OIL CARGO PREFERENCE LEGISLATION: ITS POTENTIAL IMPACT ON NEW ENGLAND

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Working Paper No. MIT-EL-77-012WP

May 1977

INTRODUCTION

On January 6, 1977 Bill HR(1037), most commonly referred to as the Oil Cargo Preference Bill or the Energy Transportation Security Act of 1977, was introduced to the U.S. House of Representatives. The bill would initially require that the Secretary of Commerce insure that 20% of the gross tonnage of all oil imports transported in bulk on ocean vessels be carried on U.S. flag vessels. After June 30, 1978 the quantity would increase to 25%. A further increase to 30% would be required after June 30, 1980.

Under the bill the term "oil" includes: crude oil and the following products: unfinished fuels, gasoline, kerosene, aviation fuels, naptha, cracking stocks, distillate heating oil, diesel oil, and residual oils.[1]

Currently, the United States is transporting approximately 4% of its imported oil on its own flagships. This study has been undertaken to determine an estimate of the short term price impact of oil cargo preference legislation on the New England consumer and the short term economic impact on New England as a region that is heavily dependent on foreign oil. [90% of all energy used in the region is petroleum based and 70% of the petroleum and petroleum products are imported].[2]

Other similar legislation has been concurrently proposed in Congress that would provide for a wide range of revisions in current policy and regulations governing the shipping and transportation of oil and other commodities into the United States.[3]

Some of the provisions of this additional legislation would 1). require retrofitting of existing tankers to meet stricter safety and operating standards; 2). require all vessels using U.S. ports to have double hulls and bottoms; 3). require minimum vessel construction, operating and equipment standards, as well as require personnel training standards to be applicable to foreign and U.S. flagships using U.S. ports; and 4). provide for intense, continuous monitoring of shipping within the 200 - mile jurisdictional limit established off U.S. coastlines.[4]

To accomplish the analysis of HR(1037) and its potential effects, this study will provide 1). estimated probable price increases (per barrel) that could result and 2). a short-term economic impact analysis by sector and state reflecting the various possible price increases. The long-term implications of oil cargo preference are not analyzed here, rather, the intent of this study is to offer timely and useful impact data to the consumer, the policymaker, and the other components that would be affected by this legislation. Some of the longer-term considerations are, however, discussed in Section V.

SECTION I - PRICE DETERMINATION AND ANALYSIS

Two facts are recognized in the general scope of this analysis. The first is that shipping costs are and have historically been appreciably greater for U.S. tankers than for equivalent foreign vessels. The reasons for these higher costs are due primarily to higher component costs (e.g., operating costs, personnel costs, building and maintenance costs, investment costs).[5] Appendix A and C provide examples of more specific descriptions of operating cost determination.

Accordingly, the second fact is that any increase in U.S. shipping involvement in oil imports would correspondingly increase the per-barrel cost of the oil shipped on U.S. ships, a price increase that would be relatively distributed to all oil imported to the United States.

Currently, the average price differential between a barrel of oil shipped via an American vessel and a foreign tanker is approximately $2.00/bbl.[6] This figure is derived from single voyage charter rates (or spot rates) and reflects the average differential of rates on oil shipped from the Middle East as well as voyages from the Caribbean to the U.S. east coast. The estimation of the price differential is key to the analysis of the impact such legislation may have and further serves as a mechanism for analyzing marginal price impact on the energy user.

This study proposes four different scenarios and correspondingly four different price differentials that we feel could materialize if this legislation is enacted and implemented.

The first differential price increase used here has been suggested by the American Petroleum Institute in its survey and analysis of cargo preference legislation.[7] The API study relies heavily on projected shipping and shipbuilding data to estimate costs for importing oil during the period covered by the legislation (1978-1990). Appendix B demonstrates the API approach and provides their cost and projected cost data through 1990. Essentially, the API study compares the cost for U.S. ships and shipbuilding to costs for foreign ships and shipbuilding and calculated import costs that were then applied to all foreign-source oil imported to derive a $/barrel cost. The API analysis projects an increased price differential by 1978 of $1.11/bbl. on oil imported solely on U.S. ships. Under the proposed shipping percentage of 22.5%, this estimate would average 25¢/bbl. on all imported oil.[8]

The second price differential used in this study is provided by the data submitted by the American Maritime Association. The calculations cost determination methods used by the AMA are essentially the same as the API calculations, which consider capital costs, fixed costs, operating and estimated annual operating costs for both U.S. and foreign vessels. Their estimate takes into account a weighted average cost for imports as would be reflected in the price fixed for entitlements under FEA regulation, thus the cost will enter into the importer's domestic price; with the additional cost will be spread across the whole spectrum of American consumption.[9]

The third scenario for estimating a likely price increase and differential is determined by the transportation rates in the current market and on the premise that these rates will remain relatively constant and justifiable at the time of passage of cargo preference.

As mentioned earlier, this average differential is currently approximately $2.00/bbl. on U.S. transported oil and has remained relatively constant since January 1977. Under the proposed shipping percentage of 22.5% this estimated increase would average 45¢/bbl.

A fourth scenario for estimating a likely price increase is promulgated on the notion that as the transition to cargo preference develops, the average cost of shipping imported oil on U.S. tankers will "float" to that rate which is the highest rate being charged by any one U.S. vessel at the time of enactment. If, hypothetically, the bill were passed immediately, that price could be as high as $2.80/bbl., which is the spot rate recently received by the Thomas M., a 28,000 DWT American vessel carrying oil from the U.S. Gulf to the U.S. east coast, north of Cape Hatteras.[10] When compared to current average foreign import cost of 50¢/bbl. this renders a differential of $2.30/bbl. (.52¢/bbl. at 22.5%).

In addition to the American Maritime Association and API studies, other studies of this bill are currently underway to provide evidence to the House Merchant Marine & Fisheries Committee. These include studies by the National Maritime Union of America, AFL-CIO and the Transportation Institute.[11] It is our opinion, however, that the data generated from the sources mentioned in our study reflect the range of most likely possibilities and in subsequent sections we take each of these and determine the impact.

Scenario	Differential per Barrel	
	U.S. Transported Oil Only	All Oil @ 22.5% Proposed 1978 Level
American Maritime Association	.95	.21
American Petroleum Institute	1.11	.25
Present Average Differential	2.00	.45
Present High Differential	2.30	.52

Projected Price Differential of Oil Shipped under HR(1037) Over Oil Shipped in Free Market Used in this Study.

SECTION II - METHODOLOGY OF SHORT-TERM ANALYSIS

For this short term analysis we were able to utilize the ISEC (Interactive Sectorial Energy Consumption) model.[12,13,14.] Essentially, the model is able to take the price increases per barrel of oil and, using ADL's coefficients, determine by sector and by state the net effect of those price increases. The model assumes no demand elasticities, however, as the incremental price increases are so slight (21¢-52¢ additional cost on a barrel of oil at $13.00) it will be assumed for the purposes of this analysis that any impact on demand will be negligible. As the model was designed to accept as input tariff or OPEC price increases, the following procedure was implemented in order to arrive at a realistic method of converting transportation cost increases per barrel of oil to a price increase that could be readily entered for processing on the ISEC modeling facility:

Step 1) Select price differentials to be utilized for the analysis (see Section 1)

Step 2) Define the increments of the increased U.S. flagship involvement (e.g., 20% initial, 22.5% by 1978, 25% after 1978, 30% after 1980, etc.)

Step 3) Determine the percentage mix of foreign and domestic oil shipped to New England

Step 4) Determine the effect of additional fixed and variable costs (e.g., annual inflation rate, projected annual oil price increase, if any)[15]

Step 5) Formulate mode of input based on above criteria

Steps 1 and 2 of the preceding methodology have been identified in the previous section. Step 3 (the percentage mix of foreign and domestic oil shipped to New England) has been estimated as a 70:30 ratio foreign: domestic sources.[16] The foreign oil includes crude oil, refined products, oil shipped directly from foreign sites as well as crude oil transported from foreign producers to domestic refineries for refining and eventual distribution to New England ports. The domestic oil referred to here includes oil which is stored either in New England ports or domestic oil trans-shipped from another domestic port to New England. The user of the ISEC model, for example, has five alternative inputs from which to choose: 1) OPEC increase, 2) crude oil tariff increase, 3) product tariff increase, 4) FEA old domestic oil decontrol data, and 5) FEA price tilt regulation data. The last two elements are not utilized here due to the specific situations in which they are applied (e.g., decontrol affects only domestic oil and price distribution (entitlements), regulations are currently being revised by FEA and are dependent on domestic pricing policies). The tariff increases would be difficult to utilize on the basis of the different methods of tariff application and the many exceptions to tariff assessment which are allowable under the Oil Import Regulations.[17] Either of these criteria, however, could be quickly included in a future analysis of this nature to further expand the spectrum of possible events if the legislation passes.

The most expedient and efficient data input mechanism, therefore, was to translate the transportation cost per barrel increase into a corresponding OPEC price increase category.

The reasons for this selection are many. Foreign crude oil prices are based on the price of the MARKER CRUDE, which is Arabian Light, 34° API. This price is set by OPEC and is, in actuality, the basis on which all other foreign crude oils are priced.[18] As of January, 1977 when OPEC raised the price of crude , the price of Arabian Light was $12.09/bbl. The average price per barrel from the Persian Gulf was $12.44/bbl.[19]

If OPEC raises its price of oil, this price increase would be reflected in the composite foreign market and, as such, the average price of foreign oil should rise correspondingly. It will also be assumed for the purpose of the analysis that an equivalent average increase in domestic oil prices will occur as a result of an OPEC-generated increase.

The following additional assumption is built into the ISEC model: the changes in price of gasoline, distillate, and residual oil in New England will be a weighted average which reflects the proportion of products from the following sources:

- imported crude oil
- imported refined product
- old domestic oil
- new domestic oil

See Appendix D for the ADL Product Sources Table which demonstrates the above assumption.

By using the ISEC model we are now able to equate on a one-for-one basis an average transporation increase of foreign oil with an average OPEC price increase of oil. Each price differential was input on the model which then generated direct impact output data for New England as a region, each New England state, and for each of the sectors of the New England economy

(commercial, industrial, residential, and transportation). As our primary concern is the immediate direct impact, the output series in this short-term analysis represents 1) the AMA, 2) the API price differential for 1978, 3) the current market price differential, and 4) the shipping industry's market price differential based on the rate determination hypothesis described in Section 1.

SECTION III - RESULTS

The results obtained in our analysis are contained in computer output form in Appendices E-H and are categorically segregated by region, state, and sectors, reflecting each of the proposed price increases. For the commercial, industrial and residential sectors a breakout is given for product source and demonstrates the varying costs of distillate (heating fuel oil), residual fuel oil and the cost of oil used in generating electricity.

These results are aggregated by states for each of the most likely price differentials in the table below. From this data a total direct impact is given for the state and region for each price increase. It is noted that Massachusetts alone consumes 58% of petroleum and petroleum products consumed in New England and would pay an additional $31 million to $76 million under the legislation by 1978 alone.

	#1	#2	#3	#4
REGION	.21/bbl.	.25/bbl.	.45/bbl.	.52/bbl.
New England	53,595,240	74,116,836	133,410,305	154,163,021
STATES				
Massachusetts	31,076,109	36,964,773	66,536,592	76,886,730
Maine	12,590,059	8,538,130	15,368,635	17,759,314
New Hampshire	10,216,882	5,193,966	9,349,138	10,803,448
Vermont	8,370,710	2,493,281	4,487,905	5,186,023
Connecticut	15,923,045	15,415,830	27,748,495	32,064,926
Rhode Island	10,499,271	5,510,855	9,919,539	11,462,579

SECTION IV - CONCLUSION OF SHORT-TERM ANALYSIS

Caution should be exercised in interpreting the results of this short term analysis as other factors could greatly affect the price implementation and impact. For example, given the wide swings of which the world tanker market is capable and the explosive nature of the tanker rates, any attempt to provide a highly accurate prediction of future transportation costs will suffer some degree of uncertainty and risk.[20] This analysis has utilized four specific cost increases (some of which were proposed by others) which are felt to represent reasonable possibilities. The study has then taken these projected cost increases and determined the potential impact on the New England energy user in the short run scheme.

In summary, our use of the most likely estimates of transportation costs indicate that the initial direct impact of cargo preference legislation, if adopted, could range from $54,000,000 (using American Maritime's transportation costs) to $154,000.00 (using the present 1977 high prices) in additional energy costs for New England. These estimated short term costs could, however, be greatly modified by the long term impacts discussed in Section 5 and the results should therefore be interpreted and utilized with this in mind.

SECTION V - BRIEF DISCUSSION OF LONG-TERM ISSUES

As mentioned previously, this analysis focused primarily on the immediate and short-run impact of oil cargo preference legislation and did not attempt to assess the possible longer-term issues that, although extremely important for consideration prior to the passage of such legislation, are not readily quantifiable at this time. Some of these longer-term issues are now briefly discussed here.

1) Environmental Impact of Such Legislation. Studies have demonstrated that the greatest proportion of tanker losses (normalized for tonnage and the number of ships) and resulting oil spills have involved foreign vessels. Appendix I demonstrates the tanker accident track record of fifteen countries from 1964-1976.[21] Some proponents, therefore, argue that with increased U.S. participation in the shipping of its own oil the probability of future severe oil spills on the U.S. coastline will be greatly diminished.

This same study indicated that the higher percentage of tankers involved in losses were older than 10 years. This fact suggests an interesting phenomenon, however, when reviewed in the context of the total world tanker age picture as demonstrated in Appendix J. Further analysis suggests that there may not, in fact, be a strong positive correlation between tanker age and accident incidence. Three of the six leading countries with loss rates greater than 50% have fleets in which at least half of the ships are younger than 9 years (Italy, 72%; Greece, 50%; Liberia, 70%). Given this situation, it becomes apparent that other factors must strongly affect the causes of tanker accidents namely operation methods, safety features, training of personnel and construction standards, etc.

Although the U.S. demonstrates a reasonably admirable track record for tanker accidents, a significant percentage of its fleet is over 20 years of age (see Appendix J). Nevertheless, to satisfy the increased shipping capability as would be required by cargo preference, and to meet the revised safety and construction standards that would likely be imposed by this and/or similar legislation, the U.S. would be faced with having to re-evaluate the condition of its shipping fleet and its ability to transport oil and other commodities under the safest and most modern conditions possible. This may require extensive revitalization and/or scrapping of these older tankers, thus creating additional transition costs which would be brought to bear on the oil consumer.

2) The Effect of Increased Shipbuilding in the U.S. and New England. Currently, the United States shipyards are producing at near maximum capacity, with orders on file well into 1980.[22] While this productivity is apparently beneficial to the economy, any full-scale increase in activity to accommodate cargo preference requirements may well pose a practical improbability to the shipbuilding industry. Additionally, the possibility of retrofitting and renovating tankers (currently not engaged in the transportation of oil or oil products) for inclusion in the U.S. oil-carrying fleet would require added manpower and expense. Yet, the world shipbuilding industry is under-utilized. Hence, there could be a duplication of capacity in the world and the creation of strained relations with countries with excess capacity. It could also be very difficult to attract capital to support this additional building and retrofitting in a market which is already extremely supply-heavy.

U.S. shipbuilders generally maintain contracts to build a significant number of vessels for foreign countries and shippers as well as for U.S. companies. A good deal of legal and regulatory supervision could result in attempting to determine whether this transition would result in possible governmental regulation of contracts to build vessels for inclusion into the U.S. tanker fleet. Both the negative and the positive aspects of these issues must be carefully weighed.

3) The Effect on Employment. Consistent with increased demand for shipbuilding as would be required with cargo preference, it would be reasonable to assume a substantial rise in employment in the shipbuilding and marine industry, and in supporting industries (e.g., steel manufacturing, rubber manufacturing, metals and other related manufacturing). It has been suggested, however, that the reverse could occur, namely that any significant rise in the price of oil as a result of cargo preference would have serious inflationary and employment consequences.[23] API argues that the additional $5.5 billion cost that it feels would result with the eventual 30% cargo preference would be charged as an additional $5.5 billion in the costs of goods and services that the American consumer could not spend for other goods and services. Thus, API suggests the real Gross National Product (GNP) is lowered by this amount. In their opinion this would result in a reduction of about 284,000 jobs spread throughout the economy (See Appendix K for their formula for calculating jobs lost).

4) The Domestic and International Shipping and Transportation Industry. Should the U.S. increase its own oil-carrying capacity to 30%, an already imbalanced world tanker market could be further strained by the addition of more U.S. tankers. (See Appendix L for further general information regarding the tanker market). The following chart demonstrates the world tanker supply/demand imbalance and the projected supply/demand from 1977-1989.[24]

Millions Tons DWT	1977	1978	1979	1980
Supply	267	277	281	276
Demand	208	225	245	263
Surplus	59	52	36	13

However, even optimistically, it will be at least well into 1980 before this trend begins to level off. To relieve this predicament, many countries have resorted to voluntary dry-docking and stockpiling of tankers.

Shipbuilding in the world markets has declined drastically due to the tanker surplus. Orders in 1/75 stood at 170 million DWT; by 6/76 orders were reduced to 50-60 million DWT.[25] The U.S. would well consider the impact of committing additional tankers to an existing crisis situation. With the anticipated transition to cargo preference, another consideration emerges and would be of interest to the long range analyst. A significant proportion of world tanker trade is conducted on vessels which fly "flags of convenience". Liberia has taken the lead in world tanker tonnage (see Appendix F), however, this tonnage group is largely owned by American and Greek companies. The owners register their ships under PANHOLIB (Panama,

Honduras, Liberia) flags of convenience and have been able to speed the rate of ship acquisition through capital accumulated from untaxed profits and in the case of American nationals, they have obtained the additional advantages of lower crew costs compared with the high wages ruling on American flag vessels. About 15% of world merchant tonnage operate this way and present formidable competition to strictly national shipping companies subject to higher taxes and more stringent laws regarding manning and safety requirements.[26] Should cargo preference be enacted, a certain portion of these companies' current comparative shipping and operating advantages could be diminished, possibly resulting in an additional transportation cost to the companies which would likely be passed to the consumer.

6) Impact on U.S. Foreign Policy. As a consequence of any of these considerations, the resultant implications on U.S. foreign policy and foreign relations may become critical. The extent of this impact and the problems therein can only be speculated. However, the long-run costs and benefits of such legislation would need to be carefully evaluated to include all these variables.

7) Possible OPEC Cargo Preference and Price Imitation. It has been suggested[27] that with the advent of U.S. oil cargo preference, other oil producing countries would choose to impose cargo preference on oil exported from their countries. Such imitation could also cause an increase in the cost of foreign transportation of oil and oil products, a cost that again, would be absorbed by the consumer.[28]

8) World Oil Pricing Strategy. Any or all of these factors could exert additional pressure on world oil-pricing mechanisms by oil-exporting countries, who in an attempt to counter potential losses in the tanker market, might increase oil prices equivalently.

9) Possible Conflict with Other U.S. Oil Transportation. If Oil Cargo Preference were to become a reality, even to the point of transporting oil at any rate greater than what is currently being shipped on U.S. vessels(4%), it could seriously conflict with other pending commitments for U.S. tankers. American tankers will be required to move Alaskan oil and will also be utilized in building the strategic petroleum reserve of 1 billion bbl., a program that already requires that 50% of the oil be transported by U.S. tankers.[29]

Given the constraints on the U.S. shipbuilding industry (as mentioned earlier in this section) and the problems that would be faced in accomodating new building, it is likely that any additional construction that would be necessary to satisfy cargo preference legislation would require even further government subsidies to the industry, thus representing an additional indirect cost element.

FOOTNOTES

1. Energy Users Report, 3/3/77, No. 186, Bureau of National Affairs, Washington, D.C., p. 28.

2. Fuel Trade and Fact Book, Yankee Oil Man, March 1974

3. HR711 (Whitehurst), HR712 (Whitehurst), HR3336 (Lent-Emery), HR776 (Braggi), S682 (Magnuson), S715 (Case), Congressional Record, Jan. 6, 1977, Government Printing Office, Washington, D.C.

4. On 1/31/77, the Coast Guard revised its regulations (33 CFR 164) to require: 1) long-range navigation equipment on all tankers greater than 1600 gross tons; 2) reporting of all ships' positions; 3) testing of ships' manoeuvring systems before entering and getting under way in U.S. waters; 4) notifying the Coast Guard if navigation equipment is out of order.

5. The Merchant Marine Act of 1920 (U.S.C. Title 46, Ch. 24, Sec. 883). Specifies stricter personnel and building requirements for U.S. tankers involved in shipping oil.

6. Spot Rates--courtesy Dietze, Inc., Ship Brokers, 30 Rockefeller Plaza, N.Y., N.Y., Tanker Market Spot Rates 3/2/77. This differential represents average spot rates for the week of 3/2/77. The average differential from Jan. 5, 1977 to 3/2/77 is $1.52/bbl. The $2.00/bbl. differential is justified for this analysis for the following reasons: The U.S. rate has demonstrated steady increases from 1/5/77-3/2/77. The U.S. tanker market has not been directly affected by the world tanker surplus nor is it characterized by the volatility which is present in the world market. [See Zannetos, Zenon S., The Theory of Oil Tankship Rates, MIT Press, 1966 for a further discussion of the world tanker rate structures and the economics of tanker markets]. This increase is also due to the severe winter and impending commencement of the Alaskan movement. The world scale rate increased briefly also during the height of the cold winter in the U.S, however, these inflated rates have begun to return to previous levels of 45-55¢/bbl.

7. Views on Cargo Preference Legislation, 1977. American Petroleum Institute, Washington, D.C. 20006.

8. Ibid.

9. Energy Users Report, op. cit. 3/3/77, p. 29.

10. Dietze, Inc., Feb. 2, 1977. Tanker Spot Rates.

11. Energy Users Report, op. cit. 3/3/77, p.29.

12. NEEMIS (New England Energy Management Information System) was developed (in part) under contract from the New England Regional Commission (NERCOM) by MIT's Sloan School's Center for Information Systems Research (CISR) and the MIT Energy Laboratory.

13. Preliminary Projections of New England's Energy Requirements, prepared for the New England Regional Commission (NERCOM) by Arthur D. Little, Inc., 1975.

14. Demonstration of the Economic Impact Analyser for the New England Regional Commission, 7/76.

15. This element would only be utilized for the input of projected increases beyond the initial impact period. Our analysis assumes a direct impact based on the current levels of prices.

16. Donovan, John J. and Walter P. Fischer, "Factors Affecting Residential Heating Energy Consumption", Tech. Rep. No. MIT-NEEMIS 76-002TR, 7/16/76.

17. Oil Import Regulations, Federal Energy Administration, 10 CRF 213, 41 FR 22341, 6/3/76.

18. International Crude Oil Product Prices, Oct. 15, 1976, prepared by Parra, Ramos and Parra and Energy Economics Research Ltd. in co-operation with Middle East Economic Survey, Middle East Petroleum and Economic Associations.

19. Petroleum Economist, 3/77, Vol. XLIV No. 3, Petroleum Press Bureau Ltd., London, p. 9 - 119.

20. Discussion with Zenon Zannetos, Professor of Management, Alfred P. Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Mass.

21. "Loss Ratio For Liberian Tankers not Highest", Oil & Gas Journal, Vol. 74 No. 37, 9/13/76, The Petroleum Publishing Co. Tulsa, Okla. Vol. 75, No. 5, 1/31/77, p. 91.

22. Ted Wett, "Tanker Trade sick despite intense remedial efforts", Oil & Gas Journal, Vol. 74, No. 37, 9/13/76, The Petroleum Publishing Co, Tulsa, Okla. p. 35 - 38.

23. American Petroleum Institute, op. cit.

24. E. Stanley Tucker, "Moving Towards a Better Balance", Petroleum Economist, 2/77, Vol. XLIV, No. 2, Petroleum Press Bureau Ltd., London, p.48 - 50

25. Oil & Gas Journal, 1/10/77, Vol. 75 No. 2, The Petroleum Publishing Co. Tulsa, Okla. p. 51.

26. A. D. Couper, The Georgraphy of Sea Transport. Hutchinson & Co., Publishers Ltd. London 1972 p. 75.

27. American Petroleum Institute, op. cit.

28. It is noted that the API study includes an additonal differential which is added to their basic derived differential. In constructing this added cost API assumes the inclusion of 1) cargo preference imitation by exporting countries, 2) a captive market premium, and 3) an inflexibility premium. In 1978, for example these hypothetical factors would add .99¢ to their original 1.11 price differential. This equates to a .47¢/bbl. increase on all oil or an impact of $119,951,250 on the New England Region. These assumptions are not given full credit in the analysis due to the hypothetical nature of these possibilities.

29. "The Tanker Bill Sinks or Swims with Carter", Business Week, No. 2485, May 30, 1977, McGraw-Hill, Inc., New York, N.Y., pgs. 26-27, 104.

APPENDIX A

ESTIMATED ANNUAL OPERATING COSTS ($M/yr)
YEAR 1977

	30 MDWT	80 MDWT	250 MDWT
U. S. Flag			
Labor (1)	$1818	$1818	$1818
Provisions	61	61	61
Stores	23	23	42
Miscellaneous (2)	103	104	157
Incremental Overhead	25	25	25
Maintenance & Repair (3)	230	345	595
Subtotal Excl. Insurance	$2260	$2376	$2698
Foreign Flag			
Labor (1)	$ 467	$ 467	$ 467
Provisions	57	57	57
Stores	45	45	53
Miscellaneous (2)	114	114	154
Incremental Overhead	25	25	25
Maintenance & Repair (3)	185	265	445
Subtotal Excl. Insurance	$ 893	$ 973	$1201

Footnotes:

(1) U.S.: 1976 estimate (32-man crew) for typical U.S. operator with MEBA/MM&P/NMU/ARA, increased by 6% to reflect annual costs as of 1/77. Foreign: Based on 45-man Italian/Indian crew.

(2) Includes material handling, rope & hose, maintenance & repair materials, equipment rental, communications, other.

(3) First 10-year average maintenance & repair costs; biennial European periodic overhaul for both vessels. 50% duty paid by U.S. vessel for periodic overhaul and 50% of voyage repairs.

(4) Operating costs for future years are based on the above costs escalated at 6%/year.

SOURCE: AMERICAN PETROLEM INSTITUTE

APPENDIX B

1978

COST OF IMPORTED OIL
U.S. FLAG VERSUS FOREIGN FLAG TANKERS (1)

	30 MDWT	80 MDWT	250 MDWT	TOTAL
U.S. SHIP COST-M$/YEAR (w/o SUBSIDY) (1)	5488	9544	17,611	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	98	244	124	466
COST OF IMPORTS-MM$	538	2329	2,184	5051
MM BARRELS OF IMPORTED OIL				3176
$/BARREL COST OF IMPORTED OIL				$1.59
FOREIGN SHIP COST-M$/YEAR (1)	2099	3053	4,743	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	98	244	124	466
COST OF IMPORTS-MM$	206	745	588	1539
MM BARRELS OF IMPORTED OIL				3176
$/BARREL COST OF IMPORTED OIL				0.48
$/BARREL COST DIFFERENTIAL				$1.11

(1) Based on annual vessel operating cost data developed from data in Tabs 2 & 5 This table shows the relative costs of importing all foreign source oil by either U.S. flag or foreign flag tankers.

(2) Based on fleet size distribution statistics shown in Tables 5a & b.

SOURCE: AMERICAN PETROLEUM INSTITUTE

1980

COST OF IMPORTED OIL
U.S. FLAG VERSUS FOREIGN FLAG TANKERS (1)

	30 MDWT	80 MDWT	250 MDWT	TOTAL
U.S. SHIP COST-M$/YEAR (w/o SUBSIDY) (1)	6193	9922	19,572	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	98	207	182	487
COST OF IMPORTS-MM$	607	2054	3,562	6223
MM BARRELS OF IMPORTED OIL				3477
$/BARREL COST OF IMPORTED OIL				$1.79
FOREIGN SHIP COST-M$/YEAR (1)	2549	3181	4,900	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	98	207	182	487
COST OF IMPORTS-MM$	250	658	892	1800
MM BARRELS OF IMPORTED OIL				3477
$/BARREL COST OF IMPORTED OIL				0.52
$/BARREL COST DIFFERENTIAL				$1.27

(1) Based on annual vessel operating cost data developed from data in Tabs 2 & 5 This table shows the relative costs of importing all foreign source oil by either U.S. flag or foreign flag tankers.

(2) Based on fleet size distribution statistics shown in Tables 5a & b.

1985

COST OF IMPORTED OIL
U.S. FLAG VERSUS FOREIGN FLAG TANKERS (1)

	30 MDWT	80 MDWT	250 MDWT	TOTAL
U.S. SHIP COST-M$/YEAR (w/o SUBSIDY) (1)	7474	10,879	21,761	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	100	183	193	476
COST OF IMPORTS-MM$	747	1,991	4,200	6938
MM BARRELS OF IMPORTED OIL				3541
$/BARREL COST OF IMPORTED OIL				$ 1.96
FOREIGN SHIP COST-M$/YEAR (1)	3153	3,573	8,181	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	100	183	193	476
COST OF IMPORTS-MM$	315	654	1,579	2548
MM BARRELS OF IMPORTED OIL				3541
$/BARREL COST OF IMPORTED OIL				.72
$/BARREL COST DIFFERENTIAL				$ 1.24

(1) Based on annual vessel operating cost data developed from data in Tabs 2 & 5 This table shows the relative costs of importing all foreign source oil by either U.S. flag or foreign flag tankers.

(2) Based on fleet size distribution statistics shown in Tables 5a & b.

1990

COST OF IMPORTED OIL
U.S. FLAG VERSUS FOREIGN FLAG TANKERS (1)

	30 MDWT	80 MDWT	250 MDWT	TOTAL
U.S. SHIP COST-M$/YEAR (w/o SUBSIDY) (1)	8877	12,731	24,390	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	103	203	210	516
COST OF IMPORTS-MM$	914	2,584	5,122	8620
MM BARRELS OF IMPORTED OIL				3687
$/BARREL COST OF IMPORTED OIL				$2.34
FOREIGN SHIP COST-M$/YEAR (1)	5194	6,317	9,508	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	103	203	210	516
COST OF IMPORTS-MM$	535	1,282	1,997	3814
MM BARRELS OF IMPORTED OIL				3687
$/BARREL COST OF IMPORTED OIL				1.03
$/BARREL COST DIFFERENTIAL				$1.31

(1) Based on annual vessel operating cost data developed from data in Tabs 2 & 5 This table shows the relative costs of importing all foreign source oil by either U.S. flag or foreign flag tankers.

(2) Based on fleet size distribution statistics shown in Tables 5a & b.

1990

COST OF IMPORTED OIL
U.S. FLAG VERSUS FOREIGN FLAG TANKERS (1)

	30 MDWT	80 MDWT	250 MDWT	TOTAL
U.S. SHIP COST-M$/YEAR (w/o SUBSIDY) (1)	8877	12,731	24,390	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	103	203	210	516
COST OF IMPORTS-MM$	914	2,584	5,122	8620
MM BARRELS OF IMPORTED OIL				3687
$/BARREL COST OF IMPORTED OIL				$2.34
FOREIGN SHIP COST-M$/YEAR (1)	5194	6,317	9,508	
NUMBER OF SHIPS FOR U.S. IMPORTS (2)	103	203	210	516
COST OF IMPORTS-MM$	535	1,282	1,997	3814
MM BARRELS OF IMPORTED OIL				3687
$/BARREL COST OF IMPORTED OIL				1.03
$/BARREL COST DIFFERENTIAL				$1.31

(1) Based on annual vessel operating cost data developed from data in Tabs 2 & This table shows the relative costs of importing all foreign source oil by either U.S. flag or foreign flag tankers.

(2) Based on fleet size distribution statistics shown in Tables 5a & b.

APPENDIX C

Estimated Costs of H.R. 1037
By American Maritime Association

Estimated Total Capacity Required To Meet 30% Preference at Projected 1980 Imports

Class	# Required	Capacity (mill. DWT)	Trade
30,000 DWT	25	.75	Clean Products
60,000 DWT	20	1.20	Dirty Products, Short Haul Crude
120,000 DWT	37	4.40	Africa, Indonesia
250,000 DWT	46	11.50	Persian Gulf
		17.85	

Waterborne Imports in 1980 Projected at 9.5 million barrels/day

N.B. Since the critical factor involved here is the differential between American and foreign rates, the difference in comparative costs will be sufficiently indicative without attempting to predict the swings in market prices as such. The cost of money is included in our estimate on the present most advantageous terms available, namely, the leasing basis. This presents a better picture than our previous estimates, about $.21/bbl in 1978, rising to about $.26/bbl in 1985, operating costs escalating at 8% per annum compounded.

Attachment #1

1978 Book Capital Costs (millions)

Size of Class	U. S. *	Foreign **
30 M DWT	$ 32.0	$12 MM
60 "	48.0	15 MM
120 "	75.0	20 MM
250 "	125.0	30 MM

* New Tonnage

** Est. Avg. Cost of Existing Modern Fleet

U.S. Financing Terms

8% Cost of Money, Based on Title XI Guarantees, Lease Financing & 10% Investment Tax Credit -

3/4 of 1% Title XI Guarantee Premium on 65% of Total Capital Cost

Foreign Terms

9.5% Cost of Money, Based on 20 Year Financi Level Debt Basis, 4%/Year Depreciation

Annual Fixed Costs/Vessel (millions of $)

Class	U.S.	Foreign	Diff.	# of Vessels	Total Capital Differential
30 M DWT	2.70	1.4	1.30	25	32.5
60 "	4.00	1.7	2.30	20	46.0
120 "	6.25	2.3	3.95	37	146.15
250 "	10.40	3.4	7.00	46	322.00
					546.65

Fixed Costs Differential = $0.158/bbl

1978 Operating Costs

	U.S. (New) $/Yr. (000's)	Foreign $/Yr. (000's)
30,000 DWT		
Labor	1,600	475
Stores, Supplies & Others	225	225
M & R	225	200
Insurance	350	200
Total	2,400	1,100

Added Operating Cost/Vessel = $1.3 MM/Year

60,000 DWT		
Labor	1,625	500
Stores, Supplies & Others	225	225
M & R	275	250
Insurance	450	250
Total	2,575	1,225

Added Operating Cost/Vessel = $1.350 MM/Year

120,000 DWT		
Labor	1,650	500
Stores, Supplies & Others	250	250
M & R	325	275
Insurance	600	300
Total	2,825	1,325

Added Operating Cost/Vessel = $1.5 MM/Year

250,000 DWT		
Labor	1,700	600
Stores, Supplies & Others	300	300
M & R	550	475
Insurance	1,200	650
Total	3,750	2,025

Added Operating Cost/Vessel = $1.825 MM/Year

Estimated Annual Operating Costs for U.S. & Foreign Flag Tankers in 1978 & 1985
(000's of $/Year)

Assumptions: Escalation @ 8%/Year Compounded

U.S. Crew: 28 men

Foreign Crew: 32 " , S. European Manned

	U. S.		Foreign		Differential	
	1978	1985	1978	1985	1978	1985
30,000 DWT	2,400	4,100	1,100	1,900	1,300	2,200
60,000 "	2,575	4,400	1,225	2,100	1,350	2,300
120,000 "	2,825	4,850	1,325	2,300	1,500	2,550
250,000 "	3,750	6,600	2,025	3,500	1,725	3,100

TOTAL OPERATING COST DIFFERENTIAL
(millions of $)

	1978	1985
30,000 DWT Class (25)	$ 32.5	$ 55.00
60,000 " " (20)	27.0	46.00
120,000 " " (37)	55.5	94.35
250,000 " " (46)	79.35	142.6
Total	194.35	337.95
Divided by 9.5 MM B/D =	$0.056/bbl	$0.098/bbl

Total Cost Differential

	in 1978	in 1985
Operating Cost Differential =	$0.056/bbl	$0.098/bbl
Capital Cost Differential =	0.158/bbl	0.158/bbl
	$0.214/bbl	$0.256/bbl

APPENDIX D

NEW ENGLAND

THE ADL PRODUCT SOURCES TABLES (NUMBERS ARE PERCENTAGES).

	GASOLINE	DISTILLATE	RESIDUAL
[illegible]	42	39	8
[illegible]	27	24	5
[illegible]	25	22	5
[illegible]	6	15	82

[illegible] CONSUMPTION FOR 4 SECTORS:
DISTILLATE AND RESIDUAL OIL ARE GIVEN IN THOUSANDS OF BARRELS
ELECTRICITY IS GIVEN IN MILLIONS OF KILOWAT HOURS CONSUMED

	DISTILLATE	RESIDUAL	ELECTRICITY
[illegible]	36106	45879	16094
[illegible]	9336	26039	17526
[illegible]	62511	0	21230

TRANSPORTATION (THOUSANDS OF BARRELS OF GASOLINE): 128728

INDUSTRIAL CONSUMPTION FOR INDUSTRIAL SUBSECTORS:
DISTILLATE AND RESIDUAL ARE IN THOUSANDS OF BARRELS
ELECTRICITY IS IN MILLIONS OF KWH

	DISTILLATE	RESIDUAL	ELECTRICITY
FOOD AND KINDRED	823	1573	963
TEXTILE MILL	917	2368	966
APPAREL, OTHER TEXTILE	49	49	129
LUMBER AND WOOD	328	153	223
FURNITURE AND FIXTURE	71	161	100
PAPER AND ALLIED	2337	13426	2555
PRINTING AND PUBLISHING	75	174	415
CHEMICAL AND ALLIED	555	2778	1534
PETROLEUM AND COAL	20	40	80
RUBBER AND PLASTICS	391	1086	1450
LEATHER AND LEATHER PROD.	231	553	341
STONE,CLAY,GLASS	779	1480	573
PRIMARY METALS	797	1336	1416
FABRICATED METAL	815	838	1248
MACHINERY (EXC. ELECTRIC)	680	845	1317
ELECTRICAL SUPPLIES	479	1123	2486
TRANSPORTATION EQUIPMENT	318	1146	1396
INSTRUMENTS	224	333	807
[illegible]	414	276	669

APPENDIX E

DISPLAY OF RESULTS : 1ST SET OF VALUES.

NEW ENGLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.21
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.21	INCREASE
IMPORTED PRODUCT:	$.21	INCREASE
NEW OIL:	$.21	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1218	$ .003	INCREASE
DISTILLATE	$ .1281	$ .003	INCREASE
RESIDUAL	$ .1932	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00034

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$4,625,179
	RESIDUAL	$8,863,823
	ELECTRICITY	$5,532,670
	TOTAL	$19,021,672
INDUSTRIAL:	DISTILLATE	$1,195,942
	RESIDUAL	$5,030,735
	ELECTRICITY	$6,024,780
	TOTAL	$12,251,457
RESIDENTIAL:	DISTILLATE	$8,007,659
	RESIDUAL	$0
	ELECTRICITY	$7,298,285
	TOTAL	$15,305,944

TRANSPORTATION: TOTAL INCREASE: $7,016,167

TOTAL DIRECT IMPACT (INCREASE): $53,595,240

MASSACHUSETTS

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.21
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.21	INCREASE
IMPORTED PRODUCT:	$.21	INCREASE
NEW OIL:	$.21	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1218	$ .003	INCREASE
DISTILLATE	$ .1281	$ .003	INCREASE
RESIDUAL	$ .1932	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00034

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$3,421,807
	RESIDUAL	$5,946,696
	ELECTRICITY	$2,971,567
	TOTAL	$12,340,070
INDUSTRIAL:	DISTILLATE	$623,591
	RESIDUAL	$1,412,485
	ELECTRICITY	$2,914,157
	TOTAL	$4,950,233
RESIDENTIAL:	DISTILLATE	$3,184,438
	RESIDUAL	$0
	ELECTRICITY	$3,585,201
	TOTAL	$6,769,639

TRANSPORTATION: TOTAL INCREASE: $7,016,167

TOTAL DIRECT IMPACT (INCREASE): $31,076,109

1. *VALUES OF THE VARIABLES FOR THIS RUN:*
TRANSPORTATION INCREASE: $.21
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. *INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:*

IMPORTED CRUDE:	$.21	*INCREASE*
IMPORTED PRODUCT:	$.21	*INCREASE*
NEW OIL:	$.21	*INCREASE*
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. *INCREASE/DECREASE IN MARKET PRICES:*

	PER BARREL	*PER GALLON*	
GASOLINE	$ .1218	$ .003	*INCREASE*
DISTILLATE	$ .1281	$ .003	*INCREASE*
RESIDUAL	$ .1932	$ .005	*INCREASE*

5. *INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL)* $.00034

7. *INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:*

COMMERCIAL:	*DISTILLATE*	$131,046
	RESIDUAL	$776,278
	ELECTRICITY	$412,527
	TOTAL	$1,319,851
INDUSTRIAL:	*DISTILLATE*	$173,063
	RESIDUAL	$1,603,753
	ELECTRICITY	$749,767
	TOTAL	$2,526,583
RESIDENTIAL:	*DISTILLATE*	$999,692
	RESIDUAL	$0
	ELECTRICITY	$727,766
	TOTAL	$1,727,458

TRANSPORTATION: TOTAL INCREASE: $7,016,167

TOTAL IMPACT (INCREASE): $12,500,059

NEW HAMPSHIRE

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: . . . $.21
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.21	INCREASE
IMPORTED PRODUCT:	$.21	INCREASE
NEW OIL:	$.21	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1218	$ .003	INCREASE
DISTILLATE	$ .1281	$ .003	INCREASE
RESIDUAL	$ .1932	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00034

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$41,248
	RESIDUAL	$410,164
	ELECTRICITY	$255,423
	TOTAL	$706,835
INDUSTRIAL:	DISTILLATE	$74,298
	RESIDUAL	$305,642
	ELECTRICITY	$615,352
	TOTAL	$995,292
RESIDENTIAL:	DISTILLATE	$851,609
	RESIDUAL	$0
	ELECTRICITY	$646,979
	TOTAL	$1,498,588

TRANSPORTATION: TOTAL INCREASE: $7,016,167

TOTAL DIRECT IMPACT (INCREASE): $10,216,882

DISPLAY OF RESULTS : 1ST SET OF VALUES.

VERMONT

1. *VALUES OF THE VARIABLES FOR THIS RUN:*
TRANSPORTATION INCREASE: $.21
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. *INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:*

IMPORTED CRUDE:	$.21	*INCREASE*
IMPORTED PRODUCT:	$.21	*INCREASE*
NEW OIL:	$.21	*INCREASE*
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. *INCREASE/DECREASE IN MARKET PRICES:*

	PER BARREL	*PER GALLON*	
GASOLINE	$ .1218	$ .003	*INCREASE*
DISTILLATE	$ .1281	$ .003	*INCREASE*
RESIDUAL	$ .1932	$ .005	*INCREASE*

5. *INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL)* $.00034

7. *INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:*

COMMERCIAL:	*DISTILLATE*	$145,009
	RESIDUAL	$103,169
	ELECTRICITY	$128,227
	TOTAL	$376,405
INDUSTRIAL:	*DISTILLATE*	$10,248
	RESIDUAL	$76,894
	ELECTRICITY	$168,964
	TOTAL	$256,106
RESIDENTIAL:	*DISTILLATE*	$442,201
	RESIDUAL	$0
	ELECTRICITY	$279,831
	TOTAL	$722,032

TRANSPORTATION: TOTAL INCREASE: $7,016,167

TOTAL DIRECT IMPACT (INCREASE): $8,370,710

CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.21	INCREASE
IMPORTED PRODUCT:	$.21	INCREASE
NEW OIL:	$.21	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1218	$ .003	INCREASE
DISTILLATE	$ .1281	$ .003	INCREASE
RESIDUAL	$ .1932	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00034

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$640,500
	RESIDUAL	$966,000
	ELECTRICITY	$1,299,459
	TOTAL	$2,905,959
INDUSTRIAL:	DISTILLATE	$256,200
	RESIDUAL	$1,352,400
	ELECTRICITY	$1,082,883
	TOTAL	$2,691,483
RESIDENTIAL:	DISTILLATE	$1,793,400
	RESIDUAL	$0
	ELECTRICITY	$1,516,036
	TOTAL	$3,309,436

TRANSPORTATION: TOTAL INCREASE: $7,016,167

TOTAL DIRECT IMPACT (INCREASE): $15,923,045

DISPLAY OF RESULTS : 1ST SET OF VALUES.

RHODE ISLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.21
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.21	INCREASE
IMPORTED PRODUCT:	$.21	INCREASE
NEW OIL:	$.21	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1218	$ .003	INCREASE
DISTILLATE	$ .1281	$ .003	INCREASE
RESIDUAL	$ .1932	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00034

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$245,568
	RESIDUAL	$661,517
	ELECTRICITY	$465,468
	TOTAL	$1,372,553
INDUSTRIAL:	DISTILLATE	$58,542
	RESIDUAL	$279,560
	ELECTRICITY	$493,657
	TOTAL	$831,759
RESIDENTIAL:	DISTILLATE	$736,319
	RESIDUAL	$0
	ELECTRICITY	$542,473
	TOTAL	$1,278,792

TRANSPORTATION: TOTAL INCREASE: $7,016,167

TOTAL DIRECT IMPACT (INCREASE): $10,499,271

APPENDIX F

DISPLAY OF RESULTS : 1ST SET OF VALUES.

NEW ENGLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.25
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:
IMPORTED CRUDE: $.25 INCREASE
IMPORTED PRODUCT: $.25 INCREASE
NEW OIL: $.25 INCREASE
OLD OIL: (EFFECTIVE INCREASE) $.00

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1450	$ .003	INCREASE
DISTILLATE	$ .1525	$ .004	INCREASE
RESIDUAL	$ .2300	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00041

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$5,506,165
	RESIDUAL	$10,552,170
	ELECTRICITY	$6,586,512
	TOTAL	$22,644,847
INDUSTRIAL:	DISTILLATE	$1,423,740
	RESIDUAL	$5,998,970
	ELECTRICITY	$7,172,359
	TOTAL	$14,585,068
RESIDENTIAL:	DISTILLATE	$9,532,927
	RESIDUAL	$0
	ELECTRICITY	$8,688,434
	TOTAL	$18,221,361

TRANSPORTATION: TOTAL INCREASE: $18,665,560

TOTAL DIRECT IMPACT (INCREASE): $74,116,836

DISPLAY OF RESULTS : 1ST SET OF VALUES.

MASSACHUSETTS

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE:	$.25
CRUDE TARIFF INCREASE:	$.00
PRODUCT TARIFF INCREASE:	$.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.25	INCREASE
IMPORTED PRODUCT:	$.25	INCREASE
NEW OIL:	$.25	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1450	$ .003	INCREASE
DISTILLATE	$ .1525	$ .004	INCREASE
RESIDUAL	$ .2300	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00041

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$4,073,580
	RESIDUAL	$7,079,400
	ELECTRICITY	$3,537,580
	TOTAL	$14,690,560
INDUSTRIAL:	DISTILLATE	$742,370
	RESIDUAL	$1,681,530
	ELECTRICITY	$3,469,235
	TOTAL	$5,893,135
RESIDENTIAL:	DISTILLATE	$3,790,997
	RESIDUAL	$0
	ELECTRICITY	$4,268,096
	TOTAL	$8,059,093

TRANSPORTATION: TOTAL INCREASE: $8,321,985

TOTAL DIRECT IMPACT (INCREASE): $36,964,773

MAINE

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE:	$.25
CRUDE TARIFF INCREASE:	$.00
PRODUCT TARIFF INCREASE:	$.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.25	INCREASE
IMPORTED PRODUCT:	$.25	INCREASE
NEW OIL:	$.25	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

16:23:44

MSG FROM OPERATOR: IF YOU ARE STILL INTERESTED, THE DEBIT IS NOW $

	PER BARREL	PER GALLON	
GASOLINE	$ .1450	$ .003	INCREASE
DISTILLATE	$ .1525	$ .004	INCREASE
RESIDUAL	$ .2300	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00041

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$156,007
	RESIDUAL	$924,140
	ELECTRICITY	$491,103
	TOTAL	$1,571,250
INDUSTRIAL:	DISTILLATE	$206,027
	RESIDUAL	$1,909,230
	ELECTRICITY	$892,580
	TOTAL	$3,007,837
RESIDENTIAL:	DISTILLATE	$1,100,110
	RESIDUAL	$0
	ELECTRICITY	$866,388
	TOTAL	$2,056,498

TRANSPORTATION: TOTAL INCREASE: $1,902,545

TOTAL DIRECT IMPACT (INCREASE): $8,538,130

DISPLAY OF RESULTS : 1ST SET OF VALUES.

NEW HAMPSHIRE

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.25
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.25	INCREASE
IMPORTED PRODUCT:	$.25	INCREASE
NEW OIL:	$.25	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1450	$ .003	INCREASE
DISTILLATE	$ .1525	$ .004	INCREASE
RESIDUAL	$ .2300	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00041

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$49,105
	RESIDUAL	$488,290
	ELECTRICITY	$304,075
	TOTAL	$841,470
INDUSTRIAL:	DISTILLATE	$88,450
	RESIDUAL	$363,860
	ELECTRICITY	$732,562
	TOTAL	$1,184,872
RESIDENTIAL:	DISTILLATE	$1,013,820
	RESIDUAL	$0
	ELECTRICITY	$770,214
	TOTAL	$1,784,034

TRANSPORTATION: TOTAL INCREASE: $1,383,590

TOTAL DIRECT IMPACT (INCREASE): $5,193,966

DISPLAY OF RESULTS : 1ST SET OF VALUES.

VERMONT

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.25
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.25	INCREASE
IMPORTED PRODUCT:	$.25	INCREASE
NEW OIL:	$.25	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1450	$ .003	INCREASE
DISTILLATE	$ .1525	$ .004	INCREASE
RESIDUAL	$ .2300	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00041

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$172,630
	RESIDUAL	$122,820
	ELECTRICITY	$152,651
	TOTAL	$448,101
INDUSTRIAL:	DISTILLATE	$12,200
	RESIDUAL	$°1,540
	ELECTRICITY	$201,148
	TOTAL	$304,888
RESIDENTIAL:	DISTILLATE	$526,430
	RESIDUAL	$0
	ELECTRICITY	$333,132
	TOTAL	$859,562

TRANSPORTATION: TOTAL INCREASE: $880,730

TOTAL DIRECT IMPACT (INCREASE): $2,493,281

DISPLAY OF RESULTS : 1ST SET OF VALUES.

CONNECTICUT

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.25
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.25	INCREASE
IMPORTED PRODUCT:	$.25	INCREASE
NEW OIL:	$.25	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1450	$ .003	INCREASE
DISTILLATE	$ .1525	$ .004	INCREASE
RESIDUAL	$ .2300	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00041

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$762,500
	RESIDUAL	$1,150,000
	ELECTRICITY	$1,546,975
	TOTAL	$3,459,475
INDUSTRIAL:	DISTILLATE	$305,000
	RESIDUAL	$1,610,000
	ELECTRICITY	$1,289,146
	TOTAL	$3,204,146
RESIDENTIAL:	DISTILLATE	$2,135,000
	RESIDUAL	$0
	ELECTRICITY	$1,804,804
	TOTAL	$3,939,804

TRANSPORTATION: TOTAL INCREASE: $4,812,405

TOTAL DIRECT IMPACT (INCREASE): $15,415,830

DISPLAY OF RESULTS : 1ST SET OF VALUES.

RHODE ISLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.25
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE: $.25 INCREASE
IMPORTED PRODUCT: $.25 INCREASE
NEW OIL: $.25 INCREASE
OLD OIL: (EFFECTIVE INCREASE) $.00

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .1450	$ .003	INCREASE
DISTILLATE	$ .1525	$ .004	INCREASE
RESIDUAL	$ .2300	$ .005	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00041

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$292,342
	RESIDUAL	$787,520
	ELECTRICITY	$554,128
	TOTAL	$1,633,990
INDUSTRIAL:	DISTILLATE	$69,692
	RESIDUAL	$332,810
	ELECTRICITY	$587,687
	TOTAL	$990,189
RESIDENTIAL:	DISTILLATE	$876,570
	RESIDUAL	$0
	ELECTRICITY	$645,801
	TOTAL	$1,522,371

TRANSPORTATION: TOTAL INCREASE: $1,364,305

TOTAL DIRECT IMPACT (INCREASE): $5,510,855

APPENDIX G

DISPLAY OF RESULTS : 2ND SET OF VALUES.

NEW ENGLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.45
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.45	INCREASE
IMPORTED PRODUCT:	$.45	INCREASE
NEW OIL:	$.45	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .2610	$ .006	INCREASE
DISTILLATE	$ .2745	$ .007	INCREASE
RESIDUAL	$ .4140	$ .010	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00074

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$9,311,097
	RESIDUAL	$18,993,906
	ELECTRICITY	$11,955,722
	TOTAL	$40,760,725
INDUSTRIAL:	DISTILLATE	$2,562,732
	RESIDUAL	$10,780,146
	ELECTRICITY	$12,910,244
	TOTAL	$26,253,122
RESIDENTIAL:	DISTILLATE	$17,159,269
	RESIDUAL	$0
	ELECTRICITY	$15,639,181
	TOTAL	$32,798,450

TRANSPORTATION: TOTAL INCREASE: $33,598,008

TOTAL DIRECT IMPACT (INCREASE): $133,410,305

DISPLAY OF RESULTS : 2ND SET OF VALUES.

MASSACHUSETTS

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.45
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.45	INCREASE
IMPORTED PRODUCT:	$.45	INCREASE
NEW OIL:	$.45	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .2610	$ .006	INCREASE
DISTILLATE	$ .2745	$ .007	INCREASE
RESIDUAL	$ .4140	$ .010	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00074

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$7,332,444
	RESIDUAL	$12,742,920
	ELECTRICITY	$6,367,644
	TOTAL	$26,443,008
INDUSTRIAL:	DISTILLATE	$1,336,266
	RESIDUAL	$3,026,754
	ELECTRICITY	$6,244,623
	TOTAL	$10,607,643
RESIDENTIAL:	DISTILLATE	$6,823,795
	RESIDUAL	$0
	ELECTRICITY	$7,682,573
	TOTAL	$14,506,368

TRANSPORTATION: TOTAL INCREASE: $14,979,573

TOTAL DIRECT IMPACT (INCREASE): $66,536,592

DISPLAY OF RESULTS : 2ND SET OF VALUES.

MAINE

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.45
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.45	INCREASE
IMPORTED PRODUCT:	$.45	INCREASE
NEW OIL:	$.45	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .2610	$ .006	INCREASE
DISTILLATE	$ .2745	$ .007	INCREASE
RESIDUAL	$ .4140	$ .010	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00074

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$280,813
	RESIDUAL	$1,663,452
	ELECTRICITY	$883,986
	TOTAL	$2,828,251
INDUSTRIAL:	DISTILLATE	$370,849
	RESIDUAL	$3,436,614
	ELECTRICITY	$1,606,644
	TOTAL	$5,414,107
RESIDENTIAL:	DISTILLATE	$2,142,198
	RESIDUAL	$0
	ELECTRICITY	$1,559,498
	TOTAL	$3,701,696

TRANSPORTATION: TOTAL INCREASE: $3,424,581

TOTAL DIRECT IMPACT (INCREASE): $15,368,635

DISPLAY OF RESULTS : 2ND SET OF VALUES.

VERMONT

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.45
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.45	INCREASE
IMPORTED PRODUCT:	$.45	INCREASE
NEW OIL:	$.45	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .2610	$ .006	INCREASE
DISTILLATE	$ .2745	$ .007	INCREASE
RESIDUAL	$ .4140	$ .010	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00074

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$310,734
	RESIDUAL	$221,076
	ELECTRICITY	$274,772
	TOTAL	$806,582
INDUSTRIAL:	DISTILLATE	$21,960
	RESIDUAL	$164,772
	ELECTRICITY	$362,066
	TOTAL	$548,798
RESIDENTIAL:	DISTILLATE	$947,574
	RESIDUAL	$0
	ELECTRICITY	$599,637
	TOTAL	$1,547,211

TRANSPORTATION: TOTAL INCREASE: $1,595,314

TOTAL DIRECT IMPACT (INCREASE): $4,497,905

DISPLAY OF RESULTS : 2ND SET OF VALUES.

CONNECTICUT

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.45
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.45	INCREASE
IMPORTED PRODUCT:	$.45	INCREASE
NEW OIL:	$.45	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .2610	$ .006	INCREASE
DISTILLATE	$ .2745	$ .007	INCREASE
RESIDUAL	$ .4140	$ .010	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00074

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$1,372,500
	RESIDUAL	$2,070,000
	ELECTRICITY	$2,784,555
	TOTAL	$6,227,055
INDUSTRIAL:	DISTILLATE	$540,000
	RESIDUAL	$2,808,000
	ELECTRICITY	$2,320,463
	TOTAL	$5,767,463
RESIDENTIAL:	DISTILLATE	$3,843,000
	RESIDUAL	$0
	ELECTRICITY	$3,248,648
	TOTAL	$7,091,648

TRANSPORTATION: TOTAL INCREASE: $8,662,329

TOTAL DIRECT IMPACT (INCREASE): $27,748,495

DISPLAY OF RESULTS : 2ND SET OF VALUES.

RHODE ISLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.45
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.45	INCREASE
IMPORTED PRODUCT:	$.45	INCREASE
NEW OIL:	$.45	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .2610	$ .006	INCREASE
DISTILLATE	$ .2745	$ .007	INCREASE
RESIDUAL	$ .4140	$ .010	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00074

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$526,216
	RESIDUAL	$1,417,536
	ELECTRICITY	$997,431
	TOTAL	$2,941,183
INDUSTRIAL:	DISTILLATE	$125,446
	RESIDUAL	$599,058
	ELECTRICITY	$1,057,836
	TOTAL	$1,782,340
RESIDENTIAL:	DISTILLATE	$1,577,826
	RESIDUAL	$0
	ELECTRICITY	$1,162,441
	TOTAL	$2,740,267

TRANSPORTATION: TOTAL INCREASE: $2,455,749

TOTAL DIRECT IMPACT (INCREASE): $9,919,539

APPENDIX H

DISPLAY OF RESULTS : 2ND SET OF VALUES.

NEW ENGLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.52
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.52	INCREASE
IMPORTED PRODUCT:	$.52	INCREASE
NEW OIL:	$.52	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .3016	$ .007	INCREASE
DISTILLATE	$ .3172	$ .008	INCREASE
RESIDUAL	$ .4784	$ .011	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00085

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$11,452,823
	RESIDUAL	$21,948,514
	ELECTRICITY	$13,699,946
	TOTAL	$47,101,283
INDUSTRIAL:	DISTILLATE	$2,961,379
	RESIDUAL	$12,457,059
	ELECTRICITY	$14,918,504
	TOTAL	$30,336,941
RESIDENTIAL:	DISTILLATE	$19,928,489
	RESIDUAL	$0
	ELECTRICITY	$18,071,943
	TOTAL	$37,900,432

TRANSPORTATION: TOTAL INCREASE: $38,824,365

TOTAL DIRECT IMPACT (INCREASE): $154,163,021

DISPLAY OF RESULTS : 2ND SET OF VALUES.

MASSACHUSETTS

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.52
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.52	INCREASE
IMPORTED PRODUCT:	$.52	INCREASE
NEW OIL:	$.52	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .3016	$ .007	INCREASE
DISTILLATE	$ .3172	$ .008	INCREASE
RESIDUAL	$ .4784	$ .011	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00085

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$8,473,046
	RESIDUAL	$14,725,152
	ELECTRICITY	$7,358,167
	TOTAL	$30,556,365
INDUSTRIAL:	DISTILLATE	$1,544,130
	RESIDUAL	$3,497,592
	ELECTRICITY	$7,216,000
	TOTAL	$12,257,721
RESIDENTIAL:	DISTILLATE	$7,885,275
	RESIDUAL	$0
	ELECTRICITY	$8,877,640
	TOTAL	$16,762,915

TRANSPORTATION: TOTAL INCREASE: $17,309,729

TOTAL DIRECT IMPACT (INCREASE): $76,886,730

DISPLAY OF RESULTS : 2ND SET OF VALUES.

MAINE

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.52
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.52	INCREASE
IMPORTED PRODUCT:	$.52	INCREASE
NEW OIL:	$.52	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .3016	$ .007	INCREASE
DISTILLATE	$ .3172	$ .008	INCREASE
RESIDUAL	$ .4784	$ .011	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00085

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$324,496
	RESIDUAL	$1,922,211
	ELECTRICITY	$1,021,495
	TOTAL	$3,268,202
INDUSTRIAL:	DISTILLATE	$428,537
	RESIDUAL	$3,971,198
	ELECTRICITY	$1,856,567
	TOTAL	$6,256,302
RESIDENTIAL:	DISTILLATE	$2,475,429
	RESIDUAL	$0
	ELECTRICITY	$1,802,087
	TOTAL	$4,277,516

TRANSPORTATION: TOTAL INCREASE: $3,957,294

TOTAL DIRECT IMPACT (INCREASE): $17,759,314

DISPLAY OF RESULTS : 2ND SET OF VALUES.

NEW HAMPSHIRE

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.52
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.52	INCREASE
IMPORTED PRODUCT:	$.52	INCREASE
NEW OIL:	$.52	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .3016	$ .007	INCREASE
DISTILLATE	$ .3172	$ .008	INCREASE
RESIDUAL	$ .4784	$ .011	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00085

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$192,138
	RESIDUAL	$1,015,643
	ELECTRICITY	$632,475
	TOTAL	$1,750,256
INDUSTRIAL:	DISTILLATE	$193,976
	RESIDUAL	$756,829
	ELECTRICITY	$1,523,730
	TOTAL	$2,464,535
RESIDENTIAL:	DISTILLATE	$2,108,746
	RESIDUAL	$0
	ELECTRICITY	$1,602,044
	TOTAL	$3,710,790

TRANSPORTATION: TOTAL INCREASE: $2,877,867

TOTAL DIRECT IMPACT (INCREASE): $10,803,448

DISPLAY OF RESULTS : 2ND SET OF VALUES.

VERMONT

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.52
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.52	INCREASE
IMPORTED PRODUCT:	$.52	INCREASE
NEW OIL:	$.52	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .3016	$ .007	INCREASE
DISTILLATE	$ .3172	$ .008	INCREASE
RESIDUAL	$ .4784	$ .011	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00085

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$359,070
	RESIDUAL	$255,466
	ELECTRICITY	$317,515
	TOTAL	$932,051
INDUSTRIAL:	DISTILLATE	$25,376
	RESIDUAL	$190,403
	ELECTRICITY	$418,387
	TOTAL	$634,166
RESIDENTIAL:	DISTILLATE	$1,094,974
	RESIDUAL	$0
	ELECTRICITY	$692,914
	TOTAL	$1,787,888

TRANSPORTATION: TOTAL INCREASE: $1,831,918

TOTAL DIRECT IMPACT (INCREASE): $5,186,023

DISPLAY OF RESULTS : 2ND SET OF VALUES.

CONNECTICUT

1. VALUES OF THE VARIABLES FOR THIS RUN:

TRANSPORTATION INCREASE: $.52
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.52	INCREASE
IMPORTED PRODUCT:	$.52	INCREASE
NEW OIL:	$.52	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .3016	$ .007	INCREASE
DISTILLATE	$ .3172	$ .008	INCREASE
RESIDUAL	$ .4784	$ .011	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00085

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$1,586,000
	RESIDUAL	$2,392,000
	ELECTRICITY	$3,217,708
	TOTAL	$7,195,708
INDUSTRIAL:	DISTILLATE	$634,400
	RESIDUAL	$3,348,800
	ELECTRICITY	$2,681,423
	TOTAL	$6,664,623
RESIDENTIAL:	DISTILLATE	$4,440,800
	RESIDUAL	$0
	ELECTRICITY	$3,753,993
	TOTAL	$8,194,793

TRANSPORTATION: TOTAL INCREASE: $10,009,802

TOTAL DIRECT IMPACT (INCREASE): $32,064,926

DISPLAY OF RESULTS : 2ND SET OF VALUES.

RHODE ISLAND

1. VALUES OF THE VARIABLES FOR THIS RUN:
TRANSPORTATION INCREASE: $.52
CRUDE TARIFF INCREASE: $.00
PRODUCT TARIFF INCREASE: $.00

3. INCREASES/DECREASES BASED ON THE ABOVE ESTIMATES:

IMPORTED CRUDE:	$.52	INCREASE
IMPORTED PRODUCT:	$.52	INCREASE
NEW OIL:	$.52	INCREASE
OLD OIL: (EFFECTIVE INCREASE)	$.00	

4. INCREASE/DECREASE IN MARKET PRICES:

	PER BARREL	PER GALLON	
GASOLINE	$ .3016	$ .007	INCREASE
DISTILLATE	$ .3172	$ .008	INCREASE
RESIDUAL	$ .4784	$ .011	INCREASE

5. INCREASE PER KWH ELECTRICITY (BASED ON 562KWH PER BARREL OF RESIDUAL FUEL OIL) $.00085

7. INCREASE/DECREASE IN COSTS FOR FOUR MAIN SECTORS:

COMMERCIAL:	DISTILLATE	$608,072
	RESIDUAL	$1,638,042
	ELECTRICITY	$1,152,586
	TOTAL	$3,398,700
INDUSTRIAL:	DISTILLATE	$144,960
	RESIDUAL	$692,245
	ELECTRICITY	$1,222,389
	TOTAL	$2,059,594
RESIDENTIAL:	DISTILLATE	$1,823,266
	RESIDUAL	$0
	ELECTRICITY	$1,343,265
	TOTAL	$3,166,531

TRANSPORTATION: TOTAL INCREASE: $2,837,754

TOTAL DIRECT IMPACT (INCREASE): $11,462,579

APPENDIX I

Country	Number of Ships Lost	%Loss Rate*
Greece	26	0.76%
Netherlands	2	0.70%
Italy	9	0.64%
Spain	3	0.58%
Panama	17	0.51%
Liberia	68	0.50%
Norway	18	0.27%
Denmark	1	0.26%
Sweden	1	0.17%
U.S.	9	0.15%
U.K.	11	0.12%
Japan	3	0.06%
France	3	0.06%
West Germany	1	0.05%
U.S.S.R.	0	0.00%

*Loss ratios were obtained for each country by dividing tonnage lost by tonnage at risk for the 13 year period 1964-1976

Source: "Loss Ratio for Liberian Tankers Not Highest", Oil and Gas Journal, 1/31/77, vol. 75, no. 5, pg. 91

APPENDIX J

AGE DISTRIBUTION OF WORLD TANK SHIP FLEET[1]
BY MAJOR FLAGS OF REGISTRY
AS OF DECEMBER 31, 1974

(THOUSANDS OF DEADWEIGHT TONS)

FLAG OF REGISTRY	AGE DISTRIBUTION												Average Age of Total Tonnage (Months)
	1-4 Years		5-9 Years		10-14 Years		15-19 Years		20 Years and Over		Total Tonnage	Percent	
	D.W.T.	Percent	D.W.T.	Percent	D.W.T.	Percent	D.W.T.	Percent	D.W.T.	Percent			
WESTERN HEMISPHERE													
Panama	2,999	31	1,174	12	1,675	17	2,178	23	1,639	17	9,665	100	133
United States	2,555	25	1,110	11	1,052	10	1,890	19	3,629	35	10,236	100	175
EUROPE—WESTERN													
France	7,844	60	2,736	20	1,414	11	762	6	359	3	13,115	100	61
Greece	3,662	23	4,174	26	2,858	18	3,609	22	1,844	11	16,147	100	119
Italy	4,611	49	2,186	23	734	8	1,077	12	734	8	9,342	100	80
Denmark	2,887	63	989	21	590	13	124	3	0	0	4,590	100	54
Norway	16,035	51	10,635	34	3,340	11	902	3	211	1	31,123	100	58
Sweden	4,889	63	2,025	26	521	7	243	3	49	1	7,727	100	49
United Kingdom	17,253	47	11,680	32	4,588	12	2,631	7	569	2	36,721	100	66
EUROPE—EASTERN													
U.S.S.R.	384	7	1,605	29	2,286	42	817	15	383	7	5,475	100	126
NEAR EAST													
Liberia	40,821	48	18,644	22	10,090	12	11,027	13	4,352	5	84,934	100	80
FAR EAST													
Japan	19,496	54	11,876	33	3,511	10	709	2	172	1	35,764	100	56
ALL OTHER	14,554	40	9,286	26	4,018	11	4,354	12	3,821	11	36,033	100	91
TOTAL WORLD	137,990	46	78,120	26	36,677	12	30,323	10	17,762	6	300,872	100	81

(1) Ocean-going vessels 2,000 gross tons and over.

AUTHORITY: "ANALYSIS OF WORLD TANK SHIP FLEET"
TANKER PRODUCTS GROUP
SUN SHIPBUILDING AND DRY DOCK COMPANY
SUN OIL COMPANY

APPENDIX K

GROSS JOB LOSS RELATED TO CARGO PREFERENCE

1) Transportation cost increases at least $5.5 billion/yr.

2) Consumers must ultimately pay this increase.

3) Therefore consumers' discretionary spending in all other sectors must be reduced by a like amount.

4) On average, dividing 1976 GNP ($1.692 trillion) by total civilian employment (87.485 million) yields the ratio of $19.340/job.*

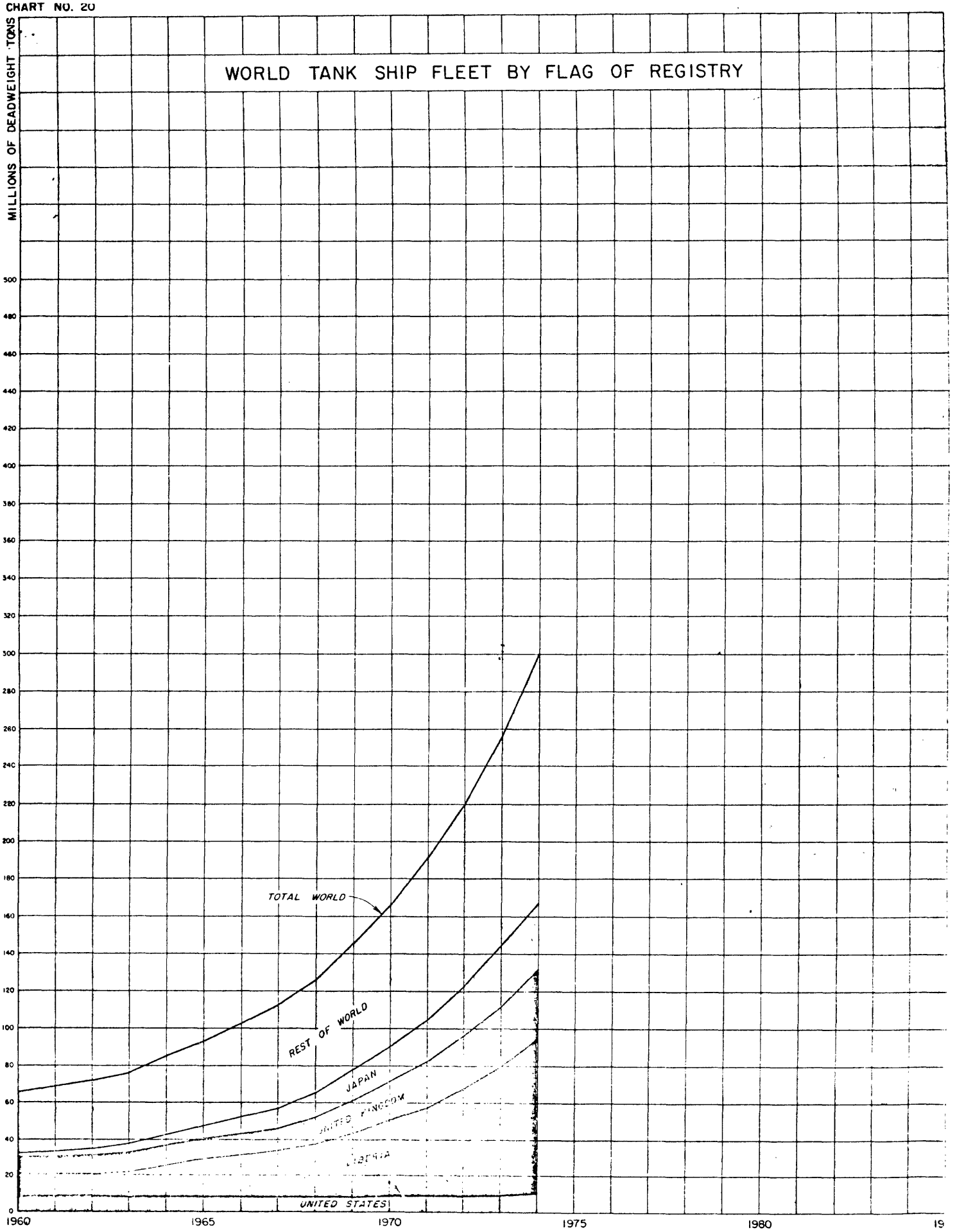
5) Therefore, throughout the economy there will be a reduction of $5.5 \times 10^9 / 1.934 \times 10^4 = 284{,}000$ jobs. These lost jobs will be spread throughout the economy with no way to directly link them to this legislation. These lost jobs would more than offset employment gains in the capital intensive shipping industry.

* Source of GNP and civilian employment figures is the January 1977 "Economic Report of the President."

SOURCE: AMERICAN PETROLEUM INSTITUTE

APPENDIX L

CHART NO. 20



SOURCE: DeGolyer and MacNaughton, 20th Century Petroleum Statistics, 1976

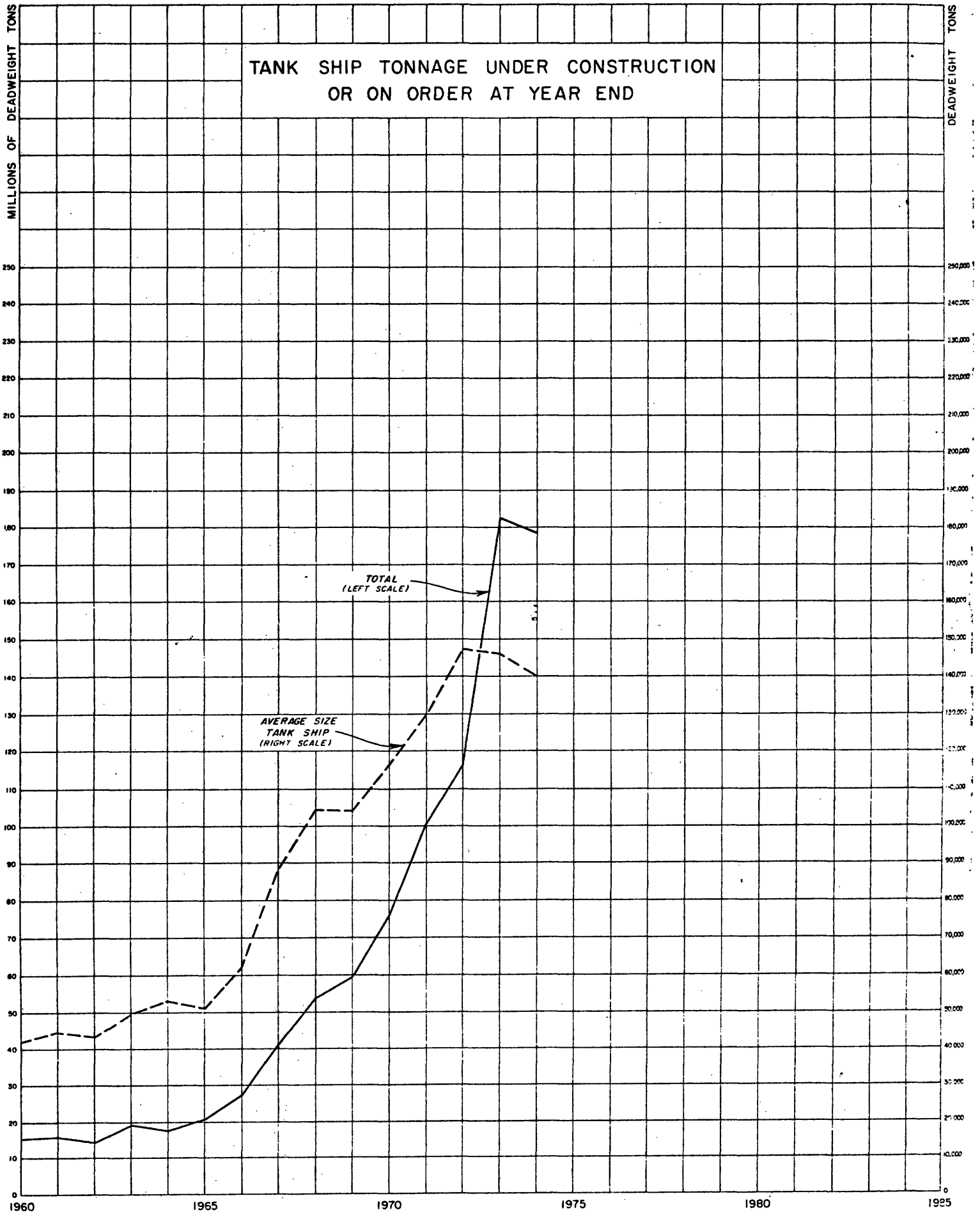
WORLD TANK SHIP FLEET BY FLAG OF REGISTRY AS OF DECEMBER 31, 1974

OCEAN-GOING VESSELS 2,000 GROSS TONS AND OVER

Flag of Registry	No.	Gross Tons (000's)	D.W.T. (000's)	Average D.W.T.	T2-SE-A1 Equivalents No.	T2-SE-A1 Equivalents Percent of World
NORTH AMERICA, TOTAL	354	6,270	10,965	31,000	733.8	3.8
Canada	22	173	267	12,200	15.8	0.1
Mexico	26	299	462	17,800	28.0	0.1
United States	306	5,798	10,236	33,400	690.0	3.6
SOUTH AMERICA, TOTAL	353	7,852	13,489	38,200	868.0	4.3
Argentina	51	598	890	17,400	54.9	0.3
Brazil	42	1,119	1,948	46,400	125.3	0.6
Panama	221	5,498	9,665	43,700	625.1	3.2
Venezuela	18	314	470	26,100	29.7	0.1
Others	21	323	516	24,500	33.0	0.1
WESTERN EUROPE, TOTAL	1,972	75,294	136,592	69,300	8,830.3	45.4
Denmark	48	2,428	4,590	95,600	293.9	1.5
France	146	7,172	13,115	89,800	855.7	4.4
Germany, West	60	2,830	5,262	87,700	340.1	1.7
Greece	344	9,009	16,147	46,900	1,035.0	5.3
Italy	174	5,316	9,342	53,700	617.8	3.2
Netherlands	72	2,090	3,636	50,500	233.5	1.2
Norway	353	16,835	31,122	88,200	2,021.3	10.4
Spain	86	2,596	4,626	53,800	293.9	1.5
Sweden	84	4,143	7,727	92,000	504.2	2.6
United Kingdom	469	20,299	36,721	78,300	2,363.0	12.2
Others	136	2,576	4,304	31,600	271.9	1.4
AFRICA, TOTAL	1,097	44,501	85,859	78,300	5,552.4	28.6
Algeria	6	112	146	24,300	10.0	0.1
Egypt	8	109	171	21,400	10.1	0.1
Liberia	1,063	43,927	84,934	79,900	5,494.8	28.2
Others	20	353	608	30,400	37.5	0.2
MIDDLE EAST, TOTAL	32	760	1,294	40,400	85.1	0.4
Iran	5	56	86	17,100	5.6	0.0
Iraq	7	150	246	35,100	16.1	0.1
Kuwait	5	316	581	116,200	39.0	0.2
Turkey	14	221	354	25,300	22.6	0.1
Others	1	17	27	27,000	1.8	0.0
FAR EAST AND OCEANIA, TOTAL	586	24,871	44,520	76,000	2,870.0	14.8
Australia	15	277	447	29,800	28.4	0.2
India	33	1,057	1,825	55,300	116.9	0.6
Indonesia	12	58	86	7,200	4.7	0.0
Japan	384	19,866	35,764	93,100	2,312.7	11.9
Korea	28	664	1,204	43,000	75.9	0.4
Singapore	39	1,194	2,098	53,800	135.2	0.7
Others	75	1,755	3,096	41,300	196.2	1.0
SINO-SOVIET COUNTRIES, TOTAL	484	5,405	8,153	16,800	513.5	2.7
China	32	404	652	20,400	40.9	0.2
Cuba	5	49	73	14,600	4.8	0.0
U.S.S.R.	392	3,799	5,475	14,000	342.7	1.8
Eastern Europe (excluding U.S.S.R.)	55	1,153	1,953	35,500	125.1	0.7
TOTAL WORLD	4,878	164,953	300,872	61,700	19,453.1	100.0

AUTHORITY: "ANALYSIS OF WORLD TANK SHIP FLEET"
TANKER PRODUCT GROUP
SUN SHIPBUILDING AND DRY DOCK COMPANY
SUN OIL COMPANY

CHART NO. 23



Source; DeGolyer and MacNaughton, 20th Century Petroleum Statistics, 1976

ANALYSIS OF TANK SHIPS ON ORDER OR UNDER CONSTRUCTION

AS OF DECEMBER 31, 1974

OCEAN-GOING VESSELS 2,000 GROSS TONS AND OVER

	No. Ships	D.W.T. (000's)	Percent of Total D.W.T.	Average D.W.T.
Deadweight Tonnage Analysis				
Under 20,000 D.W.T.	156	1,473	0.8	9,400
20,000 to 50,000 D.W.T.	280	9,074	5.1	32,400
50,000 to 100,000 D.W.T.	225	17,126	9.6	76,100
100,000 to 200,000 D.W.T.	219	29,744	16.7	135,800
200,000 D.W.T. and Over	394	121,004	67.8	307,100
Total	1,274	178,421	100.0	140,000
Intended Flag of Registry				
United States	73	7,684	4.3	105,300
France	39	6,889	3.9	176,600
Greece	55	8,041	4.5	146,200
Italy	48	5,953	3.3	124,000
Japan	114	16,985	9.5	149,000
Liberia	312	54,625	30.6	175,100
Norway	178	26,848	15.1	150,800
Panama	35	4,712	2.6	134,600
Spain	35	5,920	3.3	169,100
United Kingdom	83	11,292	6.3	136,000
U.S.S.R.	56	2,039	1.2	36,400
Others	246	27,433	15.4	111,500
Total	1,274	178,421	100.0	140,000
Country of Construction				
United States	73	7,684	4.3	105,300
Denmark	21	4,601	2.6	219,100
France	64	8,448	4.7	132,000
Germany, West	55	10,092	5.7	183,500
Italy	47	4,620	2.6	98,300
Japan	487	83,156	46.6	170,700
Netherlands	26	2,524	1.4	97,100
Norway	78	7,085	4.0	90,800
Spain	50	9,325	5.2	186,500
Sweden	107	16,339	9.2	152,700
United Kingdom	45	5,790	3.2	128,700
U.S.S.R.	23	1,365	0.8	59,300
Others	198	17,392	9.7	87,800
Total	1,274	178,421	100.0	140,000

AUTHORITY: "ANALYSIS OF WORLD TANK SHIP FLEET"
TANKER PRODUCT GROUP
SUN SHIPBUILDING AND DRY DOCK COMPANY
SUN OIL COMPANY