

# AIR POLLUTION IN TUZLA



# TUZLA



# TPP TUZLA







# **Coal mines and coal TPPs in Federation of BiH**

- **FBiH coal mines annually produce cca. 7.000.000 tones of coal (lignite)**
- **In average, 84% of produced coal is burned in Tuzla and Kakanj TPPs, 13,5% in other industry and households and 2,5% is exported.**
- **Annually TPP Tuzla emits between 50.000 to 70.000 tones of SO<sub>2</sub>.**
- **Official data published by Elektroprivreda for 2016 state that TPP Tuzla emitted 5.861 tones of NO<sub>x</sub>, 66.431 tones of SO<sub>2</sub>, 1.017 tones of solid particles and 3.941.042 tones of CO<sub>2</sub>.**
- **Installed capacity of TPP Tuzla is 715 MW (4 blocks out of which the oldest, still operational, one started working in 1966 and the “youngest” one is operational since 1978.**
- **None of the TPPs in BiH has desulphurization equipment installed.**

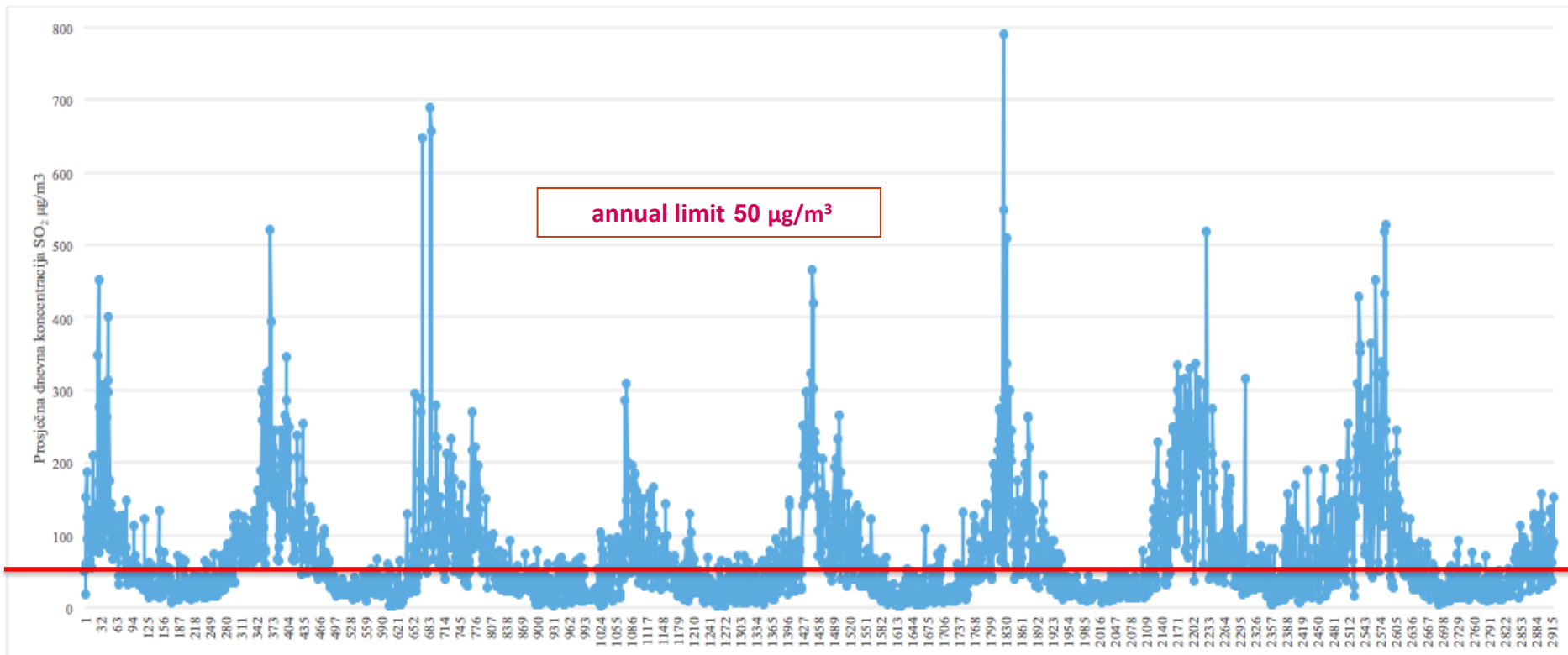
**Study published in November 2013**

TET Blocks G3-G6	NOx	PM <sub>2.5</sub>	SO <sub>2</sub>	Total
Emissions (tonnes/year)	9,843	1,990	51,661	
Chronic mortality (life years lost)	755	327	3,835	4,918
Infant mortality (1 – 11 months, cases)	0	0	1	1
Chronic bronchitis, population aged >27, cases	35	15	180	231
Respiratory hospital admissions, all ages	3	1	13	17
Cardiac hospital admissions, all ages	24	10	122	157
Restricted activity days (RADs) working age	76,571	33,154	388,748	498,473
Work loss days	20,124	8,713	102,171	131,008
Child asthma	1,895	820	9,620	12,335
Child bronchitis	178	76	892	1,143

**Converting the pollution health impacts in to monetary equivalent shows that TPP Tuzla generates annual health externality expenses in the range of 99 million EUR / year.**

## **HEALTH IMPACTS OF COAL FIRED POWER GENERATION IN TUZLA**

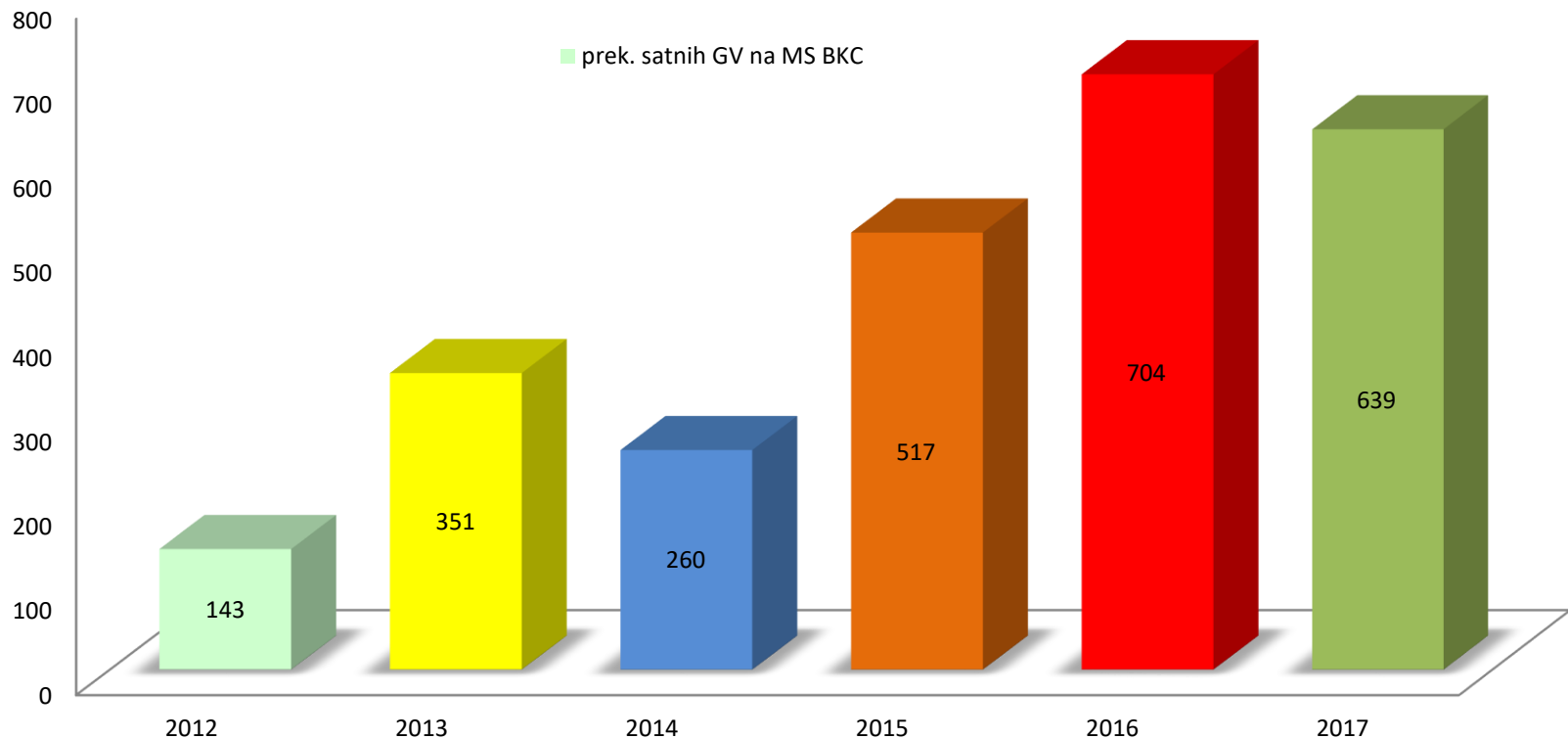
# Average daily concentrations of SO<sub>2</sub> on Tuzla MS 1 2010 - 2017



Slika 1.5. Vremenska serija prosječnih dnevnih koncentracija SO<sub>2</sub> na mjernoj stanici Skver za period 2010-2017. godina



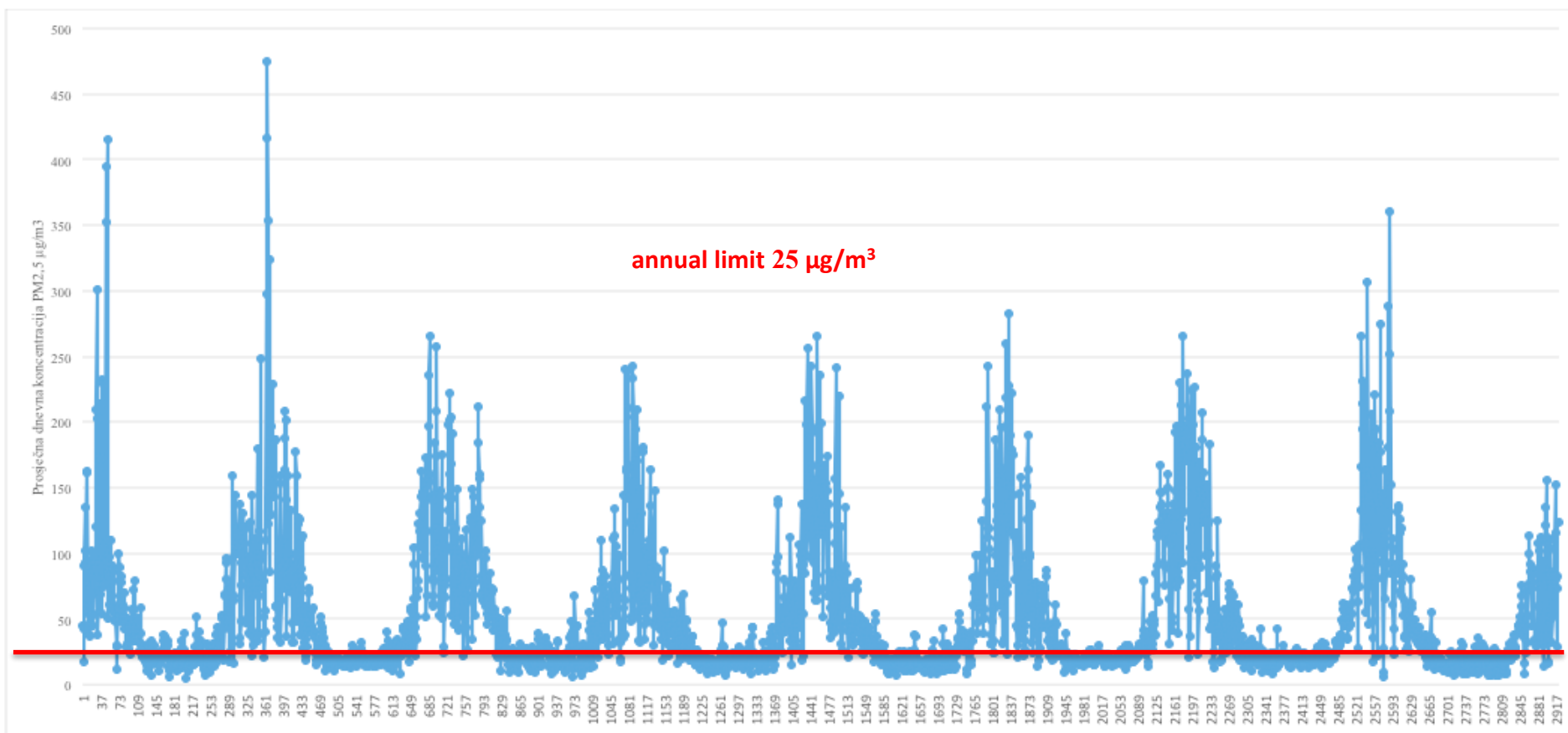
## Overview of breached SO<sub>2</sub> 350 µg/m<sup>3</sup> hourly limit on MS 2 2012, 2013, 2014, 2015, 2016 and 2017.



The allowed number of breaches is **24** times in one year

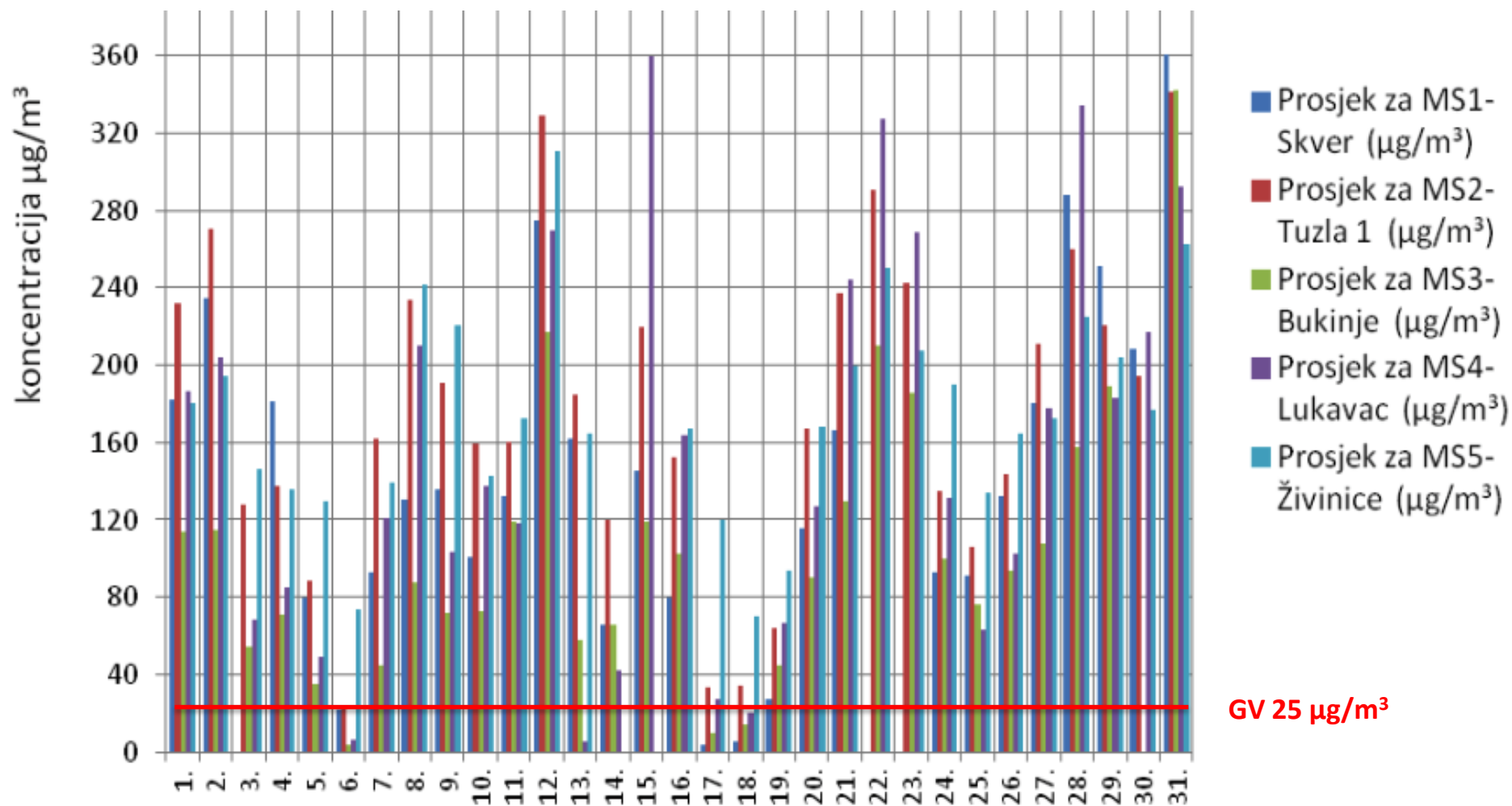


# Average daily concentrations of PM 2,5 on Tuzla MS 1 2010. – 2017.



Slika 1.7. Vremenska serija prosječnih dnevnih koncentracija PM2,5 na mjernoj stanici Skver za period 2010-2017. godina

## Average daily concentrations of PM 2,5 January 2017.





**THE PRESENCE OF HEAVY METALS IN SOIL AND LOCALLY  
PRODUCED FOOD IN THE AREA AROUND THE COAL SLAG AND  
ASH DISPOSAL SITES DIVKOVIĆI / PLANE**  
- thermal power plant Tuzla



**KVALITET ELEMENATA OKOLINE U BLIZINI TERMoeLEKTRANE  
"TUZLA" - UZROCI I POSLJEDICE NA LJUDSKO ZDRAVLJE**

## The conclusion of the heavy metals analysis is:

Analysis of samples taken in the direct vicinity of the TPP Tuzla ash disposal sites was conducted for the purpose of determining the presence of heavy metals in soil and locally produced food in the settlements around the sites.

The **soil samples** contained high concentrations of **arsenic, cadmium, chrome and nickel**, making the soil unusable for agricultural production.

**Sediment samples** contain **arsenic** in concentrations toxic for the organisms in the sediment. Concentrations of **chrome and nickel** have reached such concentrations at all measuring locations that they have a toxic impact on the benthos of the water flows. The analysed samples of sediment at all measuring sites show the presence of the toxic heavy metals **cadmium and mercury** above the limit values.

Analysis of samples of **plant and animal origin** shows the presence of **lead** above the allowed limit value.

The analysed **hair samples** showed the presence of highly toxic heavy metals; **arsenic, cadmium and lead**. The content of arsenic in hair is above the maximum reference value for 33.3% of tested cases. Such a high percentage of arsenic in human tissue (hair) is the result of its intake from the environment through the food chain and its overall presence in the environment.

Generally, it can be concluded that the **water samples** are very highly polluted with **chrome and cadmium** and that the found concentrations of cadmium and **lead** can have unacceptable negative impacts on the water ecosystem of the analyzed water bodies.

## The conclusion of the health analysis is:

In previous studies, excessive concentrations of heavy metals in soil, sediment, water, and biological media (vegetables, human hair) were established.

The analysis found statistically significant correlation between long-term exposure to heavy metals in the area around the TPP Tuzla and its ash disposal sites, measured contents of heavy metals in various environmental and biological media and health disorders.

The effects of the long-term exposure of local population to heavy metals are the diseases and deaths caused by chronic unintentional diseases in the settlements neighboring the TPP Tuzla: 41% in Divkovići, 24% in Plane, 42% in Bukinje and 29% in Šićki Brod.



# ASH DISPOSAL SITE “Jezero 2” - TPP Tuzla







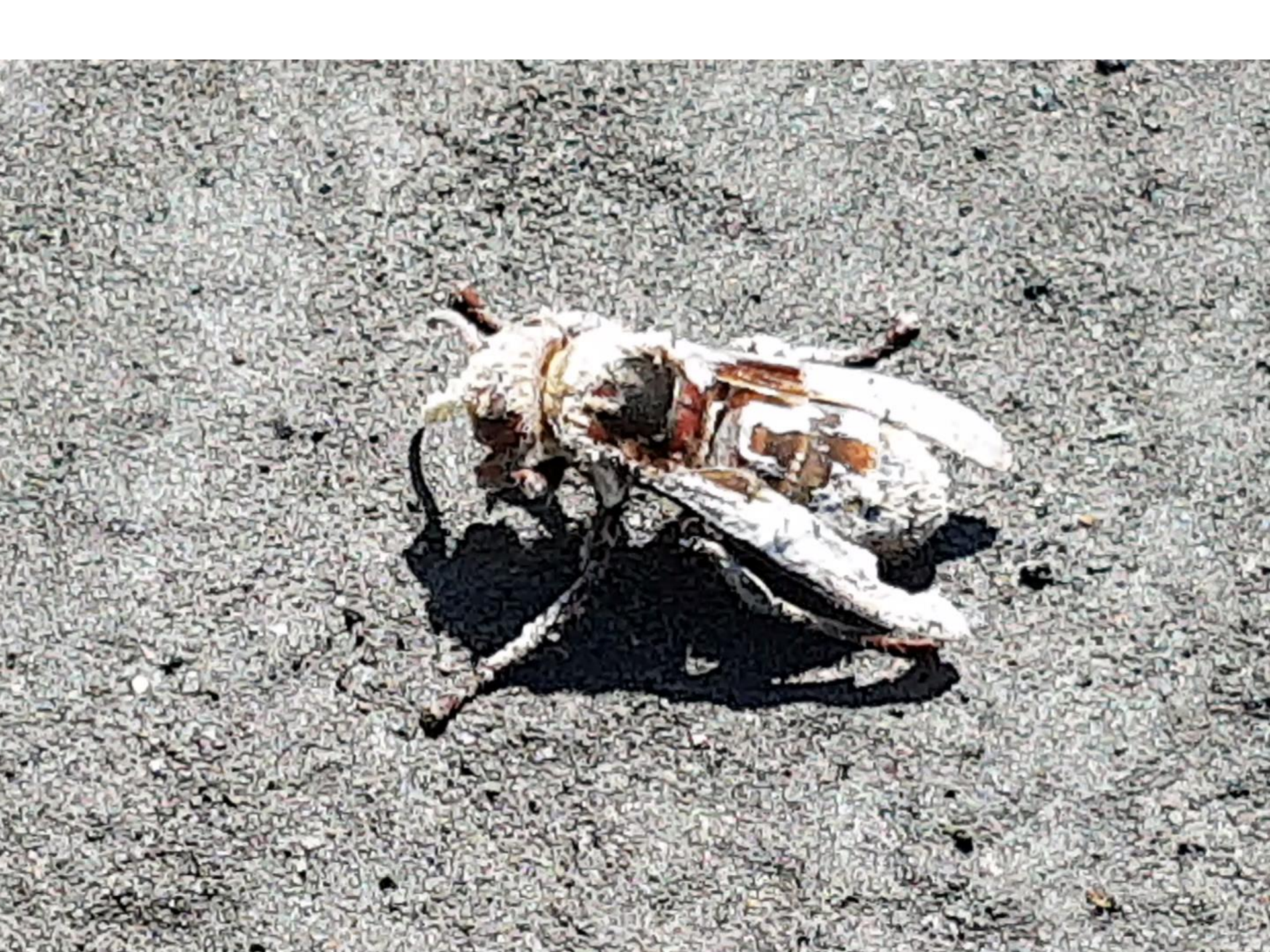




















# Thank you.



Denis Žiško, [denis.z@bih.net.ba](mailto:denis.z@bih.net.ba), +387 61 140 655  
<http://ekologija.ba/>