

EUROPEAN ATOMIC
ENERGY COMMUNITY

E U R A T O M

The Commission

Conference of Industrial Managers

A M S T E R D A M

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Address by Mr. Paul DE GROOTE,
Member of the Commission

Gentlemen,

On behalf of my colleague Mr. Krekeler and myself, and indeed of the entire Euratom Commission, I have much pleasure in welcoming you to this working session. Our Amsterdam sessions are similar in organization and purpose to those held at Tours, at which many of you honoured us by your presence.

We fully appreciate the pleasure and profit derived from meeting one another at regular intervals; but, over and above this, we recognise that such meetings are essential if we are to carry out our various tasks in proper conditions of realism and efficiency.

You yourselves, Gentlemen, assume high responsibilities in the field of nuclear activity. For it is through your devotion, your spirit of initiative, your policy in matters of technical preparation and equipment, that nuclear energy will prosper and attain to its full social and economic value.

We for our part, as you know, have been given, and have accepted, the responsibility of creating conditions in which the Community's nuclear industry can flourish and achieve a steady expansion. Our terms of reference are set out in the Treaty of Rome which the six Governments have signed. The contracting parties conferred upon us certain powers and certain means to carry out this task. But it is obvious that though our work is thus laid down, defined, and endowed with various powers, it would be of little volume or significance unless everyone in the Community who is engaged in nuclear activities displayed a genuine united will to act, to create the requisite tools and to remove the obstacles lying in our way.

Both you and we, then, have the same duty - to carry our efforts through to a common success. The sensible course, therefore, over and above the technical contacts involved in cooperation on this or that work or specific achievement, is for us to compare views and agree upon the principles guiding our activity, and to tell one another our experiences and also our preoccupations and desires. It is the intimacy and the detailed nature of such discussions, and the spirit in which they are held, that render them fruitful and prove the value of such meetings as ours today.

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Gentlemen,

Since we met at Tours, the nuclear situation has changed considerably both in the world and in the Community. Certain features of this development are undoubtedly worth stressing. As regards Euratom, you know that a second five-year programme has been put forward by us and adopted by the competent authorities. This has strengthened the ground on which we perform our scientific, technical and industrial activities.

This five-year programme, in our opinion, offers very sound guarantees for the continuity of our efforts, though it is virtually bound to undergo certain adjustments in a world where ideas, prospects and prices change ceaselessly or at any rate do not change at fixed 5-yearly intervals.

The work planned under this second 5-year programme includes:-

- on the one hand, the consolidation of activities already in hand, the value of which has been shown to be undiminished,
- on the other hand, initiatives in new fields, such as plutonium technology research and fast reactor studies, to name only two thoroughly typical examples.

A second typical feature of the nuclear situation now facing us consists in the corroboration or closer definition of the energy data and prospects relating to nuclear techniques. Our experience and information confirm both a decrease in nuclear investment costs and also a considerable likelihood of a drop in the production costs per nuclear kWh.

The falling cost of nuclear investment is plainly evident in the industrial information able to be derived during the construction of reactors in the Community or elsewhere in the world. It is the result of better knowledge of materials, the higher specific power of installations, and the systematic recovery of reactor power margins in the latest designs. These factors considerably reduce the fixed charges of nuclear electricity production, which represent a particularly high percentage of the nuclear kWh cost.

There are a number of other reasons, besides the one just quoted, for the increasing conviction that the kWh cost will follow a downward trend.

The chief of these are:-

- the technical advances achieved
- a marked drop in the price of fissile and fertile material, and our constantly improving knowledge of and practice in the manufacture of fuel elements.

But above all, I should like to insist on one essential and fundamental feature, which is the volume of energy requirements that we shall face in the coming years. This is particularly important because the medium- and long-term forecasts of electricity consumption in the Community enable us to estimate the margin of industrial requirements within which producers of nuclear material will be operating in the near future.

In June 1963, I had occasion to state before the European Parliament that it seemed more and more certain to us that the advent and subsequent development of nuclear electricity production would be, not a luxury, nor a novel energy variant, nor yet an alternative that would seriously disrupt the electrical power industry, but something that will meet an ineluctable need. What is more - and this seems to be of importance in gauging the psychological reception that will be accorded to nuclear energy - it will play its part in overall electricity production without being detrimental to traditional Community power supplies.

Let me repeat, Gentlemen, that as regards electric power alone, the most conservative forecasts that can be made at present are as follows. If we take the index figure of 100 to represent the Community electricity output for 1960, there is good reason to believe that in 1980 this index will have risen to 400. Now in 1960, the index of 100 reflected a situation accounted for by:-

- coal, oil and gas: approximately 50%;
- power generated from privileged sources of primary energy (namely water power, blast furnace gas, lignite, scrap coal, etc.): remaining 50%.

In 1980, therefore, the index is likely to be 400, and it can be predicted with a reasonable degree of accuracy that this demand will be met as follows:

- 25% by power generated from privileged sources of primary energy;
- 25% by nuclear energy;
- the remaining 50% by coal, oil and natural gas.

This prompts the assumption that in the twenty-year period in question, that is to say up to 1980, the requirements of coal, heavy fuel oil and gas will quadruple. Nuclear energy thus appears not as a new and disturbing factor in the future pattern of energy economy, but as a necessary - I would even say indispensable - contribution to the overall energy balance of the Community. From then on, nuclear industry, so far from being a controversial sector, an object of social antagonism, beset with more or less recurrent economic uncertainties, will be an activity whose very necessity assures its popularity and stability.

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From the studies carried out by the three Communities on the probable growth of nuclear electricity production in the Europe of the Six, the figure of 40,000 MWe emerges as a reasonable indication of the total nuclear installed capacity for 1980. This figure has already been quoted by the Euratom Commission in its Third General Report, and since then we have had no serious reason to change it. May I therefore be allowed to adopt it as a working hypothesis, naturally with all the reservations which are necessary in the assessment of the relevant prospects.

It may be of interest to adumbrate the scale of industrial activity inherent in these nuclear prospects in the period during which the 40,000 MWe capacity would be installed. Here, of course, we are in the realm of conjecture, and we must guard against being too free with our assumptions. Nevertheless, if we take all appropriate precautions in our interpretation and confine ourselves to ascertaining an order of magnitude, the following argument can be propounded.

The decrease in the unit cost of nuclear investment leads to the belief that between now and 1980 the average unit cost of large power plants may drop to some \$200 per kWe. But about 20% of this \$200 is made up of non-industrial elements, namely the cost of acquiring the sites and the interim interest during construction. Consequently, this leaves approximately \$180 per kWe, representing the cost of supplies to be used for actual industrial activity. Disregarding the influence of purely local factors, of inevitable variations between different types of power plant, of the writing-off of design costs in respect of several identical constructions, etc., we can estimate very roughly that the figure of \$180 per kWe for actual industrial activity will break down as follows :

- design and preparation	6 %
- civil-engineering work	15 %
- vessels	15 %
- mechanical plant	30 %
- electrical equipment	25 %
- moderators	5 %
- miscellaneous	4 %
total	100 %

I should like to observe at this juncture that the industrial activity proper, as broken down above, relates for the most part to facilities of a more or less conventional nature.

As regards its activities and general equipment, therefore, the nuclear industry will provide work for the manufacturing plants without calling for any great degree of specialization, and it is only in respect of a relatively small part, i.e. about 10% of the total expenditure, that this will not apply. Obviously, it will not be the case with purely nuclear designs or with certain highly specialized equipment which is directly associated with specifically nuclear techniques.

So far I have referred only to items intended for the equipment of nuclear power stations. Besides there, however, there are the consumables for these power stations, more particularly those which will constitute the turnover of fuel-element manufacturers, reprocessing plants and radioactive waste disposal firms.

And at this point I can attempt to examine more closely the question of what will be the industrial impact between now and 1980 of the satisfaction of the requirements arising from nuclear activity in electricity production.

As regards the industrial investment proper which is needed for the 40,000 Mwe installed capacity, I am adhering to the unit cost of £130 as an average up to 1980; this gives a total turnover of about £7,200 million for the period in question.

The consumables are more difficult to estimate. If we assume an average of two fuel charges during the 17-year period for the entire installed capacity, we arrive at a figure of about \$1,700 million for the Community's expenditure on fuel-element fabrication and at some \$1,250 million for reprocessing and waste-disposal costs.

This comes to a total of the order of \$10,000 million for supplies to the nuclear power plants to be built and operated during the next two decades. In absolute value, it may be argued that from an industrial standpoint this figure is hardly realistic.

In relative value, this progressive expenditure of \$ 10,000 million over the next 17 years might be compared with the turnover of the Community's civil-engineering, manufacturing and heavy industries in 1961. In that year, these three sectors of industry contributed \$ 62,000 million to the Community's gross national income. It no doubt behoves you to assess the comparative magnitude of these two figures by relating them to the same period of time, in order to perceive the impact of nuclear energy on the volume of your specific outputs, your future turnovers, on your requirements of specialized personnel - in general, on your industrial aspirations and obligations within the Community.

Whilst bearing in mind the reservations which are inevitable in view of the conjectural nature of these data and the possible margins of error, when one considers them one has the impression of a fairly substantial contribution of industrial activity as judged by the standards of activity obtaining in the world of today.

However, Gentlemen, we have not come to Amsterdam to subject you to excessively long speeches or to foist our own opinions on you. We have come, as I said at the beginning, to exchange views, and in this respect we feel that an acceptable procedure, after we have heard my colleague Mr. Krekeler, would be to ask our Directors-General, Directors and other officials to speak very briefly, say for about ten minutes, on the various subjects likely to stimulate our discussions and to devote most of our time to obtaining your reactions and replying to them so that we may then draw some fruitful conclusions from our joint action.