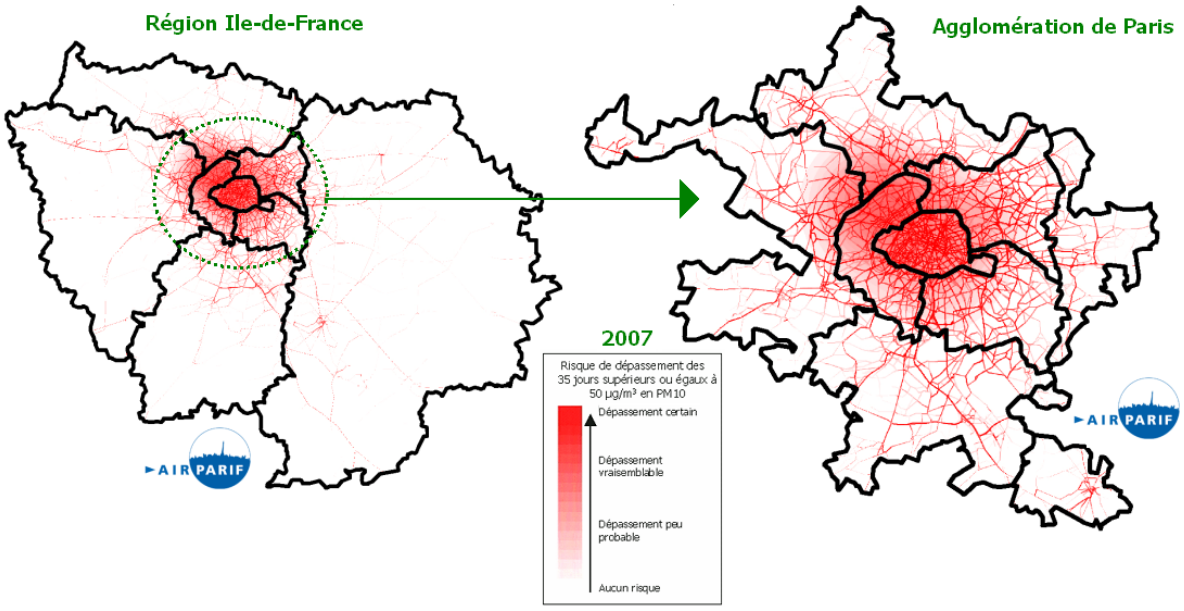
# Sources and origins of the particles being breathed in the air in the Ile-de-France region

**What are the contribution of the different human activities or natural sources on the particle level that we breathe? Among those sources, which one should a priority for action to most efficiently reduce air pollution along the streets, in the city, at the scale of the whole region, in France or in Europe? These are the objectives of the large study started by Airparif (the agency in charge of monitoring air quality in Paris and the Ile-de-France region) with the financial support of the State, the regional council and the municipality of Paris. This study will be the most important one ever carried out by Airparif : for 3 years, particles PM10 (particles smaller than a cell) and PM2.5 (smaller than a bacteria) will be measured and analysed simultaneously at six monitoring sites representative of different environment (urban traffic site, urban, rural or regional background situations) in order to determine their chemical composition and to track back their original source. The method being used was developed in Berlin and where it provided evidence to justify a low emission zone (LEZ). The Paris project is being supported technical committee being made of particles specialists from France, Berlin, London and Spain, chaired by Airparif's colleague from Berlin.**

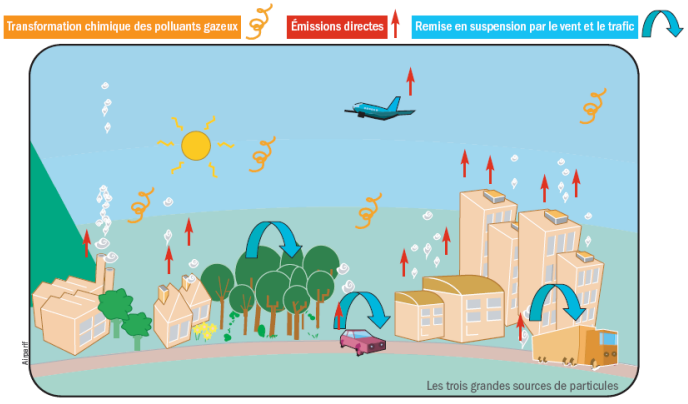
Indeed, particles represent an important issue both from the environmental and public health point of view. According to the European Union, levels of particles in the Member States would be responsible of an anticipated reduction in life expectancy of 9 months, on average. In 2007, 3.9 millions of inhabitants in Ile-de-France have been exposed to an air which did not respect the EU Limit Value for $PM_{10}$ (at least 35 days of exceedence of 50µg/m3), that is to say 36% of the regional population, mostly in the agglomeration of Paris. This exceedence presented in the maps below concerned 45% or 4 170 km of the road network. In addition, the levels observed each year have remained stable since 2000.

However, particle characteristics make it difficult to identify appropriate mitigation measures that can be taken in order to lower their levels in the environment and therefore to fulfil the regulatory objectives. The definition of the level at which those measures must be implemented and what would be their impact is even more difficult to assess.

**Risk of exceedence of the french and EU daily norme for PM10 in 2007**
In the Ile-de-France region and both for traffic and background conditions




In a matter of fact, particles are complicated pollutants from many points of view. Their chemical composition and size are very dependant on the location and on the meteorological conditions and their sources are numerous too :




- **Direct emission into the atmosphere** by diesel engines and industrial activities but also from housing and service sector especially due to heating activities, like for the nitrogen oxides
- **chemical reactions of pollutants and transport throughout Europe** like for ozone
- **and resuspension of dust** settled on the ground