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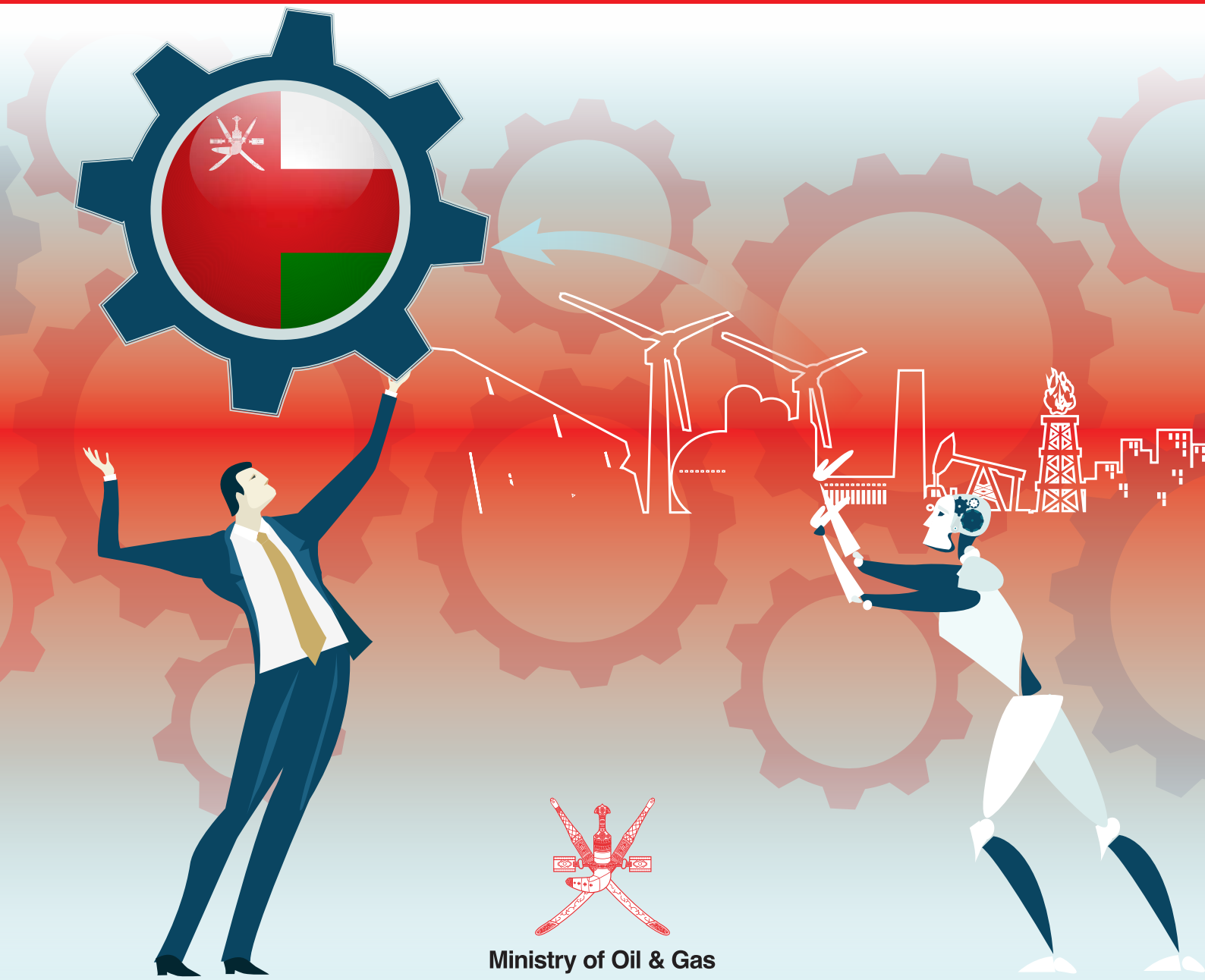
2019

Oman Energy Transition Leadership Summit

Special Report: ACTION PLAN



Ministry of Oil & Gas

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"Having A National Champion for Renewables Could be Very Valuable"

BY H.E. DR. MOHAMMED AL RUMHY
Minister of Oil & Gas, Sultanate of Oman

WE ARE IN THE INFANCY OF THE ENERGY transition. We saw huge progress last year, especially with solar projects and more constructive talks about renewables than ever before. The industry is becoming less scared of what renewables mean for the traditional energy sector. Friends and not foes is the main message – and it's true.

I have been putting a few solar panels on my home and it has been one of the most complicated projects I've ever done. Consider that statement against more than two decades of experience in the energy industry. What does this tell us? It's not simple nor easy. Why? Mainly because no one is sure who is taking charge of introducing new policies, technologies, permits and so on. So many institutions are involved that no one is sure which way to turn.

In any transition, a bit of confusion is to be expected as everyone finds their feet. But we must keep this to a minimum; clarity and not confusion must take the lead. This will be just as important as we start installing more solar panels at industrial sites. For now, residential consumption is still a sizeable area to manage. There are also very easy wins, such as changing the light bulbs and installing thermostats in every room. These seemingly small steps will make a big impact and shouldn't be ignored as important steps in the energy transition.

Having a national champion for renewables could be very valuable. Some of my own experiences illustrate this, including having to get permits from up to six agencies for one personal project. Surely having these operations under one roof makes sense? Perhaps one of the electricity companies going through privatization could be converted into a national champion to look at everything from the role of small and medium-sized enterprises (SMEs), regulations, permits, building codes, research and so on? Today, everything is scattered. It has become harder to move forward than it needs to be.

Subsidies are extremely popular, but countries suffer when they want to start removing them. The public don't want to give them up, which means there is a sensitive political element to their management. Oman's electricity subsidy was smartly structured because the more you consume the more you pay. It's not a fixed subsidy like fuel used to be. Those who can afford to pay more, should pay more. I am one of those people and I am willing. This is a low hanging fruit that we should be utilizing.

Having an energy manager for every institution in Oman that hires more than fifty staff is another idea worth considering. If a large company converts the 50% of energy savings generated by two energy managers in-house into monetary value, then it is clearly worth the initial investment in human resources. The same applies to the Ministry of Oil and Gas.

As a country, we must keep having this dialogue. It's a complicated subject and there are varying views, but we cannot shy away. We have neglected such conversations about energy in the past. We took our cheap energy for granted and believed that there was nothing to worry about. The future of energy is going to look different; that much is certain. And yes, we are going to make mistakes as we learn and grow – but we must start moving. Oman's security depends on it.

Oman Energy Transition Leadership Summit:

Top 5 Recommendations

1. NATIONAL CHAMPION

Create a National Champion company for Renewables, like PDO is for oil, which has a mandate for regulation and innovation -- research, licensing permits, regulations, incentives for SME growth, monitoring placed all under one roof.

2. CHIEF ENERGY OFFICER

Install Chief Energy Officer in every institution with more than 50 employees – could create an additional 500 jobs that would pay for themselves with the savings from achieving more efficient energy consumption.

3. DUQM – ENERGY MASTERPLAN

The Special Economic Zone in Duqm (SEZAD) stretches over 2,000 square kilometers with 60km long beach front, yet it has no long-term energy masterplan. SEZAD, which is the biggest special economic zone in the Middle East region, has started developing 45% of the area, about 800 km, yet the absence of answers to long-term power supply could deter investors.

4. OFF-GRID SYSTEMS

Regulations should allow Power generators and power consumer to be able to connect and do business outside of the national grid -- off-grid stand-alone power systems or mini-grids typically exist to provide a smaller community with electricity.

5. GOVERNMENT DECREES

a. A/C Temperature

The Government to issue decree that all Public buildings, from ministries to airports, should keep AC thermostats at 24C minimum.

b. Ban Incandescent Lightbulbs

ILs cost much less than energy-efficient alternatives, mainly CFLs (compact fluorescent lamps) & LEDs (light emitting diodes). ILs are inefficient – 90% of energy goes to heat & only 10% toward light.

c. Rationalize Electricity Subsidy

The electricity tariff structure should be further refined so that those who can afford to pay more for power & water do.

"The Energy Transition is Not Just About the Supply Side!"

BY H.E. SALIM AL AUFI

Undersecretary, Ministry of Oil & Gas, Oman

WE MUST ADDRESS THE ENERGY TRANSITION IN ITS entirety; that will sustain momentum. It's not a case of just go and bid on solar projects, add them to the grid and then we call it a day. That approach addresses a very small component of the overall energy picture. Attaching a few solar panels to a rooftop and then celebrating is not the whole story. The development of small and medium-sized enterprises (SMEs) and a broader array of skills is a key part of the journey. This must happen to make our energy and economic goals viable.

We are missing the attitude of 'lead by example'. If we want the country to follow a new road, we must take the first steps down that very road ourselves. We must demonstrate change ourselves; then others follow. If we are going to promote energy efficiency, we must show the way. This can mean more triple glazing, new light bulbs, replacing or improving the AC system, introducing thermostats in every office and reducing energy use when meeting rooms are being used and so on. Small steps can send big messages.

The energy transition is not just about the supply side. We must also look at demand and consumption. It's also not all about electricity. Yes, let's move away from the traditional gas-fired turbines towards something more sustainable – wind and solar, for example. But at the same time, we must also look at other options coming our way.

We are not even talking about the major advancements happening in the automation industry, for example or the introduction of electrical vehicles (EV) in Oman. What will the latter mean for our power supply? Is anyone driving that in terms of understanding the implications? Right now, we have far more questions than answers. Should we have a national champion to introduce EVs, or should we lead by example at a higher level and say that 50% of vehicles we buy will be EVs? This will start creating positive momentum. Nearly all of us drive, so why not take the first step? A lot of progress will come from us understanding what changes are needed, how to make them and how to build momentum around them.

There needs to be more alignment between regulators, government policy makers, industry and the public to truly realize the economic opportunities of the energy transition. The top-down and bottom-up worlds must align. What we do not want is a game of catch up; misalignment sees different groups stumbling and struggling to keep up. This just slows down progress for all; unity is key.

We must take control of what's happening around us and make sure that we are fast enough; the regional and global market cannot outpace us. Siloes that drive too many individual projects risk creating a fractured environment that is too complicated to fix later.

Such projects are happening already. I was recently told of plans to install a major solar power project that will power an industrial zone only. How does the project connect with the rest of the grid? Regulators must advise them to slow down and identify synergies with the wider energy ecosystem. Equally, project managers say speed is crucial in order to remain competitive and not fall behind. Both sides are right; we must find the middle ground for a successful energy transition.

"We Need a lot More Players to Roll Up Their Sleeves & Get Involved!"

BY RAOUL RESTUCCI

Managing Director, Petroleum Development Oman (PDO)

THE ENERGY TRANSITION IS VERY GOOD NEWS FOR Oman; a fantastic long-term sustainability goal and enabler. It is a solution for a multitude of concerns; long-term sustainability, climate change issues, economic value, job creation and many more. Oman can be a gamechanger and play an active role in this new version of energy. Now, it's about getting together this year to develop the next phase of wildly more ambitious targets – targets that I believe we can hit after what was a very successful 2018.

Our conversations must focus on who is going to sign up and contribute to implementing key initiatives. We need a lot more players to roll up their sleeves and get involved. On the economic front, projects are in the money and that clearly helps warrant a huge effort to gradually move towards a greener future. I recently had the privilege to be at the energy lab with Tanfeedh and I saw significant progress on governance, projects and several policy issues. This is just the beginning; there is so much more that can be done.

We must focus on the project side while playing an active role in creating jobs. It's about working on the supply chain and mapping out the skills that we need; skills that we must start creating today, not tomorrow. This encompasses developing small and medium-sized enterprises (SMEs) to developing key elements of the supply chain. Inverters, cabling, transformers, installation, maintenance, repair, support and many others are on the list. The scope is huge. We've got a tried and tested model in the oil and gas industry that is working very well. Let's replicate some of those key lessons in the renewable industry.

Developing talent is vital. PDO takes on average 300 interns a year; 150 are well managed, 150 are poorly managed. We intend to make it more strategic and more targeted towards the opportunities that we need to manage going forward. Historically, internships were completed as part of a summer assignment or part of the curriculum. Today, we must work harder to align all interests. This means not just having a mutual understanding of opportunities between academia and industry, but also for industry to help enhance the curriculum and help interns understand the opportunities and career choices.

In every example where we've managed the intern very well, there has been a real win-win. They come into PDO with an understanding of where they want to play an active role because they've understood the business model, the opportunities and their own passions. This is an area we must develop. We are also building on the very good progress we're achieving with EJAAD, which focuses on the alignment between industry and academia. We meet monthly and the number of projects is rising exponentially. There is far greater ownership and understanding of how we work together. We also need several national champions. I'm really pleased that everybody is on the same page as we discuss how to accelerate and maximize this opportunity. I don't hear any pushback.

Leveraging low hanging fruits – better temperature controls, better lighting policies, for example – will make a huge contribution to building momentum. Yes, we are at the embryonic stage of the energy transition and yes, we need to do so, so much more. But we have moved away from arguing the business case and we are all going after the opportunities. That's a positive and major shift.

Oman Energy Transition Leadership Roundtable Summit

Chris Breeze, Country Chairman, Shell Oman

"One crucial area I see as important is championing SMEs and the local supply chain through the tendering process because the documentation is overwhelming and can be a deterrent. We did this, for example, in our 'solar into school' project. Some thought is also needed on the pricing structure for renewables tender processes. Tariffs need to be commensurate to in-country value targets – if they dive too low, you risk having an energy transition that won't actually benefit local companies. Thirdly, we need to remember that there are also opportunities in energy efficiency for larger players in the supply chain, not just SMEs, especially where there is a higher investment risk.

On another policy front, Oman already has a national champion for oil and gas in PDO - so why not also have one for renewables along the lines of Masdar in the UAE, for example.

It would also help if power generators and power consumers could do business even if they don't use the grid. The fact that this is not currently possible is, to me, not practical."

Fathy Al Mendhry, Acting CEO, OPAL

"Public awareness is extremely important for this transition to happen and we don't have to re-invent the wheel; others have been through the same challenge and done it and we can learn a lot from their successes."

Omar Al Wahaibi, CEO, Nama Holding Company

"Oman should have an energy master plan. We need to understand why we are talking about energy transition in the first place and why we need to be using less gas and more renewables. Is it because of environmental reasons, economic reasons?"

Qais Al Zakwani, Executive Director, Authority for Electricity Regulation, Sultanate of Oman

"We do have challenges around the regulatory framework, and we are trying to facilitate it in the most sensible way – ensuring that it meets the long-term objectives of liberalizing the sector and not just achieve short-term gains for specific interest groups, as this could be counterproductive.

As the electricity sector moves towards deregulation, as well as keeping an eye on the future horizon, we also should realize the energy sector is not working in isolation. For example, why isn't every ministry in Oman installing solar on its rooftops? It should not just be the Ministry of Oil and Gas. Government institutions have a specific mindset or way of working and we need to expedite the transition process while also addressing their concerns. We're still in the infancy phase where we are trying to push these boundaries and realizing what these issues are so that we can work our way through to get to the long-term objective."

Dr. Abullah Al Abri, ICV Technical Lead, PDO

"It's important to establish clear blueprints that reach through to 2040 or 2050 on what energy transition means to us, what our targets are and what programs we need to achieve that as well as attracting foreign direct investment into the country. One challenge we face is to attract jobs into the low-paid sector as salaries and life expenses are quite high in Oman, but with a long term target, we can establish what job sectors we should develop and train Omanis for."

Yousuf Al Ojaili, CEO, BP Oman

"I'll give you another example. The port of Duqm is established legally and commercially but it still doesn't have an energy conservation plan. They are building a 300-megawatt power plant but only to capture power for the refinery. Why don't they have a master plan and build in solar capacity? What happens when and if Duqm runs out of the 300 megawatts? Perhaps the hesitancy is because that would require guaranteed consumers and they are not sure the area has the capacity to absorb the additional supply. After all, we do have the 36-inch gas pipeline coming soon and coal power generation is being considered."

How to Accelerate Oman's Energy Transition?

TOP 10 – STRATEGIC GOVERNMENT POLICY RECOMMENDATIONS

1. **GOVERNMENT REGULATION TO IMPROVE DEMAND MANAGEMENT:** Gov't policy and implementation of efficiency standards - be it for vehicles or domestic appliances — are hugely important enablers. The same applies to public buy-in, which requires comprehensive communication strategies to drive awareness on transition, especially when adjusting subsidies.
2. **ACCELERATE POWER DEREGULATION & INTRODUCE SPOT MARKET:** Oman should move to deregulate and privatize parts of its power infrastructure and introduce a spot market to allow for competition along all elements of the value chain.
3. **ESTABLISH CLEAR LONGTERM TARGETS FOR RENEWABLES & ALIGN TAX RATES TO DRIVE INVESTMENT INCENTIVES:** Oman should set clear targets that stretch out to 2040 and beyond, while at the same time correcting the current disparity In withholding tax rates on renewable projects between different countries. e.g. presently 5% on China & 10% on GCC.
4. **OMAN SHOULD INCLUDE ALL INDUSTRIES IN ENERGY TRANSITION:** Oman Energy Efficiency initiatives need to move beyond electricity and towards water desalination, transport and other industries – opportunities for decarbonization outside the power sector globally is 80%.
5. **INCREASE INVESTMENT IN RENEWABLE ENERGY:** Global investment in renewable energy needs to increase annually by 150% year on year for the world to meet the Paris Climate Agreement objectives – about $16 trillion through to 2050 – so government policies should play a central role to ensure projects are bankable.
6. **INTERNATIONAL DEVELOPMENT AGENCIES/ PUBLIC-PRIVATE:** Oman should partner with international development agencies, such as the IFC/World Bank, to ensure projects follow best practice standards and so more easily attract other commercial funding.
7. **RESOLVE OMAN GAS SHORTAGE:** Oman needs to adopt renewables and other Energy Efficient --low carbon emission-- solutions, such as CCUS and EOR, with greater urgency to prevent a gas shortage and free up gas for industrial development and export.
8. **INTRODUCE FLEXIBLE REGULATORY FRAMEWORK FOR RENEWABLES:** Install less restrictive terms & conditions in tender processes – currently companies have to have completed a minimum of two previous projects within the region to qualify, which drives international investors away, and quicker regulatory decision-making is needed to avoid abandonment of initiatives.
9. **FIRST MOVER ADVANTAGE:** Renewable energy is a relatively new field to the GCC which presents the opportunity to become a regional leader in technology development/deployment and export it – existing example is the proven technology of conversion of heat to produce hydrogen.
10. **REMOVE ELECTRICITY SUBSIDIES:** Remove/lower subsidies on water & electricity is essential to trigger end users to make rational choices and adopt energy efficient solutions (e.g. domestic smart meters) that private business are offering, which would simultaneously encourage SMEs and jobs growth in Oman.

NB. *With the recent establishment of a defacto Ministry of "Energy" – Oil, Gas and Electricity – in Oman (which was a prime recommendation of the Oman Energy Master Plan 2040): a new blueprint should address how to stimulate the Energy Transition – Some points to include:*

1. *Establishment of a National Renewable Energy Sources (RES) Blueprint for Oman – beyond the Tanfeedh timeframe. This Blueprint shall focus on energy supply for power generation and power-to-x*
2. *Establishment of a National Energy Efficiency (EE) Blueprint – this will entail efficiency practices, lower consumption and thus free up more gas for export*
3. *Establishment of a SME Development Program and Supply Chains Blueprint*

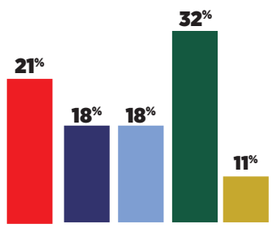
TOP 10 – INDUSTRY TO EXECUTE

	CHAMPION	SUPPORT
1. **APPRENTICESHIP:** Develop an apprenticeship program in partnership with industry in energy savings technologies for the Construction Industry.	GUTECH	ISHRAQ
2. **CATEGORIZE & SUPPORT SMEs:** Omani companies should broaden the tender process to faciliate SMEs which are an integral part of affordably and efficiently achieving success in Oman's energy transition -- support can be provided via on-the-job training (i.e. 'shadow SMEs' for a large company completing a tender) and in the categorization of SMEs' capabilities.	PDO	OCCI
3. **NURTURE LOCAL SUPPLY-CHAIN CHAMPIONS:** Bolster the respect and prestige associated with the wider local supply chain to encourage sustainable growth, including enhanced training, reducing the brain drain & boost commercial confidence.	Shell	OPAL
4. **COLLABORATION AMONG INDUSTRY STAKEHOLDERS:** Accurately monitoring and responding to supply-demand balances requires cohesion among industry stakeholders; even more so amid the shifting sands of the energy transition.		
5. **REPLICATE LESSONS LEARNED IN OIL AND GAS:** Many successful techniques to engage and grow the local supply chain have trialed and tested in the fossil fuels market. Do not reinvent the wheel; apply success stories to lower-carbon growth.	PDO	
6. **ADVOCATE VOCATIONAL TRAINING:** Pairing a strong academic knowledge base with vocational training means university leavers can apply classroom knowledge directly to a project more effectively. Such efficiency will prove vital in SMEs' ability to not only successfully compete for bigger tenders, but also support the sultanate's energy security. The intellectual gap between theoretical and practical skills must narrow.	Shell	PDO
7. **INTERNSHIPS - HARNESS LOCAL TALENT:** People matter - investing in local capabilities will pay off. This broad spectrum encompasses better alignment between industry and academia, such as ensuring longer-term internships in the winter and not summer months.	PDO	OOCEP
8. **BUILD IN-COUNTRY R&D:** Undertaking applied research project on solar panel efficiency to maximize the opportunity for rooftop solar in Oman. Building in-country R&D capabilities for wind and solar will allow SMEs to grab the opportunity presented by the inherent demand in Oman and build the economic supply-chain.	GUTECH	BP
9. **LEVERAGE DIGITAL TOOLS:** Digitalization & technologies can be leveraged more coherently to have a greater enabling role. Such tools are key in achieving scalability in the transition, such as when renewables will inevitably account for more than 15% of the overall grid. The same applies to creating a digital cloud to incentivize more FDI, therefore enabling a greater flow of ideas and funds to drive the energy transition.		OOCEP
10. **DRIVE PUBLIC AWARENESS ON TRANSITION:** The mindset on energy transition still needs to shift – industry should work with the government to build general awareness of energy efficiency so that this is instinctively translated into measures taken across the economy and within households.	OPAL	PDO

Oman Energy Leadership Summit Survey Results – How to Accelerate Oman's Energy Transition?

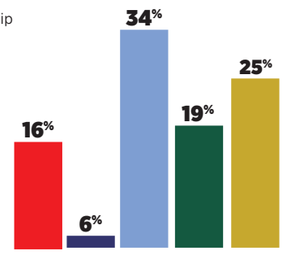
INDUSTRY TO EXECUTE:
How to Accelerate Oman's Energy Transition?

- **A.** Apprenticeship Programmes
- **B.** Categorize & Support SMEs
- **C.** Nurture Local Supply-Chain Champions
- **D.** Collaboration among Industry Stakeholders
- **E.** Replicate Lessons Learned in Oil and Gas



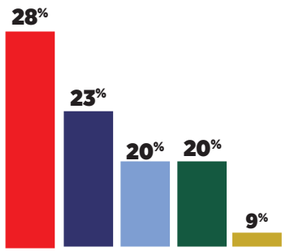
INDUSTRY TO EXECUTE:
How to Accelerate Oman's Energy Transition?

- **A.** Advocate Vocational Training
- **B.** Harness Local Talent: Winter Internship
- **C.** Build In-Country R&D
- **D.** Leverage Digital Tools
- **E.** Decouple Power & Water Generation



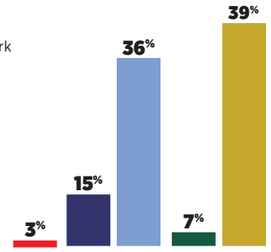
GOVERNMENT POLICY RECOMMENDATIONS:
How to Accelerate Oman's Energy Transition?

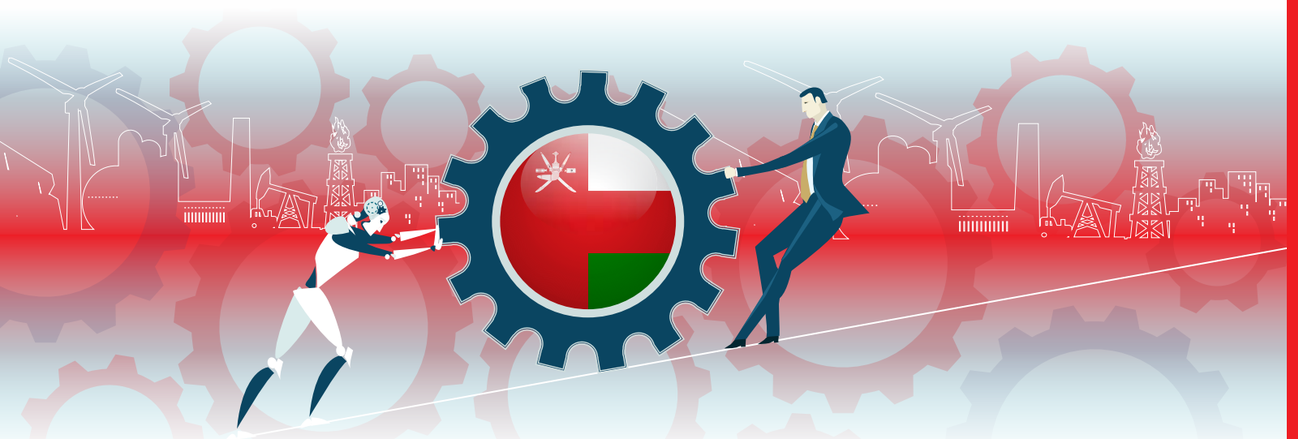
- **A.** Government Regulation to Improve Demand Management
- **B.** Accelerate Power Deregulation & Introduce Spot Market
- **C.** Establish Clear Longterm Targets for Renewables & Align Tax Rates to Drive Investment Incentives
- **D.** Oman Should Include all Industries in Energy Transition
- **E.** Increase Investment in Renewable Energy



GOVERNMENT POLICY RECOMMENDATIONS:
How to Accelerate Oman's Energy Transition?

- **A.** Engage International Development Agencies/ Public-Private
- **B.** Resolve Oman Gas Shortage
- **C.** Introduce Flexible Regulatory Framework for Renewables
- **D.** First Mover Advantage
- **E.** Remove Electricity Subsidies





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