| 1 | INTRODUCTION  
(District Cooling in GCC, Key Drivers, Growing Focus of Governments) |
| 2 | DISTRICT COOLING IN GCC |
| 3 | DISTRICT COOLING IN QATAR |
| 4 | INTRODUCTION TO MARAFEQ QATAR |
Introduction

District Cooling in GCC

GCC is the second largest DC market after Americas with a total installed capacity of 4.1 MN RT

- The Middle East, with its extremely high temperatures, provides excellent scope for air conditioning systems
- In late 90’s, the new concept of District Cooling attracted attention of the Middle East due to its high efficiency and eco-friendly features over Conventional Cooling systems
- Within a short span of time, after its introduction in the region, GCC have reached more than 4 MN RT of installed capacity accounting for 32% of the total capacity worldwide
- UAE is the market leader among GCC countries with a total installed capacity of 2.6 MN RT accounting for 65% market share followed by KSA (22%) and Qatar (7%)
- GCC District Cooling market is projected to grow at a phenomenal CAGR of 16% over the next 5 years because of large scale developments in the real estate and commercial sectors, increasing population and demand for energy savings
- The KSA is projected to lead the growth of District Cooling in GCC with projected growth rate of 34% for the next 5 years
- FIFA World Cup 2022 will drive the growth of DC in Qatar which is projected to grow at 18% CAGR for the next 5 years

[Source: DC Market – Global Trends and Forecast to 2019, report by Markets and Markets]
Introduction

Key Drivers for District Cooling in GCC

DC Systems can help reducing the peak demand for power thereby saving billions in power capex

HIGH TEMPERATURES
- GCC region experiences temperatures in the range of 35-55 degree Celsius
- This coupled with high standards of living makes cooling an essential utility

COMMERCIAL AND RESIDENTIAL DEVELOPMENT
- GCC region has experienced heightened construction activity in the last decade
- Major residential programs, transportation infrastructure, economic zones are driving high growth of cooling

ENERGY SAVINGS AND ENVIRONMENTAL STABILITY
- About 70% of the total power consumption in GCC is attributed to cooling; District Cooling systems are 25-50% more energy efficient than conventional cooling systems
- DC produces 50-60% lower carbon emissions than conventional cooling systems

COST EFFECTIVENESS
- District Cooling systems have 11-18% lower costs compared to conventional cooling
- DC plants with Thermal Energy Storage helps in clipping the peak demand of electricity thereby saving billions in power capex

OTHER DRIVERS
- Reliability in excess of 99.7%
- Presents attractive value proposition in utilization of space
- Flexibility in capacity design and installation
**Introduction**

**Growing Focus of Governments**

Government has an important role to play in ensuring acceptance and adoption of District Cooling

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**Dubai**
- 1998: Government commissions Tabreed for DC
- 2003: DEWA invests in Empower (70% stake)
- 2012: Government forms RSB which is examining methods to promote and regulate DC
- 2012: Government Energy Strategy - DIES identifies DC for creating energy efficiency

**Qatar**
- 2012: Separate DC Services Department formed;
- 2012: Government sets guidelines for DC
- 2013: Tarsheed, national campaign for electricity and water conservation, recognizes DC for energy conservation

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**Potential Focus Areas in GCC to Increase DC Penetration**

- **Designation of appropriate zones**: Mandate DC in defined areas where it is commercially viable and easily available
- **Tariff Regulation**: Standardized tariff determination framework and clarity in tariff to be charged to the end-users
- **Service Standards and Technical Codes**: Define basic levels of reliability and standard practices for DC providers
- **Spread Awareness**: Conduct awareness campaigns on the benefits of DC over Conventional Cooling

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DEWA – Dubai Electricity and Water Authority
RSB – Regulatory and Supervision Bureau
DIES – Dubai’s Integrated Energy Strategy
DSCE – Dubai Supreme Council of Energy
ESP – Energy Service Providers
CHP – Cooling, Heating and Power
INTRODUCTION

2 DISTRICT COOLING IN GCC
   (Current Market Landscape, Future Growth)

3 DISTRICT COOLING IN QATAR

4 INTRODUCTION TO MARAFEQ QATAR
District Cooling in GCC

Current Market Landscape

GCC DISTRICT COOLING MARKET – KEY HIGHLIGHTS

- **4,100 KRT** Installed Capacity in 2014
- **$ 5.5 BN** Market Size in 2014
- **6%** DC Penetration in 2014
- **16%** Projected growth rate of DC for 2014-19
- **7%** Share of Qatar in total capacity of GCC countries

GCC DISTRICT COOLING MARKET – COUNTRYWISE AND APPLICATIONWISE

- **UAE** has the highest market share of 65% among GCC countries
- **KSA** is the fastest growing DC market followed by Qatar
- Majority of DC offtake is for the residential purposes

[Source: DC Market – Global Trends and Forecast to 2019, report by Markets and Markets]

FEW LANDMARK PROJECTS

- The Pearl, Qatar
  Capacity – 130 KRT
- Dubai Motor City Project
  Capacity – 100 KRT
- Dubai Metro
  Capacity – 55 KRT
- World Trade Center
  Capacity – 168 KRT
- Lusail Development
  Capacity – 300-500 KRT
**District Cooling in GCC**

**Future Growth**

District Cooling in GCC is projected to grow at a stupendous CAGR of 16% for the next 5 years

- By 2019, GCC region is expected to overtake Americas to become the region with the highest installed capacity

- DC in GCC is projected to grow at 16% from current installed capacity of 4.1 MN RT to 8.6 MN RT in 2019

- Growth in construction sector, increased awareness and government focus on energy savings will ensure growth momentum

- Clear regulatory framework will ensure entry of new players and competitive tariffs

### COUNTRYWISE GROWTH

- KSA is projected to grow at a phenomenal rate of 34% for the next 5 years to become the largest DC market in GCC

- Qatar which is set to host FIFA World Cup 2022 is the second highest growing market due to heightened construction activity and government initiatives to promote DC

- UAE, being a mature market, is expected to have a moderate growth

- Real estate development in Bahrain and Oman, Infrastructure and Industrial development in Kuwait shall drive the growth of DC in these countries

### DC installed capacity (KRT)

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity (KRT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>3,245</td>
</tr>
<tr>
<td>2013</td>
<td>3,496</td>
</tr>
<tr>
<td>2014</td>
<td>4,082</td>
</tr>
<tr>
<td>2015F</td>
<td>4,747</td>
</tr>
<tr>
<td>2016F</td>
<td>5,521</td>
</tr>
<tr>
<td>2017F</td>
<td>6,421</td>
</tr>
<tr>
<td>2018F</td>
<td>7,468</td>
</tr>
<tr>
<td>2019F</td>
<td>8,685</td>
</tr>
</tbody>
</table>

### Expected CAGR for 2014-19

<table>
<thead>
<tr>
<th>Country</th>
<th>Expected CAGR for 2014-19</th>
<th>Expected Installed Capacity in 2019 (KRT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>34%</td>
<td>3,975</td>
</tr>
<tr>
<td>UAE</td>
<td>6%</td>
<td>3,550</td>
</tr>
<tr>
<td>Qatar</td>
<td>18%</td>
<td>1,431</td>
</tr>
<tr>
<td>Oman</td>
<td>17%</td>
<td>263</td>
</tr>
<tr>
<td>Kuwait</td>
<td>15%</td>
<td>153</td>
</tr>
<tr>
<td>Bahrain</td>
<td>15%</td>
<td>140</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>16%</strong></td>
<td><strong>8,685</strong></td>
</tr>
</tbody>
</table>

[Source: DC Market – Global Trends and Forecast to 2019, report by Markets and Markets]
INTRODUCTION

DISTRICT COOLING IN GCC

DISTRICT COOLING IN QATAR
(An Opportunity, Major Players, Growth in Construction Sector, Role played by the Government)

INTRODUCTION TO MARAFEQ QATAR
District Cooling in Qatar
An Opportunity

FIFA 2022 World cup to drive Qatar DC market at an unparalleled growth rate

QATAR DISTRICT COOLING MARKET – AN OPPORTUNITY

270 KRT
Installed Capacity in 2014

10%
DC Penetration in 2014

18%
Expected CAGR of Installed Capacity from 2014-19

Qatar is the second fastest growing DC market in GCC and has become one of the most attractive District Cooling business hubs.

At the moment, district cooling in Qatar has reached a penetration rate of 10% and increasing steadily year after year. In terms of DC penetration, Doha ranks second after Dubai among GCC cities.

A new department – District Cooling Services Department – has been established within Kahramaa with a view to establish regulations that promotes use of District Cooling.

Large scale real estate, commercial and infrastructure development in Qatar shall ensure continued momentum in the growth of DC industry.

KEY GROWTH DRIVERS

- Increase in Construction Activity complemented by FIFA World Cup
- Low penetration levels and increased awareness
- High Temperatures
- Growing Demand for Energy efficient cooling
- Clear regulatory framework

DC Installed Capacity (KRT)

[Source: DC Market – Global Trends and Forecast to 2019, report by Markets and Markets]
District Cooling in Qatar

Major Players

District Cooling in Qatar is served by two major service providers

1. Qatar Cool
   - Capacity – 195 KRT
   - Established in November 2003, as a joint venture between Qatar’s United Development Company (UDC) and UAE’s National District Cooling Company (Tabreed) along with some local Qatari investors
   - 3 cooling plants covering West Bay and The Pearl-Qatar districts
   - Over 1247 million ton-hours of refrigeration sold to date
   - Key Projects – Pearl, Qatar and West Bay

2. Marafiq Qatar
   - Built Capacity – 42 KRT
   - In various stages of development – 300 KRT
   - Established in March 2009, as a fully owned subsidiary of Qatari Diar
   - Business Areas – District Cooling, Gas Distribution and Environment Services such as sewage treatment and waste disposal
   - Marafiq Qatar is developing one of the largest DC system in the world to provide cooling services to Lusail Development. This DC system shall have a capacity of 300 KRT when completed
   - Barwa city District cooling plant provides 37 KRT of refrigeration
District Cooling in Qatar

Key Driver - Growth in Construction Sector

- Qatar is experiencing growth in the construction sector similar to that experienced by UAE between 2006 and 2014

- Housing for increasing population, economic zones and infrastructure for economic diversification and FIFA 2022 World Cup are driving the growth of construction sector in Qatar

- Numerous **Commercial and Residential projects** are planned including Lusail Development, Barwa Commercial Avenue, Hilton Doha Residence, The Amphibious 1000 among others

- 9 **new stadiums** are being constructed for FIFA 2022 World Cup which includes Lusail Iconic Stadium and Umm Slal Stadium

- 3 huge **Economic Zones** have been planned and are in construction Phase

- Government is spending unprecedented amounts on developing **Transportation Infrastructure** which includes Metro Project in Doha, Qatar Bahrain Crossway and Sharq Crossing

**Construction Value (USD BN)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (USD BN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>24</td>
</tr>
<tr>
<td>2011</td>
<td>23</td>
</tr>
<tr>
<td>2012</td>
<td>27</td>
</tr>
<tr>
<td>2013</td>
<td>31</td>
</tr>
<tr>
<td>2014</td>
<td>34</td>
</tr>
<tr>
<td>2015</td>
<td>36</td>
</tr>
<tr>
<td>2016</td>
<td>29</td>
</tr>
<tr>
<td>2017</td>
<td>34</td>
</tr>
<tr>
<td>2018</td>
<td>35</td>
</tr>
<tr>
<td>2019</td>
<td>36</td>
</tr>
</tbody>
</table>

In order to deliver both the FIFA 2022 world cup and the National Vision (2030), Qatar intends to spend significantly over the next decade on new projects

Providing cooling services through District Cooling to the new establishment is commercially more attractive

**NOTABLE PROJECTS**

- **Urijuan Project**
  - Cost: USD 35

- **Lusail Development**
  - Cost: USD 5.5 bn

- **Sharq crossing**
  - Cost: USD 5 bn

- **Doha Metro Project**
  - Cost: USD 3 bn

- **Entertainment city**
  - Cost: USD 1.5 bn

- **Amphibious 1000**
  - Cost: USD 0.5 bn
District Cooling in Qatar
Role Played by the Government

Government push acts as a catalyst for accelerated growth of the DC Industry

Qatar government recognizes benefits of District Cooling over Conventional Cooling and has taken significant measures to promote the growth of District Cooling in the country:

DISTRICT COOLING SERVICES DEPARTMENT
- District Cooling Services Department was formed within Kahramaa in 2012 with a view to frame policies to promote DC
- Roles and Responsibilities of the department:
  - Suggest general policies for District Cooling
  - Set up rules and responsibilities for DC and ensuring that they are being complied with
  - Set up DC standards and specifications
  - Decide on areas to be served by DC as per priorities and viability in coordination with concerned authorities
  - Suggest tariff structure for customers
  - Approve DC Activities

QATAR NATIONAL VISION (2030)
- District Cooling is aligned with the Qatar National Vision (2030) which focuses on:
  - Economic Development by promoting and ensuring reduction in Qatar’s Electricity and Water savings
  - Environmental Stability with a focus on reduction in carbon emissions
1. INTRODUCTION

2. DISTRICT COOLING IN GCC

3. DISTRICT COOLING IN QATAR

4. INTRODUCTION TO MARAFEQ QATAR
   (Company Overview, Major Projects)
Introduction to Marafeq Qatar

Company Overview

Established in 2009, Marafeq Qatar is one of the leading player in Utility Services

Company Brief

• Marafeq Qatar, established in March 2009, is a full life cycle infrastructure company which provides professional utility development and O&M services for clients having new or existing city developments or which manage, maintain, and plan for residential, commercial, and industrial zones

• Marafeq’s focus is on utilities and infrastructure, right from inception to implementation, which a real city or zone developer does not have, and helps in developing risk management and operational excellence

Major Shareholders

• Marafeq Qatar is 100% owned by Qatari Diar, the real estate arm of Qatar Investment Authority, the country’s sovereign wealth fund

• Qatari Diar has identified implementing and controlling the utilities, i.e. planning, design, finance, construction and operation, as critical for the success of the real estate developments

Products and Services

• Marafeq provides a full range of development services including Utility strategy, Utility business modeling and Utility implementation

• Supervision of construction & erection of utility plants and network

• Operating and maintaining the plants and network

Projects

• Lusail city
  • Lusail City utility development services including waste and gas distribution
  • Lusail City District Cooling Project BOO
  • O&M of Lusail City District Cooling Project
  • O&M of Lusail City Temporary Chillers

• Barwa City
  • O&M of Barwa City District Cooling Project
  • Barwa City Sewage Treatment Plant Design and Build
# Introduction to Marafeq Qatar

## Major Projects – Lusail City Projects

Lusail City is the biggest single development to be undertaken in Qatar

- Lusail City is the biggest single development to be undertaken in Qatar, located about 15 km north of the city centre of Doha
- It is a mix of entertainment, residential and commercial projects covering 19 districts and an area of 38 km² including 28 km² of waterfront
- Its master plan specifies accommodation for 190,000 residents, a workforce of 170,000, and a capacity to welcome 90,000 visitors

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Project Name</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1.     | Lusail Development Services                 | Project Development and Construction Monitoring | • Contract between Marafeq and Lusail Real Estate Development  
• Marafeq to provide complete project development and construction monitoring services for an initial term of 8 years                                                                                      |
| 2.     | Lusail District Cooling Project             | District Cooling                | • Exclusive rights to provide District cooling services to the entire city of Lusail including its existing and future developments and sub-developments  
• Marafeq shall sell the entire DCP output of 500,000 TR to Lusail under a 25 year term on a build, own and operate (BOO) basis                                                                |
| 3.     | Lusail DCP O&M                              | O&M                             | • Contract for complete O&M services for the Lusail DCP, as per a standard project financing structure                                                                                                     |
| 4.     | Lusail City Solid Waste                     | Solid Waste Management          | • The scope involves construction supervision of the network and Pneumatic Waste plants and servicing certain segments of the Lusail development, along with the associated development of traditional solid waste management for the balance areas  
• Possible future scope involves a BOO structure for provision of solid waste for the full development                                                                                       |
| 5.     | Lusail City Gas Distribution                | Gas Distribution                | • Marafeq is involved in the construction supervision of the Gas Farm which will convert LPG sourced from tankers into Synthetic Natural Gas and network from the Farm to the buildings served within the Lusail Development  
• Possible future scope involves a BOO structure for the construction & O&M for the Gas Farm and Network.                                                                                  |
Introduction to Marafeq Qatar

Major Projects – Barwa City Projects

Marafeq Qatar has been tasked with providing STP and DCP utility solutions to Barwa City

- Barwa City, located in Musaimeer approximately 15 minutes from the centre of Doha, comprises around 7,000 apartments in 128 buildings across 2.7 km².
- It offers affordable, modern homes in a contemporary living space
- It is a vibrant and cosmopolitan community complete with international schools, nurseries, retail outlets, mosques, restaurants and a variety of recreational facilities

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Project Name</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Barwa City STP Construction</td>
<td>Sewage</td>
<td>The plant is located at Barwa City which is a development by the leading Qatari real estate developer Barwa Real Estate Company. The contracted engagement stipulates that Marafeq be involved in the construction, supervision and the handing over of the Barwa City STP Plant.</td>
</tr>
<tr>
<td>2.</td>
<td>Barwa City DCP O&amp;M</td>
<td>O&amp;M</td>
<td>DCP plant with a capacity to grow to 70,000 TR on completion of Phase 2. Marafeq is already providing construction monitoring services.</td>
</tr>
</tbody>
</table>
THANK YOU