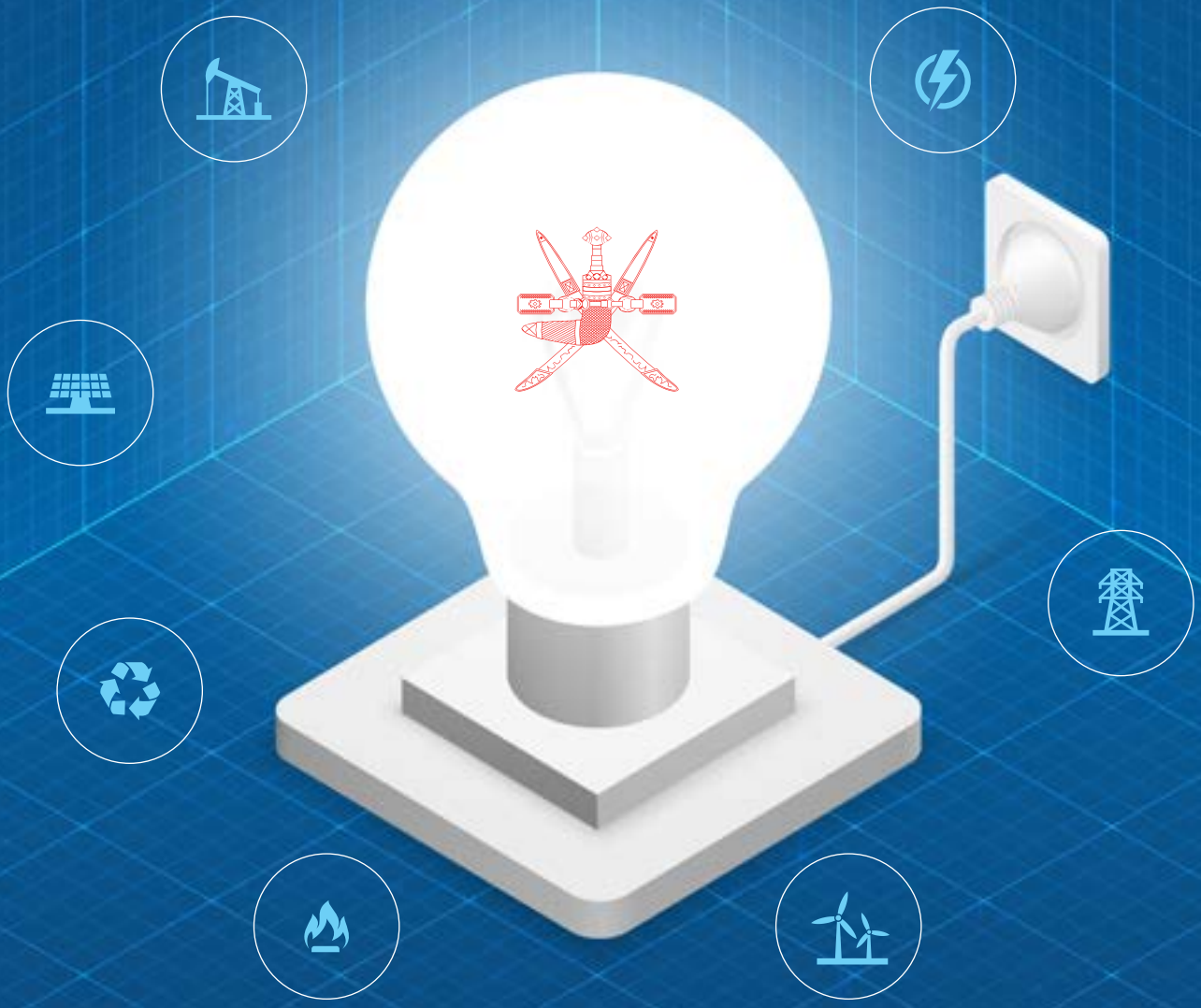
Oman Energy Master Plan 2040

Three Years On – What's Happened?



PROGRESS REPORT 2016-2017-2018

GI Consultancy
Gulf Intelligence

Executive Summary: Progress Report 2016-2017-2018

While the Sultanate of Oman has been able to use petro-dollars to fuel strong development over recent years, its economic and demographic growth is now poised to outstrip resources, posing a complex nexus of questions about how best to diversify its energy mix, while ensuring energy security and is it possible to do both without liberalizing the economy. There is no doubt Oman faces major energy challenges in the coming decades as conventional fossil fuel resources dwindle and its young population continues to grow rapidly.

Inevitably that leaves officials grappling about the long-term viability of the economy and the best energy sources and strategies to meet its needs and drive economic growth. Should Oman pursue clean coal, nuclear power or renewable resources? How important is R&D and the advent of new technology, what about addressing state subsidies that risk the frittering of cheap state energy. We need to ensure that industry-academia-government is adequately aligned to deliver the knowledge and labor force for overcoming tomorrow's challenges.

While there are divergent views on which of these questions are most important, a consensus emerges on the first step to resolving this riddle – that is the need to draft a 25-Year Oman Energy Master Plan. Rising domestic energy demand is presenting the country with a string of challenges and pressure on the Sultanate's already tight natural gas resources. Oman will have to devise a long-term strategy that considers adding alternative power generation sources such as renewable energies, while also enhancing energy efficiency and improving demand-side management both on an individual and industrial level.

As the major contributor to the national GDP, the oil and gas industry and the energy sector in general are uniquely placed to drive innovation in all sectors of the economy. The private sector is of fundamental importance. For Oman to succeed in its long-term quest of becoming a diversified, knowledge economy that offers high-valued and sustainable employment for nationals and doesn't have to rely on the sale of hydrocarbons, the country may need to liberalize the economy and establish a much bigger private sector that serves as an economic growth and job creation engine – and provide incentives for Omanis to move into it.

Two hundred national & international stakeholders from the Oman energy industry, and its associated ecosystem from academia, government, international organizations and the private sector gathered for The OEF Industry Workshop on Oct. 20, 2015 to answer the Question:

What does Oman need to do to ensure that it it still a significant oil & gas producer in the year 2040?

The answers revolved around five streams of study:

1. **Energy Supply**
2. **Energy Demand**
3. **R&D**
4. **Labour**
5. **Water-Food-Energy Nexus**

The Oman Energy Master Plan 2040 Whitepaper was published in Q1, 2016 with 3 RECOMMENDATIONS in each of the 5 STREAMS of Study - see opposite page attached:

Oman Energy Master Plan 2040

– Original 15 Recommendation Published in Q1, 2016 Listed below:

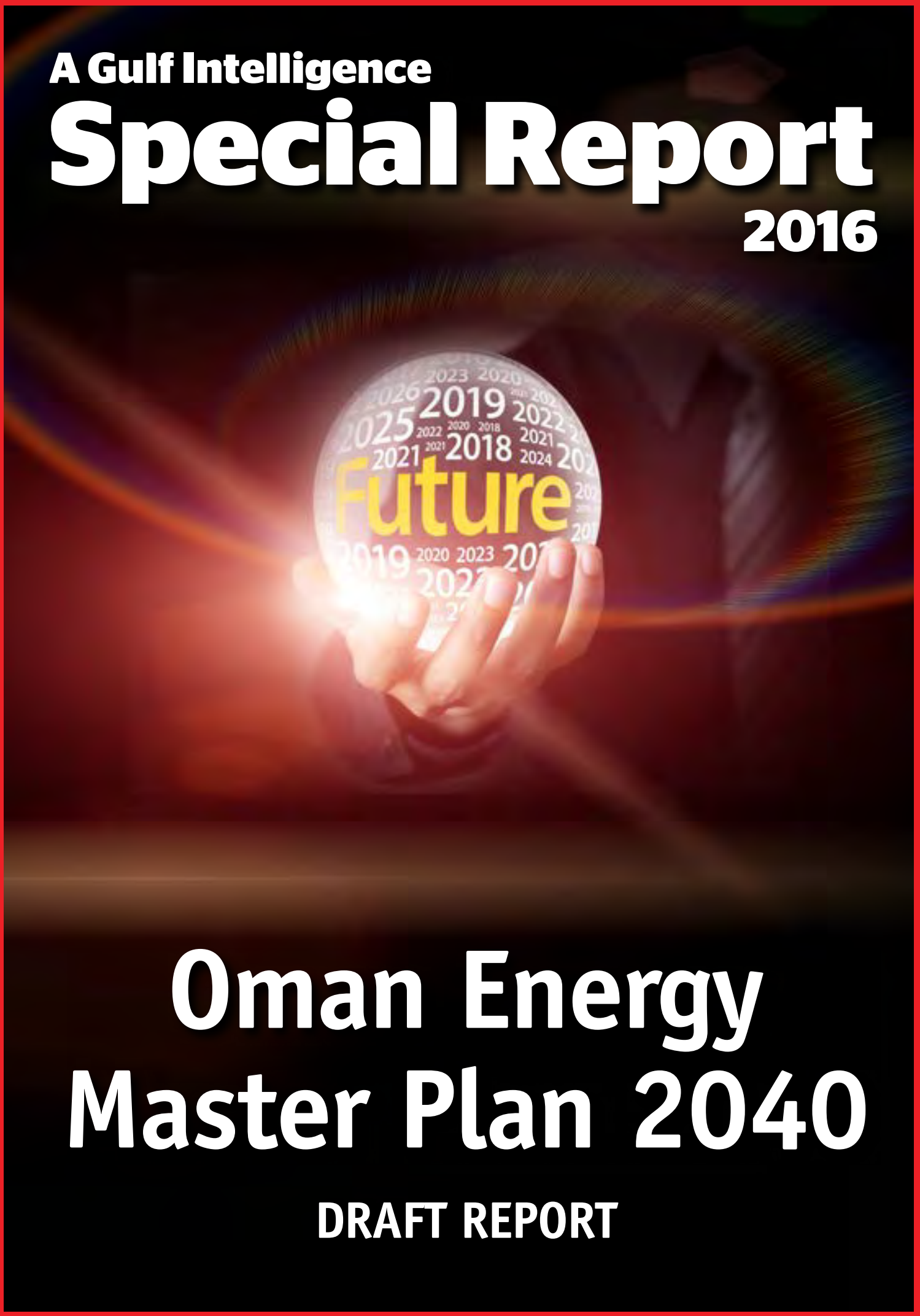
** Updates for this publication have been compiled from information that is publicly available*

RECOMMENDATIONS	SUMMARY	PROGRESS ON PAGES
STREAM I ENERGY SUPPLY *What Are The Top 3 Recommended Strategies To Maximize Benefits To Oman Of Its Energy Resources?*		
1. Create, Adopt and Implement a Comprehensive Energy Action Plan that can Facilitate the Immediate Implementation of Renewables	Increasing Oman's renewable energy activity requires clear targets and dedicated policy and regulatory frameworks, which nurture institutional coordination and nationwide capacity building.	6
2. Establish a Ministry of Energy	Establishing a dedicated energy ministry that is responsible for renewable energy and development in what is an increasingly diverse sector would mark a major step towards improving national energy and economic security.	6
3. Establish Small Scale Rooftop and Hybrid Power Generation, which also Support Local Communities	The government can encourage the development and application of small scale roof top solar installations that are backed by an official regulatory body, which monitors policy, permits and building code and standards. local communities can get involved in hybrid power generation – consisting of solar, wind, diesel and gas – which is particularly cost-effective and useful for remote homes.	7
STREAM 2 ENERGY DEMAND *What Are The Top 3 Recommendations For Tackling Oman's Domestic Energy Demand & Consumption Over The Next 25 Years?*		
1. The Structured Removal of Subsidies	Conversations in Oman to reduce, or cut energy-related subsidies have long been met with confusion and resistance. Cuts must be adjusted as per an individual's standing in society so that the lifestyle of those who are most vulnerable is not jeopardised. The government must provide transparent examples as to where the cash that is typically earmarked for subsidies will be spent	8
2. Inducing Positive Human Behaviour on a National Scale	Inducing a nationwide change in behaviour is essential in boosting the level of energy efficiency in homes, workplaces and modes of transport throughout Oman.	8
3. Centralize Oman's Energy Policy under a Single Authority	There are many demands on Oman's government to establish a coordinated energy policy that is driven by a single and empowered body. The entity must have the authority to determine the right energy mix for the country - one that incorporates oil, gas and renewables - and the power to establish a mandate for the efficient use of that energy portfolio.	9
STREAM 3 RESEARCH & DEVELOPMENT *What Are The Top 3 Strategies Needed To Align Academia And Industry To Deliver An Enhanced R&D Ecosystem In Oman?*		
1. Narrow the Gap between Industry and Academia to Establish Efficient R&D Partnerships	The alignment between Oman's Industry and Academia must be urgently improved in order for Oman to deliver an enhanced R&D ecosystem that fosters efficient private-partner partnerships.	10-11
2. Establish Research Clusters and Incubators with Universities across Oman that are Linked with Promotional Entities.	The establishment of research clusters and incubators across the country will aim to promote R&D in all parts of Oman, bringing together the various stakeholders and facilities across the country such as universities, private-sector institutions, multinational corporations and the public sector.	11
3. More Omani students need to get their PhDs in Oman.	Encouraging a higher number of PhD students to study and work in Oman is vital – they represent the intellectual value and driving force behind top-level research.	11
STREAM 4 LABOUR *What Are The Top 3 Recommended Strategies That Need To Be Adopted To Align Industry And Academia To Meet Oman's Future Labour Market Requirements?*		
1. Establish a Coordinating Committee with an Operational Mandate that Comprises of Senior Representatives from the MOM and the MOE, as well as selected Industry Leaders.	A coordinating committee could target the creation of 50,000 vocational job opportunities across Oman's private sector within two years, costing an estimated OMR220 million.	12
2. Bolster the government's role in regulating education and reduce its influence in delivering education.	The role of the government in Oman's education system should be solely as a regulator and not as a service provider.	13
3. The mismatch in skill sets between Oman's Industry and Academia and the Importance of Streaming Students into Vocational Training early on.	The mismatch between the number of Omani students in higher education and the job requirements set by the labour market is a major challenge facing the country's economy.	13
STREAM 5 WATER-FOOD-ENERGY NEXUS *What Are The Top 3 Recommended Innovative Solutions To Achieve Sustainable Growth?*		
1. Establish and Mandate and Executive Authority that Focuses on Water, Energy and Food. Identify Linkages between the Three Sectors, Develop Knowledge and Induce Behavioural Change.	An executive authority must be established to fulfill three main responsibilities to create a coordinated and integrated strategy.	14
2. Renewable Energy Based desalination should be key to Address the Issue of Water Security on a Small and Large Scale with A Focus on Cost Competitive Technologies.	Renewable desalination of water – a necessity in the Middle East – can be used to augment the increasing demand for fresh water supplies.	14
3. Enforce Building Codes and Standards for Sustainable Homes to Promote Water Savings and Energy Efficiency, such as the Development of Green Homes.	An official and nationwide programme that promotes, develops and regulates green homes in Oman must be based on well-defined building codes and standards that encompass four key points: economic efficiency, energy efficiency, sustainability and the minimal use of water.	14

A Gulf Intelligence

Special Report

2016



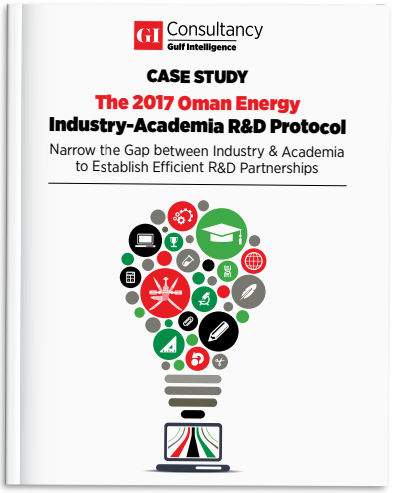
Oman Energy Master Plan 2040

DRAFT REPORT

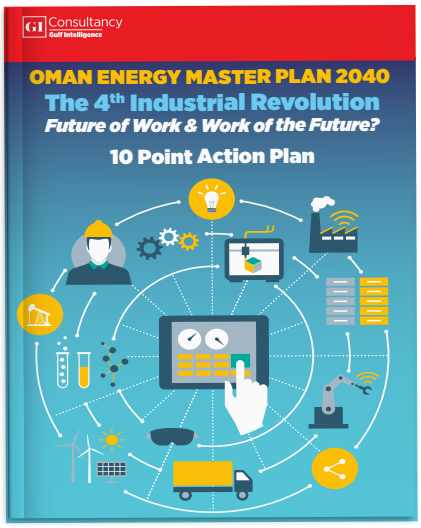
Sample of Campaign Implementations

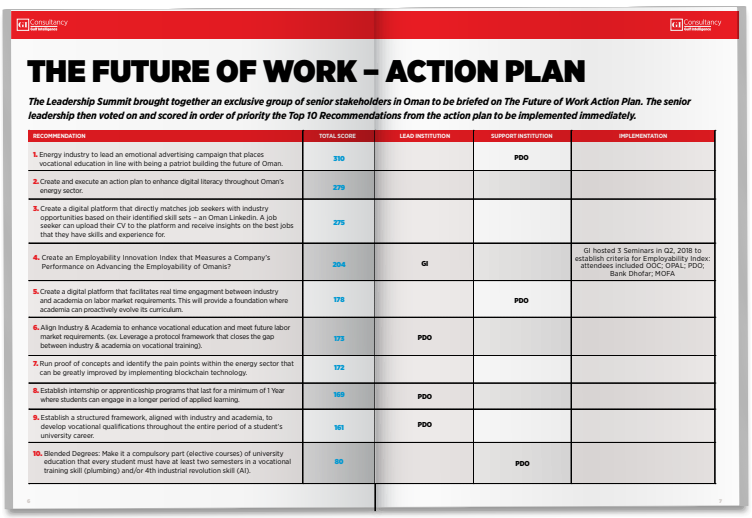
2016

2017



2018





RECOMMENDATION	TOTAL SCORE	LEAD INSTITUTION	SUPPORT INSTITUTION	IMPLEMENTATION
1. Energy industry to lead an emotional advertising campaign that places vocational education in line with being a patriot building the future of Oman.	310		PDO	
2. Create and execute an action plan to enhance digital literacy throughout Oman's energy sector.	279			
3. Create a digital platform that directly matches job seekers with industry opportunities based on their identified skill sets – an Oman LinkedIn. A job seeker can upload their CV to the platform and receive insights on the best jobs that they have skills and experience for.	275			
4. Create an Employability Innovation Index that Measures a Company's Performance on Advancing the Employability of Omanis?	204	GI		GI hosted 3 Seminars in Q2, 2018 to establish criteria for Employability Index; attendees included OOC; OPAL; PDO; Bank Dhofar; MOFA
5. Create a digital platform that facilitates real time engagement between industry and academia on labor market requirements. This will provide a foundation where academia can proactively evolve its curriculum.	178		PDO	
6. Align Industry & Academia to enhance vocational education and meet future labor market requirements. (ex. Leverage a protocol framework that closes the gap between industry & academia on vocational training).	173	PDO		
7. Run proof of concepts and identify the pain points within the energy sector that can be greatly improved by implementing blockchain technology.	172			
8. Establish internship or apprenticeship programs that last for a minimum of 1 Year where students can engage in a longer period of applied learning.	169	PDO		
9. Establish a structured framework, aligned with industry and academia, to develop vocational qualifications throughout the entire period of a student's university career.	161	PDO		
10. Blended Degrees: Make it a compulsory part (elective courses) of university education that every student must have at least two semesters in a vocational training skill (plumbing) and/or 4th industrial revolution skill (AI).	80		PDO	

Oman Energy Master Plan 2040

Progress & Implementation Timeline

2015

May 2015

Gulf Intelligence meets with the Ministry of Oil and Gas in Oman

"We need a long term Oman Energy Master Plan that delivers recommendations and solutions that are aligned with All stakeholders from Industry, Academia, and Government"
– Senior Government Official

Ministry of Oil & Gas

Oct 2015

The 2015 OEF Industry Workshop

Two hundred national & international stakeholders from the Oman energy industry, and its associated ecosystem from academia, government, international organizations and the private sector gathered to answer the question:

What does Oman need to do to ensure that it is still a significant Oil & Gas producer in the year 2040?
The answers revolved around five streams of study:

1. Energy Supply
2. Energy Demand
3. R&D
4. Labour
5. Water-Food-Energy Nexus

2016

Jan 2016

Oman Energy Master Plan 2040 – Draft Report Published

The top three recommendations harvested from the OEF Industry Workshop for each of the key energy challenges addressed form the heart of the Oman Energy Master Plan 2040.

Special Leadership Briefing with H.E. Dr. Mohammed bin Hamad Al Rumhy, Minister of Oil and Gas in Oman

Presentation of the Oman Energy Master Plan 2040 – Draft Report

R&D Timeline

Q1 2016

Gulf Intelligence meets with Sultan Qaboos University and The Research Council to discuss the next steps in pushing forward the top R&D recommendation from the Oman Energy Master Plan 2040 which is "Align Academia and Industry in the Delivery of an Enhanced R&D Ecosystem in Oman."

Q2-Q4 2016

The Inaugural Occidental Oman Student Awards for the Advancement of Post-Graduate Education recognized four accomplished Winners (two, PhD, two Masters) at the Oman Energy-Industry Academia R&D Summit. The awards celebrate the country's future academia and industry leaders who will contribute to developing and enhanced R&D ecosystem in Oman.

Q4 2016

Oman Energy Industry-Academia R&D Summit Action plan created from the reccomendations and solutions from The 2016 Oman Energy Industry-Academia R&D Summit & Whitepaper

"It's a very good piece of work, especially considering the participants that contributed. I think what will really help us is to make this piece of information available to the public"

– H.E. Dr. Mohammed Hamad Al Rumhy, Minister of Oil and Gas in Oman, comments on the Oman Energy Master Plan 2040 at the Special Leadership Briefing in Nov. 2016.

January 2017

Oman Energy Master Plan 2040 – Progress report One Year On

November 2017

Oman Energy Master Plan 2040 – Progress Report Two Years On

LABOUR – THE FUTURE OF WORK

Timeline

November 2017

The 5th Gulf Intelligence Oman Energy Forum tackled the Topic of 'The Future of Work and the Work of the Future' in coordinance with the Oman Energy Master Plan 2040

February 2018

The **Leadership Summit** brought together an exclusive group of senior stakeholders in Oman to be briefed on The Future of Work Action Plan. The senior leadership in attendance then ranked, in order of priority, the Top 10 Recommendations to be taken forward and implemented immediately.

May 2018

The Oman Employability Index Roundtable Brought together an exclusive group of key stakeholders to brainstorm the criteria and parameters that will form the heart of the index.

Gulf Intelligence hosts **Employability Index Seminars** with PDO; with OOC; with OPAL

May 2018

The Future of Work Action Plan captured the key recommendations that emerged from the Oman Energy Forum brainstorming sessions.

2017

Q1 2017

Special Leadership Summit with H.E. Dr. Mohammed bin Hamad Al Rumhy, Minister of Oil and Gas in Oman

Q2 2017

Drafting of Oman Energy Industry & Academia R&D Protocol
Narrow the Gap between Industry & Academia to Establish Efficient R&D Partnerships

Q3-Q4 2017

Ratifcation of Oman Energy Industry & Academia R&D Protocol
40+ Institutions ratify The 2017 Oman Energy Industry-Academia R&D Protocol in an effort to build a vibrant research ecosystem within the country that can deliver the solutions that the energy industry requires to sustain output through to 2040 and beyond.

Q1-Q2 2018

Implementation of Oman Energy Industry & Academia R&D Protocol

Q3 2018

Research Project Implemented: Oman Energy Industry & Academia R&D Protocol
Four research agreemenet to boost R&D collaboration between Industry & Academia in Oman signed between the Ejaad platform, Sultan Qaboos University and Petroleum Development Oman.

2018

ENERGY TRANSITION – SUPPLY

Timeline

Q2-Q3 2018

Tanfeedh Energy Lab
Oman's first Institute of Oil and Gas, Tanfeedh labs on energy, mining inaugurated.

Q4 2018

Oman Energy Forum - 27th Nov.
Powering Oman's Energy Transition for the Future?
The Oman Energy Master Plan 2040: Tackling the Top Energy Supply Recommendation will be the key focus of the 2018 Oman Energy Forum.

STREAM 1: ENERGY SUPPLY (TRANSITION)

What Are The Top Recommended Strategies To Maximize Benefits To Oman Of Its Energy Resources?

RECOMMENDATION 1

Create, Adopt and Implement a Comprehensive Energy Action Plan that can Facilitate the Immediate Implementation of Renewables

October 2016

PAEW's final report and recommendations regarding the National Energy Strategy are with the Ministry of Finance for a decision on how to take the various recommendations forward.

Source: https://goo.gl/tfJJkK

November 2016

Tanfeedh, the National Programme for Enhancing Economic Diversification, indicates that new investments in the renewable energy projects will contribute to 10 per cent of the total power produced from the renewable energy including solar and wind energy by 2050

Source: https://goo.gl/ksoZbg

November 2017

Petroleum Development Oman (PDO) announces, at the 5th Gulf Intelligence Oman Energy Forum that it will transform into Energy Development Oman (EDO), a fully-fledged energy company with a greater focus on using renewable energy to increase efficiencies and provide services outside of the Oil & Gas Sector.

Source: https://bit.ly/2zLxlUX

December 2017

Shell Development Oman (SDO) and the Embassy of the Kingdom of Netherlands host a seminar to facilitate Energy transition in Oman and Identify opportunities for collaboration on renewable energy and energy efficiency.

Source: https://bit.ly/2uuIASb

In support of Oman's energy transition and renewables skills capacity building, Shell Development Oman (SDO) holds its newly launched annual week-long 'PV basics' training course at the Public Authority for Small and Medium Enterprises Development (Riyada)

Source: https://bit.ly/2mtGXQx

Oman Power and Water Procurement Company (OPWP), unveils plans to build the country's first utility-scale solar independent power project (IPP) in Ibri with a capacity to generate 500 megawatt of electricity. This is part of a larger initiative to enhance the contribution of renewable energy in the total energy mix to 10 per cent by 2025.

Source: https://bit.ly/2mkX8zk

January 2018

Petroleum Development Oman (PDO) issues a call for Expressions of Interest for the development, construction and operation of a 100-MWp solar park.

Source: https://bit.ly/2zLPkjM

Oman Oil Marketing Company announces plans to install Photovoltaic Solar Panels at its service stations. Fitted on the rooftop of canopies, the panels will generate 40KWp.

Source: https://bit.ly/2zMqqAv

February 2018

Petroleum Development Oman (PDO) inaugurates 1GW solar power plant Miraah, expected to be one of the world's largest solar power plants and puts Oman on the global renewable energy map.

Source: https://bit.ly/2JtJa7z

Oman's first Institute of Oil and Gas, Tanfeedh labs on energy, mining inaugurated.

Source: https://bit.ly/2L4XAjd

BP bids for Oman solar projects participating in a competitive tender for the development of a 500 MW utility-scale solar photovoltaic project being procured by the state-owned Oman Power and Water Procurement Company (OPWP) in Ibri in Dhahirah Governorate.

Source: https://bit.ly/2GLXHf9

BP bids for Petroleum Development Oman's (PDO) contract for the development of a 100 MW solar PV scheme planned at Amal in the south of its concession.

Source: https://bit.ly/2GLXHf9

April 2018

Shell Oman opens its first solar-powered service station in the Sultanate in Mukhaizna, Al Wusta Governorate, as an initial phase of its "Solar Into Stations" project, which was launched in the third quarter of 2017, with more sites planned in Muscat to be announced.

Source: https://bit.ly/2JwlBuJ

July 2018

Oman Power and Water Procurement Company (OPWP) launches plan to reduce the share of natural gas fuel in Oman's electricity generation to 83 per cent by 2024 from current 100 per cent. "OPWP projects that the fuel diversification plans, including renewable energy development and the Duqm clean coal independent power project (IPP), will enable the gas share of fuel for power generation to fall from 100 per cent in 2018 to 83 per cent by 2024."

Source: https://bit.ly/2NXFiPA

A tender for Phase 1 of the North-South Interconnect Project, which will integrate the nation's two main power grids to support reserve sharing between the Main Interconnected System and the Petroleum Development Oman (PDO) system, is expected to be floated before the end of 2018.

Source: https://bit.ly/2Nl8XSt

September 2018

Petroleum Development Oman (PDO) partners with GlassPoint to develop the SolaRISE (Solar Research, Innovation and Sustainability in Energy) technology center in Muscat, with the aim to develop and test solar technologies in oil fields.

Source: https://bit.ly/2xkZvbx

October 2018

Petroleum Development Oman's (PDO's) Majlis Stakeholder Engagement Session calls for a national strategic action plan to increase the country's energy efficiency and sustainability. It includes reducing power consumption, progress reporting and monitoring systems.

Source: https://bit.ly/2PEOEUY

Petroleum Development Oman (PDO) organizes two Energy Majlis' – an April panel discussion on energy management and renewables, and in October based around forming a national plan 'with clear strategies, policies and projects to boost energy efficiency in the Sultanate.'

Source: https://bit.ly/2DBgv0Q
Source: https://bit.ly/2Ab6nIX

To continue building momentum for energy transition, PDO organizes an executive workshop on energy efficiency in collaboration with the EU Commission. Participants include policy makers, industrial and building energy-users, engineers, technology providers and academics.

Source: https://bit.ly/2PGZrOh

Petroleum Development Oman (PDO) awards the contract for the 100 MW Amin solar project to a consortium led by Japanese conglomerate Marubeni. The Amin plant will power PDO's operations in Oman under a 23-year power purchase agreement.

Source: https://bit.ly/2AaJFk1

November 2018

The 6th Gulf Intelligence Oman Energy Forum aims to create a comprehensive energy action plan that facilitates the acceleration of Oman's energy transition to maximize benefits to Oman of its energy resources and align all stakeholders on current initiatives that are taking place.

Source: https://bit.ly/2xtgElj

GlassPoint Solar signs an MoU with Occidental of Oman to build a large-scale solar thermal EOR plant at Oman's Mukhaizna oilfield. Capacity will be more than 2 GW and produce as much as 100,000 barrels of solar steam per day.

Source: https://bit.ly/2KmPVd9

RECOMMENDATION 2
Establish a Ministry of Energy

January 2016

Gulf Intelligence presents the Oman Energy Master Plan 2040 – Draft Report to H.E. Dr. Mohammed bin Hamad Al Rumhy, Minster of Oil and Gas, Oman and H.E. Mohammed Bin Salim Bin Said Al Tobi, Minister of Environment & Climate Affairs, Oman. H.E. Dr. Mohammed bin Hamad Al Rumhy agrees to present the top recommendations to the Council of Ministers (Cabinet of Oman).

Source: https://goo.gl/XwvtLz

March 2018

The second round of Tanfeedh energy labs takes place with an aim to advance a national strategy for energy, including discussions to develop a unified governance structure, Ministry of Energy, to centralize policy under one authority.

Source: https://bit.ly/2uuxm05 ***Source:*** https://bit.ly/2NVkd8c

RECOMMENDATION 3
Establish Small Scale Rooftop and Hybrid Power Generation, which also Support Local Communities

February 2016

Shell Development Oman announces its fifth gift to the nation; in the next five years solar energy will power twenty-two public schools in Oman. By putting these installations into schools, Shell Development Oman hopes to build a platform for development and implementation of small-scale solar projects in Oman.

Source: https://goo.gl/uMm0Wa

March 2016

Authority for Electricity Regulation (AER) in Oman announces the Solar Rooftop Project. The power sector regulator is taking steps to pave the way for home and building owners to consider installing solar photovoltaic systems on their rooftops and to channel any surplus electricity output into the national grid.

Source: https://goo.gl/l5U3Xw

August 2016

Authority for Electricity Regulation (AER) in Oman floats a tender to appoint a specialist consultant to assist it in developing technical integration standards and rules for the connection of rooftop solar photovoltaic (PV) systems.

Source: https://goo.gl/lGB89s

October 2016

Authority for Electricity Regulation (AER) in Oman appoints international experts to provide consultancy services on its landmark plan to enable the rollout of rooftop solar power generation for the first time in the Sultanate.

Source: https://goo.gl/wa5Pwh

Qais Al Zakwani, Executive Director, Authority for Electricity Regulation (AER) announces that "rooftop solar is expected to be a reality in the Sultanate by the first quarter of 2017."

Source: https://goo.gl/wa5Pwh

November 2016

Authority for Electricity Regulation, Oman (AER Oman) has appointed CESI Middle East as the lead consultant for the integration of rooftop solar photovoltaic (PV) panels in the sultanate.

Source: https://goo.gl/88e87D

January 2017

Petroleum Development Oman (PDO) installs thousands of solar panels in its car parks to provide power for its headquarters in Muscat.

Source: https://goo.gl/oFm4oL

May 2017

Authority for Electricity Regulation (AER) launches 'Sahim', a renewable energy initiative that will allow and introduce residential grid-connected solar power generation systems. The project enables homeowners, who wish to install photovoltaic cells in their homes, to approach AER, which will then direct them towards companies that will outfit their homes with these cells.

Source: https://goo.gl/qbyky5

September 2017

Shell Development Oman launches its 'Solar into Schools' initiative. The 'Solar into Schools' initiative is part of Shell's 'Gift to the Nation' in which Shell committed to train small and medium enterprises (SMEs) and contract them to install solar systems into 22 schools across all governorates of the Sultanate in the coming few years.

Source: https://goo.gl/DFwFaS

Authority for Electricity Regulation Oman (AER) announces plan for a solar panel scheme that will target residential customers with the promise of subsidized installations where residents can save up to 42% on their electricity bills if they opt in for rooftop solar panels.

Source: https://bit.ly/2zTiDRg

December 2017

Oman Oil Marketing Company announces plans to install Photovoltaic Solar Panels at its service stations. Fitted on the rooftop of canopies, the panels will generate 40KWp.

Source: https://bit.ly/2zMqqAv

January 2018

Bank Muscat inaugurates the country's first rooftop solar-powered bank branch aimed at promoting renewable sources of energy in Oman. The solar-powered Al Khoudh branch comes as part of the bank's ongoing Imprints CSR initiative.

Source: https://bit.ly/2L4sYis

Petroleum Development Oman (PDO) inaugurates its first solar park in car parks at Mina Al Fahal to provide power for the company's office buildings. The 6-megawatt installed peak (MWp) project will save more than 3.1 million m3 of gas a year – enough to provide electricity for almost 1,000 homes – and cut co2 emissions by 6,662 tons a year.

Source: https://bit.ly/2PJmIPP

March 2018

The Authority for Electricity Regulation Oman (AER) contracts UK-based smart home energy management platforms provider, PassivSystems, to consult on the first phase of its 'Sahim' project to install rooftop photovoltaics (PV) on more than 30% of Omani rooftops. A pilot project will see 1,000-3,000 homes fitted out with solar PV before extending the initiative to more than a quarter of a million properties.

Source: https://bit.ly/2zTiDRg

April 2018

Shell Oman opens its first rooftop solar-powered service station in the Sultanate in Mukhaizna, Al Wusta Governorate, as an initial phase of its "Solar Into Stations" project, which was launched in the third quarter of 2017, with more sites planned in Muscat to be announced.

Source: https://bit.ly/2JwlBuJ

May 2018

Oman's Authority for Electricity Regulation (AER) begins the process to qualify and select companies for the supply of an automated operational and risk management system for the second phase of the 'Sahim' residential rooftop photovoltaic (PV) program.

Source: https://bit.ly/2k2qTUp

July 2018

Oman's Authority for Electricity Regulation (AER) starts a grid connection for the wide scale deployment of small photovoltaic (PV) systems for residential solar rooftop projects, launched under its renewable energy initiative 'Sahim'. It is hoped the project will cut electricity bills by 40%.

Source: https://bit.ly/2J5JokU

STREAM 2: ENERGY DEMAND

What Are The Top Recommendations For Tackling Oman's Domestic Energy Demand & Consumption Over The Next 25 Years?

RECOMMENDATION 1

The Structured Removal of Subsidies

January 2016

Ministry of Finance announces government plans to cut subsidy spending by almost two thirds to help tackle a budget deficit caused by low oil prices.

Source: https://goo.gl/3oUu7p

Oman reduced government subsidies on gasoline.

Source: https://goo.gl/qdWmm9

Prices of super grade petrol were raised for the first time to 160 baisas per litre, from 120 baisas a litre; they were increased to 140 baisas for regular grade petrol, up from 114 baisas a litre, and 160 baisas for diesel per litre, against an earlier 146 baisas per litre.

Source: https://goo.gl/g9z2Nk

October 2016

The Authority for Electricity Regulation of Oman announces that subsidies available for large consumers, mainly government, commercial and industrial users, will be cut and a higher revised tariff structure will be effective from January 1, 2017. The Authority for Electricity Regulation (AER) has said that RO100mn worth of subsidies will be cut for large commercial, government and industrial users

Source: https://goo.gl/Xf8suz ***Source:*** https://goo.gl/uYYIAB

January 2017

Subsidies removed for major Omani power major customers consuming more than 150 megawatt-hours (MWh) per annum. An estimated 10,000 government, commercial and industrial customers will no more be provided any subsidy on electricity as per the Cost Reflective Tariff (CRT) issued by the Public Authority for Electricity and Water (PAEW). The government hopes to save RO100mn annually from the decision.

Source: https://goo.gl/CaF8dG

November 2017

Oman allocates 100mn OMR (260mn USD) in 2018's budget to help citizens hurt by the national fuel subsidies cut after oil revenue dropped.

Source: https://bloom.bg/2iP6H7v

December 2017

Oman's Ministry of Oil and Gas drops a government cap on M91 after the introduction of a subsidy programme for Omanis. M91 is now priced at 199 baisas per litre, 13 baisas above its previously capped limit of 186. The price of M91 will now reflects global oil prices, but Omani families on low incomes have been protected by the government's National Subsidy System (NSS).

Source: https://bit.ly/2JsXxcc

May 2018

The International Monetary Fund (IMF) predicts Oman's GDP growth at 2.1% in 2018 and 4.2% in 2019. The organization proceeds to state, that Oman's projected growth is not only due to a resurgence of oil prices but also due to improvement of government finances through the reduction of subsidies.

Source: https://bit.ly/2NoBJ3T

June 2018

Oman and other GCC countries significantly reduce gasoline and diesel subsidies, and implement automatic price adjustment mechanisms linking domestic prices to international oil price fluctuations.

Source: https://bit.ly/2HYBZmR

October 2018

Oman's Ministry of Oil and Gas, the Authority for Electricity Regulation (AER) and Petroleum Development Oman (PDO) discuss ways of providing electricity subsidies only to those that need them, in order to reduce the current OMR500 million annual handouts.

Source: https://bit.ly/2DNVgdi

RECOMMENDATION 2
Inducing Positive Human Behaviour on a National Scale

October 2016

The Supreme Council for Planning formed a committee to develop a comprehensive green design code for Oman in the context of a unified GCC Building Code. New codes have the potential to reduce the lifecycle costs of buildings and result in macro-economic benefits such as reduced consumption of energy at the national level. Currently around 70 per cent of the national energy consumed in Oman is used for cooling buildings.

Source: https://goo.gl/kXImjk

December 2017

BP's launches the second edition of "Mustadeem", an initiative aimed towards supporting renewable energy in Oman. The program strives to inculcate the social culture of renewable energy and the importance of its sustainability amongst 450 university and college students in the Sultanate.

Source: https://bit.ly/2LpN03i

January 2018

Petroleum Development Oman (PDO) launches a new energy management campaign 'Estidama' (Sustainability) which supports centralizing communication for all strategic projects that fall under the banner of energy and environment under one platform. The campaign is dedicated to building a positive environmental culture across Oman by focusing on six main pillars: Renewable energy, people, energy efficiency, environment, energy saving and economy.

Source: https://bit.ly/2zJb000

June 2018

Muscat Electricity Distribution Company (MEDC) pledges financial support for the publication of a booklet that features energy conservation tips designed for students in Cycle Two (Grades 5 to 10). The company is supporting the publication of the booklet, in order to educate students about issues related to energy conservation and the proper maintenance of national energy facilities.

Source: https://bit.ly/2LfV8GN

RECOMMENDATION 3
Centralize Oman's Energy Policy under a Single Authority

January 2016

Gulf Intelligence presents the Oman Energy Master Plan 2040 – Draft Report to H.E. Dr. Mohammed bin Hamad Al Rumhy, Minster of Oil and Gas, Oman and H.E. Mohammed Bin Salim Bin Said Al Tobi, Minister of Environment & Climate Affairs, Oman. H.E. Dr. Mohammed bin Hamad Al Rumhy agrees to present the top recommendations to the Council of Ministers (Cabinet of Oman).

Source: https://goo.gl/XwvtLz

March 2018

The second round of Tanfeedh energy labs takes place with an aim to advance a national strategy for energy, including discussions to develop a unified governance structure, Ministry of Energy, to centralize policy under one authority.

Source: https://bit.ly/2uuxm05 ***Source:*** https://bit.ly/2NVkd8c

STREAM 3: RESEARCH & DEVELOPMENT

What Are The Top Strategies Needed To Align Academia And Industry To Deliver An Enhanced R&D Ecosystem In Oman?

RECOMMENDATION 1

Narrow the Gap between Industry and Academia to Establish Efficient R&D Partnerships

October 2016

The Inaugural Occidental Oman Student Awards for the Advancement of Post-Graduate Education recognized four accomplished Winners (two, PhD, two Masters) at the Oman Energy-Industry Academia R&D Summit. The awards celebrate the country's future academia and industry leaders who will contribute to developing and enhanced R&D ecosystem in Oman.

Source: https://goo.gl/CXYkoM

The Oman Energy Industry-Academia R&D Summit, Hosted by Sultan Qaboos University
The Oman Energy Master Plan 2040 – Tackling the top R&D recommendation was the key focus of the 2016 summit hosted by SQU: "Align Academia and Industry in the Delivery of an Enhanced R&D Ecosystem in Oman" The summit brought together the top 100 Omani stakeholders from industry, academia, and government to develop an Energy R&D Action Plan for adoption and implementation in the delivery of an enhanced R&D Ecosystem in Oman.

Source: https://goo.gl/BRKtG5

November 2016

The Oman Energy Industry-Academia R&D Action Plan is created from the reccomendations of The 2016 Oman Energy Industry-Academia R&D Summit *(See Page 10).*

Source: https://goo.gl/pWN5dc

December 2016

Petroleum Development Oman (PDO) signs an agreement with the German University of Technology in Oman (GUtech), which will boost research and development efforts in both the oil and non-oil sectors in the Sultanate's economy. Under the terms of the memorandum of understanding (MoU), PDO has pledged the support of its experts in the creation of GUtech's state-of-the-art technology centre and can also use the centre for its own research.

Source: https://goo.gl/LCc3UP

February 2017

The Oman Industry Academia R&D Special Leadership Roundtable Briefing with H.E. Dr. Mohammed bin Hamad Al Rumhy, Minister of Oil and Gas in Oman takes place to brainstorm the top recommendation from the Oman Energy-Industry Academia R&D Action plan which is: create a protocol with principles that will be ratifies with the signatures of companies operating in Oman's energy sector and their peers in academia.

Source: https://goo.gl/pWN5dc

June 2017

Oman's Ministry of Oil & Gas, Petroleum Development Oman (PDO) and The Research Council ratify The 2017 Oman Energy Industry-Academia R&D Protocol in an effort to build a vibrant research ecosystem within the country that can deliver the solutions that the energy industry requires to sustain output through to 2040 and beyond.

Source: https://goo.gl/KkaWML

July 2017

Petroleum Development Oman (PDO) signs research and development agreements with Sohar and Al Sharqiyah Universities to help resolve some of its complex technical challenges.

Source: https://goo.gl/8VW2qw

November 2017

Petroleum Development Oman (PDO) has signed a research and development R&D agreement with Muscat University to help resolve some of its complex technical challenges.

Source: https://goo.gl/CXYkoM

Petroleum Development Oman (PDO) signs a research and development agreement with Muscat University to help resolve its complex technical challenges and advance Oman's academic and vocational development.

Source: https://bit.ly/2zSKSjj

Petroleum Development Oman (PDO) signs a research and development agreement with Muscat University to help resolve its complex technical challenges and advance Oman's academic and vocational development.

Source: https://bit.ly/2zSKSjj

Jun. - Dec. 2017

40+ Institutions ratify The 2017 Oman Energy Industry-Academia R&D Protocol in an effort to build a vibrant research ecosystem within the country that can deliver the solutions that the energy industry requires to sustain output through to 2040 and beyond.

Source: N/A

December 2017

December 2017 The Research Council (TRC) in collaboration with Petroleum Development Oman and the Ministry of Oil and Gas launch an uber-like digital portal to connect industry and academia on R&D in the energy sector.

Source: https://bit.ly/2LzUZdW

GlassPoint Solar signs a collaboration agreement with The Research Council (TRC), Innovation Park Muscat (IPM), Public Authority for SME Development (Riyada) and Sharakah. An intensive full-cycle incubation programme. GlassPoint will provide aspiring Omani entrepreneurs an integrated ecosystem of scientific, technical and business support.

Source: https://bit.ly/2JvpgsF

January 2018

Four research agreements worth more than 300,000 OMR (≈ 780,000 USD) are signed in a bid to boost research and development collaborations between industries and academia in Oman. The agreements, which were signed by Ejaad Platform, Petroleum Development Oman (PDO), and Sultan Qaboos University, target different research challenges faced in Oman, offering a unique opportunity to support the nation's sustainable development.

Source: https://bit.ly/2uvwica

July 2018

His Highness Sayyid Shihab bin Tariq Al Said, Adviser to His Majesty the Sultan, Chairman of the Research Council affirmed that the Council is will develop a national strategy that outlines the path of scientific research and development in the Sultanate in connection with the track of comprehensive development plans being executed by the Government in a bid to develop the Omani citizen. The strategy aims to make the Sultanate among the leading countries in the innovation field (within best 20 countries in 2040).

Source: https://bit.ly/2LkbU7x

November 2018

Schlumberger Oman and Muscat University sign a Memorandum of Understanding (MoU) to increase student placements/internships, leverage staff mobility, and to collaborate in software and engineering research and education.

Source: https://bit.ly/2zhUQYP

RECOMMENDATION 2

Establish Research Clusters and Incubators with Universities across Oman that are Linked with Promotional Entities.

October 2016

Innovation Park Muscat expected to open in Q4 of 2016. Innovation Park Muscat has been strategically located close to Sultan Qaboos University, Rusail Industrial Area, and knowledge Oasis Muscat. Innovation Park Muscat is Oman's newest science and technology development. It is one of the major initiatives by The Research Council (TRC) in a bid to encourage scientific research, innovation and activate collaboration between the academic, private and the diverse industry sectors of local and international communities.

Source: https://goo.gl/UYDpSh

December 2017

The Research Council (TRC) in collaboration with Petroleum Development Oman and the Ministry of Oil and Gas launch an uber-like digital portal to connect industry and academia on R&D in the energy sector.

Source: https://bit.ly/2LzUZdW

March 2018

Oman launched its first Oil and Gas institute (instOG) on Sunday which will specialise in the training and development of professionals in the energy sector, is an addition to educational institutes in the Sultanate.

Source: https://bit.ly/2L0x4UP

2018

Innovation Park Muscat officially opens.

Source: https://bit.ly/2L5WyUV

January 2018

GlassPoint Solar signs a collaboration agreement with The Research Council (TRC), Innovation Park Muscat (IPM), Public Authority for SME Development (Riyada) and Sharakah. An intensive full-cycle incubation programme. GlassPoint will provide aspiring Omani entrepreneurs an integrated ecosystem of scientific, technical and business support.

Source: https://bit.ly/2JvpgsF

GlassPoint Solar signs a collaboration agreement with The Research Council (TRC), Innovation Park Muscat (IPM), Public Authority for SME Development (Riyada) and Sharakah. An intensive full-cycle incubation programme. GlassPoint will provide aspiring Omani entrepreneurs an integrated ecosystem of scientific, technical and business support.

Source: https://bit.ly/2JvpgsF

RECOMMENDATION 3

More Omani students need to get their PhDs in Oman.

October 2016

The Inaugural Occidental Oman Student Awards for the Advancement of Post-Graduate Education recognized four accomplished Winners (two, PhD, two Masters) at the Oman Energy-Industry Academia R&D Summit. The awards celebrate the country's future academia and industry leaders who will contribute to developing and enhanced R&D ecosystem in Oman.

Source: https://goo.gl/CXYkoM

November 2017

The 2nd Occidental Oman Student Awards for the Advancement of Post-Graduate Education recognizes four accomplished Winners (two, PhD, two Masters) at the Oman Energy-Industry Academia R&D Summit. The awards celebrate the country's future academia and industry leaders who will contribute to developing and enhanced R&D ecosystem in Oman.

Source: https://goo.gl/CXYkoM

Dr. Ahmed Said Hamed Al Hatrooshi, Occidental Oman Student Award Winner 2017, gives tedX speech to 200+ senior government officials and c-suite executives on why millennials should pursue post-graduate education in alignment with helping the Sultante reach its long term development goals.

Source: https://bit.ly/2LauG1V

2017- 2018

The Occidental Oman Student Seminars for the Advancement of Post-Graduate Education enhance the dialogue between students, academic institutions and industry in Oman. The seminars gave students access to prominent leaders from industry, academia, and the government, to discuss the benefits of post-graduate education and career opportunities in Oman after obtaining masters or PhD degrees.

Source: https://bit.ly/2umoB7t

2017	2018
GUTech Oman - May 13th	GUTech Oman - Feb. 21st
Muscat University - Feb. 6th	Sultan Qaboos University - April 27th

STREAM 4: LABOUR

What Are The Top Recommended Strategies That Need To Be Adopted To Align Industry And Academia To Meet Oman's Future Labour Market Requirements?

RECOMMENDATION 1

Establish a Coordinating Committee with an Operational Mandate that Comprises of Senior Representatives from the MOM and the MOE, as well as selected Industry Leaders.

October 2016

His Majesty Sultan Qaboos issues four Royal decrees on October 17, 2016 to set up a National Training Fund.

- ✓ Royal Decree No 48/2016 establishes a national training fund and promulgates its system of functioning.
- ✓ Royal Decree 49/2016 appoints Dr Mohammed bin Hamad bin Saif al Rumhy as Chairman of the National Training Fund.
- ✓ Royal Decree 50/2016 establishes an implementation unit
- ✓ Royal Decree 51/2016 appoints Dr Khamis bin Saif bin Hamoud al Jabri as Chairman of the Implementation and Follow-up Support Unit, with a Minister's Grade.

The National Training Fund aims to bridge the gap between the supply and demand for training in the labour market through building the capacities of the national workforce. In order to be able to achieve its goals the fund has been given wide powers including evaluating the current state of training efforts, determining training requirements and priorities, and setting up a comprehensive database for training information. The fund is particularly tasked with narrowing the gap of efficiencies in the national development projects and the emerging sectors. The Fund's tasks include establishing partnerships with local and international leading institutions concerned with training and benefiting from their programmes to support strategic sectors and the private sector. The National Training Fund will identify the standards required for financing training programmes as well as specifying the standards for training curricula financed by the Fund.

Source: https://goo.gl/MSJINI ***Source:*** https://goo.gl/UU5uRJ

RECOMMENDATION 2

Bolster the government's role in regulating education and reduce its influence in delivering education.

November 2018

Oman's State Council Sessions approve an Education and Research Committee proposal to study the "development of the regulation of private training institutions." It will include the need to develop specialized competencies responsible for private training institutions.

Source: https://bit.ly/2OVjJhQ

Oman's Ministry of Manpower participates in the 2nd meeting of the GCC strategic plan working group for joint cooperation in the field of technical education and vocational training, held in Kuwait.

Source: https://bit.ly/2zm0hG1

RECOMMENDATION 3

The mismatch in skill sets between Oman's Industry and Academia and the Importance of Streaming Students into Vocational Training early on.

November 2017

The 5th Gulf Intelligence Oman Energy Forum
The Future of Work and The Work of the Future in the 4th Industrial Revolution?

Data Science. Mobile supercomputing. Intelligent robots. Automation. Data Harvesting and Mining. Self-driving cars. Digitization. We stand on the brink of a technological revolution that will fundamentally alter the way we work and how labor markets are structured. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders, from the public and private sectors to academia and society.

Source: https://goo.gl/LixpwY

2018

OPAL launches vocational training standards and qualifications for Oman. Nearly 50,000 Omanis graduate from various institutes at different levels of education every year but lack of industrial competency is limiting job prospects and threatening their careers.

Source: https://bit.ly/2zTZZJ9

September 2018

Themed "In-Country Value: The Road to Localising Omani Industry and Services," a Petroleum Development Oman (PDO) Majlis Stakeholder Engagement Session focuses on greater collaboration between the oil and gas sector and academia, in order to encourage a culture of entrepreneurship amongst graduates.

Source: https://bit.ly/2QYCi6A

THE FUTURE OF WORK – ACTION PLAN

The Leadership Summit brought together an exclusive group of senior stakeholders in Oman to be briefed on The Future of Work Action Plan. The senior leadership then voted on and scored in order of priority the Top 10 Recommendations from the action plan to be implemented immediately.

RECOMMENDATION	TOTAL SCORE	LEAD INSTITUTION	SUPPORT INSTITUTION	IMPLEMENTATION
1. Energy industry to lead an emotional advertising campaign that places vocational education in line with being a patriot building the future of Oman.	310		PDO	
2. Create and execute an action plan to enhance digital literacy throughout Oman's energy sector.	279			
3. Create a digital platform that directly matches job seekers with industry opportunities based on their identified skill sets – an Oman Linkedin. A job seeker can upload their CV to the platform and receive insights on the best jobs that they have skills and experience for.	275			
4. Create an Employability Innovation Index that Measures a Company's Performance on Advancing the Employability of Omanis?	204	GI	OOC	
5. Create a digital platform that facilitates real time engagment between industry and academia on labor market requirements. This will provide a foundation where academia can proactively evolve its curriculum.	178		PDO	
6. Align Industry & Academia to enhance vocational education and meet future labor market requirements. (ex. Leverage a protocol framework that closes the gap between industry & academia on vocational training).	173	PDO	OPAL	
7. Run proof of concepts and identify the pain points within the energy sector that can be greatly improved by implementing blockchain technology.	172			
8. Establish internship or apprenticeship programs that last for a minimum of 1 Year where students can engage in a longer period of applied learning.	169	PDO	OPAL	
9. Establish a structured framework, aligned with industry and academia, to develop vocational qualifications throughout the entire period of a student's university career.	161	PDO	OPAL	
10. Blended Degrees: Make it a compulsory part (elective courses) of university education that every student must have at least two semesters in a vocational training skill (plumbing) and/or 4th industrial revolution skill (AI).	80		PDO	

STREAM 5: WATER-FOOD-ENERGY NEXUS

What Are The Top Recommended Innovative Solutions To Achieve Sustainable Growth?

RECOMMENDATION 1

Establish and Mandate an Executive Authority that Focuses on Water, Energy and Food. Identify Linkages between the Three Sectors, Develop Knowledge and Induce Behavioural Change.

July 2018

Petroleum Development Oman (PDO) extends its long-term offtake agreement with Bauer Nimr Oman (BNO) to expand the capacity of BNO's water treatment plant by 60,000m3/day. Operating a reed bed concept using constructed wetlands, the plant treats residual water from PDO's oil wells in the Nimr oilfields.

Source: https://bit.ly/2Kqcm12

RECOMMENDATION 2

Renewable Energy Based desalination should be key to Address the Issue of Water Security on a Small and Large Scale with A Focus on Cost Competitive Technologies.

October 2017

Petroleum Development Oman (PDO) will turn to a fully fledged energy company over the next decade encompassing hydrocarbon and renewable energy generation and water management.

Source: https://goo.gl/WKR2ya

2018

Solar- and wind-powered water desalination projects will be crucial for sustaining the energy-intensive desalination processes in the future. Oman is gearing up to increase its water treatment capacity by 66 per cent over the next seven years to keep up with the rising demand, according to the latest outlook posted by Oman Power and Water Procurement Company.

Source: https://bit.ly/2zTZZJ9

RECOMMENDATION 3

Enforce Building Codes and Standards for Sustainable Homes to Promote Water Savings and Energy Efficiency, such as the Development of Green Homes.

October 2016

The Supreme Council for Planning formed a committee to develop a comprehensive green design code for Oman in the context of a unified GCC Building Code. New codes have the potential to reduce the lifecycle costs of buildings and result in macro-economic benefits such as reduced consumption of energy at the national level. Currently around 70 per cent of the national energy consumed in Oman is used for cooling buildings.

Source: https://goo.gl/kXImjk

March 2018

The Oman Convention and Exhibition Centre (OCEC) becomes Oman's first tourism development project to receive an LEED Gold certification from the United States Green Building Council (USGBC) for its exhibition centre, car park and energy centre.

Source: https://bit.ly/2DOmBfc

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