

QATAR



COUNTRY INTRODUCTION

- Qatar is a small Gulf state with territorial waters that hold the third-largest proven reserves of natural gas in the world.
- Revenues from international gas supply contracts have placed Qatar at the top of the global GDP per capita ranking and also fueled multi-billion dollar investment programs in desalination and wastewater treatment.

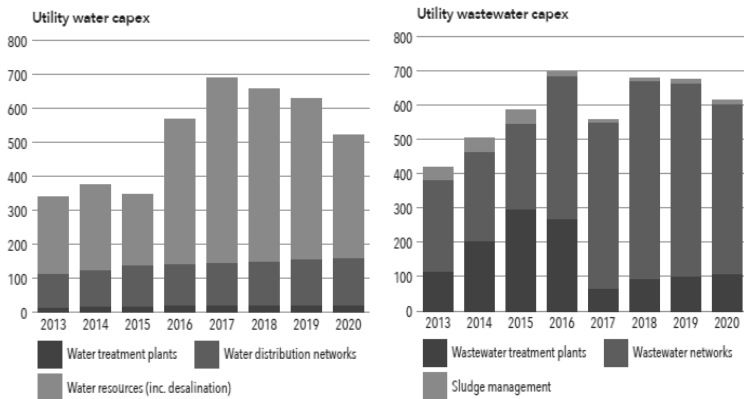
WATER GOVERNANCE

- The public sector Qatar General Electricity and Water Corporation, known as Kahramaa, acts as the bulk purchaser of power and potable water from private producers through power and water purchase agreements.
- Kahramaa is responsible for both distribution and transmission of power and water, and planning, tendering and implementing new projects, such as water distribution infrastructure.
- The Public Works Authority, Ashghal, is responsible for the development of infrastructure at the national level. Its drainage department is responsible for WWTPs, sewerage networks and associated infrastructure, and issues tenders for projects.
- The Supreme Council for the Environment and Natural Reserves (SCENR) works in conjunction with the Ministry of Environment (MOE), whose responsibilities include monitoring water quality. The Department of Agriculture and Water Research oversees agricultural production.

COMPETITION

- Private sector participation is already widespread in the desalination and wastewater treatment plant (WWTP) sectors, and the country is taking strides towards privatization of its wastewater infrastructure.
- The Qatar Electricity and Water Company (QEWC) is 42.7% government-owned, with the remaining 57.3% held by individual and corporate shareholders on the Qatar Exchange. QEWC is a part-owner of all the major power and water production plants in Qatar.
- QEWC has a long-term purchase agreement from Kahramaa, under which QEWC sells desalinated water and electricity to Kahramaa.

MARKET FORECAST (million \$)



Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

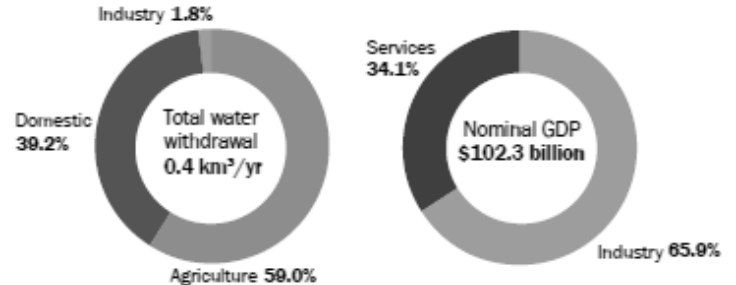
MACRO DATA

Urban Population	0.9 Million
Rural Population	0.0 Million
Total Population	1.0 Million
National GDP (2015)	166 908 Million USD
National GDP per capita (2015)	74 667 USD
National GDP Growth (2015)	3.6 %
Growth Rate (2015 - 2025)	132 %
FDI Stock as % of GDP (2015)	17.9 %
Danish Investment Stock (2014)	4.7 Billion DKK
Danish Export (2015)	732 Million DKK
Danish Water Technology (DWT) Export (2015)	103 Million DKK
DWT Export in % of total Danish Export	14 %
Import as % of GDP (2015)	36 %

BUSINESS ENVIRONMENT

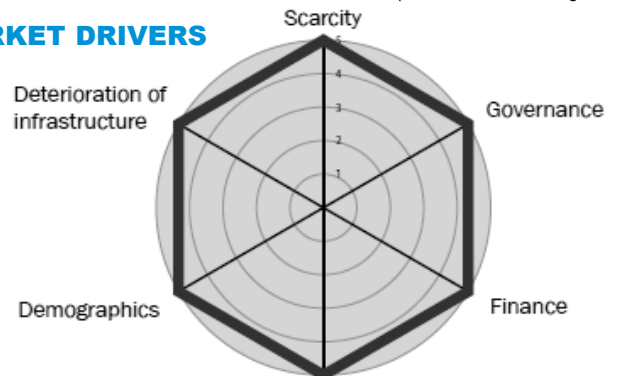
Global Competitiveness Rank	2016-2017 Index	18 / 138
Government Effectiveness Rank	2014 Index	36 / 158
Corruption Rank	2015 Index	22 / 168
Ease of Doing Business Rank (World Bank)	2015 Index	68 / 189

SECTORAL GDP AND WATER WITHDRAWAL



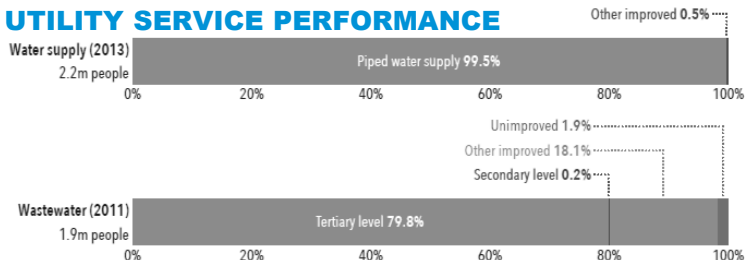
Source: GWI Global Water Market 2011 (Global Water Intelligence, 2010)

MARKET DRIVERS



Source: GWI Global Water Market 2014 (Global Water Intelligence, 2010)

UTILITY SERVICE PERFORMANCE



Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

WATER MARKET BY SECTOR (Million \$)	2013	2014	2015	2016	2017	2018	2019	2020
Utility water capital expenditure	341	375	348	569	691	657	628	523
Water networks	98	107	121	124	127	130	134	139
Water treatment plants	13	14	16	17	18	19	19	20
Water resources (excl. desalination)	114	127	147	156	162	168	174	180
Seawater and brackish water desalination	116	127	63	272	385	340	300	184
Utility wastewater capital expenditure	420	505	587	696	560	682	676	615
Wastewater networks	269	258	252	419	483	577	565	498
Wastewater treatment plants	111	203	293	265	64	92	98	105
Sludge management	40	44	41	13	13	12	13	13
Utility capital expenditure	761	880	935	1 266	1 251	1 338	1 304	1 139
Industrial capital expenditure	63	87	50	56	58	64	78	102
Total capital expenditure	824	967	985	1 321	1 309	1 402	1 382	1 241

Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

1. DRINKING / PROCESS WATER

- Kahramaa reported that water demand rose from 277 000 m³/d in 1997 to 786 000 m³/d in 2008. The number of water customers has risen from 89 811 in 1998 to 151 485 in 2007, and to around 178 000 in 2009.
- Groundwater taken from wells in Qatar is generally not potable, although statistics from Kahramaa indicate that several wells are used as tanker refilling stations.
- Qatar has no water treatment plants, as nearly all potable water is provided by desalination plants.
- Qatar was among the early adopters of desalination, and its first major plant came online in 1962. 99.9% of water provided by Kahramaa comes from desalination, with only 0.1% derived from groundwater.

2. WASTEWATER

- Qatar has six main wastewater treatment plants. Two of them are Doha West and Doha South with capacities of 135 000 m³/d and 112 000 m³/d respectively. The other four WWTPs are the Lusail, the Industrial Area, Al Thakhira and the one at Al Khor.
- Qatar does not treat all of the sludge produced by its WWTPs. Much of the sludge is transported to the Al Khiraana Waste Dumping Site, which is run by the Ministry of Municipal Affairs and Agriculture.
- To comply with environmental regulations, it is mandatory for camps built to house workers for Qatar's construction projects to have WWTPs. These typically serve 5 000 – 35 000 people and employ tertiary treatment so that the treated wastewater can be reused for irrigation purposes.

3. CLIMATE ADAPTATION

- Qatar's main challenges are geographical. The hot climate and a predominantly low-lying desert landscape with no permanent lakes or rivers are accompanied by a low annual rainfall.
- Qatar faces challenges due to substantial population and economic growth as well. The population has nearly doubled over the last 20 years, increasing the strain on the water and wastewater infrastructure. According to Government figures, water demand rose by 8% in 2009.

Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

WATER UTILITY DATA

No. of people connected to water network	2,161,516	2013
% of people connected to water network	99.5	2013
No. of water connections	262,018	2014
Utility water supply capacity (m ³ /yr)	495,179,753	2014
Length of water network (km)	-	-
Meter coverage (%)	90.0	2008
Non-revenue water (%)	21.2	2014
No. of WTPs	-	-
Design capacity of WTPs (m ³ /d)	-	-
Operational capacity of WTPs (m ³ /d)	-	-

Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

WASTEWATER UTILITY DATA

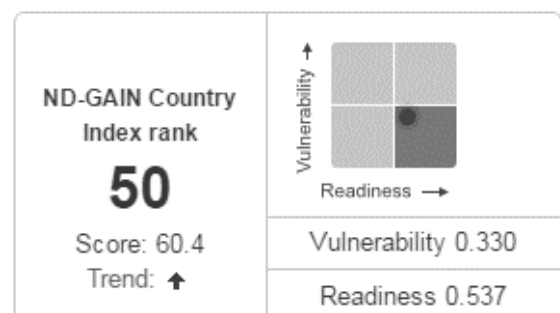
No. of people connected to sewerage network	1,496,033	2011
% of people connected to sewerage network	80.0	2011
No. of wastewater connections	98,515	2010
Volume of wastewater produced (m ³ /yr)	169,118,440	2013
Wastewater collected (%)	89.3	2013
Wastewater treated to secondary level (%)	0.3	2012
Wastewater treated to tertiary level (%)	99.7	2012
Length of wastewater network (km)	-	-
No. of WWTPs	20	2013
Design capacity of WWTPs (m ³ /d)	640,160	2013
Operational capacity of WWTPs (m ³ /d)	-	-

Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

CLIMATE ADAPTATION

Global ND-GAIN index, Combined	Rank	50 / 181
Global ND-GAIN index, Vulnerability	Rank	41 / 181
Global ND-GAIN index, Readiness	Rank	61 / 181
Yearly rainfall (NRI)	mm/year	76

GLOBAL CLIMATE ADAPTATION INDEX



Source: Notre Dame Global Adaptation Index (2017)

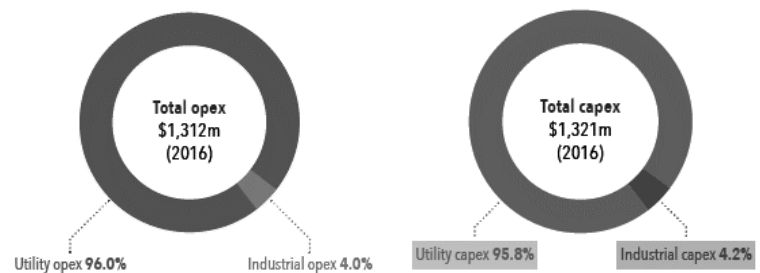
WATER MARKET BY SECTOR (Million \$)	2013	2014	2015	2016	2017	2018	2019	2020
Pipes	118	125	128	180	198	220	221	205
Pumps	49	57	57	76	80	84	83	77
Valves	24	26	26	38	43	45	44	40
Screens	11	15	14	24	25	23	21	16
Agitation/Mixing/Settling	9	13	16	18	11	11	11	10
Aeration	9	15	21	20	6	8	9	10
Gas flotation	3	4	4	5	5	5	4	4
Oil-water separation	44	47	30	30	34	36	48	54
Non-membrane filtration	6	8	7	11	11	11	10	8
Low pressure membranes (MF/UF)	1	2	1	3	4	3	3	2
High pressure membranes (RO/NF)	3	2	2	5	7	8	10	10
Thermal desalination equipment	9	20	6	23	30	23	16	11
Ion exchange	1	1	1	1	1	1	1	1
ED/EDI	0	0	0	0	0	0	0	0
Activated carbon	1	1	1	1	1	1	1	1
Disinfection	3	4	4	6	6	5	5	4
Chemical feed systems	4	6	6	8	6	7	7	6
Sludge thickening/dewatering	10	11	10	4	4	4	4	4
Sludge drying/thermal processes	2	2	2	1	1	1	2	2
Anaerobic digestion	2	2	2	1	1	1	1	1
Other sludge stabilisation	1	3	2	1	1	1	2	3
Meters	8	9	10	10	11	11	12	12
Sensors	7	9	9	14	12	12	12	9
Testing/Analysis	7	9	7	14	17	15	14	10
Automation/control	28	36	41	51	44	47	47	43
Other equipment	67	83	85	125	122	126	123	103
Total equipment	426	509	491	670	679	711	708	646
Design and engineering	58	68	72	94	93	101	100	91
Civil engineering/fabrication	383	435	469	607	593	654	645	583
Regulatory & professional costs	12	14	16	18	18	19	19	19
Total expenditure	878	1 026	1 048	1 390	1 383	1 485	1 472	1 339

Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

WATER FINANCE

- Revenues from Qatar's energy exports have put the government in a strong position to fund water projects. Compared with other countries in the region, income from energy sales has not been hit so badly by the drop in oil price over 2008-09.
- Nationally-sourced funding can come directly, either through the state budget or through banks which have a substantial government ownership stake.
- Another example of a specific financing deal is the Ras Girtas IWPP, where Kahramaa raised \$3 billion in financing through the state-owned QP.
- Qatari nationals are not currently required to pay water tariffs and receive all utility services free of charge from the government.
- Expatriates, who are estimated to comprise as much as 80% of the Qatari population, are subject to a subsidized flat domestic water tariff of \$1.20/m³, which covers around 35% of costs. The tariff is \$1.42/m³ for commercial clients or hotels and \$1.90/m³ for government-related users such as ministries. There is no wastewater tariff in Qatar.

OPEX AND CAPEX (2016)



Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)

OPERATING EXPENDITURE (Million \$)	2013	2014	2015	2016	2017	2018	2019	2020
By sector								
Utility water	774	837	914	963	1 021	1 080	1 153	1 232
Utility wastewater	226	238	250	296	351	440	503	574
Industrial	48	49	51	53	54	56	58	60
By segment								
Labour (in-house services)	358	384	415	447	486	535	581	632
Energy	183	196	212	230	252	282	308	338
Parts & consumables	55	59	63	68	74	83	90	98
Chemicals	43	45	48	52	55	60	64	69
Third party services	51	54	58	62	67	73	79	85
Oil & gas water services	0	0	0	0	0	0	0	0
Other	360	387	419	452	492	544	592	644
Total operating expenditure	1 049	1 125	1 215	1 312	1 426	1 576	1 714	1 866

Source: GWI Global Water Market 2017 (Global Water Intelligence, 2016)



MARKET ASSESSMENT

OVERALL MARKET ASSESSMENT

- After years of investments in the water sector, the infrastructure is now in place, and focus has changed to maintenance and upgrading of the existing structures.
- There is an intention to move towards more sustainable solutions, but no policies or targets are being enforced.

DRINKING / PROCESS WATER

- As desalination is the only source of drinking water in Qatar, all new investments and developments are pushed in that direction, e.g. towards osmosis and other membrane technologies.
- Leakages are relatively high, and there is a need for smart network management solutions.

WASTEWATER

- Alternative solutions for landfill of wastewater sludge are not actively being sought at the moment. However, they are likely to be needed in the near-future.

CLIMATE ADAPTATION

- There will be a need for flood management solutions, but the current focus is on upgrading existing solutions, and not on building new solutions.

DANISH COMPETITIVENESS

OVERALL MARKET ASSESSMENT

- Qatar is a small, but growing market searching for high technology solutions.

DRINKING / PROCESS WATER

- NRW is high in Qatar, surprisingly, when water resources are scarce. No metering is used, so Qatar is missing insights and possibilities in metering consumption, which Danish companies could provide.

WASTEWATER

- Worker's camps are already equipped with high level WWTPs. The WWTPs around the Qatar cities might be of modern standards. If Qatar will take care of WWTP sludge at a more advanced level, Danish companies can deliver solutions.
- Turnkey installations for oil worker camp etc. is an existing Danish competence.

CLIMATE ADAPTATION

- Not important/relevant as it is not a priority.

COUNTRY RANK	MARKET ASSESSMENT (1-10 scale, 10 = best)	DANISH COMPETITIVENESS (1-10 scale, 10 = best)
QATAR	3	5
<p>The water market is medium-sized and stagnating. Main areas of focus are desalination solutions, and alternatives to sludge landfill.</p> <p>Danish component and system manufacturing can be competitive on the market, but there is little focus on efficient solutions.</p>		