

# THE SPEAKER

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## ENERGY SECURITY ISSUES

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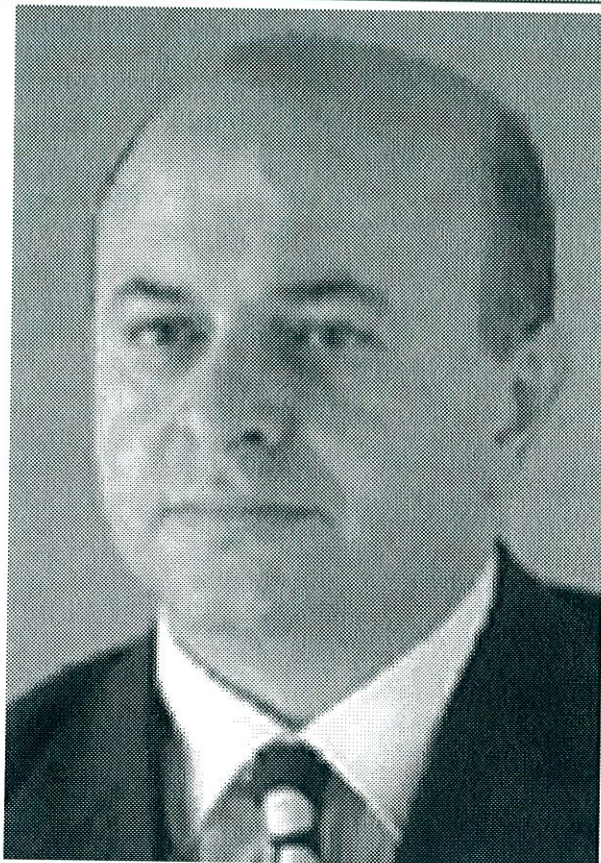
Minister of Energy, Armenia

Before speaking of energy development and security issues, I would briefly like to present some statistics. Currently, energy can be divided into two main branches: electric energy and gas. The Ministry of Energy also bears some responsibility for thermal energy. To make it simpler, thermal energy includes the plants in Gyoomree, the Hrazdan Thermal Power Plant (TPP), and the Yerevan TPP. If one considers the thermal energy sector in general, the Ministry of Energy is involved in it to the extent of about 25%. The remaining portion falls under the authority of the respective cities and regions.

From 1985 to 1989, when the nuclear power plant was decommissioned, about 15 billion kW/h of electric energy were generated in Armenia, of which 2.5-3 billion kW/h were exported to the shared energy system of the former USSR. We had about 12-12.5 billion kW/h of energy left over to satisfy the immediate needs of Armenia. As for our gas supply, the highest volume was in 1989 (5.9-6 billion cubic meters). This was taking place while our volumetric capacity was generally higher and could have reached up to 17 billion cubic meters.

Almost all types of stations were used to generate electric energy, including thermal power plants, hydroelectric plants, and the nuclear power plant. In general, this is how the resources were distributed: 20-25% came from the nuclear power plant, 15% came from hydroelectric sources, and the rest was generated by thermal power plants. Currently, the breakdown is the following: 40% nuclear, 40% thermal, and 20% hydroelectric sources.

The most powerful stations are the Hrazdan TPP (1,100 MW), the Yerevan TPP (550 MW), and the Vanadzor TPP (94 MW). The figures in brackets only reflect the electric energy generation capacity of the TPPs. The Vanadzor TPP has been privatized together with two enterprises of the chemical complex, and the new owner has been carrying out major renovations. In fact, this TPP is ready to re-start its operations.



The total capacity of the Armenian Nuclear Power Plant is 815 MW. Currently, only the second unit is used (capacity of 407 MW), and the maximum utilized capacity is about 380-385 MW.

The capacity of the Sevan-Hrazdan hydroelectric cascade is 550 MW, but the plants operate only during the summer irrigation season. This is the only time when we have the opportunity to use the water from Lake Sevan to generate electric energy. Currently, this water is not being used to maintain the plants, due to the automation of a number of processes. The last time we extracted water from Lake Sevan was about a year and a half ago, and it was done to maintain the security of the energy system.

The total capacity of the Vorotan cascade is 404 MW, with an annual generation figure of one billion kW/h -- mostly used during peak times. Taking into consideration the amount of water in recent years, one may say that this figure has gone up as high as 700-800 million kW/h. The Vorotan tunnel is currently under construction. Thus, water resources used for electric energy will diminish, and generation will be

at about 500 million kWh, assuming that 160 million cubic meters of water will flow to Lake Sevan. By the end of this phase, we will have already released 90 million cubic meters from Lake Sevan and the difference between this and the previous figure is what will remain in the Lake. On the other hand, some people claim that the angle at which the water will flow will be steeper, and this will allow for a greater amount of electric energy to be generated. Unfortunately, they are not right, and in fact, we will incur a loss of water resources. But, considering the importance of Lake Sevan, we have considered the alternatives for such a situation in our plans.

Currently, Armenia is connected with all of its neighboring countries by means of electric transmission lines. The only exception was Iran, but a 220 V line was put into operation in 1997. This allows us to import and export electric energy from and to Iran, Turkey, and Azerbaijan.

We have quite a developed network of lines (35 kW, 10 kW, 6 kW, and 0.4 kW), substations, and lines that extend for dozens of thousands of kilometers. In other words, we have quite an important network, and, if we add the gas sector, we may consider this to be a large system.

As far as energy security is concerned, the gas accumulation reservoir is of a great importance, because it allows us to satisfy demand and solve supply problems when the northern gas pipeline is damaged.

In general terms, the gas supply network is divided into three parts: high pressure, median pressure, and low-pressure lines. The total length of high-pressure pipelines is 558 kilometers. The median pressure pipelines extend 2600 kilometers. According to the estimates of the World Bank, the whole system is currently accessible. As far as the electric energy sector goes, this represents about 90%. In other words, we have managed to preserve our energy system. In practice, we can use all our resources, except for the first unit of the nuclear power plant. Re-commissioning this unit would require 300 million US dollars. Another resource that cannot be utilized is one of the units of the Yerevan TPP. All other units are currently accessible, even though one must note that what exists is quite outdated, and the resources are reaching their normal life expectancy.

We have recorded several phases of energy development. The worst was the crisis from 1992 to 1995. This phase ended on 1995 11 05, when the second unit of the Armenian Nuclear Power Plant (ANPP) was re-commissioned. In this respect, let me note an interesting fact. A study carried out in 1992 showed that 92% of Armenia's

population was against the re-commissioning of the ANPP. A survey carried out during the crisis showed that 92% of the population support the idea of re-commissioning the ANPP.

The crisis phase was characterized by an unstable supply of natural gas. During this period, the gas pipeline was blown up 28 times. It is clear that in such a situation, the amount of electric energy generated by the TPPs had fallen, because the blockade had made it difficult to import fuel oil. Consequently, we had an unstable electric energy supply. In those years, major problems arose in connection with Lake Sevan. Generally, even if water was released only for the maintenance of the energy system, the generation capacity reached about 1.5 billion kWh annually. In the winter of 1993-1994, 4.8 billion kWh of energy was consumed.

At that time, losses were very high. Technical losses have existed all along. In Soviet years, they were about 11.5-13%, and now, they are about 14.5-15%, according to our estimates. I must note that in developed countries such as the USA, losses are about 2-4%. During the crisis, commercial losses emerged in addition to technical ones. They were about 40-45% in those years.

The quality of electric energy suddenly worsened. Frequency was the first factor to be affected. It declined to an unacceptable level of 42-44 Hz. Instead of the nominal voltage of 220 V, the actual voltage was about 180 V, and at times, even 150 V. The number of breakdowns in the network increased, and there was no centralized heating supply.

The next phase was that of overcoming the crisis in 1995-1996, when the ANPP was re-commissioned. In this period, it became possible to manage demand to a certain extent. The monopoly structure was broken down. "Armenergo", which used to be the generating, transmitting, and collection enterprise, was restructured. In practice, it was impossible to do so many things at one time. The electricity and natural gas supply were restored to a 24-hour schedule. A program of reforms was elaborated and initiated. The years 1997 and 1998 are characterized as a period of stabilization. Pre-conditions existed for financial rehabilitation and further development. This was primarily due to the fact that we started to manage financial flows. Major activities were carried out in the area of metering electrical consumption. The foundation was created for the process of setting areas of responsibility for metering, generating, transmitting, and distributing. Energy improvement and development plans were elaborated – mostly by qualified local experts, as well as with support from foreign partners, primarily ones such as the World Bank, the European Bank



**Karen Galustyan** was born on 1951 01 05 in Kalinino, Armenia. In 1968, he finished -- with honors -- the local secondary school. In 1973, he graduated from the Electric Energy Faculty of the Polytechnic Institute of Yerevan – again with distinction. He obtained the qualification of electro-mechanical engineer. From 1973 to 1976, he worked as a senior laboratory expert in the Electric Machines and Devices Chair of Yerevan State Institute and, concurrently, he was a post-graduate student of the same Chair. From 1976 to 1980, he studied at the Graduate School of the Pan-Soviet Electrical Machines R & D Institute of Moscow, where he was a junior science fellow. From 1983 to 1984, he obtained additional qualifications from Newcastle University (Great Britain). From 1984 to 1992, he worked in the Electric Mechanics Chair of Yerevan State Institute as a dean, then, as Chairperson, and finally, as the Deputy Rector of the Institute for Scientific Affairs.

In January 1992, he was appointed Deputy Minister of Energy of Armenia. From 1997, he was First Deputy Minister. On 2000 05 20, Karen Galustyan was appointed Minister of Energy of Armenia.

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He is proficient in Armenian, Russian, English, and French.

for Research and Development, and the European Union. This was important in terms of understanding the details of a market economy and the approaches abroad, as well as attracting investments from foreign organizations. This was the period during which a number of projects with various concepts were developed. The first project that was developed in 1994, was with a company called "Lahmeyer International GmbH". It contained a limitation in terms of the principal position. This was because Armenia was basically a closed country with no export or import of electric energy, notwithstanding exports to Karabagh, which continue at present. Now, when we look at the development of the energy sector, we consider regional cooperation as the main factor in terms of energy security.

Another characteristic of this period was that barter took up an extremely large percentage of the sales balance of the energy sector. Revenue in the form of funds made up 40% of the total, while revenue from barter consisted of 60%. Currently, barter forms a negligible percentage of payments, and we are trying to decrease it further to the extent possible. Sometimes, there are cases when barter is unfavorable for us, but we have to do it. We often do it to keep a factory or enterprise operational. Otherwise, the existing rules require us to switch off the electric energy supply. We do not actually switch it off, taking into consideration the need to develop industry and other branches of the economy.

An issue in the agenda is the privatization process that is taking place in this sector. One must note that privatization in our sector has been very slow, partially due to the energy security factor. Plans should be implemented only when the sector is ready. Despite this caution, however, some privatization has taken place. We started privatization with those enterprises that were not directly involved in the generation, transmission, or distribution of electric energy – the rest maintained their public status. One may say that we obtained a rich experience from the privatization of hydroelectric plants. In practice, we have already privatized thirteen hydroelectric plants. The results are satisfactory: all privatized power plants are currently generating electric energy. It is true that we cannot ensure that they collect all their receivables. When we were considering the privatization of the distribution companies, the payment factor was one of the main arguments. Currently, the only entities that have been privatized are those in the gas and thermal generation, transmission, and distribution network, as well as the previously-mentioned thirteen plants. The privatization of these entities has been, in our opinion, a step that was carefully planned; and we will try to avoid making any mistakes in the process of privatization in the future.

A major issue is that of the attraction and promotion of investment. This process started with the realization of loans. Back then, there was no distinct flow of investors. There were investments by banks, technical assistance programs, and humanitarian aid.

The creation of a comprehensive legal framework has been very important. A number of laws (Energy, Responsibility for Accidents in the Utilization of Nuclear Energy, and others) were adopted. These were vital for the reform and development of the energy sector.

In the stabilization phase, the "Armrusgasprom" company was established. For a country such as ours, without resources, this company created a practical opportunity to establish a joint venture with one of the most powerful gas companies of the world, "Gasprom". Having created a joint venture, we managed to utilize the resources of the partner for the implementation of our own objectives. In this sense, the Russian "Gasprom" has played the role of a regulator. Our agreement is with the privately owned "Itera" company, and if we do not execute the necessary payments, "Itera" has the right to disconnect the supply. In this situation, the participation of "Gasprom" with a 45% share introduces practically complete regulation. Firstly, it helps us in the area of strategic planning, and it also creates an appropriate energy policy balance in the region. In the future, major investments are expected. One of the main objectives in creating "Armrusgasprom" was to supply gas to Turkey. So far, this has not been done -- but neither have we stopped work in this direction. There are certain political factors that impede the implementation of this project. Nevertheless, the process is underway, and the issue is very important for us.

Restoring the Armenia-Iran power transmission line also played an important role. It allowed the restoration of a stable 50 Hz frequency. An efficient economic regime was created for the ANPP, allowing it to operate in the summer, as well.

At that time, the eleven distribution companies consolidated into four new ones. Earlier, there were 62 of them. Very often, people ask why this consolidation was needed. Various explanations can be offered. The justification for this consolidation was economic. We considered cash flows, the number of consumers, and the operating and maintenance costs to be incurred. Our estimates showed that the best scenario would be one in which there are four to six companies. Today, we have four distribution networks.

The National Dispatching Center is very important. It has technical and economic dispatching as its main objective.

Unfortunately, the Ministry of Energy is currently unable to perform in full its main task of developing and implementing a policy and a strategy for the sector. We are currently forced to deal with operational matters. The Ministry has some influence over the enterprises of the sector in terms of operational solutions. In practice, our Ministry currently resembles the management of a holding company. This is unacceptable for us, and we are taking measures to have direct horizontal links between the generating, transmitting, and distributing companies. They must regulate their relationships in the manner stipulated by legislation. We are preparing amendments to the Energy Law, which has to stipulate clearly that the Ministry should only deal with policy.

The Energy Commission handles regulatory issues. It has two functions: licensing and approval of tariffs. This is a very important institution, if we look at it from the perspective of foreign companies and investors, in general. In practice, it should regulate anti-monopoly affairs and tariffs so as to protect the interests of both small and large plants. A side issue is the criticism leveled against the Commission for being, as yet, incomplete.

All instances are obliged to follow the instructions of the National Dispatching Center and the defined technical

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specifications, because most deal with security. All stations, whether public or private, have to comply with existing norms and standards. Failing this, their licenses may be revoked, and the operators may no longer own their plant.

The next phase is that of financial improvement and rehabilitation. Today, this is the most important issue, because we have serious problems with financial flows. There are large payables and receivables. To solve these issues, we have to find ways of rehabilitating our system. Various ways of rehabilitation have been examined. Currently, administrative methods have reached an organizational peak, and their further development may not be very useful. One needs to initiate distinct changes (such as the privatization of the distribution companies) provided that regardless of amounts they collect from their consumers; the distribution companies would pay the full amount for the electric energy they receive for distribution. This has to do with investments. We have designated investments in the transmission network. Our suggestions were discussed in the National Assembly. We also spoke in favor of a projected loan that would help us overcome these difficulties.

There are issues related to the modernization of the metering system.

The privatization of the distribution companies is currently carried out in accordance with the existing legislation (the privatization law that was enacted recently). After the Law was adopted, a Tendering Committee of sixteen members (including, according to the Law, seven representatives of different parliamentary groups and factions, and a person from the National Academy of Sciences) was established. The next step deals with the selection of a legal counsel in the near future. The Tendering Committee then has to approve the privatization timetable. One of the main conditions in the timetable will be the drafting of the package of bid documents, with the help of legal counsel.

An assessment of the energy sector of Armenia done by international experts concludes that the sector is in a dire need of renovation. It was created in Soviet times, and practically speaking, it is now necessary to substitute it with a new one. We are very close to a major equipment crisis, and if we do not do anything about it now, we will have to face a major problem in terms of energy security. Having recognized this thoroughly, we have initiated certain measures.

Presently, about 30% of our installations have been in use for over thirty years. The number of operational hours of the TPPs is close to the limit of 2000 hours. I am principally referring to the equipment directly involved in the generation process. Of the equipment installed in the HPPs, 70% has been utilized for over 30 years, and 50% of it is more than 40 years old. These examples illustrate the situation.

Energy security is the assurance of reliable energy supply to meet all the needs of individuals, society, and the country whether under conditions of regular development or in extraordinary situations. When assessing the extent of energy security in Armenia, one must consider the fact that Armenia does not have any local fuel resources. The equipment in the energy sector is worn out. Gas supply to Armenia by means of one gas pipeline is exposed to political, technical, and economic risks. The gas pipeline coming

through the North Caucasus and Georgia is in an awful physical condition, and we must have to think seriously about renovating it. Our neighbors are in an energy crisis and, unfortunately, do not have enough funds to repair the gas pipelines.

We have adopted the core principles of energy security. We have considered all the alternatives related to the further development of energy security. In this sense, the three-level policy on energy diversification is a priority. This means that generation should be organized in the HPPs, TPPs, and the ANPP. Currently, for example, the ANPP is operating within a planned precautionary renovation program. We are make use of only the HPPs and TPPs. Thus, having these three sources of generation, we manage to substitute one for another, choosing the best economic regime and ensuring safety.

The next issue is that of securing fuel (natural gas, fuel oil, and nuclear fuel) and developing local energy resources. The latter means that hydroelectric and alternative (including solar, aeolian, and geothermal) energy sources have to be developed. Sometimes, they are expensive, but we consider them to be our priorities as far as security is concerned.

In thinking about routes to import fuel (gas and oil pipelines), we consider not only the Northern, but also the Southern gas pipeline. This is the reason why we are actively involved in the Baku-Jeyhan, Transcaspian, Inogate, and other projects. We see major chances to diversify energy routes.

Economizing energy and regional cooperation are the other directions of the strategy to ensure energy security.

In 1999, the ANPP generated 35.6% of the total electric energy generated in the country. Thermal energy accounted for 42.1%, and hydroelectricity for some 22% of total energy output. If the ANPP is decommissioned, we will have to compensate for it by means of the TPPs. This would mean that we would have to produce 78% of our total electric energy on the basis of imported resources. Nuclear fuel is easy to import (it can be transported in a plane), but importing gas involves a daily process. If the gas pipeline coming from the North is disconnected – for whatever reason -- we will find ourselves in a very difficult situation. Thus, we have to find appropriate ways. Currently, we are working on this; we will never have a crisis like that of 1992-1995. One way to avoid that crisis is to store gas in our reservoirs. We are already doing this. We can use the reserves if and when gas supply is interrupted. Moreover, we have the capacity to get electricity from Iran. Currently, we are building a common connecting substation in Meghree. This will help us increase existing capacity. In this context, it may be very difficult to explain why we are building a substation while in a difficult financial situation such as we find ourselves in. The answer is that this increases our security. It will allow us to receive electrical energy from Iran under certain schedules (including a more efficient utilization of the ANPP during the summer).

We have signed an agreement with Turkmenistan. In the summer, it is very difficult to receive electric energy from Iran. Instead, it can be easily imported from Turkmenistan, especially when one considers that the necessary connection exists. One may say that the minimum pre-conditions for security have been developed, but they should not be considered to be satisfactory. This is why the construction of the Iran-Armenia gas pipeline has become an

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extremely important issue. As Minister of Energy, I must be assured of satisfying external conditions and of creating a favorable framework.

The issue of the decommissioning of the ANPP has often been discussed on various occasions. In this respect, it is important that international experts assess the energy security of Armenia. They have done so. According to this assessment, in early 1989, when the ANPP was decommissioned, our energy security decreased to 15%. In 1995, when the ANPP was re-commissioned, security increased to 60%. If the ANPP is decommissioned again in 2004-2005, we will have 15% security, and we will be on the brink of another crisis. It is clear that in a situation like this, no government or energy system would ever refuse to utilize a nuclear power plant. The issue is formulated in this way: the ANPP can be decommissioned only when we have an adequate number of resources to compensate for the absence of the ANPP. This is the formula that we use as the basis for our strategy.

By saying "energy security", one normally understands quite an elaborate plan. To compare it with other CIS countries, Armenia is both theoretically and practically ahead of the others. We have developed eight directions of energy security, including socio-political security, structural security, financial-economical security; fuel resources supply security, technological security, and so on.

Under socio-political security, we understand energy legislation, working with the public, and open and transparent activities of the Energy Commission.

Under structural security, we mean the creation of a market-oriented model for the energy market, in which accessible and equal working conditions will be ensured for domestic and foreign investors.

Financial-economic security is concerned with cash flows, without which it would be impossible either to rehabilitate the sector, or to develop it and introduce new technologies.

In order to ensure the security of fuel resources, the creation of strategic resources of fuel oil, gas, and hydro-energy is very important. The standards of the European Union specify having energy reserves for ninety days. We meet this requirement.

Moreover, we still have not given up on the idea of building a new nuclear power plant. This is not just a simple declaration: feasibility studies and other work are being carried out in this area.

The safety of technological modernization is another urgent issue, because our equipment is extremely outdated. We have to introduce new equipment as urgently as possible. There is another important factor here: currently, the average age of the people working in the energy sector of Armenia is

above fifty, and their knowledge is based on Soviet technologies and training. Now, the technological bases of all equipment have greatly changed. It is very important to have experts trained appropriately to deal with sophisticated technologies. Measures are being taken to meet this need, as well: in particular, significant changes are planned to take place in the educational system.

Economizing energy is another resource for energy security. The greater we economize, the less we import.

In terms of energy cooperation, we give a high priority to our participation in various organizations of the European region (such as the Europe Energy Charter, the BSEC, and others), that would help us defend our interests and ensure energy resources. We are linked to our neighbors by means of different lines, and this factor also has to be used, especially because we are in a better position in terms of energy generation than any one of them. Moreover, every one of our neighbors needs additional electric energy resources.

If we look at the long distances covered by Turkmenian gas to get to Armenia, it becomes obvious why the construction of the Iran-Armenia gas pipeline is important.

Armenia is also -- economically -- the most convenient transit country for the proposed Transcaspien gas pipeline. Turkmenian gas going through the Caspian Sea could pass through Armenia to get to Erzurum. Because of political considerations, it is planned to build the pipeline through Azerbaijan and Georgia, even though building it through Armenia would be the most cost-effective way. We have submitted these estimates to all stakeholders. Clearly, when we speak of the Baku-Jeyhan oil pipeline, Azerbaijan is in a position to set some conditions, because in the last analysis, it is its oil that is being delivered. However, in this situation, we are speaking of Turkmenistan's gas, for which Azerbaijan is only a transit country, while Turkmenistan may express its interest in selling some part of this gas to Armenia. It is not necessary to have the pipeline pass through Armenia. It could also pass through Georgia, because otherwise, Azerbaijan might completely reject the idea of a pipeline. Now that a large quantity of gas has been found in Azerbaijan, implementing this project has become more difficult for Turkmenistan than it would have been. There is another scenario for this project, in which Armenia is also designated to join the project.

We have developed some plans in connection with the oil pipelines passing through the region. If possible, we are capable of joining each one of them. In particular, we have been discussing the possibility of building an oil refinery and recycling plant at Meghree: raw material from the pipeline that passes parallel to the gas pipeline can be processed there. In any case, the implementation of oil projects in the region will require huge amounts of funds and a lot of time.

## QUESTIONS AND ANSWERS

*-Is the decommissioning of the Armenian Nuclear Power Plant conditional upon ensuring security in the energy system of Armenia? Are there specific plans and actions that Armenia is going to implement prior to declaring that it is ready to decommission the ANPP?*

-This is, indeed, a complex issue. Why does everyone speak about the year 2004? This year has become a playing card in the hands of participants of various international meetings. Firstly, we understand that we are a state, and we must fulfill our obligations. The year 2004 was first brought up in 1996. It was designated that before 2004, we would be able to

make necessary investments and have adequate diversification of energy sources. Unfortunately, no investments have been made yet, because an appropriate climate was not created in which the international community would provide support. Another factor is that nobody forced Armenia and its people to decommission the ANPP in 1989; we decommissioned it ourselves. Six and a half years later, we decided to re-commission the ANPP. Nobody should try to surprise us by telling us that the ANPP needs to be closed, because we know very well about all of the problems related to the ANPP. This is the reason why we set a clear goal when re-commissioning the

ANPP: the level of security in the ANPP would be higher than the designated level. Experts say that we have been successful in doing so. The international community has been supporting us greatly in increasing the security of the ANPP. The USA has provided a grant of 18 million US dollars to increase the level of security; the European Union has provided 11 million US dollars. In practice, the difficulty is that this work will finish during the current year.

Parallel to this, there is a clear formula: to de-commission the ANPP in 2004 or at any other time, we need to have diversified alternative capacity. Some may point at our thermal capacity, but it depends on the gas pipeline coming from the North. In this case, the level of security will be equal to that of the period from 1992 to 1995. This is unacceptable for us. Another source is the Iran-Armenia gas pipeline, which allows us to increase capacity, but it is not enough. We need an adequate amount of our own resources, and hydroelectric resources can fill this gap. When we have all of this, we may consider that the ANPP resource is generally designated to last until 2010. Meanwhile, we should know how much the de-commissioning of the ANPP would cost us, as well as what program and principles we should use to de-commission the plant. We are already working on this issue, and we have a clear plan.

*-You mentioned that after the Iran-Armenia gas pipeline is built, Armenia would become a transit zone in terms of energy. What directions and volumes are you thinking of? What sources are you expecting funding to come from?*

-Armenia was discussed as a transit country for energy resources (namely, gas) as early as 1995, when Iran was assessing the routes it can use to export gas to Europe. Studies have shown that the European market has practically no serious competition. In other words, it will not have any major problems with suppliers of gas, because the European market is quite large and tends to get larger. In this sense, Iran is being thought of as a possible observer in the project. This is a project of the EU. One of its objectives is to build new routes for gas and oil pipelines to Europe. Iran is also studying these possibilities, one of which involves Armenia. The first phase of the Iran-Armenia gas pipeline has several stages. In the other phases,

Armenia is not a direct participant: it is simply a transit country for the gas pipeline. This is a project to be discussed in some five to six years. Currently, we are only considering the first phase, during which we can build 41 kilometers of gas pipelines in our territory, while Iran will build 100 kilometers on its territory. In practice, we can finish this work in nine to ten months, and in a very short period of time, we will have a gas pipeline connecting us with Iran. Virtually all of the organizational matters have been resolved. We have three possible sources of funding for the construction of the gas pipeline in our territory. We are now negotiating to obtain the best.

There is an obstacle: the price of gas. When I recently visited Iran, I met with top level officials. I must say that both sides are in a compromising mode. This means that we should be able to find the way to a good solution. Our main argument here is that we have the CIS market, and pricing should be determined in accordance with this market.

*-Please, elaborate on the activities aimed at creating alternative sources of energy.*

-For several years now, attempts are made to implement various projects. In Armenia, this work is carried out in several directions. Our compatriots are providing financial support to study solar and wind energy. Monitoring is done by the administration dealing with aeolian energy. Later, it is planned to investigate solar energy. Activities in this area will be based on the private sector. The Government of the Netherlands has been providing support to this project. The involvement of the Japanese Government and the Marudeni" company in the Pushkin tunnel is extremely important. The administration dealing with aeolian energy has carried out a study there, and it has been decided to install a 15 MW wind station there. This work has been split into several phases; we are now working with the Japanese Development Bank to obtain funding.

The next area is geothermal energy. We are preparing to study the Azat-1 exploratory well (it has so far been used to search for oil). Water at a temperature of 75 degrees Celsius was found at 2400 meters. We shall continue our exploration to find thermal energy.

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