

Detailed Comments of Pilkington North America, Inc.

The Department of Energy's (DOE) 11 February 2003 letter and attachments (Letter) offers two alternative proposals for review and comment. The first alternative is "the same one proposed in May 2002, based on a three-zone map." The second is based on a four-zone map. The DOE Letter indicates that both alternatives "meet our objectives of increasing energy savings, meeting or exceeding code requirements, and offering a consumer-friendly approach to selecting high-performance windows."

Despite the fact that it has concluded that the four-zone alternative "results in a higher national energy savings potential," the DOE expresses a preference for the three-zone alternative because of "the importance of reducing cooling energy requirements and maximizing peak load savings."

Unfortunately, the analysis underlying DOE's preference is unsubstantiated and wrong in a number of respects.

Furthermore, DOE's analysis fails to disclose significant advantages flowing from the four-zone map relative to cooling and peak load energy savings. As a result of that failure, DOE's analysis fails to properly compare the two alternatives.

When the factual and technical flaws in DOE's analysis are revealed, it becomes clear that the four-zone map is superior to the three-zone map on all or virtually all levels.

- The four-zone map will result in a *significantly larger savings* in heating energy than the three-zone map.
- The four-zone map will result in a savings in cooling energy that is very nearly equal to the three-zone map.
- As demonstrated below, and contrary to DOE's analysis, *the four-zone map will actually provide a significantly greater reduction in primary carbon emissions (greenhouse CO₂) than the three-zone map.*
- Finally, DOE's peak energy load analysis is flawed, both factually and technically. In fact, *the four-zone map will have no material effect on the need to build new generating capacity to satisfy peak energy load demands.*

I. The four-zone map will actually result in a greater reduction in primary carbon emissions than the three-zone map.

A primary basis for DOE's preference for the three-zone map is its belief that it will result in a greater level of cooling savings and, thus, result in a greater reduction in primary carbon emissions than the four-zone map. **That is simply not true.** While the amount of cooling energy savings attributable to the four-zone map is only **slightly** less than expected from the three-zone map, the savings in heating energy attributable to the four-zone map is **significantly** larger than the three-zone map. The DOE analysis simply does not take into account the magnitude of these differences between the four-zone and the three-zone maps.

In footnote 5 on page 6 of its Letter, the DOE correctly points out that “[t]ypical primary emissions for Natural Gas and Electricity, in million metric tons of carbon per quad, are 14.4 and 16.03, respectively.” However, DOE never takes those primary emission levels and applies them to the total annual heating savings and total annual cooling savings set out in Table 2 of its Letter to determine whether the four-zone or the three-zone map yields a greater anticipated reduction in primary emissions.

This omission in the DOE analysis is significant. Applying the primary emissions data to the heating savings and cooling savings of Table 1, quickly reveals that the four-zone map yields an anticipated total primary carbon emissions savings of **186 million metric tons**, whereas, the three-zone map only yields an anticipated savings of **163 million metric tons**.

That calculation understates the anticipated environmental benefits of the four-zone map as compared to the three-zone map, because it assumes that all home heating is done using natural gas. In fact, however, that is not true. Some 29% of homes are actually heated electrically.¹ When that fact is taken into account, the four-zone map yields an anticipated total primary emissions savings of **188 million metric tons**, whereas, the three-zone map yields a much smaller savings of only **164 million metric tons**.

II. The DOE Letter analysis does not fairly compare the two alternative maps.

In addition to ignoring completely the substantial environmental benefits to be derived from use of the four-zone map, DOE’s Letter does not fairly compare the advantages and disadvantages of the four-zone and three-zone maps that its analysis does find.

In its summary of advantages and disadvantages of the two maps,² DOE does not even mention that in its comparison of “Consumer Economics”³ the four-zone map is projected to ***deliver a significantly greater monetary savings to consumers than both the current Energy Star program and the three-zone alternative.***⁴

This economic advantage affects the pocketbooks of the very consumers that are intended to be affected by the Energy Star Program. It clearly should be included in a fair statement of advantages relating to the four-zone map.

¹ 1997 **Residential Energy Consumption Survey**, Energy Information Administration, DOE, Washington, D.C.

² Letter at page 16.

³ Letter at pages 9-10.

⁴ At the same time, DOE acknowledges that both proposals provide consumers with improved comfort and reduced condensation. Letter at page 10.

The DOE also unfairly compares the “disadvantages” relative to the two maps. In that regard, DOE says that the three-zone map leaves “some energy savings unrealized.” It says the same thing as to the four-zone map. What DOE does *not* say is that the *magnitude* of energy savings left “unrealized” as between the four and the three-zone maps is *nominal* at best respecting cooling savings and *large* when it comes to heating savings. In that regard, the three-zone map yields only **26.8%** of the heating savings that the four-zone map is projected to deliver. On the other hand, however, the four-zone map delivers a full **85%** of the cooling savings attributable to the three-zone map.⁵

Finally, in its comparison of advantages and disadvantages, DOE’s Letter fails to disclose or take into account several serious disadvantages relating to the three-zone map. In that regard, the three-zone map would allow many less efficient products to bear the Energy Star label, while, other, more efficient products are denied access to the Energy Star label. The DOE Letter also fails to take into account the marketplace confusion and other consequences that such an upside down labeling practice would have on consumer confidence and the credibility of the Energy Star label itself.

III. DOE’s conclusion that the four-zone map will result in a need for additional power plants is flawed.

Another basis for DOE’s preference favoring the three-zone map is its belief that a three-zone map will reduce peak load energy demand which, DOE, in turn, believes will result in the need to build fewer electric power plants. However, DOE’s Letter analysis contains no information from which to determine existing peak energy loads or to estimate peak energy loads in the future. It, likewise, contains no information from which to determine whether any need currently exists to build new power plants, or whether there would be such a need in the future. In short, DOE’s belief that the four-zone map will result in a need to build new power plants to satisfy peak energy loads is wholly conclusory and unsubstantiated by any supporting science or evidence.

In addition to being unsubstantiated, DOE’s belief that the four-zone map will result in the need to construct new electrical generating facilities rests, in part, on the factually flawed assumption that an electrical generating shortage either currently exists or is predicted sometime in the foreseeable future. Nothing could be further from the truth. In fact, there is currently an *excess* electrical generation capacity that is actually projected to grow into the foreseeable future.

This was recently reported in the Wall Street Journal:⁶

[T]he reserve margin – *the amount of capacity beyond what is needed to satisfy peak demand* – hit 31% in the 11-state Western

⁵ The 15% difference in cooling savings between the four-zone and three-zone maps is within the margin of calculational error.

⁶ **Wall Street Journal**, *Surplus of Electricity Supplies May Persist at Least Until 2005*, A-3 (Feb 12, 2003).

region at the end of last year and could hit 56% of total capacity by 2006 if current projects under construction are completed. In the Northeast, reserves of 29% could hit 45%. The Southeast, excluding Florida, would see reserves shoot from 30% to 52%. (Emphasis added.)

IV. DOE's conclusion that reducing electrical peak loads will result in less air pollution than reducing gas heating loads is also flawed.

DOE's preference in favor of the three-zone map is also based on the assumption that a nominally larger reduction in cooling energy related to the three-zone map will reduce peak loads which, in turn, will have a larger impact on the reduction of power-plant pollution emissions than corresponding reductions in heating energy associated with the four-zone map. However, once again, DOE's analysis is purely anecdotal. Nothing in its Letter analysis substantiates its belief.

Worse, the assumptions underlying DOE's belief are flawed. In that regard, DOE's analysis is based on the simplistic assumption that cooling loads are satisfied by electric energy while heating loads are satisfied by natural gas. However, neither hypothesis is accurate. First, 29% of homes are heated electrically.⁷ Second, many electric utilities are turning to small, natural gas powered facilities to create reserve margins against peak loads. The Blade recently reported that⁸:

The electricity shortages that were a problem in Ohio a few years ago will be much less likely to occur after four electric power plants open in the state this year. The *mostly gas-fired plants* will provide a maximum of 3,440 megawatts of electricity by summer's end. (Emphasis added.)

DOE simply did not take any of these real-world facts into account before forming its preference for the three-zone map.

V. The three-zone map will deceive consumers and erode confidence in the credibility of the Energy Star Label.

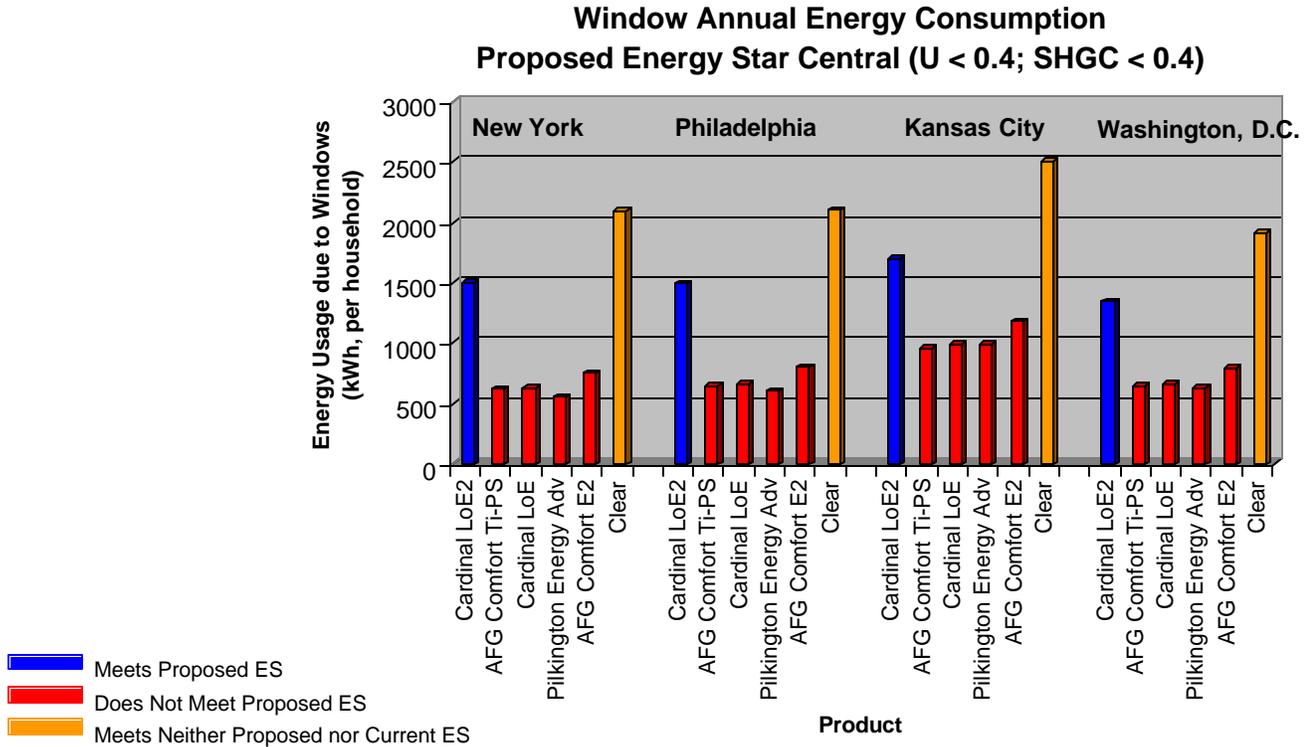
DOE acknowledges that it is the specific objective of EPA and DOE to have consumers identify the Energy Star label with the "*most energy-efficient subset of the market.*" DOE Letter, p. 1. However, if the three-zone map is adopted, DOE will deliberately bestow the Energy Star label on a less efficient subset of products while deliberately withholding the Energy Star label from a more efficient subset of products. That will, in turn, result in marketplace confusion, consumers being misled by the Energy

⁷ Ft. nt. 1, *supra*.

⁸ *The Blade*, 4 Ohio plants will ease power crunch, (January 12, 2003).

Star label, and a deserved erosion in the credibility of the Energy Star Program and its label.

The following chart illustrates this point:



If the three-zone map is adopted, the *most energy efficient* subset of products listed above will *not* qualify for the Energy Star label while the *least efficient product* will qualify for the Energy Star label.⁹

This result would not only contradict the most important, stated objective of the Energy Star Program, it would mislead consumers. By selecting windows labeled under the three-zone criteria, consumers will actually be misled to select products that are *less*

⁹ The above chart compares the annual energy consumption (heating + cooling) impact of various types of glazing in a typical home in different cities in the Central region of the three-zone map. Vinyl framed, argon-filled double glazed windows were used, where only the type of glazing was varied. Calculations were done in accordance with NFRC 901 proposed guidelines using RESFEN 3.1 software based upon the U.S. Department of Energy calculation method (DOE 2.1E). The window properties, including angular dependence data, were calculated with Window 4.1 and imported into the RESFEN 3.1 program. To determine the individual impact of each glazing type on the home's annual energy consumption (heating + cooling), the energy usage of the home without windows was subtracted from energy usage of the home with windows for each of the window types described for each of the cities listed in the chart. Positive values for this difference represent the relative increase in home energy consumption contributed by the windows with the various types of glazing products and the best energy performance is represented by the products with the lowest value bars.

efficient than other products available in the marketplace, but not entitled to bear the Energy Star label. This type of consumer deception is certain to damage the credibility and value of the Energy Star label.

VI. The three-zone map will destroy the market for hard-coat low-e products and grant a monopoly to soft-coat low-e manufacturers.

One need only look at the vast area comprehended by the southern and central regions of the three-zone map to realize that, if adopted, it will destroy the market for hard-coat low-e products in the United States. The central region of the three-zone map alone lumps such diverse climates as Tucson, Arizona with New York City. Within that region alone, the three-zone map would preclude hard-coat products from bearing Energy Star's seal of approval as far north as Columbus, Ohio; Boston, Massachusetts; Philadelphia, Pennsylvania; and New York City. It would do the same thing as far south as Key West, Florida.

Now, imagine a national or even a regional window manufacturer of hard-coat low-e products with manufacturing facilities located in Cincinnati or even Dayton, Ohio. Under the three-zone proposal, that manufacturer would be prohibited from distributing Energy Star labels on high efficiency hard-coat products in geographic regions north, south, east, and west of its own facilities.

This, of course, not only explains why the three-zone map originated with the soft-coat low-e manufacturers, but why at least one soft-coat manufacturer is relentlessly attempting to secure its adoption. Soft-coat manufacturers stand to gain a significant market share and a monopoly in the low-e market through the destruction of the hard-coat technology if the three-zone map is adopted.

There is simply no scientific justification whatsoever for using the Energy Star Program to destroy the hard-coat low-e coating technology or to vest monopoly power in soft-coat manufacturers.

Moreover, the results of destroying the hard-coat market in the United States would be disastrous both here and in Canada.

Hard-coat customers have informed PNA that the adoption of the three-zone map will result in a switch to soft-coat products, even in regions where it is clearly more energy-efficient to use hard-coat low-e products. In the last comment period, DOE was put on notice of the probable destruction of the hard-coat market that would result if the three-zone map is adopted. Nevertheless, DOE ignored that comment and has failed to even analyze what consequences the elimination of hard-coat products would have on the energy consumption, environmental and other conclusions contained in its Letter report.

PNA commissioned Enermodal Engineering, Inc. to evaluate the consequences of eliminating hard-coat products in Canada, since Canada would also be adversely affected if the hard-coat market is destroyed in the United States. Enermodal's report is attached

hereto. It details the disastrous consequences on energy consumption and increasing levels of greenhouse gasses in Canada if DOE adopts the three-zone map, thus jeopardizing the availability of hard-coat products both here and in Canada.

Conclusion.

DOE has tabled a four-zone map for consideration. The four-zone map will save more primary carbon emissions than the three-zone map. At the same time, it will save the entire Nation more energy than the three-zone map. The four-zone map will also maintain the integrity of the Energy Star Program by labeling the most efficient subset of products. At the same time, it will allow marketplace forces to shape the future course of both forms of low-e coating technology.

The three-zone map was originally proposed on behalf of soft-coat manufacturers. It was designed to shrink, if not eliminate, the market for hard-coat products, thus resulting in an increased share of the market for soft-coat producers.

The three-zone map was proposed for the first time in 2001 and then withdrawn. It was proposed again in 2002 and, again, withdrawn. The three-zone map is on the table for a third time for public comment.

All of the same reasons to withdraw the three-zone map from consideration still exist. If adopted, the three-zone map will still destroy the market for hard-coat products. If adopted, the three-zone map will still deprive the most efficient subset of products in the north central region from using the Energy Star label, while awarding it to a less efficient subset of products and jeopardizing the integrity of the label.

Finally, the three-zone map is not as efficient as the four-zone map in reducing primary carbon emissions and it saves less energy than the four-zone map.

Pilkington North America, Inc. respectfully, urges DOE to adopt the four-zone map and withdraw a third and final time the three-zone map.