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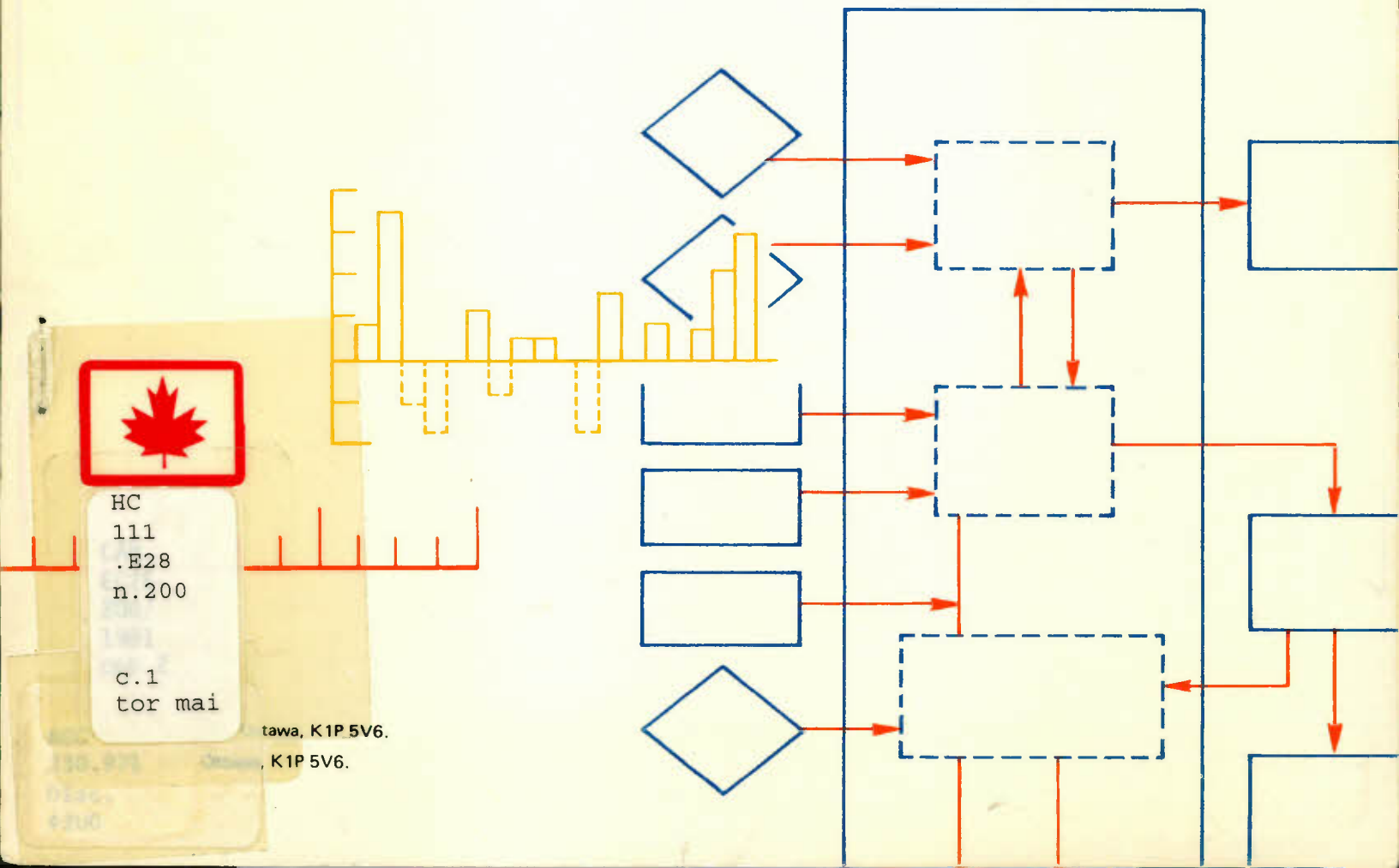

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DISCUSSION PAPER NO. 200

Canadian Crude Petroleum Self-Sufficiency in Alternative Domestic and International Pricing Environments

by Bobbi Cain, H. M. Saiyed, R. S. Preston
assisted by P. Nevin, M. Willis

Technical Background Documentation
to the Special Committee on Alternative
Energy and Oil Substitution

The findings of this Discussion Paper are the personal responsibility of the authors and, as such, have not been endorsed by Members of the Economic Council of Canada.

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Résumé

Le Comité spécial de l'énergie de remplacement du pétrole a demandé au Conseil économique du Canada d'examiner les effets, sur l'économie, d'une réduction de la dépendance du Canada à l'égard du pétrole d'ici 1990. Les auteurs examinent ici quatre options ou degrés d'autosuffisance, ou de dépendance à l'égard du pétrole importé, qui devraient permettre d'y arriver.

La première option comprend les effets qui résulteraient d'une recherche de l'autosuffisance par la seule mise en valeur des ressources en sables bitumineux de l'Ouest canadien. La seconde consiste à analyser les possibilités d'équilibrer le commerce des combustibles fossiles d'ici 1990 par le biais d'une mise en valeur plus poussée des sables bitumineux et d'un effort accru de récupération. La troisième option, soit le scénario de référence du Conseil économique présenté dans le Dix-septième Exposé annuel, suppose un certain degré d'autosuffisance obtenu par la mise en oeuvre des projets actuellement prévus. Enfin, la dernière option consiste à examiner la remise à plus tard ou l'abandon de plusieurs projets prévus d'exploitation de sables bitumineux et de construction de pipelines.

Pour examiner ces divers degrés d'autosuffisance, les auteurs se servent de trois différents scénarios couvrant toute une gamme de hausses possibles des prix mondiaux. Pour l'option de l'autosuffisance, ils utilisent quatre scénarios différents de prix intérieurs reflétant les politiques de prix possibles, compte tenu des trois hypothèses en matière de prix internationaux.

La comparaison entre l'autosuffisance et la simulation où les grands projets d'investissement sont annulés donne les résultats suivants :

- Baisse de l'inflation, particulièrement vers la fin de la période, alors que diminuent les pressions inflationnistes attribuables aux importations de pétrole.

- Plus forte croissance réelle du PNB attribuable à l'augmentation des investissements, mais un peu atténuée par les effets inflationnistes des divers régimes de prix.

- Accroissement de l'emploi, qui est cependant sensible aux politiques mondiales et nationales relatives aux prix du pétrole.

- Redressement du solde au compte courant qui, faible au départ, devient excédentaire vers la fin de la période, par suite de la réduction des importations du pétrole.

- Raffermissement du dollar canadien par suite de l'amélioration du compte courant.

- Augmentation de l'excédent au compte des gouvernements provinciaux, par suite de recettes fiscales et de redevances supplémentaires.

- Excédent budgétaire du gouvernement fédéral, attribuable à la politique visant le prix mixte du pétrole et à la diminution des paiements de transfert.

Les auteurs examinent en somme, dans leur étude, toute une gamme de situations extrêmes en matière d'investissements, de prix intérieurs et internationaux du pétrole ainsi que de réserves étrangères et canadiennes de pétrole brut. L'autosuffisance, obtenue par la seule production des sables bitumineux, en supposant une demande modérée, nécessiterait la mise en place de cinq autres usines de traitement. Le cas échéant, les gouvernements fédéral et provinciaux auraient à régler les difficultés découlant de la répartition des rentes de l'exploitation du pétrole et du gaz, et les provinces de l'Ouest, de difficiles problèmes de gestion des ressources.

ABSTRACT

The Special Committee on Alternative Energy and Oil Substitution asked the Economic Council of Canada to investigate the impact on the economy of reducing Canadian dependence on imported oil by 1990. To do this, four degrees of self sufficiency, or dependence on imported oil, are examined.

The first option incorporates the effects of pursuing oil self sufficiency solely through the development of Western Canada's oil sands resources. The second option assessed analyses balancing trade in fossil fuels by 1990 through the implementation of a combination of increased oil sands development and enhanced recovery activities. The third option, the Economic Council of Canada's base case for the Seventeenth Annual Review, implies a degree of self sufficiency obtained through the completion of presently scheduled projects. The last option examines the deferral or cancellation of many scheduled and proposed oil sands and pipeline projects.

In examining these various degrees of self sufficiency three world pricing environments covering a range of possible world price increases are used. The self sufficiency option is explored using four domestic pricing environments, reflecting possible pricing policies, within the three international price cases.

Under self sufficiency, as compared to the simulation where the large investment projects are removed, the following results are indicated:

- Inflation is lower, particularly towards the end of the period as inflationary pressures arising from imported oil diminish.

- Real GNP growth, because of increased investment activity, is higher, however is somewhat ameliorated by inflationary impacts of the various pricing regimes.

- Employment levels are higher, though the gains are sensitive to world and domestic pricing policies.

- The current account balance, after an initial weakening, moves to surplus by the end of the period due to the reduction in oil imports.

- The Canadian dollar strengthens as a result of the improved current account balance.

- The provincial government surplus increases due to additional royalty and taxation revenues.

- The federal government moves to a surplus position, induced by the blended pricing policy combined with reduced transfer payments.

This paper explores a range of extremes in investment, in international and domestic pricing, and in foreign and domestic crude petroleum supply levels. Self sufficiency through only oil sands production, under moderate demand assumptions, requires five additional oil sands plants. Implementation would require the resolution of difficult oil and gas rent allocation questions by the federal and provincial governments, in addition to the solution of some difficult resource management problems for the governments of the Western provinces.

INTRODUCTION

The Special Committee on Alternative Energy and Oil Substitution has asked the Economic Council of Canada to investigate the impact on the economy of reducing Canadian dependence on imported oil by 1990. In this document we examine four degrees of self sufficiency or dependence on imported oil.

The first option incorporates the effects of pursuing oil self sufficiency by 1990 solely through the development of Western Canada's oil sands resources. The second alternative assesses the option of balancing trade in fossil fuels by 1990, implemented through a combination of increased oil sands development and enhanced recovery activities. The third option is the Economic Council of Canada's base case for the 17th Annual Review. This is an environment that implies a degree of self sufficiency that is obtained through the completion of presently scheduled projects. These include the two major oil sands projects presently awaiting government approval, the Alsands and the Cold Lake Projects. Our fourth option of oil dependence examines the deferral or the cancellation of many scheduled and proposed projects -- those very projects that enable Canada to achieve self sufficiency in our first option, and to achieve a non-negative fossil fuel balance in our second option.

Table 1

A Classification of Alternatives - Self Sufficiency, World Pricing, Domestic Pricing

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The Following Degrees of Self Sufficiency or
Dependence are Examined

- self sufficiency
- fossil fuels in balance
- completion of scheduled projects
- deferral or cancellation of scheduled and proposed projects

Within Three World Pricing Environments

- 1.0-1.5% real increase (1981-1990)
- 7.0% real increase (1981-1990)
- 1.0-1.5% real increase (1981-1990), $15 real shock (1986)

Within the Self Sufficiency and World Pricing Environments
the Following Domestic Pricing Schemes are Examined

- $2 wellhead
- $4 wellhead
- blended price ($2 wellhead) natural gas tied to wellhead
- blended price ($2 wellhead) natural gas tied to blended price

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In examining these various degrees of self sufficiency three world pricing environments are used. They are: the environment that is included in the Economic Council of Canada's base case, implying a 1.0 to a 1.5 per cent real price increase over the 1981 to 1990 period; an environment in which the real price of international oil increases by 7 per cent per annum over the 1981 to 1990 period; and a third environment in which the base case real price increase is assumed until 1985. In 1986 it is assumed that the OPEC cartel imposes a $15.00 real price increase in the international price of crude petroleum. After this period, during 1987 to 1990, the assumptions included in the base case are used. Within the self sufficiency environments and the international pricing alternatives we study four domestic pricing schemes. The first two assume a) an increase in the domestic price of $2 per annum above the present level, and b) $4 per annum above the present level. The second two assume a blended price scheme with a $2 per annum wellhead increase and explore two natural gas pricing schemes.

The two questions of energy pricing and the impact of energy investment decisions leading to a particular self sufficiency environment are interrelated: their analysis shows that these investment projects have an important impact on growth and demand in the early part of this decade. They also have a substantial impact on the balance of payments and the composition of savings and investment during the latter part of the decade.

Following a presentation of the current medium-term outlook for the Canadian economy included in the Council's base case, we present our assumptions for the various self sufficiency environments, the various world pricing environments, and the domestic pricing schemes. We will then present an analysis of the impact on selected economic indicators such as the Consumer Price Index, growth in real Gross National Product, cumulative employment effects, exchange rate effects, the current account balance and the impact on federal and provincial balances. We then briefly summarize the lessons which can be learned from this exercise and the main points emerging from our analysis of the various alternatives.

THE BASE CASE OUTLINE

THE BASE CASE EXTERNAL ENVIRONMENT, ENERGY, AND DOMESTIC POLICY ASSUMPTIONS

Before dealing with each of these areas in detail we indicate the assumptions that underline the base case projection. The base case is used for purposes of comparison when alternatives are developed and discussed. The assumptions can be divided into three broad classes: those directly associated with the external environment (U.S. and other OECD); those closely related to domestic energy pricing and energy investment; and, those related to domestic fiscal and monetary policy.

Table 2 includes the major indicators that summarize the anticipated performance of the United States and other OECD economies for the period 1980-1990. Most apparent is the weak performance we anticipate for the OECD and in particular for the United States in 1980. This poor performance continues with only a weak recovery in 1981. In the United States, we anticipate the unemployment rate will increase to 8.4 per cent and then follow a path close to 7 per cent as we move to the mid point of the decade. Inflation rates in the United States we anticipate will be close to 14 per cent in 1980 and average above 8.5 per cent for the remainder of the decade. U.S. interest rates are anticipated to follow a downward trend from current levels, averaging close to 9.0 per cent by mid decade.

Table 2

External Environment Assumptions - Base Case Projection[1]

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
OECD											
Industrial Production (Per Cent Change)	-1.7	1.2	5.1	5.0	4.4	3.6	3.6	3.4	3.8	3.5	3.5
United States[2]											
Real GNE (Per Cent Change)	-1.3	0.5	3.6	2.7	3.0	2.0	2.4	2.4	2.9	2.2	2.2
Industrial Production (Per Cent Change)	-4.0	0.7	5.9	5.2	4.4	3.2	3.2	2.9	3.4	2.9	2.9
CPI (Per Cent Change)	14.0	11.2	10.1	8.2	8.3	9.2	9.3	9.8	8.6	8.2	8.2
Unemployment (Per Cent Level)	7.5	8.4	7.9	7.4	7.1	7.1	7.0	7.0	6.9	6.8	6.7
Short-Term Interest Rate (Per Cent Level)	11.3	10.4	8.9	8.7	8.6	9.0	9.1	9.4	8.7	8.6	8.6
Overseas Countries[3]											
Industrial Production (Per Cent Change)	2.1	2.1	3.4	4.6	4.4	4.4	4.5	4.5	4.5	4.5	4.6
Crude Petroleum[3]											
International Price - $ CDN (Per Cent Change)	63.5	11.1	9.7	10.6	9.4	9.2	9.0	8.8	8.8	8.7	8.8

1 CANDIDE Model 2.0, August 1980.

2 Latest available projections of Wharton Econometric Forecasting Associates, Philadelphia, Pa., as of August, 1980.

3 Economic Council of Canada Estimates, August, 1980.

This performance for both the United States and other OECD countries is extremely poor. The recovery period (1981-1982) for the United States is nothing like that which was experienced after the U.S. downturn of 1974-1975. Real growth in the United States during 1976 approached 7.0 per cent. We do not see this occurring during the period 1981-1984. Worse still, the weak sectors in the U.S. economy are those which are very important for Canadian exports: automobiles, farm machinery, steel and lumber.

The international price of crude petroleum in the base case tracks a path which is near 10.0 per cent during 1981-1985 and then drops to 9.0 per cent for the remainder of the decade. This follows after a substantial adjustment in 1980. It implies that international oil prices will increase from one to one and a half percentage points more per year than Canadian domestic prices.

In our base case projection, after incorporating the most recent adjustments to domestic oil price as of August, 1980, we made the assumption that the domestic price of crude petroleum will not be governed by pre July 1980 agreements between the federal government, the producing provinces and the producers. We have assumed that the domestic price of crude petroleum will advance at the rate of $4.00 per barrel per year from 1981 onward, but the

Table 3

Large-Scale Energy Investment Project Phasing 1980-1990[1]

Project	Phase In	Period Peak	Phase Out
Syncrude Extended	1980	1981-1982	1988
Alsands	1981	1984-1985	1987
Q + M Pipeline	1981	1982	1984
Alaska Highway Gas Pipeline	1981	1983-1984	1987
Cold Lake	1982	1986-1987	1990
East Coast Gas Pipeline	1988	1990	1992

1 Economic Council of Canada Estimates

Table 4

Domestic Policy Assumptions, August 1980[1]

Oil Pricing	$4 per barrel per year (.85 natural gas price parity) with existing revenue splits between producing provinces, producers and federal government maintained. Federal oil import subsidy programme maintained. Syncrude levy held at $1.75 ceiling.
Tax Policy	All presently in place policies unchanged.
Spending Policy	Government restraint at 1.5 per cent per year real growth on goods and services. All indexed transfers maintained. Established programme financing renegotiated in 1981-1982 along existing lines. Equalization payments and tax point agreements maintained.
Monetary Policy	Canadian interest rates follow U.S. rates as decade unfolds. Money supply growth targets in the 5 to 9 per cent range (average 8 per cent).

1 Economic Council of Canada Estimates

existing revenue splits as of August 1980 between the producing provinces, the producers and the federal government will be maintained. We have also assumed maintenance of the federal oil import subsidy programme.

Table 3 summarizes the major oil sands and energy pipeline investment projects now underway, or anticipated during the period 1980-1990, the effects of which are built into the base case. Table 4 summarizes the domestic policy assumptions underlying the base case projection.

This is only a broad outline of a very detailed set of assumptions which are incorporated in the base case calculation. A more detailed discussion is found in Canada - The Medium Term, Performance and Issues (ECC Fall 1980). However, they do summarize the current outside forces which we anticipate will operate on the Canadian economy during the next half decade.

SUMMARY OF THE BASE CASE PROJECTION

The base case projection points to the many problems that we currently face in an unchanged domestic policy environment with a world outlook situation that is lacklustre. In summary, the major problems which can be seen by close examination of Table 5 are as follows:

-- Real growth in 1980 is extremely weak with an unspectacular recovery period in 1981-1983. There are only 2 years during the period where growth is near potential.

-- Inflation in 1980 we anticipate will be close to the double digit range with high rates continuing through 1981. The long term trend we expect to track in the range of 8.0 to 9.0 per cent.

-- Unemployment rates remain above 7 per cent until 1982. They then drift close to 6 per cent.

-- Continued decline in the rate of growth of real wages through 1982 and then only a modest recovery in growth.

-- Nominal wage growth in the 8.0 to 10.0 per cent range in 1981-1983 with a long run trend close to 10 per cent.

-- Decline in the personal saving rate from the current high level of above 10 per cent, in part due to the erosion of personal savings incentives from inflation.

-- An increased percentage of output devoted to investment due to many large energy projects assumed to come on stream in the early part of the decade.

-- Continued federal deficits and provincial surpluses.

-- Continued current account deficits.

-- Poor performance in rate of growth of output per manhour in part due to the cyclical adjustment currently underway in the economies of our trading partners.

Table 5

Selected Indicators - Base Case Projection[1]
(percentage increase)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross National Product ($1971)	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
Consumer Price Index	9.8	10.6	9.9	9.0	9.0	8.7	8.1	8.4	7.9	8.1	8.2
Unemployment Rate (level)	7.9	8.0	7.5	7.0	6.7	6.5	6.5	6.1	5.9	5.9	5.6
Labour Force	2.4	2.1	1.9	1.9	1.9	1.5	1.7	1.5	1.6	1.5	1.4
Employment	2.0	2.0	2.4	2.4	2.4	1.7	1.7	2.0	1.9	1.5	1.7
Productivity	-2.3	-0.7	0.9	1.3	1.1	1.0	1.4	1.4	1.2	1.0	1.3
Real Wage Rate	-2.2	-2.4	-0.1	0.7	0.5	1.2	1.7	1.3	2.2	1.9	2.0
Nominal Wage Rate	7.4	8.0	9.8	9.8	9.6	9.9	10.0	9.8	10.2	10.1	10.4
Saving Rate (level)	10.1	9.5	9.2	9.1	8.8	8.6	8.5	8.3	8.1	7.9	7.6
Participation Rate (level)	62.4	62.7	63.1	63.5	64.0	64.3	64.7	65.1	65.5	65.9	66.3
Real Investment (% of GNE)	22.6	23.0	23.2	23.8	24.6	24.8	24.9	25.1	25.2	25.3	25.4
Federal Deficit (% of GNE)	-3.8	-4.0	-3.6	-3.3	-2.5	-2.5	-2.4	-2.3	-1.9	-1.7	-1.3
Provincial Surplus (% of GNE)	1.0	1.4	1.7	1.8	1.9	2.0	1.9	1.8	1.5	1.3	1.1
Balance of Payments											
Current Account Balance (% of GNE)	-1.8	-1.8	-1.6	-2.0	-2.1	-2.2	-2.2	-2.4	-2.3	-2.4	-2.3
Energy Balance (% of GNE)	1.2	1.5	1.5	0.9	0.8	0.4	0.0	-0.4	-0.7	-1.0	-1.1
Non-energy Balance (% of GNE)	-3.1	-3.3	-3.1	-3.0	-2.9	-2.6	-2.2	-2.0	-1.6	-1.4	-1.3

1 CANDIDE Model 2.0, August 1980

THE ASSUMPTIONS

ASSUMPTIONS ASSOCIATED WITH THE SELF SUFFICIENCY ALTERNATIVE

In 1980 in the base case, total crude petroleum requirements are estimated to be just over 700 million barrels or 1900 thousand barrels per day. Of that, total imports are estimated to be just over 200 million barrels per year or 560 thousand barrels per day. In 1979 Canada imported 609 thousand barrels per day of crude petroleum of which over 100 thousand barrels per day were included in the Swap program.

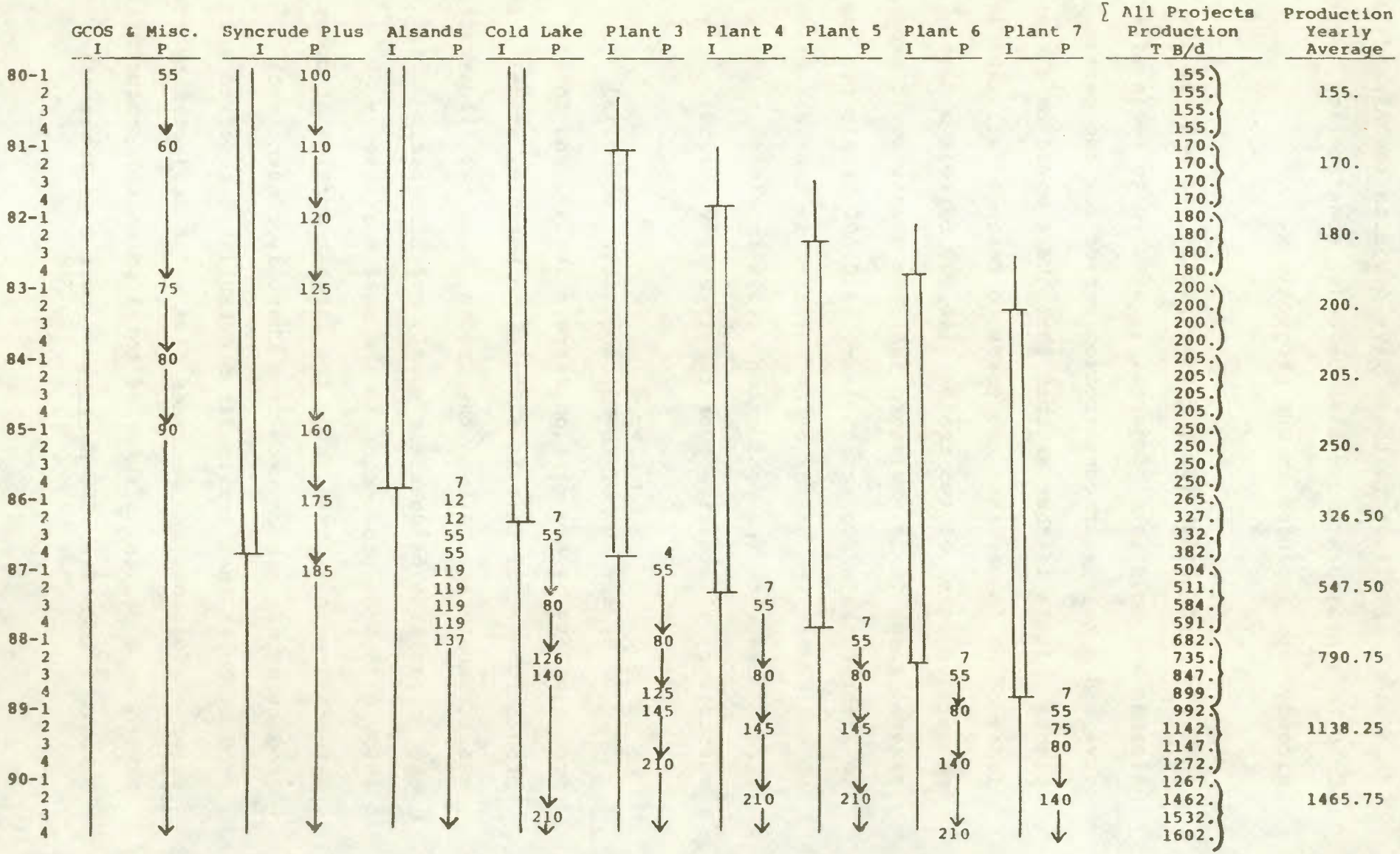
Total crude petroleum requirements in Canada are assumed to increase at declining rates of growth over the decade, averaging a little over 1 per cent per annum over the 10 year period. This National Energy Board demand scenario implies a reduced share for crude petroleum in Canada's total energy requirements with other fuels, particularly natural gas and electricity, assuming a larger share of total energy requirements in the country. Export demand for crude petroleum is also taken from the National Energy Board's 1978 oil report.[1] By the end of the period it consists of just 10 million barrels of crude petroleum per year, all of which is heavy oil production. The total of domestic demand and export demand is combined with domestic supply to give the gross import requirements for the decade.

In the base case by 1990, 460 million barrels per year of crude petroleum are anticipated to be produced domestically in Canada, of which 200 million arise from oil sands production. Included in this assumption of oil sands production is a total of 97 million barrels in 1990 arising from the Alsands and the Cold Lake Projects. The total domestic requirement in 1990 for both domestic consumption and export demand, minimal as it is, is 794 million barrels. In designing the self sufficiency scenario it is assumed that additional production in Canada must replace over 300 million barrels of crude petroleum in 1990.

In designing a self sufficiency alternative using exclusively oil sands production, as had been requested by the Committee, it is necessary to move to a quarterly schedule of production and investment that is illustrated in Table 6. In order to obtain sufficient production from oil sands to offset the import requirements by 1990, given the declining level of established reserves, and given a not-too-rapid increase in reserve additions and pentanes plus, it is necessary to schedule five additional oil sands plants to come on stream before the end of the decade. It was assumed that this would be two mining plants and three in situ plants. The pressure arising from the overlap of labour requirements would then not be as extensive as one would first believe when contemplating five projects all starting within the decade and all coming on stream in the

Table 6

Self Sufficiency Scenario, Oil Sands Production (P) and Investment Timing (I) (Thousand Barrels per Day)



decade. In addition to these five projects the Alsands and Cold Lake projects would also be under construction, as has already been included in our projections.

Production for the five plants, as well as the Alsands and Cold Lake projects, is assumed to begin after a five and a half year construction period for the particular plants. It is further assumed that there would be a time lapse of no longer than two years to reach a full capacity production level of two trains (140,000 barrels a day). In several cases it is envisaged that the plants would expand to a three train production level (210,000 barels per day) by the end of the decade or be pointing in that direction. Table 7 presents the production levels implicit in the self sufficiency alternative over the 1980-1990 period.

By the end of the decade, total potential producibility is 824 million barrels in 1990 and total production out of that is 816 million barrels, assuming only small amounts are left in the ground. Chart 1 illustrates the composition of domestic supply over the period. By 1990, oil sands production in the self sufficiency alternative is assumed to be the largest portion of domestic production. As can be seen from Chart 1, conventional production -- that arising from established reserves and reserve additions and pentanes plus -- is projected by the NEB to be a declining share of total potential producibility as established reserves decline. Chart 2 presents the

Table 7

Composition of Crude Petroleum Production in Self Sufficiency Scenario (millions of barrels)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Established Reserves	490.	433.	381.	334.	294.	259.	230.	203.	181.	162.	145.
Reserve Additions and Pentanes Plus	77.	88.	99.	108.	114.	120.	128.	132.	137.	140.	142.
Oil Sands	42.5	58.	66.	72.	78.	93.6	122.2	202.8	290.9	418.	537.7
- Great Canadian Oil Sands & Misc.	20.	22.	22.	27.	33.	35.	35.	35.0	35.	35.	35.
- Syncrude plus Syncrude extended	22.5	36.	44.	45.	45.	58.	63.8	68.0	68.	68.	68.
- Alsands						.6	12.2	43.4	50.	50.	50.
- Cold Lake							10.6	24.6	44.4	51.	63.8
- Plant #3							.6	20.	33.	58.8	76.5
- Plant #4								10.8	24.9	47.	70.7
- Plant #5								.6	25.	47.	70.7
- Plant #6									11.	34.7	57.5
- Plant #7									.6	26.5	45.5
Total Potential Producibility	609.5	579.0	546.0	514.0	486.0	472.6	480.2	537.8	608.9	720.0	824.7
Total Production	546.0	575.0	530.0	490.0	480.0	460.0	479.1	508.8	580.5	690.4	816.0

Source: Estimates for Established Reserves, Reserve Additions and Pentanes Plus, GCOS and Syncrude are taken from the NEB Base Case, in Canadian Oil, Supply and Requirements, National Energy Board, September 1978.

Estimates for Alsands and Cold Lake are based on figures obtained from Shell and Esso in telephone conversations, October 1980.

Estimates for other oil sands projects are based on the Alsands and Cold Lake estimates and estimates supplied to the National Energy Board in various submissions prior to the 1978 Report.

Chart 1

COMPOSITION OF DOMESTIC SUPPLY - ..LF SUFFICIENCY SCENARIO

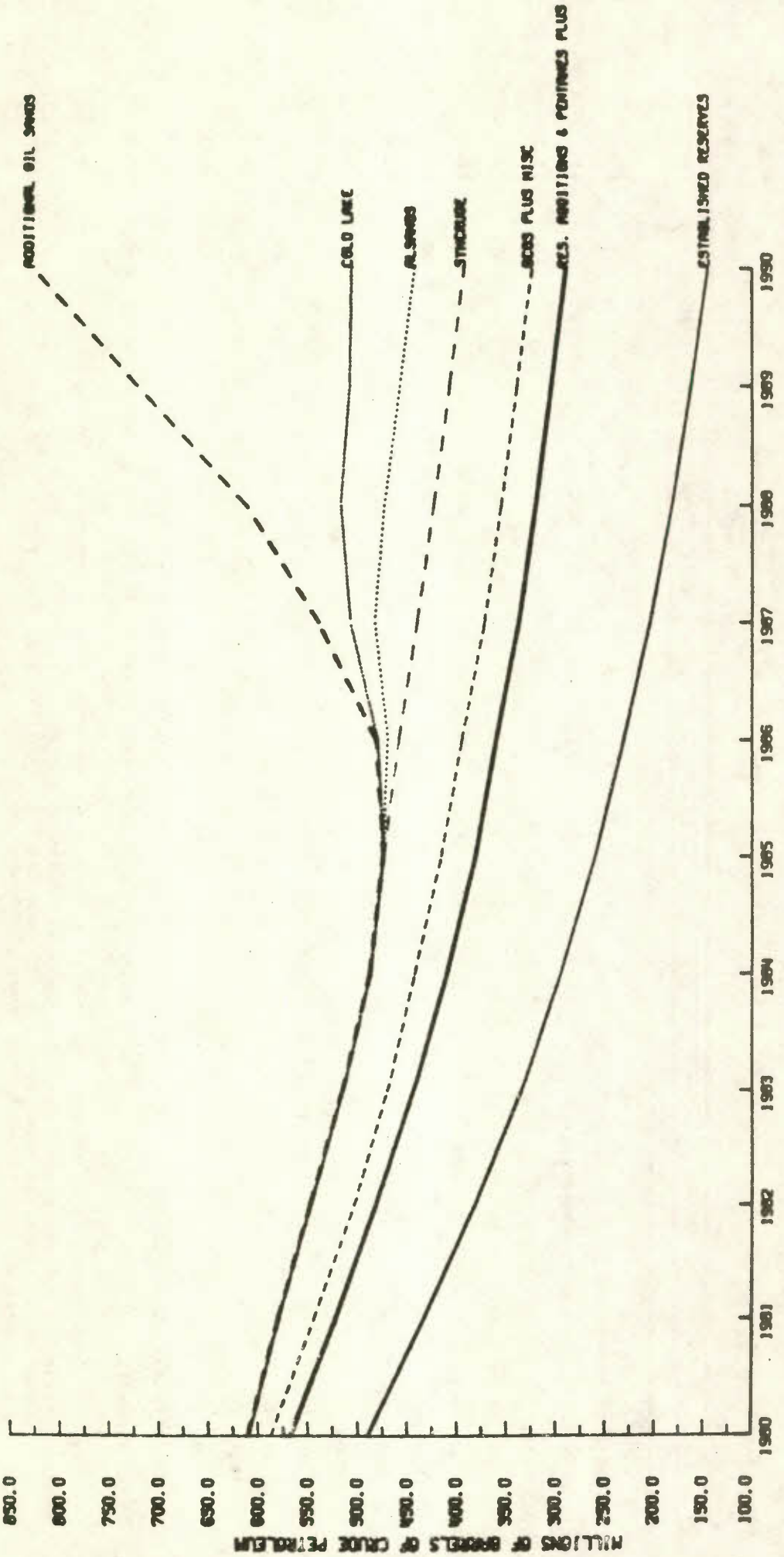


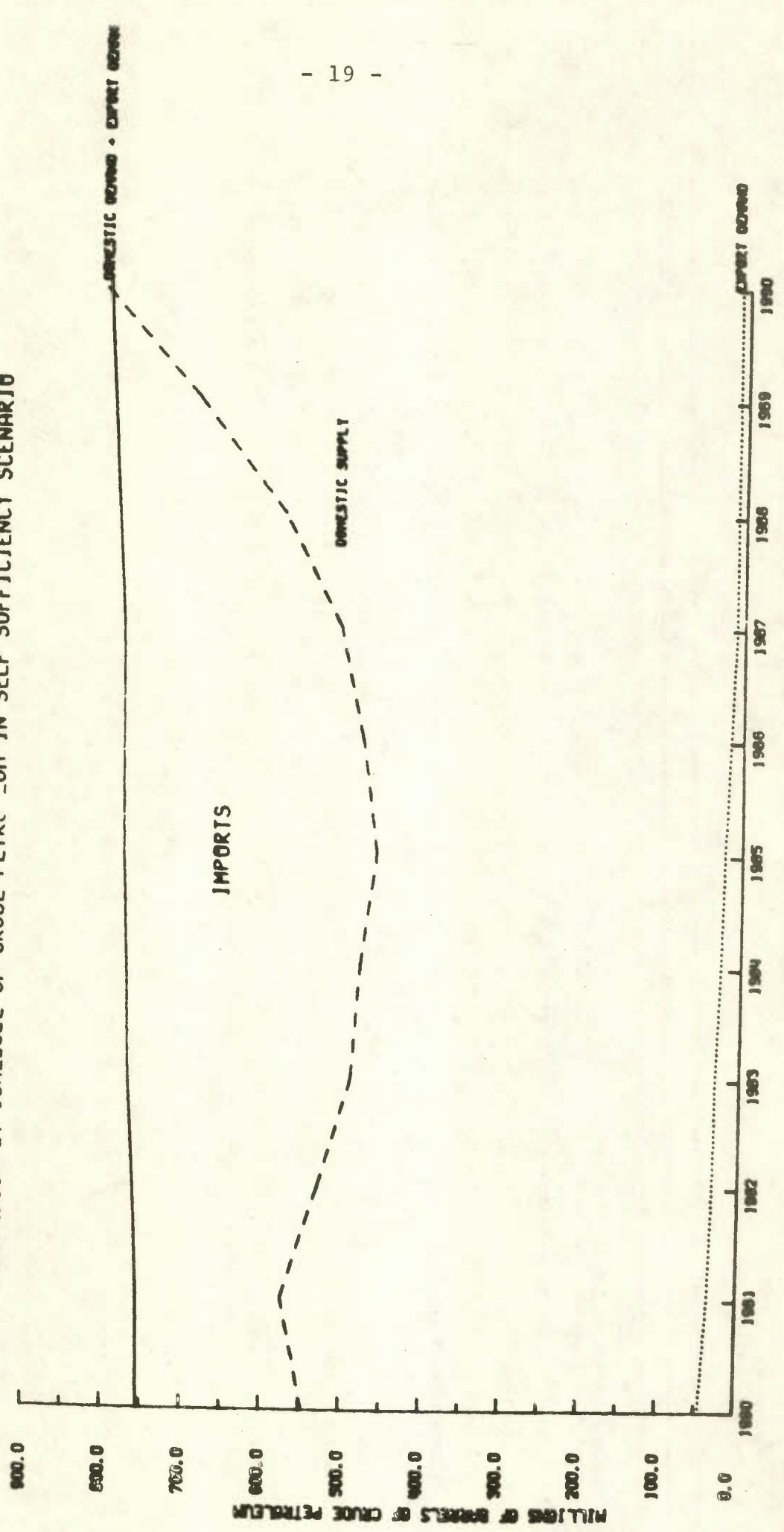
Table 8

Oil Sands Investment Assumptions - Self Sufficiency Scenario (millions of 1971 dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Great Canadian Oil Sands (GCOS) and Miscellaneous	40.5	27.0	30.4	30.4	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Syncrude plus Syncrude Extended	252.9	232.0	216.5	203.7	215.8	229.3	215.8	218.5	195.6	76.2	74.2
Alsands (Mining)	27.0	25.0	132.9	275.2	284.0	576.7	488.3	177.4	27.0	27.0	27.0
Cold Lake (In Situ)	36.8	142.6	182.1	377.2	347.3	449.0	382.2	349.6	362.1	238.1	99.3
Plant #3 (In Situ)	37.4	156.1	235.6	445.0	482.6	456.3	403.0	359.8	340.6	261.9	134.6
Plant #4 (Mining)	-	49.9	191.6	250.2	509.9	473.5	450.6	387.2	350.7	337.3	236.8
Plant #5 (In Situ)	-	25.0	120.7	220.9	380.1	491.7	462.0	418.9	369.0	344.0	287.0
Plant #6 (Mining)	-	-	49.9	191.6	250.2	509.9	473.5	450.6	387.2	350.7	337.3
Plant #7 (In Situ)	-	-	25.0	120.7	220.9	380.1	491.7	462.0	418.9	369.0	344.0
Total	394.6	657.6	1184.7	2114.9	2717.8	3593.5	3394.2	2851.0	2478.1	2031.2	1567.0

Chart 2

DEMAND/SUPPLY SCHEDULE OF CRUDE PETR_UM IN SELF SUFFICIENCY SCENARIO



demand and supply picture for crude petroleum over the decade.

Investment assumptions for the self sufficiency alternative are presented in Table 8 in millions of 1971 dollars. Shell and Esso assisted the Committee by submitting investment profiles for their two plants, the Alsands project and the Cold Lake project, based on their latest projections.[2] The Great Canadian Oil Sands and Syncrude investment profiles are based on data provided by Energy Mines and Resources in reference to earlier work. The investment assumptions for the additional five oil sands plants are based on the data obtained from Shell and Esso and assume levels of real investment which are approximately the same amount of investment as planned for the Cold Lake Project.

In the mining projects such as the Alsands plant the amount of ongoing maintenance investment after the project has reached full capacity is minimal as there is no additional construction but rather just additional utilisation of the mining site. In the case of an in situ plant, like the Cold Lake plant, the amount of maintenance investment is higher. This requirement was explained by the Esso people as being analogous to the requirement in a more conventional mining project for additional wells which are required to be drilled on an almost continuous replacement basis. The wells in the in situ process can

only be used for a certain length of time and then a new well site must be drilled with a new shaft sunk, etc., in order to explore the site additionally. The estimate for ongoing investment in the in situ process is around 100 million (1971) dollars per year and presumably will last at this rate over the life of the project. Both the Alsands and Cold Lake Projects were estimated to have a 25 year life after full capacity is reached.

In considering the viability of a self sufficiency scenario such as has been designed in this exercise, several uncertainties were addressed. These included questions such as the potential size of oil sands projects, the length of time required to construct the plants given the legislative and physical constraints involved, and the time required to reach full capacity once the projects come on stream.

In its testimony to the National Energy Board hearings prior to the September 1978 oil report the Alberta Energy Resources Conservation Board stated that it believed a third mining plant and a first commercial in situ plant would be developed simultaneously to come into production by 1986. These presumably would be the Shell and Esso plants -- the Alsands Plant and the Cold Lake Plant. Evidently discussions with the two operators had centered on concerns about coincident construction and considerations of individual labour demands during the construction period. In recent conversations held with both Shell and Esso it was

suggested that the labour requirements of these particular plants, because of the differing technologies involved, might imply that the flow of labour from one particular plant to another might not present a serious impediment given coincident construction.

The AERCB assumed that beyond 1987, plants would be brought in at three or four year intervals with in situ and mining schemes alternated. In their submission "...plant size was estimated to be at 210,000 barrels per day." In referring "...to the optimum economic size for future ... plants, the AERCB based its thinking on the size of a single train being about 70,000 barrels a day and that future plants would have three of these trains."[3]

The present plans for the Cold Lake Plant involve two trains giving a maximum of 145,000 barrels per day. For the mining plant, the Alsands Plant, estimated full production is 137,000 barrels a day. That figure has been revised downwards from 145,000 barrels a day, a figure formerly associated with Alsands production.

Conversations were held with officials from both Esso and Shell concerning the investment time lags relating to the Oil Sands Projects and the on-stream producibility lags (see footnote 2).

A scenario was drawn for these officials that suggested an environment where oil sands production was

considered to be a matter of national emergency -- a scenario in which the development of the oil sands and the production of these units were considered to be necessary to replace imports during a time period in which all regulatory and manpower constraints were either removed or smoothed, a time period in which an approach was taken to oil sands production that resembled a Manhattan Project type of situation. In this environment the following questions were posed: "Would the normal six-year lag that is associated with construction of these projects be able to be reduced and if so, by how much; and secondly, would the enhancement of the environment surrounding oil sands production mean a shortening of the on-stream build up period that is normally associated with the projects?" All gentlemen agreed that, as well as the regulatory and legislative constraints, the physical constraints regarding the projects -- the sheer massiveness of the projects, the material requirements, the size of machinery, the type of land formations that the projects are associated with -- dictate a constraint that would be not shortened by more than say, six months, even in an enhanced environment. This environment was labelled by the Shell people as an Utopia.

The geography and physiography of the projects, facts that were particularly relevant to the Alsands Project, necessitated a work period that excluded portions of certain seasons of the year and necessitated the building of a large town to house employees and associated

infrastructure. These constraints and requirements were very real and very large.

In the case of the Cold Lake Project a similar argument was put forward even though the technology is considerably different. It was agreed that the construction period associated with the projects could perhaps be shortened in this hypothetical case by six months, but by no more than six months. In the case of the on-stream buildup production, estimates were given that would indicate a shortening of this period by as much as 12 months of the production period -- from a two and a half year to an 18 month period of on-stream build up to full capacity.

In constructing the self sufficiency environment, consideration of these uncertainties and the outcome of the conversations noted above resulted in our shortening the construction period for the Alsands, Cold Lake and five additional projects from six years to five and a half years. Similarly, the build up to full capacity was assumed to take place in an average of 18 months. While a two train plant size was considered to be standard, three trains were assumed where necessary.

ASSUMPTIONS ASSOCIATED WITH THE FOSSIL FUEL BALANCE ALTERNATIVES

The second option to be evaluated assesses the effect of balancing trade in fossil fuels by 1990 through an implementation of some combination of increased oil sands development and enhanced recovery activity. In these alternatives the assumed rate of increase of domestic oil requirements is identical to that in the self sufficiency scenario and the export demand is also identical to this scenario. In these fossil fuel balance alternatives the Cold Lake and Alsands Projects were conceived as they were in the base case with no foreshortening of the construction or production build up period.

In order to calculate the implied reduction in crude petroleum imports necessary to attain a zero or positive balance on the fossil fuel trade, the balances implicit in the base case scenario where the fossil fuel deficit increased to over 8 billion in 1990 were considered. It became clear that the volume of imports of crude petroleum should fall from its 1985 peak to below 200 million barrels in 1990 in order to maintain a surplus or zero balance, given the low world price environment. Secondly, it became clear that in order to attain this similar balance in the higher world price environment, given the higher price level of the crude petroleum deflator, it would be necessary to decrease this import dependence by a further 30 million barrels in 1990.

Therefore, we will discuss two fossil fuel balance alternatives, the first being the low world price alternative and the second being the high world price alternative. In the low world price alternative, one additional in situ oil sands plant was deemed to be necessary to make up the balance between increased enhanced production, which we will discuss later, and import requirements in order to achieve a positive fossil fuel balance in 1990. As can be observed in Chart 3, imports fall from their 1985 peak to 199 million barrels by the year 1990 -- a considerable difference from the zero of our self sufficiency alternatives.

In the higher priced alternatives it was found necessary to further increase oil sands production, additional to the one plant assumed in the low world price fossil fuel balance simulation, in order to retain a zero or surplus balance on the fossil fuels. Accordingly, one additional mining oil sands plant was assumed to come on stream in 1988. Because of the additional production from this second plant the import requirement is less by 1990; 169 million barrels of oil are imported, approximately 30 million barrels less than in the low world price fossil fuel balance scenario (Chart 4). Chart 5 illustrates the composition of domestic supply in the low price fossil fuel balance alternative, and Table 9 presents the various production levels.

Chart 3

DEMAND/SUPPLY SCHEDULE OF CRUDE PETROLIUM - LOW PRICE FOSSIL FUEL BALANCE

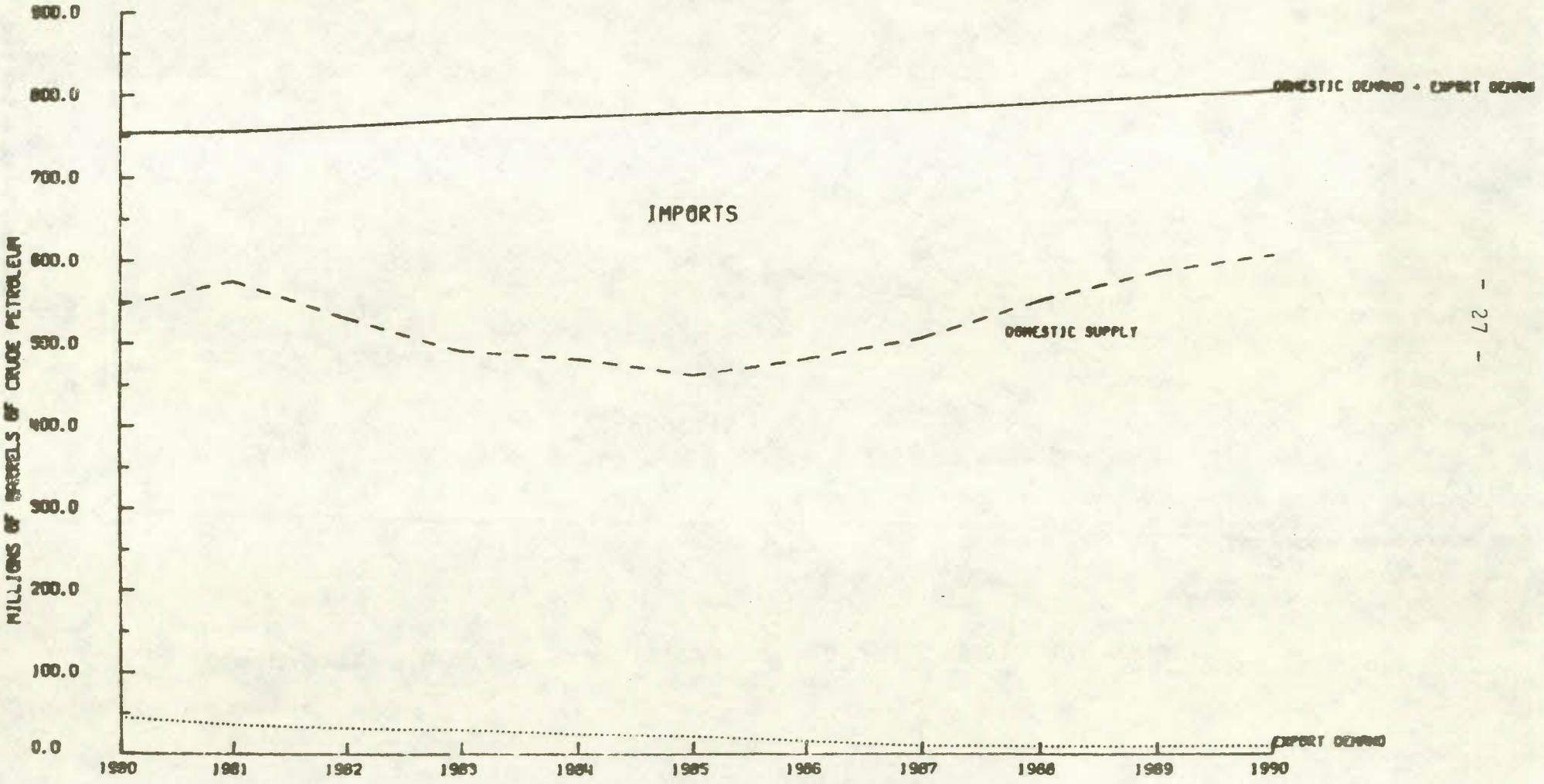


Chart 4

DEMAND/SUPPLY SCHEDULE OF CRUDE PETROLE - HIGH PRICE FOSSIL FUEL BALANCE

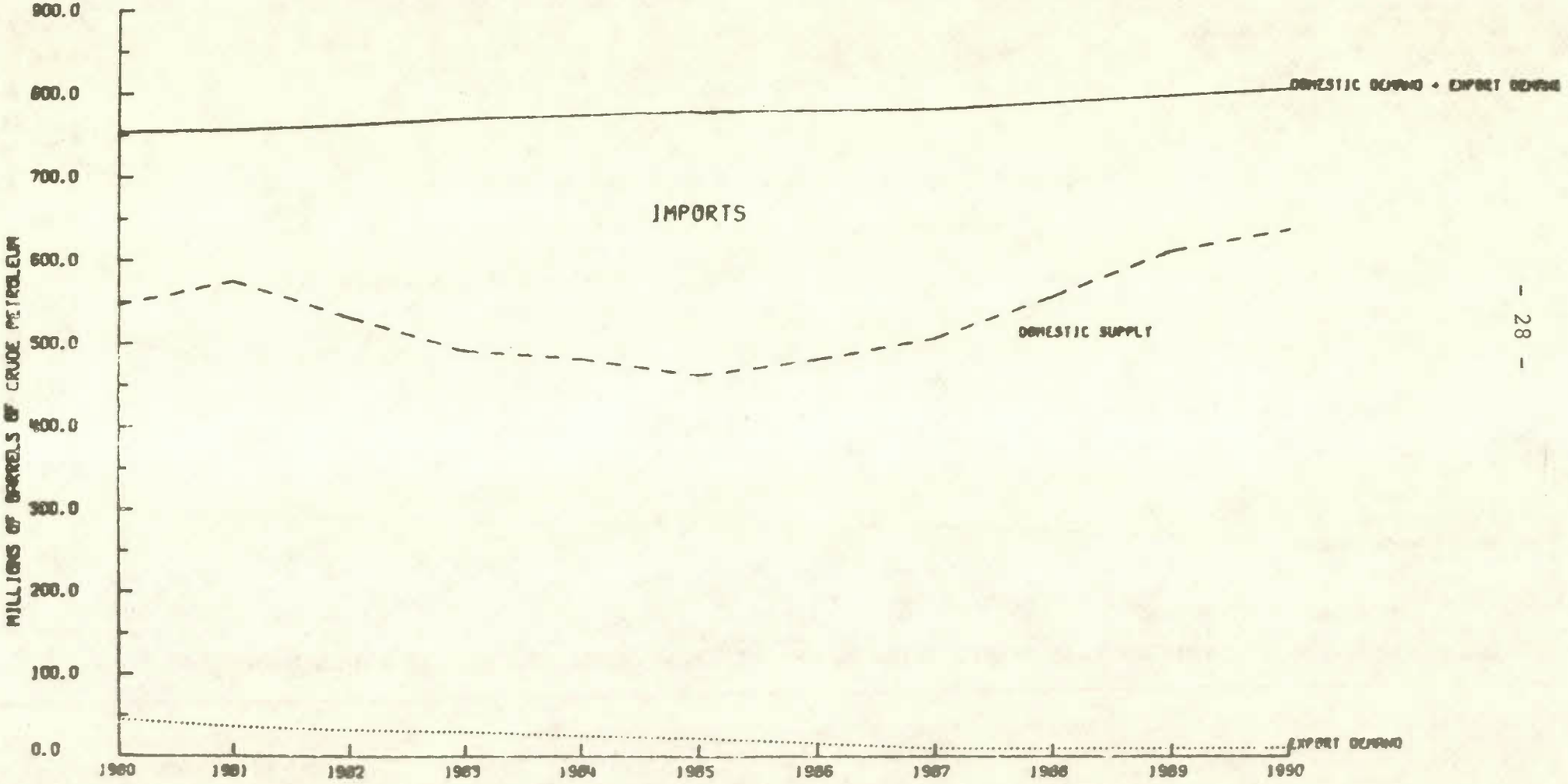


Chart 5

COMPOSITION OF DOMESTIC SUPPLY - LOW PRICE FOSSIL FUEL BALANCE SCENARIO

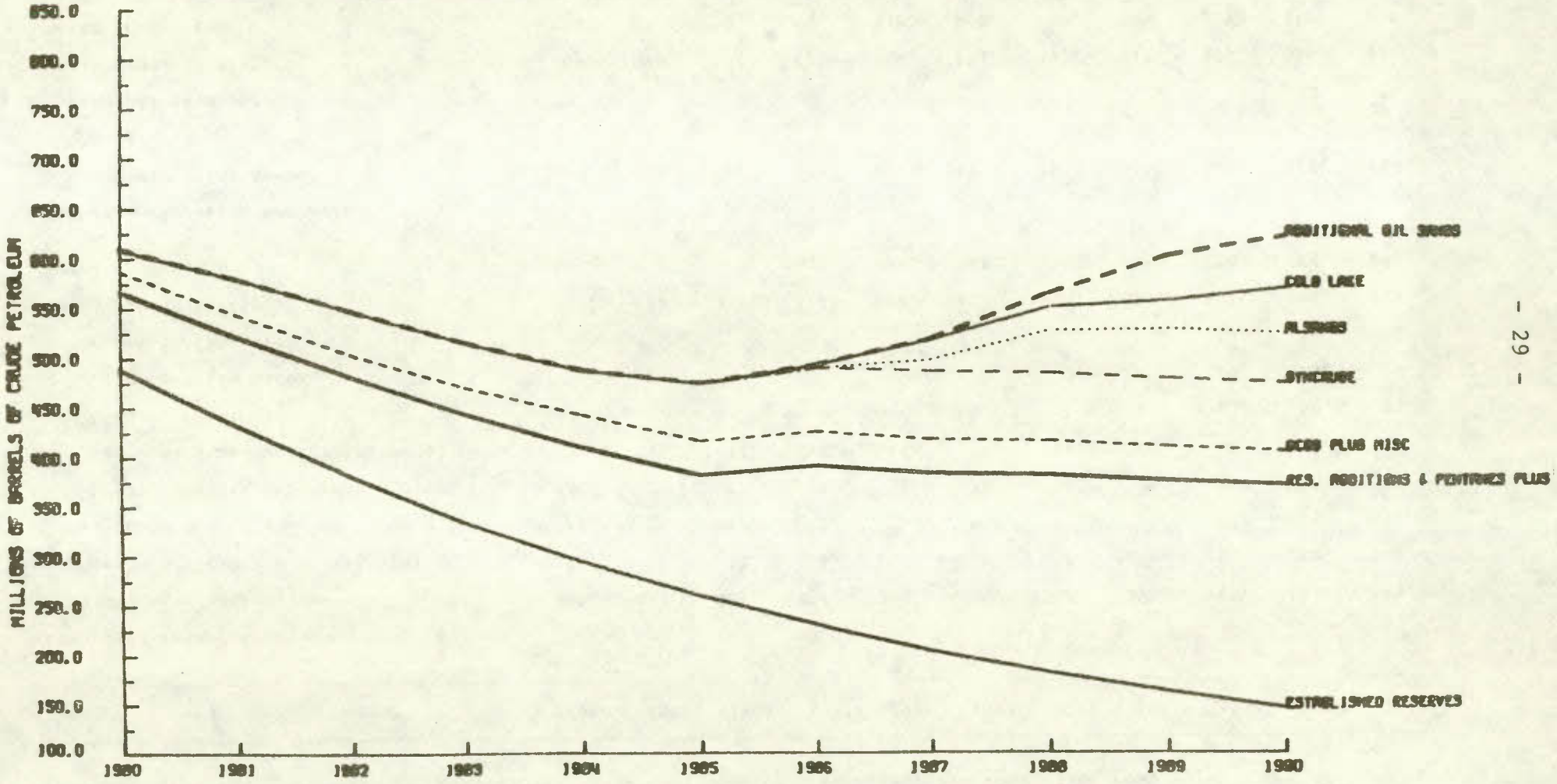


Table 9

Composition of Crude Petroleum Production in Fossil Fuel Balance Scenarios (millions of barrels)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Low World Price Scenario											
Established Reserves	490.	433.	381.	334.	294.	259.	230.	203.	181.	162.	145.
Reserve Additions & Pentanes Plus	77.	88.	99.	108.	114.	120.	158.	177.	197.	210.	222.
Oil Sands	42.5	58.	66.	72.	78.	93.	102.	135.	183.	226.	250.
Great Canadian Oil Sands & Misc.	20.	22.	22.	27.	33.	35.	35.	35.	35.	35.	35.
Syncrude plus Syncrude extended	22.5	36.	44.	45.	45.	58.	64.	68.	68.	68.	68.
Alsands (mining)								12.	43.	50.	50.
Cold Lake (in situ)							3.	20.	24.	29.	46.
Plant #3 (in situ)									13.	44.	51.
Total Producibility	609.5	579.	546.	514.	486.	472.	490.	515.	561.	598.	617.
Total Production	546.	575.	530.	490.	480.	460.	480.	505.	550.	585.	605.
Higher World Price Scenarios											
Low World Price Assumptions plus	609.5	579.	546.	514.	486.	472.	490.	515.	561.	598.	617.
Plant #4 (mining)									3.	20.	24.
Total Producibility	609.5	579.	546.	514.	486.	472.	490.	515.	564.	618.	641.
Total Production	546.	575.	530.	490.	480.	460.	480.	505.	555.	610.	635.

Source: Estimates for Established Reserves, Reserve Additions and Pentanes Plus, GCOS and Syncrude are table form.

NEB Base Case in Canadian Oil, Supply and Requirements, National Energy Board, September 1978. Estimates for additional enhanced recovery-production are based on Prince, op cit.

Estimates for Alsands and Cold Lake are based on figures obtained from Shell and Esso in telephone conversations, October 1980. Estimates for other oil sands projects are based on the Alsands and Cold Lake estimates and estimates supplied to the National Energy Board in various submissions prior to the 1978 Report.

While the level of imports in both scenarios represents a declining dependence on imported oil, it still represents a considerable drain on the balance of payments. However, one can argue that in both these fossil fuel balance alternatives the import requirements are being paid for by exports of other fossil fuels and, therefore, are not exerting additional pressure on the balance of payments. In addition to the production coming from the two oil sands plants in the fossil fuel balance alternatives, a substantial increase in production arises from additional enhanced recovery production.

In formulating the assumptions concerning enhanced recovery potential, considerable use was made of the research done by J. Philip Prince of the Canadian Energy Research Institute in his study "Enhanced Oil Recovery Potential in Canada".[4] The volumes of enhanced oil that have been added to the category, reserve additions, in both fossil fuel balance alternatives are above those assumed in the NEB oil report,[5] but only half of the potential regarded by Prince in his study as being available by 1990 through enhanced recovery methods. Hence, the assumptions used in the fossil fuel balance alternatives can be considered to be a conservative assumption of enhanced recovery potential, given an environment of high price for new oil from this source.

High price in Prince's study is regarded as $25 a barrel supply price. Prince studied three supply pricing scenarios between $15 to $25 per barrel. Results of supply elasticities calculated in the study suggest that in comparison with the unitary elasticity of supply suggested for conventional oil, the enhanced oil recovery is about twice as responsive to price increases as conventional oil recovery. This was considered a very rough comparison since the unitary elasticity estimate for conventional oil was made at lower price levels and it might possibly have been higher for higher prices and for the large price changes that were used in Prince's calculation.

Prince's analysis of enhanced recovery was conducted by a pool-by-pool process. For instance in discussing the various types of enhanced recovery techniques it turned out that carbon dioxide flooding was "...the best choice in 99 reservoirs whereas hydrocarbon floods are best in 210 reservoirs."[6] It was suggested that if the carbon dioxide process turned out to be impractical due to inadequate sources of CO_2 it is likely that the former 99 reservoirs could be developed with hydrocarbon miscible approach.[7] Thus, there would seem to be some substitutability between processes which would be useful in offsetting adverse developments in any particular area.

Prince estimated that 16.7 billion barrels lie in reservoirs which would potentially respond to enhanced recovery techniques. If fully exploited without regard to cost this would yield 3.1 billion barrels of crude petroleum. However, considering unforseeable economic conditions and with certain assumptions regarding royalties and taxation procedures and technical constraints on enhanced recovery potential, the Alberta recovery potential was estimated by Prince to be 2.4 billion barrels. This would be produced over a 28 year period with an average yearly production of 86 million barrels which amounts to 235,000 barrels per day. This production was seen to build slowly to a peak by 1992 and then gradually taper off in the first decade of the 21st century.

In Alberta, Prince postulated that 78 per cent of the potential recovery would come from the miscible and immiscible gas processes, 17 per cent from thermal processes and 5 per cent from chemical processes.[8] The miscible processes refer to the injection of a compatible property into the oil, for example carbon dioxide, which thereby mixes with it, resulting in a less viscous oil. In the thermal processes, heat is applied to the reservoir through some method such as fire flooding in order to reduce the viscosity to allow flow through the reservoir. The chemical processes - the highest risk, but potentially most effective

Table 10

Oil Sands Investment Assumptions - Fossil Fuel Balance Alternatives (millions of 1971 dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Low World Price Environment											
Great Canadian Oil Sands (GCOS) + Misc.	40.5	27.0	30.3	30.3	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Syncrude plus Syndrude Extended	252.9	232.0	216.5	203.7	215.8	229.3	215.8	218.5	195.6	76.2	74.2
Alsands (mining)	27.0	25.0	132.9	275.2	283.9	576.6	488.3	177.4	27.0	27.0	27.0
Cold Lake (in situ)	36.8	142.6	182.1	377.2	347.2	448.9	382.2	349.5	361.5	238.1	99.3
Plant #3 (in situ)		23.6	37.1	141.6	182.1	377.7	347.3	448.5	384.4	349.3	361.5
Total	357.2	450.2	598.9	1028.0	1056.0	1659.5	1460.6	1220.9	995.5	717.6	589.0
High World Price Environment											
Sub Total (above)	357.2	450.2	598.9	1028.0	1056.0	1659.5	1460.6	1220.9	995.5	717.6	589.0
Plant #4 (mining)			43.8	114.6	215.8	377.7	360.8	438.4	391.2	342.6	350.7
Total	357.2	450.2	642.7	1142.6	1271.8	2037.2	1821.4	1659.3	1386.7	1060.2	939.7

-- affect the characteristics of both the oil and the porous rock formations holding the oil, gas and water within them.

The levels of investment associated with the fossil fuel balance alternatives are similar in the individual oil sands project requirements to those in the self sufficiency scenario and are presented in Table 10. The additional enhanced recovery investment has been calculated on a basis which allocates the increase in crude petroleum and natural gas mining investment proportionate, with a two year advance, to the increased supply. While information on the capital requirements of this type of production is scarce, our calculations are based on estimates of lifting, construction and upgrading costs associated with a specific tertiary recovery project.

THE NO LARGE PROJECTS ALTERNATIVE: WHAT IT MEANS

Within each of the three world price assumptions we have, as illustrated in Table 1, several alternatives which portray degrees of self sufficiency. The first simulates the situation in which self sufficiency -- no imports of crude petroleum -- is obtained by 1990. The second illustrates two cases in which the fossil fuel balance is maintained in a surplus or zero position throughout the decade. While this does not imply full self sufficiency, it does imply a considerable amount of energy investment within the system, and a lessened dependence on imported crude petroleum.

In the no large projects alternative we have removed, under each world pricing situation, both the energy investment included in the self sufficiency scenarios as portrayed in Table 8 as well as that referred to in our summary of the base case in Table 3. This includes transportation investment requirements of the Alaska Highway Gas Pipeline, the East Coast Pipeline, and the Q and M Pipeline. We have also reduced the rate of growth of utility investment in the economy from our base case assumption of 2 per cent real growth from 1982 to 1990 to an assumption of a decline of 1.5 per cent real per annum from 1981 to 1990.

A considerable amount of energy investment is stripped out of the economy in each of the no large scale

Chart 6

CRUDE PETROLEUM AND NATURAL GAS MINING INVESTMENT

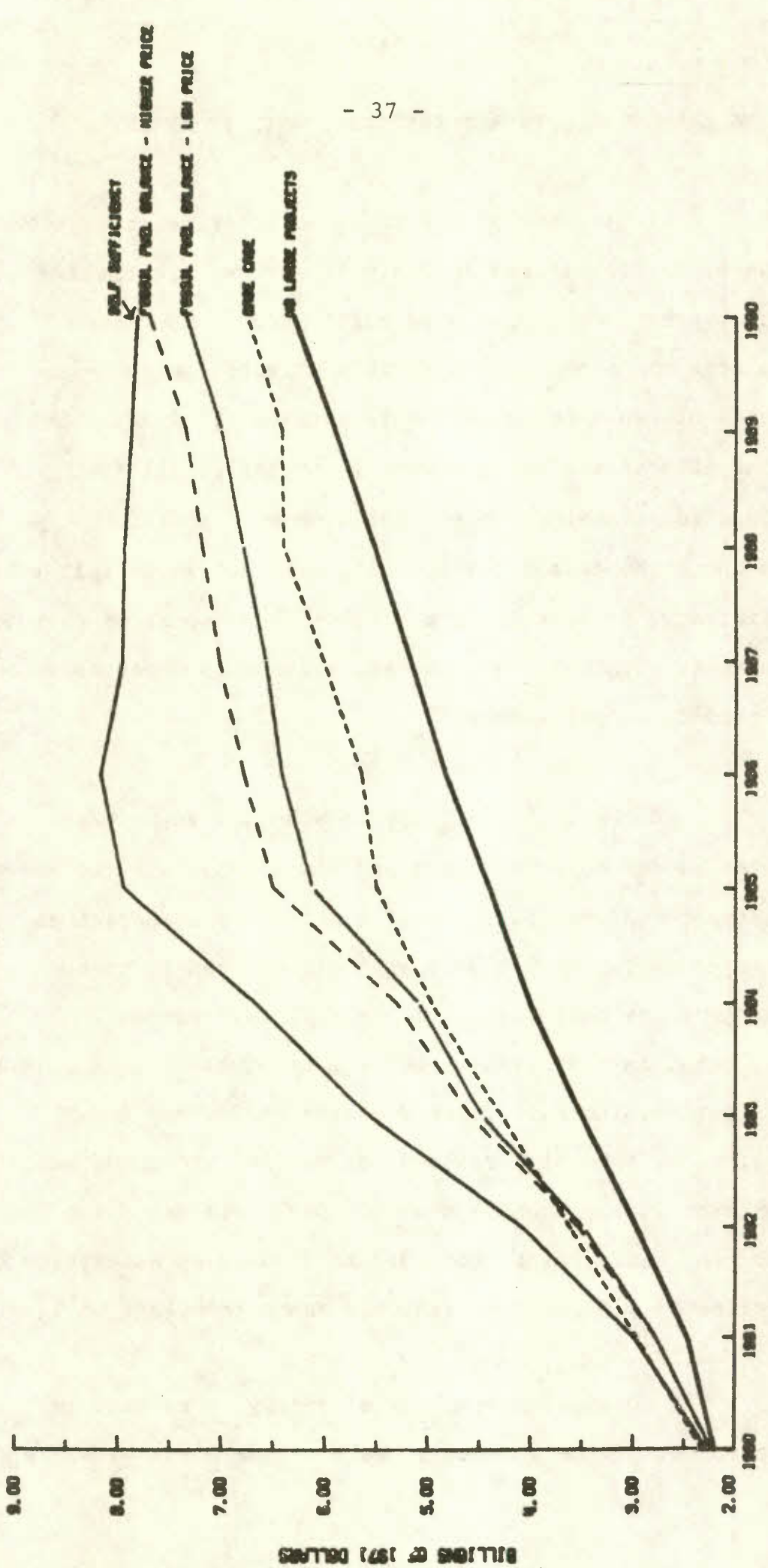
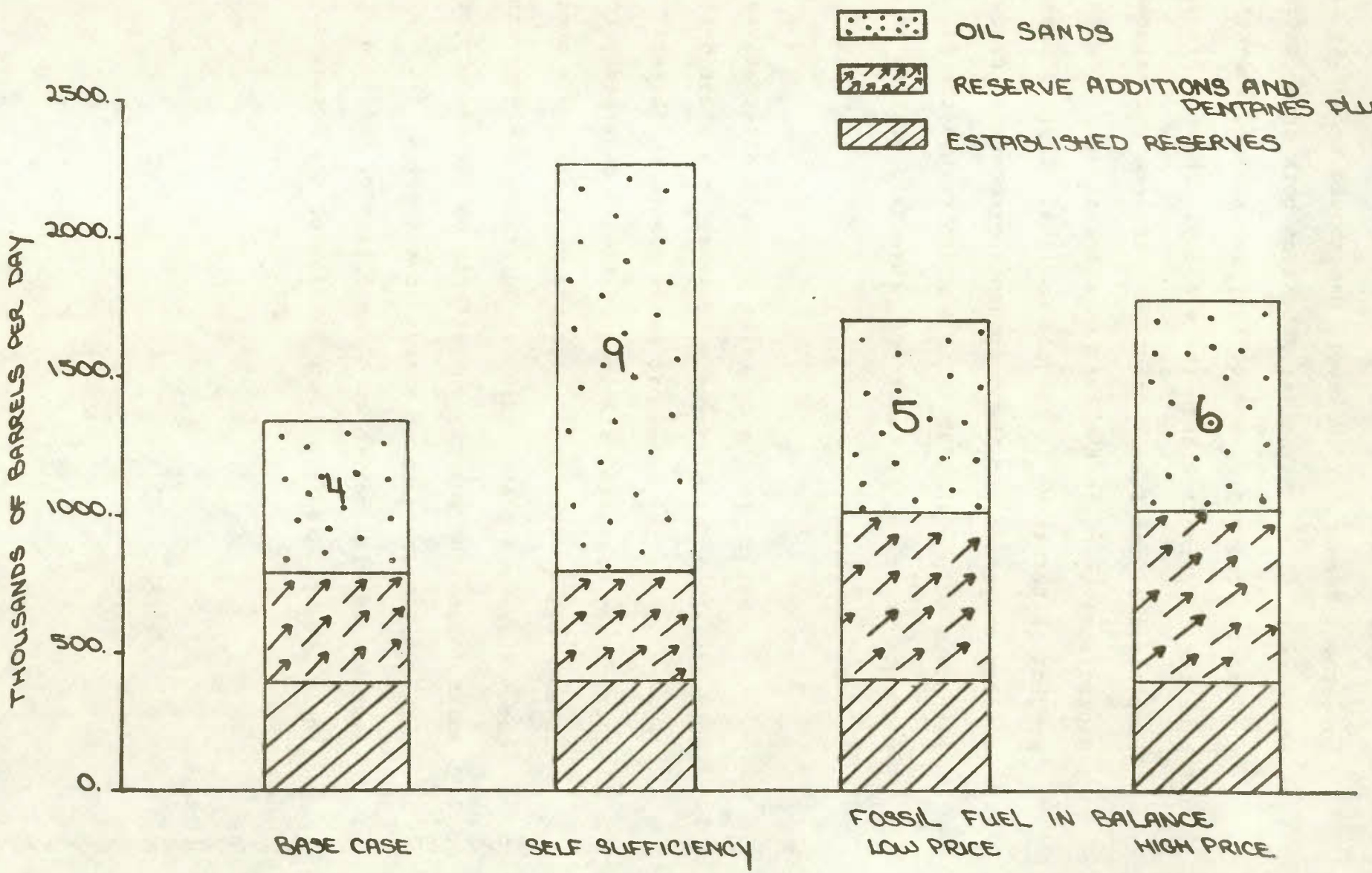


Chart 7

DOMESTIC PRODUCTION OF CRUDE PETROLEUM IN 1990



investment scenarios. However, one should recognise that there is still a substantial amount of both crude petroleum and natural gas mining and utility investment, and other pipeline investment within the economy. Chart 6 presents a comparison of the levels of crude petroleum and natural gas mining investment in the various alternatives. The no large projects alternative is the bottom line. Chart 7 presents a similar comparison of the components of domestic crude petroleum supply in 1990. The numbers within the oil sands segments refer to the number of projects operative in 1990 in each alternative.

Still, in the no large projects alternatives a substantial amount of investment -- all the additional investment for the seven oil sands plants in the self sufficiency scenario, all the additional enhanced recovery investment, several major pipeline projects -- is stripped out. These are scenarios under our three world pricing assumptions that portray the effects on the economy of a considerable decrease in energy investment within the system. We will return to our analysis of the impacts of these assumptions in a later section of the document.

THE WORLD PRICING ENVIRONMENTS

As we mentioned in our review of the base case assumptions, the international price of crude petroleum in the base case tracks a path which averages 10 per cent during the 1981-1985 period then drops to 9 per cent for the remainder of the decade. This follows, of course, after a substantial adjustment in 1980. We have this international pricing path as the basis for our low world price alternative and have used it in concert with our assumptions in the base case for the external environment and commodity prices, such as are reviewed in Table 2.

In our second world pricing alternative an assumption is made that the real international price of crude petroleum will increase by 7 per cent per annum over the 1981-1990 period, again after the substantial adjustment in 1980. This implies that by 1990 the international price of crude petroleum will reach $149.79 in Canadian dollars, a substantial adjustment over the base case assumption of $84.59 by 1990.

Since an increase of 7 per cent real per annum in the international price of oil would presumably inflict a substantial inflationary blow on the economies of our trading partners as well as on our own economy, an alternative overseas and U.S. scenario was included with the 7 per cent real pricing alternative. This scenario was

Table 11

Comparison of United States and Overseas Environments - Low World Price Scenario and High World Price Scenario

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
OECD Industrial Production (per cent change)											
Low World Price Environment	-1.7	1.2	5.1	5.0	4.4	3.6	3.6	3.4	3.8	3.5	3.5
High World Price Environment	-1.7	1.2	5.1	4.8	4.0	3.0	2.9	2.8	3.6	2.9	2.9
Overseas Industrial Production (per cent change)											
Low World Price Environment	2.1	2.1	3.4	4.6	4.4	4.4	4.5	4.5	4.5	4.5	4.6
High World Price Environment	2.1	2.1	3.4	4.4	4.1	4.2	4.2	4.2	4.2	4.3	4.3
U.S. Industrial Production (per cent change)											
Low World Price Environment	-3.5	0.7	5.9	5.2	4.4	3.2	3.2	2.9	3.4	2.9	2.9
High World Price Environment	-3.5	0.7	5.9	5.0	4.0	2.5	2.3	2.0	3.3	2.1	2.1
U.S. Consumer Price Index (per cent change)											
Low World Price Environment	14.0	11.2	10.1	8.2	8.3	9.2	9.3	9.8	8.6	8.2	8.2
High World Price Environment	14.0	11.2	10.1	8.6	9.2	10.5	11.1	12.2	10.5	10.3	10.3
U.S. Short Term Interest Rate (per cent)											
Low World Price Environment	11.25	10.40	8.94	8.73	8.58	8.96	9.06	9.41	8.73	8.56	8.56
High World Price Environment	11.25	10.40	8.94	8.90	8.98	10.00	10.69	11.60	10.60	10.60	10.80

Source: Low World Price Environment: Latest available projections of Wharton Econometric Forecasting Associates, Philadelphia, Pa., as of August, 1980.

High World Price Environment: Wharton Econometric Forecasting Associates, Special Solution, July 1980.

especially constructed for the Council by the Wharton Econometric Forecasting Associates early in the summer and has been adjusted to reflect the latest short-term developments in the American economy commensurate with the short-term U.S. forecast included in the base case. The major assumptions of this U.S. scenario relative to the base case U.S. scenario are included in Table 11. In addition to adjusting the U.S. forecast we also adjusted the forecasts of our major overseas trading partners -- the economies of the United Kingdom, the Federal Republic of Germany, France, Italy, and Japan -- in order to reflect this substantial international price increase in crude petroleum.

Our third international pricing alternative assumes that in 1986 OPEC will again visit the economies of the World with a $15.00 real price increase. Up to this period we have assumed that our base case international pricing assumptions hold, in other words a one to one and a half per cent increase in the real price of oil. However, in 1986 the real price of petroleum jumps by $15.00. This implies over a 52 per cent nominal increase in the international price of crude petroleum. The rate of increase then again reflects our base case pricing assumption, reaching by 1990 a level of $118.58, still far above our base case level of $84.59 but considerably below the high pricing environment of the 7 per cent real case, which is $149.00.

Chart 8

INTERNATIONAL PRICE OF CRUDE PETROLEUM

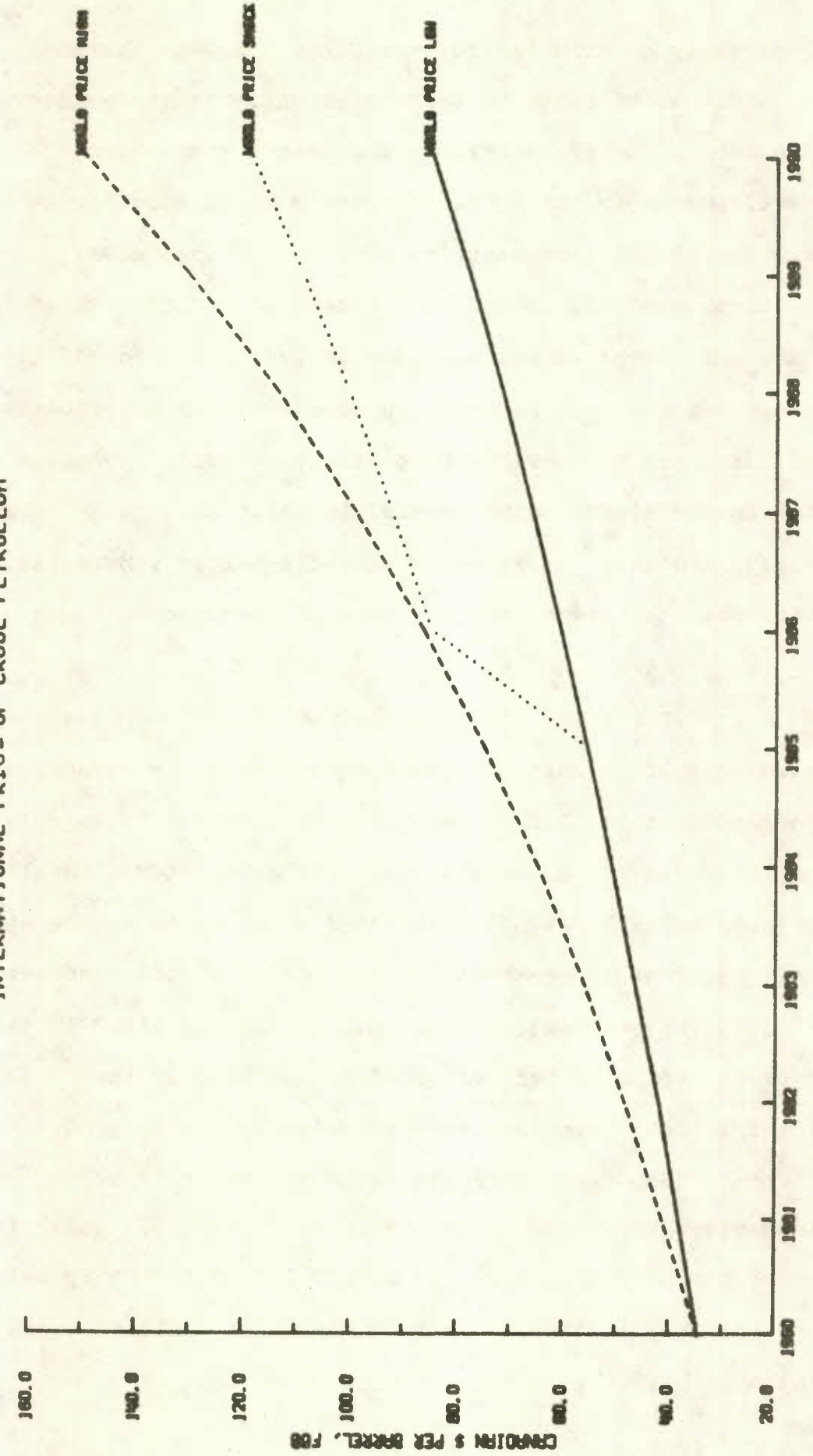


Table 12

International Price of Crude Petroleum (Canadian $ per barrel, FOB)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
WORLD OIL PRICE LOW											
Self sufficiency, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	60.42	65.74	71.53	77.75	84.59
Fossil fuel balance, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	60.42	65.74	71.53	77.75	84.59
No large projects, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	60.42	65.74	71.53	77.75	84.59
Self sufficiency, $2 per year	34.42	38.24	41.95	46.40	50.76	55.43	60.42	65.74	71.53	77.75	84.59
Self sufficiency, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	60.42	65.74	71.53	77.75	84.59
Self sufficiency, blended price, low gas	34.42	38.24	41.95	46.40	50.76	55.43	60.42	65.74	71.53	77.75	84.59
Self sufficiency, blended price, high gas	34.42	38.24	41.95	46.40	50.76	55.43	60.42	65.74	71.53	77.75	84.59
WORLD OIL PRICE HIGH											
Self sufficiency, $4 per year	34.42	41.24	48.31	55.85	64.62	74.64	86.05	98.91	113.63	130.46	149.79
Fossil fuel balance, $4 per year	34.42	41.24	48.31	55.85	64.62	74.64	86.05	98.91	113.63	130.46	149.79
No large projects, $4 per year	34.42	41.24	48.31	55.85	64.62	74.64	86.05	98.91	113.63	130.46	149.79
Self sufficiency, $4 per year	34.42	41.24	48.31	55.85	64.62	74.64	86.05	98.91	113.63	130.46	149.79
Self sufficiency, blended price, low gas	34.42	41.24	48.31	55.85	64.62	74.64	86.05	98.91	113.63	130.46	149.79
Self sufficiency, blended price, high gas	34.42	41.24	48.31	55.85	64.62	74.64	86.05	98.91	113.63	130.46	149.79
OPEC OIL PRICE SHOCK 1986											
Self sufficiency, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	84.71	92.18	100.27	108.99	118.58
Fossil fuel balance, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	84.71	92.18	100.27	108.99	118.58
No large projects, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	84.71	92.18	100.27	108.99	118.58
Self sufficiency, $2 per year	34.42	38.24	41.95	46.40	50.76	55.43	84.71	92.18	100.27	108.99	118.58
Self sufficiency, $4 per year	34.42	38.24	41.95	46.40	50.76	55.43	84.71	92.18	100.27	108.99	118.58
Self sufficiency, blended price, low gas	34.42	38.24	41.95	46.40	50.76	55.43	84.71	92.18	100.27	108.99	118.58
Self sufficiency, blended price, high gas	34.42	38.24	41.95	46.40	50.76	55.43	84.71	92.18	100.27	108.99	118.58

Chart 8 and Table 12 present the three international pricing assumptions. One can observe the substantial adjustment in 1986 in the shocked price path.

To be consistent with our assumptions of a considerable shock in the price of crude petroleum we devised with this alternative, a set of assumptions for the international commodity prices -- export and import prices which are exogenous to the CANDIDE model -- to reflect this considerable price shock. Our assumptions for these commodity prices are similar to the price movements that emanated from the 1979-1980 shock. This generally portrays a pattern of a considerable adjustment in primary goods trade prices followed, with a six months to a year lag, by a lesser adjustment in manufactured trade prices. This latter adjustment in export and import prices takes longer to filter through the system than the primary goods adjustment. This commodity price environment is included in all the alternatives which are labelled "World Price Shock in 1986".

THE DOMESTIC PRICING ENVIRONMENTS

Four domestic pricing environments are explored within each of the three world pricing environments and within the self sufficiency alternatives. As in the base case, a $4 per year increase in the Toronto City Gate price of crude petroleum is our first alternative. In this alternative the wellhead price moves at a similar rate, the only difference between it and the Toronto City Gate price being transportation costs to Toronto from the wellhead. In this alternative the pre-budget split of oil revenues -- 45 per cent to the producers, 45 to the provinces, and 10 per cent to the federal government -- is maintained.

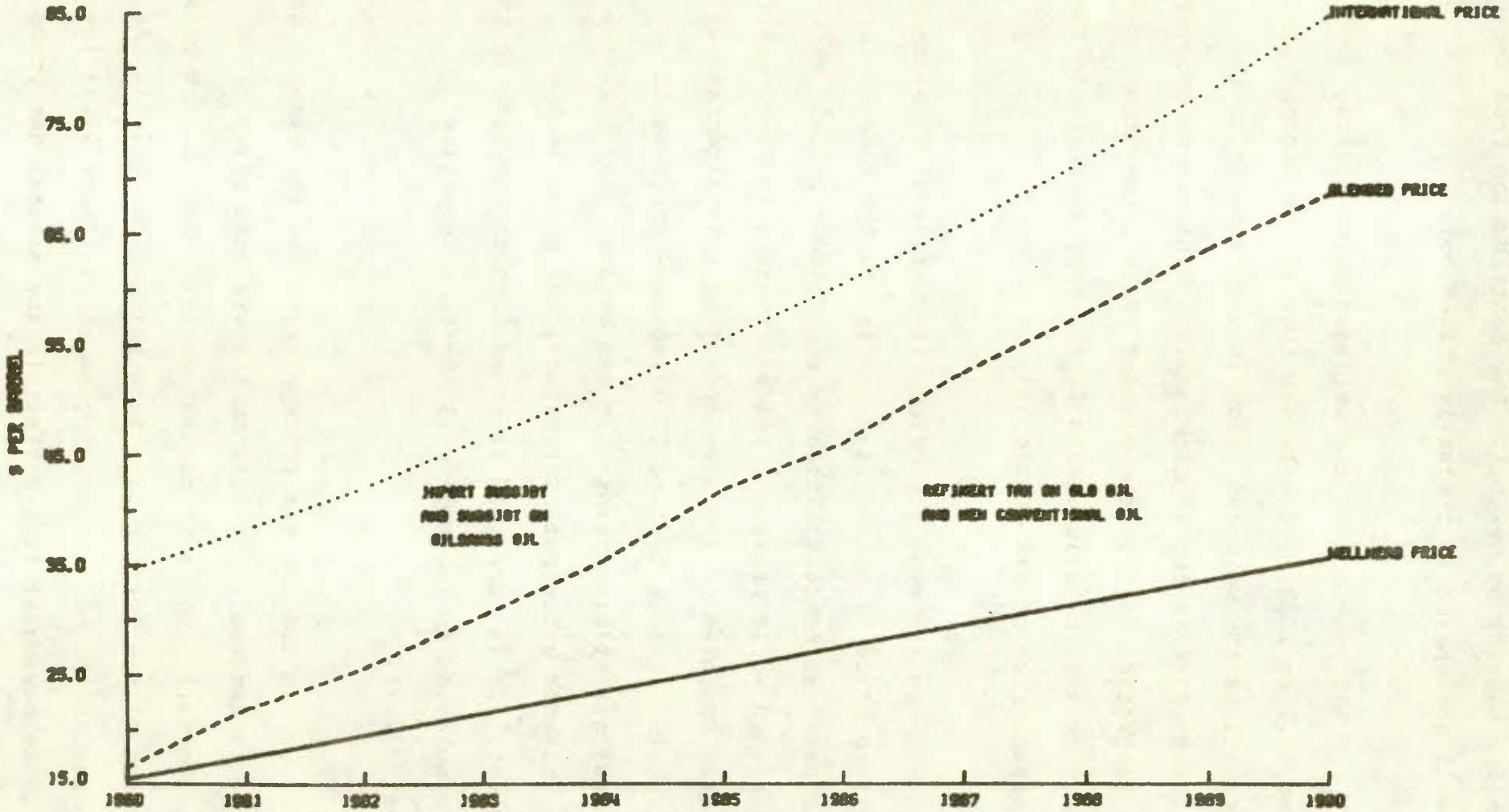
In our second pricing environment, the Toronto City Gate price is assumed to increase at the rate of $2 per year -- half of the $4 increase. Similarly, the wellhead price is also assumed to increase at this rate, the difference between the two prices again being transportation. A similar revenue split is maintained 45-45-10. In both of these alternatives provincial royalty revenues are calculated based on the wellhead price in the case of old conventional oil and new conventional oil, and are calculated on the world price in case of oil sands production. These revenues are calculated with an approximation of the present Alberta formulae for royalty revenues.[9]

In the blended price cases the various domestic production volumes and import volumes are weighted by their relevant prices to arrive at a blended price. As shown in Chart 9, the blended price lies between the international price and the wellhead price. The relationship of the blended price to the two boundary prices depends upon the production of old and new oil and the proportion of imports. In this graph you can see that by the end of the period the blended price is approximately 65 per cent of the difference between the international price and the wellhead price.

In our conceptualization of the blended pricing schemes we have assumed that the blended price fund will be in balance by 1985, at which time the federal government will no longer be required to make a contribution from general revenues to support the import subsidy program. In Chart 9 you will notice that the area between the blended price and the wellhead price is marked the "refinery tax on old oil and the tax on new conventional oil." Revenues obtained from these two taxes are used along with oil export tax revenues to offset the import subsidy and the subsidy on oil sands production, the area marked between the blended price and the international price. The rationale of this version of the blended fund is that the export tax revenues plus the old oil tax revenues, plus the contribution from the federal government would be equal to the import subsidy

Chart 9

BLENDED PRICING SCHEME



plus the subsidy on new oil. The contribution from the federal government is gradually phased out.

If you look at the wellhead price charts, Chart 10.1 to 10.3, you will see that in the blended price alternatives the wellhead price is very similar to the wellhead price in the $2 alternative. This is so because of the assumption that in the blended price scheme the producers will be allocated a $2 per year increase in the wellhead price of oil (Table 12).

In the high gas price alternative it is assumed that the price of natural gas is tied to the Toronto City Gate price as conceptualized by the blended price. This assumption would provide a price incentive to producers for further exploration and development of this alternative to petroleum. Charts 12.1 to 12.3 indicate the domestic natural gas pricing paths: it can be seen that the high gas, blended price path for natural gas price is the highest. It is more than twice as high as the path in the $4 simulation in the high world price alternative (Chart 12.2).

In the low gas price alternative the natural gas price is assumed to be tied to the wellhead price, plus transportation costs to central market, which is the present concept of the Toronto City Gate price (Chart 12.1). As you can see in the oil wellhead price chart (Chart 10.1) the oil price is moving at $2 a barrel; in the natural gas price

chart (Chart 12.1) in the low gas blended price scheme the Toronto City Gate price of natural gas is moving at approximately 30 cents a year which is the impact on this price from a $2 price increase in the wellhead price of oil. In the case of the low gas scenario the incentive is provided to energy consumers to substitute a lower priced fuel, natural gas, for petroleum.

To recapitulate, Charts 10.1 to 10.3 and Table 13 present the various wellhead petroleum pricing assumptions. Charts 11.1 to 11.3 and Table 14 illustrate the similar domestic (at Toronto) oil pricing assumptions. In Charts 12.1 to 12.3 and Table 15, we present the various domestic (at Toronto) natural gas pricing assumptions for the alternatives.

Chart 10.1

WELLHEAD PRICE OF CRUDE PETROLEUM - WORLD PRICE LOW

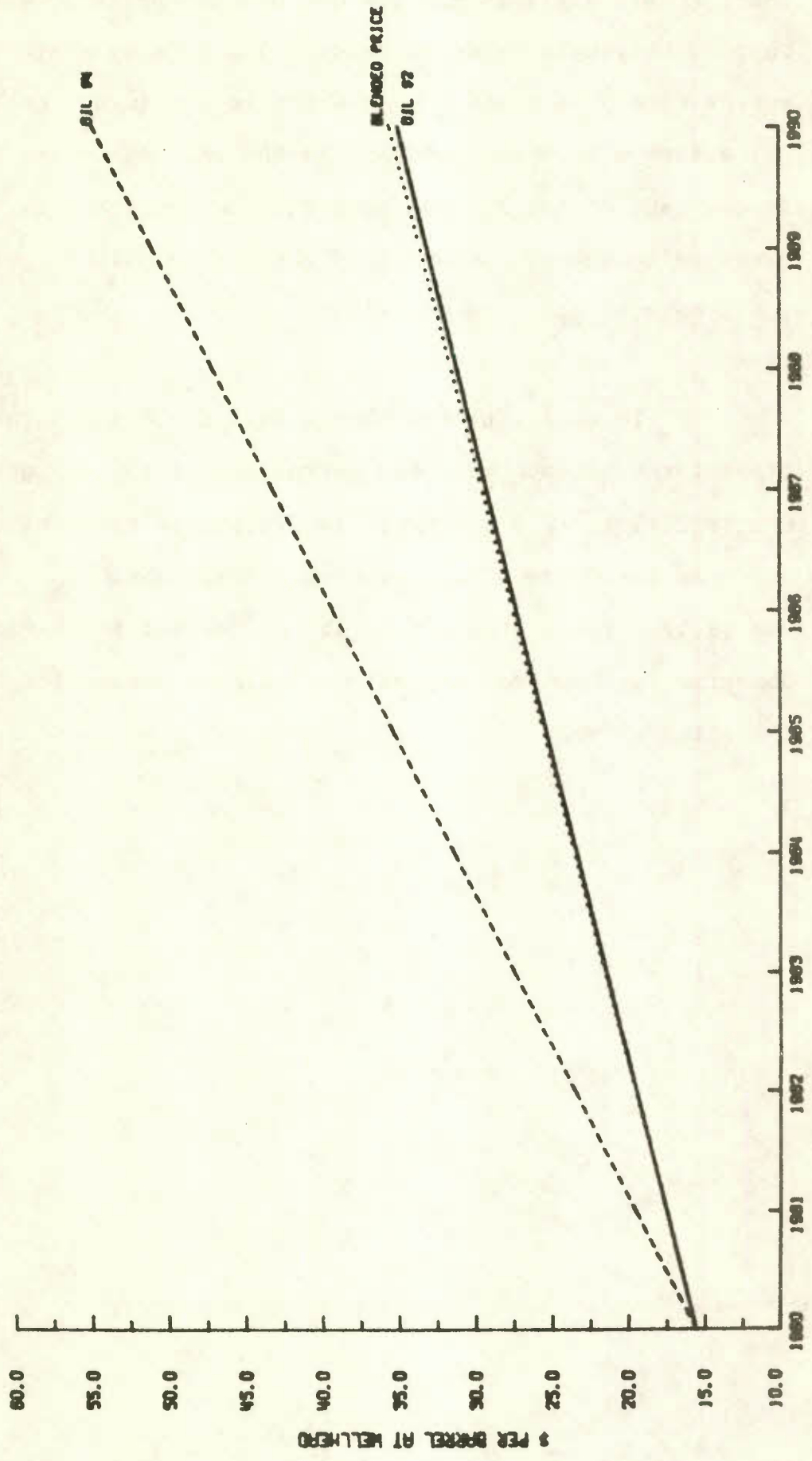


Chart 10.2

WELLHEAD PRICE OF CRUDE PETROLEUM - WORLD PRICE HIGH

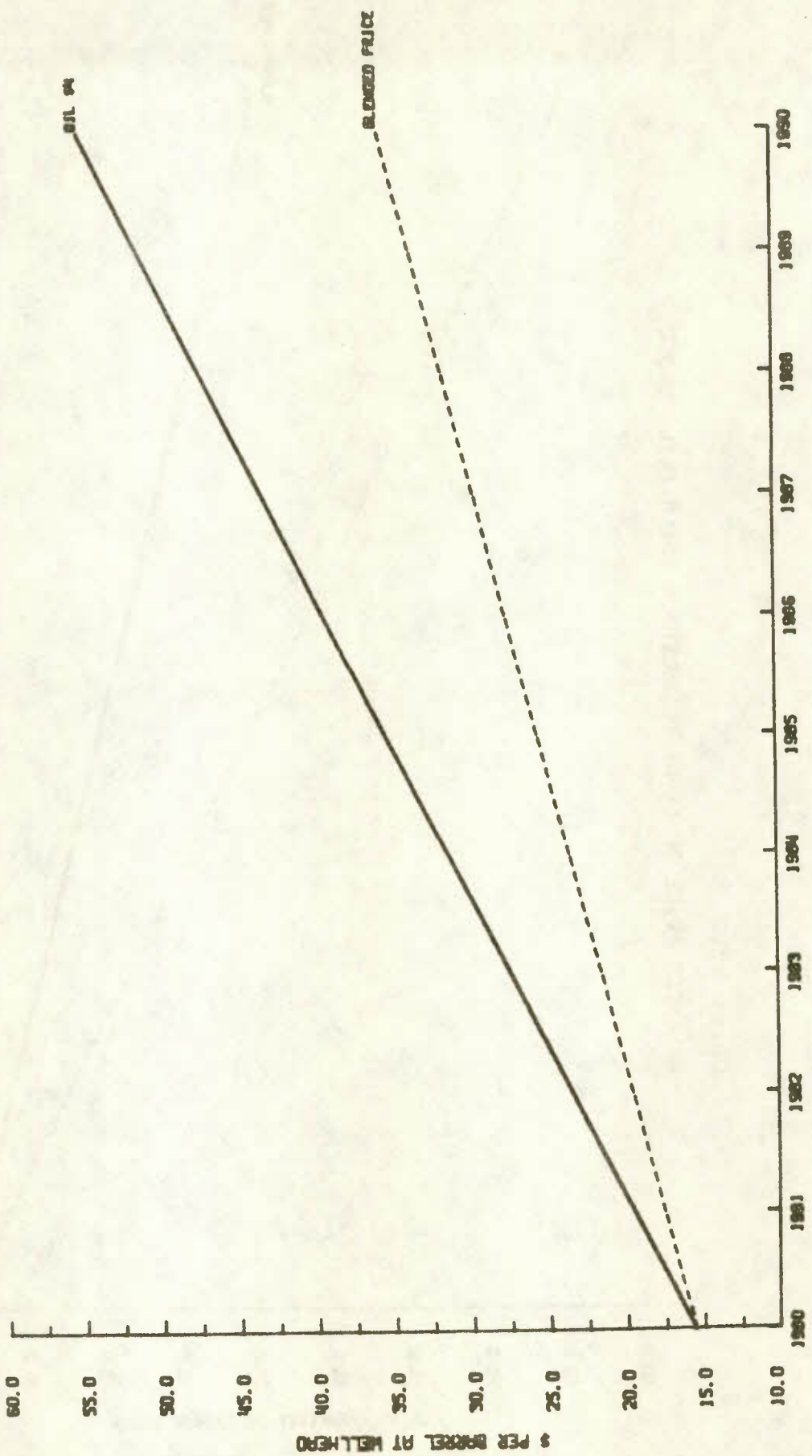


Chart 10.3

WELLHEAD PRICE OF CRUDE PETROLEUM - WORLD PRICE SHOCK

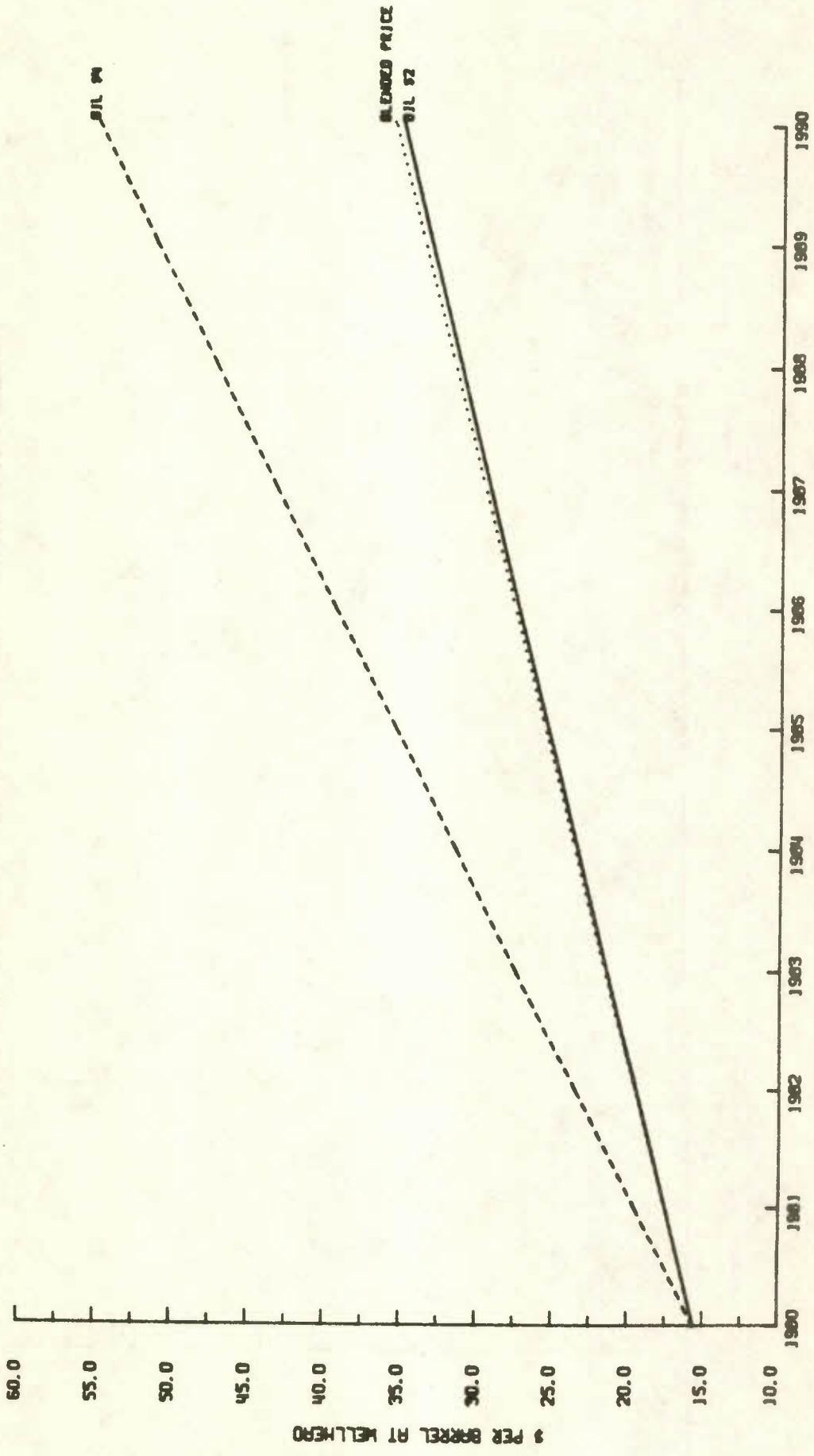


Table 13

Wellhead Price of Crude Petroleum ($ per barrel at wellhead)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
WORLD OIL PRICE LOW											
Self sufficiency, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Fossil fuel balance, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
No large projects, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Self sufficiency, $2 per year	15.58	17.53	19.49	21.44	23.39	25.33	27.27	29.21	31.15	33.08	35.01
Self sufficiency, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Self sufficiency, blended price, low gas	15.58	17.58	19.58	21.58	23.58	25.58	27.58	29.58	31.58	33.58	35.58
Self sufficiency, blended price, high gas	15.58	17.58	19.58	21.58	23.58	25.58	27.58	29.58	31.58	33.58	35.58
WORLD OIL PRICE HIGH											
Self sufficiency, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Fossil fuel balance, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
No large projects, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Self sufficiency, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Self sufficiency, blended price, low gas	15.58	17.58	19.58	21.58	23.58	25.58	27.58	29.58	31.58	33.58	35.58
Self sufficiency, blended price, high gas	15.58	17.58	19.58	21.58	23.58	25.58	27.58	29.58	31.58	33.58	35.58
OPEC OIL PRICE SHOCK 1986											
Self sufficiency, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Fossil fuel balance, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
No large projects, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Self sufficiency, $2 per year	15.58	17.53	19.49	21.44	23.39	25.33	27.27	29.21	31.15	33.08	35.01
Self sufficiency, $4 per year	15.58	19.53	23.49	27.44	31.39	35.33	39.27	43.21	47.15	51.08	55.01
Self sufficiency, blended price, low gas	15.58	17.58	19.58	21.58	23.58	25.58	27.58	29.58	31.58	33.58	35.58
Self sufficiency, blended price, high gas	15.58	17.58	19.58	21.58	23.58	25.58	27.58	29.58	31.58	33.58	35.58

Chart 11.1

DOMESTIC PRICE OF CRUDE PETROLEUM - WORLD PRICE LOW

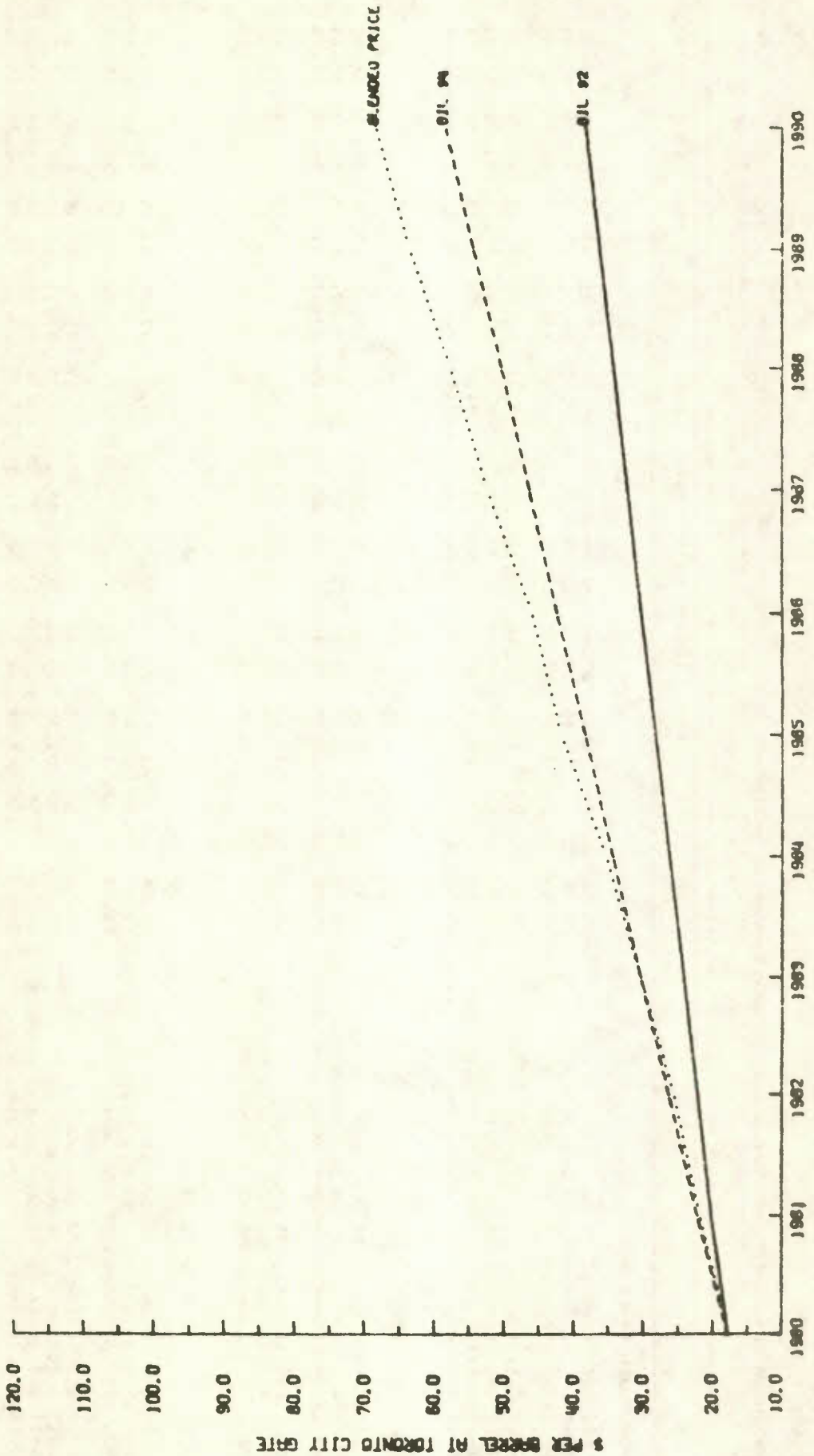


Chart 11.2

DOMESTIC PRICE OF CRUDE PETROLEUM - WORLD PRICE HIGH

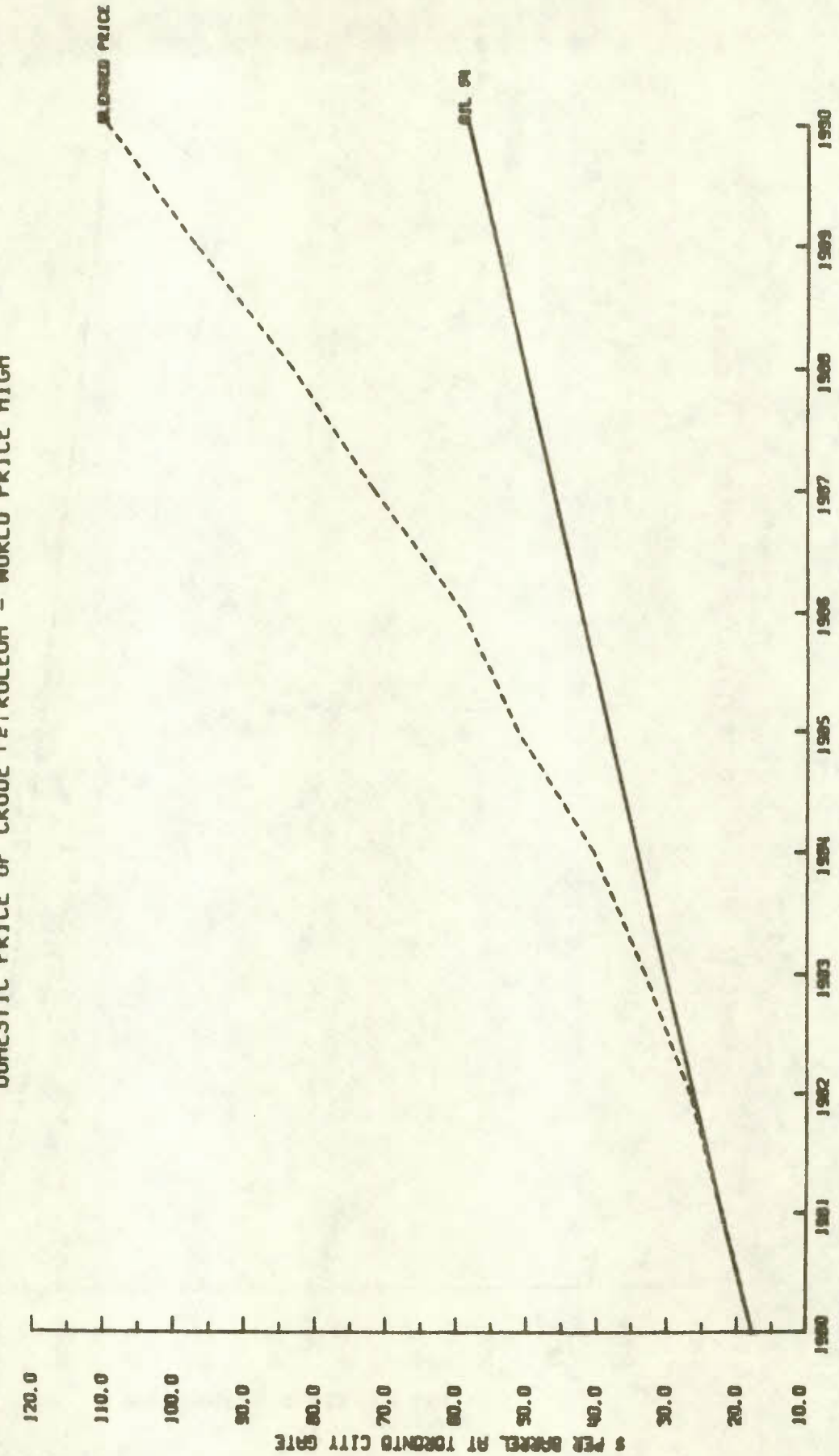


Chart 11.3

DOMESTIC PRICE OF CRUDE PETROLEUM - WORLD PRICE SHOCK

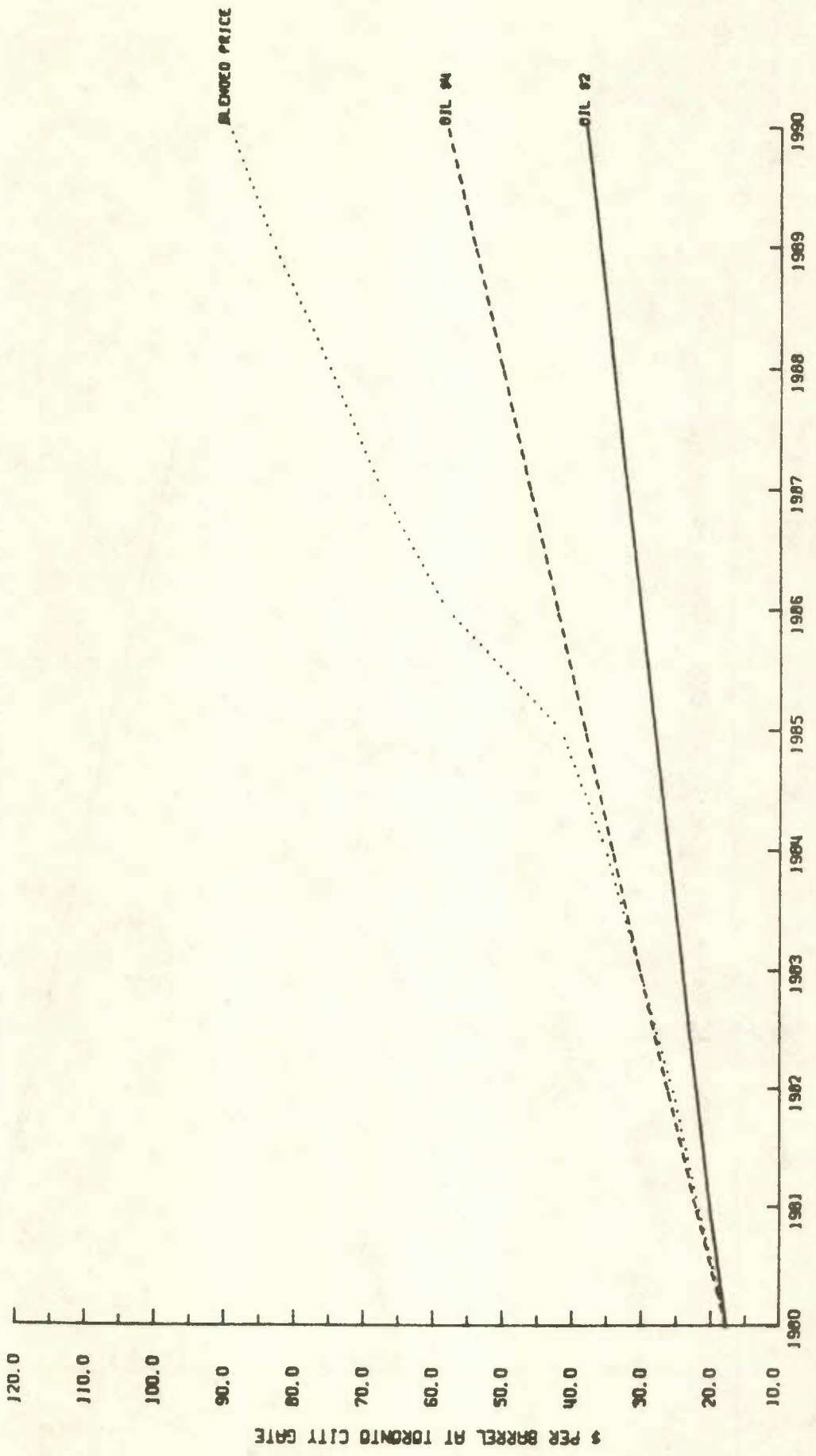


Table 14

Domestic Price of Crude Petroleum[1] ($ per barrel at Toronto City Gate)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
WORLD OIL PRICE LOW											
Self sufficiency, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Fossil fuel balance, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
No large projects, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Self sufficiency, $2 per year	17.81	20.33	22.33	24.33	26.33	28.33	30.33	32.33	34.33	36.33	38.33
Self sufficiency, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Self sufficiency, blended price, low gas	17.81	21.88	25.61	30.40	35.33	41.81	45.93	52.38	57.69	63.49	68.39
Self sufficiency, blended price, high gas	17.81	21.88	25.61	30.40	35.33	41.81	45.93	52.38	57.69	63.49	68.39
WORLD OIL PRICE HIGH											
Self sufficiency, $4 per year	17.81	22.33	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Fossil fuel balance, $4 per year	17.81	22.33	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
No large projects, $4 per year	17.81	22.33	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Self sufficiency, $4 per year	17.81	22.33	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Self sufficiency, blended price, low gas	17.81	22.25	26.83	33.10	40.48	51.27	59.00	71.74	83.37	97.04	109.61
Self sufficiency, blended price, high gas	17.81	22.25	26.83	33.10	40.48	51.27	59.00	71.74	83.37	97.04	109.61
OPEC OIL PRICE SHOCK 1986											
Self sufficiency, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Fossil fuel balance, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
No large projects, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Self sufficiency, $2 per year	17.81	20.33	22.33	24.33	26.33	28.33	30.33	32.33	34.33	36.33	38.33
Self sufficiency, $4 per year	17.81	22.22	26.33	30.33	34.33	38.33	42.33	46.33	50.33	54.33	58.33
Self sufficiency, blended price, low gas	17.81	21.88	25.61	30.40	35.33	41.81	58.32	67.82	75.22	83.37	89.88
Self sufficiency, blended price, high gas	17.81	21.88	25.61	30.40	35.33	41.81	58.32	67.82	75.22	83.37	89.88

1 Includes levy or blending schemes.

Chart 12.1

DOMESTIC PRICE OF NATURAL GAS - WORLD PRICE LOW

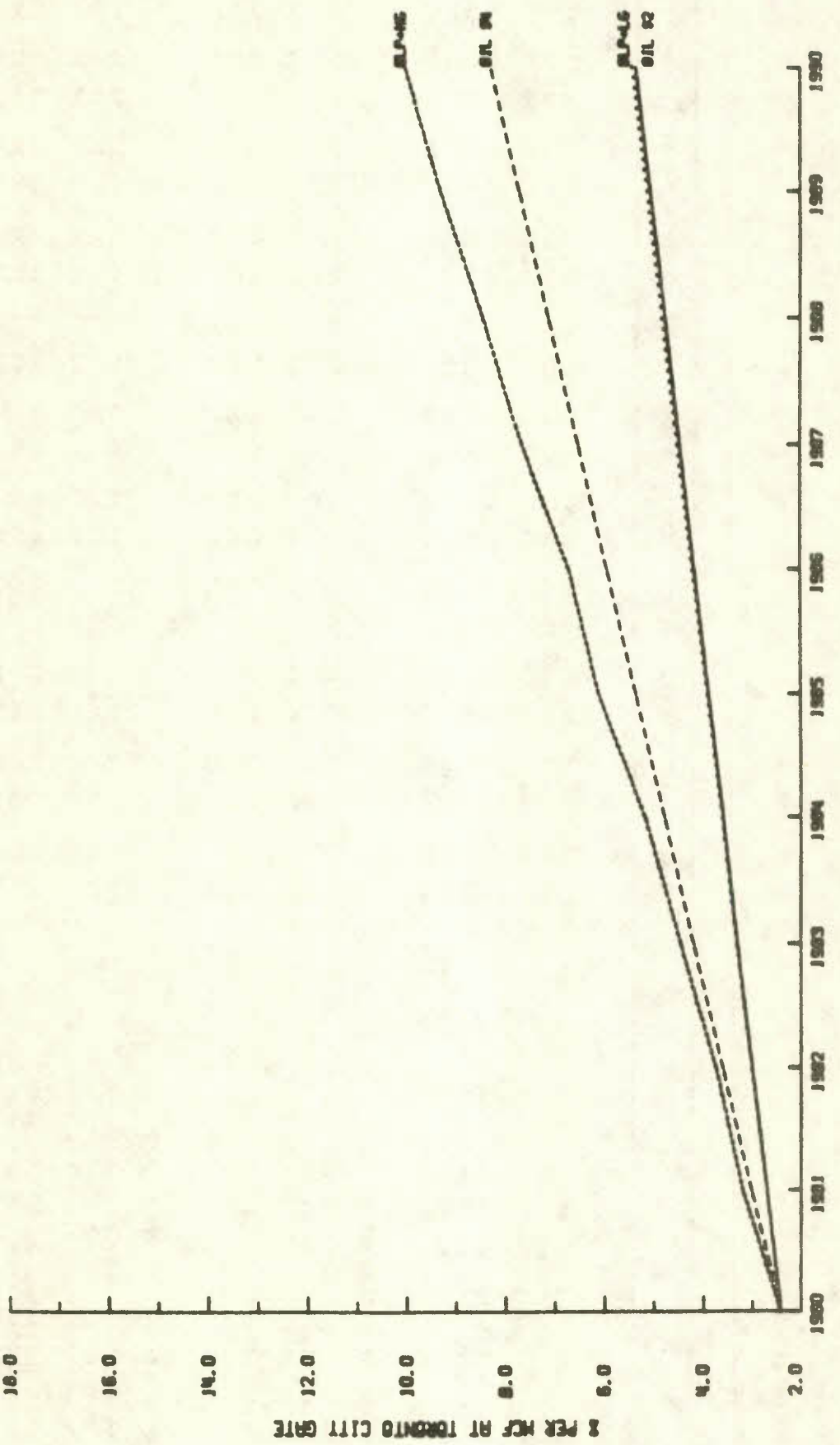


Chart 12.2

DOMESTIC PRICE OF NATURAL GAS - WORLD PRICE HIGH

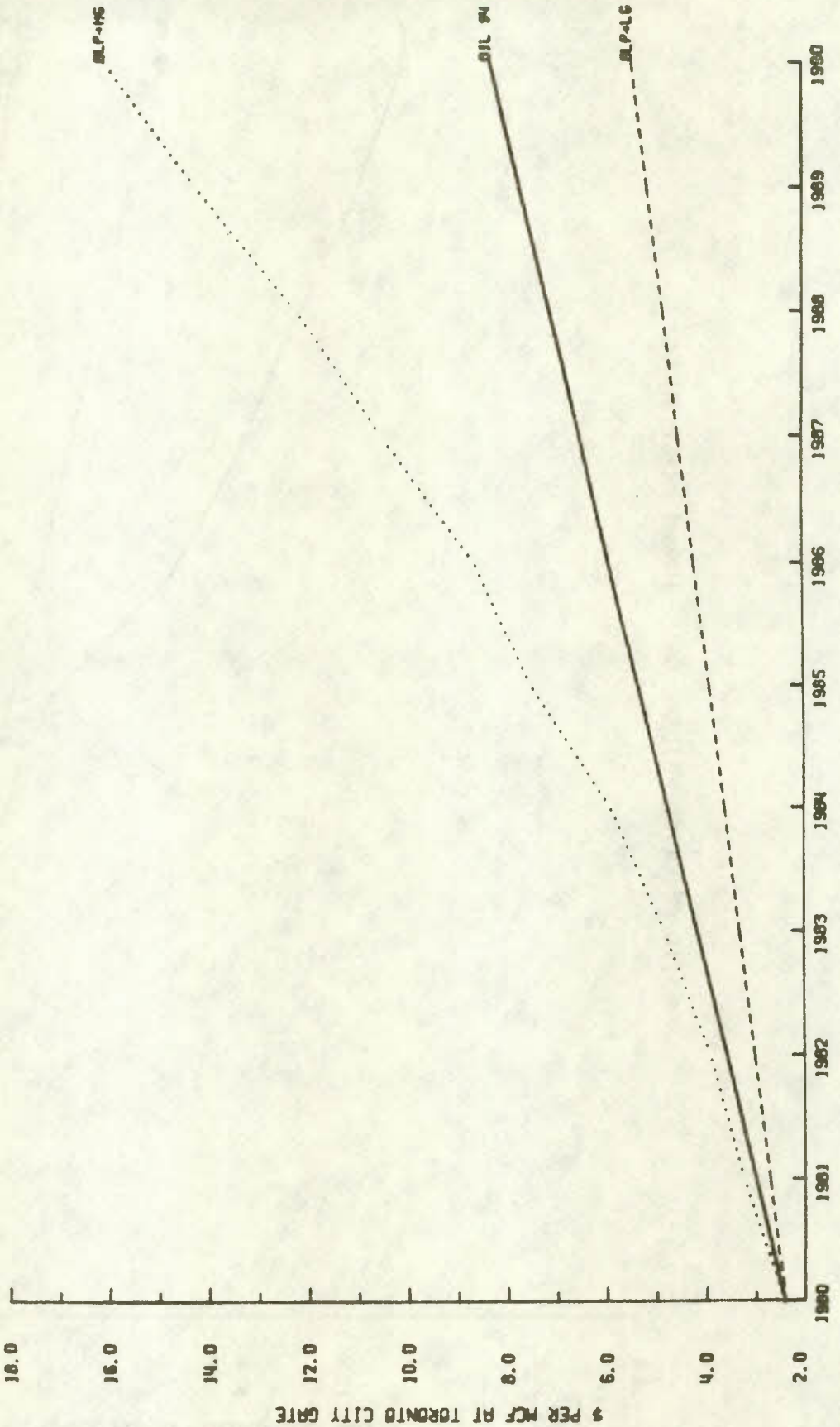


Chart 12.3

DOMESTIC PRICE OF NATURAL GAS - WORLD PRICE SHOCK

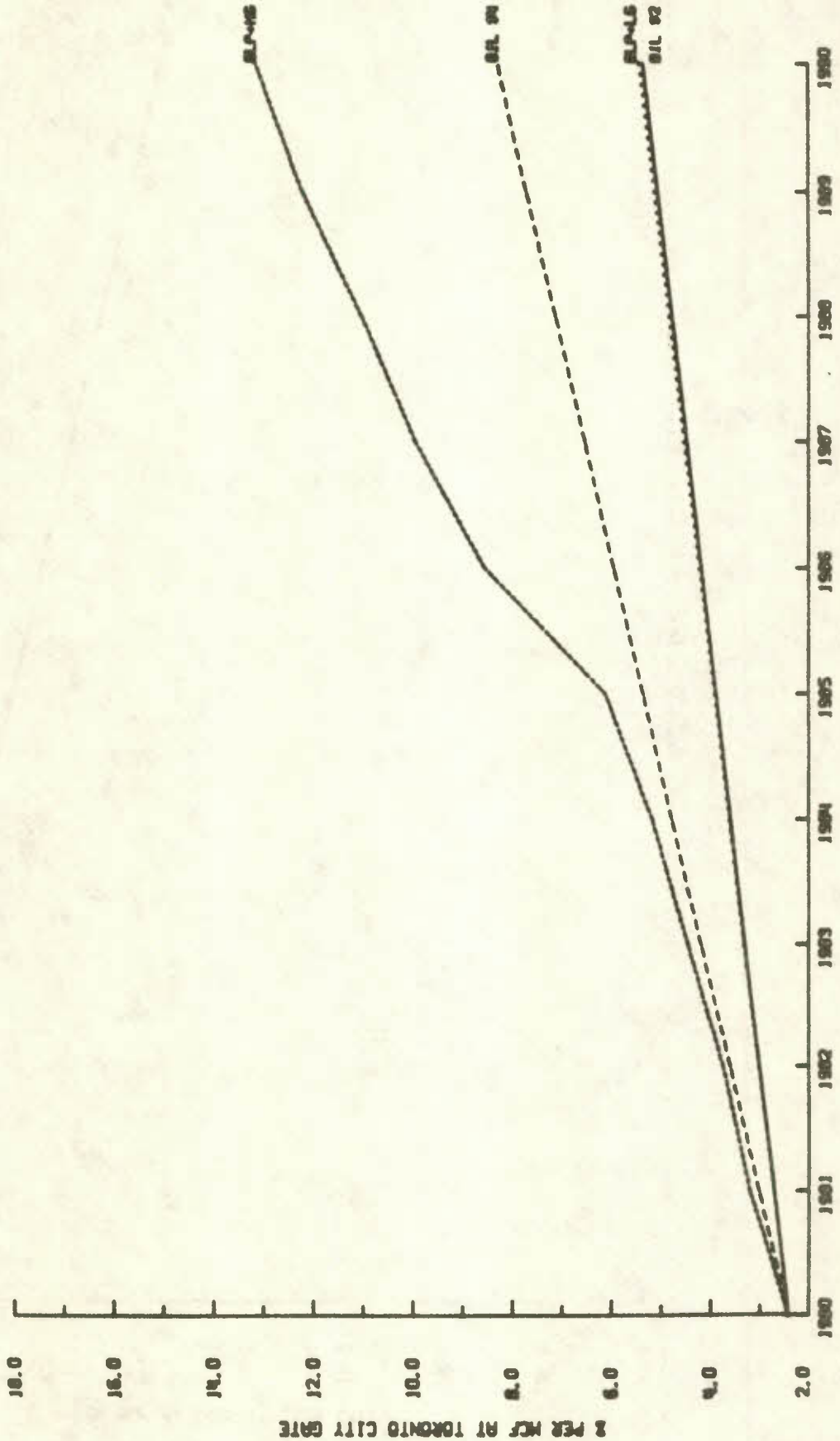


Table 15

Domestic Price of Natural Gas ($ per MCF at Toronto City Gate)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
WORLD OIL PRICE LOW											
Self sufficiency, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Fossil fuel balance, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
No large projects, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Self sufficiency, $2 per year	2.43	2.72	3.02	3.31	3.60	3.90	4.19	4.48	4.77	5.07	5.36
Self sufficiency, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Self sufficiency, blended price, low gas	2.43	2.73	3.03	3.33	3.63	3.93	4.23	4.54	4.84	5.14	5.44
Self sufficiency, blended price, high gas	2.43	3.21	3.75	4.46	5.18	6.13	6.73	7.68	8.45	9.30	10.02
WORLD OIL PRICE HIGH											
Self sufficiency, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Fossil fuel balance, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
No large projects, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Self sufficiency, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Self sufficiency, blended price, low gas	2.43	2.73	3.03	3.33	3.63	3.93	4.23	4.54	4.84	5.14	5.44
Self sufficiency, blended price, high gas	2.43	3.26	3.93	4.85	5.93	7.51	8.65	10.51	12.22	14.22	16.06
OPEC OIL PRICE SHOCK 1986											
Self sufficiency, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Fossil fuel balance, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
No large projects, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Self sufficiency, $2 per year	2.43	2.72	3.02	3.31	3.60	3.90	4.19	4.48	4.78	5.07	5.36
Self sufficiency, $4 per year	2.43	3.02	3.60	4.19	4.78	5.36	5.95	6.53	7.12	7.71	8.29
Self sufficiency, blended price, low gas	2.43	2.73	3.03	3.33	3.63	3.93	4.23	4.54	4.84	5.14	5.44
Self sufficiency, blended price, high gas	2.43	3.21	3.75	4.46	5.18	6.13	8.55	9.94	11.02	12.22	13.17

THE IMPACT ON SELECTED ECONOMIC INDICATORS

Within CANDIDE Model 2.0 there are many sectoral economic indicators. For our purposes we compare across all alternatives a selected group of aggregate economic indicators. These include: (1) the consumer price index, (2) real gross national product, (3) real personal disposable income, (4) the cumulative deviation of employment from the base case, (5) the current account balance as a per cent of gross national product, (6) the exchange rate, (7) the government deficit as a per cent of gross national product, (8) the federal deficit as a per cent of gross national product, and (9) the provincial surplus as a percent of gross national product. These are not the only indicators available for comparison. However, in providing an overview of the general impact that different degrees of self sufficiency, different domestic pricing environments and different world pricing environments could have on Canadian performance, this set of aggregate economic indicators gives an informative picture.

The results for each of the alternatives will be presented in chart form. In Appendix I we record the data in tabular form. For each indicator we organize the alternatives into six charts. The first three charts compare the impact on each indicator of different degrees of self sufficiency under three different world pricing

environments given the same domestic pricing environment (the wellhead price increasing at $4 per barrel per year with pre-budget revenue splits). The second three charts present the impact on each indicator for the case of self sufficiency under various domestic pricing schemes in three different world pricing environments.

In the first set of charts we look at varying degrees of self sufficiency for a given domestic pricing scheme under changing world conditions related to world oil prices. In the second group of charts we look at the self sufficiency case under various domestic pricing schemes in different world pricing environments. In the first set what is common to all alternatives is the domestic pricing environment. What changes is the degree of self sufficiency and the world pricing environment. In the second set what is common to all alternatives are investment and production levels necessary for self sufficiency. What changes are domestic pricing schemes and the world pricing environment. All simulations have been computed for the period 1980 through 1990. Let us now proceed to the presentation of charts and analysis of results for each of nine selected economic indicators.

THE CONSUMER PRICE INDEX

In Charts 13.1 through 13.6 we record the percentage change in the consumer price index for the alternatives considered. Charts 13.1 through 13.3 record the percentage change in the consumer price index under various degrees of self sufficiency for three different world pricing schemes where the domestic price of oil increases at the rate of $4 per barrel per year and pre-budget legislation determines the allocation of rents. Charts 13.4 through 13.6 show the percentage change in the consumer price index in a self sufficient investment/production environment for different world pricing developments and different domestic pricing schemes.

Let us first examine the impact of various degrees of self sufficiency on the consumer price index with a given domestic pricing environment under changing world pricing conditions. A movement towards self sufficiency by 1990 would put downward pressure on the rate of growth of the consumer price index. But, in the early part of the decade a drive towards self sufficiency would put upward pressure on the consumer price index. This is clear from the examination of Chart 13.1. In the period 1982-1986 the self sufficiency alternative shows higher rates of inflation than the no large energy projects alternative. However, by the end of the decade dependency would lead to higher rates of inflation. The four alternatives which embody varying

degrees of self sufficiency rank the CPI, by the end of the decade, according to the degree of self sufficiency. The no large energy projects alternative has the least degree of self sufficiency, the control is a little more self sufficient, the fossil fuel in balance alternative is a little more self sufficient than the control, and the self sufficiency alternative is the limiting case. The ranking of the CPI is the same.

Let us now compare these investment and production alternatives in a world environment which implies much higher international increases in the real price of oil. In Chart 13.2 we see the rate of inflation for the CPI for three alternatives, each with a different degree of self sufficiency or dependence. Each of these alternatives embodies the higher world pricing assumption. But each includes the same domestic pricing assumptions as the alternatives of Chart 13.1. The ordering of these three alternatives by the end of the decade with respect to inflation rates is identical to that of the low world price environment. The no large energy projects produces the highest rate of inflation, and the self sufficiency environment produces the lowest rate of inflation. We also observe the early decade reversal of this ranking and the mid-decade crossover as observed in Chart 13.1. Under $4 domestic pricing environment higher world prices will add <u>indirectly</u> to Canadian inflation rates. A higher world

Chart 13.1

CONSUMER PRICE INDEX - % CHANGE (OIL $4 - WORLD PRICE LOW)

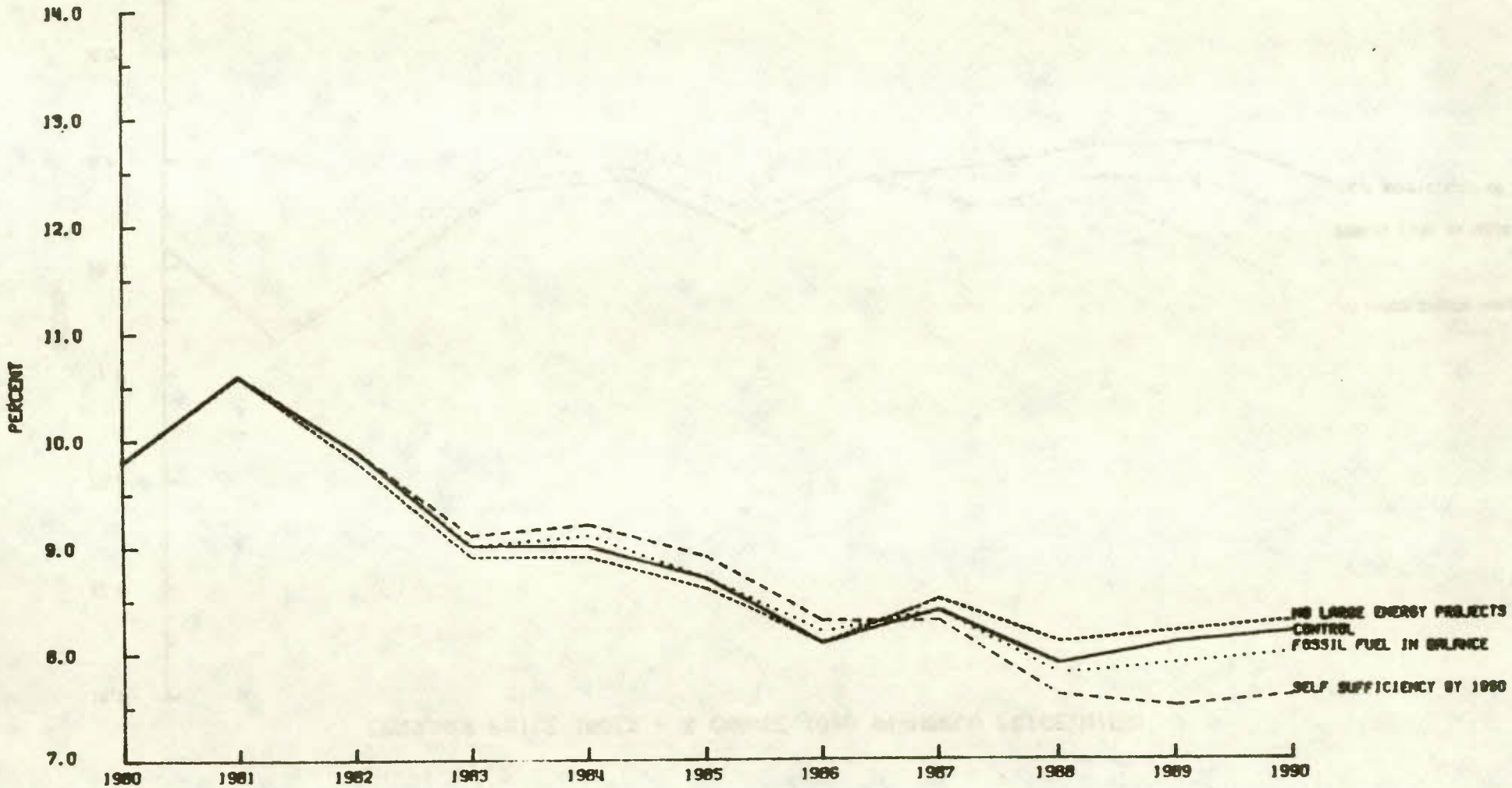


Chart 13.2

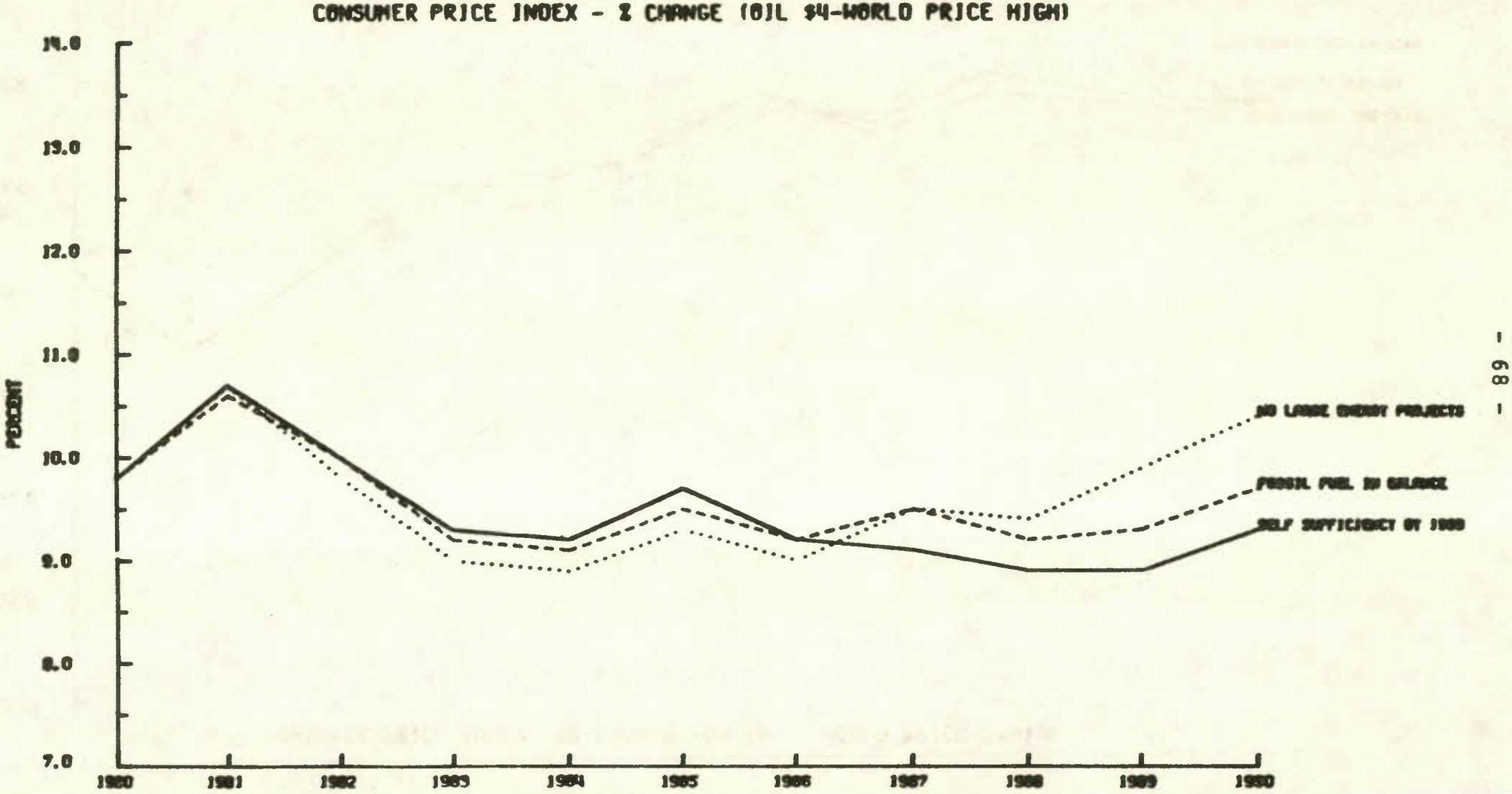
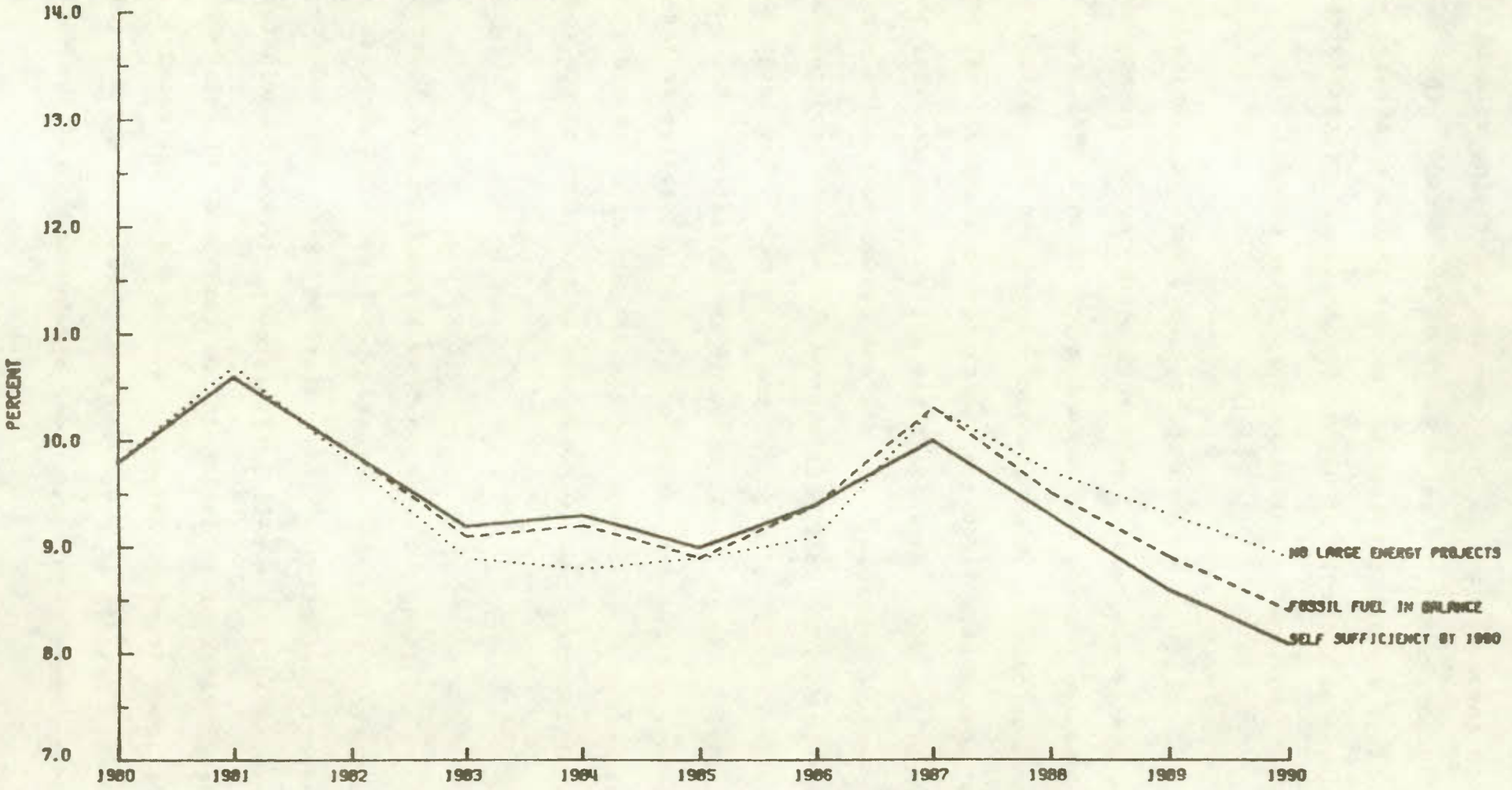

CONSUMER PRICE INDEX - % CHANGE (OIL $4-WORLD PRICE HIGH)
PERCENT
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
NO LARGE ENERGY PROJECTS
FOSSIL FUEL NO BALANCE
SELF SUFFICIENCY BY 1988

Chart 13.3

CONSUMER PRICE INDEX - % CHANGE (OIL $4-WORLD PRICE SHOCK(1986))



price environment will buttress the underlying rate of inflation during the latter part of the decade. The rankings and the reversal of the rankings are robust. What changes as a result of higher international prices is the underlying rate of inflation during the decade.

Let us move to Chart 13.3. Here we examine alternative degrees of self sufficiency or dependence under a domestic pricing environment which is unchanged from previous cases, but in a world pricing environment which includes a very large real shock to the international price of oil in 1986. Once again the early decade ranking, the mid-decade crossover, and the end of decade ranking are preserved. The self sufficiency environment produces the lowest rate of inflation by end of decade. The large shock in 1986 produces a welling up of the inflation rate, but because the domestic price of oil is insensitive to the international price most of the effects here are indirect resulting from induced movements in the price of non energy imports.

In summary, we observe the following. Under a domestic pricing environment which assumes an increase in the price of oil of $4 per barrel per year (pre-budget revenue splits) a self sufficiency environment would imply higher rates of inflation in the early part of the decade and lower rates of inflation at the end of the decade. This general pattern is preserved under the three world pricing environments examined. Under an environment of low world

prices, high world prices, or large shocks in world prices the general characteristics and ranking are unchanged. However higher world prices buttress the underlying rate of inflation.

Let us now examine the impact of different domestic pricing schemes in a self sufficiency environment under alternative world pricing environments. In Charts 13.4, 13.5 and 13.6 we record the inflation rate for the CPI in each of these cases. In Chart 13.4 we see the inflation rate for the CPI for the case of domestic self sufficiency, which includes a low rate of increase in the world price under four domestic pricing schemes. The path for the alternative labelled OIL $4 in Chart 13.4 is the alternative labelled SELF SUFFICIENCY BY 1990 in Chart 13.1.

What can we learn by examining this second group of alternatives? First of all, the four domestic pricing alternatives have two distinctly different paths. The alternatives labelled OIL $2 and OIL $4 are domestic oil pricing schemes which are insensitive to world price. The remaining two are blended pricing schemes which are sensitive to the world price inasmuch as the domestic price of oil in each case is a weighted average of import costs and domestic costs. These blended pricing schemes also have the additional feature of providing for a domestic price in the early part of the decade which is high enough to phase out the federal contribution from general revenues to the oil import subsidy program.

By the end of the decade the blended price low gas alternative would bring lower rates of inflation than either the $2 or the $4 case. However, during the bulk of the decade blended pricing would yield upward pressure on the CPI. Furthermore, tying the price of natural gas to the blended price rather than to the wellhead price would put additional upward pressure on the CPI. Part of the reason that the blended price alternatives produce lower rates of inflation by the end of the decade when compared to either the $2 or the $4 case under a low world pricing environment is related to exchange rate movements. We will present these later. In short we have found that in a self sufficient environment a blended pricing scheme in the long run produces a stronger dollar. This takes some pressure off inflation rates by way of exchange effects by the end of the decade. These results are also borne out in Chart 13.5. Under a high world price environment the blended pricing inflation rates, although reaching higher levels during early and mid decade, eventually fall back to the range of the OIL $4 case.

The risk of blended pricing is seen quite clearly in Chart 13.6. Here we see the impact on the consumer price index of the alternative pricing schemes in a self sufficiency environment for the case in which a large shock in world prices occurs in 1986. Note that under the $2 and $4 case the effects on the CPI are primarily from indirect

sources. These effects result from higher priced imports due to higher costs of our trading partners stemming from the large shock in world oil prices. But, if we choose to blend prices during the period in which we move to self sufficiency and the world undergoes another large shock in the price of oil, the blended pricing scheme would transmit this shock directly to the CPI, since the blended price is a weighted average of world prices and domestic costs. By 1990 the blended price schemes produce inflation rates, after the shock has been digested, which are lower than either the $2 case or the $4 case.

In summary, we have learned the following: 1) a drive towards self sufficiency under three different world pricing environments with the domestic price of oil moving at a rate of $4 per barrel per year will put downward pressure on inflation rates during the latter part of the decade; and 2) in a self sufficiency environment for different world pricing environments an examination of four domestic pricing schemes leads to the two following observations; because of exchange rate effects the blended pricing scheme in a self sufficient environment by the end of the decade produces lower rates of inflation; and, blended pricing schemes will transmit shocks and/or high world price environments directly to the CPI thus buttressing the underlying rate of inflation in Canada.

Chart 13.4

CONSUMER PRICE INDEX - % CHANGE (WORLD PRICE LOW-SELF SUFF BY 1990)

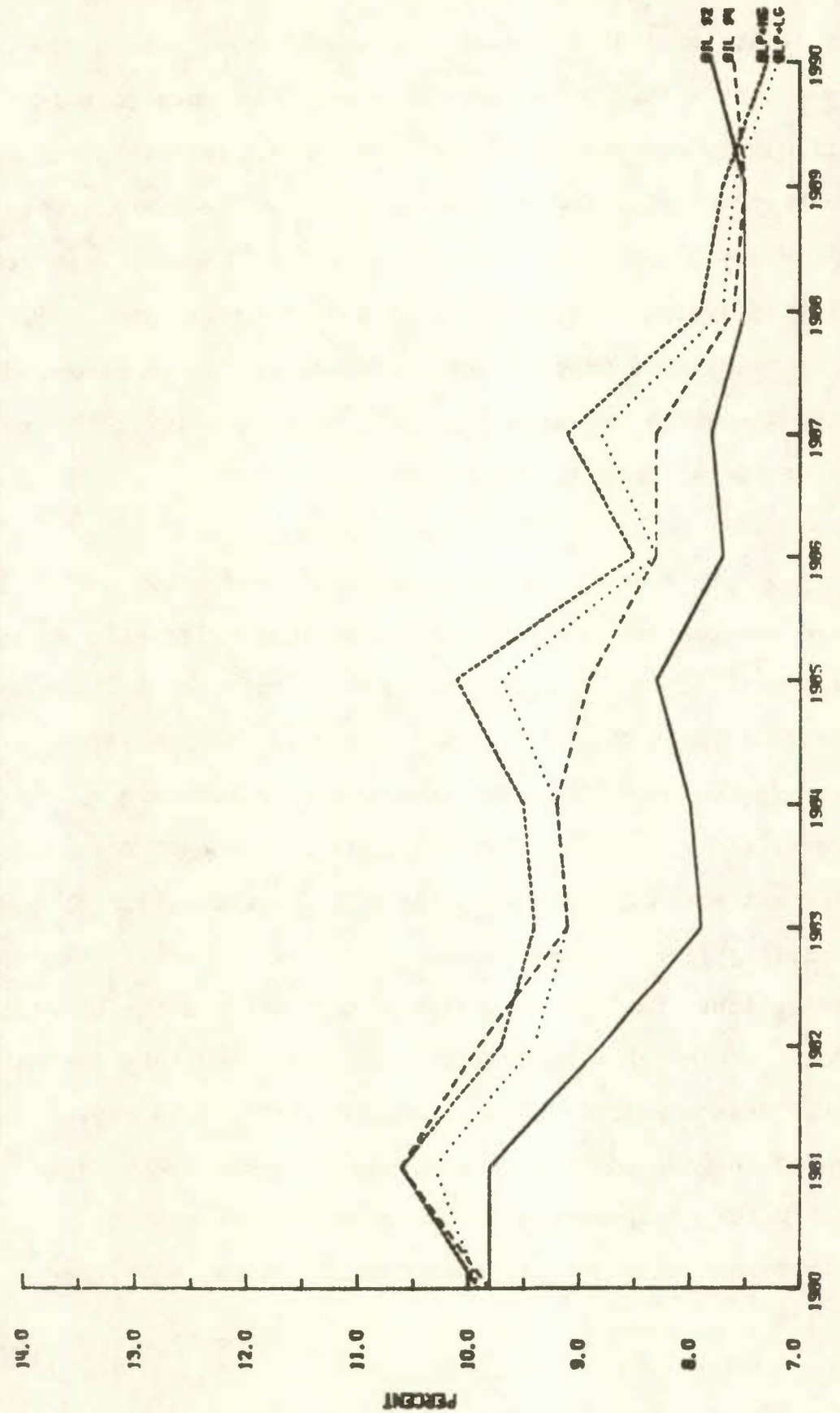


Chart 13.5

CONSUMER PRICE INDEX - % CHANGE (WORLD PRICE HIGH-SELF SUFF BY 1990)

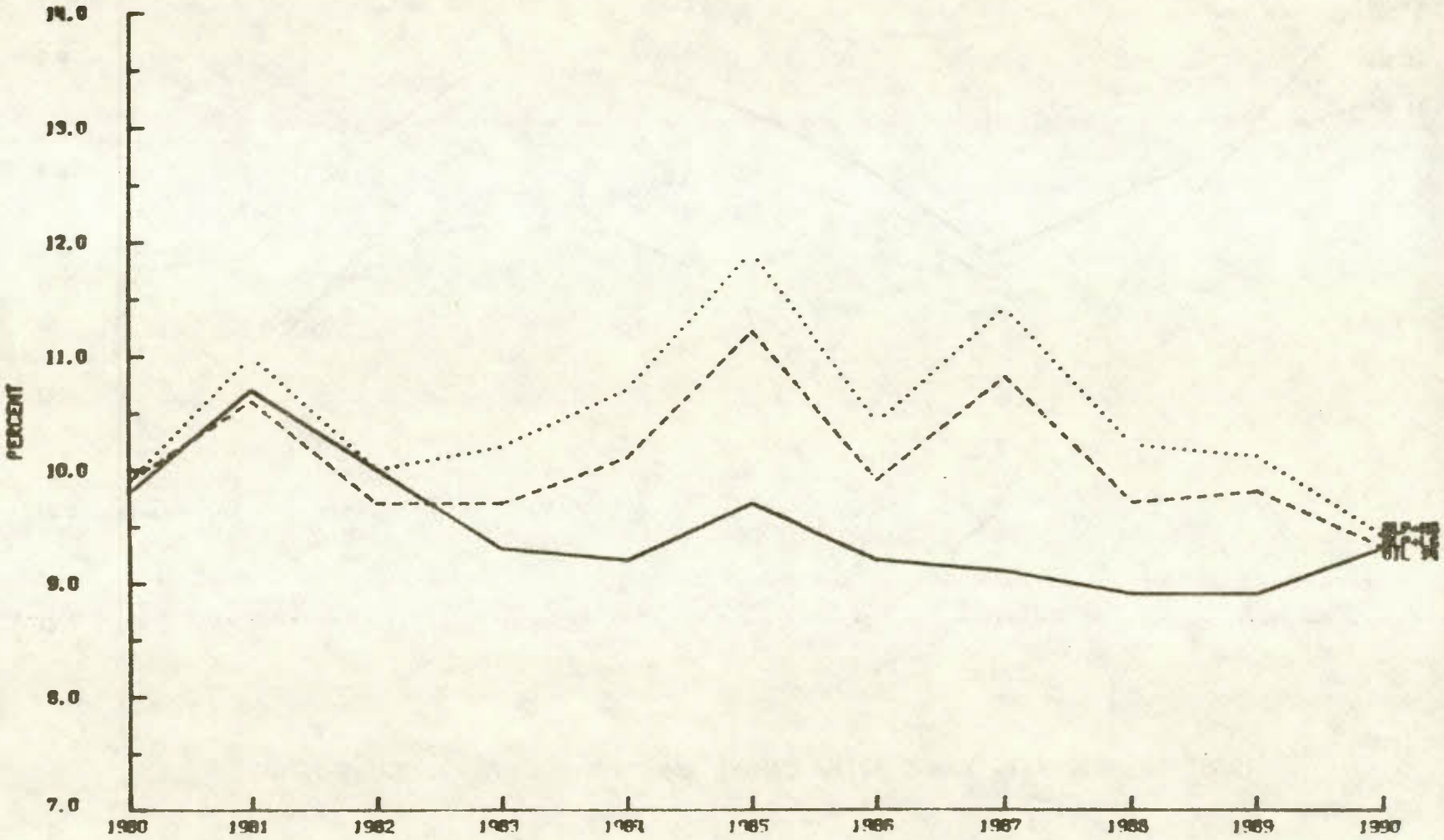
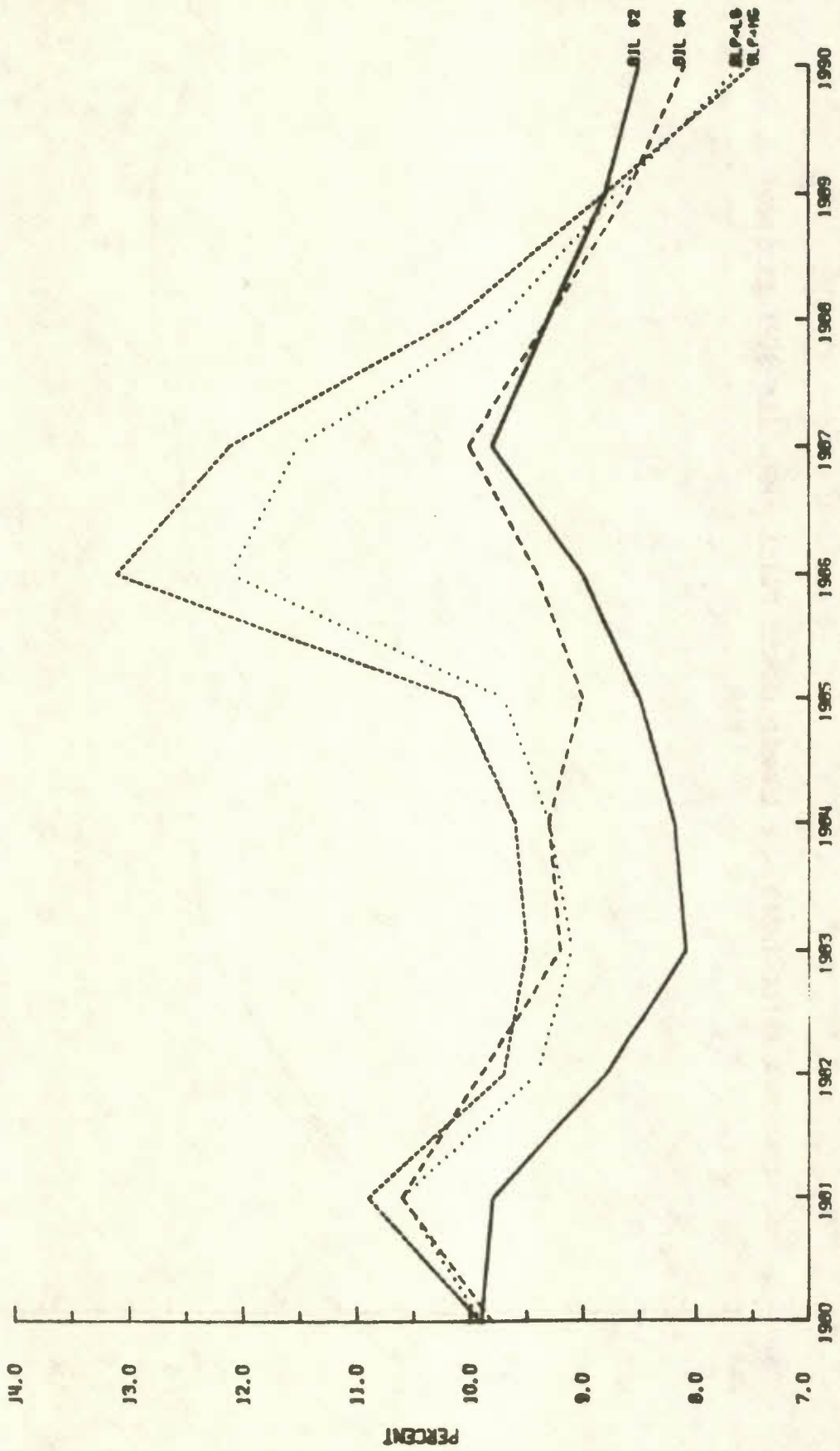


Chart 13.6

CONSUMER PRICE INDEX - % CHANGE (WORLD PRICE SHOCK-SELF SUFF BY 1990)



REAL GROSS NATIONAL PRODUCT

As in the previous section we divide our discussion into two separate groups. Within each group we consider three different cases. The first group deals with the impact of varying degrees of self sufficiency in an environment where the domestic price of oil increases at $4 per barrel per year under alternative world pricing arrangements. In the second group we deal with the case of self sufficiency under alternative domestic pricing schemes for various world pricing environments. In the charts contained in Charts 14.1 through 14.6 we record the growth rates in real gross national product for the period 1980 through 1990. What is common in Charts 14.1 to 14.3 are the domestic pricing assumptions. What varies is the degree of self sufficiency and the world pricing environment. What is common to Charts 14.4 to 14.6 is the level of self sufficiency. What varies are domestic pricing schemes and the world pricing environment.

Let us consider first Chart 14.1. Here we see the results of varying degrees of self sufficiency in a low priced world environment and a $4 per barrel domestic environment. During the period 1981 through 1984 growth rates rank from highest to lowest by degree of self sufficiency. More investment projects imply more real growth and less dependence on foreign supplies by 1990.

The great bulk of these investment projects will make their impact in the period 1981-1985. The peak impact occurs in 1983-1984 where the growth rate spread is in the 1.0 to 1.5 percentage point range.

When the CPI was discussed we indicated that during the early part of the decade the self sufficiency alternative produced higher rates of inflation. Part of the reason for this is now apparent. It stems from higher real growth rates and the pressure that higher rates of resource utilisation will put on labour and capital markets. The remaining pressure comes from exchange rate effects. This we will see later. By the end of the decade the GNP growth rates all converge to near the 3 per cent range. The self sufficiency solution does have a lower growth rate by end of decade. This is because of inventory stock adjustment effects. It should not be interpreted as a reduction in our potential growth.

Let us consider Chart 14.2. Here we change the world oil environment to one which is high priced. In a high priced environment we see the same early decade ranking as that observed in Chart 14.1, and the reversal of this ranking by the end of the decade. Let us now consider Chart 14.3. Here a large shock in the real price of oil is imposed on the self sufficiency alternatives while holding the domestic price of oil at an increse of $4 per barrel

Chart 14.1

GROSS NATIONAL PRODUCT 71$ - % CHANGE (OIL $4 - WORLD PRICE LOW)

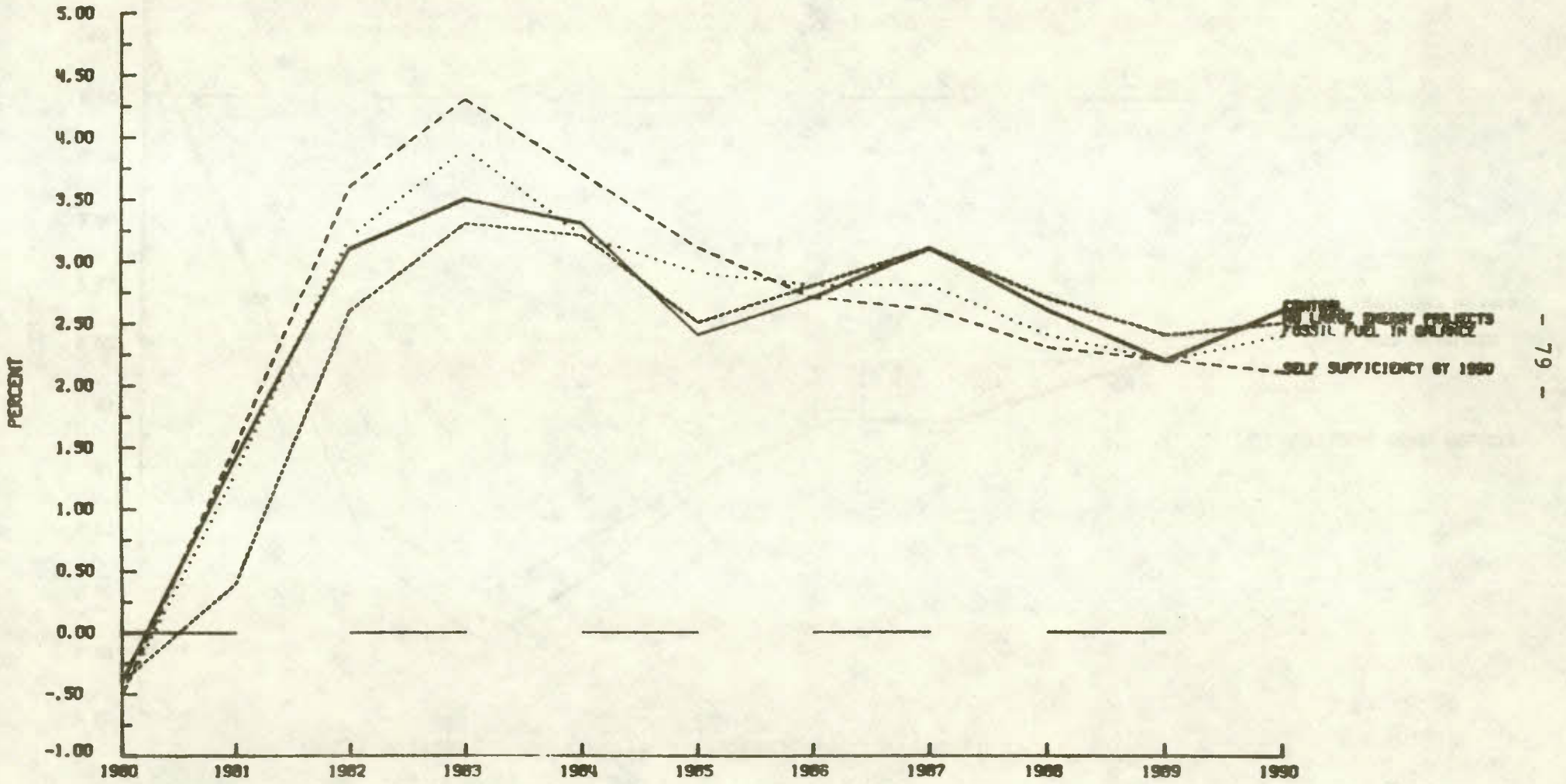


Chart 14.2

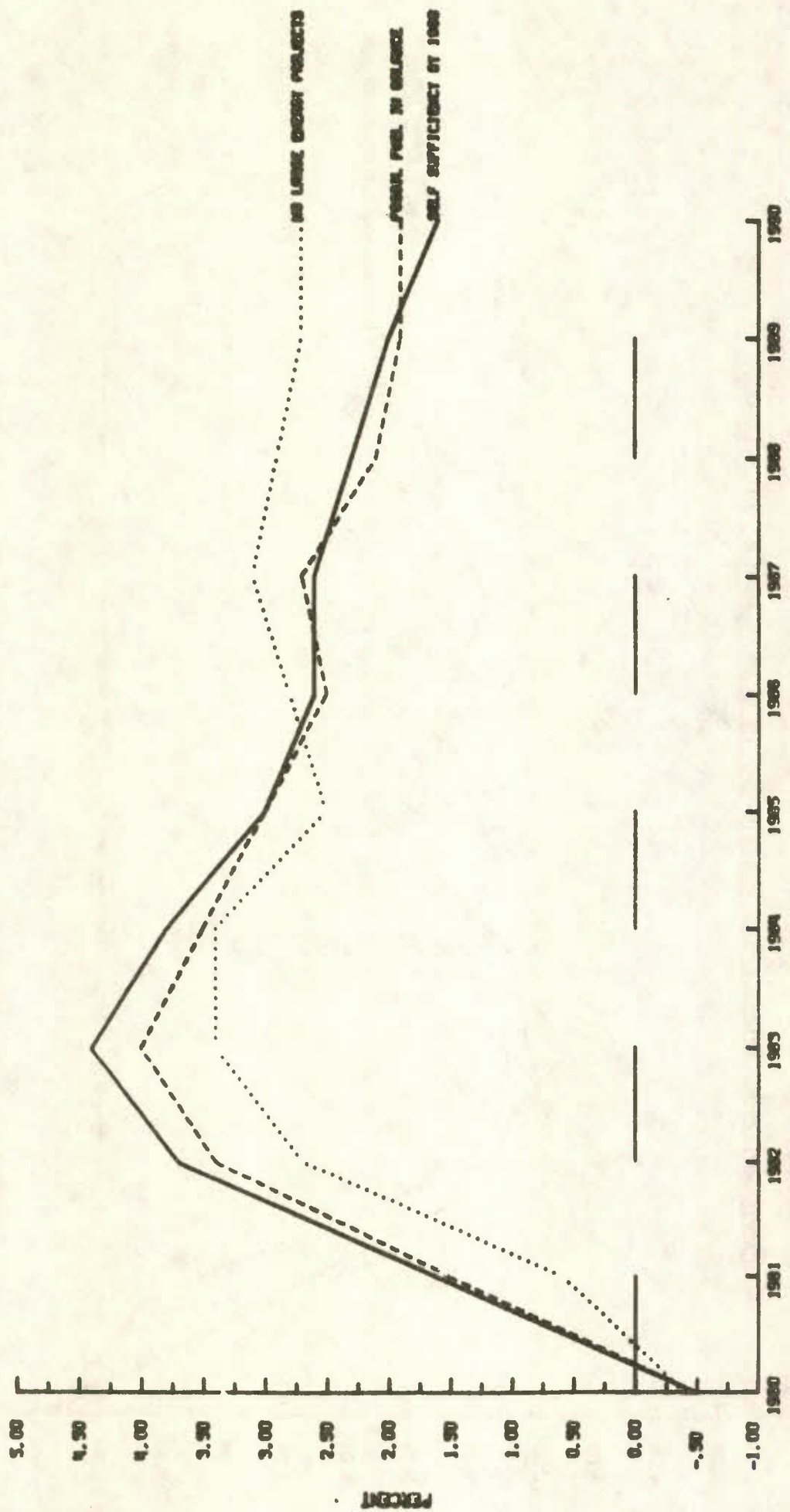
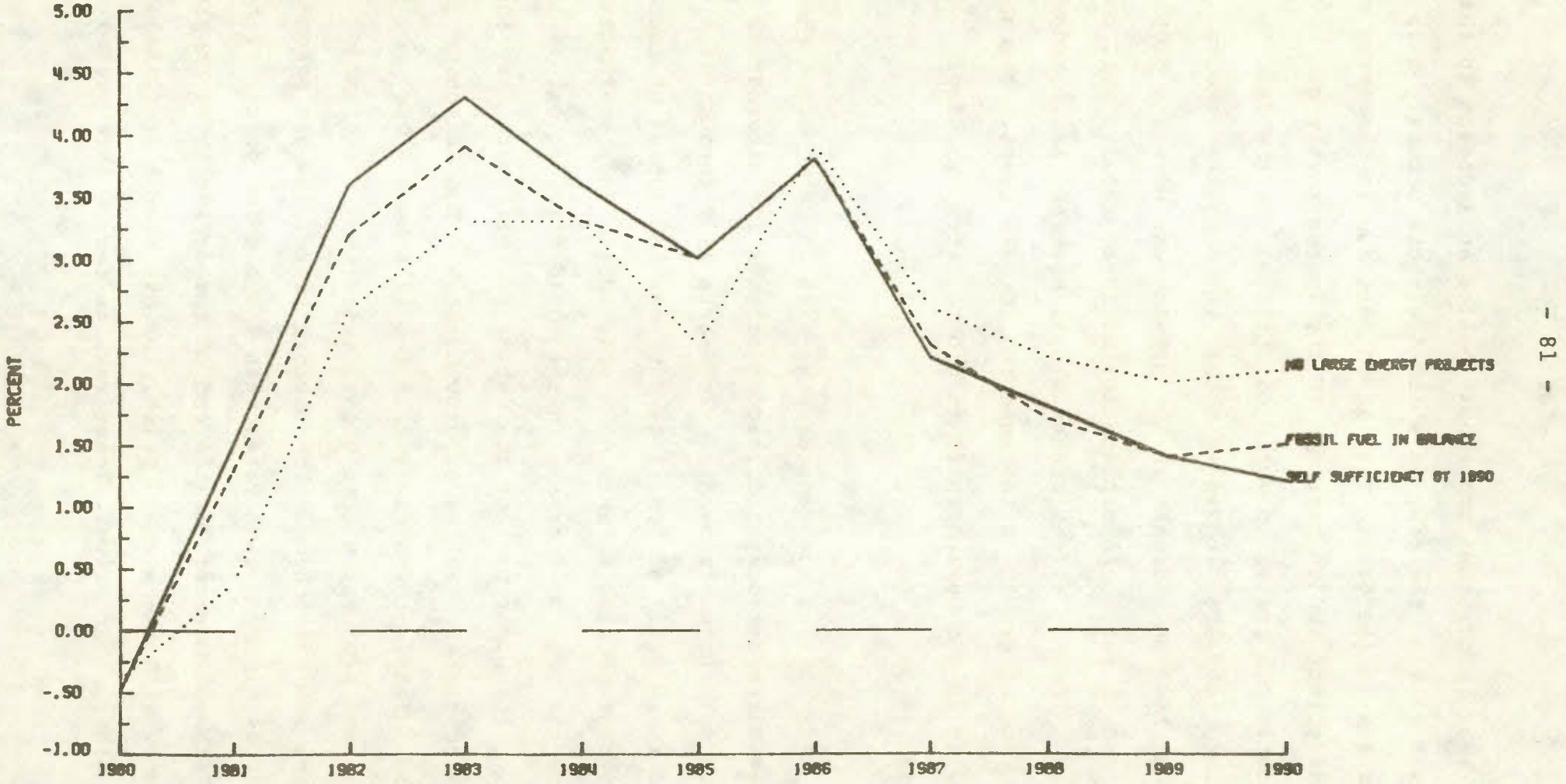

GROSS NATIONAL PRODUCT 71$ - % CHANGE (OIL $4-WORLD PRICE HIGH)
NO LARGE ENERGY PROJECTS
FOSSIL FUEL IN BALANCE
SELF SUFFICIENCY BY 1988
PERCENT
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-.50
-1.00
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990

Chart 14.3

GROSS NATIONAL PRODUCT 71$ - % CHANGE (OIL $4-WORLD PRICE SHOCK(1986))



per year. Note that the shock implies an increase in the growth rate in the year in which the shock occurs. This increase in the growth rate is in part due to the terms of trade effect and in part due to the insensitivity of domestic oil prices to world oil prices. In the case in which prices are blended we obtain the opposite results. Rather than an increase in the growth rate we see a drop in the growth rate. An explanation of these results will come later. The net effect of the shock, however, is to reduce the rate of growth in the long run for all cases. The shock results in a downward shift in growth rates by end of decade.

Let us now consider the case of self sufficiency under different domestic pricing schemes for alternative world pricing environments. In Charts 14.4 through 14.6 we find these results. Chart 14.4 traces the impact of four different pricing schemes on a self sufficiency environment where the rate of increase in the world price of oil is low. During the major part of the decade you will note that there is a consistent ranking of growth rates. The $2 scheme yields higher growth rates than the $4 scheme. The $4 scheme produces higher growth rates than the blended price, low gas scheme. The blended price, low gas scheme produces higher growth rates than the blended price, high gas scheme. However, at the end of the decade these rankings change, with the blended price, low gas scheme overtaking the other alternatives. These results can be interpreted

as follows: as we move from a $2 pricing scheme to a blended price, high gas scheme the real domestic price of oil is increasing. Our results demonstrate that higher real domestic prices have a depressing effect on domestic real growth rates. The results presented in Chart 14.5 also imply that higher world prices will have a depressing effect on domestic growth rates. A major impact of higher world prices is a downward shift in all growth rates, independent of the domestic pricing scheme in force.

The asymmetrical results obtained for blended pricing versus nonblended pricing under conditions of a world shock are seen in Chart 14.6. Under the blended pricing scheme oil prices are a weighted average of domestic costs and world prices. We saw that the increase in the world price is reflected in a dramatic increase in the CPI during the period of the shock. If prices are blended the effect on the CPI will have a tendency to eliminate, or work in the direction opposite to, the terms of trade effect. Under a blended pricing scheme the 1986 shock in world oil prices produces much lower real growth rates than the nonblended pricing schemes. However, once again by the end of the decade, the blended pricing schemes begin to overtake the nonblended pricing schemes.

In summary what have we learned? Charts 14.1 through 14.3 show the ranking of real growth rates in the

early part of the decade depends upon the intensity of the drive towards self sufficiency. They indicate that by end of decade the growth rates converge to a level near 3 per cent. These results also indicate that higher world prices will tend to depress GNP growth rates in general.

Charts 14.4 through 14.6 indicate the following: pricing schemes which make domestic prices sensitive to foreign prices will have a tendency, under varying foreign pricing environments, to depress growth in the presence of shocks and in the presence of high world price world environments relative to low priced world environments because of competitiveness and terms of trade effects.

Chart 14.4

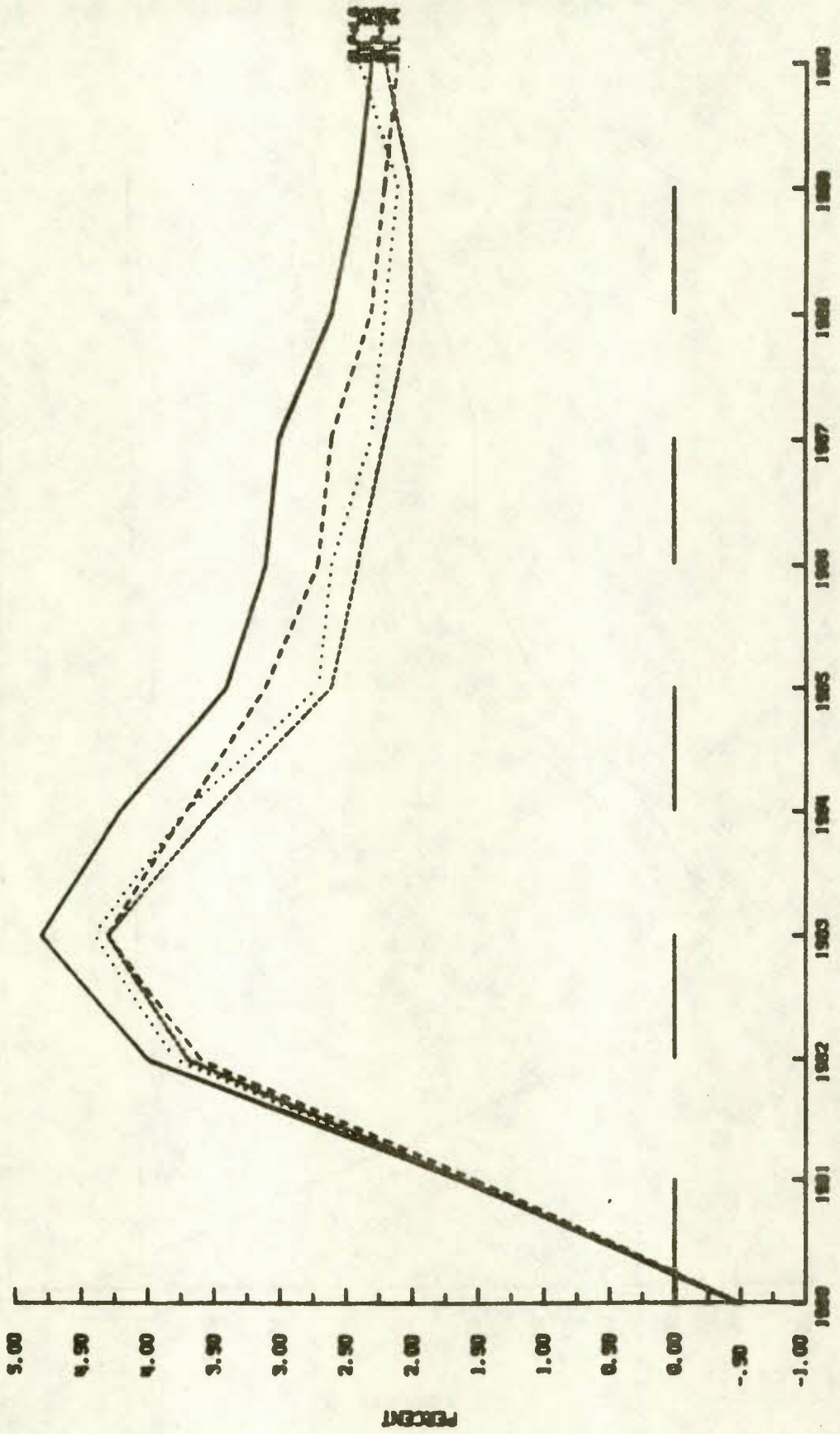

GROSS NATIONAL PRODUCT 71$ - % CHANGE (WORLD PRICE LOW-SELF SUFF BY 1990)
PERCENT
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
.50
0.00
-.50
-1.00
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990

Chart 14.5

GROSS NATIONAL PRODUCT 71$ - % CHANGE (WORLD PRICE HIGH-SELF SUFF BY 1990)

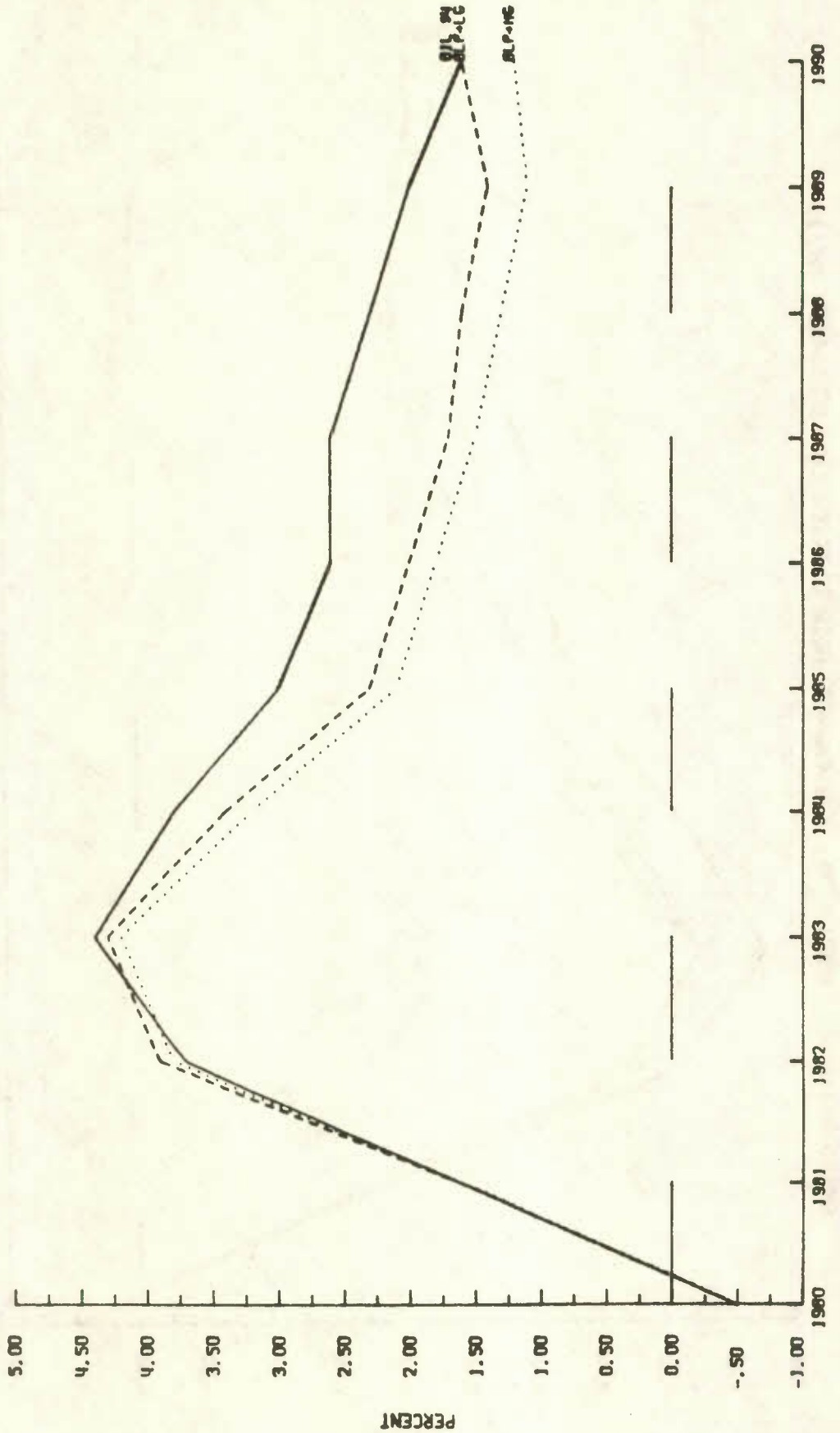
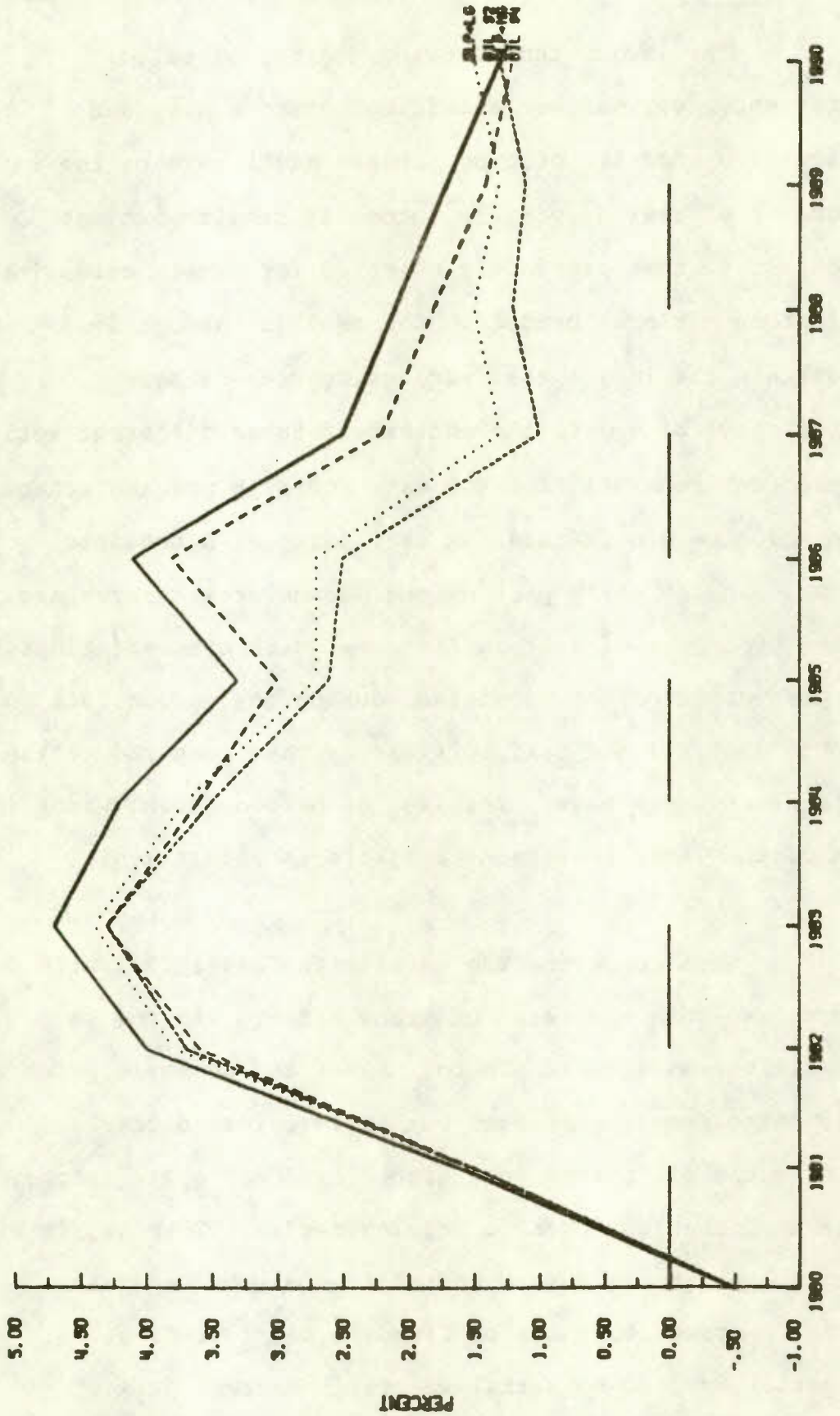


Chart 14.6

GROSS NATIONAL PRODUCT 71$ - % CHANGE (WORLD PRICE SHOCK-SELF SUFF BY 1990)



REAL DISPOSABLE INCOME

The impact that varying degrees of self sufficiency, various world pricing environments, and alternative domestic pricing schemes might have on the rate of growth of real disposable income is similar but not identical to that previously observed for growth rates in real gross national product. Charts 15.1 through 15.3 illustrate the impact that various degrees of self sufficiency, placed in the context of three different world pricing environments (for the same domestic pricing scheme), might have on growth rates in real personal disposable income. In the early part of the decade growth rates are ranked by degree of self sufficiency, with a spread close to 1.0 percentage points maintained during the period 1981 through 1986 for the self sufficiency case compared to the no large projects case. This is the period during which the bulk of the large investment projects is undertaken.

When comparing the results in Charts 15.1 with 15.2 we see both the terms of trade effect, and the competitiveness effect. In both cases the domestic price of crude petroleum is unchanged but world prices differ. Higher world oil prices mean higher real aggregate income, given an unchanged domestic pricing regime. This is, in part, due to the increased competitiveness of Canadian exports compared to those of Canada's major trading partners. We also note that we still observe, during

Chart 15.1

REAL DISPOSABLE INCOME - % CHANGE (OIL $4 - WORLD PRICE LOW)

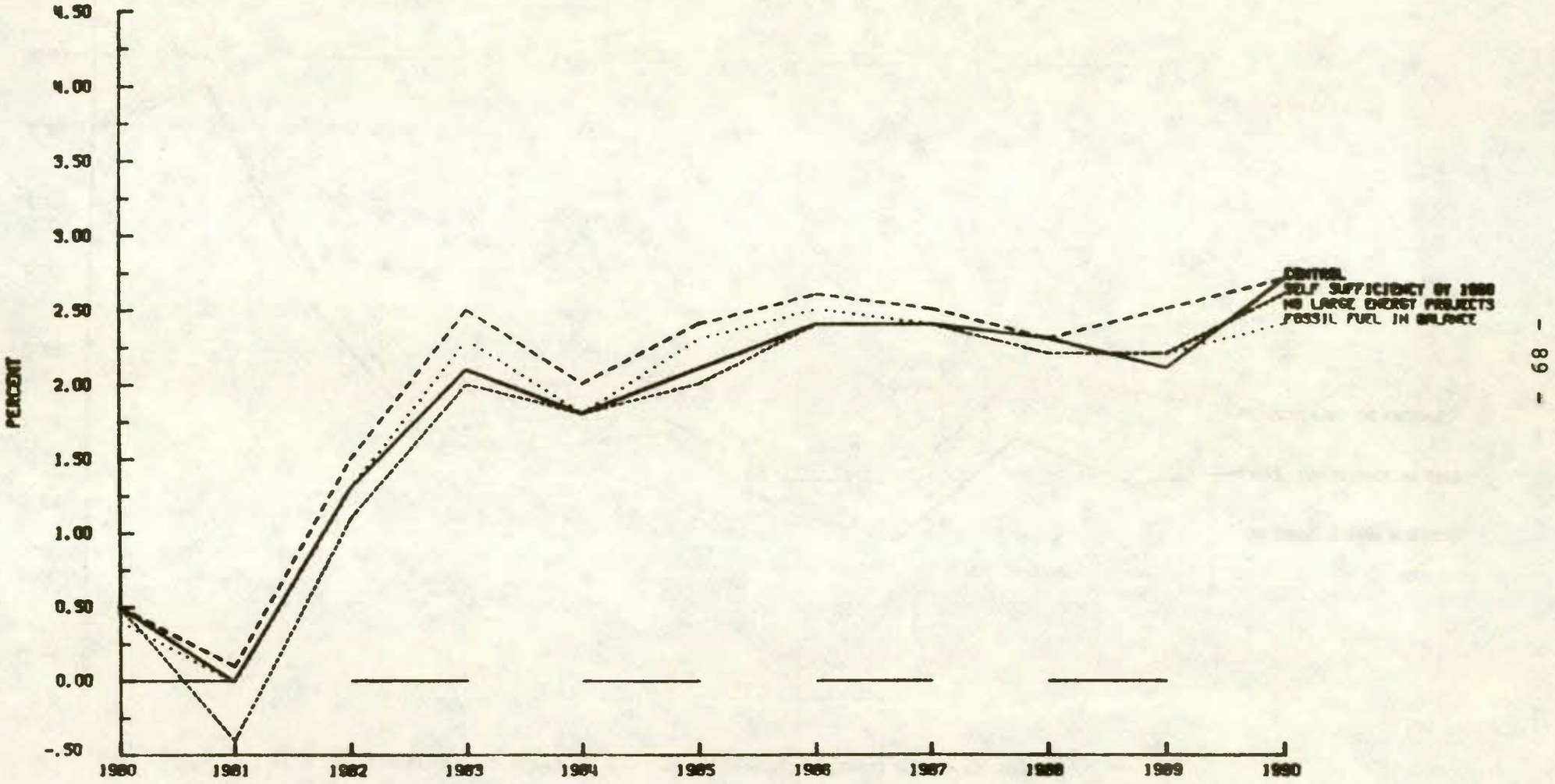


Chart 15.2

REAL DISPOSABLE INCOME - % CHANGE (OIL $4-WORLD PRICE HIGH)

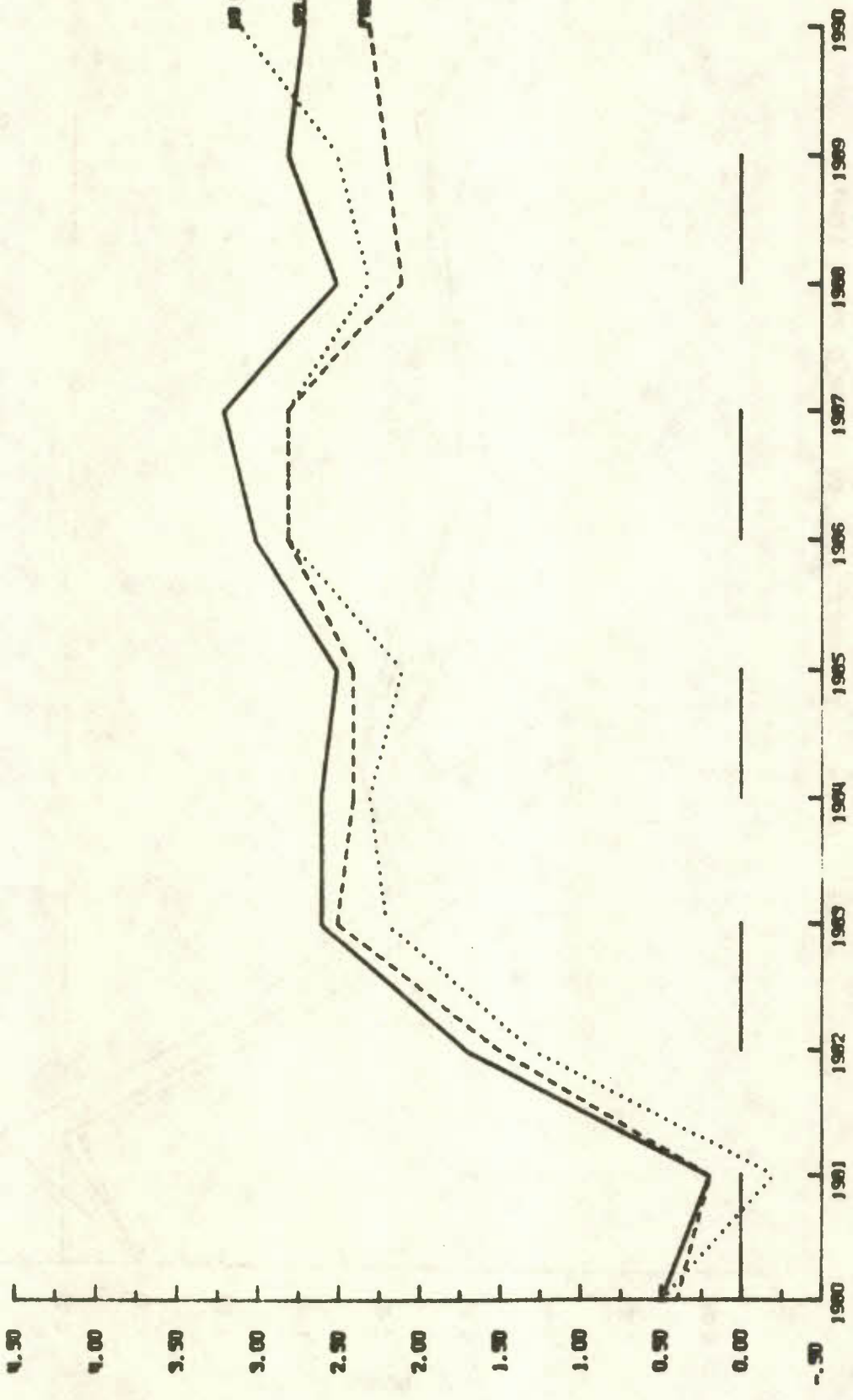
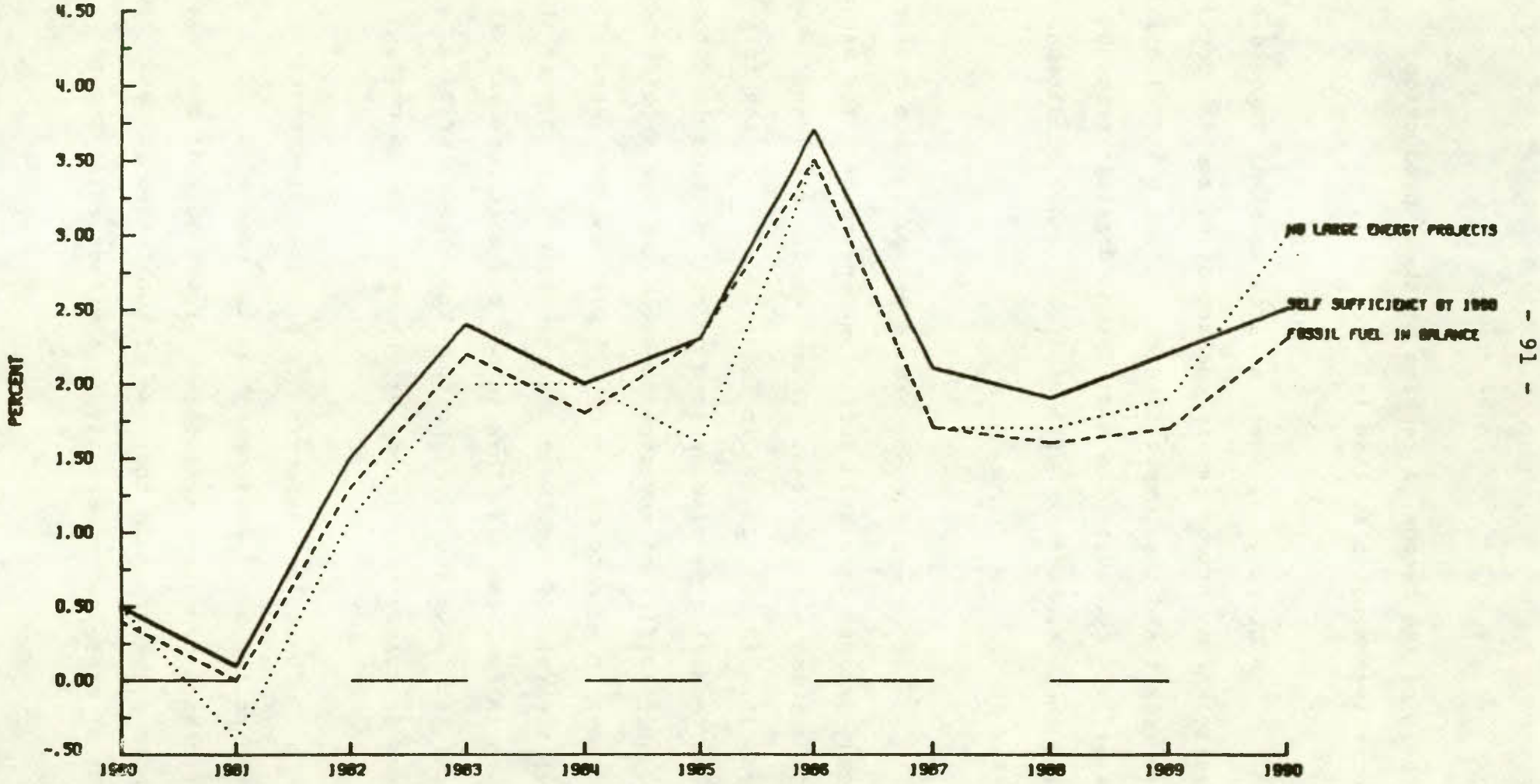


Chart 15.3

REAL DISPOSABLE INCOME - % CHANGE (OIL $4-WORLD PRICE SHOCK(1986))



the bulk of the decade, a ranking of these production alternatives similar to that in Chart 15.1.

In Chart 15.3, where a large shock is imposed but domestic energy prices remain unchanged, we see the terms of trade effect and the competitiveness effect quite clearly. However, when we switch to a different domestic pricing scheme these two effects will disappear under conditions of a large shock.

Let us examine now the impact of various domestic pricing schemes in a self sufficient environment for various world pricing alternatives. These results are found in Charts 15.4 through 15.6. In Chart 15.4 we see the impact of four domestic pricing schemes on real disposable income in a self sufficient environment where the world price of oil grows in a range of 1.0 to 1.5 per cent per year. The lower the rate of growth in domestic prices the higher the growth in real income. This is obvious when comparing the $2 oil path with the $4 oil path. The blended pricing scheme depresses real income growth below the $4 case.

Chart 15.5 supports our original statement that a higher priced world environment in the case of self sufficiency depresses real income growth more in the case of blended prices than in the case of nonblended prices. The terms of trade and competitiveness effect shift growth

rates upward (Chart 15.5) for the straight $4 case in a high priced world environment. However, for the case of blended pricing the high priced world environment shifts growth rates downward when compared to the low price environment (Chart 15.4). The same results are apparent in the case of a world price shock in 1986. Here the pricing schemes which are insensitive to world prices produce a growth benefit stemming from both the terms of trade and the competitiveness effect. This is seen clearly in Chart 15.6. The cases in which domestic prices are blended show the opposite response; a fall in real income growth in response to a world price shock.

In summary the results for growth in real personal disposable income are similar to those we obtain for growth in real gross national product. However, we have gained additional information. This pertains to the impact that blended pricing has on competitiveness and the terms of trade when comparing identical self sufficiency schemes in world environments where world pricing levels differ. The blended pricing schemes nullify terms of trade and competitiveness effects, while pricing schemes which are independent of world price levels reinforce terms of trade and competitiveness effects when comparing two world pricing environments. Other than this, the positive influence that the large energy projects will have on real income growth and the depressing effects that higher domestic prices will impart to income growth are apparent.

Chart 15.4

REAL DISPOSABLE INCOME - % CHANGE (WORLD PRICE LOW-SELF SUFF BY 1990)

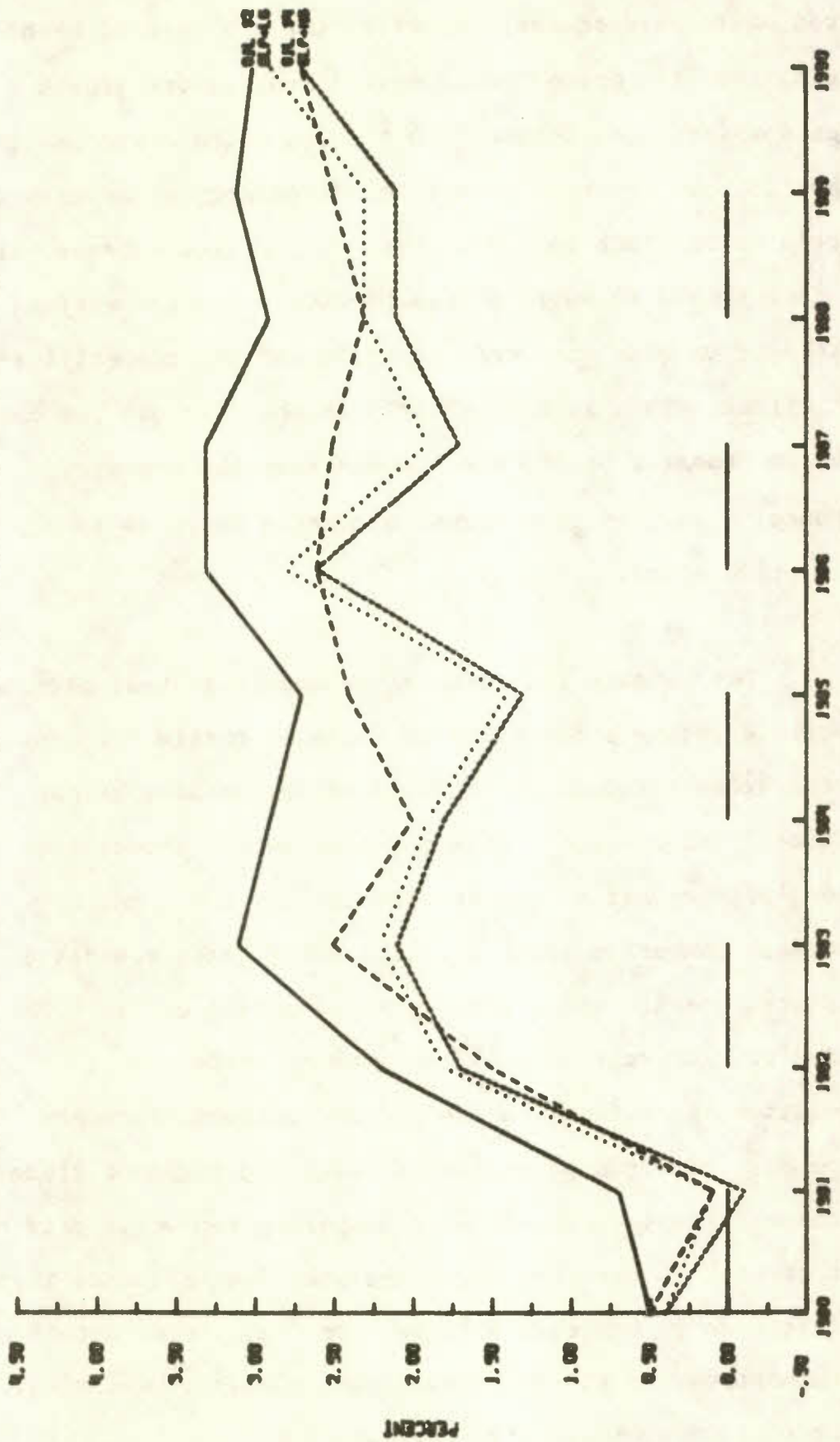


Chart 15.5

REAL DISPOSABLE INCOME - % CHANGE (WORLD PRICE HIGH-SELF SUFF BY 1990)

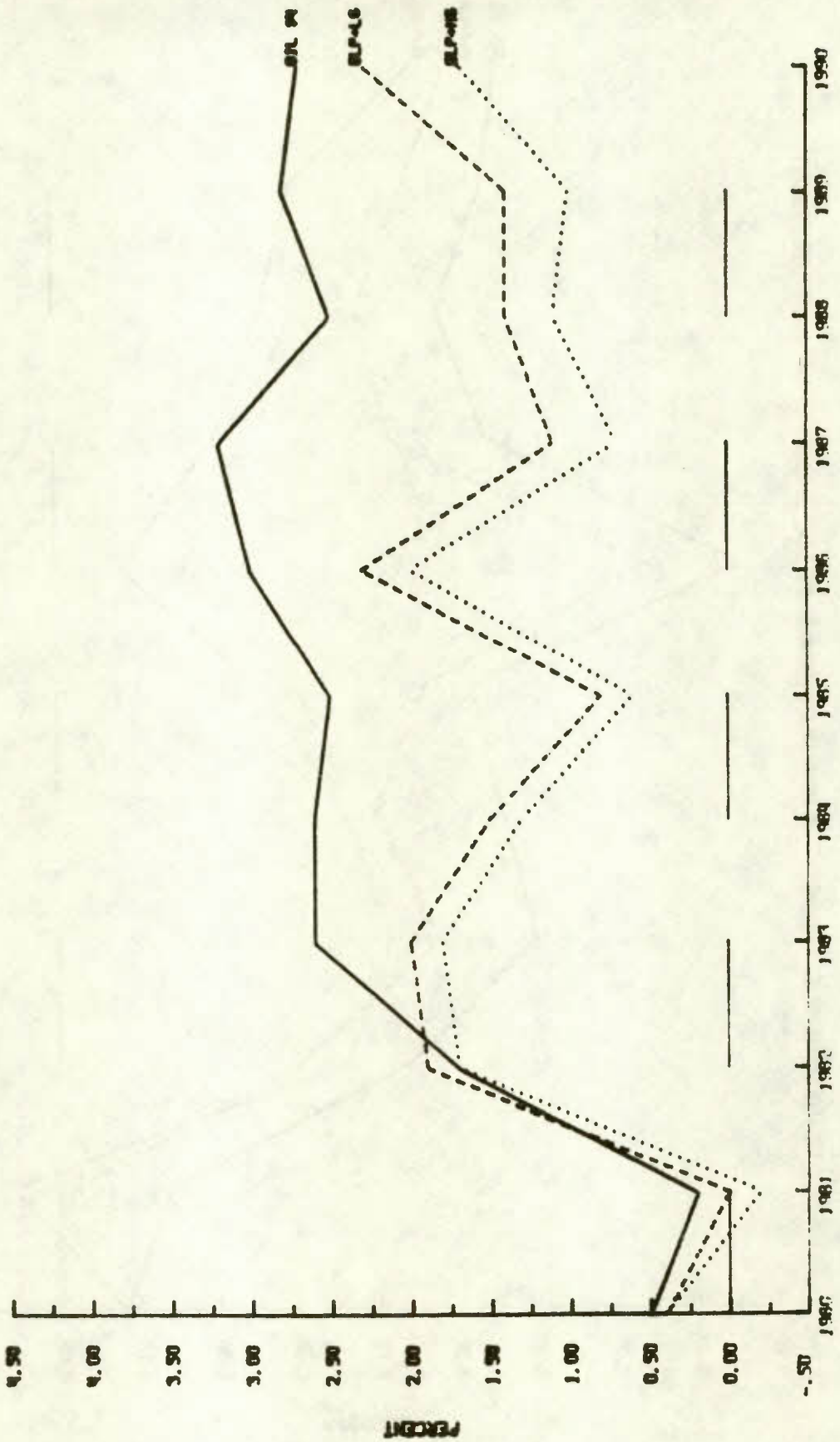
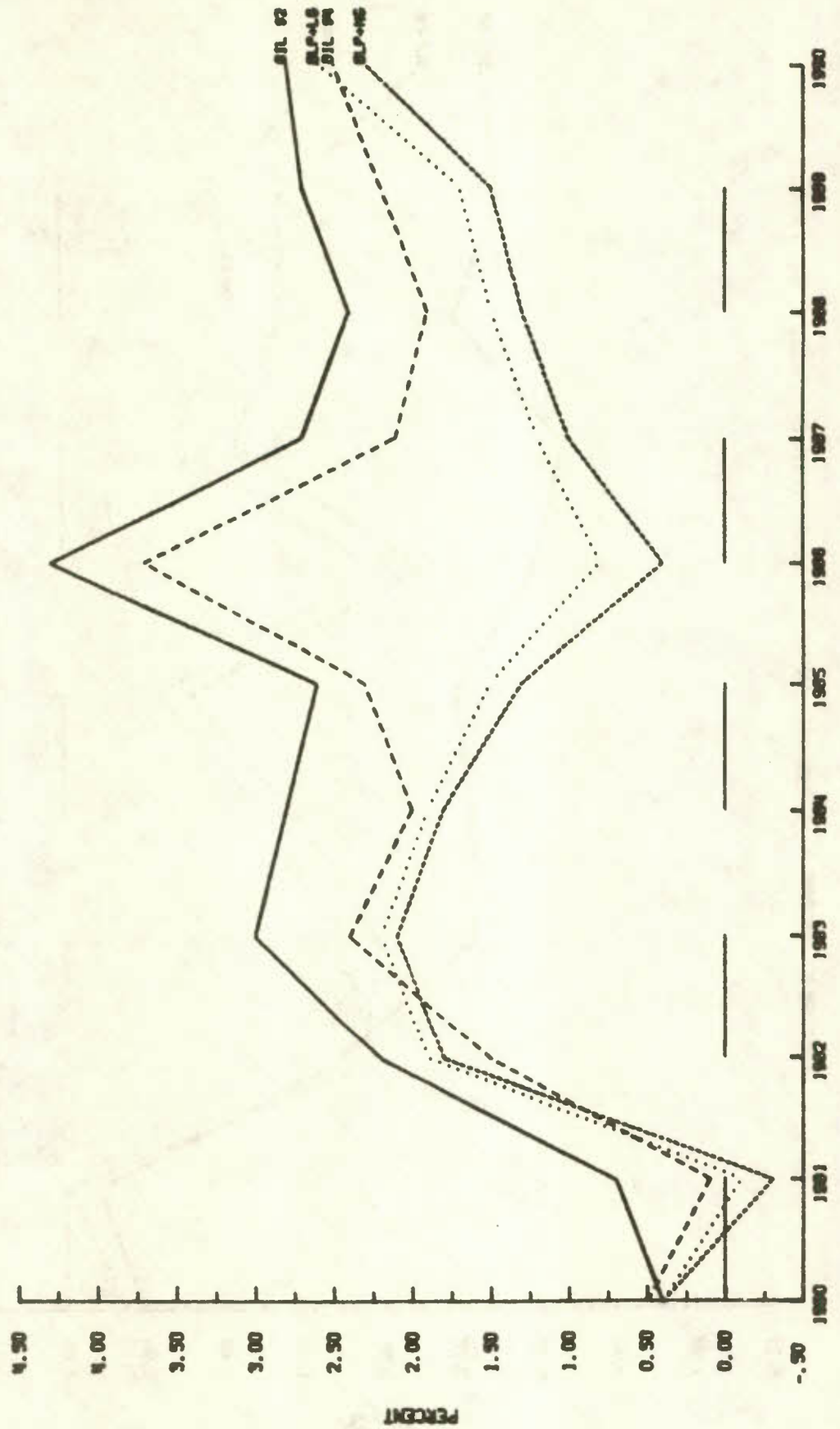


Chart 15.6


REAL DISPOSABLE INCOME - % CHANGE (WORLD PRICE SHOCK-SELF SUFF BY 1990)
PERCENT
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-.50
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990

EMPLOYMENT

We have reported pricing, GNP, and real disposable income effects. Let us now consider the employment effects of these various alternatives. We will measure these effects in the following manner. Rather than charting the levels of each individual alternative for the various domestic and foreign pricing schemes, we will chart the amount by which each alternative deviates cumulatively from the Council's base case solution. The Council's base case solution was not a self sufficiency alternative nor was it a no large projects alternative; it was between these two extremes. Under these circumstances the zero line in Charts 16.1 to 16.6 represents the base case. The remaining lines in each figure represent the cumulative difference through time from the base case for each alternative.

As in our previous presentations we divide the simulations into two groups, each with three cases with each case having a number of alternatives. Let us consider first Charts 16.1 to 16.3. Chart 16.1 shows the cumulative difference from the Council's base case in a $4 domestic price environment with a low world price assumption for, (1) the self sufficiency case, (2) the fossil fuel balance case, and (3) the no large energy projects case. These graphs show quite clearly that self sufficiency will cumulatively stimulate, directly and indirectly, 900,000 more jobs during the decade than the Council's base case. The no

Chart 16.1

EMPLOYMENT - THOUSANDS (OIL $4 - WORLD PRICE LOW)

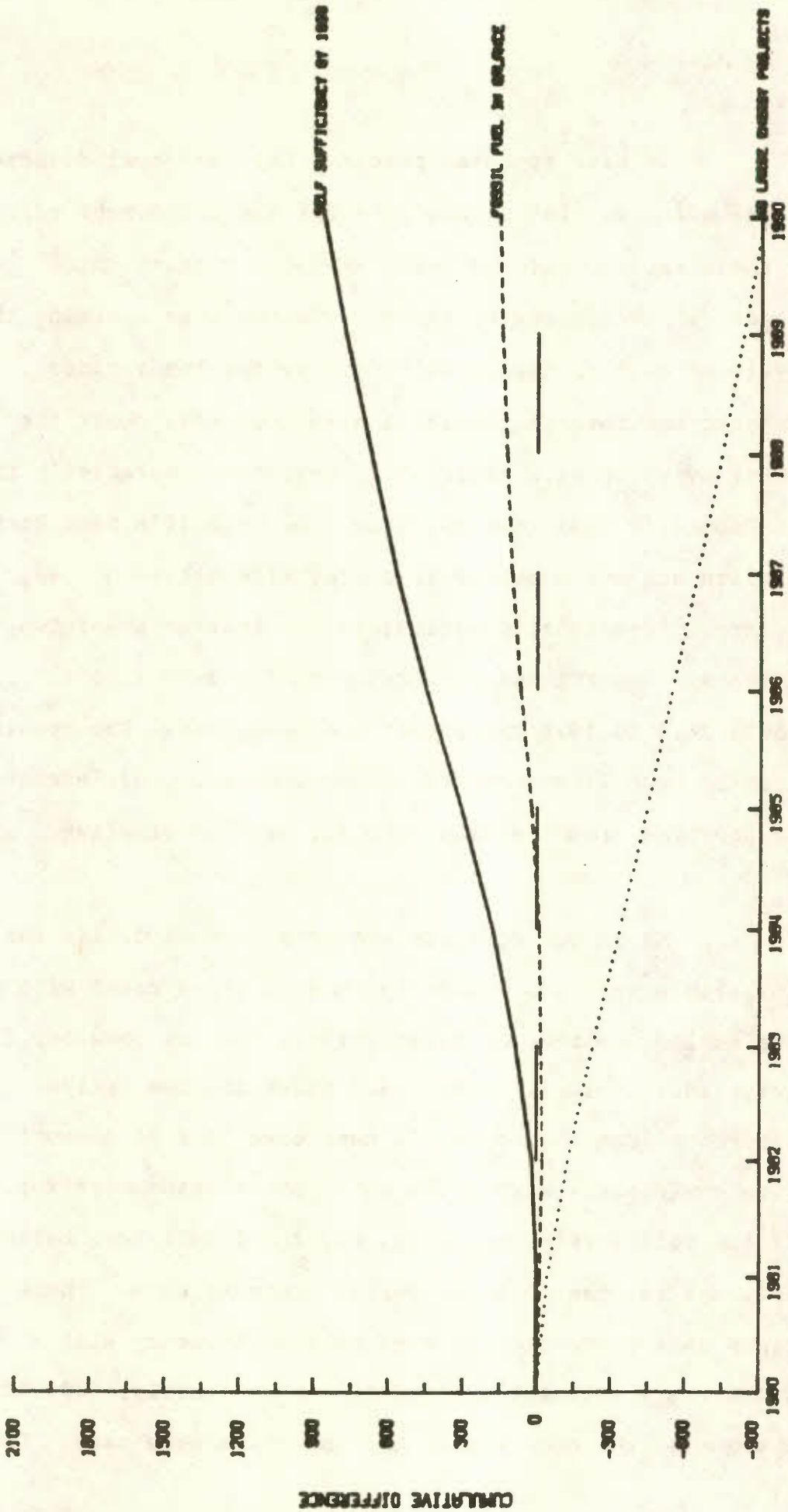


Chart 16.2

EMPLOYMENT - THOUSANDS (MIL $4-WORLD PRICE HIGH)

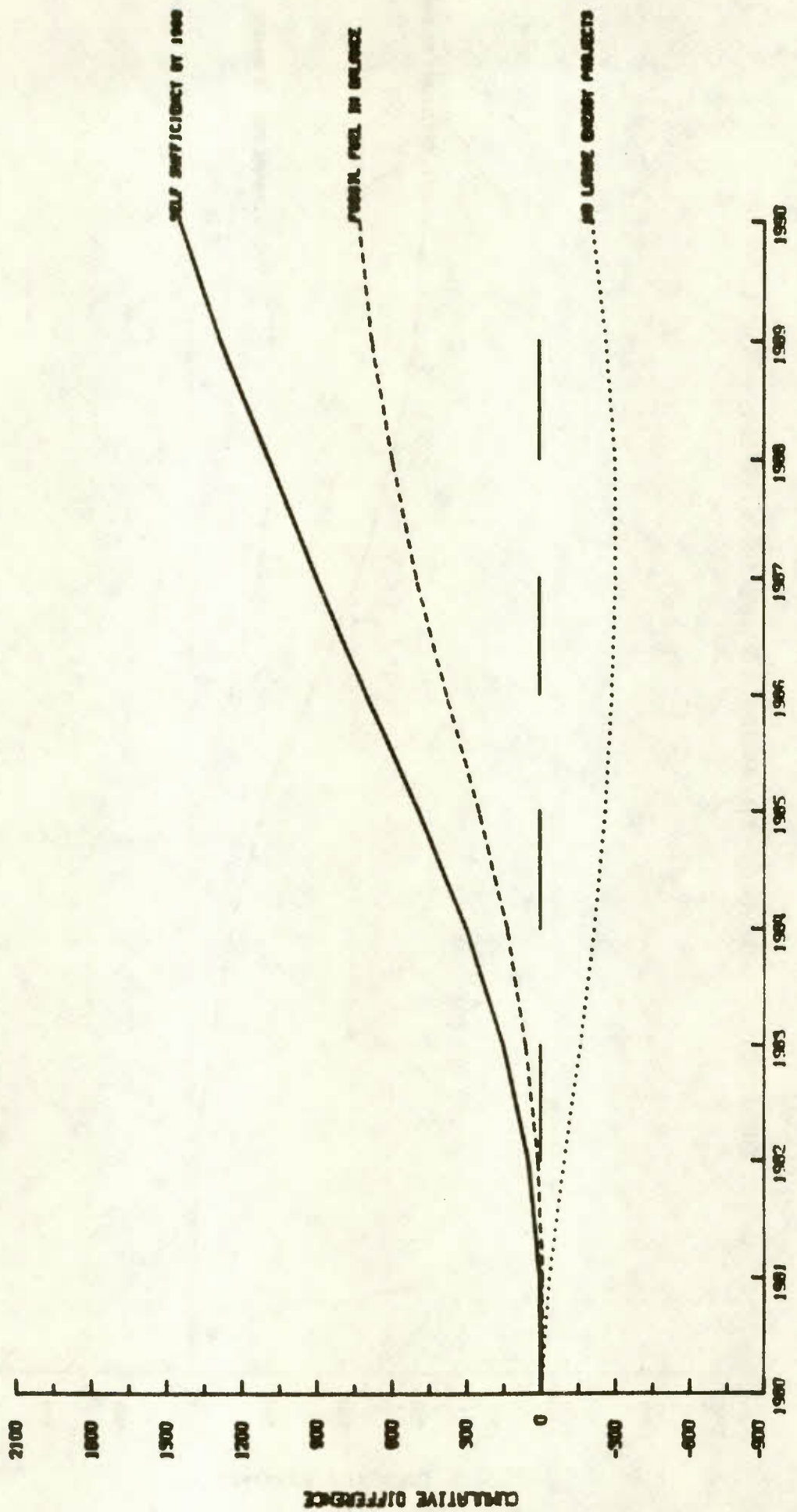
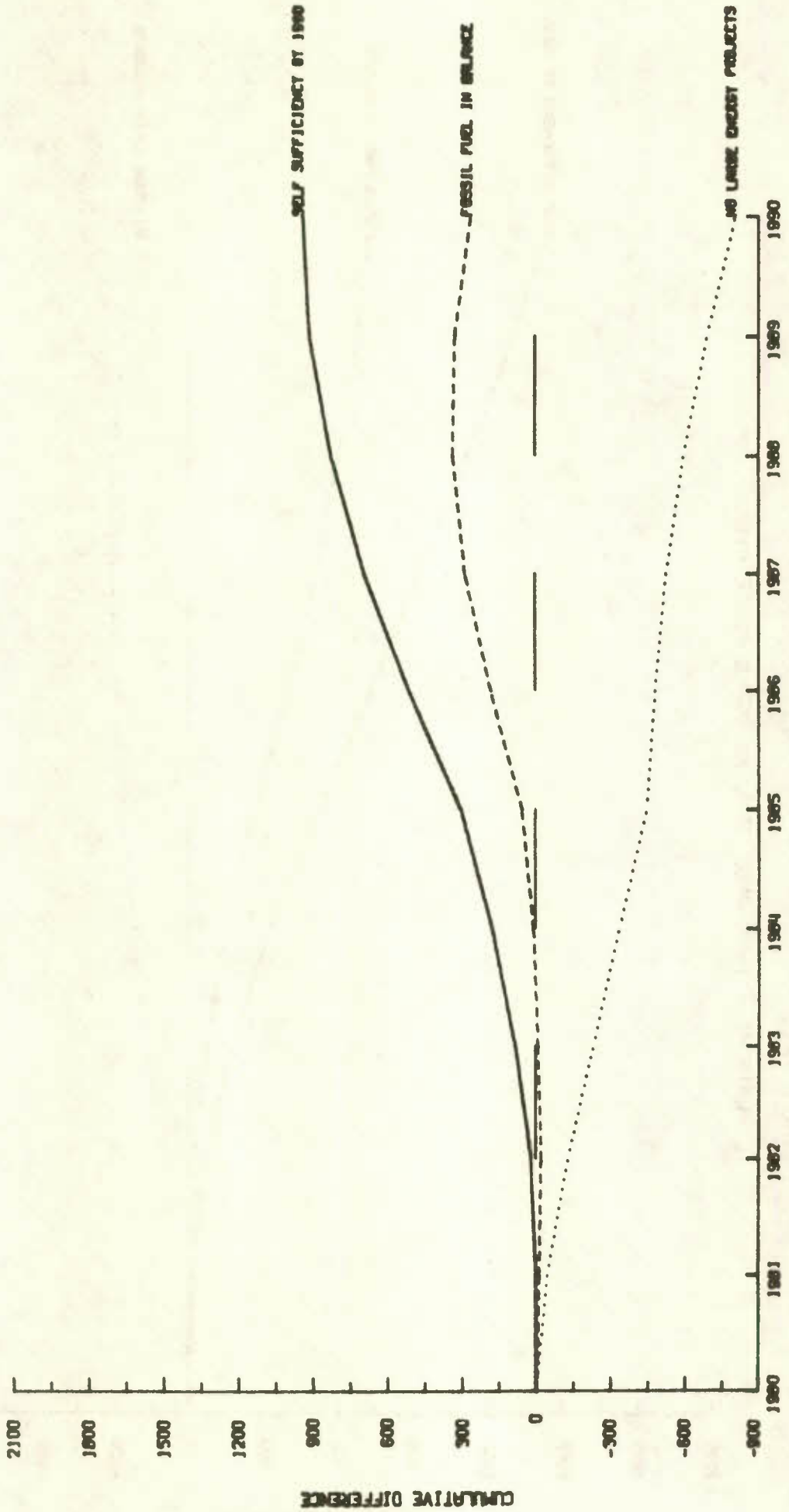


Chart 16.3

EMPLOYMENT - THOUSANDS (OIL $4-WORLD PRICE SHOCK(1986))



large energy projects alternative will cumulatively stimulate 900,000 less jobs during this period. The investment projects outlined in the section on self sufficiency plus the large pipeline and utility investments described earlier could cumulatively account for both directly and indirectly 1.8 million person years of employment. The fossil fuel in balance solution provides for a cumulative impact that is just marginally greater than the Council's base case.

A higher world price environment shifts these three graphs upwards, but the spread between self sufficiency by 1990 and no large energy projects remains the same. The upward shift is due to the terms of trade and competitiveness effect stemming from the maintenance of domestic prices below international prices in a high priced international environment. In the world price shock in 1986 alternative there is still a spread between self sufficiency and no large projects but each alternative tends to level off and turn down.

Let us now consider what happens in a self sufficient environment under different domestic pricing schemes and alternative world pricing developments. Charts 16.4 through 16.6 record these results. Cheap oil domestically produces employment growth. This does not mean cheap oil produces real income growth, because exchange rate effects must also be taken into account. The $4 oil scheme

and the two blended pricing schemes are similar in their impact. Remember that the $4 oil scheme of Chart 16.5 is the same as the self sufficiency solution in Chart 16.1. The blended pricing schemes have a tendency to reduce employment opportunities by the end of the decade. However, the employment opportunities are still greater than in the Council's base case which is not self sufficient and does not include a blended pricing scheme. A blended price, self sufficient environment turns out to be better in the long run, job wise, than the current alternative which the Economic Council of Canada is using as the base case for development of alternatives.

What happens in a high priced world? Again one can see in Chart 16.5 the impact of the terms of trade effect and the competitiveness effect within the context of a $4 oil alternative. One also can see the way blended pricing schemes nullify these effects. In a high priced world oil environment with the same domestic pricing assumptions, employment opportunities would be expanded because of terms of trade and competitiveness effects. However, under blended prices they would move back close to the base case by end of decade. This is also seen in Chart 16.6, which records the results of a price shock in 1986. When domestic prices are only indirectly sensitive to such shocks we see terms of trade and competitiveness effects. But, when blended prices are directly sensitive to

external price shocks we see that these effects are cancelled due to the direct transmission of the price shock to higher living costs.

What have we learned here? We have learned that the large energy projects may cumulatively account for 1.8 million person years of employment during this decade. We have learned that high world price environments for energy, where Canadian domestic prices are insensitive to these high prices, will produce competitive and terms of trade effects. We have indicated that blended pricing schemes will have a tendency to cancel these competitiveness and terms of trade effects, but these negative effects are not as disastrous as the employment effects of the no large energy projects alternative.

Thus far we have seen some pluses and some minuses. The pluses are associated with the quantity and price effects that result from moving to a self sufficient environment. We have seen higher growth in the early part of the decade and less inflation by the end of the decade. The negatives are associated with the domestic pricing schemes that might prevail during a move to a self sufficient environment. Pricing schemes which make Canada more sensitive to world prices will make Canada less competitive. They defuse terms of trade effects in large price shock environments.

Chart 16.4

EMPLOYMENT - THOUSANDS (WORLD PRICE LOW-SELF SUFF BY 1990)

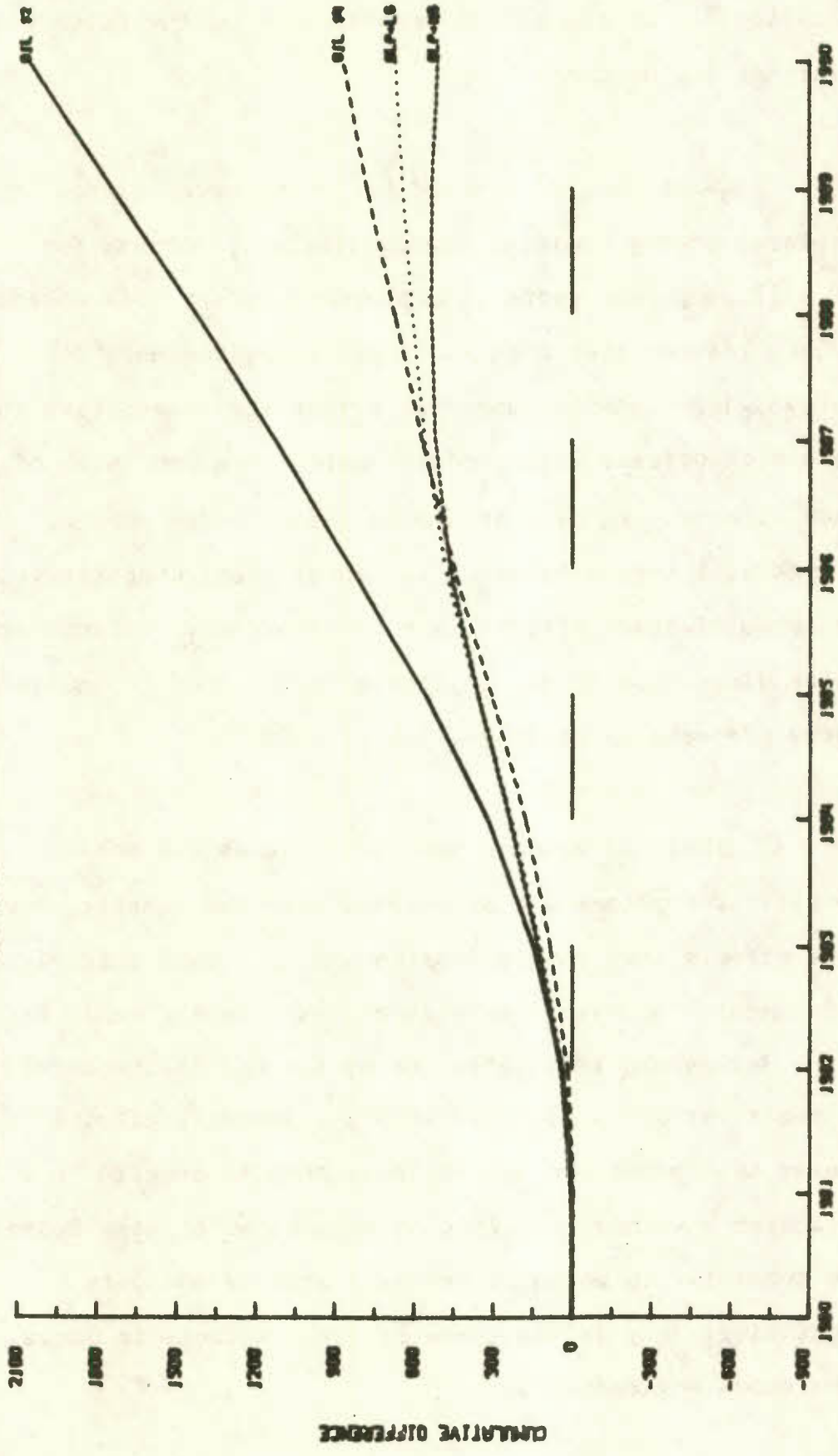


Chart 16.5

EMPLOYMENT - THOUSANDS (WORLD PRICE HIGH-SELF SUFF BY 1990)

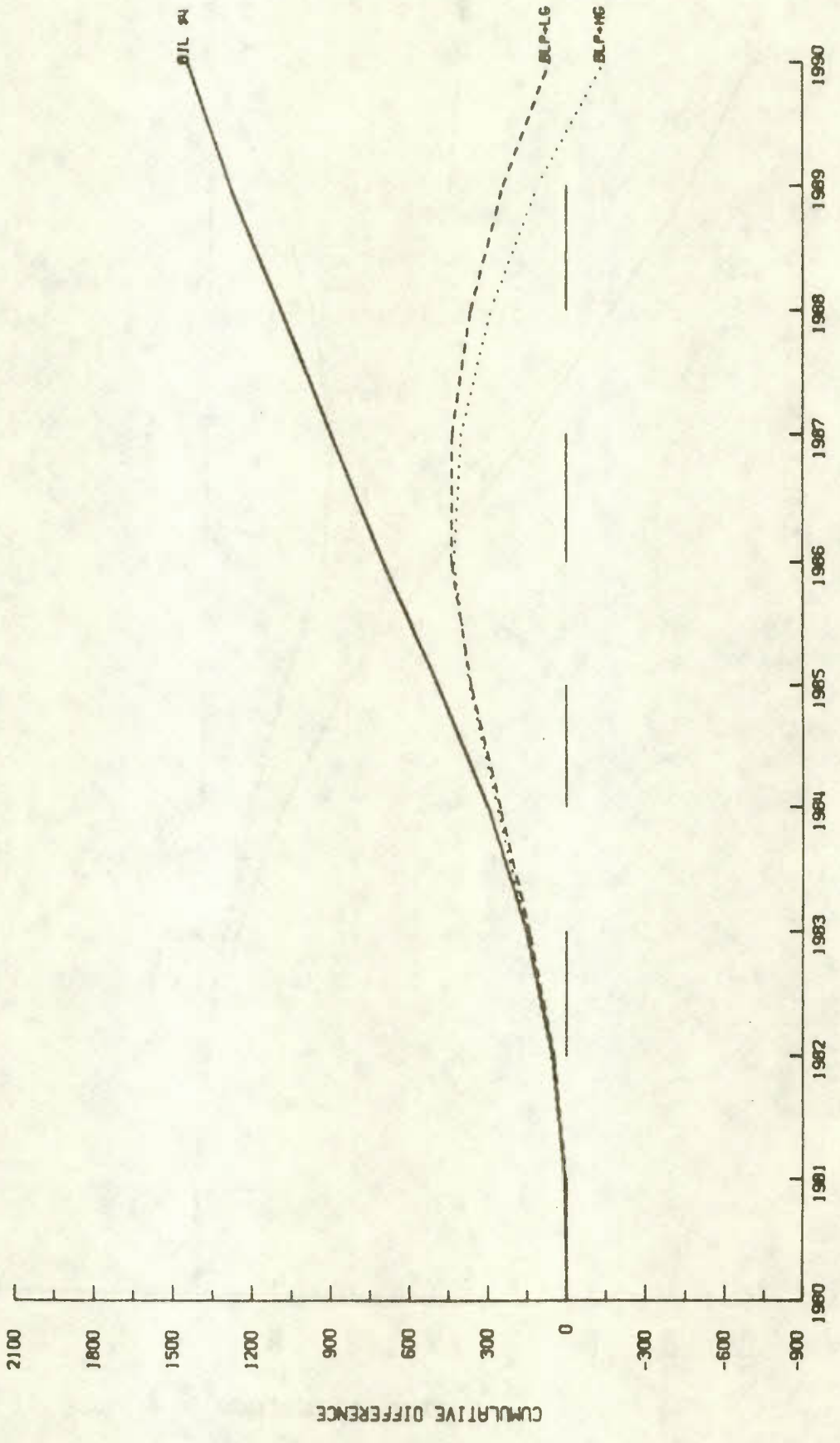
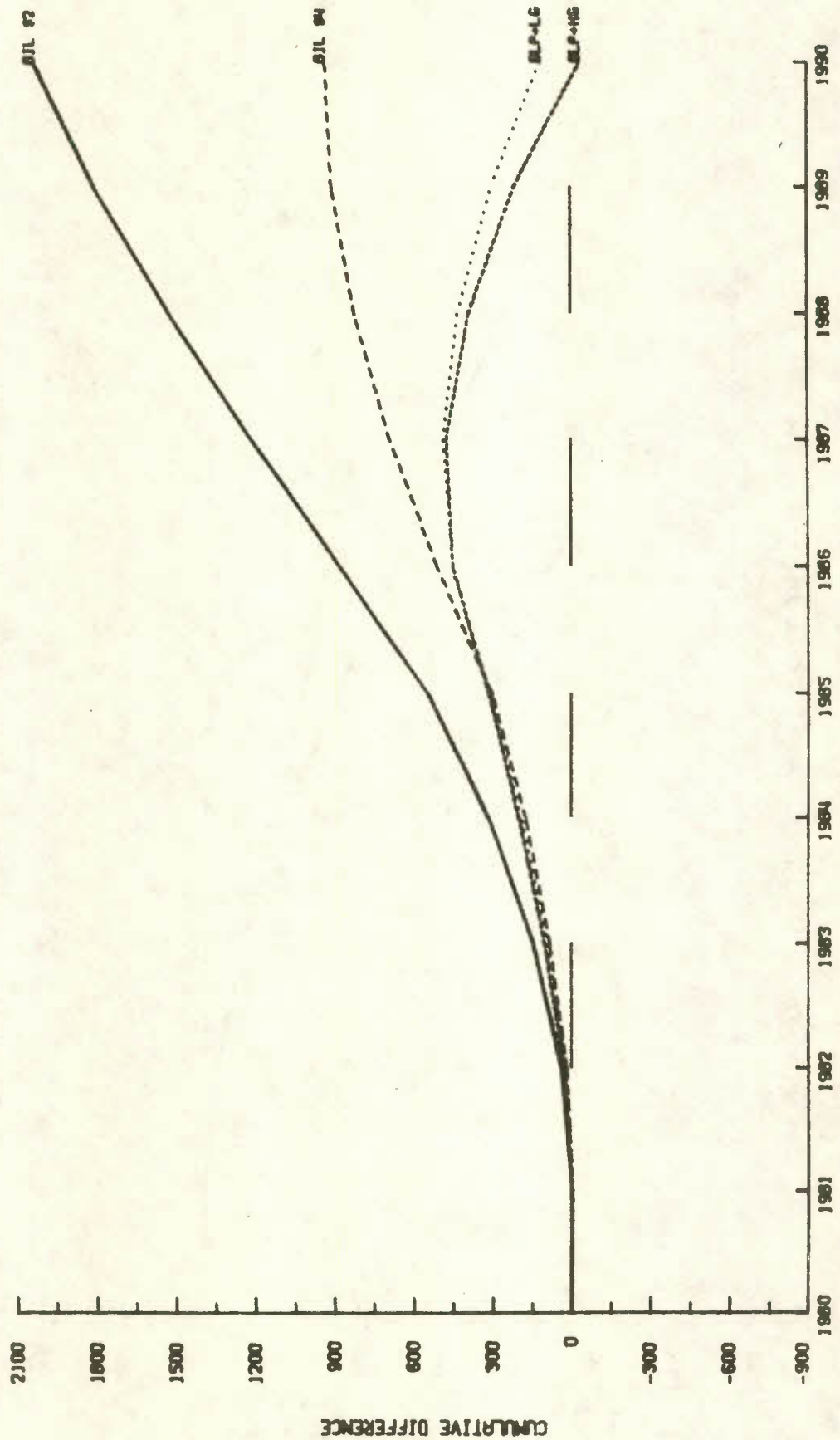


Chart 16.6

EMPLOYMENT - THOUSANDS (WORLD PRICE SHOCK-SELF SUFF BY 1990)



CURRENT ACCOUNT BALANCE

Let us consider the current account balance. The current account balance as a percentage of GNP is recorded in Charts 17.1 through 17.6. As noted before, we will examine two groups of alternatives and within each group, three cases. The first group deals with the impact on the current account balance of various degrees of self sufficiency under a domestic pricing scheme of $4 per barrel per year for three alternative world pricing environments. These results are quite dramatic. One must remember, in interpreting these results, the investment projects begin in the early part of the decade. They do not pay off until the latter part of the decade. As a result, the effects on the balance of payments emerge after 1987. If we had run our simulations to 1987 only, we would have missed these results. From this point of view, it is clear that the perspective you must have on energy is one that spans as a minimum a whole decade, and perhaps two.

In Chart 17.1 we see the current account balance as a percentage of GNE for four alternative degrees of self sufficiency or dependence. It is clear what is happening. The more self sufficient Canada is, the stronger the current account balance. It is interesting to note that the ranking with respect to strength of current account balance is identical to the ranking with respect to weakness of inflation. The more self sufficient Canada is the lower

Chart 17.1

CURRENT ACCOUNT BALANCE - % OF G.N.P. (OIL $4 - WORLD PRICE LOW)

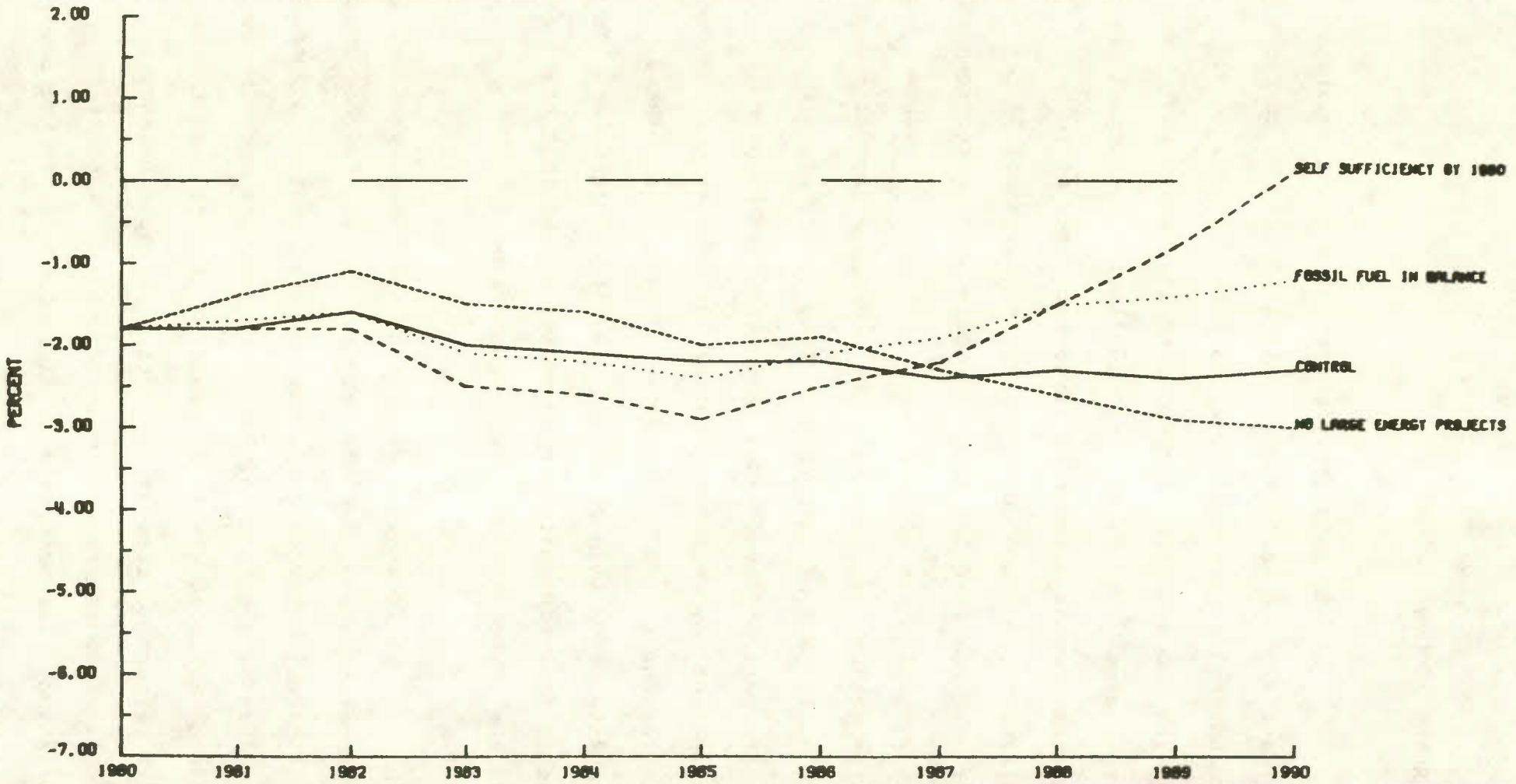


Chart 17.2

CURRENT ACCOUNT BALANCE - % OF G.N.P. (OIL $4-WORLD PRICE HIGH)

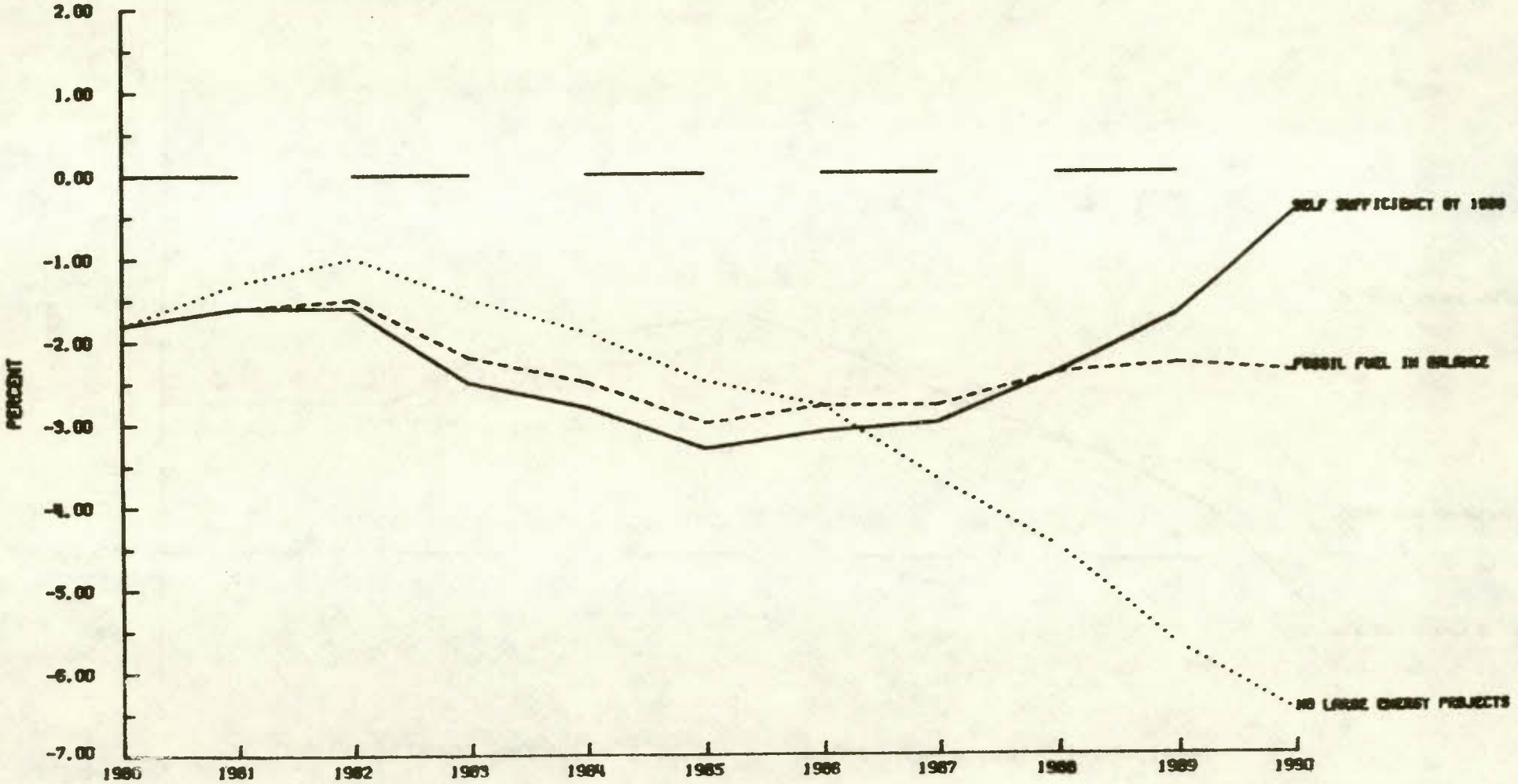
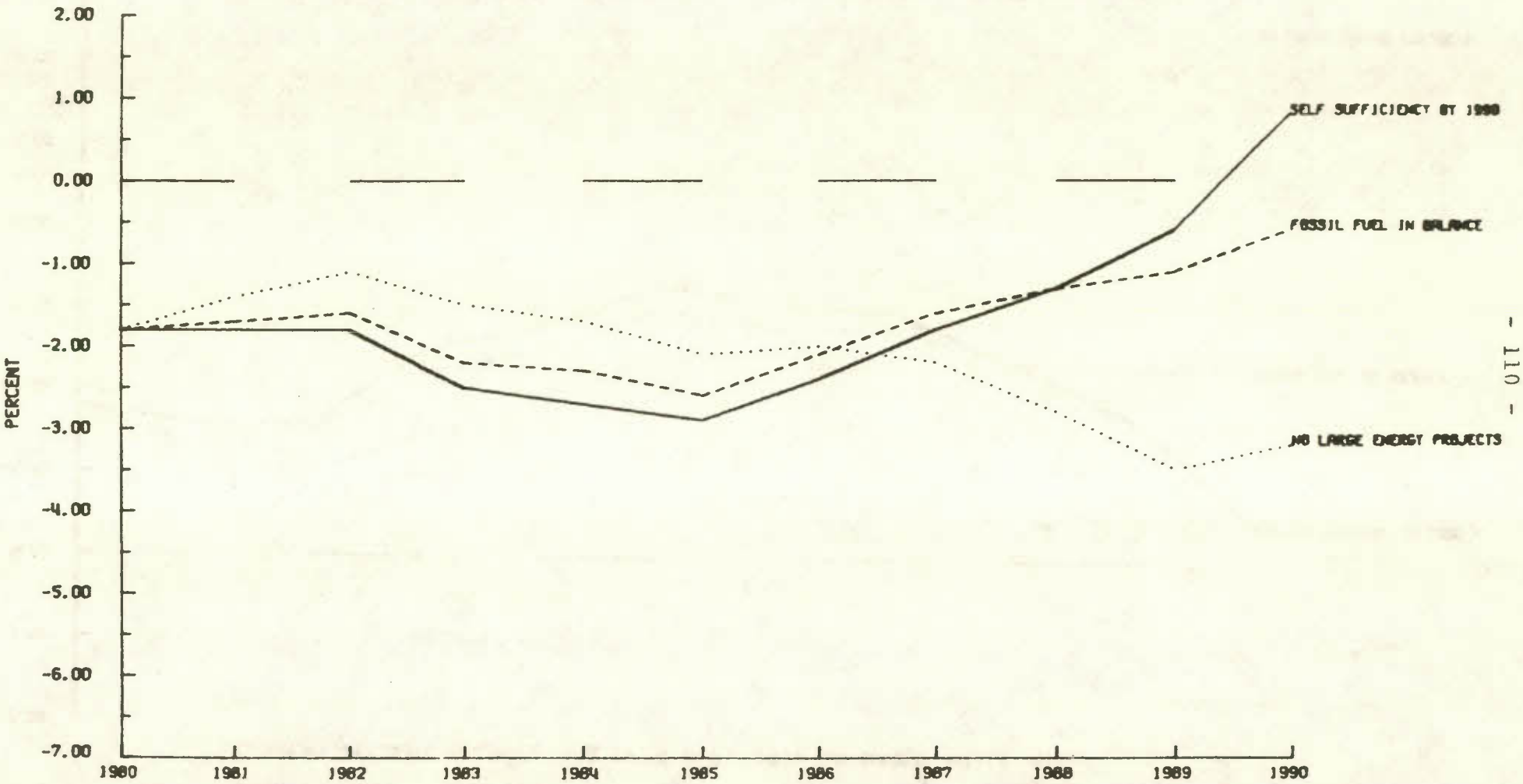


Chart 17.3

CURRENT ACCOUNT BALANCE - % OF G.N.P. (OIL $4-WORLD PRICE SHOCK(1986))



the rate of inflation; the more self sufficient Canada is the less negative the current account balance as a percentage of GNE. However, during the period in which we are driving towards self sufficiency the current account balance weakens. This is due to induced imports resulting from higher levels of activity brought on by more energy investment.

What does a higher world price environment imply for the current account balance under varying degrees of self sufficiency? These results are recorded in Chart 17.2. Under a higher world price environment, Canada's trade balance in a self sufficient environment by end of decade is not much different than under a lower priced world environment. However, the no large energy projects alternatives show considerable weakness in a high world price environment. In a sense this illustrates the problems that Canada will face if we do not pursue the large energy projects. If this is the case, Canada's current account balance will continue to weaken. In a self sufficient environment the current account balance will not be much different in either a high or low world price environment. Self sufficiency will insulate Canada from the influence that high or low energy prices could have on the current account balance as the decade draws to a close. These results also hold in the case of a large price shock. We record this case in Chart 17.3.

Let us now consider the impact of various domestic pricing schemes in a self sufficient environment for alternative world pricing developments. We see in Charts 17.4 to 17.6 some extremely interesting results. In a self sufficient environment blended prices will marginally improve the current account balance. This is true in the case of low world prices (Chart 17.4), high world prices (Chart 17.5), and under conditions of a world price shock (Chart 17.6). Canada's trade balance will be strongest in a self sufficient blended price environment. These results, of course, will have a major influence on the exchange rate. Let us consider these effects next.

Much of the movement in the current account balance in the various alternatives arises from movements in the fossil fuel balance. When Canada's imports of crude petroleum fall to zero in the self sufficiency scenario the fossil fuel balance improves considerably in any of the international pricing environments. In those alternatives which explored the possibility of a non-negative fossil fuel balance it can be seen from Appendix Table A.17 that the fossil fuel balance is in balance throughout the period in all the pricing alternatives.

Chart 17.4

CURRENT ACCOUNT BALANCE - % OF G.N.P. (WORLD PRICE LOW-SELF SUFF BY 1990)

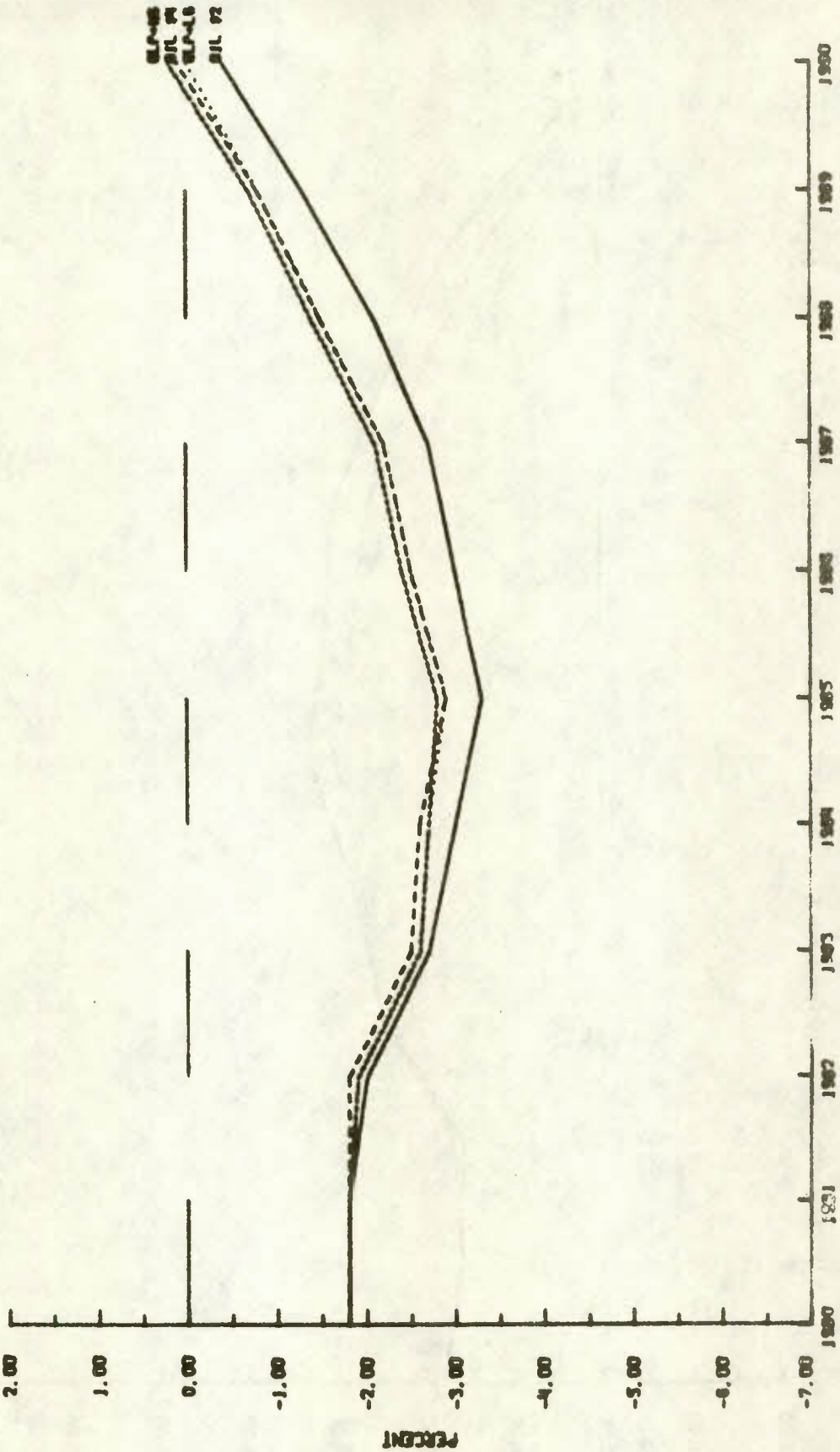


Chart 17.5

CURRENT ACCOUNT BALANCE - % OF G.N.P. (WORLD PRICE HIGH-SELF SUFF BY 1990)

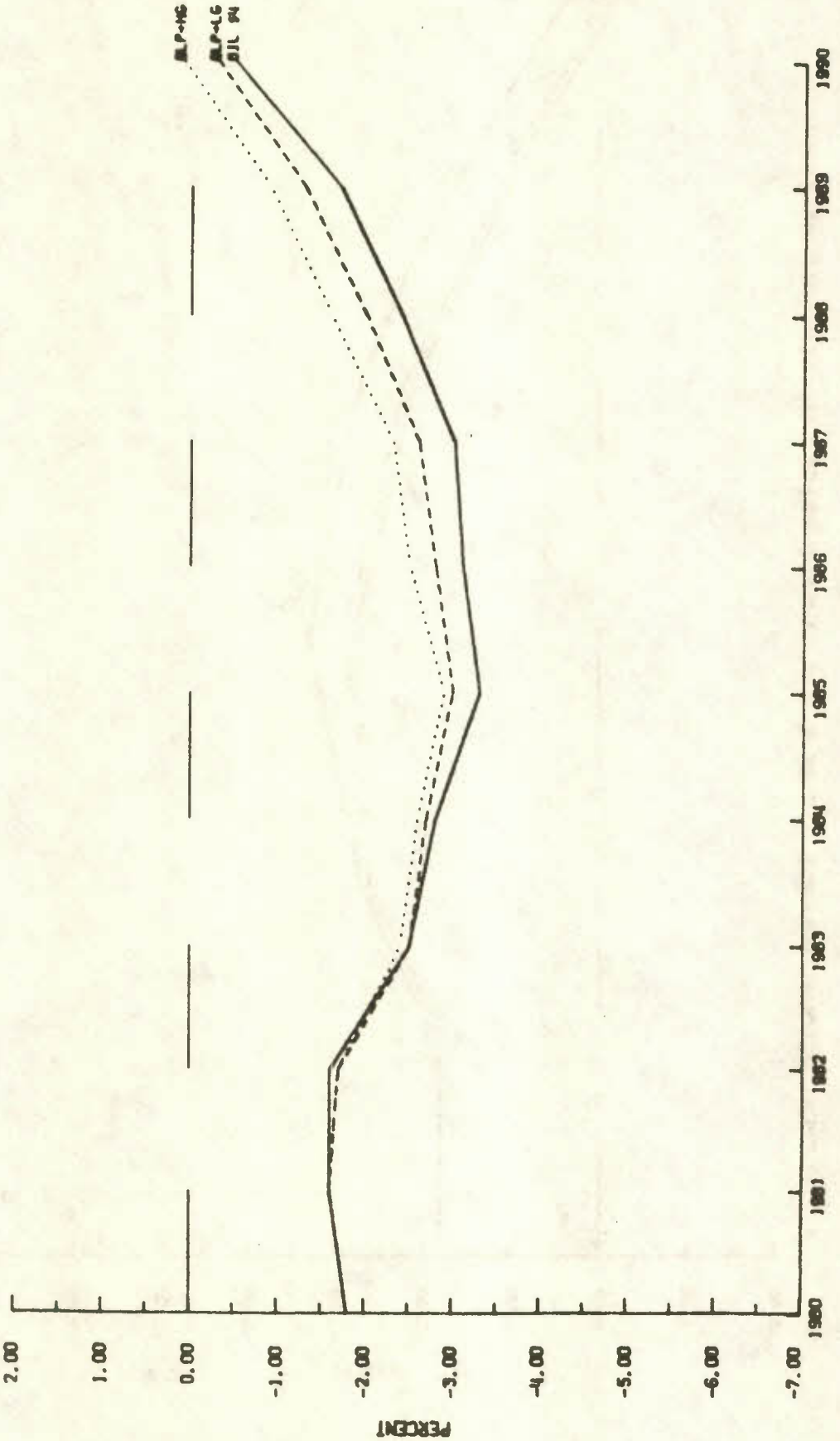
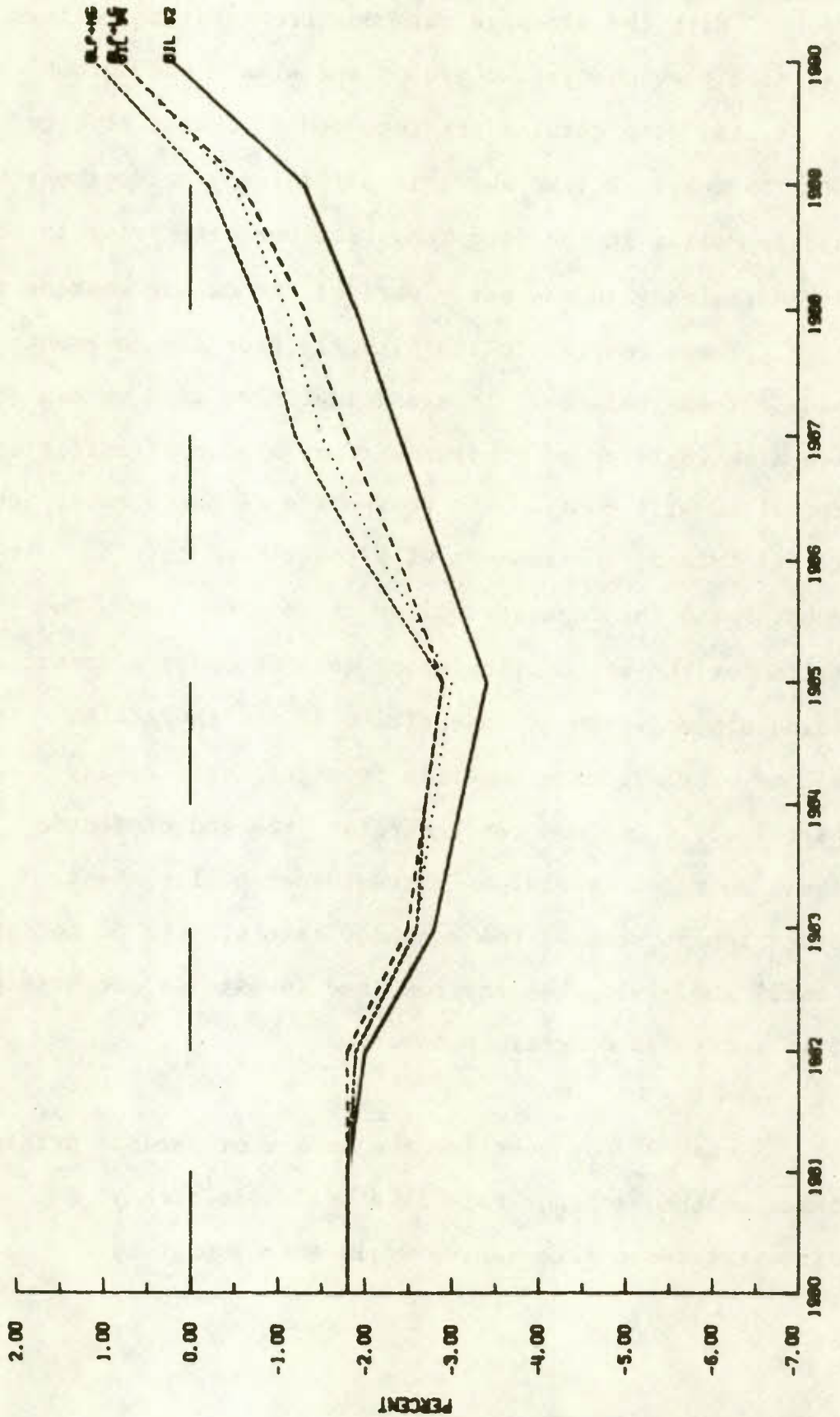


Chart 17.6

CURRENT ACCOUNT BALANCE - % OF G.N.P. (WORLD PRICE SHOCK-SELF SUFF BY 1990)



THE EXCHANGE RATE

With the exchange rate our presentation follows those made previously; two groups and within each group three cases. The results are recorded in Charts 18.1 to 18.6. In Chart 18.1 we see self sufficiency strengthens the Canadian dollar in the long run. However, the drive towards self sufficiency in the early part of the decade weakens the dollar. These results follow directly from the movements in Canada's trade balance. In examining Chart 18.2 we can see how a high world price environment and a no self sufficiency alternative will continue to weaken the exchange rate, but a self sufficiency environment will contribute to strengthening the Canadian dollar in the long run. The results for the world price shock in 1986 under a domestic pricing scheme which is insensitive to the shock also indicate exchange rate benefits from self sufficiency (Chart 18.3). One now can understand the end of decade effects on price levels. A strengthened dollar means reduced import costs. The exchange rate effects do not show up until 1987-1990 when the combined investment projects pay off in increased domestic production.

Let us now consider the impact of various pricing schemes on the exchange rate in a self sufficiency environment under alternative world energy pricing

Chart 18.1

EXCHANGE RATE - U.S. CENTS (OIL $'I - WORLD PRICE LOW)

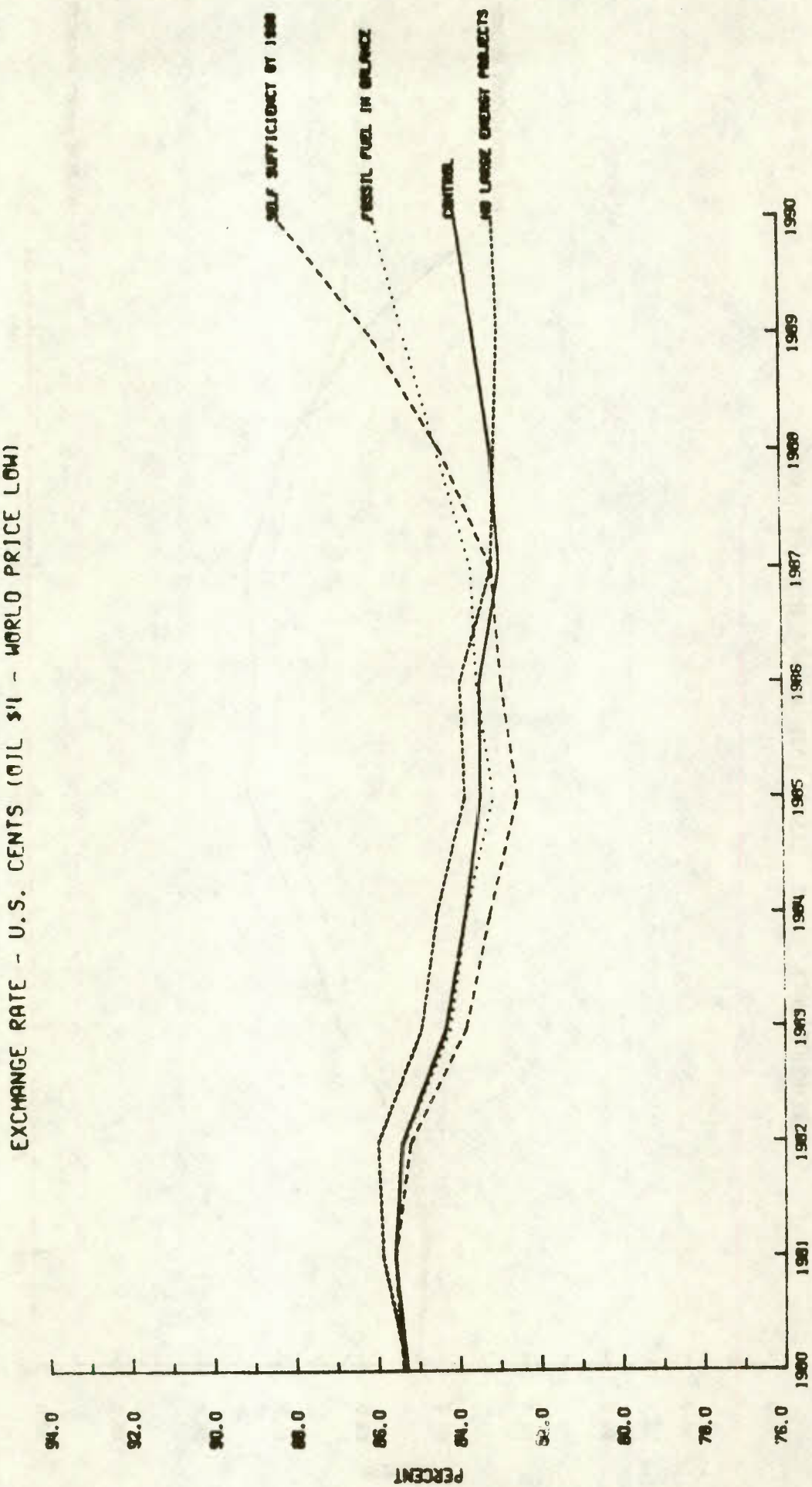


Chart 18.2

EXCHANGE RATE - U.S. CENTS (OIL $4-WORLD PRICE HIGH)

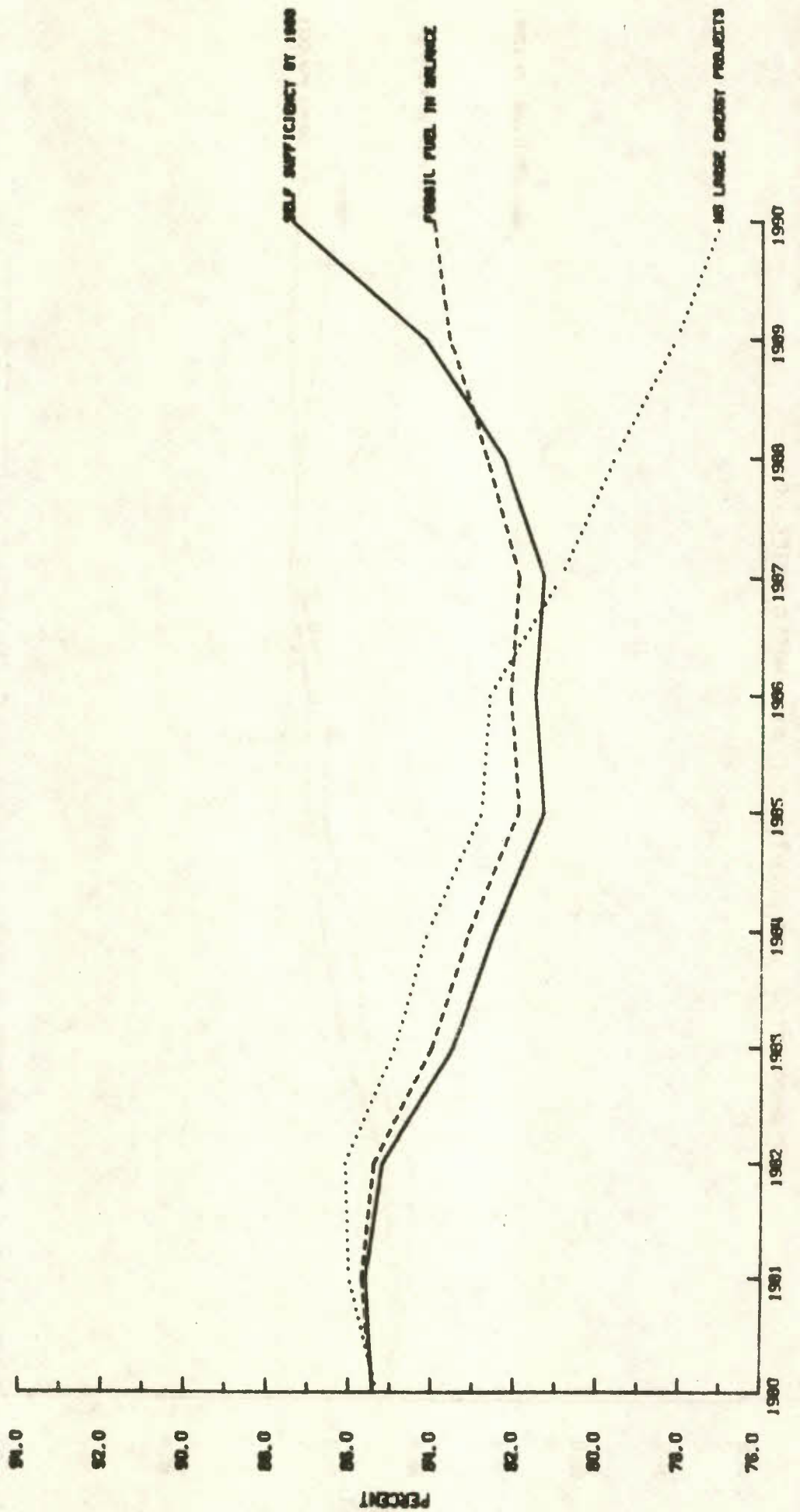
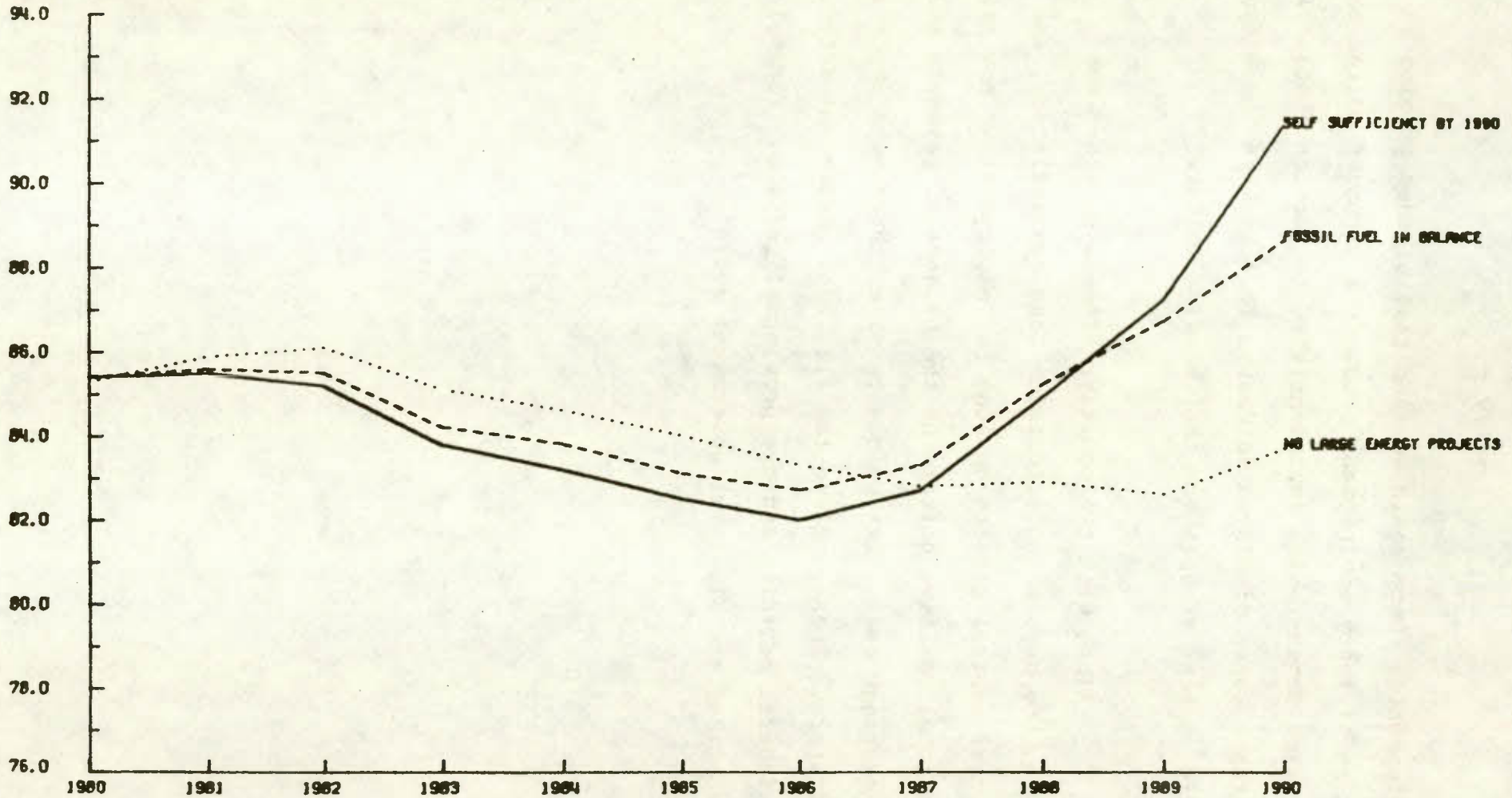


Chart 18.3

EXCHANGE RATE - U.S. CENTS (OIL $4-WORLD PRICE SHOCK(1986))



developments. Once again we find that blended pricing in a self sufficiency environment produces a stronger dollar than a pricing scheme which is insensitive to foreign costs. In all three cases displayed in Charts 18.4 to 18.6 the blended pricing scheme strengthens the Canadian dollar.

Along with the positive effects on short run growth, the depressing effects on long run inflation, and the near neutral effects on long run employment we now have additional positive effects on the balance of payments and the exchange rate. Let us now consider three more important indicators. These include the all level government deficit, the federal deficit, and the provincial surplus. First let us consider the all level government deficit.

Chart 18.4

EXCHANGE RATE - U.S. CENTS (WORLD PRICE LOW-SELF SUFF BY 1990)

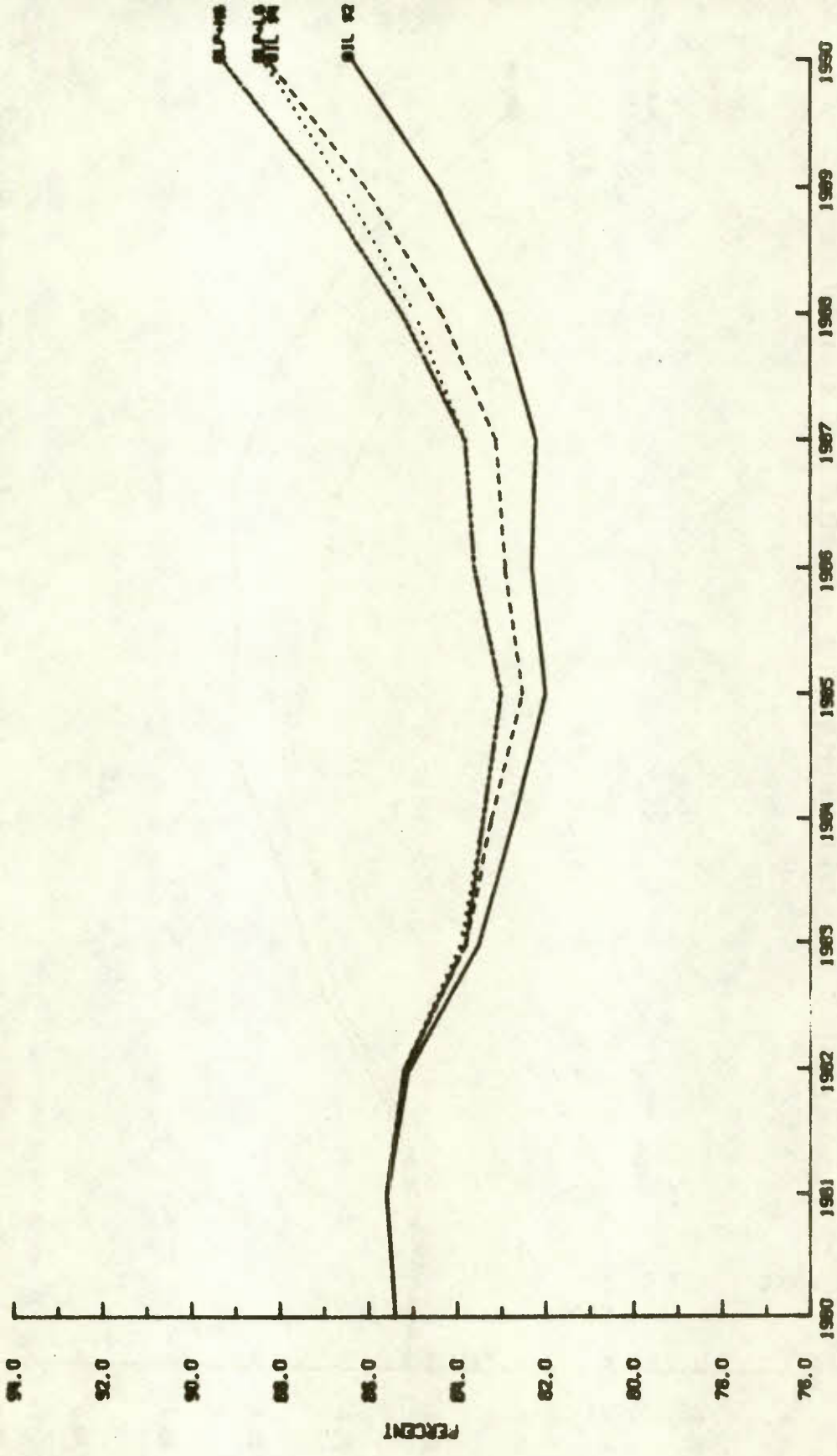


Chart 18.5

EXCHANGE RATE - U.S. CENTS (WORLD PRICE HIGH-SELF SUFF BY 1990)

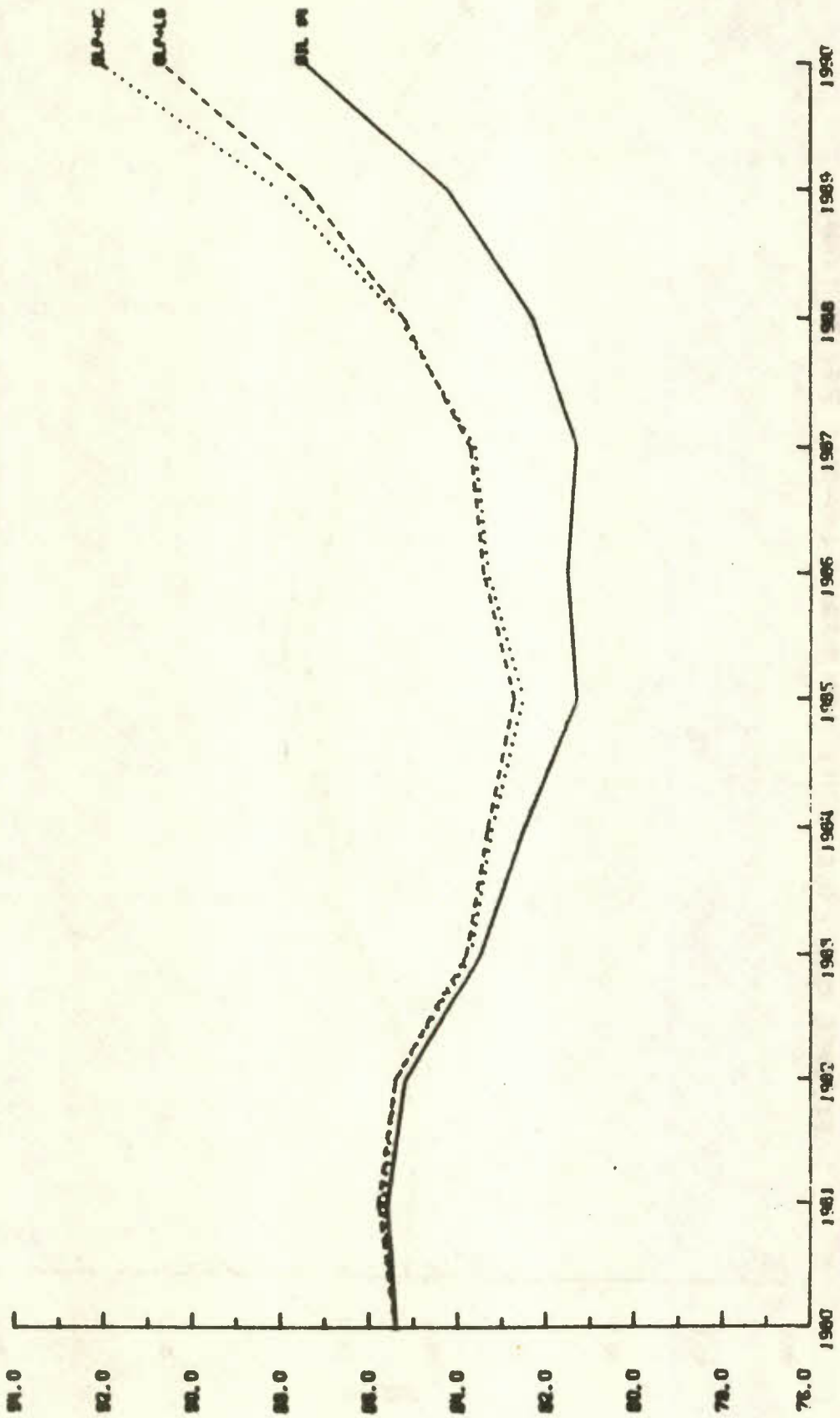
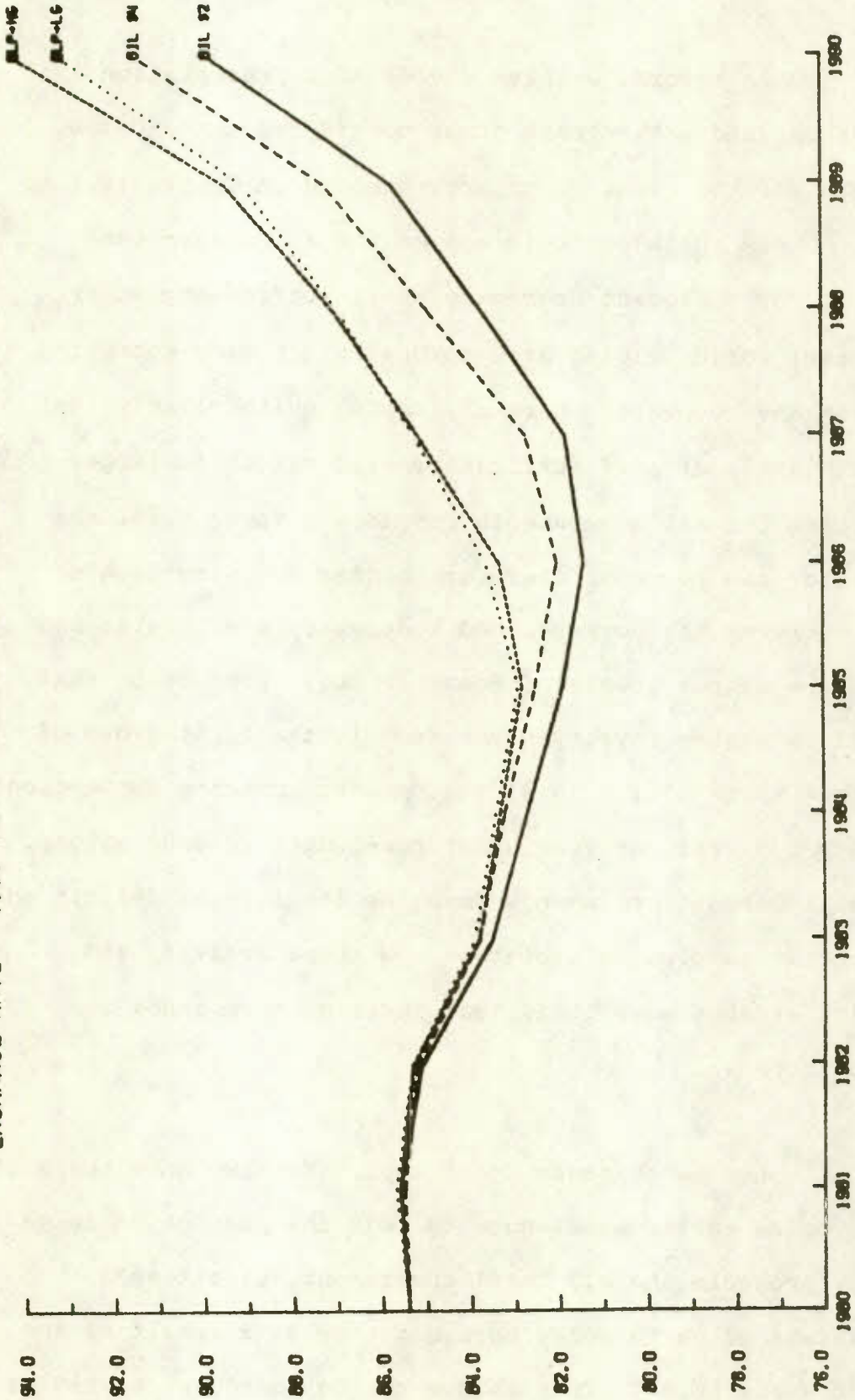


Chart 18.6

EXCHANGE RATE - U.S. CENTS (WORLD PRICE SHOCK-SELF SUFF BY 1990)



THE ALL LEVEL GOVERNMENT DEFICIT

As before, we have divided our presentation into two groups and within each group considered three cases. Results for the first group are recorded in Charts 19.1 to 19.3. These include the impact on the all government deficit for different degrees of self sufficiency under different world pricing assumptions in the same domestic pricing environment. Chart 19.1 shows quite clearly that higher levels of self sufficiency will result in larger surpluses for all governments combined. These surpluses occur for two reasons: there are higher activity levels that increase tax revenues and reduce transfer costs; and there are higher levels of domestic (oil) production that result in higher royalty payments. In the first group of charts (Charts 19.1 - 19.3) the domestic pricing assumption is $4 per barrel per year under pre-budget revenue splits. We will demonstrate when we examine the federal deficit and provincial surplus in isolation how these activity and royalty effects move individual government revenues and expenditures.

Let us consider Chart 19.2. Here we have the high world price environment. Note that in the case of no large energy projects the all level government deficit as a percentage of GNP becomes more negative as a result of the higher world price. This is due to the increased subsidies which would be due in a $4 domestic environment with a

Chart 19.1

TOTAL DEFICIT - % OF G.N.P. (OIL $4 - WORLD PRICE LOW)

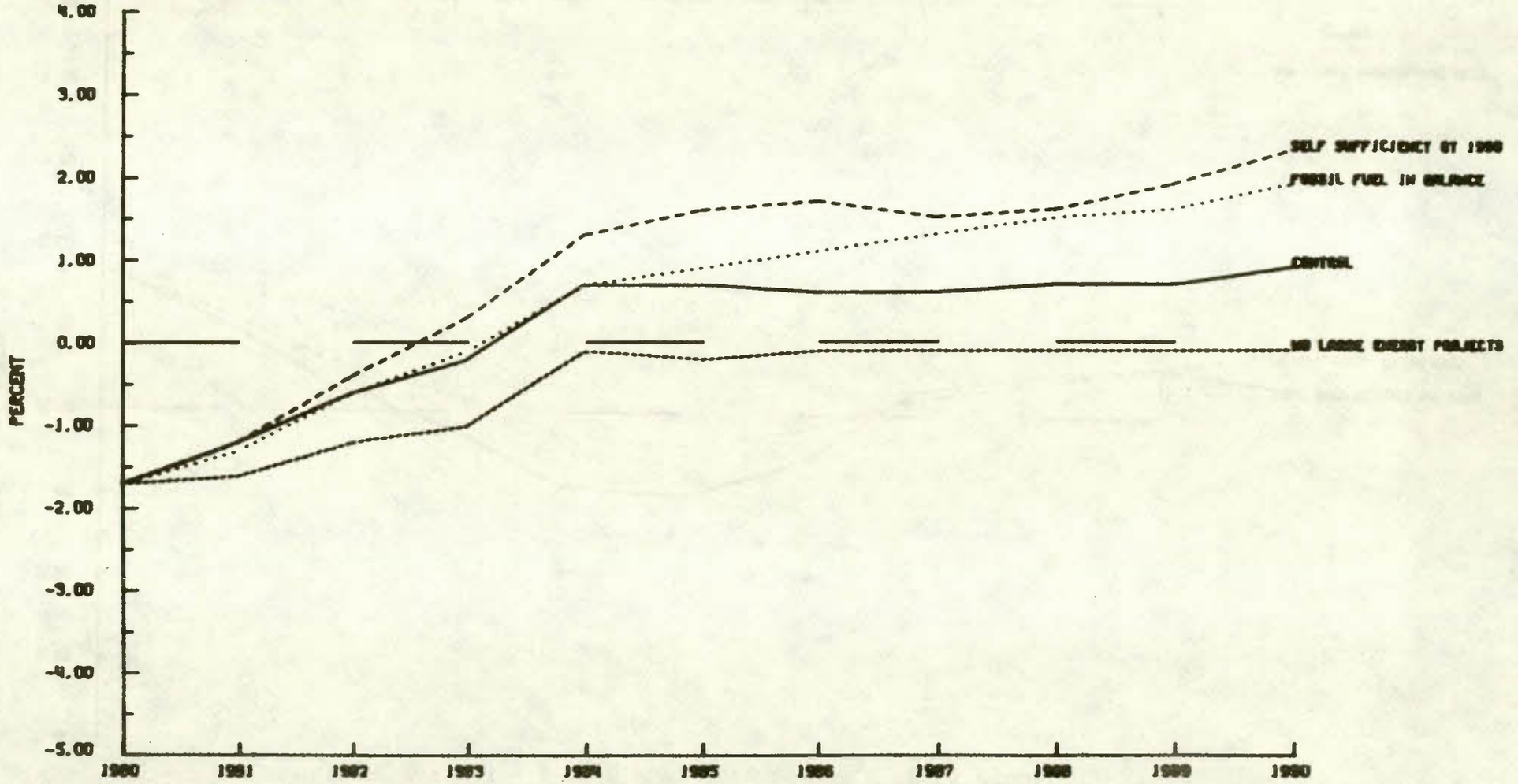


Chart 19.2

TOTAL DEFICIT - % OF G.N.P. (OIL $4-WORLD PRICE HIGH)

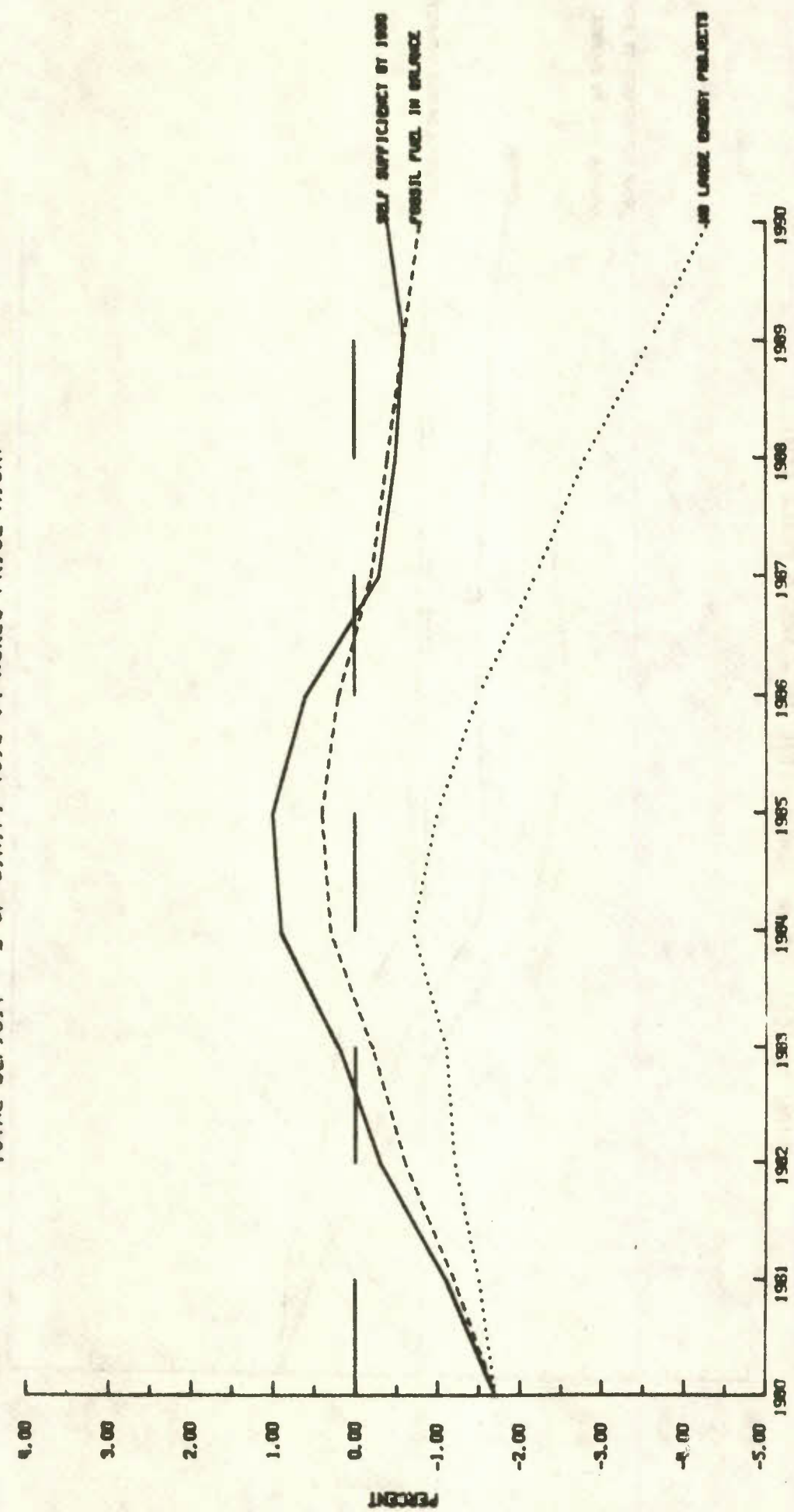
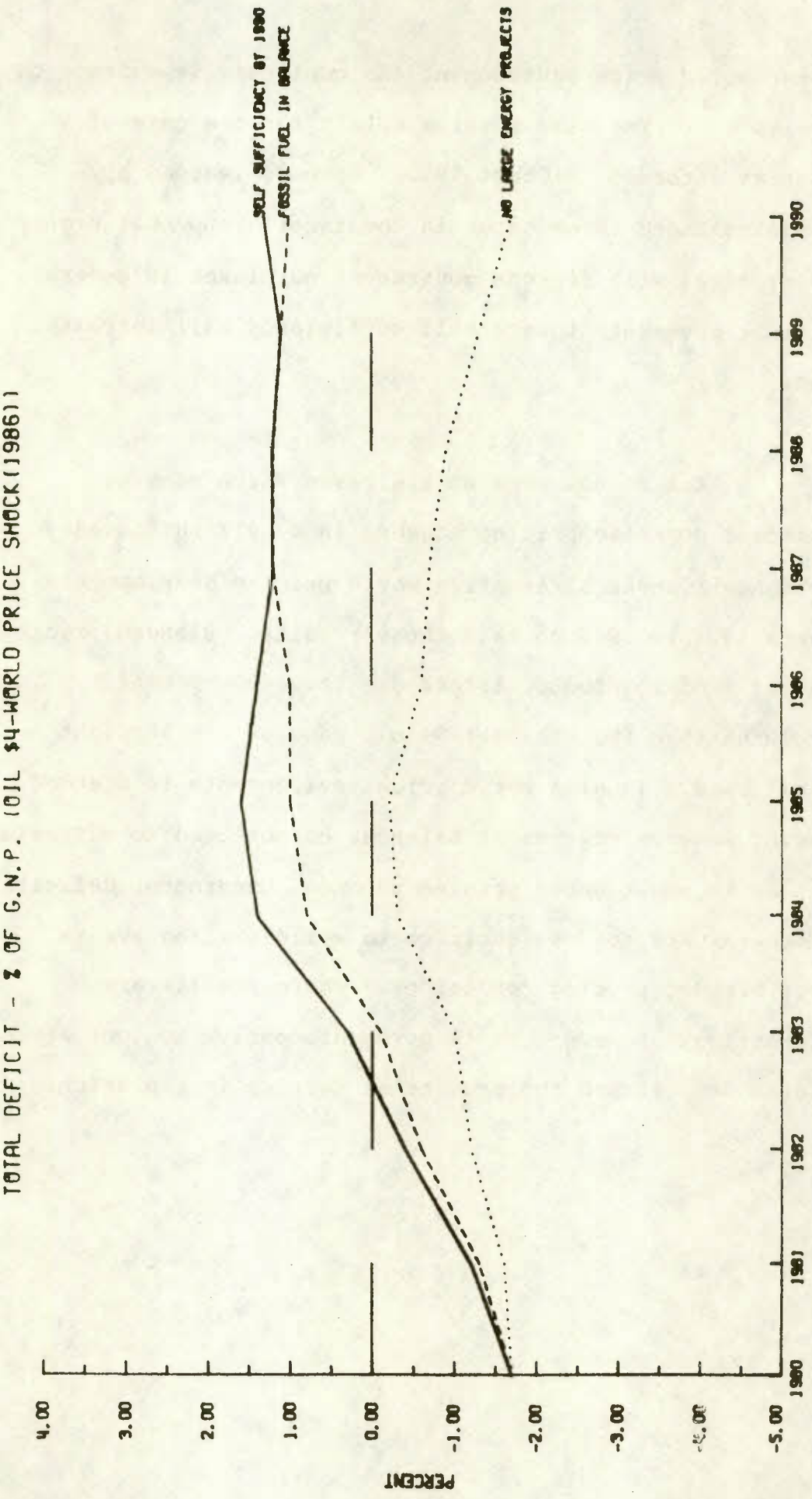


Chart 19.3


TOTAL DEFICIT - % OF G.N.P. (OIL $4-WORLD PRICE SHOCK(1986))
SELF SUFFICIENCY BY 1990
FOSSIL FUEL IN BALANCE
NO LARGE ENERGY PROJECTS
PERCENT
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-5.00
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990

higher world price environment and continued dependence on foreign oil. The same results obtain for the case of a shock as recorded in Chart 19.3. We have learned by examining these three cases in the first group that higher world prices will depress government surpluses in general, but that movements toward self sufficiency will increase them.

Let us now look at the cases which examine different domestic pricing schemes in a self sufficiency environment under alternative world pricing developments. Charts 19.4 to 19.6 contain these results. Blended pricing schemes tend to produce larger all level government surpluses than the straight $4 oil case or the straight $2 oil case. In high world price environments in blended pricing schemes government balances do not tend to suffer as much as in non-blended pricing schemes. Government deficits in general are not as sensitive to world pricing events under blended pricing conditions. These results are interesting. However, it is more informative to look at the federal deficit and the provincial surplus in isolation.

Chart 19.4

TOTAL DEFICIT - % OF G.N.P. (WORLD PRICE LOW-SELF SUFF BY 1990)

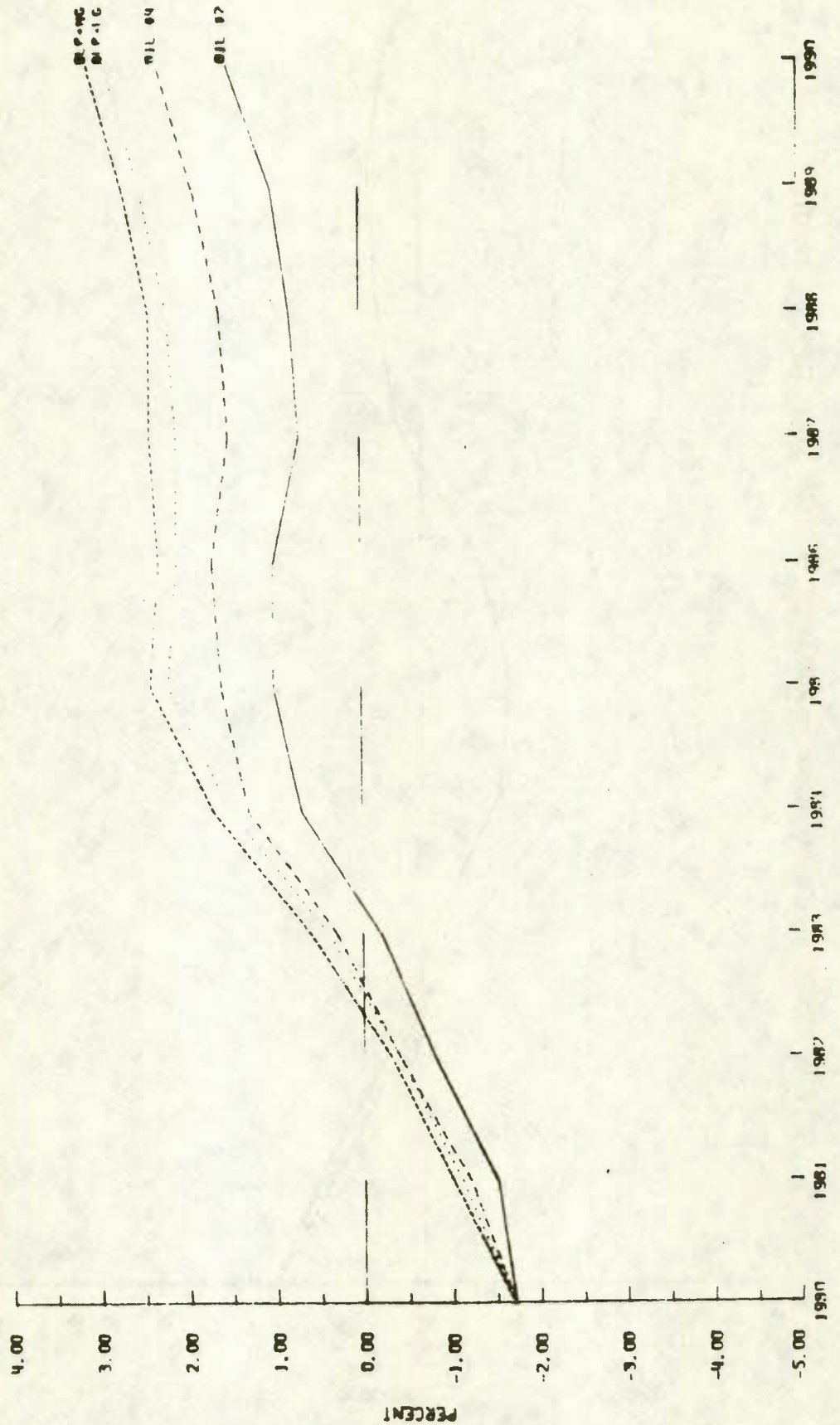


Chart 19.5

TOTAL DEFICIT - % OF G.N.P. (WORLD PRICE HIGH-SELF SUFF BY 1990)

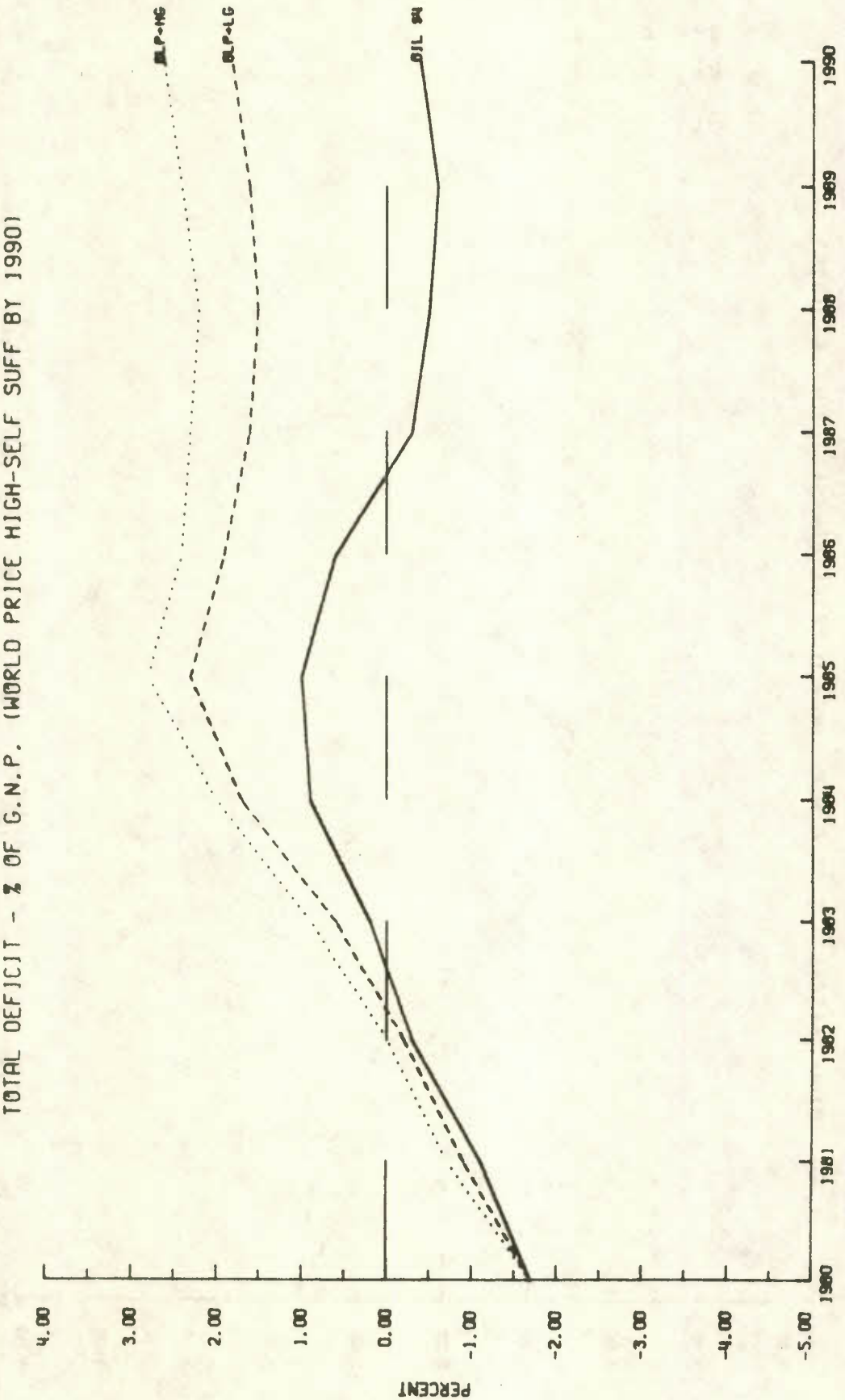
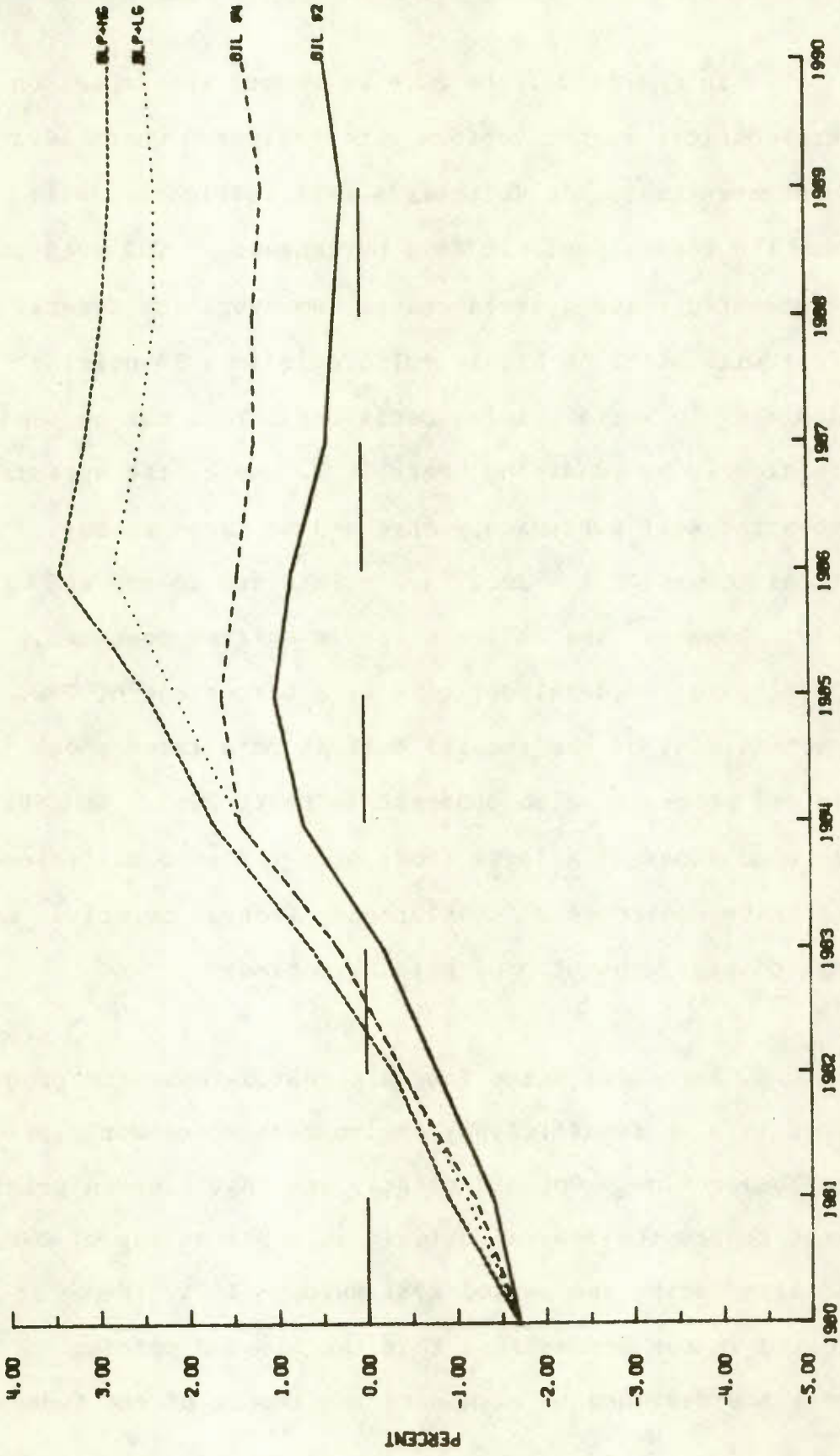


Chart 19.6

TOTAL DEFICIT - % OF G.N.P. (WORLD PRICE SHOCK-SELF SUFF BY 1990)



THE FEDERAL DEFICIT

In Charts 20.1 to 20.6 we record the impact on the federal deficit of the various alternatives. Chart 20.1 demonstrates that a drive towards self sufficiency will reduce the federal deficit as a percentage of GNP even under a $4 domestic pricing arrangement. However, the federal deficit will still be highly vulnerable in a $4 pricing environment to world pricing decisions. This can be seen quite clearly by examining Chart 20.2. Here, the spreads between the self sufficiency case and no large energy projects (Chart 20.1 - 20.2) are maintained to the end of decade. However, the entire graph is shifted downward, implying larger federal deficits as a percentage of GNP. The sensitivity of the federal deficit to a large shock in world oil prices is also apparent in Chart 20.3. In 1986 under conditions of a large shock even the self sufficiency alternative undergoes a deteriorating federal deficit. Let us now consider the blended pricing schemes.

Chart 20.4 shows four alternative domestic pricing schemes in a self sufficiency environment where world price increases are low. One can clearly see that blended pricing schemes reduce the federal deficit as a percentage of GNP, especially during the period 1981 through 1985. We indicated in our assumptions that the blended pricing schemes are designed to eliminate the impact of the federal

Chart 20.1

FEDERAL DEFICIT - % OF G.N.P. (OIL $4 - WORLD PRICE LOW)

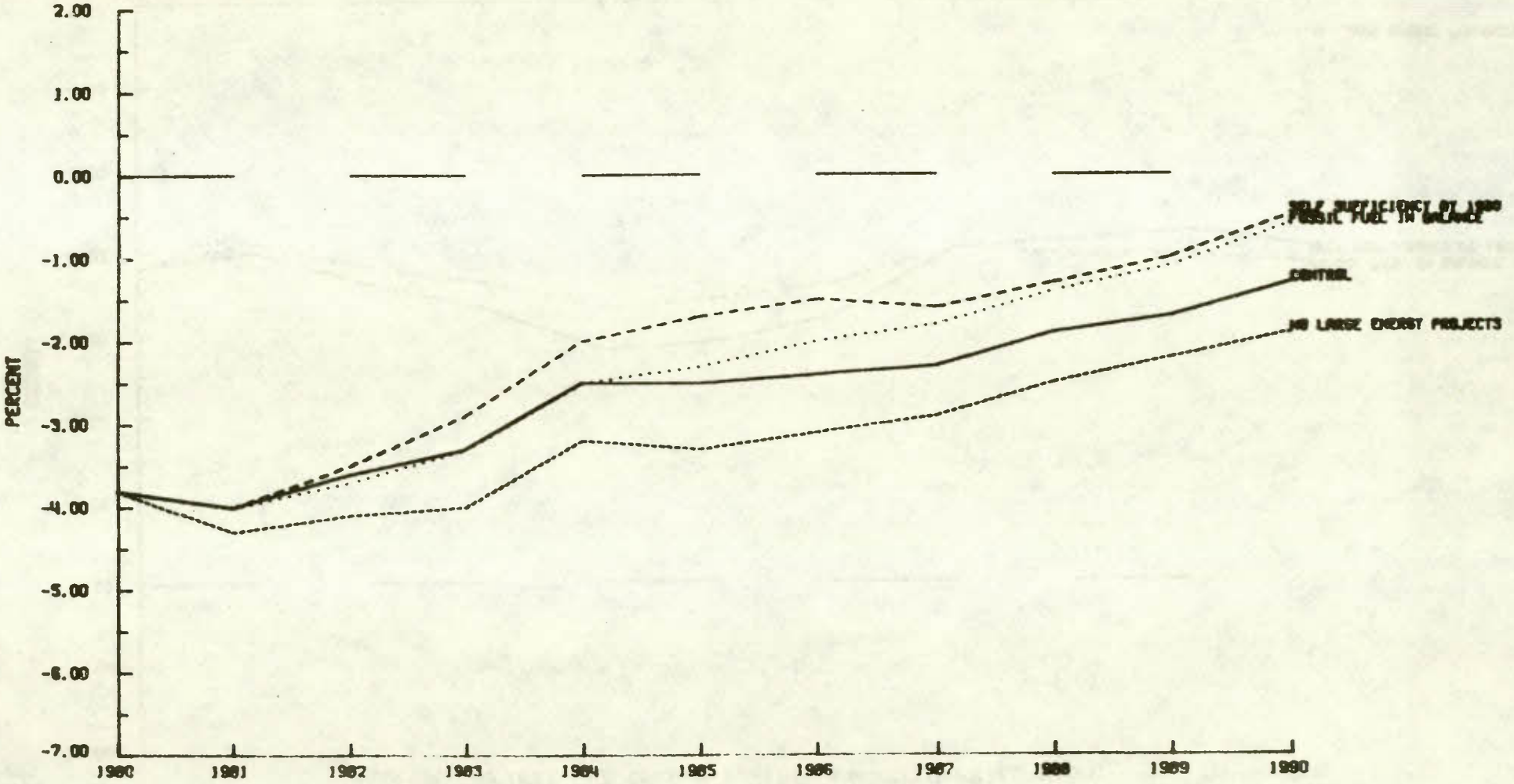


Chart 20.2

FEDERAL DEFICIT - % OF G.N.P. (OIL $4-WORLD PRICE HIGH)

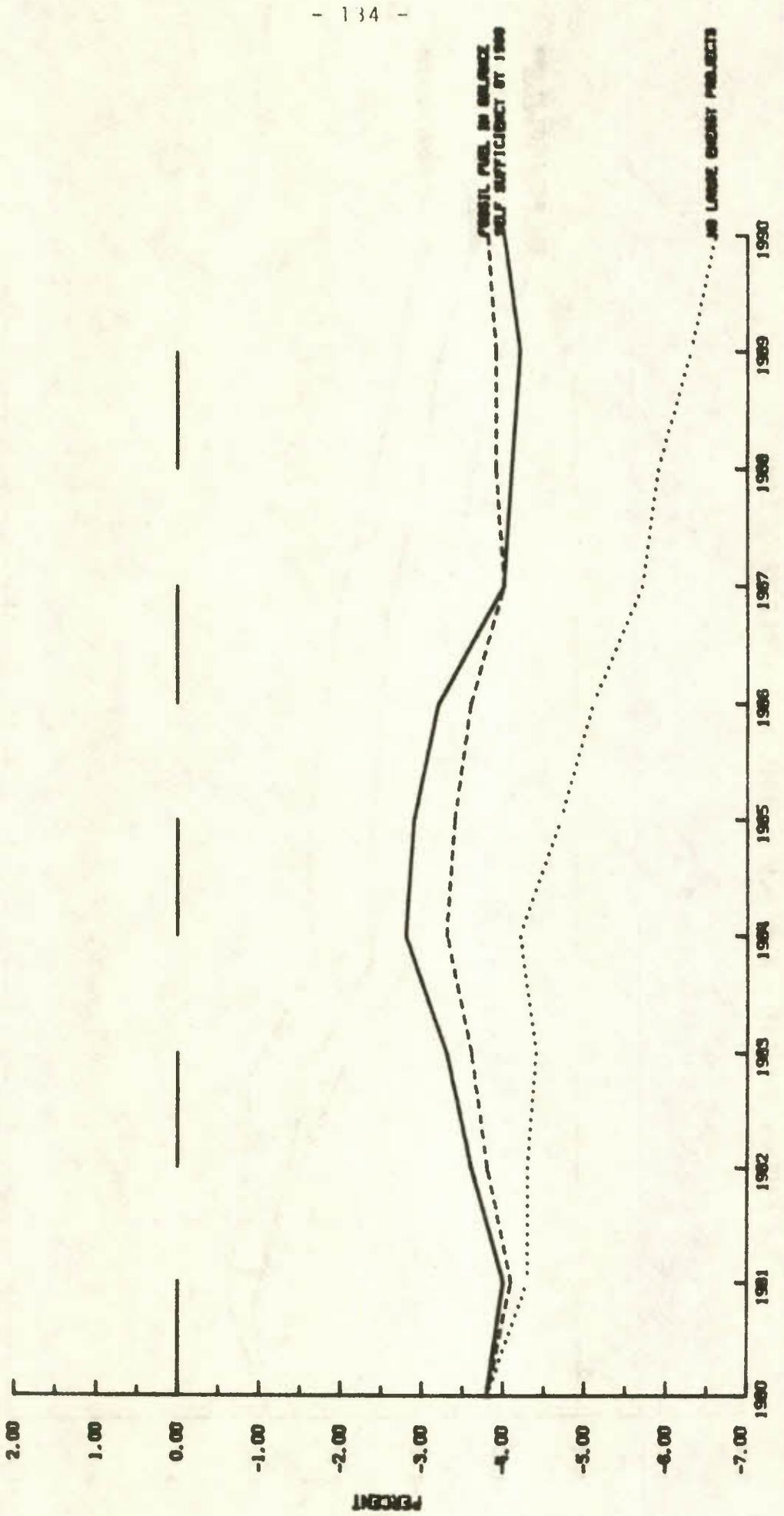
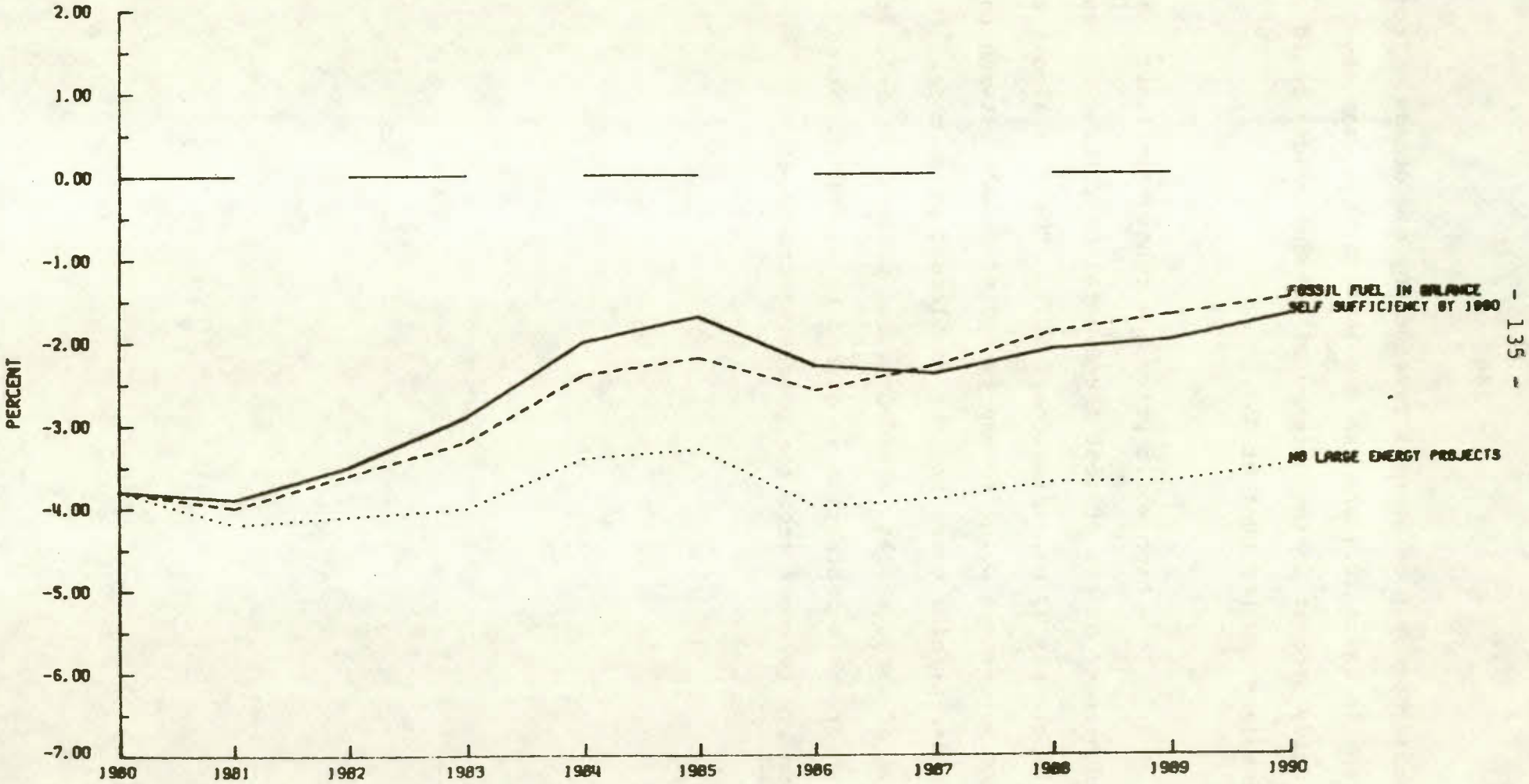


Chart 20.3

FEDERAL DEFICIT - % OF G.N.P. (OIL $4-WORLD PRICE SHOCK(1986))



subsidy program on general revenues by mid decade. From the graph in Chart 20.4 one can see that in this case the subsidy program in the absence of blended prices could cost Canadians one per cent of GNP.

In a high world price environment self sufficiency and blended prices protect the federal deficit. One can see this clearly by examining Chart 20.5. There is almost a four percentage point spread by end of decade between the blended pricing cases and the nonblended price case. In the case of large shocks, blended prices protect the deficit. However, this protection is gained by way of increased resource revenues from the producing provinces.

Chart 20.4

FEDERAL DEFICIT - % OF G.N.P. (WORLD PRICE LOW-SELF SUFF BY 1990)

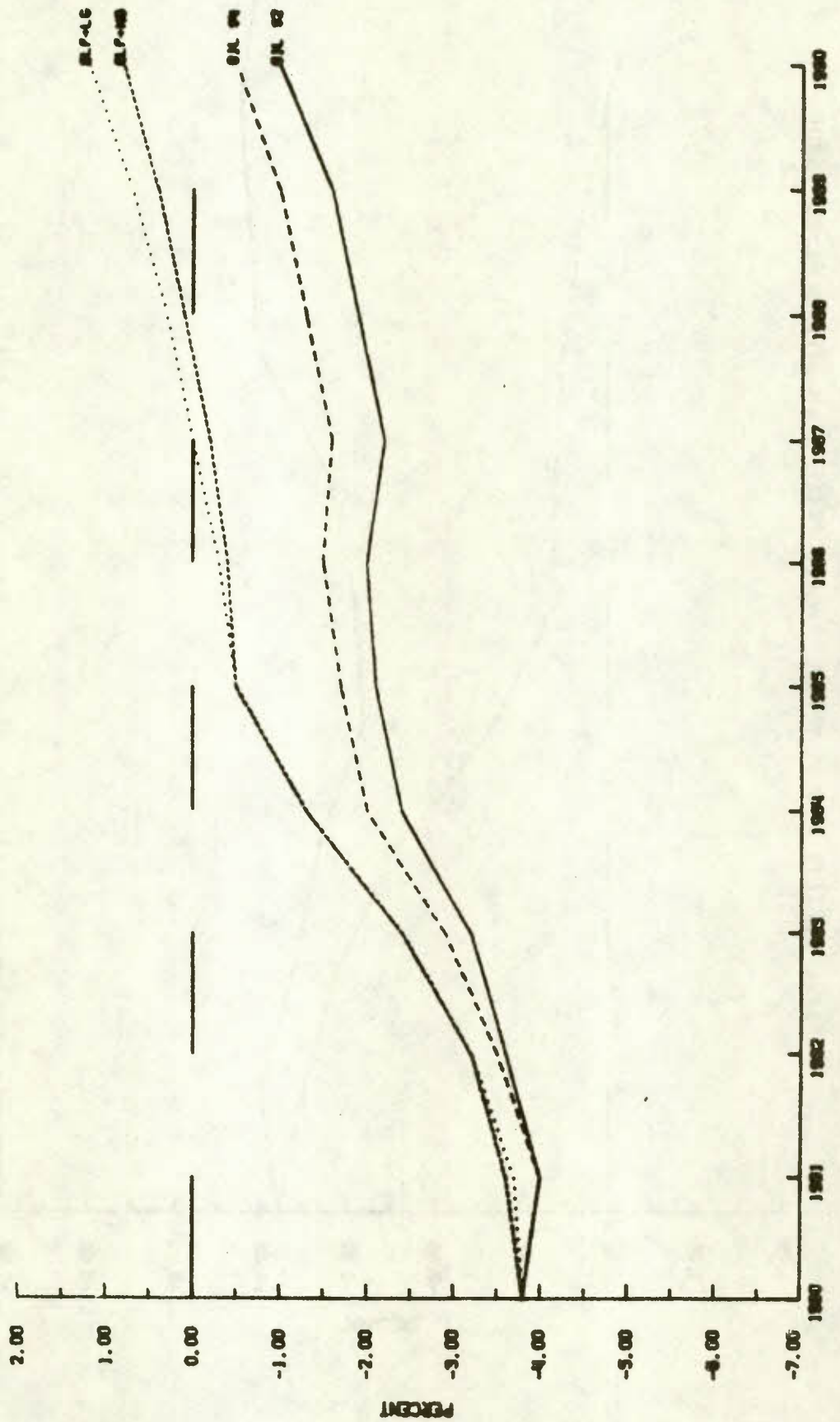


Chart 20.5

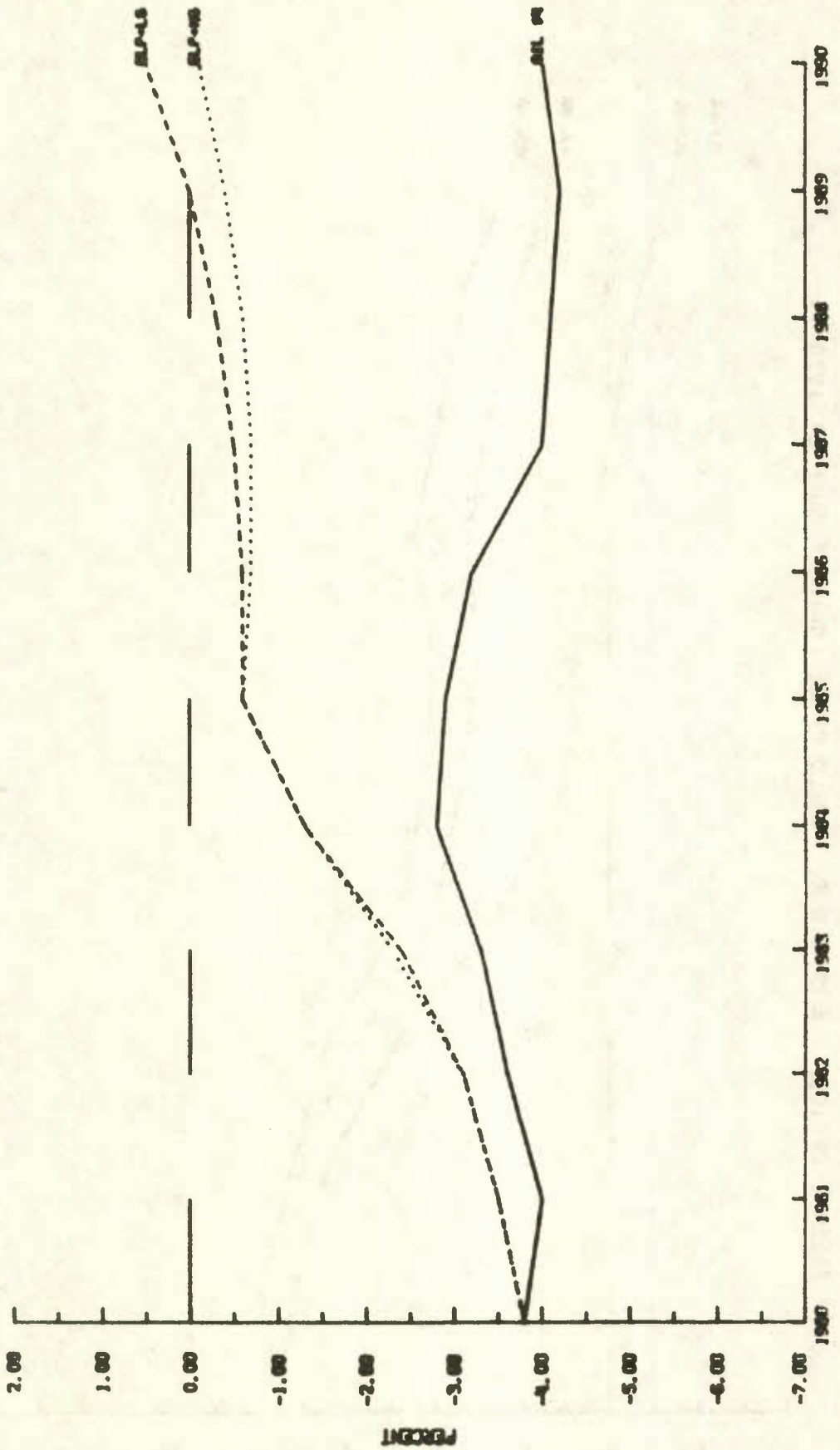
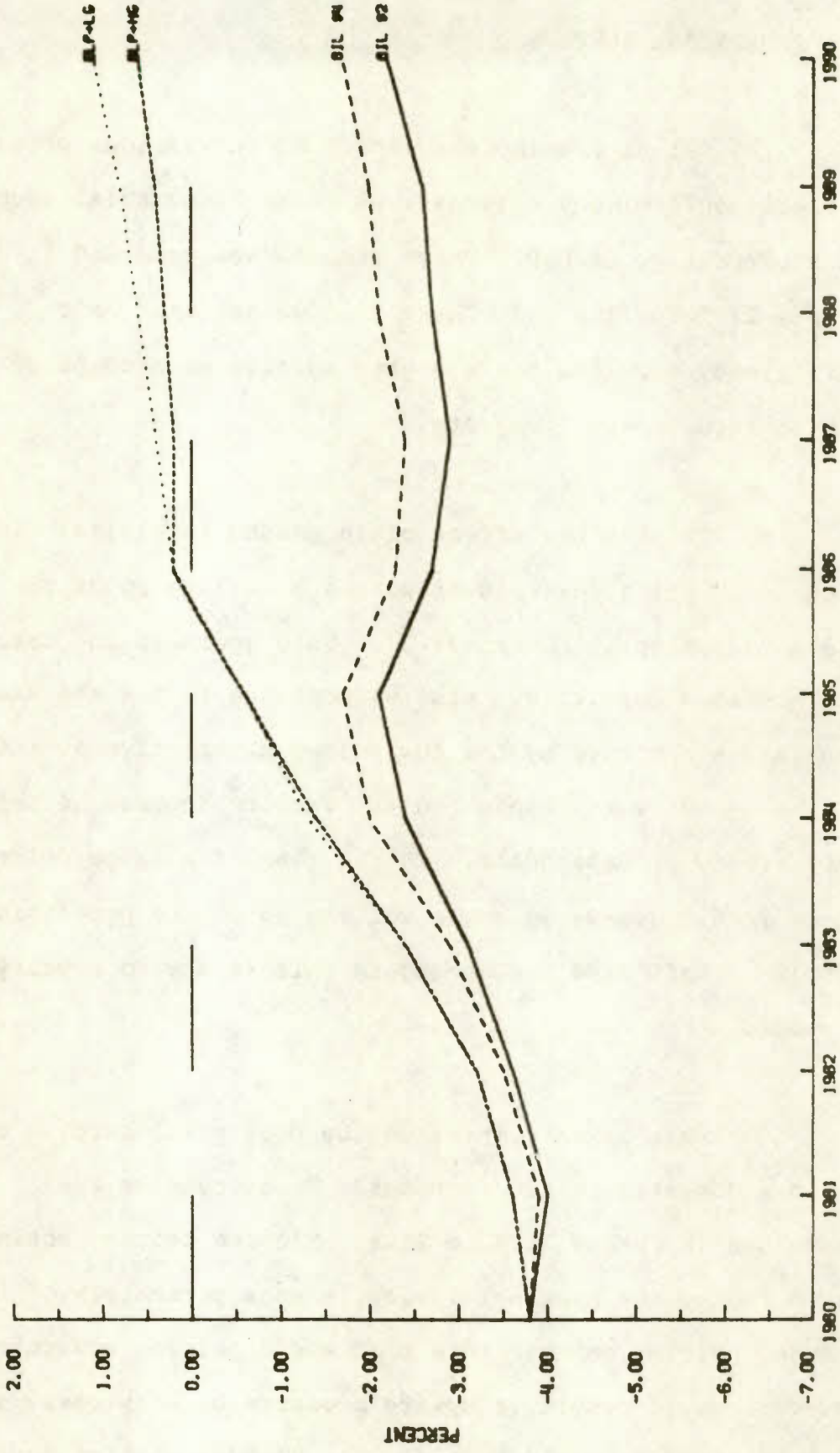

FEDERAL DEFICIT - % OF G.N.P. (WORLD PRICE HIGH-SELF SUFF BY 1990)
PERCENT
2.00
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
-6.00
-7.00
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990

Chart 20.6

FEDERAL DEFICIT - % OF G.N.P. (WORLD PRICE SHOCK-SELF SUFF BY 1990)



THE PROVINCIAL SURPLUS

Let us examine the impact of the various pricing and self sufficiency alternatives on the provincial surplus as a percentage of GNP. These results are recorded in Charts 21.1 to 21.6. In Chart 21.1 we see that self sufficiency provides for a higher surplus when compared to the no large energy projects.

This is the effect of increased royalties. In a high world price environment we see a welling up of the provincial surplus (Chart 21.2). This again is the result of increased royalties. Also we continue to see the same ranking as recorded by the low priced alternative at the end of the decade with respect to the various degrees of self sufficiency or dependence. In the case of a large price shock in mid decade we see a welling up of the provincial surplus (Chart 21.3). Once again this is due to royalty payments.

What is the impact on the provincial surplus of various domestic pricing schemes? These results are contained in Charts 21.4 to 21.6. Blended pricing schemes would reduce the provincial surplus as a percentage of GNP. Blended pricing schemes in a high world pricing environment, however, would result in upward pressure on surpluses, as would a shock to world prices. The blended pricing schemes implemented in the alternatives are only examples as to how

Chart 21.1

PROVINCIAL SURPLUS - % OF G.N.P. (OIL $4 - WORLD PRICE LOW)

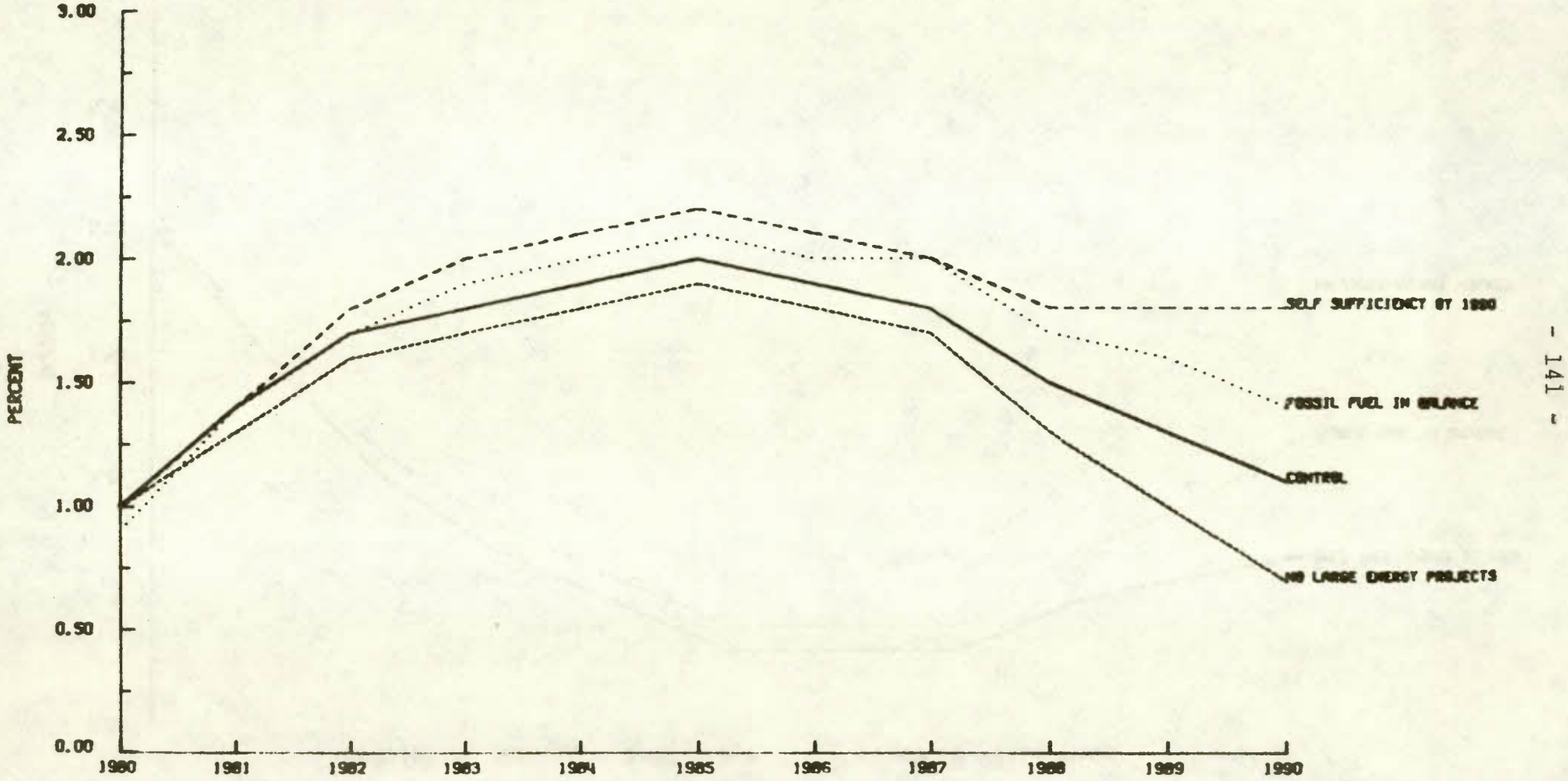


Chart 21.2

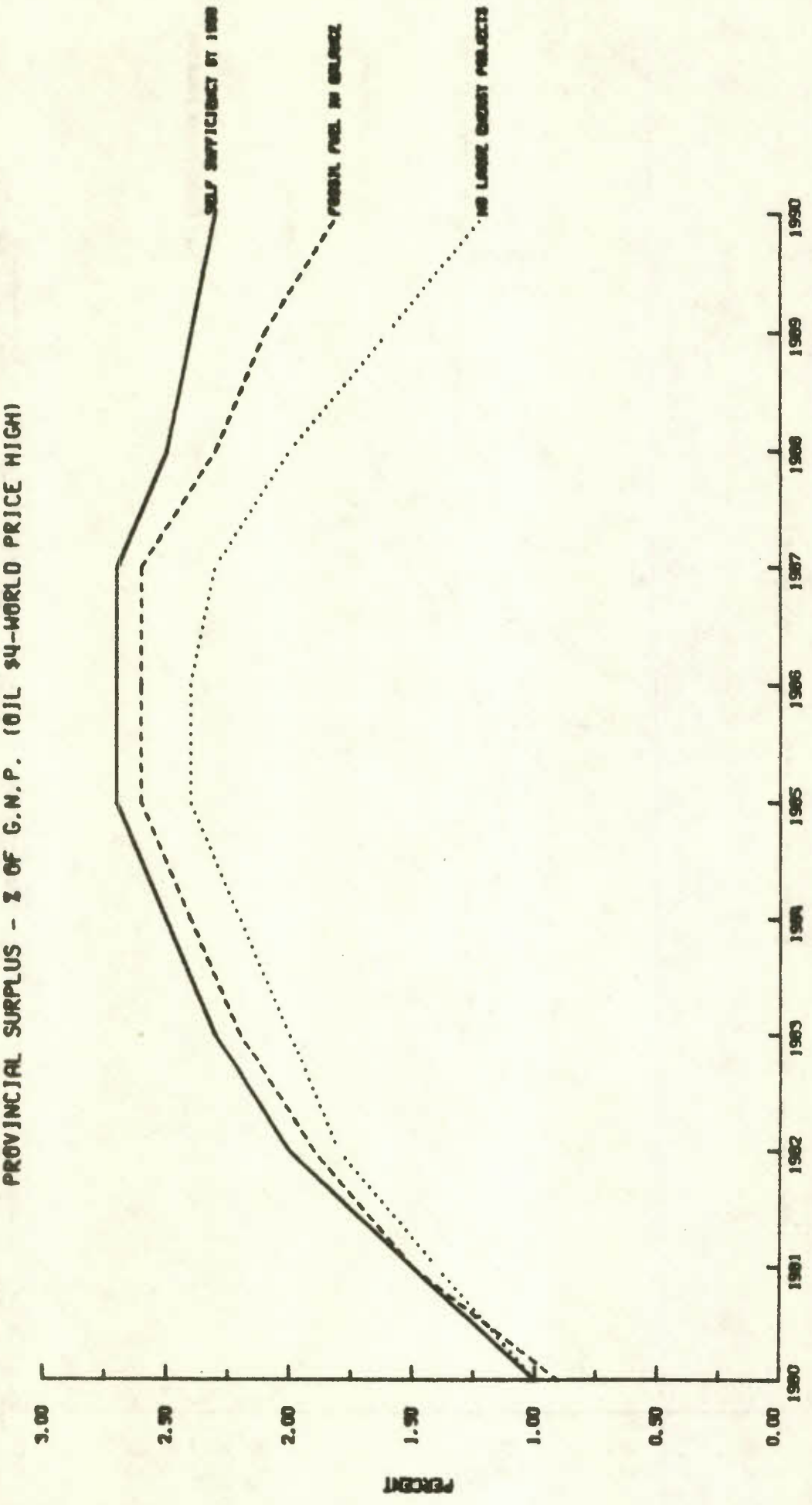
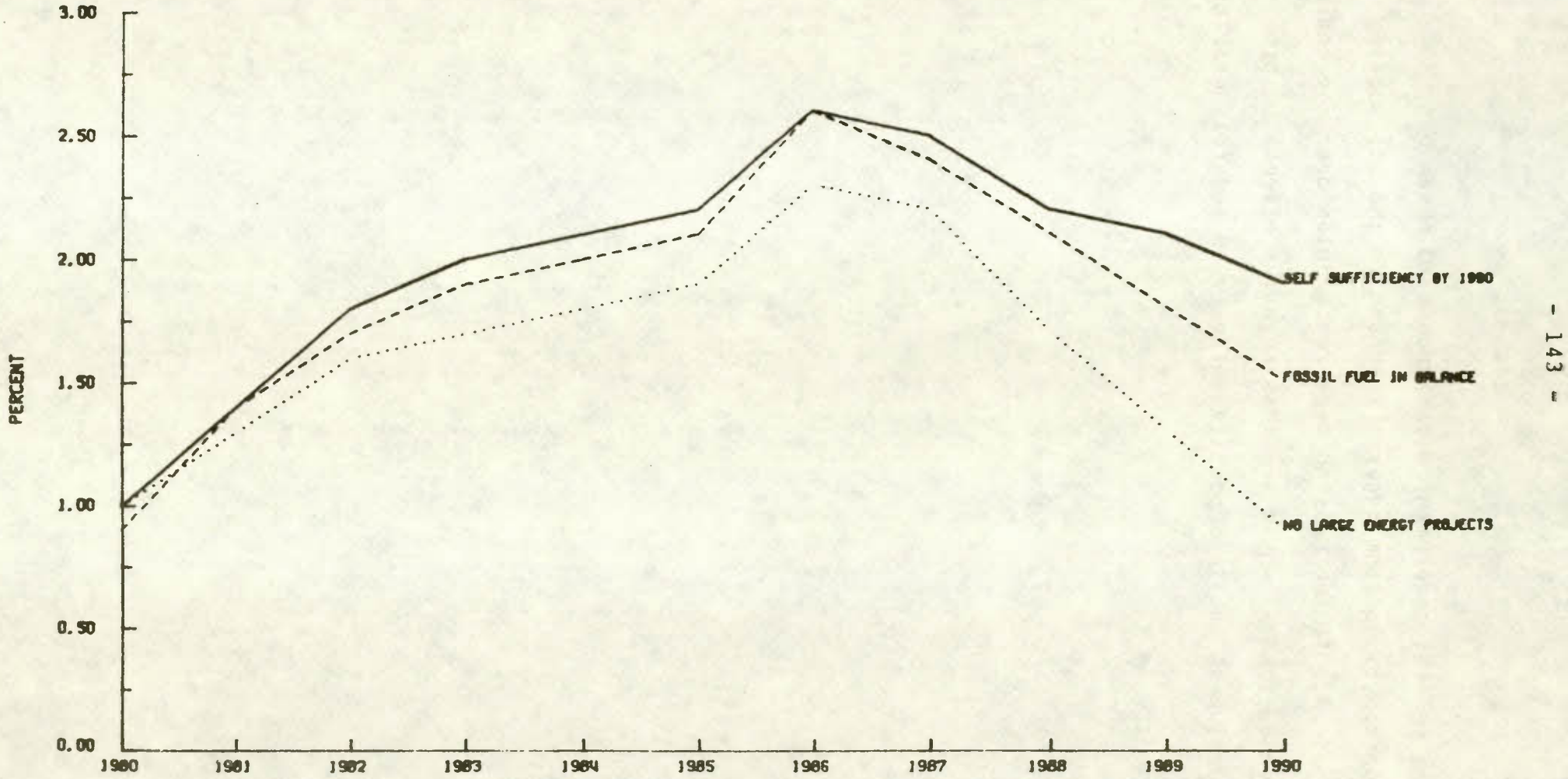

PROVINCIAL SURPLUS - % OF G.N.P. (OIL $4-WORLD PRICE HIGH)
PERCENT
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990

Chart 21.3

PROVINCIAL SURPLUS - % OF G.N.P. (OIL $4-WORLD PRICE SHOCK(1986))



the federal government might choose to phase out contributions from general revenues to the oil subsidy program. If the phasing were rescheduled over the entire decade then we would see less negative effects on provincial surpluses, but less positive effects on federal deficits.

Chart 21.4

PROVINCIAL SURPLUS - % OF G.N.P. (WORLD PRICE LOW-SELF SUFF BY 1990)

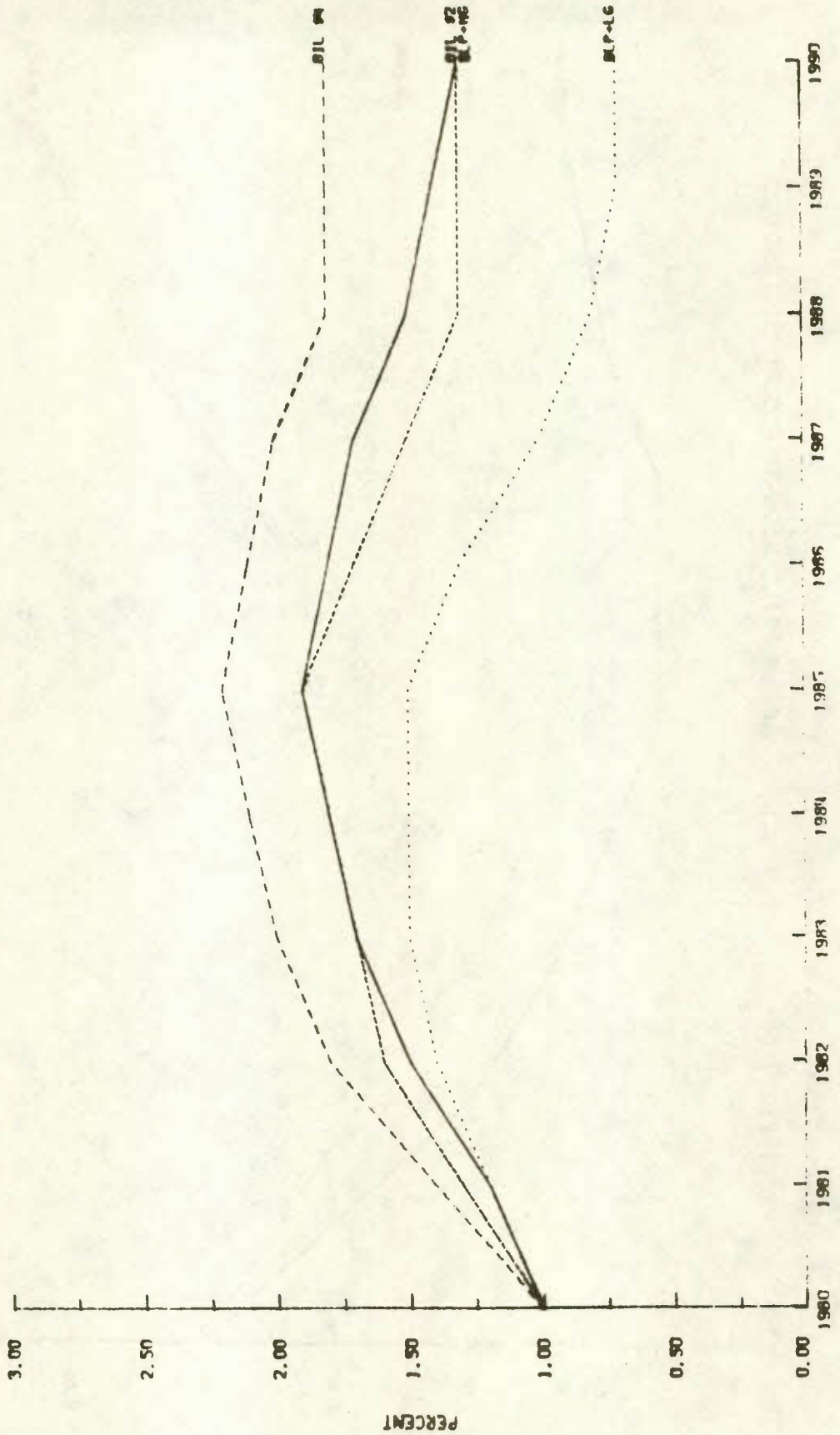


Chart 21.5

PROVINCIAL SURPLUS - % OF G.N.P. (WORLD PRICE HIGH-SELF SUFF BY 1990)

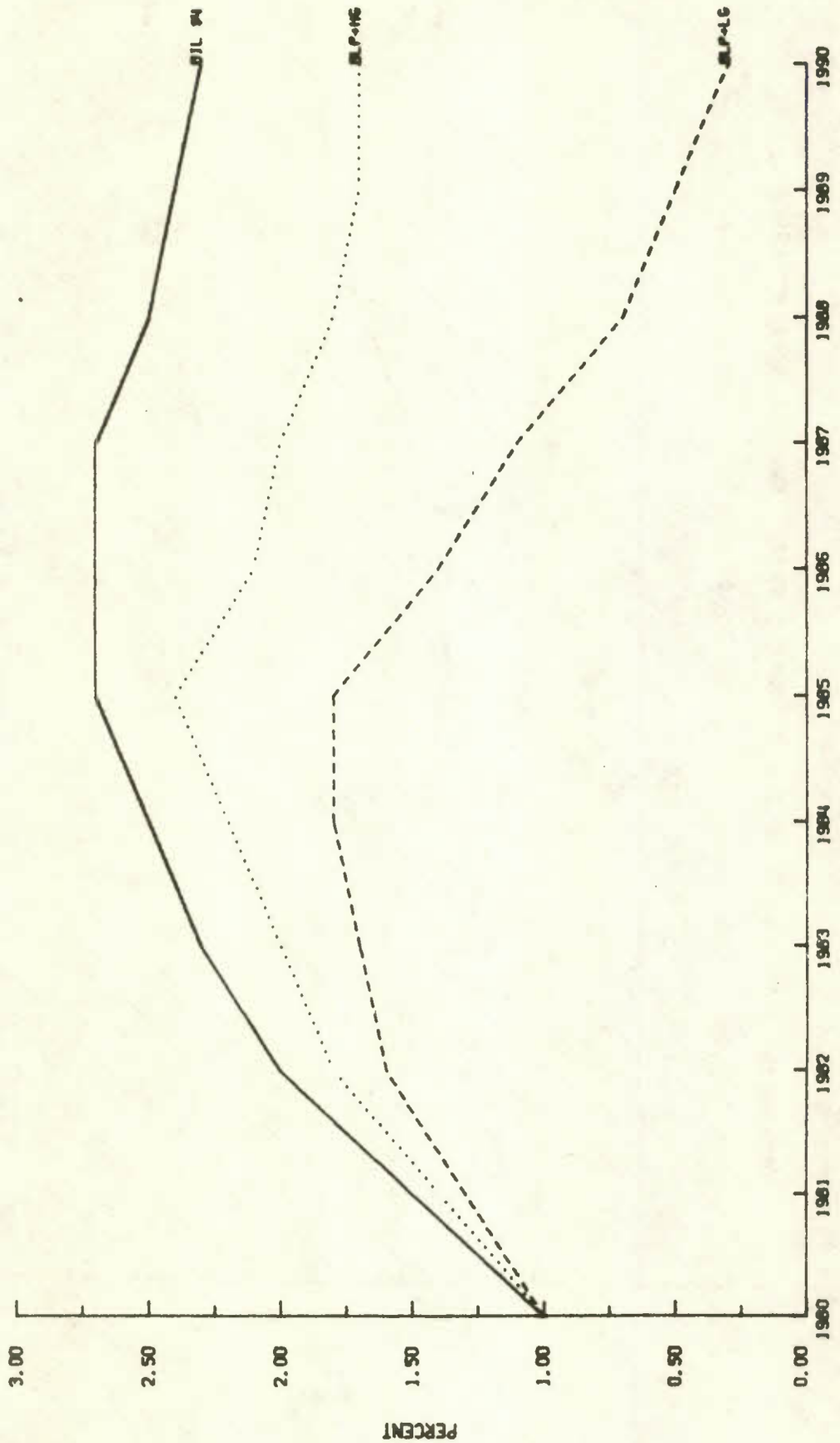
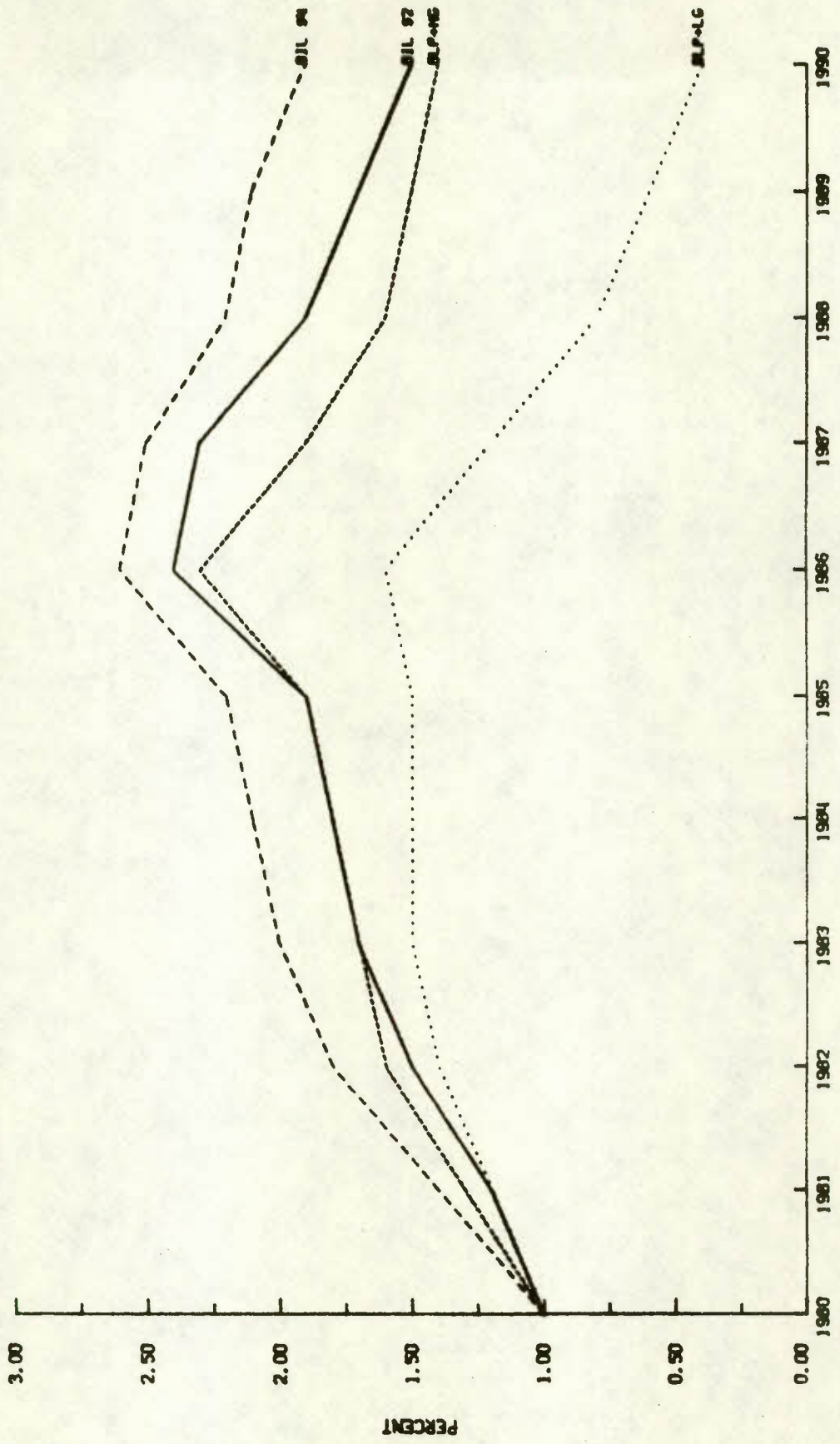


Chart 21.6

PROVINCIAL SURPLUS - % OF G.N.P. (WORLD PRICE SHOCK-SELF SUFF BY 1990)



SUMMARY

In the no large energy projects alternative provincial surpluses by the end of decade are in the range of 0.5 to 1.0 per cent of GNP. The blended price, low gas self sufficiency alternative brings the provincial surplus close to the same percentage of GNP by the end of the decade.

In the first case we are not self sufficient, our dollar is weak, our trade balance is weak, inflation rates are higher, we have foregone employment gains by mid decade, and incurred considerable federal deficits along the way. In the second case we are self sufficient, we have undergone an investment boom in mid decade, we have a strong current account balance by the end of the decade, we have a strong dollar by the end of the decade, we have employed 1.8 million more people years during the decade, we have eliminated the contribution from general revenues to the subsidy program, we are running a general surplus at all levels of government and we have made considerable contributions to western development by way of large provincial surpluses in the west during the decade. An even stronger picture would emerge under the blended price, high gas scenario.

Table 16 records the values for selected economic indicators in six of the alternatives that we have examined.

Table 16

Summary of Selected Economic Indicators for Year 1990[1]

	World Price Low		World Price High		World Price Shock	
	No Large Projects	Self Sufficiency	No Large Projects	Self Sufficiency	No Large Projects	Self Sufficiency
Consumer Price Index (per cent change)	8.3	7.3	10.4	9.4	8.9	7.5
Government Deficit (per cent of GNE)	-0.1	3.1	-4.3	2.6	-1.7	2.8
Federal Government Deficit (per cent of GNE)	-1.9	0.8	-6.6	-0.1	-3.5	0.6
Provincial Government Deficit (per cent of GNE)	0.7	1.3	1.2	1.7	0.9	1.4
Current Account Balance (per cent of GNE)	-3.0	0.2	-6.5	0.1	-3.2	1.1
Energy Balance (per cent of GNE)	-2.2	2.0	-4.6	2.7	-3.3	2.2
Exchange Rate ($US/$CA)	83.0	89.2	77.0	92.0	83.7	94.0
Cumulative Deviation from Control						
Emloyment (thousands)	-910	508	-205	-142	-805	-32
Gross National Product (billions, $1971)	-22.5	11.3	-14.2	-14.7	-22.9	-6.4
Government Deficit (billions)	-41.2	88.2	-155.3	89.9	-76.7	108.0

1 Self Sufficiency alternative includes the blended price high natural gas price assumption.

It displays the extremes (within the alternatives) in world pricing, the extremes in investment and production levels related to energy, and the extremes in domestic pricing. It is clear that self sufficiency in a blended price environment produces a large number of pluses; higher growth, more jobs, a stronger dollar, better current account balance, smaller federal deficits, and continued provincial surpluses. The choice is obvious from these results. Implementing the choice is not as easy. It requires among other things some very hard decisions about revenue splitting between levels of government, and some very difficult resource boom management problems for the Western Provinces.

Footnotes

1 National Energy Board, Canadian Oil Supply and Requirements, September 1978.

2 Estimates for the proposed investment profiles in both the Alsands and Cold Lake projects were obtained from Shell and Esso. As well, estimates of a scheduled production build-up were obtained.

3 Alberta Energy Resources Conservation Board submissions to National Energy Board re oil sands plants, Canadian Oil Supply and Requirements, op cit., page 61.

4 J. Philip Prince, Enhanced Oil Recovery Potential in Canada, Canadian Energy Research Institute, Study No. 9, March 1980.

5 Canadian Oil Supply and Requirements, op cit.

6 J. Philip Prince, Conclusions and Policy Implications from Enhanced Oil Recovery Potential in Canada, Study No. 9, Canadian Energy Research Institute, March 1980, page 9.

7 Carbon dioxide flooding involves the injection of CO_2 into the reservoir which then mixes with the oil, resulting in a solution that flows more readily to the producing well. Hydrocarbon miscible approach involves the injection of a hydrocarbon to gain a similar effect.

8 Prince, op cit., pages 4 and 5.

9 A further description of these calculations can be found in the Appendix to Canada, The Medium Term Performance and Issues, Economic Council of Canada, forthcoming.

APPENDIX

The tables in this Appendix present the data for the several economic indicators we have discussed in the text across the various alternatives. The Appendix also includes data for indicators such as the percentage change in productivity, the cumulative difference in nonresidential construction expenditures from the base case alternative, the cumulative difference in gross national product from the base case alternative, the savings rate and growth in the money supply. Additional information for the many economic indicators in the CANDIDE Model are available upon request.

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.1 CONSUMER PRICE INDEX (% CHANGE) - CPI

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	9.8	10.6	9.9	9.0	9.0	8.7	8.1	8.4	7.9	8.1	8.2
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	9.8	10.6	9.9	9.1	9.2	8.9	8.3	8.3	7.6	7.5	7.6
13	FOSSIL FUEL IN BALANCE - OIL $4-----	9.8	10.6	9.9	9.0	9.1	8.7	8.2	8.4	7.8	7.9	8.0
14	NO LARGE ENERGY PROJECT - OIL $4-----	9.8	10.6	9.8	8.9	8.9	8.6	8.1	8.5	8.1	8.2	8.3
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	9.8	9.8	8.8	7.9	8.0	8.3	7.7	7.8	7.5	7.5	7.8
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	9.8	10.6	9.9	9.1	9.2	8.9	8.3	8.3	7.6	7.5	7.6
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	9.9	10.3	9.4	9.1	9.2	9.7	8.3	8.8	7.7	7.6	7.2
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	9.9	10.6	9.7	9.4	9.5	10.1	8.5	9.1	7.9	7.7	7.3
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	9.8	10.7	10.0	9.3	9.2	9.7	9.2	9.1	8.9	8.9	9.3
25	FOSSIL FUEL IN BALANCE - OIL $4-----	9.8	10.6	10.0	9.2	9.1	9.5	9.2	9.5	9.2	9.3	9.7
26	NO LARGE ENERGY PROJECT - OIL $4-----	9.8	10.7	9.8	9.0	8.9	9.3	9.0	9.5	9.4	9.9	10.4
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	9.8	10.7	10.0	9.3	9.2	9.7	9.2	9.1	8.9	8.9	9.3
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	9.9	10.6	9.7	9.7	10.1	11.2	9.9	10.8	9.7	9.8	9.3
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	9.9	11.0	10.0	10.2	10.7	11.9	10.4	11.4	10.2	10.1	9.4
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	9.8	10.6	9.9	9.2	9.3	9.0	9.4	10.0	9.3	8.6	8.1
36	FOSSIL FUEL IN BALANCE - OIL $4-----	9.8	10.6	9.9	9.1	9.2	8.9	9.4	10.3	9.5	8.9	8.4
37	NO LARGE ENERGY PROJECT - OIL $4-----	9.8	10.7	9.8	8.9	8.8	8.9	9.1	10.3	9.7	9.3	8.9
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	9.9	9.8	8.8	8.1	8.2	8.5	9.0	9.8	9.3	8.8	8.5
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	9.8	10.6	9.9	9.2	9.3	9.0	9.4	10.0	9.3	8.6	8.1
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	9.9	10.6	9.4	9.1	9.3	9.7	12.1	11.5	9.7	8.7	7.6
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	9.9	10.9	9.7	9.5	9.6	10.1	13.1	12.1	10.1	8.8	7.5

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.2 GROSS NATIONAL PRODUCT 1971$ (% CHANGE) - GNE

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.5	1.5	3.6	4.3	3.7	3.1	2.7	2.6	2.3	2.2	2.1
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.5	1.3	3.2	3.9	3.2	2.9	2.8	2.8	2.4	2.2	2.4
14	NO LARGE ENERGY PROJECT - OIL $4-----	-0.4	0.4	2.6	3.3	3.2	2.5	2.8	3.1	2.7	2.4	2.5
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.5	1.6	4.0	4.8	4.2	3.4	3.1	3.0	2.6	2.4	2.3
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.5	1.5	3.6	4.3	3.7	3.1	2.7	2.6	2.3	2.2	2.1
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.5	1.6	3.8	4.4	3.7	2.7	2.6	2.3	2.2	2.1	2.4
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-0.5	1.6	3.7	4.3	3.5	2.6	2.4	2.2	2.0	2.0	2.2
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.5	1.6	3.7	4.4	3.8	3.0	2.6	2.6	2.3	2.0	1.6
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.5	1.5	3.4	4.0	3.5	3.0	2.5	2.7	2.1	1.9	1.9
26	NO LARGE ENERGY PROJECT - OIL $4-----	-0.4	0.6	2.7	3.4	3.4	2.5	2.8	3.1	2.9	2.7	2.7
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.5	1.6	3.7	4.4	3.8	3.0	2.6	2.6	2.3	2.0	1.6
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.5	1.6	3.9	4.3	3.4	2.3	2.0	1.7	1.6	1.4	1.6
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-0.5	1.6	3.8	4.2	3.2	2.1	1.8	1.5	1.3	1.1	1.2
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.5	1.5	3.6	4.3	3.6	3.0	3.8	2.2	1.8	1.4	1.2
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.5	1.3	3.2	3.9	3.3	3.0	3.8	2.3	1.7	1.4	1.5
37	NO LARGE ENERGY PROJECT - OIL $4-----	-0.4	0.4	2.6	3.3	3.3	2.3	3.9	2.6	2.2	2.0	2.1
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.5	1.6	4.0	4.7	4.2	3.3	4.1	2.5	2.1	1.7	1.3
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.5	1.5	3.6	4.3	3.6	3.0	3.8	2.2	1.8	1.4	1.2
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.5	1.5	3.8	4.4	3.7	2.7	2.7	1.3	1.5	1.3	1.5
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-0.5	1.5	3.7	4.3	3.5	2.6	2.5	1.0	1.2	1.1	1.3

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.3 GROSS NATIONAL PRODUCT 1971$ (BILLION) - GNE

LINE	ITEM	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION (ACTUAL)											
3	==========											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	128.8	130.6	134.6	139.4	144.0	147.5	151.4	156.1	160.3	163.7	168.0
6												
7	SHOCK - CONTROL (DIFFERENCE)											
8	==========											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.0	0.6	1.8	2.3	3.3	3.5	2.8	2.4	2.4	1.7
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.3	-0.2	0.3	0.2	0.9	1.1	0.7	0.3	0.3	-0.0
14	NO LARGE ENERGY PROJECT - OIL $4-----	0.0	-1.3	-2.0	-2.3	-2.6	-2.6	-2.4	-2.5	-2.5	-2.1	-2.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.1	0.2	1.4	3.1	4.6	6.1	6.9	7.0	7.2	7.7	7.3
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.0	0.6	1.8	2.3	3.3	3.5	2.8	2.4	2.4	1.7
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.1	0.2	1.2	2.3	2.9	3.3	3.3	2.3	1.6	1.5	1.3
19	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-0.1	0.2	1.0	2.1	2.4	2.7	2.4	1.1	0.2	-0.1	-0.7
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.2	1.0	2.3	3.1	4.0	4.1	3.5	3.0	2.8	1.2
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.0	0.3	0.9	1.3	2.1	2.0	1.4	0.6	0.1	-1.0
26	NO LARGE ENERGY PROJECT - OIL $4-----	-0.0	-1.1	-1.6	-1.9	-1.9	-1.8	-1.7	-1.8	-1.4	-0.6	-0.4
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.2	1.0	2.3	3.1	4.0	4.1	3.5	3.0	2.8	1.2
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.1	0.2	1.2	2.3	2.5	2.4	1.6	-0.6	-2.2	-3.5	-5.0
30	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-0.1	0.2	1.0	1.9	1.9	1.5	0.2	-2.3	-4.4	-6.1	-8.4
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.1	0.6	1.7	2.2	3.2	5.0	3.7	2.4	1.3	-0.9
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.2	-0.1	0.4	0.4	1.2	2.9	1.7	0.2	-1.0	-2.7
37	NO LARGE ENERGY PROJECT - OIL $4-----	0.0	-1.3	-2.0	-2.4	-2.5	-2.7	-1.0	-1.8	-2.5	-2.9	-3.7
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.1	0.2	1.4	3.0	4.4	5.8	8.2	7.6	6.8	6.2	4.2
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.1	0.6	1.7	2.2	3.2	5.0	3.7	2.4	1.3	-0.9
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.1	0.0	0.9	2.1	2.7	3.1	3.3	0.6	-1.2	-2.7	-4.4
42	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-0.1	0.0	0.8	1.8	2.2	2.5	2.3	-0.8	-3.0	-4.9	-7.1

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.4 PRODUCTIVITY (% CHANGE) - GNE/HE

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-2.3	-0.7	0.9	1.3	1.1	1.0	1.4	1.4	1.2	1.0	1.3
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.3	-0.6	1.1	1.7	1.2	1.3	1.4	1.2	1.1	1.1	1.1
13	FOSSIL FUEL IN BALANCE - OIL $4------	-2.4	-0.7	0.9	1.5	1.1	1.3	1.4	1.2	1.1	1.1	1.2
14	NO LARGE ENERGY PROJECT - OIL $4------	-2.3	-1.2	0.7	1.3	1.1	1.0	1.4	1.3	1.2	1.1	1.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2------	-2.3	-0.3	1.4	1.9	1.6	1.4	1.6	1.5	1.3	1.3	1.2
17	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.3	-0.6	1.1	1.7	1.2	1.3	1.4	1.2	1.1	1.1	1.1
18	SELF SUFFICIENCY BY 1990 - BLP+LG------	-2.4	-0.5	1.3	1.6	1.2	1.0	1.5	1.0	1.2	1.1	1.3
19	SELF SUFFICIENCY BY 1990 - BLP+HG------	-2.4	-0.6	1.2	1.5	1.2	0.9	1.5	0.9	1.1	1.0	1.2
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.3	-0.6	1.1	1.6	1.3	1.1	1.3	1.2	1.0	1.0	0.7
25	FOSSIL FUEL IN BALANCE - OIL $4------	-2.4	-0.6	1.0	1.4	1.2	1.1	1.1	1.1	0.9	0.9	0.9
26	NO LARGE ENERGY PROJECT - OIL $4------	-2.3	-1.1	0.7	1.2	1.1	0.8	1.2	1.2	1.2	1.2	1.3
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.3	-0.6	1.1	1.6	1.3	1.1	1.3	1.2	1.0	1.0	0.7
29	SELF SUFFICIENCY BY 1990 - BLP+LG------	-2.4	-0.5	1.3	1.4	1.0	0.7	1.2	0.5	0.8	0.6	0.9
30	SELF SUFFICIENCY BY 1990 - BLP+HG------	-2.4	-0.7	1.2	1.3	0.8	0.4	1.0	0.3	0.6	0.4	0.6
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.3	-0.6	1.1	1.6	1.2	1.3	1.7	0.8	0.9	0.9	0.6
36	FOSSIL FUEL IN BALANCE - OIL $4------	-2.4	-0.7	0.9	1.5	1.1	1.3	1.6	0.7	0.8	0.8	0.8
37	NO LARGE ENERGY PROJECT - OIL $4------	-2.3	-1.2	0.7	1.2	1.2	0.8	1.7	0.7	1.0	1.0	1.1
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2------	-2.4	-0.3	1.4	1.9	1.5	1.3	1.9	1.0	1.1	1.1	0.7
40	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.3	-0.6	1.1	1.6	1.2	1.3	1.7	0.8	0.9	0.9	0.6
41	SELF SUFFICIENCY BY 1990 - BLP+LG------	-2.4	-0.6	1.3	1.6	1.2	1.0	0.8	0.6	1.0	0.9	0.9
42	SELF SUFFICIENCY BY 1990 - BLP+HG------	-2.4	-0.7	1.2	1.5	1.1	0.9	0.4	0.4	0.8	0.7	0.8

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.5 REAL WAGE RATE (% CHANGE) - W/CPI

LINE	ITEM	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-2.2	-2.4	-0.1	0.7	0.5	1.2	1.7	1.3	2.2	1.9	2.0
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.2	-2.3	-0.1	0.7	0.6	1.4	2.1	1.8	2.4	2.3	2.2
13	FOSSIL FUEL IN BALANCE - OIL $4------	-2.2	-2.4	-0.1	0.7	0.5	1.2	1.7	1.4	2.2	1.9	1.9
14	NO LARGE ENERGY PROJECT - OIL $4------	-2.2	-2.4	-0.1	0.6	0.4	1.0	1.5	1.1	2.0	1.8	2.0
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2------	-2.2	-1.6	0.5	1.2	1.3	1.5	2.7	2.4	2.9	2.9	2.6
17	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.2	-2.3	-0.1	0.7	0.6	1.4	2.1	1.8	2.4	2.3	2.2
18	SELF SUFFICIENCY BY 1990 - BLP+LG------	-2.2	-2.0	0.2	0.5	0.7	0.7	2.6	1.2	2.6	2.1	2.5
19	SELF SUFFICIENCY BY 1990 - BLP+HG------	-2.2	-2.3	0.2	0.3	0.6	0.5	2.5	0.9	2.4	1.9	2.2
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.2	-2.4	-0.1	0.6	0.8	0.9	2.0	2.0	2.3	2.5	2.3
25	FOSSIL FUEL IN BALANCE - OIL $4------	-2.2	-2.4	-0.1	0.5	0.7	0.7	1.6	1.4	2.1	1.9	1.8
26	NO LARGE ENERGY PROJECT - OIL $4------	-2.2	-2.4	-0.1	0.5	0.6	0.5	1.3	1.0	1.8	1.9	2.3
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.2	-2.4	-0.1	0.6	0.8	0.9	2.0	2.0	2.3	2.5	2.3
29	SELF SUFFICIENCY BY 1990 - BLP+LG------	-2.2	-2.3	0.2	0.1	0.2	-0.1	1.9	0.3	1.8	1.3	2.0
30	SELF SUFFICIENCY BY 1990 - BLP+HG------	-2.2	-2.6	0.0	-0.2	-0.0	-0.5	1.8	-0.2	1.5	0.8	1.6
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.2	-2.4	-0.1	0.6	0.6	1.3	1.2	1.2	2.3	2.4	2.3
36	FOSSIL FUEL IN BALANCE - OIL $4------	-2.2	-2.4	-0.1	0.6	0.5	1.1	0.9	0.6	2.1	2.0	1.9
37	NO LARGE ENERGY PROJECT - OIL $4------	-2.2	-2.4	-0.1	0.5	0.6	0.6	0.9	0.2	1.8	1.9	2.3
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2------	-2.2	-1.6	0.5	1.1	1.2	1.4	1.7	1.9	2.9	3.1	2.8
40	SELF SUFFICIENCY BY 1990 - OIL $4------	-2.2	-2.4	-0.1	0.6	0.6	1.3	1.2	1.2	2.3	2.4	2.3
41	SELF SUFFICIENCY BY 1990 - BLP+LG------	-2.2	-2.3	0.3	0.4	0.6	0.7	-0.9	1.2	2.3	2.1	2.4
42	SELF SUFFICIENCY BY 1990 - BLP+HG------	-2.2	-2.6	0.3	0.3	0.5	0.5	-1.6	1.2	2.1	1.8	2.2

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.6 REAL DISPOSABLE INCOME (% CHANGE) - PDY$/CPI

LINE	ITEM	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	0.5	0.0	1.3	2.1	1.8	2.1	2.4	2.4	2.3	2.1	2.7
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	0.5	0.1	1.5	2.5	2.0	2.4	2.6	2.5	2.3	2.5	2.7
13	FOSSIL FUEL IN BALANCE - OIL $4-----	0.4	-0.0	1.3	2.3	1.8	2.3	2.5	2.4	2.2	2.2	2.4
14	NO LARGE ENERGY PROJECT - OIL $4-----	0.5	-0.4	1.1	2.0	1.8	2.0	2.4	2.4	2.2	2.2	2.6
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	0.5	0.7	2.2	3.1	2.9	2.7	3.3	3.3	2.9	3.1	3.0
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	0.5	0.1	1.5	2.5	2.0	2.4	2.6	2.5	2.3	2.5	2.7
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	0.4	0.1	1.8	2.2	1.9	1.4	2.8	1.9	2.3	2.3	2.9
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	0.4	-0.1	1.7	2.1	1.8	1.3	2.6	1.7	2.1	2.1	2.7
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	0.5	0.2	1.7	2.6	2.6	2.5	3.0	3.2	2.5	2.8	2.7
25	FOSSIL FUEL IN BALANCE - OIL $4-----	0.4	0.2	1.5	2.5	2.4	2.4	2.8	2.8	2.1	2.2	2.3
26	NO LARGE ENERGY PROJECT - OIL $4-----	0.5	-0.2	1.3	2.2	2.3	2.1	2.8	2.8	2.3	2.5	3.1
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	0.5	0.2	1.7	2.6	2.6	2.5	3.0	3.2	2.5	2.8	2.7
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	0.4	0.0	1.9	2.0	1.5	0.8	2.3	1.1	1.4	1.4	2.3
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	0.4	-0.2	1.7	1.8	1.3	0.6	2.0	0.7	1.1	1.0	1.7
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	0.5	0.1	1.5	2.4	2.0	2.3	3.7	2.1	1.9	2.2	2.5
36	FOSSIL FUEL IN BALANCE - OIL $4-----	0.4	-0.0	1.3	2.2	1.8	2.3	3.5	1.7	1.6	1.7	2.3
37	NO LARGE ENERGY PROJECT - OIL $4-----	0.5	-0.4	1.1	2.0	2.0	1.6	3.5	1.7	1.7	1.9	3.0
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	0.4	0.7	2.2	3.0	2.8	2.6	4.3	2.7	2.4	2.7	2.8
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	0.5	0.1	1.5	2.4	2.0	2.3	3.7	2.1	1.9	2.2	2.5
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	0.4	-0.1	1.9	2.2	1.9	1.5	0.8	1.2	1.5	1.7	2.4
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	0.4	-0.3	1.8	2.1	1.8	1.3	0.4	1.0	1.3	1.5	2.3

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.7 UNEMPLOYMENT RATE (LEVEL) - DURATE

LINE	ITEM	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	==========											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	7.9	8.0	7.5	7.0	6.7	6.5	6.5	6.1	5.9	5.9	5.6
6												
7	ALTERNATIVE SOLUTIONS											
8	==========											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	7.9	8.0	7.3	6.5	5.9	5.5	5.5	5.4	5.4	5.6	5.5
13	FOSSIL FUEL IN BALANCE - OIL $4-----	8.0	8.1	7.6	7.0	6.6	6.2	6.1	5.8	5.7	5.8	5.6
14	NO LARGE ENERGY PROJECT - OIL $4-----	7.9	8.4	8.2	7.8	7.5	7.3	7.1	6.7	6.4	6.2	5.9
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	7.9	8.1	7.4	6.5	5.8	5.3	5.2	4.9	4.9	5.0	5.0
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	7.9	8.0	7.3	6.5	5.9	5.5	5.5	5.4	5.4	5.6	5.5
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	7.9	8.0	7.3	6.5	5.9	5.5	5.7	5.6	5.8	6.0	5.9
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	7.9	7.9	7.2	6.3	5.8	5.4	5.6	5.6	5.8	6.0	5.9
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	7.9	7.9	7.1	6.2	5.6	5.0	4.9	4.8	4.8	4.9	5.0
25	FOSSIL FUEL IN BALANCE - OIL $4-----	8.0	8.0	7.4	6.6	6.1	5.5	5.4	5.1	5.1	5.3	5.3
26	NO LARGE ENERGY PROJECT - OIL $4-----	7.9	8.3	8.0	7.6	7.1	6.7	6.5	5.9	5.5	5.2	4.8
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	7.9	7.9	7.1	6.2	5.6	5.0	4.9	4.8	4.8	4.9	5.0
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	7.9	7.9	7.2	6.3	5.7	5.3	5.5	5.5	5.8	6.1	6.2
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	7.9	7.9	7.1	6.1	5.5	5.1	5.3	5.4	5.7	6.0	6.2
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	7.9	8.0	7.3	6.5	5.9	5.5	4.8	4.7	4.9	5.3	5.7
36	FOSSIL FUEL IN BALANCE - OIL $4-----	8.0	8.1	7.5	6.9	6.5	6.1	5.3	5.1	5.2	5.6	5.8
37	NO LARGE ENERGY PROJECT - OIL $4-----	7.9	8.4	8.2	7.8	7.5	7.3	6.5	6.0	5.8	5.9	5.8
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	7.9	8.1	7.4	6.5	5.8	5.2	4.5	4.3	4.4	4.9	5.3
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	7.9	8.0	7.3	6.5	5.9	5.5	4.8	4.7	4.9	5.3	5.7
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	7.9	8.0	7.3	6.5	5.9	5.5	5.0	5.3	5.6	6.2	6.6
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	7.9	7.9	7.2	6.4	5.8	5.4	4.8	5.1	5.5	6.2	6.6

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.8 TOTAL DEFICIT ALL LEVELS OF GOVT. (BILLION) - GD$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	**********											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-4.8	-3.8	-2.8	-0.9	3.0	3.3	3.4	4.0	4.8	5.3	7.2
6												
7	ALTERNATIVE SOLUTIONS											
8	**********											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-4.8	-3.8	-1.4	1.2	6.1	8.2	9.4	9.4	11.3	14.4	19.9
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-4.9	-4.1	-2.2	-0.6	3.3	4.6	6.3	7.8	10.0	12.3	15.6
14	NO LARGE ENERGY PROJECT - OIL $4-----	-4.8	-5.0	-4.1	-3.7	-0.5	-0.8	-0.5	-0.4	-0.5	-0.8	-0.8
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-4.8	-4.6	-2.8	-0.8	2.9	5.2	5.6	4.4	5.5	7.7	12.7
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-4.8	-3.8	-1.4	1.2	6.1	8.2	9.4	9.4	11.3	14.4	19.9
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-4.8	-3.5	-1.5	1.5	6.8	11.0	11.6	12.9	14.8	18.8	24.1
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-4.8	-3.1	-1.0	2.3	7.8	12.5	13.2	14.9	16.9	21.0	26.4
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-4.8	-3.6	-1.2	0.9	4.1	5.1	3.4	-1.8	-3.4	-5.1	-3.8
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-4.9	-3.9	-2.1	-0.8	1.5	1.9	0.9	-1.6	-2.5	-4.8	-4.8
26	NO LARGE ENERGY PROJECT - OIL $4-----	-4.8	-4.8	-4.1	-4.3	-3.1	-5.0	-8.3	-13.8	-19.2	-27.4	-37.6
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-4.8	-3.6	-1.2	0.9	4.1	5.1	3.4	-1.8	-3.4	-5.1	-3.8
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-4.8	-2.8	-0.1	2.4	7.7	11.9	10.9	10.4	10.9	13.1	16.5
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-4.8	-2.3	-0.0	3.6	9.5	14.7	14.3	15.1	16.3	19.5	23.6
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-4.8	-3.8	-1.3	1.2	6.2	8.2	8.2	7.6	8.5	9.2	11.4
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-4.9	-4.1	-2.1	-0.4	3.7	5.3	5.8	7.7	8.9	9.1	9.0
37	NO LARGE ENERGY PROJECT - OIL $4-----	-4.8	-4.9	-4.1	-3.8	-1.3	-0.9	-3.1	-4.1	-6.4	-10.3	-14.8
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-4.8	-4.5	-2.7	-0.7	3.0	5.1	4.3	2.4	2.2	1.7	3.2
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-4.8	-3.8	-1.3	1.2	6.2	8.2	8.2	7.6	8.5	9.2	11.4
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-4.8	-3.4	-1.6	1.4	6.5	10.5	16.2	16.0	16.6	18.3	20.9
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-4.8	-3.0	-1.1	2.3	7.6	12.1	20.4	20.6	21.1	22.9	25.4

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TABLE A.9 TOTAL DEFICIT PER CENT OF G.N.P. - GD$/GNE$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	**********											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-1.7	-1.2	-0.6	-0.2	0.7	0.7	0.6	0.6	0.7	0.7	0.9
6												
7	ALTERNATIVE SOLUTIONS											
8	**********											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-1.7	-1.2	-0.4	0.3	1.3	1.6	1.7	1.5	1.6	1.9	2.3
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-1.7	-1.3	-0.6	-0.1	0.7	0.9	1.1	1.3	1.5	1.6	1.9
14	NO LARGE ENERGY PROJECT - OIL $4-----	-1.7	-1.6	-1.2	-1.0	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-1.7	-1.5	-0.8	-0.2	0.7	1.0	1.0	0.7	0.8	1.0	1.5
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-1.7	-1.2	-0.4	0.3	1.3	1.6	1.7	1.5	1.6	1.9	2.3
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-1.7	-1.1	-0.4	0.4	1.5	2.2	2.1	2.1	2.2	2.5	2.9
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-1.7	-1.0	-0.3	0.6	1.7	2.4	2.3	2.4	2.4	2.7	3.1
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-1.7	-1.1	-0.3	0.2	0.9	1.0	0.6	-0.3	-0.5	-0.6	-0.4
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-1.7	-1.2	-0.6	-0.2	0.3	0.4	0.2	-0.2	-0.4	-0.6	-0.8
26	NO LARGE ENERGY PROJECT - OIL $4-----	-1.7	-1.5	-1.2	-1.1	-0.7	-1.0	-1.5	-2.2	-2.8	-3.6	-4.3
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-1.7	-1.1	-0.3	0.2	0.9	1.0	0.6	-0.3	-0.5	-0.6	-0.4
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-1.7	-0.9	-0.2	0.6	1.7	2.3	1.9	1.6	1.5	1.6	1.8
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-1.7	-0.7	-0.0	0.9	2.0	2.8	2.4	2.3	2.2	2.4	2.6
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-1.7	-1.2	-0.4	0.3	1.4	1.6	1.4	1.2	1.2	1.1	1.3
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-1.7	-1.3	-0.6	-0.1	0.8	1.0	1.0	1.2	1.2	1.1	1.0
37	NO LARGE ENERGY PROJECT - OIL $4-----	-1.7	-1.6	-1.2	-1.0	-0.3	-0.2	-0.6	-0.7	-0.9	-1.3	-1.7
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-1.7	-1.4	-0.8	-0.2	0.7	1.0	0.8	0.4	0.3	0.2	0.4
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-1.7	-1.2	-0.4	0.3	1.4	1.6	1.4	1.2	1.2	1.1	1.3
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-1.7	-1.1	-0.4	0.3	1.4	2.1	2.8	2.5	2.3	2.3	2.4
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-1.7	-0.9	-0.3	0.6	1.7	2.4	3.4	3.1	2.9	2.8	2.8

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TABLE A.10 FEDERAL GOVERNMENT DEFICIT (BILLION) - GDFS

LINE	ITEM	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-10.8	-12.5	-12.8	-13.3	-11.4	-12.5	-13.4	-13.8	-13.1	-12.7	-10.5
6												
7	ALTERNATIVE SOLUTIONS											
8	=====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-10.9	-12.5	-12.3	-11.7	-9.0	-8.8	-8.8	-9.9	-9.1	-7.9	-4.6
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-10.9	-12.7	-13.0	-13.1	-11.1	-11.6	-11.2	-11.0	-9.5	-8.0	-5.0
14	NO LARGE ENERGY PROJECT - OIL $4-----	-10.8	-13.3	-14.4	-15.6	-14.2	-15.9	-16.5	-17.2	-16.7	-16.4	-15.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-10.8	-12.7	-12.9	-12.6	-11.0	-10.5	-11.1	-13.4	-13.0	-12.2	-8.6
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-10.9	-12.5	-12.3	-11.7	-9.0	-8.8	-8.8	-9.9	-9.1	-7.9	-4.6
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-10.8	-11.6	-11.3	-9.5	-5.7	-2.5	-1.5	0.1	2.1	5.3	10.1
19	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-10.8	-11.5	-11.3	-9.6	-5.9	-2.8	-2.2	-1.0	0.4	3.1	7.1
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-10.9	-12.6	-13.1	-13.4	-13.2	-15.0	-18.9	-26.4	-30.0	-34.6	-36.4
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-10.9	-12.9	-13.7	-14.7	-15.2	-17.4	-20.7	-25.4	-27.7	-31.4	-34.0
26	NO LARGE ENERGY PROJECT - OIL $4-----	-10.8	-13.4	-15.2	-17.4	-18.8	-23.0	-28.1	-35.3	-40.7	-48.6	-57.3
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-10.9	-12.6	-13.1	-13.4	-13.2	-15.0	-18.9	-26.4	-30.0	-34.6	-36.4
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-10.8	-11.1	-11.1	-9.6	-6.0	-3.1	-3.3	-3.0	-1.9	0.4	4.7
30	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-10.8	-11.0	-11.1	-9.6	-6.1	-3.3	-4.1	-4.4	-4.2	-3.0	-0.8
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-10.9	-12.5	-12.3	-11.7	-8.9	-8.8	-13.2	-15.4	-15.4	-16.2	-15.1
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-10.9	-12.7	-12.9	-12.9	-10.9	-11.1	-14.8	-14.7	-13.8	-13.9	-13.4
37	NO LARGE ENERGY PROJECT - OIL $4-----	-10.8	-13.2	-14.4	-15.6	-15.1	-16.0	-22.0	-24.0	-25.5	-28.0	-30.3
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-10.8	-12.6	-12.8	-12.6	-11.0	-10.5	-15.5	-19.0	-19.6	-21.0	-19.9
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-10.9	-12.5	-12.3	-11.7	-8.9	-8.8	-13.2	-15.4	-15.4	-16.2	-15.1
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-10.8	-11.4	-11.3	-9.7	-6.0	-3.1	1.0	2.4	4.1	6.0	9.5
42	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-10.8	-11.3	-11.3	-9.7	-6.2	-3.3	1.0	1.6	2.4	3.3	5.2

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TABLE A.11 FEDERAL DEFICIT PERCENT OF G.N.P. - GOF$/GNE$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-3.8	-4.0	-3.6	-3.3	-2.5	-2.5	-2.4	-2.3	-1.9	-1.7	-1.3
6												
7	ALTERNATIVE SOLUTIONS											
8	=====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-3.8	-4.0	-3.5	-2.9	-2.0	-1.7	-1.5	-1.6	-1.3	-1.0	-0.5
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-3.8	-4.0	-3.7	-3.3	-2.5	-2.3	-2.0	-1.8	-1.4	-1.1	-0.6
14	NO LARGE ENERGY PROJECT - OIL $4-----	-3.8	-4.3	-4.1	-4.0	-3.2	-3.3	-3.1	-2.9	-2.5	-2.2	-1.9
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-3.8	-4.0	-3.6	-3.2	-2.4	-2.1	-2.0	-2.2	-1.9	-1.6	-1.0
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-3.8	-4.0	-3.5	-2.9	-2.0	-1.7	-1.5	-1.6	-1.3	-1.0	-0.5
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-3.8	-3.7	-3.2	-2.4	-1.3	-0.5	-0.3	0.0	0.3	0.7	1.2
19	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-3.8	-3.6	-3.2	-2.4	-1.3	-0.5	-0.4	-0.2	0.1	0.4	0.8
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-3.8	-4.0	-3.6	-3.3	-2.8	-2.9	-3.2	-4.0	-4.1	-4.2	-4.0
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-3.8	-4.1	-3.8	-3.6	-3.3	-3.4	-3.6	-4.0	-3.9	-3.9	-3.8
26	NO LARGE ENERGY PROJECT - OIL $4-----	-3.8	-4.3	-4.3	-4.4	-4.2	-4.7	-5.1	-5.7	-5.9	-6.3	-6.6
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-3.8	-4.0	-3.6	-3.3	-2.8	-2.9	-3.2	-4.0	-4.1	-4.2	-4.0
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-3.8	-3.5	-3.1	-2.4	-1.3	-0.6	-0.6	-0.5	-0.3	0.0	0.5
30	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-3.8	-3.5	-3.1	-2.3	-1.3	-0.6	-0.7	-0.7	-0.6	-0.4	-0.1
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-3.8	-3.9	-3.5	-2.9	-2.0	-1.7	-2.3	-2.4	-2.1	-2.0	-1.7
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-3.8	-4.0	-3.6	-3.2	-2.4	-2.2	-2.6	-2.3	-1.9	-1.7	-1.5
37	NO LARGE ENERGY PROJECT - OIL $4-----	-3.8	-4.2	-4.1	-4.0	-3.4	-3.3	-4.0	-3.9	-3.7	-3.7	-3.5
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-3.8	-4.0	-3.6	-3.1	-2.4	-2.1	-2.7	-2.9	-2.7	-2.6	-2.2
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-3.8	-3.9	-3.5	-2.9	-2.0	-1.7	-2.3	-2.4	-2.1	-2.0	-1.7
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-3.8	-3.6	-3.2	-2.4	-1.3	-0.6	0.2	0.4	0.6	0.8	1.1
42	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-3.8	-3.6	-3.2	-2.4	-1.4	-0.6	0.2	0.2	0.3	0.4	0.6

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TABLE A.12 PROVINCIAL GOVERNMENT DEFICIT (BILLION) - GDP$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WORLD PRICE LOW (1.0-1.5% REAL)-	2.7	4.5	6.1	7.3	8.7	10.0	10.5	11.0	10.4	9.7	9.1
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	2.7	4.5	6.3	7.9	9.5	11.1	12.0	12.6	12.7	13.6	15.1
13	FOSSIL FUEL IN BALANCE - OIL $4-----	2.7	4.4	6.1	7.5	8.8	10.3	11.2	12.1	11.9	11.9	11.7
14	NO LARGE ENERGY PROJECT - OIL $4-----	2.7	4.2	5.6	6.7	8.0	9.0	9.7	10.1	8.9	7.5	5.9
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	2.7	3.9	5.4	6.8	8.2	9.7	10.3	10.8	10.4	10.8	11.3
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	2.7	4.5	6.3	7.9	9.5	11.1	12.0	12.6	12.7	13.6	15.1
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	2.7	3.9	5.1	6.1	6.9	7.7	7.0	6.3	5.5	5.4	5.6
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	2.7	4.2	5.6	7.0	8.2	9.6	9.4	9.4	9.1	9.8	10.8
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	2.7	4.8	7.1	9.3	11.6	14.2	15.8	17.4	17.9	19.5	21.2
25	FOSSIL FUEL IN BALANCE - OIL $4-----	2.7	4.7	6.9	8.8	11.0	13.4	15.1	16.6	16.6	16.8	16.5
26	NO LARGE ENERGY PROJECT - OIL $4-----	2.7	4.5	6.4	8.0	10.0	11.8	13.2	14.3	13.4	12.2	10.1
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	2.7	4.8	7.1	9.3	11.6	14.2	15.8	17.4	17.9	19.5	21.2
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	2.7	4.1	5.7	7.0	8.1	9.2	8.1	6.8	5.1	4.2	2.8
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	2.7	4.5	6.4	8.3	10.0	12.4	12.4	12.9	12.8	13.9	15.2
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	2.7	4.5	6.3	7.9	9.5	11.1	15.4	16.5	16.3	16.7	17.1
36	FOSSIL FUEL IN BALANCE - OIL $4-----	2.7	4.4	6.1	7.5	8.9	10.5	14.7	15.8	15.2	14.6	13.4
37	NO LARGE ENERGY PROJECT - OIL $4-----	2.7	4.2	5.5	6.7	8.0	9.0	12.8	13.4	11.8	9.9	7.3
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	2.7	3.9	5.4	6.8	8.3	9.7	13.8	14.8	14.0	13.8	13.1
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	2.7	4.5	6.3	7.9	9.5	11.1	15.4	16.5	16.3	16.7	17.1
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	2.7	3.8	5.1	6.1	7.0	7.8	9.3	7.5	5.7	4.8	3.7
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	2.7	4.2	5.6	7.0	8.2	9.7	13.6	13.0	11.9	12.1	12.4

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TABLE A.13 PROVINCIAL DEFICIT PERCENT OF G.N.P. - GDP$/GNE$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	**********											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	1.0	1.4	1.7	1.8	1.9	2.0	1.9	1.8	1.5	1.3	1.1
6												
7	ALTERNATIVE SOLUTIONS											
8	**********											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.0	1.4	1.8	2.0	2.1	2.2	2.1	2.0	1.8	1.8	1.8
13	FOSSIL FUEL IN BALANCE - OIL $4-----	0.9	1.4	1.7	1.9	2.0	2.1	2.0	2.0	1.7	1.6	1.4
14	NO LARGE ENERGY PROJECT - OIL $4-----	1.0	1.3	1.6	1.7	1.8	1.9	1.8	1.7	1.3	1.0	0.7
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	1.0	1.2	1.5	1.7	1.8	1.9	1.8	1.7	1.5	1.4	1.3
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.0	1.4	1.8	2.0	2.1	2.2	2.1	2.0	1.8	1.8	1.8
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	1.0	1.2	1.4	1.5	1.5	1.5	1.3	1.0	0.8	0.7	0.7
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	1.0	1.3	1.6	1.7	1.8	1.9	1.7	1.5	1.3	1.3	1.3
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.0	1.5	2.0	2.3	2.5	2.7	2.7	2.7	2.5	2.4	2.3
25	FOSSIL FUEL IN BALANCE - OIL $4-----	0.9	1.5	1.9	2.2	2.4	2.6	2.6	2.6	2.3	2.1	1.8
26	NO LARGE ENERGY PROJECT - OIL $4-----	1.0	1.4	1.8	2.0	2.2	2.4	2.4	2.3	2.0	1.6	1.2
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.0	1.5	2.0	2.3	2.5	2.7	2.7	2.7	2.5	2.4	2.3
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	1.0	1.3	1.6	1.7	1.8	1.8	1.4	1.1	0.7	0.5	0.3
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	1.0	1.4	1.8	2.0	2.2	2.4	2.1	2.0	1.8	1.7	1.7
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.0	1.4	1.8	2.0	2.1	2.2	2.6	2.5	2.2	2.1	1.9
36	FOSSIL FUEL IN BALANCE - OIL $4-----	0.9	1.4	1.7	1.9	2.0	2.1	2.6	2.4	2.1	1.8	1.5
37	NO LARGE ENERGY PROJECT - OIL $4-----	1.0	1.3	1.6	1.7	1.8	1.9	2.3	2.2	1.7	1.3	0.9
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	1.0	1.2	1.5	1.7	1.8	1.9	2.4	2.3	1.9	1.7	1.5
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.0	1.4	1.8	2.0	2.1	2.2	2.6	2.5	2.2	2.1	1.9
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	1.0	1.2	1.4	1.5	1.5	1.5	1.6	1.2	0.8	0.6	0.4
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	1.0	1.3	1.6	1.7	1.8	1.9	2.3	1.9	1.6	1.5	1.4

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TABLE A.14 CURRENT ACCOUNT BALANCE (BILLION) - TBC_BAL_CAN$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-5.2	-5.6	-5.8	-8.1	-9.6	-11.1	-12.0	-14.7	-15.5	-17.6	-19.2
6												
7	ALTERNATIVE SOLUTIONS											
8	=====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-5.1	-5.6	-6.4	-10.0	-12.0	-14.6	-14.2	-13.8	-10.5	-6.2	1.0
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-5.1	-5.3	-5.6	-8.5	-9.8	-12.1	-11.7	-11.9	-10.2	-10.4	-10.1
14	NO LARGE ENERGY PROJECT - OIL $4-----	-5.2	-4.4	-3.9	-5.9	-7.1	-9.5	-10.4	-13.9	-16.9	-21.2	-24.1
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-5.1	-5.7	-7.0	-11.0	-13.7	-16.6	-16.6	-17.0	-14.2	-10.3	-3.3
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-5.1	-5.6	-6.4	-10.0	-12.0	-14.6	-14.2	-13.8	-10.5	-6.2	1.0
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-5.1	-5.7	-6.9	-10.5	-12.5	-14.6	-14.1	-13.8	-10.6	-6.4	0.4
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-5.1	-5.8	-6.8	-10.4	-12.3	-14.3	-13.6	-13.1	-9.7	-5.5	1.3
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-5.1	-5.1	-5.9	-10.1	-13.2	-17.2	-17.9	-19.8	-17.4	-13.5	-6.8
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-5.1	-4.9	-5.2	-8.8	-11.3	-15.3	-15.9	-18.2	-17.2	-18.7	-21.8
26	NO LARGE ENERGY PROJECT - OIL $4-----	-5.2	-4.0	-3.4	-6.1	-8.4	-12.6	-15.4	-22.9	-31.1	-43.8	-56.1
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-5.1	-5.1	-5.9	-10.1	-13.2	-17.2	-17.9	-19.8	-17.4	-13.5	-6.8
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-5.1	-5.1	-6.0	-10.1	-12.5	-15.6	-15.8	-16.9	-14.2	-10.5	-2.6
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-5.1	-5.2	-6.0	-10.0	-12.2	-15.0	-14.8	-15.2	-11.7	-7.2	1.1
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-5.1	-5.6	-6.4	-10.0	-12.1	-14.9	-14.0	-11.7	-9.4	-5.2	3.2
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-5.1	-5.4	-5.7	-8.7	-10.3	-13.0	-12.0	-10.2	-9.2	-8.9	-4.9
37	NO LARGE ENERGY PROJECT - OIL $4-----	-5.2	-4.4	-3.9	-6.0	-7.7	-10.1	-11.2	-13.6	-19.4	-26.8	-27.2
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-5.1	-5.8	-7.1	-11.1	-13.9	-17.0	-16.8	-15.4	-13.9	-10.5	1.6
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-5.1	-5.6	-6.4	-10.0	-12.1	-14.9	-14.0	-11.7	-9.4	-5.2	7.2
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-5.1	-5.6	-6.7	-10.5	-12.7	-15.0	-12.5	-9.5	-8.1	-4.2	6.9
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-5.1	-5.7	-6.7	-10.4	-12.4	-14.7	-12.0	-8.2	-6.2	-1.7	9.5

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TABLE A.15 CURRENT ACCOUNT BALANCE PERCENT OF G.N.P. - CAN$/GNE$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-1.8	-1.8	-1.6	-2.0	-2.1	-2.2	-2.2	-2.4	-2.3	-2.4	-2.3
6												
7	ALTERNATIVE SOLUTIONS											
8	=====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4------	-1.8	-1.8	-1.8	-2.5	-2.6	-2.9	-2.5	-2.2	-1.5	-0.8	0.1
13	FOSSIL FUEL IN BALANCE - OIL $4------	-1.8	-1.7	-1.6	-2.1	-2.2	-2.4	-2.1	-1.9	-1.5	-1.4	-1.2
14	NO LARGE ENERGY PROJECT - OIL $4------	-1.8	-1.4	-1.1	-1.5	-1.6	-2.0	-1.9	-2.3	-2.6	-2.9	-3.0
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2------	-1.8	-1.8	-2.0	-2.7	-3.0	-3.3	-3.0	-2.7	-2.1	-1.3	-0.4
17	SELF SUFFICIENCY BY 1990 - OIL $4------	-1.8	-1.8	-1.8	-2.5	-2.6	-2.9	-2.5	-2.2	-1.5	-0.8	0.1
18	SELF SUFFICIENCY BY 1990 - BLP+LG------	-1.8	-1.8	-1.9	-2.6	-2.7	-2.9	-2.5	-2.2	-1.5	-0.8	0.0
19	SELF SUFFICIENCY BY 1990 - BLP+HG------	-1.8	-1.8	-1.9	-2.6	-2.7	-2.8	-2.4	-2.1	-1.4	-0.7	0.2
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4------	-1.8	-1.6	-1.6	-2.5	-2.8	-3.3	-3.1	-3.0	-2.4	-1.7	-0.5
25	FOSSIL FUEL IN BALANCE - OIL $4------	-1.8	-1.6	-1.5	-2.2	-2.5	-3.0	-2.8	-2.8	-2.4	-2.3	-2.4
26	NO LARGE ENERGY PROJECT - OIL $4------	-1.8	-1.3	-1.0	-1.5	-1.9	-2.5	-2.8	-3.7	-4.5	-5.7	-6.5
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4------	-1.8	-1.6	-1.6	-2.5	-2.8	-3.3	-3.1	-3.0	-2.4	-1.7	-0.5
29	SELF SUFFICIENCY BY 1990 - BLP+LG------	-1.8	-1.6	-1.7	-2.5	-2.7	-3.0	-2.8	-2.6	-2.0	-1.3	-0.3
30	SELF SUFFICIENCY BY 1990 - BLP+HG------	-1.8	-1.6	-1.7	-2.4	-2.6	-2.9	-2.5	-2.3	-1.6	-0.9	0.1
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4------	-1.8	-1.8	-1.8	-2.5	-2.7	-2.9	-2.4	-1.8	-1.3	-0.6	0.8
36	FOSSIL FUEL IN BALANCE - OIL $4------	-1.8	-1.7	-1.6	-2.2	-2.3	-2.6	-2.1	-1.6	-1.3	-1.1	-0.6
37	NO LARGE ENERGY PROJECT - OIL $4------	-1.8	-1.4	-1.1	-1.5	-1.7	-2.1	-2.0	-2.2	-2.8	-3.5	-3.2
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2------	-1.8	-1.8	-2.0	-2.8	-3.1	-3.4	-2.9	-2.4	-1.9	-1.3	0.2
40	SELF SUFFICIENCY BY 1990 - OIL $4------	-1.8	-1.8	-1.8	-2.5	-2.7	-2.9	-2.4	-1.8	-1.3	-0.6	0.8
41	SELF SUFFICIENCY BY 1990 - BLP+LG------	-1.8	-1.8	-1.9	-2.6	-2.8	-3.0	-2.2	-1.5	-1.1	-0.5	0.8
42	SELF SUFFICIENCY BY 1990 - BLP+HG------	-1.8	-1.8	-1.9	-2.6	-2.7	-2.9	-2.0	-1.2	-0.8	-0.2	1.1

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TABLE A.16 ENERGY BALANCE (BILLION) - TBC.BAL.FOSSIL

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	3.5	4.8	5.2	3.8	3.5	2.0	0.2	-2.2	-4.7	-7.3	-8.9
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4------	3.5	4.8	5.2	3.8	3.5	2.0	1.8	2.0	3.8	9.1	17.5
13	FOSSIL FUEL IN BALANCE - OIL $4------	3.5	4.8	5.2	3.8	3.5	2.0	1.9	1.8	1.9	1.9	2.2
14	NO LARGE ENERGY PROJECT - OIL $4------	3.5	4.8	5.2	3.8	3.4	1.0	-0.6	-3.9	-8.9	-13.7	-17.4
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2------	3.5	4.8	5.2	3.8	3.5	2.1	1.9	2.0	3.9	9.3	17.9
17	SELF SUFFICIENCY BY 1990 - OIL $4------	3.5	4.8	5.2	3.8	3.5	2.0	1.8	2.0	3.8	9.1	17.5
18	SELF SUFFICIENCY BY 1990 - BLP+LG------	3.5	4.8	5.2	3.8	3.5	2.0	1.8	2.0	3.8	9.0	17.5
19	SELF SUFFICIENCY BY 1990 - BLP+HG------	3.5	4.8	5.2	3.8	3.5	2.0	1.8	2.0	3.8	9.0	17.3
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4------	3.5	5.5	6.3	4.9	4.6	2.5	1.9	1.5	3.6	11.6	25.9
25	FOSSIL FUEL IN BALANCE - OIL $4------	3.5	5.5	6.3	4.8	4.5	2.5	1.9	1.2	0.9	2.1	2.5
26	NO LARGE ENERGY PROJECT - OIL $4------	3.5	5.4	6.3	4.8	4.5	1.1	-1.6	-7.6	-17.5	-28.7	-39.4
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4------	3.5	5.5	6.3	4.9	4.6	2.5	1.9	1.5	3.6	11.6	25.9
29	SELF SUFFICIENCY BY 1990 - BLP+LG------	3.5	5.5	6.3	4.8	4.5	2.5	1.8	1.5	3.5	11.2	25.0
30	SELF SUFFICIENCY BY 1990 - BLP+HG------	3.5	5.5	6.3	4.8	4.5	2.5	1.8	1.5	3.5	11.1	24.6
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4------	3.5	4.8	5.2	3.8	3.5	2.0	0.2	0.3	2.6	9.4	20.3
36	FOSSIL FUEL IN BALANCE - OIL $4------	3.5	4.8	5.2	3.8	3.5	2.0	0.3	0.0	0.3	1.8	2.5
37	NO LARGE ENERGY PROJECT - OIL $4------	3.5	4.7	5.1	3.7	3.4	1.0	-3.2	-8.0	-15.3	-22.6	-28.0
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2------	3.5	4.8	5.2	3.8	3.5	2.1	0.2	0.3	2.6	9.6	20.7
40	SELF SUFFICIENCY BY 1990 - OIL $4------	3.5	4.8	5.2	3.8	3.5	2.0	0.2	0.3	2.6	9.4	20.3
41	SELF SUFFICIENCY BY 1990 - BLP+LG------	3.5	4.8	5.2	3.8	3.5	2.0	0.2	0.3	2.5	9.2	19.9
42	SELF SUFFICIENCY BY 1990 - BLP+HG------	3.5	4.8	5.2	3.8	3.5	2.0	0.2	0.3	2.5	9.2	19.7

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TABLE A.17 ENERGY BALANCE PERCENT OF G.N.P. - TBC_BAL_FOSSIL/GNES

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	**********											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	1.2	1.5	1.5	0.9	0.8	0.4	0.0	-0.4	-0.7	-1.0	-1.1
6												
7	ALTERNATIVE SOLUTIONS											
8	**********											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.2	1.5	1.5	0.9	0.8	0.4	0.3	0.3	0.6	1.2	2.1
13	FOSSIL FUEL IN BALANCE - OIL $4-----	1.2	1.5	1.5	0.9	0.8	0.4	0.3	0.3	0.3	0.2	0.3
14	NO LARGE ENERGY PROJECT - OIL $4-----	1.2	1.5	1.5	1.0	0.8	0.2	-0.1	-0.7	-1.3	-1.9	-2.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	1.2	1.5	1.5	1.0	0.8	0.4	0.3	0.3	0.6	1.2	2.1
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.2	1.5	1.5	0.9	0.8	0.4	0.3	0.3	0.6	1.2	2.1
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	1.2	1.5	1.5	0.9	0.8	0.4	0.3	0.3	0.6	1.2	2.1
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	1.2	1.5	1.5	0.9	0.8	0.4	0.3	0.3	0.5	1.2	2.0
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.2	1.7	1.8	1.2	1.0	0.5	0.3	0.2	0.5	1.4	2.8
25	FOSSIL FUEL IN BALANCE - OIL $4-----	1.2	1.7	1.8	1.2	1.0	0.5	0.3	0.2	0.1	0.3	0.3
26	NO LARGE ENERGY PROJECT - OIL $4-----	1.2	1.7	1.8	1.2	1.0	0.2	-0.3	-1.2	-2.5	-3.8	-4.6
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.2	1.7	1.8	1.2	1.0	0.5	0.3	0.2	0.5	1.4	2.8
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	1.2	1.7	1.8	1.2	1.0	0.5	0.3	0.2	0.5	1.4	2.8
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	1.2	1.7	1.8	1.2	1.0	0.5	0.3	0.2	0.5	1.4	2.7
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.2	1.5	1.5	0.9	0.8	0.4	0.0	0.1	0.4	1.2	2.2
36	FOSSIL FUEL IN BALANCE - OIL $4-----	1.2	1.5	1.5	0.9	0.8	0.4	0.1	0.0	0.0	0.2	0.3
37	NO LARGE ENERGY PROJECT - OIL $4-----	1.2	1.5	1.5	1.0	0.8	0.2	-0.6	-1.3	-2.2	-3.0	-3.3
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	1.2	1.5	1.5	1.0	0.8	0.4	0.0	0.1	0.4	1.2	2.3
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	1.2	1.5	1.5	0.9	0.8	0.4	0.0	0.1	0.4	1.2	2.2
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	1.2	1.5	1.5	0.9	0.8	0.4	0.0	0.1	0.3	1.2	2.2
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	1.2	1.5	1.5	0.9	0.8	0.4	0.0	0.1	0.3	1.1	2.2

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TABLE A.18 NON-ENERGY BALANCE (BILLION) - TBC.BAL.CAWS-FOSSIL

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-8.7	-10.3	-11.0	-11.9	-13.1	-13.1	-12.2	-12.5	-10.9	-10.3	-10.4
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-8.6	-10.4	-11.6	-13.8	-15.5	-16.7	-16.0	-15.8	-14.4	-15.3	-16.5
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-8.6	-10.1	-10.8	-12.2	-13.3	-14.1	-13.5	-13.7	-12.1	-12.2	-12.3
14	NO LARGE ENERGY PROJECT - OIL $4-----	-8.7	-9.2	-9.1	-9.6	-10.5	-10.6	-9.8	-9.9	-8.0	-7.5	-6.7
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-8.6	-10.5	-12.2	-14.8	-17.2	-18.6	-18.4	-19.0	-18.1	-19.5	-21.2
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-8.6	-10.4	-11.6	-13.8	-15.5	-16.7	-16.0	-15.8	-14.4	-15.3	-16.5
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-8.6	-10.5	-12.1	-14.3	-15.9	-16.6	-15.9	-15.7	-14.4	-15.4	-17.1
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-8.6	-10.6	-12.0	-14.2	-15.8	-16.4	-15.4	-15.1	-13.5	-14.4	-16.0
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-8.6	-10.6	-12.2	-15.0	-17.7	-19.7	-19.8	-21.4	-21.0	-25.1	-30.7
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-8.6	-10.4	-11.5	-13.6	-15.9	-17.8	-17.8	-19.4	-18.1	-20.8	-24.2
26	NO LARGE ENERGY PROJECT - OIL $4-----	-8.7	-9.5	-9.6	-10.8	-12.8	-13.7	-13.8	-15.3	-13.7	-15.0	-16.8
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-8.6	-10.6	-12.2	-15.0	-17.7	-19.7	-19.8	-21.4	-21.0	-25.1	-30.7
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-8.6	-10.6	-12.4	-15.0	-17.0	-18.0	-17.7	-18.4	-17.7	-21.7	-27.6
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-8.6	-10.6	-12.3	-14.8	-16.7	-17.5	-16.6	-16.7	-15.2	-18.3	-23.5
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-8.6	-10.4	-11.6	-13.8	-15.6	-16.9	-14.2	-12.0	-11.9	-14.6	-13.1
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-8.6	-10.1	-10.9	-12.5	-13.8	-15.1	-12.3	-10.2	-9.5	-10.7	-7.4
37	NO LARGE ENERGY PROJECT - OIL $4-----	-8.7	-9.1	-9.1	-9.8	-11.1	-11.1	-8.0	-5.6	-4.1	-4.2	0.9
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-8.6	-10.5	-12.3	-15.0	-17.5	-19.1	-17.0	-15.7	-16.6	-20.1	-19.0
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-8.6	-10.4	-11.6	-13.8	-15.6	-16.9	-14.2	-12.0	-11.9	-14.6	-13.1
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-8.6	-10.4	-11.9	-14.3	-16.1	-17.1	-12.8	-9.9	-10.6	-13.4	-13.0
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	-8.6	-10.4	-11.9	-14.2	-15.9	-16.7	-12.2	-8.5	-8.7	-10.9	-10.2

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TABLE A.19 NON-ENERGY BALANCE PERCENT OF G.N.P. - CAN$-FOSSIL/GNES

LINE	ITEM	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-3.1	-3.3	-3.1	-3.0	-2.9	-2.6	-2.2	-2.0	-1.6	-1.4	-1.3
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4----	-3.0	-3.3	-3.3	-3.4	-3.4	-3.3	-2.8	-2.5	-2.1	-2.0	-1.9
13	FOSSIL FUEL IN BALANCE - OIL $4----	-3.0	-3.2	-3.0	-3.1	-3.0	-2.8	-2.4	-2.2	-1.8	-1.6	-1.5
14	NO LARGE ENERGY PROJECT - OIL $4----	-3.1	-2.9	-2.6	-2.5	-2.4	-2.2	-1.8	-1.7	-1.2	-1.0	-0.8
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2----	-3.0	-3.3	-3.4	-3.7	-3.8	-3.7	-3.3	-3.1	-2.6	-2.6	-2.5
17	SELF SUFFICIENCY BY 1990 - OIL $4----	-3.0	-3.3	-3.3	-3.4	-3.4	-3.3	-2.8	-2.5	-2.1	-2.0	-1.9
18	SELF SUFFICIENCY BY 1990 - BLP+LG----	-3.0	-3.3	-3.4	-3.5	-3.5	-3.3	-2.8	-2.5	-2.1	-2.0	-2.0
19	SELF SUFFICIENCY BY 1990 - BLP+HG----	-3.0	-3.3	-3.4	-3.5	-3.5	-3.2	-2.7	-2.4	-1.9	-1.9	-1.9
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4----	-3.0	-3.3	-3.4	-3.7	-3.8	-3.8	-3.4	-3.3	-2.9	-3.1	-3.3
25	FOSSIL FUEL IN BALANCE - OIL $4----	-3.0	-3.3	-3.2	-3.4	-3.5	-3.5	-3.1	-3.0	-2.5	-2.6	-2.7
26	NO LARGE ENERGY PROJECT - OIL $4----	-3.1	-3.0	-2.7	-2.7	-2.9	-2.8	-2.5	-2.5	-2.0	-2.0	-1.9
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4----	-3.0	-3.3	-3.4	-3.7	-3.8	-3.8	-3.4	-3.3	-2.9	-3.1	-3.3
29	SELF SUFFICIENCY BY 1990 - BLP+LG----	-3.0	-3.3	-3.4	-3.7	-3.7	-3.5	-3.1	-2.9	-2.5	-2.7	-3.1
30	SELF SUFFICIENCY BY 1990 - BLP+HG----	-3.0	-3.3	-3.4	-3.6	-3.6	-3.3	-2.8	-2.5	-2.1	-2.2	-2.6
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4----	-3.0	-3.3	-3.3	-3.4	-3.4	-3.3	-2.4	-1.8	-1.6	-1.8	-1.4
36	FOSSIL FUEL IN BALANCE - OIL $4----	-3.0	-3.2	-3.1	-3.1	-3.1	-3.0	-2.1	-1.6	-1.3	-1.3	-0.8
37	NO LARGE ENERGY PROJECT - OIL $4----	-3.1	-2.9	-2.6	-2.5	-2.5	-2.3	-1.5	-0.9	-0.6	-0.5	0.1
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2----	-3.0	-3.3	-3.5	-3.7	-3.9	-3.8	-2.9	-2.4	-2.3	-2.5	-2.1
40	SELF SUFFICIENCY BY 1990 - OIL $4----	-3.0	-3.3	-3.3	-3.4	-3.4	-3.3	-2.4	-1.8	-1.6	-1.8	-1.4
41	SELF SUFFICIENCY BY 1990 - BLP+LG----	-3.0	-3.3	-3.3	-3.5	-3.6	-3.4	-2.2	-1.5	-1.5	-1.7	-1.5
42	SELF SUFFICIENCY BY 1990 - BLP+HG----	-3.0	-3.3	-3.3	-3.5	-3.5	-3.3	-2.1	-1.3	-1.2	-1.3	-1.1

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.20 SAVING RATE (LEVEL) - S$/PDY$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	10.1	9.5	9.2	9.1	8.8	8.6	8.5	8.3	8.1	7.9	7.6
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4----	10.1	9.5	9.1	9.1	8.9	8.6	8.6	8.4	8.2	8.0	7.8
13	FOSSIL FUEL IN BALANCE - OIL $4----	10.1	9.5	9.1	9.1	8.9	8.6	8.5	8.3	8.1	7.8	7.6
14	NO LARGE ENERGY PROJECT - OIL $4----	10.1	9.6	9.1	9.1	8.8	8.6	8.4	8.2	8.0	7.8	7.6
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2----	10.1	9.6	9.2	9.2	9.0	8.8	8.8	8.8	8.6	8.3	8.2
17	SELF SUFFICIENCY BY 1990 - OIL $4----	10.1	9.5	9.1	9.1	8.9	8.6	8.6	8.4	8.2	8.0	7.8
18	SELF SUFFICIENCY BY 1990 - BLP+LG----	10.1	9.5	9.2	9.1	8.9	8.6	8.6	8.4	8.2	8.0	7.8
19	SELF SUFFICIENCY BY 1990 - BLP+HG----	10.1	9.5	9.1	9.0	8.9	8.5	8.6	8.3	8.1	7.8	7.6
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4----	10.1	9.5	9.2	9.1	9.0	8.8	8.8	8.8	8.5	8.3	8.1
25	FOSSIL FUEL IN BALANCE - OIL $4----	10.1	9.5	9.2	9.1	9.0	8.8	8.8	8.6	8.3	8.1	7.8
26	NO LARGE ENERGY PROJECT - OIL $4----	10.1	9.6	9.2	9.1	9.0	8.8	8.6	8.5	8.3	8.1	8.0
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4----	10.1	9.5	9.2	9.1	9.0	8.8	8.8	8.8	8.5	8.3	8.1
29	SELF SUFFICIENCY BY 1990 - BLP+LG----	10.1	9.5	9.2	9.1	8.9	8.6	8.7	8.5	8.2	8.0	7.9
30	SELF SUFFICIENCY BY 1990 - BLP+HG----	10.1	9.4	9.1	9.0	8.8	8.5	8.6	8.3	8.0	7.7	7.5
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4----	10.1	9.5	9.1	9.1	8.9	8.6	8.8	8.9	8.2	8.0	7.9
36	FOSSIL FUEL IN BALANCE - OIL $4----	10.1	9.5	9.1	9.1	8.9	8.6	8.7	8.7	8.1	7.8	7.7
37	NO LARGE ENERGY PROJECT - OIL $4----	10.1	9.6	9.1	9.1	8.9	8.6	8.6	8.5	8.0	7.8	7.8
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2----	10.1	9.6	9.2	9.2	9.0	8.8	9.0	9.2	8.7	8.4	8.3
40	SELF SUFFICIENCY BY 1990 - OIL $4----	10.1	9.5	9.1	9.1	8.9	8.6	8.8	8.9	8.2	8.0	7.9
41	SELF SUFFICIENCY BY 1990 - BLP+LG----	10.1	9.5	9.2	9.1	8.9	8.6	8.4	8.6	8.2	8.0	7.8
42	SELF SUFFICIENCY BY 1990 - BLP+HG----	10.1	9.4	9.1	9.0	8.9	8.5	8.3	8.5	8.1	7.8	7.5

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TABLE A.21 INVESTMENT PERCENT OF G.N.P. - (IBNAR$+IBNAC0$)/GNE$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	15.8	16.3	16.8	17.6	18.3	18.6	18.7	19.0	19.2	19.5	19.7
6												
7	ALTERNATIVE SOLUTIONS											
8	====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	15.8	16.4	17.1	18.5	19.6	20.4	20.5	20.2	20.0	19.8	19.5
13	FOSSIL FUEL IN BALANCE - OIL $4-----	15.7	16.2	16.6	17.7	18.4	19.0	19.2	19.3	19.3	19.5	19.7
14	NO LARGE ENERGY PROJECT - OIL $4-----	15.8	15.6	15.5	16.1	16.7	17.1	17.4	17.8	18.2	18.7	19.0
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	15.8	16.4	17.2	18.7	19.8	20.7	20.8	20.6	20.3	20.1	19.7
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	15.8	16.4	17.1	18.5	19.6	20.4	20.5	20.2	20.0	19.8	19.5
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	15.8	16.4	17.2	18.6	19.6	20.3	20.4	20.1	19.8	19.7	19.4
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	15.8	16.4	17.2	18.6	19.7	20.4	20.4	20.2	19.8	19.7	19.5
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	15.8	16.4	17.2	18.8	20.0	20.9	20.9	20.6	20.2	19.9	19.5
25	FOSSIL FUEL IN BALANCE - OIL $4-----	15.7	16.2	16.8	18.0	18.9	19.8	19.9	19.9	19.7	19.8	20.0
26	NO LARGE ENERGY PROJECT - OIL $4-----	15.8	15.7	15.6	16.3	17.0	17.5	17.8	18.2	18.7	19.5	19.9
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	15.8	16.4	17.2	18.8	20.0	20.9	20.9	20.6	20.2	19.9	19.5
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	15.8	16.4	17.2	18.7	19.8	20.5	20.5	20.0	19.5	19.3	18.9
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	15.8	16.4	17.3	18.8	19.9	20.7	20.6	20.2	19.7	19.5	19.2
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	15.8	16.4	17.1	18.5	19.6	20.4	21.0	20.9	20.6	20.2	19.4
36	FOSSIL FUEL IN BALANCE - OIL $4-----	15.7	16.2	16.7	17.8	18.6	19.3	20.0	20.2	20.1	20.0	19.8
37	NO LARGE ENERGY PROJECT - OIL $4-----	15.8	15.6	15.5	16.1	16.8	17.2	17.8	18.5	18.9	19.4	19.3
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	15.8	16.4	17.2	18.7	19.8	20.7	21.3	21.3	20.9	20.4	19.6
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	15.8	16.4	17.1	18.5	19.6	20.4	21.0	20.9	20.6	20.2	19.4
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	15.8	16.3	17.1	18.6	19.6	20.3	20.7	20.5	20.0	19.7	19.0
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	15.8	16.4	17.2	18.6	19.7	20.4	20.9	20.7	20.2	19.9	19.2

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TABLE A.22 EXCHANGE RATE (U.S. CENTS) - 1/REXCAN

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	85.3	85.6	85.4	84.3	83.8	83.4	83.4	82.9	83.1	83.5	83.9
6												
7	ALTERNATIVE SOLUTIONS											
8	=====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	85.4	85.6	85.2	83.8	83.2	82.5	82.9	83.1	84.3	86.0	88.2
13	FOSSIL FUEL IN BALANCE - OIL $4-----	85.4	85.6	85.4	84.2	83.8	83.1	83.5	83.6	84.4	85.2	85.9
14	NO LARGE ENERGY PROJECT - OIL $4-----	85.3	85.9	86.0	84.9	84.5	83.8	83.9	83.1	83.0	82.9	83.0
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	85.4	85.6	85.1	83.5	82.7	82.0	82.3	82.2	83.0	84.4	86.3
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	85.4	85.6	85.2	83.8	83.2	82.5	82.9	83.1	84.3	86.0	88.2
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	85.4	85.6	85.2	83.9	83.4	83.0	83.6	83.8	84.9	86.5	88.3
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	85.4	85.6	85.2	83.8	83.4	83.0	83.6	83.8	85.2	87.0	89.2
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	85.4	85.6	85.2	83.5	82.5	81.3	81.5	81.3	82.3	84.2	87.4
25	FOSSIL FUEL IN BALANCE - OIL $4-----	85.4	85.7	85.4	84.0	83.1	81.9	82.1	81.9	82.7	83.6	84.0
26	NO LARGE ENERGY PROJECT - OIL $4-----	85.3	86.0	86.1	84.9	84.1	82.8	82.6	80.9	79.6	78.1	77.0
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	85.4	85.6	85.2	83.5	82.5	81.3	81.5	81.3	82.3	84.2	87.4
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	85.4	85.8	85.4	83.8	83.3	82.7	83.4	83.7	85.2	87.4	90.6
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	85.4	85.7	85.4	83.7	83.2	82.5	83.3	83.6	85.3	88.0	92.0
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	85.4	85.5	85.2	83.8	83.2	82.5	82.0	82.7	84.9	87.2	91.3
36	FOSSIL FUEL IN BALANCE - OIL $4-----	85.4	85.6	85.5	84.2	83.8	83.1	82.7	83.3	85.2	86.7	88.6
37	NO LARGE ENERGY PROJECT - OIL $4-----	85.3	85.9	86.1	85.1	84.6	84.0	83.3	82.8	82.9	82.6	83.7
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	85.4	85.6	85.1	83.5	82.7	81.9	81.4	81.8	83.7	85.7	89.7
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	85.4	85.5	85.2	83.8	83.2	82.5	82.0	82.7	84.9	87.2	91.3
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	85.4	85.7	85.3	83.9	83.4	82.9	83.6	85.2	86.9	89.0	93.0
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	85.4	85.6	85.3	83.8	83.3	82.8	83.3	85.1	87.0	89.4	94.0

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TABLE A.23 MONEY SUPPLY (% CHANGE) - FMONEYSUPPLY

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	8.1	7.9	8.0	8.1	8.1	8.0	8.0	7.9	8.0	8.1	8.0
6												
7	ALTERNATIVE SOLUTIONS											
8	=====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4----	8.1	8.0	7.9	7.7	7.3	7.0	6.6	6.7	6.7	6.5	5.5
13	FOSSIL FUEL IN BALANCE - OIL $4----	8.1	8.0	8.0	8.1	8.0	7.8	7.3	7.1	6.9	6.8	6.4
14	NO LARGE ENERGY PROJECT - OIL $4----	8.1	8.2	8.5	8.8	8.9	9.0	8.8	8.6	8.8	9.1	9.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2----	8.1	8.3	8.6	8.6	8.5	8.1	7.7	7.8	7.9	7.8	7.0
17	SELF SUFFICIENCY BY 1990 - OIL $4----	8.1	8.0	7.9	7.7	7.3	7.0	6.6	6.7	6.7	6.5	5.5
18	SELF SUFFICIENCY BY 1990 - BLP+LG----	8.1	8.0	8.3	8.2	7.8	7.1	6.9	7.1	7.2	7.0	6.2
19	SELF SUFFICIENCY BY 1990 - BLP+MG----	8.1	7.9	7.9	7.7	7.2	6.5	6.1	6.2	6.3	6.1	5.2
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4----	8.1	8.0	7.6	7.4	7.2	7.0	7.1	7.7	8.6	8.8	8.4
25	FOSSIL FUEL IN BALANCE - OIL $4----	8.1	8.0	7.8	7.7	7.8	7.9	7.7	7.8	8.5	8.8	9.1
26	NO LARGE ENERGY PROJECT - OIL $4----	8.1	8.1	8.3	8.6	8.9	9.3	9.6	10.2	11.3	12.1	13.2
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4----	8.1	8.0	7.6	7.4	7.2	7.0	7.1	7.7	8.6	8.8	8.4
29	SELF SUFFICIENCY BY 1990 - BLP+LG----	8.1	7.9	7.8	7.6	7.3	6.6	6.7	7.4	8.3	8.3	8.1
30	SELF SUFFICIENCY BY 1990 - BLP+MG----	8.1	7.7	7.5	7.0	6.3	5.4	5.2	5.5	6.2	6.0	5.4
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4----	8.1	8.0	7.8	7.6	7.3	7.0	6.6	6.3	6.4	6.5	6.3
36	FOSSIL FUEL IN BALANCE - OIL $4----	8.1	8.1	8.0	8.0	7.9	7.7	7.2	6.5	6.2	6.5	6.9
37	NO LARGE ENERGY PROJECT - OIL $4----	8.1	8.1	8.5	8.8	9.0	9.1	9.0	8.6	8.9	9.7	10.6
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2----	8.1	8.3	8.5	8.5	8.5	8.1	7.7	7.5	7.5	7.9	7.8
40	SELF SUFFICIENCY BY 1990 - OIL $4----	8.1	8.0	7.8	7.6	7.3	7.0	6.6	6.3	6.4	6.5	6.3
41	SELF SUFFICIENCY BY 1990 - BLP+LG----	8.1	8.1	8.2	8.1	7.8	7.2	6.2	6.0	6.4	6.7	6.9
42	SELF SUFFICIENCY BY 1990 - BLP+MG----	8.1	7.9	7.9	7.7	7.2	6.6	4.8	4.1	4.5	4.9	5.1

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TABLE A.24 SHORT TERM INTEREST RATE - FRATE_FCPAPER3M

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION											
3	================											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	12.1	12.4	11.0	11.0	10.6	10.8	10.8	11.1	10.4	10.3	10.3
6												
7	ALTERNATIVE SOLUTIONS											
8	=====================											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4------	12.1	12.4	11.0	11.0	10.6	10.8	10.8	11.1	10.4	10.3	10.3
13	FOSSIL FUEL IN BALANCE - OIL $4------	12.1	12.4	11.0	11.0	10.6	10.8	10.8	11.1	10.5	10.3	10.3
14	NO LARGE ENERGY PROJECT - OIL $4------	12.1	12.4	11.0	11.1	10.7	10.9	10.8	11.1	10.5	10.4	10.4
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2------	12.1	12.3	10.8	10.7	10.1	10.3	10.4	10.8	10.3	10.3	10.4
17	SELF SUFFICIENCY BY 1990 - OIL $4------	12.1	12.4	11.0	11.0	10.6	10.8	10.8	11.1	10.4	10.3	10.3
18	SELF SUFFICIENCY BY 1990 - BLP+LG------	12.1	12.3	10.8	10.7	10.2	10.4	10.3	10.5	9.6	9.2	8.8
19	SELF SUFFICIENCY BY 1990 - BLP+MG------	12.1	12.4	10.9	10.9	10.4	10.7	10.6	10.8	10.0	9.6	9.3
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4------	12.1	12.5	11.1	11.4	11.2	12.1	12.8	13.8	13.3	13.6	14.2
25	FOSSIL FUEL IN BALANCE - OIL $4------	12.1	12.5	11.1	11.4	11.2	12.1	12.8	13.8	13.3	13.6	14.0
26	NO LARGE ENERGY PROJECT - OIL $4------	12.1	12.5	11.1	11.4	11.2	12.0	12.7	13.7	13.1	13.3	13.8
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4------	12.1	12.5	11.1	11.4	11.2	12.1	12.8	13.8	13.3	13.6	14.2
29	SELF SUFFICIENCY BY 1990 - BLP+LG------	12.1	12.4	10.9	11.0	10.8	11.6	12.1	12.9	12.0	11.9	11.9
30	SELF SUFFICIENCY BY 1990 - BLP+MG------	12.1	12.4	11.0	11.3	11.1	12.1	12.7	13.6	12.7	12.7	12.8
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4------	12.1	12.4	11.0	11.0	10.6	10.8	11.1	11.9	11.6	11.6	11.6
36	FOSSIL FUEL IN BALANCE - OIL $4------	12.1	12.4	11.0	11.0	10.6	10.9	11.2	11.9	11.6	11.6	11.5
37	NO LARGE ENERGY PROJECT - OIL $4------	12.1	12.4	11.0	11.1	10.6	10.9	11.1	11.8	11.6	11.5	11.6
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2------	12.1	12.3	10.8	10.7	10.2	10.4	10.8	11.7	11.5	11.7	11.8
40	SELF SUFFICIENCY BY 1990 - OIL $4------	12.1	12.4	11.0	11.0	10.6	10.8	11.1	11.9	11.6	11.6	11.6
41	SELF SUFFICIENCY BY 1990 - BLP+LG------	12.1	12.4	10.8	10.8	10.3	10.4	10.7	11.3	10.8	10.3	9.6
42	SELF SUFFICIENCY BY 1990 - BLP+MG------	12.1	12.4	10.9	10.9	10.5	10.7	11.1	11.9	11.4	11.0	10.3

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TABLE A.25 EMPLOYMENT (THOUSANDS) - NE

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION (ACTUAL)											
3	==========											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	10360.1	10566.9	10823.2	11085.7	11346.8	11543.5	11738.7	11971.4	12193.2	12381.9	12586.5
6												
7	SHOCK - CONTROL (CUMULATIVE DIFFERENCE)											
8	==========											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4----	-2.3	-1.5	20.7	86.2	179.2	307.8	448.6	569.6	672.3	775.7	865.3
13	FOSSIL FUEL IN BALANCE - OIL $4----	-4.1	-13.9	-22.6	-15.3	-6.9	24.4	68.9	104.4	125.5	145.5	155.4
14	NO LARGE ENERGY PROJECT - OIL $4----	-0.0	-44.1	-125.0	-225.1	-333.1	-442.0	-543.2	-643.4	-741.0	-825.9	-910.7
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2----	-2.3	-0.7	39.8	148.3	320.2	555.4	831.2	1117.8	1413.6	1730.6	2044.8
17	SELF SUFFICIENCY BY 1990 - OIL $4----	-2.3	-1.5	20.7	86.2	179.2	307.8	448.6	569.6	672.3	775.7	865.3
18	SELF SUFFICIENCY BY 1990 - BLP+LG----	-1.8	2.8	40.8	125.6	236.2	362.8	482.8	561.3	607.4	642.7	670.7
19	SELF SUFFICIENCY BY 1990 - BLP+HG----	-1.8	7.2	47.5	133.5	240.7	360.4	464.4	520.5	534.2	530.2	508.7
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4----	-2.4	7.7	52.1	152.4	297.4	488.2	695.6	893.1	1082.1	1275.6	1437.7
25	FOSSIL FUEL IN BALANCE - OIL $4----	-4.3	-3.9	12.6	61.1	133.6	247.6	375.9	494.9	590.5	673.4	724.4
26	NO LARGE ENERGY PROJECT - OIL $4----	-0.2	-34.1	-93.4	-159.8	-216.2	-260.7	-288.3	-304.6	-300.9	-262.8	-205.8
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4----	-2.4	7.7	52.1	152.4	297.4	488.2	695.6	893.1	1082.1	1275.6	1437.7
29	SELF SUFFICIENCY BY 1990 - BLP+LG----	-2.0	5.8	50.7	142.9	253.7	364.0	438.7	435.8	364.0	240.3	62.5
30	SELF SUFFICIENCY BY 1990 - BLP+HG----	-2.0	10.5	59.4	155.6	265.4	371.4	429.2	400.9	287.7	109.3	-142.9
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4----	-2.3	-0.9	21.6	86.9	178.4	303.5	510.0	689.1	823.0	909.3	933.8
36	FOSSIL FUEL IN BALANCE - OIL $4----	-4.1	-13.4	-19.7	-7.0	10.7	56.7	182.6	285.3	333.6	323.2	256.7
37	NO LARGE ENERGY PROJECT - OIL $4----	-0.0	-45.3	-128.1	-230.7	-335.5	-445.4	-480.2	-525.9	-595.5	-690.4	-805.0
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2----	-1.8	0.7	41.2	148.2	316.0	543.1	877.4	1209.5	1520.8	1804.5	2034.6
40	SELF SUFFICIENCY BY 1990 - OIL $4----	-2.3	-0.9	21.6	86.9	178.4	303.5	510.0	689.1	823.0	909.3	933.8
41	SELF SUFFICIENCY BY 1990 - BLP+LG----	-1.8	-3.0	23.9	96.4	196.4	313.8	450.5	486.9	430.8	302.6	115.9
42	SELF SUFFICIENCY BY 1990 - BLP+HG----	-1.8	1.8	31.9	106.8	204.3	316.1	451.6	474.2	389.3	215.6	-32.6

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TABLE A.26 GROSS NATIONAL PRODUCT 1971$ (BILLION) - GNE

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION (ACTUAL)											
3	==========											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	128.8	130.6	134.6	139.4	144.0	147.5	151.4	156.1	160.3	163.7	168.0
6												
7	SHOCK - CONTROL (CUMULATIVE DIFFERENCE)											
8	==========											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.0	0.6	2.4	4.7	7.9	11.4	14.3	16.6	19.0	20.8
13	FOSSIL FUEL IN BALANCE - OIL $4----	-0.1	-0.4	-0.5	-0.3	-0.1	0.8	1.8	2.5	2.8	3.2	3.2
14	NO LARGE ENERGY PROJECT - OIL $4----	-0.0	-1.3	-3.2	-5.6	-8.2	-10.8	-13.2	-15.7	-18.1	-20.2	-22.5
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2----	-0.1	0.2	1.6	4.7	9.3	15.3	22.2	29.3	36.4	44.1	51.5
17	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.0	0.6	2.4	4.7	7.9	11.4	14.3	16.6	19.0	20.8
18	SELF SUFFICIENCY BY 1990 - BLP+LG----	-0.1	0.1	1.3	3.7	6.5	9.9	13.2	15.5	17.0	18.6	19.9
19	SELF SUFFICIENCY BY 1990 - BLP+HG----	-0.1	0.1	1.1	3.2	5.6	8.3	10.7	11.8	12.1	12.0	11.3
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	0.1	1.2	3.4	6.5	10.6	14.7	18.1	21.1	23.9	25.1
25	FOSSIL FUEL IN BALANCE - OIL $4----	-0.1	-0.2	0.1	1.1	2.3	4.4	6.5	7.9	8.5	8.6	7.6
26	NO LARGE ENERGY PROJECT - OIL $4----	-0.0	-1.1	-2.7	-4.6	-6.4	-8.3	-10.0	-11.8	-13.2	-13.8	-14.2
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	0.1	1.2	3.4	6.5	10.6	14.7	18.1	21.1	23.9	25.1
29	SELF SUFFICIENCY BY 1990 - BLP+LG----	-0.1	0.2	1.4	3.7	6.2	8.6	10.1	9.6	7.4	3.9	-1.1
30	SELF SUFFICIENCY BY 1990 - BLP+HG----	-0.1	0.1	1.1	3.1	4.9	6.4	6.6	4.3	-0.1	-6.2	-14.7
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.0	0.6	2.4	4.6	7.8	12.8	16.5	18.9	20.2	19.3
36	FOSSIL FUEL IN BALANCE - OIL $4----	-0.1	-0.4	-0.5	-0.1	0.3	1.5	4.4	6.2	6.4	5.4	2.6
37	NO LARGE ENERGY PROJECT - OIL $4----	-0.0	-1.3	-3.3	-5.8	-8.3	-11.0	-12.0	-13.8	-16.4	-19.2	-22.9
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2----	-0.1	0.2	1.5	4.6	9.0	14.8	23.0	30.6	37.4	43.6	47.8
40	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.0	0.6	2.4	4.6	7.8	12.8	16.5	18.9	20.2	19.3
41	SELF SUFFICIENCY BY 1990 - BLP+LG----	-0.1	-0.0	0.9	3.0	5.6	8.8	12.0	12.7	11.4	8.8	4.3
42	SELF SUFFICIENCY BY 1990 - BLP+HG----	-0.1	-0.1	0.7	2.5	4.7	7.1	9.5	8.6	5.6	0.7	-6.4

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TABLE A.27 INVESTMENT CONSTRUCTION & ME (BILLION) - IBNAM$+IBNAC0$

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION (ACTUAL)											
3	==========											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	44.9	51.6	59.6	70.1	81.9	92.2	102.9	116.3	130.1	145.5	163.4
6												
7	SHOCK - CONTROL (CUMULATIVE DIFFERENCE)											
8	==========											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.1	1.5	6.4	13.9	25.5	38.8	49.8	58.4	65.3	68.2
13	FOSSIL FUEL BR BALANCE - OIL $4----	-0.2	-0.8	-1.3	-0.7	-0.1	2.9	6.9	9.9	11.6	13.6	14.8
14	NO LARGE ENERGY PROJECT - OIL $4----	0.0	-2.7	-7.9	-14.9	-23.4	-32.4	-41.5	-51.2	-60.9	-69.5	-79.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2----	-0.1	-0.2	1.2	5.9	13.2	24.8	38.0	49.5	58.9	66.9	70.9
17	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.1	1.5	6.4	13.9	25.5	38.8	49.8	58.4	65.3	68.2
18	SELF SUFFICIENCY BY 1990 - BLP+LG----	-0.1	-0.1	1.4	6.2	13.2	24.0	35.8	45.0	51.0	55.1	55.3
19	SELF SUFFICIENCY BY 1990 - BLP+HG----	-0.1	0.1	1.9	7.3	15.4	27.7	41.0	52.1	60.2	66.6	69.1
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	0.2	2.7	9.4	20.0	36.5	55.5	73.6	90.5	108.0	123.7
25	FOSSIL FUEL BR BALANCE - OIL $4----	-0.2	-0.5	-0.0	2.7	7.0	15.9	26.8	38.2	49.0	61.7	77.3
26	NO LARGE ENERGY PROJECT - OIL $4----	0.0	-2.4	-6.9	-12.5	-18.9	-24.8	-29.9	-34.1	-35.8	-31.8	-22.7
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	0.2	2.7	9.4	20.0	36.5	55.5	73.6	90.5	108.0	123.7
29	SELF SUFFICIENCY BY 1990 - BLP+LG----	-0.1	0.1	2.2	8.3	17.4	31.2	46.2	58.7	67.8	75.8	81.0
30	SELF SUFFICIENCY BY 1990 - BLP+HG----	-0.1	0.3	2.9	10.0	20.7	37.3	55.7	72.6	86.9	100.9	112.5
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.1	1.5	6.4	14.0	25.8	45.6	66.8	86.8	105.1	116.9
36	FOSSIL FUEL BR BALANCE - OIL $4----	-0.2	-0.8	-1.2	-0.1	1.5	6.3	18.0	32.7	46.9	60.7	72.0
37	NO LARGE ENERGY PROJECT - OIL $4----	0.0	-2.8	-8.0	-15.0	-23.5	-32.4	-36.9	-38.7	-38.9	-36.7	-35.4
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2----	-0.1	-0.1	1.3	6.2	13.7	25.4	45.7	67.8	89.2	109.3	123.0
40	SELF SUFFICIENCY BY 1990 - OIL $4----	-0.1	-0.1	1.5	6.4	14.0	25.8	45.6	66.8	86.8	105.1	116.9
41	SELF SUFFICIENCY BY 1990 - BLP+LG----	-0.1	-0.1	1.3	6.0	13.1	24.0	41.4	58.5	73.4	85.5	91.0
42	SELF SUFFICIENCY BY 1990 - BLP+HG----	-0.1	0.1	1.9	7.3	15.4	28.1	49.1	70.4	90.0	107.0	117.0

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TABLE A.28 FEDERAL + PROVINCIAL DEFICIT (BILLION) - GDF$+GDP$

LINE	ITEM	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION (ACTUAL)											
3	==========											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	-8.1	-8.0	-6.7	-5.9	-2.7	-2.6	-2.9	-2.8	-2.7	-3.0	-1.5
6												
7	SHOCK - CONTROL (CUMULATIVE DIFFERENCE)											
8	==========											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	-0.0	0.6	2.7	5.9	10.8	17.0	22.5	28.7	37.4	49.4
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.3	-0.6	-0.3	0.0	1.3	4.2	8.1	13.1	20.0	28.1
14	NO LARGE ENERGY PROJECT - OIL $4-----	0.0	-1.1	-3.3	-6.3	-9.9	-14.1	-18.0	-22.4	-27.5	-33.4	-41.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.0	-0.8	-1.6	-1.5	-1.6	0.2	2.3	2.6	2.8	4.3	8.6
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	-0.0	0.6	2.7	5.9	10.8	17.0	22.5	28.7	37.4	49.4
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.0	0.3	0.8	3.2	7.1	15.0	23.4	32.7	42.9	56.6	73.8
19	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-0.0	0.8	1.7	5.0	9.9	19.3	29.4	40.7	52.9	68.8	88.2
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.2	0.9	2.7	3.9	5.7	5.5	-0.7	-10.0	-22.2	-35.9
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.2	-0.3	-0.2	-1.8	-3.2	-5.9	-11.9	-20.3	-31.9	-47.9
26	NO LARGE ENERGY PROJECT - OIL $4-----	-0.0	-0.9	-3.1	-6.7	-12.8	-21.4	-33.4	-51.5	-76.1	-109.6	-155.3
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	0.2	0.9	2.7	3.9	5.7	5.5	-0.7	-10.0	-22.2	-35.9
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.0	1.0	2.3	5.6	10.4	19.1	26.9	33.5	39.4	46.9	55.9
30	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-0.0	1.5	3.5	8.1	14.7	26.3	37.5	48.8	60.2	74.0	89.9
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	-0.0	0.6	2.8	6.0	10.9	16.1	19.9	23.5	27.0	30.5
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.3	-0.5	-0.0	0.7	2.6	5.3	9.2	13.3	17.1	18.6
37	NO LARGE ENERGY PROJECT - OIL $4-----	0.0	-1.1	-3.3	-6.3	-10.7	-15.0	-21.3	-29.1	-40.0	-55.2	-76.7
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.0	-0.7	-1.5	-1.3	-1.4	0.4	1.6	0.1	-2.8	-7.1	-12.3
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.1	-0.0	0.6	2.8	6.0	10.9	16.1	19.9	23.5	27.0	30.5
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	-0.0	0.4	0.8	3.1	6.7	14.0	27.3	40.0	52.4	66.3	81.0
42	SELF SUFFICIENCY BY 1990 - BLP+MG-----	-0.0	0.9	1.8	5.0	9.7	18.7	36.2	53.5	70.5	89.0	108.0

CANDIDE MODEL 2.0 - ECONOMIC COUNCIL OF CANADA

TABLE A.29 BUSINESS UNREMITTED PROFITS (BILLION) - Y.URPROF.CORPS

LINE	I T E M	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1												
2	CONTROL SOLUTION (ACTUAL)											
3	==========											
4												
5	OIL $4 - WRLD PRICE LOW (1.0-1.5% REAL)-	16.4	18.1	21.1	25.4	28.8	31.0	33.0	38.8	40.7	43.2	47.3
6												
7	SHOCK - CONTROL (CUMULATIVE DIFFERENCE)											
8	==========											
9												
10	WORLD OIL PRICE LOW (1.0-1.5% REAL)											
11												
12	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.0	-0.0	0.5	1.8	3.1	4.9	6.2	6.7	7.2	9.5	12.5
13	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.2	-0.2	0.2	0.3	1.2	2.2	2.7	2.7	3.6	4.2
14	NO LARGE ENERGY PROJECT - OIL $4-----	0.0	-0.9	-2.0	-3.0	-3.8	-4.5	-4.8	-5.1	-5.9	-6.4	-7.2
15												
16	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.0	0.1	1.2	3.4	6.4	10.1	13.6	17.0	20.8	26.6	33.1
17	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.0	-0.0	0.5	1.8	3.1	4.9	6.2	6.7	7.2	9.5	12.5
18	SELF SUFFICIENCY BY 1990 - BLP+LG-----	0.0	-0.7	-0.5	0.0	-0.1	-1.3	-3.7	-7.5	-12.5	-16.4	-19.5
19	SELF SUFFICIENCY BY 1990 - BLP+HG-----	0.0	-0.6	-0.6	-0.1	-0.3	-1.5	-4.2	-8.3	-13.7	-17.9	-21.6
20												
21												
22	WORLD OIL PRICE HIGH (7% REAL)											
23												
24	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.0	0.8	2.7	6.0	10.5	16.8	23.9	32.9	45.1	63.3	83.9
25	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	0.6	2.8	4.4	7.8	13.4	20.0	28.2	38.1	51.8	69.4
26	NO LARGE ENERGY PROJECT - OIL $4-----	0.0	-0.1	0.1	0.8	2.8	6.1	11.2	18.5	27.8	40.4	56.7
27												
28	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.0	0.8	2.7	6.0	10.5	16.8	23.9	32.9	45.1	63.3	83.9
29	SELF SUFFICIENCY BY 1990 - BLP+LG-----	0.0	-0.2	0.6	1.9	2.4	1.7	-0.6	-4.4	-9.4	-12.4	-13.1
30	SELF SUFFICIENCY BY 1990 - BLP+HG-----	0.0	-0.1	0.7	2.0	2.6	2.2	-0.4	-4.1	-9.3	-12.2	-12.9
31												
32												
33	OPEC OIL PRICE SHOCK 1986 ($15 REAL)											
34												
35	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.0	-0.0	0.5	1.8	3.0	4.8	17.9	29.6	39.9	51.7	68.4
36	FOSSIL FUEL IN BALANCE - OIL $4-----	-0.1	-0.2	-0.2	0.3	0.6	1.7	14.0	25.0	33.6	42.5	55.2
37	NO LARGE ENERGY PROJECT - OIL $4-----	0.0	-0.9	-2.1	-3.2	-3.8	-4.6	5.7	15.2	23.4	31.5	44.0
38												
39	SELF SUFFICIENCY BY 1990 - OIL $2-----	-0.0	0.1	1.2	3.4	6.4	9.9	25.3	39.8	53.2	68.3	88.1
40	SELF SUFFICIENCY BY 1990 - OIL $4-----	-0.0	-0.0	0.5	1.8	3.0	4.8	17.9	29.6	39.9	51.7	68.4
41	SELF SUFFICIENCY BY 1990 - BLP+LG-----	0.0	-0.6	-0.4	0.2	0.3	-0.6	5.0	6.0	5.0	4.2	7.7
42	SELF SUFFICIENCY BY 1990 - BLP+HG-----	0.0	-0.4	-0.4	0.3	0.3	-0.5	5.8	6.2	4.5	3.2	5.5