

Please wait. The webinar will begin promptly at 1:05 pm Gulf Standard Time.



Webinar: Cutting Energy Costs in Industrial Facilities: Case Study of an Award-Winning ISO 50001 Project in Oman

Date: Monday, 29th of July, 2019

Time: 1 - 2 PM (Gulf Standard Time)



Ridah Sabouni
Managing Director MENA
Energetics
Moderator



Liam McLaughlin
Chief technology Officer
GEN Europe



Imam Ergawi
Assistant Manager for
Industrial Engineering & Energy
Management
Areej Vegetable Oils & Derivatives



CEBC Introduction and Context to the Topic

Clean
Energy
Business
Council



مجلس
صناعات
الطاقة
النظيفة

Middle East & North Africa
الشرق الأوسط وشمال أفريقيا

Ridah Sabouni

- Managing Director, MENA Energetics (www.energetics.com)
- Advisor and Industrial Energy Efficiency Lead, CEBC (<http://cebcmena.com/whatwedo/EEWG/>)

What is the Clean Energy Business Council?

- ◆ Registered as a Not-for-Profit Company in Masdar City in Abu Dhabi, **the Clean Energy Business Council** is the pre-eminent organization representing the private sector involved in the clean energy sector across the MENA region.
- ◆ Our goal is to establish a dialogue between the public and private sectors, and to drive the development of appropriate and much needed regulation and policy to support the development of the clean energy sector.



What we do

- ◆ We work on behalf of our members to promote the uptake of renewable and clean energy technologies, through **partnerships** with government and stakeholders, **events** and opportunities to **collaborate**.
- ◆ We also develop and present **policy solutions**, in coordination with our member organizations.
- ◆ We provide **advocacy and thought leadership** for the clean energy sector, with special insights into the MENA region.
- ◆ Throughout the year, we host **workshops and events**, allowing our members the opportunity to share and promote their ideas, services and knowledge
- ◆ We run a range of working groups on a range of clean energy topics, including **Future Mobility, Clean Energy Policy, Energy Efficiency, Climate Finance**
- ◆ We also have programs focused on **Women in Clean Energy** and a Program focusing on **outreach to K-12 Schools**

CEBC Working Groups and Programs

- ◆ Future Mobility lub (FMC);
- ◆ Energy Efficiency Working Group (EE);
- ◆ Women in Clean Energy Working Group (WICE);
- ◆ Climate Finance Working Group; and
- ◆ High School Programme.

CEBC Members (100+ members)



CEBC Partners



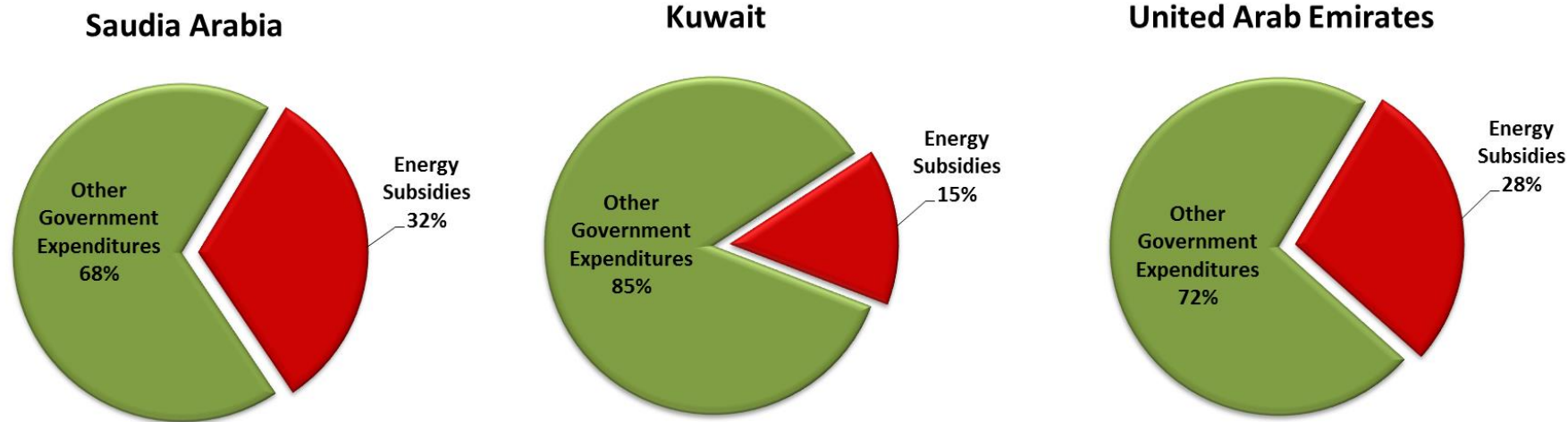
Join the CEBC!

- ◆ Platform for connecting stakeholders from private and government sectors to promote dialogue and facilitate projects;
 - ◆ Excellent networking opportunities;
 - ◆ Amplify your company's viewpoints through our advocacy and lobby group work;
 - ◆ Leverage off CEBC's profile and networks to promote your messages and increase brand awareness of your organization;
 - ◆ Participate in high caliber events where you can gain and share your knowledge with others in the sector, including the opportunity for members to present and speak at our events; and
 - ◆ Opportunity to participate in our working groups.
-
- ◆ Further information: Email ahmed@cebcmena.com or visit our website at: <http://www.cleanenergybusinesscouncil.com>

Energy Subsidies in the GCC

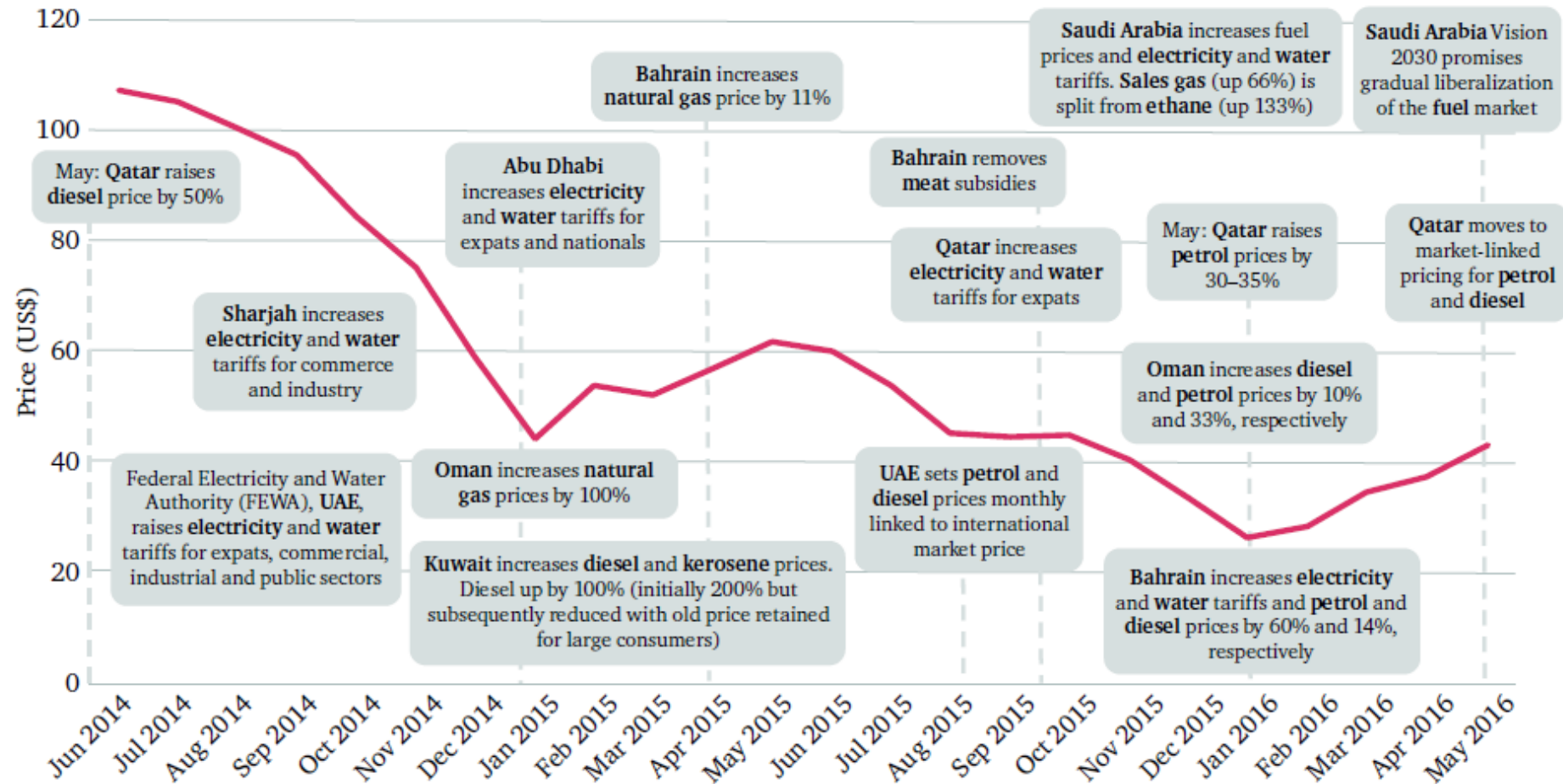
- In 2011, the MENA region as a whole accounted for 50% of all global pre-tax energy subsidies

Energy Subsidies as a Percent of Government Expenditures, 2010



Source: Brookings Center - Low-Carbon Energy Transitions In Qatar And The Gulf Cooperation Council Region (2014). All Data 2010.

Drop in the Price of Oil



Source: Glada Lahn (Chatham House), "Fuel, Food and Utilities Price Reforms in the GCC A Wake-up Call for Business" June 2016.

Recent Energy Pricing Changes Across the GCC

Three Gulf states raise gasoline

101 days ago 4965 views

Kuwait water, electricity prices up by 500 per cent

Kuna/Kuwait
Filed on August 23, 2017 | Last

The energy subsidies dam has finally broken in the Middle East

Robin Mills
January 3, 2016 Updated: January 3, 2016 06:52 PM

Related

Robin Mills: Region quenches oil demand with end to subsidies

- Kuwait last GCC country to hike petrol prices to curb government costs

- Saudi Arabia's water minister sacked after

When dams break, they begin with a small crack – until the swirling waters suddenly break through and the whole edifice collapses.

The array of Middle East energy subsidies now is also being swept away. Following on the UAE's change to market-based fuel prices, Abu Dhabi raised utility rates, Saudi Arabia's latest budget cut subsidies and Oman has said they will be eliminated. Bahrain will raise diesel and kerosene prices gradually, while Kuwait's finance ministry proposes to trim more than a third from handouts.

Three powerful forces are driving this change.

Power tariffs to gradually increase to

By: dt news, Posted on 05-Jan-2016

Abu Dhabi resid

Water and electricity introduces

Saudi Arabia hikes fue

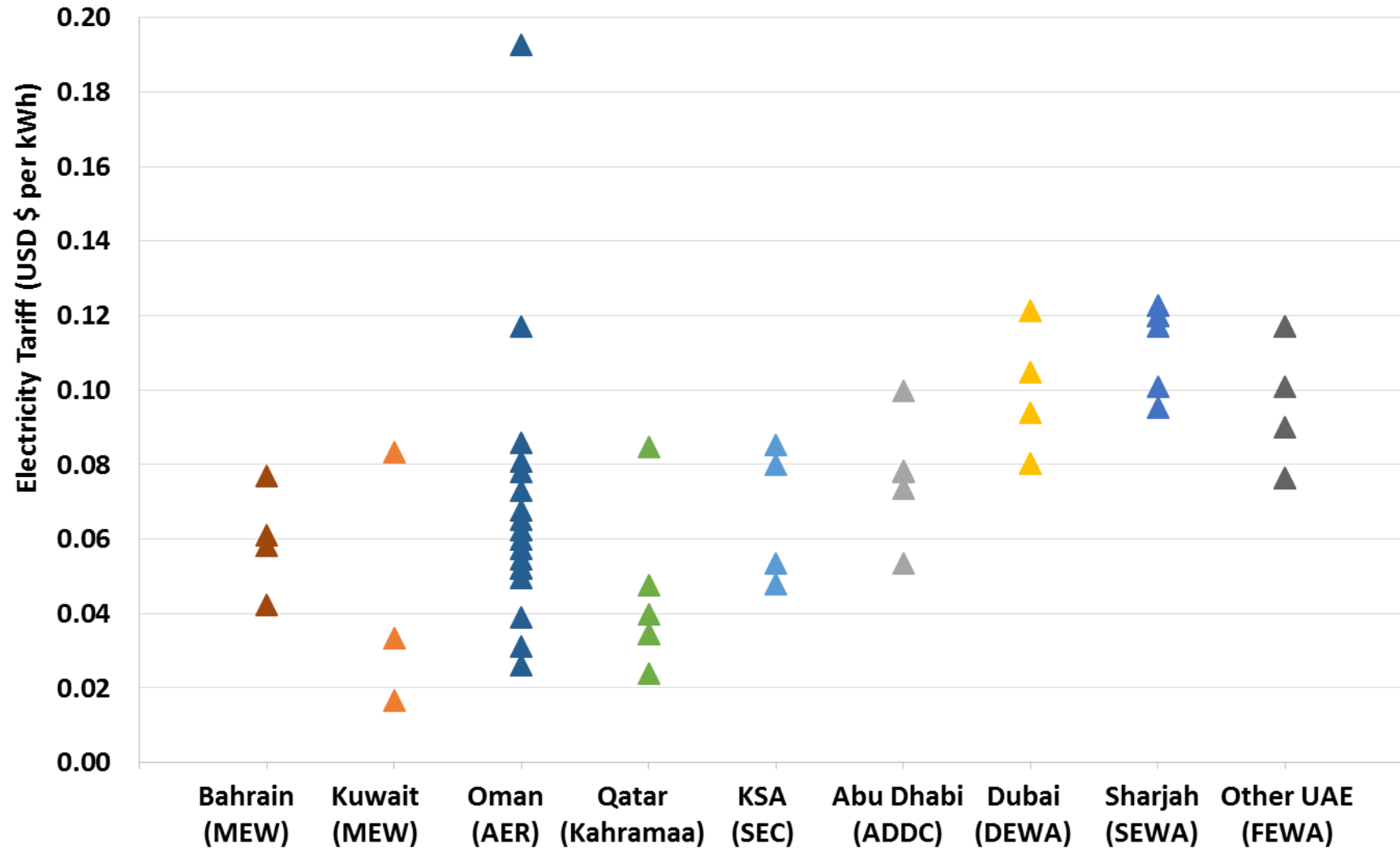
11 days ago 171984 views

Higher tariff for large electricity consumers in Oman from January 2017

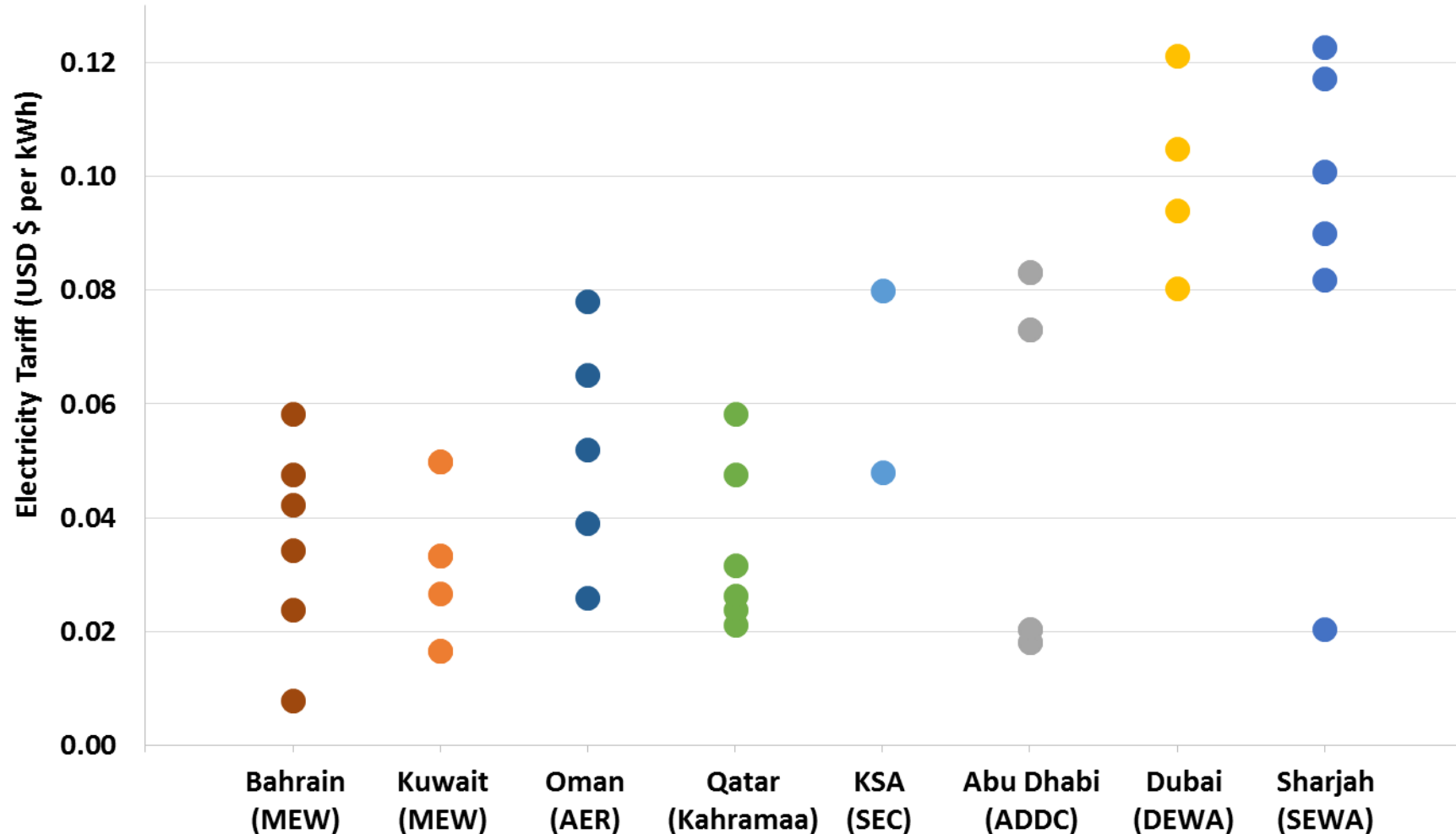
October 12, 2016 | 3:41 PM by Times News Service

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Current GCC Electricity Tariffs: Industrial, Government & Commercial Sectors



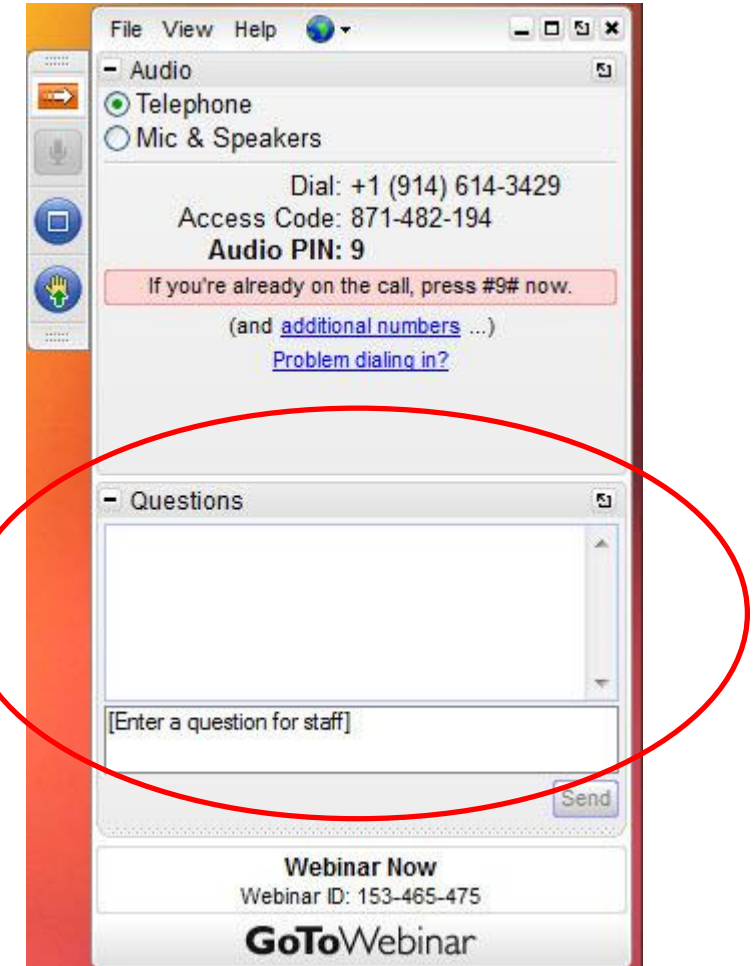
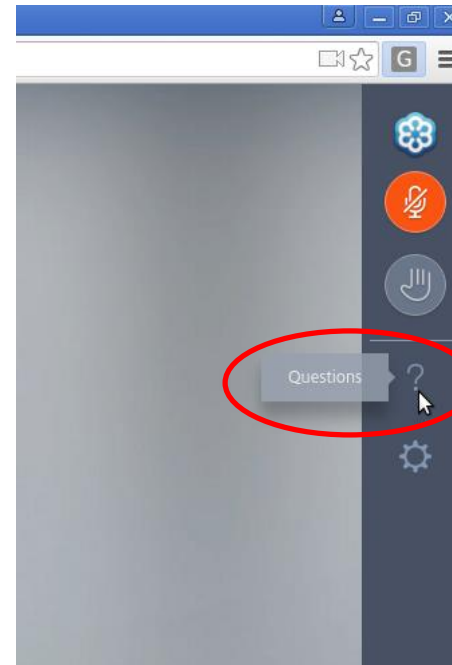
Current GCC Electricity Tariffs: Residential Sector



<http://cebcmena.com/whatwedo/gcc-residential-tariffs-latest/>

Agenda and Instructions for Attendees

- 20 - 30 min presentation from Eng. Liam McLaughlin and Eng. Imam Ergawi
- Final 15 min of the webinar for questions from the audience
- All attendees are muted, but we welcome your comments and questions. Use the gotowebinar attendee control panel (similar to the screenshots shown to the right) to ask any questions or make comments



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CUTTING ENERGY COSTS IN INDUSTRIAL FACILITIES: CASE STUDY OF AN AWARD-WINNING ISO 50001 PROJECT IN OMAN

CLEAN ENERGY BUSINESS COUNCIL WEBINAR

29 JULY 2019

Eng. Imam Ergawi

Assistant Manager – Industrial Engineering & Energy Management

Eng. Liam McLaughlin

Chief Technology Officer, GEN Europe

OUTLINE



- Introduction to ISO 50001
 - What is Strategic Energy Management?
 - What causes energy consumption to change?
 - What is ISO 50001?
 - What are the benefits?
- ISO 50001 at AVOD
 - Motivation
 - Timeline
 - Barriers
 - Benefits

GEN EUROPE INTRODUCTION



Lithuania
Oman
Tunisia
Uzbekistan
India
Sri Lanka
Jordan
Egypt

Croatia
Ghana
Armenia
Senegal
Barbados
Kazakhstan
Iraq
Thailand

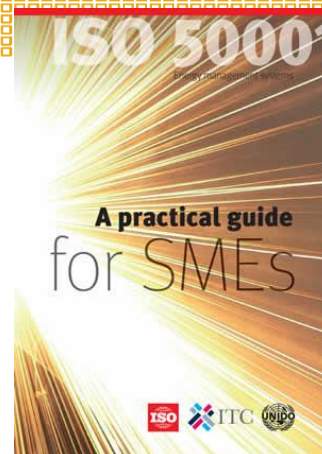
Members of ISO TC 301

- **Liam McLaughlin**
(United Nations)
- **Andrea López**
(Spain)

Cork

Madrid

Technical experts in ISO
50001 for the
Accreditation Bodies in
Ireland and Spain

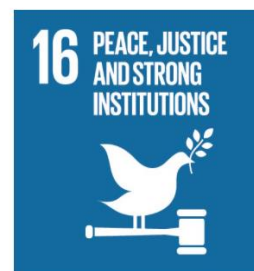
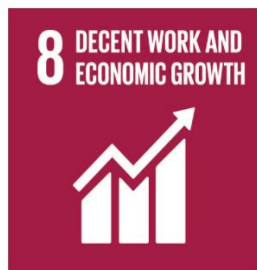


Malaysia
Moldova
South Africa
Russia
Macedonia
Iran
Ukraine
Georgia

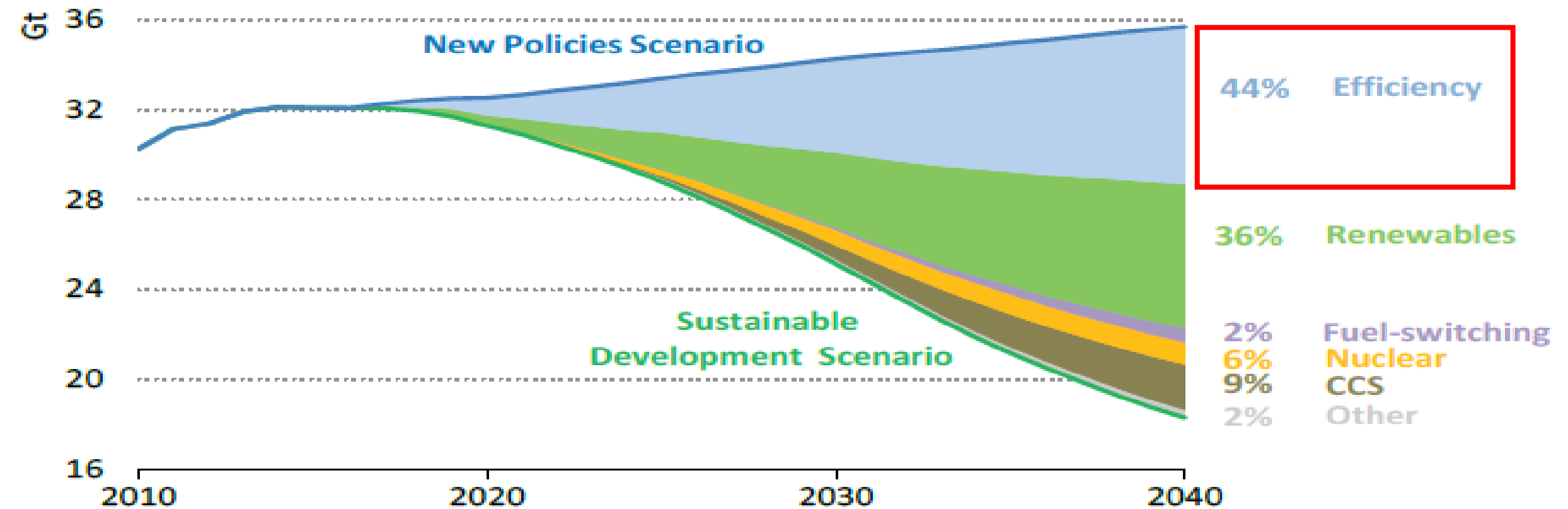




SUSTAINABLE DEVELOPMENT GOALS



CLIMATE CHANGE POLICY SCENARIOS



Source: IEA – Energy Technology Perspectives 2018

Impact of UNIDO-GEF EnMS-ISO 50001-ESO Program

7,500 GWh of
final energy
savings

=



Annual energy
consumption of
1,230,000
EU households

OR



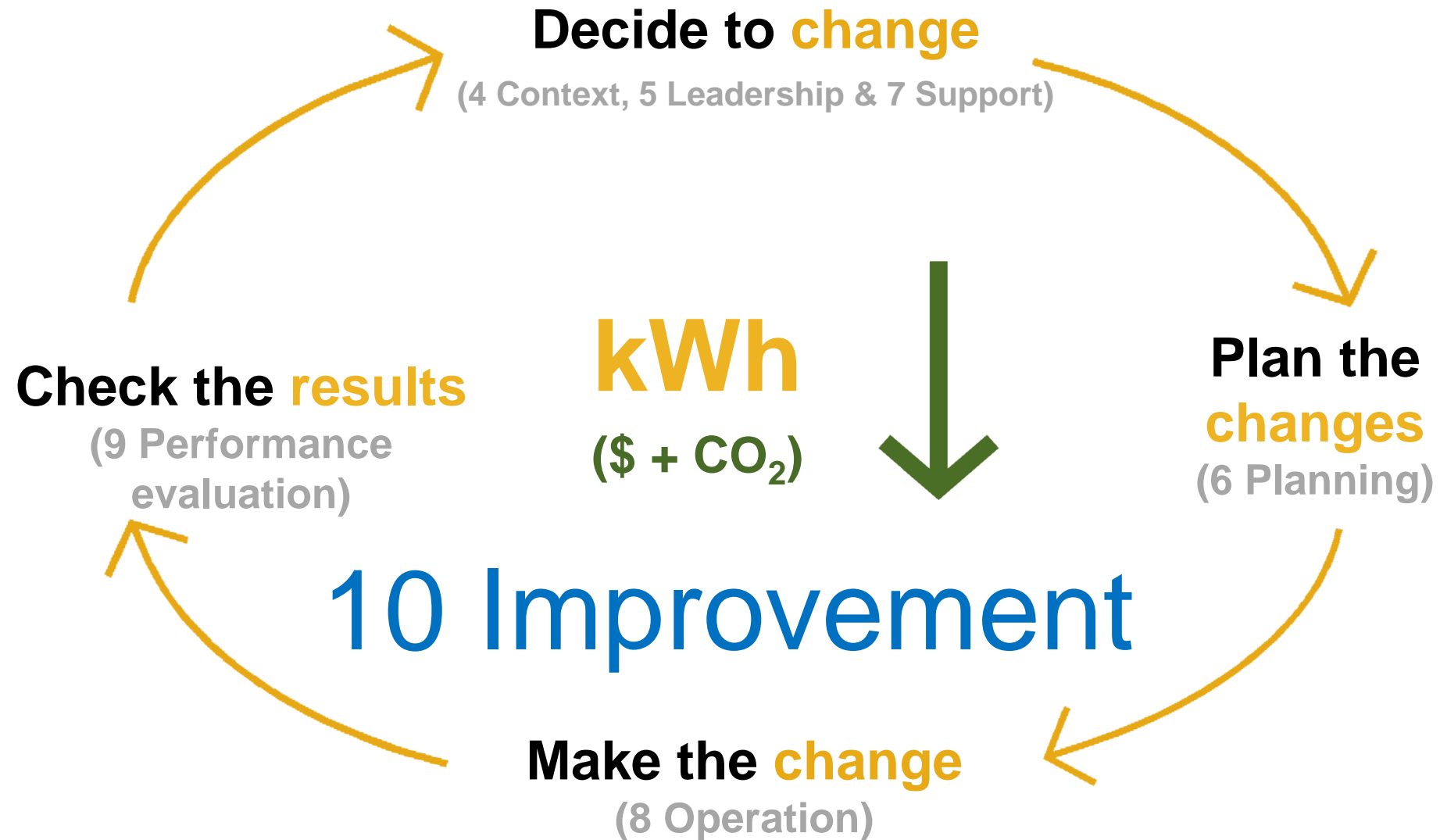
5 years energy
production of
400 1 MW wind
turbines

OR



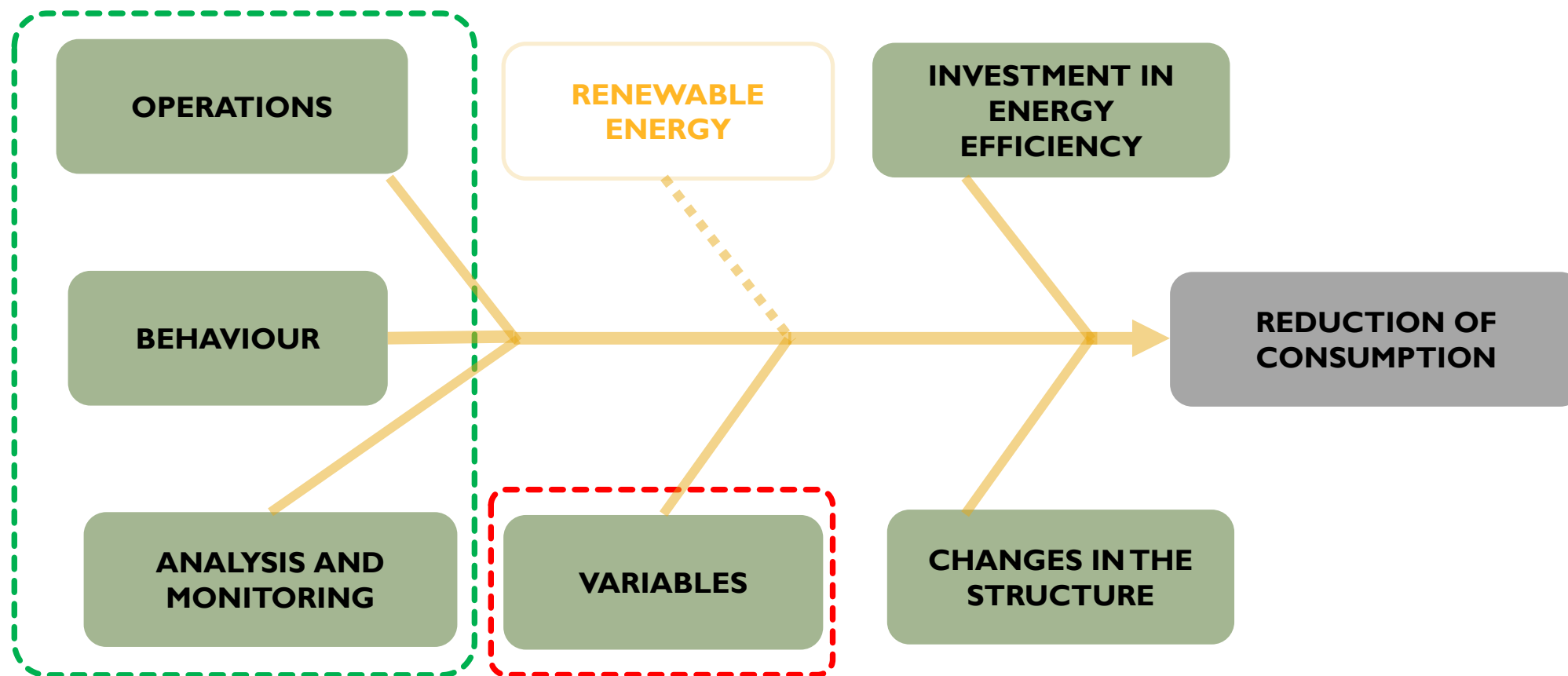
CO2 emissions of
1,875,000 middle
class cars (running
12,500 km per year)

- Organization-wide energy savings in first 1-2 years range from 4% to 15%, with little or no capital investments
- Cumulative cost savings of beneficiary companies estimated to exceed **USD 250 mio** without considering non-energy benefits
- Direct GHG emission reductions of more than **4.8 million tCO2**
- Sustainable pipeline of IEE investments generated





WHAT CAUSES ENERGY CONSUMPTION TO VARY?



CRITICAL SUCCESS FACTORS

- Top management commitment and support
- Integration into normal business processes
- Enthusiasm from the energy manager
- Good practical technical knowledge of the energy using systems
- Data analysis skills
- Openness to change

AREEJ VEGETABLE OILS & DERIVATIVES S.A.O.C (AVOD)



History

- Founded in 1980 as an LLC company by Dr. Omar Zawawi and Mr. Mohsin Haider Darwish
- Commercial production started in Nov. 1982
- Converted into a Joint Stock Company in 1984 with 50% of shares owned by Dr. Omar Zawawi Group and ~ 40% owned by MHD Group.



شركة أريج للزيوت النباتية ومشتقاتها ش.م.ع.
AREEJ VEGETABLE OILS & DERIVATIVES SAOG

www.avod.com.om

Product Portfolio

- Cooking Oils, Vegetable Ghee, Margarine, Specialty Fats, Butter, Mayonnaise, Salad Dressings and Ketchup

AVOD leading brands

- Minara, Sohar, Khafeef, Jabal Akhdar, Muscat Margarine

AREEJ VEGETABLE OILS & DERIVATIVES S.A.O.C (AVOD)



Business Model

- Plant Capacity = 240,000 TPA
- Current Staff Strength: 750 Employees (58% Omanis)
- One of the largest companies in OMZEST Group
- Consistently Figures in the OER Top 20 List

Client base

- Unilever, Emborg, Heinz, Hellmann's, Knorr

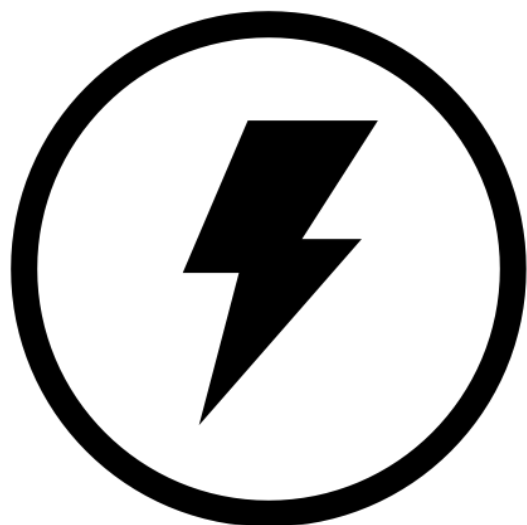


AVOD exports to 30 countries, from Canada in the North to New Zealand in the South, and USA in the West to Uzbekistan in the East

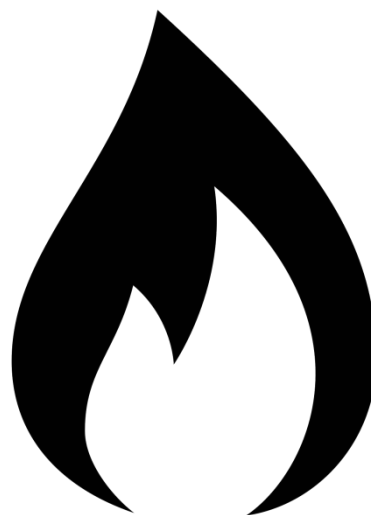


ENERGY CONSUMPTION AT AVOD

- Average energy & water consumption (2015-2017)



51 Million kWhr



3.1 Million m³



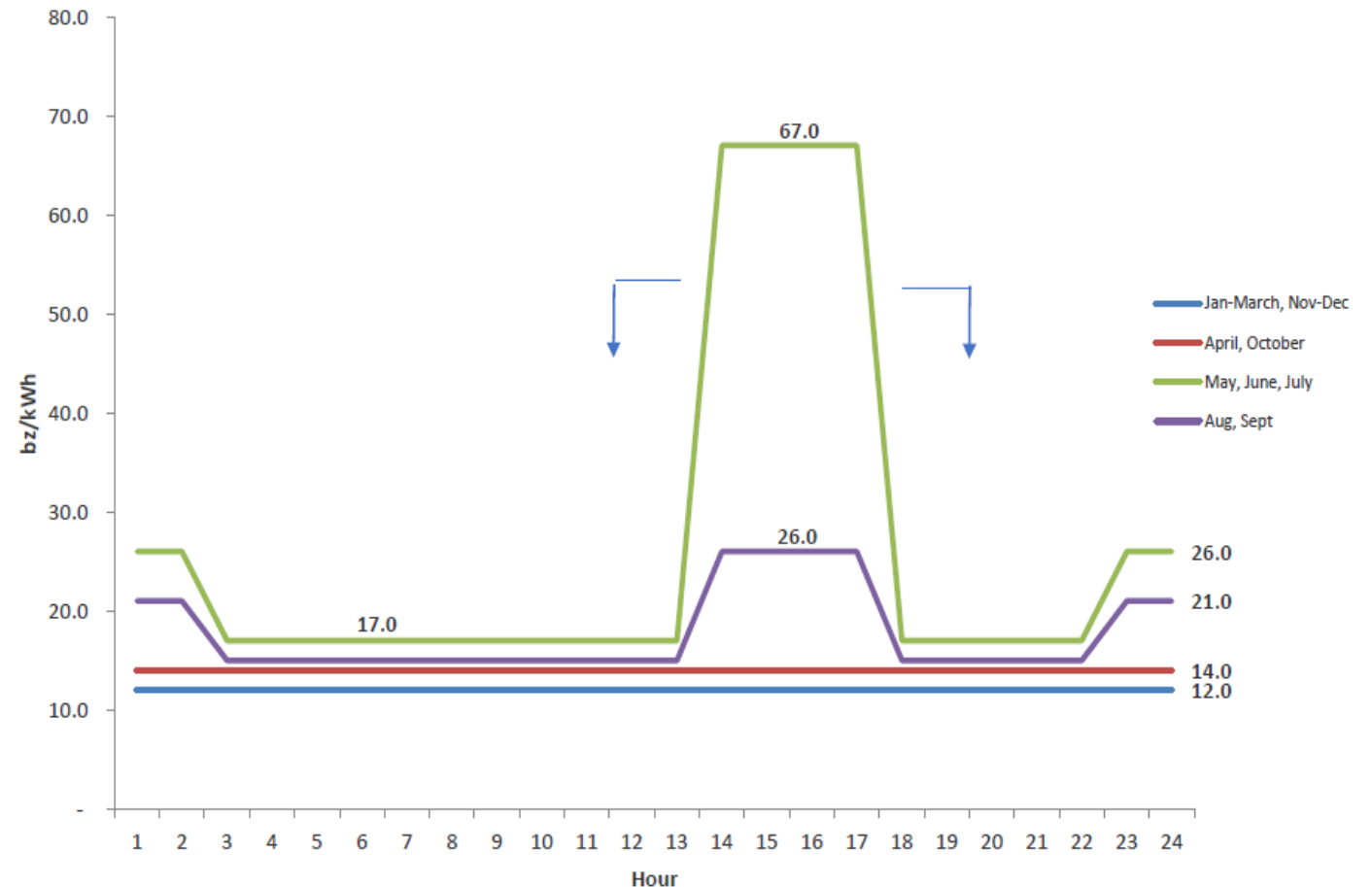
195,000 m³

MOTIVATION



Cost-reflective tariff in Oman: 1 January 2017

- Although electricity *consumption* (kWh) stayed flat, electricity *spending* (OMR) rose by 62% from 2016 to 2017!
- Overall energy + water spending increased by 47% from 2016 to 2017

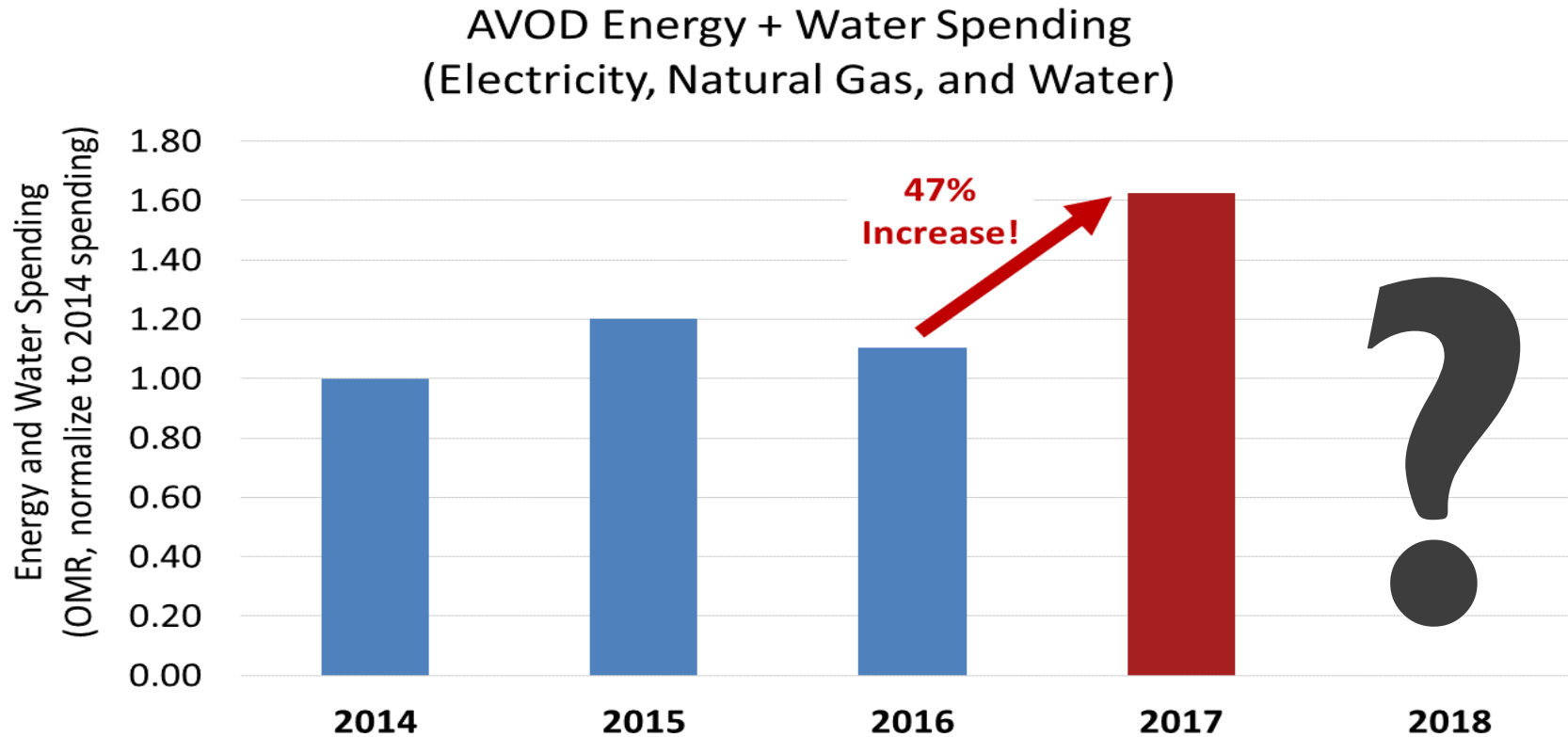


Source: Oman AER, Industrial Day Presentation (2017)

MOTIVATION



- *Top management needed a proven method to get energy costs under control*





ISO 50001 IMPLEMENTATION TIMELINE



ISO 50001 IMPLEMENTATION – A SAMPLE OF TASKS



- Establish scope and boundaries
- Develop and implement energy policy
- Establish roles and responsibilities
- Develop energy manual
- Legal and other requirements
- Collect energy data
- Energy balance and SEUs
- Develop energy baselines
- Develop EnPIs
- Monitor energy performance
- Identify technical energy saving opportunities involving investment
- Review operational control
- Competence and training
- Internal Audit

OVERALL ENMS HIGHLIGHTS



- Total of 169 identified energy savings opportunities (ESOs)—including 102 in 2018
- Major Savings from ESO List:
 - Reduction of Compressed Air pressure
 - Heat and Water recovery from steam condensate
 - CIAD Compressor Centralization project
 - Optimizing the cycle time of DF generation by eliminating DF 68
 - Insulation of Steam/Oil lines
 - Operational Control and process modifications
- Trained **160** AVOD staff on different aspects of the EnMS
 - General energy management awareness training
 - Steam technical training
 - Compressed air technical training
 - Refrigeration technical training
 - Effectively measuring energy performance improvement
- Installation of 102 Smart Meters



CHALLENGES FACED

- Data collection
- Data quality
- Documentation and recording of data/plans
- Availability of information
- Staff experience with energy management

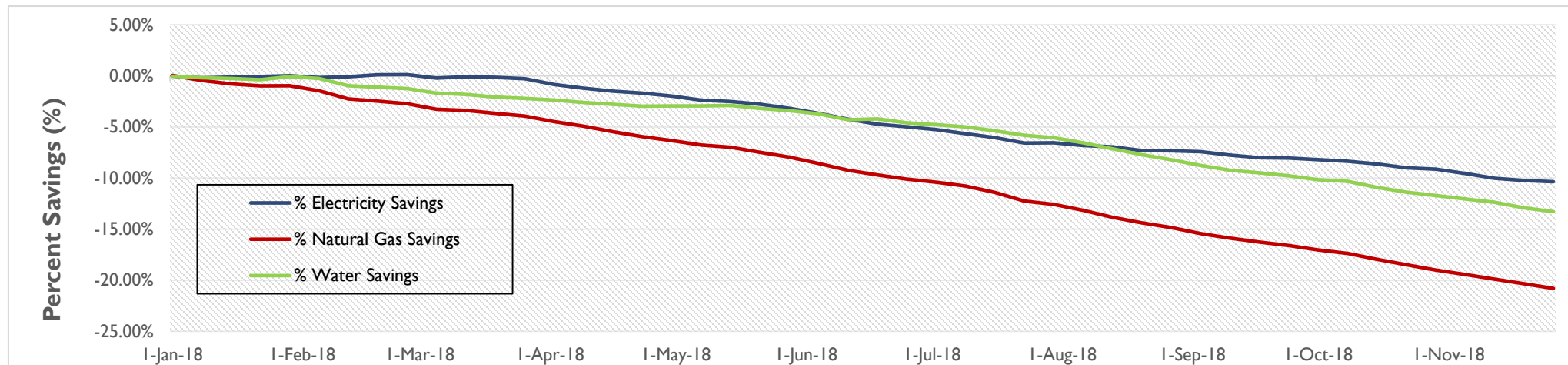


RESULTS: ENERGY & WATER SAVINGS

■ Overall Savings (Jan to Nov. 2018):

Year (2018)	Electricity		Natural Gas		Water	
Target	15%	7,551,364 KWH	5%	130,746 m ³	10%	17,760 m ³
Actual (YTD)	10.36%	5,215,404 KWH	20.79%	543,672 m ³	13.28%	23,593 m ³

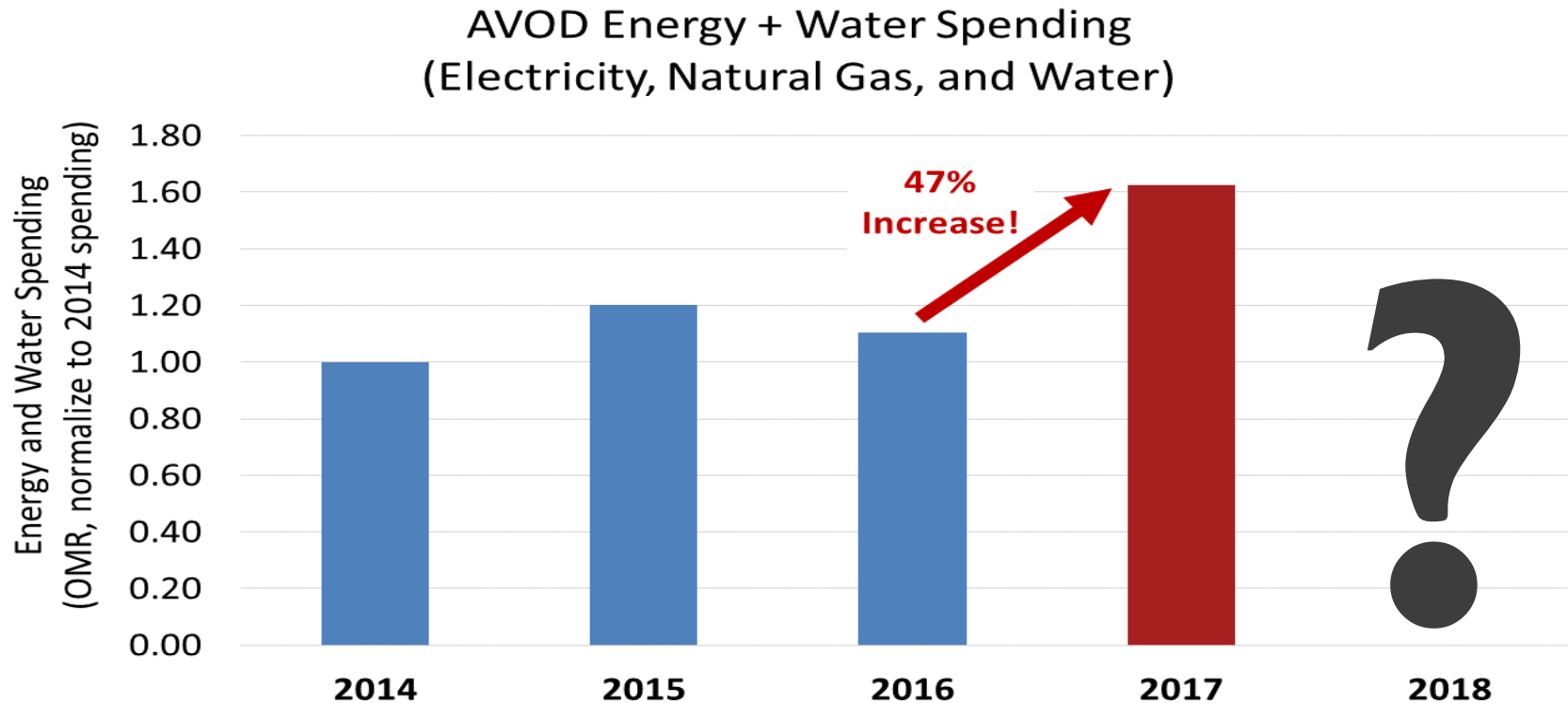
All savings normalized to take into account production and weather variables (using multi-variate regression models)



OVERALL RESULTS



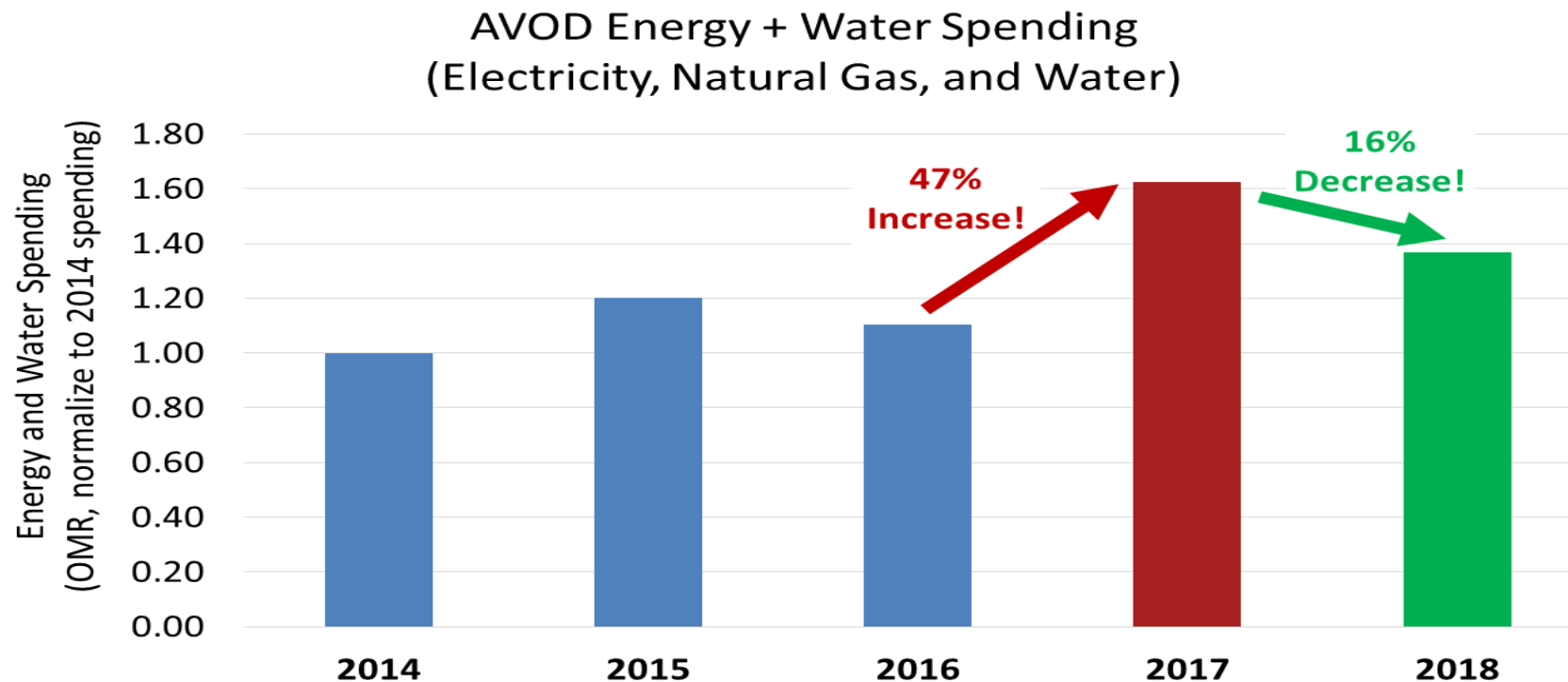
- *Top management needed a proven method to get energy costs under control*





OVERALL RESULTS

- **Reduced energy costs—for the long-term.** Reduced CO₂.
- Additional non-energy benefits: Improved process control, motivated staff, positive PR/marketing



ISO 50001 CERTIFICATE



DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No: 264493-2018-AD-ARE-RvA Initial certification date: 08 November 2018 Valid: 08 November 2018 - 21 August 2021

This is to certify that the management system of

Areej Vegetable Oils and Derivatives SAOC



Next to MHD Gas Factory, Old Nizwa Road, Rusayl, Plot No. 149, P. O. Box: 22, Postal Code: 124, Muscat, Oman

has been found to conform to the Energy Management System standard:
ISO 50001:2011

This certificate is valid for the following scope:
Processing, Manufacturing and Warehousing of Cooking Oils, Vegetable Ghee, Margarine, Specialty Fats, Butter, Blended Butter, Mayonnaise, Salad Dressing and Ketchup.

Place and date:
Barendrecht, 02 November 2018





For the issuing officer:
DNV GL - Business Assurance
Zwitserweg 1, 2994 LB, Barendrecht,
Netherlands


Eric Kuik
Management Representative

Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.
DNV GL - Business Assurance B.V. - 2700 Zandvoort, The Netherlands. Tel. +31 (0)20 240 3000. www.dnvgl.com

MOVING FORWARD

- Targets for 2019

Electricity	Natural Gas	Water
8%	10%	11%

- Technical Training
- Identifying more Energy Saving Measures
- Solar Energy

WINNER OF THE 2019 GLOBAL LEADERSHIP AWARDS IN ENERGY MANAGEMENT



ISO 50001 Energy Management System Case Study

Sultanate of Oman

Areej Vegetable Oils & Derivatives S.A.O.C (AVOD)

First organization in Oman to implement an ISO 50001 energy management system (EnMS)



Organization Profile & Business Case

Areej is one of the leading fast-moving consumer goods (FMCG) companies in Oman. Founded in 1980. We are an integrated manufacturer of a wide range of products such as: cooking oils, vegetable ghee, margarine, specialty fats, butter, mayonnaise, salad dressings and ketchup. Our products serve the local market as well as over 30 Countries around the globe. We are also partnered with many of the major brands to fulfill their production requirements in the region such as: Unilever, Emborg, Heinz, Hellmann's, Knorr. Our plant capacity is 240,000 tonnes of oil per year and our staff strength is 750 employees.

"Through ISO 50001 implementation, we are able to maintain our competitiveness in the market and deliver to our customers the most cost-effective and high-quality products"

—Eag. Saleem Al Batainey, CEO

Case Study Snapshot

Industry	Food Processing
Product/Service	Processing, manufacturing and warehousing of cooking oils, vegetable ghee, butter, margarine, specialty fats, blended butter, mayonnaise, ketchup, and salad dressing, Rusayl, Muscat, Oman
Location	
Energy management system	ISO 50001
Energy performance improvement period	1 Year (Jan 2018 - Dec 2018)
Energy Performance Improvement (%) over improvement period	Electricity: 11% Natural Gas: 23%
Total energy cost savings over improvement period	USD \$779,000
Cost to implement EnMS	USD \$138,520
Total Energy Savings over improvement period	43,763 GJ
Total CO ₂ -e emission reduction over improvement period	11,382 metric tons CO ₂ -e

Motivation
In January 2017, the Omani government introduced a Cost Reflective Tariff (CRT) for all large electricity consumers with greater than 150 MWhr of electricity consumption per year. For many years previously, Oman electricity tariffs were flat and very low. The CRT tariffs introduced a time-of-use tariff scheme to Oman with high electricity rates in peak times during the summer months, which resulted in a large 62% increase in Areej's 2017 electricity bill compared to 2016 (while maintaining a consistent production output). This was the key motivation for Areej to take the initiative to correct the situation and bring our operational expenses back in control, while reducing also our GHG footprint (in line with the direction of the Omani government and the global sustainable development goals).

2019 CEM Award of Excellence in Energy Management Winners



3M 30 sites

Global: Belgium, Canada, France, Germany, Poland, Republic of Korea, United States of America



Areej Vegetable Oils & Derivatives

S.A.O.C.
Oman



JK Tyre & Industries Ltd.

Chennai Tyre Plant
India



PT Pupuk Kalimantan Timur

PKT-3 Plant and PKT-1A Plant
Indonesia

Thank you.

Questions and Discussion

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