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**Trane Technologies Comments â€™ Title 24-2022 45-Day Express  
Terms [Docket No 21-BSTD-01]**

*Additional submitted attachment is included below.*



June 21, 2021

California Energy Commission  
Docket Unit, MS-4  
Re: Docket No. 19-BSTD-03  
1516 Ninth Street  
Sacramento, California 95814-5512  
(submitted electronically to Docket 21-BSTD-01)

Re: Trane Technologies Comments – Title 24-2022 45-Day Express Terms [Docket No. 21-BSTD-01]

Dear CEC Staff:

On behalf of Trane Technologies we are submitting the following comments to the California Energy Commission (CEC) 45-day language in the Notice of Proposed Action - Express Terms published on May 6, 2021.

Trane Technologies (Trane) is a world leader in creating comfortable, sustainable, and efficient environments and leading our industry in sustainability practices. Through our strategic brands Trane and Thermo King, and our portfolio of environmentally responsible products and services, we bring efficient and sustainable climate solutions to buildings, homes and transportation. Our bold 2030 Sustainability Commitments are central to our business strategy and include a pledge to reduce our customers' carbon emissions by one gigaton (2% of the world's annual emissions) and to bring our own operations to carbon neutral. Our ambitious greenhouse gas (GHG) emissions reduction targets which have been verified by the [Science Based Targets Initiative \(SBTi\)](#) challenge us to lead by example, collaborate with our customers to drive sustainable innovation and create opportunity for all in our workplace and our communities.

Trane Technologies offers the following comments on the technical changes to Title 24 in the Express Terms version.

**Mandatory Filter Gasketing Requirements – Sections 120.1(c )1D, 150.0(m)12Bv, and 160.2(b)1Bv**

While it is understandable that in utilizing MERV 13 filters the desire to have higher degree of filtration was desired. The terminology of requiring filter racks to be “gasketed or sealed” to eliminate any air from bypassing leaves no methodology to verify that it has been achieved. It is highly unlikely that 100% leakage or bypass can be achieved yet no leakage rate or standard is



offered to show that the filter rack is in compliance. This ambiguity will leave the code official in a hard position to in fact verify the code. Often in commercial HVAC systems side loading filters are utilized. Employing full gasketing around the filter will in fact mean through continually sliding in and out over time the gasket will crimp or degrade and not achieve the desired goal.

### **Fan Power Budget – Sections 140.4(c), 170.2**

Trane technologies has some major concerns with the Fan Power Budget as proposed. We do however encourage the alignment with the entirety of the ASHRAE 90.1 code as it was a consensus process with building designers, engineers and expert industry personnel who have significant experience in the design of existing and new buildings. While it is clear the ASHRAE 90.1 code was utilized the Title 24 version goes “over and beyond” and leads to some products and system designs will be priced out of the market by having the building designer not able to reasonable methods to keep pressure drop low enough to make systems work.

#### Summary of issues

1. Target was a 20% reduction in fan power budget. However, for some systems the budget is much lower. One test example for simple supply fan with energy recovery saw a 44% reduction in allowance. By doubling this reduction in energy, the proposal will significantly remove major system equipment types for the building designer.
2. For fan power the proposal uses mid-life for the filter pressure. This is not recommended because it can be manipulated. A supplier can use a low end of life number to manipulate the mid-life, while the building does not run this way. Recommend using clean filter to drive consistency across all suppliers.
3. The allowance values in table 140.4-A are consistently lower than the allowance values in the similar proposal for ASHRAE 90.1. This will result in a total fan power budget reduction of about 30%. Some fan systems will be pushed out of the market. One of the three we tested would no longer be marketable.
4. Title for the 4<sup>th</sup> column is incorrect. It ought to be CV and Single Zone VAV Systems > 10,000 CFM.

<u>Airflow</u>	<u>Multi-Zone VAV Systems &gt;10,000 cfm<sup>1</sup></u>	<u>Multi-Zone VAV Systems &gt;5,000 and ≤10,000 cfm<sup>1</sup></u>	<u>Multi-Zone VAV Systems ≤5,000 cfm<sup>1</sup></u>	<u>Multi-Zone VAV Systems ≤5,000 cfm<sup>1</sup></u>	<u>CV and Single-Zone VAV Systems &gt;5,000 and ≤10,000 cfm</u>	<u>CV and Single-Zone VAV Systems ≤5,000 cfm</u>
<u>Supply System Base Allowance for AHU serving spaces ≤ 6 floors away).</u>	<u>0.396</u>	<u>0.434</u>	<u>0.373</u>	<u>0.264</u>	<u>0.238</u>	<u>0.239</u>

5. There is a fan power budget deduction for terminal units that recirculate air within a zone. However, there is not a similar deduction for ceiling fans.
6. Definitions for several systems have issues:
  - a. Fan system, Multizone requires 3 or more spaces none of which have more than 40% of the total air flow. The problem is that single zone has much lower fan power budget. Thus, old multi zone systems that do not meet these criteria will have a significantly lower fan power budget.
  - b. Fan system, exhaust includes economizer in the definition. Economizers and exhaust systems have two completely different functions. This will confuse people.
  - c. Fan system, relief only allows operation during economizing mode. However, relief fans can operate to remove excess air introduced to the building in order to meet ASHRAE 62 requirements, even when not in economizing mode.

It is our recommendation that the Fan Power Budget follows clearly the similar proposal in ASHRAE 90.1 and not exceed it in the many areas it clearly does as written.

### **Residential Heat Pump Baseline – Sections 150.1 – 150.2**

Reducing our customers’ carbon emissions is what drives our support for building decarbonization, and we are excited that CEC is proposing a holistic approach to decarbonizing buildings through the electrification of space heating technologies. We support the proposal to introduce a heat-pump baseline for space heating technologies in the specified climate zones via the prescriptive compliance pathway in single-family residential buildings while allowing dual-fuel heat pump systems via the performance pathway. This proposal, coupled with the electric-ready requirements, prepares California for a 2025 all-electric code and allows time to reduce the state’s grid reliance on fossil fuels, resulting in lower marginal CO2 emissions generated from the electric grid as electricity demand is increased in the near-term.<sup>1</sup>

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<sup>1</sup> Nelson Ditcher, Aref Aboud, [Analysis of Greenhouse Gas Emissions from Residential Heating Technologies in the USA](#) (2020).



We appreciate the work by CEC staff to develop a cost-effective, performance-based Energy Code that propels the transition to all-electric buildings while allowing time for the grid and heat pump market to adjust. As other states look to California for their climate leadership, we are excited to support this performance-based approach to drive strategic electrification and building energy efficiency improvements in the United States. This approach provides a strategic electrification model in colder climates or areas where the grid relies heavily on fossil fuels without compromising comfort, cost, performance.

Thank you for the opportunity to provide feedback and we look forward to staying engaged in the development of the 2022 Energy Code.

Sincerely,

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Commercial HVAC  
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