

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 86 / 2

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FOREST PRODUCTS COSTS

The cost to source methanol from forest products is difficult to obtain at present. In general the Union Carbide Purox system for municipal waste is the preferred route although not necessarily the reactor one would design for wood and wood chips. The State of Maine Office of Energy⁶⁷ Resources has studied the conversion of wood and wood waste to methanol and finds that 40% yields of methanol can be achieved in the laboratory with a possible 30% yield in the field. The costs calculated for the production of synthetic fuels from wood appear to be approximately those estimated for producing methanol from coal. However at this stage it is unknown as to what capital cost savings are inherent in having a wood based plant.

Among the major unknowns in utilizing wood and wood waste as a source material is the cost of harvesting and transporting the material to a plant. Investigators in Maine¹¹² have studied this problem and have calculated that by selective cutting using manual harvesting methods and private roads a cord of softwood pulp can be delivered 50 miles for \$39.75 per cord (1975 dollars). This is a cost of \$18.50 per ton. (1 cord of softwood weighs 2.15 tons.)

The breakdown by item of this cost is as follows:

Cutting	\$8.00
Skidder (incl. equipment & man)	4.00
Saw	1.00
Taxes, Workman's compensation	2.00
Trucking	8.00
Stumpage	8.00
Access	2.00
Road Maintenance	1.50
Overhead	2.50
Camps	.75
Profit	2.00
\$39.75 per cord (\$18.50 per ton)	

If a machine harvester is used to bring out the same ton 50 miles the cost is calculated at \$12.07 per ton. The breakdown of this cost is as follows:

Equipment	\$1.38
Trucking	2.41
Stumpage	3.72
Labor	1.14
Fuel	.26
Access	.95
Road Maintenance	.70
Camps	.35
Overhead	1.16
	\$12.07 per ton

These costs could vary by $\pm 25\%$ as regards both geography and time. It also should be noted that in Maine this equipment is being used only 9 months of the year. This type of mechanical system has a capacity of harvesting and chipping 250 tons per day.

If the Uni Carbide Purox system is applicable to convert wood chips to methanol, the capital investment cost should be \$56 million for a system capable of handling an input of 15 billion BTU per day (1000 tons of wood) as described above. If comparable operating costs of \$6.1 million per year are assumed, then the difference in cost between the municipal waste and wood as feedstock is simply one of cost and process yield. The annual quantity of wood for this size system would be 365,000 tons which at a cost of \$12.07 per ton is \$4.4 million. The total annual cost for a 1000 tons per day wood fueled system producing 285 tons of methanol per day is

1000 TONS PER DAY WOOD INPUT

\$8.4 million	15% of Tot. Capital Investment of
	\$56 million
6.1 million	Annual Operating Cost
<u>4.4 million</u>	Annual Wood Cost
\$18.9 million	TOTAL Annual Cost

This is a cost of \$9.10 per million BTU of methanol. (\$1.38 per gallon.)

If this wood-to-methanol system were scaled using the 0.6 power of capacity scaling convention for plant investment, the total annual cost for a plant comparable in size to each of the two AEC plants above producing 5000 tons of methanol per day would be:

$$\text{Scaling factor} = (2.37 \times 10^{11} / 15 \times 10^9)^{0.6} = 5.25$$

15,700 TONS PER DAY WOOD INPUT

\$44.0 million	Capital Investment
96.0 million	Annual Operating Cost
<u>69.5 million</u>	Annual Wood Cost
\$209.5 million	TOTAL Annual Cost

This is a cost of \$6.40 per million BTU of methanol. (\$0.98 per gallon.)

It is difficult at this stage to assess the comparative costs between methanol systems using various source materials. However the above calculation is conservative in that a direct scale up of operating costs by a factor of 15.7 was used. This is clearly excessive since there would be economies of scale in operating costs as well as in investment costs. The wood fuel cost was scaled by 15.7 since the source material would vary directly with plant capacity.

The annual requirements of 5,700,000 tons of wood and wood waste can be readily met in an area such as Maine. (See Table VI). The costs listed above for harvesting and transporting wood over 50 miles are applicable as an area surrounding a plant of this size with a 50 mile radius would contain 1.3 million acres. This area should be sufficient to supply the major part of the plant's requirements.

A more complex cost problem is that related to forecasting the price of energy materials such as coal, wood, agricultural waste, petroleum, etc. as demand increases in the forthcoming years. The major advantage enjoyed by wood is that it is a renewable resource whose growth can be improved by scientific management.

OFFSHORE FLARE GAS COSTS

The 4 trillion cubic feet of natural gas estimated as being vented and flared in the Middle East and North Africa offers great potential as a source material if it can be economically delivered into the U.S. The two major avenues of exploiting this resource are liquifying the gas (LNG) at the well and transporting it in refrigerated bulk carriers or converting it to methanol and bringing it in conventional tankers to U.S. ports. The cost advantage of LNG versus methanol rests heavily on the shipping distance. Studies which compare the two alternatives conclude that the longer the shipping distance and the cheaper the waste natural gas, the more favorable are the economics for methanol. Investigations have shown that for shipment from the Persian Gulf the two processes have comparable economics when natural gas is available at 50 cents per million BTU. For more expensive

gas the economics favor LNG and for less expensive gas methanol is the preferred alternative. Estimates of the gas price have generally been in the neighborhood of 10 cents per million BTU in the Persian Gulf. For methanol delivered to the U.S. Gulf Coast it has been estimated¹ that a price of \$1.15 to \$1.25 per million BTU could be expected. (7.5 to 8.0 cents per gallon.) Although the prospects for inexpensive methanol from abroad appear attractive, to date little beyond the planning stage has occurred.¹⁰⁴

The potential use for methanol production of the natural gas being vented and flared offshore U.S. rests not only on the economics but also on present regulations requiring that flaring be terminated. Although technically feasible to construct an offshore methanol plant with mobility capability, the economics of this alternative compared to a pipeline network will depend greatly on the quantity of the gas available and its distance offshore. In view of the approaching offshore drilling programs, an early analysis of this option cannot be avoided. The annual value, for example, of all the gas being produced in the Gulf of Mexico is rapidly approaching \$3 billion evaluated at \$1 per 1000 cubic feet. The 2% being vented and flared is of the order of \$57 million based on the same value per 1000 cubic feet. Since this \$57 million per year is currently being lost to the atmosphere, the problem is one of deciding how much the country is willing to spend to recover a source of energy of this value presently being lost each year.

FEEDLOT COSTS

The economics of computing cattle manure conversion to methanol were dictated by the existing concentrations of cattle in feedlots. The upper limits as mentioned earlier were 750,000 head with as many as 600,000 head concentrated in a 15 mile radius. A more realistic figure representative of this industry is of the order of 200,000 which would provide approximately 1,200 tons per day to a processing plant on a 330 day per year basis. (90% plant service factor.)

Since investigators⁴⁸ have had difficulty in assigning a cost to this raw material, evaluations in general have assigned a zero value to the cost of manure at the feedlot and employ only the cost of transportation in the raw material cost. These costs of course depend upon both distance and volume of material. The available information indicated that a potential plant site should be at no greater radius than 50 miles from the sources of wastes.

Based on an assumption of truck transportation of \$0.05 per ton mile and an average haul of 20 miles an average charge of \$1.00 per ton is calculated. This rate is reasonable for a high volume short distance trucking. For a plant size of 1100 tons per day input which is capable of gasifying the manure to a synthesis gas to be used for producing methanol, it has been calculated^{47, 48} that a total capital investment of \$2,686,000 including \$1,593,000 direct plant cost would be required. The annual operating costs for the plant exclusive of raw material would be \$852,000 and the raw material costs would be \$360,000 delivered to the plant.

This gasifying process is estimated^{46, 47} to yield 8 million SCF per day (166 tons/day) at a cost of approximately \$0.46 per thousand cubic feet of gas. At this stage the cost to synthesize methanol from this gas awaits further detailed information on the process and yields.

ENVIRONMENTAL IMPACT

The utilization of methanol as an alternative fuel for gasoline will require a thorough analysis of the environmental implications of the products of combustion and emission gases as well as the ecological impact of the large scale mining operations required. To date, the in-situ coal gasification programs have yet to be demonstrated to be feasible, although the current work is encouraging. The fracturing of coal and the maintenance and control of the combustion still require additional development. Since both coal (and oil shale) use large mining operations that clearly affect the areas negatively, it is necessary to develop programs for restoring the areas environmentally. Such programs can take the form of using a percentage of the revenue derived from the resource to restore the area. For example, in the western states a 60 foot seam of coal will yield approximately 100,000 tons per acre. At one cent per ton assessment for reclamation there would be available \$1,000 per acre to restore the terrain. Alternatives to such a system would, for example, be the development of surface mining systems that would simultaneously couple extraction and reclamation processes and the combustion of coal and oil shale in-situ. In order to achieve satisfactory alternative fuels from coal and/or shale it is estimated that the country's mining capacity will have to triple in the next 25 years.

Laboratory tests as well as limited field evaluations have revealed that an auto fueled with methanol has considerably lower emissions than

a similar car operated with gasoline. Based on analyses of HC, CO, and aldehyde emissions and on the rate of formation of NO_2 from NO, it appears that the reactivity of the exhaust from a methanol-fueled auto is, in fact, lower than for gasoline. However, until more extensive tests are conducted it is premature to describe quantitatively the extent to which improved exhaust emission may be possible. Some of the more obvious explanations for lower emissions are the lower combustion temperatures which reduces the rate of formation of NO and the higher flame speed of methanol which permits retarding the spark.

The various investigations that have recently been conducted do not permit a precise side-by-side comparison. However in the interest of identifying some of the reported results a partial compilation of some emission products measured has been made.

Tabulated below are the results of a number of tests that have been conducted in various universities and industries to measure NO_x in auto emissions. Although these results are not conclusive there does appear to be evidence of a build-up of NO_x when the operation is richer than stoichiometric and a decrease of NO_x when leaner. The results indicate the need for more comprehensive fuel and engine studies in this area as regards not only NO_x but also CO, HC, and aldehyde emissions. The latter may prove to be particularly significant in the combustion turbine engine.

NO_x EMISSIONS WITH METHANOL AND GASOLINE
(grams/mile)

EXXON	SANTA CLARA	ARB	CONOCO	VW	STANFORD
6.4 g/mi ^a (gasoline)	0.67 g/mi ^d	1.30 g/mi ^f	4.0 - 10.0 g/mi ^g (gasoline, max power)	2800 ppm ⁱ (gasoline)	1.07 g/mi ^k
8.1 g/mi ^a (blend)			2.2 - 1.8 g/mi ^g (methanol, max power)	2200 ppm ⁱ (methanol)	
2.6 g/mi ^b (gasoline)	0.282 g/mi ^e		.8 - 8.0 g/mi ^h (gasoline, road load)	4400 ppm ^j (gasoline)	
2.3 g/mi ^b (blend)			.2 - 1.8 g/mi ^h (methanol, road load)	2500 ppm ^j (methanol)	
2.6 g/mi ^c (gasoline)					
1.7 g/mi ^c (blend)					

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VW values are in parts per million
ARB - Air Resources Board
CONOCO - Continental Oil Company

- a 1967 auto, blend is 15% methanol and 85% gasoline, air-fuel ratio is slightly rich
- b 1973 auto, blend is 15% methanol and 85% gasoline, air-fuel ratio is approximately stoichiometric
- c Advanced model auto, blend is 15% methanol and 85% gasoline, air-fuel ratio is approximately stoichiometric
- d 1972 Plymouth Valiant tuned for best emission performance
- e 1970 Gremlin in 1974 Reduced Emission Devices contest - Santa Clara University
- f Air Resources Board test on Santa Clara University auto
- g 1973 Ford, for a range of speeds 30 to 70 miles per hour
- h 1973 Ford, for a range of speeds 30 to 70 miles per hour
- i Single cylinder engine with compression ratio of 8.5, air-fuel is stoichiometric, Volkswagen tests
- j 4-cylinder engine with compression ratio of 8.5 operating at 3000 rpm.
- k 1970 Gremlin in 1972 Reduced Emission Devices contest - Stanford University

SOCIOLOGIC-ECONOMIC IMPACT

The current market at retail levels for the annual 100 billion gallons of gasoline fuel consumed in U.S. is in excess of \$30 billion per year. Investment in the chemical process industry formerly required one dollar in investment for each dollar in sales. Consequently the U.S. gasoline business represents an investment of over \$30 billion. The development of an alternative fuel economy that would dislocate this business to any extent would produce severe financial problems. Current production of methanol is one billion gallons per year valued at a current market price of \$380 million. In order to add, for example, only 2% methanol to gasoline would require an investment in facilities approximately \$560 million. Correspondingly gasoline production facilities of 1 billion gallon capacity would be utilized less. The economic and social impact of adding and changing the utilization of one of the nation's major industries would have to be thoroughly studied.

Since the location of methanol production facilities may be in the area of the source of coal, shale, or forest products, there will be major problems of shifting populations into regions which are not prepared for major increases in population. Concurrently sufficient people must be found with the skills, or, who can be trained to handle equipment of this type. Finally the production of mechanical mining and earthmoving equipment is limited by virtue of the few companies producing large scale off-highway trucks, grader, scrapers, and loaders. In recent years as many

as 40% of these vehicles have been for the export market. A particularly severe limitation in this regard is the production of draglines for excavating since the number of manufacturers are few and individually they are of relatively small size. As regards off-highway trucks, in 1972 for those of greater than 45 ton capacity such as are used to transport materials in mining, construction, petroleum developments, and similar projects approximately 40% (\$31,000,000) were exported of a total of \$83,000,000 produced that year.⁴⁰

It is estimated that 50% of the U.S. coal reserves are located on public lands. These include lands under the supervision of the Bureau of Land Management, the Forest Service, or the Bureau of Indian Affairs. Since the siting of a plant and selecting a coal source are critical to the success of the total program it is necessary to resolve any inherent problems such as those associated with Indian populations that may at present inhabit the areas. These problems may not only consist of physically disrupting the land but may also involve the utilization of other resources such as water, or the diverting of water, which had already been scheduled for other uses such as farming. It will be necessary for all competitive sites in each coal producing region to be evaluated from a socio-political acceptability standpoint and potential for commercialization in order to select the optimum site.

TOXICITY AND FIRE HAZARDS

The hazards and toxic effects from concentrated hydrocarbons is well known. While these organic substances vary as to their effect, in the vapor state they are generally poisonous and as liquids are equally so if taken internally.

Methanol is a Class 1B flammable liquid as defined by the National Fire Protection Association (NFPA) and U.S. Occupations Safety and Health Standards and has been handled safely for many years.^{16,17} As a fire hazard the limits of flammability of the vapor of methanol in air are broad compared to gasoline. Liquid methanol must be kept away from heat, sparks, and open flame and when stored or handled should be adequately ventilated. Chemicals in any form can be safely stored, handled or used if the physical, chemical and hazardous properties are fully understood and the necessary precautions, including the use of proper safeguards and personal protective equipment are observed.

The Manufacturing Chemists Association³⁶ have developed comprehensive procedures and instructions for the safe handling and use of methanol. This material delineates the hazards and the engineering control of such hazards; employee education and training policies and procedures together with personal protective equipment instructions; instructions for fire-fighting and equipment to be employed; the handling, storage, and unloading of methanol; the labeling of storage containers to conform with the Federal Hazardous Substances Labeling Act and similar state and

municipal regulations, statutes, and ordinances; the cleaning of equipment and waste disposal; and the toxic effects and preventive measures.

Serious poisoning will rarely be encountered with methanol in circumstances other than from oral ingestion. However in circumstances of heavy exposure by inhalation or skin contact medical attention should be sought at once. Inhalation exposure of one to two hours at concentrations in the order of 50,000 parts per million can be fatal. Precautionary measures should be taken to maintain concentrations at levels not exceeding 200 ppm although the American National Standards Institute³⁸ has established an acceptable ceiling concentration of 600 ppm with an acceptable peak for a 30 minute exposure of 1000 ppm.

INTERNATIONAL AND POLITICAL IMPACT

The United States has been a net exporter of methanol notwithstanding the approximately 5 to 10 million gallons frequently imported in a year.¹¹ Tariff restrictions in recent years have limited imports but more recently these have been lifted for specific applications.⁹⁵

In view of the existing petroleum situation it would be expected that imports would decline rapidly as the producing countries utilize the production in their local markets. Furthermore since most heavily industrialized countries are large consumers of petroleum as well as methanol, such countries as Japan, Italy and Canada who formerly exported to the United States would now compete for methanol in the world market as importers. Japan's production of methanol in 1969 was estimated to be of the order of 274 million gallons which is close to 30% of the U.S. production. This would rank that country as the world's second largest¹¹ producer. Japan's consumption is forecast to exceed 500 million gallons in 1975.

A major difficulty in assessing the European supply and demand situation (and hence the price) is the existence in the Soviet Union of the capability to shift plant production from methanol to ammonia. In the past when these Soviet plants were scheduled to produce methanol there had been as much as 60 million gallons of methanol available for export. On the other hand when production was concentrated on ammonia for fertilizer, there was no methanol for export.

U.S. has for years exported methanol to all parts of the free world. In 1969 exports totaled over 100,000,000 lbs. (16,000,000 gallons). Among the major countries to which shipments were made in that year were, in order of size, Mexico, Brazil, Australia, Colombia, Philippines, Venezuela, Canada, Germany, and South Africa.¹¹ This export market is generally unstable and depends upon the amount of excess capacity over demand in this country and in other exporting countries, the number of new plants installed in less developed countries, and the policy of the Eastern European countries toward methanol. As mentioned earlier Japan and the Soviet Union are major contributors to this instability. In order for the U.S. to move in the direction of a methanol-fueled economy with consequent large increases in U.S. production, it may be necessary to make changes in the tariffs since an international methanol surplus could readily result. If any of the Middle East countries decide to construct production facilities, the problem of surplus would be compounded.

POLITICAL AND ECONOMIC IMPACT

At present tax rates, a 30% reduction in the consumption of automotive fuel for transportation will produce a \$3 billion decrease in the Federal Highway Administration revenues. This is equal to 1% of the total annual U.S. budget. The political and financial impact of reducing the use of gasoline and associated tax revenues will have to be thoroughly considered in weighing the implications of introducing an alternative fuel. Furthermore, if the government makes a commitment to financially assist in developing large methanol from coal facilities, it will be competing for money which in turn will force interest rates higher producing higher costs of construction.

INTRODUCTION OF METHANOL INTO THE MARKET

The introduction of methanol into the automotive market will require an approach considerably different from that for public utilities. The latter are relatively few in number and are technically proficient and equipped to evaluate alternative fuels and make the decision to utilize a specific fuel providing the operating performance is satisfactory, the economics are acceptable, and it can be supplied and stored in sufficient quantities on a timely basis.

On the other hand the automotive market is one in which customer acceptance must be gained through price, availability, and proven performance. There is not an overly developed feeling of brand loyalty among car owners and at times when gasoline is in short supply any such loyalty disappears. However, where a shift from gasoline to a completely "new" fuel such as methanol is being stressed, there must be some inducement for the consumer to use methanol if gasoline is simultaneously available. Since an incubation period is going to be necessary before acceptance is achieved in any degree, the early introduction of methanol or a gasoline-methanol blend at the service station pumps is desirable. In view of the quantities of methanol now being produced from natural gas, there should be made available some of this production in order to begin introducing methanol to the consumer. An alternative course of action opens if methanol imports were to increase by virtue of European capacity or Soviet Union capacity increases or the addition of new plant facilities in the Middle East oil fields. This additional

source could provide methanol for the transition period until methanol-from-coal was available.

To accelerate the introduction, state or federal government inducement and assistance would aid considerably. California is currently considering legislative action which would require the introduction of methanol-¹¹³ gasoline blends by 1980 for vehicle use in the state. It may be necessary also to underwrite a part of the financial investment involved if the early methanol plants costs are too costly for private enterprise. Such assistance may take the form of reduced federal taxes on methanol used for transportation purposes or for public utility fuel. In any case notwithstanding the introductory difficulties, government aid will be needed in order to provide price support for methanol in the event the price of foreign crude oil is reduced with a resulting drop in gasoline prices in the U.S. Industry is particularly reluctant to embark on a program involving major commitments of personnel and funds if there is an obvious risk such as that existing in international oil prices. Some studies have concluded that a substantial commitment is necessary by the federal government in order to assure success in this area. Such commitments should include: organizing allocation programs where needed for resources, manpower, and equipment; removing institutional roadblocks in the production and use of energy resources; devising policies for related action by all branches of the government; devising financial incentives where needed; and supporting research and development when risks are too great for private investors.

PUBLIC UTILITY COMBUSTION TURBINE DEMONSTRATION

The specific program that is needed first is to launch methanol as an alternative fuel to distillate for the combustion turbines in public utility electric generating plants. This will require a demonstration to the electric power industry of a combustion turbine operating under load for a time period sufficient to conclusively show the favorable performance and characteristics of methanol as well as to uncover any unforeseen problems not revealed in laboratory tests.

This field program should be a joint effort of a public utility, combustion turbine manufacturer, producer of methanol, a sponsor and ERDA. The machine will need to be converted for methanol combustion. This will involve some minor modifications in fuel pumps, fuel flow systems, combustion liners, manifolds, as well as some fuel additives to improve lubricity of the methanol and explosion proofing of the unit. This conversion should be performed by the turbine manufacturer. A demonstration is desirable with a relatively new machine sufficiently large to scale the test results to a much larger turbine. A 20 or 30 megawatt unit appears to be satisfactory for this purpose. It is expected that a dual fuel unit which can burn natural gas is needed for starting purposes. Emission products will need to be monitored and measured for various air-fuel ratios and consequently a simple cycle machine would permit this to be accomplished more readily. The validity and integrity of the measurements of the products of combustion are important and should if possible be performed by an independent laboratory.

A 20 megawatt machine burns 4,000 gallons/hour of methanol. For a 500 hour test approximately 2,000,000 gallons will be consumed. However, since this will be a test in which electricity is generated and sold, the net fuel cost of the demonstration is the differential cost between distillate and methanol at the time the test is conducted.

The total daily production of methanol in the U.S. is 3,000,000 gallons. With the current slump in methanol sales owing to reduced construction in the nation, there are chemical manufacturers holding inventories as high as 12,000,000 gallons. Consequently the current period is excellent for conducting the test. A planned schedule should be developed, as soon as a public utility has agreed to conduct the test on one of its combustion turbines, to secure and store the methanol needed for the test. The most likely source of large quantities of methanol is the Gulf Coast which means that movement of the methanol will probably be by tanker or barge to a tank farm in the general area of the utility. Concurrently a commitment should be secured from the gas turbine manufacturer, who agrees to participate, as to his planned schedule of modifications for the demonstration unit.

Widespread publicity of the demonstration should be made to the public utility industry as to the first large scale demonstration of a synthetic fuel on an operational basis.

AUTOMOTIVE DEMONSTRATION

There has to date been published in the literature considerable amounts of fragmentary data on using methanol and methanol blends as

fuel in autos. Much of this work although limited experimentally has been encouraging. A series of definitive tests should now be considered to verify the widespread applicability of this fuel by undertaking a large field program involving fleets of vehicles to supply statistically meaningful performance and operating data.¹²⁹

This vehicle test program should involve the selection of vehicle fleets utilizing either local government, municipal, or agency vehicle pools who have controlled operation and maintenance of their vehicles as well as limited geographical areas in which they operate.

The development of programs to evaluate various blends as well as pure methanol is essential. This would include obtaining data on such factors as carburetor settings, moisture levels in fuel, driver reaction, leaks and spillage, carbon monoxide and oxides of nitrogen and hydrocarbon emissions.

The fleet testing should be conducted for at least 1 year in order to secure performance through various seasons as well as wet and dry weather. Concurrently a laboratory test program should be conducted to support the field program. The goal of this work would be to obtain engine performance and emission information under controlled conditions and with specific fuel blends for the purpose of eventually being able to optimize the engines for methanol. A part of this program will be fuel studies to further enlarge knowledge of phase stability, material compatibility, handling and storage and distribution practices, additives, and other physical and chemical characteristics.

The need for continuous publicity as regards this fleet testing is vital in order to keep methanol before the public. Publicity should be focused on the sourcing in the near future of this fuel not from petroleum sources but instead from coal, municipal waste and trash, and forest products in the U.S.

Vigorous stimulation of the federal government to embark on a number of methanol-from-coal, methanol-from-waste, and methanol-from-forest products programs should be undertaken. Early introduction of methanol-gasoline blends should be aggressively pushed within the framework of any constraints growing out of the laboratory and fleet test programs. The assistance of federal, state, and local authorities and legislative bodies should be enlisted to further this goal through proposed legislation and planned energy programs.

A most encouraging conclusion growing out of this analysis is the recognition that the U.S. forests offer an excellent solution to one of the country's energy problems. Logging and mill wastes alone if converted to methanol using a 30% efficient process are sufficient to produce annually 11.5 billion gallons of methanol. This is equal to 5.7% of the total annual consumption of gasoline in the nation. Further, the State of Maine, Office of Energy Resources, study on wood reveals that the principal thrust of U.S. energy development should be in the direction of scientific management and development of forest resources. Their field studies show that from Maine's 17.7 million acres of forests there is the potential to remove with the aid of good methods and practices waste and undesirable growth in sufficient quantities to also produce 11.5 billion gallons of methanol each year within the state.

A similar study conducted in California's north coastal region in a limited area found that 1 million tons of wood waste were being created annually and constituted an excellent and large source of raw material for converting to methanol as a fuel supplement.

APPENDIX I

In making estimates of energy resources of petroleum, natural gas, natural gas liquids, coal and other U.S. minerals, it becomes necessary to differentiate between deposits that (a.) are known and have been carefully evaluated, (b.) those that are known to exist but have not been measured, and (c.) those believed to exist based on geologic information but the precise location of which is unknown. Further, in order for the resource to be usable the deposits must be accessible. Consequently estimates must be such that the resources can be categorized based on current technical and economic capability for extraction.

A classification⁵⁸ of resources which provides reasonably well-defined categories is as follows:

a. Known recoverable reserves are deposits whose size and location have been determined. Furthermore they can be extracted or recovered by means of current engineering technologies on an economically acceptable basis.

Such terms as proved and inferred of the American Petroleum Institute and measured economic resources of the Department of the Interior are essentially equivalent to this category.

b. Undiscovered recoverable deposits are those that can be extracted economically with the present technology; however their specific location is unknown but is indicated by geological information.

c. Known marginal and submarginal deposits are those

whose size and location are known but cannot be extracted either until improvements in the extraction technology occur, or, until economic conditions change.

d. Undiscovered marginal and submarginal resources are those whose presence and size are indicated by geological information but neither the specific location is known nor can extraction take place until the technology advances or the economics become more favorable.

On April 15, 1974 the Department of the Interior issued a news release defining mineral resources terminology which differs from that generally used by American Petroleum Institute and the oil industry. It was planned that U.S. Bureau of Mines and the Geological Survey would henceforth adopt this terminology. Currently it is understood that members of the oil industry and the American Petroleum Institute have preferred to continue with API defined terms.

BIBLIOGRAPHY

1. H. Jaffee, F. Endelman, J.R. Hightower, B. Berger, W. Crothers, A. Pasternak, and R. Carter, Methanol from Coal for the Automotive Market, U.S.A.E.C. Report, February 1, 1974.
2. G.A. Mills and B.M. Harney, The New Fuel from Coal, Chemtech, January 1974.
3. T. Reed and R. Lerner, Methanol: A Versatile Fuel for Immediate Use, Science, 28 December 1973.
4. L.G. Cook, The Rapidly Changing Technology of Electricity Generation and the Major Consequences in Fossil Fuel Technology, Esso Research and Engineering Company, May 1973.
5. D. Garrett and T.O. Wentworth, Methyl Fuel - A New Clean Source of Energy, American Chemical Society 1973 Annual Meeting, Division of Fuel Chemistry Paper #9, August 27, 1973.
6. E. Starkman, H. Newhall and R. Sutton, Comparative Performance of Alcohol and Hydrocarbon Fuels, SAE Paper 254, June 1964.
7. D.L. Ray, The Nation's Energy Future, U.S.A.E.C. Report, Washington, D.C., 1973.
8. J.A. Bolt, A Survey of Alcohol as a Motor Fuel, SAE Paper SP 254, June 1964.
9. F.H. Kant, Feasibility Study of Alternative Fuels for Automotive Transportation, Exxon Research and Engineering, June 1974.
10. Synthetic Fuels Panel - Hydrogen and Other Synthetic Fuels: A summary of the work of the synthetic fuels panel, U.S.A.E.C. Rep. TID-26136, September 1972.
11. Chemical Economics Handbook - Stanford Research Institute Section 674.50221, May 1971.
12. In-Situ Coal Gasification, D.R. Stephens, University of California, Lawrence Livermore Laboratory, 1974.
13. A New Concept for In-Situ Coal Gasification, G.H. Higgins, University of California, Lawrence Livermore Laboratory, 1972.

14. H. G. Adelman, D. G. Andrews, and R. S. Devoto, Exhaust Emissions from a Methanol-Fueled Automobile, SAE Paper 720693, 1972.
15. Methanol Storage and Handling, E. I. duPont de Nemours & Co., 1974.
16. Fire Hazard Properties of Flammable Liquids, Gases, Volatile Solids, National Fire Protection Association, NFPA 325M, 1969.
17. Flammable and Combustible Liquids Code, NFPA No. 30, 1969.
18. U. S. Energy Prospects - An Engineering Viewpoint, National Academy of Engineering, Washington, D. C. 20418, May 17, 1974.
19. Solid Waste Disposal Resource Recovery - Purox System - Environmental Systems Department, Union Carbide Corporation, N. Y.
20. Mechanical Design of 5000 Tons per Day Methanol Energy Plant, Chemico Process Plants Co., N. Y.
21. On the Use of North Coast Timber Wastes to Produce Supplemental Energy, Select Committee on Manpower Development, Chairman Bill Greene and Select Committee on North Coast Timber Economy, Barry Keene, Chairman.
22. A. D. Pasternak, Methyl Alcohol - A Potential Fuel for Transportation, McGraw Hill Handbook on Energy Technology, December 1974.
23. R. K. Pefley, H. G. Adelman and M. C. McCormack, Methanol-Gasoline Blends - University Viewpoint, Paper presented at 1974 Engineering Foundation Conference on Methanol, Henniker, New Hampshire, July 1974.
24. G. D. Ebersole and F. S. Manning, Engine Performance and Exhaust Emissions: Methanol versus Iso-octane, Paper 720692, Society of Automotive Engineers, San Francisco, Calif., August 21-24, 1972.
25. R. G. Jackson and R. M. Tillman, Automotive Uses of Methanol Fuel, Paper presented at the 1974 Engineering Foundation Conference on Methanol, Henniker, New Hampshire, July 1974.
26. B. J. Berger, Environmental Aspects of Methanol as Vehicular Fuel: Health and Environmental Effects, Paper presented at the 1974 Engineering Foundation Conference on Methanol, Henniker, New Hampshire, July 1974.
27. A. D. Pasternak, Methyl Alcohol Production by In-Situ Coal Gasification, Lawrence Livermore Laboratory Report UCRL-51600, 1974.

28. E. F. Osborn - Clean Synthetic Fuels from Coal: Some Prospects and Projections, Paper presented at annual meeting of API Division of Production, Denver, Colorado, April 9-11, 1973.
29. D. B. Thompson - Synthetic Fuels: straw man or strong man in energy crisis? Industry Week, September 3, 1973.
30. G. C. Szego and C. C. Kemp, Energy Forecasts and Fuel Plantations, Chemtech, May 1973.
31. F. L. Jones and K. S. Vorres, Clean Fuels from Coal - An Alternative to SNG, Amer. Chem. Soc. Meeting, Chicago, 1973.
32. K. R. Williams and N. Van Lookeren Campagne, Non-fossil fuels raise costs, Hydrocarbon Processing, July 1973.
33. FT4C-1 Methanol Fuel Test at Florida Power Corporation, Bayboro Station TPM#700, Turbo Power & Marine Systems, Farmington, Conn., January 23, 1975.
34. Methyl Fuel - Boiler Combustion Demonstration - Test, A. B. Patterson Plant, New Orleans Public Service, Inc., 5400 Dwyer Road, New Orleans, Louisiana, September 17-23, 1972.
35. R. M. Tillman, O. L. Spilman and J. M. Beach, Potential for Methanol as an Automotive Fuel, Continental Oil Company, Ponca City, Oklahoma.
36. Chemical Safety Data Sheet SD-22, Manufacturing Chemicals Association, Washington, D. C., July 1970.
37. U. S. Department of Labor - Title 29, Part 1910.93 Air Contaminants.
38. American National Standards Institute, 1430 Broadway, New York, N. Y., Standard Z37.14-1971.
39. Static Electricity, National Fire Protection Association, Standard #77.
40. Current Industrial Reports - Construction Machinery Series MA-35D(72)-1, U. S. Department of Commerce, Bureau of Census, May 1973.
41. Texaco Canada Ltd. is constructing a 95,000 bbl/day refinery at a cost of \$400 million to be completed in 1977.
42. Chemical and Engineering News, p. 2, September 10, 1973.
43. Chemical and Engineering News, p. 17, July 8, 1974.

44. Gulf of Mexico OCS, Total Amount of Gas Flared report U.S. Geological Survey, Conservation Division, April 25, 1974.
45. C. Winter and A. Kohill, Chemical Engineering, November 12, 1973.
46. W.P. Walawender, L.T. Fan, C.R. Engler, and L.E. Erickson, Feedlot Manure and Other Agricultural Wastes as Future Material and Energy Resources: Introduction, Kansas State University, April 1972.
47. W.P. Walawender, L.T. Fan, C.R. Engler, and L.E. Erickson, Feedlot Manure and Other Agricultural Wastes as Future Material and Energy Resources: Process Descriptions, Kansas State University, March 1, 1973.
48. W.P. Walawender, L.T. Fan, C.R. Engler, and L.E. Erickson, Feedlot Manure and Other Agricultural Wastes as Future Material and Energy Resources: Economic Evaluations, Kansas State University, July 1, 1973.
49. Energy Self-Sufficiency: An Economic Evaluation by the Policy Study Group of the M.I.T. Energy Laboratory, Technology Review, May 1974.
50. American Petroleum Institute, Use of Alcohol in Motor Gasoline - A Review, Publication No. 4082, Washington, D.C., 1971.
51. R.W. Duhl and T.O. Wentworth, Methyl Fuel from Remote Gas Sources, Amer. Inst. Chem. Engineers, Eleventh Annual Meeting, Los Angeles, April 16, 1974.
52. U.S. Geological Survey, Royalty Accounting, Outer Continental Shelf - Oil and Gas Lost - All Stations 1974-1975, Reston, Virginia.
53. A Modular Integrated Waste Disposal/Resource Recovery System for Municipal or Regional Use, Barber-Colman Company, February 1975.
54. J.E. Anderson, The Oxygen Refuse Converter - A System for Producing Fuel Gas, Oil, Molten Metal and Slag from Refuse, Union Carbide Corporation, 1973.
55. Combustion Power Company Inc., Summary of the CPU-400 Development, U.S. Environmental Protection Agency, Cincinnati, Ohio, September 1974.

56. Committee on Interior and Insular Affairs (U.S. Senate), U.S. Energy Resources - A Review as of 1972, Serial No. 93-40 (92-75), Washington, D.C., 1974.
57. C. J. Anderson and E. Behrin, New Energy Research and Development: A Rationale for Setting Priorities, Lawrence Livermore Laboratory Report UCRL-51589, May 15, 1974.
58. Energy R & D and National Progress, Interdepartmental Energy Study, Directed by A. B. Cambel, Government Printing Office, 1964.
59. Gustav Egloff, Motor Fuel Economy of Europe, Ind. and Eng. Chemistry Vol. 30, No. 10, 1938.
60. Chemical and Engineering News - March 25, 1974.
61. Gulf Oil Corporation, Annual Report 1973, p. 7.
62. Oil Shale Corporation - TOSCO Process.
63. National Academy of Sciences - Report by the Committee on Motor Vehicle Emissions, February 1973.
64. Methanol - Data Sheet, Industrial Chemicals Department, E. I. duPont de Nemours & Co. Inc., January 1974.
65. 1973, 1974 Uniform Statistical Reports - General Public Utilities, New York, N. Y.
66. U.S. Department of Agriculture, Forest Service, The Timber Resources of Maine, Bulletin NE-26, 1972.
67. State of Maine, Office of Energy Resources - Collected Working Papers on the Production of Synthetic Fuel from Wood, Maine Methanol, March 31, 1975.
68. Bechtel Corporation - Fuels from Municipal Refuse for Utilities: Technology Assessment, prepared for Electric Power Research Institute, Palo Alto, California, March 1975.
69. American Gas Association - Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1972, Arlington, Va., Volume 27, May 1973.
70. Federal Energy Administration, Project Independence Report, November 1974.

71. R.K. Pefley et.al., Study of Decomposed Methanol as a Low Emission Fuel, Environmental Protection Agency, April 30, 1971.
72. J. Stone, Survey of Alcohol Fuel Technology - Interim Report, Mitre Corporation, McLean, Virginia, July 1974.
73. T.O. Wentworth, Outlook Bright for Methyl-Fuel, Environmental Science and Technology, November 1973.
74. T.O. Wentworth, Methyl Fuel Could Provide a Motor Fuel, Chemical and Engineering News, September 17, 1973.
75. R.G. Jackson and R.M. Tillman, Coal Derived Methanol as a Motor Fuel, Paper presented at the Engineering Foundation Methanol Conference, Henniker, New Hampshire, July 10, 1974.
76. Mathematical Sciences Northwest Inc., Feasibility Study of Conversion of Solid Waste to Methanol or Ammonia (prepared for the City of Seattle), September 6, 1974.
77. City of Seattle, Department of Engineering - Solid Waste Disposal Incorporating Ferrous Metal Recovery and Production of Methanol or Ammonia (presentation to the Seattle City Council), 1974.
78. City of Seattle, Department of Lighting - Seattle's Solid Waste... An Untapped Resource (prepared by Paul A. Wratrak, City Engineer, and Gordon Vickery, Superintendent of Lighting), May 1974.
79. H. Perry, The Gasification of Coal, Scientific American, March 1974.
80. Naval Research Laboratory, Verbal Communication with Dr. Robert Hazlett on NRL's tests with automotive use of methanol, November 1974.
81. W.D. Harris and R.R. Davison, Methanol from Coal, Oil and Gas Journal, December 17, 1973.
82. International Research and Technology Corporation, A Systems Approach to Problem Oriented Research Planning: A Case Study of Ford Production Wastes, Arlington, Virginia, June 21, 1973.
83. U.S. Department of Agriculture, Forest Service, The Outlook for Timber in the United States, FRR-20, July 1974.
84. Encyclopedia Britannica, Peat, R.S. Redmayne, Institute of Mining and Metallurgy of England.

85. Chemical and Engineering News, p. 15, March 17, 1975.
86. Volkswagenwerk AG - Research and Development, VW-Research
the Future, 1974.
87. D. Shah, S. Bongiorno, J. Tourtellotte, Methanol as a Gas Turbine
Fuel, Chemical Construction Corporation, New York.
88. San Diego County Air Pollution Control District, Rule 68. Fuel-
Burning Equipment - Oxides of Nitrogen, July 1, 1971.
89. San Diego County Air Pollution Control District, Rule 66, Organic
Solvents, July 1, 1972.
90. H. Heitland, W. Burkhardt, and W. Lee, Comparative Results on
Methanol and Gasoline Fueled Passenger Cars, Volkswagenwerk AG,
Wolfsburg, Germany.
91. Mobil Oil Corporation, Toward a National Energy Policy, New York,
N. Y., 1974.
92. Celanese Chemical Company, Methanol Product Bulletin, New York,
N. Y., April 1969.
93. The Wall Street Journal, U.S. Geological Survey Reduced Estimates
of Undiscovered Oil and Gas Reserves, May 8, 1975.
94. Borden Chemical Company, Specification on Methanol, P-180
(Rev. 1), Columbus, Ohio, 1974.
95. The Wall Street Journal, House Panel Votes to End Methanol Fuel,
Zinc Ore Duty, March 27, 1974. The duty on methanol imported
for use as a fuel is to be removed.
96. J. Newman, Center for Energy Information, Verbal communication
relative to use in Brazil of a 75% gasoline - 25% alcohol blend. The
alcohol is reported to be made from sugar cane.
97. The Wall Street Journal, Sun Oil Company Reduces Its Propane
Prices 7.5 cents a gallon to between 14 cents and 9.75 cents per
gallon, August 22, 1974.
98. The Wall Street Journal, Texaco reduced its propane gas price 7
cents per gallon, September 3, 1974.
99. The Wall Street Journal, Cities Service Oil Company cuts its propane
price 7.5 cents a gallon, August 19, 1974.

100. The Wall Street Journal, Phillips Petroleum Company cuts propane price by 3 cents per gallon, September 11, 1974. Earlier a 3-1/2 cents a gallon reduction was made on August 20, 1974.
101. Georgia Pacific Corporation, Typical Properties of Georgia Pacific Methanol, 1972.
102. Monsanto Company, Methanol Data Sheet, St. Louis, Missouri, November 1970.
103. University of Santa Clara, Verbal communication with R. K. Pefley and M. McCormack on emission products of methanol fueled auto, February 18, 1975.
104. Houston Natural Gas Corporation, Annual Reports 1973, 1974 on joint venture in Saudi Arabia for production of methanol.
105. Chemical and Engineering News, Outlook Detailed for Petrochemical Feedstocks (Large amounts of natural gas being flared in the Middle East may become available at 20, 10, or even 0 cents per million BTU.), March 18, 1974.
106. Chemical and Engineering News, Oil Shale Potential Surveyed, April 23, 1973.
107. G. A. Mills, Gas from Coal, Fuel of the Future, Environmental Science and Technology, December 1971.
108. A. D. Foster, Gas Turbine Fuels, General Electric Company, Publication GER 2222H (1972)
109. W. O. Statler, Fuel Systems, General Electric Company Publication GER 2476A (1970)
110. General Electric Liquid Fuel Specification (GEI 41047D) and GEI 41047E Supplement B
111. H. Perry, Coal Conversion Technology, Chemical Engineering, July 22, 1974
112. Maine Wood Fuel Corporation, Verbal communication from M. Bonney, June 12, 1975
113. California Legislature - Assembly Bill No. 443, Solid Waste Conversion to Synthetic Fuels 1975
114. California Legislature - Assembly Bill No. 1575, Energy Conservation and Development 1974

115. W.L. Crentz, Agricultural Wastes - An Energy Resource of the Seventies, Presented at the World Farm Foundation Symposium, December 1971, Anaheim, California
116. U.S. Department of the Interior, Minerals Yearbook Vol. 1 1972 Published 1974
117. Gordian Associates Inc., Where the Boilers Are (prepared for EPA) February 1974
118. H. R. Williams and C. J. Meyers, Manual of Oil and Gas Terms, Stanford University, 1971
119. R. F. Curry, Methanol Swapping Garbage for Fuel in an Age of Energy Poverty, American Motorist, April 1975
120. E. V. Anderson, Methanol Fortunes Take Turn for Better, Chemical and Engineering News, October 9, 1972
121. M. J. Royal and N. M. Nimmo, Big methanol plants offer cheaper LNG alternatives, Oil and Gas Journal, Feb. 5, 1973 Power-Gas Ltd., London, England
122. Wood Draws Attention as Plastic Feedstock, Chemical and Engineering News, April 21, 1975
123. G. A. Mills and H. Perry, Fossil Fuel - Power + Pollution, Chemtech January 1973
124. Great Canadian Oil Sands Ltd., Annual Report 1973, 1974
125. Chemical and Engineering News, p. 11 May 6, 1974
126. S. Glasstone, Textbook of Physical Chemistry, Van Nostrand, New York, N. Y. 1946
127. Federal Power Commission, The 1970 National Power Survey, December 2, 1968
128. Chemical and Engineering News, p. 19 June 2, 1967
129. Methanol as an Alternate Fuel - Conference Report, 1974 Engineering Foundation Conference, Henniker, N. H. July 7-12, 1974
130. L. A. Spano, Statement before Subcommittee on Priorities and Economy in Government on the conversion of Cellulose to Glucose Sugar, U.S. Army Natick Laboratories, May 20, 1974

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10/28/75

A Brief Review of the Multistate Tax Compact

- A) What The Compact Does (And Does Not Do)
- B) The Economic And Financial Effects Of The Compact
- C) The Allocation Formula
 - 1) The Property Factor
 - 2) The Payroll Factor
 - 3) The Sales Factor
 - 4) The Adjustment Provision
- D) Preliminary Results from Compact Membership
- E) Alternatives to the Compact
- F) Conclusion

A) What the Compact Does

Basically, the Compact provides a means which has not been available in the past to enforce a state's corporate income tax laws. By providing for a general uniformity between the tax laws and regulations of the member states, corporations (and other multistate taxpayers) can be forced to provide the same income reports to all of the states. This makes it possible for states to pool their auditing resources and more carefully check the accuracy and consistency of multistate taxpayer reports. This basic uniformity also helps avoid disputes based on charges of double taxation, charges which could develop if every state's tax laws were significantly different. If disputes as to the proper allocation of incomes do arise, a method of arbitration is provided by the Compact. What the Compact does not do is depart any significant way from past policy in the treatment of multistate corporations. Thus the Compact is basically an agreement between states to ensure the effective and fair taxation of multistate businesses.

B) The Economic And Financial Effects Of The Compact

The Compact has two significant characteristics which a state by itself does not have. First, the enforcement capabilities of the Compact provide a tool by which states can approach a greater equity in the treatment of interstate and intrastate businesses. Without the Compact

it is possible for some multistate corporations to shift their net incomes to non- or low-tax states, something that one-state businesses can not do. Second, the basically uniform allocation of a corporation's income between states combined with the arbitration mechanism reduces the possibility of significant double taxation to its practical minimum. This eliminates the claim that multistate taxpayers should have special (lower) tax treatment due to the double taxation possibility, and allows the state to tax at whatever rate it deems reasonable.

C) The Allocation Formula

The advantages of enforceability and equity are bought at the price of basic uniformity in the allocation formulas and regulations of the member states. Although the details of the formula may be shaped by each state, the basic formula which all member states must use is given in Article IV, Sec. 9 of the Compact. The following is a discussion of the three factor formula of property, payroll, and sales, as it relates to Alaska.

1) The Property Factor: This factor, according to the Multistate Tax Compact, Article IV,¹⁰ includes, "... the average value of the taxpayer's real and tangible personal property owned or rented and used in this state during the tax period." The Alaska Administrative Code, 15AAC10.120(a) states that the property factor numerator "...shall include the average value of the taxpayer's real and tangible personal property in this state during the tax period used, is available for use, or is capable of being used for the production of business income." For most businesses the above definitions are adequate, however, they do not clearly include mineral reserves in the property factor of extractive industries.

Although they imply that reserves may be included, it is suggested that

the phrasing adopted by the Multistate Tax Commission, Feb. 13, 1973, be included in the updated revenue code (to be proposed by the Dept of Revenue in the near future) as follows: "Property held as reserves or standby facilities or property held as a reserve source of material shall be included in the factor. For example, a plant temporarily idle or raw material reserves not currently being processed are includable in the factor" (Commission Reg. IV. 10.(b),).

This would remove any doubt concerning the inclusion of oil, gas, and mineral reserves in the property factor of extractive industries. With the clear inclusion of mineral reserves in the property factor of multi-state taxpayers, the property factor should fairly reflect the property interests of a business in this state. (Note: The Alaska Code might also specifically state by what method mineral reserves will be valued, e.g. the same method as for ad valorem tax purposes. This might help avoid debate as to what valuation of reserves should be used.)

2) The Payroll Factor: Fortunately for Alaska, this factor is based upon the "total compensation paid" to the taxpayer's employees rather than the number of employees paid by the taxpayer. Thus, the higher salaries paid in Alaska will be reflected in a high portion of the payroll factor being allocated to Alaska than if a simple head count were used. This is economically justified by the fact that government services are also made more expensive than in other states. No significant changes to the payroll factor appear to be needed.

3) The Sales Factor: According to the Multistate Compact, both sales which occur in the state and sales which are predominantly due to "income

producing activity" in the state are allocated to the state (Article IV. 15 and IV.17.((a)(b).). The Administrative Code, 15AAC 10.280., defines an "income producing activity" as "the act or acts directly engaged in by the taxpayer for the ultimate purpose of obtaining gains or profit." The major exclusion from this allocation rule is "income producing activity" performed by an independent contractor. Such activity is not included in the sales factor because the contractor pays the income tax on that activity. For most business activities in the state this is a fair and reasonable method for the allocation of gross sales. The complex contractual arrangements between the several large petroleum corporations active in the state (and their vertical integration) make the allocation of their sales and "income producing activities" more difficult to determine. It is clear that the Multistate Tax Compact is referring to just the type of activity which extractive industries are pursuing in Alaska when it refers to "income producing activities." It is suggested that the Alaska Administrative Code for Revenue contain specific reference to the extractive industries and examples of how sales from their "income producing activity" should be allocated to Alaska.

4) The Adjustment Provision. This provision allows for unique situations which may arise in relation to specific states or businesses. Article IV. 18. of the Compact states:

If the allocation and apportionment provisions of this Article do not fairly represent the extent of the taxpayer's business activity in this state, the taxpayer may petition for or the tax administrator may require, in respect to all or any part of the taxpayer's business activity, if reasonable:

- (a) separate accounting;
- (b) the exclusion of any or more of the factors;
- (c) the inclusion of one or more additional factors which will fairly represent the taxpayer's business activity in this state; or

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(d) the employment of any other method to effectuate an equitable allocation and apportionment of the taxpayer's income.

Thus, in special cases (e.g. the sales factor for a vertically integrated industry cannot be made to reflect the industry's actual activity in the state) the adjustments can be made without affecting the Compact or allocation formulas in general. Such adjustments must be made only with very good reason and with great care, because their "reasonableness" may be challenged in the courts or during arbitration. The general uniformity of the Compact, however, is not a straight jacket.

D) Preliminary Results From Compact Membership

Although the Multistate Tax Compact did not go into effect in Alaska until July 1, 1970, and the current Administrative Code relating to the Compact did not go into effect until July, 1972, some tentative observations can be made. In 1970-71, the first year under the Compact, and in 1973-74, the first year in which extensive enforcement of the Compact allocation was implemented, corporate income tax revenues jumped 14.41 and 18.34 percent respectively over previous years. This compares with growth rates of 6.48 and 7.84 percent in fiscal years 1970 and 1971 respectively (Figures from "Revenue Projection Detail", 12/19/74). It is not clear just what portion of the greater increases in fiscal years 1971 and 1974 were merely due to surges in economic growth in Alaska, but it is possible that part of the extra growth in tax collections was due to the Compact and its enforcement. A more concrete example of the Compact's value is seen in the additional corporate income tax billings being sent to five or six major multistate (oil) corporations. These are based on Department of Revenue audits which the provisions of the Compact facilitate. Two of these billings are for well over one million dollars each, totalling approximately three million. The final amounts of the other billings

have not yet been determined. Note that this compares with the \$134,860 originally paid by 3 of the 10 oil producers operating in the state in fiscal year 1973 (April 17, 1975 memo by Kathy Hollier, Research Analyst, Department of Revenue). In addition to these billings, the state has already received over \$150,000 and has approximately \$2.5 million in pending assessments due from other multistate taxpayers' operations in Alaska. Thus, preliminary evidence indicates that the Compact is assisting the Department of Revenue in obtaining significant increases in corporation net income tax revenues. As Alaska's Administrative Code for the Compact is fine tuned to Alaska's needs, it is probable that the Compact will be even more helpful in the future.

E) Alternatives To The Compact

It is possible that the State could choose to develop its own tax allocation formulas and regulations independent from other states. The object of such an independent approach would be to allocate a greater share of multistate taxpayers' incomes to the state than is possible under the Compact. There are three major problems with this approach. First, if Alaska's corporate income tax varies in major ways from other states, Alaska would have to enforce the tax without the close assistance of other states. If past experience is any guide, the state would likely loose money rather than gain it. Second, if the formula caused the tax burden of multistate tax-payers to be significantly higher than intrastate taxpayers, the long term economic effect would be to discourage new investment in the state. Such a possibility should be considered carefully in view of the state's current employment situation. Third, and perhaps most important, all of the legal battles concerning the legal standing and equity of the new tax approach would have to be fought. These

battles have largely been fought and won for the basic formula and approach used in the Multistate Tax Compact. Thus, for enforcement, economic equity, and legal reasons, such an independent course would be difficult to pursue.

It might be suggested that the state withdraw from the Compact but maintain the basic tax approach of the Uniform Division of Income for Tax Purposes Act (UDITPA - the basis of the Compact). This would gain the state nothing in the way of really new tax options while weakening its enforcement ties with other states. Such an approach would seem to be the worst of both worlds.

Finally, the state could remain within the Multistate Tax Compact, refine the state's implementing code, and make any further adjustments needed through the Compact's adjustment provisions. In those industries, specifically extractive industries, which may impose special burdens on the state and/or on future citizens of the state, severance taxes and/or ad valorem taxes could be used to supplement revenues from the net income tax.

F) Conclusion

The Multistate Tax Compact generally appears to be well suited for the needs of Alaska. Preliminary indications are that the Compact is assisting the Department of Revenue in the enforcement of the state's corporate net income tax. The allocation formula lends itself to a basically equitable treatment of both intrastate and interstate taxpayers while allowing for special or unusual cases. If such revenues are considered too low in certain industries, additional separate taxes should be used.

ALASKA
STATE LEGISLATURE

MEMORANDUM

October 20, 1975

TO: Senator John Huber, Chairman
FROM: Terry Berman, Assistant
SUBJECT: October 6, 1975, meeting with Sterling Gallagher,
Commissioner of Revenue

The staff met with the Commissioner of Revenue to discuss the multistate tax compact and the severance tax.

Commissioner Gallagher discussed the information collection and processing that was being done with respect to multistate corporations and the changes in administrative procedures regarding collection. He also expressed interest in increasing the severance tax.

This meeting enabled us to begin obtaining needed information from the Department of Revenue.

TITLE: LEGAL ANALYSIS OF THE MULTISTATE TAX COMPACT

REQUESTED BY: Senator John Huber, Chairman
Committee on Taxation and Revenue

DATE SUBMITTED: 10/16/75

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STATEMENT OF FACTS

The Committee on Taxation and Revenue's staff in its initial review of corporate income taxation has put special emphasis on taxation of multistate corporations, under the present Alaska income tax statutes. Alaska is one of forty five (45) states and the District of Columbia which levies an income or franchise tax based on the net incomes of corporations and other similar organizations. Alaska's tax base is tied to the Federal income tax net income figure.

The State of Alaska is a member of the Multistate Tax Compact. The Compact was drafted in 1966 and became effective in 1967 after seven (7) states had adopted it. Alaska became a member on July 1, 1970. The purposes of the Compact are: 1) To facilitate proper determination of State and local tax liability of multistate taxpayers by equitable apportionment of tax bases and, 2) To avoid duplicative taxation.

On this, the initial review of the corporate income statutes, it has been tentatively decided that more revenue can be raised from the multistate corporations by use of the Compact. The method of accomplishing this would be through strict enforcement of the present allocation formula or through changes to the present allocation formula.

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Questions Presented

- 1) Is Alaska's participation in the Compact legal under the United State Constitution?
- 2) Will the use of an allocation formula on income derived in Interstate commerce run afoul of the Commerce Clause and Fourteenth (14th) Amendment Due Process Clause of the Constitution?
- 3) Can the income from a subsidiary of a multistate corporation be unitized with the parent corporation for purposes of applying the allocation formula?

Brief AnswerLegality of the Compact

Under the correct interpretation of the U.S. Supreme Court, the Compact is legal. The Compact does not increase the political power of the states.

Use of Allocation Formula

The allocation formula set out in 15 AAC 10, Multistate Tax Compact, only levies taxes on that portion of the taxpayers net income arising from its activities within Alaska. The taxes imposed by the allocation formula are not a direct burden on interstate commerce and do not conflict with the Due Process Clause.

Unitizing Income of Subsidiaries and Parent Corporations

When the operation of business done within the state is dependent upon or contributes to the operation of the business without the state, the operations are unitary. The income from a subsidiary of a multistate corporation can be unitized with the parent corporation.

Applicable StatutesArticle I, Section 10, Clause 3 of U.S. Constitution

No state shall, without the consent of Congress ... enter into any agreement or compact with another state ...

Article I, Section 8, Clause 3 of U.S. Constitution

The Congress shall have power . . . to regulate commerce .. among the several states . . .

Fourteenth Amendment of U.S. Constitution - Due Process Clause

No state shall make or enforce any law . . . nor shall any state deprive any person of the life, liberty, or property,, without due process of law.

AS 43.19.010. Article IV

Article too long to reproduce

15 AAC 10 Multistate Tax Compact.

Compact too long to reproduce

DiscussionLegality of the Compact

Even though the words of the Constitution seem to prohibit all compacts entered into without the consent of Congress, current judicial interpretation limits the all or nothing aspect of the Article. The United States Supreme Court in 1893 laid down the rule in Virginia v. Tennessee, 148 US 503 (1893), 37 LE 537, which states: "...Looking at the clause in which the terms "compact" or "agreement" appear, it is evident that the prohibition is directed to the formation of any combination tending to the increase of political power in the states, which may encroach upon or interfere with the just supremacy of the United States..."

The several states have entered into the Compact as a means of insuring that the states power to tax multistate corporations will not be interfered with by Congressional action. Congress has set some restrictions in Pub Law 82-272 (15 USCS 381) and has made studies. Each session has seen the matter come up, but with the exception of Pub Law 86-272, nothing has been done.

The Compact does not increase the political power of the states. The states have the power to tax. In entering into the Compact they are facing the economic reality that much of the business in the country is carried out by multistate corporations. In order to derive a fair amount of tax from those corporations, the states have entered into the

Compact to ensure equitable apportionment among themselves and avoidance of duplicative taxation.

Consent of Congress can also be implied. Virginia v. Tennessee supra.

Since the Compact's inception in 1967, there has been continuing Congressional action on the matter. That action has not resulted in any legislation approving or disproving the Compact, of which Congress is well aware.

"..It seems fair to say that Congress impliedly consents to the existence of any compact of which it has knowledge and has not been negated by legislators..." The Compact meets the test of Constitutionality.

Use of Allocation Formula

The use of the allocation formula has been attacked on the following grounds by the multistate corporations: 1) It is a tax on the privilege of engaging in interstate commerce, 2) It is inherently discriminatory and 3) It results in a multiple tax burden. The first raises an issue under the Commerce Clause and the second and third raises issues under the 14th Amendment Due Process Clause of the U.S. Constitution.

Both issues have been extensively litigated and most decisions have been returned in favor of the allocation formula. A tax that is a direct burden upon the operation or act of interstate commerce is unconstitutional. The mere act of carrying on business in interstate commerce does not except a corporation from state taxation.

The U.S. Supreme Court stated in the leading case of Northwest States Portland Cement Co. vs. State of Minnesota, 358 US 450, 3 Led 2d 421, 79 S.Ct. 357: "...We conclude that net income from the interstate operation of a foreign corporation may be subjected to state taxation provided the levy is not discriminatory and is properly apportioned to local activities within the taxing state forming sufficient nexus to support the same..." In the case of General Motors Corp. vs Washington, 377 US 436, 440-441 (1964), the U.S. Supreme Court following Northwest stated this controlling test:

"...A careful analysis of the cases in this field teaches that the validity of the tax rests upon whether the state is exacting a constitutionally fair demand for that aspect of interstate commerce to which it bears a special relation. For our purposes the decisive issue turns on the operating incidence of the tax. In other words, the question is whether the state has executed its power in proper proportion to appellant's consequent enjoyment of the opportunities and protections which the state has afforded ... As was said in Wisconsin vs J.C.Penny, 311 US 435, 444 (1940), 'the simple but controlling question is whether the state has given anything for which it can ask return'..."

The U.S. Supreme Court has sustained the above decisions in Colonial Pipeline Co. vs Treigle, -US-, 44 L Ed 2d 1, 95 S.Ct. --.

Since the taxes imposed are only levied on that portion of the taxpayers net income which arises from its activities within the taxing state, they do not conflict with the Due Process Clause. Northwest supra. The use of an allocation formula that is nondiscriminatory, properly apportioned,

and related to local state activity to tax multistate corporations will not run afoul of the Commerce and 14th Amendment Due Process Clauses of the U.S. Constitution.

Unitizing Income of Subsidiaries and Parent Corporations

One of the major problem areas in taxing multistate corporations is where the activities done in the taxing state are carried out by a subsidiary of the parent multistate corporation. This issue has been decided principally in state courts. As noted in the immediate prior discussion, the allocation formula has been upheld.

The general test was stated by the California Supreme Court in Edison California Stores vs McColyes, 30 Cal. 2d 472, 183 P2d 16 (1947). It states "...If the operation of the portion of the business done within the state is dependent upon or contributes to the operation of the business without the state, the operations are unitary ... A more particular statement of the test is that a business is unitary if these circumstances are present: 1) Unity of ownership, 2) Unity of operations as evidenced by central purchasing, advertising, accounting and management division, and 3) Unity of use of its centralized executive force and general system of operations..."

The test was followed in Chase Brass and Copper Co. vs Franchise Tax Board, App. 86 Cal Rptr 350 (1970), dismissed 400 US 961 (1970). Chase was a wholly owned subsidiary of Kennecott Copper Corp. Kennecott did

no business in California. Applying the above test, the California Supreme Court found the business between Kennecott and Chase Brass unitary. The same rationale was followed by the Oregon Supreme Court in Coca Cola Co. vs Dept of Revenue, 533 P2d 792 (1975).

Following the lead of the various state courts, the income from a subsidiary of a multistate corporation can be unitized with the parent corporation for purposed of applying the allocation formula. The power to impose the tax on a unitary business flows from the authorized method of determining income from the taxpayers activities within the state, and authority to pursue the method is present whenever activities are partially within and partially without state, whether or not integral parts of the system are seperately incorporated, or the accounting system of the taxpayer does not clearly reflect the income. Edison California Stores, supra.

Conclusion

From a legal point of view the Multistate Tax Compact is valid under the United States Constitution. Use of an allocation formula that is not discriminatory will forestall any attack under the Commerce and Fourteenth Amendment Due Process Clauses. It is also possible to unitize the income from a subsidiary of the multistate corporation with the parent.

There is an area in which the Multistate Tax Compact is inadequate for the State of Alaska. That area is the taxation of oil and gas revenues.

Only a small amount of tax revenue would be generated if the Compact were used exclusively to get to the multistate oil companies' profits. For taxation of the multistate oil companies another type of tax is needed, ie severance, value added, ad valorem, in addition to the Compact.

Franklin D. Fleeks

Tax Counsel

ALASKA STATE LEGISLATURE

MEMORANDUM

October 16, 1975

TO: Senator John Huber, Chairman
Committee on Taxation and Revenue

FROM: Franklin D. Fleeks
Committee Tax Counsel

SUBJECT: Value Added Tax

At each of the meeting held, whether formal or informal, the topic of a value-added tax has been discussed. Though all participants had heard of a value-added tax, its concept and operation was not clearly defined. The purpose of this memo is to try to bring clarity to the subject.

History

The value added tax (VAT) is an out growth of multistate turnover taxes used in Europe. The multistate turnover tax was first introduced in Germany during World War I.¹ France adopted the value added tax in 1954. With the formation of the European Common Market (EEC) and its emphasis on harmonizing the various nations taxes, the vehicle chosen was the value-added tax. At present, all of the member states of the EEC have enacted value-added taxes.² In the United States, only the state of Michigan had a modified VAT. The modified VAT was repealed when Michigan revamped its law in 1967.³

Discussion

Just what is a value-added tax? The simple definition is that it is a tax on 'value added' by the taxpayer. The most accurate definition found is that VAT is a net turnover tax with prior tax deduction.⁴ What must be emphasized is that VAT is a sales tax collected in multistages.

"...It is a method of collecting a sales tax that insures that the tax is shifted to the consumer..."⁵ As another writer states "...The value-added tax is neutral as to businesses because it does not apply to businesses; rather it is a retail sales tax on the consumers of goods and services and not a tax on the producers or sellers of goods and services..."⁶

The way the tax works is as follows. A producer or seller of goods or services multiplies his total sales by the applicable rate. From this amount, by the tax credit system, the producer or seller subtracts the amount of tax he paid on his purchases and pays the net amount to the government.⁷

Application of the Tax to Alaska

The question to be asked is: Can a value-added tax increase significantly the revenues from multistate corporations and oil and gas?

Even though the tax has only been used in one state, Michigan, there is nothing in the Federal or State laws that would bar a VAT. Under Article IX, Section 1, of the Alaska Constitution, the State can enact a VAT law.

An Alaskan VAT tax would have one fatal flaw if applied to raise tax revenue from the multistate corporations and oil and gas. That fatal flaw is that the VAT is a sales tax. Under current Supreme Court decisions, Alaska cannot apply a sales tax on goods produced here and sold out of the state. The United States Supreme Court has stated:

"...The vice of the statute as applied to receipts from interstate sales is that the tax includes in its measure, without apportionment, receipts derived from activities in interstate commerce; and that the exaction is of such a character that if lawful it may in substance be laid to the fullest extent by States in which the goods are sold as well as those in which they are manufactured. Interstate commerce would thus be subjected to the risk of a double tax burden to which intrastate commerce is not exposed, and which the commerce clause forbids..."⁸

In a 1972 New Mexico case where the state levied on proceeds from contracts entered into outside the state with out of state clients, the U.S. Supreme Court in a unanimous decision stated: "...But a tax levied on the gross receipts from sales of tangible personal property in another state is an impermissible burden on commerce..."⁹

Conclusion

The purpose for which a value-added tax would be enacted is to raise significant tax revenues from multistate corporations and oil and gas.

Because the VAT is a sales tax and under current U.S. Supreme Court decisions the rate cannot be applied to total sales outside Alaska, the VAT would not generate significant additional tax revenues. It is my conclusion that enactment of a VAT tax would serve no useful purpose for the State of Alaska.

Sources

1. Norr and Hornhammer, The Value-Added Tax in Sweden, 70 Columbia Law Review 381 (1970)
2. Gordon T. Butler, The Value-Added Tax; A New \$40 Billion Tax For the United States, 50 Texas Law Review 267 (1972)
3. Michigan Compiled Laws Annotated, Chapter 206, Income Tax Act of 1967
4. Butler, supra
5. Butler, supra
6. Stanley Surrey, Value-added Tax: The Case Against, 48 Harvard Business Review 77-94, Nov.-Dec. 1970
7. Norr, supra; Butler, supra
8. J.D. Adams Mfg. Co. vs Storen, 304 US 307, 82 L.Ed 1365, 58 S.Ct 913.
9. Evco vs Franklin Jones, 459 US 91, 34 L.Ed 2d 325, 93 S.Ct 349 (1972).

ALASKA STATE LEGISLATURE

MEMORANDUM

10/9/75

TO: Senator John Huber, Chairman
Committee on Taxation and Revenue

FROM: Franklin Fleeks
Tax Counsel

SUBJECT: Notes on meeting with Michael Tanzer, Economist

Persons present:

Michael Tanzer, Consultant
Hugh Malone, Chairman of House Finance Committee
Steve Cowper, Member of Committee on Taxation and Revenue
and House Finance Committee
James Rhode, House staff
Norman Bailly, House staff
Franklin Fleeks, Senate staff

The purpose in attending the meeting was twofold. The first was to hear what the consultant, Michael Tanzer, had to say. The second was to exchange ideas, cement relations and to determine that the course being set by the House and Senate was parallel.

The following items were discussed at the meeting.:

Discussion with House Representatives

In prior talks with the House staff, it was found that there was not much support for the Multistate Compact. Since this staff had heard only the Administration's side, which was favorable to the Compact, the House staff was asked to state their objections. Their main objection to the Compact is that it is not a good tool to tax the oil and gas revenues coming to the State. The allocation formula is not adequate to

return to the State its fair share of tax revenue. No objections were voiced to the Compact's validity in taxing other multistate business activity. The House staff as well as this staff believes that the Compact's procedures and enforcement can be strengthened. Both staffs have experienced difficulty in securing hard data on which to base their analysis. It was the consensus that the Agencies have the data but the data is not in an easily accessible form. It was agreed that any data received by the two staffs that might be useful to the other would be shared. This has already been implemented.

The political implications of the proposed tax was also discussed. From the House side it is believed that one large stumbling block will be the Native Regional Corporations. In order to persuade the Native Representatives to go along, it must be anticipated that some form of exemption must be written into the statute. (It must be stressed that this exemption is still very much in the discussion stage.) The type of exemption discussed can be constructed to exclude all Alaskan Corporations and include the multistate corporations.

It was the consensus of the staffs, after this discussion, that we are moving on parallel paths and there is no significant difference in our policies or aims.

Discussion with Michael Tanzer

The meeting with Tanzer was basically to orient him to the situation in Alaska, to let him see the developments himself, to see what additional

information he would need, and to set up a timetable for completion of his work. He stated that his basic approach would be the one set out in his August memo. All assumptions will be weighted to the conservative side to forestall any oil industry argument and, if possible, the data used would come from the oil industry. He will use as his period 20 years; from which he will make three computations.

He was asked to explain his idea of an "excess profits tax". He stated that this was just a label, not a concept. Members of the staffs had constitutional problems with the idea of a state "excess profits tax".

The remaining time was spent dealing with the technical details, i.e. how many computations, what type of format, who would provide what, etc. The timetable agreed on was a final report by December 15, 1975, with an interim report submitted for comment.

Conclusions and Recommendations

Dr. Tanzer is qualified to give an analysis of the oil industry. One of the plus factors is that this analysis will be from a point of view that the legislature has not seen. Even with Tanzer's report going to the House members, I would still recommend that our staff, Ed Sterner in particular, make an in-house analysis. The in-house analysis will provide a comparison to Tanzer's analysis and any other analysis that will be submitted.

Miscellaneous

After meeting with Tanzer, I spent the remainder of the time in Fairbanks looking for data from sources known to me personally. Vic Fischer of

10/9/75

ISGER and his editor Ron Crowe were especially helpful, allowing me full access to their files. Other data, consisting of books, prospectus, statistics, etc. were obtained from my personal sources.

October 6, 1975

TO: Senator John Huber, Chairman
Special Committee on Taxation and Revenue

FROM: Franklin D. Fleeks
Committee Counsel

SUBJECT: Alaska Mineral Severance Tax, SB 294.

This memo is a summary of what has happened up to this date on SB 294. It is submitted for your information.

Review of the letters submitted and testimony at the hearing held on May 9, 1975, reveals that mining industry representatives, municipal utility officials, ancillary industry representatives, and interested individuals were unanimously opposed to the tax. The only testimony in favor of the tax was from the Department of Revenue.

The Department of Revenue Position

The Department of Revenue representatives stated that there is a severance tax on all of the state's renewable and non-renewable resources, oil and gas, timber, fishing, etc., except the "hard" mineral industry. The industry, at present, is taxed through a mining license tax, which is a tax on net income. From Commissioner Gallagher's testimony, the hard mineral industry grossed \$62,000,000 for the 1974 fiscal year. The sources were as follows:

Sand and Gravel	\$42,000,000
Coal	14,000,000
Other	6,000,000
Total	<u>\$62,000,000</u>

From the approximately 200 licenses issued only two paid tax. One from the coal industry and one from the platinum industry. The amount collected brought the state \$30,000 in revenue. The mining license tax is considered ineffective.

The present law is an additional new income tax. The Department considers it a tax on efficient procedures. Their position is that if a graduated severance tax is imposed it will fall on all producers of hard minerals in the State except those who sever less than \$100,000 worth of minerals in a year. SB 294 would serve to tax a non-renewable resource,

extract revenue from those producers who ship out-of-state or to foreign countries, provide easier administration, and would provide additional revenues from a source that other taxes may not be able to touch. Instead of \$30,000 the anticipated revenue is \$3,500,000.

SB 294 is considered prospective because of the low level of hard mineral activity in the State. Passage would allow the hard mineral industry to plan rationally its tax cost if further development takes place.

In answer to criticism that the bill was like the British Columbia Royalty tax, the Department of Revenue stated the following. The B.C. bill is a two step royalty linked to international price for the refined mineral and a Canadian wholesale price index. The royalty is in addition to Federal and provincial taxes and cannot be taken as a deduction in computing the taxes. The proposed mineral severance tax would be deductible on Federal and State Income Tax returns, the effect being that the tax would be paid half by the Federal and State governments and half by the taxpayer.

In talking to John Messenger, Assistant Attorney General, it was sensed that it is still the intent of the Department to go forward with the bill. Attempts will be made to make it more palatable.

Mining Industry Position

From testimony and the letters the industry's position is that passage of SB 294 will discourage current and future exploration for minerals. They consider the mineral severance tax a gross receipts tax and as such it is inherently unfair. They also stated that because the proposed tax would add another cost to the already heavy burden of exploring and developing minerals in Alaska, only those prospects having the greatest potential will be exploited. Marginal deposits would be left untouched.

Ancillary Industry Position

Testimony was given by Jim Dotson of the Alaska Air Carriers Association. He represented the view of the air taxi and air charter firms in the State. A large amount of the revenue of his members is derived from providing support to survey teams, geological teams, and others doing the summer exploration work. He had been informed that just because SB 294 had been proposed, two large summer contracts for 1975 had been cancelled. His position was that passage of SB 294 would seriously reduce the air carriers' revenue with a consequent reduction in air service in the State.

Utilities Position

Letters were received from Fairbanks Municipal Utilities System and Golden Valley Electric Corporation, since they are two of the largest consumers of coal for electric generating purposes. Their position is that the proposed tax would be passed on to them and increase their operating costs. This in turn would lead to a rate increase for their customers.

Native Corporations Position

In our Anchorage staff meeting on September 24, 1975, Representative Anderson gave the Native Corporations' position. He stated that SB 294 would make it more difficult to go to the capital market to obtain funds for exploration and development. He also stated that the proposed bill had caused delays in current negotiations with financial institutions.

It should be noted that the Administration, by Governor Hammond's letter of May 8, 1975, states that further hearings would be held " . . in order to jointly develop a rational tax . . . "

Listed below are the names of the companies and persons who wrote to the Committee.

Mineral Severance Tax Project

Digest of Letters

<u>Date</u>	<u>Correspondent</u>
4/25/75	Dr. Johl Morris
4/17/75	Perry, Knox, Kaufman Inc. M.A. Kaufman
4/30/75	Cominco American J.C. MacLean
4/11/75	Rodney A. Blokestad
4/10/75	U.S. Borax J.E. Stephens
4/18/75	Heflinger Mining & Equipment Company Carl F. Heflinger
4/12/75	Eagle Creek Lodge Don Bennett
4/8/75	GVEA R.L. Huffman
4/4/75	Alaska Miners Association - Fairbanks Branch Mark Ringstad
4/11/75	MUS Robert Hanson
5/5/75	John E. Clark
5/6/75	Ketchkian Pulp Company Edward W. Borger, Sr.
5/6/75	Alaska Gold Company W.A. Glovinovich
5/19/75	C.C. Hawley & Association W.E. Shoemaker

ALASKA STATE LEGISLATURE

MEMORANDUM

September 23, 1975

TO: Senator John Huber, Chairman
Committee on Taxation

FROM: Ed Sterner, Research *ES*
Committee on Taxation

SUBJECT: Multistate Tax Compact

The basic concern over the Multistate Tax Compact is that the allocation formula for corporate net income would result in little or no oil (and other multistate corporate) income being allocated to Alaska. It appears that this is not the case if the allocation regulations are properly implemented.

THE PROPERTY FACTOR: Both the Compact and the implementing regulations specify that oil reserves should be included in the property factor, not just capital improvements. This would ensure that Alaska's oil reserves are represented in the allocation of oil net income.

THE SALES FACTOR: The Compact is also clear that the sale of Alaska's oil, even if it actually occurs elsewhere, should be allocated to Alaska. The implementing regulations also strongly suggest this point. However, slight word changes or additions might help clear up any doubt. The allocation of Alaska oil sales to Alaska would also help ensure that Alaskan interests are properly represented in the allocation of oil corporation net income.

THE CORRECTION FACTOR: Finally, if the allocation formula still does not represent the role of Alaskan oil (or other resources) in the oil industry, then Article IV. 18. allows for either the exclusion of factors in the formula, or the inclusion of new factors, or an entirely different method of allocation if necessary.

At its peak, Alaska oil will very likely be supplying 10% of the nation's oil (1.8 - 2 M barrels per day out of 18 - 20 M barrels per day). It is possible that Alaska oil will represent more than 10% of the owned or leased reserves of most oil corporations since oil outside North America

and Western Europe is generally nationalized. Assuming the crude oil price is only half the price of refined oil, oil reserves are only half the capital worth of the oil industry (both are very conservative estimates), and the salary factor is basically zero, Alaska would still get a large part of oil corporation's net income.

0% = salary factor
5% = property factor
5% = sales factor

$$\frac{0 + .05 + .05}{3} = \frac{.10}{3} = 3 \frac{1}{3}\%$$

It should be remembered that this would be 3.3% of corporation net income after royalties, ad valorem, and severance taxes are paid.

In short, the Multistate Tax Compact, if used properly, should work to the advantage of Alaska. In 1973, only 3 of 10 oil producers in the state paid corporate net income taxes. I cannot envision this happening again if the Compact is properly implemented by Alaska. I would hope to determine in the next few weeks what effort the Department of Revenue is making to assure that the allocation formulas are being applied fairly to Alaska.

MEMORANDUM

September 23, 1975

TO: Senator John Huber, Chairman
Committee on Taxation

FROM: Terry Berman, Assistant
Committee on Taxation

SUBJECT: Scope of work

The staff met to discuss the scope of our work. It was agreed that we look at the areas suggested by the letter of Senator Croft to Governor Hammond, dated January 24, 1975.

These are:

- 1) The corporate tax structure.
- 2) The corporate tax structure of the oil industry with particular emphasis on such things as percentage depletion allowance and investment tax credit.
- 3) The advantages and disadvantages of taxation of oil in place by elimination of the present exemption.
- 4) Possible revision of the severance tax law in light of increasing oil prices.
- 5) The difference between rates of taxation of oil and of gas.
- 6) Such other matters relating to taxation of the oil and gas industry in particular, and taxation in general, as it deems advisable.

At present, we would like to concentrate on the more general areas of taxation, particularly the corporate tax structure, leaving the taxation problems of specific industries to a later time. In this way, we hope to form a base from which to attack the more complex areas such as oil and gas.

Specifically, the staff will be looking at fitting resources into the income tax structure. Ed Sterner is examining the Multistate Tax Compact. Frank Fleeks intends to review corporate income tax structure by researching the statutes of other states. He will also write a set of definitions of the various taxes so that we can have a standard guide.

page 2

Memo to Senator Huber

From Berman

I will be assisting Frank with his research and Ed with data analysis, taking charge of any programming that may be necessary. When they have finished their tasks, I will edit the reports and submit them to you.

AGO 513524

ALASKA STATE LEGISLATURE

MEMORANDUM

September 19, 1975

TO: Senator John Huber, Chairman
Subcommittee on Taxation and Revenue

FROM: Staff
Subcommittee on Taxation and Revenue *im*

SUBJECT: Letter from Representative Nels Anderson, Jr., Chairman
House Resources Committee, dated August 1, 1975

In his letter, Representative Anderson requested the subcommittee to make three studies: 1) Study and evaluate the canned salmon industry to determine possible additional tax, 2) A study to determine what a fair and reasonable price per pound is for Alaska's salmon resource, and 3) A study to determine if the scales used for weighing salmon should be changed to another type.

It is the consensus of the staff that only the first requested study is within the mandate of the subcommittee. The second requested study can be better handled by the Department of Fish and Game, Commercial Fisheries Division. The third requested study should be referred to the Department of Commerce, Weights and Measures Section, as they have the primary responsibility for inspection and certification of scales used in commercial transactions, which includes the fishing industry.

Attached is a draft copy of a reply to Representative Anderson for your review.

ALASKA
STATE LEGISLATURE

MEMORANDUM

September 18, 1975

TO: Senator John Huber, Chairman
Sub-committee on Taxation and Revenue

FROM: Frank Fleeks *af. Fleeks*
Tax Counsel for Sub-committee

SUBJECT: Meeting with officials of the Department of Revenue

The committee staff met with Fred Boetch, Deputy Commissioner of Revenue, and Gary Jenkins, Director of Audit. The purpose of the meeting was to establish lines of communications with the Department of Revenue. The discussion was general in nature with the committee staff members and the Revenue representatives giving a generalized view of what problems lay ahead.

The Revenue representatives promised complete cooperation in the obtaining of staff reports and other necessary data which they might have in their files. It was a short but fruitful session.

A Talk with Dick Krigore of Levy Associates
in New York

7/29/75

Senator Huber, Senator Colletta, Judy Whitney-Assistant to Representative Bradner.

Levy Associates has said, for many years now, that you people in Alaska should be reviewing very carefully the corporate income tax because we can see, just off the top of our heads a number of problems with the way it is structured now. Whether that will get you an appropriate amount of income from Prudoe Bay we don't know but it should.

We have no lawyers on the staff here, so we can not address ourselves to the legal questions involved. We hope to make a real contribution through our knowledge of the oil industry and how various ways of apportioning, etc. may work for the oil and how much you may get out of it by taking various approaches to the Corporate Income Tax. Perhaps we can have some interchange with legal people who can answer some of the legal questions.

We have been following what is happening in Alaska and notice that the Department of Revenue has taken some steps to try to get more out of the Corporate Income Tax. They have noticed that a lot of corporations are accounting on a real line basis and showing losses on their operations in Alaska and therefore paying no Corporate Income Tax at the present time.

Formula Apportionment Basis. Really what you end up doing is that you get relatively little in the way of Corporate Income Taxes. Interstate Compact, COP ACT, Uniform Division Act, with its 3 formula thing takes

the percentage of sales, property and payment in Alaska of the company's operation and then apportions the income to Alaska. Looking at the whole thing, it is unfortunate, but, that method turns out to be a very inappropriate kind of device for apportioning income to Alaska especially with Alaska having oil for leasing operations. Almost every factor really doesn't work.

I do not know how you people have looked at this or what knowledge you have of it, but... Looking at it briefly.

A lot of what I am going to give you is tentative but this is very clear to us, that there are so many problems in using such a formula in this case that it is not appropriate.

PROBLEMS AND THEN AVENUES FOR GETTING AROUND THIS. We have just gotten the materials on what other states are doing and are still thinking it through and seeing what other states are doing in this area and how they have come to grips with this thing. We are really just getting started in this area.

1) Sales factor. When looking at the oil producing operations, you find out that very little crude oil production is sold in Alaska. Most of it results in integrated operations and therefore there is no sale in Alaska. It actually goes to an affiliate refinery down in California or wherever it may be. So you end up with the sales part of this being zero. There are virtually no sales. (Noticed that your own Revenue people assume in their own projections of what you are going to get out the Corporate Income Tax that you are going to get 0% on sales from Prudhoe Bay, also. No sale just a transfer.)

Senator Huber and Mr. Killgore agreed that Alaska is unique in several ways and almost has to be looked at as a foreign country rather than just another state.

So sales is almost completely knocked out of the formula but you are still dividing by three. Utterly disastrous for Alaska. You need the sales factor.

2) Payroll factor. Almost as bad because what we are talking about is income from oil production and there are really very few people involved. Once we get through with Alyeska there ought to be none. When the real production starts it takes very few people to keep the whole production operation going. The big employment in the oil industry is in what? refinery? Actually no, it is in marketing, home office, distribution, and this kind of thing. Employment in Alaska in all these areas as compared to elsewhere is going to be very small, meaning there will be a very very small percentage of the employment in Alaska. Yet, the profit in the future will be very big. So you have to have a formula that does not involve people or payroll or you will only get a very small portion of income allocated that way, but the income will really be generated from the oil production. The payroll factor is very very small. .

Department of Revenue says .08% on payrolls..

We have been trying to build up sort of a hypothetical oil company model that will be something on the scale of ARCO to show what they have outside Alaska and what they have inside and so forth.

Colletta would like to see this done with Sohio.

AGO 513529

Huber: Have you looked to see how the particular relationships between the companies and the pipeline itself enhances or further degrades us under the Interstate Compact Act?

Killgore: No we have not because of the way they operate. They may not be direct employees but rather employees of contractors with the apparent companies. We haven't looked into it but have notes on it and it is a potential problem. They just use contractors and for the other people that are not on the payrolls that is a problem.. I still think that if you looked at all the employees that are not directly on the payrolls you would still come up with only a very small ratio so it really doesn't help very much.

3) Property factor.. Probably the best way of the three but it still is not the solution. If you look at the oil exploration producing operations what you find is a lot of losses all over the place. One drills dry holes endlessly so there are a lot of expenses that are completely unproductive and are not put into the property accounts of the oil companies; they are just written off as losses. So looking at what gets left in those successful producing adventures such as Prudhoe Bay, and even with the very high costs involved you just don't have that much money actually spent. You still get a relatively small fraction because they have tremendous amounts of money invested in mining all over the place. There is an incredible amount of money spent in marketing. You wouldn't believe the amount of money spent on gasoline station sites alone, and so on.

What you get are three factors, none of which are really good factors for income to Alaska.

Sales are virtually zero, payrolls you can hardly see, and property which is somewhat better but still by our own figures nowhere near the percentage of income that you would really allocate to Alaska if you did it on oil in place.

Department of Revenue. 12% on the property tax, .08% on payrolls, 0% on sales. Two of which you can not see, dividing by 3 and you end up with 4%. That is 4% of the company's total taxable income allocated to Alaska.

Preliminary numbers. Direct allocation. 1/3 of their net income being on oil production. Looking at where they may be when Prudhoe Bay production comes in, looking at their other operations and then looking at Alaska. The apportionment formula your own people would say 4% but on a generous basis it might come out to be 10%. (33% against 10%).

It is very clear that because of the nature of oil producing operations in Alaska that this formula is really inappropriate. You will end up way below what really is the profitability of oil production.

Huber: Donaldson of Sohio said that they own 52% of the North Slope Reserves and as such are a larger sharer in the pipeline than most.

B.P. remains the prime lease holder. They just sold their production. Very complicated. B.P. gets a certain percentage of production after a certain point.

Huber: In some of the definitions we put out. Any portion of the ABC plan is taxable as an interest. Just wonder if that right to purchase the gas reserves is covered.

I would be inclined to suspect that Sohio would not fit under that.

Huber: The conclusion is that Alaska needs to find a way to tax oil producers in the State of Alaska based upon the profitability of their Alaska operations the same as though they were an Alaska corporation doing the producing, selling, or whatever it is.

What is a fair share? In effect it is around 9% of what really is producing profit in Alaska.

Most obvious and what we have always thought of is, would be some sort of direct allocation scheme. It would appear, if you look at the law, (I don't have the Alaska Statutes but I have asked for it) and I am sure that you have it also - Uniform Division. This would imply that you could ask the administrator to keep reasonable various kinds of things like separate accounting, and other factors that you would need.

Must get at what the producing revenues are. Without worrying about the legalities and whether this could be done. Look at Prudhoe Bay production and what the individual company's production is and price it out that way and call it the revenue being generated from production. The pipeline should be separate accounting and you should deal with that as another tax issue.

Real question of how to handle the allocation of profit. May be a problem for the state. A lot of pretty serious questions on cost allocation.

Losses that companies have sustained in prior periods. How do you handle that? They have been making investments, drilling dry holes,

have intangible costs on drilling development at least for Federal Income tax purposes. They have been running losses and the question is how do you handle the carriage forward of this things.

Overhead. Things done for production in Alaska are done in Huston, Texas which adds another serious problem of how do you directly allocate those things. The more we think of these things the more we see potential problems.

In other states (and a reason why we try to look at what other states are doing) there seem to be provisions where one allocates costs on bases of revenue or something of that sort. Perhaps you can get around this by some simple formulas which would be reasonably acceptable and would give you a half way decent allocation of costs associated with the Alaska operation which really take place somewhere else and are really appropriate to charge against the Alaska cost.

Huber: Are you familiar with an income type taxation by any other producing countries?

Vertually every country has an income tax but in many countries the income tax and royalty tax distiction has a blur. Back in the old days where there was a 50%/50% royalty and income tax they were in a position to be rather arbitray about it. They said that the revenue was the posted price. That has changed but that is not our situation as we have the Constitution, Interstate Compact, etc.

Huber: Is there a way that we can get out of the Interstate Compact?

Yes, it is my undertand that you can get out of it. This is the kind of question that legal people in Alaska should be looking at. Dont rely on us for this kind of thing. Milton asked the Department of Revenue people when he was in Alaska and they said that yes you could get out.

Direct allocation. There are very clearly serious administrative problems. These can not be minimized, but perhaps it can still be done.

On the revenue side it would appear straight forward. One could just say that production times whatever the posted price is in Prudhoe Bay but the legal question you have to ask is, "Does that cause any future problem with any other state?" The companies are going to feel that they are being double taxed on sales. Here and in California there is a potential legal problem.

If you go "value added" and another state does apportionment based on total revenue which does not exclude the cost of coming in there is a potential problem. Maybe not.

The payroll factor would really be appropriate to the state of Texas because the oil companies have substantial payrolls in Huston and Dallas. The apportionment method would be good for them but Texas does not have a corporate income tax.

Cost allocation is not just a simple thing. Many different things have to be considered; however in concept it is the way to go.

Huber said that he will be sure that Levy Associates gets all the material that his committee works up that would relate to what they are doing.

Colletta: Asked some questions but he was too far from the microphone to pick up the questions, but basically he was concerned that Alaska be able to run Prudhoe gas off the big pipeline that goes to the Cordova area. There will be no way that we will be able to take any of the gas unless the company wants us to. There is a direct distiction. You can enter into any kind of contact that you want to with one exception that there will be no break in the area of regulation by Federal power.

Louisana had to run a small line along side the large line to get by those regulations.

Huber: New pipeline committee with W. Bowman, chairman, is to find out all that is effected by the pipeline and that gas must be available to Alaska. There was discussion on how to protect gas for Alaskans and it was decided that this area will not be over looked, by the above mentioned committee nor any other group.

Colletta: If there are too many complications we could in the lease ask them to lay a small line along side the large one (pipe at our expense)

Kilgore agreed to furnish the committee with material on CH₄ and CH₃OH which he has. (Methol alcohol and methol burned instead of gasoline).

We will be looking at what other countries (non-Arab) are doing along with what other states are doing.

Discussed Witherspoons study.

Direct allocation a fair way of doing it as long as the practical and legal problems are not so overwhelming. Other alternatives would have to be taken if there are legal problems, so we should not be concentrating all of our efforts in this one area.

If Alaska's law is like these others, I don't know why the Dept of Revenue went along with Sales, payroll and property as the three factors. One or two of them could be substituted for other factors that do relate, fairly. We are trying to think of other factors to modify the plan. Maybe "crude production" should be one of the factors..

Huber: Did you receive any of the materials that Bill Macguire had gotten on the taxes in the Cook Inlet? Do write to him for them.

We are looking at other states and so far it does not look like any other state has gone this direct route but then none of them have the problem at the scale that you do.

Huber: Milton informed me that you were working on a formula to be sure that Alaska received her full share in the Corp Income Tax.

Failing all else Alaska could go the Severance Tax route, but that would only be if other formulas can not be worked out.

Huber: The income tax should be our largest source of income so we will have to find a way to change the law so that it can be beefed up.

I agree that we must find a way of using the Corp Income Tax.

SCOMM

11:3

TO: Senate President Chancey Croft
FROM: John Huber, Chairman
Senate Special Committee on Taxation and Revenue
DATE: February 21, 1975
SUBJECT: Report on First Meeting with Milton Lipton on February 12, 1975

I am enclosing a copy of the transcript of the Senate Special Committee on Taxation and Revenue's first meeting with Milton Lipton on February 12, 1975. We feel that the contents should be of interest to all members of the Legislature and suggest that it be printed in the Journal as a means of making it available to all legislators as well as those people who have requested transcripts.

A transcript of our second meeting is in progress and will be available as soon as it is finished.

Sincerely yours,

John Huber, Chairman
Senate Special Committee on
Taxation and Revenue

JH: kb
Enclosure

May 31, 1975

Senator Chancy Croft
President of the Senate
Capitol Building
Juneau, Alaska 99811

Dear Chancy:

Attached is a letter from Bruce Kendall, Speaker of the Alaska State House of Representatives in 1963 and 1964, prepared in Journal form.

Due to the universal interest in the subject of oil and gas ad valorem taxation, I respectfully request that it be printed in the Senate Journal Supplement.

Sincerely yours,

John Huber

JH:kb
Attachment

May 12, 1975

Senator Chancy Croft
President of the Senate
Alaska State Legislature
Pouch V
Juneau, Alaska 99811

Dear Chancy:

Enclosed is a letter from Robert Paschall, Consulting Valuation Geologist
& Engineer, concerning HB 297.

Due to the universal interest of the subject matter, I request that it be
printed in the Journal Supplement.

Sincerely yours,

John Huber

JH:kb

Enclosure

AGU 513539