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Re: Sizing of Log/pellet boilers

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At 01:38 PM 9/2/2008 +0100, you wrote:

Wed Sep 3, 2008 5:15 am

>Hi Norbert

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>

>Thank you for your reply, I am furiously trying to complete my MSc project
>at the moment and this issue has raised its head....

>

>I have come across a 'Rule of thumb' in boiler system sizing in the UK, that
>says for wood/pellet systems you should size the boiler to meet only 60-70%
>of the peak thermal demand (e.g. I calculated the thermal losses (fabric +
>ventilation) for the building and increased by 15% to account for pipe
>losses etc.), then added 2kW for water heating. The reasons given being
>safety and allowance for wood burning systems to be run continuously. As
>pellet boilers are very controllable and log boilers are run in batch mode
>with suitably sized thermal stores, this rule of thumb seems out of date.
>However, reputable installers are still using it which might explain why
>wood systems have a reputation for not heating the building properly.

>

>As I understand it, if your outside design temperature is -1C and you have a
>day when the temperature stays around freezing, if you size your boiler to
>output only 60-70% of your thermal losses, your house will not warm up. In
>fact it will lose heat until it reaches an equilibrium temp (about 2/3 of
>design inside temperature).

>

>Am I missing something, or do you do things differently in Canada and the
>US?

>

>Best wishes

>Jane

Hi Jane:

Sizing HVAC systems is not within my everyday practice. I'm more
versed in household scale batch burns of cordwood, so the following is more
of an educated guess:

- For continuous burn cordwood stoves, turndown
ratio is an important consideration.

In general, people get stoves that are too large, and have to turn them down
too much on an average day, which causes particulate emissions from
smoldering
combustion. Newer technologies with secondary air

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and refractory insulation make it possible to reduce the smoldering point to a somewhat lower burn rate.

- the design temperature for the coldest day of the year will only be reached one day per season - the coldest day. It makes more sense to size the stove somewhat smaller, and use a small backup system (perhaps even fossil fueled) to kick in a small annual amount of BTU's, in order to allow the main system to be smaller.

- this is also our experience with batch burning masonry heaters - in our particular case, it gets quite expensive to make them larger past a certain point, so they work best in conjunction with a smaller second system. The masonry heater can supply the base load (which is adequate 70% of the time), and a small, responsive, backup system can fill in when needed. Even with electricity (low capital equipment cost), this is usually only a small expenditure of fuel.

- your points with pellets are well taken. I'm not familiar enough with them to know what the turndown ratio issues might be.

- I once met an entrepreneurial electronics engineering professor/apartment landlord, who made money by guaranteeing a one-year payback on his system to multi-unit apartment owners. Here in Ottawa, Canada, heat is included in your rent. The apartment buildings have a single, large, furnace in the basement. He simply installed a temperature sensor in each apartment so that he could get some kind of average, and two furnaces, a medium and a small. He ran the whole system off a Tandy Model 100 laptop (this was mid 1980's). All it did was run the small furnace only, and only kick on the large furnace when it got cold enough. This was a huge improvement at the time over the primitive system of a large furnace running all the time, and apartment dwellers having to open their windows to regulate the temperature (sad but true, truly low hanging fruit).

Best Norbert Senf

>-----Original Message-----

>From: Norbert Senf [mailto:mheat@...]

>Sent: 02 September 2008 13:01

>To: dave andrews; Jane Williams

>Subject: Re: Sizing of Log/pellet boilers

>

>At 05:12 PM 9/2/2008 +0700, dave andrews wrote:

> ><<mailto:mheat@...>>mheat@...

> >might be able to help, but please do put your

> >queswtion to the group....thanks..Dave

> >

> >On Tue, Sep 2, 2008 at 5:03 PM, dave andrews
> ><dave.andrews@...> wrote:
> >Jane - don't worry - we've given up on the new
> >site...can I ask you to send this query to the
> >old Yahoo address and see what comes up?

> >
> >I try and avoid it always being me?
> >
> >Meantime I'll dig out a few contacts....

> >
> >Best
> >
> >Dave A

> >
> >On Tue, Sep 2, 2008 at 5:03 PM, Jane Williams
> ><<<mailto:jane@...>>>jane@...> wrote:

> >
> >Hi Dave

> >
> >
> >
> >I am sorry to admit that I haven't got my head
> >around the new site yet (my only excuse being
> >that I have being trying to focus my attention
> >on my MSc project deadline fast approaching).

> >
> >
> >
> >However, I really need some urgent advice from
> >experts on boiler sizing for large
> >domestic/small commercial log/chip/pellet
> >boilers. Could you suggest any group members who would be able to help?

> >
> >
> >
> >Best wishes

> >
> >Jane

>
>Hi Jane:

>
>What do you need to know? Sizing is usually done
>by rated heat output, which is often based on a
>heat load calculation, or educated guess, of the
>space being heated. Heat output translates
>backwards into pounds of fuel per day, per hour, etc.

>
>
>Best Norbert Senf

>
>
>-----
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Re: Sizing of Log/pellet boilers

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Norbert Senf [masonryheat](#) Sep 3, 2008
5:15 am



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