From:	Hunt, Marshall
To:	"Zhang, Yanda D." (YDZhang@trcsolutions.com); Bijit Kundu (BKundu@energy-solution.com)
Subject:	FW: power supply costs for furnaces
Date:	Wednesday, March 25, 2015 2:51:27 PM

Please put this on the "to do" list

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From: Andrew deLaski [mailto:adelaski@standardsasap.org]
Sent: Wednesday, March 25, 2015 2:33 PM
To: Hunt, Marshall
Cc: Alex Chase; Joanna Mauer; Delforge, Pierre
Subject: power supply costs for furnaces

Hi Marshall: As I mentioned on the conference call, I know the IOU team has done a lot of work on power supply efficiency over the years. In the furnace docket, DOE is proposing standby standards that they predict will require changing form a liner power supply to a switch mode power supply with a low loss transformer. See table IV.7 of the proposed rule. They estimate this change will save 2.5 watts per unit (11 watts for baseline linear power supply drops to 8.5 watts) and increase manufacturer production costs by $11.12 per unit. See table IV.11.

There is a little discussion of the designs to gain these efficiency improvements in the TSD, on page 5-25. I've copied that text below. (For some reason, the TSD shows the increase in manufacturer production cost as $9.67 rather then $11.12. I don't know why there is this discrepency between the rule and the TSD.)

Can you check with your folks to see if those numbers seem to be in the right ball park? It may be that they are and no further investigation is needed. But, if they seem high, it may be worth digging a little deeper and, if you have data that shows that power supply costs can be lower, share it with the docket in written comments.

I'm thinking this work may have been done for the battery charger docket although I don't know if it's transferable to this docket.

Thanks for looking into this item.

If any of those cc'd on this email have any reactions to this line of inquiry, feel free to chime in.

Andrew
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From page 5-25 of the TSD

The first design option (utilized at Efficiency Level 1) is the change from a standard transformer to a low-loss transformer (LLTX). The second design option (utilized at

Efficiency
Level 2) is the change from a linear power supply to a switching mode power supply. The third
design option (utilized at Efficiency Level 3) incorporates both of the first and second design
options by utilizing both an LLTX and a switching mode power supply. In the third design option, a
transformer is only needed to step-down the voltage for the thermostat because the switching-mode
power supply is able to step-down the voltage for the other components of the furnace. As such, a
smaller, lower cost LLTX is used at Efficiency Level 3. Table 5.10.2 lists the standby mode and off
mode power consumption and associated MPC increases for each design option analyzed.