[Chairman: Mr. Kowalski] [2:30 p.m.]

MR. CHAIRMAN: Good afternoon, ladies and gentlemen. Welcome to day five of the committee meetings of the Standing Committee on the Alberta Heritage Savings Trust Fund Act. This afternoon we have appearing before us the Hon. John Zaozirny, Minister of Energy and Natural Resources. I might point out to committee members that sections of the annual report of the Heritage Savings Trust Fund contain paragraphs on pages 13 and 14 dealing with portfolio responsibilities of the Minister of Energy and Natural Resources.

Welcome, Mr Zaozirny. Perhaps you would be kind enough to introduce the gentlemen with you. If you have overview comments please proceed, and then we'll go to questions from the committee members.

MR. ZAOZIRNY: Thank you very much, Mr. Chairman. I'd like to introduce two gentlemen who are with me this afternoon. On my right is Morris Carrigy, the vice-chairman of the Alberta Oil Sands Technology and Research Authority, affectionately known as AOSTRA, and on my left of course is Fred McDougall, the deputy minister of the renewable resources side of the department. These gentlemen are here to respond to the questions of fine detail that may come forward, in which instance I'll feel no compunctions about calling upon them.

I would like to make a few opening remarks on the three specific projects under the capital projects division of the Heritage Savings Trust Fund for which I am responsible. The first, of course, is the Alberta Oil Sands Technology and Research Authority. AOSTRA is now moving into its ninth year of operations. Its mandate is twofold: to promote and assist pure and applied research into economic and efficient methods, firstly for the recovery and processing of petroleum from oil sands deposits and heavy crude oil reserves, and secondly for enhancing the volumes of oil that can be produced from conventional oil sources.

This second aspect of AOSTRA's mandate, enhanced recovery of conventional oil, was legislated in 1979. In this area AOSTRA provides financial assistance in support of field work by petroleum companies, usually on a 50 per cent cost-sharing basis, and laboratory work to test recovery processes. By way of example of the work being done in this area, an agreement with Vikor Resources Ltd. for testing the carbon dioxide flooding process in a watered-out reservoir in the Joffre conventional oil pool near Red Deer is now being finalized, and it's expected that the pilot will commence operation this year.

As members will be aware, the vast majority of AOSTRA's activities are in the areas of oil sands and heavy oil research and development. AOSTRA supports field work to test in situ recovery processes, funds research conducted by staff and students in Canadian universities, and supports a number of oil sands programs at the Alberta Research Council. This work is done in co-operation with industry and other research groups, as well as individuals.

The highlights of each of the field pilot tests in various oil sands and heavy oil reservoirs are given in AOSTRA's annual report, which I trust members will have a copy of. I would be remiss in not drawing to the attention of members of the committee, the success of the first phase of the AOSTRA/BP pilot in the Cold Lake oil sands deposit. The first phase of the pilot tested an in situ recovery process using steam stimulation and, as members will be aware, the results were sufficiently encouraging to lead to BP's decision to proceed with the development of a 7,000 barrel per day project. I think we can all be justifiably proud of AOSTRA's contribution to the research and development work behind the Wolf Lake project. AOSTRA and BP are now moving to the second phase, which is to test the wet combustion.

What's ahead for AOSTRA? First of all, additional tests at the AOSTRA/Shell pilot at Peace River will be undertaken to enhance the commercial attractiveness of this project, which is now well into its first pressure blowdown phase and produced its one-millionth barrel of oil not long ago. Secondly, AOSTRA will aggressively pursue new programs in the very important Athabasca deposit, as it continues to be the most challenging.

Thirdly, the conceptual design of an extraction test centre has been completed, along with the co-operation and undertaking of nine other organizations. A specific proposal in that regard is now being assessed by potential industry participants. The centre's purpose, of course, would be to test front-running alternatives to the hot water process now used in surface mining, particularly on higher clay content feedstocks, which are prevalent in the surface mineable areas.

Fourthly and finally, in heavy oil upgrading AOSTRA and nine other organizations have completed an assessment of nine new upgrading processes, and a proposal to construct a demonstration plant is now being considered.

The second major area is the Pine Ridge reforestation nursery. The construction of the nursery is essentially completed. There will be some work this year on paving roadways and the parking lot, and on the expansion of the genetics and the tree improvement facility. The nursery of course was established to provide Alberta with a modern, efficient facility for seed processing and the production of planting stock for the government's and industry's replanting programs. It's located at Smoky Lake, and the nursery provides bareroot and container seedlings, seed extraction and seed storage services, as well as genetic and tree improvement research for private industry reforestation, and as well for reforestation programs carried out directly by the Alberta forest service, which includes the maintaining our forests program. I would encourage members to view the facility. I have had the opportunity to view it; it's most impressive and a real credit to this investment of the Heritage Savings Trust Fund.

I would simply mention as well that while it was initially intended to have produced some 20 million seedlings per year, the production target was revised and the nursery is now capable of producing some 36 million seedlings per year.

The third area is the maintaining our forests program. As you may know, since 1966 reforestation has been a shared responsibility between the government and the forest industry in Alberta. Industry bears the cost for reforestation in most of the logged areas, either by doing the work themselves or paying a reforestation levy, in which case we have the Alberta forest service do the actual work. The maintaining our forests program was designed to assist in our efforts to reforest these areas, and these are areas that are not covered by this type of mechanism. I should add that the forest service also has the responsibility for reforestation of areas that were harvested prior to '66 and areas which have been affected by forest fires and disease or where the forest land base has been lost due to energy-related activity or single use zoning. The maintaining our forests program was designed to assist in our efforts to reforest these areas and to improve our productivity in the future on forested areas, through activities such as wetland drainage and thinning over dense stands. Beginning in '79, $25 million over seven years was committed to this effort, and the program is primarily directed to activities in northern Alberta. We feel it is a very positive one. It has provided employment in areas such as heavy equipment, semi-skilled and unskilled jobs in northern Alberta.

Mr. Chairman, I hope that's a sufficient overview and, with those opening remarks, would invite questions and discussion with the committee.

MR. CHAIRMAN: Okay, Mr. Zaozirny. On pages 13 and 14 of the annual report there is one sector, grazing reserves development. I take it that we will be dealing with the Hon. Don Sparrow with respect to that category?

MR. ZAOZIRNY: Yes, that is correct.

MR. CHAIRMAN: Then we'll go to members and their queries. The following is the order I have at this point: Mr. Moore, to be followed by Mr. Notley, Mr. Hyland, Mrs. Cripps, Mr. Nelson, and Mr. Thompson.

MR. R. MOORE: Thank you, Mr. Chairman. Mr. Minister, in the two projects, AOSTRA and the conventional oil enhanced recovery program, I see the government now has $197 million committed to that. I'd like to know what the involvement is of the private sector here. Are they joint projects, or what are they spending? Industry is the end beneficiary of all this. How much involved are they? You touched on it on a couple of occasions in your overview, but are they in there for the same amount, for more, or are they participating in these programs just in a minor capacity?

MR. ZAOZIRNY: I think it's fair to say that the normal practice is a fifty-fifty cost-sharing arrangement with many of the endeavors. I suppose I should add that the ultimate beneficiaries of these various programs are the people of the province of Alberta. AOSTRA was established with that very much in mind. I think there is a clear recognition that the energy resource industry is of tremendous importance to the economic well-being and the future of this province. AOSTRA was established in an effort to provide some additional catalyst for the development of the extensive reserves we have. So in the first instance, I would suggest that the beneficiaries are very much the people of this province.

The modus operandi of AOSTRA is to work in concert with the private sector, and you'll note in some of the opening remarks the indication that that is the approach we're taking in these various project areas. Mr. Carrigy, I wonder if you'd like to supplement those remarks.

MR. CARRIGY: In answer to your question about the amount of money, generally the industry is putting up an equal amount of money in these projects. They and their affiliates get access to the technology and are able to use the technology. Our purpose in going into these projects is to make sure that the industry is using the technology. We don't go into projects if there is no industrial interest. We expect that industry will get involved early and be able to carry straight on with the commercial development of these projects.

MR. R. MOORE: A supplementary, Mr. Chairman. In Alberta we have the Alberta Research Council, and you touched on that briefly, Mr. Minister. How much of this work could they be doing? What I'm looking at is, are we duplicating services? The Alberta Research Council does extensive work throughout the province, and I'd like to know whether we're running parallel with two projects here, where one could do it.

MR. ZAOZIRNY: As a preliminary — and I'll invite Mr. Carrigy to comment, as he has indicated an interest in doing — clearly, AOSTRA is involved in some work with the Alberta Research Council. But I think it's fair to say that the degree of active participation and the degree of specialization that AOSTRA both possesses and has developed are really quite unique. Mr. Carrigy, perhaps you might want to supplement that.

MR. CARRIGY: What I was going to say is that through our funds we also support the oil sands research program of the Alberta Research Council, so we're working jointly on this in this area. To date, I think the Alberta Research Council is funding the projects 40 per cent and we're funding them 60 per cent, but the programs are certainly developed jointly. We give as much emphasis as we can to the program, in light of the fact that we want industry to receive most of the benefit from and the commercialization of these

processes. So we don't spend as much time or as much money doing research for the sake of research. We think that's the Research Council's mandate and not ours. Our projects are really designed to get things going.

MR. R. MOORE: A final supplementary, Mr. Chairman. On that final statement, sir, could you expand on how you've got the industry going through your projects?

MR. CARRIGY: As Mr. Zaozirny mentioned, the Wolf Lake project is one of the projects we were involved in with BP. We see they're going ahead with a 7,000 barrel per day project. The opening ceremony is taking place today. We're very proud of that effort and very pleased with it. We're also dealing with Shell at Peace River, and that project looks very promising. It's right on target, and hopefully it will lead to a commercial development in about three or four years' time.

Most of the other projects are not to the point where they could take the commercial step. They still need a few more years of more information, I guess, before they can make that assessment as to whether to go commercial or not.

MR. CHAIRMAN: Mr. Notley, to be followed by Mr. Hyland, Mrs. Cripps, and four other hon. members.

MR. NOTLEY: Mr. Chairman, first of all to the minister; I have several questions later on for Mr. Carrigy. The appropriation in 1982-83 was $54 million. The total expended was $29.5 million. So about 57 or 58 per cent of the money authorized by the Legislature was in fact expended during the budgetary year. Along with that, I might just add that when we voted that sum of money, the then minister outlined the estimates for the various projects. I have them here in my estimates book. Perhaps you could advise us where things stand project by project, or at least make that available to the committee. We have the 1982 information, but I have no information on 1982-83. Would you give an undertaking to supply that to the committee?

Secondly, would you advise us as to the difference between the authorized vote of the Legislature and the actual money expended and, on a summary basis, where that shortfall occurs in the projects this year?

MR. ZAOZIRNY: I don't see any difficulty in meeting that request. I suppose I should add by way of a general comment that given the nature of research and development undertakings, there is inevitably some difficulty in being able to forecast with great precision particular needs in a particular year. That's just the nature of the business the Authority is engaged in. But certainly to the extent that it's possible, we will provide that more detailed information for members of the committee.

MR. NOTLEY: The other part of that first question, Mr. Chairman, was with respect to the shortfall, if we could have summarized the difference between the $54 million authorized and the $29.5 million expended.

MR. ZAOZIRNY: As a matter of fact, Mr. Carrigy has indicated he may be able to provide the committee with some assistance on that at the present time.

MR. CARRIGY: In terms of the general difference between what we asked for and what we were able to spend, each year we ask for what we think the industry will spend, what applications will be made. It's something we're unable to predict very well. What we find is that even once we have approved a project and our commitments may have well fulfilled what we said here at $54 million, the amount of money spent in that year doesn't come up to that level for two reasons: one, because it takes a long time to get the project agreements in place; and, another, it takes a while for the industry to get

started. So the amount of money they actually expend in the year usually falls far short of what they've asked for and what we've agreed to. That's the usual reason why we don't meet the amount we ask for. But we have to ask for it in case, by some chance, they will in fact get started earlier — or on time, I guess, is what they should be able to. But they usually don't; they're usually much later starting than we had hoped.

MR. NOTLEY: Mr. Chairman, my first supplementary is to Mr. Carrigy. Is there any reason why there should be such a significant shortfall? To ask the Legislature for $54 million and then outline how it's going to be invested — in a quite detailed form, as a matter of fact; it would do credit to the then minister — but then we find that just barely half of that is in fact expended, is that unusual?

It would strike me there would be a carry-over. This is a program that has been going on since it was announced in 1974. I find that strange in terms of the budgeting process, not that it is upsetting the taxpayer to come under estimates. If it's under estimates, that is one thing; but if it's under budget because we've not undertaken projects, it's a different story.

MR. CARRIGY: That's something we've been concerned about ourselves over the years, that we've been asking for considerably more than we've been able to spend and each year we fall short. We feel that if we haven't got the money, we really can't make the commitment. So in order to make the commitment to the company, we need to know that the money is available to carry out our share of the project. But as you say, it's very difficult to estimate the actual expenditures, and we haven't done a very good job of it.

MR. NOTLEY: Mr. Chairman, my second supplementary question is with respect to the nature of the agreements over ownership of technology. As I understand it, when we go into an arrangement with a company, the company has access to that technology and the government has access to the technology. To what extent are we protected? In other words, to what extent is there protection that a company would not simply earn that technological advance, partly paid for by the taxpayer, shift it to some other part of the world, and we would not then be able to contract with another firm that might be interested in using that technology in our own oil sands? What protection do we have of access, of complete control over the technology, so that if for one reason or another the company we're working with doesn't follow through to our satisfaction, we could farm it out to another firm?

MR. CARRIGY: We have ownership of the technology and complete licensing rights within Canada. Outside Canada, the company and its affiliates also have equal licensing rights. But any income, no matter where it comes from, is shared between us and the company. So we always get our share of the money. I don't know that we can control the licensing outside the province, except that we have the licensing rights inside. If, say, Shell were to operate in Venezuela and they could sell the technology to someone in Venezuela, then we would get a share of that income.

MR. NOTLEY: Fifty per cent?

MR. CARRIGY: Yes. And we would also have the right to set that price in conjunction with Shell.

MR. CHAIRMAN: Mr. Hyland, to be followed by Mrs. Cripps, Mr. Nelson, Mr. Thompson, and four other members.

MR. HYLAND: Thank you, Mr. Chairman. Maybe I should get Mr. Notley to pass me the rest of his questions. That's along the same line I was, and he's asked most of mine.

We've talked about the projects at Wolf Lake and Peace River. Once they are complete, at what point in time does the technology become useful to other companies? At what point will the government and the company developing the technology enter into a contract for other companies to use if they want to develop?

MR. CARRIGY: I think I can answer that one: at any time. Even today a company can come in and buy access to the technology. There's no particular time. In fact we have had companies come to us already and buy into the projects that we are actually developing. So there's no particular time that you can say the technology is complete or we have a package to sell at some time. It's really ongoing all the time, and the earlier the company gets in, I guess, the more information it gets on the technology and the sooner it's able to use it. So we encourage them to get in as early as possible to learn about the technology so that they can apply it just as soon as it's ready to go.

MR. HYLAND: My first supplementary. So other than the cost of the technology, there's no prohibition on other industries looking at the technology if they can use it, paying the price, and starting their own projects in oil sands or whatever, even if it is beside or in competition with the companies that developed it?

MR. CARRIGY: That would be the case. That's the way we wrote our agreements, so that any and all companies would have access to the technology, that no single company could control the technology.

MR. HYLAND: Thank you.

MR. CHAIRMAN: Mrs. Cripps, to be followed by Mr. Nelson, Mr. Thompson, Mr. Anderson, and six other members.

MRS. CRIPPS: I think you just answered my question on access to technology. I understand that any company has access to technology developed in conjunction with the government under the AOSTRA program. Is that correct?

MR. CARRIGY: That's correct. They have to pay a price to get it, and the price is set by us and the company. I guess the company wants as much as it can get, and we want to make sure that the technology is used. So we'll come to some agreement as to the price of the technology and how much they will have to pay to get access to it. But you're correct; there are no strings attached to any other company's getting access to any technology developed by AOSTRA.

MRS. CRIPPS: My second question isn't a supplementary. Traditionally, not more than 30 per cent of the conventional oil is produced. How much activity is there in the enhanced recovery program, and what type of activity is taking place?

MR. CARRIGY: There is less activity than we had hoped to generate when we first went into supporting enhanced recovery, but we have at least one project, on CO_2 flooding with Vikor Resources, which we hope will go into operation this year, which will ultimately produce significantly more than 30 per cent of the oil in place. In fact, in that reservoir it's already been watered out. It was abandoned, and we're coming back in with carbon dioxide and hopefully getting some more oil out of the ground so that the whole field will be economically reworked, I guess you could say, and more oil produced. This is oil that wouldn't have been produced otherwise.

In terms of other enhanced recovery processes, they take a long time to get into place because, generally speaking, they're not like the oil sands, where you have one owner. You have a lot of owners and you have units, and it takes a long time to get all the people together to get an agreement going. That's what's taken the extra time with Vikor; there have been so many unit holders and so many people we've had to deal with that it's taken a long time to get the agreement in place.

MR. ZAOZIRNY: Perhaps I might supplement that response by indicating that in the aftermath of our enhanced oil recovery incentives program of October 18, 1982, we've been very pleased with the number of applications that have come forward. This is not specifically within the purview of the AOSTRA involvement, of course, but is very relevant to the question. Prior to the October '82 announcement, we had had only four projects brought forward and approved. Since that time, some 14 projects have gone through the full application process and been approved, and an additional six projects are pending.

I should also say that one of the challenges, if you will, of the present economic times, with limited financial capability of companies to pursue projects, it becomes a matter of choosing between alternatives. If a company has a certain amount of capital available for a project, an enhanced oil recovery project has to be compared — in terms of the return that's available, in terms of the immediacy of the cash flow that will be derived from the project — with other alternatives, whether they be in the heavy oil area or other types of drilling activity. So that is obviously a limiting factor to some extent. Nevertheless, we've been very pleased with the number of applications in the enhanced oil recovery field that have come about since October '82, and feel that there is just a tremendous potential in that area. I think the member will be quite familiar with the numbers.

MRS. CRIPPS: A supplementary. You can put me back on the list, because I'm not going to get my last question. Can you give me any indication of the nature of the enhanced recovery projects? Are we looking at, say, the conventional field in Drayton Valley, which I know in many cases is only 20 per cent produceable?

MR. ZAOZIRNY: I can undertake to get a specific response to you on that one. The overall numbers are that we've had some 5 billion barrels of oil produced to date. We believe that with the implementation of this kind of scheme — if we used only the normal production techniques, we perhaps have an additional 5 billion barrels of known reserves that are recoverable. But with the enhanced oil recovery program, we believe that the potential is very significant: nearly a 50 per cent increase in what would otherwise be recovered.

In terms of the specifics in the Drayton Valley area, I'd have to get back to the committee with that specific information.

MR. CHAIRMAN: Mr. Nelson, to be followed by Mr. Thompson, Mr. Anderson, Mr. Speaker, and eight other members.

MR. NELSON: Mr. Chairman, a question to the minister. There has been a considerable amount of investment by the Heritage Savings Trust Fund, or the people of Alberta, in enhancing the recovery of oil in the province. I'm wondering if you could indicate to us the return in dollars to the investment provided by the Heritage Savings Trust Fund, and how much of that investment of $186.4 million is used for capital as against the operating cost, including in that people hired by the agency and so on.

MR. ZAOZIRNY: I suppose the broad question of what our return is on this investment is, in a sense, the first question that's always asked, particularly of research and

development operations, because of the very nature of them. So often in the research and development area, there is some difficulty in providing hard numbers on an ongoing basis, to provide comfort, if you will, in the very short term to the investors, in this case the people of the province.

With the undertakings of AOSTRA, I think we have to bear in mind that we have been operational for a relatively short period of time, some seven years. As you are aware from the annual report of AOSTRA and other information, they are involved in a wide array of projects. Again, the specific example one would refer to is the BP Wolf Lake one where, as a result — and I think it's fair to say a specific result — of that involvement in the pilot project, we now have a project coming on stream which is going to recover a significant amount of oil. The royalty and other economic benefits that accrue from the development of that project will flow to the people of Alberta.

So one is hard-pressed to give the specific numbers one might like to have, but I would say that overall there probably has never been a more important time in this province for us to encourage the development of our oil sands areas, which we have in such great abundance.

Perhaps Mr. Carrigy would like to supplement.

MR. CARRIGY: I'd just like to comment on the second part of that question. In general, it's about half capital and half operating. I couldn't give you the specific numbers.

MR. NELSON: A supplementary, Mr. Chairman. Considering the minister's reply — it may be a difficult area to give a specific reply in dollars and cents. But through the funds provided by both industry and the government — of course, industry isn't going to throw money down the drain for nothing; they must see a return to that investment, unlike governments in some cases.

However, would there not be some way of digging out numbers to determine what return has been obtained by spending money in research? For example, there must be some manner in which we've taken a research project and enhanced the recovery of oil, whether it be conventional oil or other oils, through receiving royalties from that enhancement or whatever, in that nature. I think we would have some numbers around that would enlighten us as to the propriety of our investment.

MR. ZAOZIRNY: I think it's fair to say that when industry has made the decision to invest in these undertakings, they have very much recognized the often long-term nature of the investments, whether it's trying to improve processes or to assess the potential of a specific area. They are recognized to be that. Really, we're talking about the area of research and development. Because of that, both industry and government, recognizing the nature of research and development, take a longer rather than a shorter term view of a return on that investment.

As far as the specifics are concerned, I can advise the committee that AOSTRA has received upwards of $10 million in revenue from the sale of technology rights, even in its first seven years, and a further approximately $10 million from production revenues. Again, that's bearing in mind that we started from square one some seven years ago and have already seen some fruits in terms of technology rights and production revenue.

When you get into the broader area of degrees of return, I suppose one could try to calculate the numbers out in the BP Wolf Lake project on the premise that it wouldn't have occurred otherwise. If the committee thought it appropriate, we could endeavor to work those kinds of numbers.

Mr. Carrigy, you might want to supplement.

MR. CARRIGY: All I can say is that the way the province benefits is in terms of royalties it collects. The industry benefits in terms of the profit it makes on the

production from this particular technology. AOSTRA benefits from the sale of the technology. How we could break all of those down — all I know is what we have actually received in technology sales for the present. As Mr. Zaozirny said, that's about $10 million. We also receive income from the production of the particular pilots we're investing in. That is used to supplement the money the Alberta Heritage Savings Trust Fund is putting in, and that is in the order of $10 million. Of the first $186 million, we've got back about $20 million so far.

MR. NELSON: Mr. Chairman, one further question to the minister. You indicated in your brief overview that you could control the use of the technology within the province as far as the oil industry is concerned. However, outside the province, around the world, other than the sale of certain types of technology which you get 50 per cent of the return on, is there any method by which you could patent the various activities you're involved in, so the government could in fact control the technology that is being developed, to a great extent at the taxpayers' cost and in conjunction with the industry which is participating in that particular development?

I think "development" is a key word here, because development to me is possibly producing. Insofar as the government would also obtain a return on that investment that they are not getting today in certain areas of the technology that we are developing in conjunction with the industry, is there any way we can develop worldwide patents that would enhance our sale of knowledge, and possibly create additional jobs for Albertans in that field?

MR. ZAOZIRNY: Yes, a number of specific patents have arisen as a result of the work. As was mentioned earlier, there is a fifty-fifty sharing of those patent rights with the particular business concern that engaged in the original work. So that is in fact occurring.

I do want to back up for just a moment, if I might. I think the response is in terms of the question and both supplementaries as far as a return is concerned. While I think it's proper and necessary that we be looking on a regular basis at how we're doing in this area, I do think it's so essential at this time — bearing in mind our need to develop these vast reserves of oil sands — that, if anything, we be accelerating that developmental process. For example, we want to encourage, if at all possible, the construction of additional oil sands facilities, of heavy oil. One of the factors that will determine whether investment takes place, of course, is whether the technology that is available is such that the project is economically viable.

So, as I say, while it's entirely appropriate that we be looking on a regular, year-to-year basis at the specific return we've gotten, if as a result of the work of AOSTRA and industry — and I mentioned earlier that there was a lot of work being done with respect to an oil sands test centre for demonstration of new extraction technology. If as a result of those endeavors they are able to develop technology that makes the extraction of oil from our oil sands only half as expensive as the present hot water processes, the returns on that kind of investment will be in such a rate that they will be beyond belief. That's obviously the kind of approach that's being taken. But I don't in any way take away from the validity of the concerns that the member is raising.

MR. CHAIRMAN: Mr. Thompson, to be followed by Mr. Anderson, Mr. Speaker, Mr. Gogo, and seven other members.

MR. THOMPSON: Thank you, Mr. Chairman. I'd like to move on to a different area, the Alberta reforestation nursery in Smoky Lake. A couple of years ago I was down in Oregon and toured a research facility where they were breeding new, faster growing trees. They were involved in cloning. I was wondering if there is a research arm involved with your nursery up there that is looking into things like that. Is anything being done on diseases and insects like the pine beetle, that type of thing?

MR. ZAOZIRNY: Mr. Chairman, to the member. In fact that is the case. The expanded genetics laboratory and greenhouse are looking at ways in which we can move more extensively to facilitate co-operative genetics projects, particularly with the forest industry. That's part and parcel of the '83-84 program of the Pine Ridge nursery. Perhaps Fred McDougall would like to supplement on that one.

MR. McDOUGALL: We have a very active tree improvement program in co-operation with the forest industry in the province, Mr. Thompson, and we're very proud of the work that's being done on genetic improvement at Pine Ridge. If at some time members of the committee want to visit that facility, I'm sure the minister would be pleased to help us arrange a trip.

We are not into genetic engineering or some of the more advanced technology with respect to gene splicing and things like that, but we do have an excellent program in terms of plus tree selection, seed orchard establishment, and tree breeding.

MR. THOMPSON: But nothing with preventive things like disease and insect control? Or would that be in that area?

MR. McDOUGALL: As you know, we have mountain pine beetle infestation in southwestern Alberta, where we have an active control program under way, which is successful. We were too late in the area south of Highway 3, around Waterton Park, and there of course we're dealing with salvage rather than control. But north of Highway 3 we do have a successful and active control program.

In terms of the technology in insect and disease control, we have a co-operative program with the Canadian forestry service, funded primarily by the federal government, which is looking into Pheromone development and some of the other insect control technology. But we ourselves do not have an active provincial research program in insect and disease control, because the federal government has had a very good program in that area for many years.

MR. THOMPSON: Mr. Chairman, do I have any supplementals left? One.

You mention that you have 21.3 million seedlings. When you put them up, just roughly how many acres would that reforest?

MR. McDOUGALL: The planting rate varies: a maximum of 1,000 per acre, but more often between 600 and 800 trees per acre. So from that you can . . .

MR. CHAIRMAN: Mr. Anderson, to be followed by Mr. Speaker, Mr. Gogo, Mr. Musgreave, and six other members.

MR. ANDERSON: Thank you, Mr. Chairman. Before I ask my question, for the interest of the minister I should mention that on a recent trade mission by this government, Alberta's reforestation techniques were extremely well received in Kenya, Sudan, and Egypt — especially in Kenya, where they're trying to reforest much of the country, and appreciated very much some of the techniques.

My question really relates to that of Mr. Moore, initially, and AOSTRA. While I think we are all impressed with the work that has been done by that agency, it is the responsibility of this committee to ensure that there isn't duplication of effort. While the minister's answer regarding why AOSTRA would not be part of the Research Council indicated its unique nature, I fear that that standard could be applied to just about any kind of research carried out by that council. So perhaps I could place the question in a different way. What negative effects, if any, would there be in making AOSTRA an arm of the Alberta Research Council, and perhaps what positive effects would there be, if the minister could see any of those as well?

MR. ZAOZIRNY: I'd have to answer that question in the most general of ways, not having as intimate a knowledge of the Research Council and its operations as I might like to have. But in making a decision of that nature, I think one simply has to look at the magnitude, at the importance of research and development of our energy resources in this province. I think that back in 1974, when the Act established the Authority, that clearly was the judgment of this government: that in the long-term future of this province, the development of our energy resources is a very important factor in the long-term well-being of our province. Without wishing to be repetitive, I don't think that that's ever been more apparent than at the present time. We have the potential there. We've got to develop technology that brings down the price of recovering these vast reserves. We know the reserves are there; it's simply a matter of the technology to make their extraction economically viable.

Certainly on the oil side, in our judgment there's no problem; the markets are there. That's clear. We don't have a shut-in oil problem at the present time, and we think there's no need to have one. We think if we are going to achieve true energy self-sufficiency in this country, we've got to encourage the development of those resources.

So my answer would have to be in that context, that I come down strongly on the side of a strong organization, namely AOSTRA, to be the leading edge in the development of this technology. Its separate existence I think underlines just how much importance we place on the work they're doing. That's not to comment at all adversely with respect to the Research Council.

MR. ANDERSON: Mr. Chairman, with respect to my supplementary, I appreciate the minister's comments regarding the important nature of AOSTRA. I think we all recognize that and how it must be a leading edge. I guess I'm just trying to ascertain why that could not happen in another division achieving the same ends. Indeed those decisions were made initially. Is the minister indicating that there's been no assessment of that possibility of further joint relationship, if not total amalgamation, since its initial establishment? I realize the minister is fairly new in the portfolio and may not have that history, but is that not an area we should be looking at in times of economic restraint, et cetera?

MR. ZAOZIRNY: Again, there's never a situation where it isn't perhaps useful to take a careful look at levels of expenditures and ways in which government can operate as efficiently as possible. But I believe there is a good healthy working relationship between the two organizations. I suppose it's debatable as to whether one would actually arrive at efficiencies of operation by some amalgamation. Sometimes amalgamation gives rise to efficiencies, and other times it does not. One can't make that assumption.

I think what I might do is invite Mr. Carrigy to comment on the actual structural aspects, in which he might be more versed in terms of detail, and try to respond to the question in that fashion.

MR. CARRIGY: Thank you, Mr. Zaozirny. The main difference between AOSTRA and the Research Council is that AOSTRA is a funding agency. We don't do any research ourselves. If we want to do research, we either go out to private industry, the Research Council, or any other research organization that can actually do the research, and we fund it from that source. We like to have the direct involvement of industry in these projects; we don't just like to do research. We like to have industry tell us what the problem is, and then we'll go out and solve it. If necessary, we'll use the Alberta Research Council to put in whatever they have, their part of the project. But often, it's a matter of industry wanting a particular problem solved.

In most research organizations, you find that they get an in-house activity going, and it's very difficult to swing them over to a problem somebody has brought in today.

They'll say, yes, we'll do that as soon as we've finished our own in-house project. This is why we felt it was better to separate the funding from the actual research, because a funding organization has the funds and can put them where they're needed at the right time and get the research done; it doesn't have any competing research that would prevent doing that immediately.

I think that's one reason. If you want something done immediately — it's a technology question that's quite often more a service technology development than a research project — industry and the industrial people can react more quickly than, say, an organization that has its own in-house research.

MR. ANDERSON: Mr. Chairman, thank you for that information. I appreciate and certainly support the demonstration nature of the research done by AOSTRA and wouldn't want to jeopardize that in any way. I hope, though, we always explore the possibility of duplication and what that could do. I appreciate the minister's point that indeed there are economies of scale, and perhaps this is one case where we've reached that point. None the less, I think we have to take a look at those options.

Therefore, my last supplementary question is the same question only with respect to the Alberta reforestation research projects mentioned by the deputy minister previously. Are those being carried out in any way with the Research Council? If so, what's the difference? How do you define what is done within the department and what the Research Council carries out?

MR. McDOUGALL: The Alberta Research Council has a very active soils research group and soils capability, that we have relied upon over quite a long period of time, for many years. In the area of reforestation techniques and vegetative manipulation, they do not have and never have developed a strong program. As I mentioned earlier, our main interrelationship there is with the forest industry, and our tree improvement program is a joint program with the industry and with the Canadian forestry service, which traditionally has a strong program in insect and disease research.

MR. R. SPEAKER: Mr. Chairman, to the minister. In the 1982-83 report before us, the natural gas and natural gas by-products royalties account for 37 per cent of where our funds come from. At this time, as a committee we must be concerned about the income as well as the expenditures. I understand as well that our natural gas markets into the United States could be reduced drastically in this coming year with the new policy by the American government.

I wonder if the minister could indicate what type of forecasts are indicated; that's number one. Number two: what negotiations or discussions have gone on with the American government through the Canadian government with regard to this matter and the impact it will have on the Alberta economy and, specifically within this committee, on the Heritage Savings Trust Fund?

MR. ZAOZIRNY: Mr. Chairman, in responding to those very important questions, I suppose I should throw out the caveat that investment policy broadly falls within the purview of the Provincial Treasurer. My direct responsibility is with the administration of these three programs, but I'm happy to respond in a general way because the questions are most important.

As far as the forecasting is concerned, let me start by acknowledging the importance of our natural gas exports to the United States; that is the one export avenue we have. In the past fiscal year, sales to the United States accounted for approximately one-third of our total natural gas sales, with the other two-thirds split roughly equally between intra-Alberta sales and sales outside of Alberta in other parts of Canada. So it's clearly a major component of our natural gas market.

To try to forecast the possibility of change in U.S. policy or legislative action is

an exceedingly difficult thing. Today at a luncheon, I was involved in some meetings with some staff members from the United States Senate energy committee. They had been invited to come to Canada, to Alberta specifically, and we had an opportunity to discuss the issue of legislative action. I would say at this juncture it's not possible to predict whether there might be any legislation in the United States on natural gas which may or may not include provisions dealing with the importation of Canadian and other gas from other areas apart from the United States.

We view this as a very important matter, that a great deal of attention is being paid to. We're working very closely with industry, who have been extensively involved in communications in the United States, with government agencies and representatives, and industry. As you will recall, of course, the proposal for an adjustment to our uniform border price and the incentive pricing proposal derived from joint Alberta and industry consultations. The fact is that those consultations are continuing, and we are monitoring the situation very closely.

The short answer to your question on forecasting is that at this time, I certainly wouldn't be in a position to make any particular forecast. It depends very much on factors such as whether or not there is legislation in the United States dealing with imports. It's going to depend in part on the demand for natural gas, which is a factor of, amongst other things, both the economic upturn in the United States and increasing demand for natural gas on the industrial side, as well as the need for natural gas as a winter heating fuel. Last year, of course, we had a combination of factors which worked against sales, namely an economic recession of a significant magnitude in the United States, as well as a particularly mild winter. We've had two of those running.

So those are the kinds of factors that are indeterminate but which play a very important part in what the immediate future holds for natural gas sales. We think that the incentive pricing proposal was a very useful step in lessening the prospect of adverse legislation and in enhancing the possibility of some added sales. It's a matter of how events unfold in the United States in the months ahead.

On the question of the extent to which there have been discussions, I can't comment on the extent to which Canadian officials have been involved in those communications, except to say that I know there have been communications. The federal government is well aware of the importance of natural gas sales to the United States. In a recent speech in Aspen, Colorado, Geoff Edge, the chairman of the National Energy Board, underlined the seriousness with which Canada would of course view any legislation in the United States that effectively legislated a breach of contract, if you will, given that there are international arrangements. So I think it's clear that the Canadian government is very much involved in communications.

But speaking for ourselves, of course, the Premier has made a recent visit to the United States to state squarely the case for Canadian and Alberta gas. We are involved in ongoing dialogue with them. As I said, this afternoon we had a meeting with some staff members of the Senate energy committee, to get an up-to-date briefing on where matters stand. I think that's as much as I can say in response to the question.

MR. R. SPEAKER: Mr. Chairman, to the minister. Indications are that the American government would like to bring in the legislation by November of this year. Is that a firm indication at this time? Would we as a committee or a Legislature this fall have a more firm indication of where the American government stands — I know you can't answer that — and what the trend will be with regard to gas sales?

MR. ZAOZIRNY: You're right; I can't answer that, simply because the process that's involved in the United States is a very complex one. As you're well aware, they have a dual House system, with the House of Representatives and the Senate itself being involved. Both bodies have had the administration energy Bill in committee and have come forward with proposals for legislation that may or may not reach the floor of the

House, ultimately of the Congress. It's really simply not possible to state with any precision what will happen in the months ahead.

On the administration side, there's a hearing scheduled on September 8 in Washington by the economic regulatory authority of the Department of Energy in the United States, to assess the appropriateness of existing criteria for importation of gas from outside the United States. So obviously the U.S. administration has its own thoughts and in fact brought forward the administration Bill that both the Senate and the House of Representatives has been examining. There's a multitude of factors there. I think it underlines just how important it was for us to move earlier this year with the initiatives that we did, in terms of the uniform border price adjustment and incentive pricing system. We'll simply have to see how events unfold, but it is certainly a very high priority with the government.

MR. R. SPEAKER: Mr. Chairman, to the minister. The policy that would be enunciated by the United States would ask for the lowest and most flexible pricing formulas with regard to the natural gas that is exported to the United States. What is the present attitude of the Alberta government with regard to that kind of policy, if we wanted to sell our gas under any circumstances?

MR. ZAOZIRNY: We continue to hold the view that natural gas is a very valuable commodity, and that within a relatively short span of time we're going to see significant increases in the demand for Canadian natural gas by the United States. Again, one can't pinpoint with precision exactly when that's going to happen. Someone said to me the other day that the most important tool that a forecaster can have these days is his eraser, and I think there's something in that.

But certainly, while we're interested in marketing our natural gas, while we recognize that one has to be market competitive, we view that resource as a very valuable one and think that the medium- and long-term prospects for sales are very good. So that's the kind of approach we take to this very important area.

MR. GOGO: Mr. Minister, I've found the explanation with regard to AOSTRA versus the Alberta Research Council extremely helpful, because for some time I too have wondered why there appears to be what I would call a duplication. However, the explanation that AOSTRA funds research projects clearly is a sufficient differentiation between the two, although I still am one of those who wonders why, for example, although we depend so heavily on non-renewable revenue — perhaps that's a reason we don't do projects such as nuclear and solar research, et cetera. However, I don't want to pursue that.

Mr. Chairman, with regard to AOSTRA, I'd like to ask the minister the opportunities for Albertans or students. My understanding was that for the longest time most of this research was done in the U.S. — Houston, Dallas, et cetera, — and since '74, '76, and '77 Alberta has become very serious about this research. I've talked at length to Dr. Hepler from the U of L, now here at the U of A, and I have become very excited about what I would view the opportunities for Alberta students.

The question I have is: how are young Albertans in our universities who show an inclination for this, enticed or made interested in the fellowships which are currently going on, as opposed to scholarships? Is this done by the initiative of AOSTRA going to our universities or, following your explanation of the difference between the Research Council and AOSTRA, that AOSTRA funds research, does AOSTRA wait for applicants to apply; for example, Alberta students in our universities saying, hey, I've got an idea about a hydrocarbon or what I would think would be something in the heavy oil that should be researched, et cetera? I know it sounds jumbled. The question really is: what initiative does AOSTRA take directly towards interesting Albertans in our universities in undertaking projects with AOSTRA?

MR. ZAOZIRNY: I'll pass that one to Mr. Carrigy.

MR. CARRIGY: I'm glad you asked that question, because we have a number of programs that we are developing. We had the same concern that you have about the amount of research being done in the United States; we had the resource and they had the technology. So we've done a lot of work to try to bring that technology into Alberta, and I think we can take part of the credit for Shell moving its research facilities to Calgary to do work on oil sands research. We've tried to impress on other companies as much as possible to bring that research that is related to Alberta resources into Alberta.

With regard to students, we have several programs. We're funding at the University of Alberta a master of oil sands degree, I guess, in the department of engineering. AOSTRA is putting up the funds for people who are outside the industry at the present time but would like to come in and would like to go back to university. We are putting up the funds for them to make that change, so that they don't lose on the exchange.

That has been fairly successful, although it has died down. In the last year or so, we've had less interest than we had about two or three years ago, when the frenzy with the shortage of oil was in place. Now that there seems to be a surplus of conventional oil, we've had less interest from students in that area.

We also fund postdoctoral fellowships and scholarships at the universities in Alberta. These can only be taken at Alberta universities. I think we funded eight fellowships and 25 scholarships for our first program. Those were all taken up, and we're instituting a new program. We also give training programs to industry and to students, and we have a summer student program. We usually hire about eight summer students, but this year we increased it to 23 so that everybody who wanted to get into this area would have an opportunity to go in with industry and get some training in this particular area.

We feel this is something we have to do now so that later on, when the pendulum swings, we'll have the students and the university people trained so that they can jump right into the new developments as they occur.

MR. GOGO: Mr. Chairman, to the minister. Do you have a priorization policy in place so that Alberta students would receive first call, as it were, on any of these research projects — in addition to the scholarships, which obviously would be Alberta universities. Have you set in place a policy that says in effect that priority for these projects will go to either Albertans or Alberta students?

MR. CARRIGY: No, we haven't got that policy. Our lawyer has advised us that we can only discriminate as far as Canadians are concerned. We initially said they had to be Canadian citizens or immigrants to Canada, and that was as far as we could go in that aspect.

MR. GOGO: Yes, I would think that the new Canadian Charter of Rights and Freedoms clearly would prohibit any discrimination against a Canadian citizen or landed immigrant on that basis.

I don't have another question, just a closing comment, Mr. Chairman. I believe AOSTRA is one of those organizations that Alberta can be extremely proud of. As I see it they have very minimal staff, yet at the same time they seem to carry out a tremendous number of research projects. I strongly endorse it.

MR. MUSGREAVE: Mr. Chairman, I want to make a few remarks, more from an information point of view; I don't want to ask any questions. I want to advise Mr. Carrigy that at the Alberta Research Council we're not doing research for the sake of doing research; at least, I hope we're not. We leave that function to the universities, where

they're always searching for the eternal truths, whatever they may be.

We at the Alberta Research Council are mission-oriented, and one of the main objectives of our long-range plan is to assist in the development of new technology and systems to help in the separation of oil and sand in a cheap way. I'd like to point out to the committee that AOSTRA is one of our most valued clients. The head of AOSTRA, Dr. Clem Bowman, sits on the board of the Alberta Research Council. He is also a member of our science and technology committee, which reports to the president of the Research Council, which in turn reports to the science policy committee of cabinet.

Finally, for the information of all, and particularly Mr. Carrigy, I agree with him that sometimes research institutes are kind of locked into their own little way of doing things. We have a new program called Use Our Brains. This is a joint funding where we've asked the community at large to come and use our facilities, and we share in the funding program. We've had a tremendous response. I just thought I'd put that out there, Mr. Chairman, for the information of all those here today.

MR. CHAIRMAN: I take it there are no supplementaries, then, Mr. Musgreave. We'll move to Mr. Martin, to be followed by Mr. Moore, Mr. Notley, Mr. Nelson, and three other members.

MR. MARTIN: Mr. Chairman, I'd like to take a look at the relative costs of the latest technology. I expect this is one of the major things AOSTRA is doing. When we think of them, I think quickly of enhanced recovery, the heavy oil we've talked about, the tar sands, and the heavy oil in the eastern part of Alberta. Coal gasification is another one that's mentioned.

At this point, do we have a handle on this? We know they're all very expensive, but it's something we're looking at in terms of the future. Surely this is the type of information we need before we get into many more projects, in terms of which one is the cheapest for us at this point. Where is the research in those areas?

MR. ZAOZIRNY: There is, of course, a great deal of ongoing work done with respect to the economics of various forms of energy and recovery of those forms of energy. Ultimately, the situation is somewhat more complicated than simply saying which one is a better route to go, because they involve investment decisions by the private sector.

Clearly, at the present time one of the reasons we're most interested and view it as so important to work on the recovery of oil sands, making that even more economic, is that when you compare it to conventional drilling activity, it's a more expensive process. We have to command a higher price per barrel.

Again, the situation is complicated because it has to do with the end use of the various fuels. At the present time, we operate our vehicles using gas extracted from crude oil, as opposed to natural gas. It's a matter of being able to market the product as well.

So the best answer that can be given is that we're certainly conscious of the costs of recovering each of these energy sources, and work is done in those areas. By the same token, there is more involved than that in whether or not the exploration and recovery of that particular energy source will occur. If you talk about coal, the respective extraction costs of coal may compare favorably. But what do we use coal for? If it's metallurgical coal being used in steel manufacturing, then it's a matter of how great the demand is. If it's thermal coal being used to fuel various facilities, that's another consideration.

Mr. Carrigy, perhaps you might comment in terms of the specifics as to whether or not AOSTRA is involved in that type of research work.

MR. CARRIGY: I'd like to refer more to the cost of actually doing an experiment and what it takes to go from one step to the next. If you're looking at a laboratory, a

concept or an idea doesn't really cost you much at all. The next step is to do something in the lab. It might cost you $100,000 to $200,000 to get the concept developed and tested. Then if you move into the field, usually in the oil sands the first test is to drill a well and test the reservoir to see what reservoir you have. You're looking at something like $1 million to $5 million. The next step is to build a pilot to make sure this thing works properly and is reliable. Here, you're looking at $20 million to $50 million. The next step is to put it into a demonstration phase, and here you're looking at something like $200 million.

So the number of ideas that are going to progress from the idea stage to actual demonstration stage — there can't be too many ideas that pass each screening step. Of the hundred ideas you get, perhaps one of those might get to the demonstration phase. So there's a big falloff as you go along and as you consider each step. It's a very expensive process. The development of a single process, to take a good idea to the commercial stage, would probably cost in the order of $300 million. So that's just one successful project.

MR. MARTIN: If I can follow up, Mr. Chairman, what we're saying at this point — and I recognize the problems and expense — is that at this stage we really do not know what might be the best way to go for a specific project. For instance even in terms of gasoline — let's use that example, that we're looking 20 years down the line. We hear varying things from the industry, I guess, depending on what you own and which private company you're in, that a lot of things were cheaper than the tar sands for the same purpose. I'm sure you've heard many people in the industry say this.

Are we saying at this point — I would have thought that one of the prime things AOSTRA would be looking at is the most economic way to achieve our goals in the future. Recognizing the expense if we get into a wrong project, because they're mammoth now — if we get into the tar sands or whatever, that could be a lot more expensive in the long run. I guess I'm asking: are we saying that we don't have any handle on this at all? I hear varying reports from the industry. I'm sure you do.

MR. ZAOZIRNY: If I could begin the answer: quite the contrary; I think there is a very clear understanding. We do have a pretty good handle on these respective costs. In terms of the matters that are within the purview of this committee, namely AOSTRA, that underlines just how important it is that the research and development work they are undertaking be carried out. We know, for example, that if we can significantly reduce the cost associated with extracting oil from our oil sands, that simply has to enhance the economic viability of it, provided we've got markets for it.

So the answer is yes. I think there is a good and broad recognition of the respective costs of different types of resource development, and that is why the work that AOSTRA is doing is so very important.

MR. CARRIGY: I'd just like to comment perhaps that before we go beyond each stage, we do an economic analysis to say: if this process works and if the price of oil is what we think it is, is this an economic project? That's the way it gets stopped or gets the go-ahead. There is an economic analysis made at every step of the way, so that no project gets beyond a certain stage of development unless it's economic. To take one beyond, say, the pilot stage, you really have to have a very good economic return for that project before you take it past that stage, because the economics usually disappear as you get more and more into the project.

MR. MARTIN: A supplementary, Mr. Chairman. Let me break it down into, say, the four areas — there may be others. Would we have, say, one project in each of the areas? I know we do in the tar sands and enhanced recovery, because it's there, and coal gasification. You're talking about the upgrading plant; maybe I can throw half a question

in about that. Is that to look at heavy oil, and would we then have projects in all four areas, so that we could be monitoring this?

MR. ZAOZIRNY: As was mentioned earlier, specifically with the oil sands extraction that's in place or conventional activities there on the . . . I'm sorry, what was the third one?

MR. MARTIN: I was looking at coal gasification. I think that's probably the one that we haven't . . .

MR. ZAOZIRNY: I would have to enquire of Mr. Carrigy as to whether or not there's work being done by AOSTRA in that area. As I think had been mentioned on the heavy oil upgrading, there has been an assessment by an engineering consultant of some nine new upgrading processes. I believe that report is being finalized, and we will be moving towards a specific proposal for construction of a demonstration plant. That proposal will be moving towards some decision during 1983.

With that, I'd invite Mr. Carrigy's comments.

MR. CARRIGY: I really can't comment too much on the coal research except that it's being done and funded under ERRF, the energy resources research fund program, and mainly at the Research Council of Alberta. But when we get industry, engineering, or consulting companies to make the comparisons, they usually compare them against the most likely competing technology, so that all our comparisons are made against them. In different cases, there are different technologies you have to compare with. Coal gasification is not one that we usually run into, because we're looking mostly to produce liquid products.

MR. CHAIRMAN: Mr. Moore, to be followed by Mr. Notley, Mr. Nelson, Mr. Hyland, Mrs. Cripps, and Mr. Thompson.

MR. R. MOORE: Thank you, Mr. Chairman. Mr. McDougall, for years we've had the provincial nursery program — I think it's located at Oliver — and it's been supplying the counties with shelterbelt trees and so on. Now we have this fine facility at Smoky Lake, the Pine Ridge nursery. First of all, is the capacity of that nursery at Smoky Lake such that it can provide all the trees that we need in Alberta from a provincial government standpoint?

MR. McDOUGALL: As you know, for some years the nursery at Oliver, which is run by the Department of Agriculture, attempted to supply our needs as well as the needs of the farm population for things like the shelterbelt program, and there were a great many difficulties in attempting to achieve that objective. The soil at Oliver is fairly heavy, and for the purposes of lifting coniferous tree seedlings in the spring, which is what we have to do in large-scale quantities, there was a great deal of difficulty in lifting out of that soil. Clay soil was adhering to the root systems, and we had a lot of difficulty with root damage when we lifted. Also, that facility was aimed at a very wide variety of programs. We had a program aimed at fairly large quantities of coniferous seedlings for the forest industry and ourselves. In addition to that, there was the problem with their trying to meet a large number of small shipments to the agricultural community, plus the need simply outgrew the capacity at Oliver by many times.

So it was decided to split the two programs. The forest service coniferous seedling program was moved out to Smoky Lake and put on a sandy soil, which is very suitable for its needs. Its production is aimed at reforestation of cut-over and burned-over areas in the forestry areas of the province. It specializes in the production of white spruce and lodgepole pine seedlings, whereas at Oliver they're looking at a much wider

variety of planting stock — caragana, green ash, poplar: the kinds of things farmers are interested in for farmstead planting.

So really it's a different program. It's run by the Department of Agriculture and meets a different need than our program.

To a limited extent we are making some coniferous seedlings available from Smoky Lake for local farm use, but that's a very minor part of the program. It's done mainly for community relations. The Oliver facility is now able to meet the farmstead needs in the province, having, if you like, gotten rid of us as a problem there.

MR. R. MOORE: A supplementary, Mr. Chairman. It's all a nursery program — both of them. Wouldn't there be a saving if it were all run under one department, whether it's under your department or under Agriculture? Regardless of whether you have a plot at Smoky Lake, one in Vegreville, and one in Oliver, it would run as a program, rather than have two separate programs going. I'm looking at the duplication of services here, and dollars spent. I feel that one nursery program for the province should be more efficient than having two run under two separate departments.

MR. McDOUGALL: I honestly don't think so, because the Smoky Lake facility is geared at very large production of basically two species, white spruce and lodgepole pine. It specializes in running large quantities of those two kinds of tree species. It's aiming its program at a different clientele, the forest industry and the forest service. It ships in large volumes and is geared, and its production is timed, to the needs of planting in the green area of the province, in the forestry zone. It's not dealing in many of the species that Oliver is primarily producing, and Oliver is basically aimed at farm needs.

So there is very little duplication and overlap, and we've achieved significant cost savings and very much better quality production out of Pine Ridge since we moved our program there.

MR. CHAIRMAN: Mr. Notley, to be followed by Mr. Nelson, Mr. Hyland, Mrs. Cripps, and Mr. Thompson.

MR. NOTLEY: Mr. Chairman, first of all just a quick comment on the issue of technology. Listening to Mr. Carrigy answer my questions and others, I understand there is an arrangement where if a company sells that technology outside the country, we get 50 per cent of the proceeds. I can understand that there's some merit to that. However, if we're interested in developing a science and technology base in this province in the long term, it seems to me that the major advantage would be in the manufacturing of such processes or equipment. It strikes me that one of the problems with just sharing the proceeds is that we may well find that the manufacturing of some of this equipment we have helped to fund will originate in other parts of the continent or perhaps even other parts of the world.

In looking at how we can make the best use of our investment dollar to encourage the development of a genuine research industry in our province, I wonder if it isn't wiser to look at a more restrictive approach with respect at least to the manufacturing of those processes. That's just a comment; if either the minister or Mr. Carrigy cares to comment, so be it.

My question relates specifically to the Shell project, which I note has $63 million committed. This is the Peace River project. The minister indicated that the millionth barrel of oil has been produced. However, I put to both the minister and Mr. Carrigy whether or not the proving up of the technology in Peace River still makes that a viable proposition in terms of the experience we now know from the economic point of view.

A year and a half ago, the government backed away from Alsands — correctly so. But that was at a time when the outlook for oil prices in the world was much more optimistic than it is today. With the massive capital costs, it just wasn't possible to

make a dollar out of Alsands in April 1982. Even though we know it is now feasible to produce oil from the Peace River deposits, to what extent is a commercial enterprise of a megascale viable at all?

MR. ZAOZIRNY: Perhaps we can talk about it as a 'mini-mega', rather than as a megaproject, or let's just talk about moving to some more commercial production in the broadest sense of the term. Clearly, that decision is going to be arrived at by the private-sector participant. Unless we want to get into the business of financing this development, that's where the money is coming from. Therefore, the decision-making has to be vested with the private-sector participant; in this instance, Shell.

It's my understanding that they are very pleased with the results to date in respect of this deposit and this project. They are of the view that some additional analysis is required and, at some point in time, a decision is going to have to be made about moving ahead on a more commercial basis.

Again, I get back to an earlier comment about limited availability of dollars. That's a major factor in the present economic environment. A company has available to it a finite number of dollars, whether they be dollars generated in-house or dollars borrowed, depending upon their capability to do so. They have to look at the number of dollars available and the extent to which they are prepared to invest to their capacity, and then at that point compare various alternatives. So at some point in time an organization is going to come to some ranking of various investment alternatives, and it would be that kind of decision-making process that would have to occur in the Peace River situation.

AOSTRA of course plays a very important role as a catalyst in getting that initial work done and, if you will, encouraging subsequent development. With respect to that project, I could say no more than that it's my understanding that the results have been very satisfying, and the commercial viability of that project will be decided in due course. The decision as to whether or not to proceed with an expansion will be made by Shell itself.

Mr. Carrigy, do you want to supplement that?

MR. CARRIGY: I'd just like to comment on the first part of your question. There are usually three things in the technology rights: the right to disclose, the right to use, and the right to manufacture. All three of those rights belong to AOSTRA in these cases. If we feel something that is being developed in Canada is a particularly good piece of technology, we try to keep the manufacturing rights in Canada. We try to make sure they are assigned to a Canadian company.

MR. NOTLEY: My first supplementary, Mr. Chairman. I'd like to pursue the Peace River Shell project for a moment. You have a commitment of almost $70 million from the province, and I gather that's equalled by Shell, so you're looking at a project considerably over $100 million in the Peace River area.

I don't want to spend a lot of time in the realm of speculation, but I have a hunch that megaprojects of the Syncrude or Alsands size are passe and that it's going to be a long time before another one of those projects becomes commercially viable, even though it may be technically possible. Given the fact that Shell is not likely to be able to turn this pilot project into a commercially profitable venture itself, I'd be interested — if either of you can answer — whether or not the current $100 million plant would be able to stand on its own.

As a person somewhat interested in the economy of the area, the question I raise is: supposing Shell defers indefinitely, until there's a significant change in the international oil market, to what extent will the Peace River project be continued? Does AOSTRA have any plan over a period of time, let us say three to five years, to continue partially funding the operating costs of the Shell project at Peace River?

MR. CARRIGY: First, in terms of the current pilot we would like to make sure that the experiment is completed; in other words, that we find out what the ultimate depletion of that reservoir is. That will take a number of years to do, without any other objective. We would like to know whether it's 40 per cent or 55 per cent, because that has a very important bearing on the economics of the operation. So we'd like to keep Shell in there as long as possible in order to determine that point.

In terms of the pilot itself being the first stage of a commercial operation and how we can go from there, I think you're already aware that we have an asphalt plant associated with that pilot. That is producing asphalt to the specifications of the Department of Transportation. We are selling quite a bit of that right now, and in the last month that has actually paid for the whole of the project.

Whether we can keep that up, whether we can keep the wells we have in operation, or whether there will be a sufficient number of wells there to keep that plant going for a long period of time, I can't say. I think it would require more wells to be drilled and produced, and we may get involved in that. The logical thing, I think, for Shell to do is to take it step by step and to, say, go from the current 1,000 or 2,000 barrels a day up to 5,000 to 10,000 barrels per day. I think you can do that without upgrading, but you have to face the upgrading situation sooner or later. Then you're looking at the scale at which upgrading becomes economical. Current thinking is that it's around the 70,000 barrels per day range. We're looking at the possibility of making upgrading more economic at a lower level of production, say around 10,000 to 20,000 barrels per day, and we hope that we can come up with some process that will make it economical. Currently it doesn't appear to be.

So I think there's a point at which you have to stop, and then you have to think: how much more of this material can be absorbed into the market without upgrading? I don't know what that point is, but I guess the companies have a pretty good idea.

MR. ZAOZIRNY: Perhaps I might comment as well. I suppose one has to get into a definition of what constitutes a megaproject. Clearly we are seeing some new developments in the oil sands area. We've got BP Wolf Lake. Esso has made a new application with the Energy Resources Conservation Board for a scaled-down, phased-in type of project at Cold Lake, which initially would be in the order of 20,000 barrels per day. So these developments are occurring. Clearly technology breakthroughs would have some impact on whether or not there would be a larger scale development earlier on, and I think one has to recognize that the energy picture in the world can change rather dramatically. I'm sure every member of the committee is well aware of that. We've seen it happen.

So I tend to the view: let's not write off larger developments of our oil sands. That's one of the major reasons why we're working so hard with AOSTRA in terms of research and development. Depending upon the supply and demand for crude oil, time will tell what the potential is in this very important area.

MR. NOTLEY: My final question — and it's a question rather than a supplementary because I'd like to direct this to Mr. McDougall, since we have a person of his expertise before the committee. It's with respect to whether the government is looking at any investment in market research as far as our forest industry is concerned.

Let me just explain why I put the question. I have been told by at least several people in the industry that looking at the forest industry in Alberta, we tend to be in a type of development where we aren't really very competitive in the long term; we're only competitive if we can use our forests quickly, and then we have the problem of a long period of time for those forests to replenish themselves. No matter how much money we stick into programs of one kind or another, we come up against the problems of climate. In contrast, development of the forest industry in a place like Brazil or Central America,

the tropics, where the forest grows very, very quickly, is always going to put us in a very difficult competitive position in terms of pulp or the sort of conventional forest industry. To what extent are we looking at market development of, say, fine paper making, perhaps furniture development — this kind of thing?

As well, if I can wrap one other comment into my question — and I just pass on to you, Mr. McDougall, the sort of comments I get in my constituency from old-timers who say, my God, 30 or 40 years ago we could get lumber that was produced in the Peace; today the lumber that's produced in the Peace for the most part is shipped out to an export market, and we don't have locally produced lumber any more. I have heard the answers from the department on that, but the fact of the matter is that it seems to me that we are in a rather tricky market situation. The forest industry is going to be a major industry for the province. We have seen several efforts — the aspen board plant in Slave Lake — go belly up. To what extent do we have a handle on market forecasts and what changes, if any, should we be making in terms of our market strategy?

MR. McDOUGALL: There are several aspects to that question, of course. It's a difficult question to answer with a short, succinct answer. But going back to the early part of the question, with respect to the natural productivity of Alberta's forest lands and how competitive with other parts of the world we are in terms of growing forest, the South American, Central American situation is not as attractive as many people at one time thought it was. Some of the recent large projects in Brazil have run into very severe problems. The tropical forest soils tend to be very, very poor. Most of the nutrients in those forests are held within the vegetation itself. Once those forests are cleared, they're often left with a very, very marginal growing situation and very extreme problems. The Jari project in Brazil is a good example of that, where huge amounts of money have been lost, and more and more money is being required. The whole viability of the project is now in question, as opposed to our situation in Alberta, where we really are blessed with very favorable growing conditions compared to northern Ontario, northern Saskatchewan, and northern Manitoba. They're located on the Canadian Shield and, as you know, very shallow soils, very poor growing situations.

Alberta does have the advantage of good, deep clay soils in our whole northern boreal forests, right up to the Northwest Territories boundary. So our productivity here, in Canadian standards, is actually very good. It's not as good as the B.C. coast, but it certainly compares very, very well with anything in interior Canada, from Quebec across through to coastal British Columbia. In fact, as you probably know, Alberta's capable of growing excellent softwood fibre.

So I don't really think that in terms of long-term development, we need to be afraid of our competitiveness. I think we have a much better and more productive situation than most of Canada. There are exceptions in the maritimes and in coastal B.C., but by and large we rate very well. In terms of the United States I think it's a simple case of, yes, they have much higher productivity, but it's a question of how much land base they're going to be able to make available for their growing of forest crops.

So on that part of your question I would say that I would be optimistic rather than pessimistic about our future.

In terms of straight marketing in today's context, it's true that lumber markets have been depressed for some time. All of Canada tends to be in the role of a marginal supplier to the U.S. market. The North American lumber market is roughly 40 billion board feet a year. Our production, which, interestingly, has grown in the last decade from about .5 billion board feet a year to — I think this year we'll hit 1.1 billion or 1.2 billion feet; we crossed the billion board foot threshold about a year ago. So we've had pretty good growth in our lumber production in spite of the ups and downs and vagaries of the market. But I believe — and there's a lot of evidence to support this — that our competitive position in lumber is going to be stronger rather than weaker as we move along into the future, simply because the supply of softwood sawlogs in much of eastern

Canada is dwindling very rapidly, partly because of poor forest management. They're looking at more and more marginal stands all the time, and I think our industry here, in terms of lumber, is going to be much more competitive.

In terms of the supply of timber in the Peace River country, it's true that there have been a significant number of small producers go out of the business in that part of the province over the years. I think that relates, as you know in your constituency, to a tendency and requirement for mills to become more competitive and larger scale. You have the one at Hines Creek, which in effect is an amalgamation of a number of previous operators — H.R.N., H.M. Smith, and a number of those people who were active in that country years ago — for various reasons, family businesses. Capital requirements in the industry are growing. The old days of putting in a sawmill for $50,000 or $100,000 are over. For any sawmill to be competitive today, you're looking at $.5 million minimum; probably much more than that.

A big factor in that was the fact that revenue from chipping the sawmill residues and the sale of those residues to pulp mills has become a very important cash flow item in the economy of sawmills, and you just simply cannot put in chip recovery equipment for less than $150,000, or in that area. So that in itself has dictated against the economics of very small mills.

As you know, we try to maintain an active timber permit system so that small mills can obtain timber. In fact, there's more timber available under permit in the Peace River country than we've had demand for. In other words, we could expand the supply to small sawmills if the demand were there. We have not allocated anywhere near all of the timber in that area to large mills.

MR. CHAIRMAN: Mr. Nelson, to be followed by Mr. Hyland, Mrs. Cripps, and Mr. Thompson.

MR. NELSON: Mr. Chairman, the federal government tends to expend a considerable amount of money, or at least offer a lot of incentives to the oil industry for development of frontier and offshore resources. I wonder what effort we've made in having some of those funds funnelled into the development of enhanced oil recovery on a shared basis with both the province and the industry, to encourage additional research and to speed up that process of recovering more oils from conventional areas.

MR. ZAOZIRNY: First of all, with respect to enhanced oil recovery of conventional reserves, as was mentioned earlier, we moved last October with some significant adjustments to our regulations with respect to our overhead cost allowance and capital depreciation allowance in particular, which we feel have helped the economics of that type of recovery in a significant way. By the same token, I should mention that these benefits are only available if it's made clear that the benefits and the net return to the province by way of royalties in the long term will exceed the cost of this allowance. But I had outlined that some 14 enhanced oil recovery projects on our conventional reserves have been approved since October 1982.

The frontier exploration program is administered through the petroleum incentive plan of the federal government, commonly referred to as PIP. In Alberta we have a PIP as well, which applies specifically to Alberta and encourages exploration for conventional oil right here in the province. We believe that the combination of the PIP, our exploratory drilling program, our existing royalty regime and, most recently, our development drilling program, continue to make Alberta conventional oil exploration very attractive.

On that point, we've been extremely pleased with the results of the development drilling program which was initiated in the spring, as members will recall. There had been very low predictions of the level of drilling activity in Alberta this summer. The fact of the matter is that in our most recent review, we have considerably in excess of

200 rigs drilling here in Alberta during the summer. It compares very favorably; it's a significant increase over 1982. The well servicing program has been successful as well. The $70 million in the development drilling program has all been taken up now. What is going to be very important now is to see how the winter drilling season moves along without the development drilling program.

I would simply say that we've been extremely pleased with the results of the development drilling program, and feel that overall our incentives for conventional oil exploration make Alberta an attractive place to invest.

MR. NELSON: A supplementary to the minister, Mr. Chairman. How is the program that was announced some time last year, the $5.4 billion as incentives for oil companies, coming along in relation to the development of new oil in the province, and also the redrilling of old wells to other depths? Is this incentive being picked up fairly readily by the industry?

MR. ZAOZIRNY: The oil and gas activity plan involved a series of measures, including enhancement of our royalty tax credit program and a reduction of the royalties payable on oil and natural gas. It involved a development drilling program in and of itself. It was a comprehensive program of five years' duration, with the bulk of the benefits flowing in the early years. It's important to recall that the program was brought in in an effort, frankly, to assist the industry in getting back on its feet in the aftermath of the impact of the NEP and given the economic recession that was gripping the country even at that time.

We believe that the financial circumstances of our explorers are improving very markedly. There's no question that a priority of the explorers was to get their own balance sheets in order, and I think that's a necessary step that had to be taken to restore the health of the industry. It's only once the financial strength has been restored to a significant extent that they can look at increasing the level of exploration.

This spring, we were confronted with a new phenomenon; namely, difficult market and marketing circumstances for our natural gas. Of course, one can't expect massive amounts of exploration on the natural gas side with the level of shut-in reserves that are in place. Nevertheless, if you take a look at the numbers, the level of drilling activity in 1983 is dramatically increased from 1982 on the oil side. Even on the natural gas side, in terms of discoveries it compares quite favorably to this point in the year.

We think the program continues to be a very important part of the restoration of the health and vitality of the energy industry. Those are the broad comments I would make on that topic.

MR. NELSON: Thank you, Mr. Chairman.

MR. CHAIRMAN: Mr. Hyland, to be followed by Mrs. Cripps and Mr. Thompson.

MR. HYLAND: Mr. Chairman, my question has already been asked by a previous member.

MRS. CRIPPS: Mr. Chairman, in view of the fact that Alberta has 10 million acres of swampland, under maintaining our forests has consideration been given to increasing the value of the timber resource by draining some of these lands? Is there a pilot project that has been or is under discussion?

MR. ZAOZIRNY: When it was initiated, one of the objectives of the maintaining our forests program was to investigate the feasibility of bringing our wetlands, such as muskeg areas, into production. I'd invite Mr. McDougall to make more specific comments with respect to activities in that area.

MR. McDOUGALL: Under MOF, we have one project on wetland improvement, in the Slave Lake area. It's just getting under way, and we're optimistic that it will show significant benefit. Some years ago, a very small trial was done in the Fort McMurray area, with notable success. There was a notable acceleration of growth on the area following some very simple drainage techniques. The most impressive program of that kind that we're aware of is in Finland where, over many, many years going back into the 1880s, with hand-dug ditches the Fins have converted thousands and thousands of acres of what we would call muskeg into very productive forest lands. Much of those lands is now the mainstay of their timber industry.

So when you look at what they have done over there, the potential is certainly there for Alberta. In fact, Mrs. Cripps, the 10-million-acre figure you quoted is a bit low. It's actually somewhat over 20 million acres of potential muskeg or wetland areas in Alberta's green area.

MRS. CRIPPS: A supplementary. So you have one project under way, and you've had one project. Are you thinking of establishing more projects?

MR. McDOUGALL: I think there's been some feeling that we would like to assess the costs and results of the project that's under way now before committing to anything on a very large-scale basis. But hopefully, if this one is positive and the costs are reasonable, it's an area that the province could look to an increased program in the future.

MRS. CRIPPS: Just a comment, Mr. Chairman. I had the opportunity to visit your Pine Ridge nursery. I was really impressed and would recommend to members of the committee that they take the opportunity, if available, to view that facility.

MR. CHAIRMAN: Mr. Thompson, to be followed by Mr. Speaker and Mr. Martin.

MR. THOMPSON: Mr. Chairman, I understand that Syncrude and Alberta Energy Company are under the responsibility of the minister. Is that right, Mr. Minister?

MR. ZAOZIRNY: The Syncrude investment falls under the purview of the Provincial Treasurer, and in fact Alberta Energy legislation really does the same. But don't feel shy.

MR. THOMPSON: Thank you.

MR. CHAIRMAN: You were seeking clarification, so go on to your first question.

MR. THOMPSON: I was wondering if you could possibly expand on the success of Alberta Energy in drilling in the Primrose field, or if there has been any activity along those lines.

MR. ZAOZIRNY: Gosh, apart from the most general of comments, I wouldn't be able at this time to provide you with very specific information on that one. I'm happy to undertake to do so. I think it's fair to say that in totality, the Alberta Energy Company is a real success story. They have done extensive work, not only in the Primrose area but in other areas of the province. They've been a major drilling force and entity in the province for some time now. They have a very healthy financial situation and continue to be an active explorer throughout the province of Alberta, as well as being involved now in a range of other activities, including the forestry side of course.

MR. THOMPSON: A second supplementary. Has there been any participation on the part

of Alberta Energy in any of the AOSTRA programs?

MR. CARRIGY: Yes, we have a program going at the Suffield Block with Alberta Energy, and we're looking there at an in situ combustion process. So far we have got to the point of putting in the air and we've got the fire started, and things are looking pretty good. But we need another couple of years before we'll know whether it's an economic situation or not.

MR. CHAIRMAN: Mr. Speaker, to be followed by Mr. Martin.

MR. R. SPEAKER: Mr. Chairman, my question is to the minister, and the purpose of the question is to try to gain some indication of attitude towards the Heritage Savings Trust Fund and its future. The first questions I asked of the minister were with regard to the potential income, what could happen with regard to our natural gas exports. I felt that the minister was maybe just a little too casual with regard to this matter, in that I think it's more serious than we really understand. If resource revenue doesn't come into the province, then the Heritage Savings Trust Fund would come to an end and any types of new programs that this committee may suggest or dream up would be just a lot of exercise in thought.

So specifically to the minister. On September 8 there will be that meeting in Washington, D.C., that determines a lot of our future resource revenue. Is the minister intending to go to that meeting, and if so, what position would the minister use to try to influence anybody that's present in that environment?

MR. ZAOZIRNY: Mr. Chairman, I'm happy to respond. I suppose I have some difficulty in determining how, when it's indicated that the question of natural gas exports is one of the very highest priorities of this government at this time, the hon. member can conclude that our approach is casual. However, he's entitled to make his comments as he sees fit.

In fairness, I would suggest the member is somewhat overstating the implications and likely result of this September 8 meeting. It is in fact an administrative, if you will, hearing as opposed to a Congressional one. As I mentioned, it is being sponsored by the economic regulatory commission of the Department of Energy. It is not a Congressional hearing, nor in our opinion would it be, as I intimated, fair to suggest that it will be in and of itself the determinant of the direction of U.S. energy policy. It is one part of the process.

We are presently considering the appropriateness of government representation at that hearing. We've been in discussions with industry over the period of the last week, in terms of what the proper strategy is in terms of that meeting itself. It's expected that there will be specific industry representation from both the Independent Petroleum Association of Canada, IPAC, and likely the Canadian Petroleum Association. Obviously our communications with them and the determination of strategy — we will be working with them closely in our discussions with them on almost a daily basis.

As I say, we have not made any final decision on whether it would be appropriate at this particular meeting to have specific representation from the government of the province of Alberta. It's my understanding that the federal government has not made any decision yet on whether it's appropriate to have federal government representation at this particular hearing. There will certainly be eyes and ears there, if you will, but these other matters have not yet been determined. If the determination on the part of the government of the province of Alberta is that specific representation, and thereafter being requested to respond to questions from this administrative body, is the best approach, the decision then has to be made as to whether we send an elected person or a representative from within the government who is knowledgeable in the area.

I made the member aware of this as some indication of the fact that we are monitoring the situation in the United States on natural gas matters extremely closely,

and we are presently going through that decision-making process. In due course, in the near term, we'll arrive at a decision on it.

MR. R. SPEAKER: Mr. Chairman, to the minister. Are there other avenues outside the September 8 meeting that will be used by the government, other meetings with counterpart ministers of the United States — the United States Energy minister, for example? Have meetings such as that been planned on this very important issue?

MR. ZAOZIRNY: The Premier, in his Washington visit, has already met with the U.S. Energy minister or secretary, and we've met with the senior representatives of the ERA, the economic regulatory commission. We've also met with Michael Butler, who is the head of the federal economic regulatory commission — I hope I've got that right — the federal energy regulatory commission, otherwise referred to as FERC, which is the chief administrative body in the United States. As I mentioned today, I was involved in a luncheon with senior staff of the Energy and Natural Resources committee of the Senate. There is a tremendous amount of work being done in this area, and you can be completely assured that we are going to be taking every appropriate measure to protect Alberta's interests and ensure that our best interests are put forward.

MR. R. SPEAKER: Mr. Chairman, a final supplementary to the minister. It's with regard to the programs we've been discussing this year. Is it proposed to ask for an increase in expenditures on those programs for the coming year? Has the minister any indication or projections at this time? Will there be decreased expenditures, hold-the-line expenditures, or a budget requested for these programs we've been discussing? The programs I refer to are the conventional oil enhanced recovery program, AOSTRA, reforestation, the forestry program. Can the committee have an indication of that at this time?

MR. ZAOZIRNY: I suppose the best answer that can be given to that query is that as part of government, we will be following our approach, which is one of restraint, of ensuring no costs are incurred beyond those which are necessary to ensure that we properly engage in the activities outlined in the objectives of these various programs.

MR. CHAIRMAN: Mr. Martin, to be followed by Mr. Moore.

MR. MARTIN: I'd just like to follow up with AOSTRA. It says: it promotes and assists research into methods of recovery and processing, et cetera. Could you explain to me — I don't know if it would be the minister or not — how you would decide on which project you're going ahead with? What is the process there?

MR. ZAOZIRNY: It would be appropriate for Mr. Carrigy to answer the question, inasmuch as those decisions are really within the purview and decision-making authority of the Authority.

MR. CARRIGY: Originally, we took the attitude that we would not be the people who had the ideas, but we would select from the ideas that came into us from outside, from the industry, individuals, inventors, and university professors. We've followed that procedure pretty well: rather than have our own competing ideas, we depend on others to come in and then we select from among those the best ideas.

If there is an area where we feel there is some particular need, we'll call for proposals from outside, and people will then put in the proposals. If we don't get a response that is sufficiently good and we have an idea of our own that we think is probably better, we will reluctantly try to bring an industry or some other partner in with us to work on that idea. But if we can't convince anybody it's a good idea, we don't do

any research on it.

MR. MARTIN: A supplementary question following along, somewhat similar. Is there not a danger that there can be some bias? I go back to relative costs, that I think are important. If AOSTRA has decided through the minister, through the government, or through a number of companies that are coming that the tar sands is the way to go, is there not a danger that doing it this way we can be biassed and not be looking at other research? In other words, I'm suggesting the possibility that we should be looking at it in a different way, that AOSTRA should be taking a look at all the different technologies to deal with the oil industry and not having a bias and saying: here's a project, we want a company to look into this one; if it's coal gasification, enhanced recovery, all the way along. I'm going back; I'm trying to figure out what is operating here, because I think it's important. We're dealing with a lot of money.

MR. CARRIGY: I can't answer that one without incriminating myself, but I think that the AOSTRA program is the submission we have, and it's the only one we can consider. When we ask our consultants to look at these things, we say: what's the nearest competing technology, and are we better or worse than that? If we are not in a competitive situation, then we wouldn't go ahead with the research.

In terms of the overall government, how it arrives at whether it would do coal gasification as opposed to, say, bitumen upgrading, I don't know. Maybe the minister can answer that question.

MR. ZAOZIRNY: The AOSTRA mandate is specifically with respect to the oil sands area, and for some of the reasons outlined earlier. I suppose the import of the question really is broader than AOSTRA and, in a sense, broader than what the committee is looking at specifically, but it's a fair question.

By and large, our activities as a government are aimed at encouraging the private sector to undertake activity, whether it's conventional oil, drilling, or natural gas. Really, the economics are determined by the private sector. The ultimate decision to go ahead or not is determined by the private sector.

On balance, there has been a pretty broad approach taken in terms of encouraging the development of our resources. For example, if you look on the coal side, the royalties charged are really very nominal and essentially tied to profits. On the oil and gas side, as I mentioned, we think we have in place a regime, if you will, a set of incentives, that make oil and gas exploration attractive. You have to have markets, of course, but we work on that as well.

So we feel that on the oil and gas side there's a proper approach in terms of oil sands development. Our royalty structure is one that involves, in a broad sense, very modest royalties in the pre-payout stages of these projects, because we recognize the highly capital-intensive nature of these undertakings; therefore, the bulk of the royalty is paid in the latter stages of these developments. Just by way of example, I think there's been a determined effort to encourage a multitude of types of resource development within the province.

MR. MARTIN: A final supplementary, Mr. Chairman. I have no doubt that AOSTRA is looking at its mandate, trying to do its best in the tar sands, and checking a number of different procedures for doing that; I think that's correct. I'm suggesting that it's possible we can have a built-in bias, even ahead of that. You're right, asking in a broader sense if it should be done differently. I know you and I would probably disagree on that, but that's fine.

I'm going to get to my third question. Did I hear in your prologue that there was going to be a small upgrading plant built? If there is, how big would it be and where would it be located?

MR. ZAOZIRNY: I think it's important to clarify that. There is an assessment, which is I believe in process of being completed and finalized by way of a report by an engineering firm engaged by AOSTRA and a number of other organizations, of different upgrading processes. The steps, as I understand them, and Mr. Carrigy can supplement, would be to assess that report and then look to a specific proposal for construction of a demonstration plant. So there's a significant time frame involved here. I wouldn't want to leave you with the impression that there was some significant size development pending. Mr. Carrigy can perhaps elaborate on that.

MR. CARRIGY: I think it's important to distinguish here between the type of upgrading that AOSTRA would be looking at. We'd be looking at new technology that wouldn't normally go into a commercial operation for quite a number of years, unless it's demonstrated on a significant scale. So the type of thing we're looking at is not the same as, say, an industry would be looking at now if they wanted to upgrade their oil at the present time. The type of technology we're looking at is something that gives you a much higher liquid yield, fewer emissions to the atmosphere, and would use much more of the material.

So I think there's a difference between what we're doing and the type of upgrading the industry would hope to get off the shelf and put into place tomorrow. We're looking perhaps 10 years down the line before our technology would be commercial.

MR. CHAIRMAN: Mr. Moore.

MR. R. MOORE: Thank you, Mr. Chairman. Mr. McDougall, in your reforestation program have you given any consideration into research into hardwood varieties, so that in future years we can establish a hardwood industry here in Alberta? Or are you sticking mainly just to pine and spruce?

MR. McDOUGALL: We're sticking primarily to pine and spruce, although we are doing some work in hardwoods. We're particularly interested in improvement of the poplar species, because we know they'll grow well here. We're doing a little bit of work in hardwood exotics, but it's had very limited success. White birch grows well here. But as with the other birches, it is susceptible to quite a wide range of disease and insect infestation, which is a bit discouraging. We've done a little bit of work with the maples, primarily because we were requested by this Legislature to do so a few years ago. I must say the experimental work with maples has been discouraging, but we are continuing it as a very modest initiative. It appears that the Alberta climate is just too severe, too harsh, for most of the true maples. I know what they call Manitoba maple — which of course is really a box elder — grows well here, but the wood quality of Manitoba maple is not in any way superior to the poplars if you select the better strains.

So in a nutshell, Mr. Moore, I guess the answer is that to a limited degree we are doing some work in hardwoods.

MR. R. MOORE: Thank you.

MR. CHAIRMAN: Would there be additional questions from members of the committee? Well then, Mr. Zaozirny, Mr. Carrigy, and Mr. McDougall, thank you very much. I'm not sure, Mr. Zaozirny, that you're interested in statistics, but you should note that you have answered 49 questions this afternoon at this meeting of the Standing Committee on the Alberta Heritage Savings Trust Fund Act. You've now had to answer more than any of your colleagues who have appeared before us in the last several days. So thank you very much. If we're all here one year hence, we'll look forward to meeting with you again.

Members of the committee, we will now adjourn and reconvene tomorrow afternoon at two o'clock. Appearing before us will be the Hon. Mary LeMessurier, Minister of Culture.

I might just point out to you that Mrs. Davidson should have circulated to all members of the committee the transcript of the second meeting we had, on Tuesday, August 9, 1983. Just an aside comment: I understand we're going to be facing a new text or a new typewriter item this fall, and that accounts for the reason that the print is slightly different from in the past.

Thank you very much. We'll see you tomorrow afternoon at two o'clock.

[The meeting adjourned at 4:52 p.m.]