

Rachel:

I was at the conference in Chicago last week where you requested input to help EnergyStar develop a standard for HVAC for 2006. Here is a summary of my thoughts:

1) EnergyStar should have a standard rather than drop out for a few years. The standard can be as simple as SEER 14 or SEER 14/EER 12, with or without an installation component, but there should be an EnergyStar standard. EnergyStar is very effective in the market.

2) Equipment Standard – One of the most important features of the equipment standard you select for 2006 is its implementability. What has evolved over the last several years is the use of a database, which I believe is the right approach. However, when the standard is stated in terms of unpublished criteria, difficulties immediately arise. Should the installation's specific model number set not appear in the database, confirmation of system performance requires additional time and effort. To date, the first step in resolving this is to put the burden of proof on the customer via a reject letter. This is an unfriendly first step, and every effort should be made to avoid it. The customer, who neither knows nor cares about the technical details of system performance, knows only that his expectations have not been met and that he must now get involved in these details. His first step is to the contractor who installed the system. The contractor is forced onto the defensive with his customer as to why the installation did not qualify and, eventually, goes to his distributor or manufacturer to obtain a printout that shows all of the required details. When the printout shows the system to qualify, the customer resubmits and the application is reprocessed. To avoid customer-relations problems, many contractors elect to not participate in the program. The solution to all of this is the database, but it must be complete to make implementation straightforward. An example is refrigerators. In 2004, we will probably rebate on some 40,000 EnergyStar refrigerators. Of all the measures we rebate on, this one has the least problems. Though the standard for EnergyStar qualification is stated as 15% better than the federal standard, I do not believe we have had even one refrigerator in dispute. The reason is that the database is complete. For all practical purposes, the criteria is: if it is on the list, it qualifies; if it is not, it does not. Customers and retailers can understand this. We need the same thing for HVAC. Define the equipment standard as you see fit, but build a database that supports it fully and completely. This is no small task. The ARI database of October 2002 had appx. 132,000 combinations of listings, and we still encountered processing difficulties with on the order of half the applications. From an implementation standpoint, it would be a good idea to define "EnergyStar Qualified" as to whether it appears in the database or not. This would require more time and money to ensure every combination of coil/condenser/furnace that met your standard was in it, and that it was routinely updated, but it would be well worth it. Participation would increase significantly. This question touches another question you have for the proposed specification – as to whether or not to be EnergyStar qualified the equipment has to come from the same manufacturer. It would make building and maintaining the database easier, but I do not believe this is viable. See comments under 7c.

3) The role cost-effectiveness might have in deciding whether SEER 14 is a good standard should not weigh in on your decision. The reason is that we should look at cost-effectiveness from the total installed cost point of view - the price the end customer pays. The total cost is the cost of the equipment and associated mark-ups, plus installation. The price is what the contractor believes he can get for the whole package from that customer. Installation costs can vary widely as can the price the contractor proposes for the entire job. It is entirely possible for a customer to get a SEER 14 at a price at or below a SEER 13, depending upon how hard he shops. Prices do vary. The customer's best practice is to obtain two or three quotes competitively and in so doing, will almost always come out ahead. If we were looking at a wider difference of say a SEER 12 federal standard and a proposed EnergyStar standard of SEER 15, we would want to look at cost effectiveness. But when the difference in standard is SEER 13 to SEER 14, and I know from processing 10,000 systems a year that prices vary widely, I do not believe that for this case a cost effectiveness question is pertinent.

4) In reviewing the chart that summarized opportunity to achieve savings, it sure looks like it makes sense to have an installation component to the standard. If those figures accurately reflect the situation in the field, there is a great deal of savings to be had here. There are a number of courses of action EnergyStar could take on this:

- a) Maintain a hands-off approach for now.
- b) Develop a detailed installation component to the specification and implement it with the change in standard for 2006.
- c) Develop a detailed installation component to the specification and implement it in phases over the next several years.

For a above, I recommend that you review the sources of energy savings and satisfy yourselves that they are valid and accurate. If valid, I would drop course of action a in total. But if you are not satisfied completely that the sources of energy savings are valid, I would keep a hands-off approach until you are.

If you are satisfied that the energy savings justifies it, proceed with either b or c above:

For b, I thought I heard discussion from some of the conference participants that you should develop a detailed specification and implement it all at once. I recommend against that. The key to success in implementing anything is simplicity. In developing an installation specification, EnergyStar will be charting new ground and, based upon all that I heard at the conference, a great deal of new ground. The specification represents the theory. The manufacturers and contractors in the field have to translate it into reality. Until there is an experience base to draw from, you cannot know ahead of time what kinds of difficulties will emerge in translating the theory into reality. So, I believe it is best to take it in steps and keep it simple.

If you elect c above, I recommend that you continue working closely with the trade allies. Develop a detailed specification with intent of implementing it in phases, letting everyone know in advance what the time-phased intentions are. **As an example**, you might do something like this:

- 1) Announce in April of 2005 that effective January 1, 2006 the EnergyStar standard for split system Central AC is SEER 14 (or SEER 14/EER12) with phase 1 of an installation component to take place on July 1, 2006. Phase 1 is that in order to be EnergyStar qualified, the installation has to be signed off by a NATE certified HVAC professional. By requiring a NATE certified installer, you will send the signal that NATE is the future and will also contribute to the establishment of a national source of education for HVAC contractors. NATE can then grow and mature over time and serve as a conduit for the flow of HVAC standards. The establishment of NATE certification might be the first step in implementing an installation specification since before you can realistically implement something of this nature, the educational infrastructure for it has to be well established. The date by which you expect contractors to become NATE certified is something you should give a lot of thought to. I have July 1, 2006 simply as a placeholder because I do not know realistically how much time is reasonable to get people educated and certified without causing a panic. Once this is established, you can define and implement your installation standards as slowly or quickly as the means of communicating, educating, and certifying professionals will allow.

- 2) In December of 2005 you might announce your phased intentions (again dates are placeholders) as:

- a) January 1, 2007: Required - NATE Certified HVAC professional signs off on "commissioning report" that Refrigerant Charge and Airflow are adjusted to manufacturer's specifications.
- b) July 1, 2007: New Construction HVAC installation standards go into effect.
- c) January 1, 2008: New HVAC systems must have on-board diagnostics built in. I believe on-board diagnostics to be a better method of achieving the intention of verification than what is presented in I. A. i. of the draft specification. In I.A.i, you are telling the manufacturers how they must design their systems, believing that by doing so, the ability to readily conduct post installation verification and diagnostics will be secured. This paragraph of the specification does not accomplish this. Rather, it

would be better to just tell the manufacturers what the capability has to be, then let each one figure out for itself how best to accomplish it - similar to what you have in I.A.ii.

d) I would not go beyond these criteria for now. In fact, you may not want to specify all of these criteria. I would recommend making this decision based upon feedback from the manufacturers and contractors.

5) Options for Field Verification - Ultimately I believe you should go with a form of Self-Verification (per II. 6 of the draft specification) simply because implementation at the lowest level possible is almost always the most efficient and effective, and of greatest satisfaction to customers. Contrast this to the other end of the spectrum where a federal agency (EPA, Option 5) is proposed as the source of field verification. I do not believe a federal level agency should go down to the level of signing off on the performance of an individual system at a private residence. EPA is not set up to do this, nor do I believe it ever wants to be. Essential to making field verification feasible is the development of educational and certification infrastructure. To satisfy yourselves at the federal level that the program is or is not delivering what it was designed to, you can hire certified professionals of your choosing to conduct checks on selected homes. Simply advertise on the EnergyStar website that you would like to conduct free, independent system checks of residences that have had an EnergyStar qualified system installed within the last 3 months (or in whatever time intervals you like). Interested owners then apply on line and get whatever you want to give them as an incentive. As you receive applications, you can randomly select installations and direct your local certified professionals to conduct the test and render their reports. Based on the outcomes, you will know how effective the program is and where its shortcomings are. The shortcomings can then be fed back into the educational infrastructure. **I have to say that I strongly disagree with the captioned premise in III. 6 of the specification that self-certification provides the least probability of increased efficiency.** Implicit in this statement is that the higher the level of oversight, the greater the probability of results. I believe it is just the opposite. The key, of course, is proper education. When properly trained and educated, people will do things the right way. I do agree that no certification will guarantee the desired results, but it is the best single factor toward a guarantee. Certainly, there is nothing of value in the electronic submittal of a report to EPA and its being "analyzed" from afar. Nor do I believe EPA/EnergyStar is set up to process what would amount to hundreds of thousands of submittals each year, or to keep files on thousands of contractors, or the hundreds of thousands of follow-up phone calls that would be generated. If submittals to EPA were required, I believe support for the program would rapidly diminish - just because implementation would prove untenable. At your level, it is important to keep things high-level.

6) I don't think a "label" should be used. True, everyone likes labels on their hardware, and there is a very attractive symbolic aspect to having a label, but I believe the qualifier is what you call the commissioning report, signed by the NATE installer. It is the performance that makes it qualified, not the label. If you have the label as the seal of qualification, you will run into implementation problems. First is where you put the label - outside or in? If you put it outside it will be worn away by the elements. If you put it inside, where do you put it? No matter where you put it, it cannot attest to what is inside. Only the commissioning report can do that. It has the model numbers and the actual performance. The customer can keep the report in his files along with his invoice and owner's manuals. Secondly, if you have a "label" that is affixed somewhere, you have to come up with a method to control distribution, and that can rapidly become involved, encumbering, and unpleasant. If you decide you must have a label, put it on the commissioning report, but I believe it is better to just avoid all of this.

7) Other Criteria to Consider:

a) Should EnergyStar require built-in pressure and temperature sensors to allow for advanced diagnostics? If EnergyStar decides to go in the direction of requiring advanced diagnostics, I believe you should define what you expect in the way of diagnostics and let the manufacturers figure out how best to accomplish it. Don't tell them how to do it, just tell them what you want done.

b) Should EnergyStar require installation of EnergyStar systems by NATE certified technicians only? If you decide to go with an installation specification, you will need some method of delivering it. That will require extensive contractor participation, and so you should ask yourselves what is the best way to reach contractors who want to participate and how to certify them. If NATE works best for you, then do so. In time, other organizations will surely want you to allow them to offer certification, and you should have a means by which they can qualify to become technician certifiers. This is all a part of establishing and developing the educational infrastructure that is essential to implementing any aspect of an installation spec.

c) Should EnergyStar require that all system components come from a single manufacturer? No. The contractors depend heavily on multiple sources to meet their customers' needs and to be competitive. If you require this, you will lose participation in the program.

If I were to summarize my input, it would be:

Phase your plans in, step by step, keeping each one as simple as possible so as to facilitate implementation and encourage participation. Include the input of the trade allies each step of the way. Let the implementation of the program take place at the level closest to the end customer as possible. Design and implement non-intrusive verification mechanisms from which you derive the information needed to tweak or revamp the program as necessary.