Design & Engineering Simulation for **Sustainability**

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If you haven't already done so, I would encourage you to find the time to watch Ola Rollén's keynote presentation on YouTube entitled "Your Data can Save the World" from our annual HxGN LIVE event in Las Vegas last June. In it, Ola, Hexagon's CEO, succinctly outlines why sustainability is critical to all of us on planet Earth given the way we are polluting our environment, depleting our natural resources, and not recycling enough of what we've already manufactured. Legislation and societal pressures will contribute to rectifying our pernicious habits, but it is science and engineering that will ultimately underpin many of the real-world answers to these problems that our children and grandchildren will inherit from us.

I believe that predictive computer-aided engineering (CAE) simulations will play a big part in ensuring we deliver the renewable energy and transportation solutions that will help solve our sustainability challenges this century. Our Vice President of Marketing, Keith Hanna, articulates how CAE will be in the vanguard of delivering practical engineering solutions to future sustainable development in his commentary on page 14. As Ola pointed out in Las Vegas, this is a real business opportunity for all industries, as well as a way to resolve some of the biggest and most complex problems facing humanity today.

At HxGN LIVE, I shared our vision of a smarter design ecosystem where better decisions can be made at the point of design. It is a vision we are making real through our unique portfolio of simulation solutions that improve any CAE user's productivity, make it possible to enhance your product quality and maximize your manufacturing efficiency. To make these tools smarter, we have developed new capabilities in several of our CAE products that provide you with design-for-manufacturability outputs, cost optimization in a common environment and enable product sustainability decisions to be made at the design phase.

In this edition of *Engineering Reality*, several of our customers share their approaches to sustainability. Coriolis from India (page 44) describes work simulating composites with Digimat to lightweight aircraft wings that improve aircraft fuel efficiency and Analog Way in France (page 78) outlines how it used our Cradle Computational Fluid Dynamics (CFD) software to reduce the thermal effects of big video display screens in Times Square New York to save electricity.

Additive manufacturing will be a transformative technology for sustainability in the next 20 years, since its mass commercialization minimizes scrappage, enables the lightweighting of transportation parts and right-first-time manufacturing benefits as shown by stories from the US Army (page 60) and MBFZ Toolcraft (page 82).

There are an estimated 1.3 billion road vehicles in the world today, the majority of which contribute to greenhouse gas emissions and air pollution in urban areas. Most analysts agree that autonomous vehicles will play an important part in our suburban future, with concurrent developments in smarter technologies and electrification offering reduced emissions and noise pollution. As the industry races to make safe autonomous vehicles reality, I encourage you to read this edition's excellent 'Thought Leadership' article by Chris Kinser from General Motors in Detroit (page 9) that describes how our VTD product line is central to GM's virtual test mileage requirements for safe and efficient self-driving cars.

This magazine sees several excellent cutting-edge co-simulation stories from Samsung in Korea concerning washing machine design (page 50), Volkswagen in Germany for sub-assembly duplication (page 6), and Panasonic in Japan optimizing fan design (page 86). I would also bring to your attention the fascinating US Army additive manufacturing use of MaterialCenter for data management. In Aerospace & Defence, Avio also share their experience, plus we have several automotive stories from leading companies such as Ford, Adient, Audi, VW, Daimler, Hyundai and Sany in this packed magazine.

Launched recently, MSC Apex Generative Design provides unprecedented productivity benefits for our users in additive manufacturing and a wide range of other CAE design spaces. We also have excellent commentaries on Integrated Computational Materials Engineering (ICME), Smart Generative Design and additive manufacturing in this magazine from our in-house experts Roger Assaker, Raj Dua and Hendrik Schafstall respectively. Finally, do check out our 'Tips & Tricks' article showing co-simulation between MSC Nastran and AVL Excite (page 84) and the exciting Artificial Intelligence (AI) and Reduced Order Modelling (ROM) work we are doing that combines our CAE product portfolio with the machine learning capabilities of our partner CADLM from Paris (page 27).