



Industrial Policies and Strategies, 2: The Netherlands

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**IIASA Collaborative Paper
November 1980**



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INDUSTRIAL POLICIES AND STRATEGIES, 2:
The Netherlands

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November 1980
CP-80-33

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PREFACE

In the coming years the world will be undergoing a major structural transformation as the size, composition, and geographic distribution of industry changes under the influence of:

- o increases in factor prizes: energy, labor;
- o depletion of resources: minerals, cheap liquid fuels;
- o changes in technology: microelectronics, biotechnology;
- o industrialization of the LDCs.

The already-industrialized nations, whose industrial structure was shaped by relatively inexpensive energy and easy access to resources, will find certain sectors losing competitiveness to newly-industrialized nations with access to similar technologies, and cheaper labor. The newly-industrializing nations will strive to increase their portion of the global industrial pie, while the industrialized nations will compete with each other to preserve their shares. At the same time, population increase and economic development will place new demands both for employment and for goods on the industrial system.

At the national level, this transformation will affect economic growth, employment, regional development, balance of payments, R&D, and many other sensitive constituents of national well-being. For the small economies that have a relatively large foreign trade sector, the transformation can be traumatic. Even the large, autarkic economies will face substantial challenges.

IIASA is now beginning an exploration of the role that it might play in analyzing and improving understanding of the global and national issues arising from this transformation of the international industrial structure. One part of the exploration has

been the commissioning of a series of papers by outside specialists.

A central question for all nations in the face of the industrial transformation is: what strategy should be followed to maximize the prospects of national well-being, given the anticipated changes? The second paper in the series addresses this question for a medium-sized nation with a very open economy: The Netherlands. Its author, Dr. Pieter de Wolff, is Chairman of the Dutch Central Committee of Statistics, Vice-Chairman of the Advisory Council for Science Policy of the Netherlands Government, and member of the Social Economic Council of the Netherlands. From 1957 to 1966, he was Director of the Netherland's Central Planning Bureau.

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CONTENTS

Page

1. INTRODUCTION	1
2. SOME FACTS ABOUT THE NETHERLANDS	3
3. POLICIES FOR STRUCTURAL CHANGE IN THE NETHERLANDS	5
3.1 The years 1977-1979	5
3.2 Recent developments	8
3.3 The innovation paper	10
4. APPENDIX	15



INTRODUCTION

Industrial change is by no means a new phenomenon. Ever since the beginning of the industrial revolution important changes have taken place. The post-war period is perhaps the most outstanding example in this respect. Many new products appeared on the markets. Production processes were strongly improved leading to rapidly rising productivity and an unprecedented rise of material well-being in many countries.

During the seventies a growing awareness developed about the consequences of ongoing technological developments on the environment and on the threatening depletion of the resources of raw materials, in particular oil. "The Limits of Growth" published by the Club of Rome in 1972 was a typical exponent of this concern. In many circles in the Western world the possibility as well as the desirability of continuing growth in the traditional sense were questioned.

This process of reassessing economic targets was reinforced by the growing competition of several developing countries which strongly affected the labor intensive industries in the developed countries. Although this is a desirable phenomenon per se, as it is an essential condition for growth in the less developed countries, it became particularly painful after the oil crisis when growth rates in many industrially advanced countries became too low to provide jobs for those which were lost due to the competition of the low wage countries.

These developments strengthened the perception that the Western world had to restructure its economy by developing and stimulating those activities in which it had or could attain advantageous positions, obviously within the framework of the constraints set by new economic and social targets.

Moreover, the increasing oil price itself called for structural changes directed to an accelerated restriction of the use of oil, through savings as well as through the transition to other sources of energy (coal, nuclear, renewables).

Obviously, the required industrial change has to be based on a well considered exploitation of national resources. This can be achieved in different ways such as by a more sophisticated refinement of advantages of site, improving productivity and innovation throughout the whole productive apparatus, and, above all, by exploiting human resources through increased attention to R&D.

Governments aware of the necessity of restructuring tried and continuously try to cope with the ensuing problems of investment, risks, lack of information, etc., through a variety of policies. In centrally planned economies this might be done by directly interfering with the economic processes. In the Western countries, where freedom of entrepreneurship forms a basic element of the economic order, this can only be done by policies stimulating desirable developments and at the same time satisfying constraints resulting from the desirability of attaining other aims, such as the protection of the environment, improving working conditions of the labor force, enhancing regional developments, etc.

A large and widely varying set of governmental policies, differing from country to country, has been developed or is still in the process of being designed to promote efficient industrial change.

The main categories can be summed up as follows:

1. Financial support to high technology sectors; aerospace, nuclear, electronics, chemicals, computers. In France, Germany and the U.K. they comprise up to 80% of total governmental support of innovation.
2. Stimuli resulting from a well designed governmental purchasing policy. This is particularly important for the bigger countries.
3. Promoting R&D carried out by universities, research institutes and firms.
4. General financial support, investment incentives, subsidies, credit facilities.
5. Special policies to support small and medium sized firms.
6. Stimuli to the quaternary sector.

The Netherlands' government is also actively involved in applying policies to enhance adequate industrial change through a series of measures. However, before describing these in some detail, a few facts about the Dutch economy will be presented.

2. SOME FACTS ABOUT THE NETHERLANDS

The Netherlands is a small, rapidly growing and densely populated country with an area of about 37,000 km². Population almost trebled during the twentieth century; it rose from 5.1 m. in 1900 to 14.1 in 1980, i.e. on average by 1% p.a., although in recent years this rate has dropped to .8%. At present the density is 382/km².

The rate of participation in the labor force is low, viz. 37% for the population as a whole, mainly due to the still low share of married women (cf. Table 1).

The educational level is fairly high but natural resources are limited. Climate and soil are well suited to cattle farming, agriculture and horticulture. The country is very well situated for international transport. However, it is poor in raw materials. It has small oil deposits but large resources of natural gas. Developed coal deposits were of a poor quality and, therefore, mines were closed down after the discovery of the natural gas in the early sixties. Rich coal deposits are present, but at a depth yet unattainable under existing techniques. Finally, there are some deposits of sodium and magnesium salts. But, after all, industry is largely dependent on foreign raw materials and semi-finished products.

The country has a very open economy. The value of both imports and exports is in the order of 50% of the GNP which at present is about 21,500 gld/cap. (10,700\$/cap.)

It is the site of important multinationals (Akzo, Philips, Shell, Unilever) which play an important role in industrial production and particularly in exports. But trade and transportation are still very important as can be seen from the composition of the labor force (cf. Tables 2 and 3).

The Netherlands came out of the War in a deplorable state and the second half of the forties was a period of reconstruction. Business was under strict governmental control to ensure an efficient use of the very scarce resources. A strict wage and price policy favored investments and exports and the Marshall aid was very helpful.

In the early fifties the restrictive measures were gradually lifted and an expansion period started, largely borne by rapidly growing world trade and a continuing low cost level. Industrial growth was stimulated through favorable profits and special investment incentives. Unemployment decreased rapidly, also due to an effective emigration policy (cf. Table 1). GNP in real terms increased on average by 4.6%. Industrial production rose by 6% p.a. The typical growth industries, the chemical industry, oil refineries, metallurgical and electrotechnical industries reached even higher figures.

The sixties started with a tense labor market partly eased by a gradually increasing import of foreign labor. The incomes policy of the previous period lost much of its influence; wages rose strongly, also in real terms. Economic development was heavily stimulated by the discovery of a huge deposit of natural gas in 1962, which was rapidly developed. The use of gas penetrated private consumption and industry at a high rate (cf. Table 4). Moreover, it had a positive influence on the trade balance as roughly half of the increasing production was exported. It also strengthened the state budget as the lion's share of the proceeds flowed into the treasury.

GNP rose by 5.9% p.a. and this resulted not only in a considerable increase in real incomes but also in heavy claims on public expenditure. This led to increased taxes but still more so to a steep rise in social security expenditures (financed through premiums paid by entrepreneurs and workers). This fast growth of collective expenditures (cf. Graph 1) gradually eroded the profit situation although the balance of payments on current account remained positive, in part due to the export of gas.

Already in the beginning of the seventies signs of a world wide weakening of the economic situation became clear, but the situation changed drastically after the upsurge of oil prices in 1973.

In the Netherlands the level of activity was affected first. Exports grew more slowly, GNP increased only moderately and less than productivity, leading to increasing unemployment. For some time the balance of payments remained positive and this in turn put a strong upward pressure on the guilder when exchange rates started to float. This had a dampening effect on inflation but, nevertheless, adversely affected the competitive position. In particular as labor costs remained high, both in comparison to levels in other W. European countries as well as in relation to its share in the GNP (cf. Table 5). Moreover, due to the rather high energy content of the export products the impact of the rising oil prices was heavily felt.

Since 1978 the balance of payments is negative and at present the prospects for growth are very low and the consequences for the employment situation are rather gloomy.

These developments are aggravated by the fact that the production of natural gas will be diminished in the coming years in order to avoid a too rapid depletion of the resources, which will increase the pressure on the balance of payments.

From the preceding description it will be evident that it is of paramount importance to stimulate processes that can contribute to a reinforcement of the Dutch economy.

3. POLICIES FOR STRUCTURAL CHANGE IN THE NETHERLANDS

3.1 The years 1977 - 1979

Policies aimed at structural change of various forms have been applied ever since the end of the Second World War. The investment incentives mentioned in 2 can be interpreted as such. The same is true for measures stimulating industrial development in the province of Limburg in order to alleviate the unemployment problems caused by the closing of the coal mines and several others could be added.

An interesting instrument of this kind is the so-called "Law for Rules on Selective Investments" (S.I.R.), enacted in 1975 and intended to counteract the crowding of industrial activities in the Western part of the country, in particular in the Rhine estuary (the region around Rotterdam). Investments in the latter area became subject to authorisation and, in addition, to a levy of 10%; in the remaining part of the S.I.R. region only reporting is required and levies are lower. This law is still in the books and in particular during the boom period it was reasonably effective.

However, the difficulties caused by the 1973 oil crisis, the weakness of certain parts of our industry and the growing competition of foreign countries required a more fundamental approach and an important step in this direction was set with the 1976 "Governmental Paper on Selective Growth". Its aim was to design policies leading to and maintaining full employment within the framework of so-called facets (hence the term "selective"), viz. environmental protection, regional development, efficient use of energy and raw materials, reinforcing the infrastructure and, finally, taking into account the consequences of the necessary growth process in the developing countries.

The paper rejected the idea of a blue print for industrial development and even the possibility of ordering productive sectors in accordance with the way they would fit the aims. Due to the complexity of inter-industrial relations, the widely varying share of exports in the output of different sectors, the differences in earning power between sectors, etc. it was felt to be impossible to allocate appropriate weights to the sectors.

Therefore, a more flexible additional program was set up. Based on a study by the Central Planning Bureau on the macro-effects of various possible measures (cf. Table 6), it was decided to allocate some 70% of the assigned annual budget to investment premiums and the remainder to subsidies on wages and social security premiums. It was estimated that this program would reduce unemployment by 60,000 in 1980. Moreover, it was decided to evaluate the program at certain intervals.

In addition to this program, several other important measures were taken.

A new "Law on Investment Accounts" (W.I.R.) was proposed to replace the traditional system of investment deductions, which allowed a certain percentage of investment costs to be set off against profits by a system of subsidies (irrespective of profits being made) differentiated according to facet criteria. This law intending to increase the power of the government to steer the economy was enacted in 1978. During the transition period, the effect of the existing system was reinforced by increasing the deduction for building from 8% in each of two consecutive years to 12% and, for other fixed assets from two times 4% to two times 8%.

The multi-annual budgets for 1977 - 1980 contained already substantial provisions for structural improvements of industrial sectors, technological improvements and regional policies (including support to individual firms), viz. of the order of 400 m. gld. p.a. It was decided to raise these amounts by sums rising from 500 to 700 m. gld.

In order to improve the functioning of the labor market agencies and to get a better adaptation of the supply of labor to the demand, amounts varying from 200 to 230 m. gld. were made available for increasing labor mobility, improving labor conditions and, to alleviate the social consequences of the restructuring process.

Facilities for export credits were increased; the existing fund for this purpose was raised from .8 to 1.5 b. gld. Moreover, in view of the disappointing development of international agreements about untied aid to less developed countries, steps were taken to arrive at bilateral arrangements.

The organizational side of restructuring industry also got much attention. Extensive sectoral investigations were carried out, statistical information was improved and the Netherlands' Reconstruction Foundation, already set up in 1972, was charged with the preparation of the measures to be taken. In particular emphasis was put on increasing the efficiency of the R&D effort and to promoting activities (so-called spearheads), such as energy projects, studies about a second international airport, etc.).

Three years passed until the new program took shape, but before making some remarks about its evaluation, a more detailed description will be given of the W.I.R. which, as has already been said, became effective during the period under consideration.

It was the intention of the government to design an instrument for a selective investment policy and, therefore, the law contains a set of precisely stipulated conditions for granting subsidies of different types. The legal form was chosen to provide clarity and security to future investors. In first instance the following facilities were offered:

- 1) a basic premium differentiated according to sectors (23% for building and varying from 12 to 15% for other types) and still subject to the S.I.R. restrictions.

- 2) a small scale allowance of 6% for very small investments and linearly decreasing to zero for investments of 800,000 gld. and over.
- 3) a regional development allowance to be seen as an additional incentive to move activities from the S.I.R. area to so-called growth points in other parts of the country, again differentiated between building (15%) and other types of fixed assets (7½%).
- 4) a special regional development allowance reserved for depressed areas (with high unemployment) for which the subsidies sub 3) will be increased by one third.
- 5) an allowance for large projects, viz. those over 30 m. gld., based on the estimated employment created by the project and only for the fraction by which the costs surpassed the limit of 30 m.

In order to avoid an accumulation of subsidies to an undesirably high level, maxima are built in of 50% for building and of 25% for other investments. Moreover, due to E.E.C regulations, regional subsidies are also subject to certain upper limits.

An evaluation of the program remains very difficult as it is almost impossible to disentangle the various factors involved.

In the first place, economic development has been strongly affected by the disappointing development of external forces; viz. the growth of world trade and the fierce competition not only from the developing countries but also from E.E.C. partners and the U.S., caused by our high cost level and the strong position of the guilder. Hence the economic growth was much less than expected (cf. Table 7). Moreover, as a consequence, several firms got into difficulties and therefore a considerable part of the funds had to be spent on support to insolvent firms and, hence, the program became more defensive and less promotional than intended.

Organizational difficulties also arose. In several instances, e.g., the N.E.H.E.M. did not succeed in harmonizing the conflicting opinions of entrepreneurs and trade unions about the sector goals or to overcome the fear of the stronger firms of a sector for unfair competition resulting from support to the weaker ones.

However, some information is available on the direct support to firms. Roughly 2.2 b. gld. has been spent on such programs, affecting firms employing 130,000 persons. Of this amount .9 b. gld. refers to big firms and to approximately 61,000 jobs for which the results are still rather uncertain. The following table gives some indications for the smaller firms.

Evaluation of the direct support to firms

In terms of	expenditures	number of jobs	number of enterprises
successful	49%	60%	48%
doubtful	36%	23%	19%
failure	15%	17%	33%

The results differ considerably from sector to sector. The percentage of successful operations, measured by jobs, varied from 30% for the metal industry through 38% for textiles and 70% for food to 98% for the chemical industry.

Summarizing the effect of the total program, it is obvious that, in particular, the goal for unemployment has not been reached. But it is perhaps justified to say that the situation without its support would have been still less favorable.

3.2 Recent developments

The results mentioned in the previous section indicate that more extensive action would be needed to cope with the difficulties. To this end, in the autumn of 1979 two important governmental papers have been issued, viz. the "Progress Report on Economic Structure Policy" (in September) and the "Innovation Paper" (October).

In the first one the present government endorses the principles outlined in the 1976 paper, but recognizing the fact that the policies pursued, perhaps unintentionally had got a strong "micro" character (i.e. directed to individual firms), in a number of cases leading only to postponing an unavoidable bankruptcy, it decided in future to direct its activities mainly to the so called "meso" level (i.e. to entire sectors of the economy). In its opinion the micro policy could easily lead to unfair competition, to undermining individual responsibility and obstructing an effective functioning of the free-market principle. The meso policy would be a more efficient tool to adapt the structure of the Dutch economy to the conditions imposed by international developments. Moreover, it would enable entrepreneurs to formulate their own policies in accordance with the sectoral outlook; it would improve the possibilities of anticipating new developments; yield better information about the effects on the sector of special facet programs and, finally, increase the clarity and the security of governmental programs. Henceforward therefore, individual support will be restricted to a limited number of cases, viz. to areas with exceptionally high unemployment and to very big firms. During the coming four years the corresponding means will gradually decrease from 110 m. gld. to 30 m. gld. p.a.

With respect to the meso policy two different categories have been distinguished, viz. so-called simple cases and multiple ones.

The first one refers to cases where only one important problem has to be solved, e.g. introduction of recycling to save

raw materials, acquisition of information about important new technological developments, improving export promotion, removing bottlenecks for the introduction of retraining programs, etc. In such cases support can be obtained subject to a set of well defined conditions, to the willingness of entrepreneurs to bear themselves a sizeable fraction of the cost of the program and for a restricted period. This type of support can go up to a maximum of 20% of the total cost involved (25% if facet aspects play a role).

The second category covers cases where a more fundamental reconstruction is required, viz. those with on the whole a too low earning power, with low expectations about possible future improvements and often with serious over-capacities. In these cases the government will be helpful in setting up sector committees (on a voluntary basis) where experts from institutes of technology, private firms, etc., will investigate and advise on measures to be taken to solve the problem. The government will then be prepared to participate in the costs, provided a large part of the firms involved is willing to cooperate.

If it turns out that the necessary reconstruction can only be achieved through a considerable reduction in size of the sector with an unavoidable loss of jobs, due attention will also be paid to the social consequences of the adaptation. In a number of cases sector committees are already at work.

The restructuring foundation N.E.H.E.M. is assigned an important role in the execution of the program and to this end its structure which in the past led to difficulties will be adapted. Moreover, it will work closely with existing organizations in the field of small and medium sized firms (SME) to ensure that these firms will also be able to profit from the benefits which may be derived from the policies envisaged.

Considerable means are provided for these purposes, viz. 1.4 b. gld. for each of the years 1980 to 1984, which represents a considerable extension of the previous program.

Special attention will be given to increasing the possibilities offered by the W.I.R. Additional subsidies for energy saving investments have already been incorporated. The possibility of subsidies for job creating activities, which are much more difficult to implement, are still under consideration.

3.3 The innovation paper

Whereas the papers described in the previous sectors deal with restructuring policies in general, the innovation paper is devoted to policies specifically intended to promote innovative activities. It is generally felt that in order to be able to maintain our present level of prosperity it will be necessary to make more efficient use of our human resources through specializing in the production of know-how intensive goods and services. We will have to anticipate technological developments and to match what is going on in these fields abroad in order to improve our competitive position with respect to the other highly industrialized countries. The necessity to be alert on this aspect is all the more important as a recent investigation has shown that since 1976 the share of know-how intensive products in our exports is declining. The government wants to play an important role in stimulating innovation and in removing possible bottlenecks, in particular through increased attention to R&D.

The Netherlands spends a considerable amount of money on R&D, viz. about 2% of its GNP (cf. Table 8) and is, in this respect, in line with most other industrialized countries.

In accordance with the general cost level, R&D costs are relatively high as is shown by the following figures for 1975 borrowed from an O.E.C.D. publication.

R&D costs per worker					
Sweden	Netherlands	W.Germany	France	U.K.	Japan
103	100	86	80	47	46

In recent years these differences may have become smaller, but they have not disappeared.

Some 55% of the total is financed by enterprises, the remainder from public funds. About 70% of the private funds is spent by the five big multinationals and the effort of smaller firms in general is rather modest. In this respect they lag behind their counterparts in some other small countries like Denmark and Israel.

A little bit less than one half of public funds is spent on research in universities and institutes of technology, over one half goes to various research institutes (like the National Air Traffic Laboratory, the Energy Center Netherlands (E.C.N.) and, in particular T.N.O., the center for technical and scientific research which runs a considerable number of specific research institutes). In contrast to the situation in many other countries, a very small percentage of public expenditures on R&D is directly granted to individual firms as may be seen from the following figures:

Share of direct subsidies to firms in the public outlay on R&D			
U.S. (1975)	U.K. (1973)	France (1974)	W. Germany (1970)
53%	36%	30%	25%
Netherlands (1978)			
5%			

There are, however, a few sectors where governmental support has been both important and very successful, e.g. in agriculture, in water works and in aircraft development.

In analyzing the factors influencing innovation the paper identifies two fundamental concepts. Technological trajectories, i.e. technical and scientific currents which during a certain period set the trend of the development (economies of scale, substitution of natural raw materials, miniaturization, etc.) The selecting environment, viz. the acceptance of innovations by the market, effects of the socio-economic climate, effects of governmental policies, etc. The distinction between these two tendencies is not very sharp and they often influence each other. Still, this distinction is considered to be more useful than the traditional one of technology push and demand pull.

The main policy lines are the following:

- 1) Stimulating innovation by individual firms which is badly needed in order to reinforce the weakened competitive position.
- 2) Reinforcing the role of the R&D infrastructure, in particular by supporting the growing cooperation between the (semi) governmental R&D potential of institutes of technology, universities and research institutes.
- 3) Reinforcing advisory and informative services focusing on innovative activities in particular for the benefit of small and medium-sized firms.
- 4) Improving technological innovation in the "facet" areas (energy, environment, etc.) and putting more emphasis on the instruments of governmental purchasing power and regulations.

The choice of these themes is partly inspired by national experience and partly based on foreign examples. The strong attention given to the SME [not only in 3)] is based on the conviction that they will have to play a very important role in the restructuring process; not only because they have shown a much greater resistance to the negative influences of the economic trend in recent years but also because of their innovative power. In this respect reference is made to the successful experience in the U.S. of the Small Business Investment Corporations and also to the results presented in the study "Six Countries Program on Aspects of Governmental Policies towards Technological Innovation in Industry".

The policy measures can be grouped under four headings:

I The "cost line".

This part of the program includes subsidies for R&D, in particular for SME or groups of such firms; financial support to commissions by firms to investigate innovative possibilities; support for acquiring licences and patents. The subsidies will be subject to maxima to make sure that SME will derive the largest part of the benefits of this part of the program. Guidance of innovation projects will also be brought under this heading. This is an extension of a program which already exists on a small scale and which has been successful. It refers to cases where the government grants bear the cost of technical and commercial advice to a firm or a group of firms engaged in

a feasibility study on a promising innovative idea.

II The "risk line".

This part refers to two different types of measures, viz: A substantial increase of the budget for development credits to SME and, Introduction of a new budget for development credits to big firms for supporting new attractive projects of great importance but incurring heavy risks to be borne by individual enterprises.

III The R&D infrastructure.

In this category a large number of activities has been envisaged. The most important ones will be described briefly:

- a) Research programs aiming at innovation will be developed. To this end program committees will be set up in which representatives of participating institutes (from universities and institutes of technology) as well as users will be members. Their task will be the selection of promising projects, to promote the execution and evaluate the progress of the activities. Modest financial means are made available to start such projects, but in the course of time their financing will have to be incorporated into the normal budgets of the institutes.

The following areas have been selected for the first experiments in this field: chemistry and chemical technology, biotechnology, building, production technics of the metal industry and microelectronics and informatics. Support will be provided by the results of so-called exploratory committees which have been instituted in certain fields of research in order to map the ongoing studies and to select strong points. The report of the committee for chemistry is already available and is being used for this purpose.

- b) The reprogramming of existing research institutes will be stimulated. This refers in particular to the work done by the Energy Center Netherlands (E.C.N.) and by the institutes controlled by T.N.O. Their research programs will consequently be adapted to requirements of the changing technological situation. Due attention will also be given to investigations into the social consequences of the changes.
- c) Steps will be taken to meet the rapid rise of microelectronics. These consist of spreading information to employers, trade unions and other groupings in society; adapted retraining schemes, financial support to individual firms to restrict the risks of very promising projects (part of the "risk line" activities), financial support to firms or groups of firms to share the cost of advice on the applications of microelectronics and promoting cooperation between research institutes and firms in order to create applications for SME. Special attention will be given to what extent Dutch industry might profit from the know-how of the Philips factories, a leading

firm in the production of integrated circuits and their industrial uses.

- d) The scope of Z.W.O., the Foundation for Pure Scientific Research, will be extended. This foundation contributes to the financing of first-class research of public institutes and institutes of higher learning from a budget annually put at its disposal by the Minister of Science and Education. In the past according to its statute it had to restrict its activities to pure scientific research. Now it will also be able to support high-level applied research. Its budget will be increased accordingly.
- e) T.N.O. is in the process of reconstruction. In the course of time it developed into four big entities for research in the fields of industry, food, health and defense, loosely coupled together under the umbrella of a central organization. The management becomes more centralized and in this process special attention will be given to the interface between the results of the research and their application to the innovation process of the individual firms. The transfer of know-how will be improved and a more active marketing policy will be pursued. The access of SME to the organization will be facilitated. Among the many measures which will be taken to realize these aims, mention may be made of the institution within T.N.O. of an industrial service center and of shifting part of the governmental subsidy (which forms a considerable part of the total income of T.N.O.) to customer-contracted commissions. The transfer of technology will also be facilitated through the institution of so-called transfer points in which T.N.O. is cooperating with institutes of technology, a development which is already well on its way.

IV Governmental purchasing policy and side-effects of governmental regulations in general.

In general the purchasing policy of the Dutch public authorities has been aimed at an economical use of public money and, hence, to strive for the lowest bid irrespective of this being of national or of foreign origin. On the other hand it is generally recognized that a well designed purchasing policy can have very favorable stimulating influences on industrial development, even though the effect will be the more important the bigger the country. Nevertheless, the Dutch government feels that even in a small country a shift in policy from trying to fulfill precisely stipulated needs at short notice to one that also takes into account longer term effects may be an efficient tool for promoting innovation. It is not easy to carry through such a change in policy overnight, but the governmental purchasing agency has been authorized with the help of experts to make purchasing officials of the various ministries aware of the ways in which they might stimulate innovation. These efforts will also be extended to the lower authorities. An interdepartmental committee has recommended a list of areas in which a well considered policy could be very effective.

What has been said about purchasing policy is to a certain extent also pertinent to the effects of official regulations in general. To give an example, the Netherlands as a highly industrialized and densely populated country has to be in the forefront of environment protection measures. Usually such measures are a burden to industry, but the government can also stimulate the development of appropriate protection techniques and in this way contribute to a positive spin-off. In future, systematic attention will be given to developments of this kind.

The various aspects of the innovation program spelled out above indicate that it is a somewhat ambitious one. It is not surprising, therefore, that its elaboration will require considerable national means. Table 9 gives some information about their size during the period for which the program is intended, as well as for the share of the various items in the total. Graph 2 shows that the program will lead to a drastic change in the size of the governmental R&D effort outside the institutes of higher learning.

In addition, it may be added that the active cooperation of all persons concerned will be required to ensure a successful realization of a program that will form a corner stone in the total set of policies which have to be developed in order to be able to meet the challenges the Netherlands has to face in a changing world.

Appendix

Table 1

Area: 36.948 km² = 14.272 sq. miles

Population in mill. on Jan. 1st.

	1900	1910	1920	1930	1940	1950	1960	1970	1980
	5.1	5.9	6.8	7.8	8.8	10.0	11.4	13.0	14.1
Annual increase in %		1.39	1.55	1.38	1.21	1.27	1.31	1.27	0.81

Density: 382/ km² = 988/ sq.mile (Jan.1st, 1980)

Economically active population (1978)

Age	Men		Women		Total	
	1000's	% 1)	1000's	% 1)	1000's	% 1)
15 - 24	603	49.9	552	47.6	1155	48.7
25 - 49	2282	95.1	763	33.6	3045	65.2
50 - 64	740	77.1	184	17.6	924	46.1
65+	34	5.3	9	1.0	43	2.8
Total	3659	70.2	1508	28.1	5167	48.8

1) percentage of total age group

Migration

Annual averages

	1955/'64	1965/'74	1975/'76	1977
Immigration	54,784	80,074	105,108	83,999
Emigration	54,868	60,754	58,730	61,051
Balance	- 84	19,320	46,378	22,848

Table 2

Labour force (in 1000 manyears)

Sector		1965		1977	
Agriculture and fishing	388	8.6	289	5.9	
Manufacturing (and mining)	1381 (50)	30.4	1022 (-)	21.0	
Public utilities	42	0.9	45	0.9	
Construction and allied ind.	464	10.2	446	9.1	
Trade, rest., hotels, repair	746	16.4	916	18.7	
Transport, storage and comm.	304	6.7	310	6.4	
Other services	661	14.6	962	19.7	
Enterprises, total	3986	87.8	3990	81.8	
Government (central - and lower authorities)	516	11.4	668	13.7	
Registered unemployed	36	0.8	218	4.5	
Grand total	4538	100.0	4876	100.0	
Average annual growth			0.6%		
Estimated ann. growth in the 80'ies			1.0%		
Labour force as a percentage of total population		36.9		35.2	

Table 3

Foreign trade in relation to GNP

	1960		1970		1978	
	bill. gld.	%	bill. gld	%	bill. gld.	%
GNP	42.30	100.0	115.11	100.0	282.45	100.0
<u>Imports</u>						
Commodities	17.63	41.7	49.14	42.7	117.00	41.4
Services	2.71	6.4	7.03	6.1	17.45	6.2
Prim. incomes	1.03	2.4	4.17	3.6	11.95	4.2
Total	21.37	50.5	60.34	52.4	146.40	51.8
<u>Exports</u>						
Commodities	15.94	37.7	43.26	37.6	109.40	38.7
Services	5.20	12.3	10.83	9.4	24.50	8.7
Prim. incomes	1.50	3.5	4.70	4.1	11.90	4.2
Total	22.46	53.5	58.79	51.1	145.80	51.6
Balance of pay- ment (curr. acc.)	1.27	3.0	- 1.55	- 1.3	- 0.60	- 0.2

Table 4

Transition to natural gas

Energy use of Dutch enterprises (in % of total)

	Coal	Mineral oil	Natural gas	Total
1965	29	69	2	100
1970	12	50	38	100
1975	5	22	73	100

Table 5

International comparison of labour costs (oct. 1977)

Netherlands = 100

	W. Germany	France	E.E.C.
All enterprises	87	69	74
of which:			
textiles	83	60	68
chemical and rubber	86	73	75
basic metals	84	68	73
metal industry	95	72	79
electrotechn, industry	78	58	65
prod. of means of transp.	100	81	84

incl. of social security premiums paid by entrepreneurs;
weighted according to the Dutch employment pattern

Wage costs per hour (national averages) (Oct. 1977)

	W.Ge	France	Neth.	Belg.	Lux.	U.K.	Denm.
	DM	FR.	FL	FR	FR	£	KR
Nat. curr.	20.50	33.70	24.60	337	346	2.20	49.90
Eur. Units of account	7.80	6.00	8.80	8.20	8.50	3.40	7.10
Neth. = 100	89	68	100	93	97	39	81

Share of labour costs in % of NNI 1)

1953/'62	1963/'72	1973	1974	1975	1976	1977	1978	1979
72	81	85.0	87.8	93.0	90.6	91.2	90.4	91.5

1) excl. of mining (in later years mainly production of natural gas),
public utilities and exploitation of dwellings

2) preliminary

Table 6

Estimated effect of different policy measures, each resulting in a 1% increase of the financial deficit of the governmental budget during 1977 - 1980 (based on computations by the Central Planning Bureau)

Size of measure on annual basis	Effect in 1980 on Employment (1000's)	Consumer price level (%)
Increase of investments by .65% of GNP	<u>95</u>	-.8
Wage subsidies .9% of total wage bill	70	-3.6
Reduction of direct taxes by .4% of GNP	30	-.4
Reduction of indirect taxes by .42% of GNP	55	-3.2
Increased governmental spending by .59% of GNP	30	+.8

Table 7

Volume of production in the Netherlands, 1973/1980
(annual increases in %)

Sector	Forecasts, end 1975	Recent estimates
Agriculture (incl. of fisheries)	3.8	2.7
Manufacturing industries of which:	4.2	1.5
Energy production	4.8	1.4
Chemical industry	7.8	3.5
Electrotechnical industry	6.7	2.9
Textile industry	-0.2	-5.2
Building industry	-0.1	0.2
Services	4.0	3.2
Total	3.7	2.6
Labour productivity	3.7	2.8

* 1973/1979

Table 8

R. & D. expenditures and personnel (science)

<u>Expenditures</u> (mill. gld.)	<u>1964</u>	<u>1976</u>	
Enterprises	649	2565	
Research institutes of which TNO	286	1085	240
Universities and institutes of technology	246	865	
Total	1181	4515	
Total in % of GNP	1.92	1.89	
Personnel costs	52%	62%	
Material expenditures	24%	28%	
Investments	24%	10%	
Total	100%	100%	
<u>Personnel</u> (1000 manyears)			
Enterprises	26.7	27.2	
Research institutes	10.0	12.8	
Universities and institutes of technology	5.8	9.2	
Total	42.5	49.2	
University graduates	17%	24%	
Other personnel	83%	76%	

Table 9

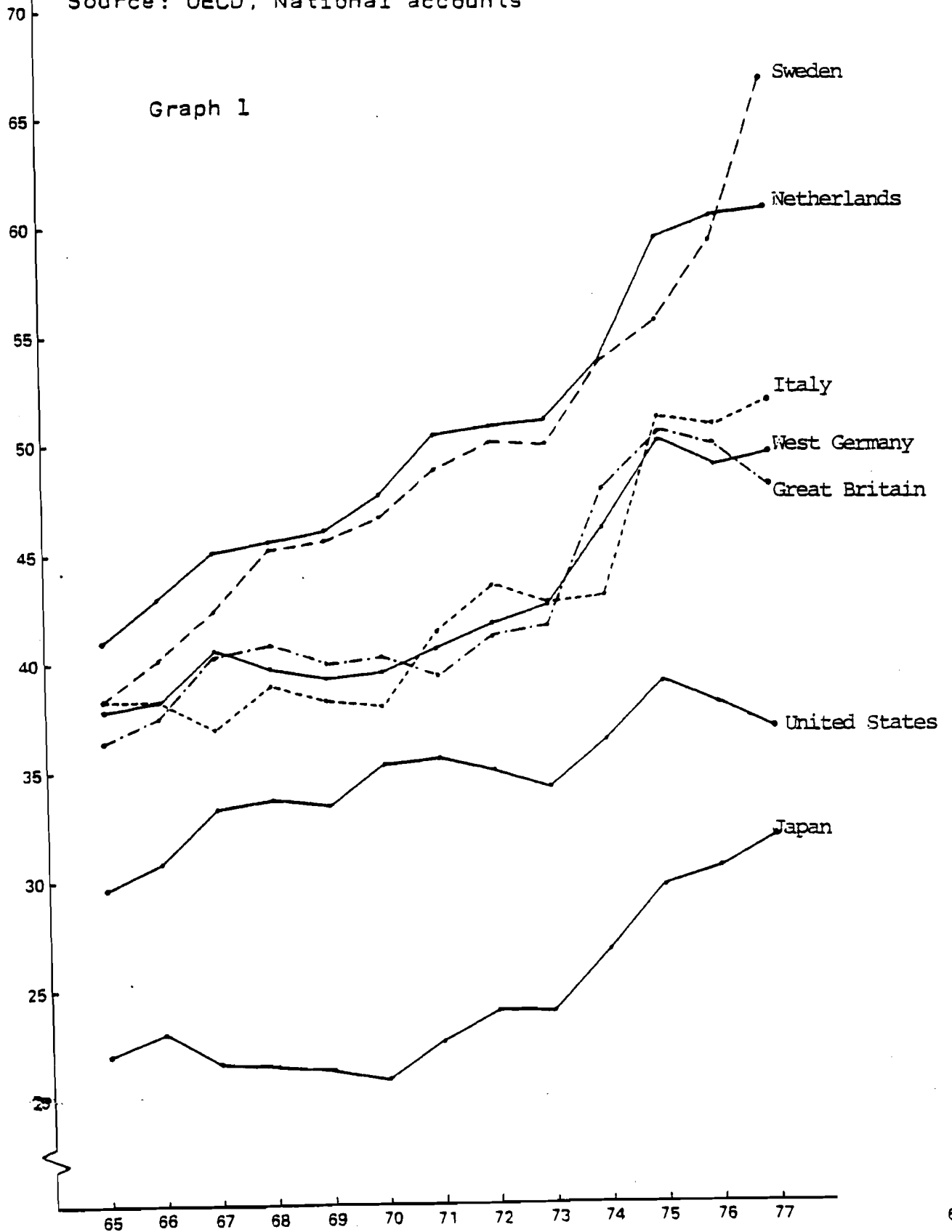
Planned governmental expenditures for
the innovation program, 1980 - 1984 (mill. gld.)

	1980	1981	1982	1983	1984
<u>Contributions to R.&D.-ccsts</u>					
R.&D/costs of firms (wages, commissions, licences, patents)	109.9 (152.8)	155.1 (155.9)	158.1 (158.9)	161.4 (162.0)	164.5 (165.7)
Guidance of innovation projects	7.9 (10.5)	12.6 (13.3)	15.4 (16.1)	16.2 (16.3)	16.5 (16.5)
<u>Total contribution to costs</u>	<u>117.8</u> <u>(163.3)</u>	<u>167.7</u> <u>(169.2)</u>	<u>173.5</u> <u>(175.0)</u>	<u>177.6</u> <u>(178.3)</u>	<u>181.0</u> <u>(182.2)</u>
<u>Contribution to risk bearing projects</u>					
Additional development credits to small and medium sized firms	2.0 (10.5)	3.8 (10.6)	5.7 (10.7)	7.6 (10.9)	9.5 (11.0)
Development credits to large firms	7.9 (157.3)	47.3 (159.1)	95.9 (161.1)	143.1 (163.1)	160.8 (165.0)
<u>Total risk bearing projects</u>	<u>9.9</u> <u>(167.8)</u>	<u>51.1</u> <u>(169.2)</u>	<u>101.6</u> <u>(171.8)</u>	<u>150.7</u> <u>(174.0)</u>	<u>170.3</u> <u>(176.0)</u>
<u>Contributions (additional) to infrastructural types of R.&D.-activities</u>	<u>14.2</u> <u>(36.9)</u>	<u>33.9</u> <u>(47.2)</u>	<u>50.5</u> <u>(60.4)</u>	<u>58.7</u> <u>(61.5)</u>	<u>61.6</u> <u>(62.1)</u>
<u>Grand total</u>	<u>141.9</u> <u>(368.0)</u>	<u>252.7</u> <u>(386.1)</u>	<u>325.6</u> <u>(407.2)</u>	<u>387.0</u> <u>(413.8)</u>	<u>412.9</u> <u>(420.3)</u>

Figures refer to estimated actual expenditures, figures in parentheses indicate upper limits of commitments

Share of the collective expenditures in the net national income
(market prices)

Source: OECD, National accounts



Graph 2

