



مكتب التنظيم والرقابة لقطاع الكهرباء و المياه
RSB FOR ELECTRICITY & WATER

**REGULATORY AND SUPERVISORY BUREAU FOR THE
ELECTRICITY AND WATER SECTOR**

**REGULATIONS FOR DISTRICT COOLING PURSUANT TO
EXECUTIVE COUNCIL RESOLUTION (6) OF 2021**

RD03: ENERGY PERFORMANCE

Version History

ISSUE NO.	MODIFICATION	ISSUED	APPROVED	DATE
1.0	First Issue	J. Grinnell	G. Sims	23/03/2022

1. Definitions and interpretation

DC Plant – means, chillers, pumping stations, cooling towers, control units, pipes, connections and any other ancillary equipment, including such things as reverse osmosis facilities, used for the production and distribution of chilled water.

District Cooling Services – has the meaning given to it in the Resolution.

District Cooling Service Provider - an entity permitted to furnish District Cooling Services in accordance with the Resolution.

DSCE – means the Dubai Supreme Council of Energy.

Electrical Efficiency Performance Threshold – the minimum electricity efficiency performance to be achieved by DC Plant for a Reporting Period.

Energy Performance Thresholds – means either electrical Efficiency Performance Threshold and/or Water Efficiency Performance Threshold.

Resolution – means Executive Council Resolution 6 of 2021, Regulating the Provision of District Cooling Services in the Emirate of Dubai.

Reporting Period – means annually under normal monitoring conditions, or monthly under enhanced monitoring.

RSB – means the Regulatory and Supervisory Bureau for the electricity and water sector.

Water Efficiency Performance Threshold – the minimum water efficiency performance to be achieved by DC Plant for a Reporting Period.

2. Scope and objective

a. These regulations:

- i. have been approved by the DSCE and issued pursuant to Article 4(a)4 of the Resolution.
- ii. apply to any Person furnishing District Cooling Services in the Emirate of Dubai.
- iii. aim to incentivize continual improvement in energy performance of DC Plant.
- iv. set the minimum performance standards expected to be achieved at each and every DC Plant operated by District Cooling Service Providers in respect of electrical efficiency and water efficiency.

- v. do not prescribe technical specifications for design, construction or operation and maintenance.
- b. The RSB may update these regulations from time to time subject to the approval of the DSCE.
- c. When the RSB considers applications for new DC systems or additional DC Plant to be added to existing DC Systems, it shall expect planned electricity and water efficiencies to represent a significant improvement compared to the Energy Performance Thresholds set out herein.

3. Basis of Energy Performance Thresholds

- a. The RSB sets these Energy Performance Thresholds having reviewed data submissions by District Cooling Service Providers since 2012. Electrical Energy Performance Thresholds have been established for water-cooled and air-cooled DC Plant and Water Efficiency Performance Thresholds have been established for water-cooled DC Plant.
- b. In this first edition of the regulations, Energy Performance Thresholds have been set at the 25th percentile of all DC Plant returns based on 2018 data.
- c. If other technologies become more prevalent in Dubai's district cooling sector, the RSB may add additional Energy Performance Thresholds where it considers them appropriate and subject to approval of the DSCE.

4. Exemptions

- a. A District Cooling Service Provider may, pursuant to article 8 of the resolution, make an application to the RSB for a DC Plant to be exempted from the obligation to comply with an Energy Performance Threshold. When making an application he must demonstrate to the RSB's satisfaction there have been exceptional circumstances beyond the District Cooling Service Provider's control that have directly affected performance, or that he is carrying out a specific test or innovation, or that the DC Plant is innovative by design, rendering the Energy Performance Threshold not applicable.
- b. The RSB shall assess such applications and, if satisfied, grant an exemption certificate stating:
 - i. The DC Plant subject to the exemption
 - ii. The duration for which the exemption is valid
 - iii. The specific Energy Performance Thresholds included in the exemption
 - iv. Any additional reporting requirements that are conditions of the exemption.

5. Electrical efficiency

- a. Electrical efficiency for each DC Plant shall be measured annually, or monthly when a DC Plant is subject to enhanced monitoring:

$$\text{Electrical efficiency} = \frac{\text{Electrical Consumption (kWh)}}{\text{Cooling Energy Output (TRh)}}$$

Where:

The Electrical Consumption shall be calculated based on readings from the DEWA electricity meter(s) serving the DC Plant.

The Cooling Energy Output shall be calculated based on readings from the Btu meters recording DC Plant output and as stated in the Schedule that permits the DC Plant to be used for furnishing District Cooling Services.

- b. Where recycled water is provided by Dubai Municipality or a third party, electrical consumption of any reverse osmosis plant used to raise the quality of recycled water used in the production of chilled water must be included in the electrical consumption of DC Plant calculation shown above.
- c. Where electricity is supplied or supplemented by onsite generation, be it by temporary generators running on fossil fuels of any kind, or by onsite renewable sources, an electricity meter must be installed to measure and record the output of the generator or renewable energy source as the case may be. Its readings shall be included in the electrical consumption of the DC Plant.
- d. Any form of electricity generation used at the DC Plant must be specified in the Schedule permitting the DC Plant for the provision of District Cooling Services.

DC Plant Configuration	Annual Energy Performance Threshold (Max kWh/TR-hr)
Air-cooled	1.29
Water-Cooled	0.98

Table 1: Annual electrical efficiency performance Thresholds

6. Water efficiency

- a. Water efficiency for each DC Plant shall be measured annually, or monthly when a DC Plant is subject to enhanced monitoring:

$$\text{Water efficiency} = \frac{\text{Total Water (Litres)}}{\text{Cooling Energy Output (TRh)}}$$

Where:

Total Water shall be calculated based on readings from the DEWA water meters serving the DC Plant added to readings from meters recording all recycled water supplies.

The Cooling Energy Output shall be calculated based on readings from the Btu meters recording DC Plant output and as stated in the schedule that permits the DC Plant to be used for furnishing District Cooling Services.

- b. Blowdown water quality shall be compliant with the Dubai Municipality standards in effect at the time. Failure to comply with the standards set by the Dubai Municipality shall be deemed a failure to comply with the water efficiency performance Thresholds.
- c. A District Cooling Service Provider may apply for an exemption to comply with the Water Efficiency Performance Threshold if it can demonstrate to the satisfaction of the RSB, that the quality of recycled water provided to the DC Plant fell outside of the standards expected and that the parameters falling outside such expected standards compromised the water efficiency of the DC Plant.

DC Plant Configuration	Annual Water Efficiency Performance Threshold (Max litres/TR-hr)
Using DEWA / RW and RO	8.92
Using DEWA / RW Only	10

Table 2: Annual water efficiency performance Threshold

7. Synchronizing input and output measures

- a. In determining energy efficiency performance, readings for the electricity, water and Btu meters shall be taken simultaneously to ensure input and output values are consistent. The time and date of each reading shall be recorded by the Permit Holder and made available on request. Annual readings shall be taken on the 31st December. When enhanced monitoring is required, readings shall be taken on the last day of each month.
- b. Where access to input meters such as DEWA meters is limited, billing data shall be used to perform an accrual at the end of each year to align electricity and water consumed with the cooling energy produced. Calculations used in such accruals shall be made available to the RSB on request.

8. Enhanced monitoring of energy efficiency performance

- When energy efficiency performance falls short of minimum requirements, the RSB shall issue a violation notice detailing the shortfall in performance and requiring it to be corrected by the following year's review.
- If a Permit Holder fails to comply with the requirements of a violation notice the RSB shall adopt enhanced monitoring until the energy performance of the DC Plant concerned has been raised sufficiently to meet minimum expectations for a period of at least 12 months.
- When enhanced monitoring is in place the RSB shall monitor compliance with monthly minimum requirements for electrical and water efficiency as set out in Table 3 and Table 4, respectively.
- Figure 1 shows the process by which a Permit Holder may move from a normal monitoring routine to an enhanced monitoring, and back again. In the event that a District Cooling Service Provider fails to meet the monthly Energy Performance Thresholds, it may face penalties in accordance with the Resolution.

<i>Month</i>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Water</i>	0.97	0.92	0.91	0.91	0.93	1.00	1.01	1.00	1.00	1.00	1.00	1.00
<i>Air</i>	1.27	1.22	1.20	1.20	1.23	1.32	1.33	1.32	1.32	1.32	1.32	1.32

Table 3: Seasonal electrical efficiency performance Thresholds (kWh/TRh)

<i>Month</i>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>RO</i>	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
<i>No RO</i>	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5

Table 4: Seasonal water efficiency performance Thresholds (L/TRh)

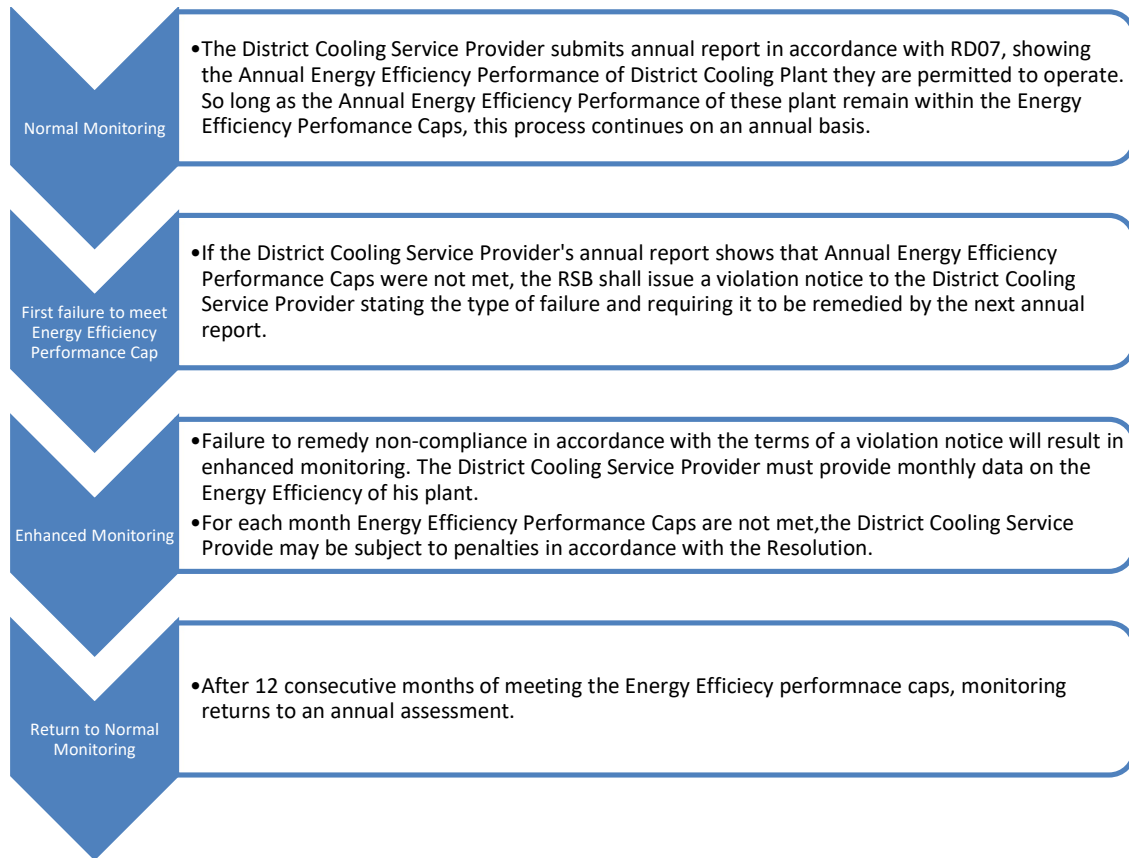


Figure 1: Process for managing failures against Energy Performance Thresholds