

Finlayson, Ian (ENE)

From: Fred Davis <fred@freddaviscorp.com>
Sent: Thursday, 11 August 2022 4:41 PM
To: STRETCHCODE (ENE)
Subject: BUILDING CODE COMMENTS

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To: Ian Finlayson, Department of Energy Resources
From: Fred Davis
Subject: Comments on the Stretch Energy Code and Specialized Stretch Code Draft Regulation
Date: Aug. 11, 2022

My name is Fred Davis. I'm a long-time professional, and a long-time advocate, in clean energy. I am President of Fred Davis Corporation, Efficient Lighting. Until recently, I was Chair of the Medfield Energy Committee. And I am currently President of Jewish Climate Action Network.

I provide remarks below about the code and decarbonization, about implementation, about lighting, and about lighting for cannabis production.

Commendation. I want to commend DOER for its leadership, in moving this iteration of code forward. I know that over months, and over years, and even over administrations, I have been proud to be a citizen of this, the leading state in the country.

Look ahead not back. As of today, we are at a true transition point, as we have major federal legislation, major state legislation, and now a major code change opportunity all coming together within a few days. From here forward, we should be looking ahead only.

'Industry opposition' misplaced and/or disingenuous. We should realize that much cautiousness to date may have been misplaced. Also, much of the so-called 'industry opposition' may have been misplaced, as so many buildings-related businesses stand to thrive handsomely to the extent that building codes mandate change.

(Decades ago, I was one of the authors of the first lamp-efficiency standard promulgated in the country; this was work commissioned by DOER in 1989. As that standard progressed then, on its way to being the first such federal standard, it was also met with 'industry opposition.' Such concerns could eventually be seen to be ridiculously misplaced, as the lighting industry subsequently thrived over many iterations of innovation and transformation, in response to codes and standards.)

Code decarbonizing. It is past time to embrace the future resolutely.

This code:

- should be allowing implementation as early as possible
- should be allowing more than just 10 municipalities to eliminate fossil fuels
- and should be clearly disallowing new-building fossil fuel pathways.

Also, a whole new segment of code is needed to accelerate decarbonization of existing buildings.

Municipal implementation. Two comments about implementation among the municipalities:

Publicity toward municipalities: all towns and cities will be needing assistance, to learn about the code, and to educate their residents. And after adoption, code officials of course need training, but even more critically, residents and builders can benefit from a variety of channels of communication.

This is where Massachusetts should be more explicitly leading, in the public space, to foster the future that is necessary. Public education, public relations, posters, statements from notables, etc. – major positive campaigns are warranted that will accelerate decarbonization in the built environment.

Screaming need for municipal coordination. Currently, there are a variety of awesome organizations toiling in this space. For instance, DOER's amazing Green Communities has been so successful and now DOER's "Climate Leaders" program is formulating. In the private sector, MAPC and MCAN have provided great leadership and networking. MassEnergize, CEC, and HeatSmart Alliance – providing amazing tools and programs.

Among all these efforts, there is an impressive amount of non-competitive helpfulness. But it is easy to imagine that more effort, some overarching effort, to coordinate municipal progress could be of significant help. Because, each municipality 'going it alone' and 'recreating the wheel' is, within this climate arena, even less helpful than usual.

I welcome further developments on municipal climate efforts and would look forward to working with the Energy Office on such.

Lighting general. Two general points:

Any energy reductions from lighting will become ever more precious as the climate solution demands more and more reliance on the electric grid.

Perhaps this is a truism across all sectors, but I know that for lighting, code requirements have dramatically lagged behind technology. Over decades, papers have been written bemoaning the lost energy opportunities as lighting design, even though 'to code,' remained so inefficient.

Lighting specifics.

Residential lighting:

Regarding the definition "HIGH-EFFICACY LAMPS": this is presumably a reference for R404.1, which I believe states "All permanently installed lighting fixtures, ... shall contain only high-efficacy lighting sources."

If so, the phrase in the current draft, "High-Efficiency *Lamps*," should be changed to match, so "High-Efficiency *Light sources*," because most LED fixtures, whether for residential or other usages, don't have (separable) *lamps*. Certainly it would be an unfortunate and unintended consequence if the market started installing fixtures with medium sockets just to accommodate screw-in LED *lamps*; these would not be as efficient as most LED fixtures (which don't use separable *lamps*), and would allow for backsliding.

So, then perhaps the intent becomes: "All ... fixtures ... shall contain only" ... "Light-emitting diode (LED) *sources*..." In which case, what has been mandated is a technology. But not a minimum efficiency.

Not all LED lighting is the same efficiency, far from it. Contrary to common belief, the variability of efficiency *within* LED technology is quite wide (this was also the case *within* incandescent, and *within* fluorescent technologies). So, the age-old question recurs: mandate a technology, or an efficiency threshold level? The latter is usually wiser.

Numbers are important, and as drafted, both the efficacy levels, and the wattage brackets, are meaningless. They are outdated, as they formerly referred to incandescent technology.

The efficacy levels mentioned -- 45, 50, 60 lpw -- are definitely problematic. They are way too low compared to actual LED technology today (these levels would have been way too low even when efficient LED products were first emerging years ago). Today, if those levels were mandated, I would be very concerned that someone would start making low-efficiency LED products 'just for code' -- !

Probably 60 lpw is a reasonable lowest-threshold for *source* efficacy. All Energy Star minimums are above that threshold. The lowest category is high-CRI, directional lamps: 61 lpw. The low threshold for Energy Star fixtures is 65 lpw at the source.

(Note, Energy Star minimums do drop as low as 50 lpw, but that's for *fixture* efficacy not *source*. Source data may not be readily available for some fixtures in these low categories, but there are plenty of fixtures for those type that have fixture efficacy of over 60lpw too.)

It seems a minimum source efficacy of at least 60lpw is likely very doable for all lighting...

But I'd still hate to see anyone 'designing to code' at those levels, because in almost every situation, efficacies twice that high are easily attainable!

Which comes back to the extreme need for ongoing education.

Commercial lighting:

I see a tightening in daylight controls, otherwise, I presume there is no MA-specific change expected here to IECC 2021.

In general, IECC 2021 makes significant energy improvements in lighting, compared to IECC 2018. It will drive down energy consumption both through watts and hours. Lighting power allowances are tightened: in the range of 20% for offices and retail, somewhat less for schools and warehouses. Controls are substantially tightened and will continue to remake the field of lighting in new-construction.

Cannabis Cultivation Crazyness. Lastly, I would be remiss if I didn't mention a major concern about indoor cannabis cultivation, a relatively new, super-high energy-using building category. When the CCC began, significant attention by DOER meant that Massachusetts created at least some energy limits, which at the time were 'best-in-country.' Since then, those regulations were watered down. As of today there is no public information about compliance with those energy regulations. In any case, the regulations were far from adequate to motivate and prioritize low-energy, meaning

outdoor, production. Attention needs be paid. Since the cannabis industry and CCC cannot implement appropriate energy policy, DOER should step in and incorporate these building types into building codes. For rational energy policy, it is necessary.

Sincerely,

– Fred Davis

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