

# BATTERY MANAGEMENT SYSTEM FOR THERMAL MANAGEMENT OF LI-ION SYSTEMS

**Innovations and Benefits** - The extension of electrification in 'niche' road (micro-cars) and in 'non-road' sectors (agriculture, shipbuilding, hobby industry) using diesel- and gasoline-fuelled engines not only represents a considerable environmental and energy worth but also offers an upgrading chance for an existing industrial sector.

Using new Li-Io technologies for the onboard power storage requires the development of auxiliary systems for charge equalization and for the thermal management of cells, which expand their performance over time (the so-called BMS - Battery Management Systems). The BMS systems developed by ENEA – modular air-cooled or changing-status – are very cost-effective even for reduced series.

**Uses** - Two-, three-, four-wheeled cars.

**Past and Present Activities** - 12 V – 30/60/100 Ah modules for re-powering electric buses with lead-acid batteries. Development of hybrid power-pack for micro-car (Spazia HPP).



Hybrid Spazia HPP micro-car

