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FUEL RESEARCH INSTITUTE OF SOUTH AFRICA

TECHNICAL MEMORANDUM No. 12/1954.

IN SUPPORT OF AN APPLICATION FOR
AN INCREASE OF THE LEVY ON COAL.

By

A.J. Petrick

FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

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AN INCREASE OF THE LEVY ON COAL.

The fuel and power supplies developed reasonably uniformly with the demand in the Union of South Africa up to about 1945.

Although the coal industry made adequate provision for future requirements and has even now adequate potential production capacity to meet demands, more and more serious coal shortages have been experienced in recent years. The coal industry is not to blame, but it is not the object of this memorandum to discuss the reasons for this position.

Accepting it as a fact, it must be realised that, apart from its economic effects, the situation has given rise to technological problems that require study.

To meet this situation the Fuel Research Board planned expansion of the activities of the Institute, but soon realised that it could not undertake research on an adequate scale without additional funds.

Accordingly, representations were made to the Government for an increase in levy. This was acceded to by an amendment of the Act making provision for a maximum levy of a half penny per ton and raising the levy from one eighth penny to a farthing per ton of coal sold in 1948, and later to three eighths penny per ton in 1952.

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In order to be able to provide further, necessary facilities the Board requested a further increase of the levy by one eighth penny to the full half penny on sales in 1953 - but this was not acceded to.

The Fuel Research Board was, therefore, forced to revise and to reduce the research programme of the Institute for 1954. Aware of its responsibility the Board decided, however, not to curtail the programme as drastically as might have been necessary but to meet the expected deficit by drawing on its limited capital reserves to balance revenue and expenditure during the current year.

The position then was :-

<u>Original estimate for 1954</u>	<u>£127,546.</u>
Expected revenue (essentially based on a 3/8d. per ton levy on 30 million tons of coal sold in 1953)	£106,298.
Deficit	<u>£ 21,248</u>
<u>Revised estimate for 1954</u>	<u>£121,764</u>
Expected revenue (coal production of 31.3 million tons in 1953)	£110,298
Deficit	<u>£ 11,466</u>

In effecting the revision the Board had to place more emphasis on the continuation of research already in hand rather than on the initiation of new investigations, however desirable the latter appeared to be.

Such a conclusion is inevitable as long as the Institute does not receive any grants for capital expenditure but must defray capital as well as running expenses from its current income and the latter is at such a low level that a capital .../

capital fund of adequate magnitude cannot be built up.

Extension of research into new fields would require substantial capital investment and additional staff as shown later in the table attached hereto. This added expenditure could certainly not be faced with the levy at 3/8d. per ton of coal sold.

In adopting the revised estimate there was one exception. It was decided to retain research on the hydro-carbon synthesis. This section only came into operation towards the end of 1953. The additional staff required could not be appointed on the basis of the revised estimate but work could continue as Sasol seconded certain staff to the Institute temporarily until such time as they would be required at its own plant.

Although this section is so young it has already proved to be of great value to the petrol-from-coal industry. It is desirable not only to maintain it at its present level of activity but also to expand activities. If maintained at its present level, however, staff appointments will be necessary when the Sasol staff is withdrawn. (Incidentally this unit has proved a very excellent training ground for that staff).

Meanwhile, the fuel and power position in the Union has become even worse than in 1953 and one has to accept that this position will have to be faced for a fairly long period.

It has, therefore, become even more important than formally to initiate or intensify research on technological problems both at collieries (producers) and at the installations of consumers.

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The Fuel Research Institute is the proper body to conduct research in these matters.

These subjects for research may be divided into those occurring at the collieries (producer end) - e.g. crushing, grading, coal preparation, effect on processing by imposed wet mining and slurry problems - and those occurring at the consumer end - e.g. difficulties encountered by being of necessity provided with fuel types considered unsuitable for the particular type of boiler, efficiency of utilisation of fuel in general and improving same, storage of coal (possibility of spontaneous heating), effect of forcing boilers, boiler and other furnace deposit problems.

It is the Fuel Research Board's policy to conduct research on such practical problems, when they are of individual interest to a company or individual only, against payment by that company or individual. Many of the problems are, however, of such broad national importance that the Fuel Research Board has had to conclude that the research must be financed out of the general revenue of the Institute.

It is natural for the coal industry to be most interested in research on problems of coal production and preparation and the industry considers it proper that its contribution to the general funds of the Institute should be used to finance research on such projects of general interest to the industry, including surveys of coal resources.

Since there is no provision in the Act to procure any running income from fuel users similar to the levy on coal producers, the position is not as straight forward in regard to research on problems that are essentially of consumer interest but are of such general interest that no single individual could reasonably be expected to bear the cost of research.

Nevertheless, .../

Nevertheless, the Fuel Research Board is aware of its responsibility in regard to such research and of the necessity and urgency of undertaking it. To do this properly, however, it must have more funds at its disposal. So far, work in this field has had to be confined mostly to relatively small scale work conducted by a limited number of officers.

Superimposed on these fuel and power problems, the problem of coking coal and coke is assuming greater importance. In order to illustrate the obligations of the Institute in this respect one cannot do better than refer to the very recent correspondence between the Steel and Engineering Industries' Federation of South Africa, the Department of Commerce and Industries and the Coking Coal Advisory Board, (C. & I file No. 177/50), copies of which have been forwarded to the Institute by the Chairman of the Coking Coal Advisory Board. In this correspondence it is stated, inter alia, that additional reserves of coking coal (if present) will only be revealed by prospecting operations or as the result of discoveries made during research work in methods of coal preparation and into methods of carbonisation or coke production. The responsibility for this research rests with the Institute.

The Institute has received frequent complaints regarding the quality of coke. It has already had occasion to satisfy itself that matters could be materially improved by better carbonisation practice at certain collieries, but much research remains to be done.

The Coking Coal Advisory Board, just as the Coal Commission 1946/47, depends almost entirely on the Institute to provide it with information regarding reserves, assessment of coking properties, coal preparation for carbonisation and carbonisation technology. This is fit and proper. Yet, with its present means the Institute cannot embark on a comprehensive
research .../

research programme covering all the matters under consideration, and which is calculated to provide answers to all the questions raised, within a reasonable period of time. Meanwhile, the coking coal resources continue to be largely consumed for general purposes.

My Board has considered this research as of such national importance that it should be financed from its general revenue, augmented by special grants from the government, to defray part of the cost of the collaborative effort on prospecting for coking coal.

The government has indicated its attitude to the coking coal problem, by accepting the recommendation of the Coal Commission, at least in part, authorising and financing a prospecting programme for coking coal conducted by the Geological Survey Office and controlled by the Coking Coal Advisory Board of the Department of Mines.

The Institute has an important and major rôle in this investigation, but there was considerable difficulty in obtaining additional revenue from the Treasury to help to finance such work.

The Institute has stressed, on various occasions in meetings of the interdepartmental committee responsible for guiding prospecting in the Waterberg coalfield and the Coal Advisory Board, that it would be necessary to have pilot plant facilities for a full assessment of the potentialities of the Waterberg coalfield and other potential additional sources of straight or blend coking coal. However, the capital for such a pilot plant could not be provided.

During 1953, the Institute negotiated with the coal industry and Iscor and these industries have now agreed to provide as a special grant to the Institute, a capital sum of some £130,000, for the erection of a pilot coal preparation plant. This plant may come into operation in 1955.

It will be a most useful tool. It will be used not only for studying problems of individual interest (against payment) but will also be available for the study of problems such .../

such as those in the field of coking coal which are of national importance. The running cost of this plant must therefore be met in part from the Institute's general revenue fund, but this will have to be larger than at present.

Many new industries established in this country in the post war period require gaseous fuel. This has led, for example, to the erection of a new gasworks at Springs.

There is still a tendency in gasworks practice to apply processes requiring coking coal. This tendency should be discouraged in South Africa, due to the shortage of coking coal, but suitable alternative processes should then be available. This would require research into the gasification of South African coal. Such research may become increasingly urgent within the framework of measures to conserve coking coal for the production of metallurgical coke. Research of this nature require considerable capital equipment and the running cost would be high.

Only some of the more urgent matters requiring research have been mentioned in the foregoing pages. If followed up to any appreciable extent they would require an additional income greater than that to be expected from an increase in the levy by one eighth penny per ton as the attached table indicates.

Note: The requirements for large scale practical research work given in the attached Table have been estimated on the assumption that for larger scale field tests etc. in the various sections temporary assistance would be drawn from other divisions e.g. the present complement of staff stationed at the Institute's premises, Lynwood Road.

Furthermore .../

Furthermore, that for much of the routine analytical work the services of the general and survey laboratory would be available.

This implies that the present complement of staff at the Institute must be kept intact and possibly expanded to be able to render this service in addition to its commitments in such matters as coal grading, railway contract grading, survey of coal resources (general as well as for the government). Any additional commitment such as grading of inland coal would materially increase these costs.

Since it is not known what may eventuate in this respect it may be assumed that the additions at the Institute's site, Lynwood Road, in the next five years would require:

Capital for additional buildings and equipment	(say)	£10,000
Additional staff analysts	(say 10 at £800)	£ 8,000 p.a.

A. J. PETRICK.

DIRECTOR.

PRETORIA.
14th. September, 1954.

FUEL RESEARCH INSTITUTE OF

ESTIMATES OF EXPENDITURE PROVIDING FOR

1954 (Revised Estimate).			1955 (Immediate)		
Staff Salaries & Allowances.	Running Expenses	Capital.		Staff Salaries & Allowances.	Running Expenses.
74,000	19,000	28,000	For present Staff...	78,000	26,000
			<u>Additional:</u>		
			Staff to replace Sasol Employees (H.C.S.)	7,150	
			Staff to operate Pilot Plant	5,900	
			Staff to further study Carbonisation, Combustion & Gasification	6,700	
			Materials for development of Pilot Plant, Carbonisation & Combustion Tests..		7,000
			<u>Development of site at Pretoria West:</u>		
			Property Improvement Buildings		
			Vehicle		
			Laboratory & Workshop Equipment		
74,000	19,000	28,000		97,750	33,000
	TOTAL	121,000		TOTAL	

SOUTH AFRICA.

DESIRED EXPANSION OF ACTIVITIES.

1956 - 1958 (Future).				
Capital.		Staff Salaries & Allowances.	Running Expenses.	Capital.
5,000	On 1955 Staff	108,000	44,000	5,000
	<u>Additional:</u>			
	Staff for Hydrocarbon Synthesis	3,300		
	Staff for Coal Preparation	1,000		
	Staff for Carbonisation	7,200		
	Cumbustion Problems...	3,900		
	Gasification	3,300		
	Staff for Lynnwood Road	8,000		
	Materials for development of Pilot Plant, Carbonisation and Combustion tests		8,000	
	Hydrocarbon Synthesis Equipment & Housing...			11,500
4,000	<u>Coal Preparation, Pretoria West.</u>			
9,000	Laboratory & Workshop Equipment			8,500
1,500	Vehicle			1,500
	Buildings			12,000
6,500	<u>Carbonisation.</u>			
	Coke ovens			20,000
	Boiler & Furnace			75,000
	Gasification, Equipment & Housing			10,000
	Lynnwood Road Extensions			10,000
28,000		134,700 p.a.	52,000 p.a.	153,500
158,750				