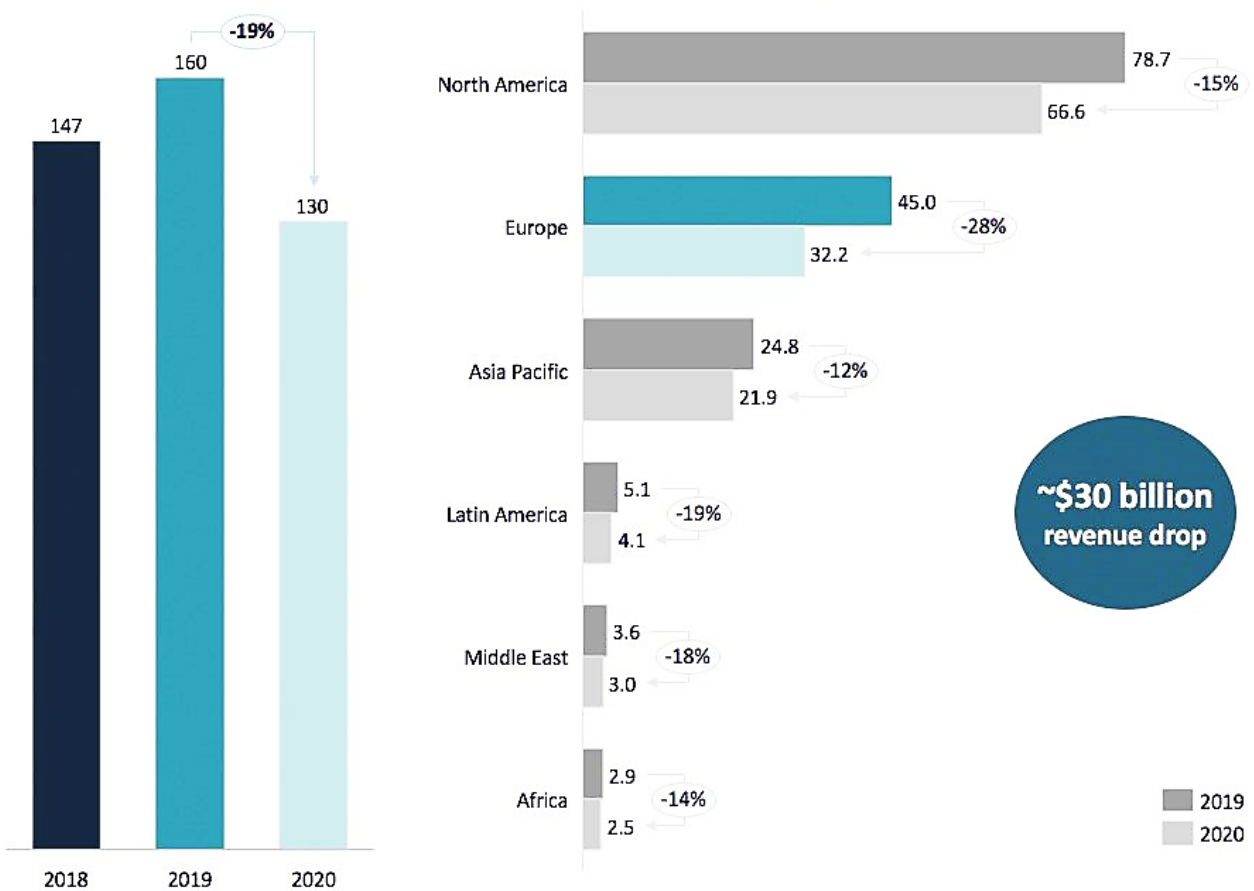
The consulting industry has already been noticeably impacted by the global pandemic in a number of ways. Consultants are regular travelers, making them particularly susceptible to the virus' spread, while the financial downturn will likely have a large impact on their revenues.

According to research done by Consultancy.org, the global consulting industry could lose up to \$30 billion in revenue in 2020.

Source Global Research collected data from various consulting firms across the globe to understand the impact of this pandemic on the consulting industry. The research concluded that Covid-19 could reduce the size of the consulting sector by 19%. This translates to a decrease in market value from \$160 billion to \$130 billion as of 2020.

The global consulting markets, like the UK (largest consulting market), has seen stagnant growth. This is due to the UK's exit (Brexit) from the European Union. The growth decreased to 4% last year, making it the slowest growth progress since 2012.

Apart from the UK, Europe's consulting scene is also declining. The European market generates € 12 billion in revenues coming from Germany, Austria, and Switzerland combined. Germany's contribution to the European consulting market in terms of revenue is 85%. Making Germany the second-largest market after the UK. This is due to the fact that the German market has an extensive automobile manufacturing base. Just like Britain, Germany has been walloped by the Covid-19 situation. The supply chain and manufacturing industry are likely to see a massive dip in revenue and their market to shrink more than the average.



Source: Consultancy.org estimates, Source Global Research. All data in US\$ billion

Impacts of Coronavirus on Europe’s consulting industry

6.1 Opportunities for consultants

The current situation has not only affected the consulting industry but also the consultants. Remote working for consultants is not new. Consulting is the first industry to pioneer remote working, as consultants need to work from different parts of the world for their projects. The current digitization trend and adoption of technologies has become key in helping businesses survive during these challenging times.

Many companies are wondering how to deal with the situation and the economic consequences. And that's why consultants are still in demand.

At the same time these technologies have made the job of consultants easier by bringing their clients and work closer to them. Companies around the world are looking for answers on how to deal with this situation, and they are looking for consultants to get these answers. Firms must restructure and cut their costs to reduce losses, which is something consulting firms have been doing for a long time. Covid-19 has also created strains in human capital for businesses. HR consultants are in high demand to tackle these economic consequences.

6.2 *Strategies for businesses to reduce the impact of corona*

6.2.1 *Make people safety and continuous engagement the priority*

It is recommended that firms have flexible work arrangements. If remote working is not possible, companies should provide protection to workers against infection.

6.2.2 *Reshaping business strategy*

Companies are facing disruption in their daily operations and business revenue. It is recommended to inject short term cash inflows to avoid cash shortages. Closely monitor direct costs attached to your business and look for a way to contain the price fluctuations.

Firms need to work on different financial plans and establish multiple scenarios and modify the plans to stay agile. They will need to look at near-term capital raising, debt refinancing, and policy support from the government while considering the curtailing of non-essential expenses.

6.2.3 *Communicate with stakeholders*

Communicate the situation with employees and clients to strike a balance between caution and business. Contact the suppliers to find alternative supply chain options. Let customers know the impact of your product or services in this situation.

6.2.4 *Maximize the use of government support policies*

Firms should monitor the government support policies and national organizations that offer support. They may help with tax exemptions, social insurance, contribution reductions, and the support can be crucial if the crisis worsens.

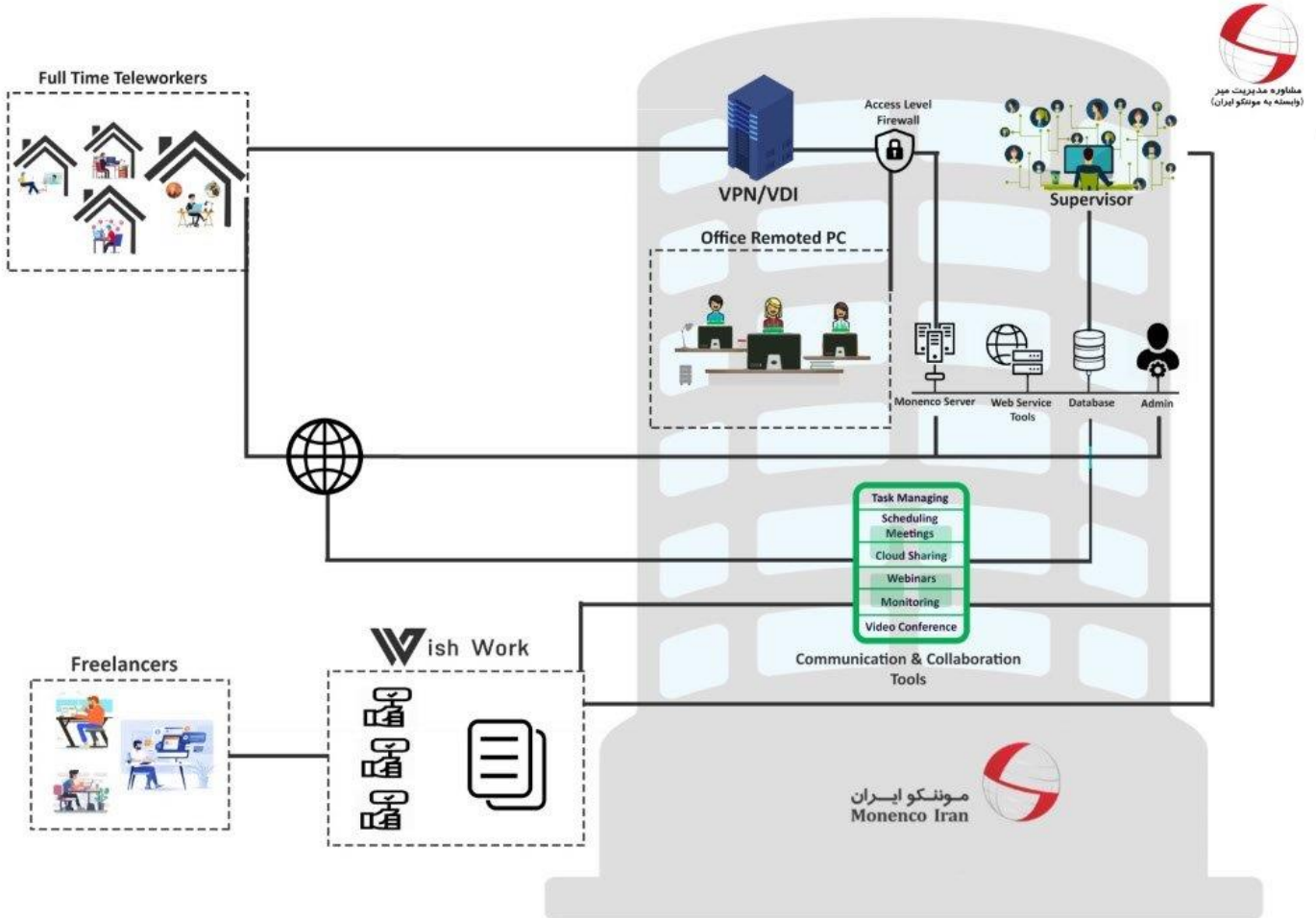
6.2.5 *Build resilience in preparation for a new normal*

After building new strategies based on the stress tests to tackle the crisis, firms need to execute the plans to sustain themselves. After the outbreak is controlled, firms need to look back at the problems faced concerning labor shortage, lack of infrastructure, and other issues. This will help businesses to create an effective contingency plan and respond to the crisis better in the future.

Teleworking solutions can improve capability of the engineering companies to manage the crisis of COVID-19 outbreak,

In this regard developing teleworking solutions and platforms should be considered as a one of the most effective solutions in engineering companies to deal with the crisis,

Tele working Platform



7 Health

7.1 Description

The first COVID-19 cases in Oman, diagnosed on 23 February 2020, since then, the Sultan of Oman, His Majesty Sultan Haitham bin Tarik has mobilized the national response through the newly formed Supreme Committee for COVID-19, established on 10 March. The Supreme Committee is multisectoral, led by the Minister of Interior and chaired by His Majesty Sultan Haitham himself for its key sessions.

In times of crisis, Oman demonstrates in practice its continued commitment to universal health coverage by increasing hospital capacity and the number of intensive care beds, supplies and mobilizing human resources to serve its population. This includes both Omani citizens as well as nearly 48% of non-Omani residents, to whom the Government is extending its diagnostic and treatment coverage for COVID-19, free of charge.



7.2 Risk

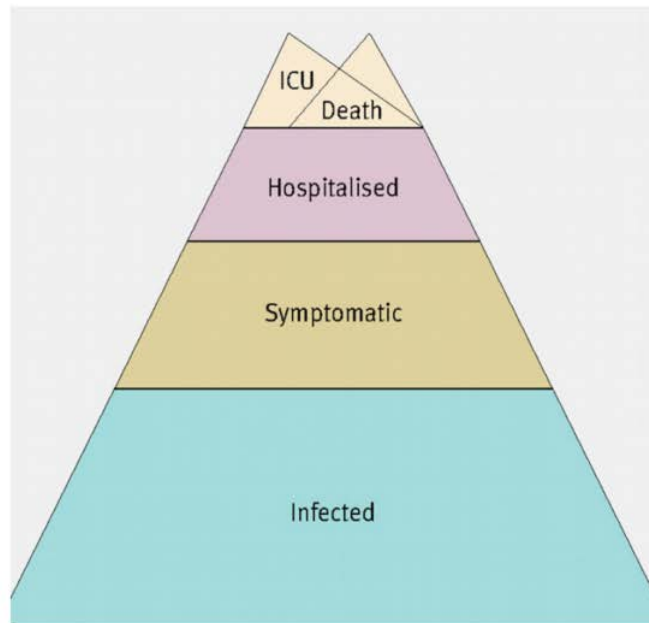
Health system response to the COVID-19 pandemic and its resilience in this condition is so vital for the country, so that government should develop different options for managing the crisis, Although the mortality rate of the COVID-19 is less than similar cases in SARS and MERS , however the COVID-19 is spreading very fast , so that it will be infecting many people in a short period of time , demands from the system will increase rapidly which the health care system may not be able to respond properly,

For managing the crisis and increasing resilience of the health care system the government should take necessary actions to find different possibilities of increasing capacity and resilience in the

healthcare system of the country, which e-health is one the option which can be considered for dealing with the condition properly,

COVID 19 Clinical presentation

- **Mild** (no or mild pneumonia) reported in about **80 percent**.
- **Severe disease** (e.g., with dyspnea, hypoxia, or >50 percent lung involvement on imaging within 24 to 48 hours) reported in about **15 percent**.
- **Critical disease** (e.g., with respiratory failure, shock, or multiorgan dysfunction) reported in **5 percent** (these complications **mainly in elderly and those with other health problems**)



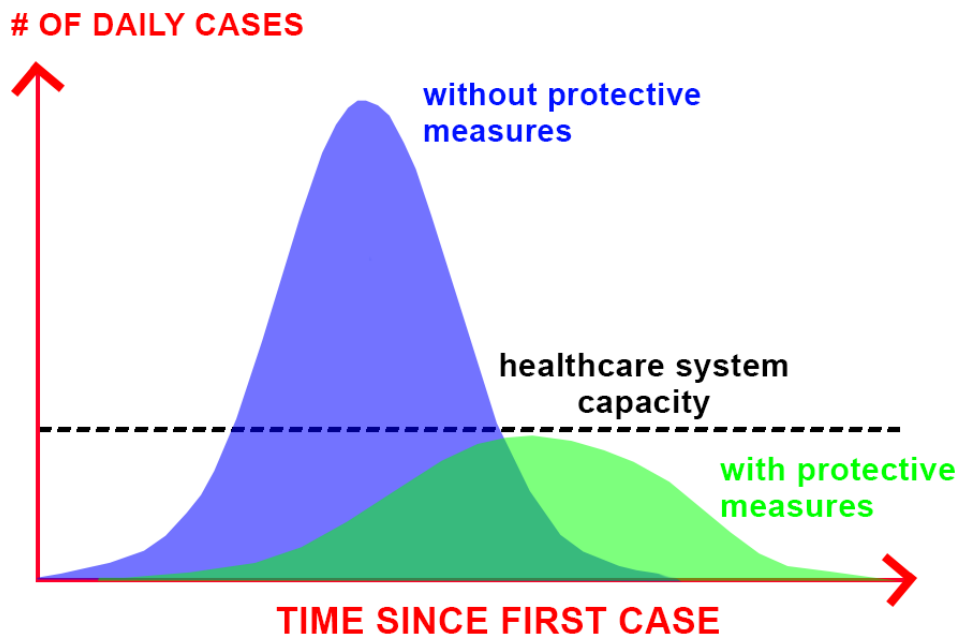
7.3 E Health.

E-Health is the use of information and communication technologies (ICT) for health. The eHealth unit works with partners at the global, regional and country level to promote and strengthen the use of ICT in health development, from applications in the field to global governance. The unit is based in the Department of Service Delivery and Safety in the Cluster of Health Systems and Innovation.



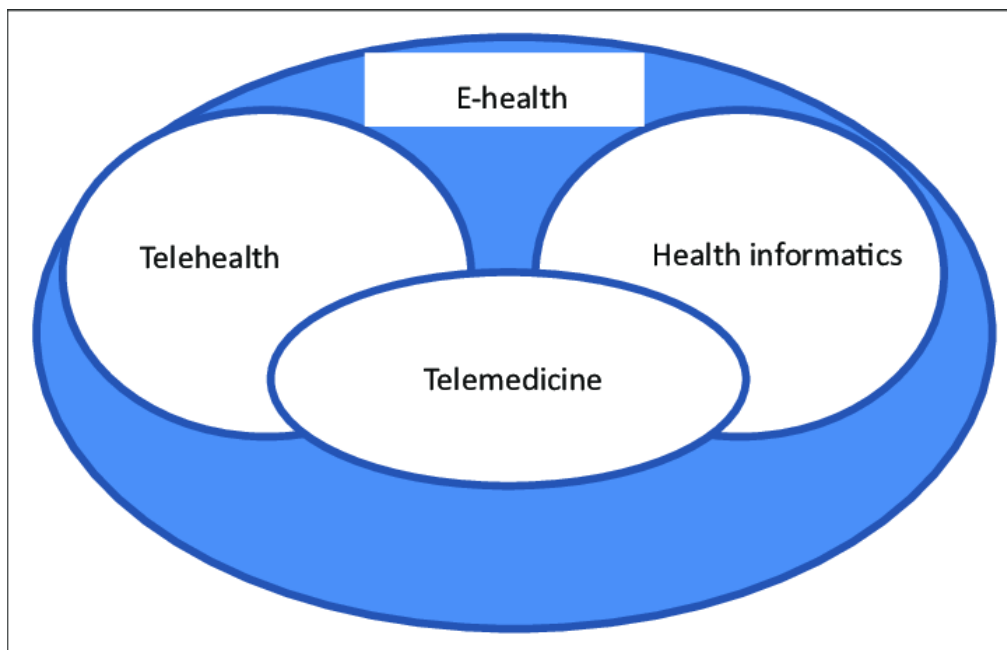
The actual Corona pandemic strains and sometimes overstrains the healthcare systems in the different countries. eHealth solution can help to lighten the load of the different professions a little bit or at least to support them in their work.

This is the reason for this report, to show which eHealth tools are used by the different partner countries to handle the crisis. This article is only an overview of some selected measures in some European countries. It should demonstrate the changes in the eHealth sector that are happening now.



Online Consultations with doctors

In the current situation video consultation with the doctor guarantees safer medical care. Especially people with chronic disease need regular contact to the doctor but are part of the high-risk group. They can stay at home and have their consultation online. Furthermore, it helps preventing other people and medical staff to get infected in the waiting rooms.



Chance for more digitalization

A lot have been done to still provide the needed healthcare services and that can be a chance for more digitalization in this area. A high level of flexibility is visible at the moment – because the people are forced to be flexible. Some of the measures are temporary with a good reason, but some other will have a chance to establish afterwards. E-Health solutions have a lot of advantages, regardless of this world-wide pandemic.

The people have to adapt to the current situation, are trying new things and maybe in some cases will accept new tools. Hopefully some of these tools will be more successful – even after the Corona crisis.

Governing eHealth Investments

The MOH of Oman eHealth Strategy should be represented by government, a massive investment in Healthcare technology, and major changes to clinical and business processes, will be required. Managing a program of this nature, which affects tens of thousands of physicians, nurses, pharmacists and other system users, as well as Omani citizens and residents served by MOH, will require a highly organized governance structure.

By governing the organization below advantages will be available to health care system:

Benefits to Providers

With eHealth, Healthcare professionals (doctors, nurses, and other professionals) will have ready access to all information and whatever required for their services very easily,

Benefits to Health System Managers

With eHealth, Health System Managers, in Hospitals, Regions and Headquarters will be able to optimize their services and their cost and time and it will increase their capabilities, especially during any crisis such as COVID-19 which may happen in future,

Benefits to Patients

With eHealth, Patients will feel the difference in Healthcare delivery of Medicare services,

Recommendations:

For establishing e-healthcare system in Sultanate of Oman properly, Oman routine program work has to be done, to manage all the current efforts being re-oriented to respond to the ongoing health emergency. While at the onset of the emergency, the supports including speedy shipments for minimum initial requirements of testing supplies and personal protective equipment (PPE), have to be provided by the government,



Oman collaboration with international organizations such as WHO will be required to fight against the COVID-19, and below actions are suggested to be taken by the government based on science and research, including:

- Exchange, wide dissemination and use of WHO's generated evidence, technical guidelines and procedures that give directions to various preparedness, management and response activities;
- Coherent use of Information, Education and Communication (IEC) materials and cooperation on responsible media messages;
- National workshops and trainings for the surveillance, management and emergency operations across the Sultanate;
- Engagement in global research, solidarity trial and other partnerships to build evidence for planning/projections, diagnostic, management of COVID-19 infected patients, surveillance and response strategies;
- Mobilizing UN and other partners' contributions under one Strategic Preparedness and Response Plan for COVID-19 and coordinating partners' response aligned with the national response, and its strategic mandate to promote health, keep the country safe and protect vulnerable.



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