EQCMeeting2of2DOC19840608

6/8/1984

OREGON
ENVIRONMENTAL QUALITY
COMMISSION MEETING
MATERIALS

DEQ

State of Oregon
Department of Environmental Quality

SPECIAL EQC MEETING ON ADOPTING WOODSTOVE RULES

June 8, 1984

PETERSEN: I would like to welcome you to the special meeting of the Environmental Quality Commission, for the purpose of deciding rules on woodstoves in the state of Oregon; implementing legislation passed in the last session of the Oregon Legislature. We have only one agenda item today, and that is the proposed adoption of Woodstove Certification Rules as a revision to the State Implementation Plan.

I would like to call on Mr. Hansen to introduce the topic.

HANSEN: Thank you, Mr. Chairman. The 1983 Oregon Legislature enacted House Bill 2235 which requires the Commission, you, to adopt rules dealing with woodstove certification by July 1, 1984. The Department has developed proposed rules with the aid of a Woodstove Advisory Committee primarily representing Oregon's woodstove industry. Hearings were also held on the proposed rules in five locations throughout the state during early May. As a result of hearing testimony, the Department is proposing revisions to the proposed rules in four areas. The most significant revision is a change in the second stage emission standard to a level originally recommended by the Woodstove Advisory Committee. This recommended change would achieve between a 70 to 74 percent reduction in woodstove emissions. This revision is being proposed on the basis that downward revisions in

HANSEN: (continued) population growth projections indicate airshed improvements needs are not quite as great as first thought. Secondly, that during some additional testing of woodstoves we have found that production stove technology--the actual production models available--are not quite as effective in reducing emissions as the prototype technology that we originally tested. Other revisions include: (1) revisions in the particulate sampling method equivalency criteria, which may allow use of the Condar particulate sampler; (2) provisions to reduce emission tests from four to two tests as a cost-saving measure with an intent this be used only for low sale volume or specialty stoves--we were concerned about the additional cost on those limited production models; and (3) includes minor modifications to the testing equipment specifications. The Department proposes that these rules be adopted today in order to ensure meeting the statutory deadline of rules being adopted by July 1, 1984. John Kowalczyk and other members of the Air Quality Division of the Department are here to answer any questions you may have.

PETERSEN: Thank you. Today we have a long list of people who would like to address the Commission on this subject, and I would ask that people stay within their proposed time limit. There are several who have asked for additional time but I would like to limit testimony from any one person to ten minutes, so that we can get through and give everybody a chance to address the Commission, and go from there.

PETERSEN: (continued) By way of introduction, I would like to say that the Commission has had an opportunity to become fairly familiar with this issue. This is the amount of written material that has been generated. A lot of this, in that stack, represents summarization of verbal hearing testimony that was conducted around the state. And I can represent to everybody in this audience that every one of us up here has, in fact, been through that stack and has reviewed the summaries as well as the submitted written testimony. Which does not mean that we could take a final examination and pass it as far as memorizing or remembering every item that is in there, but I think that we have a fairly good understanding of the issues that have been raised and as much as lay people--nontechnical people--can, a grasp of the technical issues and a feeling for their complexity and the fact that apparently reasonable men with a technical background can differ on some of these issues, we accept that fact. I would like to ask that as people testify that they remain, after their testimony they remain near the microphone so that if anyone has any Commission or any Commissioner has any questions, that we can address them to you and kind of move it along in that fashion, so that each person gets a chance to have questions asked of him or her about their testimony. I would like to ask the Department members who plan to support their report to also be available for questions. The first person I would like to call is Lawrence Cranberg from Austin, Texas. Mr. Cranberg has a ten-minute presentation on the definition

PETERSEN: of woodstove and related concepts and developments.

(continued) Mr. Cranberg.

CRANBERG: My name is Lawrence Cranberg, my address is Austin, Texas. I'm here as a consulting physicist and as the owner of Texas Fireframe Company which markets a fireplace ~~vention (phonetic)~~ invention, which has been characterized as a physicists fire. It's an approved method of using a fire in a conventional fireplace. I have followed the development of the activities of this Commission in this area with the greatest interest. And I want to heartily endorse the efforts of the Commission, its goals and its achievements to date. I regret very much that I haven't had an opportunity to provide personal input prior to this time, that has come about as a result of the fact that I had a rock-solid commitment that I couldn't possibly break during the week that was reserved for public testimony. However, I have made voluminous written submissions to the Commission to which I have not yet received any response. And I believe that those materials, if they don't have any bearing on the immediate issues before the Commission, will certainly have an influence on their future actions. Addressing myself narrowly to the immediate issue before the Commission, which is the precise language of the rules, I'd like to raise a question about the definition of a woodstove. Now, the definition of a woodstove which is given in the draft rules, in a paragraph on page 4 at the bottom of the page under Item 16, it says, "Woodstove means a woodfired appliance with a closed fire chamber, which maintains an air to fuel ratio

CRANBERG: (continued) of less than 30 during the burning of 90 percent or more of the fuel mass consumed in the low firing cycle." Now, there are two key elements in that definition. One, closed fire chamber, and the other, air to fuel ratio less than 30. Now, in the accompanying Appendix I, the standard method for measuring the emissions and efficiencies of woodstoves, there is another definition of a woodstove. And I will read it. That's on page 1 of that document, paragraph 1.1.2, "A woodstove is defined as an appliance having an air to fuel ratio by weight less than 30 during the burning of 90 percent or more of the fuel mass consumed in the low firing cycle." Now what's the difference between those two definitions? Well, one of them refers to a closed container, the word "closed" I think is actually pivotal in this whole discussion; and in this other document there is no reference to the word "closed" at all. And the definition hangs entirely on the mass to fuel ratio. Well, I respectfully submit that the language which should hold, which is applicable, is one which pivots around the word "closed". And I have some reservations, I think Auckums (phonetic) Razor should be applied to the less than 30 figure. And my reason for that is that as written, the reader would be led to believe that you have to have a closed firebox in order to have an air to fuel ratio of less than 30, and that is NOT true. And as a matter of fact, that's the thrust of one of my major submissions to the Commission. I pointed out that with a "slot fire" or

CRANBERG: (continued) the physicists fire which is a fire in an open fireplace the air to fuel ratio is about 10, which is substantially less than 30. And I dare say that the Commission does not want to include my invention within the scope of its regulations. And so I would urge the Commission resolve that inconsistency, do so preferably by retaining the word "closed" and perhaps dispensing with this less than 30 altogether. Let me say, however, that doesn't, those, that remark doesn't qualify in any way my fundamental endorsement of the basic posture of the Commission with respect to these draft rules. I think that they are excellently conceived and I think their implementation could be improved. I hope that in subsequent versions of the rules, refinements will be made. And I'm sure that's contemplated by the Commission. In particular, I have strong objection to the use of the word "efficiency" as used here. "Efficiency" is a concept which warrants much more critical examination than has been given by the Commission so far as I have been able to determine. I think it's extremely important to distinguish between efficiency for the production of radiation and efficiency for the production of convected energy. Those are two completely different forms of energy, they are easily confused in the mind of the public because frequently the same units are used to measure them, mainly BTU's. That's most unfortunate because they are totally different in their physical character and in their effect on thermal comfort. And they have a vital, the difference between those two is extremely important for the design

CRANBERG: (continued) of products which are intended to use wood energy; they are extremely important from the point of view of the consumer making discriminating and sensible choices of appropriate equipment for his purposes. I regret to say that the physicist community has not been as effective as it might be in imparting to the general public an understanding of the distinction between convected and radiant energy. This is partly due to the fact that we ourselves in the physicist community have only come to have a real grasp of the nature of radiant energy in the last 100 years. It has taken 100 years for us to get a good grip on it and we haven't done the job we should have done, should be doing all along in disemanating the essentially novel and characteristic features of radiant energy and distinguish them clearly from convected energy. Because if one does this, I think you will find that once you have a clear grasp of this difference it will have a very important effect on the future actions of the Commission. I would, if I have another moment or two, I would like to call attention to the fact that this action of the Commission is actually part of a process now ongoing which is gonna have, I believe, a profound effect on the use of wood energy by the American public. This document of yours is, shall we say, Exhibit 1. This is Exhibit 2, this is the label which is mandated on all woodstoves effective October of this year, by the U. S. Consumer Product Safety Commission. I think this represents a very important step forward in the intelligent and responsible use of wood

CRANBERG: (continued) energy. Another very important development, about which almost nobody knows, is that this brochure on energy efficiency which is promulgated by the Wood Heating Alliance and which characterizes the fireplace as effectively a loser as an energy source, that this document has been withdrawn and I've been assured that it will never surface again. I consider the information which it contains about the fireplace is defamatory and completely misleading. I think the fireplace has been grossly underestimated and underrated as a useful heat source and I believe that the basic facts will materialize in due course. Some of the most important information about this was presented this past January at the annual meeting of the American Physical Society in San Antonio, where I presented the results--the most recent results--on the performance of an open fire using the configuration which I've invented called the physicists fire or the slot fire. And I'll just read a few of the numbers to indicate what the status of the technology is at the present time. An extensively tested calorimeter room gave the following average results on five rods. Fuel combustion rate is 4.5 pounds/hour (about 2 kilograms per hour). Air draw about 40 pounds/hour. Now, that's an air to fuel ratio of about less than 10 to 1. The range that you're talking about for woodstoves. Radiant energy output, you know just like talking about radiant energy output, in order to identify what it is I'm really talking about, radiant energy output on the horizontal beam, 11,800 BTU/hour. Fuel efficiency is 31 percent. Flue temperature

CRANBERG: (continued) is 620° Fahrenheit. This represents a dramatic technological advance in the use of wood energy. I think this tips the balance dramatically back toward the fireplace which has been the traditional source of heat, of utilization of wood energy. I might say that right now we're at just about the same stage that we were 200 years ago when Benjamin Franklin ardently opposed the massive intrusion of woodstoves in the American home. And he realized that what had to be done was to improve the efficiency of the fireplace, and he addressed himself to the issue. Unfortunately, astute and shrewd as he was, he was 100 years ahead of his time, he was in fact 400 years in advance of our present understanding of radiant energy, which is essential to the rational utilization of wood energy. I have one final remark to make. We talk about combustion in woodstoves. Combustion is a very simple chemical process in essence, in which you oxidize a hydrocarbon and you produce carbon dioxide and water which are perfectly harmless products. They wouldn't be a problem if we had just combustion. But we don't have combustion when we try to burn wood under airtight conditions. What we have is another process which is sometimes called pyrolysis, but the term that I prefer is distillation. A woodstove--I hope my friends of the woodstove industry won't be too offended--a woodstove is really a wood still. It's a stove still. It distills, it carries out a product, destructive distillation of wood, and essentially

CRANBERG: (continued) constitutes a chemical factory which produces hundreds of compounds which are, of course, the root of your concern. What we need is a utilization of modern means of technology which assures that we carry out a process of true combustion and not distillation. And so far the evidence indicates that this can be achieved, we can move forward with wood, not go back to wood. There is technology which is available which will enable us to make much more effective use of our wood energy, of our wood resources. Thank you.

PETERSEN: Thank you, Mr. Cranberg. Are there questions of Mr. Cranberg?

BISHOP: I'd like to ask one question if I may. That is, of this physicists fire, can it be used in existing fireplaces or are you only talking about construction of new fireplaces?

CRANBERG: No, there's, I think I can answer that question most effectively by presenting a slide which gives the, if I may?

PETERSEN: You bet.

CRANBERG: (Inaudible, because he walked away from the microphone.)

PETERSEN: Go ahead, tempt us.

CRANBERG: (Inaudible.)

PETERSEN: Mr. Cranberg, thank you very much, but I'm afraid we've exceeded our time. I would like to ask John Kowalczyk, or somebody from the Department, whether they have any comment with regard to Mr. Cranberg's statement about inconsistency on definition because I think that comment went directly to our rules and that kind of thing.

KOWALCZYK: Mr. Chairman and members of the Commission, I am John Kowalczyk with the Air Quality Division. There is a slight difference in wording in the two definitions, we would feel, however, that the controlling factor is the air/fuel ratio and that is the same in both definitions. However, we would not be opposed to inserting the words, I think I have the words written here, into the second definition in the test procedure "closed fire chamber". That would be inserted in "Definitions" or, actually, "Scope of the Test Procedure" 1.1.2. I don't think it's a necessary thing to do but for complete consistency it would be desirable probably to add that.

PETERSEN: To make it clear that this type of device would not be regulated by these rules.

KOWALCZYK: That is correct.

PETERSEN: Thank you. Are there any other questions on that point? I'd like to call Mr. Graig Spolek, the Chairman of the Woodstove Advisory Committee.

SPOLEK: I'm Graig Spolek, Chair of the Advisory Committee. I provided for you written testimony of what I'd like to say here. Basically, as you know, the Advisory Committee and the DEQ worked very closely. The recommendations before you now are from the Advisory Committee and the DEQ are virtually identical. I think that they are technically sound and workable. However, subsequent to public hearings, there was the inclusion of the "Option to Test Procedure". As I understand, the motivation for that was to provide for financial relief for small manufacturers. I wanted to point out that that option is inconsistent with the intent of the Advisory Committee and it potentially provides a loophole for manufacturers to circumvent the intent of the Advisory Committee's recommendations. Specifically, the original Four-Test Procedure was included in the recommendations not only to accommodate the nation interest that we heard, but to close what we perceived as a potential loophole whereby a particular woodstove manufacturer could, in a sense, tune a woodstove to perform very well at a specific heat rate but not perform as well over the entire range of heating rates that it might be expected to perform at. Hence, the Four-Test Procedure was developed. In terms of the effect of the cost of that procedure on manufacturers, there was no strong opposition voiced at the Advisory Committee meetings neither from within the Committee itself nor from participants in the outside. The final vote was clear, all of the manufacturers voted for the Four-Test Procedure; the small manufacturing

SPOLEK: (continued) representative spoke in favor of the Four-Test Procedure. Hence, I encourage and urge the Commission to use the Four-Test Procedure as originally recommended and delete from the current package Section 340-21-152(4) of the rules package and Section 5.8.8 of the Test Method, those being the sections that specifically allow the Two-Test Option.

PETERSEN: Could you give me those numbers again, please.

SPOLEK: They are in the written testimony that I provided for you, if you want to use that as a reference. With that, I would be happy to answer any questions.

PETERSEN: Are there questions of Mr. Spolek?

Mr. Chairman, may I ask a question on another matter, other than the regular rules?

PETERSEN: Yes.

UNKNOWN: Do you see anything unfeasible about continuing the present Advisory Committee only to be on-call of either the Commission or perhaps on-call to the Chairman? Do you see anything wrong with that procedure?

SPOLEK: I can't speak for the availability of all of the members. I think that their devotion to this point indicates their commitment to the problem. I think as a Committee we

SPOLEK: (continued) perceive that we may be asked back at some point in the future to review what has transpired over some period of time through which the test procedures have been developed, and the initial results have been accumulated. There may be an advantage to asking an Advisory Committee to reconvene, if it be this same Advisory Committee or not is not up to me to say.

PETERSEN: Would you personally be available or willing to participate in that process?

SPOLEK: Is this being recorded?

PETERSEN: Do you need to ask your wife first?

SPOLEK: At this point, yes, I would be willing to participate.

PETERSEN: Thank you. I'd like to say to you right now, and I'm sure we'll be talking to you more this morning, that we really appreciate what you've done and the rest of the Advisory Committee and the countless number of hours and days that have been spent in going through this process. We, as a Commission, appreciate that very much.

SPOLEK: Thank you.

PETERSEN: Thank you. I'd like, while you're still up there, Graig, while we can maybe take this Two- versus Four-Test issue and develop it out with questions. Anybody on the Commission have any questions about that? The Two- versus Four-Test.

UNKNOWN: (Inaudible) ask John Kowalczyk.

PETERSEN: Right. Whoever from the Department wants to address that point and respond to Mr. Spolek's comments. We know what you've recommended in your report to us, and we'd like to give you an opportunity to expand on that if you'd like.

KOWALCZYK(?): Mr. Chairman, it's true that the Advisory Committee and, as we perceived it, the woodstove industry favored the Four-Test strictly as the requirement in the rule with no other options on the basis that it would save them money in the long run, as well as provide consumers with the type of information needed to operate their stoves at an optimum level. Since the time of the Advisory Committee actions, we are getting comments from the woodstove industry people, at least some of them, that the testing costs are gonna be excessive particularly for those manufacturers that may have many models. And the type of information we're hearing is the fact that maybe a manufacturer has 4, 6, 8 models and only 2 of those really represent the major sales. They got a few others that are for very specialized installations or sizes and that type of thing, and they just are very

KOWALCZYK(?): (continued) concerned with having to spend the full amount of testing costs for those type of limited production type models, or antique stoves even would fall into that type of a category. So we thought this was possibility of giving some relief to those manufacturers. There are problems with that particular approach, in that our rule does not provide criteria to determine where you draw the line; when a manufacturer falls into this category. We tried to develop criteria in the limited amount of time that we had to make modifications to these rules, and it looks like it would be a bigger job than time we had, so we don't have a criteria in the rules. We're trying to set out a policy saying that manufacturers should only use this in these limited cases. If it becomes abused, or if a lot of manufacturers use that option, we do feel that it would hurt the effectiveness of the program. So, our only remedy that we offer to that is that if we do see it start to be abused, that is, too many manufacturers starting to use this option then we would urge the Commission to either repeal that or try to develop some specific criteria. So that's kind of trying to resolve a problem as we see it starting. I think the Chairman of the Advisory Committee is saying -- Don't let the problem start -- so that's probably something that you would have to make a decision on.

BISHOP(?): Is it possible to go the other way, and start with four and then if you find that there are some stoves so limited that only a very few people ...

KOWALCZYK: Well, certainly it is, it would require a rule change, though, to ...

PETERSEN: How about just a variance?

KOWALCZYK: That's a potential ...

PETERSEN: How about if you came in and said, "Gee, we've got evidence now that these models 1, 2, 3, 4 in our view would warrant two tests." ...

KOWALCZYK: Sure. Sure. That's ... I think so, ...

PETERSEN: We could pass it on a variance basis ...

KOWALCZYK: I think that would be eligible and they'd have to prove the criteria that's in the statute for variances.

BISHOP(?): (Inaudible) good way to go.

PETERSEN: Because, isn't it true that the, this is a consumer-oriented issue as I understand it. We're trying to, well it's part I guess a consumer-oriented and partly reduction of pollution as well, but we're trying to give the consumer

PETERSEN: (continued) as much information as possible on the full range of performance of his or her stove. And it would seem to me the consumer would not only want to, but need to know that same information with regard to these lower production models as well, isn't that true?

KOWALCZYK(?) OR SPOLEK(?): That's correct.

PETERSEN: So the consumer aspect of it is, primarily what you're looking at is some kind of economic relief to lessen the burden of this whole economic burden on the woodstove industry. Any other questions on that point? Thank you. Jeanne Roy, League of Women Voters of Portland.

ROY: The League of Women Voters of Portland believes that all segments of our society must share in the responsibility for cleaning up the air. Therefore, we see the woodstove rules as a very important step. We would heartily support these rules if they were amended to implement a strict standard by 1986. In their present form we don't think they will do enough to clean up the air. The claim that they will bring about needed reductions in particulate pollution by the year 2000, we feel is overly optimistic. We question the following assumptions which support this claim:

ROY: (continued)

(1) That stoves will be replaced after 15 years. Because most stoves purchased in the late 70's and early 80's are not used as the main source of heat, we do not think they will necessarily be replaced after 15 years.

(2) That 100% of installed stoves will be certified. Because of the higher prices of certified stoves in Oregon, some stoves will be purchased out-of-state. DEQ predicted that this would be from 0-10%. Fewer choices of stove models and the fact that used stoves need not be certified will stimulate a used stove market. Yet, DEQ has not altered the 100% figure to take these projections into consideration.

(3) That stove owners will replace catalysts as they deteriorate. American consumers simply do not take the time to maintain their appliances as they should, even though it would be to their advantage to do so, in the long run. And we think it is extremely unlikely that they will remember and be willing to pay the price to replace woodstove catalysts in a timely manner.

(4) That the performance of new stoves will remain at a reduction level of 70-74% throughout their lifetime. EPA experience with automobiles makes us skeptical of this assumption. Auto emission controls were not nearly as effective as the tests had predicted.

ROY: (continued)

(5) That people will operate their stoves as cleanly as emission tests predict. The noncatalytic certified stoves will be more complicated to operate than the old stove, and, therefore, we feel they will be less likely to be operated as tested. We believe that if the staff had made more realistic assumptions and had come up with an emission reduction figure of 60-65%, that you would see the urgency of implementing the strict standard by 1986. We urge you to amend the rules to prevent the two-year delay.

PETERSEN: Thank you. Are there questions for Mrs. Roy? The Wood Heating Alliance is represented today by their attorney, Richard Bach, who has a statement to make and then he has five people from the industry who would like to speak to the Commission. We will take all of those people at one time for continuity of presentation. Mr. Bach.

BACH: Thank you. Mr. Chairman and members of the Commission. My name is Dick Bach, Richard Bach. I am a lawyer with the Portland firm of (inaudible), Boley, Fraser & Wyse (phonetic). As you have indicated, Mr. Chairman, I have here with me four representatives from the local woodheating industry. Betty Hume and Paul Tiegs, both of whom were members of the Woodstove Advisory Committee, and Dan Melcon who is a local distributor here in town. I have given the clerk a copy of a written statement that we have.

BACH: (continued) There are a number of copies of it and attached to that written statement was a study that we recently had commissioned in connection with this matter. Rather than read that written statement, in the interest of saving some time here today, I prefer just to make a quick summary of our position and then let our people here, this panel, be available to answer any questions that you might have. First of all, during the entire course of this proceeding we've had some really nagging doubts about some of the assumptions being made by the DEQ and some of the data being developed by the DEQ. Now, we're not here to say today that the DEQ data is wrong or that the DEQ assumptions are wrong, but this latest study that we've had prepared indicates that there are some real questions about those data and those assumptions. And we think that this Commission ought to be looking a little bit further. This decision that you are about to make today will have some very long-range and far-reaching widespread effects. Once you embark upon this program, because its results won't be seen for a long, long time, you ought to make sure that what you are doing today is gonna be correct and won't preclude you from making midcourse corrections or changing your position as we get down the road and we see what's happening in the industry actually. As I indicated, we had two sets of doubts about DEQ data and assumptions. So, we commissioned this study by Dr. James Manning, who is a marketing consultant and professor of marketing at Portland State University, to

BACH: (continued) do a survey of woodstove users and woodstove using habits around the state. He did a sample of approximately 400 interviewees which, I'm not a statistician, but I understand that 400 in an issue like this is a fairly good sample and gives a very good representation of the attitudes and the understanding of the public. I indicated we had doubts in two areas. One, we had the doubt that we, and we documented this in our previous submissions to you, the written submissions and I don't want to go into a lot of the details, but we had doubts about the emission rate that the DEQ was using as a starting point on which to base the new emission standard that would be developed here. The DEQ has indicated that it feels that existing stoves are emitting at an average rate of about 30 grams per hour (gm/hr). Now, I don't want to go through all the numbers by which they reached that or the numbers by which we feel that that 30 gm/hr is much too low. All of the information that we have indicates that it ought to be somewhere up in the 40's or 50's, the emission rate. If it were around 50, if you would apply the 75% reduction to that you would get a much higher emission standard than the DEQ is recommending. What I would like to suggest is that that emission rate, that 30 gm/hr baseline emission rate, would require that the average woodstove in the Portland area be burned for 12 hours <u>every</u> day of the 180-day heating season. And that, I think your own common sense will indicate to you that that should be questionable. Whether

BACH: (continued) all those people out there burning their woodstoves, there are about 85,000 woodstoves in the Portland area and we know approximately how much wood is being burned, but this, that rate would have to indicate that the average woodstove in Portland is being burned 12 hours every day for every day of the 180-day heating season. If you just reduce that average to 8 hours per day, it would result in a 48 gm/hr emission baseline rate rather than 30 gm/hr. Then if you apply the 75% reduction to that you come up with more in the neighborhood of 12 gm/hr, which would have to be the emission rate standard rather than 9 gm/hr standard for noncatalytic stoves. In any event, the information in this study by Dr. Manning which questioned woodstove users about their woodstove using habits and practices indicates that people just don't burn their stoves for 12 hours a day over 180-day heating season. That's one point where we think that there's more data necessary to be developed before you embark upon this course of action with a very stringent standard. Now, the second point where we had some real concerns, and again, the concerns were a gut feeling in the industry that something's wrong here, that something just isn't going to work, or something isn't working. And again, the Manning Study gave some surprising results. The entire basis for this program is that, as the lady from the League of Women Voters indicated, was that DEQ assumption that over a period of time those dirty stoves that are now in existence out there polluting the atmosphere will eventually be replaced with new, cleaner burning stoves

BACH: (continued) which would cause a significant reduction in the ambient loading of the atmosphere. The same kind of theory that was adopted with automobiles. They didn't bother with the old cars, they figured eventually the old cars would be phased off the road and would wind up in junk piles and EPA mandated cleaner engines and catalytic converters so that eventually there would be a whole generation of new, clean-operating cars on the road. Same thing here. Old stoves would be left alone, eventually would be a replacement process which would get us new stoves and much cleaner atmosphere. However, again as I said, that whole program was predicated on a replacement rate over a period of time. We're concerned that a very strict standard, the 9/4 standard that is being proposed by DEQ, will have just the opposite effect. Because, you must remember that, right now about 95% of the stoves that are now on the market, the noncatalytic stoves that are now on the market, cannot meet even the 15/6 standard that is being proposed for 1986. Only about 5% of the stoves that are now being sold can meet that 15/6 standard. As far as the catalytic stoves are concerned, I'm sorry, I want to make that clear, it's ... (tape ended) ... but in any event, what this means is that if you adopt a very stringent standard, there are very few stoves that can beat that now. And the question is whether or not the manufacturers are going to bother to spend the thousands and thousands and thousands of dollars, (inaudible) to develop a stove to beat that standard for a fairly small market. We're talking Oregon has what, maybe

BACH: (continued) 1% of the population of the United States; maybe 2% of the total stove sales. It's likely that the manufacturers are gonna say it's not worth the effort to market here in Oregon, we'll just go away from the Oregon market which will leave bootleg stoves, which will leave homemade stoves, which will leave used stoves, and which will leave a very small number of stoves that do meet the standards here in Oregon at a significantly higher price. And if that is the case, if there's a very limited number of stoves available at a much higher price, the program won't work because people won't replace their stoves at the level anticipated by DEQ. People will hold onto their stoves longer, or they'll bootleg them, or they'll use homemade stoves which are unsafe and which haven't been tested, or they'll just recycle used stoves. And we won't see reduction in ambient loadings that we expect because new stoves just won't replace the old stoves. And that's my, our basic premise here today. We're not saying that this will happen because we don't know; the data just isn't available. What we are urging you is to adopt the 15/6 standard now because the industry thinks that probably there's enough that can be developed in the next two years, between now and July 1, 1986, that there will be a viable stove industry in Oregon with the 15/6 level. And then, continue to study the matter. The industry has pledged to work with this Commission and with the DEQ to develop whatever new information might be necessary, to tell you whether or not you've made a mistake or not, whether you

BACH: (continued) need more stringent standards, or whether the 15/6 standard is enough. Our studies indicate that the more realistic baseline emission rate of the 15/6 standard will achieve as much as 75% reduction of the ambient loading. And if that's what we need, perhaps we can get it with the 15/6 standard. But we could continue to study that over the next few years. Our concern is that if you adopt a more stringent standard now it's gonna send a signal to the industry that, from which the industry can't recover. Manufacturers will walk away and they won't stick around to try to do something and to try to work on these things. If you do adopt the 15/6 standard now and not go any further, then the industry can still work and develop a viable industry to make sure that there will be enough reasonably priced woodstoves in Oregon to achieve the purposes of the program, which in the long run is cleaning up the airshed. Replacing the old stoves with newer stoves so that the ambient loading will decrease. But if your program is such that you choke off the industry and you dry up the availability of stoves, a reasonable mix of stoves at a reasonable price, it won't be here and there won't be stoves available and people just won't replace their stoves. Now, there's another factor involved in that, in the Manning Study, that indicates that what real burning habits of people are. They talked about how many people burn their stoves overnight. Burning stoves overnight, as I understand it, is loading up the firebox and setting the damper properly and going to sleep in the hopes that it

BACH: (continued) will stay warm overnight and when they get up the next morning they won't have to start it up all over again with starter and all the rest of the things. There will be a smoldering fire they can add some more logs onto or wood onto and they will catch. This standard, either the 15/6 standard or the 9/4 standard, that is proposed by the DEQ is a grams per hour standard it's not tied to heat input the way the standards are for emissions from a power plant. (Inaudible) talking about two-tenths of a pound of sulfur dioxide per million BTU of heat input. This is a strict standard that goes grams per hour which means that the stoves that are gonna be able to meet this standard are the very small firebox stoves. And those are the stoves that there's just not gonna be enough wood in there to burn overnight. People are not going to accept that kind of stove as a, from a consumer acceptance standpoint. They're gonna want more, and again, it's going to lead to nonreplacement of stoves because there will only be the small firebox stoves that will be on the market. Anyway, what we're suggesting is that for all these reasons, that you ought not to embark on a program here today that will eventually be self-repeating. If you adopt a standard that's too stringent the industry could very well walk away from the Oregon market; there won't be the mix of stoves available at a reasonable price; the stoves won't get replaced over the period of time assumed by DEQ; and the program just won't work, nothing will happen, people will be stuck with the same dirty air that we have now, and

BACH: (continued) something else will have to be done. But, this more stringent standard proposed by DEQ today, we feel, just won't do the job. We urge you to continue to adopt the 15/6 standard now, to continue the Woodstove Advisory Committee either the present committee or a new committee that might be developed, whatever in your judgment is best, but to continue to allow the industry to work with DEQ and work with you to develop the more data that's necessary, to come to a real strong conclusion as to how this program ought to work and how it ought to be (inaudible). Now at that point I've spent, I think, enough time. As I've said, we have some, I'm a lawyer not an expert, ...

PETERSEN: I know the feeling.

BACH: ... we do have people here who are experts, who'd be very glad and willing to answer any questions that any of you folks might have. I thank you.

PETERSEN: Would you answer questions that we might have also ...

BACH: I'd be delighted ...

PETERSEN: If you can.

BACH: If I can.

PETERSEN: Do we have questions for Mr. Bach? I have several. In your testimony that was presented before meeting, the written testimony, you mentioned a study in St. Helens, was it St. Helens or is there some kind of ...

BACH: Hood River ...

PETERSEN: Hood River, I beg your pardon. Could you describe briefly for the Commission what that study is.

BACH: Yes. That is a study, an energy conservation study, being done by Bonneville in connection with the local utilities, Pacific Power and Light Company is involved in that and the Hood River Electric Co-op is involved in that. What they are doing is, they're going in, they're taking Hood River essentially as a test community. They're going in and insulating the houses, they're implementing just about every kind of conservation measure that might be available, in Hood River and they're going to test it and monitor it very carefully over a period of years to see just what can be done in the energy conservation, energy efficiency field in order to then implement, to decide what procedures are cost efficient and what aren't and what ought to be implemented then in other parts of the country and the northwest. And this, of course, is part of the Northwest Power Planning Council's entire program of conservation (inaudible).

PETERSEN: To what extent are woodstoves included in that study?

BACH: To the extent that woodstoves are (inaudible).

PETERSEN: I got the impression from testimony that that was an important element.

BACH: Sorry that we left you with that impression (inaudible).

PETERSEN: That's alright, I just wanted to clarify that point. We, you know, we're looking for as much data as we can get. You also made the statement that conceivably there would be no noncatalytic stoves to buy because right now only 5 percent of the noncats can meet the 15 standard and we don't know for sure that in 1986 there are gonna be many more than that. How about the catalytic stoves? As I understand it, there are stoves on the market right now that the catalytic technology is such that these standards can be met. Wouldn't they, then, tend to predominate in the market place?

BACH: I think that's probably right. As I understand it, and correct me if I'm wrong, Dan, about, there aren't very many catalytic stoves available right now. But about 50 percent of those can meet the 6 gm/hr standard, so there would be some there. The problem with catalytics is that, as Dr. Manning's study indicates and also as all of the data that is coming out of the industry--I just saw an article

BACH: (continued) the other day, Dan, do you have a copy of that June article that indicated that sales of catalytic stoves as compared to sales of other stoves--people don't seem to like them perhaps because it's a new technology. Or, perhaps because they know they have to replace the catalysts, or because they are more expensive, but for a whole host of reasons they are not selling. Now, if they were the only stove available on the market, maybe then they would sell because people would have no choice. But right now there seems to be a lot of consumer resistance to these stoves. Perhaps, this is Dan Melcon who is a distributor here in town and is very knowledgeable about the consumer and marketing aspects of woodstoves, so perhaps he could respond to that question better than I can.

PETERSEN: Okay, let me, before we get to Mr. Melcon, let me ask you the last question I have for you at the present time. And that is, your statement about the industry walking away from Oregon. I've seen that before and I guess I'm having trouble really, I guess, believing that knowing what I know about industry and about marketplaces and that kind of thing. If, in fact, Oregon is the first state to adopt rules, and other states as I understand it are looking at Oregon, it seems to me there would be other states involved, too, in the whole process and there seems to be a trend toward the regulation of woodstoves. Every state that has a large woodstove population is faced with the same kinds of particulate pollution problems as we are. So, all of

PETERSEN: (continued) a sudden the marketplace is shrinking by more than just 1 percent, it's shrinking by 1 percent times the number of states that adopt, you know, restrictive regulations. What do you think is going to happen there?

BACH: Well, I really can't answer that and I'd ask perhaps Betty Hume, who represents...

PETERSEN: Okay.

BACH: ...one of the larger manufacturers. There's a perceptive, the large manufacturers from out-of-state who are now just marketing in this state rather than selling in this state, excuse me, rather than who are marketing rather than manufacturing in this state, they could very easily walk away and just target their marketing to those states where there are no regulations or at least until those (inaudible). The ones who manufacture and market in this state is a different question. We really don't know, but there's always that possibility that if these people feel that they can do their marketing elsewhere without losing very much and without having to spend the enormous amount of money necessary to develop these cleaner burning stoves that it's gonna be an economic business judgment on their part. But, again, as I say, perhaps (inaudible).

PETERSEN: Thank you, Mr. Bach. Mr. Melcon, did you want to comment on catalytic stoves?

MELCON: Sure. My name's Daniel Melcon. I am a member of the Board of Directors of the Wood Energy Institute West which is a regional trade organization, and I also do work in the woodstove industry as an independent sales representative, and have followed this issue very closely for a year-and-a-half. Through 1983 I represented a lot of products out there including manufacturers of catalytic stoves, the ones that have been most tested by DEQ and in the marketplace for the longest period of time. And in general, to this point there is great reluctance on the part of, I think, both the consumers and the industry itself to accept this technology point-blank. Some testimony submitted by Wood 'n Energy, another trade publication, spoke to that and gave a fairly detailed comprehensive survey. They could do it more justice than I can. The reference Mr. Bach made was to another trade publication called Alternative Energy Retailer. And Alternative Energy Retailer takes a monthly survey of the stove dealers on both a regional and national basis, and monitors what sales are. And one of the things they've found is that catalytic stoves are: (1) not selling and (2) seem to be selling even less to the point that in March of 1984, the most recent month they have for it, catalytic stoves were actually zero percent of the sales. That is, of all the people responding to this survey, they hadn't been selling any catalytic stoves as opposed to woodstoves, coal stoves, inserts, kerosene heaters, retrofit solar systems, and some of these other alternative energy sources.

PETERSEN: Did they say, why?

MELCON: They don't say why here, that has been discussed at length in the other issues, and also in this survey that Wood 'n Energy magazine provided in testimony for the public hearings. But, my own feeling is that there's immense confusion in the marketplace and that's certainly one large factor. The other is that catalytic technology is extremely promising but still unproven in the field, that is, in the test laboratory we've been able to get very, very impressive results. Paralleling those results in the field with consumers operating them has been different. And then likewise with any new technology there are some bugs that have to be worked out; there are some problems. And with catalytic stoves that I've been working with, we've found a higher rate of service both due to problems with the catalyst itself; with the stove's heating as the owners think they should; with water condensing in the stacks simply because they are so efficient they use most of the heat in the stove and the temperature of the flue gasses is so low water will condense; there's drafting problems probably the most severe for woodstoves that I've seen, backpuffing of smoke. So there are all of these little things with them that need to be worked out. The problem is that if you get somebody trying something new and they have a problem with it, they kind of have a bad taste in their mouth about it and they tell others. The same way

MELCON: (continued) with the dealers, they perhaps have gotten a little more sour on catalysts and catalytic stoves as the technology has been emerging than they will be over time.

PETERSEN: Thank you. Are there questions for Mr. Melcon?

MELCON: There's one other thing that I'd like to talk briefly on...

PETERSEN: Sure.

MELCON: ...is, not, I mean I'd be happy to answer questions and input, but on behalf of a gentleman named Roger Steen (phonetic) who is from a company called Air Quality Services, in Colorado. And he's kind of an emissions air quality expert and this trade organization I work with, the Wood Energy Institute West, did hire Mr. Steen to evaluate the DEQ's model because there were a lot of questions about it. And, I've been talking with him extensively this last week on the phone. He, unfortunately we couldn't afford to bring him out here, but his contention is that the DEQ's model has been very good and generally can be supported. He finds a much greater uncertainty factor in it than the Department has indicated. He finds around a 33 percent uncertainty factor for the annual level and that you can't really even give one for the daily level, but the big change that's come up that he wanted me to emphasize is this reduction in population projections. And by talking to Portland State, myself and others found out

MELCON: (continued) that given the state of the economy Oregon isn't growing as quickly as it was projected in the mid-1970's and, as a result of that, these lower numbers need to be factored in. Roger Steen feels that the Department of Environmental Quality, when they factored in this lower population growth, only factored it in in one place; that is, woodstove use, woodstove emissions. Whereas, if you have less people, you are going to get less pollution of all other sources and that other sources that truly need particularly addressed were road dust and kind of background noise, other sources of particulate that can't be attributed to a specific source. And these two sources are right now about 25 percent of the emissions of the TSP, total suspended particulate, in the Medford airshed, the area we're most concerned with. And, that projections are that by the year 2000, to meet this standard of 60 micrograms per cubic meter, these will actually grow to about two-thirds of it or a fortieth of 60 parts of particulate. And, so these are gonna be a much bigger source in it but if you have less people you are going to have less background noise and less road dust, and he ran through an entire model and showed that rather than the 74 to 78 percent airshed improvement DEQ now contends is necessary, it's more in the range of 66 percent. And, I asked him to check back with the Department to see what they thought of that and he told me, well, they felt maybe a strong argument could be made there but they interpreted it differently. I checked with the Department, they didn't use the word

MELCON: (continued) strong; they said an argument could be made for that case, but they don't feel that necessarily that should be, you may not get that reduction in road use or background particulate. The only point that really brings up to me is, again, the great uncertainty we have with this aspect of it as well as many other aspects of it.

PETERSEN: Thank you. Betty Hume of Klickitat Enterprises, Inc. and also a member of the Woodstove Advisory Committee.

HUME: My name is Betty Hume. Mr. Chairman and members of the EQC, I was asked I believe to address whether manufacturers would withdraw from this market. I can't speak for other manufacturers, that's a business decision, of course. I am a distributor of Kent Heating Products which come from New Zealand so I really can't say what that manufacturer would do either. They would certainly consider all aspects of it. I really was not prepared to make a formal statement, only to be a member of this panel.

PETERSEN: Okay, fine. Let me ask you, Mrs. Hume, this proposal that's been given to us for consideration has been labeled the DEQ proposal and that's true, but it also is the Woodstove Advisory Committee proposal and you served on that Committee, is that right?

HUME: Correct.

PETERSEN: And, did you support the 15/6 and 9/4 standard...

HUME: Yes, I did.

PETERSEN: ...vote in favor of that?

HUME: Yes, I did.

PETERSEN: Do you still support it?

HUME: I do support the standard. I particularly, however, would like to say, with the Manning study and with the new population numbers, I would urge the Commission to possibly reconsider the 9/4 and, to reconsider the 9/4 and to use the 15/6 and to allow us time to collect data and to be able to take a good look at it and then see what is necessary for the 1988 standard.

PETERSEN: You represent a manufacturer. When you were serving on the Committee and deliberating on this particular issue, what discussions arose as far as the available technology and what conclusions did the Committee come to as far as available technology in 1988, how we're going to get from here to there. You must have reached some conclusion to come up with a 9/4 secondary standard. Somebody must have said I think we can do it. What were the basis of that conclusion?

HUME: Actually we started with a 20/10 recommendation to the DEQ. And we were encouraged to really reconsider that as that would not be acceptable to bring, in order to, would not reach what they considered to be the necessary reduction in airshed or the 80 percent. So, we did a lot of negotiating with industry and regulators and really did work together well. The last day was a grueling day of compromising and we did compromise down to the 9/4 feeling that it was absolutely the bottom line that anyone could go. It would be, however, it would be impossible to say that any stove at that time could meet a 9/4 because they had not tested to that protocol of a noncatalytic. I do represent a manufacturer that has a very clean burning stove. I sat on the Advisory Committee representing the retailers also, that's who I represented, not a manufacturer in that position. We certainly will, and we are working as far as a manufacturer to reach that 9, however, I cannot tell you today that that's possible.

PETERSEN: You're not there yet.

HUME: No.

PETERSEN: Alright. Well, I was just wondering because I just wanted to try to discern whether there was, whether the Committee which made this unanimous choice with one abstention and one person absent, whether they were, whether the Committee now is changing their mind or trying to tell us that the

PETERSEN: (continued) decision they made was, they think, not right or, I'm trying to put everything in the right perspective.

HUME: Well, I would just, I really would like to say that I feel with the new data that is available, that has become available, that I feel there is more data there on burning, how people burn their woodstoves, and I think we should really have an opportunity to take a look at that before enforcing a strict standard of the type the 9/4 would represent to the industry, or to the state, the consumers. I, that always can be set, whatever is necessary, it might be more than that, so I would just urge them to take their time and allow us to see what the results the 15/6 will have.

????? Mr. Chairman, I'd like to ask Mrs. Hume, you indicated that there was negotiations. Was that between manufacturers or primarily between manufacturers and DEQ?

HUME: Well actually the DEQ sat, of course, as advisors, so the other members of the Committee many of them, of course, felt that it should be far stricter than, obviously, a manufacturer was going to want it to be. My position as a retail representative of the retailers was that it would not offer the retailers enough product to have a healthy retail outlet. And the retailers that are in business now are well educated; they are doing a wonderful service to the public as far as training them on how to burn, how to

HUME: (continued) size a proper stove to their home, safety installations, furnishing them with bonded, proposing bonded licensed installers to install the stoves, not forcing those stoves into a situation where there won't be that type of a retailer to service that industry. So, the negotiations were done based on just coming up with a unanimous vote was the main thing. So we could bring to you, showing that we were a unified effort in wanting to do something that was right for the state, consumers and the industry.

????? (inaudible).

HUME: No, I do not.

PETERSEN: Is it because your company does not manufacture one?

HUME: Correct.

BISHOP: Could you tell us what standard your stove does meet at this point? Is it a, well, what you could meet at, by 1986, would you go below a 15/6?

HUME: We tested to the originally proposed standard based on a different burn rate, of course, and did pass that. The Kent stove did pass that stove. Right now, we have done some testing and I feel quite comfortable to say that we no doubt could pass the 15, we have not tested to the exact protocol because it has really not been accepted.

BISHOP: Would a 12 be impossible to meet by 1986?

HUME: It would be much easier to meet than a 9. Mary, I'm, I just can't, I really can't say, I would almost have to call on the testing lab people here to answer that.

PETERSEN: Sure. We'll give them a chance.

?????: (inaudible).

PETERSEN: Alright, we have Mr. Tiegs, would you like to come forward for Omni Environmental Services. Mr. Tiegs was also on the Woodstove Advisory Committee.

TIEGS: Okay. I'm Paul Tiegs with Omni Environmental Services. I, like Betty, don't have a prepared statement, but I am available for questioning.

PETERSEN: Commissioner Bishop, did you have any questions?

BISHOP: Well, I wondered how many stoves could meet, whether you had any information on how many stoves could meet which standards by 1986.

TIEGS: At best now we have (inaudible) we do have actual data on stove types, but to extrapolate that to what is in the market presently is difficult. But I would say of the noncatalyst stoves for the 15/6 standard, you're still

TIEGS: (continued) looking at less than 10 percent of the number of models out there would pass. If you go the 9, I don't know of any at this time that have a firebox that could hold more than an hour's worth of wood that would pass. On the catalyst side, because there are still some out there that are not engineered to the best, the optimum, right now I would guestimate that there would be 50 percent of those on the market now that would not pass the 6 standard.

BISHOP: I think I have a little confusion, people aren't buying the catalyst, catalytic stoves that they're leery of them for some reason, and yet the smaller fireboxes you have to fill it up every, you're saying, every hour or every...

TIEGS: Yes, well those stoves are not selling either from what I understand.

BISHOP: I can't imagine how they would sell if you have to run to the stove every 15 minutes.

TIEGS: That would be correct I would assume.

PETERSEN: Let me ask you, there's been an indication, I think Mr. Bach indicated, he used the terms enormous (inaudible) costs thousands and thousands and thousands of dollars. I haven't seen any testimony or evidence of what he means by enormous or where he comes from in that comment other than just speculation. Perhaps you could comment on what kinds of

PETERSEN: (continued) engineering changes would have to be made to the noncatalyst stove to make it more efficient, what kinds of things are we talking about? Help me quantify this problem of, that the industry is going to have over the next two to four years.

TIEGS: Well, to make the 15/6 standard, the actual costs and what would amount to the change in the stove design would not be that terribly high I would estimate. But to make a 9 standard, this would take some new kind of technology other than catalysts. I don't know what that would be at this time. There are stoves now that have forced draft which would require some kind of electrical input to run a fan, to operate. Pellet (phonetically) feed type, automatic feed, systems to go along with that would manage, I would estimate to get emissions below the 9 level...

PETERSEN: ...because you have a small box and you'd overcome the inconvenience of that with an automatic feed, is that the...

TIEGS: Yes. With that kind of system able to control your air rate along with your fuel, control the air fuel ratio.

PETERSEN: I see. You're not aware of any studies going on right now with manufacturers that are aimed at this forcing technology?

TIEGS: No, I, there are some companies working in that area, but to my knowledge there are none that have managed to bring that 9 level.

PETERSEN: Okay. You supported the 15/6 and 9/4 recommendation to the Committee?

TIEGS: Yes, at that time, with what we had available for interpretation.

PETERSEN: Thank you. The other person in that group, John Powell of Wood Energy Institute West, requested five minutes to address the Commission. Mr. Powell.

POWELL: Thank you. Mr. Chairman and members of the Commission, I want to digress just one moment, if you would, to compliment your new Director of the DEQ. You probably read where the manufacturers in the woodstove industry has been violently opposed to everything that's gone on and had all kinds of bad feelings. I think that's been exaggerated. In fact, Mr. Hansen has gone out of his way to listen to us and there have been times when I thought he needed a hearing air while he was listening, but he did go out of his way and I think has done an excellent job for you people in trying to bring good information to you. And I would compliment him for that. Just a few years ago when I sat in some decision making roles, it was, we were told that we should be splitting wood instead of atoms. And today we

POWELL: (continued) are going to set out a course that's going to effect the woodstove industry not only in Oregon, but nationally. It is an important decision that you are making today, and it has widespread ramifications for many, many groups of people. You've heard today about the uncertainties and I want to talk just a couple of minutes about some certainties. A 9/4 standard is a catalytic mandate. It's a catalytic mandate for most manufacturers. There may well be some large manufacturers who could someday create a stove without a catalyst that would reach a 9, but I can guarantee you they are large, large manufacturers and there are very few of those in the world. One manufacturer, or representative of a manufacturer, told me that they have two million dollars into a stove right now that would meet the 15, but would not meet, wouldn't come real close to the 9. So, you're talking about a sizable investment to get to a new technology that would meet that. So I think industry-wide, or in general, the 9/4 is a catalytic mandate. And as was testified to earlier by another witness, from the League of Women Voters, that technology has a ways to go and it depends upon consumer acceptability and consumer maintenance. I would suggest to you that one of the reasons people are not attracted to the catalyst stove is that it does require maintenance and they're told that going in; it requires a higher purchase price because that price is built in to the new price of the stove; it requires the cash outlay when you replace that, if in fact you do. But perhaps more dangerously to the air quality

POWELL: (continued) in the future, is that a catalytic mandate at this time is going to shrink the reservoir of research that will go into noncatalytic technology. And I don't think we want to do that. We've been, the woodstove people have been compared to the automobile industry, and again I caution you against that kind of direct comparison. These people are not stonewalling. A 15/6, as Mr. Bach testified, a 15/6 standard creates a revolution in this industry. And they're basically agreeing to that revolution. It eliminates, when you walk into a retail store today, it eliminates almost every stove in there. So this industry is not coming to you and saying--no it's not our responsibility to help clean up the air--it's the opposite. They feel it is their responsibility. Of the woodstove people on that Advisory Committee, all but one that I know of supported the legislation that passed last Session. The one that was opposed to it retired from his position and was replaced in midstream by someone else who did support that legislation. So you are hearing from the progressive side of that industry, and they are concerned about the environment and they want to help. But it is a certainty that a 9/4 is a catalytic mandate and I don't think we want to go that direction. It is also a certainty that the highest requirement for air quality improvement is needed in Medford and Portland. This regulation is going to effect the entire state and the consumers throughout the entire state. And it is simply no question either that the costs of stoves are going to go up dramatically as a

POWELL: (continued) result of this regulation. Again, we can keep the regulation as reasonable as possible; it will allow a wider variety of stoves, more competition in the marketplace, and thus, a better price to the consumer. I think the most important thing is the replacement issue. If, in fact, the dirty stoves that are currently on the market are going to be replaced, there is going to have to be a reasonable number of stoves available in the marketplace. That's why I believe your staff is correct in their analysis, that this phased standard is necessary. It will keep a few more stoves on the marketplace. To go straight to a 12/5 or a 9/4 standard would eliminate virtually all stoves as we know them in the marketplace today. I think it is also important that you continue an advisory committee into the future and I would urge you to do so, and make that as part of your rules. In conclusion, I would just like to say, again I would like to reiterate our appreciation to your Director and the staff as have responded every time that we have called. We do disagree in some areas, but they have responded and I appreciate that tremendously. That the 9/4 is a mandate for catalytic technology, I think that, and we think that is in error. With that I would just stop and answer your questions. I might also add that I represent the Wood Energy Institute West, as I should have said when I began, and I did work throughout the Legislative Session on this issue and instead of having that much when I recently moved my office I had three cardboard boxes full of paper.

PETERSEN: Thank you for not submitting all of that.

POWELL: Yes.

PETERSEN: Any questions for Mr. Powell? I appreciate your comments on Mr. Hansen and the staff.

?????: One question, Mr. Powell. I'm not sure about this at all, but my understanding is that at the last Session there were several representatives of (inaudible).

POWELL: I think they, at that time of course, they were trying to represent the fact that the catalyst was on the move and they were improving it. And they have, in fact, done that since the Legislature adjourned. They've tried, as other I think catalyst producers have, several new designs...(end of tape and start of new one)...to consumers that that 25-cell catalyst has been breaking up. Since, I understand, they've gone back to the 16-cell with a 12,000 hour life instead of a 6,000 hour life. So they have made those kinds of improvements. One time in my office I had several people from Corning, during the Session, and they told me at that time they had about 34 stoves with catalysts on it and the standard we were talking about at that time was less stringent than this one because it was based on what people were thinking of as a different burn rate. And they told me at that time that of those 34 stoves fewer than a handful would meet that standard. So, I think there is really some

POWELL: (continued) question as to how many stoves with catalysts on them would meet this proposed standard at 6. Mr. Tiegs has testified that perhaps as many as 50 percent would, but simply because a stove has a catalytic device in it does not mean that it's going to meet these standards.

BISHOP: Could I ask one question on the heating efficiency--is there any difference between a catalyst, catalytic stove and the regular box stove on the heat efficiency, and also on safety where, are there any, is there any information on those two factors? Because I think that is (inaudible).

POWELL: Efficiency, I think without question, the fact that you are reigniting particles inside the stove you are creating more heat and thus, a more efficient stove with a catalytic device in the stove. And I think most of the literature, and your staff has prepared many schematics on the increased efficiency, and I think that varies some. But it is universally held, I believe, that a catalytic stove would be more efficient simply because you are having more complete combustion. Safety-wise, the only way a catalytic stove would be safer would be the contention that there is less creosote build-up in the chimney system. I would guess if in fact there was a chimney or creosote build-up and you had that catalyst in there at a high temperature that might well in fact create a hazard, I'm not sure. But the bottom line is that people need to hire chimney sweeps. And if you want something to compare whether or not people

POWELL: (continued) would actually replace a catalyst, people in this industry tell me that they have trouble getting people to lay out the cash to have their chimneys swept, which could actually save their lives, let alone simply picking up a $100 or $70 to go down and purchase a new catalyst. So, I think there is some question there. If all people who purchased catalytic stoves made that decision themselves, they want that catalytic device there, I believe you'd have a very high replacement rate. If you simply force that on people, say everybody will have such a device in their stove I question whether or not you will have that kind of replacement rate unless perhaps they are all paying market price for their wood, and then they might do some penciling to see if it would pay off over time.

PETERSEN: Mr. Powell, you made the statement that the 9/4 standard in your view would be a catalytic mandate, and the implication I got from the way you said that was that would be bad.

POWELL: Yes.

PETERSEN: And, I'm having a little trouble still coming to grips with why new advancing technology that can get the job done even though it's different and even though it has bugs in it right now, but still represents the best opportunity to meet emission standards, why that would be bad. Could you help me understand that?

POWELL: Yes. First of all, it requires maintenance by the consumer. And the air quality improvement that we're going to see as a result of these rules will depend not only upon people buying that cleaner burning stove in that case, but also will depend upon them replacing that device.

PETERSEN: But aren't the, don't the standards take into account the degradation of catalytic performance? I thought that was part of the, one of the assumptions.

POWELL: Yes, it is, but that degradation factor that is figured in there does not contemplate people not replacing that combuster. A combuster has, begins degradation immediately. And over the lifespan of 6,000 or 12,000 hours, it goes from 100 percent efficiency down to a much lower efficiency very quickly and then levels off for a time, but eventually will lose its ability to render the service that it's originally provided. That's the degradation factor that the staff has plugged in to the rules. And I might add that, of course, the rules use a combuster for testing and the protocol was only 50 hours on the combuster. But, again, we're not arguing against that emerging technology, we're simply saying that the consumers have shown across the country that they want more than one technology. And if a consumer wants a stove that does not need replacement parts during its normal lifetime, I think the marketplace should offer them that kind of stove. And a 15/6 standard does in fact do that. It will cut emissions by more than

POWELL: (continued) 50 percent, offer only those stoves for replacement of existing dirtier stoves and we can get on with this with more available stoves.

PETERSEN: Back to that question I asked you. Is it, are you saying that the, once this catalyst burns out or whatever they do, that the consumer then just won't replace it and as a result of that we'll be losing ground. Is that the argument?

POWELL: I think if the catalytic stove is the only stove available basically, that you will have a high incidence of nonreplacement. It requires you to do a couple of things. Number one, to know when, in fact, it is been used up, the catalyst itself. There are devices that you can purchase in addition to plug into the stove that will indicate that to you. Secondly, it requires that you either reach in and take it out or hire somebody to do that. And thirdly, it requires you to pay the purchase price, and on the 12,000 hour combuster I believe I've been told they are about 35 percent more expensive than the 6,000 hour combuster which would, I think we could all agree be a minimum of $80 probably well over a $100 for that purchase. Now, why do people buy woodstoves? They buy woodstoves to reduce their cost of living. And, if every two or three years they're required to put $100 into that stove, they're going to question that. I don't think there's any doubt, there's

POWELL: (continued) no doubt in my mind, and I guess we just have to use our backgrounds and our basic common sense to come up with where we think that replacement level might be.

PETERSEN: Okay. Thank you. Mr. Bach looks like he has something else to add; go ahead.

BACH: One last thing, Mr. Chairman.

PETERSEN: Sure.

BACH: After I introduced our panel originally, we were joined by Dick Sparwasser who's also a member of the Woodstove Advisory Committee, and who's the largest Oregon manufacturer of woodstoves. And also, Kurt Rumens from Lopi, which was one of the largest and best selling nationally and in Oregon. And they could probably answer any questions that you might have on those R and D costs, that you raised earlier; just what the companies are spending on R and D costs to lower their emission rates.

PETERSEN: Certainly. Yes. Mr. Sparwasser, did you want to ...

SPARWASSER: Thank you. My name is Dick Sparwasser and I'm from (inaudible) Corporation, manufacturer of woodstoves here in Portland, Oregon. I was a member of the Advisory Committee from about the one-third point on; replacing a gentleman who retired. I, like others here, have not a

SPARWASSER: (continued) prepared statement and have followed Mr. Bach's reading. I can answer questions that you have that were not able to be answered by those people.

PETERSEN: I think we're interested in R and D efforts, the extent of R and D that would be required to (1) bring a noncat stove up to a 9 standard by 1988, what kind of technology do you think would be necessary to do that, and I realize it's really difficult to put price tags and engineering man hours and all that, but just your comments on that; and I also would like to know (2) whether your company makes a catalytic stove and if not, will you in order to compete in that growing marketplace.

SPARWASSER: Okay. Let me pick part of the middle of the question first and say that we manufacture both catalytic and noncatalytic woodstoves. In electing to proceed, or producing catalytic products, it was based on our attempts to meet earlier proposed standards in a noncatalytic form. Finding what the apparatus required, it becomes more of an apparatus than an appliance to meet consistently low emission rates. It had numerous drawbacks in manufacturing in the size of the firebox that could be utilized and the length of burn time that the marketplace would accept for a woodheating device. Several years ago, we parted from that and followed the catalytic avenue and have since marketed a product this past year on a national basis that has not been tested to the latest protocol, it has not been tested to the latest

SPARWASSER: (continued) emission standard, as a manufacturer it is impossible to test and keep up on a week to week basis, as the Adivsory Committee we were making changes and costs just prohibit it. The success of that product has been not of the level that we had anticipated. The cost to the unit is substantially more than what a standard noncatalytic, nonclean burning woodstove of today's technology, generic stove, you could use that term, which is sold in the marketplace. So, price-wise, it was noncompetitive, is noncompetitive, and only those people who elect to take the advantage of this catalytic product, the cleaner burning and higher efficiency, the lower deposits of creosote formation, safety basis, have chosen that. But you are looking at a product that is 33% more expensive than an almost identical product without a catalytic system, not just a catalyst, but a catalytic system installed. That consumer's choice has been to date, for the standard product. We started developing clean burning products just after the legislative meetings. I cannot give you a total figure over the last three years that have been poured in to this. I know strictly on the one product in its final year of development, because it comes in last year's R and D category on the financial statement, it was the only product being tested at that time, and the development of marketing material for that was well over $100,000 last year. As a large manufacturer, even to us, that is a burden for a small return in testing a product in the marketplace that has not been highly received. It has been tested to

SPARWASSER: (continued) earlier standards and protocols and shown to achieve exceptional, say, reductions in what the generic stoves on sale today are able to produce.

PETERSEN: Do you see a possible decrease in the cost of catalytic systems over time as we get better at producing them and learn more about how to make them more cheaply?

SPARWASSER: Well, as far as the catalyst itself, the product itself is proprietary to several different manufacturers and to that industry, and even that industry themselves I'm not sure do the whole manufacturing of the product. Corning, I know for a fact, only manufactures the substraight (phonetic) and has to subcontract out to have the washcoat and the catalyst applied. The other manufacturers may do so likewise. The new substraight that Corning has announced just after the Advisory Committee adjournment was a supposedly strengthened version that had longer life and was offered to us as John Powell had said. Our offer, I believe, was a 40% increase. As a manufacturer dependent upon only this type of technology and only a (inaudible), if that becomes a mandatory product, those manufacturers of that product may be in the controling seat as to whether the cost of the product goes up or not. Corning has continually claimed that they lose money on every catalyst that they have sold over the last five years. They are a large corporation and it's a small portion of the business, but if they become in a position of power where only that

SPARWASSER: (continued) technology can be used, they may be able to strengthen their financial picture by requiring a higher price of the product.

PETERSEN: Other questions? Thank you. Mr. Bach, is that to conclude--we have no other questions of your group--does that conclude your Wood Heating Alliance presentation this morning?

BACH: That it does Mr. Chairman.

PETERSEN: Thank you.

BACH: Thank you all very much for listening to us. Of course, as other issues might come up during the continuance of this hearing, we would be, if we can answer any more questions that might be raised...

PETERSEN: We appreciate that.

BACH: Thank you. (inaudible)

PETERSEN: Thank you. I think...

BACH: We did happen to have a representative of Lopi Industries here which is one of the largest nationwide manufacturers. He could also talk to that R and D issue.

PETERSEN: Okay.

RUMENS: Yes. I would like to address the issue of R and D. My name is Kurt Rumens. I'm the President of Lopi International; I'm a member of the Board of Directors of the Wood Heating Alliance. One of my responsibilities as President of Lopi is to direct R and D. In late '82 when the emissions issue first came up here in Oregon, we added to our engineering staff and indeed felt it was a good thing for the industry. And, by March of '83 we complied with the proposed standard at that point. And we since have been heralded as a leading example of a manufacturer taking a responsible position and willing to incur additional R and D costs to achieve emissions reduction. This is the June issue of Wood 'n Energy magazine, it's the, one of the premier trade publications. In it there is an article, "Taking the High-Tech Road", it's an article on Lopi. That publication has done three manufacturing profiles in four years. They don't do it, it's not an advertisement, not because you pay for advertising to do the article. They feel we've significantly contributed and set examples in our industry and they've selected us to do a high-tech article on it. We feel, at this point, the 9 staged standard, the 15/6 and 9/4, the second stage we would have to basically stop our R and D effort because we know it's unachievable. We've spent $460,000 since November of '82 on a product line that makes six products and at this point we have one which we think, we think--we don't know yet--

RUMENS: (continued) because of testing protocols just being developed, just being finalized, we think one of the six will comply. We indeed will continue to try to make cleaner burning appliances. We do not make catalytic appliances, we make noncatalytic. We think that's what the consumer wants. Our sales indicate that, sales (inaudible) can dictate that. Catalytic stoves are not selling. We feel our strength and our market share has been enjoyed because we give the consumer what they want. They want clean air and they want a noncatalytic stove. They don't want that liability of replacement cost downstream. So, we feel at this point that the staged standard, we would not even test or certify our product line, the first phase of it because we know it's unattainable for the second phase. We have spent approximately $35,000 certifying our R and D efforts through Omni over the last year, and basically as John Powell indicated, it's a catalytic mandate--this second phase of the standard--and we feel it's just a tremendous liability and caution as a manufacturer to come out with catalytic products. They are out there, they've been out for four or five years and they haven't been accepted in the consumer sector. And we feel that emissions reduction can be obtained, can be achieved, through excellent engineering, noncatalytic. That's all I have to say, but if there's any questions I can answer for you.

PETERSEN: Are there questions?

?????: Yes. Somebody, I believe Mr. Powell, indicated that a catalytic unit would (inaudible) quite high to start with, then it would level down to a plane, then finally diminshes to nothing. What, at what point does this high rate of efficiency start dropping off to a level plane?

RUMENS: I can't answer that for catalytic stoves. We've done a lot of catalytic research and backed out of it because there's a lot of liabilities. With our product, we developed it that it had no replacement parts, nothing that would degrade over time. So, that's why we felt that emissions reduction, noncatalytic, was our goal and our priority. I can't answer the question on catalytic degradation.

PETERSEN: Are there other questions of Mr. Rumens? Thank you, Mr. Rumens. I would like to call a recess right now for several obvious reasons, but also to give the Commission an opportunity to review the Manning Study which we have not had an opportunity to review yet. And we can quickly look through it, too, at that point in time and then we'll reconvene in 15 minutes and we'll ask Mr. Kowalczyk at that time to...(tape was turned off)

PETERSEN: (Tape is back on) Mr. Bill Braaten on Canyon Drive in Portland would like to address the Commission. Mr. Braaten.

BRAATEN: Thank you. I've been kind of insistent that the microphone be close, so the people could hear, even though maybe some of you don't care to hear what I have to say but we'll take it as it is. I've attended several of the meetings that, regarding the woodstove hearings that they've had. First of all I'd like to correct a, make a correction on the Eugene testimony on page, well, AS63, in which my name is E. M. Braaten a Portland resident felt, indicated he felt it should have evaluated emissions from woodstoves using different wood types; he also felt we should investigate the possibility of cleaning up smoke with water sprays in the stack. Basically, if that was interpreted as being, spraying water into smoke, this is not the intention. The intention was that there was tars that would accumulate in the stack; if this was ignited with a piece of paper or anything else like this, this would immediately start the cinders or the charcoal burning, and to control the burning we'd put sprays in the area that would eliminate this particular problem. This has been done before. Incidentally, my parents, my father was a stationary system engineer, and I have a great deal of experience in this (inaudible) snubbing donkey (phonetic) for some number of years when I was working some of my way through college. So, this experience in itself is something that's traumatic, and it can be all cleaned up within a period of 30 to 45 seconds. Incidentally, there is a technique, or there's a report in the Bonneville indicating that chimney sweeps themselves have a problem of colon cancer and this is high

BRAATEN: (continued) incidence, so anytime you can eliminate a problem that involves people, and I believe that this is the way to go and I suggest that the Commission investigate this particular report and find out the data in this. With that I'll clear up that particular issue. I attended two of the meetings and I tried to (inaudible) those parts that I felt that were contributing solving this problem. Basically it's a problem and it's a solution. Now, I'm gonna leap into the future about 65 years from now, and that means that by the year 2050 there'll be 26% of the population of the people that are over 65 years of age, and this is quite obvious to many of them, those that are not that time, there are already these people (inaudible) are laid for these particular people. These will be senior citizens, of course, and these will be people who will be made the comfort of homes. And as a consultant indicated in his previous testimony, he indicated that the radiation from this particular fire burning and this is quite common, I've seen the article in the Scientific American and I agree with it. I would like to think that you might consider that there's three ways of energy or heat that is conveyed. This is conduction, radiation and convection. This may seem rather simple, but it is actually aiding to our comfort. These are the comfort zones. My mother lives in a house in Salem that in the ceiling of her house she had pipes that were copper tubing, this is radiant heating in a house, and I won't explain this. I want to explain to you the fact that this, this energy that's radiated from

BRAATEN: (continued) a fireplace, which it does, this comes in radiation. The convection heat is your woodstoves and most of this particular thing that has to do with making it comfortable for you to live. And also, for a demonstration for your own feeling that you'll hold up your hand by the side of your face; you can feel the radiation from your hand that converts over to your face. This is quite obvious; it's more dramatically formed because if you hold a piece of aluminum. The reason why I bring these particular points in, the people, when the environment is to live in their house, it will be a time when wallpaper, this will have a radiant material like aluminum foil that would maybe artistically form so that people can have comfortable areas around where they sit. Now, to (inaudible) to about 65 years in the future, we have, I'm sure that you all know, young men and people that are involved in computer analysis, can you imagine with all this data that you're having presented to you today, you would get a sophisticated young man maybe an eagle scout or maybe a little importee from Vietnam that we have here, he will establish a program and he will set up his own system and his own business and he will go to an architect and say, look, Mac, I've got this particular wood situation and a fire a combustible system that we can design it around this category. And he could program it so he can design the metal, the shape and the material that fit into the room, and make it on the basis of comfort for people that may live there. Basically it would eliminate 75 or 80 percent of the people that are

BRAATEN: (continued) in this room for a job. But I think that this is gonna be the way that it's gonna come. With this particular thought in mind, I have, I'll complete my story as that particular time. If there's any questions, I'll be glad to answer them. Thank you very much.

PETERSEN: Are there questions for Mr. Braaten? Thank you.

BRAATEN: Thank you.

PETERSEN: Mr. Ben Myren of the Intermountain Ambient.

MYREN: My name is Ben Myren and I reside at 323 East Beckwith in Missoula, Montana. I am Vice President in charge of operations for Intermountain Ambient, an air pollution consulting firm that specializes in ambient monitoring and emissions testing, and that firm has its offices in Missoula, Montana. I am also here representing Energy and Environmental Measurement Corporation, EEMC, a consulting firm that specializes in emissions testing, and that firm is headquartered in Billings, Montana. Intermountain Ambient and EEMC in conjunction with Stove Testing Lab, of Portland, intend to qualify as an accredited woodstove testing laboratory. I'm going to depart somewhat from my prepared testimony as I go along so that I can sort of respond to some of the earlier comments that have been made here today. And one of my responses, I feel, should come now. And that the reason I'm here is because what Oregon

MYREN: (continued) does is going to have a major impact on what the state of Montana does and what the city of Missoula, Montana does. Missoula has already adopted several regulations aimed at reducing emissions from woodstoves. One in particular I think that Oregon might consider is an opacity regulation that can, they can use that regulation to deal with emissions from woodstoves where the catalytic combuster has degraded and is no longer performing correctly. What Oregon does in terms of adopting its testing regulations, so will Missoula; so will everybody else because the industry can't stand to have 10 different states with 10 different regulatory agencies with 10 different testing procedures. So the decisions that you make today, or whenever you make your decision, are going to be critical to this entire industry. It's gonna have an impact on our business and we've been following the progress of the Oregon woodstove regulations for well over a year now. Several times during this period we have, made, discussed regulations with members of DEQ staff and proposing what we felt were constructive changes in these regulations. Particularly those covering the stove testing procedures. In the draft rules before the EQC today, we find that several of the suggestions that we have made have been incorporated into the rules as changes. And here I'm going to echo a comment that was made earlier by saying that we are well aware of the fact that the DEQ has taken a lot of flack over these proposed rules, but the rules will definitely have a very major impact on the industry. So

MYREN: (continued) here is an instance where the DEQ staff has listened to the suggestions made by knowledgeable people in the testing field and has made changes that will benefit everyone involved in the testing. It will benefit me because it makes my job easier; it will benefit my clients by reducing his costs; and it will benefit the public by providing the same measure of clean air at approximately the same cost. And I wish to commend the DEQ staff for their efforts in this area. I think they've done an admirable job. We also support the change of the proposed 1988 emission standard for catalytic stoves to 4.0 gm/hr. We believe that the explanation given by the DEQ for this change reflects reality. The technology is available to meet this standard, in other words, the manufacturer can do it if he engineers the stove correctly. However, we cannot support the proposed emission rate of 9 gm/hr for noncatalytic stoves. For we are unaware of any noncatalytic stoves that have consistently been able to achieve this emission rate. Based upon the information presented on page 7 of the DEQ Agenda Item A, we are unaware of any population of noncatalytic stoves that has an upper bound of 9.0 gm/hr. In fact, 9.0 gm/hr is more likely the lower bound of the state of the art noncatalytic stove population. Thus, we feel that the proposed 1988 noncatalytic emission rate, or emission standard is too low. Certainly it is a worthy goal, but I think that the EQC needs to take a long, hard look at this standard before adopting these regulations because the adoption of an unrealistic standard may effectively

MYREN: (continued) eliminate development of noncatalytic technology. And there I echo comments made earlier as that in essence what you've done by adopting a 9/4, is adopting a catalytic mandate; and I think it's wrong to sort of close the door on a technology that has a lot of promise. No where in the industry am I aware of anybody that's using noncatalytic, or catalytic technology. Coal-fired power plants don't use catalysts; they just use a noncatalytic technology that effectively burns their coal. And I think that that can be developed for the woodstove industry if they're given enough time. Another major concern we have with the proposed regulations is with Section 340-21-165(5) concerning the audit by DEQ of stoves tested by a laboratory. To date, one laboratory has done almost all of the testing for DEQ, especially with the proposed method and fuel configuration. Based upon the, for published test results, we have a good feel for how precise that lab's work is, but we do not have any feel for how accurate those results are. Before going any further I'd like to say, however, that we have no reason to doubt the figures, we just haven't seen any data that verifies their accuracy. Let me explain what I mean by precision and accuracy by using an example. When a person zeros in his rifle, they generally shoot several shots at a target and they get a shot group here. They aimed at a bullseye here. Okay, the relationship of the shot group is known as precision; one hopes to have good precision always when one shoots. And then one zeros in his rifle by bringing the shot group

MYREN: (continued) down to the target. Okay, thus far with the DEQ data, we have a number of tests by one lab which represents a shot group, but until we get some additional data from additional labs, we have no real feel for how accurate that cluster of shots or tests really is. And we have nothing to compare them with to establish the accuracy of the those results. So, the reason that we are concerned is thus we feel the DEQ needs to be very careful when it establishes it's (inaudible) tolerance limits. At present, there is no alternative but to establish an arbitrary set of limits for example, plus or minus 15 percent or 20 percent or whatever. But plus or minus 15 percent from what figure? Hopefully, not the data from just one lab. For what happens if, after several labs have been tested or have tested the same stove, the initial lab's results are found to be off somewhat? Then another lab might wrongfully be denied accreditation or have a stove wrongfully fail an audit because of arbitrarily set tolerance limits. At present, the regulation contains no express tolerance limits for audits or accreditation which is understandable given the amount of data which is available. Therefore, because of the expense involved in seeking accreditation and the possibility of civil penalties if the stove that we certify should fail a DEQ audit, we ask that the EQC give this situation very careful consideration and direct the DEQ to adopt limits that are reasonable, based upon verifiable data and defendable. Another major area of concern is with our foreign competition. In the past few weeks, in particularly

MYREN: (continued) at the latest energy show in Reno, we have heard some very disturbing rumors about the intentions of Canadian testing laboratories. These labs enjoy a monopoly position in Canada because Canadian authorities refuse to recognize test results from American labs. On the other hand, American authorities recognize test results from Canadian labs. We feel it is an unfair situation which needs to be addressed; for if it is not, the Canadians, as we have heard, will quickly put the American testing labs out of business. Already many of our potential clients are taking their testing business north of the border and will continue to do so until Canadians recognize the American lab results. Thus, until Canadian authorities change the rules and accept the American lab results, we strongly urge the DEQ to accept only test results obtained from tests done in American labs. We're not afraid of competition, we just want equal competition and we're not having that right now. I'd like to digress here on a couple of points that I feel that were raised earlier, and I feel I would like to make a comment on. The two-test option -- DEQ's emission standards are based upon a heat output of 13,000 BTUs per hour which is based upon Oregon's climate. This climate is certainly not representative of the entire Pacific Northwest or the Northern Rockies. In Missoula, where I live, this past winter we had three weeks of weather where the temperature was minus 20^{O} F. constantly. Which means that the heat demand where I live is considerably different from what Oregon's is. I personally am a woodburner and I burn easily

MYREN: (continued) 9 to 10 cords of wood a year, and I'm not considered by any means above average. I'm probably, in fact, just right at average. Thus, test results will probably be interpolated by other regulatory agencies to determine emission rates based on their own local climates. In that sense, the two-test option may not be in the best interests of the industry because they will find that, sure, it's cheap to do it for Oregon, but what happens when Idaho, Wyoming and Montana come on line with regulations and they've got to come right back in and go through the whole test procedure again for categories 3 and 4. So I feel that only on a very, very limited basis should the two-test option be allowed. And then, I think, you have to take a very long, hard look at it, and only for very small manufacturers. And here, I think, that the point that I made earlier, I would like to repeat. That concerns precedence. What Oregon does will effect everybody. And, so, any changes that you make in the regulations, I think you need to consider that. Certainly you are making, adopting regulations that are aimed specifically at Oregon, but as a consultant who deals with industrial clients, in this case the woodstove industry, we cannot afford as an industry to have each regulatory agency adopt a different set of rules and that therefore, we want you to consider that when you adopt your rules. And I think that the Oregon market issue that was raised here earlier by the industry is somewhat false because the whole industry is moving in this direction. And after I came back from Reno I specifically

MYREN: (continued) stopped in Idaho and talked with their regulatory people and I have since talked with the people in Montana, and both of these states are now moving in this direction very, very quickly. And basically all they're doing is waiting for you people to get your regulations adopted, give you a couple of years of experience, and then they're going to do the same thing. So that manufacturer if he ignores what happens in Oregon, I think, is foolish, because he's ignoring the whole trend of the industry. And I think that this is something that we're gonna have to live with. I've personally worked on studies that developed emission rates in the industry for towns in Montana, particularly Missoula, I'm completely familiar with the field work that goes into it and the modeling and I understand what has happened here in Oregon, and Missoula has a terrible problem and a lot of it is attributable to woodstove emissions and so do a lot of other towns in Montana, and something's going to have to be done. And I think this is a reasonable and rational approach. Thank you. Any questions?

PETERSEN: Any questions for Mr. Myren? Mr. Myren, thank you very much. Mr. John Charles from Oregon Environmental Council.

CHARLES: Thank you. My name is John Charles, Executive Director of the Oregon Environmental Council. And I sent you some additions to my comments that I made in front of the hearings officer and I hope you've all received them in the last day or two. If not, I have some other copies.

CHARLES: (continued) In the immortal words of Dr. Schade, I am here before you as a friend of the Department this morning. And I apologize that Dennis Heightman (phonetic) isn't here with me. He served on the Advisory Committee representing OEC and he had to be in Massachusetts this week. But I believe he has sent you a letter earlier this week expressing his views; particularly, why he abstained from the key vote on the Advisory Committee. I don't want to read our testimony because that wasn't the purpose of sending it to you ahead of time, I'd like to summarize just briefly the points I made in there. The chief problem that I see in all of this is that it's easy to get seduced by the numbers that come out of the end of the equations. The problem is the assumptions that go into the front and that's what we focus on. We did not do what I would call a worst case scenario. We picked a kind of the middle of the road scenario. Some assumptions might go wrong. One of them would be the assumption that by the year 2000 all residential woodstoves in Oregon will be certified. I live without a fantasy; perhaps I'm being hyperbolic. But in some ways it is. I think that most people would like to think that's going to happen--I would. I don't think it's going to, unfortunately, for two fundamental reasons. The potential for bootlegging no matter what we do, and the existence of the used stove market which is going to flourish forever as far as I can tell. And because of that I think I'm more realistic in my assessment of what might happen by the year 2000. It is not 100 percent penetration of the market but

CHARLES: (continued) somewhere between 70 and 85, and so we've put together a chart for you showing what would happen to the expected emission reduction levels if that happens. And I can't tell you what's going to happen, I just gave it to you to get a range. Assumption number 2 is that all new stoves in the home will perform at the optimum levels, the 9/4 standard for the life of the stove. And, again, I would like that to happen, but I don't think it's going to. And I used the analogy of the automobiles, and I know some people don't like that, but the reason I used it has to do with what you expect people to, how, to what extent people will cooperate with you...(end of tape) (start of new tape)...a car that requires unleaded gasoline for the catalyst just simply do that. You don't have to do anything else except maybe in Portland, you have to get it checked every two years. That's a very passive program; you have to actively set about to rip out the catalyst or disable it in order to evade the intent of the program. And when I talked to Bob Jacobsen of the Seattle EPA, on Tuesday, I asked him that question. What is your best estimate of the noncompliance with the auto standards, and their estimate is, that as of right now, 17 percent of all emission control systems on cars have been removed or disabled. Seventeen percent of the people have actually gone out in their garage or some other way gone about to subvert the intent of that program. And it's a very passive program. The woodstove program, on the other hand, is going to require active participation of the consumer. As

CHARLES: (continued) everyone knows, these technological standards are really only half the game. The other half is education--people actively cooperating, not burning their household garbage in their stove; seasoning their wood properly so that the assumptions on moisture content used in the lab has some bearing in reality; not doing a whole host of things such as not replacing your catalyst if you have a catalytic stove--to help meet the ends of the program. And it just seems to me that if the best estimate now is that we're getting 17 percent noncompliance in a program that really requires almost nothing, in the automobile sector, I don't see how we can expect zero evasion of a program that's going to require some active learning, changing in habits and cooperation by the user. And so, again, we've put together a little chart kind of speculating--and I admit that's what it is--what happens if stoves don't really perform at the optimum, what if they perform at a 12/5 level or a 15/6 level, and you can see that emissions really drop dramatically. Assumption number 3 is that the cost of competing fuel sources will remain relatively moderate. I think that most people would like to think that's true, but again we don't really know. According to someone on the staff Monday, stove sales in the state of Washington are, at least by virtue of talking to people in the trade, apparently showing some brisk business in response to rising electricity costs in the state of Washington. Well, I think that's the driving force, of course, for people's use. They're very, their demand is very elastic and they will

CHARLES: (continued) engage in fuel switching when it appears to be in their best interest. And who's to say that in 1987, right when you're in this phase-in period, something dramatically, something dramatic in the energy field goes wrong and you have this huge increase in people who suddenly buy woodstoves. That really throws off the whole assumptions upon which this is predicated. And that's a problem. Assumption number 4 is that the proposed change now from 7/3 to 9/4, which we believe is a reasonable change, will be mitigated by some (inaudible) alternative control strategies. Specifically in Medford, that's really the only thinking. And again, I'd like to think that's going to happen, but I really don't, daily curtailment I think is extremely unpopular; it hasn't worked very well in Missoula, I don't think it's going to work very well in the Valley if one looks at what Ashland voters recently did and what Medford voters recently did on curtailment and I/M, respectively. Another assumption is that while we're trying to get a handle on this nonattainment problem, the impact on those nonattainment airsheds in terms of their attractiveness to industrial growth will be mitigated by the offsets program and unfortunately as much as I have always felt, in the last three years, the offsets (inaudible) program has not really worked. It's not, Bruce Snyder of AOI said that in his testimony, that it's just not attractive, it's very cumbersome and I think the longer the airsheds are clogged up with source, particulates from one source it's going to be a burden on other sources. So,

CHARLES: (continued) what we did in the end, on page 7, is to just take two of the assumptions, we couldn't really quantify four--we don't have computer models to work with--so we just took two of the assumptions and combined them together and said well what if they don't quite work out the way we'd all like them to. And our best guess is in the box on the left-hand corner. We think that is kind of where reality is going to be. That compliance of stoves certified in the field, percentage is going to be somewhere between 70-80 percent, and that the emission rate of certified stoves in the field is going to be between 9/4 and 12/5 by the year 2000 depending on a lot of factors. And if you look at the range there, you're looking at 45 percent reductions on the low to 59 on the high. And no matter what number you put in there it's a far cry below the low to mid 70s estimates that the Department is making for what we, where we need to be. So, when I think of, well, what's you're remedy here? The remedy is really, you only have two choices. You can either tighten the standards, which I think you or your successors will be faced with that difficult choice in about 1990 or 1991 cranking down the standards dramatically, but it doesn't appear to be possible now. Or, the other option could be to phase the standard in, the 9/4 in quicker and eliminate the transition phase. If you do that I think you'll get significant gains, much more significant than any other single strategy you could possibly use. When I look at the reasons for why you might delay, I find it hard to figure them out. You could delay for reasons, general

CHARLES: (continued) statutory reasons of why you do this, health, welfare, or environmental quality. But in all three of those cases, delay brings exactly the reverse of what you are attempting to accomplish--health, welfare, and environmental quality all are degraded by a delay. The only reason that you would delay would be for reasons of economics. The trouble with that is, from a decision-makers standpoint is, that it cuts two ways or three ways. Obviously there are some people who are going to benefit by a reprieve, such as it might be, if you delay the 9/4. But for all those people who benefit there are those who are harmed. From public health standpoint the two physicians in Pendleton and their testimony very clearly felt that there was a significant public health cost in dollars and cents, as well as the inestimable human cost of increased air pollution. There's that cost that's a downside risk of delay. There's the obvious cause to Tom Donaca's clients of delay. And, so there's no doubt that certain people may make a financial killing and others are going to get killed. And so if you try to factor in economics, it's just not very helpful as a factor in decision-making. And I guess ultimately, although I know people aren't saying very kind words about one particular technology today, and that's the catalytic. I guess in the abstract why should the Commission really care which technology survives. You have certain policy ends and the means by which we get there are, in some ways, irrelevant to you. It shouldn't really matter if you, if there are 12 technologies--that would be kind of nice--but

CHARLES: (continued) as long as there's one that exists, and it does. And the latest round of testing shows that there are stoves available today, production model stoves, that can meet the, at least the 4 standard fairly easily. It seems to me why should you be in the position of trying to help one survive against the other, or help several survive, that just seems like a very difficult task for you to engage in, a much broader social task than you really exist to regulate. I guess the final point I'd like to make, the final point or two I suppose, has to do with self-fulfilling prophecies. We're all familiar with what they are. One example was in the famous Bottle Bill, in discussions about 12 years ago we had a lot of the same arguments you've heard here. National people were just coming unglued at these crazy Oregonians wanting to something that no one else wants to do; and we're not going to change our whole manufacturing status; we'll just leave you out in the cold; we'll pull out of the market; certain people in the blue collar labor force clearly were going to lose their jobs, they always do from Bottle Bill Legislation, and other people make financial killings, some people in the recycling business. And ultimately the State's view was, well, we're going to do what's good for the state from a policy perspective and let the chips fall where they may. And they did, and it worked out. And the Gloom and Doom Scenario just never really played out. The reverse of that, one I almost hesitate to mention here, is the self-fulfilling prophecy we've been putting up with for 14 years in Portland. That's the

CHARLES: (continued) backyard burning issue. If you say long enough that you can't do it, it doesn't get done. When the Commission finally said in November, well it shall get done, it is happening. And it seems to me those things have a real impact and I think that there's a certain symbolic value in the Commission saying well, this, there can be self-fulfilling prophecies and we think this can work and we're going to move affirmatively to make it work. So I guess in the final analysis the Commission has to do what may be kind of cold-hearted, and that is to take the complex economic arguments about who's gonna gain and who's not gonna gain and kind of put that aside and say, well that's important and I care personally about that but from a policy standpoint we could be here for days arguing that and it's never gonna help us. And I think you have to decide, you've got statutory objectives for health and environmental quality, welfare, and we've got to figure out a way to meet those; we've got objectives and we've got to figure out the best, fastest way to get there. And let the chips fall where they may. And I really think that's where you are today. And our recommendation, obviously, is to adopt the 9/4 standard effective 1986 and not phase it in. Thank you.

PETERSEN: Questions for Mr. Charles?

BISHOP: Well I'd like to ask one because I really would like the Oregon environment, is my goal as well as your's. But I'm concerned that if we put in the 9/4 we're gonna have the

BISHOP: (continued) bootlegging of stoves, we're gonna have the nonreplacement of stoves and (inaudible).

CHARLES: I think the nonreplacement or the, or another way of describing that is simply the used stove market to replace your stove or replace it with another noncertified.

BISHOP: Right.

CHARLES: That is probably going to go on for a long time and there's probably not much of a way to get at that. And I don't know to what extent it's going to be helped or hurt by phasing or not phasing. I think the bootlegging is actually more resolvable, I thought it was in the Legislature, that we might have made a mistake in not amending the statute to tie it in with building codes for one thing, especially in Portland where you have the most obvious problem. If people are already required to have their stove checked for codes enforcement, and I realize some people don't do that either, but if you have to get it checked for that it's pretty simple to have the codes people have one more little check off on their list of things to check. If your stove isn't certified by DEQ it's illegal--it's a clear violation. So I think that you can do some local, since we didn't do it by statute, I think it's fairly simple to get in the area's of the state where the bootlegging problem is going to be the worst, to amend building codes so that you have an

CHARLES: (continued) enforcement way actually at the point of installation of getting at it. The other thing is the extent to which surrounding states will soon join us. And I believe the staff has told me that the state of Colorado, their Legislature has recently passed a similar bill; the state of Washington is certainly concerned; and it may well be that we'll get lucky and in the next couple years the surrounding states enact similar programs, and that would be a significant, show a significant decrease in the bootlegging problem.

BISHOP: One other concern of mine has been with the catalytic converter that it comes out looking well in the beginning but degrades so rapidly, and also (inaudible) if we didn't have the 9/4 we're gonna have catalytic stoves. And I agree with you that we can't get into the economics (inaudible) but we may be making one manufacturer, or one kind of stove survive that perhaps is not the best stove, so we're not continuing research in other kinds of stoves, and I wanted, help me with this.

CHARLES: Well, that's a possibility. It, who's to say that if someone manufactures both catalytics and noncatalytics that they may continue to do research in a noncatlytic, not just for Oregon but for a lot of other states that they sell in. But, again, it gets to the problem of trying to guess the future which we can't do. And I guess I have to rely on what do we test now in the labs, and the most recent round

CHARLES: (continued) shows that at least the catalysts that were tested easily fell below the 4 and that now the major manufacturer of catalysts is going to a 12,000 hour instead of a 6,000 hour; to me that's a step forward. And you have to hope that that's going to work out and that if the evidence shows that it doesn't, and I'm sure we'll have lots of evidence, lots of data in the next year or two, then I assume the Department would come back for some further rulemaking. But at this point we feel we can only go by what data we have, albeit it's sketchy, and the data to me indicates that it's a reasonable thing to put a 9/4 in 1986.

BISHOP: Thank you.

PETERSEN: Mr. Charles, you do acknowledge the fact that the Commission does have the statutory responsibility to look at the economic side of the environmental equation as well, don't you?

CHARLES: As with everything, it's a balancing act.

PETERSEN: Thank you very much. Mr. Larry Hill, State Representative from District 42.

HILL: Thank you, Mr. Chairman, members of the committee, and guests. I was serving in the Legislature when this bill was passed this last Session; I served on the Environment and Energy Committee which worked on the bill for several

months and had, what seemed like, endless hearings on it. I also Chaired the Special Subcommittee of the Environment and Energy Committee on the woodstove bill to resolve some difficulties we had late in the Session and I carried the bill on the Floor of the House. I am somewhat familiar with the bill and have been following the minutes of the Advisory Committee's meetings. I have a few comments to make on Legislative attempt and my own personal views of the bill, or on the proposed rules. The bill originated from the need to reduce particulates and other affluents of woodstoves. CO_2 is the only notable problem with woodstove smoke. The DEQ brought the bill to the Legislature's attention with the support of the Governor. It was supported by a broad coalition of interest groups including health advocacy groups, consumer groups, environmental groups, business groups including the Associated Oregon Industries, labor groups including the AFL-CIO, and local government groups. An extremely broad coalition of interest supporting this need; supporting something to approach the problem of woodstove smoke. I think it's important to remember that in these discussions. Our problem is not how to help the industry, it's not here, we're not here to discuss how to help a particular manufacturer to deal with the requirements that we're now putting forward. Our task is to address the problem, the broad social problem of the state, caused by woodstove smoke. We have health problems, we have economic problems directly stemming from woodstove smoke. In the Portland

HILL: (continued) area we have more problems in the airshed with woodstove smoke than from industrial smoke. We had companies come to the Legislature and testify that they have to purchase very expensive offsetts--pollution offsets--in order to expand their facilities in the Portland metropolitan area. We had people come and say that they would not expand their plants and their industries if something wasn't done, because they couldn't afford to purchase the offsets or it would soon be prohibitively expensive. Those are the kinds of problems we are approaching. The Legislature considered various alternatives and decided the only approach was to enforce a standard, and we heard much the same testimony that you're hearing today and additional testimony. The only approach that the State could take would be to establish a standard and enforce that standard for efficiency and the clean burning aspects of woodstoves. The Legislature specifically says the rules should be adopted by July 1, 1984 and the standards shall be implemented by 1986. The intent of the Committee in the Legislature was to have standard adopted after careful scrutiny that would achieve a 75-80 percent reduction within the next 15 to 20 years of woodstove pollution. And those were standards that we envisioned would be adopted in 1986. The Advisory Committee has done an excellent job; a very thorough job. I'd like to compliment all the members of the Advisory Committee for sticking to those discussions and bringing them all aspects and thoroughly exploring them. I think that serious compromises were made. Compromises that were perhaps

HILL: (continued) painful to various parts of various representatives on the Advisory Committee and perhaps the industry and perhaps environmental groups, but they were necessary compromises in order to have a workable standard. The three major compromises was to adopt a split standard between catalytics and noncatalytics, to adopt a phased standard, and finally, the last compromise was to drop from a 7/3 standard to a 9/4 standard. These are three very significant compromises that I think in hindsight were necessary. They do not actually represent the Legislature's intent. We did not intend these compromises to be made. We intended that a single standard be adopted that would result in 75-80 percent reduction. But I think you'll find that most of the Legislators who supported this bill and are interested would accept these compromises if necessary. However, the Legislature would not accept, in my own view, will not accept a single standard of 12 and 6, I believe. Is the 12 and 6 ...

PETERSEN: 15 and 6.

HILL: 15/6, excuse me. And will not accept a standard of 12 and 5, I believe that was the second close standard. Based on my following of the testimony and the information, those would not achieve 75 percent reduction of particulates. If we don't achieve these reductions, we'll have environmental problems, economic problems; the federal government could put a moratorium on local areas. And certainly if a

HILL: (continued) standard is adopted which doesn't achieve adequate cleanup of woodstove smoke, the Legislature will take further action either through instructing the DEQ to revise the standards or creating overlay zones in the state, or more stringent requirements. It'll probably come about as another increase in stringency of the standards because that's the only feasible way to try to control this. As I said, I find the compromises that have been made acceptable. It wouldn't be my first choice, but I think that the members of the Committee and the DEQ with their access to technical information can make that decision more accurately than I. I am afraid that the formulas that are being used were projecting population trends and growth of woodstove use have enough leeway in them so we could easily end up, in 15 to 20 years if the suggested standards are adopted, without having met our goal. There is so much leeway in the formulas. And the population formula, from the information I have here, has a 25 percent "fudge" margin on either side. And if we're assuming there won't be extensive, that we're not gonna pull out of the recession perhaps the 9/4 final standard will be adequate. Hopefully we're going to pull out of the recession and have a boom. At least that's what all of the politicians are saying including myself. With proper leadership, of course. But I think that if we do, succeed in that area, we'll find ourselves having a standard painfully arrived at that isn't adequate. Certainly we should not go, we should not have a more lenient standard than the 9/4. That's absolute

HILL: (continued) bottom line I think. And that's giving, that's me giving my own benefit of the doubt to the DEQ's judgment. So I urge you to adopt the standard as it is proposed and hope for the best. Hope will fall on the positive side of the various formula and it'll be successful. But I think that's the least, that's the least stringent final standard we can adopt. I'd be glad to answer any questions.

PETERSEN: Questions? Mr. Hill, if it could be demonstrated to the satisfaction of those parties involved who are acting very responsibly in this matter that the baseline emission data was estimated too conservatively, and that, therefore we don't need as high a reduction in pollution in order to achieve our goals by the year 2000, would you as a Legislator then support that? In other words, are you open minded to developing data that might occur in the next several years, that might change some of these basic assumptions that we seem to be arguing about?

HILL: Yes. The, if the social needs are met, the various social needs of the use of the airshed are met through less stringent measures and it can be shown that in some way our information is wrong, then certainly I'd be open to adopting a different approach. But the social goals remain. My interest is in achieving proper use of the airshed to enhance the various social goals that we have in our state.

PETERSEN: Okay.

HILL: If we can do that through the different approach, or slightly different numbers, fine. But we do have to achieve that approach. The best information I have before me says we need these standards to meet those social goals. Even if it, in fact, means a shake-down of the woodstove industry.

PETERSEN: Okay. Thank you.

HILL: Thank you.

PETERSEN: Mr. Kowalczyk, could I ask you to come forward. I think we might have some questions and you haven't had a chance to...first of all I'd like to ask, did you have any comments that you would like to make to any of the previous testimony that we've heard?

KOWALCZYK: Yes, Mr. Chairman, I guess I could some. I'll try to focus on the most important issue. And I think that may be, what is the consumer gonna do and is the catalyst going to work if we have to rely on that technology. And I think we have heard a lot of testimony here, today, from the industry that seems to feel that they'd really have to try to develop a noncatalyst technology and that's what the consumer wants. When we had proposed our 7/3 emission standard, the industry was violently opposed to that and their statements were that that definitely would stop progress and research on noncatalyst stoves, and that the 9/4 standard that the

KOWALCZYK: (continued) Advisory Committee had recommended would not do that. I think we're hearing now somewhat of a change. That now we have 9/4, that's gonna be stopping research and technology. I, you know, I think we have to look at what we hear today and whether that does represent the entire industry's views, and I don't think anyone really knows, but looking at some of the facts that we have before us make this somewhat questionable. For instance, Wood 'n Energy journal, which is I think a premier journal in the wood heating industry, has done several surveys and articles on clean burning technology. Back last fall, they did a special feature that identified some 52 new technology stoves that were being worked on to solve the emission problem; 40 or so of those were catalytically equipped. In looking at a survey done by this same magazine just published recently of all national manufacturers, they're showing that something like 48 percent of the national manufacturers are either marketing catalytically equipped stoves, developing catalytically equipped stoves, or considering developing those. In looking at the top eight manufacturers, in this state, of woodstoves six of those are working on marketing catalytic stoves. Now this is not to say that, that the Department really thinks catalytic stoves are the best thing. We would love to see a technology that's available that doesn't cost any more, that doesn't have any replacement parts and that does everything a consumer wants, but I don't think we know of any appliance in a house that does that. The conventional

KOWALCZYK: (continued) woodstove, of hopefully the past, maybe came closest to that because that was essentially a metal box around a campfire--as I call it. And, if you're gonna improve that, improve the efficiency, improve the emissions, you're gonna have to do some things to it and put some equipment and hardware into it, and those things are going to take some extra care and precautions by the consumer and they may need some replacement parts. So, I think that in putting that in perspective, I think that the standard that we are finally proposing as a second stage 9/4 should not deter any further research into noncatalysts, but it does recognize existing technology, and the way it looks to us the majority of the industry is going in this Country and that is catalyst equipped stoves. Those stoves can perform well and in terms of replacement and our strategy's not taking in account that some people won't replace them--and we don't doubt that that will occur. If you look at the other hand we're not taking any credit for the fact that many people will buy the cleanest of the catalyst equipped stoves on the market. And our testing would show that there is technology available now that can be used by anybody that can produce catalyst equipped stoves that'll perform four times better than our second stage standard. That's one gram per hour. And we believe that those type of stoves will be on the market this fall if this program is adopted. Some of those stoves will be. Surveys that we have done in terms of marketing would indicate that in a ratio of six to one consumers in this state are willing and want to buy the most efficient and

KOWALCZYK: (continued) cleanest stoves available, and are willing to pay a little bit more to do that. So we believe that even though we might have a 4 as a catalyst standard that people are gonna be looking at, well what's the best of that line, what's the most efficient and what's the cleanest. And I think just looking through this Manning research report that was presented to you today, I briefly looked through it, there's a couple real interesting facts in there that maybe even shed a little more light on this particular issue. For one thing, on, I guess there's not, well there's, yeah, page 23 there's a table which asks the consumers--Do you know what a catalytic woodstove is. And 67.6 percent said, no, in this state, they don't know what a catalytic stove is. Also, looking at some of the graphs relating to what consumers in this state are interested in--and this, of course, is a survey done by the industry itself--looking at pollution and whether that's an important factor in purchasing a stove in the future, on page 17 they're showing 58 percent feel that's very important in their consideration of buying of stoves and 26 percent think it's somewhat important. And you look at another bit of information in this survey and in terms of efficiency 92 percent of the potential purchasers of stoves in the future feel that it's a very important factor. I think the industry's surveys and our surveys would tend to indicate that the public is really wanting to purchase equipment in the future that is the most efficient and, and also the least polluting and we would hope that they will buy cleaner stoves, or

KOWALCZYK: (continued) the cleanest of the stoves out there not just ones that barely meet our standard, and that type of thing hopefully will compensate for those people who bootleg stoves, who don't replace their catalysts. So that's kind of, you know, there's both sides of it and I think it was characterized correctly that we basically are proposing a middle, middle of the road approach using the average of the information we have. I think, hopefully it'll work. But there also will be time to evaluate it and make corrections in the future, this is a long-term program that may not get its full effectiveness for many years--10, 15, 20 years--and trends can be monitored and adjustments made if necessary to get us back on course, if we stray off the course. So, I guess that's the main comment I would make on the majority of the concern in testimony that I heard today.

PETERSEN: Questions for Mr. Kowalczyk? I'd like to...go ahead.

DENECKE: Fireplace inserts, as I understand Mr. Hansen's memo, they have been added to the (inaudible) just as much as the standard stoves.

KOWALCZYK: Yes, Commissioner Denecke, yes, fireplace inserts would be subject to the regulations and they are a, becoming even more popular now than the free-standing stove as a sales item, and they would be covered, regulated, and the same technology would basically apply. The, generally the

KOWALCZYK: (continued) manufacturers take a free-standing stove and with some external modifications make it adaptable to a fireplace system.

DENECKE: Do you have the proposed rules in front of you?

KOWALCZYK: Yes, I do.

DENECKE: One that I don't understand is on page 5, it's "C", it refers to labeling, and the part I don't understand is--provided, however, that this section 1 shall not apply to any sale from any manufacturer or dealer. Now, maybe why the reason I don't understand it is because I though that was a semicolon and it looks like it's not a semicolon, it's a colon--to any manufacturer--yeah, well I guess I still have a question. This just doesn't apply to a sale from any manufacturer to an Oregon dealer?

PETERSEN: Right, and "dealer" is defined as "not a retailer", there's a separate definition for retailer, it's a dealer who might also ship out-of-state. And as I understand it, the reason for that was so that it was clear that we weren't trying to regulate sales out-of-state. Dealer, I got hung up on that, dealer to me means somebody who's selling to the public as well, but retailer is the word you use for that in the rules. You mentioned in your memo, or Mr. Hansen's memo, that there were members of the industry that believed that,

PETERSEN: (continued) that a 9 standard would not be technology-forcing for noncatalytic stoves. Can you identify the members of the industry that believe that?

KOWALCZYK: Mr. Chairman, I am not sure that that was the way we portrayed it, or wanted to portray it, I think in the Advisory Committee activities we heard that some manufacturers said that that was potentially achievable. That a 7 was just totally out of the question. I'm not sure exactly where that is in the staff report, but if we portrayed it wrongly, what we meant was that, that some manufacturers and specifically our small woodstove manufacturer representative, Paul Renquist (phonetic), I believe, would, would reflect in the minutes of the Advisory Committee meetings that he thought that this was a target that they, they potentially could meet. He wouldn't guarantee it, but it was potentially achievable; the 7 was just out of the question.

PETERSEN: You're right, "provide a potentially achievable goal and would not discourage research in meeting this goal", those were the words you used.

KOWALCZYK: That's correct.

PETERSEN: And it was Mr. Renquist? Was there anyone else in the industry that believed that?

KOWALCZYK: I don't recall, but I do believe that other members generally didn't, didn't feel that that was a, a off-the-wall type of a feeling, I think possibly we could ask Betty Hume what her views of that particular statement was.

PETERSEN: That's all right. I just wondered if you knew what others members of the industry. What, can you try to help me get a handle on what happens to this relationship between baseline emission rate and goals that we're trying to achieve as we, as the Woodheating Alliance argues, that as, if in fact we've blown our baseline emission rate estimate, it doesn't take much to be off in order to throw off our goals, and their whole point as I understand it isn't, you know, until we're really sure what the baseline emission rate is, why, why force the situation. Can you tell me, let's say that we a, we came with data that said instead of 34 it was 38. What is that do, what would that do to a 9/4 standard? Would it change it? Would it require less then, or how would that work?

KOWALCZYK: Yes, if the baseline is different that what we say it is, it could change the amount of emission reduction or the ultimate standard that you need. This particular issue was really researched thoroughly, discussed thoroughly; we recognized how important it was. And we've done, I think, quite a bit of work to make us very comfortable with the numbers we have for a baseline. I mean, you can't say exactly this is the number, but we believe that the data

KOWALCZYK: (continued) we have would pass the acid test that, that baseline for the test procedure we have is in the range of 30 to 34. But, to give you an example, if it, say, would be higher for some reason...

PETERSEN: 34 to 38.

KOWALCZYK: Okay, well, I'll even use 40.

PETERSEN: Okay.

KOWALCZYK: And we'll maybe contrast it with 30. Say we're looking at an 80, we need an 80 percent reduction in the airshed. At a 30 baseline, you would propose a standard of 6. At a 40, that standard would be 8. If the baseline was 50, you'd need a 10. In other words, the actual standard that you might need is not as sensitive as the changes in baseline, the standard could be relaxed slightly but not in a direct proportion.

PETERSEN: Okay. Use that same example but instead of 80, because I'm not sure that that's the goal that's been set, let's say...

KOWALCZYK: Use 30, or 70 percent...

PETERSEN: ...Mr. Hill testified 70 to 75 percent.

KOWALCZYK: Okay. Well, using a 70 percent, if the baseline is 30 you would need a 9; if it's 40 you'd need a 12. The indications that we have from our testing, we've tested stoves using baseline stoves or what we consider conventional stoves using our test data, is that the baseline could be even lower; we might be on the high side with the test procedure we have. And I think what confuses a lot of people and the industry, is that they look at the past history of data on woodstoves and conventional stoves and there's not a lot of it, but what is available is based on using all kinds of different test procedures and moisture contents and you get all kinds of numbers. We can get a baseline stove to emit 40 or 50 if we use a real high moisture content wood or we run the stove a certain way. But with using what we've gravitated to in terms of a test procedure which we think is realistic, at least as close as you can still operating in a laboratory, is realistic to what people use; the baseline for that type of a procedure is in the 30 to 34 range and maybe even lower than that. But there is data out there and there's their own data that shows higher, but it really depends on how you operate the stove and what burn rate it is. Most data that's been available in the past has been collected on higher burn rates of stoves in the lab, and there hasn't been that much recognition or understanding of what burn rates are being used in the homes. And we spent a lot of time trying to determine what that number is or what that range is, and we've come up with a number several different ways that all came up to

KOWALCZYK: (continued) about the same number. Some other researchers have actually measured burn rates in homes in other parts of the Country with similar heat loads; they come up with (inaudible) so we think we've got the burn rate where it is representing average conditions in most of the Oregon homes, and that's substantially lower than the burn rates used in a lot of previous laboratory testing. And generally when a stove is burned at a higher burn rate the emissions go down. So, or sometimes the other way, but generally using our test procedure the baseline is, I think, very well defined. And, if anything, it could be lower.

PETERSEN: Is there anything that the Department can do or anybody involved can do to pin down...(end of tape)

KOWALCZYK: (beginning of tape)...there's always more you can do. We've tested four of the typical, what we thought typical, stoves with a range stoves--small, medium, large type conventional stoves--tested those with our test procedure and we've gotten numbers that substantiate our baseline. Now, people could test more of, there probably are hundreds of different models out there, and if you tested them all then you'd average them all, and then maybe you'd come up with a true average. The question will be, well what is the average stove out there? Historically, the way stoves have been built, there's a lot of small manufacturers and there's just all kinds of designs so you've got a real wide spectrum of different type of units. They're all basically the same,

KOWALCZYK: (continued) but they all might have a baffle in a different place or an air port in a different place. I mean, to be, to get the true answer you'd have to test every one of those and weight the percentage that each one of those is in the exact market, and that's probably, you know, just absolutely impossible to do. So you try to determine, pick a sample of what's representative. We picked a sample. You can increase that sample and see if the numbers change, so you could test some more. But in looking at the sensitivity of the emission standard to the baseline, you know, going whether it's 30, 34, or 40, it doesn't change that emission standard that much; we haven't felt that it's worth spending all our research money into testing the dirty stoves, we've been spending most of our money trying to find the clean ones.

PETERSEN: But if the data did change, the Department would be prepared and in a position to change its...

KOWALCZYK: Yes.

PETERSEN: ...recommendations on rules, either tightening or relaxing depending on what we found out?

KOWALCZYK: Yes.

PETERSEN: Okay. Are there other questions of Mr. Kowalczyk? Thank you. Mr. Hansen.

HANSEN: Mr. Chairman, if I could make maybe just one brief comment because I think one of the principal issues facing you is one that we certainly wrestled with in the Department. And I'd like to share with you just briefly the thinking, certainly my thinking, on the decision that is before you as a recommendation. I began initially opposed to the phased standard and became convinced that it had value for a number of reasons. As John said, if we all had our druthers what we would have is a series of stoves out there of different technologies that would give consumers a broad range of opportunities to choose as well as no replacement parts and various other things. However, we do recognize that what we are really after is a long-term strategy and when we looked at the phased standard we really said, listen if there is, if by giving two extra years we are able to help develop a noncatalyst technology; that that is in the best long-run interest of the state. John mentioned the poll that we had done that indicated that buyer preference was going to be into a cleaner stove anyway, so we think that people will buy up in any event. We looked at the standard of 9/4 in the phased standard, the second stage, and you heard today that it is a catalyst mandate. From our perspective it is a clean stove mandate and not a catalyst mandate. If we were to look at only one standard our recommendation would be a very strong recommendation then for only the 9/4. The criteria that we used in the Department to come up with what standard ultimately to have

HANSEN: (continued) is air quality. And our basis is based on that, and our recommendation would then be for the 9/4 as the ultimate standard. Thank you.

PETERSEN: Are there comments from the Commission? I guess having invested not nearly the number of hours that the Woodstove Advisory Committee has invested on the subject, and once again I commend you for that, but having invested probably more hours than on any other issue that I've had to deal with as a Commissioner, I do have some comments to make. First of all, I would like to commend all of the speakers and all of those people who presented testimony, not only here today, but at the hearings around the state. The quality of the testimony was extremely high; there's no doubt in my mind that everyone that presented information on this issue was doing so in total good faith and trying to help all of us achieve a set of rules that are workable and in the best interests of the people of the state of Oregon. It's a very difficult decision. The reason it's difficult for me is because I am not a technical person and, as a result, I don't have the background to be able to adequately choose between conflicting expert testimony. I suppose I am more like a juror on a jury that listens to expert testimony in a trial, you just kind of have to weigh the evidence and by a preponderance come to some conclusion as to what you think is the most, most believable and that's kind of where I am on this particular subject. Reasonable men can differ. Reasonable men--and you're all sitting out there--have

PETERSEN: (continued) differed on this subject. And I can understand why that, why that's happening on this issue. On the other, on the one hand we have a group of people who are urging us to adopt a very strict standard in 1986; they say that this is really the only way we are going to be able to achieve our goals--people like the Oregon Lung Association, the Oregon Environmental Council, the League of Women Voters, several legislators who have been very influential in the passage of the Legislation. On the other hand we have a group of people who would ask us to adopt a more liberal standard in 1986 and then leave the second phase open, just leave it open, for two reasons, either because they think that 15/6 is sufficient given their data that they've looked at, or because they want more time to come up with conclusive evidence, more conclusive evidence of the need for a stricter standard. I guess I am not pursuaded that a single 15/6 standard is warranted in light of the facts presented to us. While the evidence is conflicting on certain issues such as burn rates and test fuel loads and baseline emission rates, the evidence and approach utilized by the Department in its analysis and by the Committee seems to be, to be more believable. It's a judgment call, but one that has to be made. If you believe that a stricter standard than 15/6 is needed to achieve our goals, and I do, then I don't think we have any choice under the law but to adopt a follow-on phased standard if we choose the two phase approach. I don't think we have any choice because by July 1 we have to adopt the standard that's going

PETERSEN: (continued) to achieve our goal. I personally believe something stricter than 15/6 based on the data that's been presented is necessary, and, so, we've got to adopt, it seems to me, that second, second phase. Nor am I persuaded, personally, that a single strict standard in 1986 is warranted under the facts. This is a new program; it has potential national implications as has been alluded to earlier. We're plowing new ground and I think everybody in this room realizes that. And while I want to achieve our pollution reduction goals, I do not want to unnecessarily discourage the industry in their efforts to upgrade the stove technology. Our experts tell us that our pollution control reduction goals can be met with an initial 15/6 standard for two years followed by a stricter 9/4 standard in 1988. That's what I believe at the present time. The thing that really impresses me, I think, in this whole thing is that the Legislature passed the law and they said, we suggest that you as a Commission appoint an Advisory Committee, they didn't tell us to do that but they suggested it, and of course we took their suggestion--it was a good one. And we appointed a 10-person Advisory Committee comprised of experts in all fields that relate to this particular issue. They, five of these people, five of these 10 came from the industry itself. Awaiting in favor of the people with the vested interest. The other five represented other disciplines that bear on the issue. These 10 people met, as you've heard many times,

PETERSEN: (continued) for long hours and many days and have made a recommendation to us--basically 15/6 and 9/4. I am impressed by that. I'm impressed by the fact that the Department and the Advisory Committee that we've asked to advise us had virtually unanimously come up with that conclusion as the best result at this particular point in time, and I am really persuaded by that. And I, for one, have not heard anything today that would lead me to disagree with the considered viewpoint of these experts. Now, having said that I would like to ask the Department, and they've already indicated a willingness to do this, to keep this Commission apprised of what's going on and of data as it's evolving, and as we implement these rules and these programs we intend to keep our hand in this particular issue and make sure that we're not overreaching, that we're not overcontrolling, overregulating; that all we're trying to do is achieve the goals that the Legislature has mandated in its legislation.

HANSEN: Mr. Chairman, we will do so.

PETERSEN: So, I guess I would, that would be my, the way I'm going to vote. Are there any other comments, or...

?????: Mr. Chairman...

PETERSEN: Yes, sir.

?????: I don't think it's necessary to change the rules at all, but I personally would like to see the Advisory Committee continue, and it seems to me that they ought to reconvene at least in a year from now when (inaudible).

PETERSEN: How about the suggestion that they, I realize that they may not be willing to do this--we have one person who has volunteered, we have a chairman anyway--that they be requested to reconvene at the request of the Commission from time to time to, whenever we believe, and we'll take outside input, Department input, on when that might be the appropriate thing to do, to reconvene and continue to advise us on the technical aspects of the issues. And I don't think we need any further Legislative authority for that, or any rule, rules. There were some amendments that were made that were appealing to me. For one, I think, to handle Mr. Cranberg's problem I would suggest that perhaps we insert the language that Mr. Kowalczyk suggested in the test procedures to include closed firechamber on the definition of a, of what we're trying to regulate here. That would be one amendment. The other, pardon me? Go ahead.

BISHOP: The requirement of four tests per (inaudible)...

PETERSEN: Yes...

BISHOP: ...on the variance.

PETERSEN: Yes, I would like to also suggest that we require, the rules require four tests with the understanding--I don't think we need to put this in the rules--but the understanding would be that any variance from four down to two would have to be brought to the Commission and they would have to follow the variance procedures. I think that's probably a better way, a better way to handle that. And then there was, it seems to me there was one other. I think that was, those were the suggested amendments that occurred to me. Are there any other amendments, is there any discussion on those amendments, the proposed changes? Are they, can I assume they're agreeable with everyone up here?

BISHOP: We have three--the Advisory Committee, the four tests, and the word closed?

PETERSEN: Right.

BISHOP: Yes.

PETERSEN: Right. Mr. Hansen.

HANSEN: Mr. Chairman and members of the Commission, technically the Advisory Committee is not addressed in the rules and we would not expect it to. For purposes of understanding it would be our intent, the statute indicates that the

HANSEN: (continued) Advisory Committee was to be established, or could be established to advise the Commission on the adoption of the Commission's standards. It is our view that that has been accomplished after your action today. We would clearly, as a Department, expect to be able to use an advisory committee to further evaluate any, any aspect of the program. It may be this Advisory Committee or it may be another advisory committee, if that is acceptable understanding we would not think that would be a part of the rules, but would just be an understanding that we would utilize an advisory committee composed of possibly the same members, possibly not. We have one volunteer and that would be great.

?????: Mr. Chairman, I don't think we need any special statutory authorization. In fact, I went into that other matter and decided that that wasn't necessary. And whether to use the same one or different personnel, so long as the varied interests have representation, that's important...

PETERSEN: You bet.

?????: ...and I agree, I agree I don't think we need it in the rules either.

PETERSEN: Okay. So we're in agreement on the amendments. Then would somebody like to try their hand at a motion? There being none, this meeting's adjourned.

?????: I move the proposed regulations by the Department as amended here by the Commission be adopted.

BISHOP: I'll second that.

PETERSEN: Is there any further discussion? Mr. Hansen, would you call the role.

HANSEN: Commissioners Bishop...

BISHOP: Aye.

HANSEN: ...Bree...

BISHOP: Brill.

HANSEN: Pardon me, Brill...

BRILL: Yes.

HANSEN: Pardon me, I'm thinking of our staff member by, yes. Commissioner Brill, my apologies. Denecke...

DENECKE: Aye.

HANSEN: ...Chair Petersen...

PETERSEN: Yes. Thank you, Director Johnson. Once again I thank all of you for your participation. And at this time the meeting is adjourned.

7820 S. W. Walnut Lane
Portland, Oregon 97225
June 4, 1984

Environmental Quality Commission
P.O. Box 1760
Portland, Oregon 97207

Dear Commissioners:

I regret I will be unable to attend the Commission's meeting on June 8th. In lieu of offering comments in person, I feel compeled to comment briefly in writing on two important matters.

I was the Wood Stove Advisory Committee member abstaining on the final vote recommending an emission standard. My reason for abstaining was that at the time the Committee's recommendation, by a previous vote, stood at a ridiculously loose standard. Yet the '86:15/6, '88:9/4 standard being voted I found unacceptably loose as well. I did not want a vote against the latter proposal to be seen as a vote for the former. To be clear: I now cast my vote for a 1986 9/4 standard. The data indicate clearly that stoves meeting this standard exist today. Further, the air quality data indicate the standard is needed now. The legislature recognized that need by setting a 1986 effective date. To postpone the tighter standard to 1988 would jeopardize the airshed in a number of ways. There is a significant chance that the base of inferior stoves will expand during the four years, either due to fuel price pressures, or increased marketing efforts. Worse still, postponing the 9/4 standard to 1988 invites industry efforts to gain even more time, rather than committing to the task at hand, which is improving their product.

My second comment is prompted by some testimony you have received. Mr. Keith Cochran has made some serious accusations: "...DEQ staff had improperly manipulated the ... Committee's operation ... improperly screened its access to information." I cannot express my disagreement too strongly. The committee was chaired by Dr. Spolek, not by DEQ staff. There was never a member's concern that was denied time and consideration. Innumerable times in response to questions concerning various ways of looking at the data, the staff responded with extensive effort to satisfy the requests. Mr. Cochran used the same data in his testimony. Nothing was screened. With regard to "pressuring time constraints", all members knew the schedule for the conclusion of deliberations before accepting the appointment. Professionally, I cannot fault the desire for more data. But to fault the process as "improper" after years of study, staff work, and public involvement can at best be viewed as self-serving. I commend the staff for a professional effort.

I appreciate having had the opportunity to serve the Commission in this most important matter.

Sincerely,

Denis L. Heidtmann

Boch

BEFORE THE

OREGON ENVIRONMENTAL QUALITY COMMISSION

In the Matter of the Adoption of Wood Stove Certification Rules pursuant to Oregon Laws 1983, Chapter 333 (H.B. 2235)	)))	SUPPLEMENTAL STATEMENT OF THE WOOD HEATING ALLIANCE

Mr. Chairman, lady and gentlemen of the Environmental Quality Commission. The Wood Heating Alliance is pleased to have this opportunity to submit these supplemental comments with respect to the proposed Oregon Wood Stove Certification Program. The Wood Heating Alliance (WHA) has commented extensively on the rules proposed here today by DEQ, and we will not reiterate the arguments we have made previously.

You will recall, however, that we questioned the DEQ's assumptions with respect to the wood-burning habits of wood stove users. We asserted that DEQ had overestimated the length of time during which stoves are burned and a number of other burn rate factors, which in turn had led DEQ to a serious and significant underestimate of the emission rate for particulates from existing wood stoves. (This emission rate, in terms of grams of particulates per hour of operation, has been referred to as the "baseline rate".)

While we did not contest the DEQ data on total particulate emissions from wood stoves, we argued that this

inordinately low baseline emission rate led DEQ to propose emission standards for new stoves which are far more stringent than necessary to achieve your objective of reducing ambient concentrations of wood stove generated particulates.

During the time that WHA and local wood stove industry representatives were reviewing the DEQ data and preparing comments in connection with this rulemaking process, we kept having nagging doubts as to the validity of the DEQ burn rate assumptions. And because so much of the DEQ information on burn rates was anecdotal and contradictory, it was decided that it would be appropriate to commission a survey of wood stove users to determine if the DEQ assumptions had any basis in reality.

A copy of that survey and its results is attached hereto. It was prepared by Dr. D. James Manning who is a marketing consultant and professor of marketing at Portland State University. The questionnaire referred to in this study was introduced into the record of the public hearing in Eugene, and we had hoped to have this study for your benefit at an earlier point in these proceedings; but it only became available about a week ago. We apologize for the delay, but suggest that it contains information which warrants your consideration in these deliberations.

First, this study confirmed our nagging doubts with respect to the validity of the DEQ burn rate assumptions. The responses to questions Nos. 4, 5 and 6, which

relate to the actual burning habits and practices of wood stove owners, directly contradict the DEQ burn rate assumptions, and reinforce our belief that the DEQ baseline emission rate (which is based on the burn rate assumptions) is unrealistically low.

We are not suggesting that Dr. Manning's study conclusively proves the DEQ to be wrong. We do submit, however, that this study demonstrates that there are serious flaws in the DEQ methodology--flaws which must be corrected before this Commission embarks on a program which could have devastating effects upon the wood stove industry and wood stove users around the state.

Secondly, Dr. Manning's study has converted our nagging doubts with respect to the overall efficacy of the proposed wood stove program into raging reservations. Not only does it tend to indicate that the baseline emission rate is understated, it also tends to show that the Wood Stove Certification Program could actually exacerbate the air pollution problem. Let me explain: The objective of the proposed program is fairly clear--it is to achieve compliance with state and federal ambient air quality standards where wood stove emissions are contributing to violations of those standards, and to provide room for further growth. And the method proposed for achieving this objective is also fairly clear--it is to replace existing high emission wood stoves with new cleaner burning stoves.

This is, of course, akin to the federal program for reducing air pollution from automobiles by ignoring older cars and mandating air pollution control devices and cleaner engines on all new cars--all on the valid assumption that the older cars would soon be phased out of use.

Similarly, DEQ has assumed a level of wood stove replacements which would eventually--but over a relatively short time--lead to a cleaner airshed. DEQ assumed that although wood stoves should have a 15-year life expectancy, one-third would never be replaced, one-third would have to be replaced much sooner, and one-third will be replaced after 10 to 20 years. Thus, because most stoves in Oregon were purchased after 1976, an extensive turnover won't be experienced much before 1991. It is on this point that Dr. Manning's study offers some very significant, and somewhat surprising, insights.

The results of questions Nos. 9 through 20 of Dr. Manning's study raise a number of questions as to the purchasing expectations of existing and potential wood stove users. And once again, we submit that these questions must be answered before this Commission adopts a program which might cause significant dislocations in the marketplace without corresponding benefits.

Our proposition is simple--if the proposed wood stove certification program severely restricts the availability of wood stoves for sale in Oregon, and dramatically

increases the price of what few stove models will be available, then the program will not achieve its desired result. A significant number of wood stove users will retain their older, dirtier stoves longer than anticipated, and a significant number of consumers will cross over into Washington or California or Idaho to buy bootleg stoves. And the air won't get much cleaner if this occurs. At some point you must determine where the point of diminishing returns is located--at what level will any standard cease to be a viable tool in clean up of the air, and begin to impede replacement sales so as to actually result in dirtier air.

Again, we are not suggesting that the Manning study proves the DEQ to be wrong in its assumptions with respect to replacement rates for existing stoves, or that it would give you grounds to scrap the entire DEQ proposal. We do, on the other hand, submit that you should have the benefit of all available information before you adopt a program which could be an exercise in futility or, even worse, counterproductive.

You have heard from a number of wood stove manufacturers who sincerely believe that the Oregon wood stove market is simply not large enough to warrant the research and development expenditures necessary to develop stoves which will meet the 9/4 standard proposed for 1988. You have also heard that perhaps 95% to 98% of the stoves now

available will be incapable of meeting even the 15/6 standard proposed for 1986, and your own common sense will tell you that it makes no economic sense for a manufacturer to spend tens of thousands of dollars to research, develop, retool, test and market a stove to meet the 15/6 standard if that stove could only be marketed for two years.

So it is clear that the second stage standard proposed for 1988 (and even the first stage) will drive a substantial number of manufacturers and retailers out of the Oregon market and will dramatically drive up the price of complying stoves. If this were simply the price we must pay for clean air, then we could say, like the whaler--it's time to hang up the harpoon, our time has passed. But that is not the issue. You must satisfy yourselves that these disincentives to replacement of older stoves will not cause the entire program to collapse of its own weight.

In addition, you have heard from a number of representatives of the wood stove industry (which constitutes a significant part of our state's economic base) whose livelihoods are in jeopardy. Unfortunately, you have not heard from the vast number of citizens whose lives will be affected by these proposed rules and who (as indicated by their response to questions Nos. 22 and 23 of Dr. Manning's study) simply do not understand what is happening to them.

You have not heard from the elderly or those on limited incomes for whom a wood stove is a rational and sensible alternative to electric, gas or oil heat. You have not heard from those who augment their incomes by the monetary equivalent of $100 per month or more by cutting their own firewood in lieu of paying their local utilities. You have not heard from the significant number of wood stoves users who (according to question No. 3 of Dr. Manning's study) utilize wood stoves for their primary source of heat. We would have hoped that you would have heard from all of these people--but somewhere along the way the public input process broke down.

Fortunately, the door is not yet closed. You still have the opportunity to take a very positive step toward cleaner air while at the same time avoiding foreclosure of your future options. We submit that you can do so:

1. By adopting the 15/6 standard to become effective on July 1, 1986 and by declining to adopt any second stage standard. This will meet your legislative mandate and, as we pointed out in our earlier written comments, could achieve as much as a 75 percent reduction in wood stove emissions. This standard is achievable by the industry, and will give wood stove manufacturers an incentive to develop stove models which will assure a viable and thriving wood stove market in Oregon.

2. By going on record as recognizing the problems which have been raised in these proceedings and committing the EQC and the DEQ to working with the woodstove industry to resolve these problems. As a first step along these lines, we ask you to direct the DEQ immediately to begin developing more data to determine if further reductions in the standard are warranted by air quality considerations and are desirable from a socioeconomic standpoint. This data base should include valid and supportable information with respect to the actual baseline emission rates from existing wood stoves, and rational models with respect to wood stove replacement rates under varying economic scenarios. The wood stove industry pledges its cooperation with this kind of effort; but the door must be kept open if it is to be achieved.

3. By activating a new Wood Stove Advisory Committee to work with DEQ in its ongoing activities in connection with the wood stove certification program; and

4. By commencing a study to determine if you could develop any incentives for the replacement of older, dirtier stoves, as alternatives to the disincentives inherent in the proposed program.

We thank you for your attention. But before I close let me leave you with one more thought. As you know, the results of this program will not be seen for a long,

long time. And every time a wood stove user defers the replacement of an old stove because he or she does not want a catalytic stove, or because the price is too high, or because the variety of stoves is limited, achievement of your clean air goal will likewise be set back. If you adopt the second stage standards, you will have locked Oregon into a course of action which will be difficult to undo--while adoption of the 15/6 standard today will give you ample opportunity for mid-course corrections. This is a long-term proposition; if you make a mistake today we might not see it--but our children will.

initially
1. Opposed to phased, convinced ~~[illegible]~~ catalyst mandate
(clean stove mandate)
2. All
2. If one standard 9/4
3. Strongly opposed to continued advisory committee.

You have heard from some that with 9/4 out then they will not meet 15% to area begin.

Commissioners
Bishop
Bree
Draecke
Chair Peterson

TWO TEST OPTION OF WOODSTOVE CERTIFICATION RULES

Graig A. Spolek

Chair, Woodstove Advisory Committee

The Oregon Department of Environmental Quality worked closely with the Woodstove Advisory Committee for several months to develop the set of Woodstove Certification Rules and the Standard Method for Measuring the Emissions and Efficiencies of Woodstoves, currently being considered by the Environmental Quality Commission for adoption. Overall, this set of documents represents a technically sound and workable approach to woodstove certification and reflects the views of the Advisory Committee. However, subsequent to the public hearings, the DEQ included a "two test option" as an alternative to the originally required four test procedure. The apparent motive for this modification was to minimize the financial impact of the certification testing on small manufacturers within the state, by requiring only two experimental tests near 13,000 Btu/hr heat rate and basing the emission performance on that data alone. This option circumvents the original intent of the test procedure recommended by the Advisory Committee, and should not be included.

Throughout its discussion of the test procedure, the Advisory Committee was alert for any potential loopholes and attempted to close them prior to formulating recommendations. The incorporation of four tests for each stove addressed not only national concerns, but the possibility of a particular stove design being "tuned" to perform very well at a specific heat rate (such as 13,000 Btu/hr) but perform poorly at other heat rates that it surely would be burned at during actual use. The recommended test procedure eliminated that loophole. While the current rule proposal would

allow the DEQ to control the eligibility of a given stove design to qualify for the two test option, there does not appear to be adequately defined guidelines to assure that the option will not be abused. Consider the scenario in which a legitimate small manufacturer developed a noncatalytic stove that emitted 9 gm/hr at 13,000 Btu/hr but had significantly greater emission at lower or higher heat rates. After qualifying for the two test option and certifying this stove, the market demand justified a substantial increase in production. The new production level would not qualify for the two test option, but the stove had already received certification, there would be no grounds for revoking that certification, yet the true performance of the stove is unacceptable. Such potential problems can be avoided by eliminating the two test option and requiring all stoves to be tested by the same procedure.

The Advisory Committee did not view the cost of the four test procedure to be prohibitive. Both during the original discussion of this aspect of the test procedure (WAC Minutes, 10/31/83, p.5-7) and during the discussion preceding the vote for recommendation (WAC Minutes, 11/14/83, p.4-7), the four test procedure was favored. In fact, all stove industry representatives on the committee voted in favor of the four test procedure, and the committee member representing small manufacturers spoke in favor of the test procedure. The final vote was 8-1 in favor of the four test prodedure. In summary, the Advisory Committee felt that the four test procedure was necessary.

In light of these comments, I would encourage the EQC to follow the guidance and recommendation of the Advisory Committee by eliminating the two test option. Specifically, delete section 340-21-152-(4) from the Rules for Woodstove Certification and delete section 5.8.8 from the Standard Method for Measuring the Emissions and Efficiencies of Woodstoves.

if baseline equals 30 gms/hr

15/6 — 50% reduction

9/4 — 70% reduction

7/3 — 76%

if baseline equals 35 gms/hr

15/6 — 57% reduction

9/4 — 74% reduction

7/3 — 80%

20 gms/kg ambient = 34 gms/hr

if baseline equals 40 gms/hr

15/6 — 62.5% reduction

9/4 — 77.5% reduction

7/3 — 82.5%

RT 7-22

missing "closed" in appendix.

Recd 6/8/84

InterMountain Ambient
P.O. Box 5106 ☐ Missoula, MT 59806 ☐ [406] 543-6174

June 8, 1984

Testimony of Alben T. Myren Jr.

My name is Alben T. (Ben) Myren Jr. and I reside at 323 East Beckwith in Missoula, MT. I am Vice President in charge of operations for InterMountain Ambient, an air pollution consulting firm that specializes in ambient monitoring and emission testing and has its offices in Missoula, MT. I am also representing Energy and Environmental Measurement Corporation (EEMC), a consulting firm that specializes in emission testing and is headquartered in Billings, MT. InterMountain Ambient and EEMC in conjunction with Stove Testing Lab of Portland, Oregon intend to qualify as an accredited wood stove testing laboratory.

We have been following the progress of the Oregon Wood Stove regulations for well over a year now. Several times during this period we have discussed these regulations with members of the DEQ staff, proposing what we felt were constructive changes in these regulations, particularly those covering the stove testing procedures. In the draft rules before the EQC today we find that several of the suggestions that we have made have been incorporated into the rules as changes.

We are well aware of the fact that the DEQ has taken a lot of flak over these proposed rules, for these rules will definitely have a very major impact on the industry. But here is an instance where the DEQ staff has listened to the suggestions made by knowledgeable persons in the testing field and made changes that will benefit everyone involved in testing. And so I wish to commend the DEQ's staff for their efforts in this area.

We also support the change of the proposed 1988 emission standard for catalytic stoves to 4.0 g/hr. We believe that the explanation given by DEQ for this change reflects reality, for the technology is available to meet this standard. However, we can not support the proposed emission rate of 9.0 g/hr. for noncatalytic stoves, for we are unaware of any noncatalytic stoves that have consistently been able to achieve this emission rate. Based upon the information presented on page 7 of the EQC Agenda Item A, we are unaware of any population of noncatalytic stoves that has an upper bound of 9.0 g/hr. In fact 9.0 g/hr. is more likely the lower bound of the "state-of-the-art" noncatalytic stoves. Thus, we feel that the proposed 1988 noncatalytic emission standard is too low. Certainly it is a worthy goal, but I think that the EQC needs to take a long hard look at this standard before adopting these regulations because the adoption of an unrealistic standard may effectively eliminate the development of noncatalytic technology.

Another major concern we have with the proposed regulations is with Section 340-21-165 (5) concerning the audit by DEQ of stoves tested by a laboratory. To date one laboratory has done almost all of the testing for the DEQ, especially with the proposed method and fuel configuration. Based upon the published test results, we have a good feel for how precise that lab's work is, but we do not have any feel for how accurate those results are. Before going any further, let me state that we have no reason to doubt the figures, we just haven't seen any data that verifies its accuracy.

Let me explain what I mean by precision and accuracy by using an example. When a person zeroes in his rifle, they generally shoot several shots at the bulls eye. The closeness of the group of shots is called precision, while the relationship of that group with the center of the target is known as accuracy. At present, we have one lab's group of "shots" or tests, and we can see the preciseness of those results. But we have nothing to compare them with to establish the accuracy of those results.

Thus, we feel that the DEQ needs to be very careful when it establishes its audit tolerance limits. At present it has no alternative but to establish an arbitrary set of limits, e.g.$\pm$ 15%. But $\pm$ 15% from what figure? Hopefully not the data from just one lab, for what happens if after several labs have tested the same stove, the initial lab's results are found to be off somewhat. Then another lab might be wrongly denied accreditation or have a stove wrongly fail an audit. At present the regulations contain no expressed tolerance limits for audits or accreditation, which is understandable given the amount of data that is available. Therefore, because of the expense involved in seeking accreditation and the possibility of civil penalities if a stove fails a DEQ audit, we ask that the EQC give this situation careful consideration and direct the DEQ to adopt limits that are reasonable and based upon verifiable data.

Our last major concern is with our foreign competition. In the past few weeks we have heard some very disturbing rumors about the intentions of Canadian testing laboratories. These labs enjoy a monopoly position in Canada because Canadian authorities refuse to recognize test results from American labs. American authorities, on the other hand, recognize test results from Canadian Labs. We feel that is an unfair situation which needs to be addressed, for if it is not, the Canadians will quickly put the American testing labs out of business, because few manufacturers are going to bother to go to two different labs when they can get all of the tests done in one north of the border. Thus, until the Canadian authorities change their rules and accept American Lab's results, we strongly urge the DEQ to only accept test results obtained from tests done in American labs.

I thank you for this opportunity to present this testimony and we look forward to a long and fruitful relationship with the DEQ in a highly successful wood stove certification program. I will gladly answer any questions you might have about my testimony.

Manning Research Associates

7125 Southwest Canyon Drive
Portland, Oregon 97225
503 292-3034

D. James Manning, Ph.D
Marketing Consultant

Loreli Susan Manning
Research and Statistical Analyst

May 29, 1984

Wood Energy Institute West
Portland, Oregon

Ladies and Gentlemen:

Enclosed you will find the summary and analysis of our survey of wood burning stoves in the State of Oregon. A telephone instrument was utilized to collect the information reported in this study. The sample was randomly drawn from a stratified base covering the five major geographic areas in the State of Oregon. Telephone interviews were conducted on Sunday, April 29, and Monday, April 30, 1984.

We are confident the readers of this study will find many useful and enlightening statistics concerning current wood burning practices, as well as trends for wood burning stoves in the State of Oregon.

We are pleased to be of assistance in this effort and are willing to provide any additional services that will be beneficial. We look forward to discussing this report and its implications with you.

Very truly yours,

D. James Manning
President

DJM:chc
Enclosure

WOOD BURNING STOVES:
AN ANALYSIS OF CURRENT USAGE PATTERNS
AND FUTURE MARKET TRENDS

prepared for

WOOD ENERGY INSTITUTE WEST

by

MANNING RESEARCH ASSOCIATES

May 29, 1984

TABLE OF CONTENTS

METHODOLOGY

The research instrument (Appendix C) was designed by Manning Research Associates, with input information from members of the Wood Heating Alliance Association.

The objectives of this study were to measure the attitudes, opinions, feelings and practices of Oregon residents using wood in either fireplace inserts, or wood burning stoves, as a primary or secondary source of heat. Additionally, the research targeted to measure the attitude and future intentions of non-wood burning families in the State of Oregon.

In all, 23 questions were asked of 403 randomly selected respondents within the state. The state was stratified in order to insure proportional representation. Washington, Multnomah and Clackamas counties, the major Oregon metropolitan area, accounted for 154 of the 403 completed telephone interviews. The Willamette Valley, identified as Salem, Eugene/Springfield and Corvallis, accounted for 99 of the 403 interviews. The remaining southern Oregon area, identified as Medford, Grants Pass, Ashland and Klamath Falls contributed 50 interviews to this study. The balance (50 interviews) were drawn from both the coastal region and eastern Oregon. All households were selected on a random basis.

The interviews were conducted by Market Decisions Corporation on Sunday, April 29, and Monday, April 30. In addition,

secondary sources of statistical data, including the "U. S. Population of Census 1980", were consulted for purposes of verification and validation of some of the more general research findings presented in this study.

The highest levels of control and methodology were encouraged and executed. Standard professional methods were employed throughout the study.

QUESTIONNAIRE RESPONSES

Item 1

ARE YOU/MAY I SPEAK WITH EITHER THE MALE OR FEMALE HEAD OF THE HOUSEHOLD

	Number	Percent
Male	151	38.0
Female	246	62.0
Total	397	100.0%

The response rate between male and female was very close to the expected 60 percent female, 40 percent male response rate characteristic of a study of this type, conducted on a Sunday and Monday evening.

Item 2

DO YOU USE EITHER A WOODSTOVE OR FIREPLACE INSERT

	Number	Percent
Yes	135	33.6
No*	267	66.4
Total	402	100.0%

*if no, go to Item #8

Item 3

IS IT YOUR PRIMARY OR SECONDARY SOURCE OF HEAT

	Number	Percent
Primary	69	50.7
Secondary	67	49.3
Total	136	100.0%

Slightly more than one-third of the respondents use either a woodstove or fireplace insert. Of these people, 50.7 percent of the respondents used either woodstoves or fireplace inserts as their primary source of heat (17.1 percent of the population).

This corresponds quite closely to the 1980 census data (Appendix A), which shows that 12.5 percent of Oregon residents in 1979 (123,789 households) indicated that wood was the fuel they used most often to heat their homes. The census data further reports that 13.9 percent of the households (148,493) indicated they heated their homes with either fireplaces, stoves or portable heaters. Given the volume of sales of wood stoves for the past four years, the census data statistics correspond directly with those generated by this study.

Currently, in the State of Oregon, there are 1,071,613 dwelling units; of which, 991,573 are occupied. Multiplying the derived statistic of 17.1 percent, times this number (991,573 x 17.1%) indicates there are 169,562 wood burning stoves or inserts operating in the State of Oregon as of May, 1984.

Item 4

DO YOU BURN YOUR FIRE OVERNIGHT

	Number	Percent
Yes	74	54.8
No*	61	45.2
Total	135	100.0%

*if no, go to Item #6

Item 5

FROM OCTOBER TO APRIL, WHAT PERCENT OF THE TIME DO YOU BURN YOUR WOOD STOVE OVERNIGHT

	Number	Percent	Cum. Percent
0 - 25%	22	25.6	25.6
26 - 50%	10	11.6	37.2
51 - 75%	19	22.1	59.3
76 - 100%	33	38.4	97.7
Not Stated	2	2.3	100.0
Total	86	100.0%	

Nearly 55 percent of the respondents with wood burning stoves burn their fires overnight. During the peak burning season, from October to April, close to 60 percent of the wood burning stoves are burning overnight.

Item 6

WE NEED TO KNOW HOW MUCH WOOD YOU BURN IN ONE HOUR DURING THE PEAK HEATING SEASON (number of one-foot pieces of 2x4's)

	Number	Percent	Cum. Percent
Less than 1	7	5.3	5.3
2	11	8.3	13.6
3	14	10.6	24.2
4	26	19.7	43.9
5	6	4.5	48.5
6	9	6.8	55.3
7	6	4.5	59.8
8 or more	31	23.5	83.3
Not Stated	22	16.7	100.00
Total	132	100.0%	

The above question was asked to determine the amount of wood that is burned during the peak heating season. More than 50 percent of the respondents burned five or more pieces of 1-foot 2x4's per hour. The largest amount of wood burnt was more than eight 2x4's per hour. This accounted for 23.5 percent of all respondents. These responses indicate that, during peak seasons, those heating with wood burning stoves are burning their stoves at quite high temperatures.

Item 7

WOULD YOU BE WILLING TO NOT BURN YOUR STOVE DURING PERIODS OF POOR AIR QUALITY

	Number	Percent
Yes	80	59.7
No	34	25.4
Maybe	20	14.9
Total	134	100.0%

***skip to Item #11

The majority (nearly 60 percent) of the respondents reported they would be willing to not burn their stoves during period of poor air quality. Only a quarter of the respondents indicated that they would be unwilling to cooperate with such a request.

Item 8

DO YOU PLAN TO PURCHASE A WOOD STOVE OR INSERT

	Number	Percent
Yes	12	4.4
No*	262	95.6
Total	274	100.0%

*if no, skip to Item #22

Keeping in mind that two-thirds of the survey respondents do not use either a wood stove or fireplace insert (Item 2), only 12 (4.4%) of the households not currently using a wood burning stove or insert plan to buy one in the future.

This suggest the future retail market for wood burning stoves in Oregon is limited or quite possibly saturated. It is understood that this is an intent-to-buy type of question, which measures the consumer's intent at a point in time -- in this particular case, May, 1984. Given dramatic changes in circumstances, such as increased fuel bills or other similar conditions, this statistic could change in the future. However, it does reflect the current market status. (See Appendix B for further analysis)

Item 9

HOW SOON DO YOU EXPECT TO MAKE THIS PURCHASE

	Number	Percent	Cum. Percent
Within 90 days	-	-	-
3 - 6 months	5	41.7	41.7
Within 1 year	2	16.7	58.4
Over 1 year	4	33.3	91.7
Not Stated	1	8.3	100.0
Total	12	100.0%	

Item 10

APPROXIMATELY HOW MUCH DO YOU INTEND TO SPEND

	Number	Percent	Cum. Percent
Under $400	1	8.3	8.3
$400 - $600	2	16.7	25.0
$600 - $800	1	8.3	33.3
Over $800	3	25.0	58.3
Not Stated	5	41.7	100.0
Total	12	100.0%	

More than 50 percent of those planning to purchase a wood burning stove expect to make this purchase within one year.

Appendix B provides market projections and implications. Fully 75 percent of the respondents expect to pay more than $600.00 for their wood burning stove.

Items 11 - 18

The following eight graphs reflect the relative strengths of buying influences for eight tested variables. The eight variables are:

SAFETY
COST
ABILITY TO SEE FIRE
POLLUTION
APPEARANCE OR DESIGN
ABILITY TO HOLD FIRE OVERNIGHT
HEATING CAPACITY (AREA)
EFFICIENCY

Of these eight items, the primary dimension, in terms of perceived importance, was safety.

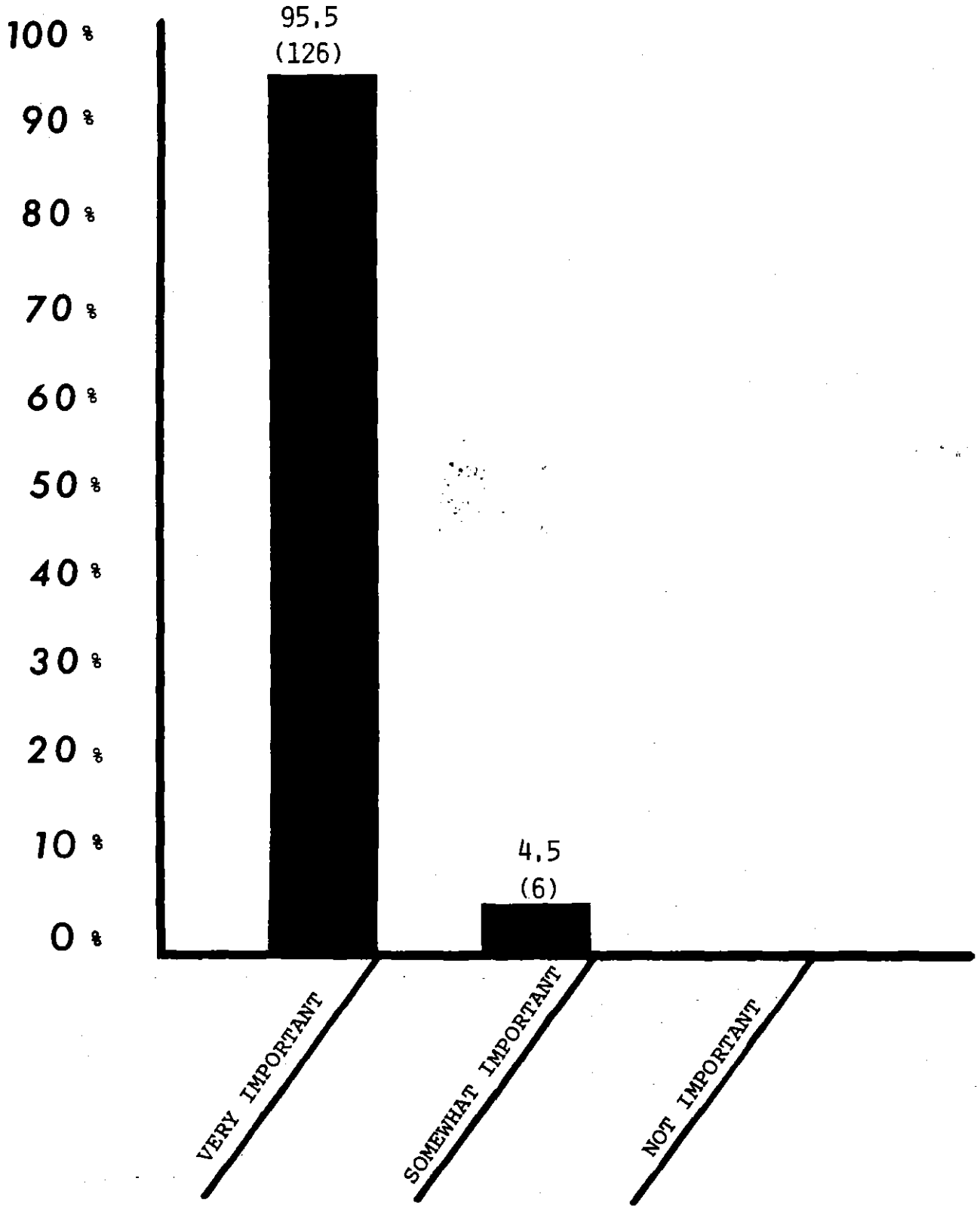
This was followed quite closely by efficiency and the heating capacity of the units. The fourth dimension receiving a high rating was the ability to hold the fire overnight.

The remaining four areas received relatively low marks in perceived importance. The lowest of all was the ability to see the fire. The pollution impact of the stoves ranked approximately in the middle of the eight dimensions measured. A review of the following graphs gives a clear, visual representation of the spread and relative importance of each variable.

Item 11

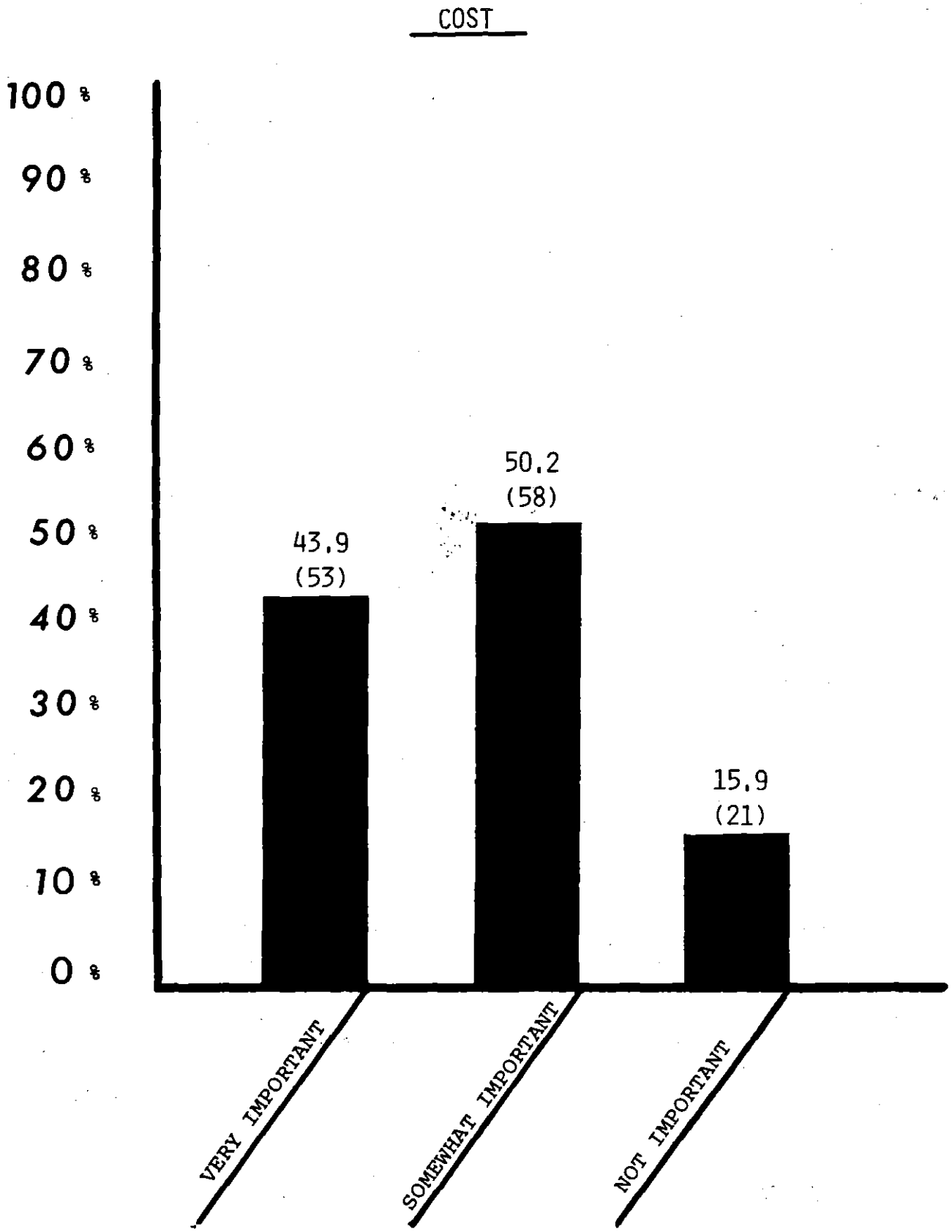
Please rate the following as to importance in the purchase of a wood stove

SAFETY



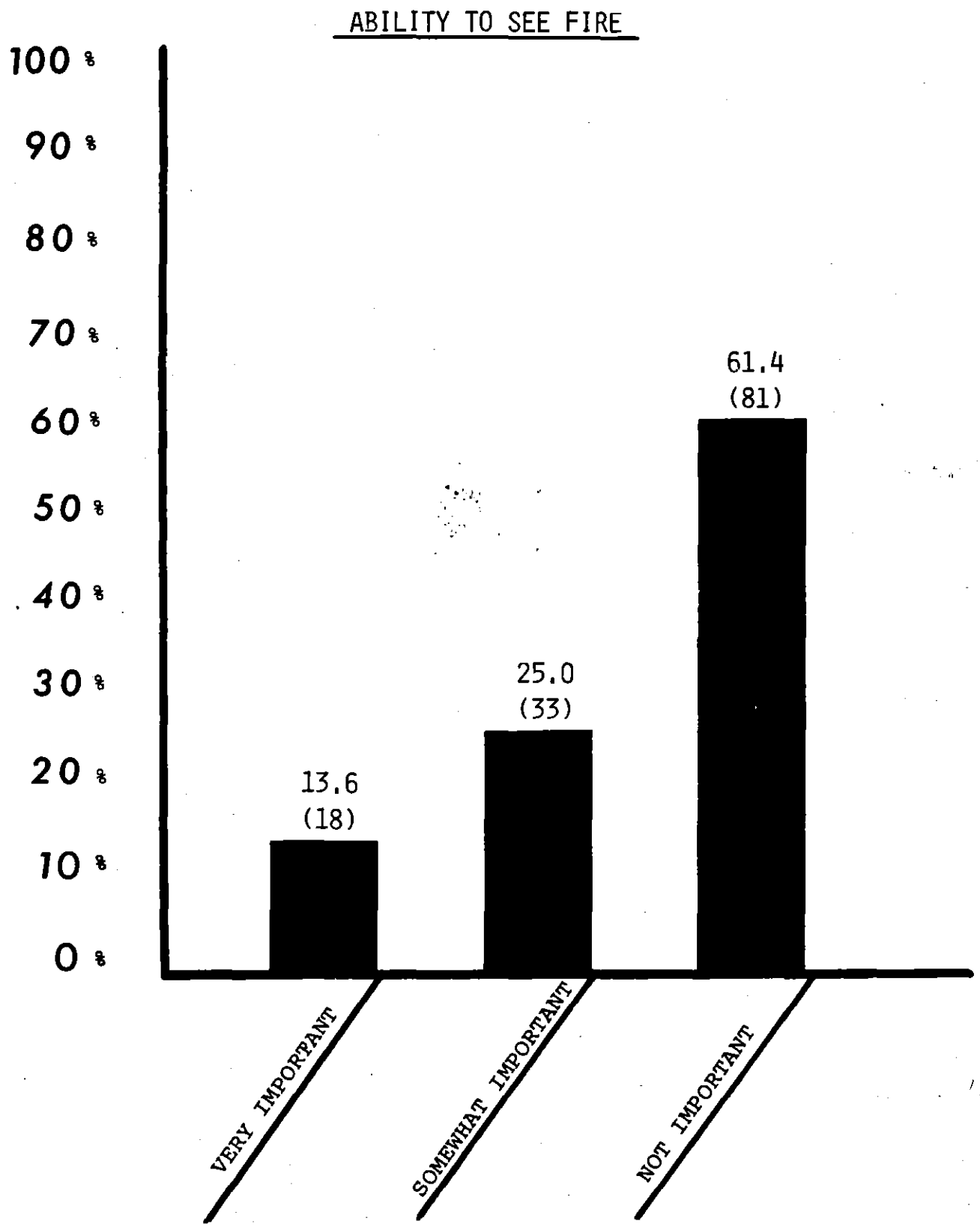
Item 12

Please rate the following as to importance in the purchase of a wood stove



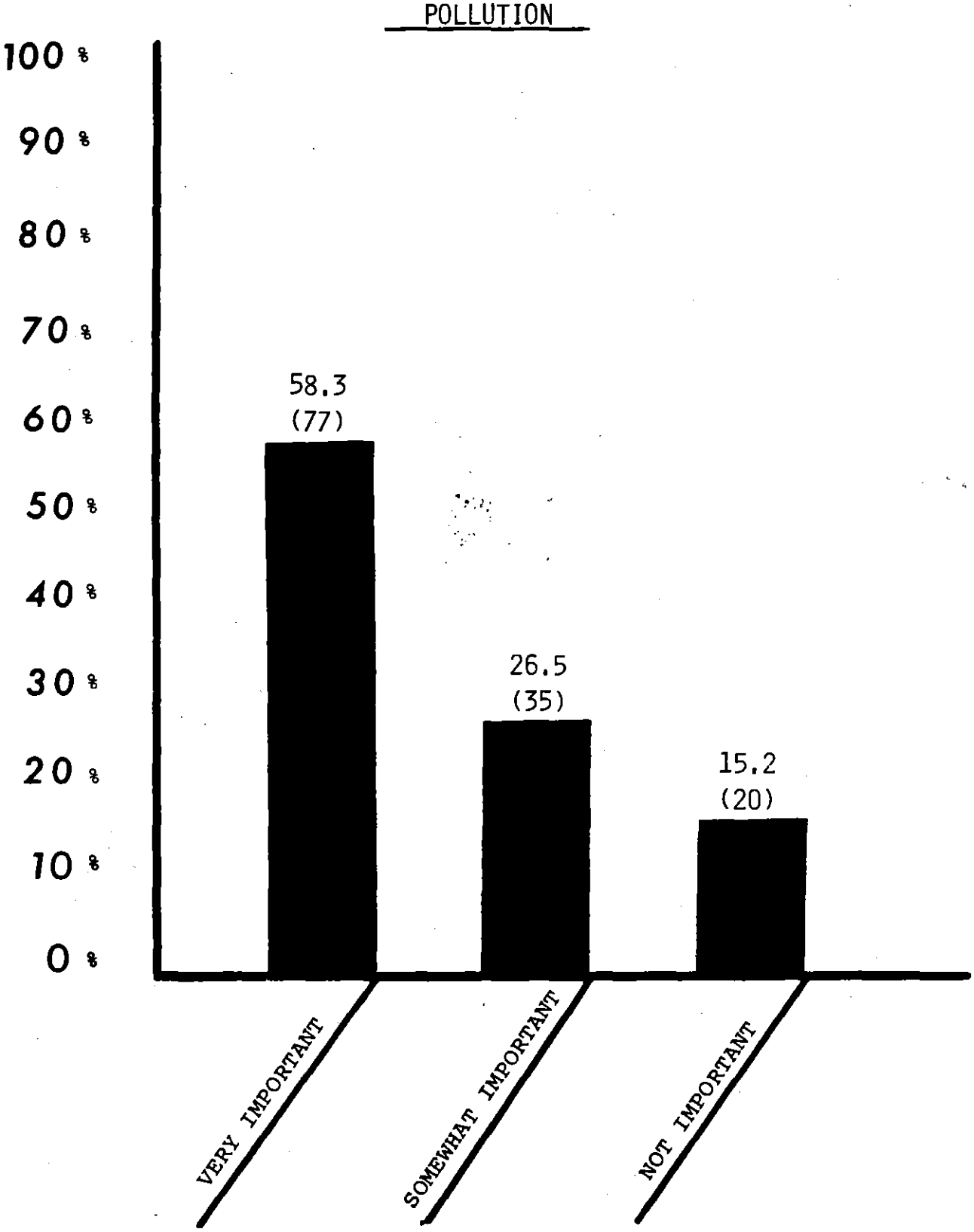
Item 13

Please rate the following as to importance in the purchase of a wood stove



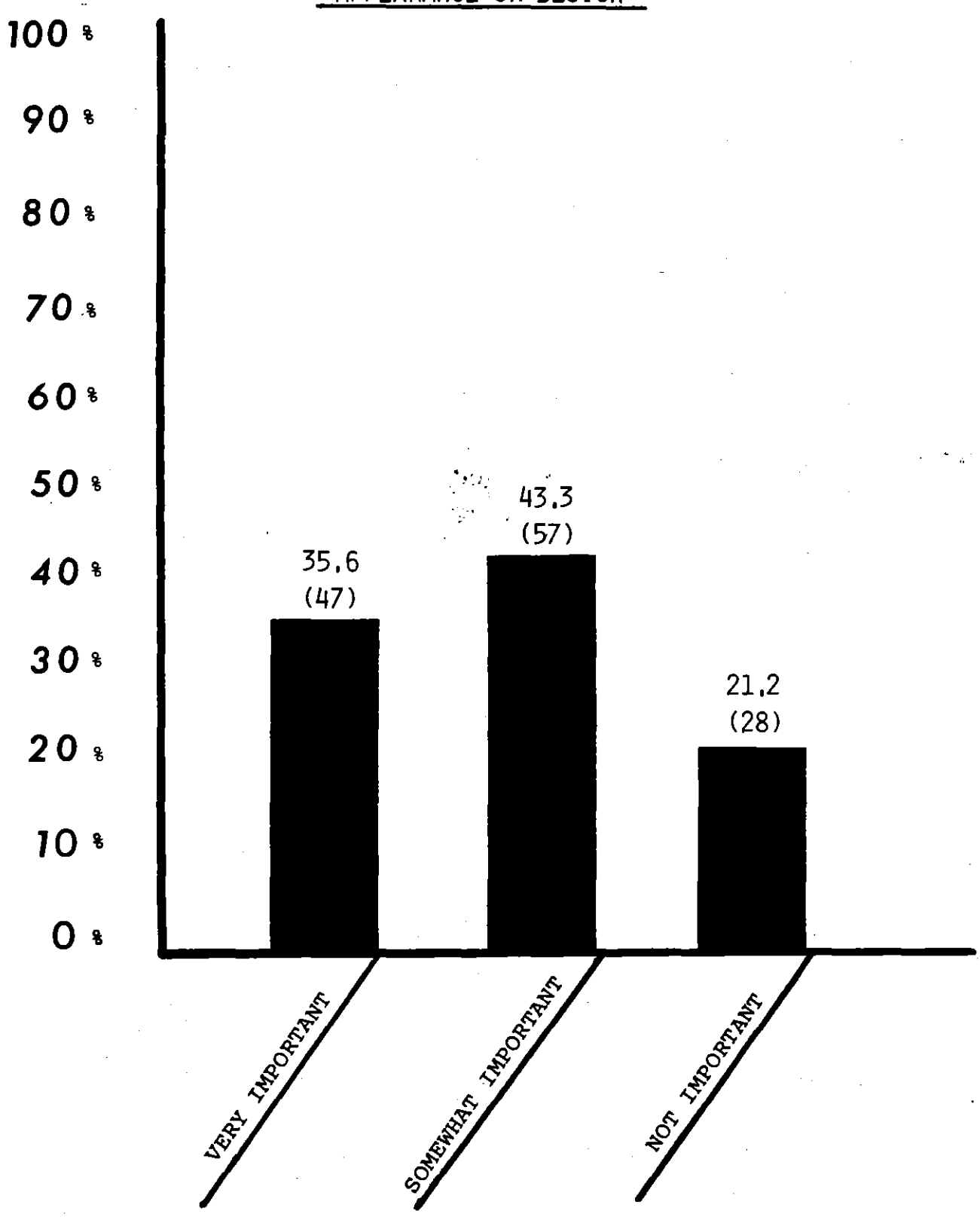
Item 14

Please rate the following as to importance in the purchase of a wood stove



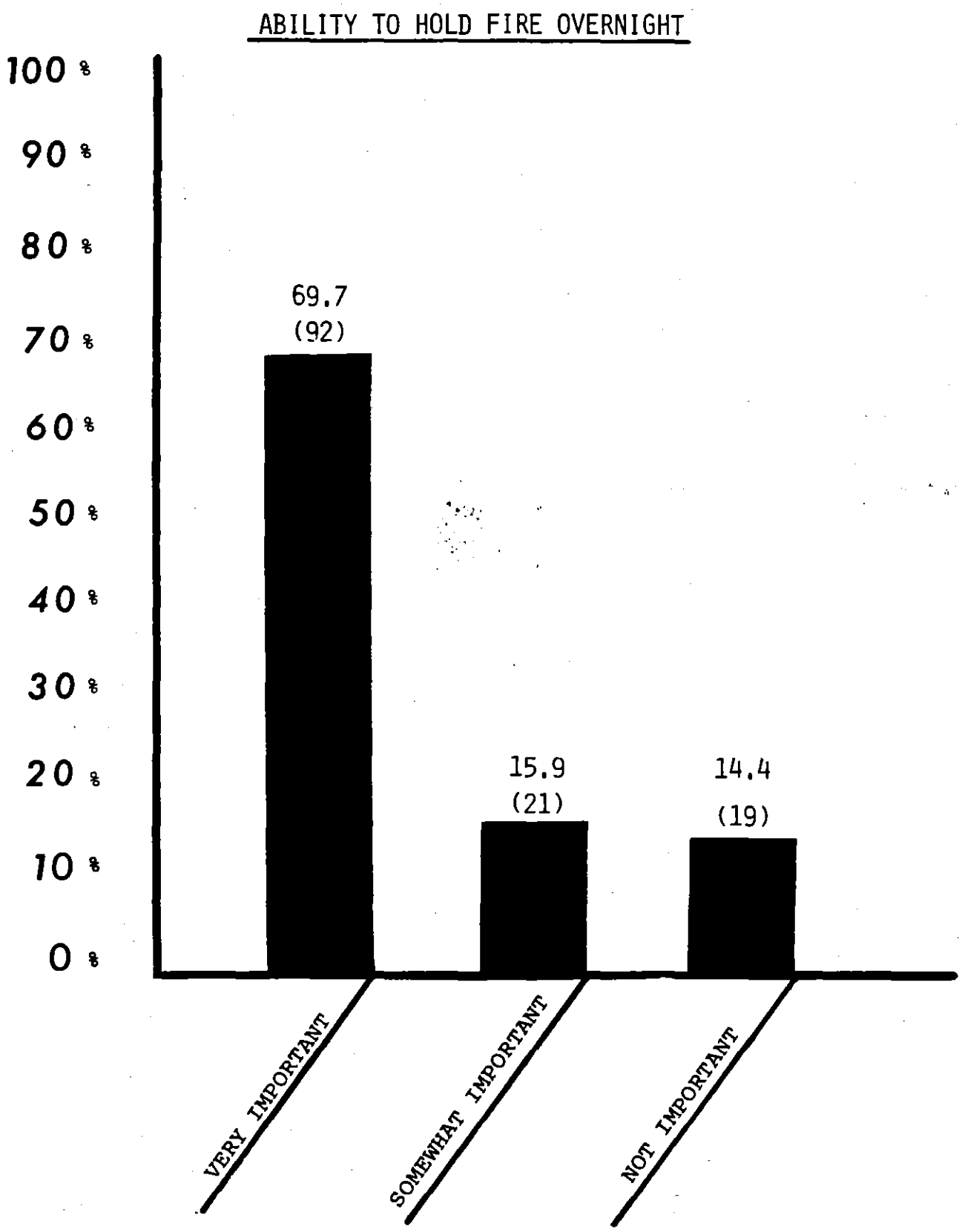
Item 15

Please rate the following as to importance in the purchase of a wood stove



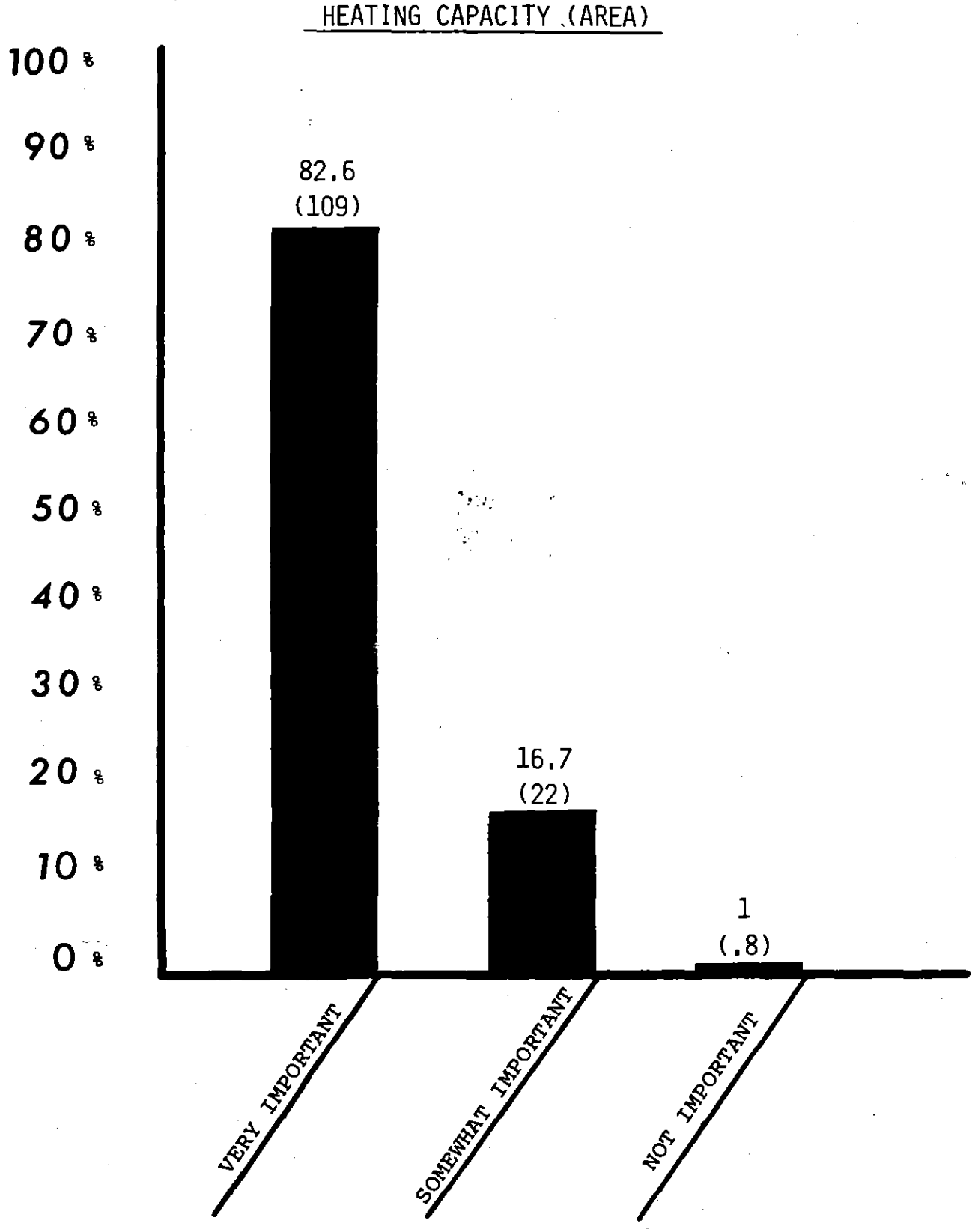
Item 16

Please rate the following as to importance in the purchase of a wood stove



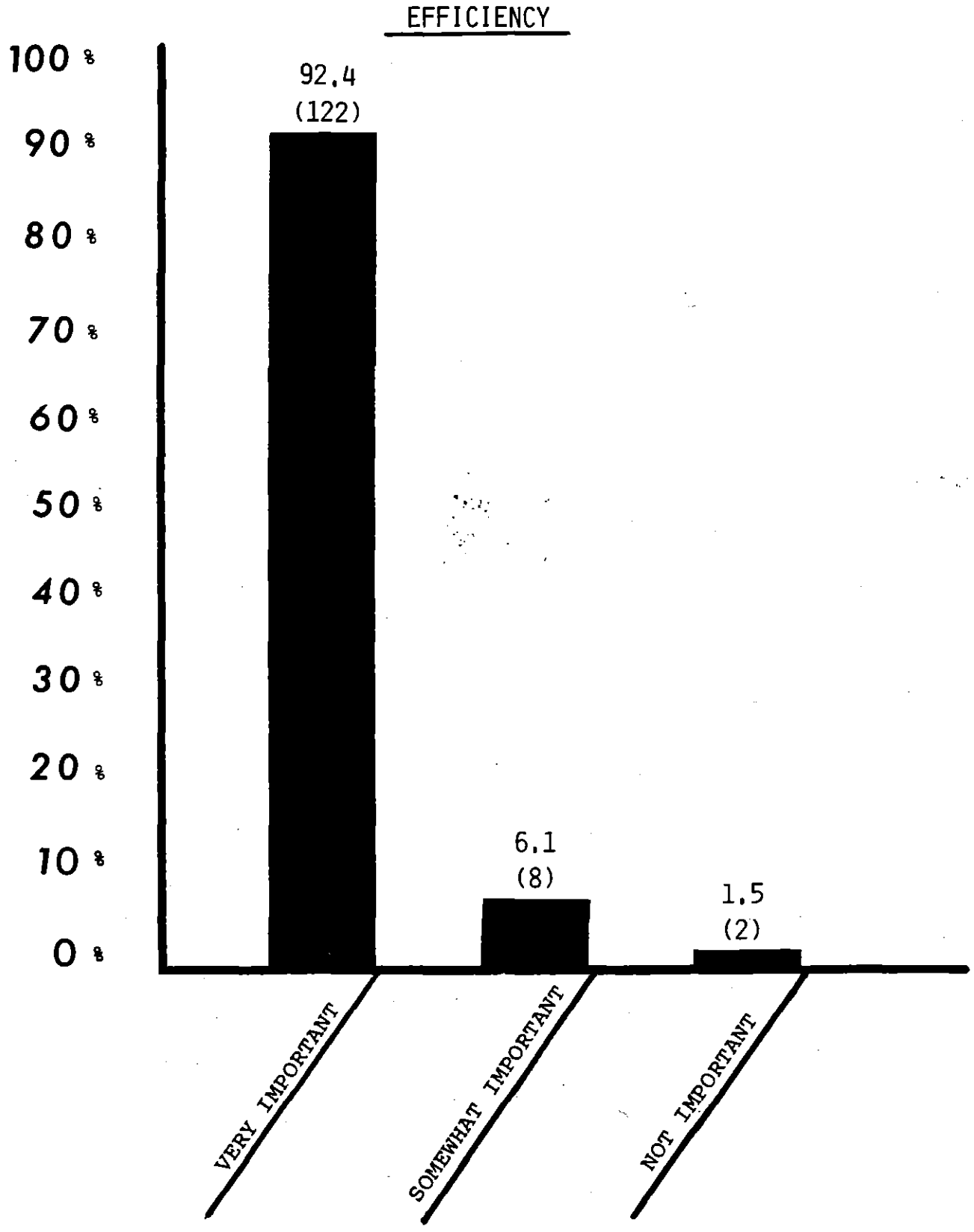
Item 17

Please rate the following as to importance in the purchase of a wood stove



Item 18

Please rate the following as to importance in the purchase of a wood stove



Items 11 - 18

FOR EACH OF THE FOLLOWING ITEMS, PLEASE TELL ME IF THEY ARE (1) VERY IMPORTANT, (2) SOMEWHAT IMPORTANT, (3) NOT IMPORTANT IN THE PURCHASE OF A WOOD STOVE

		(1) Very Important		(2) Somewhat Important		(3) Not Important	
		Number	Percent	Number	Percent	Number	Percent
11.	Safety	126	95.5	6	4.5	-	-
12.	Cost	53	43.9	58	50.2	21	15.9
13.	Ability to see fire	18	13.6	33	25.0	81	61.4
14.	Pollution	77	58.3	35	26.5	20	15.2
15.	Appearance or Design	47	35.6	57	43.2	28	21.2
16.	Ability to hold fire overnight	92	69.7	21	15.9	19	14.4
17.	Heating Capacity (area)	109	82.6	22	16.7	1	.8
18.	Efficiency	122	92.4	8	6.1	2	1.5

Item 19

DO YOU KNOW WHAT A CATALYTIC WOOD STOVE IS*

	Number	Percent
Yes	46	32.4
No	96	67.6
Total	142	100.0%

*If yes, go to Item #20. If no, provide the following explanation:

"A Catalytic stove lowers the temperature at which smoke will burn. Therefore, less smoke will be emitted than from a conventional wood stove, and the efficiency may be higher. However, it costs more, and the catalyst does need to be replaced on a regular basis."

Item 20

WOULD YOU PURCHASE A CATALYTIC STOVE

	Number	Percent
Yes	42	30.2
No	52	37.4
Don't know	45	32.4
Total	139	100.0%

Less than one-third of the respondents knew what a catalytic wood stove was. Those who did not know, were provided

the noted explanation of a catalytic wood stove and were, then, asked if they would purchase a catalytic stove. The response classifications were "yes", "no" and "don't know." Of this group, the "no" group received the highest number of responses, with 37.4 percent saying they would not purchase such a stove. This was followed by the second largest classification, "don't know", which represented 32.4 percent of the respondents. The "yes" group was mentioned by 30.2 percent of the people surveyed.

Item 21

IF ONLY CATALYTIC STOVES WERE SOLD IN OREGON, WOULD YOU CONSIDER BUYING A CONVENTIONAL WOOD BURNING STOVE IN ANOTHER STATE, PROVIDING THAT IT WAS NOT ILLEGAL TO BUY, INSTALL, OR USE IT

	Number	Percent
Yes	38	27.5
No	76	55.1
Don't know	24	17.4
Total	138	100.0%

More than half of the respondents (55.1%) stated they would not buy a conventional wood burning stove in another state for burning in Oregon, even if this practice were legal. The remaining 45 percent suggested they either would, or were not sure. This, of course, addresses the issue as to the feasibility of selling only catalytic stoves in the State of Oregon and what the impact would be under such conditions. It is difficult to evaluate a near split on a controversial issue such as this. This important issue deserves more research data on which to base appropriate long-term solutions.

Item 22

ARE YOU FAMILIAR WITH DEQ'S PROPOSED REGULATIONS FOR WOODSTOVES

	Number	Percent
Yes	132	33.2
No	256	66.8
Total	397	100.0%

Items 23

PLEASE BRIEFLY STATE DEQ'S POSITION*

	Number	Percent
Well understood	7	5.0
Partially understood	21	14.9
Minimal understanding	70	49.6
Uninformed	43	30.5
Total	141	100.0%

*Write in the response -- do not evaluate the response

When all respondents were asked if they were familiar with DEQ's proposed regulations for wood burning stoves, one-third replied in the affirmative; while slightly more than two-thirds

of the respondents stated they were not, in fact, familiar with the DEQ's intentions. Of the respondents who felt they were familiar with the DEQ's position, only five percent (5%) were classified as those who understood the position well when asked to briefly state DEQ's position; while 14.9 percent partially understood the position. The remaining 80 percent, plus, had either minimal understanding, or were totally uninformed about DEQ's proposed regulations. Obviously, as is noted by the responses to these questions, there is considerable confusion and general misunderstanding of the current regulations governing wood burning stoves or inserts.

Item 24

RESPONDENTS' AREA

	Number	Percent
Washington, Multnomah & Clackamas Counties (Portland)	154	38.2
Salem, Eugene/Springfield & Corvallis (Willamette Valley)	99	24.6
Medford, Grants Pass, Ashland & Klamath Falls (Southern Oregon)	50	12.4
Coastal area	50	12.4
Eastern Oregon	50	12.4
Total	403	100.0%

U. S. Population of Census 1980

STATE OF OREGON - HEATING FUEL
(occupied units)

	Number	Percent
Utility gas	223,456	22.5
Bottled, tank or LP gas	18,818	1.9
Electricity	434,500	43.8
Fuel oil, kerosene, etc.	186,438	18.8
Coal or coke	726	.1
Wood	123,789	12.5
Other fuel	3,060	.3
No fuel used	806	.1
Total	991,593	100.0%

STATE OF OREGON - HEATING EQUIPMENT
(year-round housing units)

	Number	Percent
Steam/hot water systems	35,396	3.3
Central warm air furnace	400,755	37.3
Electric heat pump	44,746	4.2
Other built-in electric units	317,173	29.6
Floor/wall/pipeless furnace	30,901	2.9
Room heaters with flue	75,395	7.0
Room heaters without flue	16,877	1.6
Fireplace/stove/portable heater	148,493	13.9
None	1,877	.2
Total	1,071,613	100.0%

Appendix A

CENSUS DATA ABSTRACT

	OREGON	BAKER	BENTON	CLACKAMS	CLATSOP	COLUMBIA	COOS	CROOK	CURRY
P1. POPULATION BY URBAN/RURAL RESIDENCE									
TOTAL	2633105	16134	68211	241919	32489	35646	64047	13091	16992
URBAN	1788284	9471	48138	152722	15191	11939	31477	5276	6240
INSIDE URBANIZED AREAS	1268202	0	0	136270	0	1662	0	0	0
OUTSIDE URBANIZED AREAS	520082	9471	48138	16452	15191	10277	31477	5276	6240
RURAL	844821	6663	20073	89197	17298	23707	32570	7815	10752
P2. POPULATION BY SEX BY AGE									
TOTAL	2633105	16134	68211	241919	32489	35646	64047	13091	16992
UNDER 1	43239	269	924	3837	482	605	1100	189	190
1-4	154669	910	3371	14032	1907	2364	3771	867	938
5-9	189759	1176	4112	19308	2205	3020	4796	1085	960
10-14	202064	1311	4267	21763	2262	3189	5144	966	1348
15-19	225835	1322	8212	21563	2947	3082	5513	1071	1256
20-24	237698	1017	12522	16690	2810	2386	4950	976	1089
25-29	251715	1323	7674	19955	2904	2887	5458	947	1168
30-34	229902	1008	5643	23110	2451	3050	4842	1053	1170
35-44	304218	1821	6846	33652	3380	4320	7478	1557	1807
45-54	242517	1704	4906	23842	2799	3295	6473	1256	1704
55-59	130797	800	2580	11942	1814	1678	3336	706	1191
60-64	117635	912	2016	9568	1778	1833	3471	777	1303
65+	303057	2561	5138	22657	4750	3937	7715	1641	2868
MALE	1295950	8078	34661	119249	16054	17780	31953	6478	8455
UNDER 1	21799	139	502	1924	270	299	572	101	96
1-4	79629	501	1737	7198	973	1161	1942	441	463
5-9	97208	654	2144	9902	1152	1562	2468	522	487
10-14	103367	662	2101	11063	1089	1587	2740	501	703
15-19	114494	690	4225	11160	1501	1601	2887	552	635
20-24	117844	516	6827	8385	1429	1148	2395	469	552
25-29	126007	696	3905	9613	1495	1453	2737	473	624
30-34	116201	476	3101	11234	1331	1525	2399	500	557
35-44	153330	903	3399	16897	1681	2213	3725	813	871
45-54	118529	876	2361	11778	1403	1735	3213	642	846
55-59	62784	398	1306	5880	792	862	1693	312	542
60-64	55786	401	973	4709	881	806	1664	367	656
65+	128972	1166	2080	9506	2057	1828	3518	785	1423
FEMALE	1337155	8056	33550	122670	16435	17866	32094	6613	8537
UNDER 1	21440	130	422	1913	212	306	528	88	94
1-4	75040	409	1634	6834	934	1203	1829	426	475
5-9	92551	522	1968	9406	1053	1458	2328	563	473
10-14	98697	649	2166	10700	1173	1602	2404	465	645
15-19	111341	632	3987	10403	1446	1481	2626	519	621
20-24	119854	501	5695	8305	1381	1238	2555	507	537
25-29	125708	627	3769	10342	1409	1434	2721	474	544
30-34	113701	532	2542	11876	1120	1525	2443	553	613
35-44	150888	918	3447	16755	1699	2107	3753	744	936
45-54	123988	828	2545	12064	1396	1560	3260	614	858
55-59	68013	402	1274	6062	1022	816	1643	394	649
60-64	61849	511	1043	4859	897	1027	1807	410	647
65+	174085	1395	3058	13151	2693	2109	4197	856	1445

	DESCHUTES	DOUGLAS	GILLIAM	GRANT	HARNEY	H. RIVER	JACKSON	JEFFERSN	JOSEPHNE
P1. POPULATION BY URBAN/RURAL RESIDENCE									
TOTAL	62142	93748	2057	8210	8314	15835	132456	11599	58855
URBAN	23715	40257	0	0	3579	4329	78000	0	22936
INSIDE URBANIZED AREAS	0	0	0	0	0	0	52271	0	0
OUTSIDE URBANIZED AREAS	23715	40257	0	0	3579	4329	25729	0	22936
RURAL	38427	53491	2057	8210	4735	11506	54456	11599	35919
P2. POPULATION BY SEX BY AGE									
TOTAL	62142	93748	2057	8210	8314	15835	132456	11599	58855
UNDER 1	1126	1719	20	163	150	262	2019	220	948
1-4	3790	6071	150	519	560	1043	7475	813	3388
5-9	4854	7531	138	631	816	1171	9535	1006	4368
10-14	5117	7975	140	650	554	1181	10600	1073	4679
15-19	5041	8458	182	673	728	1215	11718	1120	4777
20-24	5133	7147	143	581	637	1301	10431	896	3619
25-29	6115	7498	171	682	694	1479	11495	854	4270
30-34	5801	7522	122	613	677	1245	11067	968	4610
35-44	7684	10882	215	996	1040	1748	15779	1311	6811
45-54	5573	9301	219	825	782	1501	12618	1113	5554
55-59	2843	5052	134	434	459	795	6503	620	3701
60-64	2797	4466	132	439	393	943	6509	521	3197
65+	6265	10126	291	1004	824	1951	16707	1084	8933
MALE	31041	46866	1034	4146	4295	7899	65773	5943	28816
UNDER 1	653	830	14	85	80	81	1010	115	556
1-4	1861	3201	75	260	325	515	3769	437	1721
5-9	2409	3706	62	304	410	595	4929	548	2315
10-14	2678	4244	71	347	271	617	5443	548	2407
15-19	2586	4456	97	356	384	633	6097	614	2440
20-24	2468	3530	74	277	321	664	5074	449	1706
25-29	3163	3677	89	354	348	793	5718	497	2213
30-34	2864	3760	63	316	356	659	5572	433	2093
35-44	3926	5392	103	504	563	889	7953	646	3383
45-54	2746	4597	110	437	410	731	6324	566	2585
55-59	1305	2608	55	198	245	355	3077	314	1765
60-64	1398	2120	75	225	177	478	3232	241	1588
65+	2984	4745	146	483	405	889	7575	535	4044
FEMALE	31101	46882	1023	4064	4019	7936	66683	5656	30039
UNDER 1	473	889	6	78	70	181	1009	105	392
1-4	1929	2870	75	259	235	528	3706	376	1667
5-9	2445	3825	76	327	406	576	4606	458	2053
10-14	2439	3731	69	303	283	564	5157	525	2272
15-19	2455	4002	85	317	344	582	5621	506	2337
20-24	2665	3617	69	304	316	637	5357	447	1913
25-29	2952	3821	82	328	346	686	5777	357	2057
30-34	2937	3762	59	297	321	586	5495	535	2517
35-44	3758	5490	112	492	477	859	7826	665	3428
45-54	2827	4704	109	388	372	770	6294	547	2969
55-59	1543	2444	79	236	214	440	3426	306	1936
60-64	1399	2346	57	214	216	465	3277	280	1609
65+	3279	5381	145	521	419	1062	9132	549	4889

	KLAMATH	LAKE	LANE	LINCOLN	LINN	MALHEUR	MARION	MORROW	MULTNOMH
P1. POPULATION BY URBAN/RURAL RESIDENCE									
TOTAL	59117	7532	275226	35264	89495	26896	204692	7519	562640
URBAN	36466	2794	201178	16139	43889	11658	148339	0	551380
INSIDE URBANIZED AREAS	0	0	182570	0	0	0	124706	0	551380
OUTSIDE URBANIZED AREAS	36466	2794	18608	16139	43889	11658	23633	0	0
RURAL	22651	4738	74048	19125	45606	15238	56353	7519	11260
P2. POPULATION BY SEX BY AGE									
TOTAL	59117	7532	275226	35264	89495	26896	204692	7519	562640
UNDER 1	935	95	4138	648	1445	559	3615	147	8890
1-4	3780	525	16302	1721	5597	1890	12608	556	29909
5-9	4875	557	19381	2050	7476	2419	14620	643	33738
10-14	4814	677	20491	2294	7348	2208	16076	599	36222
15-19	5376	612	24643	2577	7893	2623	18232	686	43145
20-24	4902	538	29860	2505	7235	1917	18651	613	57070
25-29	5247	572	30026	3007	7970	1940	18873	620	62529
30-34	4554	594	25816	2710	7258	1920	16883	621	50996
35-44	6711	899	31427	3540	10386	2817	22942	902	58588
45-54	5635	938	23426	3495	8165	2686	18178	804	50692
55-59	3317	370	12539	2420	4454	1272	9666	333	29192
60-64	2683	320	10858	2402	4281	1310	8606	294	26669
65+	6288	835	26319	5895	9987	3335	25742	701	75000
MALE	29977	3825	136058	17283	44198	13305	100686	3874	270759
UNDER 1	488	35	2066	277	695	278	1829	83	4419
1-4	2013	286	8476	870	2938	977	6365	289	15401
5-9	2501	257	9885	987	3794	1198	7584	340	17403
10-14	2521	353	10600	1200	3821	1153	8105	307	18157
15-19	2817	327	12269	1369	3975	1345	9452	379	21212
20-24	2590	267	14707	1222	3576	980	9536	299	27727
25-29	2614	297	15118	1519	3981	944	9634	332	31434
30-34	2353	304	13174	1354	3628	990	8588	314	26354
35-44	3400	462	15865	1792	5199	1363	11614	461	29603
45-54	2828	468	11421	1690	3962	1285	8576	393	24444
55-59	1558	214	5928	1102	2139	618	4742	170	13821
60-64	1357	149	5165	1152	2032	628	4012	164	12041
65+	2937	406	11384	2749	4458	1546	10649	343	28743
FEMALE	29140	3707	139168	17981	45297	13591	104006	3645	291881
UNDER 1	447	60	2072	371	750	281	1786	64	4471
1-4	1767	239	7826	851	2659	913	6243	267	14508
5-9	2374	300	9496	1063	3682	1221	7036	303	16335
10-14	2293	324	9891	1094	3527	1055	7971	292	18065
15-19	2559	285	12374	1208	3918	1278	8780	307	21933
20-24	2312	271	15153	1283	3659	937	9115	314	29343
25-29	2633	275	14908	1488	3989	996	9239	288	31095
30-34	2201	290	12642	1356	3630	930	8295	307	24642
35-44	3311	437	15562	1748	5187	1454	11328	441	28985
45-54	2807	470	12005	1805	4203	1401	9602	411	26248
55-59	1759	156	6611	1318	2315	654	4924	163	15371
60-64	1326	171	5693	1250	2249	682	4594	130	14628
65+	3351	429	14935	3146	5529	1789	15093	358	46257

P1. POPULATION BY URBAN/RURAL RESIDENCE										
TOTAL	45203	2172	21164	58861	23921	7273	21732	245808	1513	55332
URBAN	29225	0	3981	32214	11354	0	13640	208283	0	24474
INSIDE URBANIZED AREAS	11077	0	0	0	0	0	0	208266	0	0
OUTSIDE URBANIZED AREAS	18148	0	3981	32214	11354	0	13640	17	0	24474
RURAL	15978	2172	17183	26647	12567	7273	8092	37525	1513	30858
P2. POPULATION BY SEX BY AGE										
TOTAL	45203	2172	21164	58861	23921	7273	21732	245808	1513	55332
UNDER 1	869	40	350	1115	449	154	328	4296	16	927
1-4	2625	139	1201	4051	1515	393	1362	14762	87	3677
5-9	3091	152	1468	4874	1957	494	1731	19257	111	4153
10-14	3864	191	1415	4430	1975	587	1706	20224	116	4608
15-19	4075	176	1589	5061	2144	565	1770	20446	136	5208
20-24	4079	137	1469	4970	2163	472	1459	22385	70	4875
25-29	3778	187	1826	5057	2011	666	1767	25336	78	4651
30-34	3794	153	1519	4757	1953	447	1750	24881	101	4243
35-44	5047	200	2160	6533	2716	817	2420	32464	165	6157
45-54	4160	239	2282	5685	2257	772	2024	22288	184	5142
55-59	2241	140	1362	2940	851	426	1359	10813	66	2443
60-64	1868	155	1173	2695	1051	400	1011	8292	121	2391
65+	5712	263	3350	6693	2879	1080	3045	20364	262	6857
MALE	21870	1097	10543	29127	11910	3648	10740	120646	766	27117
UNDER 1	385	26	189	564	177	90	207	2162	11	491
1-4	1409	61	615	2077	871	205	705	7589	38	1864
5-9	1587	84	693	2435	1002	230	871	10015	55	2118
10-14	2026	94	772	2176	1041	316	894	10348	59	2352
15-19	1905	79	834	2513	1066	303	902	10175	76	2582
20-24	1934	84	739	2464	1051	234	707	10985	39	2419
25-29	1796	102	912	2505	989	335	913	12460	36	2238
30-34	1904	72	796	2547	1007	243	854	12257	48	2175
35-44	2531	101	1097	3319	1365	421	1221	16429	77	3149
45-54	2016	101	1113	2886	1125	362	925	10944	85	2545
55-59	1084	81	642	1366	433	209	730	5102	40	1098
60-64	885	89	569	1312	473	202	451	3914	69	1131
65+	2408	123	1572	2963	1310	498	1360	8266	133	2955
FEMALE	23333	1075	10621	29734	12011	3625	10992	125162	747	28215
UNDER 1	484	14	161	551	272	64	121	2134	5	436
1-4	1216	78	586	1974	644	188	657	7173	49	1813
5-9	1504	68	775	2439	955	264	860	9242	56	2035
10-14	1838	97	643	2254	934	271	812	9876	57	2256
15-19	2170	97	755	2548	1078	262	868	10271	60	2626
20-24	2145	53	730	2506	1112	238	752	11400	31	2456
25-29	1982	85	914	2552	1022	331	854	12876	42	2413
30-34	1890	81	723	2210	946	204	896	12624	53	2068
35-44	2516	99	1063	3214	1351	396	1199	16035	88	3008
45-54	2144	138	1169	2799	1132	410	1099	11344	99	2597
55-59	1157	59	720	1574	418	217	629	5711	26	1345
60-64	983	66	604	1383	578	198	560	4378	52	1260
65+	3304	140	1778	3730	1569	582	1685	12098	129	3902

	OREGON	BAKER	BENTON	CLACKAMS	CLATSOP	COLUMBIA	COOS	CROOK	CURRY
P3. POPULATION BY RACE & ETHNICITY									
TOTAL	2633105	16134	68211	241919	32489	35646	64047	13091	16992
WHITE	2496398	15845	64873	235824	31242	34813	61898	12606	16593
BLACK	37454	38	429	927	161	27	35	8	6
AMERICAN INDIAN, ESKIMO & ALEUT	30469	161	472	1344	280	510	1267	222	277
ASIAN & PACIFIC ISLANDER	36322	66	1752	2614	680	180	495	92	20
OTHER	32462	24	685	1210	126	116	352	163	96
TOTAL	2633105	16134	68211	241919	32489	35646	64047	13091	16992
OF SPANISH ORIGIN	66164	136	1250	3518	432	526	1171	304	152
NOT OF SPANISH ORIGIN	2566941	15998	66961	238401	32057	35120	62876	12787	16840
P4. RACE & ETHNICITY BY AGE									
WHITE	2496398	15845	64873	235824	31242	34813	61898	12606	16593
UNDER 5	183069	1154	4022	17213	2301	2887	4708	996	1106
5 TO 14	365248	2418	7963	39994	4274	5989	9415	1870	2182
15 TO 59	1536399	8829	45802	146798	18190	20201	36686	7341	9181
60 TO 64	114704	895	1988	9475	1750	1824	3442	763	1283
65+	296978	2549	5098	22344	4727	3912	7647	1636	2841
BLACK	37454	0	429	927	161	0	35	0	0
UNDER 5	4028	0	41	104	2	0	13	0	0
5 TO 14	7165	0	70	163	2	0	2	0	0
15 TO 59	22790	0	299	610	157	0	20	0	0
60 TO 64	1141	0	0	23	0	0	0	0	0
65+	2330	0	19	27	0	0	0	0	0
AMERICAN INDIAN, ESKIMO, & ALEUT	30469	161	472	1344	280	510	1267	222	277
UNDER 5	2970	18	31	96	12	32	78	0	0
5 TO 14	6654	29	106	282	46	164	348	91	104
15 TO 59	18902	97	320	888	209	300	784	117	128
60 TO 64	636	17	15	19	4	0	14	14	20
65+	1307	0	0	59	9	14	43	0	25
ASIAN & PACIFIC ISLANDER	40958	81	2025	2771	714	187	504	92	0
UNDER 5	3869	5	151	315	74	24	45	22	0
5 TO 14	7385	40	203	422	145	39	92	24	0
15 TO 59	26828	31	1637	1786	457	108	340	41	0
60 TO 64	909	0	13	38	24	9	2	0	0
65+	1967	5	21	210	14	7	25	5	0
SPANISH ORIGIN	66164	136	1250	3518	432	526	1171	304	152
UNDER 5	8937	23	180	345	27	69	83	71	30
5 TO 14	14429	21	193	742	81	149	293	58	17
15 TO 59	40139	64	873	2220	298	252	719	175	105
60 TO 64	965	0	2	93	2	24	43	0	0
65+	1694	28	2	118	24	32	33	0	0

	OREGON	BAKER	BENTON	CLACKAMS	CLATSOP	COLUMBIA	COOS	CROOK	CURRY
H1. YEAR-ROUND HOUSING UNIT COUNTS									
TOTAL	1071613	6912	25158	88921	16566	13617	25482	5444	7266
OCCUPIED	991593	6169	23973	84698	12795	12742	23870	4892	6763
VACANT	80020	743	1185	4223	3771	875	1612	552	503
H2. UNITS BY TENURE & STRUCTURE TYPE									
TOTAL YEAR-ROUND HOUSING	1071613	6912	25158	88921	16566	13617	25482	5444	7266
1, DETACHED	711856	5122	15095	66190	11110	10196	17576	3520	4496
1, ATTACHED	30939	57	1060	2274	196	106	476	21	88
2	39156	224	1401	2166	667	565	950	202	280
3 AND 4	37536	239	1190	2087	903	307	800	160	160
5 OR MORE	162300	416	4764	9462	2665	810	2304	401	483
MOBILE HOME OR TRAILER	89826	854	1648	6742	1025	1633	3376	1140	1759
TOTAL OCCUPIED	991593	6169	23973	84698	12795	12742	23870	4892	6763
1, DETACHED	669208	4617	14559	63508	8763	9672	16710	3295	4237
1, ATTACHED	28553	57	1015	2092	183	106	427	15	88
2	35403	182	1318	2038	533	492	911	173	258
3 AND 4	33529	195	1079	2001	739	271	700	134	146
5 OR MORE	143809	347	4453	8633	1671	725	1938	260	401
MOBILE HOME OR TRAILER	81091	771	1549	6426	906	1476	3184	1015	1633
RENTER OCCUPIED	345641	1699	10403	21335	4536	3156	7123	1349	1671
1, DETACHED	121377	939	2749	8499	1709	1655	3142	693	724
1, ATTACHED	20459	39	881	1086	147	73	369	7	81
2	28125	153	1157	1555	386	357	691	143	187
3 AND 4	29178	148	1016	1636	674	242	630	94	134
5 OR MORE	133393	268	4336	7672	1521	607	1730	241	325
MOBILE HOME OR TRAILER	13089	152	264	887	99	222	561	171	220
H3. PERSONS IN UNITS BY STRUCTURE TYPE									
TOTAL OCCUPIED	2571686	15851	60818	238407	31282	35369	63281	12874	16821
1, DETACHED	1909640	12294	41823	192960	23308	28099	46931	9230	11132
1, ATTACHED	64817	137	2616	4749	410	270	1096	42	202
2	80804	381	3030	4744	1126	1269	2085	293	579
3 AND 4	68520	322	2134	4374	1578	510	1444	284	256
5 OR MORE	255228	644	7716	16674	2867	1537	3887	568	946
MOBILE HOME OR TRAILER	192677	2073	3499	14906	1993	3684	7838	2457	3706
RENTER OCCUPIED	780698	4290	22595	50272	9811	7768	17838	3537	3921
1, DETACHED	350041	2711	7682	24294	4548	4678	9388	2117	1830
1, ATTACHED	47278	71	2298	2632	295	175	920	14	176
2	63624	318	2625	3513	817	827	1574	250	395
3 AND 4	57925	245	1974	3431	1448	420	1262	188	227
5 OR MORE	230711	504	7433	14443	2506	1136	3299	511	724
MOBILE HOME OR TRAILER	31119	441	583	1959	197	532	1395	457	569

	DESCHUTES	DOUGLAS	GILLIAM	GRANT	HARNEY	H. RIVER	JACKSON	JEFFERSN	JOSEPHNE
H1. YEAR-ROUND HOUSING UNIT COUNTS									
TOTAL	27562	35375	993	3506	3319	6436	52024	4547	23262
OCCUPIED	22976	33367	778	3006	2942	5962	49011	3935	21878
VACANT	4586	2008	215	500	377	474	3013	612	1384
H2. UNITS BY TENURE & STRUCTURE TYPE									
TOTAL YEAR-ROUND HOUSING	27562	35375	993	3506	3319	6436	52024	4547	23262
1, DETACHED	17847	24132	785	2260	2128	4558	34793	2631	16289
1, ATTACHED	351	632	8	10	16	50	1412	26	326
2	655	1127	36	100	107	176	1729	174	800
3 AND 4	680	928	38	76	101	179	1561	116	465
5 OR MORE	2559	2738	34	312	275	666	5889	400	1692
MOBILE HOME OR TRAILER	5470	5818	92	748	692	807	6640	1200	3690
TOTAL OCCUPIED	22976	33367	778	3006	2942	5962	49011	3935	21878
1, DETACHED	14950	23063	629	2012	1917	4335	33174	2436	15527
1, ATTACHED	329	606	8	10	16	50	1314	24	326
2	535	1050	23	74	87	133	1594	158	717
3 AND 4	554	820	28	53	94	156	1393	83	386
5 OR MORE	2004	2447	15	173	210	557	5306	297	1459
MOBILE HOME OR TRAILER	4604	5381	75	684	618	731	6230	937	3463
RENTER OCCUPIED	6224	9273	257	815	795	2003	15230	1282	5751
1, DETACHED	2620	4216	206	473	433	1089	6283	633	2863
1, ATTACHED	286	422	8	4	8	27	942	17	267
2	402	836	10	50	61	108	1189	122	475
3 AND 4	479	578	12	39	44	130	1217	70	326
5 OR MORE	1726	2184	12	122	153	503	4612	239	1199
MOBILE HOME OR TRAILER	711	1037	9	127	96	146	987	201	621
H3. PERSONS IN UNITS BY STRUCTURE TYPE									
TOTAL OCCUPIED	61567	92787	2002	8137	8308	15637	128616	11498	58179
1, DETACHED	42987	67975	1628	5645	5627	12189	94285	7638	43772
1, ATTACHED	812	1655	20	15	60	232	3029	107	725
2	1233	2485	57	173	174	278	3675	460	1669
3 AND 4	1207	2040	69	84	187	272	3066	241	849
5 OR MORE	3609	4918	30	363	461	1074	10044	669	2814
MOBILE HOME OR TRAILER	11719	13714	198	1857	1799	1592	14517	2383	8350
RENTER OCCUPIED	15048	23502	672	2121	2089	4899	35434	3831	14506
1, DETACHED	7453	12475	552	1374	1322	3104	17378	2135	8396
1, ATTACHED	727	1120	20	9	40	174	2276	83	562
2	958	1963	32	103	115	251	2631	388	1038
3 AND 4	1050	1284	27	56	77	207	2651	201	704
5 OR MORE	3015	4246	21	233	281	907	8220	512	2218
MOBILE HOME OR TRAILER	1845	2414	20	346	254	256	2278	512	1588

	KLAMATH	LAKE	LANE	LINCOLN	LINN	MALHEUR	MARION	MORROW	MULTNOMH
H1. YEAR-ROUND HOUSING UNIT COUNTS									
TOTAL	24346	3181	110545	20569	35054	10439	79490	3095	246030
OCCUPIED	21688	2791	103525	14608	32773	9279	74246	2642	233135
VACANT	2658	390	7020	5961	2281	1160	5244	453	12895
H2. UNITS BY TENURE & STRUCTURE TYPE									
TOTAL YEAR-ROUND HOUSING	24346	3181	110545	20569	35054	10439	79490	3095	246030
1, DETACHED	16153	2249	70288	13480	24735	7151	54194	1709	155585
1, ATTACHED	568	56	5064	269	952	59	3231	8	7683
2	1071	113	5259	724	1265	535	2335	116	9903
3 AND 4	936	23	3573	729	1454	336	3176	76	10249
5 OR MORE	2079	137	17361	2276	3283	860	10779	266	59056
MOBILE HOME OR TRAILER	3539	603	9000	3091	3365	1498	5775	920	3554
TOTAL OCCUPIED	21688	2791	103525	14608	32773	9279	74246	2642	233135
1, DETACHED	14779	2052	67360	9884	23585	6444	51468	1529	149555
1, ATTACHED	548	56	4671	247	902	56	2959	8	7062
2	810	86	4853	569	1100	470	2078	87	9231
3 AND 4	815	19	3222	624	1235	244	2804	61	9502
5 OR MORE	1690	96	15324	1352	2862	700	9551	174	54410
MOBILE HOME OR TRAILER	3046	482	8095	1932	3089	1365	5386	783	3375
RENTER OCCUPIED	6724	809	39735	4666	10226	2862	26054	793	100947
1, DETACHED	3081	549	13399	2028	4300	1439	9581	352	27675
1, ATTACHED	322	56	3899	183	749	45	2433	6	5099
2	594	38	3935	393	985	304	1756	63	7544
3 AND 4	684	11	2812	560	1081	165	2552	46	8666
5 OR MORE	1504	48	14511	1202	2576	640	8943	164	51450
MOBILE HOME OR TRAILER	539	107	1179	300	535	269	789	162	513
H3. PERSONS IN UNITS BY STRUCTURE TYPE									
TOTAL OCCUPIED	58055	7532	268065	34852	88604	26502	194721	7476	550796
1, DETACHED	42283	5734	194434	24954	68027	19617	147765	4557	404134
1, ATTACHED	1284	117	10995	497	2233	130	6620	12	15153
2	1917	232	11410	1319	2454	1296	4711	225	20064
3 AND 4	1653	59	6495	1216	2872	606	5660	123	18042
5 OR MORE	2997	230	25775	2454	5588	1301	17939	400	87649
MOBILE HOME OR TRAILER	7921	1160	18956	4412	7430	3552	12026	2159	5754
RENTER OCCUPIED	15412	2066	89186	10624	25095	7713	60752	2008	206793
1, DETACHED	7949	1565	38871	5572	12682	4546	28425	959	80058
1, ATTACHED	598	117	9320	323	1814	104	5375	6	11119
2	1419	94	9135	895	2205	851	3901	159	16632
3 AND 4	1381	11	5411	1039	2346	343	5021	87	16363
5 OR MORE	2535	48	23759	2133	4844	1140	16140	381	81805
MOBILE HOME OR TRAILER	1530	231	2690	662	1204	729	1890	416	816

	POLK	SHERMAN	TILAMOOK	UMATILLA	UNION	WALLOWA	WASCO	WASHNGTN	WHEELER	YAMHILL
H1. YEAR-ROUND HOUSING UNIT COUNTS										
TOTAL	17399	946	12070	23110	9477	3198	8864	96549	701	20160
OCCUPIED	16410	820	8403	21077	8707	2813	8212	90930	586	19191
VACANT	989	126	3667	2033	770	385	652	5619	115	969
H2. UNITS BY TENURE & STRUCTURE TYPE										
TOTAL YEAR-ROUND HOUSING	17399	946	12070	23110	9477	3198	8864	96549	701	20160
1, DETACHED	12352	644	9073	14510	6243	2420	5840	61528	535	14439
1, ATTACHED	612	2	196	291	85	11	226	4055	2	460
2	428	11	339	1032	477	63	356	2913	9	848
3 AND 4	673	12	279	963	286	71	279	3924	16	491
5 OR MORE	2206	82	730	2882	1026	194	781	20555	8	1869
MOBILE HOME OR TRAILER	1128	195	1453	3432	1360	439	1382	3574	131	2053
TOTAL OCCUPIED	16410	820	8403	21077	8707	2813	8212	90930	586	19191
1, DETACHED	11816	563	6308	13454	5808	2161	5455	59275	451	13857
1, ATTACHED	554	2	137	262	79	11	206	3714	2	411
2	399	10	257	858	429	38	333	2729	6	784
3 AND 4	609	10	202	807	266	54	255	3514	5	449
5 OR MORE	1985	65	510	2487	864	159	638	18315	5	1726
MOBILE HOME OR TRAILER	1047	170	989	3209	1261	390	1325	3383	117	1964
RENTER OCCUPIED	5328	278	2519	7231	2633	761	2595	32938	172	5468
1, DETACHED	2060	183	1456	2857	1010	484	1174	8404	130	2289
1, ATTACHED	394	2	92	173	74	0	161	1800	0	307
2	304	10	163	627	311	23	248	2319	4	622
3 AND 4	519	10	161	734	172	31	238	2945	3	339
5 OR MORE	1888	43	418	2290	845	153	576	17078	5	1609
MOBILE HOME OR TRAILER	163	50	229	550	221	70	198	392	30	302
H3. PERSONS IN UNITS BY STRUCTURE TYPE										
TOTAL OCCUPIED	43803	2171	20828	57386	23321	7248	21341	242714	1525	53312
1, DETACHED	33749	1511	16397	38964	16762	5789	15099	179957	1220	41164
1, ATTACHED	1277	2	302	641	153	32	446	7754	6	986
2	840	34	568	2051	1078	64	712	6075	6	2037
3 AND 4	1070	27	428	1819	494	114	496	7409	5	1015
5 OR MORE	4248	175	983	5401	1522	224	1253	34763	5	3500
MOBILE HOME OR TRAILER	2619	422	2150	8510	3312	1025	3335	6756	283	4610
RENTER OCCUPIED	12286	846	5531	17903	6331	1825	6355	73754	467	13617
1, DETACHED	5542	589	3423	8156	3092	1338	3362	25421	402	6652
1, ATTACHED	945	2	183	421	148	0	361	4089	0	761
2	630	34	310	1458	767	44	510	5242	4	1536
3 AND 4	865	27	325	1648	275	62	441	6113	3	712
5 OR MORE	3908	114	699	4812	1496	212	1108	32149	5	3214
MOBILE HOME OR TRAILER	395	80	591	1408	553	169	573	740	53	742

	OREGON	BAKER	BENTON	CLACKAMS	CLATSOP	COLUMBIA	COOS	CROOK	CURRY
H8. HEATING FUEL (OCCUPIED UNITS)									
UTILITY GAS	223456	1681	7683	21275	2692	1692	197	883	62
BOTTLED, TANK, OR LP GAS	18818	233	330	891	176	217	1020	189	403
ELECTRICITY	434500	1086	11315	36465	4328	5731	11910	1644	4511
FUEL OIL, KEROSENE, ETC.	186438	1369	1828	16226	3763	2278	5247	678	181
COAL OR COKE	726	61	0	42	0	0	7	0	10
WOOD	123789	1737	2737	9701	1798	2785	5432	1498	1592
OTHER FUEL	3060	2	54	35	28	33	38	0	0
NO FUEL USED	806	0	26	63	10	6	19	0	4
H9. COOKING FUEL (OCCUPIED UNITS)									
UTILITY GAS	49064	459	969	2210	395	325	107	280	36
BOTTLED, TANK, OR LP GAS	23666	232	411	1013	168	317	1222	223	644
ELECTRICITY	911496	5315	22472	80970	12105	11999	22351	4327	6049
OTHER	4712	136	82	439	103	95	121	57	34
NO FUEL USED	2655	27	39	66	24	6	69	5	0
H10. WATER HEATING (OCCUPIED UNITS)									
UTILITY GAS	122770	1065	4691	10135	1004	706	149	306	21
BOTTLED, TANK, OR LP GAS	16165	199	270	590	145	174	682	168	426
ELECTRICITY	831469	4754	18827	73172	11217	11697	22631	4323	6270
FUEL OIL, KEROSENE, ETC.	15020	30	93	458	336	47	228	24	0
OTHER	3669	59	92	144	48	54	95	41	24
NO FUEL USED	2500	62	0	199	45	64	85	30	22
H11. HEATING EQUIPMENT (YEAR-ROUND HOUSING UNITS)									
STEAM/HOT WATER SYSTEM	35396	157	808	1294	838	188	569	60	27
CENTRAL WARM AIR FURNACE	400755	1797	9484	42649	4933	4141	5322	938	1506
ELECTRIC HEAT PUMP	44746	210	939	4644	617	424	575	147	215
OTHER BUILT-IN ELEC. UNITS	317173	679	8359	22533	4473	3738	8893	1339	3254
FLOOR/WALL/PIPELESS FURNACE	30901	220	578	1795	812	527	1146	333	85
ROOM HEATERS WITH FLUE	75395	1410	1507	3716	1869	925	2095	703	243
ROOM HEATERS WITHOUT FLUE	16877	223	266	857	354	291	479	262	87
FIREPLACE/STOVE/PORTABLE HEATER	148493	2198	3149	11355	2612	3322	6361	1662	1845
NONE	1877	18	68	78	58	61	42	0	4

	DESCHUTES	DOUGLAS	GILLIAM	GRANT	HARNEY	H. RIVER	JACKSON	JEFFERSN	JOSEPHNE
H8. HEATING FUEL (OCCUPIED UNITS)									
UTILITY GAS	2752	4999	0	13	8	563	10497	374	3139
BOTTLED, TANK, OR LP GAS	738	1415	39	180	217	117	2112	222	1617
ELECTRICITY	10381	14681	300	631	1140	2853	21038	1846	8098
FUEL OIL, KEROSENE, ETC.	2135	4419	308	775	930	1310	3938	693	1893
COAL OR COKE	6	19	0	6	2	10	0	6	0
WOOD	6951	7723	126	1401	634	1056	11360	794	7101
OTHER FUEL	27	83	5	0	11	0	31	0	16
NO FUEL USED	6	28	0	0	0	53	35	0	14
H9. COOKING FUEL (OCCUPIED UNITS)									
UTILITY GAS	1033	1888	0	5	8	75	4449	147	1146
BOTTLED, TANK, OR LP GAS	1032	2216	27	274	205	205	2616	254	2448
ELECTRICITY	20735	29027	747	2594	2712	5597	41562	3506	17952
OTHER	121	227	4	126	17	85	297	21	268
NO FUEL USED	55	9	0	7	0	0	87	7	64
H10. WATER HEATING (OCCUPIED UNITS)									
UTILITY GAS	1878	2485	0	12	11	239	6880	195	1644
BOTTLED, TANK, OR LP GAS	670	1286	21	143	92	118	2097	157	1550
ELECTRICITY	20157	29186	755	2722	2804	5497	39622	3543	18310
FUEL OIL, KEROSENE, ETC.	92	116	2	20	11	16	110	8	27
OTHER	108	180	0	49	7	20	213	4	192
NO FUEL USED	71	114	0	60	17	72	89	28	155
H11. HEATING EQUIPMENT (YEAR-ROUND HOUSING UNITS)									
STEAM/HOT WATER SYSTEM	347	399	32	19	57	93	547	46	140
CENTRAL WARM AIR FURNACE	8107	9110	344	824	1066	1622	13896	1541	4276
ELECTRIC HEAT PUMP	802	1296	33	49	133	381	4505	188	1589
OTHER BUILT-IN ELEC. UNITS	7025	9366	141	286	714	2024	12172	1083	4906
FLOOR/WALL/PIPELESS FURNACE	433	2215	34	65	115	195	2185	93	898
ROOM HEATERS WITH FLUE	1963	3518	199	373	386	687	4750	537	2937
ROOM HEATERS WITHOUT FLUE	650	648	18	142	74	100	884	105	318
FIREPLACE/STOVE/PORTAULE HEATER	8181	8785	178	1716	762	1243	13036	923	8180
NONE	54	38	14	32	12	91	49	31	18

						MALHEUR	MARION	MORROW	MULTNOMH
H8. HEATING FUEL (OCCUPIED UNITS)									
UTILITY GAS	4525	29	11446	1881	10372	2323	21939	8	65813
BOTTLED, TANK, OR LP GAS	859	225	1198	353	512	456	823	234	1547
ELECTRICITY	6617	993	70540	9196	12691	3379	33701	1588	72159
FUEL OIL, KEROSENE, ETC.	2809	474	8055	1081	2927	2033	12159	561	85123
COAL OR COKE	8	0	17	0	9	145	6	5	129
WOOD	6160	1070	11799	2076	6189	891	5402	246	6980
OTHER FUEL	656	0	425	0	45	25	162	0	1199
NO FUEL USED	54	0	45	21	28	27	54	0	185
H9. COOKING FUEL (OCCUPIED UNITS)									
UTILITY GAS	1905	12	2878	655	2026	434	2953	9	19615
BOTTLED, TANK, OR LP GAS	1298	340	1997	549	624	387	807	201	1063
ELECTRICITY	18265	2399	97964	13260	29928	8404	70195	2422	210342
OTHER	162	40	474	140	151	27	166	9	576
NO FUEL USED	58	0	212	4	44	27	125	1	1539
H10. WATER HEATING (OCCUPIED UNITS)									
UTILITY GAS	3301	14	7311	934	5718	885	10807	4	38735
BOTTLED, TANK, OR LP GAS	908	169	1116	271	399	246	702	136	1473
ELECTRICITY	16893	2524	93961	13249	26416	8047	61901	2474	180558
FUEL OIL, KEROSENE, ETC.	178	5	499	74	80	19	569	10	11262
OTHER	272	40	517	58	109	40	159	5	679
NO FUEL USED	136	39	121	22	51	42	108	13	428
H11. HEATING EQUIPMENT (YEAR-ROUND HOUSING UNITS)									
STEAM/HOT WATER SYSTEM	1313	29	1887	219	392	111	1382	21	20974
CENTRAL WARM AIR FURNACE	4553	600	23282	5576	11996	3725	36834	1553	123756
ELECTRIC HEAT PUMP	1037	81	4306	810	1180	653	4555	81	6687
OTHER BUILT-IN ELEC. UNITS	4871	636	58368	8289	8213	1793	21522	525	60565
FLOOR/WALL/PIPELESS FURNACE	1293	67	2856	625	1706	492	2199	194	6000
ROOM HEATERS WITH FLUE	2976	420	4773	1406	3995	1797	5206	271	15467
ROOM HEATERS WITHOUT FLUE	726	77	1089	290	623	453	1071	89	3556
FIREPLACE/STOVE/PORTABLE HEATER	7485	1271	13883	3261	6891	1310	6587	351	8749
NONE	92	0	101	93	58	105	134	10	276

	POLK	SHERMAN	TILAMOOK	UMATILLA	UNION	WALLOWA	WASCO	WASHNGTN	WHEELER	YAMHILL
H8. HEATING FUEL (OCCUPIED UNITS)										
UTILITY GAS	2852	9	9	4553	3533	2	534	32631	0	2507
BOTTLED, TANK, OR LP GAS	228	51	183	549	149	75	126	608	33	493
ELECTRICITY	8661	300	5827	10650	1710	677	5498	41395	146	10814
FUEL OIL, KEROSENE, ETC.	2157	378	911	2845	1323	792	1082	11108	136	2513
COAL OR COKE	0	0	0	11	146	57	3	21	0	0
WOOD	2478	82	1452	2407	1814	1210	962	5065	271	2809
OTHER FUEL	16	0	9	25	32	0	6	63	0	34
NO FUEL USED	18	0	12	37	0	0	1	39	0	21
H9. COOKING FUEL (OCCUPIED UNITS)										
UTILITY GAS	394	2	16	1006	776	4	162	2219	0	466
BOTTLED, TANK, OR LP GAS	255	62	302	699	231	213	229	531	45	326
ELECTRICITY	15688	753	8001	19260	7576	2539	7765	87953	530	18232
OTHER	73	3	81	66	103	51	24	157	9	167
NO FUEL USED	0	0	3	46	21	6	32	70	2	0
H10. WATER HEATING (OCCUPIED UNITS)										
UTILITY GAS	1280	0	5	2387	2330	2	309	16143	0	1184
BOTTLED, TANK, OR LP GAS	148	31	153	512	172	120	106	473	16	226
ELECTRICITY	14825	778	8162	17989	6059	2637	7691	73697	553	17568
FUEL OIL, KEROSENE, ETC.	92	8	38	52	17	2	51	404	0	42
OTHER	31	3	36	39	93	22	14	103	11	108
NO FUEL USED	34	0	9	98	36	30	41	110	6	63
H11. HEATING EQUIPMENT (YEAR-ROUND HOUSING UNITS)										
STEAM/HOT WATER SYSTEM	208	11	157	421	612	106	118	1521	2	291
CENTRAL WARM AIR FURNACE	5754	425	2491	7913	3541	710	2122	48136	114	6118
ELECTRIC HEAT PUMP	1036	32	392	1318	184	45	749	3902	8	943
OTHER BUILT-IN ELEC. UNITS	5568	121	5556	5900	1276	472	3815	31854	75	6769
FLOOR/WALL/PIPELESS FURNACE	445	38	190	528	313	27	200	1503	2	494
ROOM HEATERS WITH FLUE	1235	191	381	2796	1182	347	357	3054	125	1598
ROOM HEATERS WITHOUT FLUE	325	20	177	970	318	49	244	604	16	422
FIREPLACE/STOVE/PORTABLE HEATER	2765	103	2675	3169	2039	1428	1252	5924	359	3483
NONE	63	5	51	95	12	14	7	51	0	42

S14. HOUSEHOLD INCOME IN 1979

LESS THAN $5,000	120075	1014	3169	6425	1620	1466	2973	606	993
$5,000 TO $7,499	83226	747	2340	4897	1333	1020	2142	425	634
$7,500 TO $14,999	236703	1615	5664	16136	3304	2590	5952	1307	1829
$15,000 TO $19,999	147784	987	3233	11560	1848	1842	3485	908	1011
$20,000 TO $24,999	128991	619	2752	12413	1399	1949	3247	503	827
$25,000 TO $34,999	157985	809	3733	17253	1830	2385	3818	778	876
$35,000 TO $49,999	79150	338	2166	10445	992	1105	1517	223	347
$50,000 TO $74,999	26820	66	678	3653	245	361	474	76	177
$75,000 OR MORE	12016	20	254	1755	156	70	182	59	68
MEDIAN HOUSEHOLD INCOME IN 1979	16780	13323	16191	21177	15261	18562	16094	15513	14643

S15. FAMILY INCOME IN 1979

LESS THAN $5,000	43059	385	883	2496	525	597	1204	261	373
$5,000 TO $7,499	43352	497	937	2596	638	624	1239	279	460
$7,500 TO $14,999	152832	1216	3183	11134	1992	1847	4401	978	1360
$15,000 TO $19,999	111982	804	2182	8897	1491	1471	2850	793	858
$20,000 TO $24,999	108462	555	2271	10716	1146	1705	2872	450	743
$25,000 TO $34,999	138991	758	3249	15572	1605	2234	3376	735	780
$35,000 TO $49,999	70461	331	1906	9733	863	1025	1352	213	302
$50,000 TO $74,999	23760	66	614	3321	197	320	408	70	178
$75,000 OR MORE	10829	15	237	1625	139	62	176	59	54
MEDIAN FAMILY INCOME IN 1979	20027	16174	21068	23572	18820	21095	18618	17398	16827

S16. NUMBER OF WORKERS PER FAMILY IN 1979

FAMILIES	703728	4627	15462	66090	8596	9885	17878	3838	5108
NO WORKERS	92430	799	1608	6432	1267	1350	2659	560	1275
1 WORKER	232956	1483	4666	21824	3109	3750	6758	1309	1656
2 OR MORE WORKERS	378342	2345	9188	37834	4220	4785	8461	1969	2177

S17. FAMILIES BY RACE & ETHNICITY, AGGREGATE FAMILY INCOME IN 1979 (INCOME IN THOUSANDS)

WHITE FAMILIES	674700	4530	14865	64742	8385	9729	17420	3753	5013
AGGREGATE FAMILY INCOME	15495455	83683	356779	1751572	185499	219919	361325	75806	102102
BLACK FAMILIES	8620	5	70	230	7	8	0	0	0
AGGREGATE FAMILY INCOME	142982	75	1155	6477	125	139	0	0	0
AM IND, ESK. & ALEUT FAMILIES	6836	67	84	296	56	111	245	48	67
AGGREGATE FAMILY INCOME	113071	869	1518	6283	780	2062	4369	940	1167
ASIAN & PACIFIC ISLNDR FAMILIES	7941	18	374	567	139	15	128	0	0
AGGREGATE FAMILY INCOME	174144	205	6719	17143	4636	291	2572	0	0
SPANISH ORIGIN FAMILIES	12792	17	162	700	55	117	202	81	52
AGGREGATE FAMILY INCOME	224412	192	2629	16698	800	2431	3791	1595	854

	DESCHUTES	DOUGLAS	GILLIAM	GRANT	HARNEY	H. RIVER	JACKSON	JEFFERSN	JOSEPHNE
S14. HOUSEHOLD INCOME IN 1979									
LESS THAN $5,000	2444	3917	79	363	312	710	6185	432	3669
$5,000 TO $7,499	1882	3034	93	289	175	561	4731	392	2306
$7,500 TO $14,999	5873	7585	214	843	726	1545	12803	1087	6415
$15,000 TO $19,999	3579	5854	115	477	550	801	7971	691	3264
$20,000 TO $24,999	3185	4874	105	436	442	792	6173	549	2423
$25,000 TO $34,999	3621	5132	126	407	481	940	6636	523	2416
$35,000 TO $49,999	1565	2185	32	162	228	492	2862	205	933
$50,000 TO $74,999	515	611	12	40	52	130	1114	87	323
$75,000 OR MORE	308	230	11	17	23	55	556	25	108
MEDIAN HOUSEHOLD INCOME IN 1979	16587	16683	15302	15204	16925	16124	15464	15466	13074
S15. FAMILY INCOME IN 1979									
LESS THAN $5,000	1069	1661	38	143	140	260	2453	220	1799
$5,000 TO $7,499	1115	1921	55	174	74	295	2638	282	1602
$7,500 TO $14,999	4287	5874	177	647	538	979	9259	792	4996
$15,000 TO $19,999	2819	4956	99	409	479	738	6427	596	2843
$20,000 TO $24,999	2798	4361	98	387	392	693	5278	468	2139
$25,000 TO $34,999	3252	4725	113	369	448	810	6076	489	2214
$35,000 TO $49,999	1321	1993	26	149	215	465	2615	196	868
$50,000 TO $74,999	439	547	12	39	35	117	968	70	290
$75,000 OR MORE	255	198	11	15	19	47	501	25	96
MEDIAN FAMILY INCOME IN 1979	18716	18587	17292	17177	19016	19508	17794	16763	15042
S16. NUMBER OF WORKERS PER FAMILY IN 1979									
FAMILIES	17355	26236	629	2332	2340	4404	36215	3138	16847
NO WORKERS	2508	3639	93	232	189	471	5833	348	3972
1 WORKER	5673	10119	211	839	823	1335	12429	1040	5819
2 OR MORE WORKERS	9174	12478	325	1261	1328	2598	17953	1750	7056
S17. FAMILIES BY RACE & ETHNICITY, AGGREGATE FAMILY INCOME IN 1979 (INCOME IN THOUSANDS)									
WHITE FAMILIES	17138	25759	614	2306	2252	4019	35386	2558	16633
AGGREGATE FAMILY INCOME	369283	525850	12526	44228	47878	91773	741960	51059	289918
BLACK FAMILIES	14	35	0	0	0	7	27	5	0
AGGREGATE FAMILY INCOME	88	779	0	0	0	105	385	68	0
AM IND, ESK, & ALEUT FAMILIES	112	277	0	20	51	89	406	457	148
AGGREGATE FAMILY INCOME	1870	4407	0	324	1202	1429	6067	7344	1993
ASIAN & PACIFIC ISLNDR FAMILIES	52	69	0	0	16	116	172	9	31
AGGREGATE FAMILY INCOME	992	1550	0	0	164	4093	3945	78	291
SPANISH ORIGIN FAMILIES	190	422	11	27	60	260	639	147	217
AGGREGATE FAMILY INCOME	2795	7188	114	403	1190	3995	10635	2473	3126

S14. HOUSEHOLD INCOME IN 1979

LESS THAN $5,000	3194	336	13796	2068	4316	1512	9115	249	31729
$5,000 TO $7,499	2322	274	9198	1621	2864	1022	6025	218	20335
$7,500 TO $14,999	5100	730	24530	3798	8083	2708	19503	652	56824
$15,000 TO $19,999	3398	433	15767	2158	5060	1522	11187	381	33476
$20,000 TO $24,999	2712	383	13455	1661	4551	887	9949	354	28341
$25,000 TO $34,999	3298	423	15527	1976	4894	1029	10745	500	35440
$35,000 TO $49,999	1270	163	7539	843	2122	337	5424	199	18140
$50,000 TO $74,999	405	21	2503	323	592	177	1791	83	6117
$75,000 OR MORE	142	7	1290	227	252	64	780	30	2860
MEDIAN HOUSEHOLD INCOME IN 1979	15408	15493	16272	14663	16042	12994	16099	17803	16078

S15. FAMILY INCOME IN 1979

LESS THAN $5,000	1289	154	4913	732	1969	701	3505	122	8751
$5,000 TO $7,499	1338	128	4704	962	1841	723	3063	105	8168
$7,500 TO $14,999	3770	562	15360	2482	5766	2173	12991	469	30170
$15,000 TO $19,999	2832	349	12227	1695	4079	1296	8784	337	22048
$20,000 TO $24,999	2434	333	11253	1445	4116	791	8696	313	21704
$25,000 TO $34,999	2995	387	13407	1803	4486	994	9743	443	29247
$35,000 TO $49,999	1152	158	6643	767	1924	311	4940	182	15109
$50,000 TO $74,999	392	22	2275	281	535	159	1603	73	5081
$75,000 OR MORE	133	6	1167	176	231	58	725	21	2460
MEDIAN FAMILY INCOME IN 1979	18045	17931	19481	17868	18523	15021	19211	19985	20461

S16. NUMBER OF WORKERS PER FAMILY IN 1979

FAMILIES	16335	2099	71949	10343	24947	7206	54050	2065	142738
NO WORKERS	2333	189	9353	2131	3435	825	7725	133	19030
1 WORKER	6109	690	24154	3301	8845	2525	16458	725	45938
2 OR MORE WORKERS	7893	1220	38442	4911	12667	3856	29867	1207	77770

S17. FAMILIES BY RACE & ETHNICITY, AGGREGATE FAMILY INCOME IN 1979 (INCOME IN THOUSANDS)

WHITE FAMILIES	15633	2026	70093	10130	24524	6367	51729	2015	130428
AGGREGATE FAMILY INCOME	318010	39162	1566642	212145	496641	112425	1147687	44491	3114166
BLACK FAMILIES	113	0	274	4	44	14	250	0	7161
AGGREGATE FAMILY INCOME	1377	0	5751	40	626	112	3559	0	115247
AM IND, ESK. & ALEUT FAMILIES	431	48	656	131	191	38	571	0	972
AGGREGATE FAMILY INCOME	5716	772	12301	1923	3557	463	9518	0	15278
ASIAN & PACIFIC ISLNDR FAMILIES	31	0	526	55	83	269	467	0	3468
AGGREGATE FAMILY INCOME	399	0	8363	1586	1240	5993	7727	0	74517
SPANISH ORIGIN FAMILIES	344	42	976	132	346	769	1951	74	2067
AGGREGATE FAMILY INCOME	6407	630	16312	2279	6409	10860	32434	1234	36729

	POLK	SHERMAN	TILLAMOOK	UMATILLA	UNION	WALLOWA	WASCO	WASHNGTN	WHEELER	YAMHILL
S14. HOUSEHOLD INCOME IN 1979										
LESS THAN $5,000	2169	117	1178	2429	1367	414	1084	6220	91	2314
$5,000 TO $7,499	1372	78	905	1949	734	320	763	4585	98	1542
$7,500 TO $14,999	3764	244	2339	5662	2291	771	1822	17678	218	4498
$15,000 TO $19,999	2639	122	1312	3433	1309	412	1029	12877	73	3020
$20,000 TO $24,999	2021	95	908	2723	1117	354	1367	12757	42	2626
$25,000 TO $34,999	2829	100	1068	3140	1265	286	1239	19307	47	3108
$35,000 TO $49,999	1115	61	476	1243	443	126	596	11738	27	1491
$50,000 TO $74,999	385	12	169	418	180	72	276	4181	6	495
$75,000 OR MORE	126	0	85	189	57	7	55	1775	2	171
MEDIAN HOUSEHOLD INCOME IN 1979	16713	14008	14266	15742	14959	13640	17027	21572	10139	16873
S15. FAMILY INCOME IN 1979										
LESS THAN $5,000	712	56	394	945	523	125	449	2228	36	948
$5,000 TO $7,499	822	49	537	1199	407	195	396	2259	77	953
$7,500 TO $14,999	2608	189	1652	4009	1624	588	1314	9964	179	3302
$15,000 TO $19,999	2159	111	1092	2663	1111	374	806	8746	65	2496
$20,000 TO $24,999	1806	87	784	2504	1041	323	1206	10168	35	2351
$25,000 TO $34,999	2567	83	986	2924	1155	261	1112	16633	43	2917
$35,000 TO $49,999	1008	54	410	1156	415	122	554	10570	24	1389
$50,000 TO $74,999	362	12	167	378	161	63	261	3778	4	462
$75,000 OR MORE	126	0	78	183	51	7	55	1653	2	163
MEDIAN FAMILY INCOME IN 1979	19516	16083	17162	18323	17887	16498	20440	24819	12083	19532
S16. NUMBER OF WORKERS PER FAMILY IN 1979										
FAMILIES	12170	641	6100	15961	6488	2058	6153	65999	465	14981
NO WORKERS	1760	67	1179	1751	937	283	840	5387	98	1739
1 WORKER	3611	246	1891	5042	2291	775	2432	20224	199	4657
2 OR MORE WORKERS	6799	328	3030	9168	3260	1000	2881	40388	168	8585
S17. FAMILIES BY RACE & ETHNICITY, AGGREGATE FAMILY INCOME IN 1979 (INCOME IN THOUSANDS)										
WHITE FAMILIES	11732	636	6009	15175	6399	2052	5970	63688	0	14530
AGGREGATE FAMILY INCOME	256613	11426	122329	319711	128332	38656	132276	1798334	0	318128
BLACK FAMILIES	26	0	0	19	18	0	12	257	0	11
AGGREGATE FAMILY INCOME	190	0	0	192	74	0	120	5229	0	950
AM IND, ESK. & ALEUT FAMILIES	128	0	65	358	58	0	132	358	0	151
AGGREGATE FAMILY INCOME	1858	0	998	4483	673	0	2503	7289	0	2943
ASIAN & PACIFIC ISLNDR FAMILIES	71	0	0	51	4	0	18	1101	0	70
AGGREGATE FAMILY INCOME	1455	0	0	462	103	0	91	27788	0	1053
SPANISH ORIGIN FAMILIES	340	0	57	512	43	15	63	1305	0	389
AGGREGATE FAMILY INCOME	5977	0	1039	7702	891	235	957	26495	0	6812

Appendix B

FUTURE MARKET ESTIMATES

STATE OF OREGON POPULATION 2,633,105 - 2.6 persons/household ↓

Housing Units in Oregon (1984)	1,071,613
Less vacancies	(80,020)
Occupied	991,593

991,593 x 33.6% = 333,175 stoves in Oregon
(wood burning stoves or inserts)

333,175 x 50.0% = 168,920 primary source of heat
(primary source of heat)

991,593 x 66.4% = 658,418 household w/o non-wood burning stoves
(non-wood burners 1984)

658,418 x 4.4% = 28,970 plan to buy stove
(plan to buy stove)

28,970 x 50.7% = 14,688 new purchasers of stoves/ as primary source of heat
(primary source of heat)

WHEN DO YOU PLAN TO BUY YOUR WOODSTOVE

		Number	Percent	# Stoves	Cumulative Stoves	Cum. Primary Burners
Within 90 days	(28,920)	-	-	-	-	-
3 - 6 months	(28,920)	5	41.7	12,080	12,080	6,125
Within 1 year	(28,920)	2	16.7	4,839	16,919	2,453
Over 1 year	(28,920)	4	33.3	9,647	26,566	4,891
Not stated	(28,920)	1	8.3	2,404	28,970	1,219
Totals		12	100.0%	28,970		14,688

Within one year -- 16,919/333,175 = 5.1% Increase

SALES OF WOODSTOVES IN OREGON

...There are approximately 350,000 woodstoves and inserts currently in use in the State of Oregon.

...Of this usage, 50 percent are utilized infrequently or not a primary source of heat.

...Therefore, life expectancy of these infrequently used woodstoves or inserts is approximately 15 to 20 years.

...Those using woodstoves or inserts as a primary utility are represented by the remaining 50 percent (175,000) wood burning stoves in Oregon.

...Assuming the replacement rate of woodstoves and inserts used as a primary source of heat at 10 percent per year, 17,500 woodstoves and inserts represent the annual replacement market for the State of Oregon.

Appendix C

SURVEY QUESTIONNAIRE

INTRODUCTION

HELLO, I'M _____ FROM MANNING RESEARCH ASSOCIATES. WE ARE A PORTLAND BASED MARKET RESEARCH COMPANY. TODAY WE ARE CONDUCTING A STUDY ABOUT WOOD STOVES.

SCREENING

1. (ARE YOU) (MAY I SPEAK WITH) EITHER THE MALE OR FEMALE HEAD OF THE HOUSEHOLD?

   Male - 1
   Female - 2 (1)

2. DO YOU USE EITHER A WOOD STOVE OR FIRE PLACE INSERT?

   Yes - 1
   No - 2 (2)

3. IS IT YOUR PRIMARY OR SECONDARY SOURCE OF HEAT?

   Primary - 1
   Secondary - 2 (3)

4. DO YOU BURN YOUR FIRE OVERNIGHT?

   Yes - 1
   No - 2 (4)

5. FROM OCTOBER TO APRIL WHAT PERCENTAGE OF THE TIME DO YOU BURN YOUR WOOD STOVE OVER NIGHT?

   Ø - 25% - 1
   26 - 50% - 2
   51 - 75% - 3
   76 - 100% - 4
   Not stated - 5 (5)

6. WE NEED TO KNOW HOW MUCH WOOD YOU BURN IN ONE HOUR DURING THE PEAK HEATING SEASON. PLEASE ESTIMATE HOW MANY ONE FOOT PIECES OF 2 X 4's THIS WOULD EQUAL IN ONE HOUR.

   Less than 1 - 1
   2 - 2
   3 - 3
   4 - 4
   5 - 5
   6 - 6
   7 - 7
   More than 8 - 8
   Not stated - 9 (6)

7. WOULD YOU BE WILLING TO NOT BURN YOUR STOVE DURING PERIODS OF POOR AIR QUALITY?

Yes - 1
No - 2
Maybe - 3 (7) *** Skip to #11

8. DO YOU PLAN TO PURCHASE A WOOD STOVE OR INSERT?

Yes - 1
No - 2 (8) *** If no, skip to #22

9. HOW SOON DO YOU EXPECT TO MAKE THIS PURCHASE?

Within 90 days - 1
In 3-6 months - 2
Within 1 year - 3
Over 1 year - 4
Not stated - 5 (9)

10. APPROXIMATELY HOW MUCH DO YOU INTEND TO SPEND?

Under $400 - 1
$400 - $600 - 2
$600 - $800 - 3
Over $800 - 4
Not stated - 5 (10)

*** 11 Starts Here:

FOR EACH OF THE FOLLOWING ITEMS, PLEASE TELL ME IF THEY ARE (1) VERY IMPORTANT, (2) SOMEWHAT IMPORTANT, (3) NOT IMPORTANT IN THE PURCHASE OF A WOOD STOVE.

		Very	Somewhat	No Important	
11.	Safety	- 1	- 2	- 3	(11)
12.	Cost	- 1	- 2	- 3	(12)
13.	Ability to See Fire	- 1	- 2	- 3	(13)
14.	Pollution	- 1	- 2	- 3	(14)
15.	Appearance or Design	- 1	- 2	- 3	(15)
16.	Ability to Hold Fire Overnight	- 1	- 2	- 3	(16)
17.	Heating Capacity (area)	- 1	- 2	- 3	(17)
18.	Efficiency	- 1	- 2	- 3	(18)

19. DO YOU KNOW WHAT A CATALYTIC WOOD STOVE IS?

Yes - 1
No - 2 (19)

*** If yes, go to $2Ø. If no, provide the following explanation:

"A CATALYTIC STOVE LOWERS THE TEMPERATURE AT WHICH SMOKE WILL BURN. THEREFORE, LESS SMOKE WILL BE EMITTED THAN FROM A CONVENTIONAL WOOD STOVE, AND THE EFFICIENCY MAY BE HIGHER. HOWEVER, IT COSTS MORE AND THE CATALYST DOES NEED TO BE REPLACED ON A REGULAR BASIS."

2Ø. WOULD YOU PURCHASE A CATALYTIC STOVE?

Yes - 1
No - 2
Don't know - 3 (2Ø)

21. IF ONLY CATALYTIC STOVES WERE SOLD IN OREGON, WOULD YOU CONSIDER BUYING A CONVENTIONAL WOOD BURNING STOVE IN ANOTHER SITE, PROVIDING THAT IT WAS NOT ILLEGAL TO BUY, INSTALL OR USE IT?

Yes - 1
No - 2
Don't know - 3 (21)

22. ARE YOU FAMILIAR WITH DEQ's PROPOSED REGULATIONS FOR WOOD STOVES?

Yes - 1 *** If yes, go to #23
No - 2 (22) If no, go to close

23. PLEASE BRIEFLY STATE DEQ's POSITION.

WRITE IN RESPONSE
Do not evaluate the response

Well Understood - 1
Partially Understood - 2
Minimal Understanding - 3
Uninformed - 4

(23)

CLOSE

"THANK YOU FOR TAKING THE TIME TO TALK WITH ME. WE APPRECIATE YOUR HELP AND YOUR COMMENTS. GOOD BYE".

Indicate Area Code

- 1 _____ Washington, Multnomah, Clackamas County (Portland)
- 2 _____ Salem, Eugene/Springfield, Corvallis (Willamette Valley)
- 3 _____ Medford, Grants Pass, Ashland, Klamath Falls (Southern Oregon
- 4 _____ Coast
- 5 _____ Eastern Oregon

DEQ AIR Woodstove

62nd OREGON LEGISLATIVE ASSEMBLY–1983 Regular Session

Enrolled

House Bill 2235

Ordered printed by the Speaker pursuant to House Rule 12.00A (5). Presession filed (at the request of Department of Environmental Quality)

CHAPTER 333

AN ACT

Relating to air pollution; creating new provisions; and amending ORS 468.275 and 468.290.

Be It Enacted by the People of the State of Oregon:

SECTION 1. ORS 468.275 is amended to read:

468.275. As used in [*ORS 448.305, 454.010 to 454.040, 454.205 to 454.255, 454.405, 454.425, 454.505 to 454.535, 454.605 to 454.745 and*] this chapter, unless the context requires otherwise:

(1) "Air-cleaning device" means any method, process or equipment which removes, reduces or renders less noxious air contaminants prior to their discharge in the atmosphere.

(2) "Air contaminant" means a dust, fume, gas, mist, odor, smoke, vapor, pollen, soot, carbon, acid or particulate matter or any combination thereof.

(3) "Air contamination" means the presence in the outdoor atmosphere of one or more air contaminants which contribute to a condition of air pollution.

(4) "Air contamination source" means any source at, from, or by reason of which there is emitted into the atmosphere any air contaminant, regardless of who the person may be who owns or operates the building, premises or other property in, at or on which such source is located, or the facility, equipment or other property by which the emission is caused or from which the emission comes.

(5) "Air pollution" means the presence in the outdoor atmosphere of one or more air contaminants, or any combination thereof, in sufficient quantities and of such characteristics and of a duration as are or are likely to be injurious to public welfare, to the health of human, plant or animal life or to property or to interfere unreasonably with enjoyment of life and property throughout such area of the state as shall be affected thereby.

(6) "Area of the state" means any city or county or portion thereof or other geographical area of the state as may be designated by the commission.

(7) "Woodstove" means a wood fired appliance with a closed fire chamber which maintains an air-to-fuel ratio of less than 30 during the burning of 90 percent or more of the fuel mass consumed in the low firing cycle. The low firing cycle means less than or equal to 25 percent of the maximum burn rate achieved with doors closed or the minimum burn achievable.

SECTION 2. ORS 468.290 is amended to read:

468.290. Except as provided in this section and in ORS 468.450, 476.380 and 478.960, the air pollution laws contained in this chapter do not apply to:

(1) Agricultural operations and the growing or harvesting of crops and the raising of fowls or animals, except field burning which shall be subject to regulation pursuant to ORS 468.140, 468.150, 468.455 to 468.480 and this section;

(2) Use of equipment in agricultural operations in the growth of crops or the raising of fowls or animals, except field burning which shall be subject to regulation pursuant to ORS 468.140, 468.150, 468.455 to 468.480 and this section;

(3) Barbecue equipment used in connection with any residence;

(4) Agricultural land clearing operations or land grading;

(5) Heating equipment in or used in connection with residences used exclusively as dwellings for not more than four families, **except woodstoves which shall be subject to regulation under sections 4 to 10 of this 1983 Act and this section**;

(6) Fires set or permitted by any public agency when such fire is set or permitted in the performance of its official duty for the purpose of weed abatement, prevention or elimination of a fire hazard, or instruction of employes in the methods of fire fighting, which in the opinion of the agency is necessary; or

(7) Fires set pursuant to permit for the purpose of instruction of employes of private industrial concerns in methods of fire fighting, or for civil defense instruction.

SECTION 3. Sections 4 to 10 of this Act are added to and made a part of ORS chapter 468.

SECTION 4. In the interest of the public health and welfare it is declared to be the public policy of the state to control, reduce and prevent air pollution caused by woodstove emissions. The Legislative Assembly declares it to be the public policy of the state to reduce woodstove emissions by encouraging the Department of Environmental Quality to continue efforts to educate the public about the effects of woodstove emissions and the desirability of achieving better woodstove emission performance and heating efficiency.

SECTION 5. Before July 1, 1984, the commission shall establish by rule:

(1) Emission performance standards for new woodstoves;

(2) Criteria and procedures for testing a new woodstove for compliance with the emission performance standards;

(3) A program administered by the department to certify a new woodstove that complies with the emission performance standards when tested by an independent testing laboratory, according to the criteria and procedures established in subsection (2) of this section;

(4) A program, including testing criteria and procedures to rate the heating efficiency of a new woodstove;

(5) The form and content of the emission performance and heating efficiency label to be attached to a new woodstove; and

(6) The application fee to be submitted to the department by a manufacturer, dealer or seller applying for certification of a woodstove.

SECTION 6. To aid and advise the commission in the adoption of emission performance standards and testing criteria, the commission may establish an advisory committee. The members of the advisory committee shall include, but need not be limited to, representatives from Oregon woodstove manufacturers.

SECTION 7. (1) After July 1, 1984, a woodstove manufacturer or dealer may request the department to evaluate the emission performance of a new woodstove.

(2) The commission shall establish by rule the amount of the fee that a manufacturer or dealer must submit to the department with each request to evaluate a woodstove.

(3) A new woodstove may be certified at the conclusion of an evaluation and before July 1, 1986, if:

(a) The department finds that the emission levels of the woodstove comply with the emission standards established by the commission; and

(b) The woodstove manufacturer or dealer submits the application for certification fee established by the commission under section 5 of this 1983 Act.

(4) As used in this section, "evaluate" means to review a woodstove's emission levels as determined by an independent testing laboratory, and compare the emission levels of the woodstove to the emission standards established by the commission under section 5 of this 1983 Act.

SECTION 8. On and after July 1, 1986, a person may not advertise to sell, offer to sell or sell a new woodstove in Oregon unless:

(1) The woodstove has been tested to determine its emission performance and heating efficiency;

(2) The woodstove is certified by the department under the program established under section 5 of this 1983 Act; and

(3) An emission performance and heating efficiency label is attached to the woodstove.

SECTION 9. (1) The provisions of this 1983 Act do not apply to a used woodstove.

(2) As used in this section, "used woodstove" means any woodstove that has been sold, bargained, exchanged, given away or has had its ownership transferred from the person who first acquired the woodstove from the manufacturer or the manufacturer's dealer or agency, and so used to have become what is commonly known as "second hand" within the ordinary meaning of that term.

SECTION 10. The commission shall use a portion of the net emission reductions in an airshed achieved by the woodstove certification program to provide room in the airshed for emissions associated with commercial and industrial growth.

Approved by the Governor July 5, 1983.
Filed in the office of Secretary of State July 6, 1983.

SUMMARY OF
WOODSTOVE ADVISORY COMMITTEE RECOMMENDATIONS ON THE
OREGON WOODSTOVE TEST PROCEDURES AND CERTIFICATION PROGRAM

		Committee Vote
Wood Species	- Douglas Fir - Bomb calorimetry on composite of each test load.	**Unanimous**
Wood Moisture	- 16% - 20% wet basis	**Unanimous**
Wood Size	- 2x4 and 4x4 dimensional lumber with flanges 7#/ft^3 ± 10% fire box loading density	
Burn Cycle	- Hot start, full fuel load cycle starting with 25% of full fuel load coal bed	**Consensus**
Burn Rate Control	- Single primary air supply setting	**Consensus**
Number of Tests	- Four over full range of heat output levels	**8-1 in favor**
Heat Output	- Test conditions (Btu/hr): <10,000; 10,000-15,000; 15,000-25,000; maximum heat output	**8-1 in favor**
Efficiency Method	- Calorimeter or stack loss by continuous analyzers	**8 in favor; 1 abstention**
Particulate Method	- Modified EPA Method 5 (Oregon Method 7) with continuous adjustments for proportional sampling by tracer gas or equivalent. CHO balance for calculations	**Unanimous**
Labeling	- Two labels will be mandatory for each appliance; a label permanently fixed to the appliance, and a point of sale removable label	**Unanimous**
Particulate Emission Standard	- Weighted average based on Oregon weather conditions and stove performance over entire range of heat output test conditions. Two staged standard based on technology, becomes tighter over time.	**Unanimous**
	July 1986 - June 1988 / July 1988 on	
02/21/84	15 gms/hr non-catalytic, 6 gms/hr catalytic / 9 gms/hr non-catalytic, 4 gms/hr catalytic	**7-0 in favor; 1 abstention; 1 absence**

Woodstove Certification Program:

Voluntary Phase - July, 1984 - June, 1986
Mandatory Phase - July, 1986 and on

(OVER)

Lab Accreditation and Certification Fees were discussed at the last Woodstove Advisory Committee meeting but no formal vote was taken on these two issues. No objections were raised on Lab Accreditation, some objections were raised on cost of Certification.

		Committee Vote
Lab Accreditation	- DEQ accredits independent stove testing laboratories, provided specific administrative and technical requirements are met. On-site lab visit required including demonstrated stove testing and data reporting proficiency.	**No Final Vote**
Certification Fees	- Manufacturer pays DEQ $1600 non-refundable stove certification fee for first model, subsequent models, $800 non-refundable fee. DEQ evaluates stove design plans, emissions & efficiency test results, provides labeling content, issues 5 year certification after all criteria has been met. DEQ will waive re-testing and re-certification fees if no changes affecting emissions and efficiency performance are made to the stove after 5 year period. Re-testing and re-certification required before five years, if changes are made that affect emissions and efficiency.	**No Final Vote**

609

WOODSTOVE ADVISORY COMMITTEE MEMBERS

Cit Graig Spolek, Chair, Portland State University, Portland, Engineer
Pub Bruce Chinnock, Office of State Fire Marshall, Salem, Fire & Safety Code Expert
Sweep Keith Cochran, Ch-Chimney Sweeps, Beaverton, Chimney Sweep
~~Ind Tom Engle, Fisher Century Corporation, Eugene, large stove manufacturer (retired 12-83)~~
Ind Dick Sparwasser, Arrow Tualatin, Tualatin, large stove manufacturer (replaced Engle)
Env Denis Heidtmann, Beaverton, Member, Oregon Environmental Council
Ind Bette Hume, Klickitat Enterprises, Portland, stove retailer/distributor
Ind Paul Runquist, Genesis Systems, Ashland, small stove manufacturer
Lab Paul Tiegs, OMNI Environmental Services, Beaverton, stove testing lab
LRPA Paul Willhite, Lane Regional Air Pollution Authority, Eugene, air quality specialist

Medical Advisors (non-voting members)

Dr. Douglas Campbell, State Health Division, Portland, Epidemiologist
Dr. Charles Schade, Multnomah County, Portland, Health Officer

InterMountain Ambient
P.O. Box 5106 ☐ Missoula, MT 59806 ☐ [406] 543-6174

June 8, 1984

Testimony of Alben T. Myren Jr.

My name is Alben T. (Ben) Myren Jr. and I reside at 323 East Beckwith in Missoula, MT. I am Vice President in charge of operations for InterMountain Ambient, an air pollution consulting firm that specializes in ambient monitoring and emission testing and has its offices in Missoula, MT. I am also representing Energy and Environmental Measurement Corporation (EEMC), a consulting firm that specializes in emission testing and is headquartered in Billings, MT. InterMountain Ambient and EEMC in conjunction with Stove Testing Lab of Portland, Oregon intend to qualify as an accredited wood stove testing laboratory.

We have been following the progress of the Oregon Wood Stove regulations for well over a year now. Several times during this period we have discussed these regulations with members of the DEQ staff, proposing what we felt were constructive changes in these regulations, particularly those covering the stove testing procedures. In the draft rules before the EQC today we find that several of the suggestions that we have made have been incorporated into the rules as changes.

We are well aware of the fact that the DEQ has taken a lot of flak over these proposed rules, for these rules will definitely have a very major impact on the industry. But here is an instance where the DEQ staff has listened to the suggestions made by knowledgeable persons in the testing field and made changes that will benefit everyone involved in testing. And so I wish to commend the DEQ's staff for their efforts in this area.

We also support the change of the proposed 1988 emission standard for catalytic stoves to 4.0 g/hr. We believe that the explanation given by DEQ for this change reflects reality, for the technology is available to meet this standard. However, we can not support the proposed emission rate of 9.0 g/hr. for noncatalytic stoves, for we are unaware of any noncatalytic stoves that have consistently been able to achieve this emission rate. Based upon the information presented on page 7 of the EQC Agenda Item A, we are unaware of any population of noncatalytic stoves that has an upper bound of 9.0 g/hr. In fact 9.0 g/hr. is more likely the lower bound of the "state-of-the-art" noncatalytic stoves. Thus, we feel that the proposed 1988 noncatalytic emission standard is too low. Certainly it is a worthy goal, but I think that the EQC needs to take a long hard look at this standard before adopting these regulations because the adoption of an unrealistic standard may effectively eliminate the development of noncatalytic technology.

Another major concern we have with the proposed regulations is with Section 340-21-165 (5) concerning the audit by DEQ of stoves tested by a laboratory. To date one laboratory has done almost all of the testing for the DEQ, especially with the proposed method and fuel configuration. Based upon the published test results, we have a good feel for how precise that lab's work is, but we do not have any feel for how accurate those results are. Before going any further, let me state that we have no reason to doubt the figures, we just haven't seen any data that verifies its accuracy.

Let me explain what I mean by precision and accuracy by using an example. When a person zeroes in his rifle, they generally shoot several shots at the bulls eye. The closeness of the group of shots is called precision, while the relationship of that group with the center of the target is known as accuracy. At present, we have one lab's group of "shots" or tests, and we can see the preciseness of those results. But we have nothing to compare them with to establish the accuracy of those results.

Thus, we feel that the DEQ needs to be very careful when it establishes its audit tolerance limits. At present it has no alternative but to establish an arbitrary set of limits, e.g. $\pm$ 15%. But $\pm$ 15% from what figure? Hopefully not the data from just one lab, for what happens if after several labs have tested the same stove, the initial lab's results are found to be off somewhat. Then another lab might be wrongly denied accreditation or have a stove wrongly fail an audit. At present the regulations contain no expressed tolerance limits for audits or accreditation, which is understandable given the amount of data that is available. Therefore, because of the expense involved in seeking accreditation and the possibility of civil penalities if a stove fails a DEQ audit, we ask that the EQC give this situation careful consideration and direct the DEQ to adopt limits that are reasonable and based upon verifiable data.

Our last major concern is with our foreign competition. In the past few weeks we have heard some very disturbing rumors about the intentions of Canadian testing laboratories. These labs enjoy a monopoly position in Canada because Canadian authorities refuse to recognize test results from American labs. American authorities, on the other hand, recognize test results from Canadian Labs. We feel that is an unfair situation which needs to be addressed, for if it is not, the Canadians will quickly put the American testing labs out of business, because few manufacturers are going to bother to go to two different labs when they can get all of the tests done in one north of the border. Thus, until the Canadian authorities change their rules and accept American Lab's results, we strongly urge the DEQ to only accept test results obtained from tests done in American labs.

I thank you for this opportunity to present this testimony and we look forward to a long and fruitful relationship with the DEQ in a highly successful wood stove certification program. I will gladly answer any questions you might have about my testimony.

For Kowalczyk

1) 9 g/hr. technology forcing for non-catalytic stoves
   - which number of industry believe that such a standard would be achievable & would not discourage research
2) low moisture high emission rate?
3) what relationship between baseline emission rate & standard?

~~Craig Eplett - Town Administrator~~
~~- Ashburnham?~~

~~what about basic assumptions made~~

1e - what would standard have to be if baseline were 3g rather than 3Y?

what about woodstove wattage tests on ST. Idelbert?

what is current available non catalytic capability

Firebox loading. How many 20" long pine logs in a large Fireview stove

Nothing that impresses me most is the fact that we followed the legislature suggestion & appointed an Advisory Committee. The committee was comprised of a cross section of Oregonians - each bringing a special expertise to the problem. The wood stove industry was well represented on this Comm. The Comm. met for countless hours over many months to try to come to grips with these very tech issues. When it was all over, they unanimously agreed (with one abstention) on all elements of the proposed rules. ~~The dept was not on that committee but~~ And today both the Comm. & the Dept are making a ~~unanimous~~ united recommn. to us to adopt the rules in the form presented to us today. I have not been persuaded that these recommendations are erroneous & I for one plan to support them.

Now having said that - I would like to request that the Dept keep us abreast of empirical data that is being developed & that might impact the decision we have made today. I would also like to request that the Dept & the industry work together in a spirit of cooperation

commend speakers for quality of presentations
very difficult decision
conflicting technical data
reasonable men can differ
on the one hand some people are urging a single stricter standard in 1986
Oreg Lung Assoc.
OEC
League of women voters
~~City Club of Portland~~ Editorial Bd. of Oregon's largest newspaper
several key legislators (wood stove)
On the other hand there are those, primarily in the industry, that think a more liberal standard should be set in 1986 + no additional standard set @ all because either it isn't necessary or we should wait for more conclusive test data.

I am not persuaded that a single stricter standard in 1986 is warranted in light of the facts that have been presented to us. This is a new program with potentially national implications. We are plowing new ground and while I want to achieve our pollution reduction goals I do not want to unnecessarily ~~pressure~~ discourage the industry in their efforts to upgrade & have technology. The experts tell us that our pollution control reduction goals can be met with an initial 15/16 standard for 2 yrs followed by a stricter 9/1 standard in 1988

I am not persuaded that a single 15/16 standard is warranted in light of the facts presented to us. While the evidence is conflicting on certain issues such as baseline beam rates, test fuel load + baseline emission rates, the evidence & approach utilized by the dept. in its analysis seems to me to be more believable - a judgment call - but one that must be made. If you believe that a stricter standard than 15/6 is needed to achieve our goals - and I do - then we have no choice under the law but to adopt that standard at the present time. To do anything else would be an abdication of legislative over responsibility as a comm.

WHA

were these comments made to Adv. Comm?
challenge basic assumptions
main suggestions

15/6 in 1986 - leave open 1988 standard
- will data base be developed beb now & 1988?

Commend speakers
very difficult decision
conflicting technical data
reasonable men can differ
ON the 1 hand
Cotton-lung assoc.
OEC
League of women
On the other there are those - primarily in the wood-stove industry
Federal in 1988
no additional standard because either:
said unnecessary or
we should wait for more conclusive data
I am not persuaded that a single

Special EQC 6/8/84 Woodstoves

Lawrence Cranberg - # Texas Fireframe Co, —
endorse efforts of EQC.
Def of Woodstove - "Closed"
as written reader is made to believe
you need a closed firebox to get an
"air-to-fuel ratio of less than 30
(pg 4 Rules, pg 1, Appx 1)
include "closed" and leave
out "less than 30" altogether.

Action of EQC will have profound effect
on woodburning in America

fireplace grossly underrated as heat
source

Technology available to make more
effective of wood

JFK - Controlling fact Air-to-fuel ratio but wasn't include "closed" in Appx I

Craig Spolek, Chairman, Woodstove adv. Committee (written summary)

Delete

Deneche - have a problem w/being to asked to convene

Spolek - maybe some advantage to having an adv. Comm reconvene to study progress at some ltr date. Would be willing to serve.

Jeanne Roy - League of Women Voters of PDX. important step to clean up. Don't do enough to clean up air. Would like to see a stricter standard by 1986. Rules will stimulate out-of-state and used stove market. Also don't believe consumers will replace catalysts.

Richard Bach - Woodheating Alliance
written -
Doubts about DEQ Data and assumptions. Think DEQ should look further. Make sure today's action correct.

Continue to allow industry to work w/ Dept.

Daniel Nelson - Cat. does selling less than other alternative energy sources inc from wood and Energy Mgt. He feels much confusion in marketplace

Betty Hume - why would mfg withdraw from market? Could not speak to it. 15/6 9/4 std - Petersen - did you support? Yes - but with less stds see 15/6 and reconsider 9/4 for 1988. Committee did a lot of negotiating 9/4 was bottom line - but no one at that time could meet @ 9/4. Rep. Retuses — with new data available the Committee should have opportunity to review before end.

Paul Tiegs - Omni env.,

Wood energy institute - Wash
~~John Powell~~ - Compliment Fred, gone out of his way to listen to woodstove ind. and done excellent job for the OPC. 9/4 std is Catalytic mandate - only Ivg Mfgr ~~to~~ could meet.

Important to continue adv. committee appreciate responsiveness of staff

Dick Spanbauer

Kurt Rumins - Hearth int'l, layout of 6 present products will comply - don't make Catalytic Stoves - would not even try for Certification for 1st phase, ~~but store~~ because know they cannot meet 2nd stage. Catalytic stoves not accepted by consumers - feel clean air can be achieved by tech and not Catalysts.

Bill Braden - attended 2 hearings.
by 2050 25% of population will
be over 65.

Ben Myron, Intermountain Ambient
(written statement) here because what
Oregon does will have impact on
Montana and specifically Missoula.
Rules will have great impact —
staff has listened and made appropriate
changes

John Charles - DEQ (written testimony)
program is going to require active
participation of consumers - we should
expect cessation. Daily curtailment will
probably not work. Offsets and banking
also probably not work and are unpopular.

Rep Larry Hill - carried bill on floor of House.
Bill originated to reduce particulates - supported
by wide variety of interests. Rule Statute
clearly has rules adopted by July 1, 1984
and std by 1986. Adv. Committee has
done an excellent job along w/ meaningful

and necessary compromises to have a workable std. However, do not actually rep. leg intent, leg. intended single std to achieve ~~50-60%~~ 50 to reduction leg will not accept single std of 12/lbs/12/5. leg will take further action if reductions are not made. Comp. are acceptable

Kowalczyk - surveys indicate public is wanting to purchase the most efficient and cleanest stoves possible.

Peterson - Commended all speakers, quality of testimony high. Decision difficult.

Keep EQC informed about rule implementation

Deneke would like to see adv. Continued Peterson ~~Reconvene in 1 year~~. At request of Commission

Amend

① Ado. Committee

② Insert "Closed fire chamber" in test criteria

③ require 4 tests w/ understanding balance for less than 4

Deneke / Bishop - DR as amended 4-0

John Cowell

Certainties

9/4 is a catalytic mandate

shrink reservoir of data for non catal

- why

Sparrwasser

will cat tech decrease in price over time

Curt Kummens - Cope Intril

no cat stoves

Braaten

audits

adopt, limits that are reasonable & based upon verifiable data

Hill - legislative intent

intended single standard

75-80% reduction

low sale value - limited production stoves

Cranberg - owner   # meets "closed fire chamber"
Texas Fireplace Co.
def. of woodstove

slot fire

Spolek - 2 tests vs 4 tests

change to 4 tests - delete 340
allow relief thru variances
continue adv. role in coll of comm.

Roy - wants [illegible] 1 stage standard

Bach
new material

only 5% of noncatalytic stove can meet 15 g/hr.
what about catalytic?
walk away
~~St. Helens~~ Hood River, BPA - conservation

Melcon - reduction in population projections

Riggs

He talks so slowly, I think he hes breathed to much woodstove smoke.

7820 S. W. Walnut Lane
Portland, Oregon 97225
June 4, 1984

Environmental Quality Commission
P.O. Box 1760
Portland, Oregon 97207

Dear Commissioners:

I regret I will be unable to attend the Commission's meeting on June 8th. In lieu of offering comments in person, I feel compeled to comment briefly in writing on two important matters.

I was the Wood Stove Advisory Committee member abstaining on the final vote recommending an emission standard. My reason for abstaining was that at the time the Committee's recommendation, by a previous vote, stood at a ridiculously loose standard. Yet the '86:15/6, '88:9/4 standard being voted I found unacceptably loose as well. I did not want a vote against the latter proposal to be seen as a vote for the former. To be clear: I now cast my vote for a 1986 9/4 standard. The data indicate clearly that stoves meeting this standard exist today. Further, the air quality data indicate the standard is needed now. The legislature recognized that need by setting a 1986 effective date. To postpone the tighter standard to 1988 would jeopardize the airshed in a number of ways. There is a significant chance that the base of inferior stoves will expand during the four years, either due to fuel price pressures, or increased marketing efforts. Worse still, postponing the 9/4 standard to 1988 invites industry efforts to gain even more time, rather than committing to the task at hand, which is improving their product.

My second comment is prompted by some testimony you have received. Mr. Keith Cochran has made some serious accusations: "...DEQ staff had improperly manipulated the ... Committee's operation ... improperly screened its access to information." I cannot express my disagreement too strongly. The committee was chaired by Dr. Spolek, not by DEQ staff. There was never a member's concern that was denied time and consideration. Innumerable times in response to questions concerning various ways of looking at the data, the staff responded with extensive effort to satisfy the requests. Mr. Cochran used the same data in his testimony. Nothing was screened. With regard to "pressuring time constraints", all members knew the schedule for the conclusion of deliberations before accepting the appointment. Professionally, I cannot fault the desire for more data. But to fault the process as "improper" after years of study, staff work, and public involvement can at best be viewed as self-serving. I commend the staff for a professional effort.

I appreciate having had the opportunity to serve the Commission in this most important matter.

Sincerely,

Denis L. Heidtmann

TWO TEST OPTION OF WOODSTOVE CERTIFICATION RULES

Graig A. Spolek

Chair, Woodstove Advisory Committee

The Oregon Department of Environmental Quality worked closely with the Woodstove Advisory Committee for several months to develop the set of Woodstove Certification Rules and the Standard Method for Measuring the Emissions and Efficiencies of Woodstoves, currently being considered by the Environmental Quality Commission for adoption. Overall, this set of documents represents a technically sound and workable approach to woodstove certification and reflects the views of the Advisory Committee. However, subsequent to the public hearings, the DEQ included a "two test option" as an alternative to the originally required four test procedure. The apparent motive for this modification was to minimize the financial impact of the certification testing on small manufacturers within the state, by requiring only two experimental tests near 13,000 Btu/hr heat rate and basing the emission performance on that data alone. This option circumvents the original intent of the test procedure recommended by the Advisory Committee, and should not be included.

Throughout its discussion of the test procedure, the Advisory Committee was alert for any potential loopholes and attempted to close them prior to formulating recommendations. The incorporation of four tests for each stove addressed not only national concerns, but the possibility of a particular stove design being "tuned" to perform very well at a specific heat rate (such as 13,000 Btu/hr) but perform poorly at other heat rates that it surely would be burned at during actual use. The recommended test procedure eliminated that loophole. While the current rule proposal would

allow the DEQ to control the eligibility of a given stove design to qualify for the two test option, there does not appear to be adequately defined guidelines to assure that the option will not be abused. Consider the scenario in which a legitimate small manufacturer developed a noncatalytic stove that emitted 9 gm/hr at 13,000 Btu/hr but had significantly greater emission at lower or higher heat rates. After qualifying for the two test option and certifying this stove, the market demand justified a substantial increase in production. The new production level would not qualify for the two test option, but the stove had already received certification, there would be no grounds for revoking that certification, yet the true performance of the stove is unacceptable. Such potential problems can be avoided by eliminating the two test option and requiring all stoves to be tested by the same procedure.

The Advisory Committee did not view the cost of the four test procedure to be prohibitive. Both during the original discussion of this aspect of the test procedure (WAC Minutes, 10/31/83, p.5-7) and during the discussion preceding the vote for recommendation (WAC Minutes, 11/14/83, p.4-7), the four test procedure was favored. In fact, all stove industry representatives on the committee voted in favor of the four test procedure, and the committee member representing small manufacturers spoke in favor of the test procedure. The final vote was 8-1 in favor of the four test prodedure. In summary, the Advisory Committee felt that the four test procedure was necessary.

In light of these comments, I would encourage the EQC to follow the guidance and recommendation of the Advisory Committee by eliminating the two test option. [Specifically, delete section 340-21-152-(4) from the Rules for Woodstove Certification and delete section 5.8.8 from the Standard Method for Measuring the Emissions and Efficiencies of Woodstoves.]

Fred--

Newport Commission meeting---

I talked with John Borden. He'll invite local officials to lunch. John also has some other things he'd like you and the Commission to do when you're in Newport (and if you'd agree to go down the night before).

1. 8-9:30 am - visit "spiffy" new Newport sewage treatment plant. The City Manager is quite proud of what they've done and would love to show it to you and whichever of the Commission would care to see it. I know Petersen is going to Newport on Thursday--maybe he'd be interested too.

2. We've set lunch with local officials at 1:00 pm as EQC meeting starts at 10 am. That way we should be through the whole agenda and leave some time after lunch to visit informally.

3. John has some other Lincoln County "sights" he like to show off after the meeting if anyone is interested.

You might like to discuss this with theCommission tomorrow.

Carol

All are interested in both ① + ③, Nancy may want to go down with me. Arno is interested in STP. Others two and maybe some less so on ③.