ENERGY ENGINEERING & MICROCOMPUTER APPLICATIONS **ENERCOMP, Inc.**

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May 19, 2006

Steve Baden
Executive Director
RESNET
PO Box 4561
Oceanside, CA 92052-4561

Re: **Proposed Tax Credit Rules Change – Using Modified End Use Loads**

Dear **Steve**:

In the process of preparing MICROPAS7® to be accredited for use under RESNET's Tax Credit rules, we have discovered that the tax credit rules do not reference the normalized modified end use loads equation found in the full RESNET Standards (equation 1, page 3-6). Instead, only the normalized energy consumption is referenced in the Tax Credit rules (page 7).

In our opinion, this is a very serious problem because it dramatically under values cooling electrical energy use compared to heating energy use when there is gas heating. This leads to nonsensical results in mixed heating and cooling climates where builders could be rewarded under the tax credit rules for adding features to reduce heating instead of features that reduce cooling, when homeowners pay more for cooling than heating.

Using only normalized loads also makes the tax credit rules inconsistent with the full RESNET rules, and programs such as Energy Star, which will confuse the building industry and send mixed messages about what energy efficiency measures should be used for a given home in a given climate.

To address this problem and to make the tax credit rules consistent with full RESNET rules, we propose that the tax credit rules be revised to use the normalized modified end use loads approach found in the full RESNET standards as shown in the attached language.

To illustrate the problem, consider a 2689 ft2 two story slab on grade home in Las Vegas with energy features exactly equal to the 2004 IECC requirements with gas heating and electric cooling. Using prices of $1.10 per therm and $0.10 per kWh, the following table shows estimates of the heating and cooling costs, and the normalized energy consumption under the current approved rules (normalized consumption) and under the rules proposed in this letter (normalized modified end use loads).

End Use	Electricity (kWh)	Gas (Therms)	Cost ($)	Current Normalized (MBtu)	Proposed Modified (MBtu)
Heating	185	474	$540	48.00	29.28
Cooling	10644		$1,064	36.33	60.93
Total	10829	474	$1,604	84.33	90.21
% Heating			34%	57%	32%

On a cost basis, the heating makes 34% of the total cost. Yet the current normalized consumption approach values the heating as being 57% of the total. Using the modified loads approach much more closely matches the ratio of heating to cooling found on a cost basis, the only metric that is meaningful to homeowners. Attached is a table of results like these for a wider range of cases. In all cases with gas heating, the ratio of heating to cooling is much closer when using the modified approach.

The bottom line is that using normalized consumption yields misleading results on homes with gas heating in climates with a mix of heating and cooling energy use. Note that this proposed change has only a small impact on homes heated with electrical energy like heat pumps or in climates where the energy use is dominated by either almost all heating or cooling. Fortunately, an easy solution to this problem already approved by RESNET is available – implement the full normalized modified approach.

I would appreciate it if you would please forward this to the RESNET board and the technical committee or other appropriate committees for their consideration at the earliest possible time.

I look forward to working with RESNET on this issue. If you or any reviewers have any questions about this application or the tax credit version, please call me directly at 530-885-9891.

Sincerely,

Ken Nittler
Enercomp, Inc.

Proposed Change to Section 2 of RESNET Tax Credit Rules

New text shown underlined. Deleted text shown in ~~strikethrough~~

2 Computation of Energy Savings

2.1 The energy ~~consumption~~loads for heating and cooling in the Qualifying Home shall be normalized to account for the differences in improvement potential that exist across equipment types using the following formula:

nMEUL = REUL * (nEC_x /EC_r)

where:

nMEUL = normalized Modified End Use Loads (for heating, including auxiliary electric consumption, or cooling)

REUL = Reference Home End Use Loads (for heating, including auxiliary electric consumption, or cooling) as computed using accredited simulation tools.

EC_r = estimated Energy Consumption for Reference Home's end uses (for heating, including auxiliary electric consumption, or cooling) as computed using accredited simulation tools.

And where:

$$\mathbf{nEC\_x = (a* EEC\_x - b)*(EC\_x * EC\_r * DSE\_r) / (EEC\_x * REUL)}$$

.
.
Rest of section 2.1 unchanged
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2.2 Following normalization of the heating and cooling energy consumptions for the Qualifying Home as specified in section 2.1 above, the total heating and cooling ~~energy uses~~ end use loads for the Reference Home (~~EC~~REULtot_ref) shall be compared with the total normalized ~~energy consumptions~~modified end use loads for the Qualifying Home (~~EC~~nMEULtot_qual) using the following formula to determine the % Energy Reduction:

% Energy Reduction = [(~~EC~~REULtot_ref – ~~EC~~nMEULtot_qual) / (~~EC~~REULtot_ref)] * 100

Comparison of Cost, Normalized Consumption and Normalized Modified End Use Load Approaches

The tables below are for a 2689 ft2 two story slab on grade home in Las Vegas. The first table shows results with energy features exactly equal to the 2004 IECC requirements with gas heating and electric cooling. Other tables vary the equipment and envelope as specified. To estimate the cost of heating and cooling, prices of $1.10 per therm and $0.10 per kWh, typical of the Las Vegas area are used. The tables include a comparison of the heating and cooling costs, and the normalized energy consumption under the current approved rules (normalized consumption) and under the rules proposed in this letter (normalized modified end use loads).

IECC Requirements - 13 SEER/0.78 AFUE

End Use	Electricity (kWh)	Gas (Therms)	Cost ($)	Current Normalized (MBtu)	Proposed Modified (MBtu)
Heating	185	474	$540	48.00	29.28
Cooling	10644		$1,064	36.33	60.93
Total	10829	474	$1,604	84.33	90.21
% Heating			34%	57%	32%

15 SEER/0.92 AFUE

End Use	Electricity (kWh)	Gas (Therms)	Cost ($)	Current Normalized (MBtu)	Proposed Modified (MBtu)
Heating	185	402	$461	37.83	23.08
Cooling	10227		$1,023	34.90	58.54
Total	10412	402	$1,483	72.74	81.62
% Heating			31%	52%	28%

Meets Tax Credit Criteria - 14 SEER/0.92 AFUE plus envelope improvements

End Use	Electricity (kWh)	Gas (Therms)	Cost ($)	Current Normalized (MBtu)	Proposed Modified (MBtu)
Heating	100	219	$251	20.60	12.56
Cooling	5879		$588	20.06	33.64
Total	5979	219	$839	40.66	46.21
% Heating			30%	51%	27%

IECC Requirements - HP 13 SEER/7.7 HSPF

End Use	Electricity (kWh)	Gas (Therms)	Cost ($)	Current Normalized (MBtu)	Proposed Modified (MBtu)
Heating	4414	0	$441	15.06	29.28
Cooling	10644		$1,064	36.33	60.93
Total	15058	0	$1,506	51.39	90.21
% Heating			29%	29%	32%

HP 15 SEER/9.0 HSPF

End Use	Electricity (kWh)	Gas (Therms)	Cost ($)	Current Normalized (MBtu)	Proposed Modified (MBtu)
Heating	3783	0	$378	12.91	25.10
Cooling	10227		$1,023	34.90	58.54
Total	14010	0	$1,401	47.81	83.64
% Heating			27%	27%	30%