

Electric vehicles and environment

Air pollution in the cities

State of the environment and air pollution in major urban European centers.

Throughout the history of the development of the cities, people have always had to adapt to living conditions that deviate from the natural to enjoy the benefits offered by life in the urban environment. At the same time they tried to minimize all the negatives that come with living in the densely populated community in a small space. By development of the cities all main problems of their inhabitants were gradually solved; such as water supply and drainage. With the beginning of industrialization, urban areas are simultaneously faced with two challenges – the rapid increase in population and large pollution, which has produced an increasing number of industrial plants, as well as a growing number of households. In the 20th century to the causes of pollution in the cities the development of transport can be added, which to this day became so widespread, that in addition to industrial facilities, it has become one of the main causes of environmental pollution. Roads take up a significant portion of the space in cities and thus directly affecting the scanty surface for other purposes, such as parks and other green spaces. Except that they occupy considerable areas, the traffic pollutes soil and water. Transport is also a significant source of noise pollution, light and vibration that further diminish the quality of life in urban areas. Traffic has become one of the major air pollutants. Studies have shown that the total share of air pollution caused by traffic pollution is 25%; road transport caused the most of it.

Air pollution has become one of the biggest problems of the modern world because it directly affects the state of the environment and human health. Since the most traffic activities take place just in urban areas, these are precisely the areas where air quality is the worst. At the same the largest number of inhabitants live in these regions, so poor air quality affects the health of the majority of the population. The study of the European Environment Agency from 2015., conducted in 40 European countries, estimated that air pollution in 2012. caused 430.000 premature deaths in Europe (Croatia – 4800, Slovenia – 1830, Finland – 1960, Italy – 84 400, ...)

Although in the past few decades, there has been worked on the reduction of emissions from burning fossil fuels in road transport systematically, due to the constant increase in

the number of vehicles, the final result in the reduction of air pollution is not much better. Today the majority of urban areas in Europe and in the world does not have adequate air quality. As soon as you hang up a few parameters, we are witnesses to the scenes of cataclysmic proportions (Beijing, Paris). Today, more and more we can often hear the mention of sustainable development, which applies to traffic. The long-term goal of the EU is to improve air quality by introducing more stringent legislation, research and introduction of new sustainable technologies. European Environment Agency as a main institution, that coordinates the activities of all EU member states, is responsible for making long-term strategy for improving air quality in Europe. In road traffic, as part of the solution in reduction of air pollution, this perfectly fits the concept of electromobility, which promotes energy efficiency and use of renewable energy in transport. This concept has evolved thanks to the commercialization of electric vehicles, which we have witnessed in recent years, and its goal is to bring closer all opportunities and advantages of electromobility to the citizens. So that it can come to life with as many users as soon as possible. In this way, the negative trends affecting the environment will finally be stopped in road traffic, and air pollution in urban areas could be reduced to a level that will not undermine the quality of life of the majority of European citizens.

The impact of traffic on air pollution in urban areas

With the level of development of transport (construction of infrastructure, means of transport and traffic) exponentially grew the adverse effects of traffic to all aspects of the environment (air, soil, water,...). Many of these pollutants directly threaten human health as well as animal and plant life.

Also, the pollution caused by traffic contributes to global pressures.

It is believed that the traffic is responsible for at least a quarter of global anthropogenic CO₂ emissions, so that at least one quarter contributes to the greenhouse effect, global warming and changed, for the time being, still relatively stable climatic conditions on the planet.

The road traffic due to its volume (mileage), spent fuel and the space for road infrastructure, is the transport industry which mostly contaminates the environment, with direct negative effect on air, water, soil, flora and fauna, and with other influences on environment.

The influence on air:

By combustion of liquid oil (and gas) fuel, in the air are discharged: greenhouse gas emissions, pollutant emissions (different harmful polluting or toxic gases, etc., emissions of heavy and other metals (lead, copper, zinc, cadmium, chromium,...) and they affect the global concentration of greenhouse gases in the troposphere, the local pollution (dry and wet deposition), cross-border pollution (mainly acid rain), ozone layer wasting, etc.

The influence on water:

The water runs off from roads, containing products of fuel, salt (mainly anti-icing pavement), solvents, heavy metals, etc., affects the contamination of surface and groundwater and changes, the increase of acidity, in the hydrological systems.

The influence on soil:

Rinsed water from roads and the wind carried dust, which contains fuel products, salt (mainly anti-icing pavement), solvents, heavy metals, etc. affect the soil pollution.

Construction of roads and other traffic infrastructure occupies on the one hand, the immediate areas for roads and related infrastructure, and on the other hand at least as much area which is no longer usable or it changes its purpose.

The road infrastructure cuts the certain agricultural land and diminish their value and often prevents previously free access to these areas.

The influence on flora and fauna:

The landscape is destroyed using a road construction materials (quarries), by construction of roads (quarries, landfill, cuttings, embankments, retaining walls, bridges, viaducts) and by carrying over of materials.

The habitats of certain animal species are intersected by road construction; their living space is chopped up, their seasonal migration routes are interrupted.

The other negative influences:

The noise of road vehicles is a component that weighs heavily on the environment; it

strong effects on human health; it causes insomnia, affects on fetal development, etc.

The waste from vehicles (waste tires, waste oil, waste batteries, heavy and precious metals, plastics and other parts of vehicles) are pollutants of air, water and soil, flora and fauna, and of the landscape especially because of illegal dumping.

Road transport of dangerous goods affects all components of the environment.

Today's industry and transport is difficult to imagine without fossil fuels, but pollution caused by combustion acts disastrously to health. The substances that pollute the environment cause serious harm to people and other living beings, and pollution due to burning of fossil fuels prevails. The largest contribution to air pollution in cities comes from burning of fuels for transport, where road transport dominates again. Exhaust gases from motor vehicles are the main culprits among the various sources of air pollution because they contain many toxic substances. When we breathe them in, from lungs they pass into the bloodstream and thus spread through the whole organism. Many diseases and deaths may be prescribed just to air pollution due to the use of fossil fuels in road transport. Some experts consider that for the inhabitants of the cities, polluted air is more harmful than tobacco smoke - the worst pass the people who smoke or are exposed to passive smoking. State authorities are exposed to criticism that too much attention is paid to the problem of smoking, and at the same time because of fear from resentment to industrial complex, they do not dare to bring the laws that would reduce the level of air, water and soil pollution. Polluted air has proven to be the cause of many diseases and premature deaths in many surveys conducted in Europe.

In France, Austria and Switzerland 6% of deaths are associated with the effects of inhaling the polluted air. Long-term exposure to air pollution is associated with undesirable changes in the airways, impaired lung function, increased risk of illness that require hospitalization, including intensive care and increased mortality.

The most toxic substance produced by motor vehicles, while fossil fuels are burning, is carbon monoxide. Entering the blood, this compound reduces the ability of red blood cells to transmit and deliver oxygen to organs and tissues. Other toxic substances, such as lead, obstruct the production of red blood cells, and thus potentially lead to anemia. Lead can damage the nervous system and harm mental functions such as concentration and memory. Benzene, nitrogen dioxide and small toxic particles can cause damage to the bone marrow and the immune system. Thus, for example, a link between benzene and leukemia is found, especially after prolonged exposure to this combination. Hydrocarbons,

which develop by combustion of fossil fuels in internal combustion engines, have potentially carcinogenic effect on children, infants and pregnant women. Pregnant women, who breathe air contaminated with these toxins ,are exposed to an increased risk of preterm birth, birth of children with low birth weight, mental disabilities and the subsequent preferences to develop asthma.

The pollution produced by motor vehicles is more dangerous to life and health than traffic accidents. The treatment costs associated with the consequences of pollution to human health ,only from motor vehicle take 1.7 percent of gross national income in the countries ,in which the estimations are done.