October 18, 1946

NATIONAL PETROLEUM COUNCIL

Report of Special Committee
on
Pressure Tank Cars for the Transportation of Liquefied Petroleum Gas.

This Committee has been appointed by the National Petroleum Council to consider and recommend with respect to the shortage of high pressure tank cars for the transportation of liquefied petroleum gas.

The Committee has investigated at considerable length the present shortage and the future requirements and availability of this important vehicle of transportation, and unanimously finds as follows:

1. The present alarming shortage of high pressure tank cars, caused partly by the War, and to a greater extent by the immediate post-war strikes affecting the supply of steel, is now about to become more critical and of national concern because of a Government program to manufacture and export fertilizer to occupied and other countries. This program, which requires the same type of high pressure tank cars, has produced an emergency which, if allowed to run its course unchecked, will seriously affect the distribution of liquefied petroleum gases, and is bound to create untold suffering to our people, serious dislocations to our economy, unnecessary waste of natural resources, and needless risk to our national welfare.

We are convinced that the shortage of high pressure tank cars now, and especially during the coming winter months, has produced a problem of such importance and magnitude as to warrant and require the closest scrutiny by those in Government responsible for the safety, health and security of our people.

Conscious of our responsibility to bring this matter to the attention of the National Petroleum Council, and through that Council to the attention of both our Government and our industry, we set forth below those considerations which have caused us to view this problem with deep concern.

We believe that failure to recognize the serious consequences of the pressure tank car shortage to the extent that transportation of liquefied petroleum gases is involved results directly from the lack of knowledge of the importance of this petroleum product to our citizens. It is not surprising that this dearth of information on uses of liquefied petroleum gases exists for, so rapid has been the increase in its uses that few, except those directly engaged in this field, have been able to keep themselves informed.

Because of its adaptability for use by the average American family, especially those living in rural or suburban areas beyond the gas mains where it finds great favor as a fuel for cooking, refrigeration and heating, demand for liquefied petroleum gases has increased at an astounding rate.

We direct particular attention to the following highlights in recent trends in the use of liquefied petroleum gases in the United States.

In 1930 a grand total of 18,017,000 (1) gallons of liquefied petroleum gases were used in the United States. Last year, over 1,100,000,000 (2) gallons were used. That is a SIX THOUSAND PERCENT INCREASE. The principal uses were:

Household purposes	540,000,000	gallons	49%
Industrial purposes.....	280,000,000	"	26%
Gas Utility purposes.....	60,000,000	"	5%
Chemical Manufacturing.....	220,000,000	"	20%
Total	1,100,000,000		100%

The increase in the use of liquefied petroleum gases for household purposes is the most remarkable chapter in its picturesque history, as witnessed by the following:

(a) For household use 11,800,000 (1) gallons were sold in 1930. Last year the householders of the country used 540,000,000 gallons (2) - a FIFTY FOLD INCREASE.

(b) During the War household uses increased over 400 per cent during a period when all such installations and uses were under strict government control, including priorities.

(c) Liquefied petroleum gases are used in nearly 4,000,000 (3) homes in our country. Substitute fuels cannot be used in the stoves, refrigerators, water heaters, furnaces and other appliances in these homes. If there is any doubt as to its popularity among the housewives of the nation let it be remembered that ONE IN EVERY EIGHT GAS STOVES OF THE NATION BURNS LIQUEFIED PETROLEUM GAS.

(d) If the reader will climb to the top of the Washington Monument and from that vantage point survey the National Capital and its surrounding areas, he will have included in this panorama no fewer than TWENTY FIVE THOUSAND users of liquefied petroleum gas.

(e) Between 1930 and 1946 the use of liquefied petroleum gases in the industrial, utility and chemical fields increased from 6,200,000 (1) gallons to the surprising figure of 560,000,000 (2) gallons. That is an increase of NINETY FOLD, almost twice the increase in household uses.

The industrial, chemical and gas utility company uses are of utmost importance to our industrial economy. Hundreds of industrial plants producing automobiles, steel and non-ferrous metal products, glass products, sanitary ware, containers, textiles, food products, etc. are entirely dependent upon liquefied petroleum gas for all types of heating operations. Chemical plants use liquefied petroleum gases as a raw material for processing into components of synthetic rubber, anti-freeze, plastics, etc. Gas utilities in a great many cities use the commodity in numerous ways. The gas systems in many small cities are entirely dependent upon liquefied petroleum

gas, which is diluted with air to make a satisfactory fuel for all purposes, while others use the fuel for enrichment of low btu gas and as a means of additional supply during peak day demands.

IT IS THE THREATENED RESTRICTIONS IN THE USES OF THIS VITAL COMMODITY WHICH IS OUR PROBLEM - NOT BECAUSE IT IS SCARCE - NOT BECAUSE IT IS NEEDED ELSEWHERE - BUT BECAUSE OF FUTURE FERTILIZER FOR FOREIGN FIELDS!

We believe that it is vital to a correct understanding of the present high pressure tank car situation that the history of the use of this equipment during the War be reviewed.

The liquefied petroleum gas business during the War was frozen under War Production Board Limitation Order L-86. Because of the critical shortage of materials, especially steel and non-ferrous metals, no new installations of liquefied petroleum gas facilities were permitted except under the authorization of War Production Board, for plants engaged in production of essential war materials. No new home installations were authorized except for military personnel, and in defense housing areas. Nevertheless, thousands of homes were built in military and defense areas by the Federal Housing Administration and were equipped for using liquefied petroleum gases for heating, cooking and refrigeration. These houses still are occupied. As they were abandoned for wartime housing veterans were given priority for them. As a result much of the government-built housing is now occupied by ex-GI's who must depend upon a constant supply of fuel for all heating, cooking and refrigeration.

During the War the Government purchased 838 ammonia tank cars to be used in connection with the operation of ammonia plants for production of explosives. The Government also bought 483 propane tank cars to be leased to the liquefied petroleum gas industry to serve installations authorized under Order L-86. These 483 propane tank cars purchased by the Government were pooled and leased to the liquefied petroleum gas industry upon allocation by the Government.

At the end of the War the liquefied petroleum gas industry had virtually no reconversion problems. The same homes still required fuel. The same industries which used it in manufacturing war materials still required the fuel or raw material for peace time production of goods which the American People had done without for so long a time.

The same number of propane cars accordingly were still required to supply this post-war demand.

The industry, furthermore, foresaw a continued rapid increase in the uses of liquefied petroleum gases in homes, factories and gas plants as a result of the lifting of restrictions on the manufacture and installation of equipment using liquefied petroleum gases. In the fact of the huge pent-up demand for this convenient fuel, the industry undertook to expand its production facilities, and at the same time placed orders with tank car builders for some 2300 new propane tank cars. Due to difficulties in securing steel plate, castings and other materials, deliveries of these new cars have been

delayed so many months behind normal schedules that many cars urgently needed now and through the coming months are not expected to be available until next spring.

The Committee finds there were 3410 tank cars in liquefied petroleum gas service in September 1946 of which 2569 tank cars were suitable for propane, the balance being suitable only for handling low pressure products. None of these cars are idle. Based on best available data, (see Exhibits I and II) principally from the Bureau of Mines, (4) the Committee finds that 40 per cent more cars than were actively employed in September 3ill be required to meet the consumer demand for the winter months immediately ahead. This is a requirement for 1364 new cars.

This period of peak demand normally ends about the first of April. This estimated requirement for tank cars appears to be confirmed by an examination of car manufacturers' backlog of uncompleted orders on their books as of June 30, 1946, which amounted to 1,797 Class 105-A cars for liquefied petroleum gases service. The difference between the 2300 cars now on order and the 1797 on order as of June 30, 1946, or 503 cars, is, of course, to care for further expansion of the industry in 1947 and following years.

If rail movement efficiency deteriorates by reason of severe winter weather or other causes the 1364 new cars will be inadequate.

The demands of industrial consumers will increase this coming winter over last winter for the reason that during the winter months of 1945-1946 the steel plants were shut down by reason of strikes. Likewise plants of the motor, electrical and other metal consuming industries were shut down and consequently had small liquefied petroleum gas requirements last winter.

Furthermore, there has been a tremendous increase in home installations since last winter.

Yet, in 1946 only a few new propane tank cars have been made available to the liquefied petroleum gas industry.

Despite the situation outlined above, however, the Government already has taken from the liquefied petroleum gas industry 45 of the propane tank cars built by the Government for use in that industry. Those cars will be converted for the transportation of anhydrous ammonia in connection with manufacture of fertilizer program.

Ninety-two of the propane cars, after conversion, will be used by the Government directly in the fertilizer program, while the remaining 278 will be taken by the Government and leased to chemical companies as replacements for a like number of the Government's ammonia tank cars now leased to those chemical companies.

These 45 cars already taken and 370 to be confiscated or 415 cars represent 16% of the total propane cars in the Industry. The Committee finds that withdrawal of these 415 cars will cause 345,000 (5) homes using propane to be without gas - and substitute fuels cannot be used. In addition, hundreds of industrial and chemical plants manufacturing essential commodities will be unable to operate, since 3,000,000 (6) gallons per month of needed liquefied petroleum gas will not be shipped and substitute fuels cannot be used.

Based on best current estimates of tank car builders, after taking into account top priority for steel and other critical materials and fabricating to maximum of shop capacity, new car production in the last quarter of 1946 and the first and second quarters of 1947 appears to be as follows:

1946	
October	8
November	41
December	180
1947	
January	240
February	210
March	380
6 Month Total	1059

Only cars built before December (49) will be effective in alleviating this winters' shortage.

Thus, because of the Government's decision that immediate manufacture of fertilizer for foreign fields is more important than keeping American homes warm and American industry operating at capacity, millions of household and industrial consumers of liquefied petroleum gas undoubtedly will be made to suffer undue hardships this winter.

The Committee is of unanimous opinion that its study, summarized in the preceding paragraphs, clearly foreshadows calamity. On the threshold of this calamity the Committee is called upon for advice and counsel.

To the committee the most vital issue appears to be a choice between two programs. The first involves the continued and increasing supply of a commodity which has become an essential in the American plan of living. The second is a Government project for production of fertilizer for exportation to occupied and other countries.

These two programs - to the extent that they depend upon high pressure tank cars are in conflict. One or the other must give ground before an existing and increasing shortage of vital transportation equipment.

The Committee cannot judge between these two conflicting programs. We do feel, however, that we are under heavy obligation to warn those who must judge between these programs that they should carefully consider the consequences certain to follow any further curtailment in the transportation of liquefied petroleum gases.

That is our first recommendation.

Unless every effort is made to others to solve the problem presented by the two conflicting requirements for transportation equipment, this Committee has little hope that its remaining recommendations, even though fully carried out, can eliminate the crisis which we face.

We, therefore, make the following secondary recommendations, not because we believe they will avert this crisis, but because they represent the only contribution which the owners and the users of these cars are capable of making.

Clerly, then, the solution can only be found in the Government itself.

The Committee, by Resolution, recommends as follows:

BE IT RESOLVED, that this Committee recommend to the National Petroleum Council that it seek from the proper Government Agency official assurance that the 438 propane tank cars now leased to the liquefied petroleum gas industry be frozen in their present service until July 1, 1947, and that every effort be made to have replaced in the industry service 45 propane tank cars taken from it through private sale by War Assets Administration.

BE IT FURTHER RESOLVED, that, if necessary to freeze propane cars in present service, that the Government's fertilizer program be reduced until such time as the liquefied petroleum gas industry can obtain delivery on a sufficient number of new cars to alleviate the present emergency.

BE IT FURTHER RESOLVED, that the Government be requested to exert every effort in connection with priorities for manufacture of propane tank cars for more rapid delivery of materials to car builders, and that the car builders be given every assistance in an effort to speed up the manufacture of the backlog of propane tank cars now on order.

BE IT FURTHER RESOLVED, that the Government's cars that have been taken from those who have used them for many months, shall be replaced from the first new cars constructed, after which the distribution of new equipment shall be as follows:

The delivery of cars up to March 30, 1947, by the car builders shall be equitably prorated to the various companies requiring same according to the orders on the books of the car manufacturers of July 1, 1946.

AND BE IT FURTHER RESOLVED, that this Committee recognizes that there is some opportunity for increasing the efficiency of the use of high pressure tank cars for the transportation of liquefied petroleum gases by:

1. Short haul movements be made by truck to maximum extent that trucks suitable for the transportation of butane and propane are available. This practice should prevail even though the cost of truck transportation may be greater than by rail.

2. Elimination of cross hauls through exchange of products to insure movements of butane and propane from the nearest source of supply.

3. The maximum use of modified tank cars for transportation of butane.

4. A survey made to determine the number of additional modified cars that could be used for transportation of butane, what the modification cost would be and how soon the work could be performed.

5. The loading and unloading of high pressure cars should be on a seven-day, 24 hour-day basis.

The Committee recommends that the Council ask the petroleum industry for all shippers and receivers of liquefied petroleum gases using high pressure cars to take immediate steps to carry our the foregoing recommendations.

The task of this Committee would have been more pleasant had the problem it faced been more susceptible of solution by any one but the Government itself. We are fully convinced that the effective solution resides in the Government alone and we have so stated, but whatever the Government's program may be, we tender our full and sustained assistance and co-operation.

Respectfully submitted,

/s/ C. R. Musgrave

C. R. Musgrave, Chairman
Special Committee on pressure
tank cars for transportation
of Liquefied Petroleum Gas

B I B L I O G R A P H Y

R E F E R E N C E S

(1) Bureau of Mines Mineral Market Report No. MMS 543

(2) Petroleum Engineer-Liquefied Petroleum Gas in 1945 - by G. G. Oberfell and R. W. Thomas

(3) Liquefied Petroleum Gas Association, Inc.

(4) Bureau of Mines - Mineral Industry Surveys - Natural Gasoline and Allied Products Monthly Reports

(5) Based upon following Industry experience:
- a) 1.6 car trips per month
- b) 10,000 gallons average per car load
- c) 10 gallons per month per propane household user
- d) Percent of household use to total equals 49
- e) 3% of total use in propane for gas manufacture by utilities
- f) 49% / 3% = 52% 52% of 415 cars = 216 cars
- g) 216 cars x 1600 = 345600 household users.

(6) Based upon following Industry experience:
- a) 1.6 car trips per month
- b) 10,000 gallons average per carload
- c) Industrial and chemical use 46% of industry total
- d) 48% of 415 cars = 199 cars.
- e) 199 x 1.6 x 10,000 = 3,184,000 gallons per month
  =38,208,000 gallons per year

EXHIBIT I

MONTHLY SHIPMENTS OF LIQUEFIED PETROLEUM GAS

(From Bureau of Mines Monthly natural gasoline Reports. Figures in Thousands of Gallons)

	From Natural Gasoline and Cycle Plants		From Refineries	
	For Fuel	For Chemicals	For Fuel & Chemicals	Total
January, 1945	60,116	8,699	31,332	100,147
February	51,074	7,998	33,810	92,882
March	50,112	9,258	31,458	90,828
April	47,469	10,332	35 238	93,039
May	49,357	15,385	39,372	104,114
June	42,922	15,192	33,390	91,504
July	42,143	13,629	35,952	91,724
August	42,390	15,104	31,332	88,826
September	44,655	12,444	24,906	82,005
October	55,966	14,222	40,908	111,096
November	58,479	16,381	49,350	124,210
December	71,577	17,245	50,274	139,096
January, 1946	75,920	17,197	48,510	141,627
February	66,352	16,507	47,260	130,319
March	61,636	16,560	50,694	128,890
April	57,878	16,271	54,684	128,833
May	59,414	19,222	56,280	134,916
June	55,084	18,517	58,044	131,645

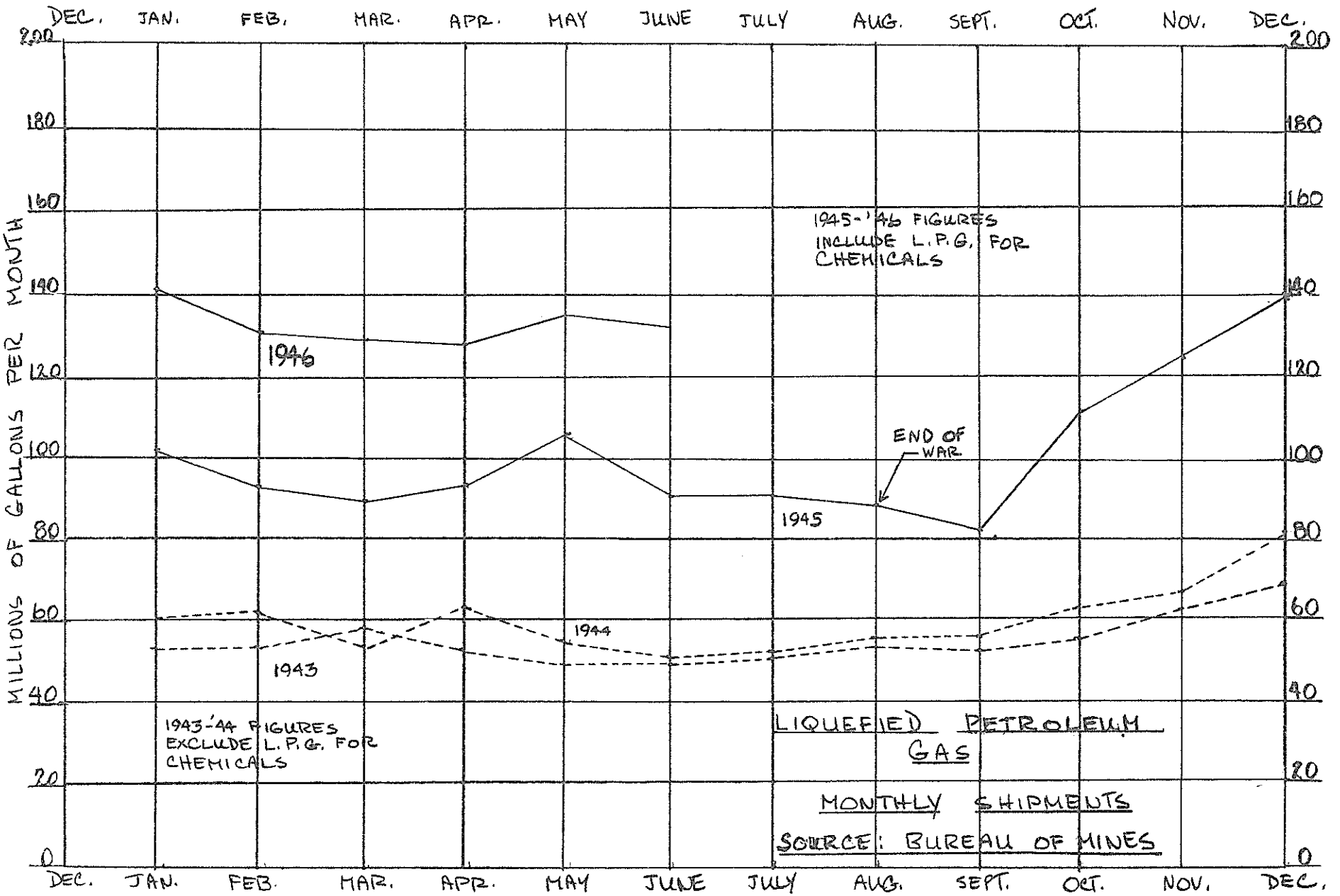
DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
200
180
160
140
120
100
80
60
40
20
0
MILLIONS OF GALLONS PER MONTH
1945-'46 FIGURES INCLUDE L.P.G. FOR CHEMICALS
1946
END OF WAR
1945
1944
1943
1943-'44 FIGURES EXCLUDE L.P.G. FOR CHEMICALS
LIQUEFIED PETROLEUM GAS
MONTHLY SHIPMENTS
SOURCE: BUREAU OF MINES

EXHIBIT II