

## **Ukraine's tears for Estonia's nuclear future**

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On the 9th of February 2021, just one month after my arrival to Estonia as an intern for the environmental NGO Estonian Green Movement, I attended something that I would think to be inconceivable in 2021 in a modern, advanced country. Fermi Energy Nuclear Energy Conference "Leading the force" was a six-hour long sequence of men and women in their expensive, formal suits talking about Small Modular Nuclear Reactors as if these were the remedy to all the evils in the world.

Kalev Kallemeets, Fermi Energia's CEO talked about nuclear energy as the way to power ventilators for saving Covid-19 patients, as the way not to be cold in winter. He even used the common wound of past invasions of Estonia to wake up nationalism in people and convince them that nuclear energy is the best and in fact only solution for the country. All of these words have been meticulously chosen to exercise psychological pressure on people's minds without them even noticing. Those words aim at the pain of those whose beloved ones are lying in a hospital relying on a ventilator to survive. They aim at those, who for a chain of unlucky consequences feel cold and at those who lost someone or something in the dark history of Estonia.

Rafael Grossi, the Director General of the International Atomic Energy Agency, said a phrase on stage that slapped me like a cold, sharp, bitter-tasting dagger. "The world needs more nuclear power". The world does not need more nuclear power and more potential pain, illness and sorrow provoked from it. It needs real, renewable and sustainable solutions. Nuclear power plants, even the still theoretical ones, are none of these things.

My home country, Ukraine, is in the 10<sup>th</sup> place in the world for most nuclear reactors. Maybe for Estonians words such as "radiation, nuclear power plant, dosimeter" are not part of their active vocabulary. For me, these are words I have been hearing since my most tender childhood. Coming from a town that is just 17 km away from Europe's biggest and the world's 7<sup>th</sup> biggest nuclear power plant (The Zaporizhzhia Nuclear Power Plant situated in the city of Enerhodar) those were words I knew the meaning of from a very young age.

My country has sadly become notorious because of the world's worst nuclear accident, known as the Chernobyl disaster. Because of this nuclear accident the health of millions of people not only in Ukraine but also in Belarus and other nearby countries has been affected. Radiation is an invisible enemy that can affect a person without giving any warning. It does not have a smell, nor a taste, it feels like nothing and it is an invisible, deadly, slow killer. Today Ukraine must still deal with the dangerous radiation threat caused by an accident that happened almost 35 years ago. It also has to deal with the exclusion zone, an area that will stay uninhabited for decades to come. In early 2020, big fires in the exclusion zone covered Ukraine's capital with black, thick dust and raised the radiation level. It is like a deadly pandemic that can come around anytime and from which you do not have any chances to escape.

Certain health concerns are more common in Ukraine than in other countries and they are proven to be the result of radiation. Among others, an important number of cancers and issues of the blood and vascular system. Even still today, in 2021, an important number of children in Belarus and Ukraine are born with malformations that are proven to be due to radiation. It

is not uncommon either, that a Ukrainian or a Belarussian is born with very soft teeth and bones, or with a weak immune system. These symptoms have been studied extensively. 1,2,3

When the accident of Chernobyl happened, my mum was a student in Kiev's university, situated only about 100 km away. The radiation coming from the exploded nuclear reactor core was so strong that the whole capital should have been evacuated. But this did not happen. The people have not even been warned about how dangerous it was to go outside, to eat fruit, vegetables, bread. My mum remembers how on the 1st of May 1986, she and her friends went to a big, beautiful parade to celebrate the International Worker's holiday. The day was sunny and warm and crowds of people invaded Kiev's streets, waving Soviet flags, laughing, enjoying life. No one knew that they were poisoning themselves with an unimaginable dose of radiation. No one knew what had happened a few days before. And no one knew that the first liquidators of the accident were dying of radiation sickness having their bodies decompose while they were still alive.

The radiation had results, years later. My older sister was born with a very weak immune system and a chronic cough. After her, my parents had a second daughter, who died only 8 months later, because of a congenital heart defect often also called "Chernobyl heart". Finally, me, 8 years after the accident, I was born with a cleft palate. The first few years of my life were determined by difficult, long operations to rebuild my palate and afterwards to learn how to pronounce certain sounds. My mum's best friend also had children. Her older daughter had a breast tumor and her youngest son was born with a congenital "Chernobyl heart" as well. My dad was almost 800 km southern than Chernobyl but since the accident he has strong, regular, unexplained headaches and a poor immune system. One of his best friends died very young because of, again, an unexplainable dysfunction of his immune system.

All of this is not only about my family, this is about a whole big nation. About people who were born many years before and many years after the accident. Everyone in Ukraine and Belarus has someone who has health issues because of radiation. Young people die from easily curable diseases because their immune system fails to protect them. Headaches, cancers, soft teeth and bones, difficult pregnancies, malformations and cardiovascular illnesses. If you do not collectively stand against Small Modular Nuclear Reactors, this will be your likely future in Estonia. With proposed designs of small nuclear reactors unveiled at the Fermi Energy conference that prioritize low cost over high safety, and the idea of building multiple reactors close together and right next to them the spent nuclear waste storage sites, the probabilities for a catastrophic failure approach near certainty. The possible radiation somehow released from the plant is still the same type as in Chernobyl, even if the plant itself looks more modern.

Throughout the Fermi Energia's conference it was often said that the SMRs are safe, nothing disastrous can happen to them. Everything in life turns around risks and uncertainty. Of course, taking risks can sometimes pay back and under certain circumstances risks can lead to innovation. However, one needs to genuinely analyze and estimate the risks and being aware of the consequences if something does go wrong due to a technical, human or unforeseen errors. Are Estonians ready to experience the stress and worries connected to a nuclear accident? Also, what does the word "safe" mean? For instance, "Safe" in a medical environment is not a synonym of harmless, it is an indicator that the medicine does more good than it has side effects. So we should think of what "safe" means to all of us and of what it might mean for a small modular nuclear reactor that has never ever been built elsewhere in

the world. One of the main reasons for the Chernobyl disaster was the experiment that was being led on the night of the 26th of April 1986. Isn't an SMR an experiment as well considering that it has never been physically built and observed over a longer time period?

During my first train ride from Tallinn to Tartu I saw endless forests, so powerful, beautiful, alive, rich. Are you really willing to risk it all only because rich businessmen want, at all cost, to build their experimental SMR and make money out of it? And they themselves claim that they do it in order to protect these same forests from being burnt for electricity, lying as if no third alternative exists. At some point in history, when nuclear energy had first been invented and power plants built, people were enthusiastic about it. At the inauguration of the Zaporizhzhia nuclear power plant people clapped their hands. Everyone in my city thought that this was a huge growth opportunity, a great chance, because now we had a huge power plant and we would not know electricity cuts anymore, people would have jobs and a bright future would wait for us. Let me tell you, that unfortunately, these hopes have not been fulfilled. We still experience energy cuts, because nuclear energy for sure does not prevent trees from falling on power lines, nor help against other extreme weather conditions that result in energy cuts. This year, the government decided to cut subsidies for people living near nuclear power plants. Electricity in my city now costs a couple of times more depending on how much electricity you use. The nuclear power that was meant to forever provide us with fair prices for electricity is now being sold to rich countries because they pay way more than ordinary, working Ukrainians. Estonia too is a part of the Nord Pool Electricity Market, so any claim that the nuclear businessmen make about providing energy exclusively for Estonia is simply false and can only apply to big nearby industries.

We, normal, modest people in Ukraine, have been put into a trap in which business is more important than our children being sick and than our elderly giving away 2/3 of their pension to have some light in the evening and a minimum of heating during our cold winters. What was thought to be an innovative, ingenious solution happened to become one of our biggest enemies. And what was once a forest planting, is now a temporary nuclear waste storage site. Nuclear power plants all seem to be so peaceful, silent, modern but some of them brought huge damage not only to nature but also to people, changing their lives significantly. Radiation does not only affect the one nuclear power plant, it affects the nature around it, the fruits, the vegetables, the animals, the soil, the water and most of all, it affects you. Every nuclear reactor, even an SMR, is a potential small Chernobyl. Radiation is an invisible, lethal, slow killer no one can escape from.

***And if a person is mortal, then "hot particles" are immortal. A person will die and in a thousand years will turn into earth, into dust, and "hot particles" will live. And this dust will be able to kill again...***

### **Chernobyl Prayer, Svetlana Alexievich**

My hometown has beautiful trees, flowers, parks, a huge, fresh river with different types of fish swimming in it. But all of it is deceiving. After the Zaporizhzhia Nuclear Power Plant was opened and after a nuclear waste site was created near my hometown, the beautiful nature became potentially dangerous. When my parents were young and before the nuclear power plant was opened, the river in my city was so clean that you could drink from it without any worries. Now, in Summer, when the temperatures rise, we can't just thoughtlessly go to swim

in the river because when you swim, you might swallow some water by mistake. Of course, swallowing water in which the power plants on the other side of the river poured their wastewater is not the best option for your health. For the exact same reason, it can also be dangerous to eat the fish that comes from the river. We also usually never go to pick mushrooms because they are in direct contact with the soil and the soil absorbs a huge amount of radiation. I have heard that picking mushrooms is also very popular in Estonia. Would you eat mushrooms that grew near a nuclear power plant or over nuclear waste, knowing that they most probably absorbed a lot of radiation? If you really love mushrooms you might not resist the temptation and give it a go, but do you really want to play at the Russian Roulette?

People who live near nuclear power plants live in fear. Some time ago a big thermal power plant situated near the Zaporizhzhia Nuclear Power Plant started to burn. The fire and smoke that could be seen on the other side of the river were huge and no one could go to bed because people's hearts were filled up with dark thoughts. A very somber atmosphere invaded our city on that night. People were thinking about their children, their parents and grandparents, their jobs, schools, houses, belongings. They were smelling the smoke, looking at the huge flames. They were thinking that it is over, that they will have to leave their homes and evacuate the whole city to leave for an undefined destination and future. They did not know what was going on on the other shore of the Dnipro, but they knew that history could repeat, and that our city could become a second ghost town where instead of couples walking hands in hands, children running and laughing, there would be desolation, emptiness, pain. Do you really want your heart to race fast every time you notice smoke tens of kilometers away?

Do you know the feeling of coming back home after having been gone for a long time? You are full of joy and you wait for your bus/train to finally arrive at your station, slowly feeling the excitement rising. You think of your home, of the ones you left behind and you unintentionally smile because you will finally hug them again. You think of all the places you will go to. Of the streets on which you grew up. You will eventually arrive, hug your beloved ones and walk on these streets again, having so many memories coming back into your mind. It will be like a time travel giving you a sweet feeling of happiness. Now imagine, that something horrible happens in your usual daily life. That an evil, toxic, radioactive cloud covers up your dear home, city, forest, that it spreads in your river and in the air. Imagine that every breath you take in what once was your home might bring you nearer to death, sorrow and illness. That instead of going to work, school, you will be put into big black buses with just a suitcase for the most essential things and you will be brought to some other place. An unknown one, where you do not have anything. No home, no friends, no family, nothing you are familiar with. Just a grey, ordinary stranger city. And imagine that you will never be able to go back home. Never. Under no circumstances. And all of your memories, feelings, old photographs, and birthday cards will remain there, like a kind of a museum of your past life. You will have to build up everything again. And for what exactly would these sacrifices be made? Bad health, polluted nature and high electricity prices? This can happen in Estonia too, as no complex system is 100% safe, yet some are extremely destructive. Ukraine already has years of painful experience. Estonia does not, yet.

Today it is not much different from what it was in 1986. It only became worse, as the soviet mentality of secrecy has been substituted with the profit motive of growth capitalism. The climate is changing so fast that we do not even have time to adapt to it. Extreme weather conditions are becoming a norm, just think of what happened in Fukushima, think of the

hurricanes and storms. I've also read scientific papers claiming that the Baltic sea is potentially not as calm as people often assume. How could human beings build something that can resist nature's growing fury?

Almost all of my family members have had, or still have, health issues related to the Chernobyl disaster. And this can be said about most Ukrainian families. Nuclear power is my pain, it is my operations, it is the pain of my country and my people. Do not multiply this pain in your beautiful Estonia. Take care of it, love it and do not let rich businessmen decide for your future. Much simpler, safer and cheaper solutions exist.

Scientific sources:

1. World Health Organisation. "1986-2016: Чернобыль 30 лет спустя. Последствия Чернобыльской аварии: новые оценки медицинских последствий". World Health Organisation. 2016. Date of consultation: 17.02.2021. URL: [https://www.who.int/ionizing\\_radiation/chernobyl/30-years/ru/](https://www.who.int/ionizing_radiation/chernobyl/30-years/ru/)
2. Pivovarov, Alexander. "Radiation Risk and Possible Consequences for Ukrainian Population". International Nuclear Information System of the International Atomic Energy Agency. Date of consultation: 17.02.2021. URL: <https://inis.iaea.org/collection/NCLCollectionStore/Public/37/101/37101568.pdf>
3. Oncology. "Воздействие радиации". Date of consultation: 17.02.2021. URL: <http://www.oncology.ru/specialist/prophylaxis/radiaton/>