Preface

The total number of vehicles on world roads today has surpassed 1 billion. The impact of this on the environment, our economies and societies is significant. With the predicted growth in population worldwide, increased density and congestion in urban environments, and with greater purchasing ability of individuals in the largest populated countries such as China and India, the impact of personal mobility and road transport in general will reach new heights.

Researchers and vehicle manufacturers have been exploring different technology scenarios and vehicle concepts in order to meet the many challenges we are facing in the domain of personal mobility. While vehicle electrification based on hydrogen fuel cells and new generation battery technologies seems inevitable, there are many transitional technologies that offer immediate solutions for reduction of emissions and fuel consumption. These include alternative fuels such as biofuels and gaseous fuels, new optimised technology solutions for downsizing of internal combustion engines, vehicle lightweighting based on alternative materials and multifunctional structures, new design and manufacturing concepts that utilise digital design and digital manufacturing systems, and others.

This book on Sustainable Automotive Technologies explores the wide range of transitional vehicle technologies that are emerging in response to the challenges and opportunities confronting personal mobility. The research reported in this book aims to provide a deeper insight into the technological solutions that have the capacity to facilitate the transition of the automotive industry and the market from now to the future. The book comprises of the following main chapters: (i) lightweight vehicle structures and materials; (ii) sustainable propulsion systems and fuels; (iii) systems solutions for sustainable mobility; and (iv) vehicle refinement and new technology concepts. Papers selected for publication in this book have been presented at the 4th International Conference on Sustainable Automotive Technologies ICSAT2012 held in Melbourne, Australia in March 2012.

All contributions included in this book have been reviewed independently by international experts with experience in relevant fields and have been edited accordingly prior to publication. We wish to take this opportunity to thank all researchers and reviewers for their respective contributions without which this book would not be possible. Also, we acknowledge in particular the continuing support

of Springer to this research field, which has enabled us to establish and publish an international book series on Sustainable Automotive Technologies that has attracted interest worldwide.

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