



LVOA

ALLIANCE OF
LITHUANIAN CONSUMER
ORGANIZATIONS

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NO₂ research and the future of the car fleet in Lithuania

Introduction

The air pollution situation in Lithuania is not the worst in Europe, but it certainly cannot be considered good. Although many Lithuanians call their country the land of the green, looking at the air pollution statistics in some cities, it would be fair to stop calling them "green oases" and objectively renaming them "smog capitals".

At the beginning of 2020, in order to reveal the real state of air pollution, the Alliance of Lithuanian Consumer Organizations (ALCO) conducted a study¹ of NO₂ concentration in ambient air in three major Lithuanian cities – Vilnius, Kaunas and Klaipėda².

Nitrogen dioxide is a reddish-brown gas with a pungent odour. Nitrogen compounds are a product of all combustion processes, but they are mainly released into the atmosphere with transport exhaust gasses and burning fuels in heating installations. It is usually released into the environment in the form of nitrogen monoxide (or nitric oxide, NO), but under normal atmospheric conditions, the released NO spontaneously oxidizes to NO₂, which is harmful to people's health. Increased concentrations of nitrogen dioxide in ambient air can irritate the lungs and reduce the body's resistance to infectious respiratory diseases. In addition, nitrogen oxides are one of the most important components of acid precipitation which damages vegetation³.

Research shows that nitrogen oxides have proven negative health effects (especially for respiratory diseases in the case of NO₂) and account for about 8 per cent of Global GHG emissions. There is no doubt that vehicles are a major source of this. Reducing NO₂ emissions would therefore help to achieve two goals: to reduce the greenhouse effect and to improve ambient air quality, especially in cities.

¹ The Nitrogen Dioxide Study conducted by the ALCO is part of a larger study conducted in several Eastern European countries. The study was coordinated by the European consumer organization BEUC. A total of 154 NO₂ samplers were placed in 2020 by the Alliance volunteer team in various locations in Vilnius, Kaunas and Klaipėda. The date of the last sampler removal was March 8th, just before the start of the COVID-19 quarantine, so quarantine restrictions did not affect the results of the field study.

² <http://www.lvoa.lt/press-releases/better-to-not-return-to-some-schools-after-the-lockdown-what-would-the-swiss-say/>

³ <http://oras.gamta.lt/cms/index> (in Lithuanian).

Research results

The total level of nitrogen dioxide concentration in Vilnius locations researched by the Alliance does not exceed the limit established by the European Union directives. The average annual limit value for NO₂ set by the EU directives is 40 micrograms per cubic meter of ambient air.

However, during the research, the “dark” spots of Vilnius, where the limit value of human health protection is approaching the annual level of 40 micrograms, became clear.

One of them is Jonas Basanavičius Gymnasium at the apex of S. Konarskio Street, next to the busy Geležinio Vilko transport artery and Vingis Park. Here, nitrogen dioxide pollution amounted to 35.1 micrograms per cubic meter of ambient air. This level would already be of concern in Switzerland, as the national average annual limit in this country, currently at 30 micrograms, is lower than that of the European Union.



The Lithuanian "anti-record" was set at the intersection of M. K. Čiurlionio and Geležinio Vilko streets in Vilnius. A diffusive sampler for nitrogen dioxide mounted on the railing of the viaduct that Vilnius residents and their families take to reach Vingis Park showed that the NO₂ concentration here reaches 35.5 micrograms per cubic meter.

In Kaunas, the highest concentration of nitrogen dioxide was recorded in the centre of Kaunas at Miško Street next to Steponas Darius and Stasys Girėnas gymnasium – 33.3 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air. Concentration data at the Maxima shopping centre near Pramonės Avenue also exceeded the level of 30 micrograms ($31.6 \mu\text{g}/\text{m}^3$). Moreover, investigators found air pollution of 25 micrograms of NO₂ per cubic meter in the area of the nearby Urmo bazė.

There are disturbing trends near the MEGA shopping centre in Kaunas, most likely influenced by the busy highway in the neighbourhood. Examination of the pollution at three MEGA open car parking lots revealed that it ranged from 24 to almost 28 micrograms. Highest readings - at the children's playground: $27.8 \mu\text{g}/\text{m}^3$.

In Klaipėda, a long highway along the port, consisting of Minija, Pilies and Naujosios Uosto streets, takes the “lead”. Pollution of $28.9 \mu\text{g}/\text{m}^3$ was recorded near AB Grigeo Klaipėda, in the Old Town next to the pedestrian tunnel of Karlskrona Square under Pilies Street ($29 \mu\text{g}/\text{m}^3$), and further north, near “Klasco Service”, with a $22.9 \mu\text{g}/\text{m}^3$ pollution mark.

However, Klaipėda's "record" was set next to Baltijos Avenue and Šilutės Drive roundabout near the city entrance point. Pollution of $32.6 \mu\text{g}/\text{m}^3$ was recorded at a popular gas station sitting next to the roundabout. The level of $22.4 \mu\text{g}/\text{m}^3$ was set in the parking lot of the nearby Banginis shopping centre.



The Problem

Nitrogen oxides and particulate matter (PMs) are a major problem coming from diesel engines, even the most recent ones⁴. A driver who spends a few hours behind the wheel on the road or in traffic jams is killing his lungs at an accelerated pace, weakening the body and shortening his life. Pollution also reaches the lungs of passers-by and passengers.

Citizens living, studying and resting in the surrounding areas also suffer. The benefits of operating a private car are enjoyed by many individuals, and the pollution caused by a car is affecting the society as a whole, and, in particular, those who have nothing to do with the use of that specific car. For example, Vilnius residents living near a busy highway "pay" with their lungs for the convenience of thousands of other Vilnius residents to travel in a relatively cheap and convenient personal vehicle.

In July 2018, the Alliance of Lithuanian Consumer Organizations conducted and published a study of total car use costs in Lithuania⁵, which confirmed that the operating cost of ICE cars fuelled with liquefied petroleum gas (LPG) is currently the lowest if all costs incurred by the consumer over 4 years are calculated. Diesel-powered cars came in second in terms of overall low operating costs. Gasoline occupies a middle position between electric cars and diesel. The study showed that without state support for clean transport and tax sanctions for polluting transport, the situation will not change, as diesel and LPG will continue to prevail. Electric passenger cars in Lithuania will reach the total cost of ownership parity with diesel engines only around 2025-2030.

The current car "pollution tax" system, adopted by the Parliament at the end of 2019 and in effect from July 2020, establishes a registration fee for cars based on CO₂ emission levels and the type of fuel that is used to run the vehicle. The taxation, starting when the CO₂ emission level exceeds 130 g/km, is higher for diesel cars compared to petrol and gas cars (emitting the same level of CO₂). This system seems to have been introduced for "testing" reasons, after long debates in the Parliament and heated discussions in the public space.

However, from the ALCO's point of view, the system is not ambitious enough and does not match the *bonus malus* (incentive and penalty) systems in place in other European countries. From July 2020, a low-carbon diesel car can be registered in Lithuania for a sum of less than one hundred euros. This will lead to both a significant increase of purchasing new diesel cars, and the import of used but low-carbon diesel cars from other European Union countries. However, the damage to health caused by pollutants from diesel

⁴ <https://www.transportenvironment.org/news/new-diesel-cars%E2%80%99-pollution-spikes-dangerous-levels-yet-pass-tests-loop-hole>

⁵ http://www.lvoa.lt/images/default/source/25.10.2018_TCO_Country_Specific_Extension_Lithuania.pdf

engines, especially PMs and, of course, nitrogen oxides, will put pressure on the shoulders of the public health system.

The cost falls on the shoulders of the state health system

Various scientific studies over the past two decades have shown that prolonged inhalation of air with elevated NO₂ levels leads to diabetes, hypertension (high blood pressure), cardiovascular disease, chronic obstructive pulmonary disease, impaired lung function in adults, and also causes significant developmental disorders in children's lung function⁶.

For Europe, the World Health Organization 2018 estimate for the number of premature deaths attributed to air pollution is over 500,000, with 400,000 early deaths in the EU28. According to various estimates, between 67 and 80 billion Euros are being spent to combat the problems caused by air pollution⁷. Similar calculations have not yet been made in Lithuania, but it can be assumed that reducing air pollution would lead to better public health and reduce the pressure put on the healthcare system.

NO₂ and Covid-19

In spring 2020, researchers from the US and Italy tested the hypotheses about the links between deaths from the Covid-19 pandemic and air pollution by nitrogen oxides.

The researchers have been investigating whether air quality data correlate with the high incidence of Covid-19 infections and deaths in specific areas particularly affected by the pandemic. In the Italian case⁸, they note that the potential long-term effects of NO₂ on the population have contributed to the spread of the pandemic.

The impact of NO₂ on respiratory diseases is not doubted by the academic world: it is widely discussed at international conferences and is the subject of extensive research. A study by researchers at Harvard University⁹ in the United States covered an area encompassing 98 per cent of the U.S. population to find out if there is a link between the level of air pollution by PMs (its spread in the air is associated with nitrogen oxides) and the higher incidence of the disease.

So far, no solid scientific evidence has been provided, so conclusions are to be drawn with caution – hypotheses of other associations between disease-promoting factors are investigated, and the results are presented as more or less likely to cause Covid-19. However, similar studies in the case of SARS in 2003 are broadly in line with the cautious conclusions being drawn by scientists now: increased pollution reduces the lungs' ability to resist diseases.

Quarantine, as shown by official studies of air quality measuring stations in four Lithuanian cities, significantly reduced the concentration of harmful substances¹⁰. According to the Environmental Protection Agency, "<...> most air quality indicators have improved significantly in those urban areas where there is usually heavy traffic. <...> nitrogen dioxide NO₂ [concentration] decreased from 25% to 34% compared to the same period in 2019".

⁶ <https://ers.app.box.com/s/81rilw1uyrj8kv24caowsy2hf7dv8nuz>

⁷ <https://epha.org/ce-delft-health-impacts-costs-diesel-emissions-eu/>

⁸ <https://www.sciencedirect.com/science/article/pii/S0048969720321215>

⁹ <https://projects.iq.harvard.edu/covid-pm>

¹⁰ <http://oras.gamta.lt/cms/index?rubricId=ce827d99-1ccb-4a59-97dc-ba41a316ea2e> (in Lithuanian).

This can be considered a coincidence, but during the "deepest" quarantine stance, the traffic flow on Vilnius's busiest Geležinis Vilkas Street had dropped by about 40 per cent, according to the sources associated with Vilnius municipality¹¹.

10 recommendations for policy makers

We suggest that public policy makers at various levels take these recommendations into account:

- *Establish a proper **'bonus malus' scheme** to encourage a mass uptake of low- and zero-emission vehicles by using blueprints from France and other European countries¹².*
- *Increase and steepen the current car registration tax scheme **tariffs**. Broaden the scope by gradually including a yearly car usage fee. The system has to be reviewed on a yearly basis to reflect the development of CO2 standards for cars and new technological advances in the automotive industry.*
- *Collected taxes from the 'bonus malus' scheme should be specifically reinvested to **support clean mobility**, prioritising the development of electric charging stations in the city blocks with predominant multi-family buildings.*
- *Avoid the inclusion of CNG and LPG as **alternative fuels** in preparation for the forthcoming parliamentary legislative procedure to adapt the Law on Alternative Fuels of the Republic of Lithuania¹³.*
- *Fast forward the uptake of **green procurement** procedures for new car purchases by public institutions.*
- *Define and publicly announce the date from which the **registration of passenger cars with ICEs** will no longer be allowed in Lithuania. Current vision supported by the Government foresees the year 2050 as a feasible date. This deadline should be pushed forward to, for example, 2035, or various dates for certain fuel types should be announced, if appropriate.*
- *Stop subsidizing fossil fuels by lowering tax levels for certain uses, which do not always correspond to the real purpose of the fuel. Gradually **abandon the tax rebate** for using diesel in agriculture and fishery.*
- *The commendable decision by Vilnius City government to **cut the transit traffic** in the City centre¹⁴ should be encouraged and implemented in other big Lithuanian cities.*
- ***Urban planning** should prioritize public health by amending plans in a way that would leave citizens protected from excess ambient air pollution when working, using services or relaxing in open spaces. Health centres, schools and kindergartens should not be built close to the most polluted motorways. Some schools with the highest pollution exposure levels should be urgently relocated.*
- *Despite the Covid-19 induced fears, a strong and decisive turn toward green and convenient **public transport** should remain the core aim for city governments.*

¹¹ <https://www.15min.lt/gazas/naujiena/gatve/dvi-karantino-savaites-eismo-intensyvumo-pokyciai-vilniuje-uzima-kvapa-221-1295662> (in Lithuanian).

¹² <https://www.euki.de/en/euki-publications/factsheet-bonus-malus-vehicle-incentive-system-france/>

¹³ https://www.transportenvironment.org/sites/te/files/publications/2020_06_TE_CNG_particle_report.pdf

¹⁴ <https://vilnius.lt/en/2020/06/28/revolution-in-vilnius-old-town-no-more-transit-and-4-streets-freed-up-for-pedestrians/>

It is often argued in the public sphere that the renewal of the vehicle fleet will take place on its own as the public gets richer. However, in our view, this is not a justification for tolerating high pollution and refusing to legislate strict regulatory measures at the state level. One of the most important tools for the state is support packages. For example, now the governments give support packages for businesses affected by the Covid-19 situation. In mid-2020, after listening to the arguments from the automotive industry for a long time, the German government finally decided to stop supporting mobility based on internal combustion technologies in its latest economic stimulus package, with a strong emphasis on electricity and hydrogen from now on.

About the research and the Alliance of Lithuanian Consumer Organizations

The Alliance of Lithuanian Consumer Organizations is an association of 13 non-governmental consumer organizations, operating since 2012. The Alliance is the only consumer umbrella organization representing Lithuania in European consumer organization BEUC. Alliance activists operate at the EU level by participating in expert groups formed by European institutions (European Commission, directorates, agencies), the European Economic and Social Committee, the European Consumer Consultative Group, and BEUC working groups. ALCO's identification number in the European Union Transparency Register: 506497923503-90. More information: www.lvoa.lt

The creators of the international project, which involves ALCO, drew inspiration from a number of similar projects run by consumer and environmental organizations, including the "Curieuzeneuzen" ("Curious Noses") in Flanders, the "Deutsche Umwelthilfe" campaign in many German *Bundesländer*, as well as Czech Republic, Slovenia, Bulgaria and Serbia. In 2020, a similar measurement campaign was launched in Italy. The country's civil society organization "Cittadini per l'Aria" has called for 3,000 volunteers, 1,000 each in Milan, Rome and Naples, three most heavily polluted cities in Italy.



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