

duction of crude oil; second, by increasing imports; and third, by developing production of synthetic oil from shale or coal. If we assume that in 1980 the portion of U.S. petroleum requirements supplied by domestic crude oil and natural gas liquids remains unchanged, and even allowing for a decline in the reserve-production ratio to 9 years' supply, gross additions to U.S. reserves of liquid hydrocarbons would have to be about 72 billion barrels during the next 14 years. This is a major task as evidenced by the fact that during the last 14 years U.S. reserve additions totalled only 48 billion barrels.

It is difficult and perhaps impossible to predict future discoveries of crude oil with a high degree of accuracy. We have, however, made such forecasts and the results of this work suggest that during the 1970's U.S. reserve additions will not keep pace with requirements. We feel it is important that this possibility be fully recognized and that serious consideration be given now to various ways of supplementing production of conventional crude oil during that period.

The CHAIRMAN. Mr. Jones, I just wanted to observe, I thought you were ad-libbing for a while, but page 1 of your statement is not available to us. The statements we have start at page 2.

Mr. JONES. We gave you a special copy to cut part of it out, I take it. (Laughter.)

The CHAIRMAN. We considered your position.

Mr. JONES. My sincere apologies. I believe, Mr. Chairman, you will find that what I say was consistent with what now appears on page 1.

The CHAIRMAN. It was very factual. It sounded very fine, but I was wondering for a moment whether you were just ad-libbing or whether there were some real meaning in why you started at page 2. I do not know whether you are superstitious, but that is all right.

Mr. JONES. I wish I could claim there was a real intent in this, but it is purely accidental on our part. [Laughter.]

If we are together now on page 2—

The CHAIRMAN. All right.

Mr. JONES. The growth of non-conventional sources of liquid energy depends, in part, on the emergence of a gap between U.S. demand and supply of conventional domestic production plus imports. Such a development would create an opportunity for shale oil; however if shale is to fill part of a possible gap, appropriate steps should be taken now to permit the development of this industry. We cannot overlook the fact that it will take a number of years to perfect the technology essential for a competitive shale oil industry.

Oil shale is in abundant supply in the United States and could become a major source of energy. But we must put to rest the mistaken fears that it will obtain a disproportionate share of the energy market. Certainly, shale oil cannot inundate the market overnight. It will likely have a modest beginning and will only supplement and not replace domestic crude oil.

Also, contrary to many public statements, the production of oil from shale will be costly. Although the per barrel investment in a commercial mining and retorting operation is lower than that for liquid petroleum, operating costs are considerably higher than for operating average oil producing properties. Our current engineering studies show that, with appropriate royalty and tax provisions, shale