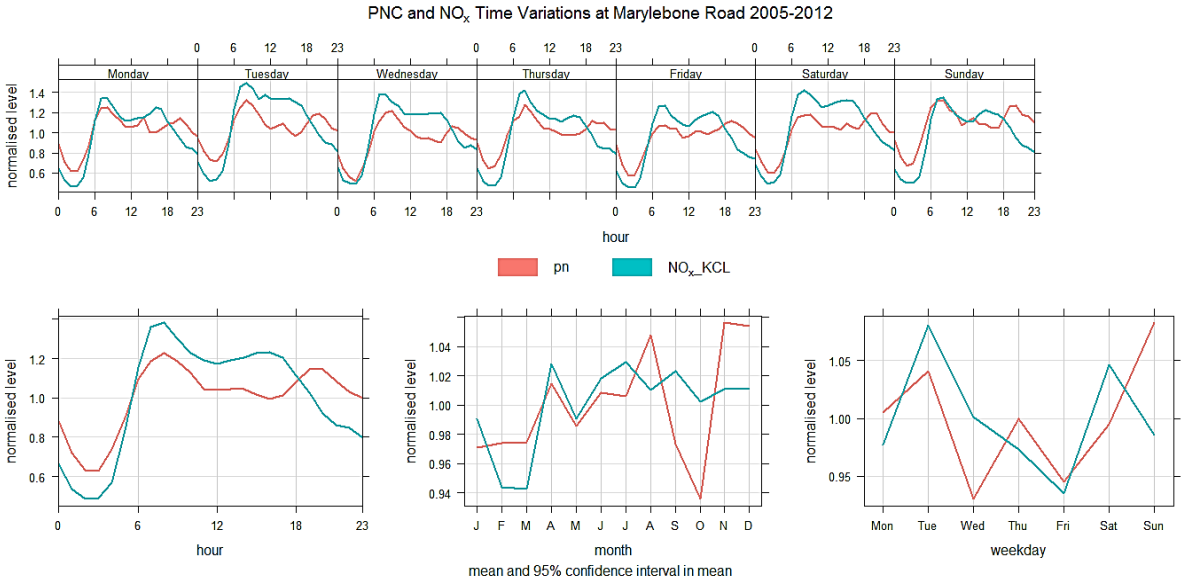
Implications of the VW scandal - Christopher Rushton and Haneen Khreis

Over the last years the team at the Institute for Transport Studies (ITS) has measured the exhaust emissions of over 1,000,000 vehicles in urban locations including a recent sample of vehicles which have passed the latest Euro Six emissions requirements. Whilst individual results are variable and highly sensitive to operational factors such as acceleration and road gradient, the overall trend has shown no improvement in emissions of NOx by diesel passenger cars of successive euro classes with the highest measurements recorded equivalent to a heavy goods vehicle's. The data by itself cannot tell whether defeat devices have been used but there is little difference between the different manufacturers. The data collected by the university and other remote sensing teams around Europe alongside recent revelations about Volkswagen suggests that the NOx emission problem is widespread and that the newest legislation has done little to solve it. Furthermore, the Volkswagen scandal opens a "window of opportunity" for advocates of limiting diesel car use in Europe.

Indeed, the extent and the implications of these emission violations are expected to be large, as most European countries have persistently transformed their fleets to diesel vehicles over the past twenty years. The policies and practices that drove these transformations should be also brought into question for lessons to be learned in the future. The European diesel car boom was to a large extent a decision motivated by the need to address global warming and improve fuel economy with the voluntary agreement signed between the European Automobile industry and the European Commission envisaging to reduce CO_2 in 1998 identified as one elementary event at its origin. Direct injection diesel engines have considerably improved fuel economy when compared to gasoline engines, but caused detrimental NOx emission performance. Combustion of diesel fuel at higher temperatures injection pressures has also increased ultra-fine particle emissions, with over 80% of diesels' total emitted particles falling in the size range around 0.1 µm in diameter. It is therefore no surprise that a large fraction of the particle number concentration in urban areas is found in the ultra-fine size range.

Large proportions of diesel ultra-fine particles are also made up from organic carbon and contain the largest fraction of polycyclic aromatic hydrocarbons; agents that are known for their carcinogenic and mutagenic properties. As yet and despite being potentially associated with a spectrum of global

disease, through specific or enhanced toxicity, ultra-fine particles are neither regulated in ambient air nor regularly monitored. Their concentrations however track traffic-NOx concentrations well i.e. Particles Number Concentrations (ultra-fine Particles) and NOx time variations at Marylebone road (2005-2012)



A more critical examination of the shift towards favoring diesel vehicles reveals that the expected CO_2 and greenhouse gas reductions were overestimated and other 'unintended' consequences, including higher emissions of agents with higher global warming potentials than CO_2 such Black Carbon indicate that some of the efforts to address climate change may have counterproductive. This all seems to be another negative consequence of a policy making style that focuses too much on economic efficiency and/ or single environmental indicators instead of placing public health centrally and keeping a holistic view on the environment.