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Preface

Transport activity is an integral part of economic development. Economic growth and parallel improvement in the welfare of population are leading inevitably to an increase in the demand for transportation. Data on car sales trend illustrate this statement clearly. By 2035, the global fleet of cars is projected to hold 1.7 billion cars compared with approximately 1 billion cars nowadays. Transportation is responsible for a large part of energy consumption worldwide. According to International Energy Agency data, about 26% of all energy-related CO_2 emissions are caused by transportation. It is likely to account for a higher share in the future, unless special measures are taken. Road transport is responsible for about three quarters of total energy consumption in the transportation segment. Nowadays, road transportation is almost entirely dependent on crude oil.

To limit the long-term global heating caused by anthropogenic activities the United Nations Intergovernmental Panel on Climate Change declared that annual global greenhouse gas (GHG) emissions must be reduced by 50 - 85% by 2050 in comparison with the emissions level in 2000. In order to meet global GHG emission mitigation targets, as well as to decrease oil dependency, overall energy consumption of road vehicles must be reduced significantly. The major challenge in reaching this goal is that the necessary reductions in carbon emissions by vehicles must be achieved without any disruptions in transportation patterns and population mobility. According to experts analysis, above 80% of the projected GHG emissions mitigation can be achieved by improving vehicle efficiency, introducing alternative fuels and decarbonizing electricity. Of course, any improvements in vehicle energy efficiency should be achieved together with zero-impact pollutant emissions, when mitigation of nanoparticle emissions is of a special importance due to their strong health effects. This special issue of *Energy and Power* is focused on advanced vehicle propulsion technologies, nanoparticle emissions by internal combustion engines, alternative low carbon intensity fuels and vehicle performance while using these fuels.

I do hope that you will find this special issue informative and useful to your research. I would like to express my gratitude to all the authors, reviewers and editors for their contributions to this special issue.

Guest Editor

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