As the use of electric vehicles grows there is a greater possibility of using aggregated sets of electric vehicles as a large flexible unit to assist with the control of the power system. In this paper, the possibility of using electric vehicles as a flexible load for frequency control is investigated. The investigations are performed in a Pan-European interconnected grid with varying wind power penetration and different operational scenarios. Within this grid, the paper focuses on primary frequency control provision from electric vehicles and how the system behaves as the vehicles are being controlled within their respective areas. The investigations show that electric vehicles can be used for primary frequency control with different wind power penetration. By controlling the vehicles, the steady state frequency is improved and, since the vehicles react fast enough to the frequency changes, also frequency nadir and rate of change of frequency are positively affected.