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Proposed changes to Title 24 are not practical and will have an adverse effect on the data center industry in California

Our teams are concerned that some of the proposed changes to Title 24 in California are not practical. Highlights are detailed here and further discussion can be found in the attached document:

1. Section 140.9 (a). Raising the supply air temperature from 55F to 65F for economizer.
a. This will limit the cooling approach temperature for water cooled equipment such as air cooled chillers with free cooling coils.
b. Furthermore, to be able to achieve the free cooling effect, the indoor Supply Air Temperatures would have to be raised in excess of 85F to account for the heat transfer losses at the coils. Such high temperatures are outside the Allowable ASHRAE windows for any hyperscale and retail clients that we serve.
c. As a result of the increased free cooling temperature requirement, this forces us to use air side economizers. Since most of our buildings are 2 stories or higher, we are limited in sizes of louvers and wall openings. Introducing outside air increases the risk of smoke and other contaminates of entering the datacenter.
2. Section 140.9.4. Heat Recovery.
a. Enforcing a heat recovery system is simply not practical. The heat to be recovered is of low quality, has limited uses and is costly utilize. More important, our buildings are not fully utilized on Day One, but rather have a gradual buildup of IT load over time, which makes heat recovery nearly impossible without sufficient load.
b. Additionally, any component we add to our Mechanical and Electrical system will impact the availability and reliability of the entire systems and may increase probability of downtime, which is unacceptable to any mission critical client.

Additional submitted attachment is included below.

October 5, 2020

Re: Comments to Title 24-2022 Proposed Revisions and Exposure on Future NTT Projects in California

A. Increased Temperature Threshold for Economizers

This submeasure proposal includes the following modifications to Section 140.9(a) prescriptive requirements for computer rooms.

- *Establish a single set of outdoor temperatures for all economizer types, instead of having separate requirements for air and water economizers.*

  NTT Comment:
  - Lumping the WSE and ASE requirements becomes prohibitive for air cooled chillers and certain refrigerant based heat recovery systems, upon which many data center systems have currently standardized on.

- *Increase minimum outdoor temperatures for full economizing to 65°F dry-bulb or 50°F wet-bulb for any type of economizer. Currently the thresholds are 55°F dry-bulb and 50°F wet-bulb for air economizers, and 40°F dry-bulb and 35°F wet-bulb for water economizers. An exception is included to allow projects to meet the 2019 Section 140.9(a)1 economizer temperature requirements as long as they also implement higher efficiency fan systems, air containment, and cooling equipment.*

  NTT Comments:

  - Air cooled chillers with free cooling water coils meets the current 55°F threshold for full economizer. Pushing the requirement to run full economizer starting at 65°F limits the "Approach" on the air-cooled chiller heat exchanger and renders them unusable unless indoor Supply Air Temperatures are raised.
  - Refrigerant based heat recovery systems have fall in a similar category as air cooled chillers.
  - Indoor Supply Air Temperatures would have to be raised in excess of 85°F to account for the heat transfer losses at the coils. Such high temperatures are outside the Allowable ASHRAE window for any hyperscale and retail clients.
  - As a result of the increased free cooling temperature requirement the only option remaining is air side economizers. This will have an impact on buildings that are 2 stories or higher since they are limited in sizes of louvers and wall openings and building heights.
  - Air side economizers will increase the cost per megawatt of a building. In this fiercely competitive environment, many data centers may opt to stop building in the State.
  - Water-cooled systems require considerable amounts of make-up water which adds CAPEX costs for storage capacity, storage space, piping, chemical treatment etc… and OPEX costs for water usage rates and sewer rates.

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- While it can be argued that water cooled systems consume less make up water than air cooled systems when viewed from a holistic municipal power generation level, nevertheless, make up water at the data center property will be in hundreds of thousands and/or millions of gallons of daily usage. This creates other problems of availability and downtime for the data center itself, as well as stress on the water utility company, the street utility piping, and municipal water sewage treatment facilities.
- In this fiercely competitive environment, the increase in cost to adapt water cooled chilled water systems is not practical and a non-option for any commercial data center operator.

B. Computer Room Heat Recovery

This submeasure proposal includes adding prescriptive requirements for computer rooms to Section 140.9 to require new buildings with both a computer room and sizable heating loads to recover heat from the computer room to serve other spaces. Computer room heat recovery is being defined as a mechanical system that transfers heat from computer rooms to provide heating to other zones in the building that require heating. This submeasure only applies to computer rooms in new buildings.

- Enforcing a heat recovery system is not practical. The heat to be recovered is of low quality energy that requires extensive capital to be captured.
- Buildings are not fully utilized on Day One with gradual build-up of IT load.
- Any component added Mechanical and Electrical system will impact the availability and reliability of the entire systems and may increase probability of downtime, which is unacceptable to any mission critical client.
- This will impact mechanical system cost which has to incorporate additional heat exchangers, pumps, piping, and controls to capture and recover the heat. All of which add points of failure and cost.