UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

MINISTRY
OF ENVIRONMENT
OF THE SLOVAK REPUBLIC

Driving towards circularity

INTERNATIONAL CONFERENCE

on circular economy in the automotive industries

Bratislava, 6-7 November 2017

Transition to the Green Economy

DISCLAIMERS

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Mr. László Sólymos
Minister of Environment, Slovak Republic
6 November 2017 – Sheraton Hotel

I am very pleased to welcome you to this conference. Today we are here to discuss innovations in the automotive industry. These innovations are based on the necessity to transition towards a "circular economy," an alternative to the unsustainable linear model of economy, which is based on the "take-make-waste" principle.

This event is organized within the framework of the Bratislava Green Economy Process. This process started in the second half of 2016 with the Transition to Green Economy conference organized in September during the Slovak Presidency of the Council of the European Union. After the success of the first year, I am very glad to welcome more than 160 participants from 15 countries. This number is proof that the circular economy, which is discussed so intensely today, is a topic attracting both professional and political attention. It is not necessary to explain that the circular economy is an economy which produces but saves natural resources during production, which consumes but consumes reasonably and is based on informed choices, and, of course, which does not throw away a product but returns it to circulation. The circular economy can become an important guide for production in Slovakia.

According to a joint study of the OECD and the Ministry of Environment of the Slovak Republic – entitled Making Slovakia a more resource efficient economy – the activity of Slovakia must be focused on increasing resource efficiency and achieving the green growth necessary for sustainable economic growth and increased prosperity. Producing more at higher quality while consuming less can reduce production costs, increase the secure supply of resources, ensure long term competitiveness, and mitigate pressure on the environment. The sooner Slovakia introduces such policies, the greater the economic and environmental contribution can be. Current strong economic growth offers a unique opportunity to carry out the necessary investment to facilitate the transition to the circular economy.

Therefore, let me say that already now, opening the event, there are at least two main messages from this event. First, the presence of the representatives of the Ministry of Economy and the Ministry of Transport and Construction is a positive sign that these Ministries do not believe that the circular economy falls exclusively under the competences of the Ministry of Environment. Like other countries, in Slovakia we realize that we can successfully respond to the challenges only by inter-institutional cooperation. The active participation of my colleagues from both Ministries in the discussions about the transition to the circular economy makes me feel very pleased and I believe that the engagement of both Ministries will continue in light of all the upcoming challenges.

The second message is that the automotive industry, having a dominant position in the industrial production in Slovakia and therefore having a great potential to significantly contribute to the transition to the circular economy, recognizes its share of environmental responsibility and is actively looking for solutions to support the transition. This is confirmed by the presence of the representatives of automotive producers as well as representatives from supply chains.

I take away these two messages already, and I believe that there will be more such important messages at the end of our two-day conference.

To introduce the principles of the circular economy to Slovakia, one of the supporting activities of the Ministry of Environment is the creation of a central platform for mutual exchange of information and experience among all relevant entities of society.

In order to introduce the principles of the circular economy in Slovakia, a creation of a central platform for mutual exchange of information and experience among all relevant entities of society is one of the supporting activities of the Ministry of Environment.

Now, I would like to thank the co-organizers, the United Nations Industrial Development Organization (UNIDO), the Ministry of Economy of the Slovak Republic, the Automotive Industry Association, the Embassy of the Netherlands and the Embassy of Norway, as well as all of our partners for the cooperation and support for today's conference.

I hope you will have inspiring discussions during these two days, which will outline new solutions, enrich you with new knowledge and represent an excellent opportunity to meet key partners and start the activities supporting the transition to the circular economy.

Thank you!

Transition to the Green Economy

Driving towards Circularity
International Conference
on Circular Economy in Automotive Industries
Sheraton Hotel | Bratislava | 6-7/11/2017

Day 1: Monday 6th November 2017

13:00-13:25	**Session 1:** Welcome Remarks
	Mr. László Sólymos, Minister of Environment of the Slovak Republic **Mr. Ratislav Chovanec,** State Secretary for the Ministry of Economy of the Slovak Republic **Mr. Viktor Stromček**, State Secretary, Ministry of Transport of the Slovak Republic **Mr. Stephan Sicars**, Director, Environment Department, UNIDO **H.E. Mr. Henk Cor van der Kwast,** Ambassador of The Netherlands to Slovakia **H.E. Ms. Inga Magistad**, Ambassador of Norway to Slovakia
13:25-13:40	• *The importance of a circular economy transition from the EU perspective* **Mr. Ybele Hoogeveen,** Head of Group, Green Economy, European Environmental Agency (EEA)
13:40-13:45	• *Introduction of the workshop and the programme* **Ms. Nilgün Tas,** Deputy Director, Environment Department, UNIDO; Chief, Industrial Resource Efficiency, UNIDO **Mr. Milan Chrenko,** Director General, Directorate for Environmental Policy, EU and International Affairs, Slovak Ministry of Environment
13:45-15:15	**Session 2:** Setting the Stage
	• *Redefining competitiveness through the circular economy* **Mr. Philipp Buddemeier,** Director, Accenture Strategy | Sustainability • *On the road to the circular car* **Mr. Ben Kubbinga**, Built Environment Programme Manager & Lead Partnerships, Circle Economy • *The electrification of the automobile is challenging the EU car industry* **Mr. Thorsten Mehltretter**, Head of Automotive, Transport & Logistics, ING Bank • *European Automobile Manufacturers' Association vision on circular economy* **Mr. Jens Warsen,** Environmental Policy Director , European Automobile Manufacturers Association (ACEA) • *Status of the Slovak automotive industry* **Mr. Ľubomír Šooš**, Vice President, Slovak Automotive Industry Association (ZAP) **Panel Discussion** *Moderator:* **Mr. Freek van Eijk**, Managing Director, Acceleratio
15:45-17:45	**Session 3:** Best Practices in the Value Chain
	• *Electrification of the automotive industry: Production and its challenges within circular economy approach* **Ms. Michaela Ploszeková**, Head of Environmental Dpt., Volkswagen Slovakia • *State of the art in remanufacturing of car electronics* **Mr. Thijs Jasink**, Chief Operating Officer, Ctronics Group • *GreenRetail* **Mr. František Pelech**, Environment & EPR Specialist, ŠKODA AUTO a.s

- *The RASA Car: The hydrogen fueled car*
  Mr. Hugo Spowers, Managing Director, Riversimple
- *Bratislava new mobility business model experiences*
  Mr. Ján Mazúr, Old Market Hall Alliance, Up City!
- *PSA:Trendsetter in sustainability*
  Mr. Peter Švec, Head of External Relations, PSA Groupe Slovakia
- *Recycling of End-of-Life-Vehicles (ELV) under the Dutch Extended Producer Responsibility (EPR)*
  Ms. Janet Kes, Manager Corporate and Public Affairs, ARN Recycling

Panel Discussion

Moderator: Ms. Ladeja Godina Košir, Leader, Circular Change

17:45 – 18:15	**Session 4:** Circular Innovation

- *Power pitches from three circular economy innovative companies*
  Mr. Šimon Krošlák, ZEUS (Zero Emission Urban Service), Go4
  Mr. Peter Hladiš, Electro-Formula, Slovak University of Technology

Moderator: **Mr. Freek van Eijk**, Managing Director, Acceleratio

Jury: **Mr. Radoslav Mizera**, Vice President, Solved
Conference Organizing Committee

18:15-19:00	**Networking**
19:00-20:30	Buffet Dinner offered by the Embassy of the Netherlands in Slovakia

With introductions from:

H.E. Mr. Henk Cor van der Kwast, Ambassador of The Netherlands to Slovakia
Mr. Norbert Kurilla, State Secretary, Ministry of Environment of the Slovak Republic
Mr. Stephan Sicars, Director, Environment Department, UNIDO

Day 2: Tuesday 7th November 2017

08:45-09:00	Summary of Day 1 & Program of Day 2 **Mr. Milan Chrenko**, Director General, Directorate for Environmental Policy, EU and International Affairs, Slovak Ministry of Environment **Ms. Nilgün Tas**, Chief, Industrial Resource Efficiency Division, UNIDO
09:00-11:00	**Session 5:** Material Innovations for Circular Economy

- *Material Innovations for Circular Economy*
  Mr. Roman Karlubík, President of the Association of Chemical and Pharmaceutical Industry of the Slovak Republic
- *Circular plastics PET trip from used packaging to automotive industry synthetic fiber*
  Mr. Constantin Damov, Co-Founder, Green Group, Romania
- *Sustainability in choosing flame retardant plastics for the automotive sector*
  Mr. Sander Kroon, Regulatory Affairs Manager, Flame Retardants and Functional Fluids, ICL Industrial Products Europe
- *Cooperation through the value chain to enable the circular economy: The case of PVC*
  Mr. Arjen Sevenster, Senior Manager, Technical & Environmental Affairs, European Council of Vinyl Manufacturers (ECVM-Vinyl Plus)

- *Textiles: A new life for car textiles as acoustic and thermal insulation material*
  Mr. Juraj Plesnik, Executive Manager, STERED

Sustainable materials

- *Circularity of steel whilst reinventing itself in automotive*
  Mr. Jan Bollen, Manager, Environmental Aspects of Products, ArcelorMittal Europe, Environmental & Climate Change Affairs
- *Norway aluminum innovations lead the way*
  Ms. Christine Frogner Brath, Director, Senior Analyst, Corporate Strategy and Analysis, Norsk Hydro

Panel Discussion

Moderator: **Mr. Freek van Eijk,** Managing Director, Acceleratio

11:25-12:35	**Session 6:** Financing the Transition to a Circular Automotive Sector

- *Circular economy as an opportunity to redesign the compact between business and society*
  Mr. Massimiano Tellini, Chief Innovation Officer, Circular Economy Project
  Intesa San Paolo Group
- *Financing the circular economy*
  Mr. Armand Ferreira, Director Sustainable Finance, ING Wholesale Banking, Amsterdam
- *European Bank of Reconstruction and Development (EBRD)*
  Mr. Sumeet Manchanda, Principal, Energy Efficiency and Climate Change,
  EBRD
- *European Investment Bank (EIB)*
  Mr. Darragh Mac Neill, Senior Industry Advisor, EIB

Panel Discussion

Moderator: **Mr. Freek van Eijk**, Managing Director, Acceleratio

13:45-14:40	**Session 7:** Facilitating the Transition to a Circular Automotive Sector

- *The Directive on End-of-Life-Vehicles (ELV) as an instrument to drive circular economy in the automotive industry*
  Ms. Bettina Lorz, Senior Expert, Waste Management & Secondary Materials,
  Directorate General (DG) Environment, European Commission
- *Findings from electric vehicle component recycling projects*
  Mr. Markus Becker, Environment, Traffic and Transport, Electric Mobility
  Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, Government of Germany
- *Which Slovak governmental actions would help the Slovak automotive industry*
  Mr. Pavol Prepiak, Vice President, Slovak Automotive Industry Association (ZAP)
  Mr. František Pelech, Environment & EPR Specialist, ŠKODA AUTO a.s.

Panel Discussion

Moderator: **Ms. Nilgün Tas**, Deputy Director Environment Department, Chief – Industrial Resource Efficiency, UNIDO

14:40-16:10	**Session 8:** Government Initiatives to Maintain Circular Economy
	• *Netherlands Circular Hotspot* **Mr. Herman Bavinck**, Programme Director, Netherlands Circular Hotspot Programme, Government of the Netherlands • *Slovenia's stakeholder involvement* **Mr. Tadej Slapnik**, State Secretary, Office of the Prime Minister, Government of Slovenia • *Slovakia's ambition to become a circular economy reference point in Eastern Europe* **Mr. Norbert Kurilla**, State Secretary, Ministry of Environment of the Slovak Republic • *How Finland innovates towards circularity in mobility* **Mr. Heikki Sorasahi**, Specialist CE mobility & logistics, The Finnish Innovation Fund (SITRA) • *Czech experiences on the promotion of the circular economy* **Mr. Vladislav Smrž**, Deputy Minister for Section of Environmental Policy and International Relations, Ministry of Environment, Government of the Czech Republic **Panel Discussion** *Moderator:* **Mr. Lawrie McLaren**, Managing Director, Burson-Marsteller
16:30-17:25	**Session 9:** International Support for Driving Towards Circularity
	• *OECD work on the circular economy* **Mr. Peter Börkey**, Principal Administrator, OECD Environment Directorate • *Accelerating the transition to a circular economy* **Mr. Attila Turos**, Lead, Future of Production, WEF • *Circular economy – International support for driving towards circularity* **Mr. Stephan Sicars**, Director Environment Department, UNIDO **Panel Discussion** *Moderator:* **Ms. Ladeja Godina Košir**, Leader of Circular Change
17:25 -17:45	Inspirational speech "Transport – Future – Alternative" **Mr. Štefan Klein**, Slovak inventor
17:45-18:00	**Close of the workshop and outlook for the future** **Mr. Norbert Kurilla**, State Secretary, Ministry of Environment of the Slovak Republic **Mr. Stephan Sicars**, Director, Environment Department, UNIDO

This was a Zero Waste Event.
All efforts have been made to **minimize waste and to utilize resources responsibly**.

(pro bono consultation by INCIEN Slovakia)

The Circle of Influence

Throughout the conference, participants were invited **to ask questions, voice opinions and vote on key issues**. The results of those discussions can be found at the back of this report.

RALLY 'ROUND

How does the automotive industry already foster the circular economy, and what more can be done?

This was the question posed by this international conference, considering circular initiatives in the automotive industry in Slovakia, Europe, and around the world. Held in Bratislava, the event was organized by the Ministry of Environment and the Ministry of Economy of the Slovak Republic in cooperation with the United Nations Development Organization (UNIDO), and with support from the embassies of the Netherlands and Norway in Slovakia. As the world's largest producer of cars per capita, Slovakia was a fitting place to hold these discussions.

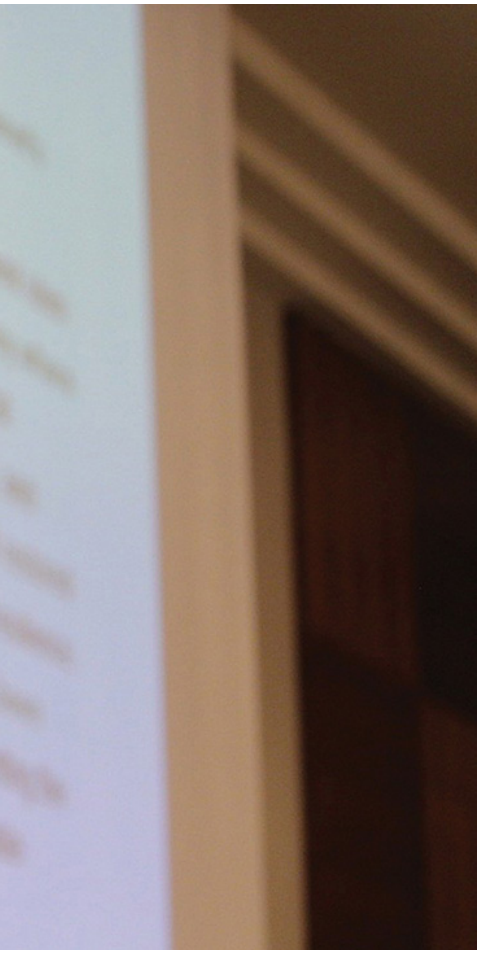
Over two days, discussions revolved around three main areas: **innovation, regulation** and **collaboration**.

The winners' circle

What is the circular economy?

The circular economy is a way of rethinking our approach to waste. Humans are the only creatures on the planet who create waste. Today's manufacturing models primarily involve taking raw material from the environment, creating new products, and disposing them after use. This is not a sustainable model. The circular economy is a way of rethinking our approach to every single stage of a product's life cycle.

By designing products for long life as well as for reuse and recycling, by shifting towards sharing models, rather than ownership, and by managing waste responsibly, we make our worlds more circular, more sustainable. A fully circular economy means a world without waste. The task ahead of us is a complicated one, and it involves everyone: industry, governments, international organizations, financial institutions, academia, start-ups, NGOs, and the public at large. **We need to change our thinking**.



Driving ambition

The automotive industry

The automotive industry is a large, highly technical industry, that creates complex products with many components. It is a significant source of jobs; in Europe alone the industry provides jobs for 12 million people, as well as accounting for 4 per cent of the GDP of the European Union. In Slovakia, the industry represents almost 43 per cent of total industrial production, and in 2015 and 2016, Slovakia produced over a million cars.

Today, with increasing environmental regulations, the automotive industry is a site of enormous, rapid change. Will we have to change industry to protect the environment at the expense of jobs or commercial success?

Two days to go full circle

The conference

The two-day conference was held in Bratislava by the United Nations Development Organization (UNIDO) and the Ministry of Environment of the Slovak Republic in cooperation with the Ministry of Economy of the Slovak Republic, and support from the embassies of the Netherlands and Norway in Slovakia. The speakers at the conference – including representatives from Slovakia, the Czech Republic, Slovenia, Romania, the Netherlands, Norway, Finland, France and Germany, as well as the European Union and numerous international institutions – addressed what the transition to the circular economy looks like today, and what is needed for the future. In the process, the speakers stressed three major themes: innovation, regulation, and collaboration.

THE ROAD AHEAD: Introductions

The first day began with introductory speeches, highlighting the importance of the circular economy in the automotive industry in Slovakia, Europe and beyond.

Mr. Rastislav Chovanec, State Secretary of the Ministry of Economy of the Slovak Republic emphasized **the key role that the automotive industry plays in the Slovak economy**. Mr. Chovanec noted that the circular economy is key to preserving the competitiveness of the automotive industry in Slovakia. As environmental and economic pressures increase, conscientious resource use is key. The 2015 European Union Circular Economy Package emphasized the importance of considering every stage of a product's life cycle.

As electrification grows in the Slovak automotive industry and beyond, Mr. Chovanec drew attention to two challenges: sufficient battery life and road infrastructure. He noted that the transition to the circular economy can bring benefits and opportunities to Slovakia, such as the opportunity to support the production and development of batteries, which is already occurring in collaboration with international stakeholders. In future, the Ministry of Economy will continue to support resource efficiency and further innovations in the automotive sector.

Mr. Victor Stromček, State Secretary of the Ministry of Transport and Construction of the Slovak Republic, noted that with cooperation between the Ministry of Transport, the Ministry of Environment, and the Ministry of Economy, **Slovakia was making good progress towards sustainability**. The automotive industry was not focused on being the first, the best, or the biggest, but on making its operations more sustainable. He explained how investment in infrastructure supported growth and innovation.

Circular economy has an important impact on our economy.

Mr. Rastislav Chovanec

The **Director for the Department of Environment at UNIDO, Mr. Stephan Sicars** highlighted the importance of **the circular economy both inside and outside the European Union**, to achieve inclusive and sustainable industrial development. He emphasized the strength of circular economy as the union between the environment and the economy, a union which can benefit industry as well as mitigate climate change.

The **Ambassador of the Netherlands to Slovakia, His Excellency Henk Cor van der Kwast** urged the need to "drive towards circularity together." He drew attention to ways in which **the Netherlands is implementing circular economy** on a national and international scale, and hoped for opportunities for both networking and learning among Dutch, Slovak and other European industry and stakeholders.

The **Ambassador of Norway to Slovakia, Her Excellency Inga Magistad** said she looked forward to continuing and **strengthening existing cooperation between Norway and Slovakia** towards circularity. She noted that Norway, as the first in the world per capita for electric cars, has the potential to offer useful cooperation with other countries. She stressed the huge potential to institute green industry initiatives and mitigate climate change.

INNOVATION

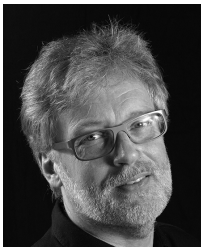
Innovation is already playing a key role in the global transition to the circular economy. Below are some examples of innovative approaches to the automotive industry, from new business models such as product as a service, to the challenges of electro-mobility, to new approaches to materials – such as making material lighter to reduce CO_2 emissions. We also look at cutting edge technology, such as Slovak inventor Štefan Klein's prototype for the flying car.

Driving ambition

Why do we need the circular economy?

We do not live within the limits of our planet.

Mr. Ybele Hoogeveen



In the keynote speech of the conference, **Mr. Ybele Hoogeveen, Head of Green Economy Group, European Environment Agency**, addressed **the global sustainability challenge** that we face. He stated that by 2050 we need to ensure that we operate within our ecological limits, in a world where nothing is wasted. He urged everyone to adopt a circular approach.

Mr. Hoogeveen addressed the major role that the European automotive industry must play in the transition to circular material use and renewable energy. He noted that the electrification of the automotive industry is only of limited benefit if the energy with which we produce electricity is not sustainable.


How could one measure
industry? How circular is

New models, new roles:

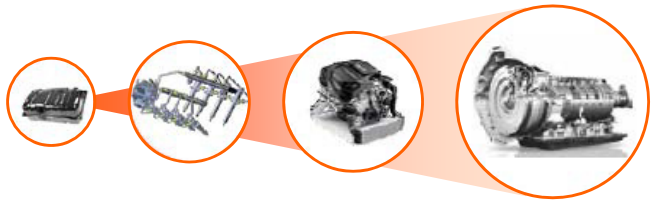
What does a circular economy look like?

Mr. Philipp Buddemeier, Director of Accenture Strategy defined **five business models of the circular economy**: circular supply chain, product life extension, sharing platform, product as a service and recovery and recycling. He drew attention to the inefficiency of the current system; at any moment $7 trillion worth of passenger cars sit idle around the world, amounting to twice the GDP of Germany. But this inefficiency, according to Mr. Buddemeier, creates the possibility of real change. He argued that huge economic gain – between $400 billion and $600 billion additional revenue by 2030 – could be achieved by adopting circular economy models, and working towards a circular ecosystem. Mr. Buddemeier acknowledged there were challenges, not least of which would be the creation of a full cost business case. He urged that there is a need to redefine competitiveness, and that a level playing field is crucial to foster real partnerships. The leap needs to be made from circular pilots – which are now common – to circular companies, and finally to a circular ecosystem.

Mr. Ben Kubbinga, Built Environment Programme Manager & Lead Partnerships, Circle Economy, argued that we need to **redefine roles in the circular value chain and rethink the concept of ownership**. New forms of collaboration are needed. Suppliers should not only offer renewable materials but consider a role as recyclers and remanufacturers. Demolition and recycling businesses can become suppliers of materials and pass lessons on to vehicle designers and engineers to design for end-of life. Ownership needs to be thought about differently; suppliers, construction companies and installers can deliver services while retaining ownership. The automotive industry can benefit from models from other industries, such as the Fairphone, which uses a product as a service model, designing a product for refurbishment and using sustainably sourced materials.

Electrification is changing the powertrain production drastically

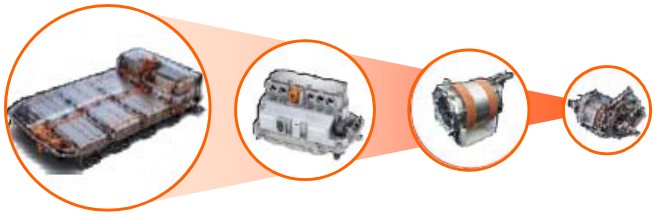
Comparison of drive trains - Complexity combustion vs. electric



Fuel tank | Air and gasoline intake systems | Crankcase, crankshaft | Multistage gear

~4,000 parts

Power train



Battery | Electronic | Electronic Engine | Singlestage gear

~320 parts

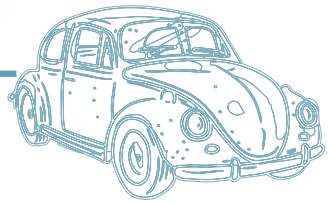
Source: PwC Analysis

Fuel for thought:

Challenges of electro-mobility

Mr. Thorsten Mehltretter, Head of Automotive, Transport and Logistics, ING Wholesale Banking, Germany, outlined **how electrification is challenging and changing the European automotive market.** Electrification is changing powertrain production significantly, going from around 4,000 parts to less than 350. Suppliers will need to review the business model. Mr. Mehltretter noted that regulations have played a key role in driving electrification. Global emission regulations are forcing Original Equipment Manufacturers (OEMs) to increase fuel efficiency and introduce alternatives to combustion engines. In the European Union, the regulation of CO_2 emissions has created the need for electrification. While electrification will be key, other factors, including the combustion engine, will continue to play a role.

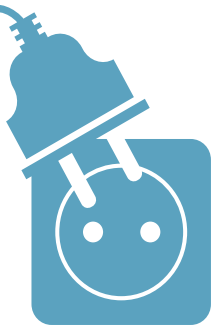
Electric vehicles continue to face challenges, such as charging points, possible range of kilometers, and battery cost. These matters are all progressing, and when they are solved there will be a great increase in electric vehicles. Mr. Meltretter stressed that ING was firmly committed to sustainability.

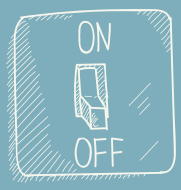


Ms. Michaela Ploszeková, Head of Environmental Department, Volkswagen Slovakia discussed:

Three main production challenges of electrification.

The first was the question of the **new body**, which needs to be more lightweight, given the CO_2 emissions regulations. At Volkswagen Slovakia, this means shifting from steel to aluminum – which is lighter – and glued rather than welded bodies. The second challenge is how to dispose of the **battery**. This is particularly the case with lithium-ion batteries, which create new types of waste. Finally, **regulations** pose a challenge, as they are often contradictory, and simply create a feedback loop. Ms. Ploszeková stressed that Volkswagen Slovakia are committed to covering the entire life cycle of a vehicle, and added that by 2025, the company aims to reduce the environmental burden by 45 per cent per vehicle by 2025, compared with 2010.





The question of **recycling electric vehicles** was addressed by **Mr. Markus Becker, Division of Environment, Traffic and Transport, Electric Mobility, Ministry for the Environment, Nature Conservation, Building and Nuclear Safety of Germany**. Mr. Becker noted that regardless of the changes that we make, motorized transport will continue to be necessary; although in urban centres and surrounds, public transport and cycling is possible, outside these areas driving is still essential. Electric vehicles are about three times more efficient than conventional powertrains. Mr. Becker noted that the German Government have supported many recycling projects to discover whether electric vehicle recycling is possible, and whether recycling can help secure material supply and lower environmental impacts. Their findings have shown that recycling battery and power electronics is technologically feasible; lithium – which is the major component for the battery – can be recycled and life cycle analysis shows that developed recycling procedures provide energy and greenhouse gas savings. However, the current prices and legislation do not require the recycling of components, including lithium.

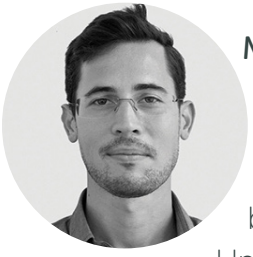
Mr. Becker went on to outline the findings of a German think tank, which arranged dialogue between government, industry and other stakeholders on resources for electro-mobility. The think tank found that the "usual suspects" – meaning lithium, cobalt, nickel, graphite and platinum – would still be abundant even if there was a rapid global uptake in electric vehicles. However, temporary scarcities and price increases would be possible, and resource extraction would have environmental impacts. The think tank recommended increased research and development to enhance material efficiency, the advance of recycling technologies, and identification of material substitutes if required. It also recommended setting up an industrial alliance for sustainable supply, and seeking international collaboration for sustainable mining. Third, a collaborative commodities radar could be set up on an international scale. Finally, an EU battery directive should be adopted. Finally, Mr. Becker stated that electro-mobility was a young technology, and urged everyone to "handle with care," to ensure that extraction methods were truly sustainable.

Along for the ride: Mobility as a service

A comprehensive shift to shared mobility services is a key element for the circular economy in mobility.

Mr. Heikki Sorassahi

Because Finland does not have a large automotive industry, the country's main transport focus is on mobility, as outlined by **Mr. Heikki Sorassahi, Specialist, Circular Economy Mobility and Logistics, The Sitra Finnish Innovation Fund.** Sitra envisages Finland as a successful pioneer in sustainable well-being. Mr. Sorassahi drew attention to the Act on Transport Services, under the Ministry of Transport and Communications, which shifts focus from owner to user and aims for **better and more agile transport services**. The Act is expanding to enable data services and open data and deregulation and market access in 2018. Mr. Sorassahi stressed that mobility services need access to data on passengers, commuting and ticket information.



Mr. Ján Mazur of **Old Market Hall Alliance**, Up City! outlined the shared mobility business model of Up City! which aims to reanimate public spaces through **shared electro-mobility in Bratislava**. The current model involves renting bikes, e-bikes, cargo bikes and electric cars in the city centre. In the future, Mr. Mazur stated that the Alliance hoped to introduce charges per minute, expanded drop-off and charging zones, and to expand to a citywide programme. Notably, the Bratislava public have responded well to this sharing economy model, which is a promising sign for future efforts.


t2gt
Transition to the Green Economy

Lightening the load: Materials

Mr. Roman Karlubík, President of the Association of Chemical and Pharmaceutical Industry of the Slovak Republic, spoke on behalf of Plastics Europe about **chemical materials in the circular economy.** He noted that chemical materials are a key contributor to the automotive industry today, stressing the omnipresence of chemistry in today's vehicles: fuels, lubricants, wheels and body.

He considered the new role of chemistry, since the automotive industry is undergoing a revolution towards electro-mobility. Chemistry is already present in the electric car, and Mr. Karlubík presented further creative solutions for electro-mobility, including infrared reflective polymer film in the windshield, high performance foams inside the car, and a solar roof with transparent solar panels and light-emitting diodes. When it comes to innovation in mobility, Mr. Karlubík stressed that plastics are a key contributor – for many reasons including safety, durability, and comfort. They also serve to reduce weight, as we move towards more lightweight materials. Finally, he noted the potential for plastic to be recycled, reused or transformed into energy or fuel at end-of-life stage.

While PVC is mostly used in the building and construction industry rather than the automotive industry, **Mr. Arjen Sevenster of Vinyl Manufacturers (ECVM-Vinyl Plus)** argued that PVC is well-suited to the automotive industry's changing needs. He stressed that PVC meets industry's needs as a flexible material, with no Volatile Organic Compounds (VOCs), and valuable qualities such as low fogging, scratch resistance, cold flexibility and soft touch effect.

Mr. Sevenster noted that there are still challenges for recycling at a product's end-of-life. He drew attention to how increased use of plastics also means the use of many different types of plastic, which leads to new challenges for recycling.

He noted that PVC is compatible with all recovery options, and he introduced the technology VinyLoop, a hi-tech patented recycling technology, which allows for the recycling of difficult polymer composites. He stated that the VinylPlus sustainability programme involves actors along the entire value chain, involving 200 companies across Europe, and the project has avoided one million tons of CO_2 emissions. Mr. Sevenster argued that VinylPlus, with an existing recycling network of more than 150 recycling companies across Europe, represents a valuable opportunity for the automotive industry.

Cooperation across the value chain is the key element of success.

Mr. Arjen Sevenster

The circularity of **steel** was the subject of a talk by **Mr. Jan Bollen**, **Manager, Environmental Aspects of Products, ArcelorMittal Europe, Environmental & Climate Change Affairs**. The European Steel Association (EUROFER) represents 100 per cent of steel production in the European Union. Mr. Bollen argued that "traditional" steel is being reinvented into a new kind of steel to match the needs of current industry.

He identified the main challenges for the automotive industry today as sustainability – including fuel economy and emission regulations, electrification, autonomous driving and car sharing – enhanced safety performance, affordability, global platforms and geographical production shifts.

Mr. Bollen noted that advanced steel solutions allow for significantly reduced weight and improved crash resistance. The steel used in the Volvo XC 90 is 125 kg lighter than its predecessor, and 200 kg lighter than most of its competitors. Mr. Bollen drew attention to the fact that steel is a permanent loop material, which can be continuously recycled. He also noted that "super lightweight designs" for vehicles actually emit higher rates of greenhouse gas (GHG) emissions. Although the design might have the best fuel economy, the emissions from the production phase are not recovered. Taking a life cycle approach, an "intelligent" lightweight design, using steel, considers GHG emissions during production, with a better result.

Aluminum was the focus of the contribution from **Ms. Christine Frogner Brath, Director, Senior Analyst, Corporate Strategy & Analysis, Norsk Hydro ASA**. She called aluminum "the metal of the future," stressing its lightweight, recyclable qualities, and its vast range of uses. Like steel, aluminum is a permanent loop material; however, recycling aluminum is easier than recycling steel.

Ms. Frogner Brath singled out technology development, energy efficiency and recycling as drivers for the circular economy. As sustainability and responsibility requirements increase, Norsk Hydro aspires towards greater goals, including the intention to be climate neutral by 2020. Ms. Frogner Brath outlined plans for a pilot plant in Karmøy, Norway, which will demonstrate the world's most efficient aluminum production. She drew attention to the close fit between the circular economy and "infinite aluminum." She noted that climate challenges have no borders, and in the new world economy, we need to establish new carrot and stick approaches to encourage everyone to face climate challenges.

Flame retardants are added to plastic and textiles to control flammability, and are used extensively in the automotive industry. **Mr. Sander Kroon**, **Regulatory Affairs Manager, Flame Retardants and Functional Fluids, ICL** talked about how to identify sustainable flame retardants. As there are a wide range of plastics there are also a wide variety of different flame retardants. Flame retardants can be hazardous chemicals, and while the nature of the chemical cannot be changed, the way it is used can.

The Systematic Assessment for Flame Retardants (SAPR) is an assessment framework to evaluate flame retardants in their application, using a scientific methodology to enable users to choose the most sustainable product for their intended use. The assessment measures both hazard and potential exposure during the intended use, and the impact on the environment and human health. Mr. Kroon noted that through this thorough assessment, it is possible for ICL to identify a more sustainable flame retardant for any specific application.


Anonymous
Latest question
@Janet: how to apply what ARN does in The Netherlands to other countries, particularly to developing countries
acceptance and new

Keeping you 'round: Industry goes circular

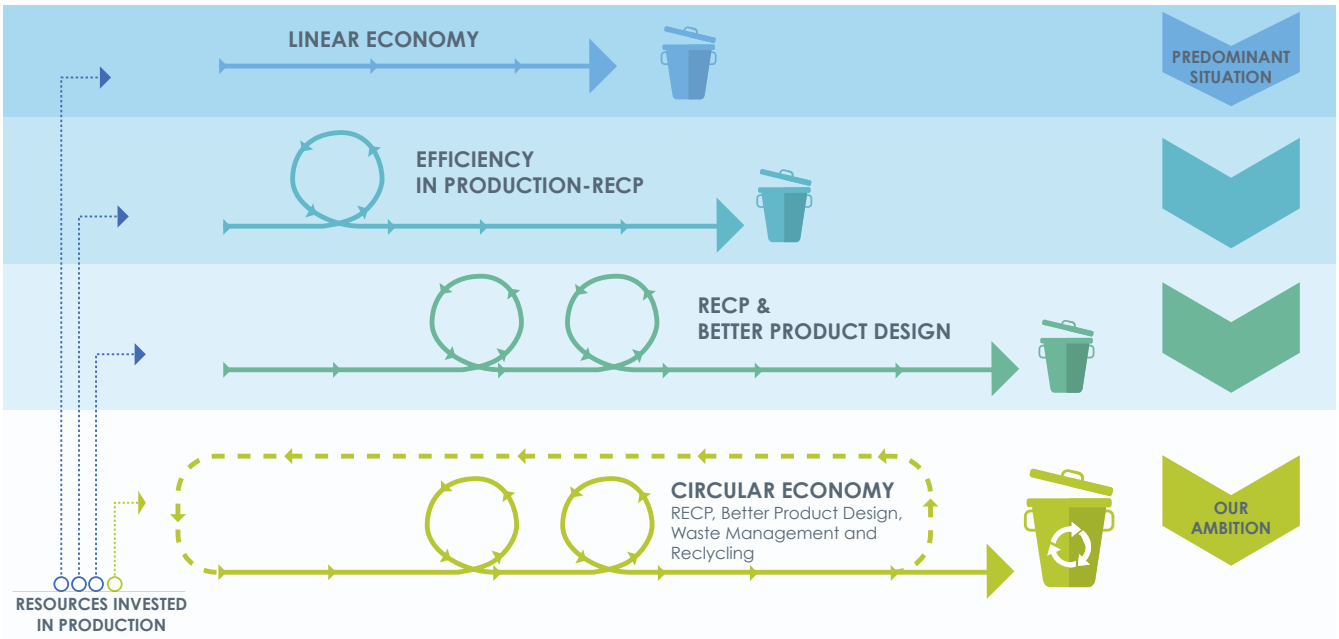
Circular economy is already everyday business in the automotive industry.

Mr. František Pelech

Representatives from ŠKODA, Volkswagen and PSA Groupe all contributed to the conference to outline the ways in which their companies are adopting circular economy methods.

Green retail, green factory, and green product are the names of programmes that ŠKODA uses to ensure their methods are environmentally friendly. **Mr. František Pelech, Environment and EPR Specialist, ŠKODA AUTO a.s**. spoke about their **various programmes that move towards a circular economy**, including e-mobility, resource management, waste prevention, end-of-life management, and commitment to reducing, reusing and recycling. This includes a tire take-back system which collects tires to use for other sources, such as in playgrounds, sewer hatches and equestrian schools.

IMPROVING Resource Use



Source: UNIDO

Mr. Peter Švec, Head of External Relations, PSA Groupe Slovakia noted that PSA is firmly committed to sustainability and is the European automotive industry leader in reducing CO_2 emissions. Mr. Švec noted that 42 per cent of PSA cars sold in Europe emitted less than 100 grams per kilometer of CO_2 in 2016, considerably less than the market average. **PSA has ambitious goals** for materials, waste materials, hybrid and electric vehicles, mobility services and autonomous cars.

We are taking circular economy and sustainability seriously.

Mr. Peter Švec

The **importance of the circular economy for the Slovak automotive industry** was the subject of a talk by **Mr. Ľubomír Šooš, Vice President, Slovak Automotive Industry Association (ZAP)**. Mr. Šooš noted that Slovakia is a world leader in automotive manufacturing per capita, and the industry is growing, with already three major car manufacturers and an expected fourth – PSA Groupe, KIA, Volkswagen, and in the future, Land Rover/ Jaguar. He outlined the key role the Association plays in balancing the wants and needs of the automotive industry with environmental protection. He outlined recent research and development projects focusing on technologies for progressive recovery of waste from old vehicles, and another project which researched waste water treatment.

What goes around comes around:

Recycling, reusing, remanufacturing

Upcycling was discussed by **Mr. Constantin Damov, the Co-Founder of Green Group, Romania**. Mr. Damov is the co-founder of the largest integrated recycling park in South Eastern Europe, and he outlined their upcycling of PET bottles. Upcycling is when you recycle a product and the product you obtain is of greater value than the original product. Mr. Damov showed how the Green Group discovered they could upcycle PET bottles into fiber used in the automotive industry. The resulting fiber is not only of higher value than the original product, but it also has a much longer lifespan – that of a car rather than a disposable bottle. He stated that five PET bottles could be upcycled into 1,500 km of fiber, which is the distance from Bratislava to London.

> In a world with limited resources, circular economy is not the future economy, but the future itself.
>
> Mr. Constantin Damov

The role of **remanufacturing** was the subject of a contribution from **Mr. Thijs Jasink**, **Chief Operating Officer of ACtronics Group**. He showed how ACtronics remanufactures electronics, and the way in which remanufacturing plays a key role in a circular economy. ACtronics remanufactures around 80,000 products a year. Mr. Jasink demonstrated that remanufacturing has many advantages over using new parts, including lower cost, lower waste rate, resolution of any development errors and support for the correct diagnosis. Furthermore, in contrast with a repair, a remanufacture involves replacement of all components, and at least two years of warranty. Despite these advantages, the use of remanufactured components comprises only 7 per cent of all replacement parts, with the other 83 per cent being new parts, and 10 per cent used. He urged that greater levels of remanufacturing were needed. Mr Jasink also noted that problems with equipment were often incorrectly diagnosed, meaning that 31 per cent of replacements were entirely avoidable. Half a billion euros could be saved if the market were educated to avoid this.

Recycled textiles from cars were the subject of a talk by **Mr. Juraj Plesnik**, **Executive Manager, STERED**, who showed how textiles from the automotive industry can have a new life as acoustic and thermal insulation material. The technical textiles used in car manufacturing are known to be mixed materials which are unsuitable for further textile processing. Slovakia is the first, and so far the only country to use STERED, a technology which recycles mixed technical synthetic textiles from the automotive industry, and revalues this material in products and applications. New solutions have arisen from the STERED method, all of which contribute to the environment, as well as mitigating the negative impact of automotive development. Mr. Plesnik drew attention to these new solutions, which include railway sound absorbers with a water retention function, which are made from a combination of recycled textile and recycled rubber from the automotive industry. Other products include roofing with high water retention and evaporation; sound-absorbing panels to block out noise; and concrete which can rapidly absorb water under sidewalks and parking lots. Mr. Plesnik said that while the automotive industry would continue to produce waste, STERED offered a good technical solution.

Car recycling's contribution to the circular economy was the subject for **Ms. Janet Kes**, **Manager for Corporate and Public Affairs, ARN Recycling in the Netherlands**. She outlined how ARN managed a recycling and recovery rate of 98.7 per cent of end-of-life vehicles (ELVs) in the Netherlands. Of new cars, 99 per cent join the collective system for ELVs in the Netherlands, and 84 per cent of all Dutch ELVs are processed through the ARN network, which comprises more than 300 car recycling chain partners. Ms. Kes outlined the key reasons for the high rate of success: an ownership tax incentivizes owners to deregister; deregistration is possible online, and is only possible through authorized treatment facilities (ATFs); and while it is possible to suspend a car from the system, it costs money. Ms. Kes also outlined their process of recycling lithium-ion batteries, where the car producers are required to responsibly dispose of the battery. Second use of cell batteries allowed for a recycling efficiency of 95 per cent.

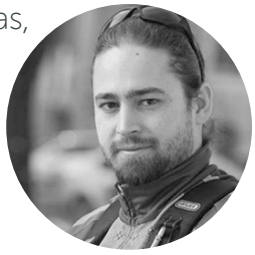
Start your engines:
Start-ups and the circular economy

The advantage of being a start-up is having a clean sheet of paper.
Mr. Hugo Spowers

Mr. Hugo Spowers, Managing Director, Riversimple, introduced the Riversimple RASA, a **hydrogen car**. Mr. Spowers stated an ambitious approach was needed to solve the problems of environmental impact. He said it was necessary not for a step-by-step programme, but for a complete change. The goal for the RASA car is to make efficiency profitable. While the cost of the car is considerable when compared with conventional combustion engine vehicles, Mr. Spowers argued that over time, low carbon vehicle technologies would lead to economic rewards from efficiency. He stated that the car was simple, efficient, light, strong, affordable, safe and sustainable. The RASA cars would not be sold as vehicles, but rather mobility would be sold as a service.

Let us hope the inbuilt obsolescence in products becomes obsolete.
Mr. Hugo Spowers

To emphasize the key role of innovation, a different method was taken in the fourth session of the conference, when two young entrepreneurs were invited onto the stage to "power pitch" **their proposals for sustainable start-ups** to the audience. The entrepreneurs – **Mr. Šimon Krošlák, of ZEUS (Zero Emission Urban Service), Go4** and **Mr. Peter Hladiš, Electro-Formula, Slovak University of Technology** – presented and received live input from **Mr. Radoslav Mizera, Vice President of Solved** and **Mr. Freek van Eijk, Managing Director, Acceleratio**. Members of the audience offered to pledge support for each of the ventures. The pitches and discussion showed an openness to new ideas, and a commitment to brand new innovation.



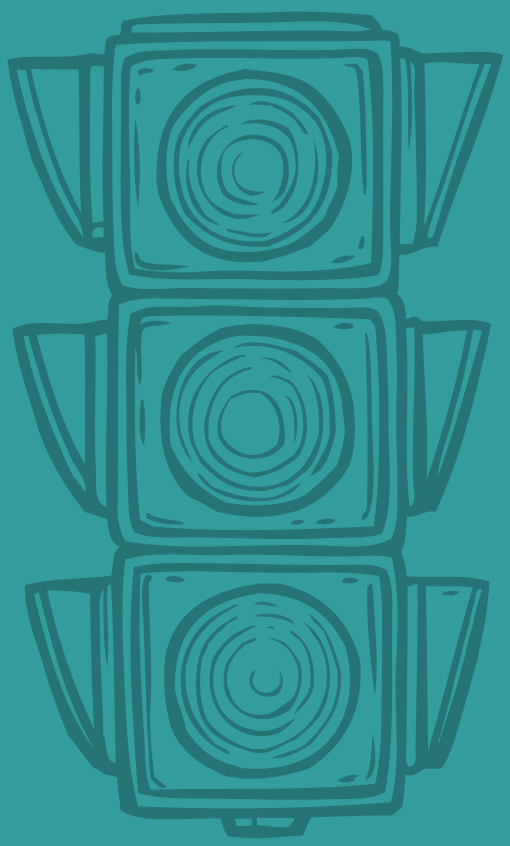
Why drive when you can fly?

The flying car

The value of innovation was further emphasized with an inspirational presentation from the **Slovak inventor Štefan Klein**, who presented **his model of a flying car**, including a world premiere of a brand new prototype. After Mr. Klein explained his research and development of more than two decades, conference participants watched a video of the car driving down a runway and taking off successfully into the air – completely transforming the idea of automotive travel.

Thinking beyond the expected is a key way to make the leap to the circular economy. We have to shift from the linear to the circular. Why not fly?

REGULATION



Regulation is vital in the transition to a circular economy. In the automotive industry of the European Union, the major regulation is the End of Life Vehicles (ELV) Directive. End-of-life vehicles in the European Union generate between 7 million and 8 million tons of waste every year. The ELV Directive aims to make dismantling and recycling of end-of-life vehicles gentler on the environment.

Streetwise:
The ELV Directive

The ELV Directive is an important instrument to drive circularity in the automotive sector.

Ms. Bettina Lorz

Ms. Bettina Lorz, **Senior Expert, Waste Management and Secondary Materials, Directorate General Environment, European Commission**, spoke about the **ELV Directive as an instrument of the circular economy**. The European Commission has made circular economy one of its main objectives. The Commission's action plan to support the circular economy focuses on innovation, investment and monitoring across five sectors, including plastics; critical raw materials; and construction and demolition.

The ELV Directive plays a key role in the automotive sector. Covering passenger cars and small vans, the ELV Directive (ELV Directive 2000/53/EC) aims to minimize the environmental impact of end-of-life vehicles (ELVs), ensure proper functioning of the internal market and avoid distortion from any competition. Ms. Lorz showed that in 2015, 6 million ELVs were disposed of in the EU, resulting in around 6.2 million tons of waste.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Skoda/VW. what do you seek from
becoming more circular?
Latest question
Anonymous
Do we need a battery raw material shortage to drive circularity in electric
battery market?

The ELV Directive has binding targets for the EU Member States. From 2015, the minimum reuse and recovery rate for ELVs is 95 per cent, and the minimum reuse and recycling rate is 85 per cent. Ms. Lorz reported that these targets have been met by the Member States. She singled out extended producer responsibility as a key concept in the Directive, to ensure that the producer remains responsible for treatment of the product after end-of-life. Producers must design cars in a way that facilitates dismantling, recycling, and recovery, integrating recycled materials as well as limiting the use of hazardous substances. They also need to set up collection systems, and ensure free take-back, as well as to provide information. Vehicle dismantling information is gathered in an international database. Treatment is carried out by authorized treatment facilities (ATF), and vehicles cannot be deregistered without a certificate of destruction (CoD).

An evaluation of the Directive found that it contributed to making car manufacturing in the EU "a more efficient, innovative, and more sustainable industry." The Directive has increased the number of ELVs treated in ATFs, increased ATFs and helped to prevent abandoned ELVs. It introduced proper treatment, reduced hazardous substances and improved information for recyclers.

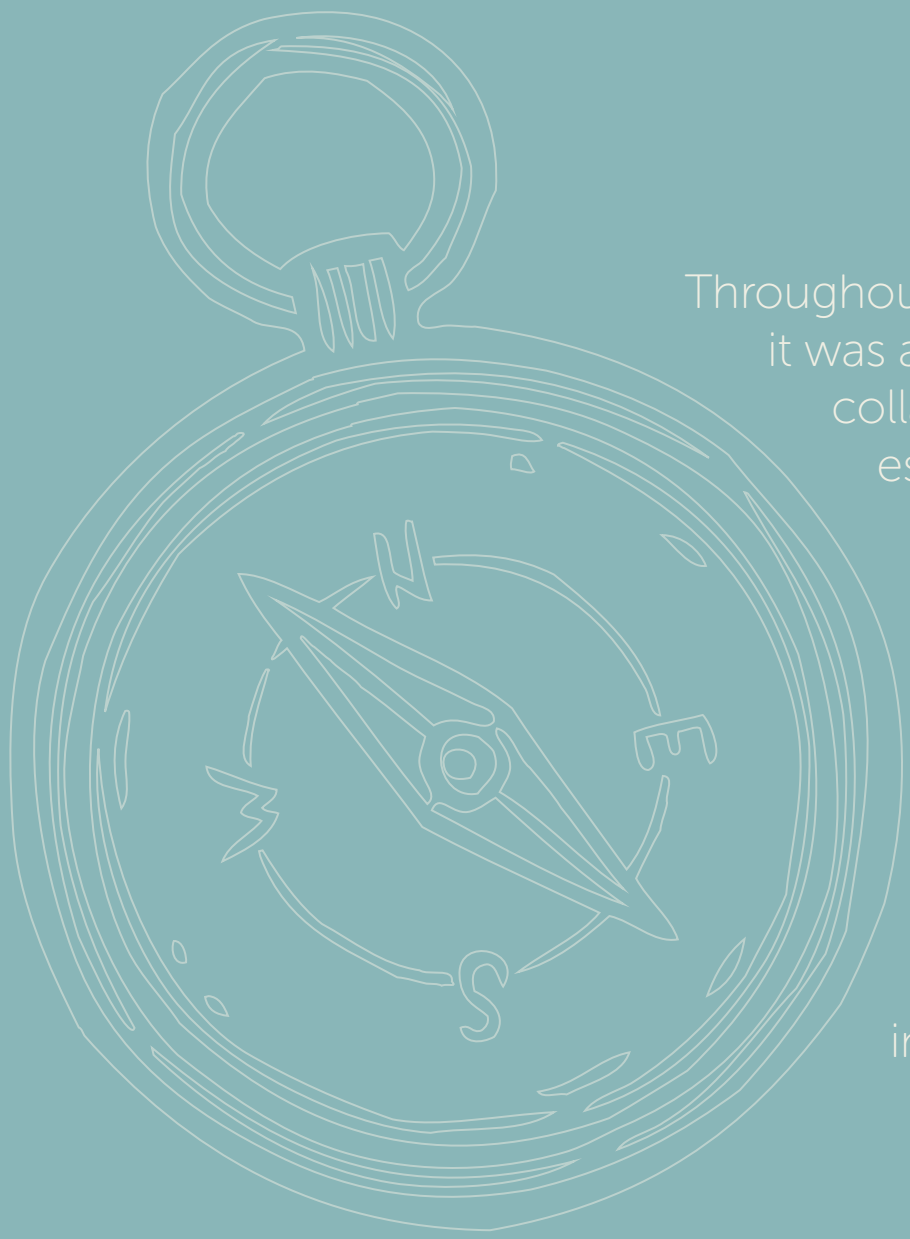
Although the high targets under the Directive are largely met by Member States, significant challenges still exist. Ms. Lorz noted that there is a systemic problem, with a recorded 4.2 million ELVs missing from the records. Gathering data from Member States is still problematic. Furthermore, new technology developments, such as electro-mobility and plastics mean that vehicle treatments need to change. Ms. Lorz pointed out that some of these challenges are also opportunities, and there is the potential for new innovations in plastic reuse and recycling, as well as the reuse and recycling of critical raw materials.

Mr. Jens Warsen, **Environmental Policy Director, European Automobile Manufacturers' Association (ACEA)**, discussed **regulatory frameworks**, particularly the European Union's Directive on end-of-life vehicles (ELV). He emphasized the importance for consistency across these frameworks. He noted that the ELV is effective, but that there are further needs and challenges, and a need to avoid inefficiency and contradictions.

He noted that the automotive industry has been committed to a circular economy for many years, through optimizing production processes, increasing product lifespan and preventing waste, and supporting reuse and recycling. He stressed that considering vehicles are one of the most complex consumer products on the market, the recycling quota of 85 per cent was high. The ELV Directive effectively prevents waste disposal, increases reuse, recycling and recovery, and ensures environmentally friendly treatment of ELVs. However, Mr. Warsen noted that improvements can still be made across existing legislation. He stated that there should be enforcement across all EU Member States to create a level playing field; where legislation overlaps, any contradictions should be removed; there should be mandatory registration and deregistration with a compulsory certificate of destruction to ensure the ELV process is carried out properly. Ideally, there should be global alignment on how to treat end-of-life vehicles.

The ELV Directive was also the focus of **Mr. Vladislav Smrž**, **Deputy Minister for Section of Environmental Policy** and **International Relations of the Ministry of the Environment of the Czech Republic**. He discussed experience with **end-of-life vehicles in the Czech Republic**. He went on to outline a specific annual programme of the Czech Republic which encourages scrapyard owners to recover more energy and materials from vehicles. The more material and energy recovery the scrapyard owners attain, the higher funding they receive from the government. This programme helps the government to adhere to the requirements of the ELV Directive. In the following question and answer format, Mr. Smrž emphasized that for both industry and government, it is essential to have a stable and clear regulatory framework.

COLLABORATION



Throughout the conference, it was agreed that collaboration was essential for a successful transition to a circular economy. Here we look at three different centres of collaboration, from financial institutions, governments and international institutions.

Does money make the world go 'round?

Financial institutions and the circular economy

This is an amazing, collective journey. Welcome on board!

Mr. Massimiano Tellini

Mr. Massimiano Tellini, Global Head, Circular Economy Project, Intesa Sanpaolo Group noted that the circular economy is collective; there is no point unless everyone is involved. Mr. Tellini stated that **financial institutions have a crucial role to play in the transition** to the circular economy, and Intesa Sanpaolo works across industry, integrating different players, different modes of transportation, and different behaviors. One example is that as a global partner of the Ellen MacArthur foundation, Intesa Sanpaolo matches startups with investors. The Innovation Centre of Intesa Sanpaulo, responsible for circular economy, focuses on the intersection of companies, the bank, and people and society. Because of the increasing scarcity of resources and growing world population, Mr. Tellini noted that there is enormous potential for growth, savings and investments.

Mr. Tellini stated that the automotive industry, along with other industries, need to recognize that the consumer is at the centre of the process. For the millennial generation, access is more desirable than ownership. He stated that the move towards circular economy was a collective action for change. In the panel, Mr. Tellini also urged that we should not focus on the risks of the circular economy; instead, we should pay attention to how risky the linear economy is.

Financial institutions need to work beyond banking to be able to finance circular business.

Mr. Armand Ferreira

Mr. Armand Ferreira, **Director of Sustainable Finance at ING Wholesale Banking**, outlined how ING works with clients to identify opportunities in the area of sustainability, and to finance and enable the circular economy. The aim is to maximize use and retain value. He noted that many clients are already moving from the linear to the circular economy.

Financial and marketing challenges still exist in the move towards circular economy models. However, Mr. Ferreira argued that in a few years' time, that will not be the case; there is no world for unsustainable companies, so it is a matter of convincing people what is necessary for the future. In the long run, circular economy models are less risky. He noted that the majority of companies already want to be sustainable. The question is working out how to do it. ING helps companies to find business models that can make sustainability work.

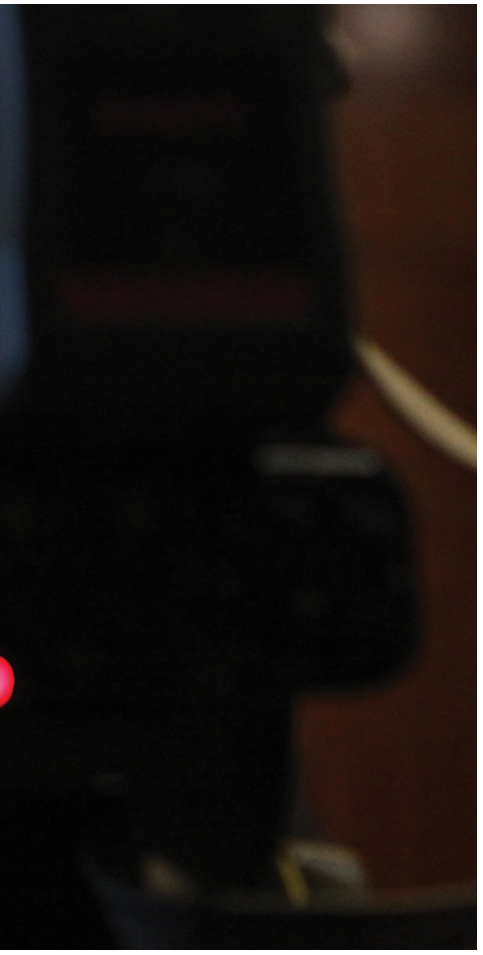
ING's model is called the orange circle, which collaborates across five themes for ING: clients, operations, knowledge, innovation and ecosystem. There is a general shift from assets to access, which is one of several circular economy areas ING has produced reports on. Mr. Ferreira noted that underutilized assets will soon be a thing of the past, and as notions of ownership change, eventually companies will become obsolete.

The role of the European Bank for Reconstruction and Development was the topic of a talk by **Mr. Sumeet Manchanda, Principal, Energy Efficiency and Climate Change, European Bank for Reconstruction and Development (EBRD)**. The EBRD is an international financial institution working in 37 countries to support post-Soviet countries in their transition to fully functioning market economies. It is owned by 66 countries, the European Union and the European Investment Bank. Mr. Manchanda noted that the ERBD works on direct and indirect financing for projects and investments, technical assistance to develop projects which are both commercially viable but also environmentally effective, as well as working with governments to contribute to policy dialogue to enable these investments. In the specific realm of circular economy, the EBRD works with governments, supports innovation, forges partnerships and also takes parts in various networks. Mr. Manchanda drew attention to multiple projects, particularly in Turkey and Ukraine, where the EBRD was investing in the circular economy. This included direct work with companies in the automotive sector towards lightweighting and resource efficiency. He noted that the EBRD has always been committed to green initiatives, and since 2006 has signed €23 billion of green financing, and recently green initiatives have amounted to 36 per cent of total business. Mr. Manchanda also noted that the EBRD was looking to support new circular economy projects.

Mr. Darragh Mac Neill, Project Directorate, European Investment Bank (EIB) discussed the European Investment Bank in the context of the circular economy. The EIB is the bank of the European Union, and about 90 per cent of lending is within the European Union. Client support is provided through direct financing, intermediated financing and financial and technical advisory services. Mr. Mac Neill noted that the EIB acts as a catalyst for different kinds of financial support; it covers up to a maximum of 50 per cent of a project's financing, because it does not want to compete with commercial banks, but rather operate in cooperation with them. There is an extensive appraisal process to determine whether a project is "sound," which includes the balancing of a project's societal, ecological and economic impact. This is known as the three "Ps" – people, planet, profitability. The EIB supports many circular economy projects, including the upcycling of carbon black from waste tires. Mr. Mac Neill drew attention to the longer tenure, diversification of funds and positive reputational aspects of working with the EIB on circular economy projects.

National treasure:

Governments and the circular economy



If you go alone you go fast. If you go together you get further. Now we have to get further fast. How do we do that?

Mr. Herman Bavinck

The Netherlands is building a national and international circular economy programme that reaches across all sectors of society. **Mr. Herman Bavinck**, **Programme Director, Holland Circular Hotspot Programme, Government of the Netherlands**, introduced us to the programme. The Government of the Netherlands has pledged to become circular by 2050, including a 50 per cent reduction of raw materials by 2030. On an international level, the intention is to create an international exchange of circular economy knowledge and innovation.

Mr. Bavinck stated that the next step is for transition agencies to decide on concrete goals, and action, social, knowledge and investment agendas. The forms of intervention that Mr. Bavinck singled out were fostering legislation and regulations, intelligent market incentives, financing, knowledge and innovation, international cooperation – and, crucially, behavioral change. This would be implemented across the five priority value chains, which include the manufacturing industry.

Mr Bavinck emphasized the need for collaboration on both the national and the international level. He stated that the role of a government moving towards a circular economy was first to set ambitious goals. Second, the government should bring different parties to the table and to try to commit them to these goals. This commitment does not need to be a contract, but a commitment based on enthusiasm and inspiration. Finally, he stated that a government should set a good example.

It cannot be done just by the government.

Mr. Tadej Slapnik

Mr. Tadej Slapnik, State Secretary, Cabinet Office of the Prime Minister, Government of Slovenia, discussed Slovenia's implementation of the circular economy. Slovenia is a special case, where the green economy programme was adopted by the Cabinet Office of the Prime Minister. The programme is based around partnership, linking policies, steering measures, structured dialogue, education and training, and examples of best practices.

Coordinated by the Cabinet Office of the Prime Minister, the partnership brings together industry, regions and local communities, experts and academics, investors, key organizations, NGOs and government in sectoral groups, set up for discussions about the green economy. Mr. Slapnik stressed the importance of partnerships for best practices, exchange of experience and knowledge, use of hands-on experience in designing policy measures, and vertical as well as horizontal cooperation. The state connects policies, improves legal frameworks, and provides support through financial mechanisms, and the partners transfer knowledge and experience, provide best practice examples, and implement green principles. Other participants at the conference applauded the Government of Slovenia for adopting these priorities at the highest level of government. With regard to collaboration, Mr. Slapnik mentioned that Slovenia, the Netherlands and Finland would like to create a circular economy triangle for collaboration and a shared knowledge base.

Mr. Pavol Prepiak, Vice President, Slovak Automotive Industry Association (ZAP) outlined potential actions on the part of the Slovak government to help the Slovak automotive industry. These actions related to general process management, end-of-life criteria and the reuse of parts. Mr. Prepiak emphasized

the importance of consistency across handling and registration of vehicles, and supervision to ensure proper control over process management. In Slovakia, waste is primarily dealt with by private companies rather than government, which means the government's role is to monitor the overall process. He suggested developing an online waste management information system; streamlining legislation to achieve the goals of the ELV Directive; and consistent treatment of take-back products. Compiling accurate and comprehensive information is crucial not only for government, but for all stakeholders. In terms of end-of-life criteria, he noted that waste management and processing is a business, and an optimum ratio between costs and sales should be reached to make a profit. Legislation should allow waste processors to put a "product" on the market, rather than modified waste. He added that reused parts rely on both the existence of a market, and adequate legislative conditions for resale.

We want Slovakia to be a reference point for circular economy.

Mr. Norbert Kurilla

Mr. Norbert Kurilla, State Secretary, Ministry of Environment of the Slovak Republic discussed the Slovak national commitment to transition to a green economy last year. This commitment included many groups, including government, the business community, investors, NGOs, academia, and think tanks. The idea was to move towards a competitive circular economy. Mr. Kurilla acknowledged that while there were obviously costs in this early phase, these are investments for much greater economic and social benefits over time.

Mr. Kurilla noted that there is currently a great deal of political momentum around the circular economy in Slovakia. He outlined four priority areas for the Ministry of Environment: policy, legislation, knowledge base and cooperation. Recent policy is geared towards a greener Slovakia and carbon efficiency for 2030. This focus adds to existing tools such as green public procurement. Legislation includes a new waste act, which introduces higher landfill charges to help meet the 2030 goals. In terms of knowledge base, a new analytical unit has been established within the Ministry for matters of environmental policy. A green education fund brings together business, civil society and others for climate action. Cooperation is vital, as can be seen in the Bratislava green economy process. "Through these kinds of activities, through cooperation and collaboration," Mr. Kurilla said, "we can be faster and credible." Finally, in the panel discussion, Mr. Kurilla supported the suggestion that Slovakia could be added to the circular best practice cooperation between Finland, Slovenia and the Netherlands.


Kingdom

All 'round the world: International institutions and the circular economy

To effectively transition towards the circular economy, governments will need to develop new policies and better align them across sectors.

Mr. Peter Börkey

Mr. Peter Börkey, Principal Administrator, OECD Environment Directorate discussed OECD research into circular economy, and noted growing momentum, both on a regional and international level, for resource efficiency and circular economy. He outlined some of the recommendations from a report on the G7, which stressed that on both the national and international level, the situation was complex, and required complex policy mixes, which take a life cycle perspective. Mr. Börkey also noted that for national governments especially, it was important to ensure policy alignment across governmental sectors for both new and existing policy. He said he was encouraged by the example of Slovenia, having circular economy driven at the highest level of government, and said that other governments would benefit from following that example.

He highlighted three areas that require attention. First was the issue of trade, where there are many barriers to circular economy; for example, obstacles to importing used products make remanufacturing difficult. Second, global value chains need to be considered, because resource efficiency must run through the entire chain to be effective. Finally, he noted that product labelling is an important driver to shift consumer behavior. There are too many labels and too much information, and harmonization and simplification of labelling could be implemented at the level of the EU or the OECD. He stated that there should be clearer incentives for producers to design their products in the right way.

Mr. Börkey asserted that we need to know much more about what the transition to circular economy will entail. Further data and analysis is required. The ongoing work of the OECD considers the macroeconomic benefits of the circular economy, including macroeconomic consequences for GDP and welfare, macroeconomic competitiveness and international trade, as well as the impact of the circular economy on sectoral structure and labor markets. Types of new business models are also being considered for the circular economy, along with environmental outcomes. Finally, research is ongoing in plastics in the environment, to align waste and chemicals management policies, and improve markets for secondary plastics.

Future areas of attention for 2019-2020 may include business and the circular economy – including supply chains for circular economy and the OECD Guidelines for Multinational Enterprises – and economic instruments for circular economy, including environmentally harmful subsidies, extended producer responsibility and green public procurement.

During the panel, Mr Börkey noted that macroeconomic modeling would help to figure out the structural changes that would be brought about from a circular economy. He noted that it was expected that there would be a decrease in the demand for raw materials, meaning there would be a smaller extracting sector; an increased demand for services, and thus a larger servicing sector; and that economies relying on raw materials extraction would be affected. He stated that OECD countries will need to help developing countries to adapt, particularly those hit hardest by the transition. For both developed and developing countries, policies will need to be developed to adapt to the structural changes. Existing international institutions can tackle this.

Mainstreaming circular automotive production has to be done in a 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. Attila Turos

Mr. Attila Turos, Lead, Future of Production, World Economic Forum discussed the **WEF multi-stakeholder platform for dialogue**. He stated that the WEF wished to serve as a platform for all the work other agencies such as the OECD, UNIDO, and the Ellen MacArthur Foundation are doing. He emphasized that to implement all this built knowledge, collaboration is essential.

Mr. Turos introduced the global public-private Platform for Accelerating the Circular Economy (PACE). PACE combines three priorities: first, collaboration, which includes engaging businesses, policy makers, thought leaders and innovators in a global leadership network; second, knowledge exchange to share expertise, connect with peers, and advance business models, 4th Industrial Revolution (Industry 4.0) technology innovations, design solutions and policy approaches; and third, action, meaning initiating prototype projects to advance the circular economy and replicate blueprints of success.

Four regional programmes are already active in Africa, China, Latin America and Europe. A digital platform also allows for connectivity regarding the sharing of activities, connecting with other members, attending circular economy related events, and receiving updates. Mr. Turos stressed that the way we produce and the way we consume, along with consumer demand, will make a huge difference to how quickly we can transition to a circular economy. WEF aims to bring together business, industry, civil society and academia to speak the same language and agree to work together. He drew special attention to public sector leadership examples that are showing the way, such as the Scottish government, the China Association of Circular Economy and the government strategy of the Netherlands.

I'm happy if we're moving towards circular economy, and I'm happy with every step we take.

Mr. Stephan Sicars

The **Director of the Department of Environment of UNIDO**, **Mr. Stephan Sicars** considered **the role of developing countries in the transition to the circular economy**. He noted that the client countries of UNIDO are largely developing countries, and the key task for UNIDO is to assist these countries to achieve inclusive and sustainable development. The strategy of UNIDO is threefold: to advance economic competitiveness, create shared prosperity and safeguard the environment. Mr. Sicars observed that where these three priorities overlap, is the territory of the circular economy.

Mr. Sicars noted that resource efficiency is the basis of circular economy, and for half a century, UNIDO has been working towards resource efficiency, particularly in production. While UNIDO works on the different building blocks of the circular economy, he stressed that it does not take a top-down approach. The Organization considers how to establish a foothold for circular economy in developing countries, so that those countries can prosper and grow.

Given the growth projections for the middle class and increased demands on resources, the business as usual scenario must change. Developing countries deliver important raw materials, components and other parts to industries, including the automotive industry. Developing countries also buy the products, making them an important market.

How is UNIDO reaching out to these countries? Mr. Sicars drew attention to a range of ongoing circular economy projects, including a large network of 65 Cleaner Production Centres (RECPnet) in 50 countries, which he defined as consultancies to help industries with cleaner production and resource efficiency. This network of centres has been built over two decades, and it has an international outreach; UNIDO advises the centres on best practice, and they use that advice as a product for manufacturers in different countries.

Other UNIDO circular economy efforts include projects on electronic waste, where governments can legislate so that the recycler pays for the costs of recycling hazardous materials, which is balanced by the inherent worth of the more valuable materials. There are also cradle-to-cradle projects, which phase out damaging chemicals to make recycling easier. UNIDO enhances product lifetimes through training services for technicians. All of these projects have an indirect, long term feedback loop into resource availability. Mr. Sicars noted that as developing countries become more prosperous – which is happening very rapidly – the further that feedback loop will be felt, in both developing and developed countries.


NORBERT
KURILLA
UNIDO

The open road: Closing the conference

After two inspirational and intensive days, the conference closed with final words from **Mr. Norbert Kurilla**, the **State Secretary of Ministry of Environment of the Slovak Republic** and Mr. Stephan Sicars of UNIDO. Although the topics over the course of the conference came from a broad range of sectors and perspectives, every speaker agreed on one thing: the future is circular.

The speakers agreed that business as usual is no longer an option for the current economy. A transition to new collaborative models – in the automotive industry of Slovakia and beyond – is urgent. New business models like circular supply chains, product life extension, sharing platforms, product as a service, and recovery and recycling offer new opportunities. As many of the participants demonstrated, innovation is an essential part of the transition.

In the automotive sector, shifting consumer demand calls for new mobility services, while tightening regulations will require collaborative innovation along the value chain. In parts and components supply chains, we can already observe several trends: in automotive electronics, a more circular design allows for improved end-of-use strategies.

In high value parts and components, strategies for maintenance, repair and remanufacturing will play a major role in the circular economy. Overall, product as a service has the potential to become more mainstream. These trends are already redefining roles for manufacturers and suppliers, where for various products, access rather than ownership is increasingly common.

While the combustion engine will remain for some time, automakers are increasingly investing in electrification, because of tighter emissions regulations. Creating circular material loops is essential for a circular economy and this will require rethinking design, production, usage and waste phases, as well as the creation of a new ecosystem enabling circularity. Regulations will need to be fine-tuned for every part of the cycle from design to production, consumption, waste and recovery.

Governments cannot drive this transition alone, and they must reach out: to industry to scale up, to knowledge communities for innovation and to consumers for support. International institutions also offer crucial research and support for the shift to circular economy. Financial institutions appear willing to facilitate the circular transition and are rethinking their roles, acting in partnership with clients to address client needs, and adjusting risk models and products.

This transition is highly complex and dynamic, and it involves collaboration between all stakeholders. The road ahead must be sustainable. **Now is the time – through further ambitious conversation, innovation and collaboration – to drive towards our goal.**

TWO DAYS TO GO FULL CIRCLE Informal discussions during the event

Courtesy of Slido

ACTIVE USERS 123

ENGAGEMENT SCORE 271

ENGAGEMENT PER USER 2.2

QUESTIONS 122

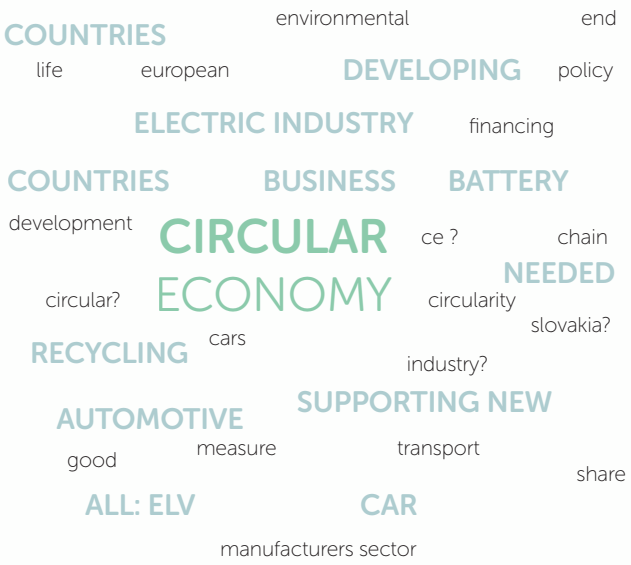
LIKES / DISLIKES 162/0

POLL VOTES 585

POLLS CREATED 9

VOTES PER POLL 65

TOPICS



QUESTIONS

How urgent is the need for a circular transition for the automotive industry?

VERY URGENT 50% URGENT 47% SOMEWHAT URGENT 3% NOT URGENT 0%

Which material will be the biggest winner in the car industry in the next five years?

PLASTIC 25% BIOBASED PLASTIC 8% FERRO 0% ALUMINIUM 8% COMPOSITES 58%

In five to ten years mechanical recycling will be replaced by chemical recycling eliminating hazardous components

YES 59% NO 41%

Which institutions do you trust most?

GOVERNMENT 20% FINANCIAL INSTITUTIONS 25% PRIVATE COMPANIES 55%

Would you be interested to be involved in a regional CE Platform for Central & Eastern Europe?

YES 80% NO/ NOT REALLY 20% DON'T KNOW/ MAYBE 0%

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