

L-171

ANNEX I

No. L-171

RESTRICTED

This report is restricted to use within the Bank.

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

FILE COPY

DESCRIPTION OF AUSTRALIAN DEVELOPMENT PROGRAMS

July 3, 1952

Loan Department

AUSTRALIA

OUTLINE OF DEVELOPMENT PLANS IN CERTAIN
KEY SECTORS OF THE ECONOMY

INTRODUCTION

This report outlines the main features of the development which the Commonwealth Government has proposed should be the basis for a loan from the Bank. It deals with programs for the following:

Agriculture and Land Settlement

Coal Mining

Iron and Steel

Electric Power

Railways

Road Transport

Non-ferrous Metals and Industrial Minerals

Industrial Development

The report is based on information provided by the Commonwealth Government. The Bank has not had an opportunity of studying the development projects which make up these programs nor of discussing them with the State and Commonwealth authorities and the business enterprises who will in fact carry them out. In the course of its work, the Bank mission which visited Australia in the spring of this year was in touch with a number of bodies concerned with carrying out development projects and saw something of the work that is being carried on. The mission did not make a technical examination of the projects. The Bank is, however, satisfied that the need for development as set out in these programs is of the highest priority and that the general lines on which this development is being carried out is appropriate to the ends in view.

I. AGRICULTURE AND LAND SETTLEMENT PROGRAM

Objectives

The need to supply food to Australia's growing population, and to expand the export of those agricultural and pastoral products which provide Australia's main source of income, have now been fully recognized by the Commonwealth and State Governments. Increased food production is also realized to be an important contribution to defence preparedness.

The Commonwealth and State Governments have accordingly agreed upon a program which sets certain output targets for the crop year 1957/58. Under this program, grain production is to be raised by 20%, the wool clip by 10%, meat production by 15% and milk production by 13%. Achievement of these aims would increase the production of Australia's principal export products by about £A 100 million (\$220 million) based on 1951/52 prices.

During the five years of the program the planned increase can be achieved only by improving existing farms and by carrying forward certain development projects already under way. Meanwhile, longer term projects will be started, although they can contribute to increased production only towards the end of the five year period.

Improvements on Existing Farms

This part of the program involves more mechanization, greater use of fertilizers and the adoption of better methods of farming and animal husbandry. The main task is to make good the arrears in maintenance and the deficiencies due to the agricultural depression of the 'Thirties and to the impossibility of getting equipment and material during and after the war. Much of the existing machinery has become uneconomical through long use, or obsolete through technical advances in design.

Increased and improved mechanization necessarily involves dollar expenditure. Heavy duty wheel tractors required for large scale cereal cropping, and additional supplies of heavy duty ploughs and harvesting machines, have to be imported from the United States, the only country where machines suited to Australian conditions are made. Fodder conservation machinery to secure the stability and expansion of livestock breeding must also be imported. The Commonwealth Department of Commerce and Agriculture estimated that the annual investment in farm machinery required would be about £A 48 million (\$107 million). Of this total imports from the dollar area are estimated to be \$22 million and imports from elsewhere (mainly the sterling area) £A 16 million (\$36 million). These figures are probably too high under present conditions.

Basic Development

Basic development, involving in most cases water conservation and irrigation works, land clearing and the establishment of new farms, will be carried out mainly, but not exclusively, by State Governments and their instrumentalities.

Northern Australia - Development of the Beef Industry

This project aims at a substantial increase of the output of beef in the sparsely settled areas of the Northern Territory, Queensland and the Kimberley area of Western Australia.

It provides for the establishment of much needed water points (sub-artesian bases and dams), for the fencing of farms and for stock route improvement. Basically the project will cover privately owned land and will be implemented by individual holders, with the Government providing assistance. Stock route development, however, will require public investment.

Assuming that one-half of the pastoralists in the area participate in the scheme, the work is estimated to comprise 1,900 bores, 1,700 dams and 50,000 miles of fencing. If material and equipment are available, the project will be completed in five years.

By the end of the five years, the direct value of the increase in the turn-off of fat and store cattle should be about LA 10 million (\$22 million) per annum, which could represent a net addition to export receipts.

Queensland

Brigalow land development: Open plains now used for extensive grazing and large belts of Brigalow scrubland, mainly east of the 24-inch rainfall line, are to be developed into a mixed farming pattern in which the cropping of grain sorghum would support intensive beef cattle husbandry and dairy farming. In better areas this would be combined with lucerne, Rhodes grass and wheat growing.

Some 750,000 to 1 million acres in the Wandoan-Tarcom region are suitable for closer settlement, with grain sorghum growing and stock fattening as major aims. Similar developments are possible in the Dalby-Toowoomba, Clermont-Rolleston-Peak Downs, Gladstone-Biloela and Goomeri-Gaynda regions.

The total area available for such development covers at least 5 million acres, and it is considered practicable to establish 1,000 new farms within five to seven years.

At full development the annual potential production would comprise:

| | |
|-------------------------|--|
| Summer grains and wheat | 4½ million bushels |
| Beef | 20,000 tons |
| Dairy produce | 3 million lbs. butter (or equivalent) |
| Pigmeats | 3 million lbs. |

The gross value of this production at current export prices would amount to LA 6.5 million (\$ 14.5 million).

Mareeba - Dimbulah Project: This project is for irrigation and land development and involves the storage of the waters of the Barron river system for the establishment of tobacco growing and mixed farming lands on the Atherton tableland. The project, which should be completed by 1969, provides for the establishment of 1,180 tobacco farms and 240 mixed farms with an annual production estimated at LA 7 million (\$15.5 million).

Burdekin Project - Stage 1: The first stage of the Burdekin project involves the construction of a weir on the Burdekin river in central coastal Queensland to create pumping facilities for approximately 200 tobacco farms. Already 80 farms have been provided with water and work on the remainder should be completed by 1953/54.

Dawson Valley Project: This irrigation and land development project in central coastal Queensland involves storing water from the Dawson river. It provides for the establishment of about 915 mixed farms to be engaged chiefly in cotton growing and dairying. Soil survey work has been completed and basic services, including transport, already cover most of the area. The scheme should be completed in about eight years, and result in additional annual production of a value of at least LA 3 million (\$6.8 million).

Emerald Project: This water conservation, land development and irrigation project in the Emerald area of the Fitzroy Basin consists of the establishment of about 500 farms to produce cotton, butter, beef, pigmeats and lamb of a gross annual value of LA 2.5 - 3 million (\$5.5 - 6.8 million).

New South Wales

Riverina Irrigation Project: By channeling and light land clearing over three years, water from existing storage is to be used for the establishment of about 1,500 irrigation farms in the Riverina area to produce dairy products, fat lambs, rice, citrus and stone fruits of an estimated gross annual value of at least LA 6 million (\$13.5 million).

Blowering Dam: This water conservation scheme is to provide for the extension of irrigation farming in Southern New South Wales. It has not yet been begun.

Other Projects: Longer term irrigation works are in progress, such as extensions to the Hume and Burrinjuck Dams.

Victoria

Heytesbury Area: In the Heytesbury area there is a project for land clearing and the development and establishment of about 600 dairy farms over five years, producing a gross annual value of LA 3 million (\$6.8 million). It has not yet been started.

Extension of Eildon Dam: This project, already in progress, involves the completion of irrigation channels and other water distribution work in the Goulburn Valley to increase the irrigable area from 350,000 to 700,000 acres over ten years. It is estimated that it will result in an annual production of more than LA 6 million (\$13.5 million).

Other Irrigation Works: Minor irrigation works are to be carried out at the Nambrok-Dennison, Cairn-Curran, Maffra-Sale and Rocklands reservoirs.

South Australia

Kangaroo Island: The project involves the clearing of 180,000 acres (over and above 70,000 acres already cleared) for the establishment, over the next seven to eight years, of an additional 150 to 200 farms, chiefly dairy and fat lamb farms, producing an annual gross value of LA 0.5 million (\$1.1 million).

Ninety-Mile Desert: A project undertaken by a leading insurance company for the clearing of about 300,000 acres of land and for the establishment of fat lamb and wool farms.

Western Australia

The project, already in progress, is centered in the Denbarker-Albany area and involves land clearing for the establishment of about 600 wool, fat lamb and beef farms over the next three to five years to result in an annual gross production of about LA 3 million (\$6.8 million).

Tasmania

Montague Swamp and surrounding areas: The project is for the draining and clearing of swamp areas for the establishment, over 10 to 12 years, of about 500 new dairy and mixed farms producing on completion a gross annual net value of about LA 3.5 to 4 million (\$7.8 to 9 million).

King Island: Land clearing and the establishment of 100 to 150 dairy farms, thereby doubling the number of farms in this area, is planned. The cost of the additional work is estimated at about LA 1 million (\$2.2 million) and the yield at a gross annual value of about LA 0.5 million (\$1.1 million).

Flinders Island: Work is in progress on a land clearing project for the establishment, over six years, of 150 dairy and fat lamb farms.

The foregoing enumeration of projects does not exhaust the full list of projects but covers the principal ones which are either under way or could be proceeded with at an early date if finance were available.

II. COAL MINING PROGRAM

Production and Requirements

Bituminous and anthracite coal (black coal), mined for the most part in New South Wales and to a lesser extent in Queensland, represents nine-tenths of the thermal value of all the coal mined in Australia. Lignite (brown coal), coming from the Yallourn field in Victoria, accounts for the greater part of the rest. There are small deposits of sub bituminous coal in South Australia and in Western Australia. Four-fifths of all this coal goes to six vital industries: railways, bunkers, electric power generation, gas production and the cement and steel industries.

For many years the demand for coal has increased faster than has production. While in 1940/41 net exports of coal totalled 324,000 tons, since 1948/49 considerable imports have been necessary. In 1949/50 net imports were 425,000 tons. As imported coal costs more than domestic coal, it has been subsidized by the Commonwealth Government to bring its cost down to that of New South Wales coal.

Australia's coal production in 1951 totalled 17.2 million tons of black coal and 7.8 million tons of brown coal (equivalent to 2.6 million tons of black coal), making a total of 19.8 million tons of black coal equivalent. Demand may be estimated at 23 million tons, so that there was a shortage of over 3 million tons, this shortage being met only partly by imports. The shortage, particularly in high grade gas and coking coal, handicapped Australian industry in many ways and was mainly responsible for steel and iron production being below capacity.

The Joint Coal Board estimates that by 1954, total black coal requirements will be 23.9 million tons and that brown coal requirements will be 3.4 million tons in terms of black coal equivalents, making a total requirement for 27.3 million tons of black coal equivalents.

Year by year requirements have been estimated by the Joint Coal Board as follows:

| | New South Wales black coal | Black coal of other States | Total black coal | Victorian brown coal | Total Require- ments |
|------|--|----------------------------------|------------------------|----------------------------|----------------------------|
| | (Expressed in millions of tons of black coal or black coal equivalents) | | | | |
| 1951 | 16.5 | 4.1 | 20.6 | 2.2 | 22.8 |
| 1952 | 17.3 | 4.3 | 21.6 | 2.3 | 23.9 |
| 1953 | 18.0 | 4.5 | 22.5 | 2.6 | 25.1 |
| 1954 | 19.0 | 4.9 | 23.9 | 3.4 | 27.3 |

Even if the development program is carried out in full, production will still be short of requirements by about 1 million tons per year.

Outline of the Program

New South Wales

New South Wales is the principal coal producing state, all other States except Queensland having been largely dependent on it for their coal supplies before the war.

Some of the mines are publicly owned and some are privately owned but all of them come under the jurisdiction of the Joint Coal Board, an instrumentality of the Commonwealth and the New South Wales Governments.

In recent years New South Wales coalfields have been unable to meet the increased demands, and despite steps already taken to reorganize coal production, some years will pass before they can supply all requirements. Consequently shipments from New South Wales to other States have been curtailed severely and they have been forced to develop whatever coal they had within their own borders in an effort to gain a measure of independence.

The following table shows estimates, in millions of tons, of production, requirements and shortages:

| <u>Year</u> | <u>Production</u> | | | <u>Requirements</u> | <u>Shortage</u> |
|-------------|--------------------|-----------------|--------------|---------------------|-----------------|
| | <u>underground</u> | <u>open cut</u> | <u>total</u> | | |
| 1951 | 11.2 | 2.2 | 13.4 | 16.5 | 3.1 |
| 1952 | 11.8 | 3.0 | 14.8 | 17.3 | 2.5 |
| 1953 | 13.1 | 4.0 | 17.1 | 18.0 | 0.9 |
| 1954 | 13.2 | 5.0 | 18.2 | 19.0 | 0.8 |

As a rapid means of providing a partial though temporary solution of the coal problem, an expansion of open cut coal production from 2.2 million tons in 1951 to 5 million tons in 1954 is being undertaken. This work is concentrated near Wallerawang on western coal fields and near Muswellbrook, Singleton and Cessrock on northern fields. It involves further expenditure on earth-moving and excavating equipment and provision for sidings, dumps, washing plants and other ancillary works.

Reserves of open cut coal being limited, an output of 5 million tons a year could be maintained only for a few years. It is expected that, during this time, planning and development of underground mines will take place and that later, underground mines will use machinery and equipment provided temporarily for open cuts.

The hard core of the problem is how to raise production in underground mines when reserves of open cut coal will have been exhausted.

The Joint Coal Board proposes to this end to develop three further mines to increase their production by a total of 1.6 million tons a year, viz:

Newstan: production to be increased from 1,400 to 3,000 tons per day,

Newcom: a new mine to produce 400 tons per day,

Huntley: to produce 2,600 tons per day as a source of coal for the Tallawarra Power Station.

The development of a further four underground mines is being carried out by the New South Wales Government to increase their production, by 1958, from about 0.5 million tons to 3 million tons per annum for the supply of railways, power generation and other public utilities.

It is further proposed to mechanize and develop the existing mines at Lithgow and Awaba and to open up and develop new mines at Liddell and Burragarong.

Many owners of private mines are undertaking programs of rehabilitation and mechanization, the principal mines involved being those associated with the steel and iron industry. Details of plans for these mines are not yet available.

The provision of housing to maintain labor recruitment is a most important part of the Program. The Joint Coal Board program requires immediately an additional 2,500 workers. The main work in house building is being done by the New South Wales Housing Commission.

The total expenditure of the coal program in New South Wales over four years is estimated at £A 12 - 15 million (\$27 - 34 million) and that of housing at £A 8 million (\$18 million). About \$11 million of equipment from the dollar area will probably be required.

Queensland

In Queensland, which also has important black coal deposits, some mines are owned by the State, others are privately owned. The Queensland Coal Board, a State authority, has certain supervisory powers over the industry.

Total production of about 2.3 million tons being sufficient to meet demand, development plans are directed mainly to raising the output of special types of coal, including coal for shipment to other States, and to technical improvements in production methods.

The program of the Queensland Coal Board comprises the following:

West Moreton Field: the expansion and rehabilitation of three existing mines to meet increasing demands of southern Queensland and the development of a new mine by the City Electric Light Co. (Brisbane) to supply the power station. The expected increase in production should yield 400,000 tons per annum by 1951.

Collinsville Field: the mechanization of an existing State mine and of a private mine and the erection of a coal washing plant to raise production.

to about 200,000 tons a year to supply the needs of central Queensland and to provide more coke for Mt. Isa Mines;

Callide: the installation of a coal-loading plant at Gladstone, the seaport for Callide.

South Australia

South Australia's only coal deposits are the sub bituminous deposits in the Leigh Creek field which is being worked by the State Electricity Trust of South Australia, a State authority.

The development of the Leigh Creek open cut, now under way, will raise output by 1956 from about 400,000 to 900,000 tons per annum. The coal is used mainly to supply power stations at Osborne and Port Augusta by the State railways and other public utilities.

Expenditure over the next few years, not including the cost of improving the railway to and from the field, is estimated at £A 3.6 million (\$8 million).

Western Australia

The development of underground mines by three private companies on the Collie field will increase annual production from 860,000 tons in 1951 to 1,250,000 tons in 1954.

Victoria

Reserves of black coal are very limited and practically the whole of the black coal output comes from a State owned mine and is used to supply the Victorian Railways. There are extensive brown coal deposits in the Latrobe Valley which are owned and operated by the State Electricity Commission.

The program being undertaken by the State Electricity Commission envisages a large increase in the production of brown coal with the aim ultimately of meeting all Victoria's demands for solid fuel. The program includes the following projects:

Yallourn: the expansion of open cuts to increase production from 7 to 10 million tons a year to supply the enlarged power station and a briquette factory and the development of the towns of Yallourn and Newborough for the benefit of coal workers. Equipment required includes coal digging plant, two new dredges to replace old ones, and another bucket wheel dredge. New railway rolling stock and belt conveyors are also needed.

Morwell: the development of a new open cut to provide initially 7 million tons of brown coal a year for a new briquette factory to supply a gasification plant and industrial consumers. No briquette or gas production is likely before 1956, but the cut is expected to produce by 1957 or 1958 about 10 million tons of brown coal a year, of which 8 million tons will be used for briquettes. This project involves removal and disposal of over-burden

and the provision of facilities including the fuel supply depots at various centers. Five or six coal dredges and an overburden spreader will be required.

A number of small, privately owned mines also propose to increase output.

Tasmania

No major development scheme is planned, but the State's policy aims at expanding coal production (about 240,000 tons in 1951) to meet local demand as far as possible.

Summary

Although total cost figures for the entire coal program are not available, on the basis of the cost of the major projects, the total expenditure on mine development, housing and accommodation for mine workers, coal harvesting and washing facilities and other ancillary work directly connected with coal (but not including transport) may be estimated at about £A 60 - 70 million (\$134 - 157 million) of which the sum required in 1952/53 might amount to about £A 20 million (\$55 million).

On the same basis, the foreign exchange component could be put at £A 12 - 15 million (\$27 - 34 million) of which £A 7 million (\$16 million) would represent purchases in dollars. It is clear, however, that the need to restrict capital expenditure and to limit dollar expenditure will necessitate substantial reductions in the above figures.

III. IRON AND STEEL PROGRAM

The Iron and Steel Industry

The centre of the iron and steel industry in Australia is in New South Wales. Its location is based on the coal fields which provide a good quality coking coal. The other raw materials required are principally iron ore and limestone, and these are brought by sea from South Australia. The two main production centres are Newcastle and Port Kembla.

The industry is largely in the hands of one group, which is completely integrated. It owns extensive iron ore deposits at Iron Knob and Iron Monarch, South Australia; it owns a blast furnace, a steel furnace and a shipyard at the port of Wyalla, South Australia; it brings ore in its own ships to Newcastle or Port Kembla, smelts the ore with coke made partly from coal raised from its own mines, and manufactures pig iron, ingots, blooms, billets, and a wide range of rolling mill products. Its plant at Newcastle and Port Kembla includes by-product coke ovens, blast furnaces, open hearth steel furnaces, rolling mills, a ferro alloy plant and ancillary plant.

The group is one of the cheapest producers in the world. Its output, however, is not enough for Australia's growing needs. Its capacity is about 2 million tons of ingot steel a year. In 1951 it produced about 1.2 million tons of finished steel products, whereas demand is estimated at 2.6 million tons. Imports in 1951 amounted to about 0.9 million tons.

General Scope of the Program

The main part of the program consists of the construction of blast furnaces, open hearth furnaces, steel furnaces, rolling mills and a tinplate plant. Ancillary developments comprise coal mining and transport of raw materials, particularly iron ore.

The program, when completed, will substantially increase the total Australian production of pig iron and ingot steel and will provide for appropriate increases in rolling mill capacity to make finished steel products. It will enable Australia for the first time to roll tinplates which will result in a considerable dollar saving.

Outline of the Program

New South Wales

At Newcastle, the main concern is to build and to complete in about two years a battery of coke ovens and a new blast furnace with a capacity of about 1,000 tons per day. The company also has plans to

erect a new skelp mill with a capacity of 275,000 tons a year. These plans are in their initial stage and the major work may not be undertaken for some years.

At Port Kembla, a subsidiary of the main concern is just completing a new blast furnace with a capacity of about 1,500 tons of pig iron per day and it will soon complete the erection of a new battery of coke ovens. It will also construct new open hearth steel furnaces and other auxiliary equipment in the open hearth plant which will increase steel producing capacity by 500,000 tons of ingot steel per year. This company is undertaking major alterations and additions to existing blooming, billet and section mills.

Its most important project is the construction of a hot and cold strip rolling mill and timplat plant with a capacity of one million tons of flat steel products a year, including timplat. The work is already well advanced and it is expected to be finished by about 1956.

At Port Kembla, another subsidiary company is extending its capacity for rolling black and galvanized steel sheet to more than double its present capacity by about 1956.

The main concern is also extending and modernizing its collieries to increase coal output by about 5,500 tons per day.

Alterations and improvements and provision of new installations and works, including electrical installations, will also take place in steel plants ancillary to those mentioned above.

Western Australia

At Kwinana, the main concern plans to build a new steel rolling mill with a capacity of 50,000 tons per year. Commencement of this work is still dependent upon negotiations with the Western Australian Government.

In New South Wales, South Australia and Western Australia, the group will provide for additional facilities for the extraction of iron ore and other raw materials for the improvement of transport facilities (including the building of ships, improved mechanical handling and wharf facilities) and for moving ore and other raw materials and finished products.

IV. ELECTRIC POWER PROGRAM

The Electric Power Supply Position

The generation and distribution of electric power in Australia is almost entirely in the hands of the six States or their instrumentalities and the Snowy Mountain Hydro Electric Authority which is a Commonwealth instrumentality.

Before the war, installed capacity was 1085 MW which exceeded maximum demand by 28%. Demand for electric power, of which 45% is required by industry, 32% by domestic consumption, 16% in the commerce and 7% by others, has increased in recent years at the rate of about 1% per annum.

During the war and in the early postwar period, construction of new generating capacity has been held up by delays in the delivery of equipment from overseas and by the shortage of labor and material, and generation has often been hampered by the shortage of coal. For these reasons the supply of electric power has not kept pace with increasing demand, and restrictions on the use of electricity have been necessary in some states. Particularly in New South Wales, the level of industrial output and efficiency in secondary industries have suffered.

Aims of the Program

- (a) To make good the present deficiency of installed capacity.
- (b) To provide for future growth of demand.
- (c) To provide sufficient surplus capacity to give an adequate operating margin over peak demand.

The Program in General

The plans prepared by the Commonwealth and State authorities responsible for power supply aim at more than doubling power capacity between 1951 and 1956. It is now certain that the completion dates envisaged in these plans will not be met, owing to the necessity of restricting the general level of public investment. The plans of Commonwealth and State authorities are now being reviewed with the object of working out a timetable appropriate to present conditions.

Present plans of the Commonwealth and the States taken together show the following position:

| | <u>1951</u> | <u>1952</u> | <u>1953</u> | <u>1954</u> | <u>1955</u> | <u>1956</u> |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| Maximum firm <u>Power</u> by winter of year (MW) | 1612 | 1927 | 2510 | 3134 | 3653 | 4115 |
| Estimated demand | 1994 | 2207 | 2412 | 2710 | 2939 | 3184 |
| Nominal margin of firm power over estimated demand (MW) | -382 | -280 | +98 | +424 | +714 | +931 |
| % of power available | -19% | -13% | +4% | +13% | +19% | +29% |

Only in 1956 will there be an adequate reserve of capacity.

The individual plans of the Commonwealth and of the States show the following position:

| | Firm power available in <u>1952 (MW)</u> | Firm power available in <u>1956 (MW)</u> |
|-----------------|--|--|
| New South Wales | 622 | 1,538 |
| Victoria | 589 | 1,047 |
| Queensland | 193 | 343 |
| South Australia | 169 | 329 |
| West Australia | 111 | 156 |
| Tasmania | 203 | 522 |
| Commonwealth | <u>-</u> | <u>180</u> |
| Total | <u>1,927</u> | <u>4,115</u> |

The total cost of the program over the five years, 1951/2 to 1955/6, is estimated at ~~£~~ 536 million (\$1,195 million), but slowing down the program will reduce this figure appreciably.

Outline of the Program

New South Wales

Metropolitan thermal stations at Pyrmont, White Bay, Balmain and Bunnerong are planned to provide an additional 305,000 KW by 1955. Plans are also being considered for ordering two 60,000 KW generators for installation at Balmain Station. These generators, if obtained quickly, could be in operation in about three years.

Three new thermal stations at Lake Macquarie (Newcastle), Tallawarra on Lake Illawarra (Wollongong) and Wallerawang (Lithgow) are intended to supply a total of 460,000 KW by 1956 and 600,000 KW when fully developed.

These stations will serve industrial enterprises in coal and steel areas and domestic consumers.

Victoria

Power stations using brown coal at Yallourn will be expanded to supply an additional 200,000 KW between 1953 and 1956 for local industrial and metropolitan purposes.

A new station at Morwell should yield 30,000 KW by 1956.

Thermal stations at Spencer Street and Newport, Melbourne, will have additional capacity of 92,000 KW by 1956. Both stations are using black coal from New South Wales, Queensland and overseas.

At Kiewa, (Victorian Alps), hydro-electric development is planned to supply 60,000 KW by 1954.

Hydro-electric projects at Eildon and Hume reservoirs in central and northeastern Victoria will yield 120,000 and 50,000 KW respectively by 1955/56. These last two projects are ancillary to irrigation schemes and will generate power in summer only.

Queensland

Two new thermal stations in Brisbane (using Queensland black coal) will develop 150,000 KW. Two regional stations, one each at Rockhampton and Townsville, will provide 22,500 KW each, and one at Howard, 15,000 KW.

These, and a small supply from hydro-electric stations at Tully and Somerset, are planned to be available by 1955.

South Australia

Of a total additional 160,000 KW of power to be provided by 1956, 90,000 KW is to be installed in the existing thermal station at Osborne "B" Station, Adelaide, and 90,000 KW in the new thermal station at Port Augusta, allowing for 20,000 KW of capacity to be retired at Osborne "A" Station.

West Australia

The main addition to power supply by 1956 will be installed in South Fremantle station. The East Perth and Collie stations will be expanded by 1957 or 1958 and a new station will be constructed at Bunbury.

Tasmania

New hydro-electric station will supply by 1956 at Tungatina, 125,000 KW; at Trevallyn, 72,000 KW; at Lake Echo, 30,000 KW; and at Wayatinah, 92,000 KW. Power production in Tasmania is entirely hydro-electric.

Commonwealth - Snowy Mountain Scheme

This is a major project with a dual irrigation and electric power function designed to feed into the inter-connected systems of New South Wales and Victoria with an ultimate planned capacity of 3,000,000 KW. It is designed to supplement supplies of thermal power and to meet peak loads. It will enable the retirement of thermal capacity in due course. By 1954, 60,000 KW, and by 1956, a further 120,000 KW should be available to be supplied first to New South Wales, to be followed by supplies to Victoria.

V. RAILWAY PROGRAM

The Australian Railway System

In Australia, with its scattered centers of primary and secondary production, railways represent the main link between industrial centers and provide principal means of transporting to local markets or to the seaboard the products of primary industries situated in the interior.

Railways in Australia developed on a State rather than on a 'continental' basis. Each of the States built its own system with an eye to its own needs and local conditions. There are five different gauges. Victoria's railways are broad gauge (5' 3"); Western Australia, Northern Territory, Queensland and Tasmania have narrow gauge (3' 6") lines. South Australia uses the broad gauge for its main lines and narrow gauge for the lines carrying lighter traffic. To link the South Australian railways to the Western Australian railways the Commonwealth Government has built a standard gauge (4' 8½") line from Kalgoorlie to Port Augusta.

There are some 2,200 miles of Commonwealth line and 24,900 miles of line in the six State systems; in addition there are about 600 miles of privately owned line, making a total of about 27,700 miles in all.

During the War, railway traffic reached unprecedented levels. After a decline during the first postwar years, traffic has again increased, coming close in recent years to wartime records.

Goods and livestock carried (in millions of ton miles) are shown below:

| | |
|---------|---------------|
| 1938/39 | 4,066 million |
| 1946/47 | 5,605 " |
| 1947/48 | 5,934 " |
| 1948/49 | 6,212 " |
| 1949/50 | 6,203 " |
| 1950/51 | 6,121 " |

Estimates for 1951/52 show a substantial increase, to 6,668 million ton miles.

During the war, maintenance work and replacement had to be deferred wherever possible, and the war ended with the railways seriously overstrained and badly needing rehabilitation. Since then, little progress has been made in overtaking backlogs in maintenance work and replacement mainly because of difficulties in securing new locomotives and other rolling stock from domestic and overseas suppliers and in getting labor and materials for permanent way repair and maintenance.

The following table shows the quantity of rolling stock of the Commonwealth and State railways:

| | <u>June 30/39</u> | <u>June 30/45</u> | <u>June 30/51</u> |
|-------------|-------------------|-------------------|-------------------|
| Locomotives | 3,587 | 3,537 | 3,638 |
| Coaches | 8,043 | 8,131 | 8,072 |
| Other | 86,538 | 90,406 | 95,714 |

Not only has the quantity of rolling stock increased little over the last 12 years, its quality is low and about 60% of the locomotives are over 35 years old.

The railways at present are unable to satisfy transport demand, thereby curtailing production and causing costly delays in the distribution of goods.

Aims of the Program

Both Commonwealth and States, in their programs, aim at overtaking backlogs of capital equipment, at expanding their equipment and at improving, standardizing and expanding permanent way in the following manner:

- (a) by buying locomotives and other rolling stock,
- (b) by restoring and duplicating existing lines, particularly in coal mining and industrial areas where the demand for railway services has been heaviest,
- (c) in certain States, such as New South Wales, where urgent transport problems have arisen in urban areas, by building new lines and electrifying existing lines. In the main, however, these are long term plans.

At present, the main emphasis is on the procurement of further rolling stock and on the improvement of existing lines and relatively little construction is contemplated for the immediate future. Consideration of plans for standardization of railway gauges throughout the mainland States has had to be deferred, with the exception of the south-east of South Australia, where work has advanced to a stage which makes completion necessary, and one standard gauge railway being built by the Commonwealth to assist coal transport in South Australia.

Outline of the Program

New South Wales

The Government intends to pay particular attention to the provision of rolling stock. Nearly one-third of total expenditure for rolling stock up to June 30, 1954 will be for locomotives, including diesel-electric locomotives from overseas.

During the next two to three years, considerable expenditure is planned on new power stations serving railway lines. Electrification, though planned on a large scale, will be deferred until after 1954.

Existing lines with a high traffic density will be duplicated and (in many cases) quadruplicated during the next three years. These include lines near Sydney and Newcastle, where coal and industrial traffic has increased substantially in recent years.

Development of the Sydney metropolitan railway system (principally the further development of the underground railway system) will mostly be postponed until after 1954.

No new lines are contemplated in areas hitherto not served by railways apart from several new spur lines to serve coal mines and power stations.

Victoria

Priority is to be given to the provision of rolling stock and that part of the program is to be completed as far as possible within the next three years.

Apart from housing for railway employees, most of the remaining part of the program for the next three years relates to the improvement and development of the permanent way. This covers relaying and reconditioning permanent way and reconstruction of bridges both in urban and country areas.

The largest single project is the electrification and partial duplication of the Gippsland line as part of the brown coal development in the Latrobe Valley.

Queensland

The greater part of the expenditure will be for rolling stock - mainly locomotives (including 33 diesel-electric engines already ordered from overseas) and wagons, particularly coal wagons.

Permanent way projects include the completion of the construction or reconstruction of lines serving the Callide and Blair Athol coal fields and the electrification of the Brisbane metropolitan railway system. Relining work consists mainly of the duplication of existing lines to meet increased demands due to the industrial development in the Brisbane area but it also includes replacement of worn out lines in other parts of Queensland.

South Australia

Besides replacement of equipment, the plans for the next three years comprise:

- (a) the conversion to standard gauge of certain portions of permanent way and the completion of the Mt. Gambier line, enabling the railways to carry certain traffic now carried by road,
- (b) the electrification of the Adelaide metropolitan railways,
- (c) the extension of the railway in the Port Adelaide area to speed up cargo clearing,
- (d) the construction of a line between Morgan and Barmera to give primary products better access to the seaboard and to link up existing lines.

Western Australia

The deterioration of the railways in Western Australia is worse than in other States.

It is anticipated that nearly £A 20 million (\$14.8 million) will be required for the purchase of new locomotives and other rolling stock, mainly trucks.

Besides extensive reconstruction of the permanent way, other important works comprise the construction of a new locomotive depot and of new marshalling yards, including one to serve the Collie coal field. No new lines are planned and some uneconomic lines are being closed.

Tasmania

The permanent way is generally in a condition to meet increased traffic demands, and most of the expenditure will be on rolling stock.

Commonwealth Railways

Practically all the expenditure during the next three years will be on the acquisition of rolling stock to serve mainly the Leigh Creek coal field. Orders have been placed for diesel-electric locomotives to serve both transcontinental and northern railways to a total value of £A 2 million (\$4.5 million).

Proposals for the construction of a new line from Dajarra in northwest Queensland to Newcastle Waters in the Northern Territory to stimulate cattle industry in Northern Australia are under consideration. If approved, the work would involve over 500 miles of new track to cost about £A 14 million (\$31.4 million) and diesel-electric locomotives for about £A 2 million (\$4.5 million), but little expenditure would be incurred before 1953/54.

It is estimated that the new line might contribute to increasing beef production by 20,000 tons per annum.

Financial Aspects of the Program

Original plans of a year ago estimated expenditure at £A 70 million (\$156.8 million) per annum over the three years ending 1953/54. Under present conditions, however, expenditure will have to be reduced and it is likely to be less than £A 50 million (\$112 million) per annum. Import restrictions may also curtail the program.

The main items of purchases from overseas will include locomotives (both steam and diesel-electric), other rolling stock and a wide range of specialized equipment such as machine tools for workshops and rail maintenance machines.

VI. ROAD TRANSPORT PROGRAM

The road transport program has two aspects: The maintenance and development of the road system and the provision of road transport vehicles.

In each State there is a central authority or government department responsible directly for main roads and for the general supervision and coordination of road policy throughout the State, the construction and maintenance of local roads and bridges being generally the responsibility of local authorities.

The total known length of roads in Australia is about 500,000 miles of which, however, only 130,000 miles represent roads with worked surface (30,000 miles of this being covered with bituminous and 1,500 miles with concrete surface, the rest being macadam road). 135,000 miles of road are only formed and 237,000 miles have natural surface only.

Australia's entire road transport system has suffered in common with other means of transportation from necessarily deferred maintenance and construction work during the war and from shortage of materials, manpower, equipment and finance in the postwar years. At the same time the inadequacy of railway and coastal shipping transportation caused a substantial increase of heavy long distance freight transports on roads. This, apart from adding to the strain on the already deteriorated road system, puts emphasis on the need for the reconstruction, repair and maintenance of existing roads, and the building of new roads.

The Commonwealth-State Consultative Committee on Road Transport, in a report dated October 1951, reported that there were shortages of labour in all States for work on the roads and that there was a need for imported building and maintenance equipment and material. In their recommendation the Committee urged the restoration and maintenance to appropriate standards of specifically important roads, the general maintenance of the existing road system, the construction and reconstruction of main and feeder roads, the building of new roads or extensions for specific urgent needs of coal mines, power station or new food production areas, the duplication of carriage ways, the widening of narrow heavily trafficked roads and the carrying out of major deviations and alignments.

In addition to the LA 84.5 million (\$189.3 million) which will be provided by the Commonwealth and the States, the proper execution of the road program would require a further LA 23.5 million (\$52.6 million) during the three years 1951/52 - 1953/54.

Only a relatively small proportion of this total is required for imported equipment. It is, however, necessary to import earth-moving equipment, graders, spreaders and industrial tractors, bitumen and timber.

The road haulage is in private ownership, and the vehicles used are purchased through normal commercial channels. Most of the heavier road transport vehicles are imported, although to an increasing extent they are being assembled by Australian subsidiaries of a few overseas automobile manufacturers. There is a need for imports of heavy road transport vehicles and components to be used in Australian-assembled vehicles.

VII. NON-FERROUS METALS AND INDUSTRIAL MINERALS PROGRAM

Objectives

The aim of the program is to increase the production of lead, zinc, tungsten, rutile and zircon for export and to reduce the need for imports by expanding the production of copper, tin, pyrites, mica and asbestos.

Outline of the Program

Lead and Zinc

Lead and zinc are found in the same ores, usually in association of silver and gold and other metals.

Most of the lead mined in Australia is produced in the form of concentrates by four companies operating at Broken Hill. Smelting and refining is done at Port Pirie, Western Australia. The plant at Port Pirie is the largest in the world and is the only producer of market lead in Australia.

Five major projects are planned at Broken Hill and at Port Pirie to increase lead production capacity from 160,000 tons a year to 200,000 tons a year. The cost is estimated at £A 2.7 million (\$6.0 million) of which about one-third will be spent in 1952/3 and one-third in 1953/4. The rest will be spent in the following three years.

Other developments in lead production are also planned.

The only producer of metallic zinc in Australia has its treatment works at Risden, near Hobart, Tasmania. About three-quarters of the zinc concentrate it uses comes from Broken Hill and the rest comes from mines at Rosebery and Williamsford on the west coast of Tasmania. (The zinc concentrate has a 31% sulphur content and sulphuric acid is produced as a by-product). Plans have been made to increase zinc production by 2,600 tons a year by the treatment of residues. The capital cost of the plant required is over £A 1 million (\$2.2 million).

By 1955 lead production will have risen from 200,000 tons a year to 258,000 tons a year, and zinc production from 200,000 tons a year to 230,000 tons a year. At these levels production will still be 20% below prewar production for lead and 10% above for zinc.

Copper

Australia uses more copper than she produces and she has been hampered by being unable to get enough from abroad.

The present plans for expansion aim at increasing by 1955 mine production from the present 16,700 tons to 35,000 tons per annum, equivalent to a slightly lower level of refined copper output. The total investment for mining and processing will be in the order of £A 1.5 million (\$3.3 million).

Tasmania: At Mount Lyell, mine production is to be raised from 8,000 to 10,000 tons a year and capacity for refining the concentrates is to be increased.

Queensland: At Mount Isa, mine production is to be increased to provide additional material for a new copper mill and smelter for fire refined copper.

New South Wales: The only customs smelter and refiner of copper-bearing materials in Australia is at Port Kembla, New South Wales. Here it is proposed to raise smelting and refining capacity by 1954/55 from 14,000 to 19,000 tons a year. The cost will be about £A 750,000 (\$1.7 million) over the next three years: about one-third of this will be for imported equipment.

Tin

Tin production in Australia has fallen from 3,100 tons in 1939 to about 2,000 tons in 1951. Whereas before the war Australia exported tin, rising domestic demand and declining production has turned her into an importer. The large tinplate rolling mill planned within the iron and steel development program is expected to raise domestic demand to over 5,000 tons a year and the development of tin production is planned to provide to the largest possible extent for the domestic demand.

A large ore body in Ardlethan, New South Wales, has been explored and it will be developed during the next few years.

It is also intended to open up new tin areas in northern Queensland by dredging.

Total investment in tin development will be of the order of £A 2 million (\$4.4 million).

Aluminum

Australia depends entirely on imports for its supplies and in 1950 imported 8,758 tons, mainly from Canada. Present requirements are well in excess of supplies and are growing.

The Australian Aluminum Production Commission is erecting a plant at Bell Bay in northern Tasmania with a capacity of 13,000 tons per annum. The Boyer process will be used for pure aluminum production from crude bauxite and the Hall-Heroult process for electrolytic aluminum from alumina. Electric power will be taken from the Trevallyn hydroelectric power station which is being built primarily to meet the requirements of the aluminum industry (see Program IV). Production is expected to begin in 1954.

Workable deposits of bauxite have been proved in New South Wales, Victoria and Tasmania, the largest deposits being in the Inverell district of northern New South Wales, where reserves of over 8 million tons have been brought under the Commission's control. The Bell Bay plant will start by using high grade imported bauxite. As domestic bauxite becomes available, it will be blended with imported bauxite in increasing proportions so that ultimately only domestic bauxite would be used.

It seems likely that by the time production commences, Australian demand will be sufficient to absorb the plant's entire production.

The total cost, which will be provided in equal shares by the Commonwealth and Tasmanian Governments, is estimated at £A 7.2 million (\$16.2 million) of which £A 3.5 million (\$7.8 million) has been spent already. Approximately £A 2 million (\$4.4 million) will be required for imports of equipment during the next four years of which about one-third is expected to require dollars.

Tungsten

Australia exports tungsten. It is proposed to increase by 50% capacity for treating scheelite (tungsten ore), mined at King Island, Tasmania. Equipment is also required for small mines in the Northern Territory and New South Wales.

Pyrites

Pyrites are required for the manufacture of sulphuric acid.

The largest mining development to exploit pyrite deposits is planned at Nairn, South Australia, where it is hoped to produce enough pyrite concentrates to make 30,000 - 40,000 tons of sulphuric acid a year.

Other developments of pyrites are planned at Norseman, Western Australia; at Mount Lyell, Tasmania, where it is a by-product of the flotation of copper ore; and at Mount Morgan, Queensland.

The production will depend on sufficient transportation being available and on the successful development of capacity to convert pyrites into sulphur (see Program VIII).

The capital expenditure is estimated at about £A 2 million (\$4.4 million).

Other Developments

These include the opening up of deposits and the expansion of the production of antimony at Blue Spec in Western Australia, of asbestos at Wittenoom Gorge, fluorspar in Northern Queensland, and beach sand minerals at Stradbroke Island.

Financial Cost of the Program

The total new investment is estimated to be of the order of £A 23.5 to 25 million (\$52.6 to 56 million) over the next three to five years. The Bureau of Mineral Resources estimates that up to £A 3 million (\$6.6 million) will be required for purchases from dollar sources of which £A 2 million (\$4.4 million) will be for capital goods and the rest for consumable material.

VIII. INDUSTRIAL DEVELOPMENT PROGRAM

General Outline of the Program

As most of the industries concerned are privately owned, their development plans may not become known until they make them public. Information received from the Commonwealth Government, consequently, refers to the general economic need and the general outlines of the possibilities of development, rather than to specific and detailed plans.

Chemical and allied industries provide an important field for development. A number of basic chemicals are hard to obtain abroad and are very expensive as well. Their manufacture in Australia would help to satisfy the growing needs of engineering and manufacturing industries and of agriculture.

Petroleum refining so far has developed in Australia in a small way only. A country with refineries, however, has a wide choice of sources of crude oil and can secure the petroleum products it wants. Modern refineries could thus be of vital importance to Australia. Should oil be found in Eastern New Guinea, where prospecting is in progress, the existence of refineries in Australia would be of great advantage.

The manufacture of fabricated shapes of non-ferrous metals could create an important link between her copper production and the electrical equipment industries.

In the basic engineering fields, planned development in earth moving and construction equipment and transport industries would meet the increasing demand created by the mechanization of agriculture, by public works aiming at the development of natural resources and by the need to improve timber production.

As in the past, Australia still depends primarily on the U. S. and on the U. K. for its supply of heavy transport vehicles. This dependence always created problems of supply and suitability and also of replacement parts. Development of the motor vehicle industry in Australia has progressed considerably but it still needs the support of domestic production of components of motor vehicles (e.g. steel forgings), greater facilities for the production of heavy duty motors and improved capacity for producing spare parts.

Typical Development

Australian agriculture relies heavily on superphosphate to maintain production. The manufacture of this fertilizer requires sulphuric acid, the manufacture of which accounts for about 84% of Australia's consumption of sulphur. Manufacture of ammonium sulphate accounts for a further 8% of sulphur consumption.

In the past, about two-thirds of the total sulphuric acid used has been made from imported brimstone (elemental sulphur). The remainder has been manufactured from indigenous sulphur-bearing materials. Although there are ample resources of sulphur-bearing materials such as iron pyrites in Australia, there are no known deposits of elemental sulphur.

In recent years, the changed world supply position of brimstone has necessitated the adoption of a program in Australia for the conversion of brimstone-burning sulphuric acid plant to the use of indigenous materials and the construction of additional acid-manufacturing capacity to meet expanding needs.

This program involves large outlays of capital and provision of substantial quantities of plant, and is expected to require some years for completion. Work has, however, started on the conversion and expansion of eight sulphuric acid plants in New South Wales, Victoria, Western Australia and South Australia.

Under prevailing conditions, the U. S. A. is the principal source of supply of sulphur, and is almost the only assured source. Hence replacement of imports by the development of domestic resources represents a substantial dollar saving. Developments now under way are estimated to reduce the need for imported sulphur by 1956 by 85,000 tons, representing a saving of \$2.3 million a year in dollar imports.

An important company engaged in zinc production and refining by the electrolytic process is building a plant at Risdon, Tasmania, to produce 50,000 tons of ammonium sulphate a year, enough to cover Australian needs. Ammonium sulphate is an essential fertilizer in Australia and is used largely in growing sugar cane. Work has been proceeding for about two years and is likely to be completed in about two more years.

A large company producing industrial gases plans to build a plant to produce calcium carbide for the production of cheap acetylene for welding and steel cutting, to make polyvinyl chloride and various chemical solvents. If certain technical problems related to the use of brown coal can be solved, the plant will be built in Victoria and will use brown coal as a source of carbon and power. It would meet by 1956 most of the expected domestic demand.

Most of the 15 cement works of the Australian cement industry are being enlarged. Three new plants are being built and new kilns are being built at five works. Within the next three years total cement capacity will be increased from about 1.6 million to about 2 million tons per annum.

A gas company in Victoria has just started work on a large brown coal gasification plant at the brown coal deposits in the Latrobe Valley to supply Melbourne's gas requirements. This project, which should be completed by 1956, will relieve Melbourne of its dependence on about 600,000 tons of black coal per annum from the New South Wales coal fields.

The Australian subsidiary of an American oil company proposes to build a refinery of a capacity of about 84,000 tons of refined petroleum per annum. The plant, which will be erected conveniently close to tanker berths, would be a modern plant with cracking facilities. It should be completed in three to four years and will supply a variety of petroleum products.

A large company proposes to increase its capacity to process copper wires and tubes by installing further equipment for tube drawing and for wire drawing and stranding. The work, to be completed by 1954, will provide copper conductors for power distribution and industrial use and high tolerance tubes for industry.

The same company proposes to double by about June, 1953, its capacity for drawing, stranding and reinforcing steel cored aluminum cable for electric power distribution. Eventually it will rely on aluminum from Tasmania, thus saving copper.

An American firm plans to commence the production in Australia of diesel-engined crawler tractors of 33 maximum draw-bar h.p. The plant, to be located in Victoria, would be an assembly plant initially. It is expected to commence production in a year's time.

The Australian subsidiary of a Canadian automobile manufacturing concern has for some time been following a program aiming at the production in Australia of V8 type motor vehicles. The final stage in this program involves the manufacture of engines capable of powering large passenger cars and trucks up to a 5-ton load capacity. As part of this program the company is planning a modern mechanized foundry and the expansion of machine shop and assembly facilities at its existing works at Geelong to make possible the production of major components for motor vehicles, especially heavy duty engines.

A forging company is building a factory for the forging of engineering components for motor vehicle and aircraft industries and also for forgings for major engineering projects. It should be completed during 1953.

A steel sheet fabricating firm is building factories or modernizing existing ones in five States to increase the production of steel drums up to 44-gallon size. Besides their many uses in industry and commerce, steel drums are important in the distribution of oil, allowing it to be shipped in bulk. Expenditure on these works over three years is estimated at £A 300,000 to £A 400,000 (\$0.7 to \$0.9 million) per annum.

A large canning company is about to begin the erection of a food canning and bottling factory in Victoria. The total cost will be about £A 3 million (\$6.7 million). The factory will process large quantities of foodstuff and should come into production during 1953/54.

Financial Aspects

The total annual cost of the major projects known to be in progress or planned is estimated at about £A 33 million (\$73.9 million) per annum. This figure, however, is no more than a broad indication of the order of magnitude.