The visible aspects of Elektroprivreda Srbije-EPS's activity are obvious: everyone gets a bill for electricity, still relatively cheap and available in most of the territory. Notice that many of the objections that people have to EPS would be completely valid – or not – solely on the basis of this, visible part. For example, we can ask ourselves whether the policy towards irregular payers is correct; or whether, contrary to what is expected and reasonable market behavior, large consumers should receive a discount on the tariff and not be penalized as is the case now. However, it all refers to the visible part.

What do we have in the invisible? First of all, what is not officially a secret, but it is not exactly talked about, and that is that the losses from the Serbian electricity network are huge, between 13.5% (lower officially recognized limit) and over 30%. It is a frightening inefficiency, one part of which is a consequence of obsolescence and inadequacy of technology, but to a large extent also a consequence of pure crime, corruption and theft of electricity in various ways, incl. setting maximum limits on measuring transformers for large consumers. However, this is not seen in the official data of EPS and EMS (Electric Networks of Serbia) and local electricity distribution companies. However, far greater and far more dangerous invisible damages are a consequence of what from the chimneys of EPS plants such as the thermal power plant "Nikola Tesla" in Obrenovac, thermal power plants Kostolac A and B, etc. exits.

## What do we see in the air in Serbia?

This is symbolic in more than one sense, given the fact that we usually do not see air pollution… except when we see it, in Belgrade, Valjevo, Uzice and many other places where, due to the geographical configuration of the terrain, extreme concentrations of smog appear, which then it becomes visible due to the scattering of photons by aerosols. At the same time, of course, some of the key toxic components are invisible and we should be aware that they are present even when visible smog is not even in sight. One of these is radon, an odorless and tasteless radioactive gas that accumulates in the soil as a product of the decay of long-lived radionuclides and is especially present in coal deposits. Radon is what makes – extremely ironically, given the public paranoia about radiation – the radioactivity near thermal power plants (e.g. in Kostolac or Obrenovac) be significantly higher than it is near nuclear power plants in regular operation (e.g. Bulgarian Kozloduy or Slovenian Krško). Radon is the second most important cause of lung cancer, after tobacco smoke. It is particularly insidious, as it is not in itself toxic in the classical sense to bind to biologically important molecules, but the products of its radioactive decay – which, depending on the isotope, occurs on a time scale from a few hours to a few days – are heavy

metals like lead, which, once they enter the body, adhere very strongly to the membranes of internal organs, especially the lungs.
Mass spectrometry of air pollution in Valjevo, initiated by Vigor Majic, director of the Petnica Research Station and probably the most valuable man in the field of education in Serbia, reveals many more things: strontium, barium, mercury, molybdenum and many other chemical elements, practically the whole periodic table. The presence of even very exotic elements, such as gallium, thorium and uranium, is astonishing – of course in very small concentrations; however, these are elements that you do not want at all in the lungs, in any concentration. Of course, all this is with the addition of "standard" poisons such as sulfate droplets – or climate-hazardous substances such as CO2. All these things are literally invisible to the naked eye (when they become, then it is usually too late), and they are especially culturally invisible, politically invisible, and unfortunately, to a large extent, morally invisible. And accordingly, as an invisible damage of Bastia's breaking of the window, they are mostly ignored. But, it is important that when you go to the EPS site, the first thing you see are huge bold letters that shout all over the screen: TRADITION. It's like an archeological museum or a cultural and artistic society, and an energy company.

## It all starts with burning coal

The origin of most of these EPS poisons is, of course, coal burning. This is probably the tradition to which the propagandists of the energy monopoly intrusively refer. Coal is the ultimate source of between 55 and over 70% of energy in Serbia, depending on whether we count only electricity or primary heating and small fireplaces (official statistics are very indicatively inaccurate – which is also the tradition of authoritarian systems). In general, coal in general, and dirty lignite in particular, is the source of a whole range of toxins with the fact that it emits a huge amount of greenhouse gases. There is no serious justification for using it as a fuel in the 2020s any more than there is for the unhealthy practices of previous centuries such as letting wastewater flow freely through the city streets. This practice has been "established" in urban areas around the world – and has certainly been the cause of millions of deaths, from diseases such as cholera, dysentery or amoebiasis, or from direct poisoning.

## Why is Serbia third in the world in terms of coal consumption per capita?

Before that – why are we talking about this at all? Well, because, unfortunately, the dominance of low-quality lignite in the domestic energy sector has been built for too long and every trend of that kind has a great inertia, and in our country, the dependence on coal

has taken on well the elements of pathology. Let's look at a relatively similar European country, for example Slovakia. Slovakia has a slightly smaller population than Serbia, but according to data for 2018, due to more developed industry and infrastructure, it consumes a very similar amount of energy (29.4 TWh compared to 33 TWh in Serbia, a relative difference of 10.9%). However, CO2 emissions differ much more: 31.63 million tonnes versus 44.79 million tonnes, which is a far larger relative difference of 29.4%, even if we accept Serbian official data sent to the intergovernmental climate change panel, which has been repeatedly criticized for "hairdressing". The real difference is probably much closer to 50%. But the share of coal in the energy sector of Slovakia has dropped from only 17% in 2019 to only 17%, thanks to an active program of using nuclear energy, and this country is today in absolute terms only the 43rd consumer in the world. In contrast, Serbia is the 18th largest consumer of coal on the planet, and when you look at the amount of coal consumed per capita, our country emerges in a shocking third place! (All data can be found here, here and here.)

## Arguments for and against the closure of thermal power plants

The economic argument against phasing out thermal power plants and switching to healthier energy sources is based on the allegedly very high price of alternatives. But at the same time, it is based on anti-Bastian delusion and seeing only what is visible, even obvious: the price of building new plants and closing existing lignite mines and thermal power plants. At no point did Serbian energy bosses or other proponents of the status quo offer an attempt to act in accordance with Bastia's theorem and to introduce costs that are not visible. Ie. they are not visible economically – in health care, for example, they have been visible for a long time, since we have long been positioned at the top of the relative mortality rate from cancer, chronic obstructive pulmonary disease and other diseases caused by air pollution. It should be noted that the highly regulated (therefore, non-market) price of electricity – if we are talking about thermal power plants – is almost completely separated from any long-term effects, not only those related to pollution, but also those related to environmental protection in a broader sense (e.g. terrain remediation), transport, agriculture, etc., even archeology and tourism. To give just two examples: (i) when it is said that "lignite electricity is cheap", due to the short time horizon, averaging over the entire operating cycle of thermal power plant use or the use of a specific lignite reserve is not taken into account at all. Because, if that were to be done, then it would have to be accepted that there are huge still invisible costs of safe decommissioning of the thermal power plant, as well as dismantling of the railway that serves the thermal power plant, remediation of deposited

slag, etc. etc. Does anyone imagine – has he ever imagined – that thermal power plants can operate for centuries or thousands of years? Does EPS have a dedicated remediation fund, like analogue companies in many other countries? (ii) Viminacium, a famous archeological site from the time of ancient Rome, is located in the immediate vicinity of TPP Kostolac – which can be seen on it, because the emission of various pollutants, especially sulfates, leaves traces on the ancient stone. Therefore, by saving electricity in the short term (visible), we reduce the value of the historical heritage in the long term, and thus do not take into account opportunity losses in tourism, catering, traffic (invisible).
So, one of the budget examples should contain the following items:
– (loss of human years of life) x (price from actuarial tables);
– (loss of working hours due to sick leave) x (price of working hours, integrated by profiles);
– (costs of excessive therapies and medications) x (expected number of additional patients compared to the situation in which there is 100% clean energy);
– (price of coal logistics – price of some other logistics, for example nuclear or wind farms) x (amount of energy produced);
– (cost of land surface remediation per unit of energy produced averaged over the operating cycle) x (area of power plants) x (amount of energy produced);
One may complain about putting monetary value on years of human lives. Without entering into the inherent ethical correctness of such a procedure, otherwise standard in the serious insurance industry, incl. and health insurance, it is enough to ask ourselves a key question: is it better to include human lives in the budget, even in that imperfect way – or not to count them at all? Because, people will get sick and die from air pollution regardless of the techniques of our budget; and the only ones who find it difficult to make the calculation difficult and dilute it with soul-caring manipulations are the polluters themselves.
Source: talas.rs