EUROHEAT & POWER

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FEATURING

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مرافق قطر
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DC-Operation & Maintenance Challenges

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Content:

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1. Introduction
2. Preliminary Challenges
3. Main Challenges
4. DC Plant KPI
5. Network
6. ETS
7. Results

Introduction:

- Challenges start from tendering stage up to plant commissioning stage
- Main challenges will start from Operation and Maintenance stage
- Proper O&M plan reduce operating cost and equipment downtime
- Maintain high productivity and efficiency
- Improve overall performance of the company.

Preliminary Challenges:

1. During RFP preparation ensure O&M requirements
2. Participate in tender evaluation
3. Review major equipment submittals
4. Review commissioning method statements for major equipment.
5. Recruit qualified and experienced personnel
6. Joint witness testing and commissioning

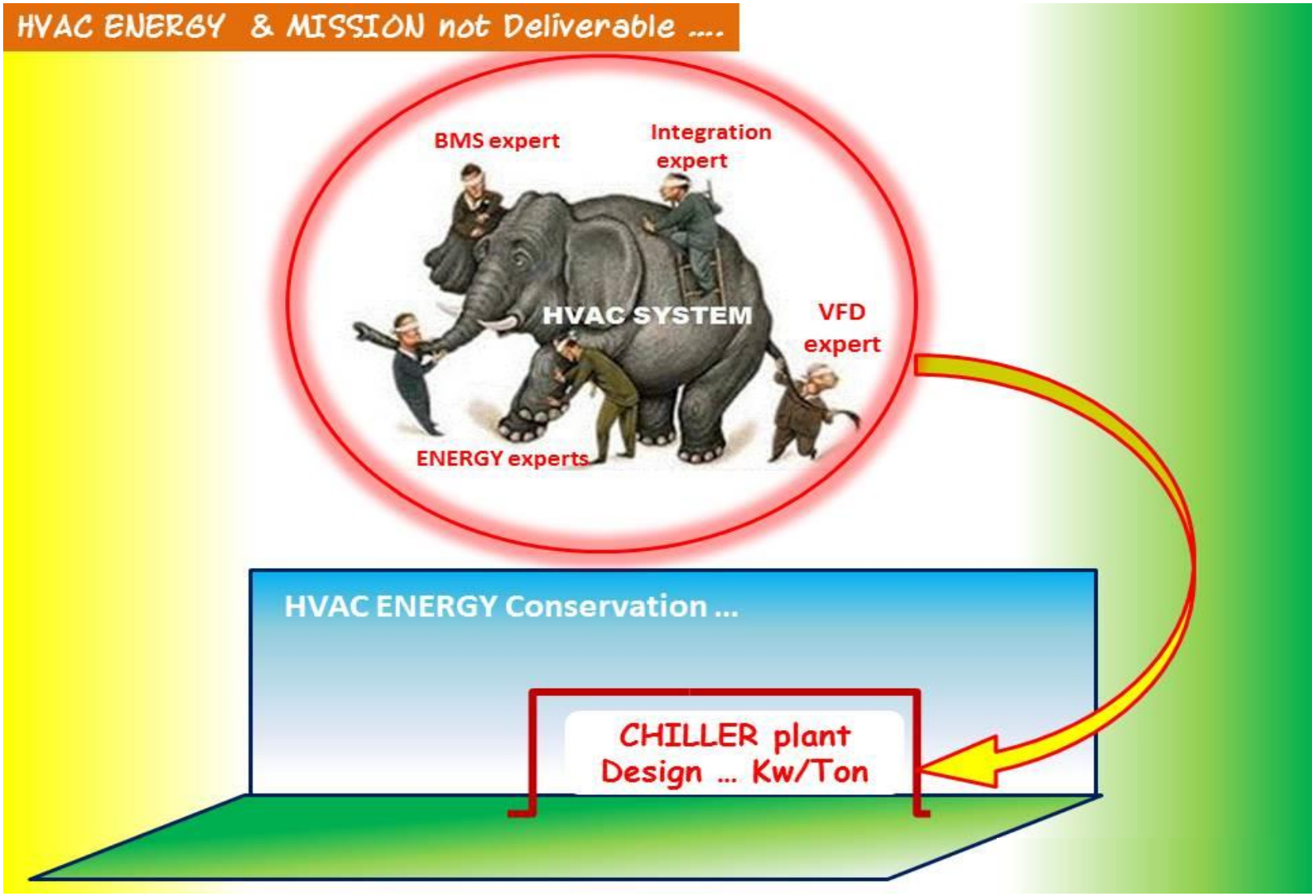
Main Challenges:

1. Taking over of DC Plant, Network and ETS packages from Projects
2. Uninterrupted chilled water supply to the customers 24x7 basis
3. Plant performance (KPI)
4. O&M budgeting and cost saving
5. Meeting authority regulations
6. Blow down network availability
7. Customer satisfaction

DC Plant:KPI

1. Overall DC Plant Efficiency (KW/TR)
2. Water efficiency (Gallon/TR)
3. Equipment Availability factor (90% above)
4. O&M Cost/TR

Factors affecting plant performance:



Factors affecting plant performance:

- Ambient temperature and relative humidity
- Low delta T from customer (plants don't cause it)
- Evaporator and condenser approaches (Poor chemical treatment)
- Poor cooling tower performances - High compressor Lift
- Lower chilled water leaving temperature increases compressor lift
- Low condenser water flow/high condenser water inlet temperature
- Part load demand & Incomplete commissioning of ETS controls

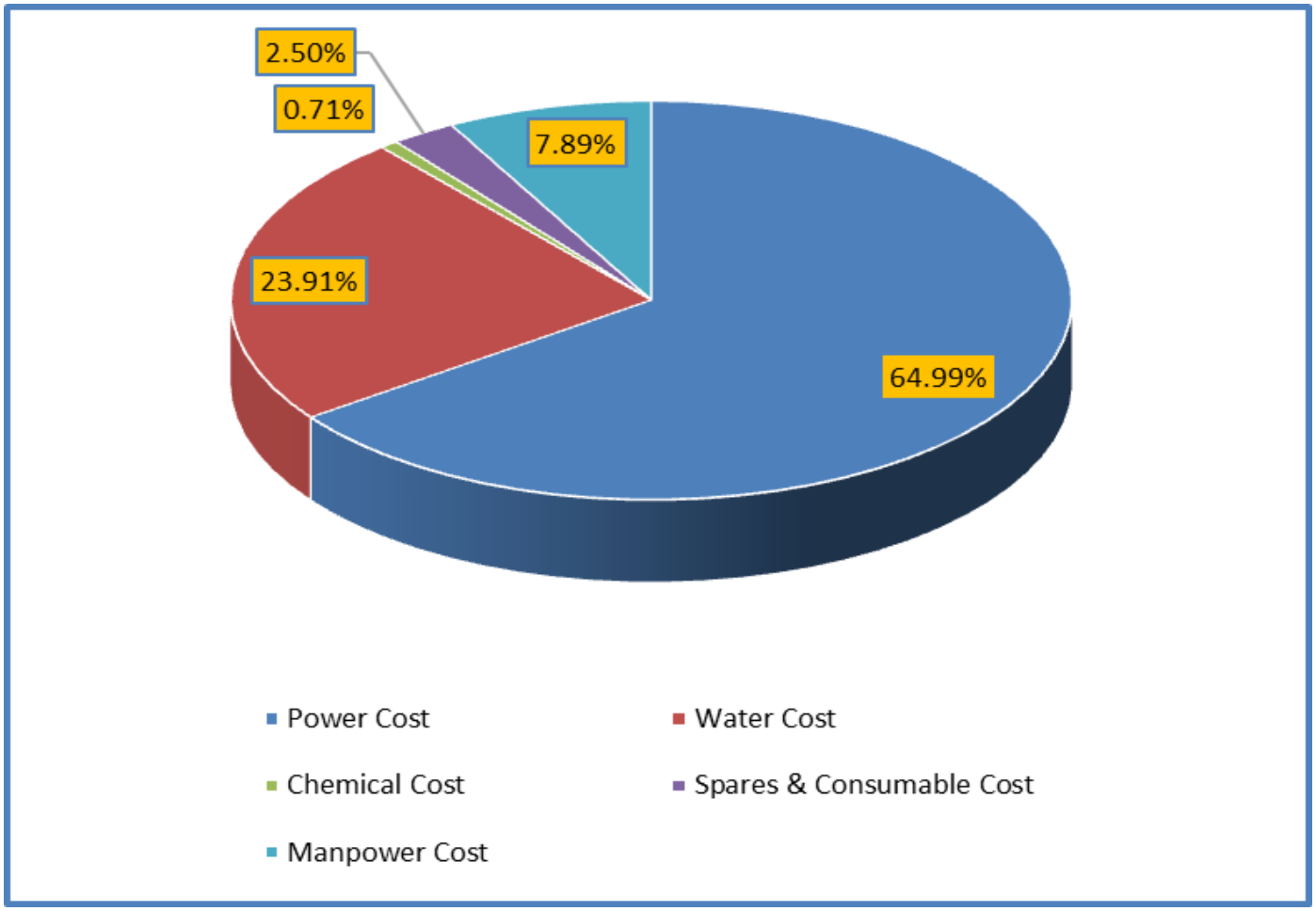
Factors improving plant performance:

- Fully commissioned ETS control system
- Tuning of chiller unit, by OEM at site to maintain the design refrigerant parameters - maximum chiller output.
- Maintain design water flow rate (evaporator / condenser)
- Close monitoring of condenser approaches using good quality chemicals
- Periodical condenser tube cleaning based on approach values.
- Proper Cooling tower maintenance improves chiller efficiency.

Factors improving plant performance (Contd) :-

- Try to run always the running compressor at full load during part load condition-Adjustment of leaving water temperature.
- Keep CT fan under good operating condition always.
- High cycle of concentration improves water efficiency and reduces chemical consumption
- Keep good working condition of Power factor correction capacitors
- Continuous training program to the plant operation staff.

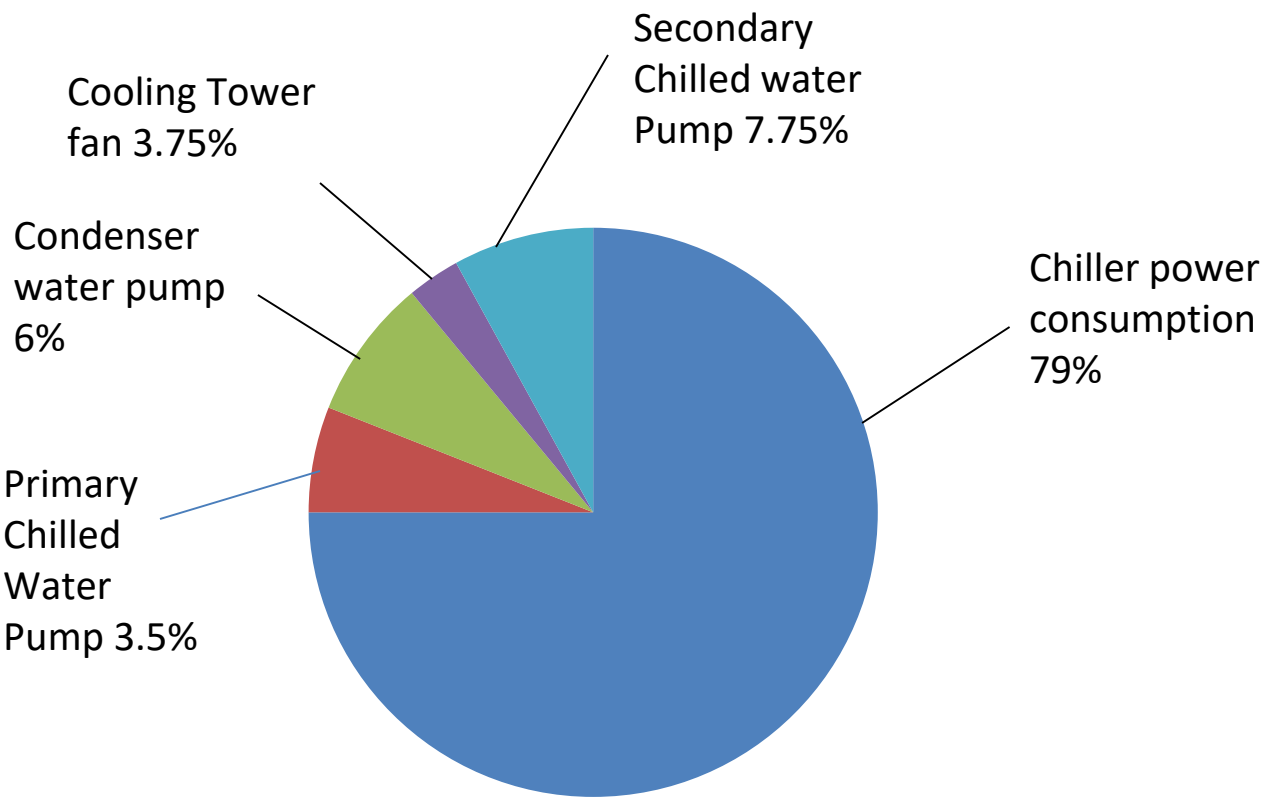
MQ District Cooling Plant cost analysis



Courtesy: Annual MIS Report for the year of 2016 of Barwa District Cooling Plant (37600 TR), Doha, Qatar.

Energy Consumption of DC Plant

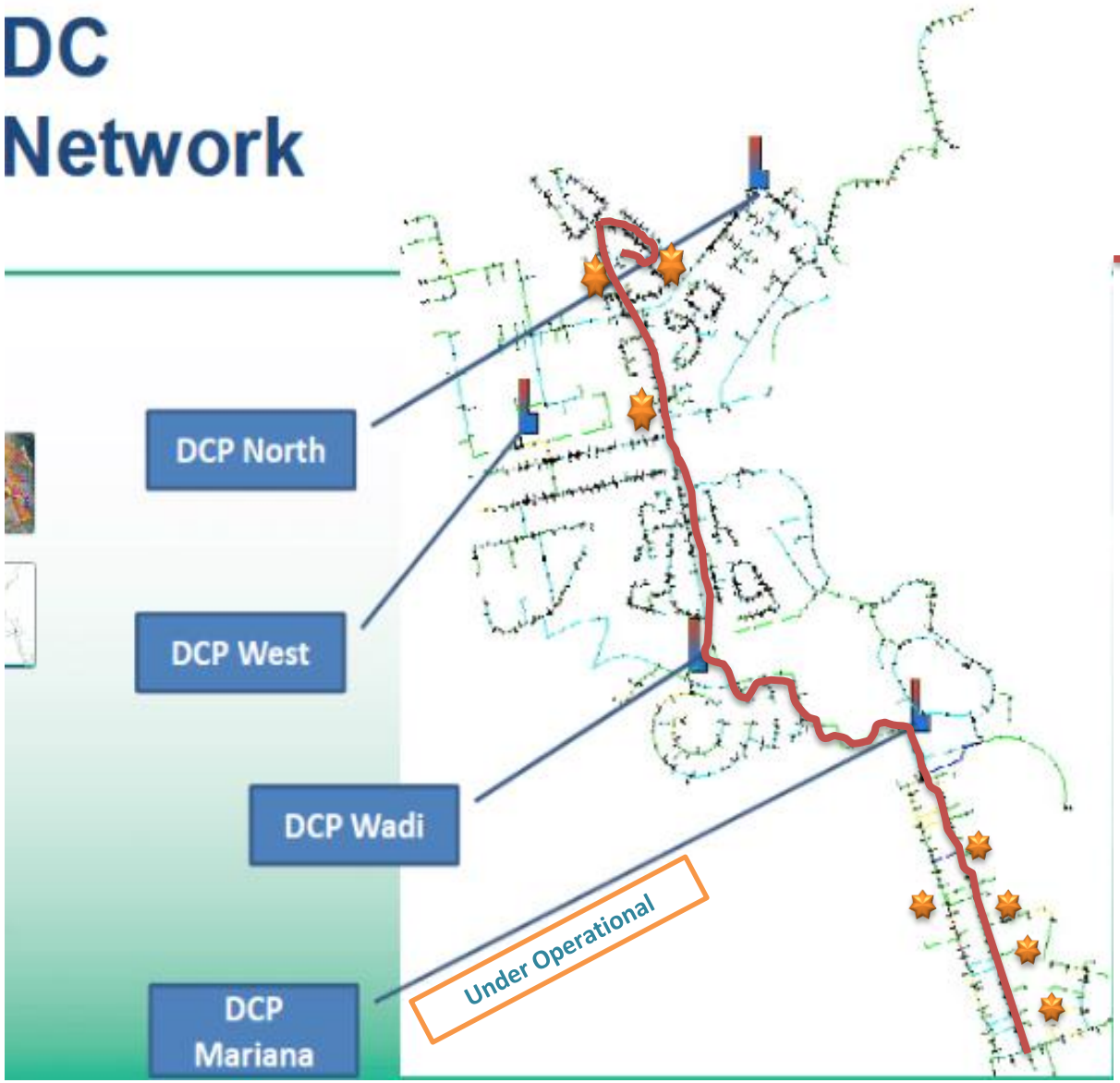
The chiller power consumption is 79% of total energy consumption of DC plant



Network:

- Different network packages connecting to the main network at different periods.
- Valves Passing Issues.
- Breakage of network pipes due to construction activities.
- Non-functional of LDS system due to FOC unavailability
- Maintaining the water quality of unconnected customer DC network.
- Accessibility of network valves installed underneath of main road.
- Confined Space Entry on the Valve Chambers, Traffic diversion road closing permit.

Network:



Due to scattered customers connected on DC network, more pumping (flow) energy required to satisfied their cooling comfort especially for the index customer during initial phase of operation.

ETS:

- Over sized equipment selection
- Poor flow control valves
- Missing connectivity between ETS and DC plant because of unavailability of FOC network.
- Absence of tertiary side pump control resulting bad HEX approach temperatures
- Poor Water Treatment cause fouling of Hex lead to higher approach poor heat transfer efficiency
- Malfunction of ETS instruments.

Results:

- Participating in RFP → O&M requirements
- Planning taking over process → smooth transition
- Quality plant, thorough Cx → predictable KPIs
- Understanding network packages → fewer surprises
- Good ETS design and Cx → better delta T
- Combined; long trouble free operation of the total district cooling system

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Thank You