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Article — Digitized Version

## Atomic energy—Key to industrial progress

Intereconomics

*Suggested Citation:* Eklund, Sigvard (1969) : Atomic energy—Key to industrial progress, Intereconomics, ISSN 0020-5346, Verlag Weltarchiv, Hamburg, Vol. 04, Iss. 7, pp. 206-209, <https://doi.org/10.1007/BF02927207>

This Version is available at:

<https://hdl.handle.net/10419/138224>

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# INTERVIEW

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## Atomic Energy — Key to Industrial Progress

Interview with Dr Sigvard Eklund, International Atomic Energy Agency, Vienna

**The International Atomic Energy Agency came into legal existence on the 29th July, 1957. It now has 101 Member States who meet annually in the General Conference. A Board of Governors consisting of 25 Member States carries out the functions of the Agency in accordance with the Statute. The IAEA is an autonomous body linked to the United Nations and a number of its Specialised Agencies by relationship agreements, but itself not a Specialised Agency. In pursuance of its first objective to promote the peaceful use of the atom for the welfare of man, the Agency is engaged in a wide spectrum of activity which could be considerably extended by the Non-proliferation Treaty. In Vienna we interviewed the Director General of the IAEA about certain aspects of the Agency's present and future work.**

**QUESTION:** You have on one occasion spoken of the terrifying ignorance of what IAEA is doing. In fact, the constantly lengthening catalogue of the organisation's responsibilities makes it almost impossible to have a clear picture of the Agency's tasks and activities. One easily gets the impression that your organisation concerns itself with everything that has anything to do with atomic and nuclear research and the use of nuclear energy without however doing any work that is really of practical value. Do you think this impression is correct?

**ANSWER:** Atomic research and the use of nuclear energy are indeed a domain that is difficult to take in at a glance. This is above all due to the fact that nuclear research is no independent, self-sufficient discipline. Atomic energy has many possibilities of application, and its area of research is shared by numerous scientific disciplines; it concerns the natural sciences, and in particular physics and

medicine, but also technology, agricultural science and hydrology, to mention but a few. The study of atomic energy is therefore not a self-contained science. Our working programme clearly demonstrates this. Our Programme is broadly designed so as to support the different applications of nuclear energy in the widest sense possible. This is naturally a very delicate task, and many are the objections that can always be raised against IAEA's programme. We are told by our critics, for instance, that we should concentrate on certain activities and drop others. This is why every time we prepare our budget proposals we carefully scrutinise our programme once again with a view to arriving at a plan that is as balanced as possible, i.e. neither too general nor too specialised.

### **Coordination of Research Projects**

**QUESTION:** Making a programme is therefore in the final analysis a question of reaching

a compromise between diversification of activities, on the one hand, and concentration on some crucial areas, on the other?

**ANSWER:** This is in fact the main criterion we apply when planning our work. Naturally, in the course of IAEA's activities shifts of emphasis occur in individual tasks or in whole areas. In the initial stages of nuclear research the practical application of radio-active substances had pride of place. That is why much of IAEA's work was devoted to assisting research in this field with radio isotopes and ray sources and their various uses. Nowadays, nuclear energy is becoming increasingly important throughout the world as a source of electricity. This has led to a marked shift in the fields of research and practical application.

**QUESTION:** The Atomic Authority's aim is to accelerate the peaceful use of atomic energy. Does your Agency seek to achieve this aim primarily by

undertaking research projects of its own or mainly by collecting, exploiting and passing on the results of research and the practical experiences of the member countries of IAEA?

ANSWER: The IAEA is not an autonomous research organisation. Its purpose is rather to help research on an international scale. The assistance is partly financial, but it mainly takes the form of coordinating research projects. We administer research and in particular those projects which are tackled more effectively by several countries together than by one single country. Let me mention some examples: In the agricultural field, for instance, we have undertaken studies which concerned the use of radio isotopes and ray sources to control pests, to improve fertilisers, to cultivate special plant types and to preserve food. We have done similar work in the field of medicine; radio-active iodine is for instance used in the diagnosis and therapy of thyroid gland cases. Hitherto the methods of measuring the quantity of radio-active iodine absorbed by the thyroid gland has differed from country to country. This has caused us to conduct a world-wide inquiry with a view to standardising the measuring methods.

#### **Aid Programmes for Developing Countries**

QUESTION: The IAEA also carries out technical aid programmes in developing coun-

tries. What kind of programmes are these or rather what kind of requests for aid from developing countries are supported and financed by IAEA?

ANSWER: As far as aid programmes for developing countries are concerned, we are guided by the provisions of the United Nations Development Programme. In other words, the developing countries must first of all decide for themselves in which fields they want to be helped. Every year we receive a large number of inquiries. We are asked for instance whether we could make available certain equipment and send some experts for consultation or whether we would be in a position to help with the training of students in certain spheres of atomic energy. Our aid programmes are therefore essentially geared to the specific requirements of the developing countries.

The limited financial means at our disposal force us of course to give priority to the most urgent problems, especially where it is possible with a relatively small pioneer effort to lay the foundation for a subsequent more diversified endeavour. Agriculture naturally occupies a prominent position in this connexion, and this includes prospecting for water resources. Apart from this, our aid programmes also concern themselves with medical problems of the developing countries, such as for instance the struggle against disease caused by pro-

tein deficiencies. Finally, a developing nuclear industry requires inexpensive uranium, and this is why we assist developing countries in the exploitation of existing reserves and the prospecting for new deposits.

QUESTION: The 12th General Conference of IAEA in 1968 unanimously approved the admittance of Niger and Zambia to membership. There is no doubt therefore that in principle membership of IAEA as an International Agency is open to all countries wishing to join. But are developing countries, devoid as they are of the most rudimentary technological basis, in a position to contribute to the work of an atomic energy organisation or even only to profit by it?

ANSWER: It is my belief that the IAEA is an organisation that can be of use particularly to developing countries which still have much leeway to make up as far as science and technology are concerned. True, the industrialised countries have at present greater chances to use nuclear energy, but it will not be long before more and more developing countries are in a position to exploit this new source of energy. Some of these countries have already successfully employed nuclear energy in the most diverse fields, which I mentioned earlier on, and the number of such countries is likely to increase considerably in the next ten years.



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A nuclear-powered economy providing as it does the means of producing huge quantities of energy and of opening up and utilising water resources is the key to industrial progress and greater productivity. At the same time, the use of nuclear energy promises the developing countries more abundant food supplies and better health services.

There are in the developing countries experts who are engaged in advanced scientific researches into nuclear problems. They need our support and we can also help them by putting them in touch with other scientists and acquainting them with more advanced research from which they will be able to profit. The work done by our theoretical research institute in Trieste has clearly shown how important this kind of support can be in the developing countries' own inquiries and research.

#### **Future Control Activities**

**QUESTION:** The new control duties which the IAEA are to undertake within the framework of the Treaty on the Non-Proliferation of Nuclear Weapons would seem to make it doubtful whether the organisation will in future still be able to accomplish its scientific tasks. It is not possible that the abandonment of the scientific work and of the job of encouraging the use of nuclear energy is the price of the IAEA's chance to emerge by virtue of its control tasks from the shadowy existence it has been leading among the organisations of the UN?

**ANSWER:** I regard it as very important that the organisation continues its scientific work. For the next few years I see no difficulties arising from IAEA's double task of acting as security and control body, on the one hand, and, on the other, as institute whose job it is to encourage scientific research. These two functions are not mutually exclusive.

Of our present budget of \$ 12 mn, \$ 900,000 are earmarked for control activities. This is a rather modest sum, which is certain to be increased in the future. Up to now I have heard of no proposal that the scientific activities of the organisation should be decreased in favour of the control tasks. On the contrary, it is more than possible that as our allocations to enable us to exercise our control functions are increased, the funds for research are also augmented.

#### **Scope of the Inspection**

**QUESTION:** In connexion with the Treaty on Non-Proliferation of Nuclear Weapons, the establishment of a control system has aroused many suspicions. It is feared that the controls may hamper the functioning of a plant and may be used as a means of industrial espionage. It is pointed out moreover that the control system will involve plant owners in considerable expense. What do you think of these fears in the light of the practical experiences you have made with the control system as evolved by IAEA?

**ANSWER:** It is my opinion that these fears are greatly exaggerated. We control in the USA two large plants — the Nuclear Fuel Services Inc., West Valley, New York and the Yankee Atomic Power Station, Rowe, Mass. At both plants I have been repeatedly assured that the inspectors of the IAEA have in no way hindered the orderly functioning of the enterprises. What did prove a nuisance were rather the many TV-people and reporters who turned up in large numbers whenever there was an inspection.

As for the alleged industrial espionage, it must be remembered that a reactor is an installation which in principle is by now well known. Descriptions are available of almost any type of reactor.

The tasks our inspectors are called upon to perform are

similar to those of an auditor in any industrial firm. The Central Accounts Office of the IAEA supplies them with a list of items against which they check the inventories, work reports and nuclear fuel stocks of the plants they control. Admittedly, this control is concerned not only with the checking of books but extends to a technical inspection with a view to ascertaining how much uranium and how much of the plutonium produced has actually been used.

But the inspectors are not entitled to ask—and this is widely misunderstood—what steel alloys are used for instance in the reactor boiler or what alloy encases the fuel elements. This and other similar matters are beyond the scope of the inspection, whose sole task it is to check the records of the stocks of fissionable material and to compare them with the actual quantities they find in the nuclear installations and in the stores.

**QUESTION:** The safeguards were laid down by the IAEA roughly ten years ago; they are still in force today although they date from the time of the research reactors. The methods of supervision then worked out strongly relied on personal control. Will they in future still be workable from the point of view of both staff and cost?

**ANSWER:** Our present control system for reactors of all types dates from the year 1965; it has since—in 1966 and 1968—been extended to cover regeneration plants and plants for the production of nuclear fuel. But I am convinced that there is still room for improving and perfecting control techniques. We have only just begun to evolve more modern and simpler methods, and much promising work is being done on this problem in the Federal Republic of Germany, in Britain and in the USA. Naturally, it will be a few years before the work will show satisfactory results from the practical

point of view, but I believe that in many cases it will very soon be possible to replace part of the personal inspections by technical control mechanisms. In this manner we shall certainly be able to reduce costs involved in carrying out our control functions.

#### **Harmonisation of Control Systems**

**QUESTION:** The Atomic Ban Treaty admittedly recognises the existing control systems as e.g. that of Euratom; what it does not provide for is that IAEA then dispenses with checking the findings of the inspections i.e. with a double check. How, in your opinion, should Euratom and IAEA cooperate in their control functions?

**ANSWER:** The rapid spreading of nuclear reactors will force many states in the near future to establish inspection systems of their own, if they do not wish to lose control of the fissionable material in their territory. It is my hope that these national inspection systems can be harmonised as far as possible with the system of IAEA. Euratom's inter-state inspection system is already outside IAEA's control. We entertain informal contacts with Euratom and know the control system of the European Atomic Community. I hope it will be possible to find in future a political solution which confirms the IAEA in its position as a supreme control organisation. It would be perfectly feasible to reconcile national or regional inspection systems with a world-wide system of safeguards, provided IAEA retains over-all control by way of random inspection.

But an essential prerequisite for a smoothly functioning world-wide surveillance of fissionable material would be harmonisation to the largest possible extent of the various control systems.

In any event, standardisation of the legal provisions appertaining to the sphere of nuclear energy is a very important task

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of the IAEA. What we are ultimately aiming for is a "World Atom Law", and some significant progress in that direction has already been made — progress which is of great importance to the nuclear economy. Cases in point are for instance the establishment of upper limits for radioactive effects to which the staff working in nuclear establishments may be exposed, provisions for the shielding of the reactor from the outside or for the transport of radio-active materials. If uniform regulations did not exist for all countries, it would for instance be extremely difficult to transport any fuel elements from one country to another.

#### **World-wide Safeguards**

**QUESTION:** In a few years' time, nuclear plants in countries which at present possess no atomic weapons will produce enough plutonium for hundreds of bombs. In view of the continuing development and spreading of nuclear technology, is it not becoming ever more difficult to solve the problem of establishing world-wide safeguards against the use of fissionable material for purposes of war?

**ANSWER:** It is of course possible that, if the establishment of a world-wide control system is delayed any further, some states evade supranational control. But, after all, even those

countries which have signed the Treaty for the Non-Proliferation of Atomic Weapons, will not tie themselves down indefinitely. It is intended that the Treaty will come up for discussion again five years after it has become effective. It will then be open to any country to renounce it on the grounds that the conditions under which the Treaty was concluded had radically changed.

One is of course entitled to hold the view that the world would be a safer place if all countries disposed of atomic weapons. Personally, I am however of the opinion that the tensions would in such a case increase still further and the situations which might lead to conflicts would become much more explosive. Most people misjudge the situation, mainly because they have no precise idea of the enormous destructive power of atomic weapons. On the other hand, a much more realistic view prevails in the USA and the Soviet Union of the danger involved in a further spreading of atomic weapons. Both these states have come to the conclusion that, as the atomic weapon potential has grown, the own security has diminished. I believe that other states will come round to the same view and that reason will ultimately prevail and agreement be reached on the establishment of a permanent world-wide control of nuclear energy.