COMMISSION OF THE EUROPEAN COMMUNITIES

COM(77) 395 final

Brussels, 29 july 1977

SECOND REPORT

ON THE ACHIEVEMENT OF COMMUNITY
ENERGY POLICY OBJECTIVES FOR 1985

S U M M A R Y

* * *

SECOND REPORT ON THE ACHIEVEMENT OF COMMUNITY ENERGY POLICY OBJECTIVES FOR 1985

(Examination of Member States' Energy Programmes)

I. INTRODUCTION

1. In its Resolution of 17 December 1974 concerning Community energy policy objectives for 1985[1], the Council requested

   - Member States to take account of these objectives when framing their energy policies;
   - the Commission to submit regular reports on the progress made towards achieving the objectives.

   This report, which follows that presented by the Commission at the beginning of 1976[2], is based on Member States' energy programmes as drawn up midway through the first half of 1977.

2. The main aims of the report are to highlight any shortcomings of national programmes in respect of progress towards the objectives, to reveal those areas of common interest where advantage could be taken for common benefit, and to indicate those sectors where Community action could help in the achievement of the objectives.

   There are three important aspects which the Commission would have liked to consider in this report but on which the majority of Member States were unable to supply forecasts, viz.

   a) the expected effect of energy conservation policies: some countries have set themselves fairly precise targets while others have merely drawn up estimates in which this effect is only approximately quantified;

   b) the build-up of intra-Community trade in energy: it has not been possible to give a breakdown of future imports and exports according to whether their origin or destination is inside or outside the Community, although the increase of trade between Member countries can lead to greater solidarity and reduce the level of dependence on energy imported from non-member countries;

---

1) OJ No C 153 of 9 July 1975, p.2
2) COM(76)9, based on the national programmes drawn up at the end of 1975.

c) the longer-term prospects for 1990: there is little possibility of significantly altering the trend between now and 1985 and henceforward it will be necessary to study longer-term options. To make up for this shortcoming, Commission staff have worked out various possible scenarios for the later period.

The Commission will investigate these three aspects further with the representatives of the Member States.

3. This report compares the situation forecast by the Member States for 1985 with both the objective set in 1974 and the situation described in the 1976 report.
The comparison is made overall for the entire Community: detailed information for each Member country is given in Annex 3.
The only objective used for comparison purposes is that of 50% dependence on imported energy: even by 1976 it was realized that the 40% level of dependence was virtually unattainable[1].

4. The economic assumptions on which the national programmes are based prompt two comments: For the period 1976-80, the GDP growth rate used in the forecasts is in line with the assumptions made in the "fourth medium-term economic policy programme"[2], including the assumption that oil prices will follow the general movement in prices.

5. For 1985, the main conclusions - which involve certain changes in Member States' programmes - are as follows:

a) Three main objectives:
- Oil imports should not exceed 500 m. tons.
- The share of oil in gross energy consumption should be significantly reduced.
- The Community's dependence on imported energy should be limited to 50%.

b) Basic policies:
- The maintenance and intensification of policies for the rational use of energy.
- Continuing effort to carry out nuclear programmes.
- Community oil production of at least 140 m. tons.
- Increased consumption of natural gas (10-25 Mtoe) in place of extra oil consumption.
- Increased consumption (by about 20 Mtoe) of imported and Community coal in power stations, in view of the likely nuclear situation.

(1) See doc. COM(76)9 and COM(76)508 final "Energy dependance" is the ratio between net energy imports (excluding nuclear fuels) and the total consumption of energy.
(2) See OJ N) C 12 of 17 January 1977.

6. A draft Resolution on the main conclusions to be drawn from this report is given at Annex 1.

7. Three further Annexes complete this document:

Annex 2 Factual analysis of Member States' energy forecasts for 1985.

Annex 3 Energy balances (1973, 1976, 1980, 1985) of the Community and the Member States.

Annex 4 Community energy investments, 1976-1985.

II. MAIN FEATURES

1. It is now nearly four years since oil prices quadrupled, and the Community's energy policy is still unclear. A look at the energy programmes of the Member States as planned for the period to 1985 illustrates both the strengths and the weaknesses.

   - The weaknesses are well known and are characterized by the inadequate exploitation of the possibilities and the existing or potential common interests within the Community: the nuclear alternative is being developed along different lines, the development of indigenous resources (oil, natural gas, coal) does not always take account of the potential of intra-Community trade and the call on external supplies basically reflects the sum of national requirements, without there being a truly Community approach which would strengthen the overall negotiating position of the Member States.

   Table 1 illustrates this situation and shows that the current forecasts of domestic energy production are below the estimates made at the end of 1975. The drop is approximately 10% and is proportional to the expected fall in demand.

Table 1 - Supply structure in 1985 (Mtoe)*

	Objectives December 1974	National programmes (end 1975) (COM/76/9)	mid-1977
Internal production	800	670-745	609-674
Imports	650	720-685	673-608
Gross consumption	1450	1390-1430	1282

There are considerable difficulties hampering the adoption of measures by which the Community could help all or some of the Member States to achieve the objectives, because the temptation to seek national solutions to the difficulties caused by developments on the world energy market is so great.

And yet, whatever the constraints imposed on individual countries, solidarity of interest in the face of a difficult future - both as regards energy and the economy in general - makes a joint effort more necessary than ever.

---

* Mtoe = million tonnes oil equivalent.

- The negative trends, however regrettable, must not mask the basic issue, viz. the will of all Member States, as displayed in varying degrees and in varying ways by their programmes, to reduce their dependence on imported energy (particularly oil), and to make better use of energy, which has now become rare and costly. To this extent, national programmes do not depart from the basic principles adopted by the Community in 1974 and have resulted in concrete measures involving a considerable financial commitment (see Table 2).

  In all the Member States the public authorities are aware of the need to save energy and expect that the measures they have taken or intend to take will lead to substantial results. An extra effort must be made in order to gauge more accurately the real impact of the measures taken or contemplated in this field.

2. Although the contribution of imported oil to energy supplies will be lower in 1985 than it is today, it will still be a key factor in the energy balance, as Table 2 shows.

   All the recent analyses of future trends on the world oil market point to the risks of considerable price rises and the physical limitations on supplies which would be occasioned by a sustained high level of demand. Accordingly, net imports into the Community should not exceed 500 Mtoe or 10 million barrels per day in 1985. This figure should be regarded as a compulsory target and form the basis of the Community's energy strategy.

Table 2 - 1976 situation, Community objectives for 1985 and prospects for national programmes

(mtoe)

1976	Estimate			
	Internal production	Net imports	Consumption	%
Solid fuels	184	23	207	22
Oil	22	520	542	58
Natural gas	144	12	156	16
Hydro & geothermal	25	1	26	2
Nuclear	21	-	21	2
Total	396	556	952	100
%	42	58	100	

1985	Objectives (Council Resolution of 17 December 1974)			
	Internal production	Net imports	Consumption	%
Solid fuels	210	40	250	17
Oil	180	515	695	49
Natural gas	175	95	270	18
Hydro & geothermal	45	-	45	3
Nuclear	190	-	190	13
Total	800	650	1450	100
%	55	45*	100	

1985	National programmes (mid-1977)			
	Internal production	Net imports	Consumption	%
Solid fuels	184	36	220	17
Oil	110-160	555-490	665-650	52-51
Natural gas	143-158	79	221-237	17-18
Hydro & geothermal	31	4	35	3
Nuclear	140	-	140	11
Total (rounded)	609-674	673-608	1282	100
%	47.5-52.6	52.5-47.4	100	

* Rounded to 50% in the Resolution of 17 December 1974.

The target limit of net oil imports of 500 m. tons, together with the prime necessity to limit energy dependence to 50% and the commitment to reduce the contribution of oil in gross energy consumption to 50% (which coincides both with the objective laid down in 1974 and the national estimates made at the end of 1975), would produce the following energy supply structure in 1985:

gross energy consumption: 1 280 Mtoe
50% imported energy i.e. 640 Mtoe
(of which oil = 500 Mtoe)
indigenous energy 50% i.e. 640 Mtoe
(of which oil = 140 Mtoe)
oil: 640 Mtoe i.e. 50%

3. In the light of these objectives and of the current forecasts made by the authorities in the Member States the two basic problems in quantitative terms to be faced between now and 1985 concern nuclear energy and oil.

(A) In the nuclear sector the situation is worrying, as is shown by Table 3:-

Table 3 - Nuclear energy: objectives, forecasts and programmes for 1985

	Objectives (Dec. 1974)	Forecasts 1975/1976 (COM/76/9)	Forecasts mid-1976	National programmes 1977
Installed capacity (GWe)	160	150 to 160	125	102.5
Production (Mtoe)	190	182 - 189	-	140

The delays over the last year in nuclear programmes while being partly due to increasing public doubts is also attributable to the lower growth prospects in electricity demand. Nevertheless, up to 1985 and beyond this would lead to a higher consumption of petroleum products (and, to a lesser of natural gas) in power stations, contrary to the aims of the Directives adopted by the Council in 1975 (1).

It seems however that even this figure of 102.5 GWe for 1985 is certainly optimistic; current forecasts suggest that installed nuclear power in 1985 will be no more than 90 GWe (i.e. approximately 120 Mtoe (2) and 20 Mtoe less than the forecasts emerging from the 1977 national programmes.

---

1) Council Directives No 75/404 and 405, OJ No C 178 of 9 July 1975.
2) See document COM(77)199 final.

This additional shortfall of 20 Mtoe needed to produce electricity should, under no circumstances, be made up by increasing oil imports; otherwise the priority objective of limiting net oil imports in 1985 to a maximum of 500 Mtoe will be jeopardized.

The potential for increasing the use of solid fuels in conventional power stations which exists in some Member States should be fully exploited, and by all possible means increased.

The use of coal alone to make up the 20 Mtoe deficit in nuclear power stations will increase the total consumption of solid fuels from 220 to 240 Mtoe (from 315 to 345 Mtce), which is rather less than the 1974 objective but 20 Mtoe (approx. 30 Mtce) more than current forecasts (see Table 4).

Table 4 - Consumption of solid fuels in 1985 (coal, brown coal and peat)

	1976	Objectives for 1985 (December 1974)	National programmes (1976) COM(76)9	(1977)	Assuming need to make up nuclear shortfall
Mtoe	207	250	243	220	240
Mtoe	295	355	347	315	345

It is difficult to imagine how such an increase in the consumption of solid fuels could be met by Community production and by imports respectively. An initial estimate might put the breakdown in 1985 as follows:

- Community production: 185 - 205 Mtoe (265 - 290 Mtce)* instead of 184.2 Mtoe (263 Mtce) in national programmes;
- Imports: 35 - 55 Mtoe (50 - 80 Mtce) instead of 35.8 Mtoe (51 Mtce) in national programmes.

Obviously such an increase in solid fuel consumption could lead to serious problems of thermal power station capacity and to difficulties,on grounds of cost, in marketing Community coal in the non-producing Member States. These difficulties must be assessed, however, in the light of the ever-increasing problems that will occur if no action is taken to stem the rising imports of oil.

(B) The will to reduce the share of oil in the Community's gross energy consumption to 50% in 1985 presupposes that by this date the amount of oil consumed will not exceed 640 Mtoe (500 Mtoe imported and 140 Mtoe Community production) which represents a reduction of between 10 and 25 Mtoe against current forecasts by Member States of between 650 and 665 Mtoe).

* Including 30 Mtoe (= 43 Mtce) of brown coal.

There are two ways of hitting this target, viz.

(i) To consume less heavy fuel oil in the power stations and to make up the 10 to 25 Mtoe with coal (Community or imported).

This solution seems scarcely realistic since, in view of the nuclear energy situation(see A above), this would require an additional increase in coal production and imports, which is not feasible either on grounds of cost or because of the new infrastructure which would be needed.

(ii) To use natural gas instead of oil to make up the 10 to 25 Mtoe in 1985 in the industrial and domestic sectors. This solution seems more reasonable: it presupposes that in 1985 the gross consumption of natural gas will be 245 Mtoe, which in turn implies:

a) Community production of 150 to 160 Mtoe (forecasts of the Member States: 143 - 158 Mtoe);

b) net imports of between 85 and 95 Mtoe, (forecasts of Member States: 79 Mtoe).

4. Table 5 shows the Community's primary energy supply situation in 1985 on three distinct hypotheses:

A. The objectives adopted in 1974.

B. Member States' current forecasts as given in their respective programmes.

C. The targets which the Community should reach in order to produce an energy balance by this date which is in line with the political will reflected by the approval of the objectives in 1974, and which is compatible with its own interests and with the foreseeable situation on the world energy market (see paragraph 3). This balance will depend upon further reliance on coal and natural gas to compensate for the shortfall arising from the need to reduce oil consumption and from the delays to nuclear programmes.

Table 5 - Community primary energy supply - 1985

	A Objective (Dec. 1974)		B National Programmes (1977)		C Proposed supply pattern		D Difference between C and B
	Mtoe	%	Mtoe	%	Mtoe	%	Mtoe
Solid fuels	250	17	220	17	240	18.5	+ 20
Oil	695	49	665-650	52	640	50	- 10-25
Natural gas	270	18	221-236	17	245	19	+ 25-10
Nuclear	190	13	140	11	120	9.5	- 20
Hydro and others	45	3	35	3	35	3	-
Total Gross consumption	1450	100	1280	100	1280	100	0
Imported oil	515	36	555-490	43-38	500	39	-55 - +10

5. Only a few governments were able to supply estimates for 1990. Commission staff have, however, prepared various scenarios to investigate the possible trend between now and 1990.

Table 6 shows two extreme cases from among these scenarios together with an extrapolation based on the national programmes.

Table 6 - Indicators for 1990

	1985			1990		
	Objective (Dec. 1974)	National programmes (end 1975)	(mid-1977	Extreme cases 1	2	Extrapolation from national programmes
Gross consumption (Mtoe)	1450	1390-1430	1280	1610	1160	1500
Average annual energy growth rate						
- period	(73-85)	(74-85)	(76-85)	(76-90)	(76-90)	(86-90)
- (%)	3.5	3.0 - 3.25	3.3	4.0	1.75	3
Dependence (%)						
- Total imports	45*	52-48	51-52	62	34	52-57
- Imported oil	35	41-38	43-38	50	25	42-48

* rounded to 50% in the Resolution of 17 December 1974.

Scenario 1 depicts a development without major constraints in which the rate of growth in demand would be fairly high, producing a level of external dependence similar to that of 1973.

Scenario 2 represents a minimum hypothesis which is apparently satisfactory from the points of view of energy conservation and external energy dependence, but which might be accompanied by insuperable difficulties regarding international trade and economic and social stability.

Extrapolation from the national programmes (which should not be considered a probability any more than the two scenarios) shows that the problem of oil dependence could recur after 1985, even if this point is passed satisfactorily. Also, before defining an energy strategy for 1990 (an absolute necessity in the short term) we should concentrate on what can be done between now and 1985 - which is the aim of this report.

III. CONCLUSIONS

The examination of national programmes in the light of the Community's energy policy objectives leads to the following conclusions which could influence the Council's work programme for 1978:

a) The energy conservation effort must be maintained and stepped up so that the present 1985 demand forecast (1280 Mtoe) is not exceeded. Overshooting this figure would lead to an increased call on imported energy, especially oil, and be likely to lead to serious price or supply difficulties.

b) The restrictions on the use of heavy fuel in conventional power stations must be tightened.

A solution to this problem requires action in the following fields:

- implementation of nuclear programmes (see (d) below);
- energy pricing policy;
- reduction of the proportion of heavy fractions in refinery production by building cracking plants;
- promoting the construction of new solid-fuel power stations;
- encouraging the use of coal in existing power stations.

c) It is vital that nuclear programmes move ahead without further delays to avoid the risks of increasing oil consumption in 1985 and of aggravating the situation in the longer term.

The problems to be overcome arise in various fields. The Commission has sent to the Council (or will do so very soon) communications and proposals on the following main questions:

- siting of nuclear power stations;
- supply of nuclear fuels;
- reprocessing;
- disposal of nuclear waste;
- fast breeder reactors.

The Commission is also to launch an open debate providing the public with access to full and objective information on the questions raised by the use of nuclear energy.

d) The part played by coal in the future supplies for power stations should be enlarged by implementing an effective coal supply strategy, especially as the need to have recourse to coal will be felt more acutely after 1985. There are two basic options open for this strategy: either to accept a supply situation based on the best use of Community resources with imports from non-member countries regarded as more or less complementary; or to rely more and more on imports and accept a reduction in the contribution made by Community coal. A carefully balanced choice must be made between these two possibilities.

e) In 1985 the Community should produce a minimum of 140 Mtoe of oil and 160 Mtoe of natural gas. These output figures should be compatible with the requirements of a rational management of resources; if necessary, help should be given to achieve these targets by means of suitable Community measures.

f) An increase in energy trade within the Community would make for improved overall security of supply, while improving the conditions under which certain resources are exploited (e.g. better utilization of production capacities). This raises the questions of infra-structure development (e.g. interconnection of gas and electricity networks), the economic conditions for such trade (price; long-term contracts) and in some cases, the problem of stimulating investment.

g) Imports of natural gas will not reach the desired level unless certain conditions are fulfilled, viz.

- encouraging the creation of purchasing consortia;
- setting up the infrastructure for gas gathering, transmission and delivery;
- safety of installations for the reception and storage of liquefied natural gas.

h) Externally, the efforts deployed to improve the Community's relations with its energy suppliers must be continued. Particular attention must be given to the possibility of increasing imports of oil and natural gas from Norway. Parallel to this, any internal measures taken by the Community will only be effective if there is cooperation with the other consumers, be they industrialized or developing

countries.

i) 1985 is already close at hand and the Community must therefore define longer-term energy policy guidelines: 1990 provides an initial reference point to which more thought should be given. With this time-scale it is still possible, by adopting vigorous measures without delay, to prevent the worrying trends discernible from a study of national programmes for 1985 (e.g. the delay over nuclear power) from becoming worse.

With eight years to run before 1985 these objectives and guidelines are attainable and reasonable. The Community can fulfil this programme and thus demonstrate its ability to react in a practical way to the changes triggered by new developments in the world energy situation.

It is for the Council unequivocally to confirm this approach, for Member States and industrial operators to continue to work towards this end, and of public opinion to understand and accept the requirements of this policy (mainly with regard to the rational utilization of energy and to prices).

Annex 1

Draft Council Resolution

The Council of the European Communities,

Having regard to a report from the Commission to the Council on the fulfilment of the 1985 objectives of Community energy policy,

Having regard to the Council's adoption on 17 December 1974 of a resolution on the objectives of Community energy policy;

1. Reaffirms its desire

   a) to reduce to 50% by 1985 the Community's external energy dependence;

   b) to reduce significantly by 1985 the share of oil in Community energy consumption.

2. Approves the objective of limiting the Community's net oil imports to a maximum by 1985 of 500 m. tons (10 mbd).

3. Requests Member States as well as energy producers and consumers in the Community to work within the following basic framework up to 1985:

   a) Community demand:

      the efforts made on the rational use of energy must be intensified and so far as is possible sectoral objectives should be rapidly established.

   b) Community energy production:

      - coal production must reach about 175 Mtoe (250 Mtce and the use of this production in power stations must be encouraged, particularly to compensate for the delay in nuclear programmes.

      - oil and natural gas production must reach levels of at least 140 Mtoe and 160 Mtoe respectively.

   c) Community energy imports:

      a more ambitious policy should be adopted towards coal and natural gas imports than that envisaged in the present forecasts by Member States.

4. Recalls that in so far as the ecological and security problems of nuclear energy are satisfactorily resolved, programmes for the installation of electricity generating capacity should be based - other than where solid fuels are to be used - on large-scale nuclear power stations, to avoid increased use of hydrocarbons, particularly of oil.

5. Emphasizes the importance of research into new energy sources.

FACTUAL COMMUNITY-BASED ANALYSIS OF MEMBER STATES' ENERGY FORECASTS UP TO 1985*

1. Energy demand

1.1 Energy demand and economic growth

	1973	1976	1985		
			1974 objectives: period 1973-1985	Earlier forecasts (COM(76)9) period 1973-1985	Current forecasts period 1976-1985
GDP growth (%)	5.5	4.3	4.0	3.2-3.5	4.2
Growth of energy consumption (%)	5.9	4.7	3.5	3.0-3.25	3.3
Energy/GDP elasticity	1.07	1.09	0.875	0.925	0.785
Total gross energy consumption (internal consumption + bunkers) in Mtoe	973.9	952.9	1450	1388/1431	1282

Two basic comments must be made about this table:

a) The significant reduction for 1985 in gross energy consumption between the 1974 estimates and the present estimates is the result of two distinct factors:

- the economic crisis of 1974 and 1975
- the improvement between now and 1985, according to Member States' forecasts, of the energy/GDP elasticity coefficient.

b) An improvement in the energy/GDP elasticity coefficient implies in practical terms that each Member State will maintain or step up its efforts in energy conservation needed to achieve its stated forecasts.

---

* This analysis is based on the Member States' estimates given in Annex 3.

1.2 Share of electricity in overall energy demand

	1973	1976	1985		
			Targets set in 1974	Previous forecasts (COM(76)9)	Current forecasts
Electricity demand (gross TWh)	1039	1119	2250	1910-1960	1865
Annual electricity growth rate (%)	7.7	6.9	7.5 (1975-85)	6.2 - 6.5 (1975-85)	6.0 (1975-85)
Proportion of energy demand covered by electricity (%)	25.6	28.2	35	32	34.6
Proportion of energy demand covered by nuclear energy (%)	1.2	2.1	13	13	11.3

The current forecasts of growth in electricity demand are closely comparable with those made by the Member States in 1975. Although the proportion of electricity from nuclear power stations in overall energy requirements will not reach the objectives or the previous forecasts, the current forecasts of electricity's share of the market are virtually the same as the target set in December 1974

2. ENERGY PRODUCTION

2.1 Solid fuels (hard coal and brown coal)

	1973	1976	1985		
			Objective (1974)	Previous forecasts (COM(76)9)	Current forecasts
1. Hard coal					
Mtoe	175	156	180	161-166	154.2
Mtoe	250	223.3	255	230-237	220
2. Brown coal and peat					
Mtoe	25	27.7	30	30	30
Mtoe	35	39.6	43	43	43
3. Solid fuels					
Mtoe	200	183.7	210	191-196	184.2
Mtoe	285	262.9	298	273-280	263

This table prompts the following comments:

a) the situation is satisfactory for brown coal and peat;

b) for hard coal the situation is slowly but steadily deteriorating, and this is worrying. Extra output in 1985 of approximately 20 Mtoe (compared with current forecasts) is possible because the capacity exists, but this presupposes firm and swift commitments to take this coal, principally for power stations;

c) an increase in the production of coal for consumption in power stations raises three specific problems:

1. the unit costs of production
2. the cost of the necessary infrastructure
3. competition with coal imported at spot prices which are currently very advantageous.

2.2 Oil

	1973	1976		1985	
			Target set in December 1974	Previous forecasts (COM(76)9)	Current forecasts
Production (Mtoe)	11.8	22.4	180	111 - 161	111 - 161

Unless new and major discoveries are made in the North Sea there seems little likelihood at present that the production target of 180 Mtoe can be reached in 1985.

On the other hand, the Community should

- produce at least 140 Mtoe in 1985 - an average of the Member States' forecasts and in line with the majority of estimates made by the industry;
- strive, with the aid of appropriate Community measures (e.g. loans, loan guarantees, long-term contracts, m.s.p.) to raise the production level to 160 mtoe, i.e. the upper limit of the range of Member States' forecasts.

Refining is another basic problem on which the Council has already received a Communication from the Commission. In this field the Commission would like Member States to clarify their thinking on forecasts of imports and exports of finished products in 1980 and 1985.

2.3 Natural gas

	1973	1976	1985		
			Objectives (1974)	Previous forecasts (COM(76)9)	Current forecasts
Production (Mtoe)	114.3	143.7	175	150 - 165	142.8-157.8

As with oil, the production target set in 1974 of 175 Mtoe now seems unattainable unless new and major discoveries are made.

On the other hand, if the right action is taken (e.g. a gas gathering pipeline in the North Sea*, a coherent pricing policy at the production and final consumption stages in order to stimulate investment), the Community should be in a position to produce between 150 and 160 Mtoe of natural gas in 1985.

* For Norwegian gas too.

2.4 Nuclear energy

	1973	1976	1985		
			Objectives (1974)	Previous forecasts (COM(76)9)	Current forecasts
Installed capacity (GWe)	12.3	18.3	160	150 - 160	102.5
Production (Mtoe)	14	21	190	182 - 189	140

In a sector where, against a background of known difficulties, the decline in prospects has been most marked, the main conclusions to be drawn from an assessment of national programmes are as follows:

a) an installed capacity in 1985 greater than 102.5 GWe is no longer possible;

b) even an installed capacity in 1985 of 102.5 GWe may prove optimistic: latest Commission estimates are based on a figure of 90 GWe[1];

c) at all events the Community's effort must aimed at:

- using, providing and deploying all the necessary financial means to ensure that there is no investment bottleneck in this sector;
- increasing the extent and clarity of information about nuclear power.

2.5 New sources of energy

Despite the efforts already made, Member States' forecasts show that the impact of new energy sources by 1985 will be no more than marginal. It is nonetheless essential, as far as both research and demonstration projects are concerned, that the efforts devoted to these resources (i.e. solar, geothermal, wind energy etc.), whose development is vital for the future, be maintained and increased in each Member State and at Community level.

---

1) cf. COM(77)199 final of 27 May 1977.

3. NET ENERGY IMPORTS

3.1 Solid fules (hard coal)

	1973	1976		1985	
			Objectives (1974)	Previous forecasts COM(76)9)	Current forecasts
Mtoe	22	23.3	40	47 - 52	35.8
Mtce	31	33*	57	67 - 74	51

Current forecasts in this area are far lower than those of last year.

This trend should obviously be corrected. It is vital that the Community should, in keeping with the solution to the problems of Community coal (see 2.1), take the necessary steps for importing between 35 and 55 Mtoe of coal (i.e. 50 to 80 Mtce) in 1985 on the basis of long-term contracts, the main aim being to cushion the impact (see 2.4) of further set-backs in the nuclear programmes (i.e. 90 GWe instead of 102.5).

---

* 42 Mtce according to Commission estimates.

3.2 Oil

	1973	1976	1985		
			Objective (1974)	Previous forecasts (COM(76)9)	Current forecasts
Mtoe	580.9	520.1	515	573 - 544	554.6 - 489.6

The current forecasts of net oil imports (including imports from Norway) in 1985 are on average fairly close to the target set in 1974 and to the actual figures for 1976. But we should not be beguiled by this, however, since there are two basic factors involved, viz. the appreciable drop in gross energy consumption in 1985 in relation to the target set in 1974 and more particularly the market penetration of Community oil.

In other words, this trend in the forecasts of net oil imports is on the whole not so much a result of a firm resolve to limit such imports as the indirect consequence of forecasts relating to economic growth, the rational utilization of energy and the growth of supplies in the other energy sectors.

A greater effort must therefore be made in future: in view of world oil supply prospects, the Community should ensure that in 1985 it does not exceed a net import figure of 500 million tons of oil (10 mbd). This limit on net imports should be reflected in 1985 targets for each Member State and be backed up by intermediate targets (each year or every two years).

3.3 Natural gas

	1973	1976	1985		
			Objectives (1974)	Previous forecasts (COM(76)9)	Current forecasts
Mtoe	3.6	12.6	95	94	78.7

Member States' current forecasts in this field are significantly lower than those of last year, which were in line with the target set in 1974.

Nevertheless, the forecasts are more a reflection of the uncertainty of the gas companies in the face of the movement of natural gas prices on the world market than of difficulties over supply, where the prospects are still hopeful (Algeria, Norway, Nigeria and possibly Canada). Subject to certain measures being taken (see 2.3 and incentives for the establishement of Community consortia), it is therefore necessary to reactivate Community policy in this field with a view to importing between 85 and 95 million toe of natural gas in 1985. In this context, the question of LPG must be taken into account.

4. STRUCTURE OF ELECTRICITY GENERATION

In TWh (and as %)	1973	1976	1985	
			Previous forecasts (COM(76)9)	Current forecasts[1]
Hydro and geothermal	112 (109)	114 (10.2)	143 (7.0)	159 (8.00
Nuclear	59 (5.7)	93 (8.4)	860 (42.0)	636 (32.0)
Conventional power stations	860 (83.4)	907 (814)	1062 (52.0)	1195 (60.0)
of which:				
hard coal	326 (31.6)	363 (32.6)	417 (20.2)	454 (22.8)
brown coal	80 (7.7)	107 (9.6)	101 (4.9)	100 (5.0)
fuel oil	326 (31.6)	268 (24.0)	349 (16.9)	484 (24.3)
natural gas	96 (9.3)	136 (12.2)	150 (7.3)	121 (6.1)
others	32 (3.2)	33 (3.0)	45 (1.7)	36 (1.8)
Total	1031 (100)	1114 (100)	2065 (100)	1990 (100)

If current forecasts are compared with those of last year the following facts or trends emerge from this table:

a) The expected delay in the nuclear programmes would, as expected, be offset by an increase in conventional fossil fuel capacity.

b) This increase in conventional fossil fuel capacity would be achieved largely by increasing the amount of fuel oil burned in power stations (from 349 TWh to 484 TWh); this is hardly compatible with Directive 75/405 on the limitation of the use of oil in power stations.

c) However regrettable it may be, this latter trend is partly inevitable to the extent that coal (Community and imported) alone will not be enough to compensate for the present delay in the nuclear programme. It should be emphasized that the forecast of 454 TWh generated in 1985 from coal-fired power stations implies a coal consumption of 150 Mtce.

---

1) The 1985 shares of different fuels in conventional power stations are based on forecasts by Commission staff.

(d) It is vital that any further delay in nuclear programmes (see Section 2.4) should not be compensated by petroleum products but by Community and imported coal.

5. INVESTMENT

The following table compares the investment forecasts made last year (COM/ENER(76)15) and this year by the Member States for the period 1976-85 (i.e. at 31 December 1976 prices and exchange rates for the Community; the figures for each Member State are shown in Annex 4).

	Investments 1976 - 1985			
	Last year's forecasts		Current forecasts	
	Absolute figures (1 000 million EUA)	%	Absolute figures (1 000 million EUA)	%
Solid fuels	11.43	5	13.30	6
Hydrocarbons	83.84	32	83.03	36
Nuclear	75.49	29	55.52	24
Non-nuclear	24.62	10	20.17	9
Transport and distribution of electricity	59.61	24	56.00	25
Total	254.99	100	228.02	100
Value as a % of GDP		1.8		1.5

Despite the shortcomings of these statistics and although the investment forecasts for energy conservation are not shown, three basic conclusions can be drawn:

a) in relative terms, the most significant change is the drop in expenditure on nuclear power (from 29 to 24%) and the corresponding increase in that on hydrocarbon fuels (32 to 36%);

b) in absolute terms, the investment forecasts made this year are 27 000 million EUA lower than last year's, and this drop is chiefly attributable to the slowdown in the nuclear programme, i.e. a drop of 20 000 million EUA;

c) the 10% reduction in forecast investment is consistent with a corresponding drop in gross energy consumption forecasts for 1985.

Taken overall, energy investment in relation to Community GDP will have fallen sharply (from 1.8% to 1.5%), which is a worrying trend: a relative decline in energy investment runs the risk of being reflected in increased imports of energy and in disequilibria on the balance of payments current account, with unfortunate consequences for economic growth.

Whilst not denying the freedom of choice of investors and the fact that, as far as energy is concerned, they are operating in different sectors,it is therefore desirable that the Community and the Member States give thought to the best ways of transferring monies not invested in nuclear power as a result of the slowdown in nuclear programme to other sectors, the most important of which is certainly energy conservation.

6. ENERGY STRUCTURE

%	1973	1976	1985		
			1974 objectives	Previous forecasts (COM(76)9)	Current forecasts
Solid fuels	22.6	22.5	17.0	17.5 - 17	17.2
Oil	61.4	55.3	49.0	49.5	51.9 - 50.7
Natural gas	11.6	16.9	18.0	17.5 - 18	17.2 - 18.4
Nuclear	1.4	2.3	13.0	13	10.8
Hydro	3.0	3.0	3.0	2.5	3.0
Total	100	100	100	100	100

A comparison of current forecasts, last year's forecasts and those implied by the Council Regulation of December 1974 shows that the energy structure will remain fairly stable up to 1985. The only notable change is the fall of more than two percentage points of the nuclear sector, and the corresponding rise in the share of oil which, on present forecasts, will still account for more than 50% of the Community's energy supplies in 1985.

een now and 1985 the share of oil must be reduced (by substitution of natural gas); this in turn implies that any further reduction in the contribution of nuclear power must be offset by a corresponding increase in the use of solid fuels in power stations.

7. ENERGY DEPENDENCE

	1973	1976	1985		
			Target set in December 1974	Previous forecasts (COM(76)9)	Current forecasts
1. Gross energy consumption (Mtoe)	973.9	952.9	1450	1388 - 1431	1282
2. Net imports (Mtoe)	608.6	556.8	650	720 - 686	672.7-607.7
of which:					
solid fuels	22	23.3	40.0	52 - 47	35.8
oil	580.9	520.1	515.0	573 - 544	554.6 - 489.6
natural gas	3.6	12.2	95	94	78.7
electricity	2.1	1.2	-	1	3.6
3. % external dependence	61	58	"50" (actually 45)	52 - 48	52.5 - 47.4

In this context the objective not to allow the Community's external energy dependence in 1985 to exceed 50% must be reaffirmed. On the basis of the developments outlined above and following certain adjustments this objective can and must be achieved.

ANNEX 3

ENERGY BALANCES AND MAIN TRENDS (1973, 1976, 1980, 1985) FOR THE COMMUNITY AND THE MEMBER STATES

(Comparison between Member States' present prospects and those set out in the first report on the achievement of the 1985 objectives (COM(76) 9)).

1985

Programmes nationaux (actuels)

en Mio tep	Comb. solides	Pétrole	Gaz naturel	Energie nucléaire	Hydro., + autres	TOTAL
1. Production intérieure						
Belgique	4,9	-	-	6,5	0,6	12,0
Danmark	-	0,5	2,5	1,2	-	4,2
Deutschland	88,0	5,0	16,0	43,5	4,0	156,5
France	7,4	0,9	5,1	56,0	14,3	83,7
Ireland	1,4	-	1,2	-	0,2	2,8
Italia	1,5	3,0	15,0	15,5	11,2	46,2
Luxembourg	-	-	-	1,0	0,0	1,0
Nederland	-	1,5	68,0	2,3	-	71,8
United Kingdom	81,0	100 à 150	35 à 50	14,0	1,0	231 à 296
COMMUNAUTE	184,2	110,9 à 160,9	142,8 à 157,8	140,0	31,3	609,2 à 674,2
2. Importations nettes						
Belgique	6,5	33,6	12,5	-	-0,6	52,0
Danmark	3,6	13,1	-	-	-	16,7
Deutschland	-12,5	157,0	45,0	-	5,0	194,5
France	16,6	126,1	28,9	-	-1,3	170,3
Ireland	0,6	9,9	-	-	-	10,5
Italia	13,7	131,9	19,7	-	-	165,3
Luxembourg	2,0	2,5	0,5	-	0,5	5,5
Nederland	6,3	61,5	-36,9	-	-	30,9
United Kingdom	-1,0	19 à -46	9,0	-	-	27 à -38
COMMUNAUTE	35,8	554,6 à 489,6	78,7	-	3,6	672,7 à 607,7
3. Consommation brute						
Belgique	11,4	33,6	12,5	6,5	-	64,0
Danmark	3,6	13,6	2,5	1,2	-	20,9
Deutschland	75,5	162,0	61,0	43,5	9,0	351,0
France	24,0	127,0	34,0	56,0	13,0	254,0
Ireland	2,0	9,9	1,2	-	0,2	13,3
Italia	15,2	134,9	34,7	15,5	11,2	211,5
Luxembourg	2,0	2,5	0,5	1,0	0,5	6,5
Nederland	6,3	63,0	31,1	2,3	-	102,7
United Kingdom	80,0	119 à 104	44 à 59	14,0	1,0	258,0
COMMUNAUTE	220,0	665,5 à 650,5	221,5 à 236,5	140,0	34,9	(*) 1.281,9

(*) soit consommation intérieure : (1.237,3 Mio tep) + soutes (44,6 Mio tep)

13/5/77

COMMUNAUTE

Tableau comparatif entre

en mio tep	Examen des programmes nationaux (actuels) 1976	Examen des programmes nationaux (actuels) 1980 [4]	Examen des programmes nationaux (actuels) 1985 [4]	Programmes nationaux précédents (cfr COM/75/5) 1973	Programmes nationaux précédents (cfr COM/75/5) 1980	Programmes nationaux précédents (cfr COM/75/5) 1985
1. Production intérieure						
Combustibles solides	183,7	185,6	184,2	200,1	198	191 à 196
Pétrole	22,4	106,5 à 126,5	110,9 à 160,9	11,8	112 à 142	111 à 161
Gaz naturel [1]	143,7	149,7 à 154,7	142,8 à 157,8	114,3	159 à 164	150 à 165
Energie nucléaire	21,5	51,2	140,0	14,1	64	182 à 189
Hydr., ... et autres	24,8	30,1	31,3	25,0	30	34
TOTAL	396,1	523,1 à 548,1	609,2 à 674,2	365,3	563 à 598	668 à 745
2. Importations nettes						
Combustibles solides	23,3	31,4	35,8	22,0	42,0	52 à 47
Pétrole	520,1	495,6 à 470,6	554,6 à 489,6	580,9	517 à 493	573 à 544
Gaz naturel [1]	12,2	47,0	78,7	3,6	59	94
Electricité	1,2	3,3	3,6	2,1	2	1
TOTAL	[2] 556,8	577,3 à 552,3	672,7 à 607,7	[2] 608,6	620 à 596	720 à 686
3. Consommation brute [3]						
Combustibles solides	207,0	217,0	220,0	222,1	240	243
Pétrole	542,5	602,1 à 597,1	665,5 à 650,5	592,7	629 à 635	684 à 705
Gaz naturel [1]	155,9	196,7 à 201,7	221,5 à 236,5	117,9	218 à 223	244 à 259
Energie nucléaire	21,5	51,2	140,0	14,1	64	182 à 189
Hydr., ... et autres	26,0	33,4	34,9	27,1	32	35
TOTAL	952,9	1.100,4	1.281,9	973,9	1.183 à 1.194	1.388 à 1.431

4. Structure en %	1985 Production	1985 Importations	1985 Consommation	1985 Production	1985 Importations	1985 Consommation
Combustibles solides	14,4	2,8	17,2	13,8 à 13,7	3,7 à 3,2	17,5 à 16,9
Pétrole	8,6 à 12,5	43,3 à 38,2	51,9 à 50,7	8,0 à 11,3	41,3 à 38,3	49,3
Gaz naturel	11,1 à 12,3	6,1	17,2 à 18,4	10,8 à 11,5	6,8 à 6,6	17,6 à 18,1
Electricité	13,4	0,3	13,7	15,5 à 15,6	0,1	15,6 à 15,7
TOTAL	47,5 à 52,6	52,5 à 47,4	100,0	48,1 à 51,9	51,9 à 47,9	100,0

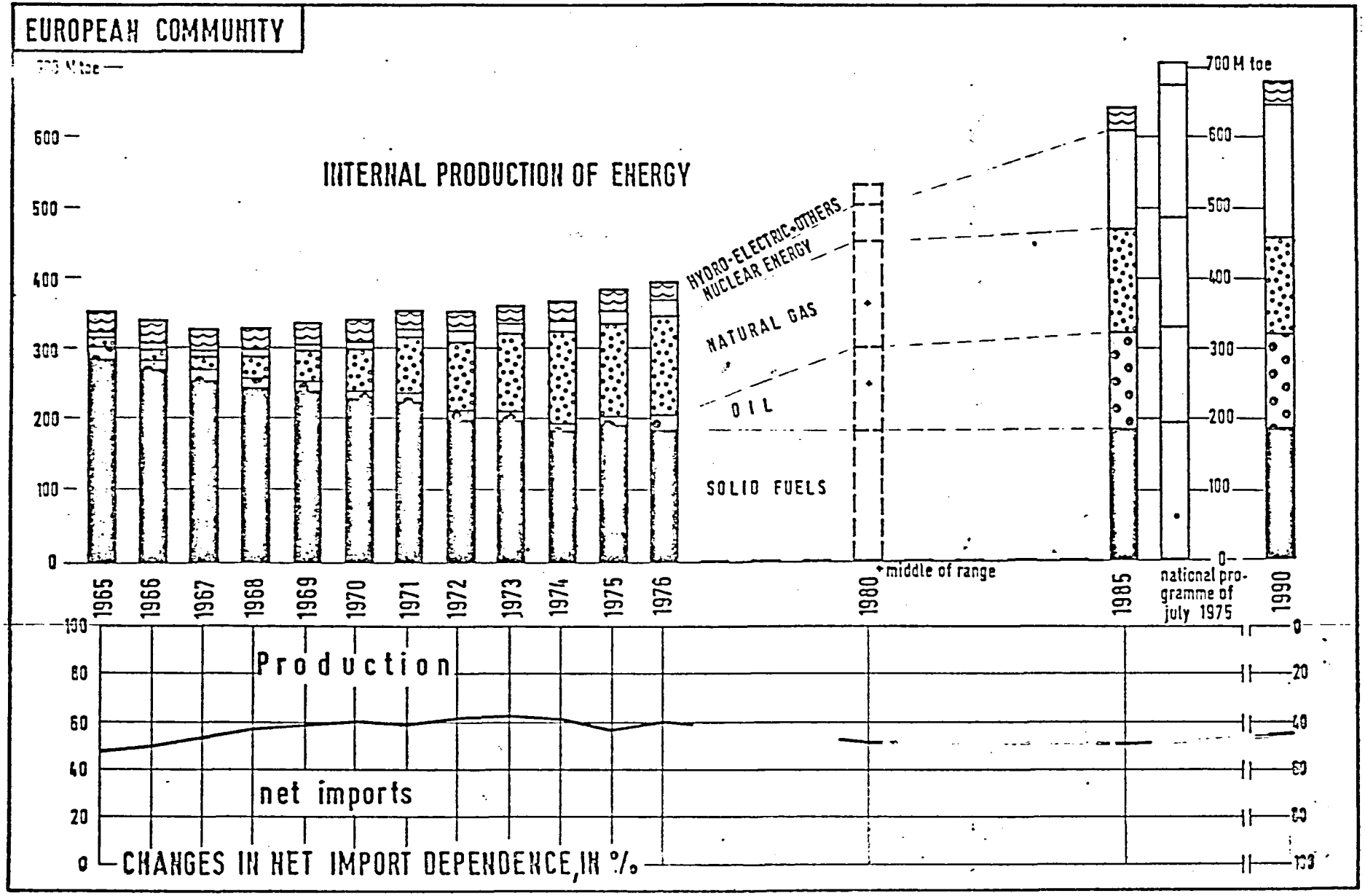
1 gaz naturel exprimé en PCI

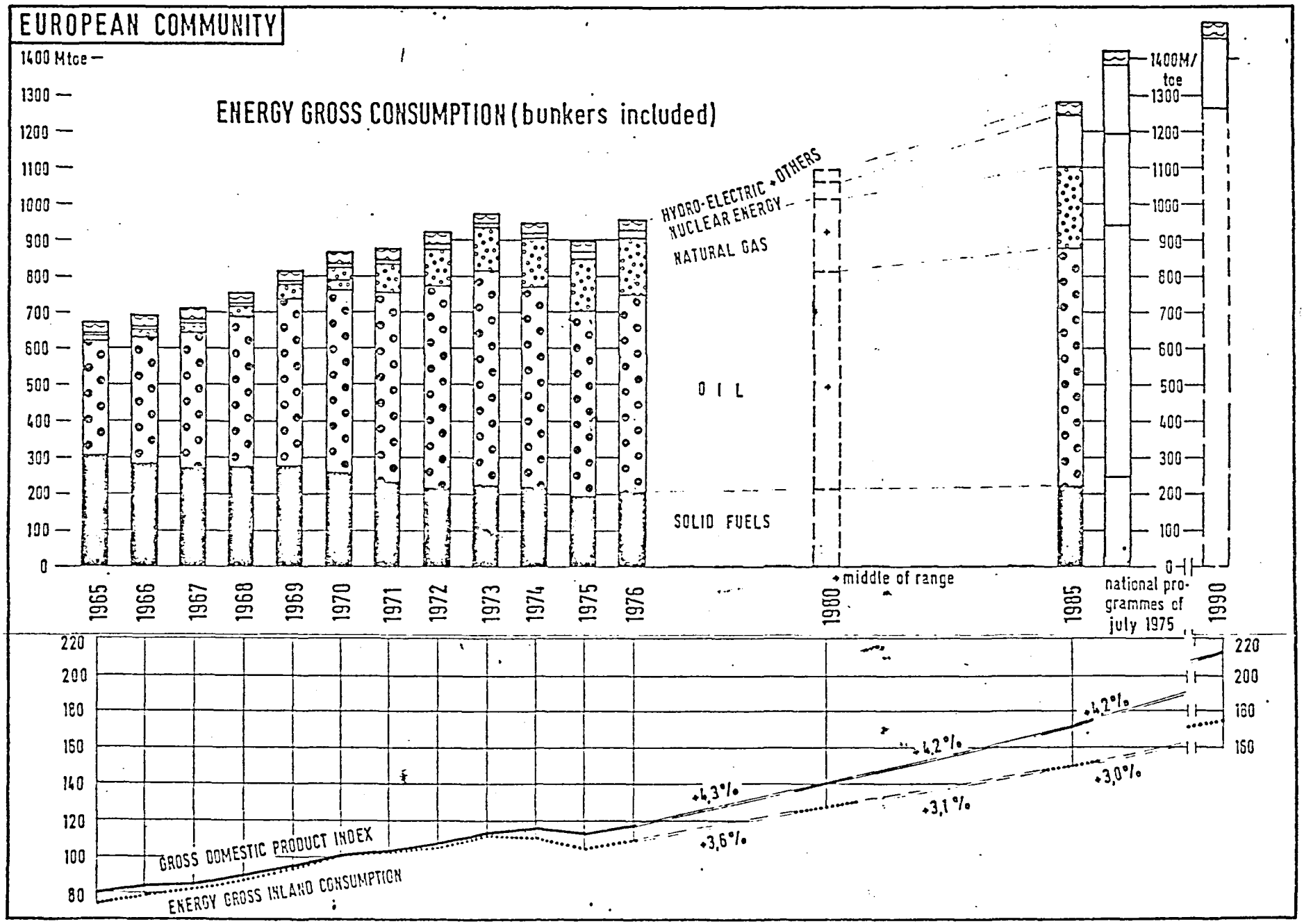
2 y compris les variations des stocks

13/5/77

3 consommation intérieure : (usages non énergétiques compris) + soutes

4 estimations des services de la Commission pour la Belgique, en 1980


EUROPEAN COMMUNITY
INTERNAL PRODUCTION OF ENERGY
HYDRO-ELECTRIC-OTHERS
NUCLEAR ENERGY
NATURAL GAS
OIL
SOLID FUELS
700 M toe
600
500
400
300
200
100
0
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
1990
middle of range
national programme of july 1975
Production
net imports
CHANGES IN NET IMPORT DEPENDENCE, IN %
100
80
60
40
20
0
20
40
60
80
100


EUROPEAN COMMUNITY
ENERGY GROSS CONSUMPTION (bunkers included)
1400 Mtoe
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
HYDRO-ELECTRIC + OTHERS
NUCLEAR ENERGY
NATURAL GAS
OIL
SOLID FUELS
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
middle of range
1985
national programmes of july 1975
1990
1400M/toe
GROSS DOMESTIC PRODUCT INDEX
ENERGY GROSS INLAND CONSUMPTION
+4,3%
+3,6%
+4,2%
+3,1%
+4,2%
+3,0%

BELGIQUE

Tableau comparatif entre

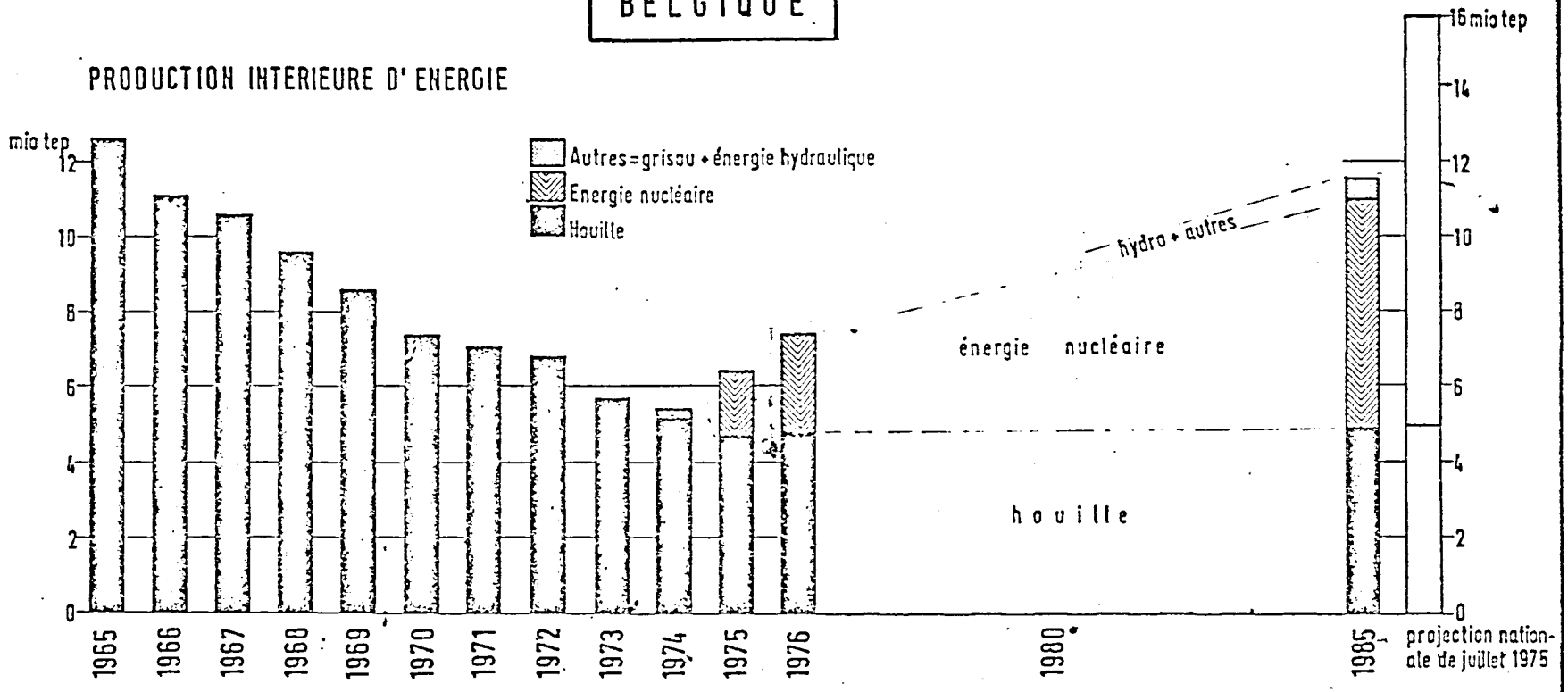
en mio tep	Examen des programmes nationaux (actuels) 1976	1980(4)	1985	Programmes nationaux précédents (cfr COM/76/9) 1973	1980	1985
1. Production intérieure						
Combustibles solides	4,810		4,9	5,6	5,0	5,0
Pétrole	-		-	-	-	-
Gaz naturel (1)	0,039		-	0,0	-	-
Energie nucléaire	2,435		6,5	0,0	4,0	11,0
Hydr., ... et autres	0,091		0,6	0,1	-	-
TOTAL	7,375		12,0	5,7	9,0	16,0
2. Importations nettes						
Combustibles solides	4,832		6,5	6,1	6,0	6,0
Pétrole	26,299(5)		33,6(5)	30,7	29,3	31,5
Gaz naturel (1)	8,761		12,5	7,3	13,0	20,0
Electricité	-0,977		-0,6	-0,2	-	-
TOTAL	38,915(2)		52,0	43,9(2)	48,3	57,5
3. Consommation brute (3)						
Combustibles solides	9,642		11,4	11,7	11,0	11,0
Pétrole	26,299		33,6	30,7	29,3	31,5
Gaz naturel (1)	8,800		12,5	7,3	13,0	20,0
Energie nucléaire	1,549		6,5	-0,1	4,0	11,0
Hydr., ... et autres						
TOTAL	46,290		64,0	49,6	57,3	73,5

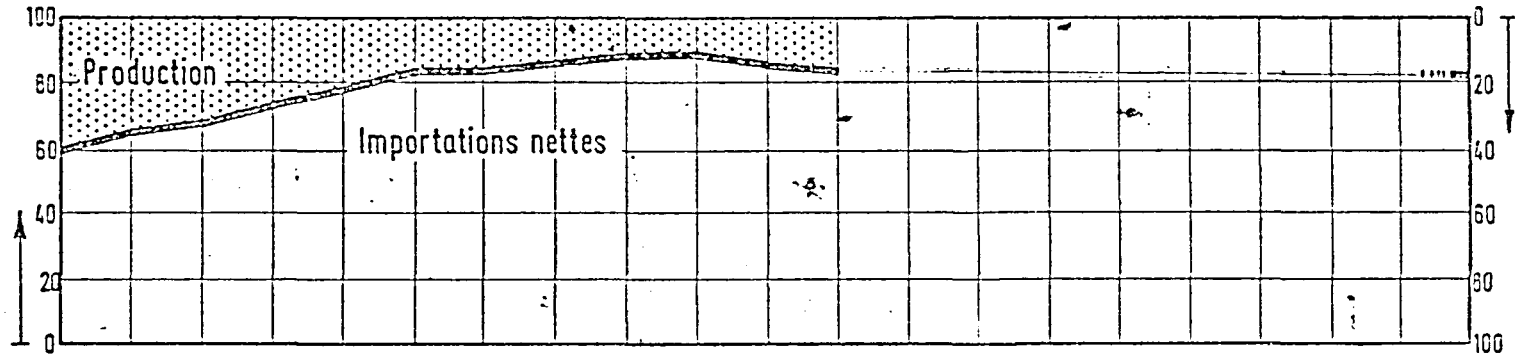
4. Structure en %	1985 Production	Importations	Consommation	1985 Production	Importations	Consommation
Combustibles solides	7,6	10,2	17,8	6,8	8,2	15,0
Pétrole	-	52,5	52,5	-	42,8	42,8
Gaz naturel	-	19,5	19,5	-	27,2	27,2
Electricité	11,1	-0,9	10,2	15,0	-	15,0
TOTAL	18,7	81,3	100,0	21,8	78,2	100,0

(1) gaz naturel converti au PCI (2) y compris les variations des stocks
(3) consommation intérieure (usages non énergétiques compris) + soutes
(4) information non reçue (5) soutes non communiquées : elles ont été estimées par les services de la DG Energie à 3,5 Mio tep en 1985 (2,8 Mio tep en 1976)

BELGIQUE

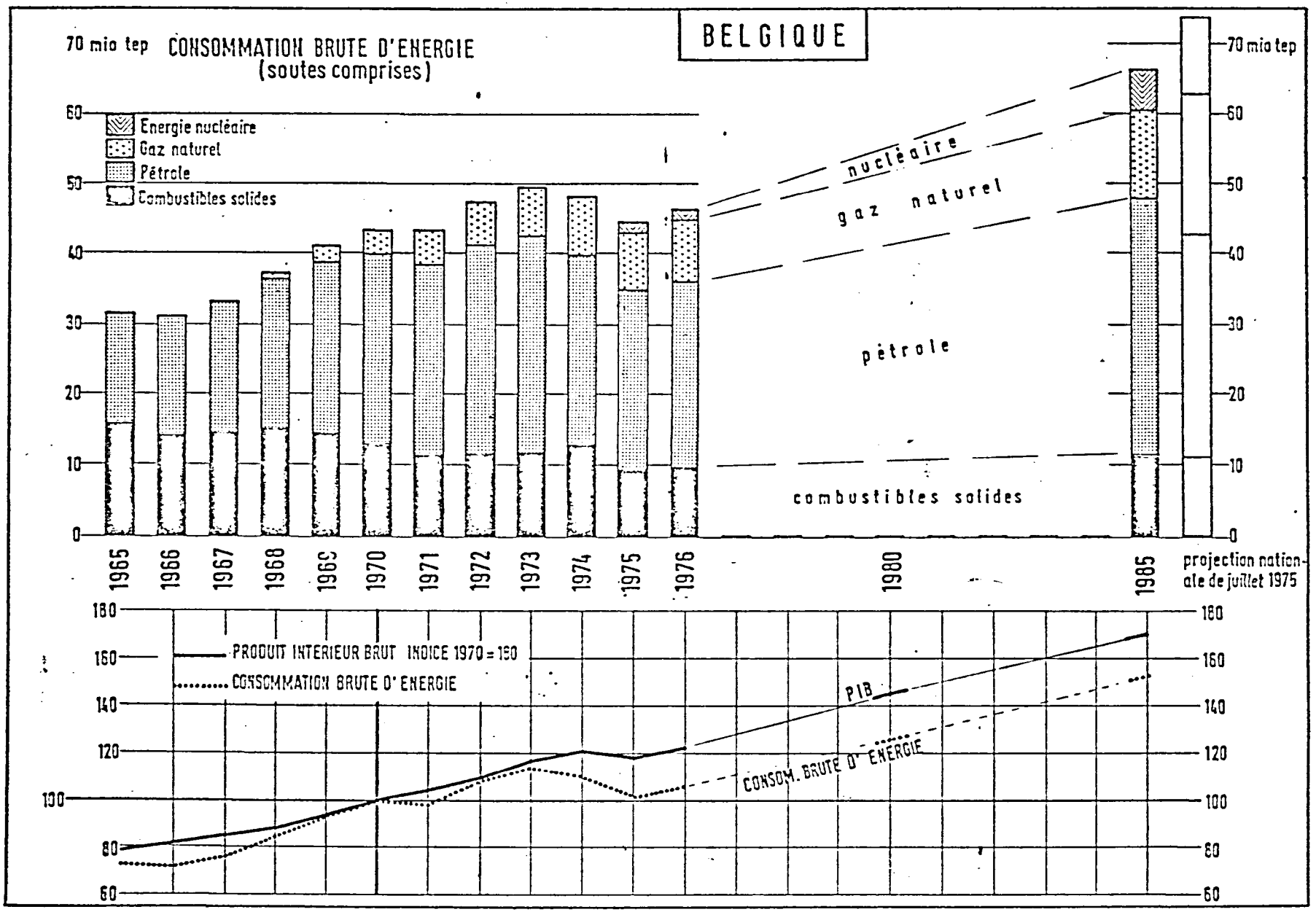
PRODUCTION INTERIEURE D' ENERGIE





EVOLUTION DU DEGRE DE DEPENDANCE ENERGETIQUE EN %

BELGIQUE


70 mio tep
CONSOMMATION BRUTE D'ENERGIE
(soutes comprises)
Energie nucléaire
Gaz naturel
Pétrole
Combustibles solides
nucléaire
gaz naturel
pétrole
combustibles solides
70 mio tep
60
50
40
30
20
10
0
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
projection nationale de juillet 1975
PRODUIT INTERIEUR BRUT INDICE 1970 = 100
CONSOMMATION BRUTE D' ENERGIE
PIB
CONSOM. BRUTE D' ENERGIE
180
160
140
120
100
80
60

DANMARK

Tableau comparatif entre

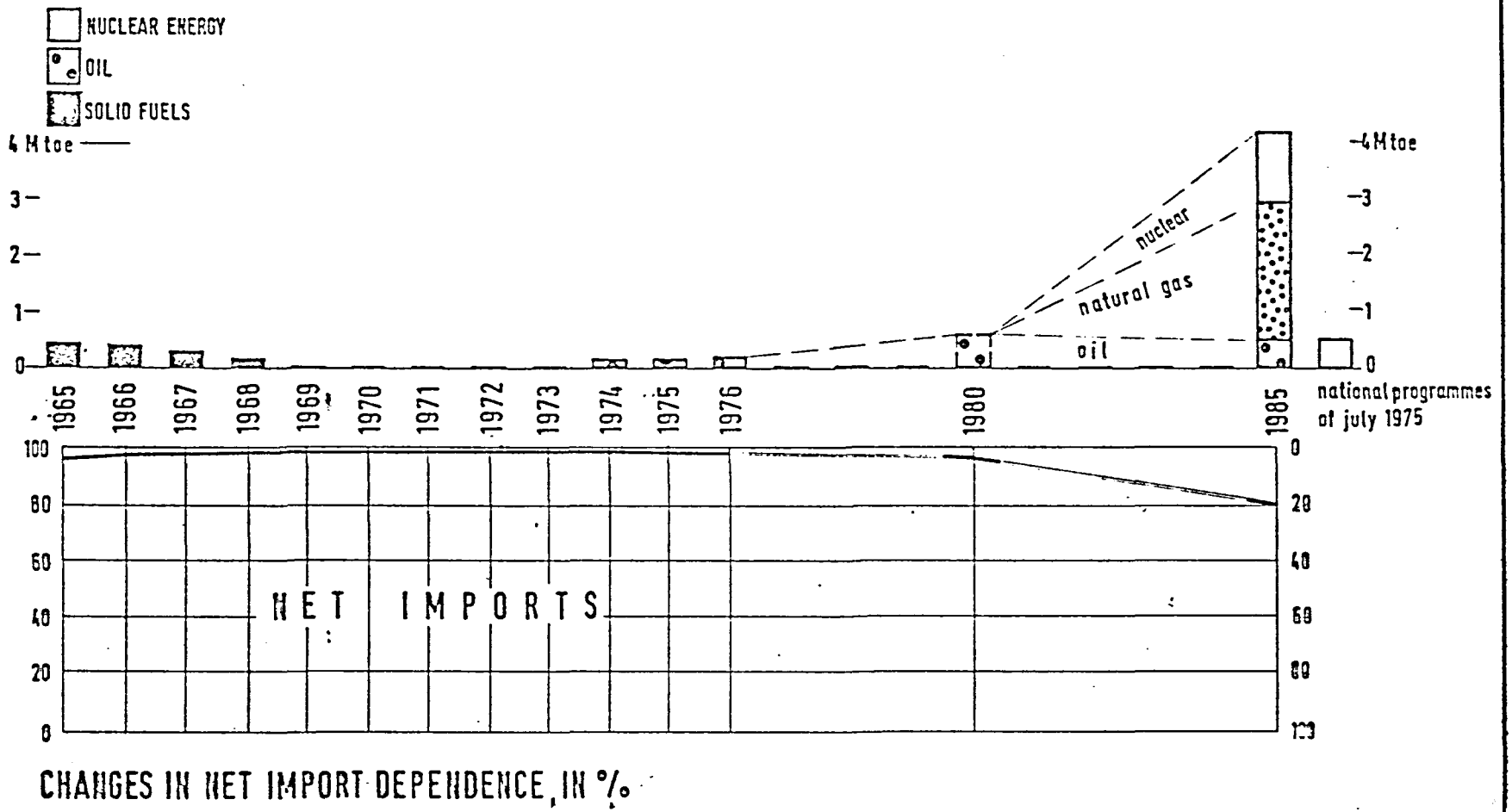
en mio tep	Examen des programmes nationaux (actuels) 1976	1980	1985	Programmes nationaux précédents (cfr COM/75/9) 1973	1980	1985
1. Production intérieure						
Combustibles solides	-	-	-	-	-	-
Pétrole	0,177	0,60	0,5	0,07	0,60	0,50
Gaz naturel	-	-	2,5	-	..	..
Energie nucléaire	-	-	1,2	-	-	..
Hydr., ... et autres	0,006	-	-	0,00	-	-
TOTAL	0,183	0,60	4,2	0,07	0,60	0,50
2. Importations nettes						
Combustibles solides	3,053	3,63	3,6	2,27	2,50	3,10
Pétrole	16,551	18,24	13,1	17,98	19,30	22,20
Gaz naturel	-	-	-	-	..	..
Electricité	0,281	-	-	- 0,04	-	-
TOTAL	19,885 (1)	21,87	16,7	20,21 (1)	21,80	25,30
3. Consommation brute (2)						
Combustibles solides	3,053	3,63	3,6	2,27	2,50	3,10
Pétrole	16,728	18,84	13,6	18,05	19,90	22,70
Gaz naturel	-	-	2,5	-	..	..
Energie nucléaire	-	-	1,2	-	-	..
Hydr., ... et autres	0,287	-	-	-0,04	-	-
TOTAL	20,068	22,47	20,9	20,28	22,40	25,80

4. Structure en %	1985 Production	Importations	Consommation	1985 Production	Importations	Consommation
Combustibles solides	-	17,2	17,2	-	12,0	12,0
Pétrole	2,4	62,7	65,1	1,9	86,1	88,0
Gaz naturel	12,0	-	12,0	..	..	..
Electricité	5,7	-	5,7	..	-	-
TOTAL	20,1	79,9	100,0	1,9	98,1	100,0

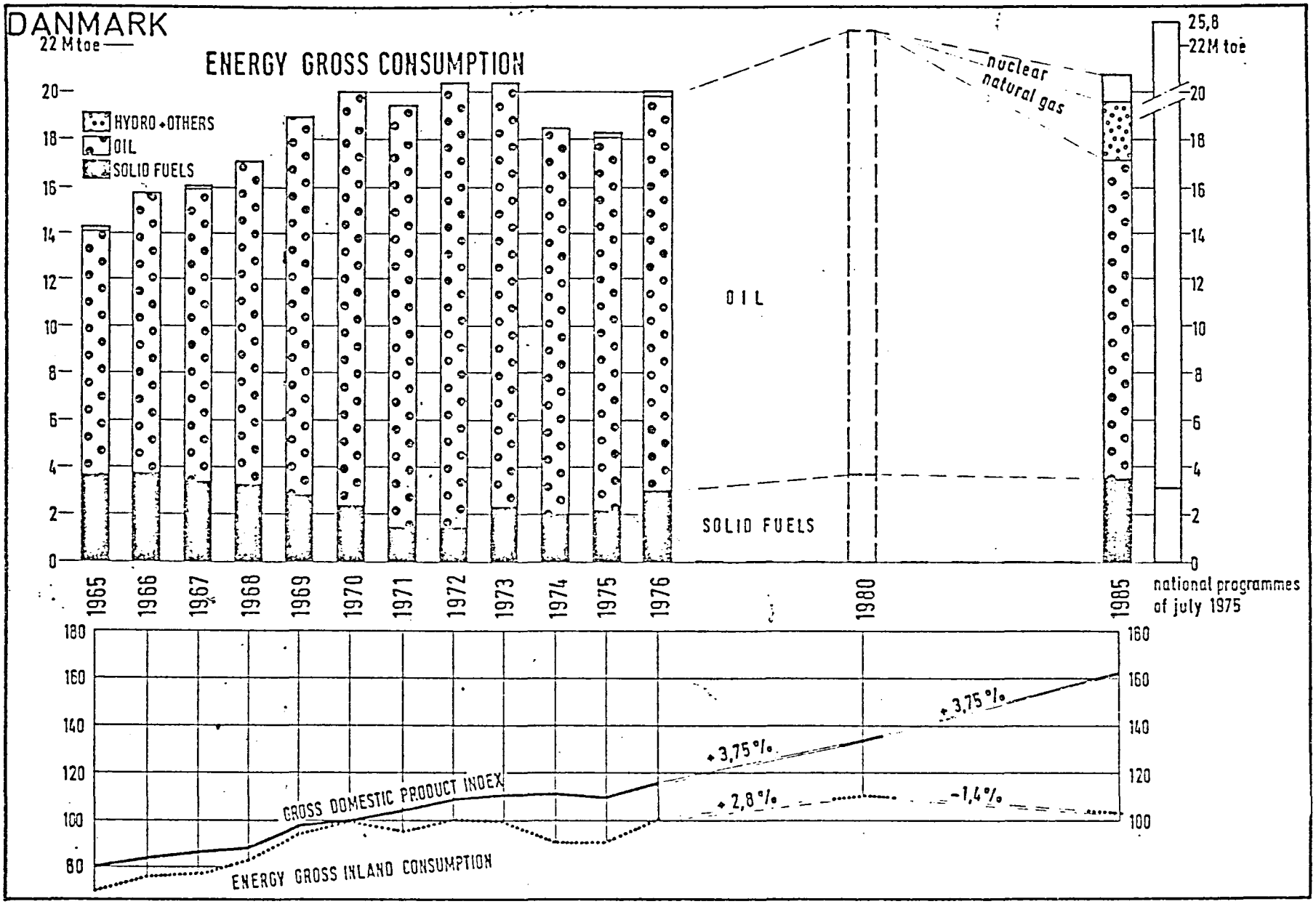
(1) y compris les variations des stocks
(2) cons. int. (us. non énergétiques compris) + soutes
.. information non reçue

DANMARK

INTERNAL PRODUCTION OF ENERGY



CHANGES IN NET IMPORT DEPENDENCE, IN %


DANMARK
22 M toe
ENERGY GROSS CONSUMPTION
HYDRO + OTHERS
OIL
SOLID FUELS
nuclear
natural gas
OIL
SOLID FUELS
25,8
22M toe
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
national programmes
of july 1975
GROSS DOMESTIC PRODUCT INDEX
ENERGY GROSS INLAND CONSUMPTION
+3,75 %
+3,75 %
+2,8 %
-1,4 %

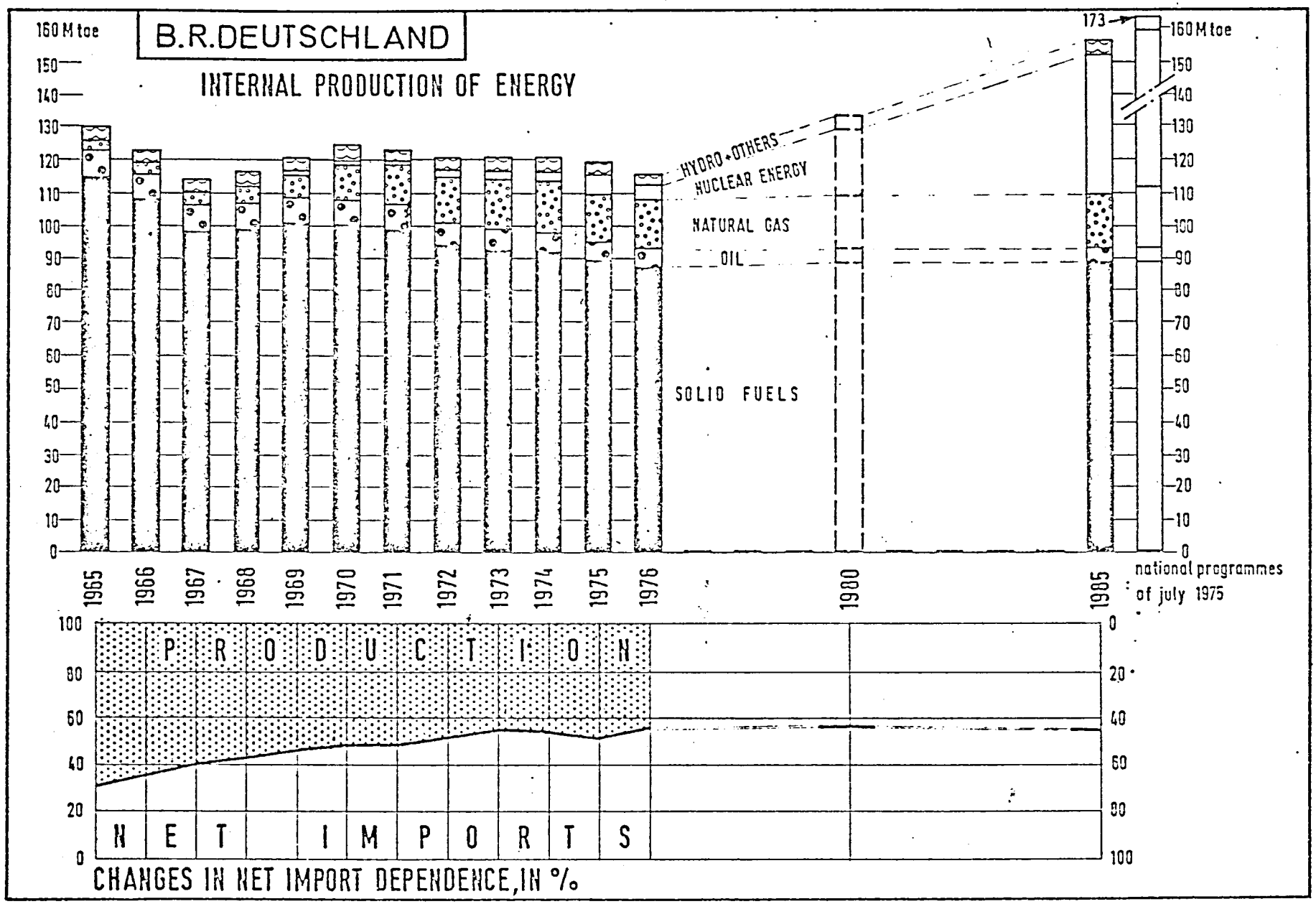
DEUTSCHLAND

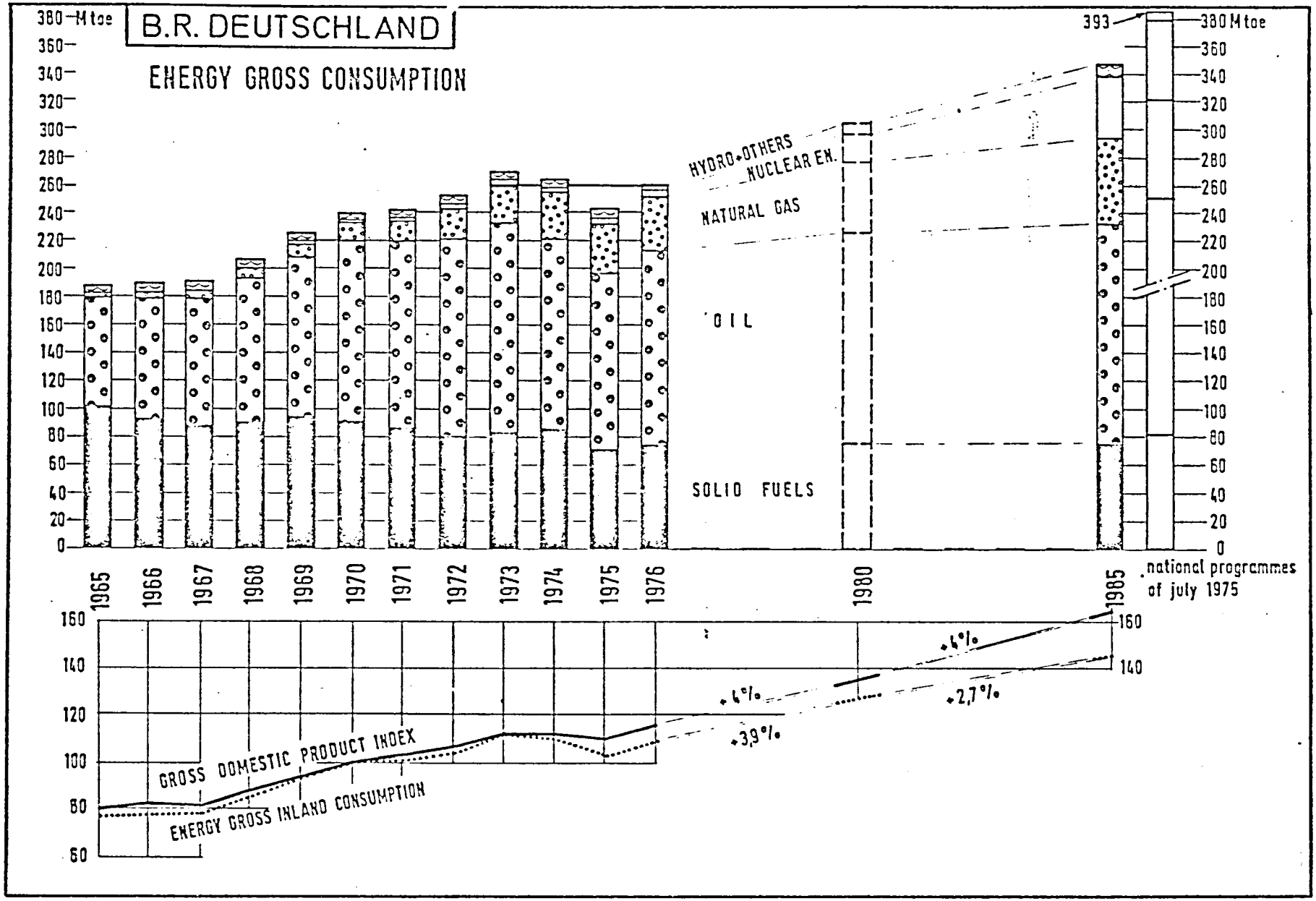
Tableau comparatif entre

en mio tep	Examen des programmes nationaux (actuels) 1976	1980	1985	Programmes nationaux précédents (cfr COM/76/9) 1973	1980	1985
1. Production intérieure						
Combustibles solides	86,8	88	88	92,0	91	88
Pétrole	5,6	5	5	6,7	6	5
Gaz naturel	15,0	16	16	15,3	18	19
Energie nucléaire	5,0	19,5	43,5	2,7	28	57
Hydr., ... et autres	3,0	4	4	4,0	4	4
TOTAL	115,4	132,5	156,5	120,7	147	173
2. Importations nettes						
Combustibles solides	-12,5	-13(1)	-12,5(1)	-8,8	-4	-4
Pétrole	134,8	150	157	143,1	154	171
Gaz naturel	23,0	35,5	45	12,2	43	52
Electricité	0,5	3,5	5	2,4	1	1
TOTAL	145,8(1)	176,0	194,5	148,9(1)	194	220
3. Consommation brute (2)						
Combustibles solides	74,3	75	75,5	83,2	87	84
Pétrole	140,4	155	162	149,8	160	176
Gaz naturel	38,0	51,5	61	27,5	61	71
Energie nucléaire	5,0	19,5	43,5	2,7	28	57
Hydr., ... et autres	3,5	7,5	9	6,4	5	5
TOTAL	261,2	308,5	351	269,6	341	393

4. Structure en %	1985 Production	Importations	Consommation	1985 Production	Importations	Consommation
Combustibles solides	25,1	-3,5	21,6	22,4	-1,0	21,4
Pétrole	1,4	44,7	46,1	1,3	43,5	44,8
Gaz naturel	4,6	12,8	17,4	4,8	13,2	18,0
Electricité	13,5	1,4	14,9	15,5	0,3	15,8
TOTAL	44,6	55,4	100,0	44,0	56,0	100,0

(1) y compris les variations de stocks
(2) consommation intérieure (usages non énergétiques compris) + soutes


B.R.DEUTSCHLAND
INTERNAL PRODUCTION OF ENERGY
160 M toe
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
173
HYDRO + OTHERS
NUCLEAR ENERGY
NATURAL GAS
OIL
SOLID FUELS
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
national programmes of july 1975
PRODUCTION
NET IMPORTS
CHANGES IN NET IMPORT DEPENDENCE, IN %


B.R. DEUTSCHLAND
ENERGY GROSS CONSUMPTION
380 Mtoe
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
393
HYDRO+OTHERS
NUCLEAR EN.
NATURAL GAS
OIL
SOLID FUELS
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
national programmes of july 1975
GROSS DOMESTIC PRODUCT INDEX
ENERGY GROSS INLAND CONSUMPTION
+4%
+4%
+2,7%
+3,9%

FRANCE

Tableau comparatif entre

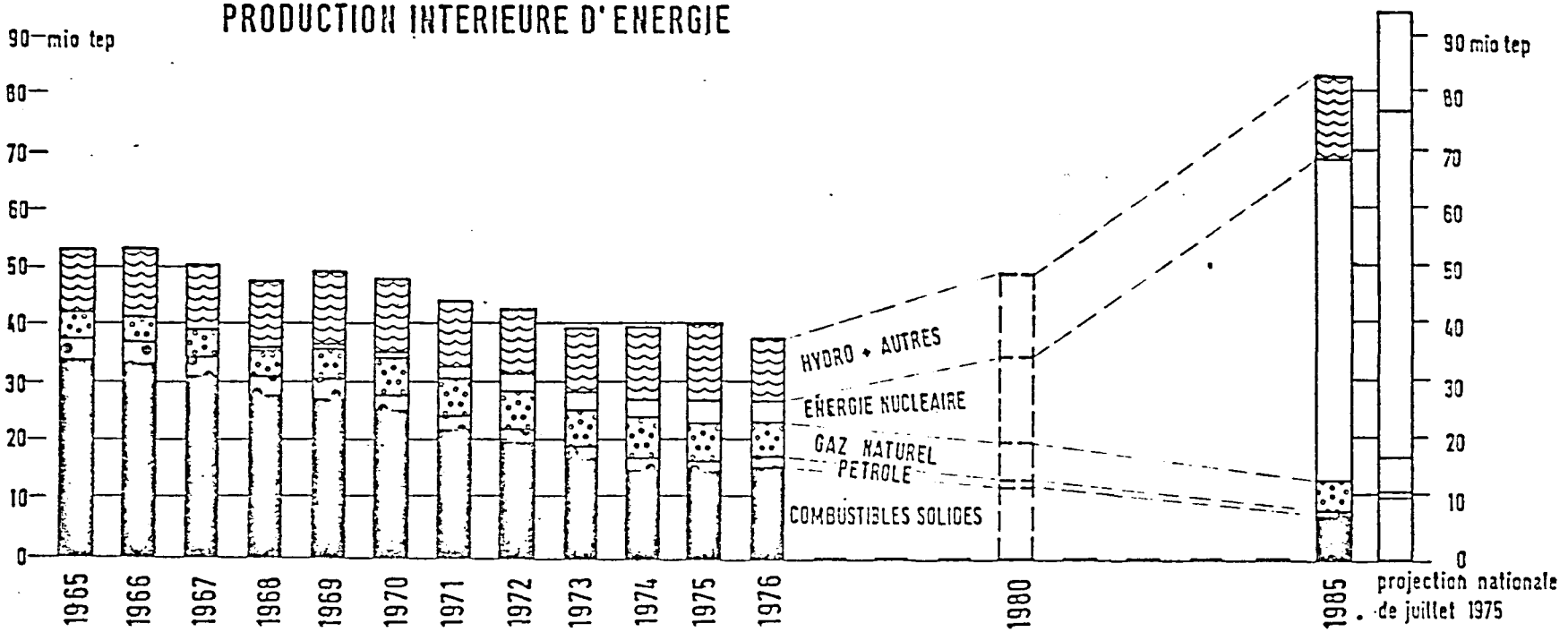
en mio tep	Examen des programmes nationaux (actuels) 1976	1980	1985	Programmes nationaux précédents (cfr COM/75/9) 1973	1980	1985
1. Production intérieure						
Combustibles solides	15,7	12,0	7,4	17,2	15,0	11,0
Pétrole	1,9	1,4	0,9	1,9	1,3	1,0
Gaz naturel	5,9	6,3	5,1	6,4	7,0	6,0
Energie nucléaire	3,5	15,0	56,0	3,3	15,6	60,0
Hydr., ... et autres	10,9	13,7	14,3	10,7	13,5	17,0
TOTAL	37,9	48,4	83,7	39,5	52,4	95,0
2. Importations nettes						
Combustibles solides	13,6	16,0	16,6	11,5	17,0	19,0
Pétrole	117,4	133,1	126,1	127,2	131,0	113,0
Gaz naturel	11,2	18,1(1)	28,9(1)	7,3	19,0	31,0
Electricité	0,4	-0,6	-1,3	-0,6	-	-
TOTAL	142,6(1)	166,6	170,3	145,5(1)	167,0	163,0
3. Consommation brute (2)						
Combustibles solides	29,3	28,0	24,0	28,7	32,0	30,0
Pétrole	119,3	134,5	127,0	129,1	132,3	114,0
Gaz naturel	17,1	24,4	34,0	13,7	26,0	37,0
Energie nucléaire	3,5	15,0	56,0	3,3	15,6	60,0
Hydr., ... et autres	11,3	13,1	13,0	10,1	13,5	17,0
TOTAL	180,5	215,0	254,0	185,0	219,4	258,0

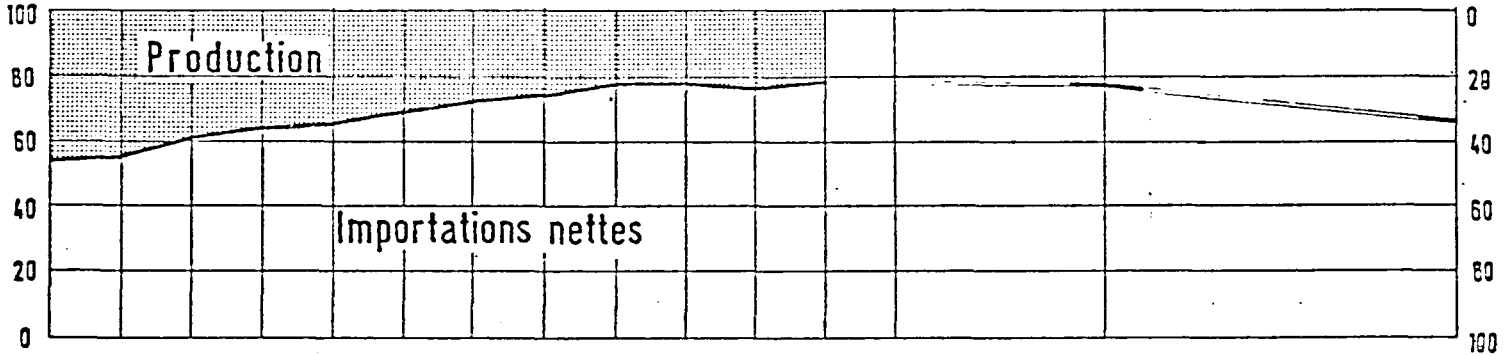
4. Structure en %	1985 Production	Importations	Consommation	1985 Production	Importations	Consommation
Combustibles solides	2,9	6,5	9,4	4,3	7,4	11,7
Pétrole	0,4	49,6	50,0	0,4	43,8	44,2
Gaz naturel	2,0	11,4	13,4	2,3	12,0	14,3
Electricité	27,7	-0,5	27,2	29,8	-	29,8
TOTAL	33,0	67,0	100,0	36,8	63,2	100,0

(1) y compris les variations des stocks
(2) consommation (usages non énergétiques compris) + soutes

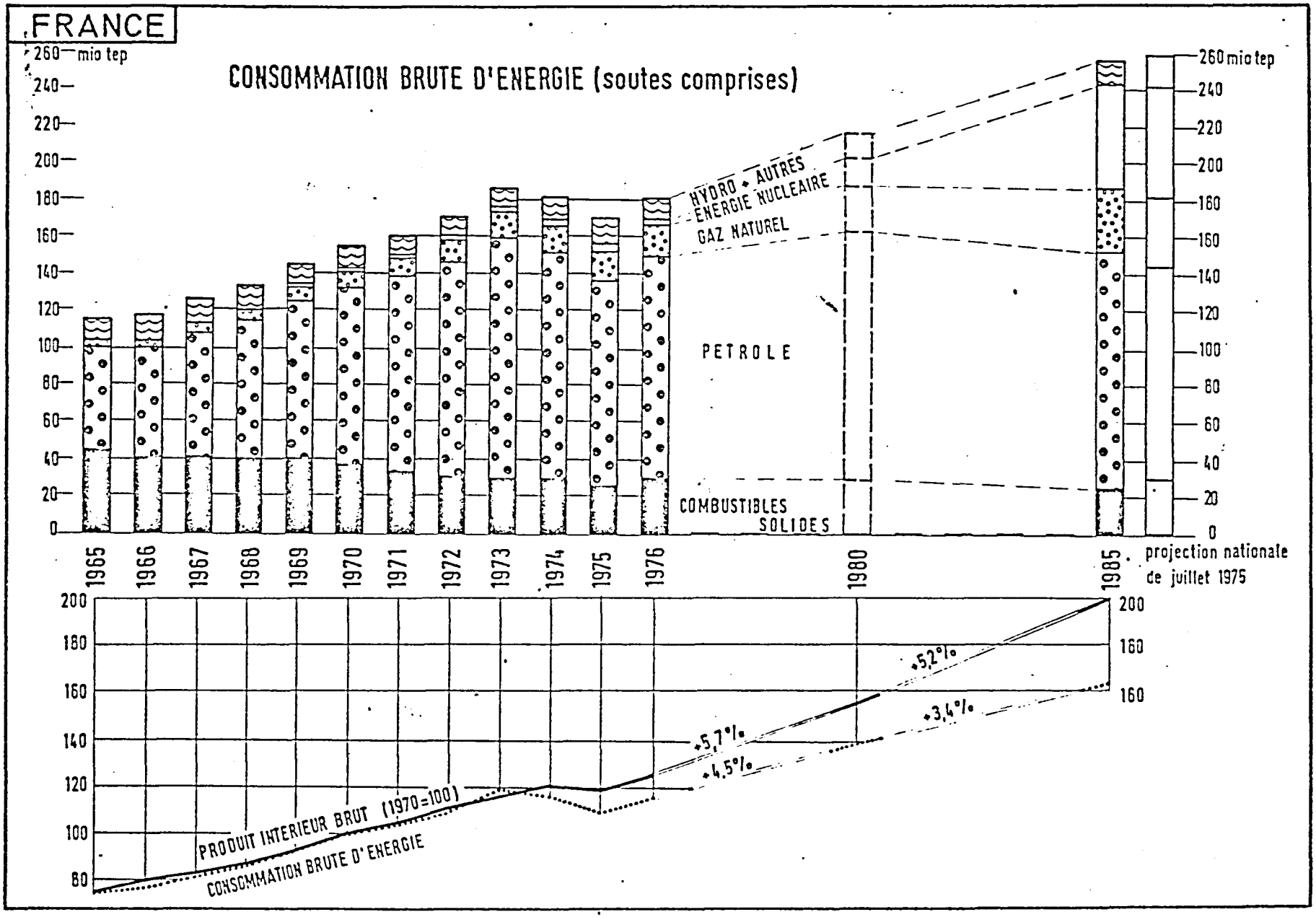
FRANCE

PRODUCTION INTERIEURE D'ENERGIE





EVOLUTION DU DEGRE DE DEPENDANCE ENERGETIQUE EN %


FRANCE
CONSOMMATION BRUTE D'ENERGIE (soutes comprises)
260 mio tep
240
220
200
180
160
140
120
100
80
60
40
20
0
HYDRO + AUTRES
ENERGIE NUCLEAIRE
GAZ NATUREL
PETROLE
COMBUSTIBLES SOLIDES
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
projection nationale de juillet 1975
200
180
160
140
120
100
80
+5,2%
+3,4%
+5,7%
+4,5%
PRODUIT INTERIEUR BRUT (1970=100)
CONSOMMATION BRUTE D'ENERGIE

IRELAND

Tableau comparatif entre

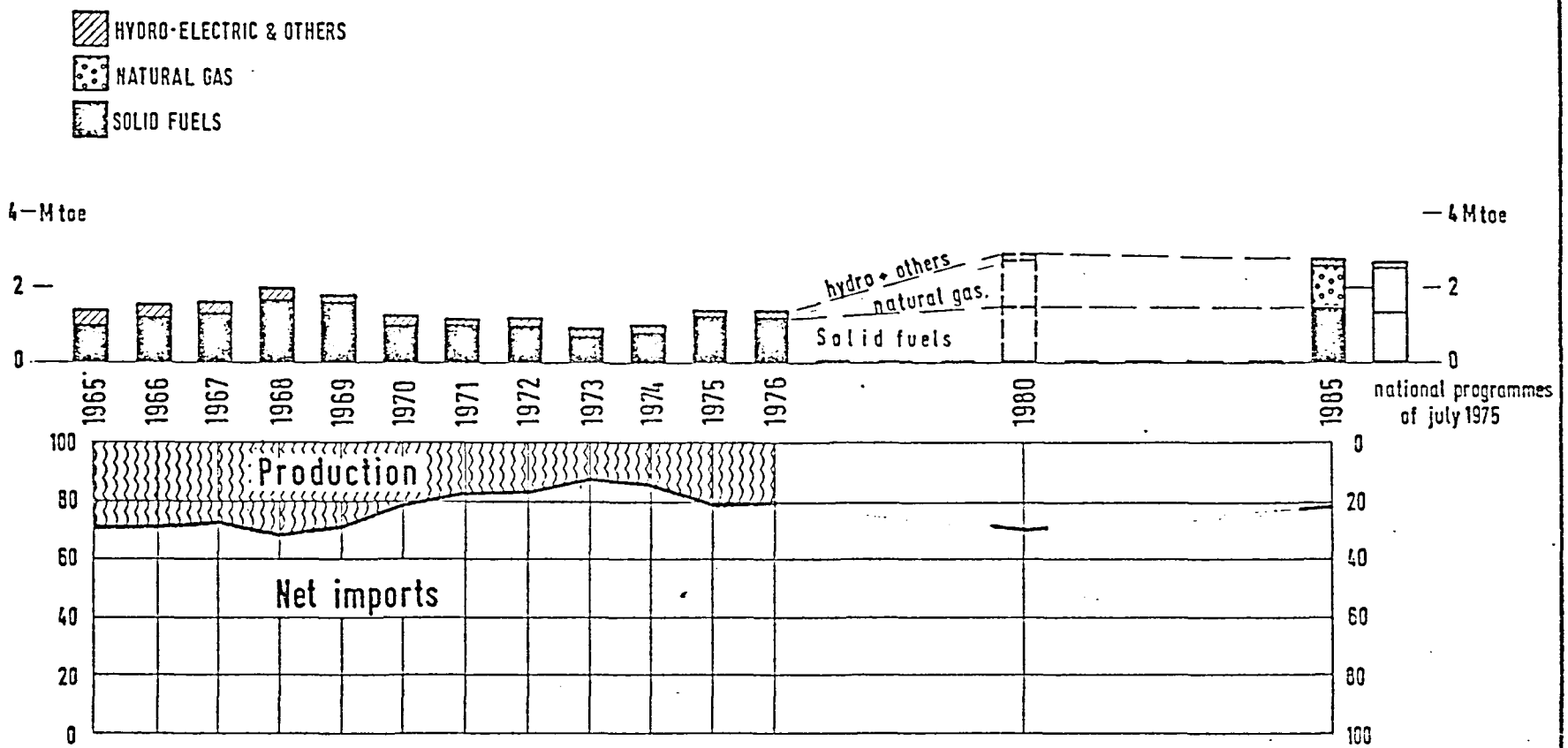
en mio tep	Examen des programmes nationaux (actuels)			Programmes nationaux précédents (cfr CCE/75/9)		
	1976	1980	1985	1973	1980	1985
1. Production intérieure						
Combustibles solides	1,200	1,480	1,410	1,020	1,250	1,380
Pétrole	-	-	-	-	-	-
Gaz naturel	-	1,160	1,160	-	1,100	1,100
Energie nucléaire	-	-	-	-	-	..
Hydr., ... et autres	0,172	0,182	0,182	0,170	0,160	0,160
TOTAL	1,372	2,822	2,752	1,190	2,510	2,640
2. Importations nettes						
Combustibles solides	0,410	0,600	0,620	0,710	0,630	0,630
Pétrole (1)	5,214	6,128	9,862	5,620	6,400	8,000
Gaz naturel	-	-	-	-	-	-
Electricité	-	-	-	0,010	-	-
TOTAL	5,624(2)	6,728	10,482	6,340(2)	7,030	8,630
3. Consommation brute (3)						
Combustibles solides	1,610	2,080	2,030	1,730	1,880	2,010
Pétrole	5,214	6,128	9,862	5,620	6,400	8,000
Gaz naturel	-	1,160	1,160	-	1,100	1,100
Energie nucléaire	-	-	-	-	-	..
Hydr., ... et autres	0,172	0,182	0,182	0,180	0,160	0,160
TOTAL	6,996	9,550	13,234	7,530	9,540	11,270

4. Structure en %	1985			1985		
	Production	Importations	Consommation	Production	Importations	Consommation
Combustibles solides	10,6	4,7	15,3	12,2	5,6	17,8
Pétrole	-	74,5	74,5	-	71,0	71,0
Gaz naturel	8,8	-	8,8	9,8	-	9,8
Electricité	1,4	-	1,4	1,4	-	1,4
TOTAL	20,8	79,2	100,0	23,4	76,6	100,0

(1) soutes non communiquées ; elles ont été estimées par les services de la DG Energie à 0,1 mio tep (2) y compris les variations des stocks
(3) cons. intér. (us..non énerg. compris) + soutes

IRELAND

INTERNAL PRODUCTION OF ENERGY



CHANGES IN NET IMPORT DEPENDENCE, IN %

IRELAND

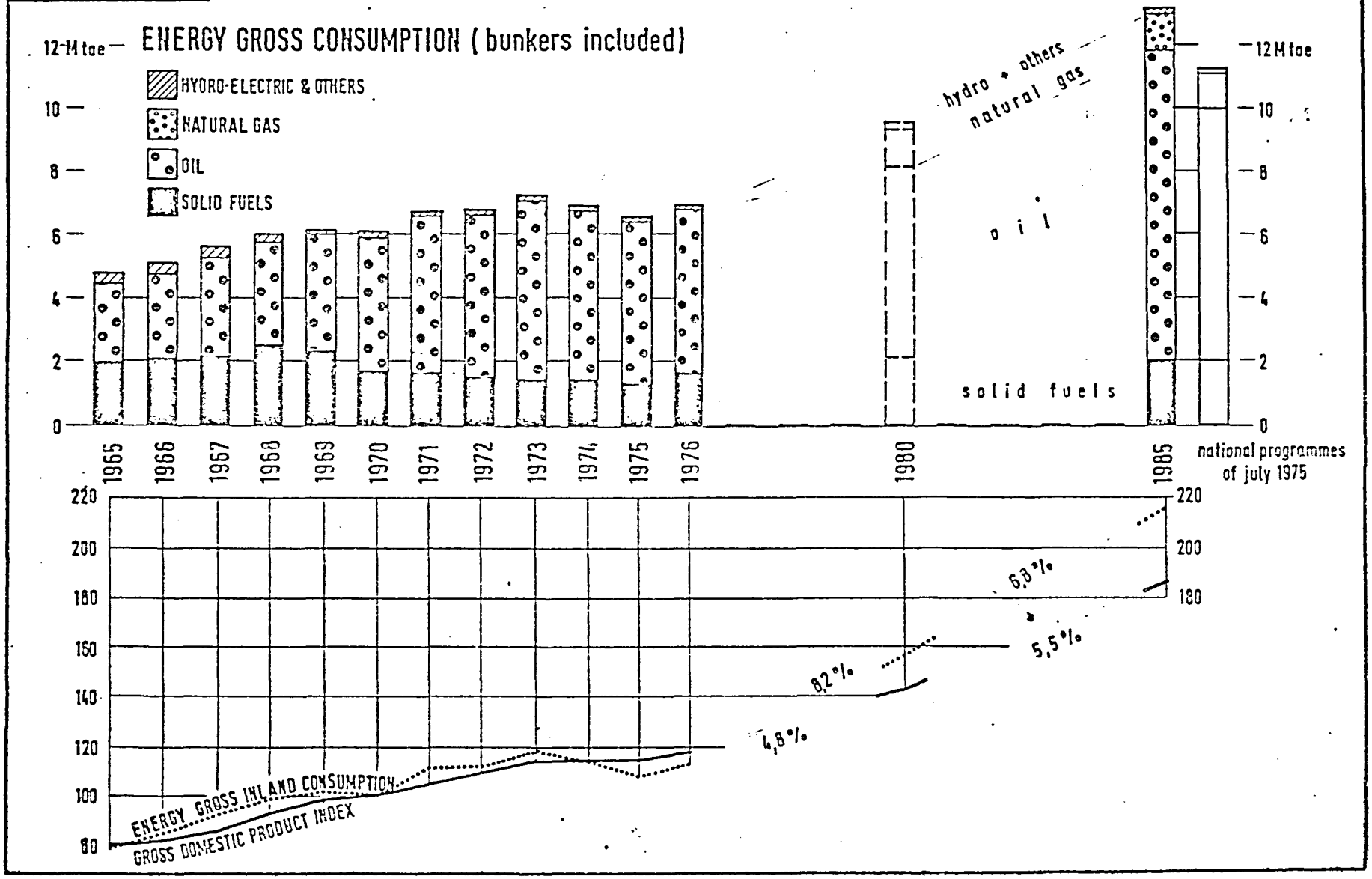
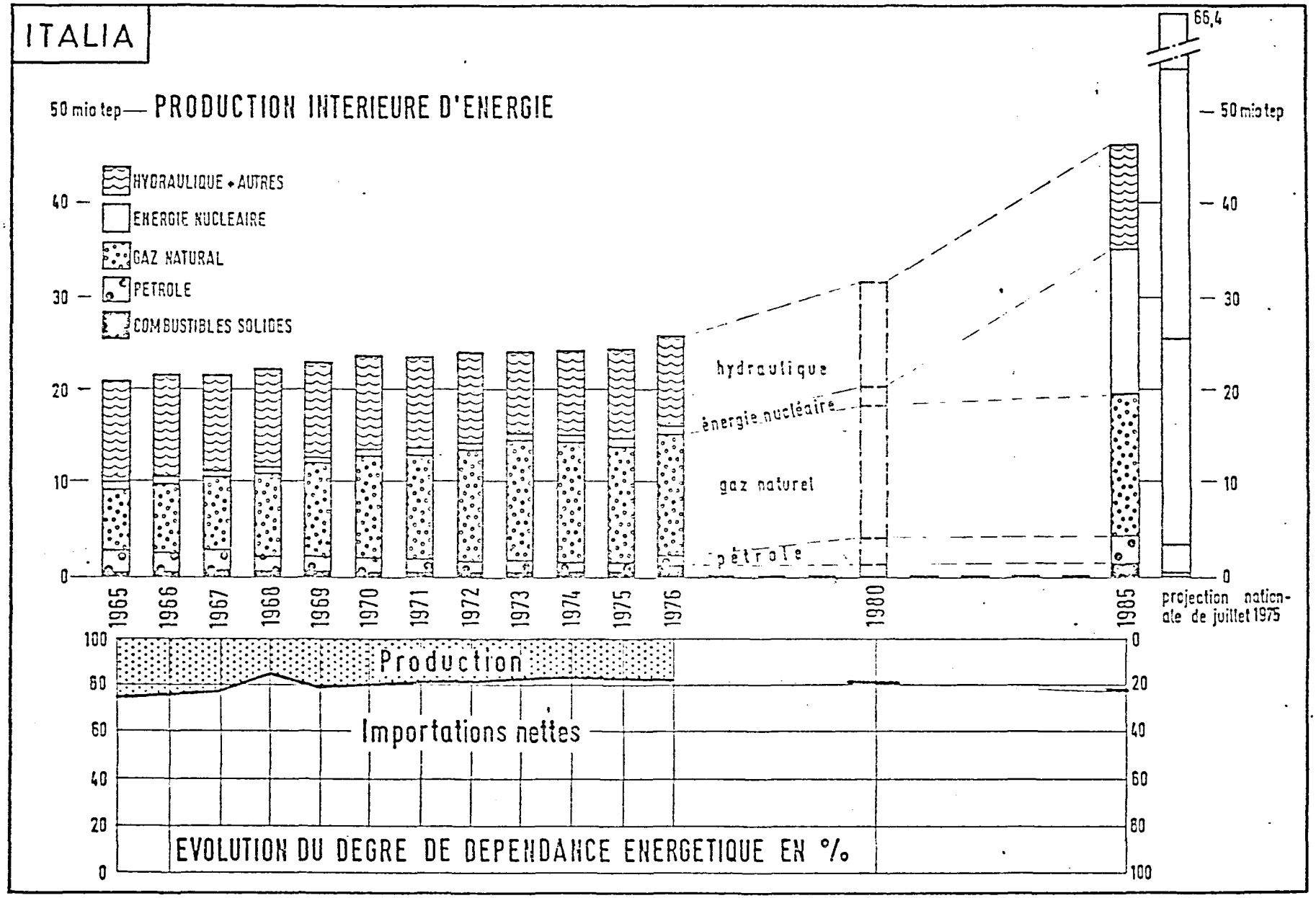

ENERGY GROSS CONSUMPTION (bunkers included)
12 M toe
HYDRO-ELECTRIC & OTHERS
NATURAL GAS
OIL
SOLID FUELS
hydro + others
natural gas
oil
solid fuels
12 M toe
10
8
6
4
2
0
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
national programmes of july 1975
220
200
180
160
140
120
100
80
6,8 %
5,5 %
8,2 %
4,8 %
ENERGY GROSS INLAND CONSUMPTION
GROSS DOMESTIC PRODUCT INDEX

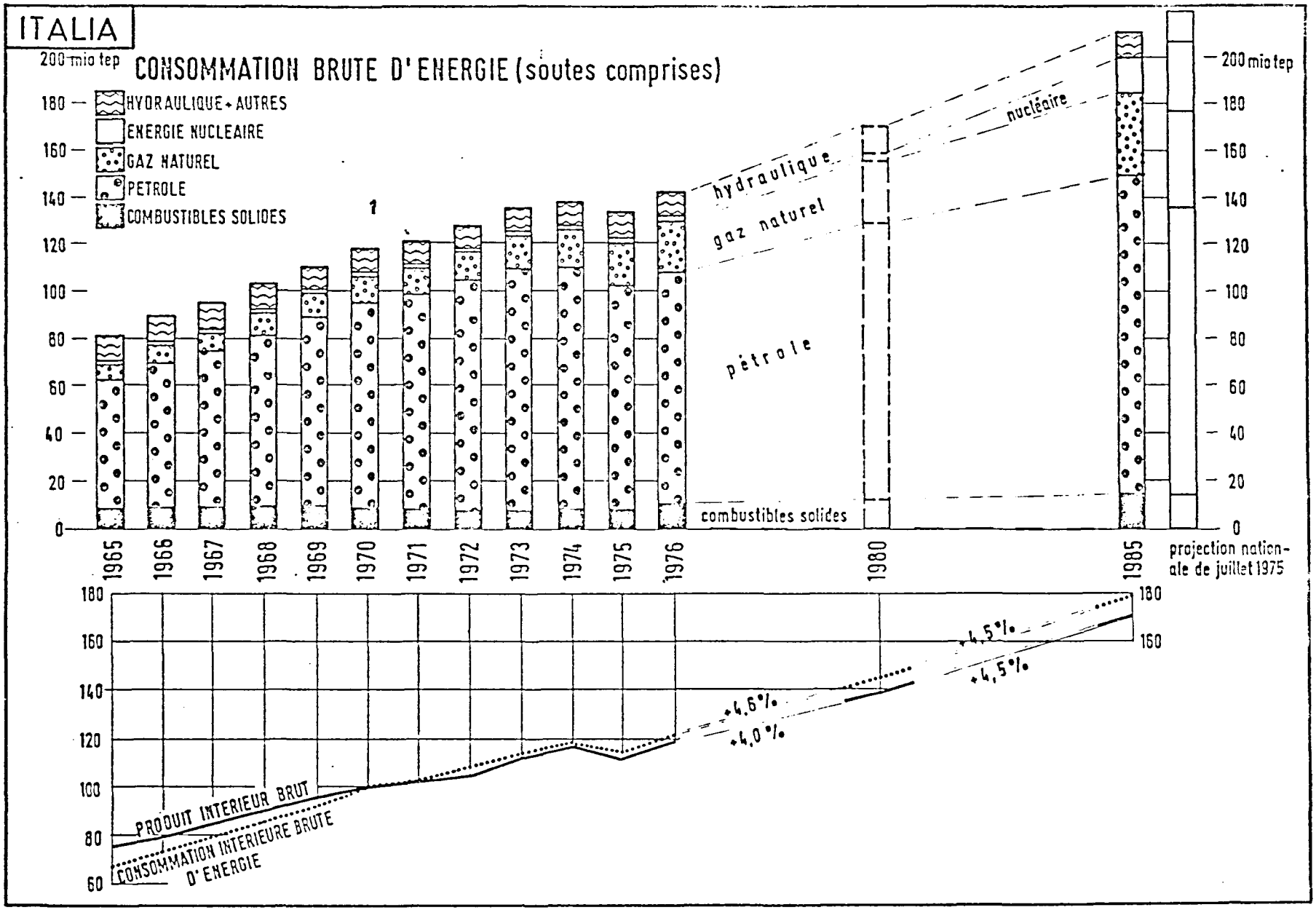
Tableau comparatif entre

en mio tep	Examen des programmes nationaux (actuels)			Programmes nationaux précédents (cfr CCE/76/9)		
	1976	1980	1985	1973	1980	1985
1. Production intérieure						
Combustibles solides	1,2	1,2	1,5	0,3	0,3	0,3
Pétrole	1,1	3,0	3,0	1,1	3,0	3,0
Gaz naturel	12,9	14,0	15,0	12,8	17,0	22,0
Energie nucléaire	0,8	2,0	15,5	0,7	2,0	29,0-35,6
Hydr., ... et autres	9,6	11,1	11,2	9,1	11,6	12,1-12,3
TOTAL	25,6	31,3	46,2	24,0	33,9	66,4-73,2
2. Importations nettes						
Combustibles solides	10,1	11,5	13,7	7,7	12,7	12,7
Pétrole	96,7	114,5	131,9	101,6	109,9-120,9	119,5-155,6
Gaz naturel	9,0	12,7	19,7	1,7	16,2	19,0
Electricité	0,2	-		0,2	-	-
TOTAL	116,0(1)	138,7	165,3	111,2(1)	138,8-149,8	151,2-187,3
3. Consommation brute (2)						
Combustibles solides	11,3	12,7	15,2	8,0	13,0	13,0
Pétrole	97,8	117,5	134,9	102,7	112,9-123,9	122,5-158,6
Gaz naturel	21,9	26,7	34,7	14,5	33,2	41,0
Energie nucléaire	0,8	2,0	15,5	0,7	2,0	29,0-35,6
Hydr., ... et autres	9,8	11,1	11,2	9,3	11,6	12,1-12,3
TOTAL	141,6	170,0	211,5	135,2	172,7-183,7	217,6-260,5

4. Structure en %	1985			1985		
	Production	Importations	Consommation	Production	Importations	Consommation
Combustibles solides	0,7	6,5	7,2	0,1	5,9-4,9	6,0-5,0
Pétrole	1,4	62,4	63,8	1,4-1,2	54,9-59,7	56,3-60,9
Gaz naturel	7,1	9,3	16,4	10,1-8,4	8,7-7,3	18,8-15,7
Electricité	12,6	-	12,6	18,9-18,4	-----	18,9-18,4
TOTAL	21,8	78,2	100,0	30,5-28,1	69,5-71,9	100,0

(1) y compris les variations de stocks
(2) cons. int. (us. non énerg. compris) + soutes


ITALIA
50 mio tep — PRODUCTION INTERIEURE D'ENERGIE
HYDRAULIQUE + AUTRES
ENERGIE NUCLEAIRE
GAZ NATURAL
PETROLE
COMBUSTIBLES SOLIDES
66,4
50 mio tep
40
30
20
10
0
hydraulique
énergie nucléaire
gaz naturel
pétrole
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
projection nationale de juillet 1975
100
80
60
40
20
0
Production
Importations nettes
EVOLUTION DU DEGRE DE DEPENDANCE ENERGETIQUE EN %


ITALIA
200 mio tep
CONSOMMATION BRUTE D'ENERGIE (soutes comprises)
HYDRAULIQUE + AUTRES
ENERGIE NUCLEAIRE
GAZ NATUREL
PETROLE
COMBUSTIBLES SOLIDES
hydraulique
nucléaire
gaz naturel
pétrole
combustibles solides
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
projection nationale de juillet 1975
PRODUIT INTERIEUR BRUT
CONSOMMATION INTERIEURE BRUTE D'ENERGIE
+4,6%
+4,0%
+4,5%
+4,5%

LUXEMBOURG

Tableau comparatif entre

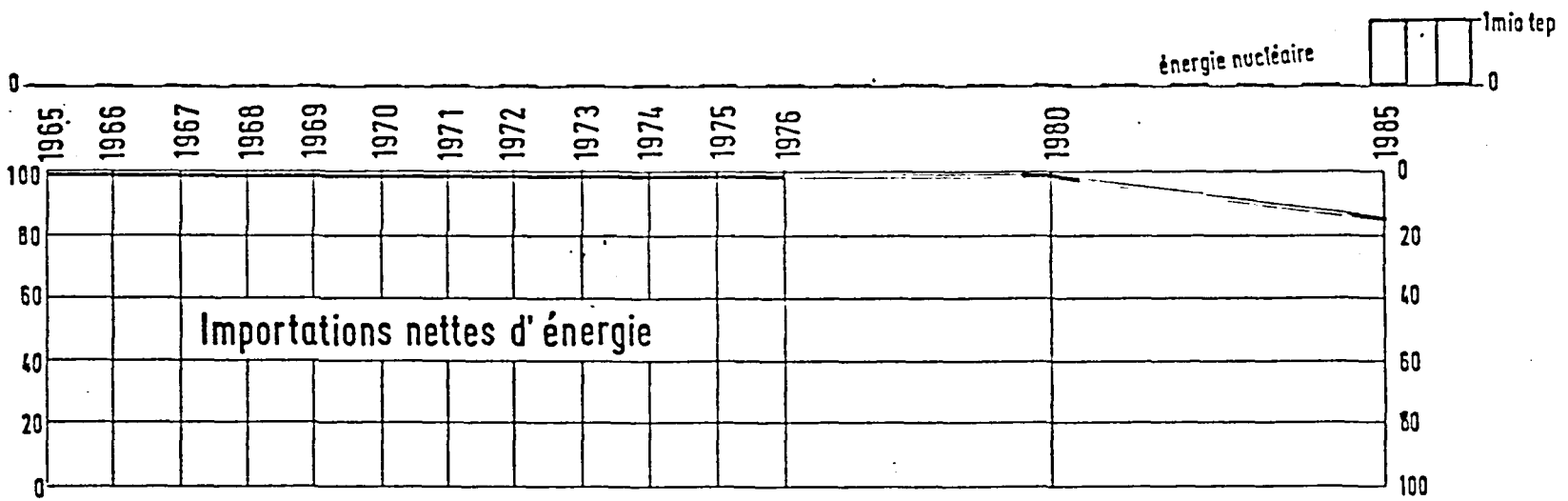
en mio tep	Examen des programmes nationaux (actuels)			Programmes nationaux précédents (cfr COM/76/9)		
	1976	1980(1)	1985(1)	1973	1980	1985
1. Production intérieure						
Combustibles solides	-	-	-	-	-	-
Pétrole	-	-	-	-	-	-
Gaz naturel	-	-	-	-	-	-
Energie nucléaire	-	-	1,0	-	-	0,97
Hydr., ... et autres	0,02	0,0	0,0	0,02	0,01	0,01
TOTAL	0,02	0,0	1,0	0,02	0,01	0,98
2. Importations nettes						
Combustibles solides	1,90	2,5	2,0	2,50	2,33	2,10
Pétrole	1,45	2,0	2,5	1,68	2,00	2,52
Gaz naturel	0,41	0,5	0,5	0,22	0,35	0,35
Electricité	0,86	1,0	0,5	0,67	0,74	-
TOTAL	4,62(2)	6,0	5,5	5,07(2)	5,42	4,97
3. Consommation brute (3)						
Combustibles solides	1,90	2,5	2,0	2,50	2,33	2,10
Pétrole	1,45	2,0	2,5	1,68	2,00	2,52
Gaz naturel	0,41	0,5	0,5	0,22	0,35	0,35
Energie nucléaire	-	-	1,0	-	-	0,97
Hydr., ... et autres	0,88	1,0	0,5	0,69	0,75	0,01
TOTAL	4,64	6,0	6,5	5,09	5,43	5,95

4. Structure en %	1985			1985		
	Production	Importations	Consommation	Production	Importations	Consommation
Combustibles solides	-	30,8	30,8	-	35,3	35,3
Pétrole	-	38,4	38,4	-	42,3	42,3
Gaz naturel	-	7,7	7,7	-	5,9	5,9
Electricité	15,4	7,7	23,1	16,5	-	16,5
TOTAL	15,4	84,6	100,0	16,5	83,5	100,0

(1) estimation des services de la Commission
(2) y compris les variations des stocks
(3) consommation intérieure (usages non énergétiques compris)

LUXEMBOURG

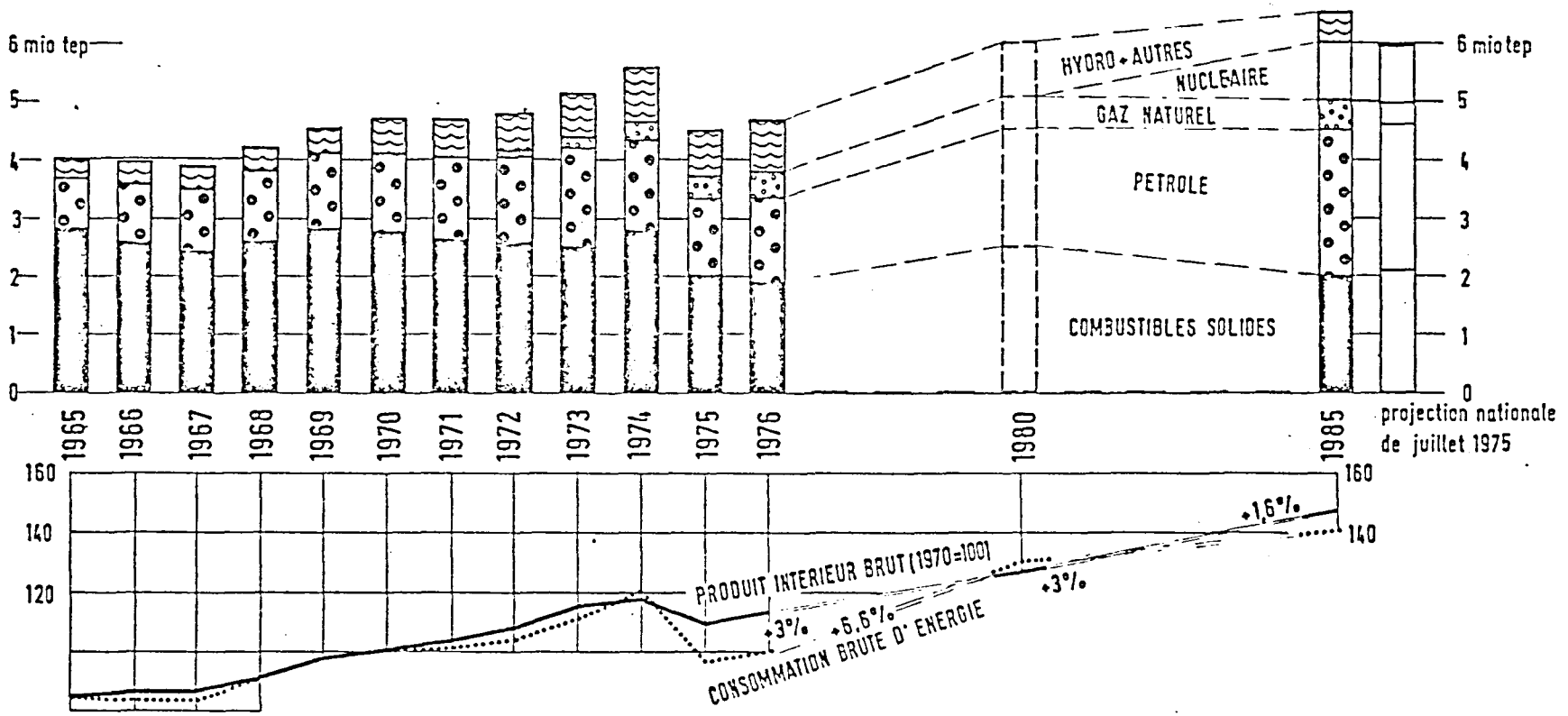
PRODUCTION INTERIEURE D'ENERGIE



EVOLUTION DU DEGRE DE DEPENDANCE ENERGETIQUE EN %

LUXEMBOURG

CONSOMMATION BRUTE D'ENERGIE



NEDERLAND

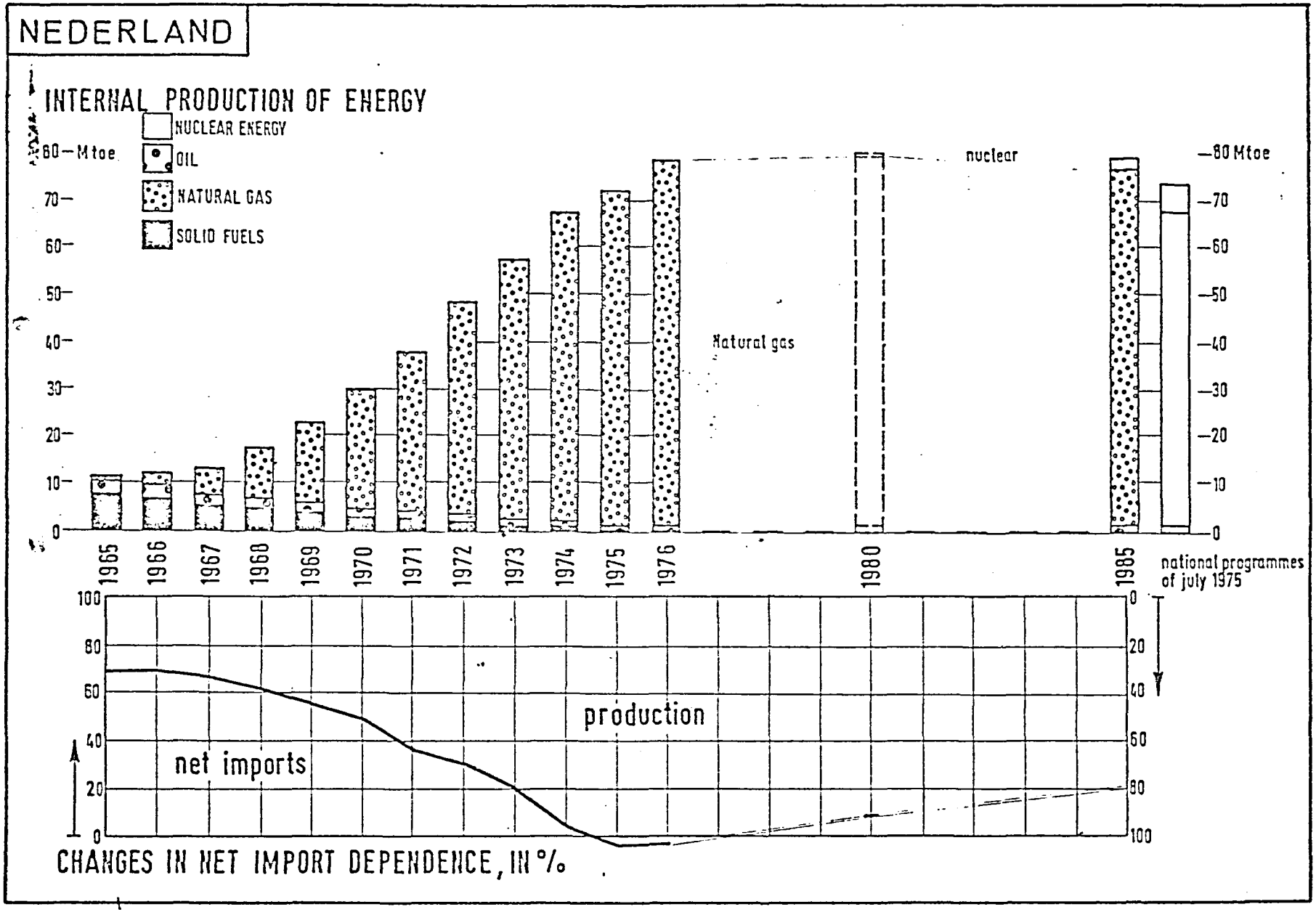
Tableau comparatif entre

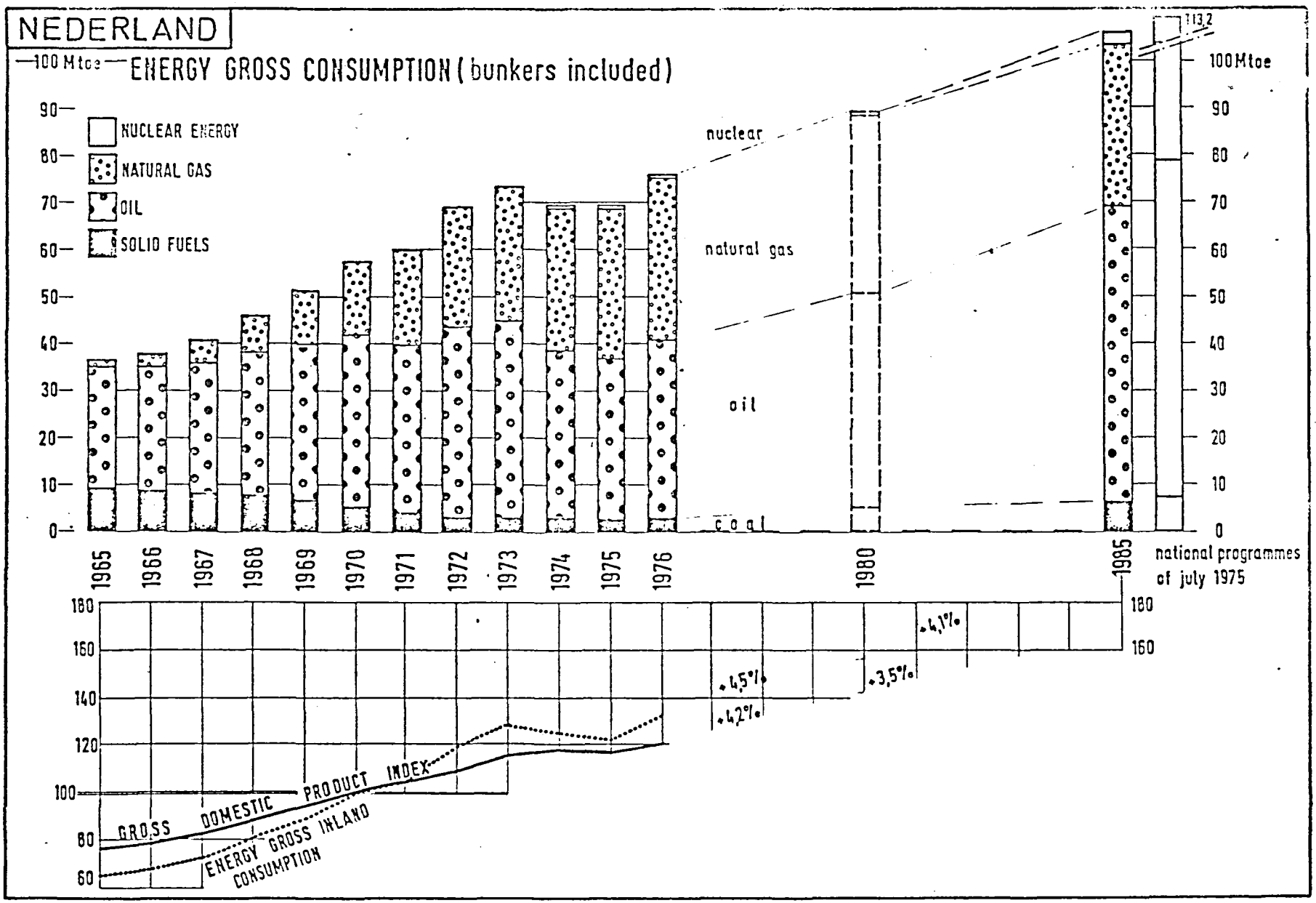
en mio tep	Examen des programmes nationaux (actuels) 1976	1980	1985	Programmes nationaux précédents (cfr COM/76/9) 1973	1980	1985
1. Production intérieure						
Combustibles solides	-	-	-	1,2	-	-
Pétrole	1,6	1,5	1,5	1,6	1,6	1,6
Gaz naturel	74,9	77,2	68,0	54,8	80,6	67,0
Energie nucléaire	0,8	0,8	2,3	0,2	0,8	5,5
Hydr., ... et autres	--	-	-	-	-	-
TOTAL	77,3	79,5	71,8	57,8	83,0	74,1
2. Importations nettes						
Combustibles solides	2,9	5,1	6,3	2,0	5,1	7,2
Pétrole	36,7	44,1	61,5	39,7	55,0	70,0
Gaz naturel	-41,2	-39,8	-36,9	-25,7	-42,9	-38,1
Electricité	-	-	-	-0,3	-	-
TOTAL	-1,6	9,4	30,9	15,7(2)	17,2	39,1
3. Consommation brute (3)						
Combustibles solides	2,9	5,1	6,3	3,2	5,1	7,2
Pétrole	38,3	45,6	63,0	41,3	56,6	71,6
Gaz naturel	33,7	37,4	31,1	29,1	37,7	28,9
Energie nucléaire	0,8	0,8	2,3	0,2	0,8	5,5
Hydr., ... et autres	-	-	-	-0,3	-	-
TOTAL	75,7	88,9	102,7	73,5	100,2	113,2

4. Structure en %	1985			1985		
	Production	Importations	Consommation	Production	Importations	Consommation
Combustibles solides	-	6,1	6,1	-	6,4	6,4
Pétrole	1,5	59,9	61,4	1,4	61,9	63,3
Gaz naturel	66,2	-35,9	30,3	59,3	-33,8	25,5
Electricité	2,2	-	2,2	4,8	-	4,8
TOTAL	69,9	30,1	100,0	65,5	34,5	100,0

(2) y compris les variations des stocks
(3) consommation intérieure : (usages non énergétiques compris) + soutes

NEDERLAND


INTERNAL PRODUCTION OF ENERGY
NUCLEAR ENERGY
OIL
NATURAL GAS
SOLID FUELS
80 Mtoe
70
60
50
40
30
20
10
0
Natural gas
nuclear
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
national programmes of july 1975
net imports
production
CHANGES IN NET IMPORT DEPENDENCE, IN %

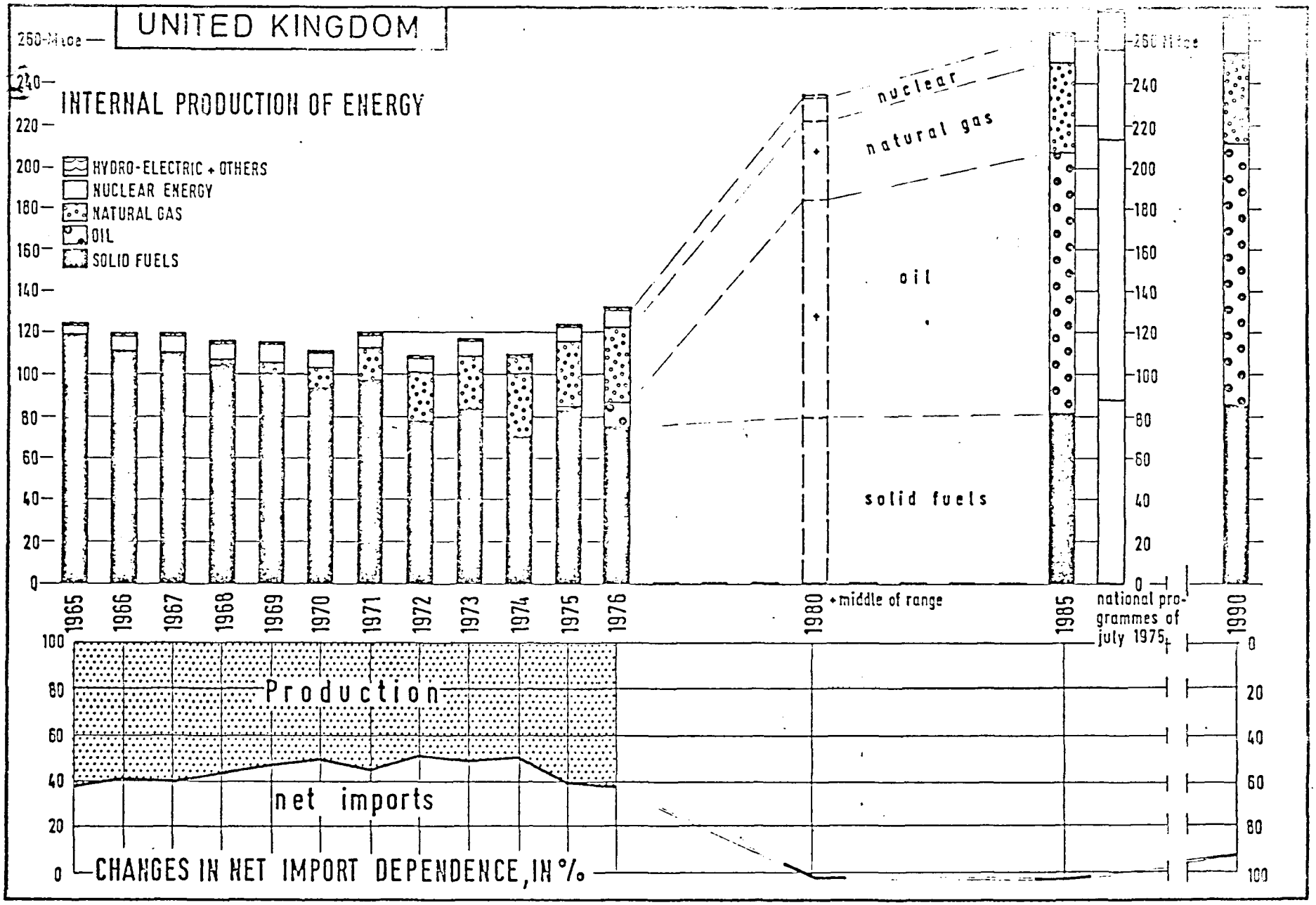

NEDERLAND
100 Mtoe
ENERGY GROSS CONSUMPTION (bunkers included)
NUCLEAR ENERGY
NATURAL GAS
OIL
SOLID FUELS
nuclear
natural gas
oil
coal
113,2
100 Mtoe
90
80
70
60
50
40
30
20
10
0
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
national programmes of july 1975
180
160
140
120
100
80
60
+4,1%
+3,5%
+4,5%
+4,2%
GROSS DOMESTIC PRODUCT INDEX
ENERGY GROSS INLAND CONSUMPTION

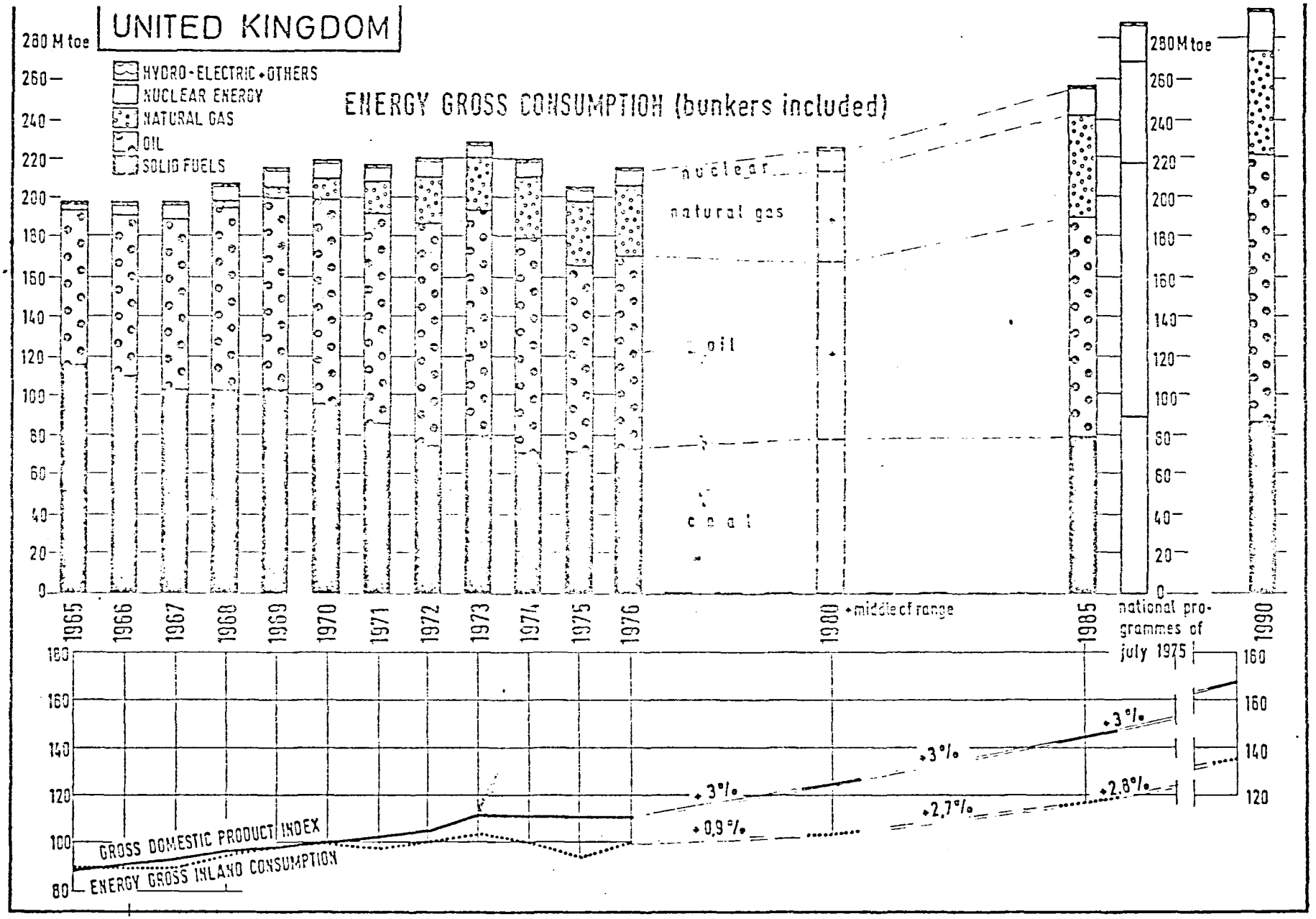
UNITED KINGDOM

Tableau comparatif entre

en mio tep	Examen des programmes nationaux (actuels)			Programmes nationaux précédents (cfr CCE/75/9)		
	1976	1980	1985	1973	1980	1985
1. Production intérieure						
Combustibles solides	74	78	81	82,8	85	85 à 90
Pétrole	12	95 à 115	100 à 150	0,4	100 à 130	100 à 150
Gaz naturel	35	35 à 40	35 à 50	24,9	35 à 40	35 à 50
Energie nucléaire	9	11	14	7,2	14	19
Hydr., ... et autres	1	1	1	1,0	1	1
TOTAL	131	220 à 245	231 à 296	116,3	235 à 280	240 à 270
2. Importations nettes						
Combustibles solides	-1	0	-1	-2,2	-	5 à 0
Pétrole	85	-2 à -27	19 à -46	113,4	10 à -25	35 à -30
Gaz naturel	1	8	9	0,7	10	10
Electricité	0	-	-	-	-	-
TOTAL	85	6 à -19	27 à -38	111,9	20 à -15	50 à -20
3. Consommation brute						
Combustibles solides	73	78	80	80,6	85	90
Pétrole	97	93 à 88	119 à 104	113,8	110 à 105	135 à 120
Gaz naturel	36	43 à 48	44 à 59	25,6	45 à 50	45 à 60
Energie nucléaire	9	11	14	7,2	14	19
Hydr., ... et autres	1	1	1	1,0	1	1
TOTAL	216	226	258	228,2	255	290

4. Structure en %	1985			1985		
	Production	Importations	Consommation	Production	Importations	Consommation
Combustibles solides	31,4à31,4	-0,4	31,0	29,3à31,0	1,7	31,0
Pétrole	38,7à58,1	7,4à-17,8	46,1à40,3	34,5à51,7	12,0 à-10,3	46,5à41,3
Gaz naturel	13,6à19,4	3,5	17,1à22,9	12,1à17,3	3,5	15,6à 20,9
Electricité	5,8	-	5,8	6,9	-	6,9
TOTAL	89,5à114,7	10,5à-14,7	100,0	82,8à106,9	17,2à-6,9	100,0


UNITED KINGDOM
INTERNAL PRODUCTION OF ENERGY
HYDRO-ELECTRIC + OTHERS
NUCLEAR ENERGY
NATURAL GAS
OIL
SOLID FUELS
nuclear
natural gas
oil
solid fuels
+ middle of range
national programmes of july 1975
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
1990
Production
net imports
CHANGES IN NET IMPORT DEPENDENCE, IN %


UNITED KINGDOM
ENERGY GROSS CONSUMPTION (bunkers included)
280 M toe
HYDRO-ELECTRIC + OTHERS
NUCLEAR ENERGY
NATURAL GAS
OIL
SOLID FUELS
nuclear
natural gas
oil
coal
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1980
1985
1990
+ middle of range
national programmes of july 1975
GROSS DOMESTIC PRODUCT INDEX
ENERGY GROSS INLAND CONSUMPTION
+3%
+3%
+3%
+2,8%
+2,7%
+0,9%

Dépenses d''investissements dans le secteur de l'énergie (1976-1985)

Mrd UCE

	L		D		F		I		N		B		UK		Irl.		DK		EUR	
	(1)	(2)*	(1)	(2)*	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Combust. sol.			6,96	6,96	0,53	0,30	-	0,01	-	-	0,08	0,07	3,80	5,9	0,06	0,06	-	-	11,43	13,30
Hydrocarbures			19,29	19,29	14,30	12,55	5,99	7,58	8,47	8,87	1,76	1,27	32,94	31,7	0,68	0,39	0,41	1,38	83,84	83,03
Nucléaire	0,60	0,60	23,84	23,84	17,87	13,12	15,56	9,45	1,60	1,63	5,00	2,75	9,81	3,4	0,38	-	0,83	0,73	75,49	55,52
Non nucléaire			2,31	2,31	0,81	2,10	5,29	4,50	1,95	1,80	0,60	0,66	12,90	7,9	0,12	0,55	0,64	0,35	24,62	20,17
Transp. & distr. d'élec.			22,20	22,20	9,19	8,45	8,67	7,55	6,22	5,05	3,76	3,32	8,69	8,5	0,54	0,61	0,34	0,32	59,61	56,00
Total	0,60	0,60	74,6	74,6	42,7	36,52	35,51	29,09	18,14	17,35	11,20	8,07	68,14	57,4	1,78	1,61	2,22	2,78	253,99	228,02

Sources (1) Prévision des dépenses d'investissements au 1.1.76 pour la période 1976-1985
COM/ENER (76)15. Rapport sur les investissements énergétiques dans le secteur de l'énergie.
(Prix et taux de change au 31.12.1976).

(2) Prévision des dépenses d'investissements au 1.1.77 pour la période 1976-1985
Enquête 1977 : Examen des programmes nationaux.
(prix et taux de change au 31.12.1976)

* Estimation inchangée par rapport au COM/ENER (76) 15.

ANNEXE 4