



Driving towards Circularity

International Conference
on Circular Economy in Automotive Industry
Sheraton Hotel | Bratislava | 6-7/11/2017

Summary

Business as usual is not an option anymore for our present economy. Looking at the importance of the automotive sector for both Europe and Slovakia a transition to new collaborative models is especially urgent. Circular Economy is an inspiring and above all promising concept. New business models like circular supply chain, product life extension, sharing platform, product as a service and recovery and recycling offer perspective and front runners are walking the talk and offer inspiration.

In the automotive sector, shifting consumer demands call for new mobility services, while tightening regulation will require collaborative innovation along the value chain. In the automotive supply chain, we can already observe several trends: in the electronics sector, circular opportunities are expected to arise from improved end-of-use strategies, enabled by circular design. In the parts and components sector, maintenance, repair and remanufacturing strategies will play a major role in the circular economy and overall, product-as-a-service has the potential to take root. There will be a need to redefine roles in the circular value chain and manufacturers and suppliers might need to rethink ownership. In the light of the tighter emissions regulations automakers must invest in electrification. However, the combustion engine will still be around for a while. Creating new material loops is essential for a circular economy and this will require rethinking the design, production, usage and waste phase.

Present "legacy" or linear support mechanisms are not adequate. Financial Institutions want to facilitate this transition and are rethinking their role in the wider value chain, becoming more a partner closer to their client's needs and are starting to adjust their risk models and support offerings. Governments cannot drive this transition alone and need to reach out to industry to scale up, involve knowledge communities for innovation and consumers for support. Regulation will need to be tuned in every part of value-chain from design to production, consumption and waste phase.

It is a highly complex and dynamic transition that will take time while change is urgent. The central keyword is collaboration.

Introduction

UNIDO, United Nations Industrial Development Organization, and the Ministry of Environment of the Slovak Republic in cooperation with the Ministry of Economy of the Slovak Republic organised an International Conference on Circular Economy in Automotive Industry on November 6 and 7 in Bratislava. The conference was organized within the scope of the **Bratislava Green Economy Process** launched at the Transition to the Green Economy Conference in September 2016, with, Automotive Industry Association of the Slovak Republic (ZAP) and the Embassies of The Netherlands and Norway in Slovakia in support of the event.

The conference had its focus on innovations that support the transition to circular economy in the value chains of the automotive industry. At the same time the presence of representatives from **Slovakia, the Czech Republic, Slovenia, Romania, the Netherlands, Norway, Finland, France and Germany** and representatives from the **European Union, European Business Associations and Institutes** created a platform for exchange of ideas, best practices and new partnerships among businesses from Slovakia and other European countries.

The automotive industry is crucial for Europe's prosperity. The sector provides jobs for 12 million people and accounts for 4% of the EU's GDP. The EU is among the world's biggest producers of motor vehicles and the sector represents the largest private investor in research and development (R&D).

The automotive industry in Slovakia makes up of 43% of value-added to the Slovak economy [check]. The production of cars *per capita* in Slovakia is highest in the world [check].

That the Slovaks take interest in the topic was clear by the presence of **Mr. László Sólymos**, Minister of Environment of Slovakia, **Mr. Rastislav Chovanec**, State Secretary of the Ministry of Economy of Slovakia and **Mr. Viktor Stromček** State Secretary of the Ministry of Transport and Construction of Slovakia.

Mr. László Sólymos mentioned that many supply chain actors in the automotive industry had already embraced circular economy practices and that this was a priority for the Ministry of Environment and a way to render the Slovakian economy more resource efficient.

For UNIDO the conference is an example of its main mission aimed at new industrial development with sustainable benefits in parallel.

Mr. Stephan Sicars, Director for the Department of Environment, UNIDO stressed the fact that the circular economy approaches were both new and old, and appreciated the way circular economy practices demonstrated economic benefits of environmentally friendly actions and made the business case.

The Dutch and Norway Embassies supported the conference and shared best practices from their countries.

HE Henk Cor van der Kwast, Ambassador of the Netherlands to Slovakia, informed that the Netherlands was working hard to implement circular economy throughout its society and its businesses and that it was taking root with large scale participation from both fronts. He

appreciated the Conference for providing opportunities for joint learning and networking among Dutch, Slovak and other European stakeholders and businesses.

HE Inga Magistad, Ambassador of Norway to Slovakia, referred to the opportunities for green industry innovation and climate change mitigation and invited Norwegian and Slovak businesses to deepen their collaboration on innovative solutions and new materials towards a circular economy transition.

Mr. Ybele Hoogeveen, Head of Green Economy Group, European Environment Agency, from the European Environmental Agency (EEA), shared EU policy plans and motivation. Business as usual is not an option anymore. Circular economy is an inspiring and above all promising concept that has been adopted by the European Commission. He stressed the fact that our world was faced with a sustainability challenge and that circular economy approaches where nothing is wasted offered some ways out if circular production and consumption patterns and reuse and recycling practices were chosen to move towards a low carbon economy decoupled from resource use. He shared analyses that a real dent could be made in CO₂ emissions related to electric cars only if renewable energy sources were used in production and disposal of vehicles as well as to fuel their propulsion.

Session 2, moderated by **Mr. Freek van Eijk**, Managing Director, Acceleratio, set the stage by presenting the larger picture of the circular economy applied to the automotive industry with an overview of business models and quantified with economics.

Mr. Philipp Buddemeier of Accenture Strategy, summarized economic gains that could be made through adoption of circular practices and said that their research showed five business models were operational in circular economy: circular supply chain, product life extension, sharing platform, product as service and recovery and recycling. He explained that while circular pilots were abundant, it was more difficult to become a circular company due to challenges in making a full cost business case and functional rigidities and silos. He also added that circular ecosystems had to be built up by creating a level playing field through policies, increasing partnership opportunities, and providing incentives for fostering long-term win-win solutions.

Mr. Ben Kubbinga, Circle Economy, discussed the need to redefine roles in the circular value chain; indicating that manufacturers and suppliers needed to rethink ownership. He gave insightful examples from successes in other sectors, e.g. the construction sectors, where actors identified new forms of collaboration; offered products as services (mobile phones), and made remanufacturing the standard (electronics) which the automotive industry could benefit from.

Mr. Thorsten Mehlretter, Managing Director Client Coverage, ING Wholesale Banking, Germany, summarized that in the light of the tighter emissions regulation automakers must invest in electrification. However, the combustion engine will still be around for a while. He provided striking examples on how electrification was changing powertrain production drastically by decreasing the number of parts and components from approximately 4,000 to about 400.

Mr. Jens Warsen, Environmental Policy Director, European Automobile Manufacturers' Association, reiterated the commitment of ACEA members to circular economy. He discussed the

impact of regulatory frameworks, particularly the End-of-Life Vehicles (ELV) directive, concluding that it had been effective, although challenges remained, for instance due to the existence of conflicting targets in overlapping regulations and enforcement.

Mr. Lubomir Soos, Vice President, Slovak Automotive Industry Association, demonstrated with figures the importance of the automotive industry for Slovakia. He also underlined the strategic objective of the Association as the minimization of the environmental impact of the industry.

Session 3 focused on best practices in the value chain moderated by **Ms. Ladeja Godina Kosir**, Executive Director at Circular Change, Slovenia.

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Ms. Michaela Ploszekova, Head of Environmental Department, Volkswagen Slovakia spoke of the production challenges that came with electrification: new body concept (light weighting); new types of waste (Li-ion batteries that are very challenging to recycle) and upcoming changes in regulations. She pointed out that renewable energy would drive the transformation to circular economy together with a holistic approach to addressing climate impact, and close by revealing her company's environmental targets to drive down environmental burdens by 45% per vehicle by 2025.

Mr. Thijs Jasink, Chief Operating Officer of ACtronics Group, stated that the circular economy is happening today for car electronics. Remanufacturing adds more value than repair as the common issue components are updated at the same time. He showed how ACtronics remanufactured electronic automotive components, indicating the proportion of components remanufactured remained small at 7% of replacement parts despite being very cost effective. He concluded by saying that 31% of replacements were due to faulty diagnosis and over half a billion euro could be saved if this were to change.

Mr. Frantisek Pelech, Environment and EPR Specialist, SKODA AUTO a.s. gave examples of their green retail network through various programs for primary resources management, waste production prevention, end of life products and secondary resources management.

Mr. Hugo Spowers, Managing Director, Riversimple (the RASA car) explained their business model as making efficiency profitable rather than optimized profit and added that they wanted to manufacture cars and sell mobility as a service over the lifetime of the vehicles instead of selling the vehicle. He concluded that bringing low carbon vehicle technologies to market would come with the associated economic rewards of efficiency.

Mr. Jan Mazur of "Old Market Hall Alliance, Up City!" spoke about the introduction of shared mobility services as part of their overall objective to reanimate public spaces. He indicated that new sharing economy models were well received by the public.

Mr. Peter Svec, Head of External Relations, PSA Groupe Slovakia introduced achievements recorded and targets in CO₂ emissions from vehicles/fuel consumption, with 42% of cars sold in Europe emitting less than 100 g/km of CO₂, as well as achievements in environmental management of materials, waste and materials cycles. In addition to demonstrating how the PSA Group recycled batteries, he explained the Group's car sharing and autonomous car initiatives.

Ms. Janet Kes, Manager for Corporate and Public Affairs, ARN Recycling, detailed key factors that have contributed to the highly successful 98.7% performance in the recycling and recovery of End-of-Life Vehicles in the Netherlands. She concluded by explaining how lithium ion batteries were recycled through repurposing for stationary use to energy storage. In the ensuing discussion, the questions asked by members of the audience contributed to further understanding of best practices demonstrated.

In Session 4, Circular Innovation was introduced "live"

Innovation is key aspect of circular economy and fundamental to countries' future economic growth. We need innovation. For start-ups, the ability to have a good pitch is essential to convince investors, clients and regulators.

Two young entrepreneurs pitched their business ideas to the audience in rapid-fire fashion. **Mr. Simon Krosiak**, of ZEUS (Zero Emission Urban Service), Go4, and **Mr. Peter Hladis**, Electro-Formula, Slovak University of Technology, delivered very short presentations and received live input from **Mr. Radoslav Mizera**, Vice President of Solved and **Mr. Freek van Eijk**, Managing Director, Acceleratio, who also moderated the session. Young entrepreneurs were pledged support by a number of members of the audience.

Day 1 ended with a networking dinner hosted by **Mr. Henk Cor van der Kwast**, Ambassador of the Netherlands to Slovakia.

On day 2 **Ms. Nilgün Tas**, Chief Industrial Resource Efficiency Division, UNIDO and **Mr. Milan Chrenko**, Director General at the Slovak Ministry of Environment kicked off the event with a summary of day 1.

Session 5, moderated by **Mr. van Eijk** of Acceleratio dealt with a topic that is close to the heart of the Slovak automotive industry: Material innovations for circular economy. Creating new material loops is essential for a circular economy. The session participants explored what this mean for the key components of the automotive sector and shared what is happening in the design, production, usage and waste phase.

Mr. Roman Karlublik, President, Slovakian Chemical Industry, spoke on behalf of Plastics Europe. He visualized Focused development of chemistry is condition for further light weighting of cars.

Mr. Constantin Damov, Co-Founder, Green Group, Romania, the largest integrated recycling park in South-Eastern Europe, showed its PET innovation and announced an investment in Slovakia. Instead of going from bottle2bottle, they upgraded PET further in making fibers for the

automotive sector. He argued that recycling becomes a feasible option when country introduces a reasonably high landfill tax.

Mr. Sander Kroon, Regulatory Affairs Manager, Flame Retardants and Functional Fluids, ICL Industrial Products Europe gave us a lesson in risk management of flame-retardants in plastics. Regulators are increasingly scrutinising applications in products and waste using a hazard approach. Applying a risk based methodology for selection of flame retardants (SAFR) provides manufacturers the most sustainable and effective choice for their automotive applications.

Mr. Arjen Sevenster, Senior Manager Technical and Environmental Affairs, European Council of Vinyl Manufacturers (ECVM-Vinyl Plus), explained the uses and safety and environmental benefits of PVC in the automotive sector, including recyclability. TheVinylPlus sustainability programme of the European PVC industry based on the co-operation of all actors along the value chain has proven its effectiveness, e.g. in boosting recycling; this experience is relevant also for the automotive industry.

Mr. Juraj Plesnik, Executive Manager, STERED showed how textiles can have a new life for car as acoustic and thermal insulation material. This innovation of repurposed textile got interest from some of the foreign guests.

Mr. Jan Bollen, Chair of EUROFER Product Regulatory Environmental Issues/Life Cycle Assessment WGs and Manager Environmental Affairs, ArcelorMittal Europe put circular economy in the European Steel industry on the agenda. He showed the potential for “new” steel with improved circular properties. Steel is a permanent loop material.

Another permanent loop material and key material in the automotive industry is Aluminium and was presented by **Ms. Christine Frogner Brath** Director, Senior Analyst, Corporate Strategy and Analysis, Norsk Hydro ASA

“Norsk Hydro shared its views on aluminium applications, markets and technology development as drivers for circular economy.” The present range of application can certainly be expanded.

Financing the circular economy was the topic of Session 6, moderated by **Mr. van Eijk** of Acceleratio.

Access to financing has been identified as a major barrier for circular economy initiatives. The EU has seen a tightening banking regulation. Circular economy business have a longer-term focus and a longer term to break even. CE Business models -from selling products to providing services-changes cash-flow and risk model. In remanufacturing models a second, third or fourth life is not valued in accounting systems. In more general terms, societal benefits of circular economy business models like carbon emission reduction are not appreciated in financial models.

Mr. Massimiano Tellini, Chief Innovation Officer Circular Economy Project Intesa San Paolo Group, explained why circular economy is not just a sustainability issue, but a strategic innovation. He convincingly showed a new role that financial institutions can play within the transition (rebuilding trust...) instead of being an obstacle (linear risk vs circular opportunity).

Mr. Armand Ferreira, Director of Sustainable Finance at ING, stated that financial institutions need to work beyond banking in order to be able to finance circular business.

Both bank representatives shared inspiring examples of circular transition from their customer base with the audience.

The EBRD and EIB manifested how they are repositioning themselves, how they set priorities for financing circular models and what it could mean for Slovak automotive industry. Lack of funding does not seem to be missing for circular economy.

Mr. Sumeet Manchanda, Principal, Energy Efficiency and Climate Change, EBRD, mentioned that the EBRD is looking at how to expand its financing for circular economy investments, and is keen to hear from more companies in this regard.

Mr. Darragh Mac Neill, Project Directorate, EIB

The transition towards a circular economy and the associated new business models represents a multifaceted challenge for which innovative and holistic solutions comprising of technical, operational and financial components are required. The longer-term horizon of the EIB makes them attractive for projects seeking funding.

Session 7, moderated by **Ms. Nilguen Tas**, UNIDO, was all about facilitating the transition to Circular Automotive Sector.

Previously we have heard that the the automotive industry is crucial for both European and Slovak prosperity. What is needed for a transition?

Change does not come by itself, it needs actions from industry itself but it also needs facilitation or stimulation actions, from the regulators at EU and national level.

Ms. Bettina Lorz, Senior Expert from the Directorate-General for Environment of the European Commission, gave an introduction speech on the end-of-life vehicles Directive as an instrument to drive circular economy in the automotive industry, a main policy instrument to shape the circular economy in the automotive sector and explained how this fits in a broader circular economy approach. Directive 2000/53/EC on end-of-life vehicles is an early tool to establish circularity for the automotive sector: the extended producers' responsibility reaches from the conception of the vehicle to the end-of-life treatment, it incentivizes ecodesign and pushes for eliminating hazardous substances used in cars, driving innovative research and progress in treatment of the ELVs so to valorize the positive value of this waste stream.

Mr. Markus Becker, German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, shared findings from electric vehicle component recycling projects with the audience. A resource strategy for e-mobility can help to secure material supply and lower costs for industry as well as to strengthen environmental protection.

Mr. Pavol Prepiak, Vice President of the Slovak Automotive Industry Association (ZAP) gave an overview on actions of the Slovak government which would help to the automotive industry in Slovakia. As an topical issue mentioned was building an online Waste Management Information System as well as expert discussion on whether the combination of all types and methods of waste management in one legal norm is optimal or the adoption of a separate legal norm allowing the return of products after the lifetime is needed. When asked how he judged the conditions for ELV in Slovakia compared to the other EU member states or neighboring countries he noted

that Slovakia set up the extended producer responsibility system for ELV correctly and in line with the directive 53/2000/EU. Slovakia is at the forefront of the EU with the process of authorizing ELV operators and the ZAP SR maintains an excellent online system for issuing a certificate of destruction, which is linked to the National Automobile Registry. Mentioned, it is necessary to fine-tune some of the inaccurate part of the law and encourage all stakeholders to support the real circular economy.

Industry needs from the perspective of a large automotive company were presented by **Mr. František Pelech**, Environment & EPR Specialist, Škoda Auto a.s. He identified the general waste management administration processes and the lack and inaccuracy of the information as the main weaknesses of the current system. He also pointed out the necessity to interlink the legal standards and to ensure compliance with the legislation in order to achieve desired results. He called the current system of the market car removal as a grey zone of cars disappearing because of the legislative discrepancies.

Session 8, moderated by **Mr. Lawrie McLaren**, Managing Director, Burson-Marsteller focussed on governmental initiatives to mainstream circular economy.

In this session, the best practices from 5 governments on their way to becoming circular were shared with the audience. What can governments do to mainstream circular economy? Which ambition did they set, which segments do they target, which interventions have they planned and how did they manage to get support and commitment from other stakeholders like industry, knowledge communities, financial sector etc. were of the main focus of speakers.

Mr. Tadej Slapnik, State Secretary, Office of the Prime Minister, Government of Slovenia spoke about Slovenia's unique stakeholder involvement. Slovenia is an example of a country that has the size to bring stakeholders together around circular ambitions. Building on the strong Slovenian Stakeholder collaboration, they want to create a regional circular economy hub in the South European region. Furthermore he mentioned that Slovenia, the Netherlands and Finland would like to create a so-called *circular economy triangle* for mutual collaboration and experience sharing.

Mr. Herman Bavinck, Coordinator of the Netherlands Circular Hotspot Programme, Government of Netherlands presented their ambition to be fully circular in 20250 and to be on the halfway in 2030. He explained that in the Netherlands they have a history of public-private collaboration. Herman stated: *"If you go alone - you go faster, if you go together - you go further. Our circular challenge is to go further and faster than ever before"*. The Dutch have identified 5 key market segments and 6 interventions. In a public-private transition agenda they are now setting concrete steps building up to the ambitions. Building coalitions in the value chain is perceived by them as a key for a transition to circular economy."

Mr. Norbert Kurilla, State Secretary, Slovak Ministry of Environment

Shared the circular economy ambitions of Slovakia and the path they have set out to get there. For the Ministry of Environment, the circular economy practices are a priority and a way to render the Slovakian economy more resource efficient. He did like the idea to reshape the circular best practice triangle of Finland, Slovenia and the Netherlands into a quadrant that also includes

Slovakia. He stressed that circular economy is in the center of the Slovak political interests and public policies. In relation to this, he announced the ambition of Slovakia to become a circular economy reference point in the Central European region.

Mr. Heikki Sorasahi from Sitra Finland showed the audience how Finland innovates towards circularity in transport and logistics under the Finnish roadmap to a circular economy. A comprehensive shift to shared mobility services (“Mobility as a Service”) is a key element for the circular economy in mobility. It requires digitization (based on open data), multimodality and deregulation.

Mr. Vladislav Smrž, Deputy Minister at the Czech Ministry of Environment, Section of Environmental Policy and International Relations, spoke about the circular economy ambitions of the Czech Republic in the field of automotive industry. He gave an overview of the policies that the government adopted and actions that have already been undertaken. He supported his speech on the success of the call to promote the recovery of ELV by data and statistics.

Session 9 dealt with various support mechanisms which could help in the transition towards circularity process. It was moderated in a central setting by **Ms. Ladeja Godina Košir**, a leader of the stakeholder platform called Circular Change. In this session we looked at the bigger picture and various support mechanisms from various transnational institutions were introduced.

Mr. Peter Börkey, Principal Administrator, OECD Environment Directorate, noted that to effectively transition towards the circular economy, governments will need to develop new policies and align them better across sectors.”

Attila Tuross, Lead, Future of Production, World Economic Forum concluded similarly: “mainstreaming circular automotive production has to be done in public private collaborative framework where business, government and civil society work in a consultative way to create good policies and invest strategically to implement change at speed and scale.”

Mr. Stephan Sicars, Director, UNIDO Department of Environment, pointed out the support mechanisms not only for already existing resource efficiency methods but also for new business opportunities. Such new business opportunities are for example value and supply chain changes to improve productivity coupled with environmental benefits or new circular business models (like chemical leasing, paying for performance), product innovations to eliminate toxicity, valorising e-waste or plastics, valorising agricultural waste or cleantech entrepreneurship development. Good support examples are the 21 UNIDO cleaner production centers.

In any discussion, we should not forget about the impact of circular transition in developed country on developing countries. The speakers estimated that circular economy transformation clearly offers opportunities for developing countries but maybe at a different pace and time.

Mr. Stefan Klein, the Slovak inventor of the AeroMobil flying car shared his dream of new mobility with the audience. His idea forced participants to think beyond the electric car or the RASA hydrogen car and allowed them to imagine a new concept, a flying car. Mr. Klein took the opportunity to present a new twin-engine concept of the AirCar flying car, with a perspective being used for personal transport.

The Slovak State Secretary **Mr. Kurilla** closed the event together with **Mr. Sicars** from UNIDO. Both expressed their gratitude and gave compliments to the organizers for organizing this content rich event, extended network and the open atmosphere of discussions. This was not an one-off event but the start of a circular transition and continued collaboration between participants.