

Nikola Tesla is a national hero in Serbia. Although he was born in what is now Croatia, Serbs still recall the day in 1892 when the scientist made his first, and only, visit to Belgrade, the Serbian capital. But it feels like he's never left. Today, there is a Nikola Tesla museum in the city — you can see a Tesla coil in action there right next to Tesla's Baptism certificate — the international airport is named after Tesla, and 40 kilometers upstream from Belgrade, along the river Sava, lies the biggest power plant in Serbia — named TPP Nikola Tesla, of course.

But while Tesla the scientist was often ahead of his time, the eponymous power plant is old-fashioned. Much of Western Europe is busy adopting wind, solar and other renewables, but coal still rules here and elsewhere in the East, where there aren't always the political and financial resources to make large changes to the power-generation base. Although Serbia, the Czech Republic and other countries are working on reducing emissions of gasses like NO<sub>x</sub> and SO<sub>x</sub> that cause acid rain, the reality is that coal is still the cheapest option. "Coal generates over half of all electricity in Central and Eastern Europe," says Adi Roesch, Central European general manager for GE's Power Service business.

Given that the ratio won't budge until renewables projects like a planned 300 million euro wind farm in Serbia switch on in 2018 and 2019, power companies are looking to modernize their existing plants and make them cleaner and more efficient.

The upgrades at Mělník 1 helped the plant run 1.5 percent more efficiently. That might not sound like much, but for every 1 percent increase in efficiency, a 10,000 MW plant reduces its carbon dioxide output by approximately 2 percent and lowers fuel consumption by 67,000 tons of coal per year.

GE is now set to launch a similar upgrade at TPP Nikola Tesla. Later this year, the company will install a new generator — the largest ever installed in Serbia — and retrofit the plant's fourth steam turbine with blades that are far more precise than previous models.

The upgrades will help the plant operators increase power output, reduce operational and maintenance costs and lower the plant's carbon footprint through less coal consumption. The technology will help operate the plant at highest availability, efficiency and reliability levels as it is contributing a secure energy supply to help match Serbia's needs.

GE is working on similar projects in Plomin, Croatia, and near Warsaw in Poland. Such upgrades should help these Eastern European countries meet the standards of the Paris Agreement, which they all signed on to last year, while they slowly transition to more environmentally friendly energy sources.

While hardware upgrades can increase the raw amount of immediate power generated by the plant, new software and predictive analytics can help utilities increase efficiency by reducing maintenance downtime over the long term. That's exactly why GE developed the Digital Power Plant for Steam. The system runs on Predix, GE's operating system for the Industrial Internet. It crunches data from some 10,000 sensors that monitor dozens of

factors including fuel mix, ambient temperature, air quality and even the weather. Using this data, operators can correct for changing conditions and help ensure that the plant is always running at peak efficiency.

It's a process Nikola Tesla no doubt would have been proud to witness.

*Source: Gereports*