

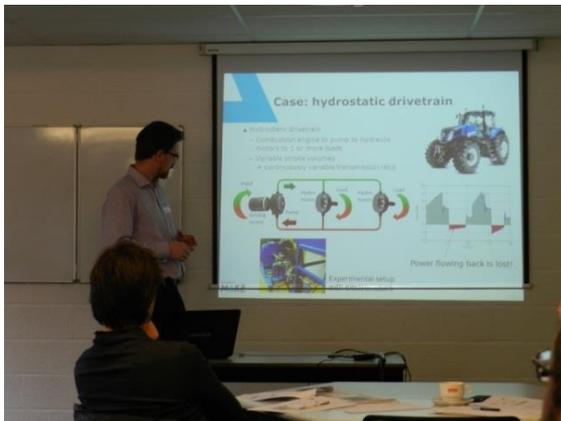
SUMMARY TECHNOLOGY SEMINAR: 'ENERGY EFFICIENCY IN MECHATRONICS: ENABLER OR JUST ANOTHER COST FUNCTION?'

Our lives are more and more influenced by technology and many applications have the potential to be more energy-efficient. Yet, innovation is not always driven by energy-efficient design.

How can mechatronics contribute?

Energy savings are a drive for innovation but are these costs a major or minor point in developing new technologies? Several experts focused on this question during a technology seminar in cooperation with Leuven.Inc - Leuven Innovation Networking Circle - on Tuesday February 3rd, 2015.

After a warm welcome by the organizers Nicole De Smyter, Manager of Leuven.Inc and Veronique Van de Kerckhove, Managing Director of VeroTech, our first speaker **Walter Driesen, Program Manager from Flanders Make**, kicked off with an introduction to the seminar's topic '*Energy Efficiency in Mechatronics: Why, what and how?*'



In Europe, we are faced with the challenges to meet requirements of the European Union to diminish gas emissions, pollution and improve energy efficiency. At the same time the industrial market is asking for lower total costs of ownership due to increasing energy prices. The answer: more energy efficient drive-trains for vehicles and machines.

Walter Driesen illustrated this statement with some case studies. For example hydrostatic drivetrains, where more efficient components lead to significant total cost reductions. Or a case study where TCO was based on energy consumption and installation cost

and improved KPIs by using more efficient components and storing excess energy to be reused when needed. Final conclusion of Walter Driesen's talk was that the focus on energy efficiency needs to be present from the very beginning of the design process. Virtual prototyping is very helpful in this approach because of relatively low costs and the possibility to try different paths.



Next speaker, **Mathieu Dutré, Application Specialist from Siemens Industry Software**, provided a systems engineering approach to energy-efficient design. In his view, many manufacturers are still approaching the development process without 'Model Based System Engineering' (MBSE), resulting in physical hardware and controller software that are only tested together at the calibration and validation stage, leading to confusion and problems at the last stage of the design process. Model Based System Engineering ensures that the design process hardware as well as software are designed together. MBSE also offers test capabilities

unavailable to experimental range. Currently this approach is used more and more.



Assistant Professor Dr. Ir. Theo Hofman from Eindhoven University of Technology focused on ‘*Vehicle system design optimization*’. Current trends are leading towards environmentally friendly vehicles, slowly switching from internal combustion engines to hybrid vehicles (oil and electric). The future though will lead us towards fully electrified cars. Current research projects are focusing on two main topics: where to get electricity from and how to store this electricity. In the meanwhile many projects look into increasing the capacity of car battery, range and speed. Who will be the first one to bring a reasonably

priced vehicle to the market?

Professor Hofman also explained the ‘Block Coordinate Descend method’ to improve the sequential design outcome.

Final conclusions of his intervention were that complex dynamic engineering systems require a system design approach!

Final speaker **Alex Serrarens, Manager Business Development from Punch Powertrain** talked about *Mechatronics in Automotive*. Punch Powertrain’s R&D team is developing the new generation of hybrid powertrains and CVT units.

Mr. Serrarens gave a short overview of mechatronics history in the automotive sector. Who knew that one of the first mechatronic components were wipers and that they are only standard part of a vehicle since 1960’s? And who knew that 100 years ago we stepped away from electric cars to fuel cars? The history has just turned full circle and we’re now trying to create new, better, faster and more efficient electric cars.

Alex also highlighted the development of 48V platforms. These days car batteries have insufficient capacity and power so the nearest future of the internal combustion engine is rather safe for another 20 years or so. The price of car batteries is still too high in comparison to conventional engine, the density which is responsible for the distance a car can go without recharging is too low. To make the switch to fully electric cars, great advancement in mechatronics and boost by 48V platform is required. It is believed that this platform will be introduced by the end of this decade.

Regardless of its maturity, the automotive industry has just begun to become truly smart, clean and exciting! And it goes further. All major players are working not only on electric cars but also on self-driving cars. Google for example, will be ready to introduce its autonomous driving car in just a couple of years, others will follow soon.



The seminar ended with questions to the speakers and rapidly turned into a fiery discussion on the different issues of the afternoon. Finally, all participants enjoyed some chat (aka networking) with a drink and bite.

