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IResearch and innovation in predictive management for bus fleets: the Ravenna case study

The innovative Predictive Maintenance system to assess the quality of engine oil for buses was tested in Ravenna and Forlì (Italy).

The system was developed within the Horizon 2020 project European Bus System of the Future 2 (EBSF_2, EC grant No. 636012).

The predictive maintenance system relied on maintenance software to analyse data coming from sensors assessing the engine oil quality, therefore detecting potential breakdowns and replacing spare parts in advance; the system also identifies which metals or problems concurred to the oil poor quality. The test involves three urban diesel-fuelled urban buses in Forlì and three methane-fuelled urban buses in the Ravenna, for a total of 27 lines and a maintenance staff of 20 units, over a 12-month testing period. The consequences in terms of improved maintenance process, and the mitigation of dangerous effects of conventional operational performance (poor quality of components, their short lifetime and recurrent disposal) are core drivers in this work and will contribute to exploitation of this innovation at full operational range.

At the same time the positive environmental consequences seem to be significant and expected to become even more important if scaled up to fleet level and full regular operations. Potential environmental benefits in terms of mitigation of emissions are estimated at 0.56 tonnes of CO2 emissions saved yearly by equipping the vehicles with the Predictive Maintenance sensors and filters; and improvement of the waste management process, by preventing the disposal of around 15 tonnes of oil every four years, if scaled up to fleet level •