A direct injected and turbocharged Euro 5 diesel engine has been set up in a test bench where the vehicle driving conditions of the European NEDC (New European Driving Cycle) test can be simulated. The engine is operated as the engine of a corresponding vehicle, equipped with a similar engine and driving through the NEDC cycle. The regulated gaseous emissions, carbon monoxide, hydrocarbons and nitrogen oxides, as well as particulate numbers and size distributions where measured in 5 selected steady state operating points during the engine test. Fuel consumptions and carbon dioxide emissions where measured as well. The steady state operating conditions were chosen within the engine operating range during a vehicle NEDC test and representing as broad an operating range as possible during the NEDC test. A method is presented in which the NEDC test emissions are calculated from the 5 steady state measurements. It is shown that the method gives emission results that agree well with values that can be expected from the vehicle in question during an NEDC test. In this way a limited number of steady state measurements can be used to simulate vehicle emissions. The reason for carrying out engine experiments instead of vehicle measurements was to obtain well controlled engine conditions and thus better insight in the operation of the engine in the individual phases of operation, and thereby enable evaluation of the possibilities for improving engine performance with respect to emission and fuel consumption reduction. Two different fuels were tested. These were a Fischer-Tropsch fuel, produced from biomass at the Güssing gasification plant in Austria and a commercial diesel from a fuel station in Denmark. The results of the measurements and engine modification considerations showed that bio Fischer-Tropsch fuel does have advantages with respect to particulate and also small advantages with carbon monoxide and carbon dioxide emissions. However, NOx emissions are rather a question of the injection timing of the fuel, and the NOx emissions can be adjusted to give the same level of emissions by changing the injection timing with ordinary diesel. The injection strategy was changed in order to attempt to reduce NOx emissions below the limits in the Euro 6 regulations.