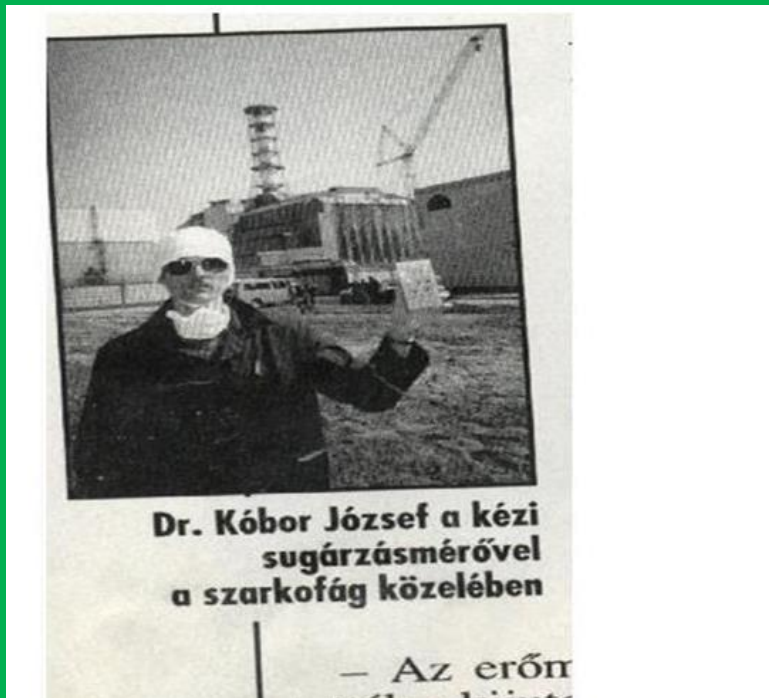


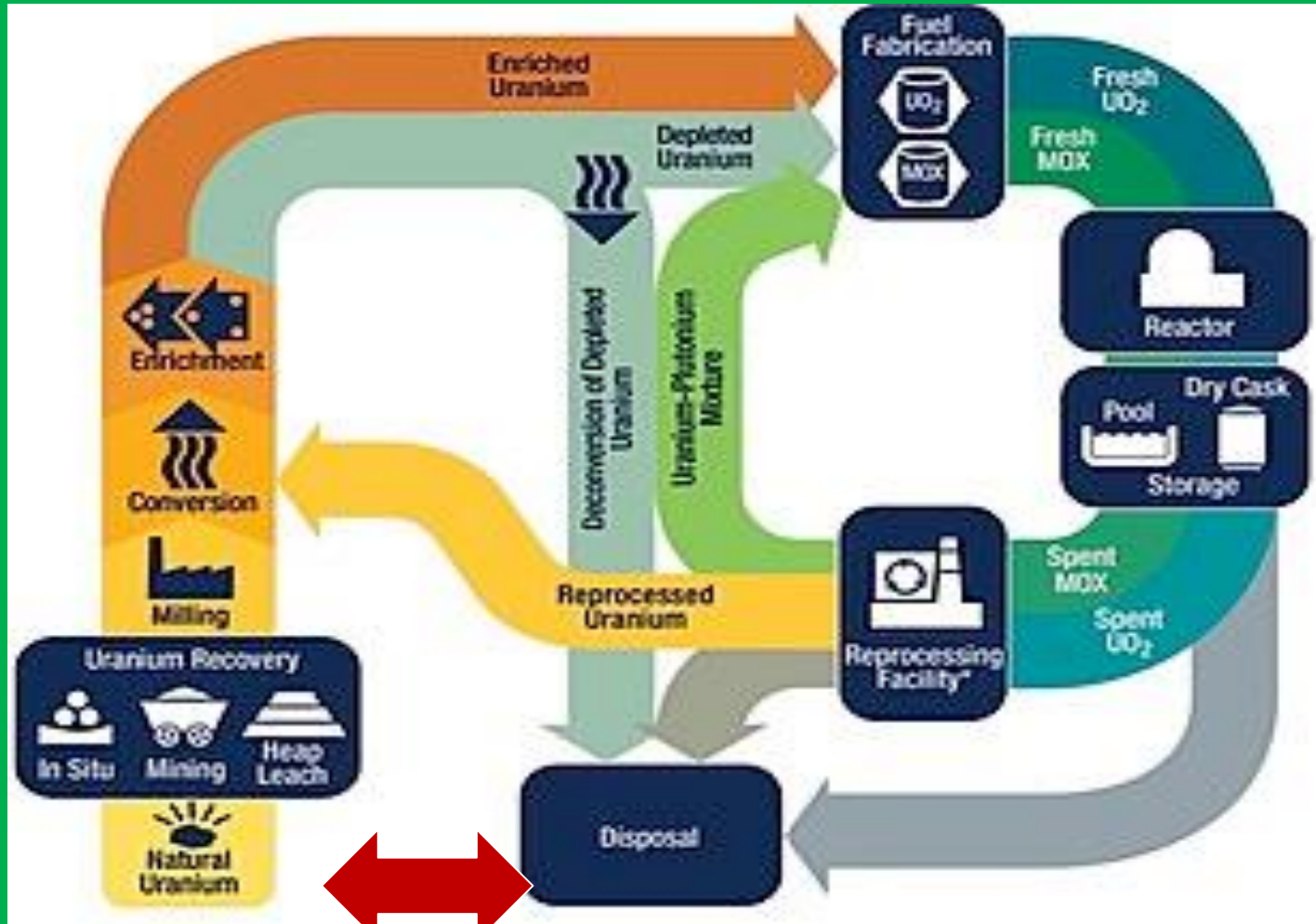


SITUATION HUNGARY

József KÓBOR, biophysicist, medical physicist, radiation safety expert



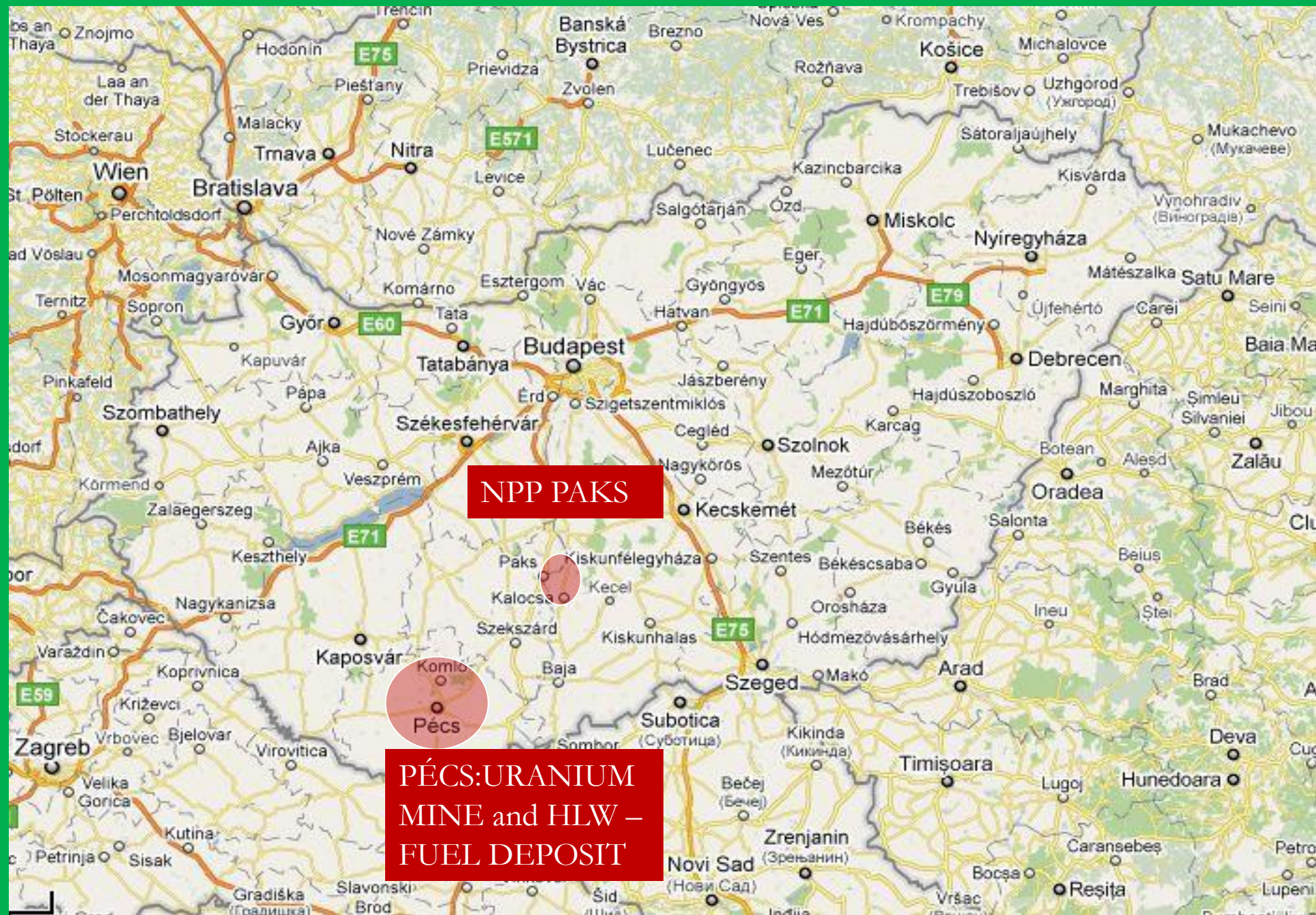
Nuclear fuel chain „nodes” in Hungary



NPP PAKS
←

←

CITY OF PÉCS, COUNTY BARANYA, SOUTH-WEST HUNGARY



NPP PAKS

**PÉCS: URANIUM
MINE and HLW –
FUEL DEPOSIT**

NPP Paks 1.



City of Pécs, 150000 inhabitants, „Capital of Culture Europe 2010” and now want to be the „Green Capital of Europe”



With uranium mine legacy, new mine projects and HLW and fuel depositing site projects..



13. January 2014 – Orbán-Putin Pact about Paks 2. NPP

Orbán-Putin Pact , January 2012



- The original Paks nuclear power plant (NPP) consists of two double blocks of soviet VVER 440 reactors which were built between 1979 and 1984. The originally 440 MW power output was upgraded to 500 MW. A serious incident occurred in 2003 when a cleaning tank (made by Siemens-Framatome) overheated and a lot of fuel rods shattered. The Russians finally solved the problem and the pieces of rods were shipped to Russia 1-2 years ago only, top secretly, presumably by air plane

- Orbán-Putin Pact (contracted in January 2014): part of a very expensive gamble.
- „Hungary has to be an energy exporter.
- Hungarian energy has to be the cheapest in Europa
- to make Hungary the most competitive.”
- – these were the ideological „catchwords“ made up for the population

- Moreover, given the reduction of public utility costs: electricity, gas (Russian import!), water, waste management (about 10-15%), the population was welcoming this policy. Meanwhile, there is no trace of energy efficiency and energy saving investments – except where the EU supports such things.

- The contract includes a 10 billion EUR loan over 30 years from Russia for two 1000MW-reactors with no payments due before 2023 when the reactors begin to work.

Nowadays Hungary got the actual amount of detail and then immediately repays it to Russia, of course, at a loss. Very good bussiness...

- Problems, contradictions:
- • A lot of secret pacts: LMP and some NGOs (ENERGIAKLUB), MEP Mr.Jávor make a lot of actions of law and are trying to get the details
- • Who will buy the energy when old and new reactors work together?
- • Environmental issues, particularly with regard to cooling of the new units – it is planned with Danube water, not with cooling towers
- • Political and security consequences
- • And last but not least: nuclear waste

The Eu. Commission announced on March 2017 that state aid would be accepted at Paks II if three conditions were met:

The Paks II. Co. cannot remain in the MVM group, Paks II must remain independent It is also necessary to separate the two companies so that the deficit cannot be spread within MVM if Paks II. would be unprofitable.

- The electricity produced there must be accessible to everyone on equal terms, and the electricity produced in the new blocks will have to be sold on the stock exchange.
- If it is profitable, the operating company will not be able to return profits to further development, just maintenance. The Russian loan will have to be repaid.

- EU managed Paks 2. as it was at Hinkley Point in England, (but those gone with Brexit)
- A lot of quality problem with Russian Rosatom planning and projects – as it is in Finland
- Political pressure to the Hungarian nuclear authority (HAEA) for exceptional accelerated procedure for licensing
- Until now practically nothing happened on the construction

News:

- Gouvernement commissioner Aszódi resigned
- officially recognized that the project will be delayed for one year

Former research, now radiopharmacology
production reactor in Csillebérc, Budapest.
2011: heavy ^{131}I release detected in more countries



Temporary LLW-depositing site at laboratories





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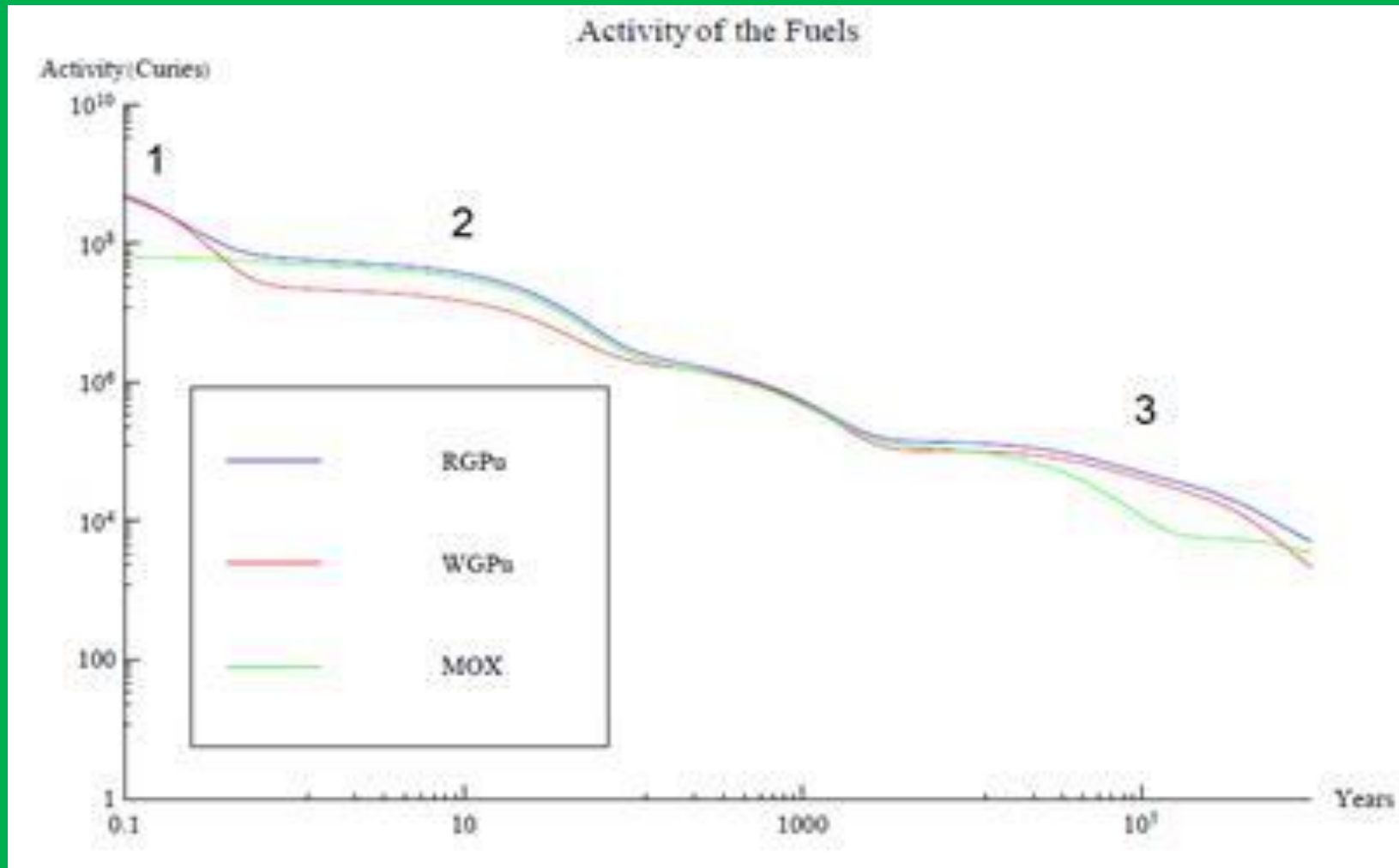
Nuclear fuel rods in zirconium envelope



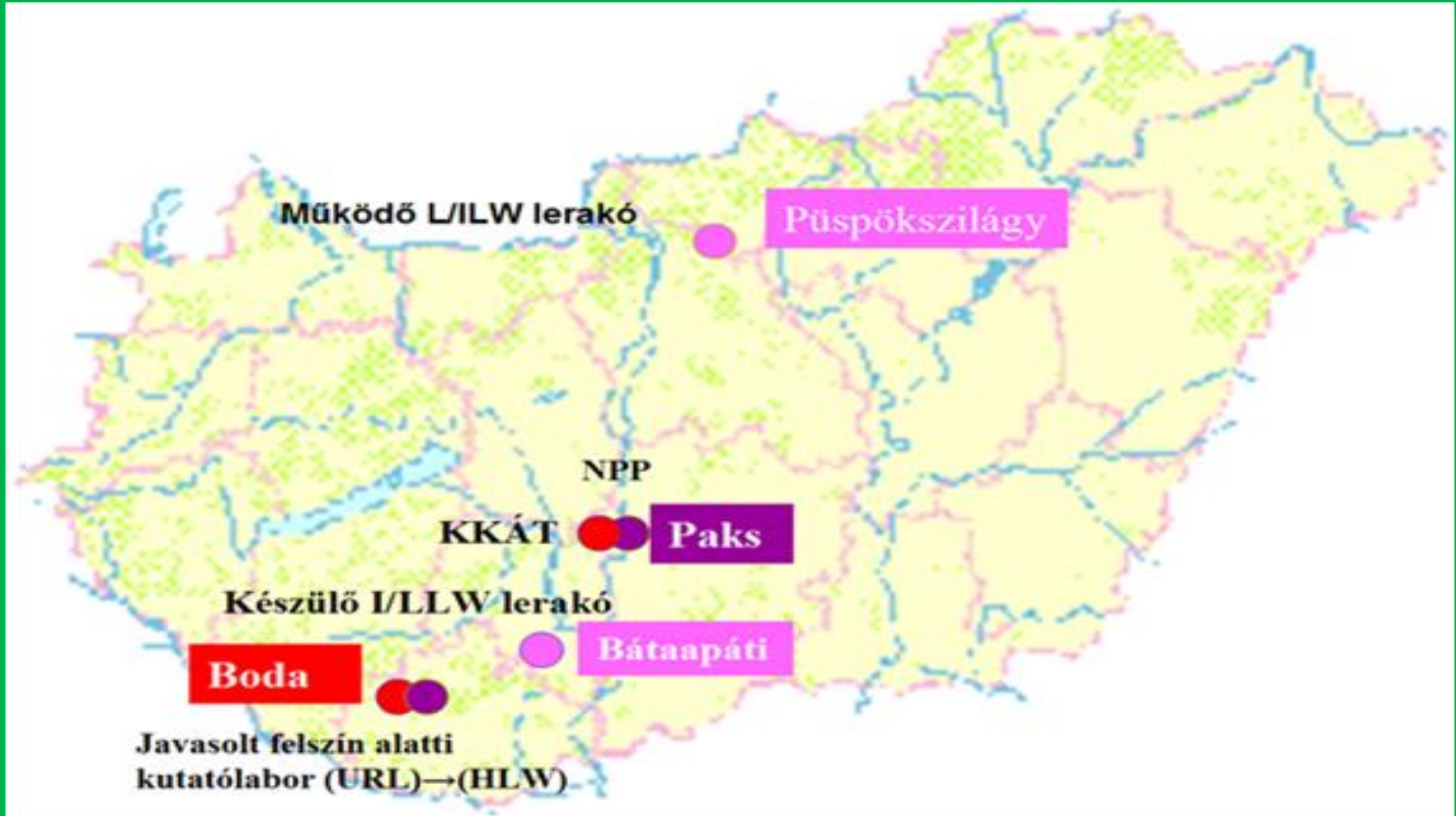
Temporary depositing site for nuclear fuel at NPP Paks 1.



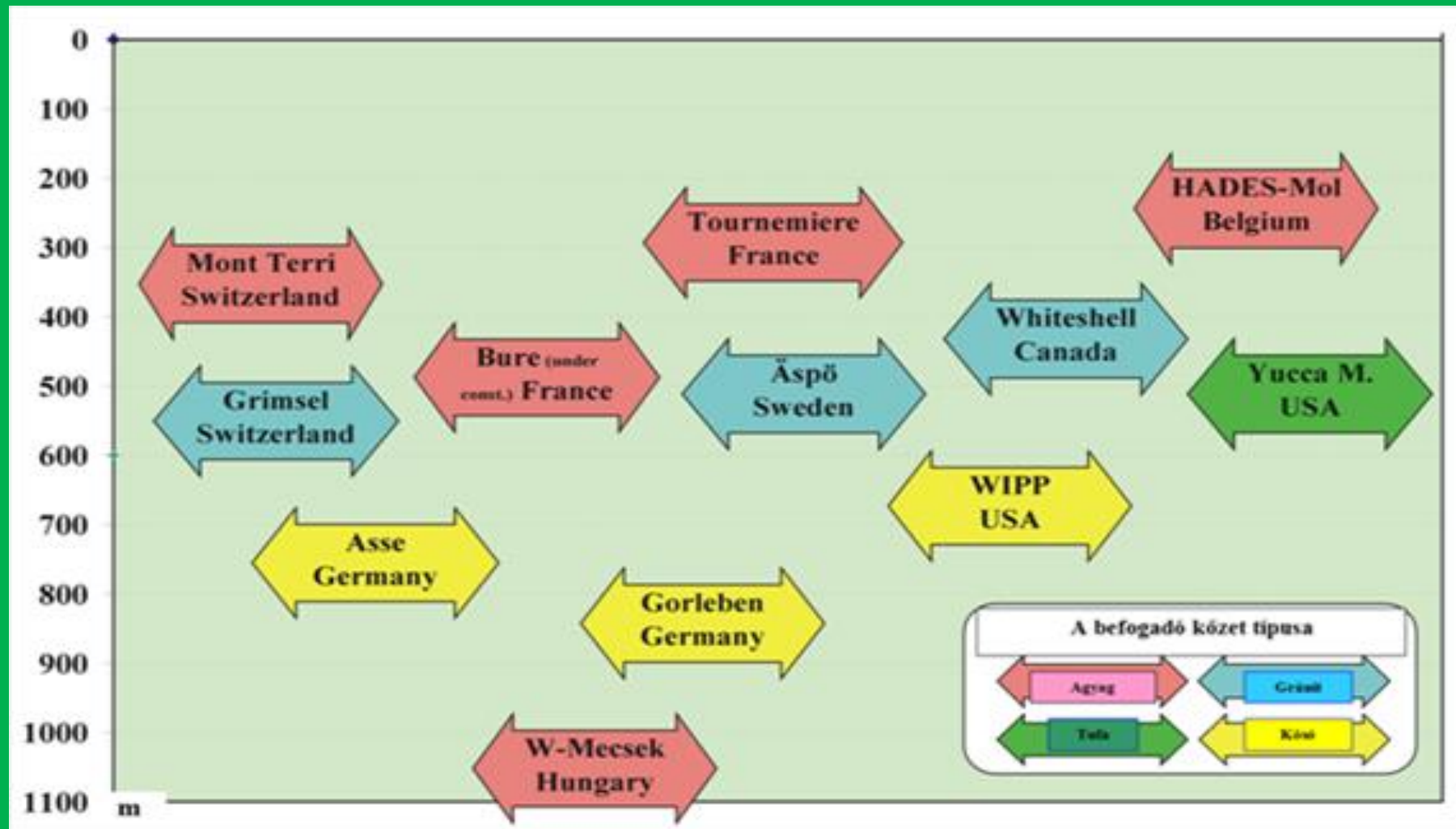
Decay of nuclear fuels on the time



Planned and acting radwaste depositing sites in Hungary



Planned deep depositing sites for HLW and fuel in the world



Bátaapáti, Hungarian place for LLW and MLW



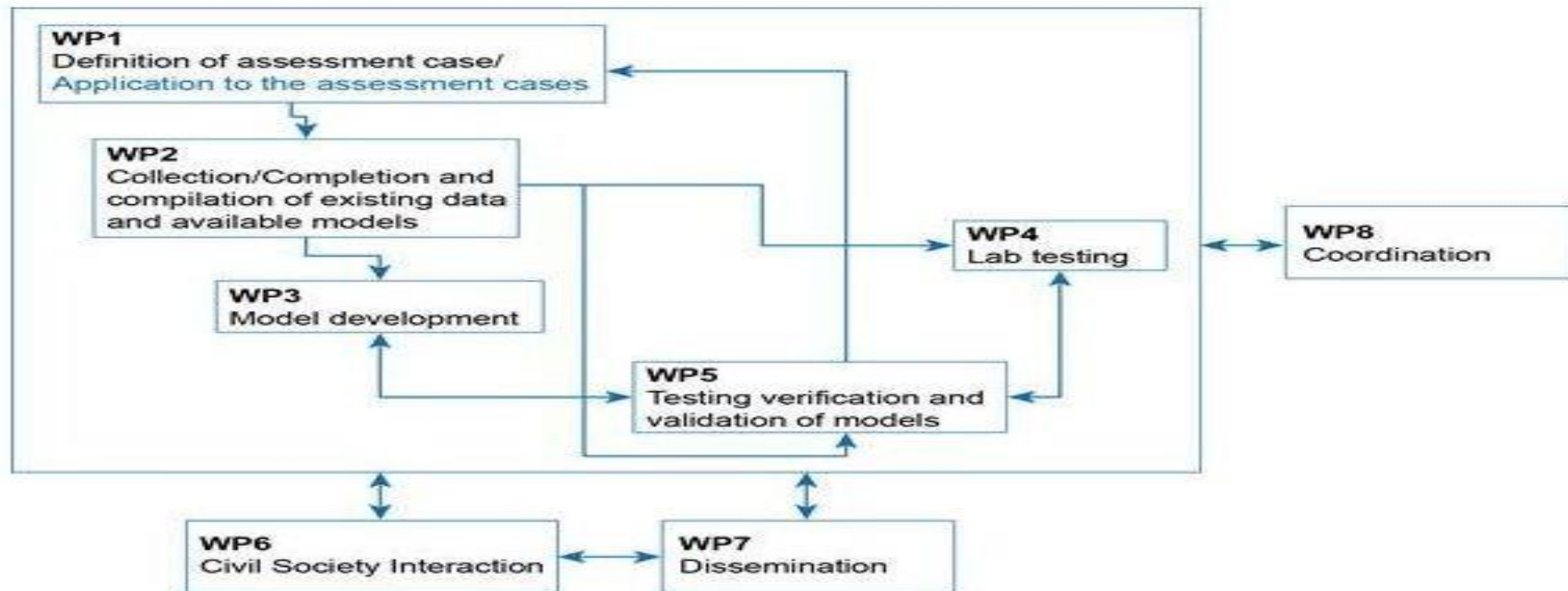
Demo at planned Hungarian deep HLW and fuel depositing site, village Boda (8 km from Pécs)



- International Nuclear Risk Assessment Group (INRAG) (Prof. Wolfgang Krompp)
- The JOPRAD Project: A step towards a Joint
- Programming on Radioactive Waste Disposal RD&D
- **(BEPPER Project, Nuclear Transparency Watch) Broad framework for Effective Public Participation in Environmental decision-making in Radioactive waste management**

- BEPPER: Energia Klub, Pécsi Zöld Kör
- Beacon („agyag”) project
- <http://www.nuclear-transparency-watch.eu/>

Beacon-project, part of the European Joint Project on Radioactive Waste Management. The WP6 is for independent expertise- but heavy attacked by atomlobby-people incorporated into the EU-officials



Edward Teller, former symbol and supporter of the Hungarian Nuclear „chauvinism”

“I was the only victim of Three-Mile Island.”

“On May 7, a few weeks after the accident at Three-Mile Island, I was in Washington. I was there to refute some of the propaganda that Ralph Nader, Jane Fonda and their kind are spewing to the news media in their attempt to frighten people away from nuclear power. I am 71 years old, and I was working 20 hours a day. The strain was too much. The next day, I suffered a heart attack. You might say that I was the only one whose health was affected by that reactor near Harrisburg. No, that would be wrong. It was not the reactor. It was Jane Fonda. Reactors are not dangerous.

Now that I am recovering, I feel compelled to use whatever time and strength are left to me to speak out on the energy problem. Nuclear power is part of the answer to that problem, only a part, but a very important part.

I have worked on the hydrogen bomb and on the safety of nuclear reactors. I did both for the same reasons. Both are needed for the survival of a free society. If we are to avoid war, we must be strong and we must help to generate the progress that makes it possible for all nations to grow and prosper.

And what is the greatest present-day threat to the prosperity and even the survival of nations? A lack of energy. Both developed and developing nations are threatened.

The citizens of the United States have just begun to recognize the impact of the world's growing energy shortage. Gasoline lines, electrical brownouts and higher prices are minor irritants. They are nothing compared to what may lie ahead. In a struggle for survival, politics, law, religion and even humanity may be forgotten. When the objective is to stay alive, the end may seem to justify the means. In that event, the world may indeed return to the ‘simpler’ life of the past, but millions of us will not be alive to discover its disadvantages.

When our existence is at stake, we cannot afford to turn our backs on any source of energy. We need them all.



Dr. Edward Teller was born in Hungary and educated in Germany. He came to the United States in 1935 and worked extensively on nuclear developments during and after World War II. He led the nuclear effort to ensure the safety of nuclear power reactors and to achieve clean power generation. In recent years he has concentrated increasingly on the world aspects of the energy energy shortage, and has argued the utilization of every possible form of energy. Active in various programs to explore peaceful uses of nuclear power, Dr. Teller is a Senior Research Fellow at the Hoover Institution, Stanford, California, and Professor Emeritus at the University of California.

Dr. Teller's newest book, *Energy from Uranium and Earth '80* (Plenum Press, A. C. Co.) traces the origin and development of energy from 15-billion years ago to the present day and to the future. Authoritative, amusing and easily understood, it is highly recommended to all who seek a balanced perspective on the energy situation.

Q. Can a nuclear reactor explode like an atomic bomb?

A. No. Energy cannot increase fast enough in the reactor. Therefore, it is absolutely impossible for a nuclear power plant to explode like a bomb. For this to happen, the laws of nature would have to be repealed.

Q. What is the risk of nuclear power compared to other forms of producing electricity?

A. It is far safer than coal or hydroelectric power, but all three are necessary to meet our need for energy. It may sound strange to say it, because coal has been around so long, but we know more about controlling radiation than we do about controlling the pollutive effects of burning coal. And, of course, a dam has no backup system to protect those who live below it. Indeed many of these people have lost their lives and more their homes.

Q. I live within 50 miles of a nuclear power plant. What are my chances of being injured by a nuclear accident?

A. About the same as being hit by a falling meteor.

Q. What about the effect of an earthquake on a nuclear plant?

A. At the first sign of a tremor, the reactor would shut down automatically. Also, reactors are built to withstand enormous structural damage. The only man-made structures I can think of that are more stable are the pyramids of Egypt.

Q. Is it true that we still have no satisfactory way to dispose of nuclear wastes?

A. No. Ways do exist. What we have not had is a decision by our government on which way to go. Waste disposal is a political problem, not a technical problem.

Q. How much radioactive waste materials are produced by nuclear plants?

A. At the moment, about 12 1/2% of our electricity is generated by nuclear power. If all of it were produced this way, the wastes from these plants over the next 30 years would cover a football field to a depth of about 30 feet. To dispose of this waste a mile underground would add less than one percent to the cost of electricity.

When it comes to generating electricity, we especially need nuclear power. Contrary to what Nader and Fonda, and their friends such as Sternglass, Wald and Kendall, would have you believe, nuclear power is the safest, cleanest way to generate large amounts of electrical power. This is not merely my opinion — it is a fact. Due to the lessons learned at Three-Mile Island, the nuclear way of generating electricity will be made even safer.

I have attempted to respond briefly to some of the questions which people ask about nuclear power. The problems that these questions raise are problems because of political indecision or public fear. Technically, they are non-problems, because the dangers they imply either do not exist or else we have the know-how to solve them. I am absolutely convinced of this, after a lifetime of work as a nuclear scientist.

I was once asked how I would like for my grandson, Eric, to think of me and my life's work after I am gone. Eric is nine years old. He is a terrible guy — he beats me at the game of “GO.” I am enormously fond of him, but I have not given much thought to what he will someday think of my life's work. I have given a great deal of thought to whether he will be alive in the next century, and whether he will be living in freedom or in slavery. If he is living under communism, he will know I was a failure.

I believe that we have reached a turning point in history. The anti-nuclear propaganda we are hearing puts democracy to a severe test. Unless the political trend toward energy development in this country changes rapidly, these may not be a United States in the twenty-first century.

The President has recognized the danger of the energy shortage. As yet, he has given only some of the answers. I think — I hope — that democracy has enough vitality to evaluate the risks and to recognize the great benefits of nuclear power to human health and well-being, and to the survival of our free society.”

Q. How dangerous is the release of low-level radiation from a nuclear power plant?

A. If you sat next to a nuclear power plant for a whole year, you would be exposed to less radiation than you would receive during a round-trip flight in a 747 from New York to Los Angeles.

Let me put it another way: The allowable radiation from a nuclear plant is five meems* per year. In Dallas, people get about 80 mremms per year from the natural background of buildings, rocks, etc. In Colorado, people get as much as 130 mremms per year from the natural background. Therefore, just by moving from Dallas to Boulder you would receive ten times more radiation per year than the person gets who lives next to a nuclear power plant.

Q. How much radiation were the people around Three-Mile Island exposed to during the accident?

A. Let me put it this way: Your blood contains potassium 40, from which you get an internal dose of some 25 mremms of radiation in one year. Among the people not working on the reactor, a handful may have gotten as much radiation as 25 mremms.

Q. Should “spent” nuclear wastes be reprocessed to save the plutonium and other by-products?

A. Yes. Plutonium, for example, is as valuable as the original uranium fuel, because of its potential use to produce still more energy. In the end, reprocessing is needed to make nuclear energy abundant and lasting.

Q. Is there a danger that the plutonium produced by nuclear reactors might be stolen by terrorists and used to construct homemade nuclear explosives?

A. I believe that reactor products can be properly safeguarded from terrorists. This can be much more easily done than the guarding of airplanes. Also, any terrorist who puts his mind to it can come up with ways to terrorize a population that are less dangerous to himself than handling plutonium. The answer is not to get rid of the reactors — let's get rid of the terrorists.

Q. Will the expansion of nuclear power by other countries enable them to produce nuclear weapons?

A. Unfortunately, yes. This is already happening. Two-thirds of the reactors in operation in the free world today are outside the United States. Since we can't stop other nations from building nuclear plants or weapons, what we must do is find better solutions to international problems. An energy-starved nation is much more likely to make and use nuclear weapons as a last resort to survival. The only way to prevent that is to see to it that there is enough energy to go around, and to strengthen cooperation and confidence among the nations.

Q. What have we learned from the accident at Three-Mile Island?

A. Two things. First, that nuclear reactors are even safer than we thought. Despite many human errors and a few mechanical failures at Three-Mile Island, the damage was contained. No one was killed, or even injured. We have also learned that a lot can be done by better educated, better paid and more responsible reactor operators, and by a more efficient display of the state of the reactor by modern instrument panels.

Three-Mile Island has cost \$500 million, but not a single life. We must pay for safety and, even after we have paid for it, nuclear energy is the cheapest source of electrical power. It is most remarkable that in the case of nuclear energy we are paying for our lessons in dollars, not in lives.

This message sponsored by a group of companies and organizations concerned with the future of nuclear power in the United States. It formerly appeared as an advertisement in *The Wall Street Journal* sponsored by *Dresser Industries, Inc.*

Homepage of the independent university environmental radiation measurement network

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