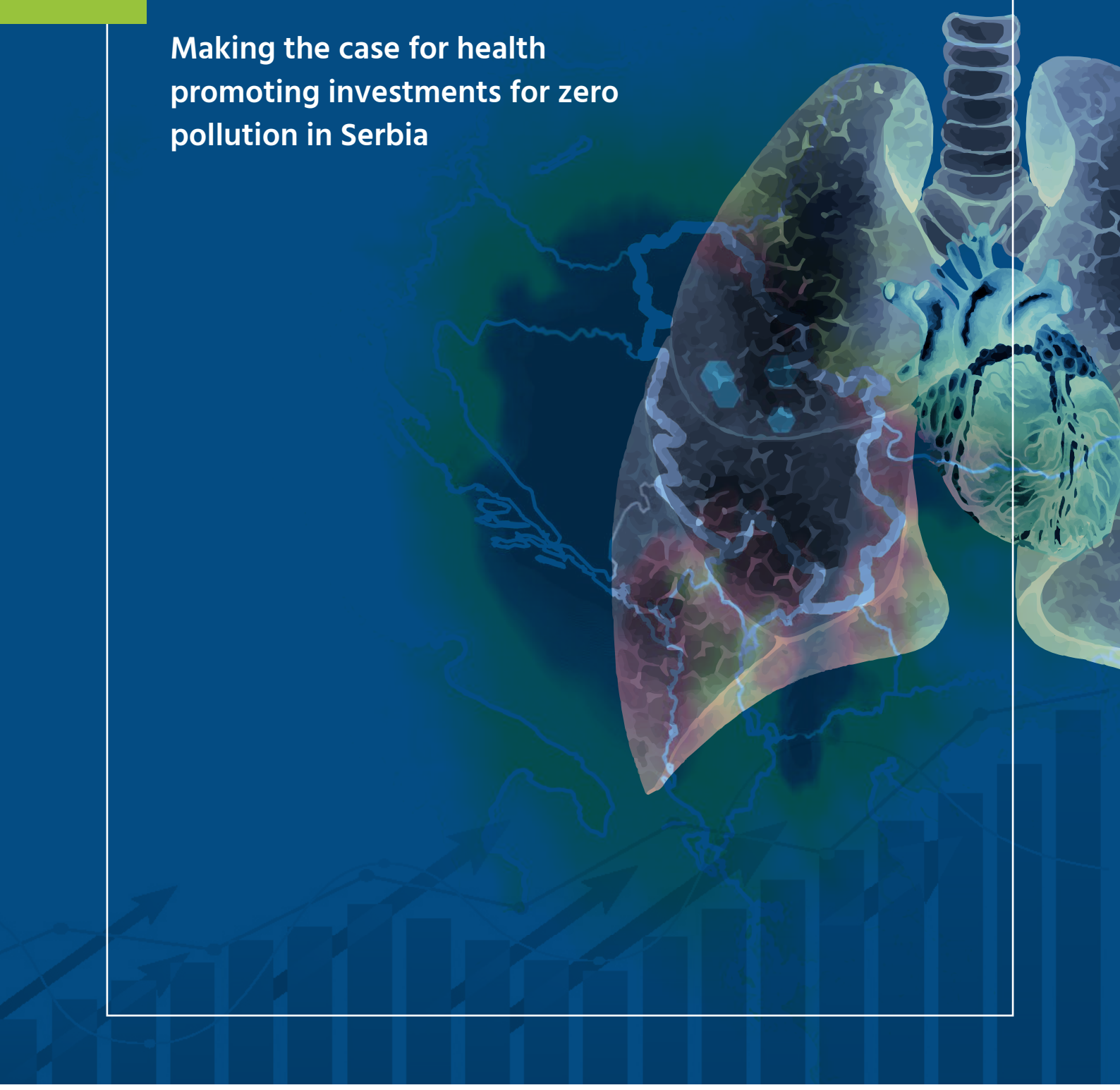
Chronic Coal Pollution Serbia

Making the case for health promoting investments for zero pollution in Serbia



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HEALTH AND ENVIRONMENT ALLIANCE

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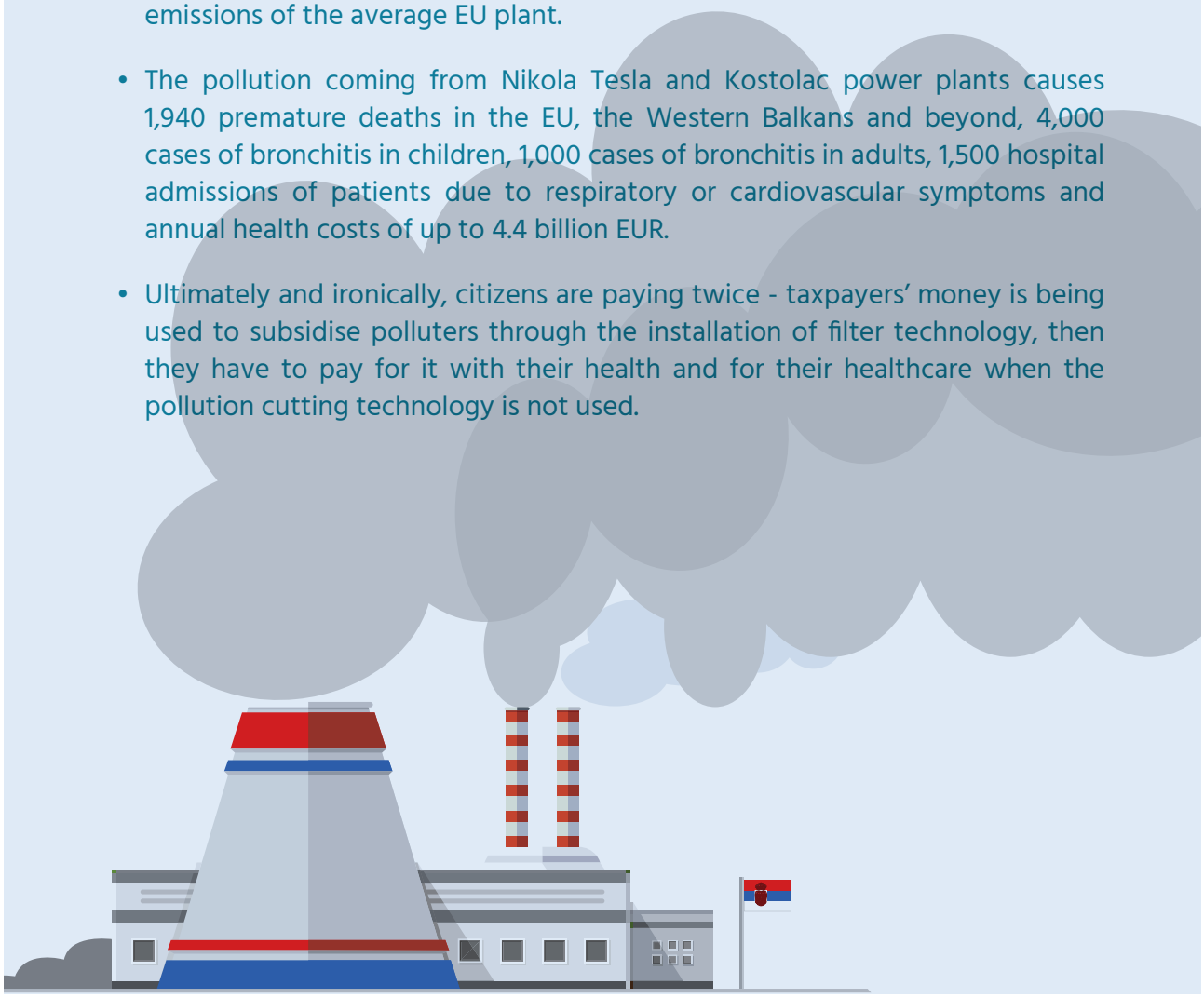
Summary

Coal combustion is the dominant form of energy generation in Serbia and the Western Balkans, with severe health consequences - the 16 outdated coal power plants in the region produce as much pollution as the 250 coal power plants of the entire European Union[1].

- Public investments in pollution control for 2 plants in Serbia amount to 47 million EUR (42 million EUR by the EU, 5 million EUR by Serbia) since 2009.
- Starting in 2018, a new pollution control directive entered into force, but emissions from coal plants are still too high, leading to continued ill-health in Serbia and the wider European Region.
- HEAL's analysis of emissions data points to emission control technology not being used.
- Emissions of Kostolac and Nikola Tesla for sulphur dioxide (SO_2) have gone up in the last decade, while emissions of particulate matter (PM) have fallen by half. Even with PM pollution going down those two plants enormous amounts of SO_2 and PM pollutants are being released into the air, 35 and 14 times than the emissions of the average EU plant.
- The pollution coming from Nikola Tesla and Kostolac power plants causes 1,940 premature deaths in the EU, the Western Balkans and beyond, 4,000 cases of bronchitis in children, 1,000 cases of bronchitis in adults, 1,500 hospital admissions of patients due to respiratory or cardiovascular symptoms and annual health costs of up to 4.4 billion EUR.
- Ultimately and ironically, citizens are paying twice - taxpayers' money is being used to subsidise polluters through the installation of filter technology, then they have to pay for it with their health and for their healthcare when the pollution cutting technology is not used.



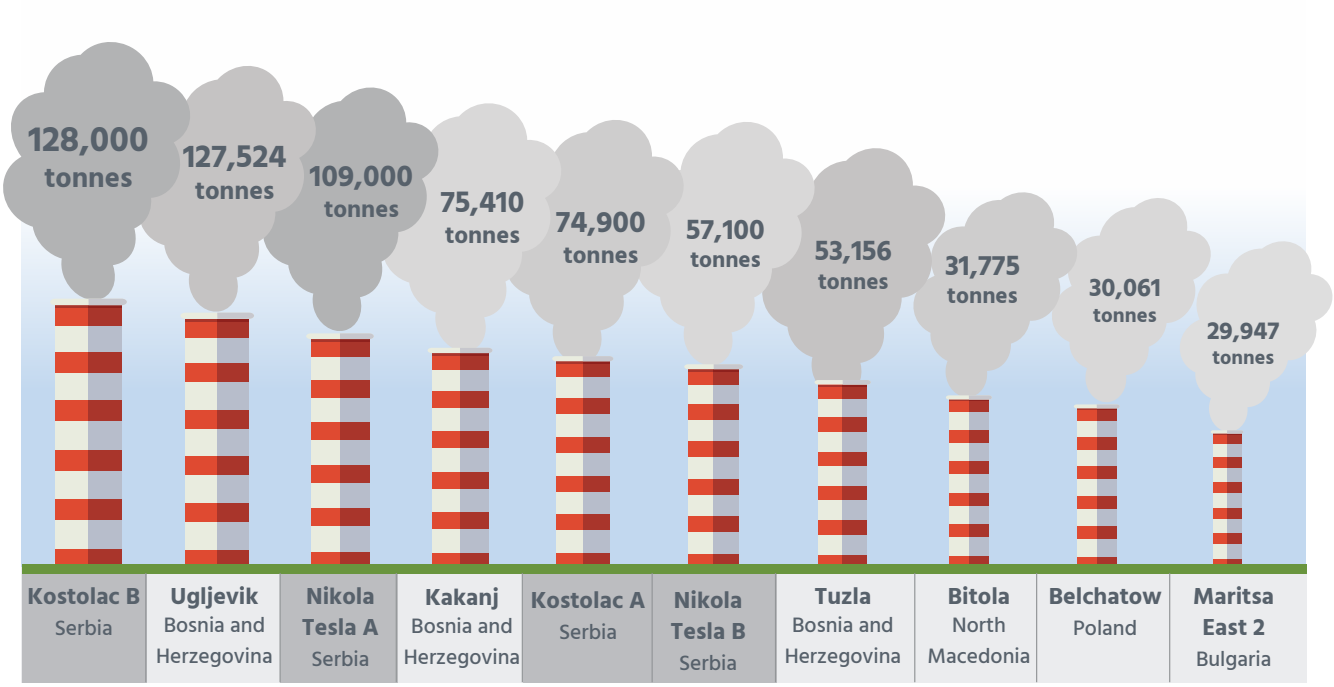
Public investments in pollution control have not delivered on their ambition

This briefing analyses public spending for pollution control in the two coal power plants Kostolac and Nikola Tesla in Serbia. This includes money provided as grants from the EU's Pre-accession Assistance (IPA) and contributions by the Serbian Government to lessen the environmental burden of the plants and reduce pollution. Additionally, the electric utility power company of Serbia, EPS, invested hundreds of thousands of euros and is planning to invest up to a billion euros to bring the pollution down to EU standards.

The EU's and Serbian government's public investment in various emission reduction works on both the Kostolac and Nikola Tesla power plants sums up to a total of 42 million EUR for the EU and 5 million EUR for Serbia between 2009 and 2019. But this spending of public funds has not delivered the intended and much needed pollution reduction. Although investments into pollution control have been made, HEAL's analysis of the pollution emissions data confirms that emissions have not gone down but instead increased. Public investment data was provided by the Delegation of the European Union to the Republic of Serbia.

Chronic polluters: the Kostolac and Nikola Tesla coal power plants

Fig. 1 Top 10 polluting plants in Europe by SO_2 emissions in 2016



Two Serbian coal power plants, Kostolac and Nikola Tesla[2], are among the top 10 power plants with the greatest pollution and health impacts in Europe.

Every year, thousands of tons of harmful air pollutants are being released from these plants, contributing to poor air quality and damaging the health of locals as well as people living further away. Serbia is most affected by this 'homegrown' pollution.

The Kostolac and Nikola Tesla power plants cause:

1,940

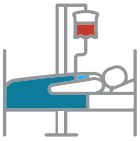
premature deaths in the EU, the Western Balkans and beyond

4,000

cases of bronchitis in children

1,000

cases of bronchitis in adults



1,500

hospital admissions of patients due to respiratory or cardiovascular symptoms

HEALTH COSTS OF UP TO

2.3-4.4 billion EUR

One third of these costs concern people living in the Western Balkans, while over half will affect people living in the EU

Pollution control technologies: a failed public health intervention

On average, Serbia's two most polluting plants, Kostolac and Nikola Tesla emit 35 times more sulfur dioxide (SO_2) and 14 times more particulate matter ($PM_{2.5}$ and PM_{10}) per installed megawatt than the average power plant in the European Union.

As of 1st January 2018, the Western Balkan countries including Serbia were obliged to start reducing their emissions for large combustion plants[3] and align national laws and rules with EU ones, including the setting of interim emission ceilings for 2018 and 2019[4]. This means that two coal-fired power plants were expected to achieve a reduction in pollutant emissions of more than 80%[5]. But instead, for example, for SO_2 in the last decade the emissions have even risen by 16%.

In July 2017, it was announced[6] that work to retrofit Kostolac B1 and B2 units B1 with the technologies to prevent and reduce SO_x emissions was completed and pollution could have been reduced from that point forward.

In addition, as of 2018, Kostolac and Nikola Tesla should have stuck to SO_2 limits of 50,000 tonnes/year but instead emitted an astonishing 303,000 tons in 2019. PM emissions were on more reasonable levels with 5,959 tons (below the ceiling of 6,222 tons).

HEAL's analysis shows that in 2019, SO_2 emissions from Kostolac' smokestacks continued to be too high (nine times higher than the interim ceiling), and Nikola Tesla exceeded the limits by four times.

SO_2 emissions from Kostolac should have fallen to 13,700 tons in 2019, but instead they were at 131,000 tons[7].

Nikola Tesla's 2019 SO_2 emissions should have been around 35,000 tons, but in reality it was 172,000 tons.

When it comes to PM pollution, here is a good example that pollution control technologies can reduce the pollution – since 2010 Kostolac' and Nikola Tesla's PM pollution went down on average 50%. However, the filter technology should actually allow for a reduction of up to 99%[8].

HEAL's analysis shows that although significant pollution control investments have been carried out in past years for both coal power plants, the corresponding emissions reductions have not been achieved but instead have increased.

The reasons for this puzzling development remain unknown, but it shows clearly that the investments of public funds in pollution control have missed their goal of reducing ill-health and health costs.

Fig. 2 SO_2 emissions of Kostolac and Nikola Tesla power plants, by year, in tonnes

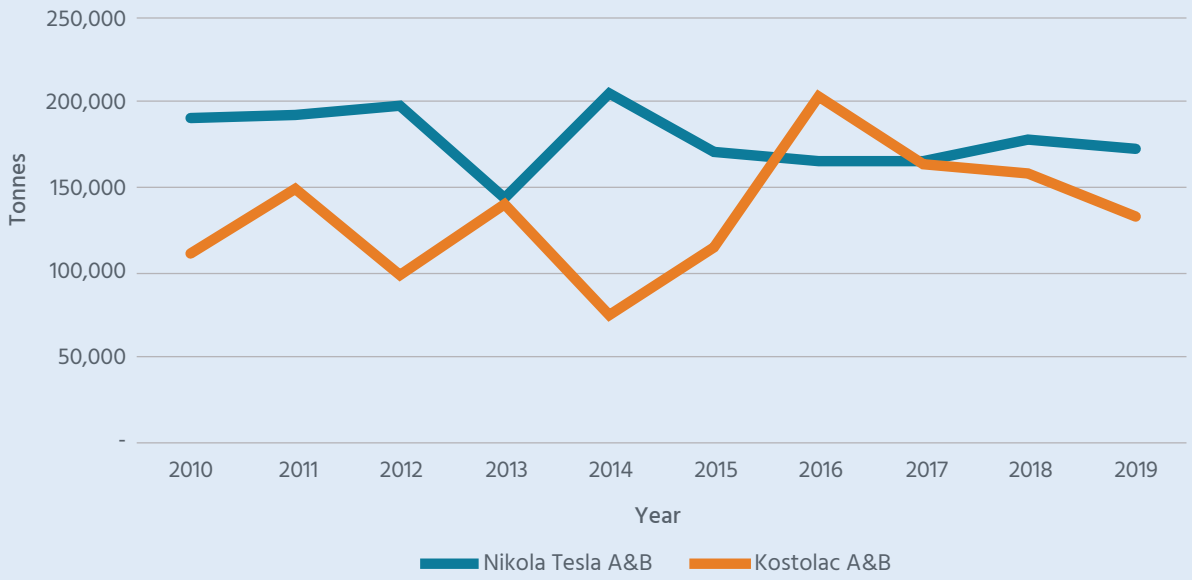
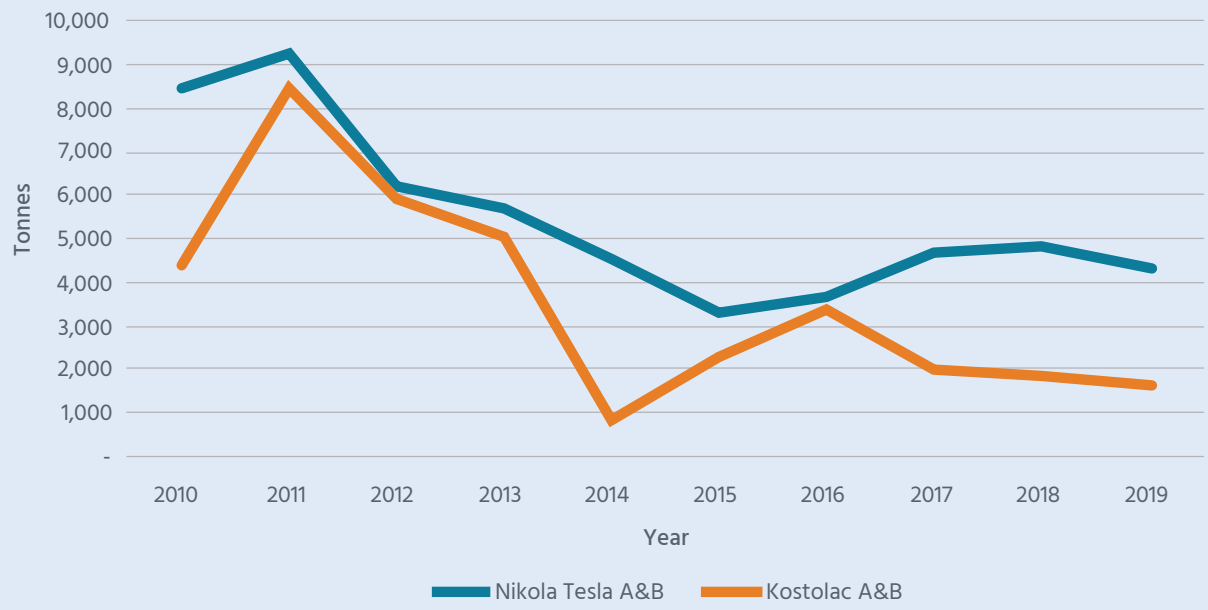


Fig. 3 PM emissions of Kostolac and Nikola Tesla power plants, by year, in tonnes



The analysis of emissions data leads to the following questions:

Have the pollution control technologies actually been installed?

Are they working or have they been switched off?

Are they not working at maximum pollution prevention potential?

What checks and enforcement action by authorities are in place to determine whether filters are being used?

Is monitoring of the emissions carried out by both operators and authorities and is the data publicly available?

Recommendations towards zero pollution in Serbia

In the next months and years, significant public investments into the country's (energy) infrastructure will be made, as part of kickstarting the economy after the COVID-19 crisis and with the EU's goal of greening the Western Balkans. HEAL's analysis of a good intention of pollution control gone astray offers some valuable lessons for decision-makers in how to prevent mistakes from the past.

Recommendations

- Investments should be made in technologies of the future, not fossils of the past - both the European Union and national governments have to invest in a healthy (energy) future.
- Instead of providing a lifeline to a dying industry, coal power generation, investments should be investments for healthy energy including energy savings.
- Cutting pollution at the source and shifting the focus to green and healthy technologies is always the best and most straight-forward route to achieving good air quality.
- Serbia has the unique opportunity to ensure the recovery from the COVID-19 crisis entails the transformation of its society and puts it on track to a healthy and sustainable future.

Annexes

Table 1 Table of the investments with public money

PPT	Project title	EU/€ contribution	National contribution	Total €	Completion
Nikola Tesla	Emission Reduction from Nikola Tesla Thermal Power Plant in Obrenovac - Supervising Engineer Service Contract	897,787	-	897,787	Completed. Sept. 2009 - Feb. 2012
Nikola Tesla A6 & B2	Emission Reduction from Nikola Tesla Thermal Power Plant in Obrenovac, Units A6 and B2 - Works Contract	10,780,000	-	10,780,000	Completed. June 2010 - Sept. 2011
Nikola Tesla B1	Design and Works tender for the Emission Reduction from Nikola Tesla Thermal Power Plant, Unit B1	7,795,000	-	7,795,000	Completed. Aug. 2011 - March 2014
Nikola Tesla A4	Supervision of works (NO_x emission reduction at the TPP Nikola Tesla Unit A4)	1,000,000	-	1,000,000	Start Sept. 2017 - 2019
Nikola Tesla	Nox emissions reduction at Nikola Tesla TPP	6,966,490	1,623,510	8,590,000	Start Sept. 2017 - 2019
Nikola Tesla	Equipment for Continuous Air Emissions Measurement at EPS-TENT TPPs	1,678,441	-	1,678,441	Completed. Nov. 2010 - June 2014
Nikola Tesla A	Construction of Waste Water Treatment Facilities in TPP Nikola Tesla A, Serbia	5,994,341	4,005,660	10,000,000	Completed. July 2014 - Oct. 2016
Nikola Tesla B	Supervision of construction and commissioning of the new WWTP at TPP Nikola Tesla B	629,660	-	629,660	Completed. May 2012 - July 2016
Nikola Tesla A	Supervising Engineer for Design&Works for construction of Waste Water Treatment Plant in the TPP Nikola Tesla A	280,539	-	280,539	Completed. Sept. 2014 - Apr. 2016
Kostolac	Works Industrial WWTP in TPP Kostolac B + supervision	5,946,813	-	5,946,813	On-going. Starts 2017
Nikola Tesla A	Supervising Engineer for construction of WWTP Nikola Tesla A	152,796	-	152,796	June 2016 - March 2019
Nikola Tesla A		**42,121,867**	**5,629,170**	**47,751,036**	

Source: The Delegation of the European Union to the Republic of Serbia

Table 2 Power plants Kostolac and Nikola Tesla blocks emissions per year

PLANT	Country	Fuel type	Owner	Coal capacity open
Nikola Tesla A	Serbia	Lignite	EPS- Elektroprivreda Srbije	1652
Nikola Tesla B	Serbia	Lignite	EPS- Elektroprivreda Srbije	1240
Kostolac A	Serbia	Lignite	EPS- Elektroprivreda Srbije	310
Kostolac B	Serbia	Lignite	EPS- Elektroprivreda Srbije	696

	SO_2 emissions									
PLANT	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nikola Tesla A	105,000	126,000	105,000	50,700	101,000	101,000	109,000	81,200	88,706	93,285
Nikola Tesla B	85,200	66,600	94,000	93,200	104,000	69,000	57,100	83,500	89,045	78,837
Kostolac A	53,000	51,700	54,200	51,700	39,900	49,000	74,900	54,200	43,914	52,710
Kostolac B	58,700	97,800	43,100	89,100	34,500	65,400	128,000	110,000	113,913	79,113

	NO_x emissions									
PLANT	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nikola Tesla A	15,700	21,600	20,200	20,100	18,000	18,200	16,400	12,200	12,028	14,008
Nikola Tesla B	15,200	14,100	12,100	14,300	15,400	16,200	11,400	13,600	12,014	11,296
Kostolac A	3,190	3,220	3,290	3,190	2,330	3,720	4,880	4,410	4,277	4,546
Kostolac B	5,570	8,670	2,950	7,670	3,390	4,610	8,820	8,630	8,076	2,973

	PM_{10} (dust) emissions									
PLANT	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nikola Tesla A	6,300	7,300	4,120	4,420	3,640	1,970	2,680	3,140	2,999	3,003
Nikola Tesla B	2,150	1,940	2,120	1,290	921	1,320	1,020	1,520	1,809	1,311
Kostolac A	1,690	1,510	1,660	1,340	499	1,300	1,030	717	615	833
Kostolac B	2,670	6,950	4,270	3,720	355	950	2,340	1,250	1,268	810

Endnotes

1 Chronic coal pollution - EU action on the Western Balkans will improve health and economies across Europe. HEAL, CAN Europe, Sandbag, CEE Bankwatch Network and Europe Beyond Coal. 2019 https://www.env-health.org/wp-content/uploads/2019/02/Chronic-Coal-Pollution-report.pdf

2 See detailed description in the Annex

3 Combustion installations with a rated thermal input exceeding 50 MW, for which the original construction licence or, in absence or such a procedure, the original operation licence was granted before 1 July 1992

4 This process is stemming from the Energy Community rules, which require coal plants currently operating in the Western Balkans to cut their emissions gradually from 2018 until the end of 2027. These rules are as a matter of fact not even in line with the latest EU rules for large combustion plants - the so-called LCP "BREF" that entered force in the EU in August 2017" but are instead more lax

5 According to Directive 2001/80/EC of the European Parliament of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants, The Industrial Emissions Directive, European Commission

6 https://www.energetskiportal.rs/blokovi-b1-i-b2-u-kostolcu-dobili-postrojenja-za-odsumporavanje

7 CEE Bankwatch Network, "Comply or close - how Western Balkan coal plants breach air pollution laws and what governments must do about it", 2020 Update

8 Techniques to prevent and reduce dust emissions are highly efficient. An ESP can capture greater than 99% of the total PM, while capturing 80-95% of $PM_{2.5}$

https://www.sciencedirect.com/topics/engineering/electrostatic-precipitator & Best Available Techniques (BAT) Reference Document for Large Combustion Plants. Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)

The Health and Environment Alliance (HEAL) is the leading not-for-profit organisation addressing how the environment affects human health in the European Union (EU) and beyond. HEAL works to shape laws and policies that promote planetary and human health and protect those most affected by pollution, and raise awareness on the benefits of environmental action for health.

HEAL's over 80 member organisations include international, European, national and local groups of health professionals, not-for-profit health insurers, patients, citizens, women, youth, and environmental experts representing over 200 million people across the 53 countries of the WHO European Region.

As an alliance, HEAL brings independent and expert evidence from the health community to EU and global decision-making processes to inspire disease prevention and to promote a toxic-free, low-carbon, fair and healthy future.

HEAL's EU Transparency Register Number: 00723343929-96

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