

# Oil and National Strength

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CANADA has come far since 1939. Emerging from the war with a much enlarged physical plant and an unprecedented demand on all sides for the materials of reconstruction, this country was able to compress extraordinary growth into a few years. All phases of the economy have been affected, but particularly manufacturing and natural resource development.

During the last war the country's total manufacturing plant was doubled by an investment of some 4½ billion dollars. In the postwar period this high level of capital expenditure has been maintained with approximately the same expenditure in real terms as occurred during the war. More than a thousand new manufacturing plants have been established covering all types of consumer and capital production including steel, chemicals, base metals, petroleum, wood products, textiles and manufactures of many types. Today Canada, 24th in population, ranks 7th in the world in manufacturing output. Manufacturing now accounts for almost a third of the national income. Its production is worth half as much again as the combined value of the agricultural, forestry, mining and fishing industries.

Resource development has been stimulated by the depletion of resources in the United States and from a universal growth in demand. The discovery of oil in Alberta and of large iron reserves in Labrador are the most spectacular increases in the production of the mining and forest product industries.

This growth and the high level of na-

tional prosperity have been stimulated by two factors—trade and investment. The physical volume of foreign trade is 60% more than it was prewar and Canada is now the third largest trader in the world, surpassed only by Britain and the United States. Canada's annual trade with the United States alone is now approximately two billion dollars each way.

Because of the postwar expansion in domestic needs, in trade and in resource development, an unusually large part of the nation's production has been required for capital needs. In 1950 almost a quarter of the gross national expenditure was to increase production. In physical terms, new investment in 1950 was twice the prewar rate. Compared with the United States, Canada has been devoting a third more of her total production since the war to the building of new plant. The power of this investment may be measured by the fact that with an increase in the working force of 30%, the physical volume of production has increased 80%.

The result of these various developments is that Canada's living standard has increased less than a third.

In this atmosphere of productivity and growth, oil has had a important role to play, not only as a source of energy but as a basic and important contributor to our national growth and wealth and to strengthening of the Canadian economy.

Oil's contribution to the Canadian standard of living may not be fully appreciated. Petroleum now accounts for one-quarter of Canada's total energy requirements. It drives our cars and our planes; it heats

our homes and our factories; it plants and harvests our crops; it lubricates the machinery of industry. Canada in 1950 used roughly 355,000 barrels of petroleum per day, or about 325 gallons per capita per year—that is, almost a gallon a day per person.

Canada's per capita consumption of 325 gallons a year is about 60% of that in the United States and over  $3\frac{1}{2}$  times that in the British Isles. It provides power to more than  $2\frac{3}{4}$  million vehicles and tractors and fuel to a power burner or a space heater for one of every five homes. In addition, large amounts of oil are used in industry, in shipping and in rail transportation. The use of oil by the railroads is increasing rapidly—this year there will be in operation more than 400 heavy oil burning locomotives in the Prairies and more than 500 diesel locomotives in other parts of the country.

Despite its 100 years of existence, the oil industry is young and growth is still its predominant characteristic. In the last ten years Canada's requirements for petroleum products have more than doubled. Our rate of increase since the war has been at almost  $2\frac{1}{4}$  times that of the United States.

Oil is peculiarly suited to the solution of many of Canada's fundamental problems—in overcoming its vast distances, in agriculture, in manufacturing, in mining and in exploiting the resources of the north. There could be no greater development for Canada than the finding within its borders of an important source of petroleum which would make indigenous crude available to a country which is placing increasing reliance on this type of energy.

## II

**A**T the time of the Leduc discovery more than 70% of the country's petroleum requirements were imported from the United States and the Caribbean area. Turner Valley had the only important crude production, supplying at that time about 5% of the country's needs. Its remaining reserves were equal to about  $2\frac{1}{4}$  months of today's requirements.

In February, 1947, after having drilled 133 dry wells over a period of 30 years Imperial Oil found oil at Leduc southwest of the city of Edmonton. This field proved to have reserves of some 250 million barrels and was one of the world's major discoveries in 1947. It was followed in 1948 by Redwater, whose reserves are now estimated to be roughly 500 million barrels. In 1949 other important discoveries were made at Gilded Spike and Stettler.

The new discoveries of 1950 have not as yet been fully evaluated. However, important extensions were made to existing fields, particularly south Leduc, northern Woodbend and in the Joseph Lake area.

The various small fields such as Bon Accord, Excelsior, Normandville and Joseph Lake have been over-shadowed by the major discoveries. They are important however, not only for their production but for the promise they give of the potential for the area. Normandville, for instance, is 250 miles northwest of Edmonton.

These various discoveries have increased Canada's Prairie oil reserves in the space of four years to roughly 1.1 billion barrels or 25 times what they were when Leduc was discovered. Further, in the light of these successes there is reason to hope that the 600,000 square-mile sedimentary area of Canada's Western basin may prove to have reserves of 5 billion barrels or more. This compares with 8 to 9 billion for Venezuela and 25 billion for the United States.

"Years of Supply" that is, the country's reserves divided by the Country's requirements, is a concept frequently used. Canada now has almost 9 years of supply. This compares with roughly 11 years of supply in the United States. In other words, in four years a reserve position comparable to that of the United States in terms of national consumption has been achieved.

How has this been done. Leduc initiated a chain reaction best illustrated by the expenditures made for finding and producing oil since 1947. In 1946, 12 million dollars was spent in searching for and developing oil in the Prairies. Each year since then the expenditure has doubled

until 1950 when the total spent on exploration and development reached 150 million dollars. This year it is anticipated that 200 million dollars will be spent.

The industry's faith in Western Canada's oil prospects may be judged by the fact that it is now the second most actively prospected region in this hemisphere, surpassed only by Texas. There are now roughly 125 parties in the field operating at a cost of perhaps 20,000 dollars a month per party.

### III

**T**URNING to the actual producing effort—as apart from exploration or searching—the industry in 1950 drilled nearly 800 producing wells, or more than 2 wells per day, increasing the potential Prairie production almost 50,000 barrels per day over 1949. The actual production was enough to meet a little more than a fifth of Canada's total requirements. This year it is anticipated that almost 125,000 barrels per day of crude will be produced, an increase of 60% over 1950, and that one-third of the country's requirements will be met from its own resources.

This increase in production is made possible by the Interprovincial pipeline—a line 1,127 miles long and varying in diameter from 16 to 20 inches. Oil moving from Edmonton to Superior at the lake-head will take about 26 days to make the trip. It was built last year at a cost of roughly 90 million dollars and the speed and imagination with which it was constructed are typical of the whole tempo of the Western oil development.

Construction of the line called for careful co-ordination and planning in a very difficult supply period. It involved laying an average of more than a thousand tons of steel per day in a trench 5 feet deep and covering it up again. The peak of activity was reached in August when almost 350,000 dollars a day in materials and labour was expended. The line was completed in a 5-month period; no pipeline project of this magnitude had ever been completed in so short a time.

The present pipeline capacity provides

for meeting the crude requirements of the various Prairie refining centres along its route and for delivering of 50,000 barrels per day of crude oil to Superior in the summertime. Winter shortage is being provided to accumulate a million and a half barrels of crude which will be moved in the succeeding open season of navigation. Two large tankers are being constructed, capable of moving approximately 115,000 barrels of crude, or about 9 trainloads in a single trip to Ontario refineries.

The pipeline in 1951 will meet half the requirements of the Ontario refineries. However, by building additional storage at Superior to increase the winter pipeline movement, and by the addition of pumping stations, deliveries of crude to Superior can be almost doubled. In this way, and with construction of additional tankers, the full requirements of the Ontario refineries can be met when sufficient crude becomes available.

The present potential crude production in the Prairies is 150,000 barrels per day and anticipated utilization this year is 125,000 barrels per day. Consequently, there is pressure to find additional outlet. Plans for expansion of the pipeline movement have been announced and as part of this programme, a third new tanker will be constructed and will go into operation in 1952. Obviously when pipeline facilities, large tankers and storage are involved there must be a time factor.

As additional crude reserves are proved on the Prairies, production potential will continue to expand and new markets will be necessary. Whether these markets lie in the direction of the West Coast or in the North Central United States around Minneapolis, or even possibly Montreal, will be determined by such factors as the continental petroleum supply situation, the availability of materials, strategic considerations, tariff developments and the rate and size of future discoveries both in the United States and Canada. Whatever pattern of development takes place, it should conform to the fundamental concept of minimizing transportation. By so doing the maximum incentive to find and produce oil in the Prairie area

will be maintained and the national interest will be best served.

#### IV

**T**HE Western crude oil development has dominated the Canadian oil scene since the Leduc discovery. However, other important projects have been completed which, while less dramatic, have nevertheless had far reaching effects on the Canadian economy and its energy potential.

As a result of wartime restrictions in Canada, refining facilities at the end of the war were inadequate in capacity to meet requirements and in many cases equipment was obsolete. There was practically no catalytic cracking, a process required to manufacture high quality fuels suitable for the modern automobile engine.

The Canadian situation contrasted with that in the United States where catalytic cracking had been quite generally installed to meet allied military demands for petroleum products. This process also provided the raw materials for aviation gasoline, rubber and chemicals.

Immediately following the war the Canadian industry, stimulated by the large growth in demand, embarked on a programme of enlargement and modernization of refining facilities. Roughly 75 million dollars has been spent in the Montreal area in doubling capacity and in installing catalytic cracking facilities. Refineries in the Toronto and Sarnia area have also been improved and increased in size. A new refinery is in the process of construction at Sarnia which plans to run Canadian crude.

The availability of the necessary by-products from refinery operations has fostered a new chemical industry in the Sarnia area. When present plans are completed over 75 million dollars will have been invested there for the manufacture of rubber, plastics and chemicals.

In the West the story is the same. New refineries have sprung up in the Edmonton area and along the Interprovincial pipeline route. Edmonton has become a major refining centre with a planned

capacity of roughly 40,000 barrels per day, representing an investment of possibly 40 million dollars. Winnipeg also has become a refining centre, and a new plant which will cost 10 million dollars will go into operation this year. With the completion of present and planned increases the Prairie refining capacity will have increased more than 150% since 1945.

Transportation and distribution have also been expanded. The Interprovincial pipeline has dwarfed other developments, but major additions to facilities have been made. The 12 inch pipeline constructed from Portland to Montreal during the war to reduce tanker requirements has been expanded by laying another 18 inch line over the 236 mile route at a cost of 15 million dollars. Requirements of Montreal refineries can be met by this means and the need to store crude for winter operation has been eliminated. This means increased flexibility and, from a strategic standpoint, increased security.

Another pipeline was built to span the 75 miles from the Interprovincial pipeline to the Winnipeg refineries so that they will obtain their raw material at the lowest possible cost and with the greatest benefit to the public.

Plans for pipelines to move products from the refineries at Montreal and Sarnia to the Toronto area have been reported. These pipelines will probably cost in the neighbourhood of 25 million dollars and will be the most economic means of transportation both in cost and in the use of strategic materials.

The large task which has been completed is only half the job. If national sufficiency in oil is accepted as an objective, approximately three times present reserves, or 3 billion barrels must be found. Based on the historical record of what has been spent to date in exploration and development, it is probable that the capital requirements to assure self-sufficiency may run in the neighbourhood of a billion dollars. That is the producing investment. However, finding and developing the oil is not all; new transportation facilities must be built corresponding to the Interprovincial pipeline to move the oil. Also it is probable that new

—and costly—refinery facilities will be required.

## V

**I**N all phases of the oil industry—in producing, in transportation, in manufacturing and in distribution a major effort has been put forth since the end of the war. What are the benefits which have resulted?

Those from the Western development are rather extraordinary and should perhaps be isolated from those resulting from the other projects. Alberta, with oil production this year worth roughly 115 million dollars, will show the most outstanding benefits.

Because almost all the mineral rights in Alberta belong to the government, it receives most of the royalties. From production on government acreage the province receives about one barrel in every eight. With reserves in excess of a billion barrels and the promise that additional billions will be found, the province appears to be in a singularly fortunate position—with an income running into hundreds of millions of dollars over the life of the fields.

Through the sale of leases important revenues have been obtained. When an oil company makes a discovery on government acreage it must return half of its reservation to the government within 90 days. The government usually auctions this land to the highest bidder. To date it has received more than 60 million dollars from the auctioning of lands whose values were developed by the oil industry.

During 1950 the provincial government's income from oil operations in Alberta amounted to about 57 dollars per capita. The gain to the Alberta citizen is showing up in the form of new highways, hospitals, university facilities, conservation projects and so on; new assets are being created with moneys obtained from the depletion of existing assets.

Expenditures by the oil industry have attracted scores of new businesses; new towns have been built; Edmonton's population has increased almost a third.

Product prices have been substantially reduced in the Prairies and lower prices these days are rather refreshing. When crude moves to Ontario refineries, Prairie consumers will pay 55 million dollars less each year for oil products than they would have had there been no new discoveries. This amounts to 22 dollars per capita and represents a price reduction of between 5 and 6 cents per gallon to a fifth of Canada's population.

Turning from Alberta to Canada, Prairie oil will permit a reduction in U. S. dollar requirements in 1951 of roughly 150 million dollars. The value of Canada's nickel production in 1950 was 113 million dollars and in the same period gold production was 168 million dollars. Four years after Leduc, oil production will be contributing to Canada's wealth and to the blanching of her U. S. dollar position an amount comparable to these long established and important industries.

In 1950 the investment in oil development amounted to almost a tenth of the total private investment in Canada. This is a remarkable contribution to be made by a single industry.

## VI

**T**HESE developments in all functions of the oil industry have tremendously increased and strengthened Canada's energy potential. The country's dependence on outside sources is being reduced at a critical time. With modern refinery equipment the industry is in a position to provide the highest quality fuels which will go far towards meeting the needs of either a peace-time or war-time economy. New facilities make possible greater production of aviation, automotive, jet and other fuels. They also can supply raw materials for rubber and chemical manufacture if these should become necessary.

The minimizing of transportation by obtaining geographic distribution of manufacturing and producing facilities is of great importance particularly in times of national peril. The Prairies, for instance, are an agricultural area depending on mechanization for their maximum pro-

ductivity. With local supplies of crude and appropriate refining facilities, the minimum strain is imposed on continental energy supply lines.

From the end of the war to the end of this year, when the various programmes for producing, manufacturing, transportation and distribution are completed, the oil industry will have spent almost a billion dollars or 70 dollars for every man, woman and child in Canada. This money has

come from oil company earnings re-invested, from venture capital seeking participation in the various developments, and from borrowings where the oil industry has mortgaged its assets to channel additional funds into productive purposes. For this expenditure a new industry has been created, a modern energy plant built, prices reduced to a fifth of the population, new industry has been induced and security has been increased.

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## *Inflation Tomorrow?*

Canada's official cost-of-living index says that,  
 between 1914 and the present,  
 Our dollar lost more than half of its retail purchasing power.

If when I get a larger income in dollars for myself,  
 I produce at the same time  
 correspondingly more than I produced before,  
 This will *not* raise my neighbour's cost of living.

But as often as I get a larger income  
*Without* at the same time producing correspondingly more  
 than I produced before,  
 My success in getting more income for myself  
*Must* raise my neighbour's cost of living.

And in parallel with this,  
 Whenever my neighbour gets a larger income in dollars for himself,  
 And at the same time enlarges his own output correspondingly,  
 He will not raise *my* cost of living.

But as often as he gets a larger income  
 Without at the same time  
 producing correspondingly more than he produced before,  
 His own success in getting more income for himself  
*Must* raise my cost of living.

When we can understand this very simple truth, and  
 When we can use not only collectively, but individually too,  
 The self-control which is our greatest need  
 in order to resist inflation,  
 We then may manage to stave off  
 the threatened inflation of tomorrow.

*But otherwise, of course, we shall fail to do so.*