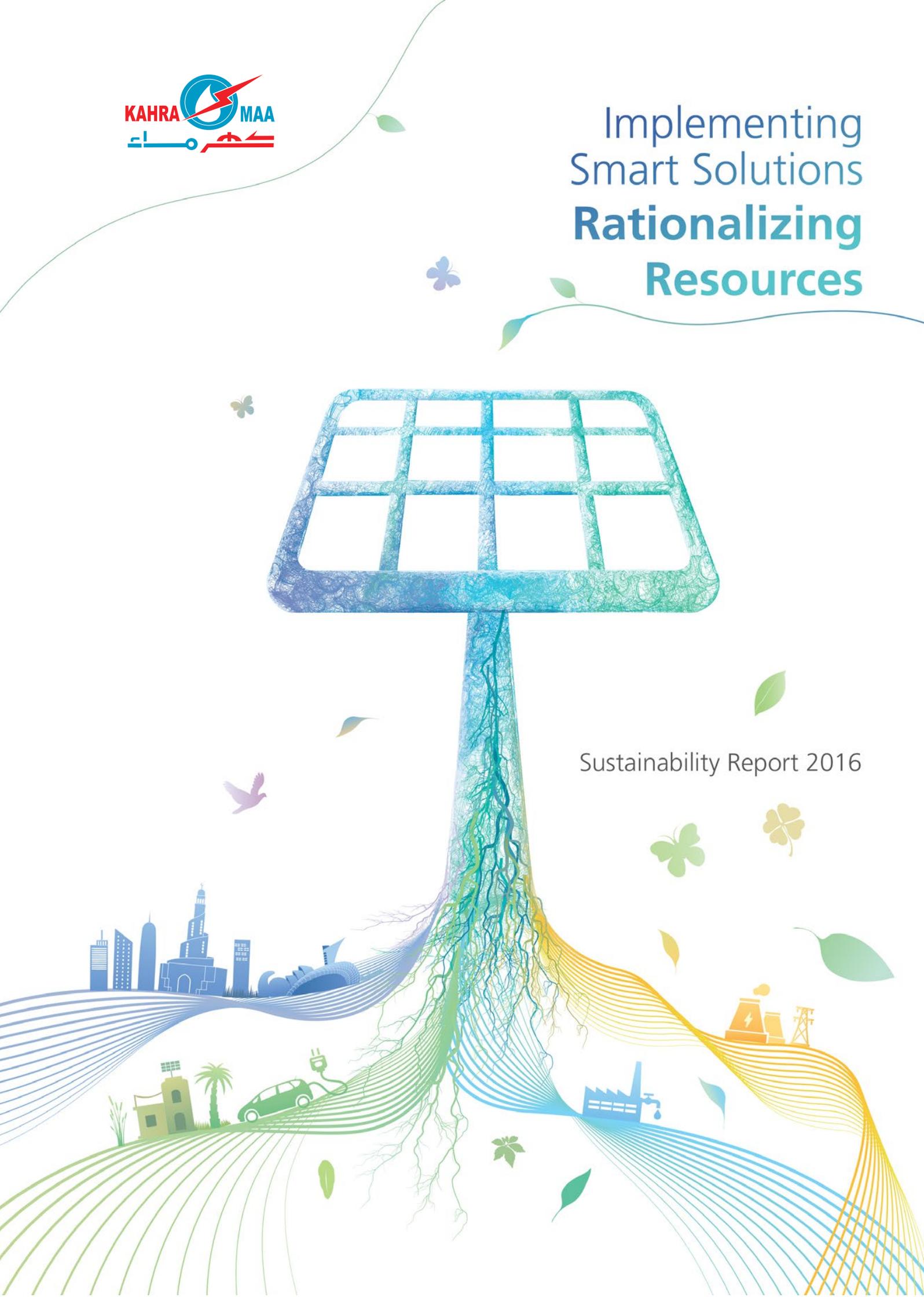




Implementing Smart Solutions **Rationalizing Resources**

Sustainability Report 2016



About this Report

We are pleased to present our fourth public sustainability report which highlights the impacts of our operations on the environment, society and Qatar's economic development.

We understand that the scale and the complex nature of the sustainability challenges often require a joined up and integrated approach involving various stakeholder groups.

By providing a clear and transparent picture of where we are today and what our future commitments are, this report aims to engage our customers, partners, suppliers, employees, and other stakeholders in a discussion about the role we all have in the delivery of Qatar's National Vision 2030 and the Qatar National Development Strategy-II (2017-2022).

Reporting process and standard

Boundary: KAHRAMAA – Qatar General Electricity and Water Corporation – represents the sole transmission and distribution system owner and operator for the electricity and water sector in Qatar. Therefore, the information provided within this report's boundaries covers only our activities of transmission and distribution, and excludes the generation of electricity and water.

Scope: The report focuses on KAHRAMAA's own framework, procedures and processes in place to drive sustainability and elaborates further on the sustainability initiatives implemented both within KAHRAMAA and on a nationwide level. We are committed to expand our scope in the future beyond our own operations to cover further information about our supply chain performance.

Reporting standard and period: This report has been prepared in accordance with the GRI Standards: Core option as well as the GRI Electric Utilities Sector Supplement, and documents our sustainability performance in 2016. Where data permits, historic figures are presented as well, however for the purpose of consistency and clarity, 2016 remains the main focus.

Future commitment: We have strived to present a detailed and comprehensive picture of our activities in this sustainability report. We are committed to continuing on our sustainability journey and would build on our sustainability reporting system in the future to be able to capture a broader data spectrum that reflects our stakeholders' needs and expectations.

Identifying priority issues to report

We face a variety of challenges and potential opportunities areas across a whole range of sustainability related topics.

Our materiality assessment process helped us prioritize environmental, social and economic topics with maximum impact on KAHRAMAA as well as on our stakeholders, which guided the sustainability reporting approach for 2016.

We engage with internal and external stakeholders to identify topics of importance, plot all identified sustainability issues on our materiality matrix, prioritize them and decide what issues to report on. For further detail on the process and the key issues identified, please refer to page 24 and 25.

Engagement

We hope this report will continue to enhance the communication with all of our stakeholders. Please connect with us to share your thoughts, feedback, or questions:

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 KAHRAMAA

 kahramaa-qa

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H.E. DR. MOHAMMED BIN SALEH AL-SADA
MINISTER OF ENERGY AND INDUSTRY

Minister's Foreword

The government is committed to creating a dynamic, competitive and broad-based economy by increasing economic diversification through the re-investment of Qatar's significant energy wealth. The outcome is evident in the rapid changes and urbanization during the last decade, brought about by wise national economic planning, stable state revenues and Qatar's vision of shaping Doha as a world-scale metropolis. This means continued buoyancy for the private sector in Qatar, and a surge in economic activities in infrastructure creation and building of civic amenities.

Large opportunities for investment and energy trade are present, coupled with continuing lifestyle improvement, development of telecommunications, information technology, knowledge economy, renewable resources and business efficiency. Qatar's rapid public infrastructure expansions and real estate development are driving the continual population growth, primarily due to the need for more expatriate manpower. Large scale investments in transport, communications, tourism, sports facilities and other services are on-going, such as the development of the Lusail City, Qatar Economic Zones (Manateq), Qatar Rail and M'sheireb real estate projects and other major infrastructure developments.

Continuing industrialization largely due to the oil and gas sector and rapid urbanization has generated increased demand for major improvements and expansion of basic infrastructure and services most notably electricity and water. As such, Qatar General Electricity & Water Corporation "KAHRAMAA" has taken all necessary procedures to guarantee the supply of these two major services and to strengthen the basic infrastructure of electricity and water sectors, to ensure the sustainability and reliability of supplies. Beside KAHRAMAA efforts to develop the electricity and water services in the state and to meet the growing demand for these vital services.

For example, Al-Duhail Superstation 11/66/220 commissioned on March 2015 at a total cost of 255 million QR. It feeds Duhail area, Wadi Al-Banat and other vital facilities. There is also, the Strategic Mega reservoirs at Rawdat Rashid meant to secure water supplies in Qatar and is considered the largest expansion of Qatar water storage ever. It aims to increase Qatar water strategic storage till 2026 (first stage). The project consists of 24 reservoirs at a total capacity of 2300 Million Gallons. The total cost of the project awarded contracts is QR 17 bn. 55% of contractors are Qatari companies. The project is due for final commissioning and operation in the second quarter of 2018.

KAHRAMAA endeavors to provide high quality services for customers by commissioning vital projects to meet the increasing demand of Qatar's preparations to host the 2022 FIFA World Cup which add more challenges to the readiness of KAHRAMAA.

Peak electricity demand in 2016 was 7,435 MW, 2.3% more as compared to 2015 with the Industrial sector peak demand of 1,560 MW in 2016, 0.1% more to 2015. Total energy transmitted in 2016 was 39,667 GWh with growth of 2.1% over 2015.

Total water production in 2016 was 560 million cubic meters, an increase by 5.07% over 2015. The maximum monthly water production in 2016 was 50.1 million cubic meters in the month of October, an increase of 1.7% over 2015.

KAHRAMAA is implementing strategic planning and transformation program to enhance customer services, meet demand growth, improve business efficiency and strengthen its workforce, through implementing smart technologies such as smart grid to the Electricity Network and other state of the art solutions. KAHRAMAA's continued vision is to transform itself into self-sustaining business, providing high quality and sustainable electricity and water for better living in Qatar.

Thanks are due to His Highness, Sheikh Tamim Bin Hamad Al Thani, the Emir of the State of Qatar for his extensive support for KAHRAMAA business development, thus contributing towards the prosperity of the State of Qatar. Thanks are also due to all KAHRAMAA employees for their efforts towards achieving KAHRAMAA's objectives and enabling KAHRAMAA in achieving much success in 2016 and beyond.

H.E. Dr. Mohamed bin Saleh Al-Sada
Minister of Energy and Industry

Qatar continues to rise as one of the world's most dynamic and fastest growing economies to achieve phenomenal GDP increase. The National Vision 2030 guides the country's growth.



H.E. ENG. ESSA BIN HILAL AL-KUWARI
PRESIDENT, KAHRAMAA

President's Foreword

Tracing the development plan in the State of Qatar and the Qatar National Development Strategy II (NDS2 2017-2022), one finds that the highest priority goes to the provision of services for all residents. It targets the promotion of the national economy and enhancement of productivity and organizational efficiency at all state authorities to cope with international economic development. We serve a rapidly growing economy and population in a region with an abundance of fossil fuels, yet scarce in water sources. In this context, it is imperative that we use our resources and manage our growth efficiently and wisely. To address this need, in 2012 KAHRAMAA launched "Tarsheed", the National Program for Conservation & Energy Efficiency to create sustainable culture and lifestyle among its residents, the public and private sector in cooperating towards conservation and efficiency to ensure optimal use of water as well as electrical and renewable energy. KAHRAMAA has implemented legislative measures enforcing compliance to the national conservation laws. It aims to influence the lifestyle of Qatar's residents in domestic consumption, as well as implement water and electricity saving technologies.

Along with this effort KAHRAMAA has plans in place to support the government to generate at least 200MW-500MW of electricity from renewable sources such as solar energy. Moreover, it has implemented alternative potable water production techniques such as Reverse Osmosis.

To align with Qatar National Vision (QNV 2030) and Qatar National Development Strategy-II (NDS2 2017-2022) KAHRAMAA is vigorously pursuing its long term road map and strategy including 10 strategic objectives: Optimize asset performance, Provide high quality water and electricity, Enhance processes and systems, Improve corporate governance and risk management, Ensure a safe and healthy working environment, Attract, develop and retain a high-performing workforce and support Qatarization, Increase social advocacy and environmental compliance, Excel at customer service, Strengthen financial performance to provide high quality and sustainable electricity and water for better living in Qatar.

Basic infrastructures are not an end in themselves; rather, they are means for ensuring the delivery of goods and services. They are crucial to achieving prosperity and growth in a way that enhances the quality of life, including the social well-being, health and safety of citizens, and the quality of their environment. We undertake these commitments seriously as we believe in the values of corporate social responsibility, customer centricity and teamwork in order to live our aspirations and to meet our mandate as a sole service provider.

I reiterate that the real challenge we encounter is continuing our successful march. We are determined to exert all efforts to maintain the place of pride KAHRAMAA has achieved. We endeavor to promote and maintain the good relationship with our customers. In fact, these objectives demand focus on sound and prudent business planning in order to achieve sustainability and KAHRAMAA is capable of realizing it. We look confidently into the future and feel proud to be part of Qatar's success story.

H.E.Eng. Essa Bin Hilal Al-Kuwari
President, KAHRAMAA

KAHRAMAA is proud to publish its fourth annual sustainability report as part of our commitment to ensure transparency and credibility to our stakeholders. This report seeks to provide Qatari government institutions, investors, the academia, our suppliers and the general public with relevant information on our sustainability approach and our performance in 2016. It also provides the end-user with an understanding and appreciation of the development of electricity, water and district cooling sectors in Qatar.

Key figures & achievements



Successful issuance of Billing using remotely collected reads Total of

26,977

Electricity reads

15,322

Water reads



Condition Monitoring Accomplishments (Estimated Net Savings)

Distribution **34** MQR

Transmission **35** MQR



Reduction in natural gas consumption Due to DC Services (1.00 Million Barrels of Oil Equivalent)



Water Losses Non Revenue Water (NRW)

10.4%

VS plan 15% Real Water Losses 4% VS plan 5%



98 tenders awarded by Materials Department with value of 2.13 Billion QR



Maintained an Average Water Stock level of

2.8 days 92.2%



Total revenue QAR **9.5** billion

Issued a regulation with the Ministry of Environment to ban the import of inefficient Tungsten lamps



Total number of customers

Electricity – **344,445**

Water – **297,261**

New **Department of Planning and Development of Production and Water Resources** formed as per Emiri Decree No. 46 for the conservation of groundwater resources

RAF A3 project

First water capacity

22 MIGD

by September 2016 final water capacity 35 MIGD by January 2017



Time of Use Billing Readiness:

30 Bulk Customers (industrial)



ISO:9001/2008 Quality Management System certifications for Technical Affairs, Water Network, Human Resources, and Public Relations, and Communications Departments
ISO:9001/2015 certification for IT Department



Monitored **91%** of the distribution network covering 11900 assets with overall health index 93%



Utilized **2.8** MM3 of Recycled Water In District Cooling by 2016



37% Qatarization



Capacity of the reservoirs increased by

77 million gallons

Invested over **150** million QAR in supporting education of Qatari students and employees over the past 5 years



38.6 million

Working man hours celebrated for electricity projects - Phase 10

93%

of paper waste recycled within KAHRAMAA operations



20% and 18% reduction on water and electricity consumption per capita thanks to 4th year of TARSHEED (Since 2012)



Member of the national renewable energy committee in Qatar, to oversee development of the national renewable energy strategy and policies



95.3%

reduction in response time to customer complaints

Zero

fatalities among our employees & contractors



Implemented the Energy Efficiency Labeling Decree for air conditioners



Implemented the Rationalisation Law No. 20/2015, with fines for wasting water upto 20,000 QAR



Cumulative savings of

8.5 million tons of carbon emissions through Tarsheed program (When compared to the baseline in 2012)



Enhanced transmission and distribution networks at a total cost of over

QAR **1.9** billion



94.74%

reduction in repair time for water-related complaints



49 Qatari employees sponsored to study in universities while working



Overall water quality reached high levels at

98.1% YTD



54,666 hours on Employees Training

Number of pipe bursts per 100 Kms decreased from 10.2 in 2012 to

5 in 2016



Reduction of portable water usage by

56% in District Cooling

KAHRAMAA at a Glance

Who we are

Up to the year 1999, electricity generation and water production, transmission and distribution services were carried out by the former Ministry of Electricity and Water (MEW).

To achieve some degree of deregulation and to encourage private investors, in the year 2000 power generation and water production services were separated and privatized into a business named Qatar Electricity and Water Company (QEWC). Since that date, several additional facilities have been built to accommodate Qatar's increasing power and water needs. Transmission and distribution of electricity and forwarding and distribution of water remained as a government service carried out by the new government corporation named KAHRAMAA (Qatar General Electricity and Water Corporation), headquartered in Doha, Qatar.

KAHRAMAA operates and maintains the sole electricity and water network in the country, focusing only in delivering these basic services to all consumers. The government continues to encourage its entrepreneur citizens to invest in the power generation and water desalination business, otherwise known as IPWP's (Independent Power and Water Producers), adopting global trends of deregulation.

QP (Qatar Petroleum) remains the sole source of natural gas as fuel for the Power & Water Production facilities run by the IPWP's. In 2016, there has not been a significant change in the size or structure of KAHRAMAA's operations and our supply chain.

As it directly interfaces with consumers, forecasting of electricity and water demand in Qatar remains with us. KAHRAMAA is intensively involved in initiating and negotiating with IPWP developers for the construction of new power stations and desalination plants. Forecasting of oil and gas and fuels consumption is centralized at QP.



 2,862 Number of employees	 Employees from 44 different nationalities
 Total number of customers Electricity – 344,445 Water - 297,261	 QAR 9.5 billion Total revenue
 37% Qatarization	 Total annual production of water 560 million m³
 Amount of electricity received from the power generating units and sent out to the grid for customers - 39,667 GWh	

Doing business with integrity

Vision

Providing High Quality and Sustainable Electricity and Water for Better living in Qatar

Mission

By 2030 our people, assets, systems and processes will set a global benchmark for performance, technological innovation, environmental sustainability and social responsibility in electricity & water sector

Our core business areas

-  Formulation of Power & Water Purchase Agreements (PWPA) and provision of necessary technical and corporate support for establishment of generation & desalination ventures
-  Own, construct and operate electricity & water transmission and distribution networks in the State of Qatar
-  Set-up plans and programs for development of electricity & water transmission and distribution networks
-  Lay out regulations, standards and codes of practices for electricity & water supplies to buildings and facilities
-  Provide consultancy services related to its activities and operations

To achieve our ambitions, we have identified five values to guide us in our everyday operations and in our interactions with others:

Customer centricity: We put our customers at the centre of everything we do. This value is valid for all of our employees. Whether in research & development, finance & accounting or human resources, all our decisions are made with the customer needs and relations in mind.

Performance and Responsiveness: Managing our operations efficiently helps us deliver better value to our customers. We are committed to revisit and reassess our processes and practices, to identify opportunities for improvement, which will help us advance our business performance.

Teamwork: We all work as a team. We believe that only by sharing our ideas and knowledge, we will be able to achieve sustainable growth and deliver on promises.

Transparency: Openness and transparency are fundamental aspects of our everyday work. Many evolving stakeholder requirements and companies are expected to disclose not only information on how they manage their business today but also how they are planning for the future. This report reflects our strong commitment to be accountable and transparent by communicating KAHRAMAA's performance, vision and actions with our various stakeholder groups.

Loyalty: The loyalty of our people is critical for the success of KAHRAMAA. In all our activities, we aim to support our corporate objectives and to celebrate our achievements.

Our 10 corporate objectives guide our business approach and management in the coming future by helping us to relate our everyday practice to Qatar's needs for sustainable long-term growth.

1900s TO 1940s

Indicators show large, permanent communities established in Qatar in need of sustained water and electricity supply for survival and industry

1980s TO 2002s

- 1.17 million meters of water distribution network mains
- Water and Electricity under one umbrella within Ministry of Energy and Industry
- KAHRAMAA established under Emiri Law number 10 as government corporation
- Power generation and water production services separated and privatized into Electricity and Qatar Company (QEWC); KAHRAMAA to focus on distribution and transmission

2009

GCC interconnection grid in 220 kV completed

2011

Reached 325 Million Imperial Gallon per Day (MIGD) after the new stations joined service

1950s TO 1980s

- First desalination plant
- First computerized electricity systems Control Centre
- Qatar became independent, Ministry of Electricity and Water (MEW) formed
- Ras Abu Aboud power station became operational
- Satellite power stations introduced

2008

Replacement of old water pipes and speed pumps installed (pumped water 24 hrs/day)

2010

- Expansion of the country's power supply system
- Construction of a new 400kV substations
- Completed SCADA system to monitor and control water network

2013

- Connection to GCC grid upgraded to 400 kV
- 10% Electricity consumption reduction and water by 6%
- District Cooling Department paved the way for The Ministerial Directive of prohibition of potable water for cooling purposes

2015

- CN department Certified for ISO 9001:2008
- New procedures in managing R&D activities in cooperation with internal and external partners
- Tarsheed 2022 (T22) Project with SC Marketing & Schools Energy Audit
- Completed the Tarsheed 2022 (T22) Project with SC Marketing & Schools Energy Audit

2012

Launch of Conservation & Energy Efficiency "Tarsheed" under the higher patronage of HH Sheikh Tamim Bin Hamad Al-Thani, Emir of Qatar

2014

- Balanced scorecard system introduced
- Pilot of Advanced Metering System launched
- Regulations proposed for District Cooling
- Risk Register and Risk Heat Map generated
- Strategic water security projects launched
- Launch of Long-Term Business Strategy

2016

- Launch and implementation of decrees, laws and codes to regulate the rational use of water and electricity in Qatar
- Deployed smart solutions to monitor and control consumption
- Continued investing in mega infrastructure projects to secure demand and enhance reliability and quality of electricity and water networks
- Publication of District Cooling Design and Water Management Code
- TARSHEED 4th Anniversary

Setting the broader context for our report

The world finds itself being disrupted by a combination of three forces of change: technology, globalization, and demographics. They affect the way we work, the way we live and the way our society is changing. So these changes, climate change, empowered customers, rapid urbanization, new generation of information technology are some of the new megatrends that global decision makers needs to consider when forming future strategies.

The Sustainable Development Goals (SDGs) address the pressing social, economic, and environmental problems. Governments, businesses and civil society, under the umbrella of United Nations, have all agreed 17 common Goals in September 2015, that we need and want to achieve at a global community level by 2030.

Qatar recognises that sustainable development can only be realized when there is social progress, economic growth and environmental change and has been committed to achieving sustainable development since 1971, starting with the Millennium Development Goals (MDGs), the precursor to the SDGs. The State of Qatar, through the Qatar National Vision 2030 and the Qatar National Development Strategy II (NDS2 2017-2022) is focused on eight priority areas: economic diversification, environment sustainability, education, healthcare, social protection, public safety and security, culture and sports, and international technical cooperation.

KAHRAMAA today faces some real economic, social and environmental challenges and considers them as potential business opportunities. The State of Qatar continues to grow as one of the most dynamic economies in the world putting significant pressure on its natural resources. This combined with a rapidly growing population, modernization, and urbanization, lead to fast rising energy and water demands. And the figures are supporting these trends. KAHRAMAA aims to integrate the 17 SDGs into its sector projects, taking into account the challenges and successes of national development. By following a result-oriented strategic planning approach, economic, social and environment aspects of development have been integrated into KAHRAMAA's corporate objectives, that seeks to achieve Qatar's Vision 2030.

Electricity sector context



The electricity sector in Qatar for example has undergone a remarkable development over the past years according to the objectives and timetable of First Qatar National Development Strategy (NDS 2011-2016), with generation reaching 42,307 GWh in 2016, which is almost double of that in 2008.

KAHRAMAA has embarked on a transformation journey by linking its corporate strategy with Qatar National Vision 2030 and the NDS, adopting 'excellence' as its slogan in all its operations and promoting the efficiency of the energy sector. We are adopting taking procedures to reduce production costs and wastage, price, electricity and water in line with economic costs after verifying the operational efficiency of all independent producers, to ensure efficiency-based economic operation.

Each year, KAHRAMAA studies the demand for electricity for the next five years and upgrades it annually. The annual rate of increase in electricity demand in Qatar is about 8%, which is among the highest growth rates in the world. KAHRAMAA's biggest commitment is to meet this challenge.

The 2016 Sustainability Report presents a summary of the most important projects in the electricity sector implemented by KAHRAMAA to reduce the per capita consumption rate (Tarsheed- National Program for Conservation & Energy Efficiency) and secure the demand for electric power and the main projects to be implemented in the near future as part of the National Development Strategy (NDS-2 2017-2022).

Although Qatar is the world's largest exporter of liquefied natural gas (LNG), the cleanest hydrocarbon fuel, which is serving Qatar's goal of sustainability and supporting its pioneering efforts to preserve the environment, NDS-2 2017-2022, achieve under the guidance of His Highness Sheikh Tamim Bin Hamad Al-Thani, the Emir of Qatar, aims to develop the mixture of energy used locally to include renewable energies, so that the contribution of solar energy generates between 200-500 MW of electricity.

Water sector context

In addition, Qatar would study the possibility of using Wind Power, which will have an impact on achieving Qatar's goals of mitigating the harmful emissions of climate change. The increasing use of renewable energy within our energy mix would allow Qatar to meet increasing domestic demand, contribute to enhancing energy security and reduce the consumption of natural gas within the country, allowing additional revenue for the country through export. The renewable energy policy is currently being developed under the umbrella of Ministry of Energy and Industry and with support of KAHRAMAA and concerned authorities in the State.



Water security is at the very heart of Qatar's survival. Aside from our basic human survival, our geopolitical security, economy, industries and communities all rely on a guaranteed and safe water supply. Accordingly, bettering Qatar's water security outlook is one of the country's three key Challenges in the QNV2030, along with energy security and cyber security.

Qatar has a shortage of natural water resources and the country only gets seven inches of rain per year. The country relies on 99% desalination of water from the sea to meet the needs and demand. This is in addition to groundwater, which is threatened by depletion due to overuse and weak compensation. As such, there is dire need to look for non-traditional and sustainable sources of water.

Water demand in Qatar has grown by an annual average of 10.6% over the ten years. With 518M cubic meters (2015) and 540M cubic meters (2016) of water consumption, the trend is expected to hit 900 m³ by 2025. KAHRAMAA, whose water networks cover 99.8% of Qatar's water supply, ensures that everybody has access to clean water. Water conservation, efficient water use and water recycling are the most important drivers that support Qatar's quest for water security.

KAHRAMAA has realized many achievements in the past six years according to the First Qatar National Development Strategy (NDS 2011-2016). A number of objectives were achieved in 2016 in the water sector including the inauguration of the Ras Abu Fontas stations (22 million gallons/day production capacity), the increase of the capacity of the reservoirs by 77 million gallons, and the decrease of the total losses and leaks in the network to less than 10%.

KAHRAMAA launched Tarsheed in 2012, which has succeeded through its various initiatives and projects to reduce the per capita consumption of water by 20% by the end of 2016 to 208 m³/Person/Year. KAHRAMAA strategy for 2017-2022 seeks to reduce per capita water consumption by another 15%.

Water recycling and reuse have also undeniably climbed higher on the agenda of Qatar's water-related stakeholders, including the Ministry of Municipality & Environment and the public works authority, Ashghal. Now, treated sewage and industrial water are used for garden irrigation, landscaping, construction works and district cooling services. Desalination plants have evolved rapidly over the last two decades and approximately 150 countries now use such technologies to help meet their fresh water requirements.

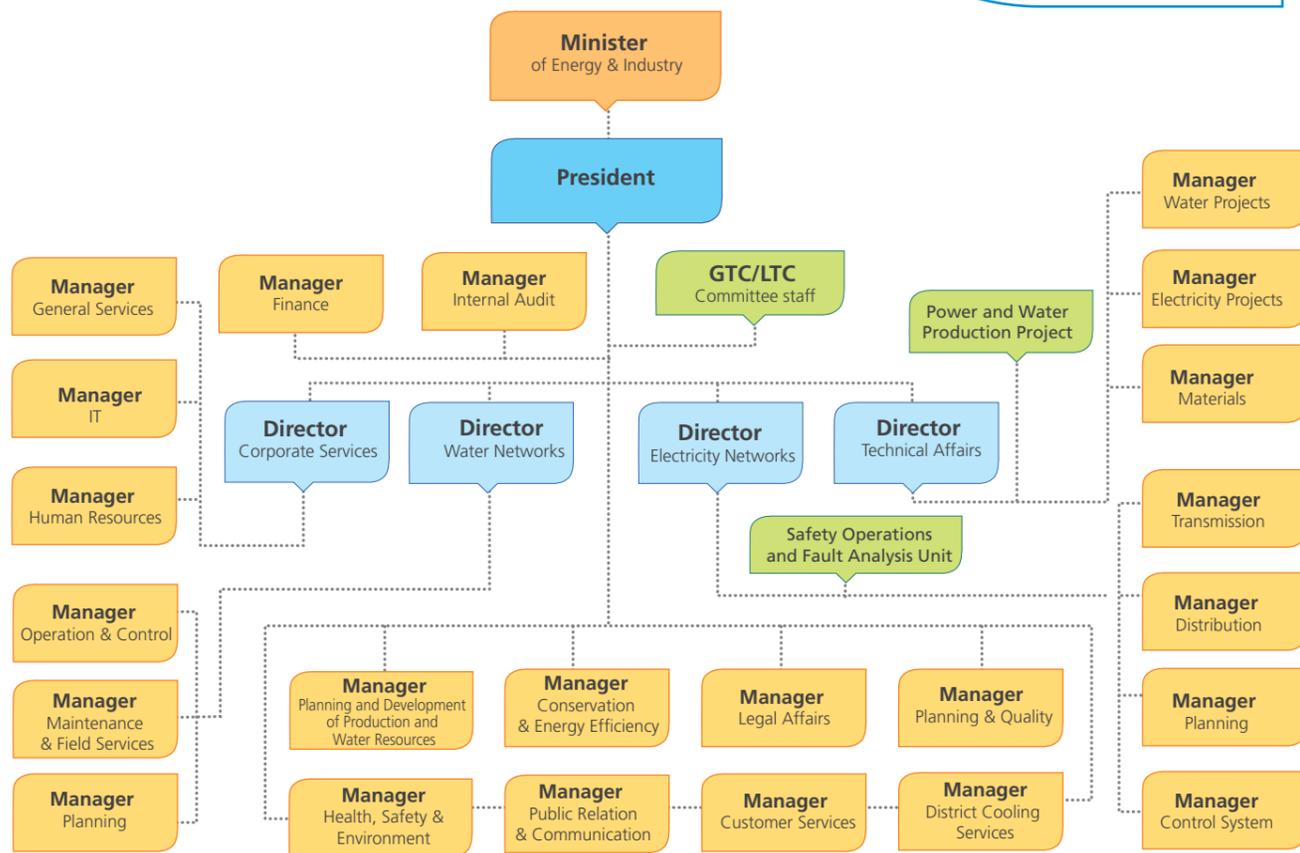
The success of Qatar's desalination technology highlights the importance of investing human and financial capital into water-related research and development (R&D). Such efforts will be integral to developing efficient technologies and scalable infrastructure to meet water demand up to 2030, as well as ensuring we cope well with any natural disasters. Our R&D team has built strong and cooperative relationships with similar teams in Qatar – a unified effort is the only way we can all succeed. We must collectively improve Qatar's water security by finding solutions that navigate the logistical and cultural barriers that stand in our way.

Governance

Qatar's Minister of Energy and Industry oversees and approves KAHRAMAA's strategic direction as the head of our governance body. Our President is the executive head of our organization and is responsible for the management of the activities of KAHRAMAA.

Our organizational structure

In 2015, as part of the Emiri Decree No. 46, the KAHRAMAA administrative structure was amended to add a new department namely Planning and Development of Production and Water Resources. This newly formed department would play a key role in the conservation of groundwater resources in accordance with the Qatar National Vision 2030.



Governance for sustainability reporting

The Sustainability Task Force within KAHRAMAA consisting of representatives from various departments such as HR, Internal Audit, Customer Services, Conservation & Energy Efficiency, Planning and Quality, Health & Safety, Water Networks, Electricity Networks, District Cooling and Technical Affairs is responsible for the collection of performance data on KPIs in line with GRI guidelines. To ensure accuracy of reported data,

each department head approves and signs-off the data or information allocated to their respective department. The Conservation and Energy Efficiency Department, acting on behalf of H.E. the President is responsible for the review of the reported content in this report with the final sign-off by KAHRAMAA's President.

Performance management

KAHRAMAA's overall strategic direction is defined by our vision, mission and values. As a performance-driven organization, our balanced scorecard approach help us to ensure alignment with our corporate objectives. The balanced scorecard in KAHRAMAA allows the organization to record, monitor and report our corporate, directorate and department-level performance KPIs, achievements and challenges and is structured around four dimensions,

- Stakeholder
- Finance
- Internal and sustainability
- People

Performance of our strategic KPIs are monitored on a monthly and quarterly basis through the Corporate Performance Review (CPR) whereby we measure performance on our plans and targets. Corporate Scorecards with KPI dashboards enables us to monitor progress and drives responsibility and accountability within the organization. The Planning and Quality department plays a key role in performance monitoring and develops KPI dashboards for H.E. the President and senior management.

Business conduct

At KAHRAMAA, we are committed to conducting our business ethically and legitimately. We carry out operations in accordance to our Mission, Vision and Values. Conducting

all business affairs while observing ethics, honesty and transparency is a critical component of our Values. Our Code of Business Conduct (COBC) sets the expectations and provides guidance to our employees to ensure that they maintain our Values wherever they conduct business.

Code of Business Conduct guides us in our day-to-day operations by focusing on areas such as conflict of interest, gifts and hospitality, managing sensitive information, non-discrimination, customer relationships, health & safety, and diversity. Our Legal Affairs Department is responsible for tracking any violations related to corruption or conflict of interests.

Human rights

In KAHRAMAA, we value the rights of our employees and believe that our business partners share the responsibility of protecting the rights of their employees as mandated by national labor laws. We therefore mandate minimum requirements related to labor and human rights compliance within all our contracts with suppliers. Our Health, Safety and Environment Department conducts regular audits at sites and looks for compliance not only with KAHRAMAA's own requirements, but also with Qatar's Labor Law and Qatar's Environmental Law. Although we do not have a human rights policy, we acknowledge the significance of the issue, especially within our value chain.

Committees and functions to manage sustainability issues

We have various committees and functions within KAHRAMAA which actively manages and provides oversight on sustainability related risks and opportunities within our value chain. Some of these include,

- Internal Audit function
- A two-tier Tender Committees
- Business Conduct Committee
- A corporate Quality Management System Electricity Networks Affairs (ENA) Safety Rules Committee
- Qatarization Committee
- Research & Development (R&D) Committee
- Smart Network Committee
- Network Security Committee
- Work Safety Assurance Committee
- Emergency Committee
- Information Security Steering Committee
- Grievances Committee
- Faults Follow-up Committee
- Tarsheed Facilitation Committee
- Inspection & Pricing Committee
- Disciplinary Committee
- Smart Grid Committee



Risk management

KAHRAMAA acknowledges that Risk Management is an essential element for good corporate governance practice. We believe that successful risk management would allow us to ensure compliance to regulations and internal policies and procedures, provide increased assurance on control effectiveness and enhance the decision making process within the organization. An effective Risk Management process also provides the opportunity for management to enhance an organization's culture based on ethical values consistent with those expected of KAHRAMAA and its employees.

KAHRAMAA's risk management policy focuses on the identification and assessment of risks, as well as the proactive implementation of mitigation measures. Our departmental and corporate risk registers helps us to record

and monitor risks which could have a potential impact on our corporate objectives. In 2016, our risk register listed the top 26 risks facing KAHRAMAA – including diverse risks such as availability of talent, loss of power supply, inadequate IT structure, lack of systems to innovate, unavailability of alternative water resources, environmental hazards, and others.

The Strategic Planning Section of the Planning & Quality department is responsible for the risk management function and for the development and coordination of risk management systems within KAHRAMAA. The Risk Officer and the Risk Management Committee act on behalf of our President to manage all activities related to risk management within KAHRAMAA.

Certification and audits

KAHRAMAA strives to ensure quality in every aspect of our business operations. We comply with international management systems to ensure that we meet the highest quality standards within our organization. We conduct regular internal audits and carry out process improvements to ensure compliance with ISO 9001:2014 Quality Management System. In 2016, our Internal Audit Committee completed 14 audits, surpassing our target of 8. These audits included Risk Management and Performance Management reports, and in coordination with the IT department, we also completed the Security Matrix.

Memberships and associations

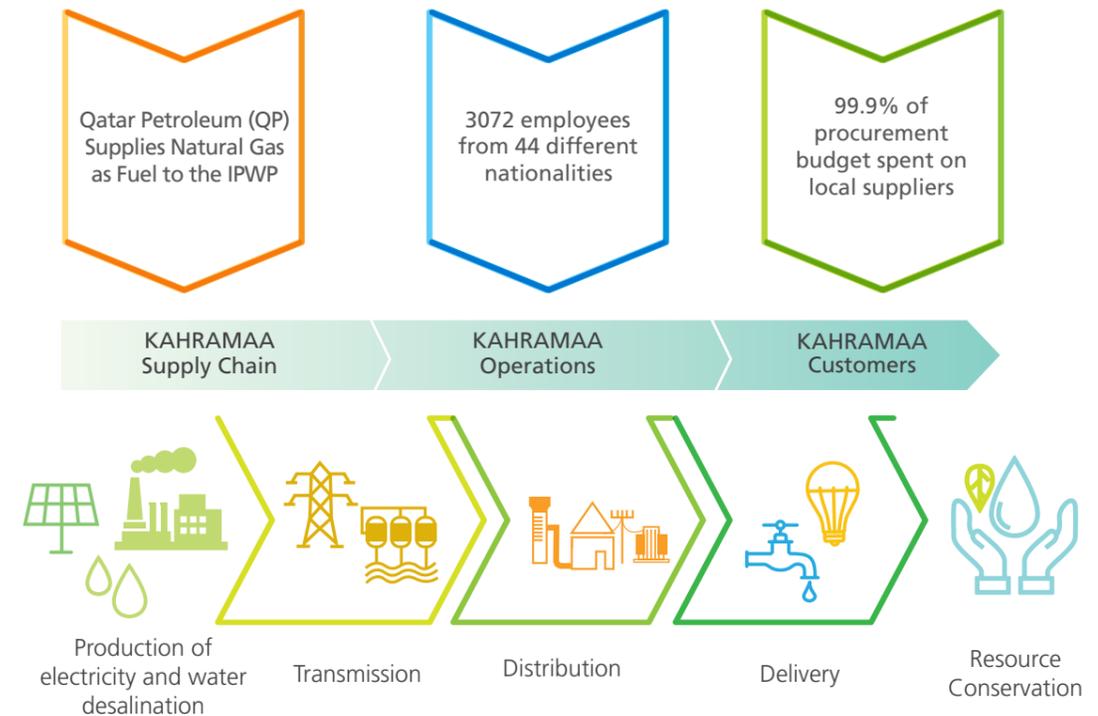
KAHRAMAA continues to play an active role as a member of a number of national and international organizations and industry associations. We seek to utilize these platforms to learn from best practices and to promote our approach to sustainable business within the region as well among our peers:



- Arab Union of Electricity
- Gulf Cooperation Council Interconnection Authority (GCCIA)
- International Council on Large Electric Systems (CIGRE)
- GCC CIGRE – (Secretary-General on CIGRE GCC)
- GCC Electricity & Water Conservation and Customer Service Committee
- Arab Renewable Energy & Energy Efficiency Committee
- GCC Benchmarking Committee
- Arab Union
- Permanent Water Resources Committee
- Conservation Media Committee
- Renewable Energy Committee
- General Security Committee, Cyber Security Committee
- Experts Municipality Follow-up Committee
- Other prominent local and regional committees related to electricity and water

Creating value for our stakeholders

KAHRAMAA is the sole transmission and distribution system owner and operator (TDSOO) for the electricity and water sectors in Qatar. Our company is responsible for forecasting electricity and water demand in Qatar and plays a key role in regulating water and electricity consumption in the country, through regulations, standards, and codes of practices. There are opportunities for resource conservation across all stages of our value chain and KAHRAMAA is working with our suppliers, operations and customers to achieve them.



	INDEPENDENT POWER AND WATER PRODUCERS (IPWP)	KAHRAMAA	CUSTOMER
KAHRAMAA role	<ul style="list-style-type: none"> • Formulate power & water purchase agreements (PWPA) and provide the necessary technical and corporate support for the establishment of power generation and desalination ventures in Qatar • Purchase power and water from IPWPs 	<ul style="list-style-type: none"> • Own, construct and operate electricity & water transmission and distribution networks in the state of Qatar • Set-up plans and programs for the development of electricity & water transmission and distribution networks • Lay out regulations, standards and codes of practices for electricity & water supplies to buildings and facilities • Support employment of qatar citizens • Engage with suppliers to ensure compliance with health and safety and environmental requirements • Ensure occupational health and safety of employees and contractors 	<ul style="list-style-type: none"> • Provide new connections, generate bills and collect usage fees • Ensure safe and reliable water and power supply • Encourage resource conservation through regulations, customer engagement and digital solutions
Value for our stakeholders	<ul style="list-style-type: none"> • Economic value to the Government of Qatar through competitive power and water purchase agreements • Support national strategic objectives 	<ul style="list-style-type: none"> • Provide reliable power and water supply to all users in Qatar • Operational efficiency to reduce wastage of power and water through transmission losses or water leakage • Support Qatarization agenda of the Government • Corporate objectives aligned to the Qatar National Vision 2030 and the National Development Strategy • Encourage sustainable practices through supplier engagement 	<ul style="list-style-type: none"> • Ensure customer satisfaction • Customer awareness on resource conservation and efficiency to support protection of scarce natural resources in Qatar

Corporate strategy

KAHRAMAA's strategic direction is aligned to the short and long-term objectives of the Qatari government as highlighted in the Qatar national Vision 2030, the Qatar National Development Strategy and other strategic objectives of national importance. Through our strategy, KAHRAMAA aims to support the national objectives and continue to stay true to our mission of providing safe, high quality and efficient electricity and water supply to the people of Qatar. We believe that our Long-term strategy would help us aspire towards our vision of transforming ourselves into a customer-centric, dynamic and self-sustaining organization.

Our Long-Term Strategy to 2030 would be implemented through three key phases, driven according to six dimensions of business excellence, to accomplish 18 corporate ambitions by 2030.

Phase 1: Strategic transformation (2014-2018)

Establishing the optimal operating model, capabilities and systems required to establish the optimal foundation on which KAHRAMAA can achieve sustained growth

Phase 2: Consolidating efficiency and regional growth (2019-2023)

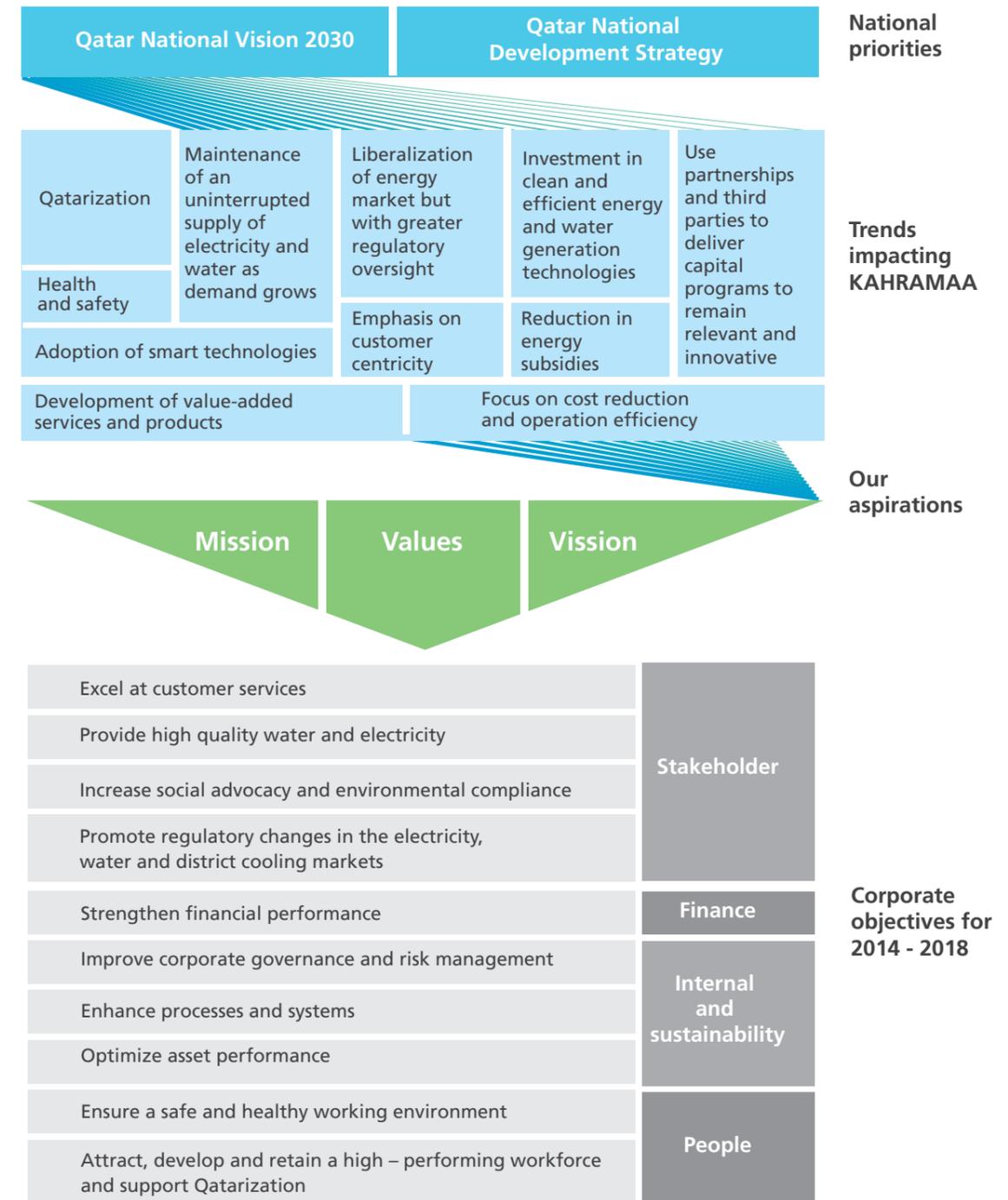
Driving continuous operational and cost-efficiency improvements and expanding service offerings in order to become the leading regional power and utilities organization

Phase 3: Global leading practice (2024-2030)

Strategic investments in innovation and leading technologies aligned to Qatar's inherent areas of competitive advantage, enabling KAHRAMAA to take its place as a leading global utilities organization

KAHRAMAA's Strategic Objectives

For the period 2014-2018, we have identified 10 corporate objectives which are aligned to our Long-term strategy.





Our approach to sustainability

102-12

The State of Qatar faces multiple challenges related to the availability and demand for natural resources. Qatar is one of the highest per capita consumers of electricity and water in the world. The country's water and electricity demand is expected to increase further with rising population, economic growth as well as due to the various ongoing infrastructure projects related to the FIFA World Cup 2022. In recognition of these challenges, the Qatar National Vision 2030 as well as the National Development Strategy highlight the sustainable consumption of scarce natural resources as well as preserving the environment for future generations as key national objectives. The country aims to ensure that it works toward conserving energy and water resources, as well as implementing innovative ways of producing water and energy that are sustainable for the future generations.

As the sole distributor of electricity and water in Qatar, KAHRAMAA plays a crucial role in the conservation of resources and the creation of value for the environment and our society. The increased affordability of clean and efficient energy and water generation technologies, in combination with the adoption of smart technologies to optimize the distribution network, provides us with opportunities to enhance our impact. Through our

national program, 'Tarsheed' we promote the standardization of energy and water saving technologies, legislate laws and regulations, spread awareness and promote renewable green energy and resource conservation among all sectors in Qatar. We believe that KAHRAMAA has a strategic opportunity to align and support the pillars of the Qatar National Vision 2030 (QNV 2030), the key tenets of National Development Strategy (NDS) 2017-2022, and the Sustainable Development Goals (SDGs) to contribute to economic, social and environmental development in Qatar. Our Corporate Strategy as well as our corporate and multiple departmental KPIs, are focused on key elements of sustainability that would ensure that future generations have the resources and opportunities that we have today.

We acknowledge clearly our responsibilities towards the State of Qatar. We understand that our corporate objectives which would help us – develop the right internal management systems, enhance our customer service practices, provide the necessary training to our people, and by encourage future research and development activities - would help us to deliver on tomorrow's needs and be able to help the nation achieve its strategic ambitions.



Corporate objectives	Alignment with Qatar National Vision (QNV)	Alignment with National Development Strategy 2 (2017-2022)	Alignment with Sustainable Development Goals (SDGs)
Optimise asset performance	Responsible exploitation of hydrocarbon resources Preserving and protecting the environment including Water	Sector 2: environment sustainability, natural resources and built environment	6 CLEAN WATER AND SANITATION, 7 AFFORDABLE AND CLEAN ENERGY, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Provide high quality supply of water and electricity	Responsible exploitation of hydrocarbon resources Building environmental awareness among the population Encouraging sustainable technologies	Sector 2: environment sustainability, natural resources and built environment	6 CLEAN WATER AND SANITATION, 7 AFFORDABLE AND CLEAN ENERGY, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Enhance processes and systems	Knowledge based economy characterised by innovation A world class infrastructural backbone The efficient delivery of services		9 INDUSTRY INNOVATION AND INFRASTRUCTURE
Improve corporate governance and risk-management	Knowledge based economy characterised by a transparent and accountable government		16 PEACE AND JUSTICE STRONG INSTITUTIONS
Ensure a safe and healthy working environment	Participate in a wide variety of cultural and sports activities	Sector 7: Culture and sports	3 GOOD HEALTH AND WELL-BEING, 8 DECENT WORK AND ECONOMIC GROWTH
Attract, develop and retain a high performing workforce and support Qatarisation	Increased and diversified participation of Qataris in the workforce through investment in training programs and incentives for Qataris to enter professional and management roles	Sector 3: Education and training	8 DECENT WORK AND ECONOMIC GROWTH
Increase social advocacy and environmental compliance	A proactive & significant regional role in assessing the impact of climate change and mitigating its negative impact	Sector 2: environment sustainability, natural resources and built environment Sector 5: Social protection	9 INDUSTRY INNOVATION AND INFRASTRUCTURE, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 13 CLIMATE ACTION, 4 LIFE BELOW WATER, 15 LIFE ON LAND
Excel at customer service	Provide high quality services that respond to the needs and the desires of individuals and businesses	Sector 6: Public safety and security	
Promote regulatory changes in the energy, water and district cooling markets	A comprehensive urban development plan for Qatar that adopts a sustainable policy with regards to urban expansion and population distribution	Sector 2: environment sustainability, natural resources and built environment	12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 17 PARTNERSHIPS FOR THE GOALS
Strengthen financial performance	Open and flexible economic structures capable of competing in a changing world	Sector 1: Economic diversification and development of private sector	8 DECENT WORK AND ECONOMIC GROWTH, 17 PARTNERSHIPS FOR THE GOALS

Engaging our stakeholders

For KAHRMAAA, we consider our stakeholders as our partners who would help us achieve our strategic objectives. We value transparency in all our business activities and seek to foster trust through open and transparent communication with all our stakeholders. Continuous engagement with our stakeholders lays the foundation for the functioning of our business, and is a precondition for the successful fulfilment of our values in all aspects of our activities. We acknowledge the wide range of stakeholders across our value chain who are influenced directly or indirectly by our services and operations. To ensure that we improve our stakeholder engagement, we continuously seek to develop new engagement channels and introduce improvements in our communication methods.



Stakeholder group	How we engage?	Why we engage?	Importance to KAHRMAAA	Topics we discuss	Our response to stakeholders (see sections in this report)
Policy makers and government agencies	<ul style="list-style-type: none"> • Direct meetings • Participation in government initiatives, regulation and policy working groups • Key national and international events 	<ul style="list-style-type: none"> • To help shape regulation and understand the issues that may impact our business, our customers and the local communities 	<ul style="list-style-type: none"> • Set policy and regulatory framework • Influence macroeconomic and political framework within which we operate • Influence our reputation 	<ul style="list-style-type: none"> • Regulation development • Resource conservation • Product quality • Innovation • Health & Safety • Customer needs 	<ul style="list-style-type: none"> • Investing in our people • Contributing to the local economy • Ensuring value for our customers • Conserving natural resources
Customers	<ul style="list-style-type: none"> • Direct meetings • Customer surveys • Call centers 	<ul style="list-style-type: none"> • To understand our customers' needs and get their feedback on our performance 	<ul style="list-style-type: none"> • Achieving high level of satisfaction from our customers and building a long-lasting trust 	<ul style="list-style-type: none"> • Quality of service • Transparency • Pricing • Service access • Reliability of service 	<ul style="list-style-type: none"> • Ensuring value for our customers • Conserving natural resources
Business partners	<ul style="list-style-type: none"> • Direct meetings • Conferences • Other events 	<ul style="list-style-type: none"> • To exchange knowledge and support local communities 	<ul style="list-style-type: none"> • Influence our reputation • Focus on partnerships/ collaborations 	<ul style="list-style-type: none"> • Local communities • Qatar's socio economic agenda 	<ul style="list-style-type: none"> • Contributing to the local economy • Supporting our communities
Suppliers (Including contractors)	<ul style="list-style-type: none"> • Direct meetings • Procurement policy • Tenders 	<ul style="list-style-type: none"> • To involve suppliers in exceeding clients' expectations and to deliver on responsible organizational operations 	<ul style="list-style-type: none"> • Influence change across the value chain • Influence our reputation • Transparent communications with contractors 	<ul style="list-style-type: none"> • Health & safety • Operational excellence • Working conditions 	<ul style="list-style-type: none"> • Investing in our people • Governance and management systems
Employees	<ul style="list-style-type: none"> • Surveys and other feedback mechanisms • Internal communications, events, publications • Intranet • Training & development opportunities 	<ul style="list-style-type: none"> • Engage employees in shaping KAHRMAAA's future direction 	<ul style="list-style-type: none"> • Enhance productivity, quality and leadership • Enhance image and reputation to attract prospective employees 	<ul style="list-style-type: none"> • Health & safety • Working conditions • Career development • Operational excellence 	<ul style="list-style-type: none"> • Investing in our people • Supporting our communities
Local communities	<ul style="list-style-type: none"> • Formal and informal group and targeted meetings • Community programs • Publications/ online • Events • Social media channels 	<ul style="list-style-type: none"> • To understand our communities' needs and expectations, and create a long-lasting positive value 	<ul style="list-style-type: none"> • Influence our reputation/Maintain license to operate • Build trust with local communities • Identify opportunities for improvement • Partnering opportunities 	<ul style="list-style-type: none"> • Education and awareness • Community support • Environment 	<ul style="list-style-type: none"> • Supporting our communities • Conserving natural resources
Academia	<ul style="list-style-type: none"> • Research • Publications • Local and international conferences & symposiums • Training & education 	<ul style="list-style-type: none"> • To explore potential partnerships and innovative solutions 	<ul style="list-style-type: none"> • Influence our reputation • Partnering opportunities • Enhancing expertise 	<ul style="list-style-type: none"> • Education • Research & Development • Innovation • Technological advances 	<ul style="list-style-type: none"> • Contributing to the local economy • Ensuring value for our customers • Conserving natural resources
Media	<ul style="list-style-type: none"> • Local newspapers 	<ul style="list-style-type: none"> • To raise awareness among the general public about KAHRMAAA's conservation activities 	<ul style="list-style-type: none"> • Influence our reputation 	<ul style="list-style-type: none"> • Conservation and environmental management • Partnerships & collaborations • Research & Development 	<ul style="list-style-type: none"> • Contributing to the local economy • Supporting our communities • Ensuring value for our customers

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The table below describes the meaning and boundaries of each identified material issue, which helps to clarify the importance of each topic to KAHRAMAA and our stakeholders. The topics have also been mapped to our corporate objectives to highlight the applicability of each topic to our long-term strategy.

Material topic identified	Relevance of this topic to KAHRAMAA	Link to KAHRAMAA's Corporate Objectives	Importance within KAHRAMAA	Importance outside KAHRAMAA	Relevance/ boundary outside KAHRAMAA	Page numbers in this report
Qatarisation	Local hiring will assist KAHRAMAA in creating a positive impact on the local economy as well as community	People excellence-Attract, develop and retain a high-performing workforce and support Qatarization	●●●●	●●●	Local communities	57,58,65
Occupational health & safety	Ensuring well-being of its employees will help KAHRAMAA retain staff and improve its productivity	People excellence- Ensure a safe and healthy working environment	●●●●	●●●●	Contractors	60,61,62
Training and education	Providing skill-gap based trainings will improve employee satisfaction and help KAHRAMAA in retaining them	Operational excellence- Enhance process and system	●●●●	●●●●	Policy-makers and government agencies; suppliers	59
Human rights assessment	Respecting human rights within the organization as well as in the supply chain will help KAHRAMAA reduce risks and enhance its reputation and brand image	Community & social excellence-increase social advocacy and environmental compliance	●●●●	●●●●	Local communities, policy-makers and government agencies, suppliers	13
Customer satisfaction	KAHRAMAA can improve its services, increase customer lifetime value and reduce any negative word of mouth by focusing on outcomes of customer satisfaction	Customer excellence- Excel at customer service	●●●●	●●●	Customers, business partners, suppliers	36
Energy use and efficiency	Promotion of energy conservation and energy efficiency measures will reduce the energy footprint within the value chain	Operational excellence- Enhance process and system Community & social excellence-increase social advocacy and environmental compliance	●●●●	●●●●	Policy makers and government agencies, local communities, business partners, suppliers	29,30,31,47,48,51,52,70,71
Water use management	Undertaking water management activities in a water scarce region will ensure uninterrupted services as well as improve its reputation	Operational excellence- Enhance process and system Community & social excellence-increase social advocacy and environmental compliance	●●●●	●●●●	Policy makers and government agencies, local communities, business partners, suppliers	29,30,31,49,51,70,71
Effluent and waste	Improper handling of hazardous waste can damage terrestrial as well as marine life will have negative impact on KAHRAMAA as well as on the local environment.	Operational excellence- Enhance process and system Community & social excellence-increase social advocacy and environmental compliance	●●●●	●●●●	Policy makers and government agencies, local communities, business partners, suppliers	53
Availability & reliability	Putting in place plans and processes to ensure availability and reliability of its services can help KAHRAMAA earn customer loyalty	Customer excellence- Excel at customer service Operational excellence-Enhance processes and systems	●●●	●●●●	Policy makers and government agencies, customers, business partners, suppliers	30,31,41,42,43,48
System efficiency	Improving system efficiency by improving generation efficiency and reducing transmission & distribution losses will improve KAHRAMAA's finances	Operational excellence-Enhance processes and systems	●●●	●●●	Policy makers and government agencies, customers, business partners, suppliers	47,48,50

Note: Our key material topics have various level of importance inside and outside the organization. We have therefore mapped the potential degree of this importance ● – being low importance and ●●●● – being high importance.

Special Feature: Regulations to Optimize Our Resources





Leaving outdoor lights on during the day is a violation.

It can also mean fines up to QR 10,000. What are you waiting for? Install a timer now. Bad habits cost.



Using flushing tools to wash your car is a violation.

It can also mean fines up to QR 20,000. It's about time to use a bucket, or to install a low-flow hose nozzle. It's as simple as that. Bad habits cost.



Eng. Fahad Tolfet
Director of Water Network



It is like a triangle; one corner is education and awareness, one corner is implementing rules and regulations and the third corner is the price of water.



The importance of regulation to rationalize resources in Qatar

Government regulation can often be a driver for rationalization of resources. Certainly, resource management regulations can create challenges for sectors, businesses and their customers, and the entire society by mandating certain standards that must be achieved, such as lower emissions, fuel consumption or water reuse.

But these challenges can be leveraged as opportunities for these stakeholders to rethink not only their behaviors and also their standard operating procedures. Regulation can drive sustainable economic growth, which is vital to the long term success of a business, customers and ultimately the overall State of Qatar. Regulation can also create a more level playing field within the energy and industry sector industry, empowering businesses to understand how they compare to their peers and enabling consumers to compare apples to apples when making purchasing decisions. This ability to benchmark one company against another can be a powerful motivating factor when developing business strategy and making decisions.

Companies in Qatar that are increasingly focusing on resource rationalization are also leveraging more advanced technology as a means of driving business results. New technology allow them for greener processes or new processes that create opportunities for greener technology in alignment to the new NDS 2017-2022.

Insightful, forward looking regulation help us build a sustainable Qatar

Our policy input and development review activities tackle technically complex challenges. Through our participation in the government decision making process that guides growth, redevelopment, revitalization and intensification throughout KAHRAMAA's influence, we advocate to our governmental partners and stakeholders to integrate innovative strategies for energy and water conservation and other sustainability considerations that support the Qatar National Vision 2030 objectives.

We assist ministries and regulatory bodies by providing advice on best conservation practices and development direction within local communities and businesses. In 2016 we were involved in many activities including comprehensive reviews of existing practices, creation of codes and development of laws to facilitate improved rationalization of resources in the State of Qatar. This work is very progressive and is increasingly important in light of heightened challenges due to climate change and water scarcity.

Qatar transitioning to smart meters

With decisive implementation plans to make the country a pioneer in smart energy management, KAHRAMAA has covered the complete geographical roll out of the smart meter project across the country by 2016. Smart meter deployment provides real-time information on the energy, water or natural gas consumption of a building or home.

The country's steady movement towards an overall smart energy approach is supported by the installation of smart grid projects and its related technologies such as smart meter that benefits consumers and energy providers in ways more than one.

Additionally, it enables KAHRAMAA to optimize energy consumption and promote energy efficiency. By adding the intelligence of IT to power distribution, KAHRAMAA aims to attain sustainable development and significantly improve the power infrastructure in the country. Encompassing a broad portfolio of technologies, smart grids ensure optimized usage of energy usage and support increased penetration of renewable energy.

With the state of Qatar witnessing rapid growth in the power sector, the government has also undertaken massive initiatives to achieve its noble vision of attaining a significant increase in renewable and energy efficiency.



CODES



CS-C5I-P1/C5 DISTRICT COOLING DESIGN & WATER MANAGEMENT CODE 2016: deals with the mandatory, minimum requirements for the design and operation of Water Cooled Central Air conditioning Systems for comfort cooling or process cooling applications.



ADVANCE METERING CODE 2016: additional Drawing named "Advanced Metering Infrastructure Layout" shall become a part of the Building Permit document submission for Kahramaa approval.



CS-C5I-P1/C1 ELECTRICITY WIRING CODE 2016: to establish standards, principles and guidelines that promote the design, construction, installation, maintenance, operation, energy conservation and metering of safe and efficient Low Voltage (LV) Electrical Installations in all Premises within the State of Qatar.



CS-C5I-P1/C2 PLUMBING CODE 2016: to prevent misuses, waste, undue consumption or erroneous measurement of water and most importantly, to prevent leakage of drinking fresh water.



CS-C5I-P1/C3 ENERGY & WATER REGULATION CODE 2016: to regulates the energy and water use features for organizations and business within the State of Qatar.

Our smart solutions enable the effective implementation of regulations among our customers

KAHRAMAA

Distribution



Transmission



Delivery



CUSTOMER CENTRIC



SHOOT... & SEND: announced (Shoot... & Send) service to inform about any remarks or suggestions via KAHRAMAA Application on smart phones within its efforts to achieve direct communication with customers and for rapid response.



e-SERVICES CONSTRUCTION & REAL STATE SECTOR: started providing inspecting, interrupting and connecting e-service for all building, properties, and construction in the country via e-website km.qa or via KAHRAMAA App on smart phones to attain the smart shift in all its services.

SELF METER READING: via KAHRAMAA smart application, the customer can record electricity and meter readings through "self-meter reading" service available at the application. The customer simply enters the current reading and attach photo of it. This service ensures regular and accurate meter reading as the application keeps the date of last reading.

LAWS



Law No. 29 of 2008: ELECTRICITY AND WATER CONNECTING the provisions provided in the draft law is that KAHRAMAA shall conduct electricity and water connections to premises, buildings and facilities, and make any additions, changes or transfers therein, and all acts of connection to or separation from the public network. Carrying out any of those tasks are permitted only after obtaining a license from KAHRAMAA.

PROCUREMENT & TENDERING LAW REGULATION LAW NO. 22: To regulate and limit violations to tendering process by government entities with more control to Ministry of finance to monitor and supervise spending.

WATER RATIONALIZATION law No.20: tightened fines on wasting water up to 20,000 riyals



LEDs save **80%** of energy as compared to the usual incandescent bulbs

DECREES

PHASING OUT OF INCANDESCENT BULBS: import and sale of 40-60 watts incandescent tungsten bulbs will be banned in Qatar from November 2016 and July 2016 for 75-100 watts.



AC EER & EEL DECREE: to help customers determine the ideal air conditioners in terms of energy efficiency and reduction of carbon emissions. Appliances that do not conform to the new standards will be banned to enter the Qatari market. Implemented in July 2016.

≥ EER = 8.5
BTU/Hr. and 9.5 BTU/Hr.

PLANNING & PRODUCTION DEVELOPMENT AND WATER RESOURCES DEPARTMENT DECREE No.46: to establish restrictions on future ground water withdrawal (either by reducing the use of each existing well or by restricting the use of a number of active wells) and also conducting experiments to re-inject the aquifer artificially with desalinated water, the provision of data on individual wells and the installation of meters and control equipment.

Regulatory

Body



IPWP



POLICY

KAHRAMAA is a key member of the national renewable energy committee, which oversees the development of the national renewable energy strategy and policies

RENEWABLE ENERGY POLICY: currently developed under the umbrella of Ministry of Energy and Industry and with the support of KAHRAMAA and concerned authorities in the State.

SMART SOLUTIONS



SMART METERS: help keep a check on power distribution, monitor consumer usage and communicate revenue unit of energy, water or natural gas consumption data in real-time between any two-distribution points.

PORTABLE WATER METER MOBILE TEST BENCH: intended to check the accuracy of water meters on site for tackling customer complaints related to the meter accuracy.

GENERAL STATISTICS SMART APPLICATION: gives customer access to general statistics related to his/her account. With collaboration of IT Department, we included a group of other services such as sending meter reading, following up status of service's request (construction license and connecting service), displaying details of properties registered under customer's name, applying the electronic services etc.

AUTOMATED ON LINE TRACKING SYSTEM of approval of Bulk Customer application form and related response: BCR Online application performs various tasks aimed at transforming the process of preparing the Initial Design Report into an automated mechanism linking the concerned parties in KAHRAMAA (Electricity Networks, Technical Affairs and Finance Department) with the procedures used in designing the expansion of the electric transmission network in the country. The application connects the subscriber's request through KAHRAMAA's portal to the data and information that is updated and added to complete the engineering design necessary for the participant.

2016 Sustainability Performance

This section focuses on our performance on creating value for our customers, environment, our employees, our local communities and to the socio-economic development of the State of Qatar.

Ensuring value for our customers

As our marketplace changes and grows with the trend to digitisation, KAHRAMAA must look toward the future and focus on adapting rapidly, delivering more solutions and services to meet our customers' evolving needs, give them incentives to take advantage of advanced efficiency options and finally achieve high level of satisfaction on our water and electricity services.



Eng. Abdullah Al-Theyab
Director of Electricity Network, KAHRAMAA



Basic infrastructure (such as water and electricity infrastructure) are crucial to achieving prosperity and growth in a way that enhances the quality of life, including the social well-being, health and safety of customers and the quality of their environment. We undertake these commitments seriously as we believe in the values of corporate social responsibility, customer centricity and teamwork in order to live our philosophy and to meet our mandate as a sole service provider.

GRI Standards alignment

We used the following disclosures from GRI standards and Electric utilities sector disclosure in this section:

103-1, 103-2, 103-3, 417-1, 418-1, EU1, EU3, EU4, EU10

Performance highlights

- Added more than 19,828 new water customers, and more than 15,135 new electricity customers
- Answered call rate was 71% in 2016
- 95.3% reduction in response time to customer complaints
- 94.74% reduction in repair time for water-related issues
- 70% satisfaction result according to customer survey with customer care
- 38,500 Faulty water meters replaced by smart meters

Our approach for high quality customer service management

Customers are the back bone of the Customer Service Department (CSD) at KAHRAMAA. That is reflected in our corporate objectives by placing the customer at the forefront of our planning and activities. Our CSD team is key in supporting to achieve our vision that by 2030 our people, assets, systems and processes will set a global benchmark for performance, technological innovation, environmental sustainability and social responsibility, in electricity and water sector.

Since the launch of Phase I of its transformation to a smart organization project, KAHRAMAA has aimed to revamp the entire customer experience and ensure expectations are met and our customers are highly satisfied with KAHRAMAA's products and services.

As KAHRAMAA goes through a process of transformation, we continue analyzing and assessing the key challenges we meet in securing world-class customer service, and have placed actions in place to address them in a timely manner. Our customer base – both water and electricity customers – continued to increase in 2016 and KAHRAMAA are investing in people and technology capabilities development to match these needs and enhance customer engagement with our services.

In 2016, KAHRAMAA continue working toward smart technology to have our customers better informed than ever, and developed access to a wide range of options to send feedback and interact with our customer service department. KAHRAMAA has a dedicated website that includes various e- services; electronic certificates, service tracking, tariff details, tenders, auctions, awards, a separate portal for the ongoing National Program for Conservation and Energy Efficiency, as well as Tarsheed's children site.

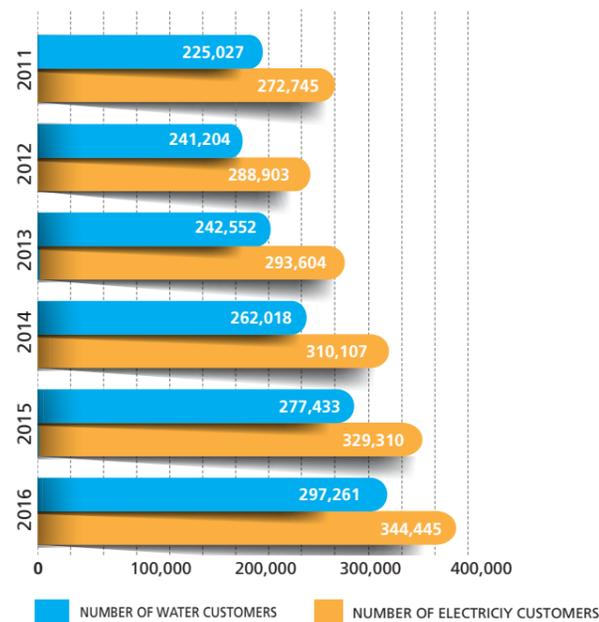
We have established a robust Customer Relationships Management framework and a platform to serve as a master source of customer data. These initiatives would improve the availability and quality of customer information that is visible for our customer facing staff and will help them further provide efficient customer service. Our new procedures and policies are designed to achieve high levels of customer satisfaction. We have in place a well-built system to control the smooth flow of any customer application, and to assure the customer to get the correct information on tracking the application process. The system allows the electronic archiving of documents to ensure customer data integrity and to ease traceability.

Managing customer privacy is also crucial for us and we have a policy to eliminate any customer data losses and not to share customer records with anyone but the customer if appropriate authorization letter is not available. KAHRAMAA is proud not to have received any data privacy complaints from our customers in 2016.

Our Planning & Quality Department also conducts regular internal audits and customer satisfaction surveys. In 2016, KAHRAMAA organized and conducted a customer satisfaction Survey where the results demonstrated 70% satisfaction from the Customer Care. Customer experience was improved by launch of new software at customer call centre. Answered call rate was 71% in 2016. The percentage answered call rate has recorded high figures across 2016 however we believe further improvements could help us perform even better.

According to the results, efficiency is now top of mind for our customers and it is seeing as an opportunity to save money and energy. In 2016 the IT department at KAHRAMAA continues working on a service through which customers are able to check their bills, building permits and service connections through 'SMS Solution'.

KAHRAMAA has now a strategy to make all its services 'smart' to enhance the quality of services and efficiency it offers. It sees this move as time-saving and enabling its client base to make online transactions round-the-clock, from all over the world. Through numerous activities, the Customer Service Department at KAHRAMAA seeks to go to smart system by automating all services provided to customers to allow them to track their applications and pay bills on line.



In 2016, KAHRAMAA added more than 19,828 new water customers, and more than 15,135 new electricity customers.



Re-thinking our overall approach to customer management

All these trends present an opportunity to fundamentally re-think our overall approach to customer management, the integration of customer management data and systems, connect better with the customer, and identify new value-added, potential services.



A dedicated team to unite the organization behind the strategic objective

- Customer Care & Call Center:** Handles front-line customer service and deals with complains.
- Bulk customer:** heavy industries and customers with high power requirements. This section also includes VIP customers.
- CS Installation:** customers with small amount of power requirements across Qatar.
- Accounts section:** billing and invoicing responsibilities.
- Meter monitoring section:** deals with consumption readings; complains about faulty meters.
- Automated Meter Recording (AMR):** deals with installing meters in an areas where a large number of meters are required



KAHRAMAA Honors Distinguished Employees in Customer Service

His Excellency Eng. Essa Bin Hilal Al-Kuwari, president of KAHRAMAA, honored the staff Customer Services Department for their outstanding performance at work on May 17, 2016. We focused on distinguished employees in their performance to achieve the satisfaction of customers which the Corporation seeks for its customers' services. The tangible efforts also leave a footprint and desired positive results in attaining the best governmental initiatives for customer services.

Advancing our smart customer service practices

Customer Care & Call Center

KAHRAMAA's Customer Care & Call Center is the main customer-facing unit in the department. Across Qatar, we have five Customer Care branches, employing around 500 employees in total. The unit consists of the following sections: Customer Care, Call Centre, Quality Assurance, and Back Office. The Call Center operates 24 hours, 7 days a week. This represents an advanced step in serving customers not only in Qatar, but also the whole region as it has latest technological means which coincides with the rapid recent developments in Qatar.

Customer complaints are treated with high priority and are attempted to be answered on the first call. Our progress toward smart customer service technologies has been highly successful, increasing our responsiveness along with our capacity to handle customer questions and complaints. In 2016, our team closed water meter complaints within 1 month and the number of received complaints by 95.3% have been reduced to less than 3,000 per month due to the installation of Pre-qualified smart water meters through Call- Off contracts. We also significantly reduced our response time to customer complaints, from 41 hrs in 2015 to 1.9 hrs in 2016. In addition, we succeeded in decreasing the repair time for water-related issues by 94.74% from 129.36 hrs in 2015 to 6.8 Hrs 2016.

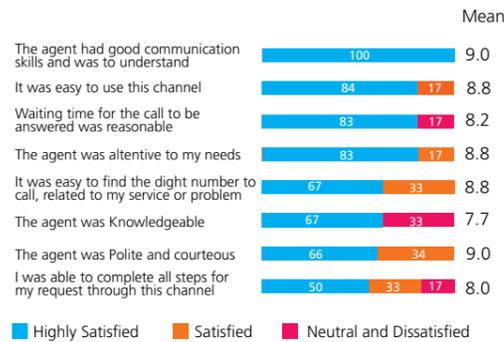
In line with Qatar's NDS 2017-2022 and its commitment to developing and modernizing public institutions through improved delivery systems and interfaces centred around people and businesses, we are striving to enhance our current practice and address our customers' needs in an innovative and results-driven way.

The Customer Care & Call Center unit faces various challenges which defer in nature. From the need for IT upgrades, through to data management, issues related to workflow efficiencies, customer service skills and bi-lingual capabilities adoption, we have transformed the department to improve our operations and to ensure we provide the best quality service to our customers which matches global international standards. On our journey to become smart organization by 2016, these initiatives are highly supported by KAHRAMAA's President and top management who provide direction and inspiration to fully live up to our motto of Customer-Oriented Utility.

Portable water meter mobile test bench

This project intended to check the accuracy of water meters on site for tackling customer complaints (High Bill) related to the meter accuracy. This allows for time, cost and manpower saving, comparable to the Station Test Bench.

The quick test can be performed on site for the water meter's accuracy by the Portable Water Meter Tester within 1 hour. We are currently studying the setup of the Mobile Portable Water Meter Tester fitted in a customized vehicle.



Despite the rapid growth of our customer base, in 2016 we maintained consistently high answered call rates with a total average of 95.03% throughout the year.



Our partnerships towards a smart grid system in Qatar

Implementation of smart meters will optimize energy and water consumption and promote efficiency, thus providing the best possible service for our customers. As another key dimension of successful "smart cities", smart grids allow for a safe and reliable service which is prepared for the integration of renewable energy sources.

Through partnerships, KAHRAMAA is working towards establishing a smart grid system in Qatar:

- We have partnered with one of the world's leading utilities in the smart grid field (IBERDROLA, the Spanish utility) as a pilot project to analyze KAHRAMAA's network and study the opportunity in applying smart grid.
- We work in close partnership with the center and with the Qatar Environment and Energy Research Institute (QEERI), to research and develop smart grid solutions for the state.
- KAHRAMAA and Belgian consultancy Elia Grid have signed an agreement to share knowledge experience around smart grid development.

KAHRAMAA transition to smart meters

The State of Qatar's steady movement towards an overall smart energy approach is supported by the installation of smart grid projects and its related technologies such as smart meter that benefits consumers and energy providers in ways more than one.

In an endeavour to offer better energy and water management solutions to consumers, KAHRAMAA has leveraged the collaborative understanding of Information Technology and the power sector to launch its smart meter project.

In 2016, KAHRAMAA have continued replacing all conventional meters in the Doha area of its service territory swapping them with smart meters. The roll-out forms part of a government-approved smart meter programme launched in January 2015 for all new projects and buildings in the country to get smart electricity and water meters. So far we have completed the installation of over 16,480 electricity smart meters and 16,612 water smart meters in 2016.

We opted for a smart electricity and water meter system equipped with consumption data recording modules for electricity

and water as well as GPS modules for localising individual metering points. Smart Meters are capable of recording consumption in detail in comparison with the electro mechanical meters. They are capable of recording more than 25 parameters which can be reported and stored in a centralized Meter Data Management System (MDMS) enabling KAHRAMAA to analyze the detailed consumption data and power quality data for better forecasting and optimization of energy use which helps to achieve energy saving targets and reduce carbon footprint.

These smart meters are capable of recording reading according to Time Of Use (TOU) and to share these details through web portals to customers. This allows customers to plan their usage resulting in changing customer consumption pattern. Remote connect/ Disconnect, On demand read helps KAHRAMAA to meet customer's expectations in terms of eliminating unnecessary administrative delays.

KAHRAMAA Advanced Metering Infrastructure (AMI) pilot project



KAHRAMAA AMI pilot project scope involves around 10,000+ water and 15,000+ electric customers who reside across two zones (Westbay, Al-Sadd) in Doha, Qatar. AMI project is expected to cover all over the state by 2017.

In 2016, we connected remotely a total of 14,968 electricity smart meters and 9,930 water smart meters in AMI Zones. AMI Pilot project Major elements include Smart Meters, Data concentrators, Head End System (HES), Meter data Management System (MDMS).



Fast-track service for customers

As part of its social responsibility and in an effort to reduce customers' waiting times, we have launched a fast-track service for disabled, elderly and women at our Customer Service office in Al Hilal. A and B tracks have been assigned for them for installations and customer care requests respectively.

The role of social media in keeping in touch with our customers

Today businesses have the opportunity to use social media not only as a way to provide customers with great service, but also as means of connecting and inspiring one another through conversations and mutual dialogue. When developing our strategy for social media program, we have conducted a research to analyse trends in the industry, evaluate experiences (in Qatar and in the region), find out which platforms KAHRAMAA customers' use, and monitor what they are saying about our brand.

Recognizing the importance of understanding better the needs of the customer and their priorities and issues, we have available both Twitter and Facebook accounts to get closer to the customer. Our Twitter account has a growing number of followers from 1,838 in 2013 to currently 31,500 and our Facebook page has 7,166 likes in 2016 as compared to 1,978 in 2013. Separately, Tarsheed has its own Facebook page which we utilize to raise awareness about the national program, to inspire change and to communicate our numerous initiatives.



Social media plays a critical role in the way we manage our customers relations. Users can interact with KAHRAMAA 24 X 7 through a dedicated WhatsApp contact number. Through this platform, we receive reports, complaints, feedbacks and grievances among others of customers and social activists related with safety and functionality of KAHRAMAA's Electricity and Water networks across the country.

Improving responsiveness

To give our customers more opportunities to communicate with our Customer Care representatives, we have introduced new working hours for our main Customer Service Centre located at 'D' Ring road. The working hours have been increased as a result of the growing number of KAHRAMAA's customers. To help us deliver on our promise of Customer-Oriented Utility, we are committed to listen to our customers and get their requirements and expectations fulfilled.



Eng. Yousef Al-Jaidah
Manager Customer Services

Our Customers are no longer required to visit KAHRAMAA headquarters or its branches in the country to transact. Every month, we will send messages to everybody in Qatar to show them their level of consumption, as well as showing them whether their consumption is above the national average. This way, people can start to understand how much they are consuming.

Improved smart application for better living

In 2016, KAHRAMAA launched the new version for its App on smart phones in both languages Arabic and English. The Application has new characteristics which benefit by the modern technologies of the smart phones. In addition to the new design of the Application, the customer can display a general statistics related to his/her account. The customer also can display a brief summary for the properties registered under his/her name as well as sending meter readings for electricity and water and displaying the details of the bills with the paying ability.

The new Application also includes a group of services such as: the request of "To whom it may concern" certificate, sending monthly meter reading, following-up status of service's request (construction license and connecting service), displaying details of properties registered under customer's name, applying the electronic services, displaying details of customers services centers besides their locations on map, providing a system of sending suggestions and complaints.

A picture of the meter can also be uploaded with the date of the meter reading, affording greater accuracy of the system. KAHRAMAA's new app will enhance the customer's experience and the authority's efficiency, by adding more services for better efficiency.

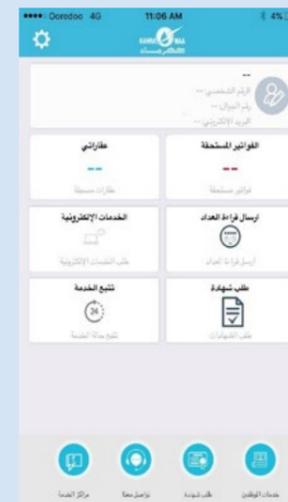
KAHRAMAA also worked to raise its performance level through adopting many initiatives which its latest one was the announcement of shifting its services to all customers, companies, consultants and contractors into 100% E-services. The Corporation moves towards introducing various services according to highest level of global quality in order to facilitate the circulation procedures for the customers, saving their time via completing them at any time and from anywhere.

The E-services are allowed around clock and the applying via electronic website is allows avoiding errors that could occur in paper applications because of lack of papers or required procedures, where the system refuses to register any application or circulation if it is not meeting all required conditions which is actually saving a lot of time and efforts.

Subscribers have been encouraged to register and update their information through its website www.km.qa or the mobile application for online transactions. In doing so, customers will better avail themselves of the many services offered.

KAHRAMAA has also a text messaging service where subscribers – citizens and expatriates alike – are notified by the facility about their monthly consumption of electricity and water. The application will also submit information on average consumption for the purpose of promoting energy efficiency awareness.

KAHRAMAA seeks to develop its services to keep in pace with the latest regulatory and technological developments of services. We have also developed an ambitious road map for the smart shifting of all its services. This road map aims at upgrading the level of services offered to our customers according to highest levels of efficiency. These services comes within the framework of continuous improvement in order to increase the customers' satisfaction through saving time and efforts via achieving circulations electronically at any time and from anywhere without referring to KAHRAMAA or any branch of customer services.



Inspecting, interrupting & connecting e-service

In an effort to enhance its customer offering, KAHRAMAA is striving to achieve a smart shift in its all services. KAHRAMAA now offers two electronic services, namely inspection, interruption and connecting for all buildings in the country via its website: www.km.com.qa or via KAHRAMAA App a smart phone app. The number of inspection requests to connect service reached 5.460 in 2016.

The additional service affords the customer the ability to request the inspection electronically-based construction readiness. Upon completion of all relevant documents, within three days, both contractor and customer will receive an SMS of the inspection's appointment, as well as immediately being informed about checking results.

The inspectors comprise a number of qualified Qatari inspectors, trained in all levels of quality and safety. KAHRAMAA mandates that all inspectors do not violate connecting procedures or fail to apply safety and security measures.

Where the customer could request the service for new property, meter readers, or paying bills, the connecting and interrupting services could be undertaken electronically.

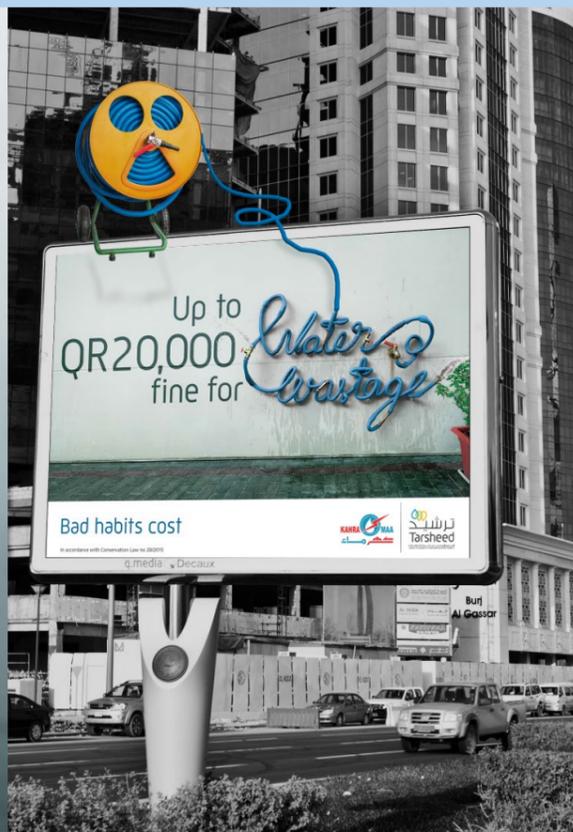
Our Conservation and Energy Efficiency Department (CN) endeavors to achieve the proper enforcement of Electricity and Water Consumption Rationalization Law No. 20/2015, and the promulgation of the punishments of violations that amount to 20,000 QAR. The minimum and maximum punishment shall be doubled if the action is repeated within three years of the punishment sentence execution or by lapse of time.

One of the department objectives is to direct campaigns for customers in order to be aware of Electricity and Water Consumption Rationalization Law as the violations increased. It aims at informing customers of the fines, punishments, and composition. On the other hand, it stressed KAHRAMAA's commitment to provide the technical consultancy in order to raise customer awareness of conservation.

Customer Technical Services and the New Conservation Law

Up to QR10,000 fine for not fixing internal water network leakage. Bad habits cost.

Up to QR20,000 fine for water wastage. Bad habits cost.



Securing reliable and high quality water for our customers

Water quality standards, policies and management system in place

At KAHRAMAA, we are strongly committed to provide safe, clean and high quality water to the consumer by ensuring strict compliance with established standards – such as the World Health Organization (WHO) Drinking Water Quality Guidelines and The Qatari Standard No. 149/2009 for Un-Bottled Drinking Water Quality - and by implementing innovative, technological developments in the fields of water treatment, distribution, and monitoring.

To achieve this endeavor, we have gone beyond compliance with international standards, and have set our own Water Quality Management Framework based on quality assurance measures and risk control and management. The framework consists of developed standards and water quality regulations, as well as strict monitoring programs and tools such as accredited labs and the provision of the Supervisory Control and Data Acquisition (SCADA) system.

Beyond developing and reinforcing water quality standards and efficiency, the framework serves a broader purpose helping to build the institutional capacity

on water quality by training and sharing information with various external parties, and organizing public awareness programs for our customers.

In terms of integrating smart technology into our water networks, last year we developed a District Metering Area (DMA) Motorized Valve system, alongside a SCADA Integration Project. The remotely operated DMA motorized valves helped to maintain efficiency during emergency isolations, and also to reduce water loss. The SCADA project used pressure transients to monitor our entire water network, optimizing management solutions across the system.

In our effort to deliver best quality, we have used the already established standards as a basis and have developed even more strict requirements and expectations. For example, WHO has set a level of 95% compliance with key water microbiological characteristics as an indicator of good performance. At KAHRAMAA, we have set ourselves a target of 99% compliance. Also, recognizing the importance for regulating

drinking water quality for public health, we are working towards full compliance with health based chemical parameters and have taken steps towards reviewing and updating the Qatari Drinking Water quality requirements.

Ensuring safe and high quality water reaches our customers, is a shared responsibility. We therefore set various policies and requirements for both the end water quality produced by private water producer companies and for the processes of water treatment and further quality management.

As part of the Water Quality Management Framework, KAHRAMAA's Health, Safety & Environment (HSE) Department reviews all proposed water projects and provides both quality and health perspective regarding the design, technology, chemicals and materials used to ensure water safety. HSE also conducts routine sanitary inspection, auditing and verification procedures on all water facilities, desalination plants, reservoirs, tanker filling stations & tankers.

More than 93 parameters in 18,006 samples are analyzed annually by the Water Quality Laboratory in line with WHO standards.

KAHRAMAA Water Quality Lab



We ensure safe and clean drinking water to high standards and quality, water is subject to a yearly sampling plan samples are collected and tested from the storage reservoirs and networks up to the service connection points

KAHRAMAA Water Quality Lab has been established as a fully equipped laboratory to conduct analysis of around 93 different water quality parameters by using the latest methods for water testing. The lab houses laboratory units that are intended for use in emergency and special cases. To ensure high level of results credibility and accuracy, the Lab has coordinated efforts with Planning & Quality Department (PQ) and HSE departments to establish a quality management system.

In 2016, the Lab successfully renewed its ISO 17025:2005 quality certificate, which reflected KAHRAMAA's strong commitment to comply and exceed international quality standards. By receiving this certification, KAHRAMAA's Lab became one of the 211 worldwide non-commercial chemical labs allowed to use the logo of the American Association for Laboratory Accreditation (A2LA).

The Lab in collaboration with HSE and KAHRAMAA's Operations Department conduct regular scientific studies to help provide a baseline data for future developments.

YEAR TO DATE BIOLOGICAL WATER QUALITY COMPLIANCE



4.6% Higher than the world Health Organization (WHO) Target of 95%

KAHRAMAA's commitment to provide Safe Drinking Water

Due to the urban and economic development witnessed by the State of Qatar and to KAHRAMAA's keenness to provide the best services to its customers, KAHRAMAA works to ensure the continuity of water supply while confirming to the international quality standards as well as reducing losses and leaks in the network to complement what has been implemented in previous years and to keep up with the urban development in the country.

Last year, we installed Radiation Monitoring Systems in the sea front, by the desalination plants, in order to provide an early detection of unsafe levels of radiation in the sea. This measures directed on minimizing the uptake of the radiation from the sea into the desalination plants, offers an additional protection measures to guarantee safe water to our customers.

Reservoirs and lift stations in the water network system represent an important element in securing customers supply.

KAHRAMAA has also connected 1,913 new properties to water networks in 2016. Our Water Network Department undertook numerous preventive and corrective maintenance works for 163 of its water constructions, including water pumping plants and water tanks. In addition, a partial launch of Al Wakir pumping station was completed in 2016 with 4 control cabinets and a storage capacity estimated at 8 million gallons on 2016.

We have received the ISO 9001 international quality certificate for water connections and in 2016 we reduced the number of water tankers to 0.1% of the total number of subscribers as an extension of the project for water distribution lines. The number of beneficiaries of this project was 2,487 participants across the State of Qatar. We also completed in 2016 a sub-connection project, where 7,284 connections were implemented in the entire State of Qatar.

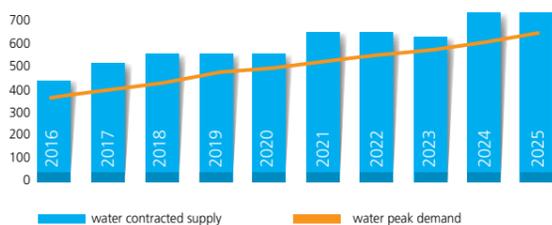


Eng. Abdul Rahman Al-Naema, Manager
Health, Safety & Environment



The pressure on Qatar's water resources has grown significantly over the last decade and we are at the beginning of our journey of innovation and behavioural change to ensure that tomorrow's supply is safe. Water conservation, efficient water use and water recycling are the most important drivers that support our quest for water security. Towards this end, we launched Tarsheed in 2012 with plans to reduce the country's water consumption by 35% within five years.

MEETING WATER DEMAND



During Q2, new water networks reaching 36km, with diameters ranging from 100m to 900m were established, to improve the performance of the water network and connect new customers.



Eng. Ibrahim El-Emadi
Manager Planning & Quality



We have expansion plans devised to meet the growing demand for electricity in Qatar, as the country continues to witness tremendous development and urbanization. The expansion plans are in line with KAHRAMAA's mission and objectives to provide high quality electricity and water services in the state to all sectors including households, business centres, shopping malls, hospitals and schools and is also in line with the company's commitment towards Qatar National Vision 2030 and National Development Strategy.

Reliable and efficient supply of electricity

Strengthening our power network

KAHRAMAA has taken several measures to improve electricity transmission, distribution and maintenance of network in 2016.

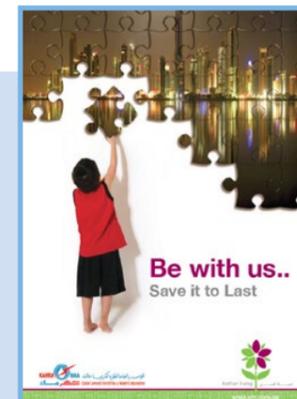
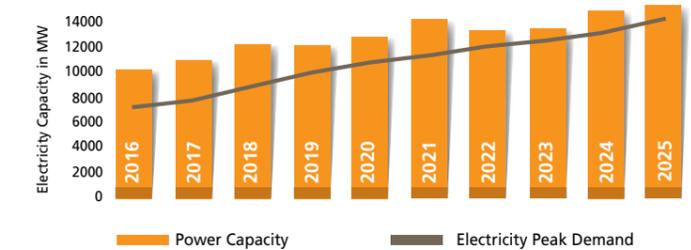
Our Electricity Control Centre carried out several maintenance works in year 2016, during which 1,658 permits were issued for maintenance, construction of stations and repairing damage. The Electricity Control Centre attended to 232 cases of damage in its distribution network and restored power to customers during the period, issued 1,557 permits for checking missions, constructed 298 new electricity distribution stations, removing around 9.33 km overhead lines, and extended 296.75 km of underground cables for supporting the medium voltage network.

Moreover, 75% of the Cyber Security Project has been accomplished for SCADA Control Centre, upgrading systems controlling the stations and securing the appropriate electrical feedings for many activities in the country.

KAHRAMAA has monitored maintenance works and replacement of the existing network in electricity distribution stations in order to reduce damage rate. We operated distribution transformers, distribution plants besides building electricity distribution stations. We also completed civilian maintenance works for stations in order to maintain the performance level of the electrical network stability within adopted operating levels.

In 2016, KAHRAMAA has also extended our distribution cables, with 1980 Km of 11kV overhead lines in service as of 31/12/2016. Also during the period 88% of protection devices were replaced with modern digital devices.

MEETING ELECTRICITY DEMAND



"Save it to last" campaign

KAHRAMAA's CSD involves in Integrated Conservation Media Campaign in GCC countries under the slogan "Save it to Last" through arranging events and activities to raise awareness for the importance of conserving electricity and water and reducing its wastage in our daily practice and developing it as culture of the community. The initiative finds the required mechanisms for conservation through the observance of the optimal use of resources. It shows the violations and punishments of water misuse through the broken internal network.

Conserving natural resources

The State of Qatar faces significant challenges related to the consumption and availability of natural resources. The country has one of the highest per capita consumption of electricity and water in the world, and global trends around urbanization and population growth play a significant role in the depletion of natural resources and the increase in competition for energy and water in the country. As the transmission and distribution system owner and operator (TDSOO) for the electricity and water sectors in Qatar, KAHRAMAA plays a key role in managing the near and future challenges related to the supply and demand of electricity and water within Qatar.



Eng. Ahmed Al-Nasr
Director of Technical Affairs, KAHRAMAA



In line with the Qatar National Vision 2030, KAHRAMAA has developed our Management System in a manner that ensures full alignment between economic, social and environmental growth. KAHRAMAA has also succeeded in embarking on infrastructure projects in both Electricity and Water and still investing heavily in these two fields to facilitate for the continual growth of the State of Qatar and to cope with the ever increasing demands for these two commodities.

GRI Standards alignment

We have used the following disclosures from the GRI standards and Electric utilities sector supplement:

103-1, 103-2, 103-3, 203-2, 302-2, 302-4, 303-1, 305-1, 306-2, 307-1, EU2, EU12, EU28, EU29

Performance highlights

- Actual electricity transmission losses amounted to 726.3GWh
- Reduction in real water loss to 4%
- 93% of paper waste recycled within KAHRAMAA
- 56% reduction in potable water usage in District Cooling
- Cumulative savings of 8.5 million tons of carbon emissions through Tarsheed (from 2012-2016)

The conservation of resources both within our operations as well as within our wider value chain is driven by the collaborative efforts of multiple departments in KAHRAMAA,

Conservation & Energy Efficiency Department

Water Network Affairs (WNA) and Electricity Network Affairs (ENA)

District Cooling Services Department

Planning & Quality Department

Technical Affairs Directorate

Directorate of Planning and Development of Production and Water Resources

Our approach to managing the conservation of natural resources

Depletion of natural resources has emerged as one of the primary environmental concerns around the world. Trends like rapid urbanization and population growth, have placed immense pressure on the environment. Competing demands on land and water today lead to resource overexploitation, posing serious questions with regards to energy security, food supply, and water availability. According to the Qatar National Development Strategy (NDS), "Qatar's natural resource endowment creates a unique mix of benefits and stresses. Significant wealth in hydrocarbons has generated one of the world's highest per capita incomes, but extreme scarcity in water and arable land has created equally unusual vulnerabilities and deficits." KAHRAMAA manages the supply and demand for electricity and water in Qatar and thereby plays a key role in the conservation of natural resources through conservation and efficiency measures.

The provision of high quality and reliable supply of electricity and water is the fundamental focus for KAHRAMAA. We

focus on the quality of supply received by our customers as well as the quality of the transmission and distribution process. We seek to ensure asset excellence by pursuing reduction in electricity and water losses throughout our network. We have also invested on the Tarsheed program and on similar demand side management activities aimed at reducing the per capita consumption of electricity and water in Qatar.

KAHRAMAA's environmental approach, in line with the NDS, places emphasis on conserving resources along our value chain. As part of our Long-Term Strategy 2030, we are committed to investing in clean technologies and ensure asset excellence, which will help us minimize the risk of supply concerns and reduce our environmental footprint.

Our commitment: Ensuring high quality and reliable supply of electricity and water



To help achieve our ambitious environmental targets, KAHRAMAA has been focusing on developing strategies and supporting projects in the four key areas outlined below. While some of these are based on basic awareness raising activities, others require more comprehensive research, analysis, planning and execution.

Awareness & community development

- Conservation (TARSHEED) Campaign
- Education Awareness Program
- Religious Awareness Program
- Community Social Responsibility Program
- Conservation & Energy Efficiency Days/ events
- Conservation Building Competition

Efficiency in consumption

- Air conditioner and Energy Efficiency labelling
- Power Factor Correction
- Phase out of inefficient Lamps

Renewable energy

- Renewable energy research studies
- Solar energy pilot project

Law enforcement & regulation

- Law No. 26 2008
- Law Enforcement
- KAHRAMAA Regulations for Electricity & Water Conservation

Conservation in resources

- Retrofit for Energy & Water Conservation Program
- Demand Side Management (DSM) – Industrial sector
- Demand Side Management (DSM) – Water conservation

Over the coming years, KAHRAMAA would seek to evaluate electricity generation from mixed sources, using the most refined and efficient fuels, multi-cycle highly efficient generators, solar energy, and increasing the efficiency of production, transmission and distribution of electricity and water. KAHRAMAA has adopted a number of future plans to use smart infrastructure in the water and electricity sectors to ensure efficiency in the water and electricity sectors. Some of the components of the smart networks include, automatic smart control systems for the distribution and supply of water and electricity, smart meters, automatic and efficient communication systems and advanced water networks.

Research and development

KAHRAMAA prioritizes research in line with QNV 2030 and NDS for investing and leveraging state-of-the-art technology. Qatar is committed to advancing research and development and has targeted 2.8% of GDP to support research. We strongly believe that focussing on R&D would help us identify solutions to challenges faced by Qatar and would help us enhance our impact along the value chain.

KAHRAMAA's R&D Committee is led by the Conservation & Energy Efficiency Department Manager and consists of representatives from diverse teams across the organization. Our Planning & Quality Department also conducts local and regional market research, in collaboration with other departments.

Our R&D Committee aims to:

- Support Qatar's R&D strategy in relation to energy and water
- Supervise and coordinate with internal and external organizations potential research opportunities related to KAHRAMAA's operations
- Develop and set R&D procedures within KAHRAMAA
- Create and maintain R&D project database
- Attract high level collaborations with institutes and researchers

Our R&D activities fall under three categories: local – within the individual departments; internal – within KAHRAMAA; and external – within Qatar. Activities cover various areas such as: transmission, distribution, energy conservation, renewable energy, recycling, health & safety, quality, smart grid, customer services, etc.

Overview of the electricity sector

KAHRAMAA aims to provide high quality and sustainable electricity for better living in Qatar



Eng. Ali M. Al-Ali,
Manager Production & Water Resource
Planning & Business Development



The country's steady movement towards an overall smart energy approach is supported by the installation of smart grid projects and its related technologies such as smart meters that benefits consumers and energy providers in more ways than one. Additionally, it enables KAHRAMAA to optimize energy consumption and promote energy efficiency.

With increasing population and rapid urbanization, the electricity sector in Qatar has undergone a significant spurt in growth. This has led to a significant increase in the electricity demand within the country.

To meet the increasing demand for electricity, the country has continued to invest in both increasing the generating capacity as well as in the transmission and distribution networks. With the continuing expansion in the size of electricity main transmission and distribution network, the

total number of sub-stations reached 14,368 as of 2016.

The power grid in Qatar faces various challenges – from expanding the electricity systems to meet the demand, through to the delivery of high quality and convenient services, and the use of renewable sources for power generation. KAHRAMAA, plays a pivotal role in meeting the growing demand through innovative approaches including our partnerships towards a smart grid system in Qatar as well as through efficiency measures within the network.

	2012	2013	2014	2015	2016
Amount of electricity received from the power generating units and sent out to the grid for customers (GWh)	32,352	32,224	36,125	38,852	39,667
Maximum demand (MWh)	6,255	6,000	6,740	7,270	7,435
Electricity reserve margin (%)	24.5	29.76	21.93	13.13	13.13
Number of customers (billed and unbilled, based on number of meters)	288,903	293,604	310,107	329,310	344,445

Smart grid in KAHRAMAA electricity networks

KAHRAMAA has signed an MOU with Iberdrola to investigate the opportunity of applying the smart grid in electricity networks through two phases:

Phase 1: Technical Study of Smart Grid applicability for KAHRAMAA's Grid

- Technical Analysis of KAHRAMAA's Grid
- Smart Grid Feasibility Study
- Cost/Benefit Analysis (CBA)

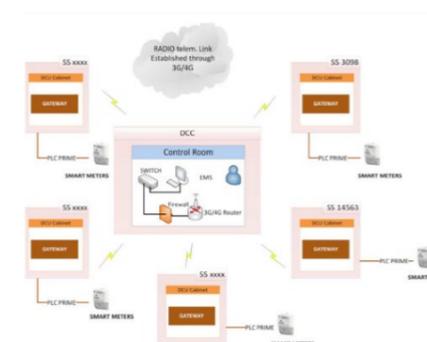
Phase 2: Pilot Project

- To test an Integrated Smart Grid in the Distribution Network.

After the pilot project, the theoretical results would be evaluated in real life conditions before implementation. The implementation of the Smart Grid could potentially have the following benefits:

- Decrease in air pollution what can drive the country to get closer to international environmental policies
- Reduce sustained outages and ensure reliable supply to customers
- Economic value of the reduced outage because of selling more electricity
- Customer oriented enhancement as the customer will have more information to contribute to the Conservation Plan for Tarsheed and Qatar National Vision 2030

Layout - Smart Grid Pilot V2



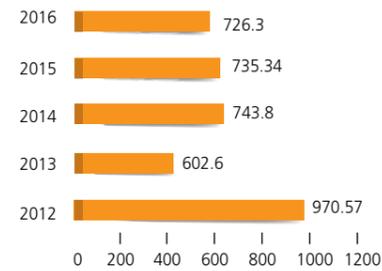
System Average Interruption Frequency Index (SAIFI): the average number of sustained interruptions per consumer during the year was **0.29**

System Average Interruption Duration Index (SAIDI): the average duration of interruptions per consumers during the year was **30.87**

Ensuring reliable and efficient supply of electricity

In 2016, the total electricity losses from our network was 6.31% with 1.87% lost during transmission and 4.5% in distribution losses. The actual electricity transmission losses amounted to 726.30GWh in 2016.

Electricity Transmission Losses



Ensuring reliable supply of power with minimal system outages is one of the focus areas for KAHRAMAA. In 2016 we had 19,467 hours of planned outages and 4,361 hours of unplanned outages in our network.

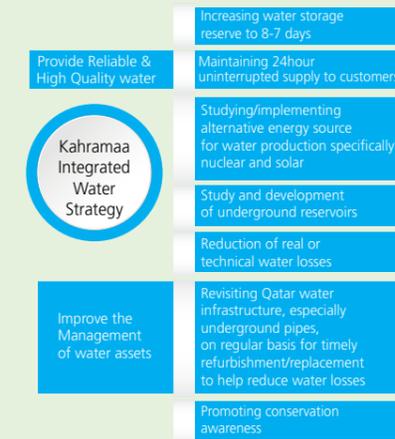
Diversifying energy sources by encouraging projects and investing in renewable energy

The Renewable Energy Technologies Section, a division of KAHRAMAA's Conservation and Energy Efficiency (CN) Department, is responsible for introducing renewable energy technologies to the power and water sector in the State of Qatar. KAHRAMAA is playing a key role in drafting Qatar's Renewable Energy Strategy and identifying the required policies in cooperation with the Ministry of Energy and Industry.

Some of our key short- and long-term initiatives to promote renewable energy in Qatar include,

- Implementation of the 200-500 MW solar power plant project: The project is expected to be implemented using an Independent Power Producer (IPP) and KAHRAMAA has already identified the land for the project.
- Executing the first Renewable Energy Atlas in the State of Qatar in collaboration with Qatar Foundation's Qatar Environment and Energy Research Institute (QEERI) to examine the best areas for application of RE, especially solar projects using parameters such as irradiance, surface temperature etc.
- KAHRAMAA has developed the guideline specifications for PV solar system (on grid system and off grid system) in Qatar. The guideline specifications for solar water heaters are currently under development.
- To evaluate wind potential in the north of Qatar, KAHRAMAA is implementing wind measurement using Sodar (Sound Detection and Ranging) that measures wind speed and wind direction up to 120 meters.
- KAHRAMAA is also actively involved in promoting private sector participation in the renewable energy sector in Qatar. We have signed an agreement with the Emirati Masdar Company and the Qatari Nebras Powers for establishing a joint business relation in the field of developing sustainable and renewable energy projects. In addition, in collaboration with Ministry of Municipality and Environment we are applying several solar PV solutions to light-up streets, public parks and shores. In addition, with Ministry of Education and higher Education we are having several pilots of applying solar systems of lighting & ACs in schools.

Integrated water strategy



To continue meeting the increasing demand, some of the key updates/developments for the water network in 2016 include the following:

- **RAF A3 water production facility operational:** In 2016, the first desalination facility producing potable water using the Reverse Osmosis (RO) desalination technology was rolled out. The Ras Abu Fontas A3 facility composed of Acciona RO units is expected to achieve a total production capacity 35.14 MIGD in 2017.
- **Roll out of the Umm Al Houll power generation and water desalination facility project:** The Facility D IWPP, is one of the largest facilities in the region which follow state of the art power and water production technologies for power generation combined cycle, thermal sea water desalination (MSF) and reverse osmosis (RO) sea water desalination. The facility basically comprises of 6 Siemens SGT5-4000F gas turbines, 6 Nooter Erikson boilers, 4 SST5-4000 steam turbines in combined cycle configuration and 5 Hitachi Zosen

Overview of the water sector

To keep up with Qatar's vast urban and economic developments, KAHRAMAA continues to place immense efforts in expanding its water capacity and distribution of water networks while conforming to international water quality standards (e.g. ISO 9001). We continue to assess our losses and leaks to reduce our non-revenue water, in our efforts to optimize our water supply.

Maintaining close interaction and coordination with our stakeholders is essential in addressing various concerns regarding water production, availability, quality and outages. Our main stakeholders include Independent Power and Water Producers (IPWP), Policy Makers and Government Agencies, Customers, Suppliers, Contractors, Employees, Local Communities and Academia.

Provide reliable and high quality water

We continue to expand the reach of our services to meet the demands of our customers with 9.7% average water production growth for the last 10 years and 6.9% in the last 5 years. Our primary source of water remains desalinated water from the sea to meet the needs and demand of our customers.

	2012	2013	2014	2015	2016
Total annual water production (million m ³)	437	465	495	535	560
Total number of customers	241,204	242,552	262,018	277,433	297,261

MSF distillers units and Acciona RO units. The facility is expected to be fully operational in July 2018 with final production of 2520 MW and 136.5 Million Imperial Gallons of water per Day (MIGD).

- **Improving our pumping stations and water tanks:** Our reservoirs and lift stations both represent the most important components for our water network's security.
 - In early 2015, we launched Al Wakir pumping station to increase our water capacity feed in Jaidaah tank station with an estimated water storage capacity of 9 million gallons.
 - We launched the pumping station for the medium and small industries with a capacity of 10 million gallons per day and storage capacity of 8 million gallons to serve one of Qatar's industrial zones.
- **Advancing our Connections and Maintenance Works:** Within a rapid period of three years, we completed one of our extension projects, which

includes the provision of 10 water distribution lines that enable our water networks and delivery expansion. The project's beneficiaries are approximately 1,842 participants. We have also added 10 sub-connection projects to introduce 7,284 additional water network connections across the State of Qatar. With our increased water network expansions, we have witnessed a 0.22% reduction in the number of water tankers of the total number of subscribers.

- **Set up of the Department for Planning and Production Development of Water Resources:** To conserve groundwater resources and to protect them from overexploitation, the KAHRAMAA administrative structure was updated in 2016 as part of an Emiri Decree No. 46 of 2015. The newly formed department would focus on establishing restrictions on future groundwater withdrawal, conducting experiments to re inject the aquifers with desalinated water, provision of data and the installation of meters and control equipment.

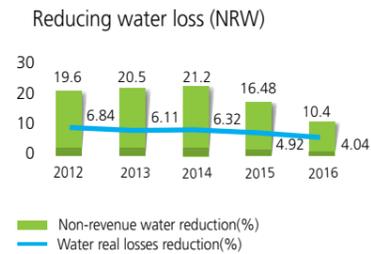
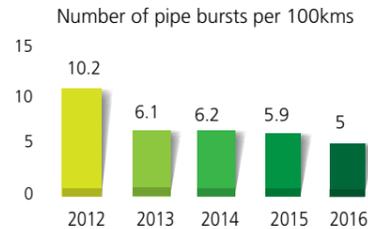
Improve the management of water assets

KAHRAMAA has put in place a comprehensive water loss reduction program in the water transmission and distribution network.

Some of the major leak detection projects in the water network include:

- Leak detection in large diameter water mains of 600mm to 1600m diameter using Smart Ball – a specially patented freely traversing acoustic device.
- Permanent noise loggings and correlating activities on the web server using Cloud computing and GSM network.
- Water balance and leak detection activities in DMA (district metered areas) inclusive of rezoning and ZPT (zero pressure tests) activities
- Pressure Transient Monitoring for identifying stress points in the water network 24/7 and predicting pipe failures and bursts in an online mode instantaneously
- Leak Monitoring via SCADA applications for active leakage management solutions for online real-time leak detection and localization of leaks in district metered areas (DMAs)

Reduction of Real Losses from a high of 35% in 2007 to the international Standards of 4% in 2016



Mr. Abdul Monem A. Darwish
Manager Water Operations & Control

“ Qatar now competes with leading nations like Japan and Singapore in the ability to control water leakage, with the rate of water leakage now in Qatar’s network at 4 percent. KAHRAMAA would not have reached this milestone if it hadn’t been for our ability to apply the creative use of available technology and resources.

Reducing real water losses to match international standards

To reduce water loss and misuse, we used variable speed pumps to control pumping pressure to ensure appropriate and constant pressure levels in the whole network. We modified our control philosophy by adding dynamic pressure control to the rising main, so that head loss will be calculated every minute against the pumped flow considering static pressure as different elevation between the pumping station ensuring required residual pressure enough for customer supply. The main achievements of this initiative include the following:

- Reducing water loss by implementing continual and effective campaigns
- Improving network pressure profile
- Eliminating customers low pressure
- Reducing water complaints at network highest points
- Reducing real losses from a high of 35% in 2007 to the international Standards of 4% in 2016

In the future, we would work on reducing the annual increase in demand using the same technique and reallocating DMAs for further optimum pumping pressure and network pressures, reducing the pressure difference between low elevation and high elevation points of districts. This would allow us to maintain NRW to a sustainable standard of 4% or even lower.

Measures to manage the growing demand of electricity and water in Qatar

Promoting resource conservation and energy efficiency through Tarsheed

The National Program for Conservation and Energy Efficiency (Tarsheed) was launched in 2012 with an aim to increase resource efficiency and to reduce environmental impact in the process. It seeks to reduce electricity consumption per capita by 25% and water consumption by 35% per capita until 2022.

Since its launch, Tarsheed has managed to reduce per capita electricity consumption by 18% and water consumption by 20% by 2016 through initiatives related to development of regulations as well as through awareness campaigns. For more details on the awareness campaigns, please refer the “Supporting the communities” section.

Tarsheed initiatives 2016

Law enforcement:

In 2016, Tarsheed successfully implemented the Rationalisation Law No. 20 for the year 2015 effectively and tightened fines on wasting water up to 20,000 riyals and released 4,670 warnings and violation fines for water.

Ban on inefficient Tungsten lamps:

Tarsheed issued a regulation with the Ministry of Environment to ban the import of inefficient Tungsten lamps (75W-100W) on 1st May 2016 and (40-60W) in November 2016. Through the increased adoption of LED or CFL, we expect a potential saving of 7523 GWhr in electricity usage and a reduction in 4,054,689 tons of CO2e by 2020.

Air conditioning energy efficiency:

The Energy Efficiency Labelling Decree for air conditioners according to the approved Qatar standards established by Tarsheed was adopted by the National Standardization and Measurement Authority in July 2016. To ensure effective implementation, Tarsheed is working closely with key stakeholders and organizing awareness campaigns in malls. Tarsheed is currently working on increasing the Energy Efficiency Ratio (EER) of the air conditioners from 9.5 to 11 and is likely to be applied in January 2018.

Other initiatives by Tarsheed to improve energy efficiency:

- Adjusting the Power Factor to a minimum of 0.9 for Bulk Customers in the industrial and commercial sectors
- Application of thermal insulation systems after issuance of Ministerial Decree No. 108 of 2015
- Forced new bulk customers to obtain energy management ISO Certification 50001
- Launched the energy audit program for government buildings in particular and for different sectors of the state

Qatar Plumbing Code:

In 2016, KAHRAMAA announced the code through Tarsheed regulations and it has been applied by the Building Permits Complex since February 2016. The regulations on flushing tanks, the largest consumer of water in homes, have been amended.

Savings through Tarsheed until December 2016:

- More than QAR 3,800 million in cost savings
- About 2,120,000 cubic feet of gas savings
- Reduction of carbon emissions by 8.5 million tons (when compared to the baseline in 2012)

CN Department: Target Plan vs Actual Dropdown Per-Capita Consumption Trend Water by 35%



CN Department: Target Plan vs Actual Dropdown Per-Capita Consumption Trend Electricity by 20%



Conservation of natural resources through District Cooling (DC)

District cooling (DC) not only plays a major role in the lives of the Qatari people but also has significant economic and environmental impact. The District Cooling Services department at KAHRAMAA has identified the following benefits of DC over conventional cooling methods for cooling high population density areas for Qatar.

In 2016, District Cooling shared up to 15% of the total cooling load in Qatar. This translated to 0.66 million TR. It is expected to potentially grow to 1.5 million TR by 2023, contributing to 24% of the total cooling load in Qatar.

We achieved 13 MW saving in generation capacity and 48 MW saving in distributed capacity from increased district cooling penetration. The reduced fuel consumption allowed us to save 67,109 tonnes of CO₂. We were also able to save 2,830 tonnes of CO₂ due to reduced refrigerant leakages. Avoided generation and distribution capacity addition helped us save 59.8 mn QAR and 89.2 mn QAR respectively.

Successful utilization of recycled water in District Cooling plants in Qatar

In Qatar, the increased demand for cooling load is met by energy efficient water cooled centralized chiller plants. However, this poses a threat to the limited water resources in the region. Taking this into consideration, KAHRAMAA's DC department paved the way of the directive which prohibited the use of desalinated potable water for cooling purposes and proposed the use of Treated Sewage Effluent (TSE) or sea water as replacements. This replacement offers both environmental and economic benefits in the form of energy and cost savings. This transition to TSE/ Sea water was met with a lot of challenges but effective multi-level DC stakeholder (DC plant operators, Ministry of Municipality & Environment and Ashghal) coordination on the part of KAHRAMAA DC department led to a reduction of 56% in potable water usage in DC.

Economic benefits	Social benefits	Environmental benefits
Consumes 40-50% less energy compared to conventional options	Improved availability of potable water	Lower air pollution
Savings in potable water due to use of alternate resources such as Treated Sewage Effluent (TSE)	Better utilisation of available space and landscape	Lower refrigerant emissions
Savings in electricity generation and infrastructure capital investment	Improved health due to reduced exposure to environmental emissions	GHG emission reduction
Enhanced energy management	Reliability of supply of services	Noise reduction
Lower maintenance cost compared to conventional options	Improved quality of life	Lower heat generation
Optimal use of chemicals	Enhanced services sustainability	Overall lower environmental footprints
Encourage technology transfer		

In spite of the above mentioned benefits, the DC sector in Qatar is currently facing number of challenges such as,

- Scarcity of potable water for DC operation in the absence of sufficient TSE presents a major challenge.
- Lack of TSE supply network at many places in Qatar.
- Non availability of TSE operating DC plant Discharge disposal destination network.
- Consumer affinity towards less efficient air conditioning alternatives due to various issues such as pricing, availability etc.
- High switching cost for retrofit systems.

KAHRAMAA's DC department has identified the benefits of using TSE for cooling purposes. In coordination with Ashghal, we are acquiring TSE and are on the way to eliminating the use of potable water in DC systems. Since the implementation of the 2013 directive to use TSE in place of potable water for cooling purposes, 7 out of 22 of our operational plants are using non-potable water. This has resulted in a total potable water saving of 2.8 million m³ in 2016.

In October 2016, KAHRAMAA issued the District Cooling Design and Water Management Code which follows on from the decree of Qatar's Permanent Water Resources Committee (PWRC) to use recycled water in district cooling. The code sets mandatory minimum requirements for the design and operations of Water Cooled Central Air conditioning Systems for comfort cooling. It is applicable to all existing and new DC plants. It is intended to set key minimum requirements deemed critical for achieving key performance

indicators in the areas of human health and environmental safety; reliability; efficient water use; efficient energy use; sustainability and cost-effectiveness.

A draft version of Qatar District Cooling Law has also been developed and is awaiting clearance. It is expected to boost investment in DC technologies and prompt customers to make a switch from conventional air conditioning to DC systems. The law will also have rules and regulation for contracts between service providers and consumers.

KAHRAMAA's DC department has been working in coordination with Urban planning department in Ministry of Municipality and Environment to finalize areas viable for DC. Mandating use of DC in high population density areas offers plenty of scope for increasing DC penetration in Qatar and further savings in energy and cost. Towards this end, KAHRAMAA has also developed a District Cooling Assessment map in Qatar.

Our environmental footprint

KAHRAMAA prioritizes the management of our environmental footprint within our operations in line with our Health, Safety & Environment (HSE) policy. Our HSE policy outlines that all activities should be conducted in a way that allows for proper regard and account to Health & Safety and to the conservation of the environment, in all areas of our operations. Due to our proactive efforts, we did not face any significant fines or legal sanctions for non compliance with environmental laws and regulations in 2016.

Waste management

Our efforts to move towards a paperless organization continued in 2016 as well. We are making efforts to digitize our internal paper forms and recycle waste papers. Yearly targets have been put in place to optimize paper recycling.



Air emissions

Within our transmission and distribution networks, we use SF₆ as an insulating gas in substations. We realize that SF₆ is the most potent of the six GHGs according to IPCC, and we are working towards reducing and controlling SF₆ gas emissions by implementing various initiatives. Examples include: installing alarm system in substations for observing SF₆ potential leakages, changing defective equipment and transmitters; as well as safe handling of SF₆ to ensure no releases in the air.

Our direct GHG emissions (Scope 1) presented here covers only KAHRAMAA's vehicles. Transmission and distribution (T&D) losses are major source of indirect GHG emissions in KAHRAMAA. Scope 2 (indirect electricity related) emissions are calculated as amount of T&D losses and

Solar energy for KAHRAMAA

KAHRAMAA is currently evaluating the use of our own unused premises to generate renewable power especially from PVs (Like roofs of parking, stations, reservoirs etc.). We have initiated a consultancy study to estimate the necessary investment cost for construction as well as O&M costs and LCOE, methods of connecting the solar power plants to the electricity grid and assessment of all KAHRAMAA sites potential for connectivity.

Using insights from the feasibility study, we have already initiated projects to install PV panels on some of our premises.



Energy audit for KAHRAMAA main building

We carried out a comprehensive Energy Audit for KAHRAMAA Main Building in 2016 & implemented conservation measures & retrofitting based on the findings. The audit aimed to find cost effective opportunities for energy savings with practical payback periods. It also identified the Energy usage of the building in terms of specific Consumption. The audit covered:

The analysis of building and utility data, including study of the installed equipment and analysis of energy bills:

- The survey of the real operating conditions;
- The understanding of the building behavior and of the interactions with weather, occupancy and operating schedules;
- The selection and the evaluation of energy conservation measures;
- The estimation of energy saving potential;
- The identification of customer concerns and needs.

by using the latest available Grid Emission Factor of 539 tCO₂/GWh, provided by study conducted by the United Nations Economic and Social Commission for Western Asia for Qatar. In 2016, we have expanded the data boundary for direct energy use and have reported direct energy from fuel use by our vehicles as well as fuel used in our generators and substations.

	2012	2013	2014	2015	2016
Scope 1 emissions (tonnes of CO ₂ e)	3,397	2,998	3,985	4,252	3,481
Scope 2 emissions (tonnes of CO ₂ e)	1,307,846	1,106,405	1,277,155	1,348,443	1,438,899
Direct energy use (GJ)	59,374	48,991	64,386	74,903	132,009

Investing in our people

It is KAHRAMAA's ongoing and long-term strategy to holistically develop, safeguard and create an empowered class of citizens, who are willing to work in an environment which nurtures them for serving their customers, contribute to our organization, as well as the nation as a whole.



Eng. Nasser Al-Mohannadi
Director of Corporate Services



KAHRAMAA is committed to providing better customer services through effective and dynamic human resources strategies, systems and business processes aligned to meet its corporate objectives set out by the Qatar National Vision 2030

Performance highlights

- Won Digital HR Award at GCC Government HR Summit
- 37% Qatarization
- 28 Qataris Sponsored in universities abroad
- 18 hrs of training per staff (on average) at a cost of 9800 QAR per employee
- ISO:9001/2008 and BS ISO 10015:1999 Quality Management (QM) certifications for Training & Development Department
- KAHRAMAA achieves a total of 59.7 million working hours without Lost Time Injury by the end of 2016.
- New HR Law implemented related to employee leave entitlements

GRI Standards alignment

We have used the following disclosures from GRI standards in this section:

102-8, 103-1, 103-2, 103-3, 202-2, 401-1, 403-2, 404-1, 404-2, 405-1

Management practices

We, at KAHRAMAA, aim to make our people feel safe at their workplace, secure the job they do, and enable our employees to fulfil their full potential by helping them develop new skills and expertise. We strongly follow our national vision of human development which seeks to empower the people of Qatar so that they will be able to sustain and support our country's growth.

KAHRAMAA believe in the holistic development of our people and is committed to provide our employees a robust, smart, rational, forward looking and transparent framework towards building their capability and competency.

Empowering our Human capital through training and education is one of our strategic approach to attain KAHRAMAA's business objectives. Our leadership are strongly committed to invest in the development of its people in order to secure a knowledgeable, motivated and inspired workforce to be able to achieve the corporation's economic objectives in line with the broader country's ambitions.

We continue our commitment to promote quality Qatarization and raise the level of competencies of employees to boost their performance and career development. Our effective training and education policy is consistent with Qatar vision 2030. The impacts of effective training and education being pursued is aimed at transforming the national work force into productive assets. This will influence the change in the social, economic and environmental dimension leading to our nation's sustainable development.

Aligned to our corporate objectives and to our nation's long-term vision's (QNV 2030) human development pillar, KAHRAMAA safeguards their employees' health and safety also abiding to International Health and Safety guidelines which are constantly growing positively. Our efforts in this area are strongly connected to growth in operations and further infrastructure

development to meet targets which we set after accurately monitoring and identifying areas for further improvements in safeguarding our people.

Our Human Resources (HR) Department is specialized in identifying corporation's needs of jobs and employees and preparing the project of the first chapter budget. It has the primary responsibility for setting up workplace policies and procedures for the management of our workforce and for talent nurturing. The Department conducts regular research and analysis of HR data to analyze KAHRAMAA, as well as, to help our leaders to constantly improve our workplace environment and performance.

The HR department also specifies training courses needs for employees in coordination with various management unit and implements procedures of performances evaluations.

Beyond the trainings and annual appraisals, we encourage our employees to have continuing conversation between employees and managers which also helps build a transparent working environment that stimulates and supports our people and the business.



KAHRAMAA wins Digital HR Award at GCC Government HR Summit 2016

This prestigious award is designed to recognize and honor outstanding contributions and achievements in the field of Human Resources. KAHRAMAA was selected for having the best HR digital services and practices in the region by an expert panel of judges comprised of analysts and HR experts.

KAHRAMAA has automated over 30 Human Resource related processes utilizing the Ultimius Adaptive BPM Suite, one of the most widely used business process management (BPM) software suites in the world.

As Qatar is a rapidly changing country with a fast growing economy, KAHRAMAA needed automation to ensure efficient and streamlined operations, eliminate paper, and provide visibility into business processes. The software's advantages in the areas of rapid solution deployment, ease of change, and ready integration with ERP and other systems were essential for the automation of HR processes such as employee on boarding and off boarding, vacation and leave requests, duty resumption, exit permits, and employee loan requests.

With the help of Ultimius software, KAHRAMAA's HR automation efforts allowed us to quickly support the rapidly changing needs associated with our growing workforce and customer base.

Our people

Technological innovations and the sector-wide shift toward smart technology, new regulations, are all requiring completely new skills to deliver on needs such as IT, distributed resources, and highly connected customers.

As the sector evolves, the capabilities required by our employees are also needs to be upgraded with whole new set of skills in order to meet the new generation customer needs and industry demands. KAHRAMAA recognizes that in today's increasingly competitive job market, employees have high expectations beyond the financial rewards. In this smart and new environment, job seekers increasingly look for employers who value, support their employees and take responsibility for ensuring their workforce is well trained, diverse, healthy, safe and empowered.

We strive to comply with the highest international standards to ensure that we have the right management practices and approaches in place and that our people's skills match global expectations. In 2016, KAHRAMAA's Human Resources Department has renewed the ISO certification (ISO:9001/2008) for its excellent Quality Management System (QMS).

Ensuring that we have the right talent in the right job positions and also matching expectations with the reality is essential to secure the success of our business. KAHRAMAA's long-term strategy aims at boosting employees' skills and developing a strong workforce for the future.

As our operations grew, driven by our dedicated workforce and the expansion of our customer base, we have seen a steady number in the workforce size over the years. Our total workforce from 44 nations was 2,862 in 2016. In terms of turnover, the percentage of our employees leaving the company in 2016 was 7%, an increase relative to the turnover ratio of 2015 due to the challenging economic environment caused by the rapid decrease in oil prices and consequent impact on the entire national economy and Energy and Industry sector in particular.

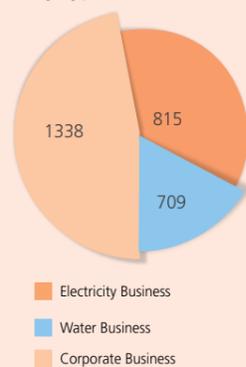
Various financial and non-financial rewards and recognition mechanisms are in place at KAHRAMAA to attract new talent and keep its workforce satisfied. Our efforts have resulted in a steady decrease of turnover rate for the past four years.

Although we do not have a formal diversity policy, KAHRAMAA is increasingly pioneering employer of women in field jobs traditionally falling under male domination and has seen recently the inflow of talented and successful female candidates for technical roles. Across our total workforce we had a rate of 11% female employment in 2016, we are proud to have our rate of female employment at the Senior Management

level at 13 %, while female employment at Middle Management level was equal to 15% in 2016. We also have added 28 more new talented ladies to our workforce as a part of our new hire in 2016.

To provide equal opportunities for everyone, we do not distinguish on the grounds of limitations in physical ability to perform the work. In 2016, we employed 15 staff with disabilities, and we aim to increase this trend in the future. There have been no incidents of discrimination reported at KAHRAMAA. However, disciplinary procedures are in place and corrective action will be taken against wrongful conduct by employees.

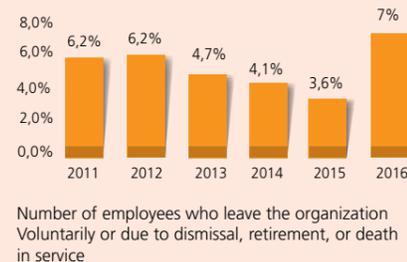
Number of employees by type in 2016



Number of total employees



Turnover rate trend



Female Employment(%)



Qatarization

KAHRAMAA's Qatarization policy is in line with our Government's policies and the QNV 2030 expectations. Qatarization plays a key role in our strong commitment to develop the country's future generation. Towards this end KAHRAMAA welcomes Qatari Nationals to be part of our team and help us to achieve our mission and vision of setting a global benchmark for performance, technological innovation, environmental sustainability and social responsibility in Electricity and Water Sector.

KAHRAMAA's Qatarization policy pays special attention to the recruitment of our skilled Qatari nationals both males and females at different positions and levels. We have maintained our overall Qatarization targets in between 35- 40% over the years and we are developing strategic initiatives to help increase this number well beyond 50% in the coming years. In 2016, KAHRAMAA employed 1169 Qatari nationals, reaching 37% Qatarization rate among our workforce. Within our total workforce, 96% of our Senior Management and 75% of our Middle Management are Qatari. In 2017, we aim to increase the level of Qatarization at our Senior Management level to 100% , and 90% among Middle Management.

An internal Qatarization Committee consisted by senior management representatives and headed by our President, oversees the Qatarization process at KAHRAMAA and is tasked with the development of mechanisms to support the Qatarization, Training and Development Team.

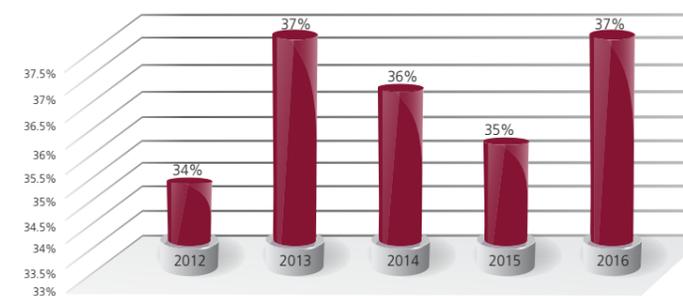
KAHRAMAA is one of the leading corporations in this area. We have attachment programs for employees. They undergo training as per the established plan. It is meant for the development of employee skills by attaching them to international companies for experience exchange in engineering, technical, and administrative fields.

In 2016, 75 engineers have received training in leading companies in Singapore, while there are initiatives to conclude agreements with Spanish, French, and Australian electricity and water companies.

We also supported 49 of our own employees to complete their education while working. Over the past 5 years, we invested around 150 million QAR in supporting Qatari students and employees in their education, of which 30 million QAR (approximately) were invested in 2016 alone.

We also support our Qatari employees with a variety of development initiatives. Each Qatari employee has his/her own Individual development program (IDP) - a competency based training plan in line with international standard ISO 10015. To help advance the English language level proficiency we provide English Language training courses for our staff based on the international standard of the Common European Frame of Reference.

% Qatarization in years (2012 - 2016)



Building the workforce of tomorrow

In addition to training, KAHRAMAA believes that education of locals is the key way to achieve development objectives and thus Qatarization's. KAHRAMAA scholarship program is one of the best programs in the State. It is meant for the high quality qualification and capacity building of students expected to assume technical and administrative jobs in KAHRAMAA. It should encourage Qatari youth to involve in scientific specifications in a way increases the number of professional Qataris in KAHRAMAA.

Since 2007, KAHRAMAA has started to attract and sponsor distinguished general and technical secondary graduates to receive high level engineering and administrative education at leading international universities inside and outside Qatar.

Once contracted and start the university education, KAHRAMAA scholars are considered senior staff and join one of KAHRAMAA departments as per their specifications. Scholars study Electrical, Mechanical, and Computer Engineering, as well as Business Administration, Finance, and Law in UK, USA, and Australia universities. KAHRAMAA aims at increasing the number of scholars especially in technical specifications.

28 Sponsored Qatari Students in International Universities abroad
21 Sponsored University/technical school in Qatar

KAHRAMAA wins the Qatarization Crystal Awards for Best Qatarization Progress

HE Dr Mohammed bin Saleh Al Sada, Minister of Energy and Industry, presided the 16th Annual Qatarization Review Meeting of the energy and industry sector.

In support of the Qatar National Vision 2030 and the National Development Strategy 2017-2022, the meeting attendees witnessed presentations highlighting the energy and industry sector's progress in managing its Qatari human capital strategies.

As he stressed the importance of technical education, HE Dr Al Sada emphasised the need to build strong bonds between educational institutions and the companies in the sector to ensure that the educational

requirements of the companies are met. This has already resulted in many companies signing memorandum of understandings (MoUs) with educational institutions to assist in research and to contribute in evaluating the curriculum of educational institutions.

The 16th Annual Qatarization Review Meeting also featured the sector's Eight Annual Qatarization Awards ceremony. KAHRAMAA was recipient of the prestigious Qatarization Crystal Awards for Best Qatarization Progress.



Universities partnerships to support our employees

Global markets today are faced with numerous challenges and there are growing expectations from customers about the quality of products and services provided by corporations.

As we are building the workforce for the future, we want our people to be fully prepared to meet international standards of knowledge, service and innovation. We therefore have several agreements with various institutes, colleges, universities and learning institutions approved by the Supreme Education Council (SEC) to support our employees' further career development aspirations. Through these partnerships, a Qatari employee can apply for high-level education and studies to enhance professionalism and to improve knowledge and skills. KAHRAMAA also supports its Qatari employees in advancing their English language proficiency levels.

Training and development

In line with the QNV 2030 human development pillar and our long-term strategy, providing the right training and developing our talent remains among the key strategic objectives of our organization. The need for particular training is identified through a multi-channel procedure including IDPs, feedback from performance appraisals, as well as any additional comments and identified gaps from the various departments.

Dedicated pre and post training counseling sessions are conducted with the employees respectively to prepare the participants for the course content and as a measure of course's impact assessment.

Qatarization, Training, and Development Section in the Human Resources (HR) Department in KAHRAMAA succeeded in renewing its ISO:9001/2008 and BS ISO 10015:1999 Quality Management (QM) certifications for Training. In 2011, the section established and applied a QM system according to ISO 9001:2008 requirements for training and development of KAHRAMAA employees and for Qatarization, education and recruitment of KAHRAMAA Qatari employees. It also complies with BS ISO 10015:1999 QM Guidelines for training in the scope of training, development and education for KAHRAMAA employees.

This makes the HR Department in KAHRAMAA among the very few entities in the Middle East who succeeded in attaining these world acclaimed certificates.

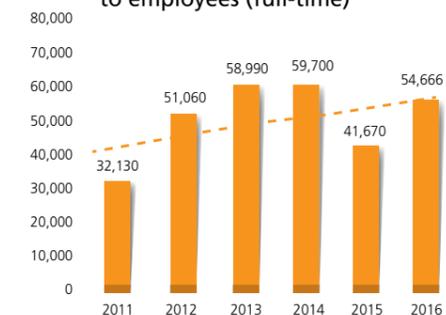
KAHRAMAA has developed many advanced training programs to enhance skills and abilities of all employees through training sessions held and carried out within and outside the country. The individual training plan is known by each employee since the beginning of the year, according to a comprehensive set plan. The trainings provided are closely related to our business focus and needs: water and electricity aspects –based programs and development of soft an management skills.

We also conduct some more specific programs such as Clerical Preparation Program (CPP), Technician Preparation Program (TPP), and Security Preparation Program (SPP), Six Sigma (Green Belt), The 7 Habits of Highly Effective People, Thinking outside the Box, and International Computer Driving License (ICDL- ICDL certifies our employees' computer soft skills).

We achieved 54,666 hours of in house and outside training for our total workforce in 2016 at a total workforce cost of 30 million QAR (approximately). This target breaks down to an average of 18 hours of training per staff member, at an average employee cost of 9800 QAR (approximately).

Post the training we also analyze the effectiveness of the program through a survey, usually three months following a particular training session to allow trainees to reflect on the past months and discuss how effective the training was for them.

Total hours of training provided to employees (full-time)



Process for Creating an Individual Development Plan (IDP)



KAHRAMAA Individual Development Program (IDP)

The program is one of the most powerful training programs in the State of Qatar. It is a competency based training plan in line with international standard ISO 10015 which compares between required skills to excel working in a position and the employee's ability. It maps the training requirements for each employee. It is based on two main streams: the first is complementing the theoretical and academic knowledge of the employee with the practical side; the second is developing the professional skills of the employee in accordance with international developments in the particular area of specialization.

The purpose of these plans is to ensure a consistent and well-managed approach towards developing our employees by identifying existing competency gaps and providing the necessary initiatives to gain required skills. In addition to serving as one of the basis for identification of the right training opportunities, IDPs are also used for transfer operations, career progression and promotion analysis and decision-making, as well as for succession planning.

An annual IDP is prepared for each employee and training needs are discussed with employee's Supervisor to collect further feedback and decide on in-house or public courses available. Each Qatari Employee has his/her own IDP and progresses follow up to improve KAHRAMAA's capacity building. A robust performance management system is in place where direct supervisors evaluate all their reporters across a number of elements and rate them on a scale of 100%. Internal management procedures such as the individual development plans (IDPs) are developed by line managers and counselors, with the President overseeing the process.

Managing safety of our staff and contractors

Safeguarding our people and setting a healthy working environment for them is one of our key corporate objectives and we remain committed to high standards, practices to help establish a consistent approach throughout our operations.

KAHRAMAA's, Health, Safety and Environment (HSE) policies are developed in line with the international standards, we follow them strictly, sets also expectations from our contractors to implement and adopt the same. Our policies encourage the development of a safe, healthy and well-managed working environment, and requires all of us to adopt a sound HSE behavior.

Our HSE management approach is based on risk management including but not limited to risk assessment, setting regulation & requirements, inspection and training & awareness.

All contractors, consultants, suppliers and service providers are obliged to comply with KAHRAMAA's HSE Policy and Manual

before they are awarded the contracts. The HSE department inspects and audits their performance during the contract period to ensure they comply with the requirements and enforces the contract terms whenever non compliance and liability issues arise.

Legal register for all pertaining HSE legal, regulatory and quality requirements in the State of Qatar is the basis for managing the health, safety and environment services in the State of Qatar. Reference is made to international standards whenever the National legal and regulatory requirements do not cover the scope of subject activities.

The HSE department also provides training to KAHRAMAA employees upon request from the relevant department or HR. The HSE department has also the responsibility to communicate with the various departments across the company and reports directly to our President on a monthly basis.

The HSE department exists in KAHRAMAA because of the Emir Resolution Number 35 for the year 2014, article number 16, describing its role as a regulatory and enforcement body for the occupational health, safety, environment and water quality services covering the scope of all KAHRAMAA people, premises and operations.



KAHRAMAA New Milestone: 28 Million Working Hours without Lost Time Injury

KAHRAMAA has accomplished a new milestone by reaching 28.6 million working hours without a lost time injury (LTI) during the first half of year 2016. This achievement comes within KAHRAMAA's efforts to apply highest levels of safety and security measures and standards at all its sites in order to provide a safety working environment.

The working hours without lost time injuries consists of KAHRAMAA and its contractors. KAHRAMAA reaches 3.2 million working hours where the contractors' working hours reaches 25.4 million hours which reflects KAHRAMAA's keenness on providing safety environment for its staff and contractors as well.

This significant achievement is a clear reflection of KAHRAMAA's commitment to ensuring that safety remains a core value in all its operations and activities. The remarkable achievement became a reality as a result of KAHRAMAA's ongoing commitment to safety, security and through its stringent safety strategies, systems, processes and vigilant monitoring mechanism.

KAHRAMAA achieves a total of 59.7 million working hours without Lost Time Injury by the end of 2016.

Our safety performance

We track both reportable injuries and the days away from work (lost time injuries) as these are standard measures to demonstrate how we are managing our operations to prevent any harm at the workplace.

We had zero fatalities among our employees and contractors in 2016, and the total number of reportable injuries for our employees decreased from 2 in 2015 to 1 while the reportable injuries for our contractor's increased from 11 in 2015 to 37 in 2016 since we have seen an increment on number of contractors working for KAHRAMAA this year.

At the same time, Total Recordable Incident Rate (TRIR) among employees was 0.0325 per 200,000 hours, with 0.138 TRIR value resulting among contractors.

In 2016, we have also observed an increase the number of injuries which has resulted in an employee or contractor being away from work for at least one day after it occurred, per 200,000 hours worked. Our on our employee Lost Time Injury Frequency (LTIF) increased to 0.032 among employees and 0.063 among contractors. (The factor 200,000 is derived from 50 working weeks @ 40 hours per 100 employees/contractor).

At KAHRAMAA, we will continue our internal focus on health and safety

matters through our HSE awareness program and a strong commitment to establish and implement strict management systems in place to improve our HSE performance. Although the number of injuries for our contractors is in control, it is still high according to our own expectations and goals. We are therefore focusing on increasing the number of site visits and risk assessments performed, and are considering the manpower required to make sure we deliver informed and on time site audits.

Incidents investigation is conducted to establish the cause and to identify next steps and learning to help prevent similar cases in the future. Recognizing the high importance of having zero-harm working environment, we have standardized our approach to managing the health and safety risks at KAHRAMAA. We continuously update our HSE risk register to ensure HSE risks are minimized. Last year, we established a local register of relevant HSE laws and requirements, and ensured they were in line with our strategies. We aim to implement a safety management system to help consolidate all safety measures and procedures across all of our sites. Working closely with the Quality & Continual Improvement Department, it is our goal to obtain ISO 9001 certification by the end of 16.

	2010	2011	2012	2013	2014	2015	2016
Employees fatalities	0	0	0	0	0	0	0
Contractor fatalities	0	2	1	0	1	0	0
Employees occupational illnesses	0	0	0	0	0	0	0
Heat stress events (employee and contractor)	0	0	0	0	0	0	0
Safe work hours (employee)	6,105,920	5,606,880	6,244,432	6,255,440	5,400,862	6,499,044	6,159,922
Safe work hours (contractor)	12,039,258	14,917,888	15,046,268	18,064,361	13,248,620	36,093,892	53,579,420



Better Water, Better Jobs

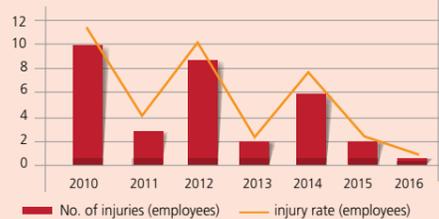
This year's theme for World Water Day, 'Water and Jobs' focuses on that – employment – and how water quality and enough quantity can impact livelihoods and possibly even transform lives, in societies and economies all over the world.

KAHRAMAA commemorated the World Water Day which falls on March 22 of every year due to its spreading message of awareness about preserving water, conserving its consumption and managing its resources which lead to achieving sustainability.

The celebration sheds light on the vital service provided by KAHRAMAA and the role of labors in water and allied sectors which create about half of the world's labor force. Their role extends to render the essential service for various sectors by enhancing of the water quality, ensuring its sustainability and touching all population for better living. Qatar goes ahead to create a sustainable economy and improve the standard of living with the four pillars: human, social, economic and environmental as envisaged in Qatar National Vision 2030.

Finally, we can say that water preservation is a common responsibility and we should preserve it. At this occasion, we called upon everyone to render their cooperation for achieving our goals and preserve our resources for our generations to come.

Total number of reportable injuries & injury frequency rate for our employees (per 200,000 hours worked)



Total number of reportable injuries & injury frequency rate for contractors (per 200,000 hours worked)



Lost Time Injury Frequency Rate - Our employees (per 200,000 hours worked)



Lost Time Injury Frequency Rate - Our contractors (per 200,000 hours worked)



“Health in the Workplace” Program

Healthy and motivated employees are the foundation for our success. KAHRAMAA invests in the physical and social well-being of its employees to help reduce health-related risks such as infectious diseases, fatigue and stress.

We identify and prioritize health hazards, and although no occupational illnesses have been recorded in 2016, noise and stress were among the top identified main concerns. Our health risk register takes into account our extensive and remote facilities where adverse conditions such as

In 2016, our occupational diseases rate (ODR) for the total workforce was Zero and 0.007 among our contractors.



dust storms, extreme heat, sudden winds, and confined spaces affect the work of our employees and contractors.

We continuously update our health risk register to ensure health risks are minimized. We conduct regular trainings and skills development sessions on the topics of time management, multi-tasking and meeting deadlines, in an effort to provide guidance on how to manage work related pressures.



KAHRAMAA collaborates formally and informally with several external stakeholders such as and not limited to the Ministry of Public Health, Hamad Medical Corporation, the Primary Healthcare Corporation and private medical centres in order to provide comprehensive integrated occupational health services to employees.

In 2016, KAHRAMAA has signed a memorandum of understanding (MoU) with the Ministry of Public Health (MoPH) to implement “Health in the Workplace” Program. The MoU aims to strengthen the cooperation between MoPH and KAHRAMAA with a view to carrying out the events and activities of “Health in the Workplace” Program in order to promote the employees’ health and to raise their awareness about adopting a healthy lifestyle.

The “Health in the Workplace” Program comes as part of MoPH’s efforts to promote the employees’ health and to achieve the NHS (2011-2016) goals so as to contribute to the promotion of people’s health as well as building a new generation enjoys better health.

Also, the program is a part of the National Nutrition and Physical Activity Action Plan 2011-2016 which includes lots of important projects at the national level to be in line with NHS goal 3 “Preventive Healthcare”, such as reducing the prevalence rate of chronic diseases and its related deaths.

In March 2016, KAHARAMAA in cooperation with the Qatar’s MoPH organized a free camp for our forty plus employees offering free eye pressure and eye errors of refraction screening tests at our headquarters. The objective was to eliminate blindness resulting from Glaucoma.

Our 2016 assistance programs about serious diseases

General health screening campaigns for early detection of diabetes mellitus, hypertension, glaucoma, ENT diseases including hearing loss and dental diseases are conducted periodically and offered to all employees.

KAHRAMAA observes World Day of Health and Safety at Workplace

KAHRAMAA observed the World Day of Health & Safety at workplace on April 28 with the slogan “Workplace Stress: A Collective Challenge”.

A large number of KAHRAMAA’s employees including senior functionaries participated in the event. The observance of the event included various activities and awareness lectures in order to disseminate the importance of implementing the standards of health and safety to ensure better health, safety, and clean environment for all employees, contractors and visitors.

The activities also included workshops for the employees such as checking blood glucose, blood pressure and basic dental care, medical advice and consultation with the nutritionist etc. It also had a number of awareness lectures on the topic such as ‘Eye Health and maintaining a Good Eye Sight’, ‘Managing Workplace Stress’ and ‘Stress Management’ among others.

- Periodic medical examinations are done for employees exposed to specific hazards such as dust, noise and chemicals.
- Respirator fit testing and training on how to use and maintain the necessary applicable PPE are conducted.
- Regular workplace environment training sessions are delivered to employees through the HSE department.
- Educational sessions on eye protection, diabetes mellitus, mental health, weight management and nutrition are delivered to employees through external stakeholders.

Contributing to the local economy

Demand for water and electricity is expected to increase as Qatar continues to experience significant economic growth, rapid urbanization and several upcoming infrastructure projects in the run up to the FIFA World Cup 2022. KAHRAMAA realises that long-term financial sustainability will enable it to fuel this economic growth and to play a key role to achieve the goals of QNV 2030 which aims to diversify the economy away from oil and gas, invest in a knowledge based economy with focus on innovation, and improve the proportion of Qataris in the workforce.



Mr. Jaber Al-Nabit
Finance Manager, KAHRAMAA



We are committed to the constant implementation of new systems for targeting better control of costs, revenue collection, operational efficiency measures to improve the use of financial resources, decrease losses and contribute to national cost reduction plans. These initiatives will allow us to strengthen our financial performance and to reduce our reliance on the government.

GRI Standards alignment

We have used the following disclosures from GRI standards in this section:

103-1, 103-2, 103-3, 201-1, 201-4, 203-1, 203-2, 204-1

Performance highlights

- Revenue QAR 9.5 billion.
- Operating cost QAR 11.8 billion.
- QAR 937 mn employee wages and benefits
- 99.5% of procurement budget spent on local suppliers
- Capital Projects QAR 7.8 billion
- Total gross assets QAR 101 billion
- Finance Department achieved Certification for ISO 9001:2015

Our approach to creating economic value

In 2016, despite low oil prices effecting infrastructure investment, the State of Qatar, with safe business sectors, established monetary segments and strong growth potentials, still remains the top most attractive markets for infrastructure investors.

Qatar is investing heavily into becoming a commercial and sporting hub in the Middle East over the next years, and is focusing on attracting more sustainable tourism by improving transport infrastructure and developing attractions. A new port has been developed, in part, to support the import of materials needed to deliver ambitious spending plans that satisfy both the Qatar National Vision 2030 and the more immediate 2022 FIFA World Cup Qatar.

Ranked number one on the list of the top richest nations because of its high GDP (PPP) per capita and only second on the Global Infrastructure Investment Index in 2016, Qatar saw USD 200bn investments in infrastructure with Government investments touching USD 160bn.

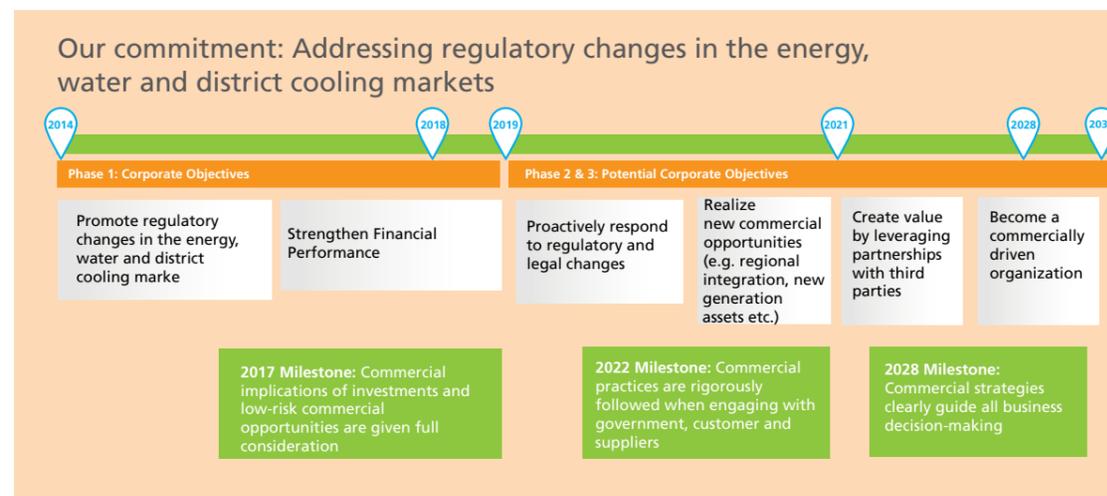
With these developments in mind, KAHRAMAA realises that in order to keep pace with the economic growth of Qatar it needs to provide water and electricity in an affordable and reliable manner. We also appreciate the fact that achieving efficiency through energy and water use reductions can reduce cost as well as protect environment.

The total budget committed for the development of key strategic megaprojects stands at QAR 374bn, with a further QAR 46bn set to be invested in 2017.

As the main utility provider in the country, KAHRAMAA's corporate objectives focuses on strengthening our financial condition and ensuring commercial success to generate both direct and indirect economic value for the country by:

- Ensuring resource conservation on the demand side of the market;
- Improving operation efficiencies;
- Enabling business growth by delivering large investments in building electricity and water infrastructure;
- Investing in skill development activities to make a smooth transition to a knowledge based economy;
- Supporting additional economic value generation through local spending; and
- Investing in CSR-related initiatives raising awareness specifically about the rational use of natural resources and educating the nation about the potential risks of resource depletion.

KAHRAMAA's institutional model has been discussed in detail in our first sustainability report. As a fully state-owned corporation, its capital expenditure is 100% Government funded and revenue is generated only through customer revenues. This data has been updated at 'Our Financial performance' section.



Our financial performance

Costs and profitability of utilities globally are subject to stringent scrutiny and KAHRAMAA is no exception to this practice. Hence, KAHRAMAA has an increased focus on improving efficiency across the board by undertaking measures such as deployment of smart technologies to assist consumers in tracking their use of resources as well as online applications which allows companies to reduce time involved in managing their accounts.

KAHRAMAA is a state-owned organisation and our entire capital expenditure budget depends on government funded subsidies and revenue is generated entirely from our growing customer base. In 2016, we received QAR 2.7bn as OPEX subsidies from government. We would like to

reduce our reliance on the government to meet the short and medium term demands and improve our revenue generation going forward. We are also implementing new processes and systems which target better control of costs, improve revenue collection efficiency and help us in pursuit of other revenue streams. This is in line with Operational Excellence- a core pillar of our long-term strategy aimed at improving the commercial viability of our business.

In 2016, our revenue which includes net sales and revenue from financial investments, were QAR 9.5bn, up from QAR 7.4bn in 2015. During the same period our operating costs increased from QAR 8.2bn in 2015 to QAR 11.8bn in 2016.

KAHRAMAA contributes to Qatar's national development agenda by hiring locals, providing training and education, investing in building electricity and water infrastructure to enable further business growth, local sourcing, active community engagement and raising awareness about resource conservation.

Promoting local hiring and supply base

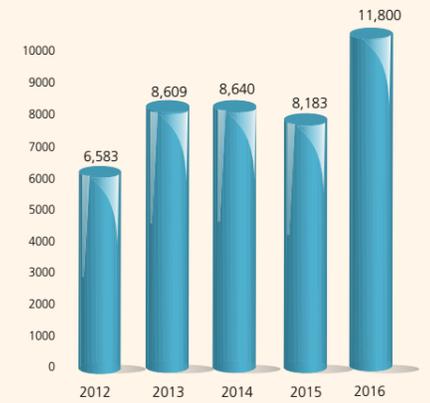
KAHRAMAA makes it a point to procure locally produced goods which is in line with the regulations requiring us to contribute to the development of local economy. We build the capabilities of the local suppliers and contractors so that they can meet our quality and safety standards. We make sure that all the material we use comply with the latest KAHRAMAA specifications alongside QCS and International code of Practices.

Electricity and water services are heavily affected by the overall economic and social development plans. It is therefore necessary for us to undertake, execute

and complete projects in a timely manner to meet the requirements of the nation. Below is a summary of some of the important projects in the electricity and water sector implemented until December 2016.

With regards to local employment, we have made Qatarization one of our key priorities as discussed in the People section of this report. Over the years we have maintained the rate of Qatarisation between 35%-40%. In 2016, our Qatarisation rate stood at 37%.

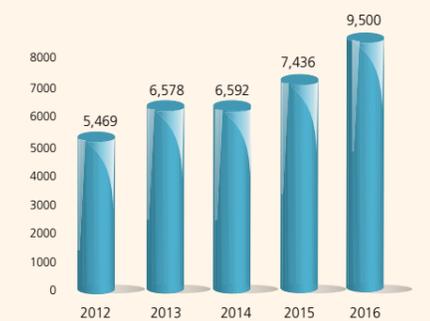
Operating cost: payments to suppliers, non - strategic investment and facilitation payment (QAR mill)



Employee wages and benefits (QAR mill)



Revenues: Net Sales + Revenues from financial investment and Sale of Materials (QAR mill)



Procurement from local suppliers

Indicator	2012	2013	2014	2015	2016
% of procurement budget spent on local suppliers	97.43%	99.85%	98%	99.5%	99.5%

National development initiatives

Electricity and water services, like other infrastructure services, are heavily affected by the overall economic and social development plans and the urban plan. It is therefore necessary to upgrade the provision of electricity and water to meet the requirements of the time and to activate their role to meet the growing demand of various sectors.

Everyone at KAHRAMAA is involved in one way or another in working towards providing water and electricity and supporting the socio-economic prosperity of Qatar. KAHRAMAA's Technical Affairs Directorate focuses on project planning and execution with its three departments – Electricity Projects, Water Projects, Materials and one section – Power & Water Production Projects. Our Water Network Affairs (WNA) and Electricity Network Affairs (ENA) departments are responsible for improving the functions and activities related to planning, transmission & distribution of water and electricity, as well as field services.

Initiatives to improve supply of potable water

Water is the essential element of life and it is inconceivable to achieve comprehensive development without the provision of safe and sustainable sources of water. Qatar has shortage of natural water resources and relies on 98% desalination of water from the sea to meet the needs and demand.



Water Security Mega Reservoirs Project

The objective of the project is to provide the seven days of potable water storage in the new mega reservoirs and the existing and future secondary reservoirs preserving the water quality as per KAHRAMAA and World Health Organization (WHO) standards.

The first phase of the project will provide the 7 days of storage for the expected water demand at horizon 2026, with 5 mega reservoir sites. The second phase will provide the 7 days of water storage for expected demand in 2036 by adding additional reservoirs within the 5 mega reservoirs sites.

Under the first phase of the project, Mega reservoirs and pumping stations will be constructed at five strategic locations along the Qatar National Utility Corridor.



Umm Al Houl power plant

Umm Al Houl power plant is a part of Qatar's power and water projects. KAHRAMAA own 60% of the special purpose company floated to construct the plant. It is being built in two phases. The first phase (1000MW) will enter into service in 2017 and its output will be increased in phase 2 by another 1500MW to have a total capacity of 2,500MW to meet the energy demand by 2020. It will also supply 136 million gallons of drinking water a day to 2.5 million homes in the area.

KAHRAMAA also has plans to set up a new power plant (total capacity of 2,500MW) which will enter into service in 2020 with a production capacity of 1,000MW which will be increased by another 1,500MW in a year to meet the demand beyond 2022.

Providing reliable and high quality water supply

- KAHRAMAA will undertake laying of 190Km x 1600mm line from proposed desalination plant in the North West Qatar to Doha
- KAHRAMAA will undertake upgradation of Shahaniya TFS and other identified stations by reconstructing 20MIG reservoir, pumping station, ancillaries and pipelines to release demand load of other stations and accommodate through this new station
- Improve the management of water assets:
- KAHRAMAA will employ consultancy services for Water GIS system upgrade and ArcFM implementation which will enhance our modelling, maintenance, management of water network assets, map production and tools to assist water and network authority (WNA) users
- KAHRAMAA will employ consultancy services for mapping underground utilities which will assist us in incorporating missing service connections in GIS database which will assist in maintenance and reduce our service connections related damage claims

Ras Abu Fontas (A3) station

It was inaugurated in September 2016 with a production capacity of 22 million gallons which will be increased to 36 million gallons per day in 2017.

In addition, the capacity of the reservoirs increased by 77 million gallons in 2016. The strategic stock reached 1,336 million gallons and the total losses and leaks in the network decreased from 30% in 2011 to less than 10% in 2016 which is a great achievements.



Enhancing reliability of electrical distribution system



The Electricity Sector, under the supervision of KAHRAMAA, has realised many achievements in the last six years according to the objectives and timetable of QNS 2011-16. KAHRAMAA has embarked on a transformation journey by linking its strategy with QNV 2030 and QNS 2011-16, adopting 'excellence' as its slogan in all its operations and adhering to the mechanisms of monitoring performance and continuous development, which is reflected on the electricity sector.

Preventing outages in Qatar

KAHRAMAA developed a system whereby it would have the capability to sense the conditions beforehand that could make a sudden large-scale power supply disruption possible. So corrective measures could be taken immediately and a brewing crisis could be averted.

This megaproject is the first of its kind in the GCC region and consist of condition monitoring for asset management of 11kV Electricity Distribution Network to enhance its performance and reliability.

The project will ensure that KAHRAMAA has an early warning about malfunctions in its system, process restrictions and degradation of equipment, as also help the Corporation assess depreciation.

The project is being executed by our Electricity Distribution Department with the aim of carrying out a comprehensive condition monitoring program of more than 11,000 Electricity Distribution Substations in-live condition within a time-frame of 3 years.

The goal is to have assessment of the health of the entire fleet of assets and prioritise the interventions based on the severity of the condition and criticality of the asset. Each asset is monitored for a set of condition parameters and a quantified scoring system is used to represent the Asset Health as per actual site conditions.

Expansion of electricity transmission networks

KAHRAMAA kept the high-quality performance indicators of the electricity network. In 2016, KAHRAMAA developed its electricity network by constructing and energising several substations, cables and Over Head Lines (OHL) at different areas to ensure safety, service sustainability and reliability of transmission and distribution networks at a total cost of over QAR 1.9 billion.

We launched a number of electricity substations, including a substation supplying power to the new port at a total cost of QAR 188 million. Besides, KAHRAMAA energised two substations 132/11 kv and associated cables to supply power to the prestigious Mall of Qatar and Doha Festival City at a total cost of QAR 171 million.

KAHRAMAA also energised a number of substations to feed power to different vital development projects and authorities, including Al Gharrafa substation 132/66/11 kv at a total cost of QAR 145 million, Lusail super substation 220/66/11 kv costing QAR 134 million and Al Dhakhirah substation costing QAR 67 million, in addition to other substations, cables and OHL at different areas.

KAHRAMAA has also led in the Gulf region in the development of conditions and regulations for the adoption of electrical materials for the electrical distribution network and identification methods and test methods, technical inspection and quality systems in order to achieve a technical performance to satisfy the customers, employees, maintenance support and adoption of modern information security system SCADA control centers in the NCC/DGCC/ENCC/ DCC and information security

The objective of the Asset Health Model is to effectively support advanced strategies in the field of asset maintenance, asset replacement, and risk-aware grid operation.

These strategies move from time-based, to condition-based and to reliability-based maintenance, considering the condition and criticality of each piece of equipment.

Various Indices were developed (such as Asset Health Index, Asset Maintenance Index, Probability of Failure, Estimated Residual Life, Asset Criticality Index, Asset Risk Index) which provide useful information to assess the situation of the distribution assets and support the decision-making process for the right action to be performed on the asset.

Till 2016, KAHRAMAA had completed condition monitoring of 91% of our distribution network covering 11,900 assets. The Overall Asset Health Index stood at 93%, reflecting the good conditions of the assets.

Supporting our communities

Engagement with our community can be a catalyst for achieving our ambitious long term goals and transforming our nation towards a more sustainable society. Change starts from us. We have an essential role to play in raising local knowledge and awareness within the local community that maintains a positive relationship and instils a culture of the rational use of natural resources.



Eng. Abdul Aziz Al-Hammadi
Manager Conservation & Energy Efficiency



Qatar's social development policy requires integration of several aspects: family cohesion and women's empowerment, social protection, public safety and security, and sports and culture. We believe engaging with the Qatari community plays an important role in how we plan our operations for the future and the results we achieve for example in Tarsheed.

GRI Standards alignment

We followed following disclosures from GRI standards:
203-2, 413-1

Performance highlights

- 2016 total social investment budget - QAR 3 million
- 4th Anniversary of TARSHEED which contributed to
 - Reduction in per capita consumption of water in Qatar by 20%
 - Reduction in per capita electricity consumption in Qatar 18% (from 2012 baseline)
- KAHRAMAA's Public Relations & Communication Department gets ISO 9000 Certification

Our approach to community engagement

Our Corporate Social Responsibility (CSR) approach is in line with the QNV 2030's dimensions of community and social excellence and the QNDS 2011-2016, supporting the endeavor for sound social development and sustainable management of the environment.

Our work with our community at various levels contributes towards building a stable and environmentally aware society, efficiently manage the scarce natural resources thereby improving the nation's image regionally as well as globally.

At KAHRAMAA, the Conservation & Energy Efficiency Department in collaboration with the Public Relations & Communications Department and the Health, Safety and Environment Department are the backbone of our community-based relationships. Next year, as part of our commitment to

build people's trust and to establish the basics of responsible operations, we are planning to launch our new CSR department and subsequently draft a formal CSR policy to serve as a guidance for our activities in the future.

Currently, TARSHEED plays a major role in conducting a wide range of activities and campaigns through which we promote and encourage social responsibility.

We engage with our communities in a number of ways such as awareness campaign, educational events, career forums, financial contributions and recreational activities. Our community engagement initiatives help us meet our ambitious long term goals and management of essential natural resources. With social media on the rise, it has never been easier to reach out to the wider public.



KAHRAMAA's Public Relations & Communication Department gets ISO Certification

Public Relations & Communication Department at Qatar General Electricity and Water Corporation (KAHRAMAA) succeeded in attaining Global Quality Certificate ISO:9001/2008 from Global Accredited TUV Company for recording the quality and other administrative management systems, complying with all procedures and instructions of work with the standards and quality system at the department.

The earned accolade has been felicitated as per the global standard for applying the requirements of the quality management system in all its functionalities and operations. The certification is added to KAHRAMAA's series of accomplishments as part of its strategy to achieve the four pillars of development enshrined in Qatar National Vision 2030 (i.e. economic, social, environmental, and human development) by complying with the highest quality standards. The certification is the reflection of the sustained high quality and performance efficiency of KAHRAMAA employees.

KAHRAMAA Futuristic Awareness Park for our community



Pre-opened in mid-2016, the park has been designed to serve as a hub for understanding of the socio-economic implications and environmental costs of water and electricity. It is aimed at both children and residents.

The \$49.4mn project was awarded the 'Qatar Sustainability Assessment System' award, for meeting all technical requirements by taking measures to minimize obstruction of daylight, providing landscape that encourages green and fights desertification, and use of efficient lighting, cooling, plumbing and irrigation system, and the use of solar energy to heat and for treating grey water. The park is built with materials that can be recycled or

reused, and do not involve much energy consumption, and offers noise insulation and controls indoor pollutant sources.

It is worth mentioning that the delegation "Sharjah Electricity & Water Authority" visited "KAHRAMAA Awareness Park" which is the first in its type in the region and it will be pre-open this year in order to test the facilities by receive the largest number of schools, universities, and researchers who are mainly targeted for this project to inform future generations of the importance of conserving electricity and water consumption, preserving natural resources to achieve comprehensive sustainability as per Qatar National Vision 2030.

The National Program for Conservation and Energy Efficiency "TARSHEED"

4 years for supporting Qatar to consume wisely

2012

Starting TARSHEED's journey

With an aim to rationalise electricity and water use in Qatar, TARSHEED was launched with the task of reaching out to the public and raise awareness regarding the energy and water conservation measures to be taken at the demand side of the energy and water market. It conducts campaigns in seven different languages.

Our Mission

- Information, awareness and suggestions to reduce daily energy and water consumption levels thereby reducing the national per capita consumption
- Reduce the overall growth of Qatar's resource consumption despite the economic growth
- Meet the targeted level of reduction within the 5 year timeline

Our Vision

Through our Vision, we encourage and empower all people in Qatar to make their homes, workplace and lifestyles reflect a sustainable, efficient and environmentally friendly nation.

Reduce electricity consumption per capita by **25%** and water consumption by **35%** until **2022**



2014



Getting accolades

- Preparing AC energy efficiency regulation
- Drafting a regulation to phase out inefficient Tungsten high glow lamps
- Partnered with Mitsubishi research to prepare an energy efficiency roadmap for Qatar 2nd edition of Conservation Building Competition
- Sustainability Innovation for Cooperating with Unilever to distribute 4000 water conservation gifts & awareness tips to 40 schools to promote water saving among students
- 50 strategic and scientific collaborations especially through Tarsheed

Reduction of Water & Electricity per capita (2012 to 2014) from 232 m³ to **216 m³** and 16,294 KWh/P/Year to **15,100 KWh/P/Year** respectively

- Conservation & Energy Efficiency (CN)
- MarCom International award for Tarsheed's energy saving bulb campaign
- Better light, Better living
- Innovation Award for ongoing National Program (Tarsheed) - Ministry of Energy & Industry
- Unilever Sustainability Award for Water Conservation Plans 2014 MENA region

2015

13% drop in per capita consumption of electricity and **14%** in Water since 2012

Tarsheed 2022 (T22)

A collaborative agreement was signed and is currently under implementation with the Supreme Committee of Delivery & Legacy to retrofit, train, educate and establish 22 models of sustainable & conservation schools in Qatar. T22 is targeted at primary school level students (ages 12-6), staff and teachers, parents and families. They are reached through conservation and energy efficiency curriculum and sports activities that teach and reinforce conservation behavior at school, which will carry over into home. An energy audit of all 22 schools is currently underway.

Rapidly gaining speed

- Issue of ministerial decree no. 2015/ 108 making thermal insulation mandatory
- KAHRAMAA wins the Best CSR Award in the energy sector for Tarsheed program
- Awareness among the population about Tarsheed and the need for resource conservation grew from %23 in 2013 to %88 in 2015, while among the Qataris the awareness grew in the same period from %35 to %92

2013

Electricity and water consumption have been reduced by **10%** and **6%** respectively

Conserving building competition



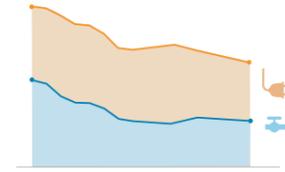
The competition comes within the activities of Tarsheed Programme, which aims at increasing awareness about building conservation measures and the possibility of its application in the existing buildings. It is meant to encourage effective participation in energy conservation. This competition is open to all types of buildings.

Our 1st anniversary

- We won the Award for Best Sustainability plan for water saving for MENA by Unilever
- Launched Conservation Building Competition
- We signed an MoU with Qatar Foundation to facilitate TARSHEED's mission
- With support from supreme council of Education it initialised a program for cooperating with schools and universities
- 30 MoUs & scientific partnerships signed in 1 year.

4th Anniversary "Tomorrow starts Today"

The celebration, held this year under the slogan "Tomorrow starts Today" and in partnership with Aamal and Doha Cables, was supported and graced with the presence of HE Sheikh Abdulla Bin Nasser Al-Thani, the Prime Minister and Minister of the Interior of the State of Qatar.



Reduced water & electricity consumption in Qatar by **20%** and **18%** respectively from 2012 to 2016

2016

Signed 56 agreements and MoUs on awareness, technical and research cooperation with different sector and institutions

Conserving building competition



We launched the 4th edition of the Tarsheed Conserving Building Competition with the slogan, "Become one with nature".

The objective of the competition was to create awareness about the benefits of adopting Building Conservation Practices in the local construction market and encourage people to embrace resource conservation strategies.



New regulation enacted to phase out Incandescent light bulbs

As per new regulations 75W and 100W incandescent lamps were phased out from 1st May 2016 Qatari market. 60W & 40W non-saving lamps were phased out from November 2016.

Ministerial Decree of Energy Efficiency Labeling of ACs



We succeeded in accrediting the specifications and technical standards for energy efficiency for air conditioners in Qatar in cooperation with the Ministry of Municipality and environment and other concerned authorities. As per the new regulation to implement Star Rating System for ACs, the import, sale and distribution of energy-saving air-conditioners, The energy efficiency rate in air conditioners (window and split) shall not be less than 8.5 and 9.5 respectively.

"Less is Blessed" Campaign



We launched a comprehensive campaign to reach put to the general public to improve their awareness regarding energy and water consumption. Awareness stickers in different languages were posted in mosques to promote electricity and water conservation. There were campaigns at malls as well. The 'Less is Blessed' campaign at Lulu Hypermarket has displayed awareness messages to educate shoppers to reduce water and electricity consumption.

Entries for Tarsheed Best Renewable Energy Initiative



It aims at supporting the development of Renewable Energy innovative technologies and business models that promote energy efficiency and help in cutting carbon emissions for Qatar's sustainable future. It is also aimed at promoting environmental awareness and inculcating culture of efficient usage of the natural resources in order to have better life and to achieve the slogan of Tarsheed, "Keep Qatar Pulsing" in line with Qatar National Vision 2030.

Launched the energy audit program for government buildings



The CN Department of KAHRAMAA conducted thorough Energy Audit in various types of buildings by an expert team.

The recommendations based on the furnished audit reports have been classified into three types: High Cost/ Medium Cost & low to no No cost measures – The payback period of these measures are less than 2 years, Medium cost measures – The payback period of these measure are between 5-2 years, Invest grade measure – The payback period of these measures are more than 5 years.



2nd phase of T22 launched

During the 2014/ 15 phase, the 22 schools involved reduced their annual consumption of electricity by 3GWh, thereby reducing carbon emission by 1,600 tons/year and saved QAR 750,000 annually. This was as a result of the energy-saving technologies and energy-efficient bulbs, dimmer switches and aerated faucets. Similarly, during the second phase 2016/ 17) of T22, the 22 targeted schools reduced their annual electricity consumption by 1,100 million units and water consumption by 4,350 m³, saving QAR 400,000 annually. It also reduced carbon emissions by nearly 700 tons/year. The best performing schools are awarded at the end of each phase.

Awareness campaign for conservation law no 2015 /20



We launched an awareness campaign aimed at creating awareness among general public about the provisions of the New Conservation Law No.20 /2015.

The awareness campaign that was launched with the theme 'Bad habits cost' with the help of a number of media tools focused on conveying conservation messages and its provisions and clauses to penalize those responsible for violation of the law as well as offering solutions to prevent violations.

All buildings to get smart meters



So far installed over 15,000 smart meters, as part of its smart grid initiative and it now plans to cover the whole of Qatar. These digital and smart meters can directly send readings to the energy supplier and ensure more accurate energy bills. They also help the customer better understand their energy usage.

Community engagement calendar

JANUARY



Our close work with a wide range of communities in Qatar allows us to contribute to establishing a secure and stable society, aware of the importance of environmental issues. It improves the management of our country's valuable resources and enhances the country's national image on a regional and global level.

MAY

KAHRAMAA joins 3rd Islamic Conference of Ministers Responsible of Water in Turkey

The conference aimed to reach a consensus for a new concept on water council to enable a concrete cooperation platform under the umbrella of Organization of Islamic Cooperation (OIC) Water Vision.



KAHRAMAA launches its new Mobile Application

KAHRAMAA seeks to develop its services to keep pace with the latest regulatory and technological developments. We launched its new and improved bilingual (Arabic & English) new version of its Apps for smart phones. The application can display general statistics related to user account along with a brief summary of the properties registered under customer's name.



SEPTEMBER

KAHRAMAA launched a smart app

We launched a new version for its smart phone app in both Arabic and English language. The app gives customer access to general statistics related to his/her account. It includes a group of other services such as sending meter reading, following-up status of service's request (construction license and connecting service), displaying details of properties registered under customer's name, applying the electronic services etc. This was in line with our ambitious roadmap for shifting all services to a smart platform. Through this app we aim to achieve the highest level of efficiency for our services.



FEBRUARY

Qatar National Sports Day

KAHRAMAA celebrated Qatar's National Sports Day at Katara Cultural Village. The event was graced by sports enthusiasts, visitors and dignitaries who enjoyed a number of fun-filled activities and sport competitions.

CENG workshop on smart grid

KAHRAMAA supported a CENG workshop with the theme "Qatar Power System Transition to a Smart Grid". The workshop provided a discussion platform for local and international researchers, and industry experts on establishing a research initiative for a successful transition of Qatar power system to a smart grid.

Omani delegation visited KAHRAMAA

We received a delegation from "Nama International Institute" - Sultanate of Oman recently at KAHRAMAA's Awareness Park and got acquainted with KAHRAMAA's experience in the field of electricity and water conservation. This visit was coordinated under the Program of "A Flower Each Spring" where the delegation had an opportunity to meet the Qatari experts of the conservation and shared their experiences vice versa.




JUNE

App Champs : "An Epic battle. Bring it on!"

KAHRAMAA conducted 'App Champ' competition in 2016 with an aim at promoting environmental awareness and inculcating culture of efficient usage of the natural resources in order to have better life. It is open to all students of Qatar-based Universities/colleges.

Qatar participates in GCC Electricity and Water Cooperation Committee meeting

Topics on the agenda included progress in electricity interconnection project, the comprehensive strategy for water in the GCC countries, the water link project among the GCC countries, and follow up on the latest developments in relation to cooperation between GCC countries in electricity and water fields.




OCTOBER

Kahramaa opens new Snapchat account

KAHRAMAA launched a new snapchat account to attain social communication to cope with its strategic plan in achieving effective direct contact with citizens and residents in state of Qatar. It will work on promoting communication with customers via displaying the latest news and activities directly and on large scale.

KAHRAMAA also presented many new e-services on its Website to provide best services in order to raise customer satisfaction. The services provided by the corporation reached 45 services.



MARCH

KAHRAMAA observed "Earth Hour"

KAHRAMAA observed "Earth Hour" in March 2016 in response to the rising challenges being faced by the environment. To mark the event, a number of government buildings, hotels and several private facilities in Qatar turned off or dimmed their lights for an entire hour.

KAHRAMAA participates at 1st Government Procurement and Contracting Conference & Exhibition

The three-day conference aimed at giving owners of local small and medium-sized enterprises (SMEs) the opportunity to deal with major purchasers. It also opens the door for co-operation between private and public sectors in Qatar.

World Glaucoma Week

KAHRAMAA observed World Glaucoma Week in cooperation with the Qatar's Ministry of Public Health. It also organised a free camp for its forty years plus free eye pressure and eye errors of refraction screening tests at its headquarters.

MoU with Ministry of Education for energy efficiency

KAHRAMAA through Tarsheed signed a MoU with the Qatar's Ministry of Education and Higher Education to work together on imparting lessons of conservation and energy efficiency as part of schools' curriculum at Qatar's schools.





JULY

KAHRAMAA participated in "Ajyal Youth Film Festival"

KAHRAMAA participated in the activities of "Ajyal Youth Film Festival 2016" under the theme "Tarsheed: use your power effectively". KAHRAMAA's booth included many cultural and awareness activities which target people of all ages to identify the proper ways of preserving resources like electricity and water and methods of reducing water and electricity consumption.



NOVEMBER

Participation at COP22 Marrakech

KAHRAMAA participated, as part of Qatar delegation, in Climate Change Cop 22 Conference held in Marrakesh of Kingdom Morocco from November 7 to 18, 2016.



Qatar signs agreement with Belgian firm on smart grid

KAHRAMAA signed an agreement with Belgian consultancy Elia Grid aimed at encouraging the sharing of information, experience and ideas to foster transmission development, network planning, KPIs enhancement, better asset management, exchange of technical information and joint co-operation.



APRIL

KAHRAMAA marks Arab and World Water Day and the GCC Water Week

The aim of these occasions was to enhance the necessity of rationalizing in the use of drinking water and maintaining it in light of the increasing pressures faced by freshwater resources in the Arab world, which make it essential to adopt solutions that ensure the achievement of sustainable development.

KAHRAMAA observes World Day of Health & Safety at Workplace

KAHRAMAA observed World Day of Health & Safety at workplace on 28th April 2016 with the slogan "Workplace Stress: A Collective Challenge".

Water Security Forum 2016

The event was attended by KAHRAMAA's President HE Eng. Essa Bin Hilal Al-Kuwari accompanying senior functionaries of KAHRAMAA amongst the presence of a number of experts, academicians, dignitaries and representatives of participating organizations among others. The forum which was hosted by the Qatar University had the objective of aligning the key stakeholders of Industry, Academia, and Government around the country's three R & D challenges- Security, Cyber Security and Water Security. The 2016 Forum was focused on Water Security.





AUGUST

Reception of Sharjah Electricity & Water Authority

Represented by Conservation and Energy Efficiency (CN) Department, we received a delegation of "Sharjah Electricity & Water Authority" within a Gulf Tour to exchange experience related to conservation of energy and water and efficient utilization of the precious resources.

Awareness activities in summer

KAHRAMAA Awareness

Activities in summer- conducted many awareness lectures explaining the concept of National Campaign for Conservation and its positive impact in raising awareness of the importance of electricity efficient consumption as well as importance of sport field and green zones.




DECEMBER

Darb Al-Saai's National Day Festivities

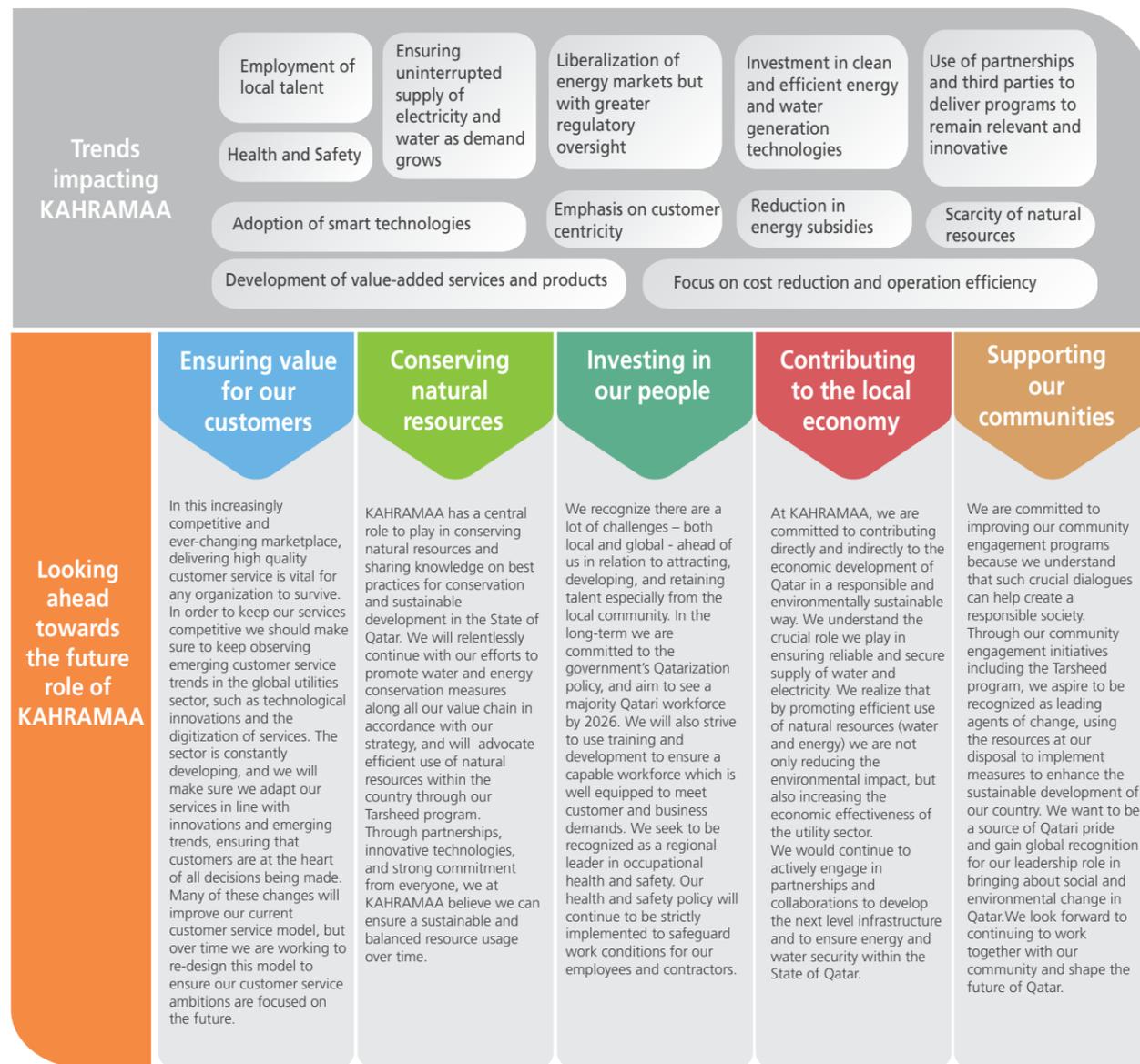
KAHRAMAA marked its presence at this year's Qatar National Day festivities through its Doha tent and Health tent. We featured a mobile water laboratory with its slogan 'Maina Zen' to exhibit its quality water which is being supplied across the country for drinking purposes. Apart from the laboratory, maintenance works were also showcased to let the visitors know about the types of small leakages and ways to fix it with little efforts.



Looking ahead

We recognize that we are impacted by various trends which can potentially disrupt our business model and how we generate value for our stakeholders. Although these are significant challenges for KAHRAMAA, we consider these trends as opportunities and seek to enhance our impact on our stakeholders in the future.

As KAHRAMAA progresses on our sustainability journey, we believe that we would continue to play a significant role in driving sustainable development in the State of Qatar. Our long-term strategy helps us to focus our efforts on key objectives related to the Qatar National Vision 2030 and the Qatar National Development Strategy 2017-2022. Although we do not have a corporate sustainability strategy, we are currently developing a dedicated sustainability strategy for our organization, which is expected to be rolled out in 2017. Through our corporate objectives and the proposed sustainability strategy, we would continue to focus on our corporate mission of providing high quality and sustainable electricity and water for better living in Qatar. In addition, we believe that in the future we would be able to play a key role in helping the State of Qatar meet the targets set as part of the Sustainable Development Goals (SDGs).



Acronyms

- AZLA: American Association for Laboratory Accreditation
- AC: Air Conditioner
- AMI: Advanced Metering Infrastructure
- ARQA: Audit, Risk & Quality Assurance
- BTU: British Thermal Unit
- CAPEX: Capital Expenditure
- CBA: Cost Benefit Analysis
- CFL: Compact Fluorescent Lamp
- CIGRE: International Council on Large Electric Systems
- CN: Conservation and Energy Efficiency Department
- CO2: Carbon Dioxide
- COBC: Code of Business Conduct
- CPP: Clerical Preparation Program
- CPR: Corporate Performance Review
- CSD: Customer Service Department
- CSR: Corporate Social Responsibility
- DC: District Cooling
- DMA: District Metering Area
- DMA: District Metered Area
- DSM: Demand Side Management
- EER: Energy Efficiency Ratio
- ENA: Electricity Network Affairs
- ENT: Ear, Nose and Throat
- ERP: Enterprise Resource Planning
- GCC: Gulf Cooperation Council
- GCCIA: Gulf Cooperation Council Interconnection Authority
- GDP: Gross Domestic Project
- GHG: Greenhouse Gases
- GIS: Geographic Information System
- GJ: Giga Joules
- GPS: Global Positioning System
- GRI: Global Reporting Initiative
- GSM: Global System for Mobile Communication
- GWh: GigaWatt hours
- HE: His Excellency
- HES: Head End System
- HR: Human Resource
- HSE: Health, Safety & Environment
- ICDL: International Computer Driving License
- IDP: Individual Development Program
- IPWP: Independent Power and Water Producer
- IPP: Independent Power Producer
- ISO: International Organization for Standardization
- IT: Information Technology
- IWPP: Independent Water and Power Project
- KPI: Key Performance Indicator
- LCOE: Levelized Cost of Energy
- LED: Light-Emitting Diode
- LNG: Liquefied Natural Gas
- LTI: Lost Time Injury
- LTIF: Lost Time Injury Frequency
- LV: Low Voltage
- MCF: Thousand Cubic Feet of Natural Gas
- MDG: Millennium Development Goals
- MDMS: Meter Data Management System
- MEW: Ministry of Electricity and Water
- MIGD: Million Imperial Gallons per Day
- MoPH: Ministry of Public Health
- MOU: Memorandum of Understanding
- MQR: Million Qatari Riyal
- MSF: Multi-Stage Flash Distillation
- MW: Mega Watt
- MWh: MegaWatt hours
- NDS: Qatar National Development Strategy 2011-2016
- NDS2: Qatar National Development Strategy 2017-2022
- NHS: Qatar National Health Strategy 2011-2016
- NRW: Non-Revenue Water
- ODR: Occupational Diseases Rate
- OHL: Over Head Lines
- O&M: Operations and Maintenance
- OPEX: Operating Expense
- PCC: Per-Capita Consumption
- PPE: Personal Protective Equipment
- PPP: Purchasing Power Parity
- PV: Photo Voltaic
- PWPA: Power & Water Purchase Agreements
- PWRC: Permanent Water Resources Committee
- QCS: Quality Control System
- QEER: Qatar Environment and Energy Research Institute
- QEW: Qatar Electricity & Water Company
- QM: Quality Management
- QMS: Quality Management System
- QNV: Qatar National Vision 2030
- QP: Qatar Petroleum
- QR/ QAR: Qatari Riyal
- RAF: Ras Abu Fontas
- RE: Renewable Energy
- RO: Reverse Osmosis
- R&D: Research & Development
- SAIDI: System Average Interruption Duration Index
- SAIFI: System Average Interruption Frequency Index
- SCADA: Supervisory Control and Data Acquisition
- SDGs: Sustainable Development Goals
- SEC: Supreme Education Council
- SML: System Minutes Lost
- SODAR: Sonic Detection and Ranging
- SPP: Security Preparation Program
- T22: Tarsheed 2022
- T&D: Transmission and Distribution
- TDSOO: Transmission and Distribution System Owner and Operator
- TOU: Time of Use
- TPP: Technician Preparation Program
- TR: Ton of Refrigeration
- TRIR: Total Recordable Incident Rate
- TSE: Treated Sewage Effluents
- WHO: World Health Organisation
- WNA: Water Network Affairs
- ZPT: Zero Pressure Test





GRI Standard	Disclosure	Page number(s) in the report/ Direct answer/ Reason for omission (if applicable)	IIRC linkage
GRI 101: Foundation 2016	GRI 101 does not include any disclosures		Aligned to the guiding principles of the Integrated Reporting Framework
GENERAL DISCLOSURES			
Organizational profile			
	102-1: Name of the organization	8	
	102-2: Activities, brands, products, and services	9	
	102-3: Location of headquarters	8	
	102-4: Location of operations	8	4A- Organizational overview and external environment
	102-5: Ownership and legal form	8	
	102-6: Markets served	8	
	102-7: Scale of the organization	8	4C-Business model
	102-8: Information on employees and other workers	8, 56	
	102-9: Supply chain	8, 15	
	102-10: Significant changes to the organization and its supply chain	8	
	102-11: Precautionary Principle or approach	14	
	102-12: External initiatives	20	
	102-13: Membership of associations	14	
Strategy			
	102-14: Statement from senior decision maker	4, 5	
	102-15: Key impacts, risks and opportunities	10, 11, 14	3C-Stakeholder relationship 4A- Organizational overview and external environment 4D-Risks and opportunities
Ethics and integrity			
	102-16: Values, principles, standards, and norms of behaviour	9, 13	4B-Governance
Governance			
	102-18: Governance structure	12	4B-Governance
Stakeholder engagement			
	102-40: List of stakeholder groups	23	3C-Stakeholder relationship
	102-41: Collective bargaining agreements	Not disclosed due to specific legal prohibitions: Trade unions are legally prohibited in Qatar	
	102-42: Identifying and selecting stakeholders	22, 23	
	102-43: Approach to stakeholder engagement	22, 23	3C-Stakeholder relationship
	102-44: Key topics and concerns raised	23	
Reporting practice			
	102-45: Entities included in the consolidated financial statements	24	
	102-46: Defining report content and topic Boundaries	2, 8, 24, 25, 26	
	102-47: List of material topics	25, 26	3D-Materiality
	102-48: Restatements of information	We have not restated any previously reported information in this report	
	102-49: Changes in reporting	No significant changes from previous reporting period.	
	102-50: Reporting period	2	
	102-51: Date of most recent report	2015	
	102-52: Reporting cycle	Annual	
	102-53: Contact point for questions regarding the report	2	
	102-54: Claims of reporting in accordance with the GRI standards	2	
	102-55: GRI Content Index	76	
	102-56: External assurance	The information in this report has been internally reviewed to ensure its accuracy. As our sustainability practice matures further, we aim to seek external verification of our performance in the future.	

GRI 102: General Disclosures 2016

MATERIAL TOPICS			
ECONOMIC TOPICS			
Economic performance			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	64	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	64	
	103-3: Evaluation of the management approach	64	
GRI 201: Economic Performance 2016	201-1: Direct economic value generated and distributed	65	4F-Performance 2C-The capital (Financial capital)
	201-4: Financial assistance received from government	65	
Market presence			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	55	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	55	
	103-3: Evaluation of the management approach	55	
GRI 202: Market Presence 2016	202-2: Proportion of senior management hired from the local community	57	2C-The capital (Human capital)
Indirect economic impact			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	64	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	64	
	103-3: Evaluation of the management approach	64	
GRI 203: Indirect Economic Impacts 2016	203-1: Infrastructure investments and services supported	66, 67	4F-Performance, 2C-The capitals (Manufactured capital, Human capital)
	203-2: Significant indirect economic impacts	51, 57, 66, 67, 70, 71	
Procurement practices			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	64	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	64	
	103-3: Evaluation of the management approach	64	
GRI 204: Procurement Practices 2016	204-1: Proportion of spending on local suppliers	65	2C-The capitals (relationship capital)
ENVIRONMENTAL TOPICS			
Energy			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	45, 46	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	45, 46	
	103-3: Evaluation of the management approach	45, 46	
GRI 302: Energy 2016	302-2: Energy consumption outside of the organization	47	
	302-4: Reduction of energy consumption	51, 52	4F-Performance, 2C-The capitals (Natural capital)

Water			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	45, 46	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	45, 46	
	103-3: Evaluation of the management approach	45, 46	
GRI 303: Water 2016	303-1: Water withdrawal by source	49	4F-The capitals (Natural capital)
Emissions			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	45, 46	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	45, 46	
	103-3: Evaluation of the management approach	45, 46	
GRI 305: Emissions 2016	305-1: Direct (scope 1) GHG emissions	53	4F-Performance, 2C-The capitals (Natural capital)
	305-2: Energy Indirect (Scope 2) GHG emissions	53	
Effluents and waste			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	45, 46	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	45, 46	
	103-3: Evaluation of the management approach	45, 46	
GRI 306: Effluents and waste 2016	306-2: Waste by type and disposal method	53	4F-Performance, 2C-The capitals (Natural capital)
Environmental compliance			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	16, 17	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	16, 17	
	103-3: Evaluation of the management approach	16, 17	
GRI 307: Environmental compliance 2016	307-1: Non-compliance with environmental laws and regulations	53	

SOCIAL TOPICS			
Employment			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	55	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	55	
	103-3: Evaluation of the management approach	55	
GRI 401: Employment 2016	401-1: New employee hires and employee turnover	56, 57	2C-The capitals (Human and relationship capital)
Occupational health and safety			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	55	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	55	
	103-3: Evaluation of the management approach	55	
GRI 403: Occupational health and safety 2016	403-2: Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	60, 61	
Training and education			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	55	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	55	
	103-3: Evaluation of the management approach	55	
GRI 404: Training and Education 2016	404-1: Average hours of training per year per employee	59	2C-The capitals (Human and relationship capital)
	404-2: Programs for upgrading employee skills and transition assistance programs	59	

Diversity and equal opportunity			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	55	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	55	
	103-3: Evaluation of the management approach	55	
GRI 405: Diversity and Equal opportunity 2016	405-1: Diversity of governance bodies and employees	56	
Human rights assessment			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	13	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	13	
	103-3: Evaluation of the management approach	13	
GRI 412: Human Rights Assessment 2016	412-3: Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	13	
Local communities			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	69	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	69	
	103-3: Evaluation of the management approach	69	
GRI 413: Local Communities 2016	413-1: Operations with local community engagement, impact assessments, and development programs	72, 73	
Supplier social assessment			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	55	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	55	
	103-3: Evaluation of the management approach	55	
GRI 414: Supplier Social Assessment 2016	414-1: New suppliers that were screened using social criteria	13, 60	2C-The capitals (Human and relationship capital)
Marketing and labeling			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	34, 35	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	34, 35	
	103-3: Evaluation of the management approach	34, 35	
GRI 417: Marketing and Labeling 2016	417-1: Requirements for product and service information and labeling	41, 42, 43	
Customer privacy			
GRI 103: Market Assessment 2016	103-1: Explanation of material topics and its boundary	34, 35	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	34, 35	
	103-3: Evaluation of the management approach	34, 35	
GRI 418: Customer Privacy 2016	418-1: Substantiated complaints concerning breaches of customer privacy and losses of customer data	34	2C-The capitals (Human and relationship capital)



Electric utilities sector-specific disclosures			
Sector specific general standard disclosure			
EU 1: Installed capacity, broken down by primary energy source and by regulatory regime	42, 43		
EU 2: Net energy output broken down by primary energy source and by regulatory regime	47		
EU 3: Number of residential, industrial, institutional and commercial customer account	34		
EU 4: Length of above and underground transmission and distribution lines by regulatory regime	43		
EU 5: Allocation of CO ₂ e emissions allowances or equivalent, broken down by carbon trading framework	Not applicable. Not reported as KAH-RAMAA is currently not covered by any emission trading schemes.		
Availability and reliability			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	34, 35	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	34, 35	
	103-3: Evaluation of the management approach	34, 35	
EU 10: Planned capacity against projected electricity demand over the long term, broken down by energy sources and regulatory regime	42, 43		2C-The capitals (Manufactured capital)
Demand side management			
GRI 103: Management Approach 2016	103-1: Explanation of material topics and its boundary	51	3D-Materiality (reporting boundaries)
	103-2: The management approach and its component	51	
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