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cc MR. LANKESTER
MR. IBBS
MR. DUGUID *n.*

MR. HOSKYNS

Transport

RAILWAY ELECTRIFICATION

The state of play on this is apparently that there is a hiatus until a paper on the future of British Rail, mainly a review of their corporate plan 1981/85, goes to E Committee towards the end of March. E Committee will be asked to decide broadly on the future of British Rail. If they decide there is a shining future then the issue of electrification would be debated, and I suspect overwhelmingly approved.

It has all been rather cleverly done. The British Rail and D/Transport carried out a joint study, but they ensured that on the Steering Group were represented the Treasury and the Department of Energy. The Treasury therefore are *parti pris*. I spoke to Mrs. Case who said that the Treasury were not involved in any further review of the case for electrification. In fact so far as I can see the only critique will come either from CPRS or us. It seems that Michael Posner has rather cleverly used the technique used by Kaldor for this proposal.

As you know, I am very doubtful indeed if there is anything like a positive case for further electrification and I am quite convinced that the British Rail/DoT assumptions are extraordinarily optimistic. I think that an independent review should be mounted. Probably CPRS is the best unit to do it, although I would be very willing to help.

AW

5 March 1981

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cc Ann Ann

10 February 1981

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ELECTRIFICATION REVIEW : PUBLICATION OF THE FINAL REPORT

I wrote to you on 3 February to tell you that we were planning to publish the report last Thursday. Subsequently, Mr Wadsworth telephoned to say that publication had been postponed. We are now aiming for 2.30 pm on Wednesday 11 February, announcing publication by means of a written answer and a joint Department/Board Press Notice. I am attaching advance copies of the latter for your information. John Palmer and Michael Posner will be holding a Press briefing that afternoon.

2. I am sending copies of this letter with enclosures to recipients of my letter of 3 February.

A T BAKER

10 FEB 1981



RAILWAY ELECTRIFICATION
REPORT PUBLISHED

A review of the case for a programme of main line electrification is published today. It was carried out jointly by the Department of Transport and British Rail.

It concludes that a substantial programme of main line electrification, covering services carrying up to 83 per cent of passenger traffic and up to 68 per cent of freight traffic, would be financially worthwhile. It would yield a real rate of return of around 11%. It would not affect total energy use, but it would cut oil consumption.

The cost of constructing the overhead wiring and other fixed works (£250m to £720m, at 1978 prices, depending on the extent of electrification) and then maintaining them would be more than covered by the lower operating and maintenance costs of electric as opposed to diesel traction and by the increased earnings due to greater speed and passenger appeal. A large part of the benefit is due to the fact that oil prices are expected to rise faster than electricity prices, but maintenance economies are very important and there are reductions in train crew costs.

There would be two other advantages from a programme of electrification. It would reduce dependence on oil; and the regular home orders for the UK railway manufacturing industry could help it win more export orders.

The report stresses that electrification would primarily benefit the main commercial businesses of the railway - Inter-City and freight. The study has assessed the advantages arising from an electrified main-line system over a diesel system but it was outside the scope of the work to evaluate the future commercial prospects of these businesses.

NOTE TO EDITORS

A summary of the Report is attached.

REVIEW OF MAIN LINE ELECTRIFICATION
FINAL REPORT

The joint Department of Transport/British Rail review of the case for an electrification programme was set up in 1978. The steering group included representatives from the Treasury and the Department of Energy; other government Departments contributed. A wide range of outside organisations were also consulted. An interim report was published in September 1979. The final report concludes that a substantial programme of main line electrification, covering services carrying 83 per cent of passenger traffic and 68 per cent of freight traffic would be financially worthwhile. It would yield a real rate of return of about 11 per cent.

The Options Evaluated

The review examines the financial returns which could be earned by investment in each of three distinct electrification options. These are then compared with a base case (Option I), which assumes only limited further electrification including St Pancras to Bedford, and certain lines in East Anglia, the North West and around Glasgow. In the base case 52 per cent of passenger traffic and 23 per cent of freight traffic would be electrically hauled - much the same as today. The three electrification options are:

- i. the smallest option (Option II) which could be completed in about 15 years. It would extend electrification up the East Coast Main Line to Leeds and Newcastle, to Sheffield on the Midland Main Line, and from York to Birmingham. In Scotland, Edinburgh to Glasgow and Edinburgh to Carstairs (on the West Coast Main Line) would be electrified. 62 per cent of passenger and 38 per cent of freight traffic would then be hauled electrically;
- ii. the medium option (Option III) would extend electrification to include London to Bristol, South Wales and Plymouth; Birmingham to Taunton; Newcastle to Edinburgh; and Liverpool to Leeds. This would mean that 75 per cent of passenger traffic and 54 per cent of freight traffic would be hauled electrically;
- iii. the largest option (Option V) would include, in addition, Edinburgh to Aberdeen and Doncaster to Hull; Plymouth to Penzance; and Crewe to Holyhead. Its completion would mean that 83 per cent of passenger and 68 per cent of freight traffic would be hauled electrically.

The following table sets out the route and track mileage included in the different options.

TABLE 1
ELECTRIFIED MILEAGE IN EACH OPTION (excluding sidings)

	Route miles	% of present network	Single track miles	% of present network	% of passenger and freight loaded train mileage electrically hauled	
					P	F
Option I: Base	2,580	23	6,390	29	52	23
II: Modest	3,460	31	8,770	40	62	38
III: Medium	4,620	42	11,450	52	75	54
V: Large	5,750	52	13,610	62	83	68
Total British Rail network at 1.7.80	11,006		21,892			

Different rates of construction would affect the flow of costs and benefits and, therefore, the returns from electrification. So two rates of progress (slow and fast) were examined for the larger options; these would allow completion of the medium option in either 15 or 25 years, and of the largest option in either 20 or 30 years.

Financial Results

For electrification to be financially justified, the increase in earnings and the reduction in train operating costs and in traction and rolling stock capital costs must exceed the extra cost of constructing and maintaining the overhead wiring and other fixed costs.

On the revenue side, it was assumed that the shorter journey times made possible by the introduction of electric traction would increase passenger traffic and earnings. Real fare rises were assumed. Freight and parcels revenue was assumed to be unaffected.

On the costs side, there are the costs of constructing and maintaining the fixed electrification works. Extra investment would be required in fixed works of between £20m and £40m a year (at 1978 prices) over 15 to 30 years depending on the extent and rate of electrification. (Most of this work would be carried out by the private sector.) Set against that is the fact that electric vehicles run faster, require less frequent and simpler maintenance and return to the depot less often. Less traction and rolling stock and less train crew are therefore needed. Maintenance and fuel costs are also lower, since oil is expected to become increasingly expensive compared to electricity.

The report compares the forecast costs and receipts over 30 years on the basis of the various electrification options and compares these with the continuation of broadly the present system. The projected annual costs and revenues of each option are calculated and discounted at a rate of 7 per cent (the standard rate used in rail and road investment projects). The advantage of the electrification options over the present largely diesel railway is then expressed in terms of its Net Present Value (NPV).

Table 5 from the report, which is reproduced below, shows how the benefits are gained from the different electrification options.

TABLE 5
NPVs OF ELECTRIFICATION OPTIONS COMPARED WITH OPTION I,
SUMMARISED BY REVENUE AND COST CATEGORY

(£m, 1978 money values, discounted at 7%)

	NPV of Option I	Better/worse (-) than Option I				
		Option II	Option IIIS	Option IIIF	Option VS	Option VF
Passenger Revenue	10,353	57	102	123	114	141
Working Expenses						
Oil	1,356	187	340	411	395	486
Electricity	695	-111	-198	-245	-231	-294
Crew	2,049	13	21	28	39	50
Traction & rolling stock maintenance	3,093	72	130	166	158	201
Fixed works maintenance	7	-26	-40	-47	-48	-58
Total	7,200	134	254	313	312	386
Investment						
Traction & rolling stock	1,286	13	27	25	40	54
Fixed Works	32	-134	-213	-261	-258	-326
Total	1,317	-121	-186	-236	-218	-271
NPV Grand Total	1,835	70	169	200	208	255

NOTE:—Totals are affected by rounding.

All the electrification options show a surplus of benefits over costs, with Net Present Values ranging from £70m to £255m (at 1978 prices), and internal rates of return ranging from 9.9 per cent to 11.1 per cent. The fast options rank higher than the slow options and the larger options rank higher than the smaller options, but the larger and faster options do make larger cash flow demands in the early years.

Where possible, known costs have been used in the analysis. Inevitably, with a study of this type, a number of important assumptions have to be made. The most important assumptions are:-

- a. the competitive position of the railways will enable them to make real fares increases;

b. while labour costs are assumed to move in line with Gross Domestic Product, corresponding gains in productivity will secure that this does not raise the unit cost of output;

c. oil prices are expected to rise faster than electricity prices.

'Sensitivity' tests have been carried out on the cost assumptions and forecast traffic levels. These tests did not overturn the financial case for an electrification programme and also showed that, if favourable chances continue, the results could be better.

Wider Effects

The report looks also at the wider economic and social effects of electrification which could not be quantified financially but could nevertheless be important.

Electrification would save up to 120 million gallons of oil a year - equivalent to $\frac{1}{2}$ per cent of total national oil consumption or one and a half per cent of oil consumption for transport purposes. It would not reduce total energy consumption but it would give greater flexibility in the use of basic fuels.

It would bring substantial regular orders for the UK railway manufacturing industry; this would assist the industry to reduce unit costs and encourage investment in research and development, thus enhancing its competitiveness in export markets.

As well as making railways cleaner, electrification would probably reduce the noise nuisance and make them safer, particularly to the railway work force. On the other hand, the presence of overhead wiring would make the railways more dangerous to trespassers. The wiring would also intrude slightly on the landscape in some areas.

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By hand

*now to be published
next Wednesday.*

Am Baker

3 February 1981

Dear Sir,

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JOINT BRITISH RAIL/DEPARTMENT OF TRANSPORT REVIEW OF MAIN LINE RAILWAY
ELECTRIFICATION : FINAL REPORT

1. I am attaching two advance copies of the Final Report of the Electrification Review. We will be publishing the report on Thursday 5 February at 11.00 am, when John Palmer and Michael Posner, the Steering Group co-chairmen, will be holding a press briefing session.

My Secretary of State will not hold a press conference himself, but will answer an inspired written Parliamentary Question at 11.00 am. Copies of the report will be available in the House of Commons for MPs (and for Members of the House of Lords) at the time of publication.

2. We shall be issuing a press notice on Thursday, but this has to be cleared with British Rail, and copies are not yet available. I will aim to send you advance copies of the Press Notice and Written Answer as soon as these are ready.

3. I am copying this letter, with two copies of the report, to Tim Lankester at No. 10, Stephen Pride at Industry, Anthea Case at the Treasury, Jean Lamont at Trade, Jim Currie at the Scottish Office, Keith Trimmell at the Welsh Office and David Miles at the Cabinet Office.

Yours sincerely,

Tom Baker

A T BAKER