MOVIN'ON Summit

The Minutes 2019

Circular Economy

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MOVIN'ON Summit

THE MINUTES 2019

Circular Economy

A C2 EXPERIENCE

This publication follows the **2019 Movin'On Summit** by Michelin, which took place in Montreal, Canada, from June 4th through June 6th, 2019, at Grandé Studios.

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“MORE MOBILITY WITH LESS IMPACT: THAT’S WHAT WE’RE LOOKING FOR. IF WE WANT A BETTER FUTURE, WE MUST ACT NOW!”

Florent Menegaux PRESIDENT **MICHELIN**

A WORD FROM THE EDITOR

The Movin'On Summit set itself the mission of moving from ambition to action — and solutions for a more sustainable mobility poured in during the three days of the 2019 edition, held in Montreal last June. More than 5,000 participants from more than 55 countries gathered for the occasion to imagine a future where mobility's impact on the environment is significantly reduced. Many attendees were able to share their ideas to achieve this objective by participating in some of the 45 working sessions, or by drawing inspiration from the 100 speakers who shared their expertise as well as their passion for this issue.

Five themes were discussed during this major event, which brought together the various stakeholders in the mobility ecosystem, and here, we offer you a summary through five separate magazines. *The Minutes 2019: Circular Economy* provides a summary of the conferences and working sessions that focused on this business model aimed at reducing the environmental impact of companies. We sincerely hope that the solutions proposed by the experts and participants at the 2019 Movin'On Summit will inspire the entire mobility ecosystem.

HAVE A GREAT READ!

The 2019 Movin'On Summit Minutes team

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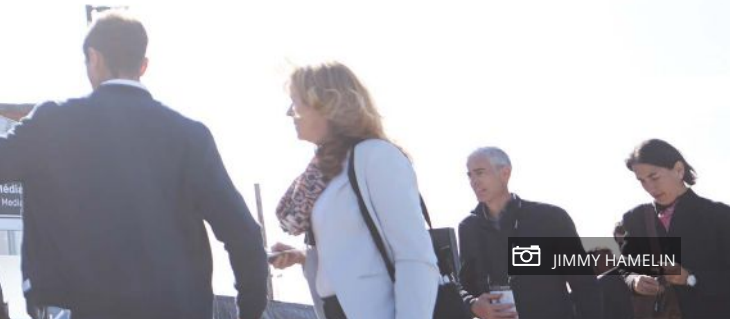
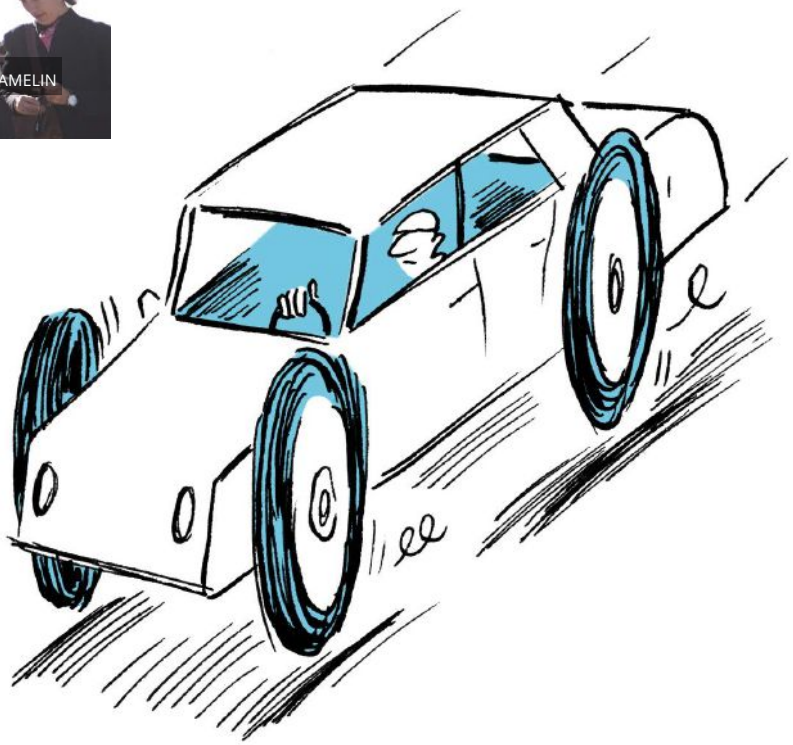




CIRCULAR ECONOMY

IN FIGURES

2 years

Between 2011 and 2013, China used a quantity of cement equal to that used by the U.S. during the entire last century.

X2

Product manufacturing uses double the resources that it did 30 years ago to design products that often break easily, can't be repaired, become obsolete quickly and end up in landfills.

9%

Percentage of the world economy that is circular.

3.7%

Renault-Nissan-Mitsubishi's percentage of reduction in the total metal usage in its supply chain from 2017-2018. For a company with nearly €20 billion in annual turn-over, it translates into buying power in the billions of Euros.

90%

Percentage of global biodiversity loss due to insufficient resource management.

WHAT GOES AROUND COMES AROUND: CIRCULAR ECONOMY AS A PATH TO SUSTAINABILITY

Nothing is created, nothing is lost, everything is transformed: how the Circular Economy paves the way for sustainability.

As global economies continue to grow, so does the strain on our planet's ability to absorb pollution and mitigate habitat destruction. Much of our traditional industrial base functions under a linear "take, make, waste" business model, where energy and material waste and/or leaks in the circular loop are mere economic externalities that don't interfere with the bottom line.

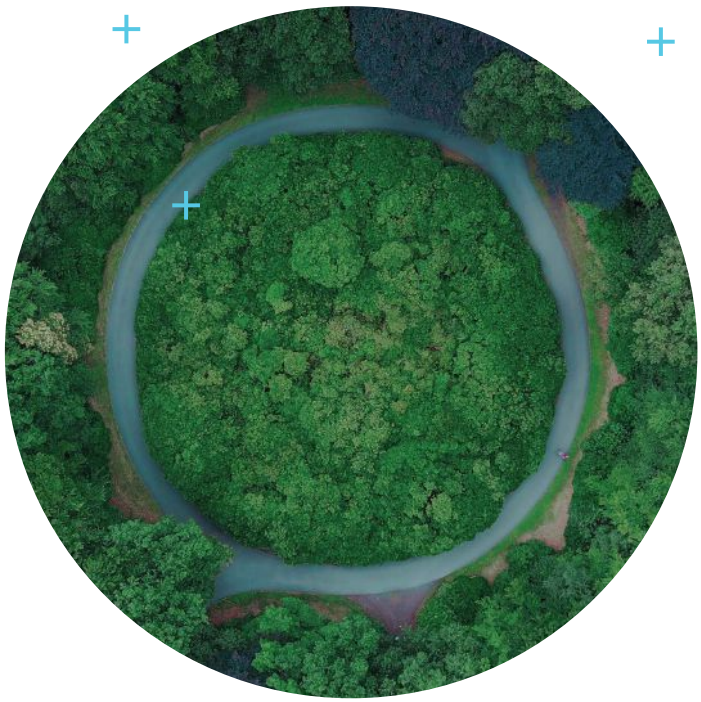
One of the most powerful actions we can take to ensure a sustainable future is to move toward a circular economic model. In nature, achieving ecosystemic equilibrium is the difference between survival and extinction. The Circular Economy seeks to mimic this elegant interdependence, where one species' waste is another species' resource, and there is no such thing as garbage.

While CE models do seek to reduce, reuse, repair and recycle, as well as minimize waste, the concept is much more profound. One way to think about it is to picture a series of concentric circles or loops that represent varying degrees of efficiency. Inner loops focus on design innovations in order to create rapid feedback mechanisms throughout a product's lifecycle. Many zero-waste initiatives share a philosophical foundation with CE principles. Refurbishing, remanufacturing and repair also play important roles. Better maintenance and more intensive use can reduce the quantity of units that need to be produced in the first place. The outermost loop, sometimes referred to as the "loop of last resort," is recycling, which does preserve materials but still consumes other resources, like the energy of labour.

As the world summit on sustainable mobility, Movin'On promotes circular thinking, action and business on the conference stage and in the working sessions. While circularity is still very much in an early growth stage when it comes to mobility development, evolving technological and commercial opportunities will allow it to be put in place in more advanced and meaningful applications.

IN SEARCH OF SUISTAINABLE DESIGN

Experts such as **Carl Bäckstrand** of innovative design firm **White Arkitekter** shared their knowledge and inspiration on the 2019 Movin'On Summit stage. White Arkitekter contributes to sustainable lifestyle designs by developing an innovative planning model for environmentally friendly neighbourhoods.



CREATOR OF PARTNERSHIPS

Utilizing bio-sourced or recycled materials often requires creating new types of partnerships across ecosystems, transforming supply chains into supply webs, or developing a cross-sector client base. **Deloitte**'s working session, which brings together veteran sustainability advocate **Christophe Durand** and several local and international experts, focused on creative ways to seek out and cultivate the unorthodox relationships that exemplify circular economic success.

BUILT TO LAST

The concept of "built to last" has always been a declaration of waste minimization. However, as technologies become more advanced, the quest for long-term durability becomes more complex. How can we avoid the premature obsolescence of a connected vehicle when the digital technologies it depends on evolve so quickly? **UNECE**'s working session on reconciling resource efficiency and environmental ambitions placed these and other questions front and centre.

ARIANNE BERGERON

SPEAKERS

Carl Bäckstrand DEPUTY CEO **WHITE ARKITEKTER**

In conversation with

Pierre Cannet INTERIM CO-DIRECTOR OF PROGRAMS **WORLD WILDLIFE FUND (WWF) FRANCE**

RADICAL MOVES IN A SMART DIRECTION

In the future, world economies will need to reject linearity in favour of circular principles that have the greatest potential to minimize environmental impacts in order to reap the many projected benefits of greener mobility.

From 1970 to 2017, as the world's population doubled, the destruction of material resources tripled within the same 50-year span, while global GDP growth quadrupled. From technology development to urban planning, solutions anchored in the Circular Economy are seen as instrumental to help reverse the devastating results of linearity. At global gatherings of environmentalists going back several decades, attendees made of up stakeholders in public and private sectors have consistently urged greater resource-efficient extraction, use and reuse of materials, more sustainable manufacturing practices and improved waste management.

But new and reimagined forms of mobility in the future could also play a vital role in helping people live well within their communities, the panelists say. "Circularity is really the future," explains architect **Carl Bäckstrand**, deputy CEO at **White Arkitekter**. "We know that we cannot continue using raw materials as we've done in the past."

SO MANY QUESTIONS...

The experts discussed controversial and often conflicting ideas as they relate to the cities and mobility sphere, such as:

→ Should mobility within cities be restricted by legislation? Could city dwellers be incentivized to live and work more locally in order to limit dependence on vehicle traffic?

→ Should drivers living in densely populated areas be taxed for contributing to congestion?

→ How can neighbourhoods and small communities become more self-sufficient and local-centric? Could they treat their own waste and recycling?

→ Should companies be required by law not just to source, use and reuse their materials, but also to hire locally?

→ How can cities be redesigned to facilitate walkability?

Solutions will likely involve a mix of top-down legislation and bottom-up input from the public. Bäckstrand, for instance, foresees a need for "completely new taxation systems to manage and encourage the Circular Economy as it relates to mobility."

To encourage people and governments to mobilize for these types of shifts, better metrics to track progress are needed. "You need to know what to measure, how to benchmark yourself and how to benchmark yourself to others," explains **Anne Baer**, CEO of **iKare Innovation**. Within the realm of mobility, Baer points to promising startups like **ElectReon**, which is premised on electrification of entire road systems as a means of keeping EVs charged; and to Waze, a Google-owned, Israeli-built app facilitating traffic-congestion management and carpooling.

SPEAKERS

Anne Baer CEO **IKARE INNOVATION**

Sakchai Patiparnpreechavud VICE-PRESIDENT, POLYOLEFINS AND VINYL BUSINESS, CHEMICALS BUSINESS, AND MANAGING DIRECTOR **SCG CHEMICALS**

Izabella Teixeira CO-CHAIR **INTERNATIONAL RESOURCE PANEL, UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)**

In conversation with

Brice Lalonde PRESIDENT **ASSOCIATION ÉQUILIBRE DES ÉNERGIES**


ARIANNE BERGERON

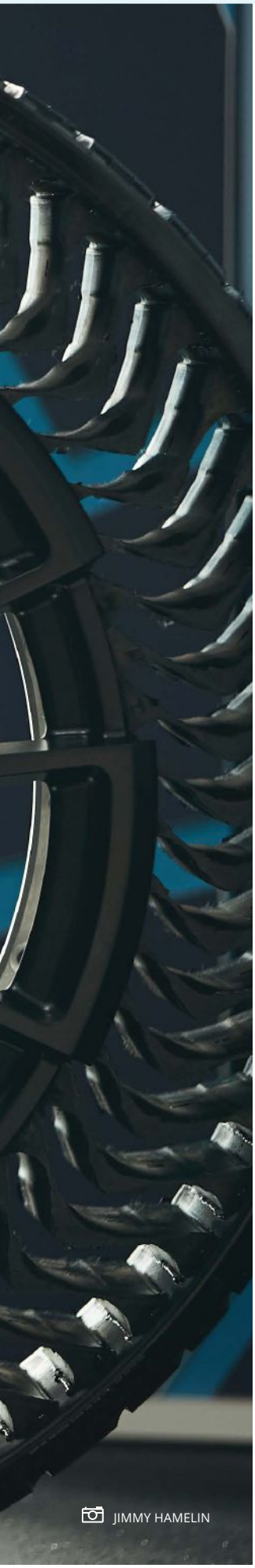
PRIORITIZING TRADE-OFFS

As in the carbon-neutral process, the panelists agree that policymakers and private-sector partners must reach some basic consensus on shared guiding priorities for mobility technology and business development. “We need to clarify what the trade-offs of the new century are — what is most urgent to address,” explains **Izabella Teixeira**, co-chair of the **United Nations Environment Programme**’s **International Resource Panel (UNEP)**.

Emerging economies are expected to be key players in the Circular Economy throughout the next half-century. And wherever technology-based mobility solutions are applied, they should be form-fit to individual nations’ political and economic circumstances.

In Thailand, for instance, **SCG Chemicals** is assembling grassroots partnerships to tackle urgent sustainable development issues such as waste management, according to the firm’s managing director, **Sakchai Patiparnpreechavud**. The company’s annual symposium invites CEOs from across Thailand and Indonesia, and has led to private-sector pilot projects that are now bearing fruit. “The Circular Economy is something we don’t just believe in conceptually, we believe in action, so we’re making it happen. Then we will coordinate to scale the most successful projects together,” he says.

As these innovations are launched, questions of fair implementation arise. Who stands to benefit — and profit — from these new tools for circular economic integration? “We need to encourage the private sector to look at new models and incorporate financial flows, ensuring the use of technology will make sense,” continues Brazil’s Texeira. “If not, in the developing world, it could be implemented unfairly.”



JIMMY HAMELIN

DOSSIER

ECO-DESIGNING THE FUTURE OF BUSINESS

Eco-designed products that minimize the use of new material resources in their manufacturing will be key to achieving carbon neutrality by 2050. So what should resource-efficient businesses of the future look like? And what hurdles stand in their way?

Tackling climate change requires a paradigm shift in the way companies do business, as they must focus on ways to make products more durable, repairable, longer lasting, and easily disassembled into reusable components that can be incorporated into future generations of products. However, companies still have margins to make — the Green Economy cannot be a utopia. That means that practical solutions to build a more resource-efficient future for business can't just be sustainable, they'll need to be profitable, too.

ADOPTING A CIRCULAR APPROACH

If the goal is to not waste the world's finite natural resources, a good place to start is by changing the way products are made. Given that up to 80% of a product's environmental impact is decided by its design, companies are focusing on how to mitigate the impact through revamping certain phases of manufacturing, while aiming for a more circular approach to a product's footprint throughout its lifecycle.

"I think this transition period is fantastic, as a risk is an opportunity," says **Fabien Derville,** president of **Mobivia.** "Mobility is ultra-noble: it establishes links between people. We are working on the fact that having fewer possible impacts on the environment and society is an opportunity."

Product manufacturers are realizing they must rely on fewer finite natural resources, which also means solving challenges along the way. There are many questions surrounding the issue of what to do with old or obsolete but still well-functioning vehicles, such as whether to repair, retrofit, recycle or scrap them.

Meanwhile, **Michelin** is busy setting up their own initiatives. The tire maker factors the cost of waste and emissions into every new product, part of ambitious plans to move to a closed-loop manufacturing process by 2048.

SPEAKERS

Fabien Derville PRESIDENT **MOBIVIA**

Arnaud Leroy PRESIDENT **AGENCE DE L'ENVIRONNEMENT ET DE LA MAÎTRISE DE L'ÉNERGIE (ADEME)**

In conversation with

Nick Molho EXECUTIVE DIRECTOR **ALDERSGATE GROUP**

Carla Bailo CEO **CENTER FOR AUTOMOTIVE RESEARCH**

Rashmi Urdhwareshe DIRECTOR **AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA**

In conversation with

Brice Lalonde PRESIDENT **ASSOCIATION ÉQUILIBRE DES ÉNERGIES**

STRIKING A SUSTAINABLE BALANCE THROUGH REGULATIONS

Experts see a need for supportive regulations that will set the bar higher for the eco-design of products. Today's marketplace heavily favours price competitiveness, and regulators can correct situations in which cheaper goods of lesser quality have an unfair advantage over sustainably made products.

"We have to work together to create rules and standards that strike a balance — setting clear, measurable targets for what we want to achieve," explains **Robert Missen,** deputy director-general for Investment, Innovative & Sustainable Transport for the **European Commission**.

There's also a role for ethical advertising standards that will raise awareness of the environmental impact of consumption. "People need to be encouraged to do the right thing, and responsible manufacturers producing items of better environmental quality shouldn't be disadvantaged on price," says **Nick Molho**, executive director of the **Aldersgate Group**. Overall, a carrot-and-stick approach works best — involving a mix of new, tougher regulations, minimum performance standards, plus fiscal incentives, says Molho.

CREATING ECONOMIES THROUGH TECHNOLOGY

Entire economies — facilitated by new technologies — are naturally evolving toward Mobility as a Service (MaaS) and long-term service relationships, which are more sustainable than traditional product ownership.

"Mobility as a service is going to be a complete disruption to how automakers work today," explains **Carla Bailo,** CEO of the **Center for Automotive Research**. She adds that many different kinds of companies offer MaaS, and that it resonates with younger generations especially, who can't afford cars and tend to prefer "usership" — paying for what they utilize of a product — over the burden of ownership.

While there are undeniable benefits to a greater use of technology in mobility, there are unintended consequences, too. "We're not sure if it's going to mean more vehicles or fewer, quite frankly. There are some people that are saying it will be more vehicles, even though those vehicles will be shared," Bailo says.

MANAGING OBSOLESCENCE AND BUILDING INCENTIVES

Another risk of quickly advancing technology is digital obsolescence. According to **François Guichard,** mechanical engineer at the **United Nations Economic Commission for Europe**: "People may have an excellent car, yet want to change it if the unit isn't cool, or doesn't display videos, or connect properly to new hardware."

To encourage positive consumer behaviour, experts propose we introduce new, more extended warranties, along with rebates, tax-code incentives and penalties. **Michelin**'s CEO **Florent Menegaux** cited the example of Hong Kong, where commuters who use a Metropass instead of their car receive a few cents' reward for helping keep the city centre decongested and traffic flowing smoothly.

Through certification, for instance, you could encourage public trust in retrofitted and remanufactured products. Through rebates, you could incentivize people to return tires to a manufacturer, where they could be retreaded and reused. Through stiffer tax penalties, you could punish offending companies and get polluting vehicles or systems off the road.

"Beyond business, beyond products, we have to shake up the culture of the consumer and change the mindset of company managers," adds **Jean-Luc di Paola-Galloni,** group corporate vice-president for Sustainability and External Affairs for **Valeo.** "Change won't come easily, but it's happening."

SPEAKERS

Fabienne Goyeneche REU AFFAIRS MANAGER **MICHELIN**

François Guichard MECHANICAL ENGINEER **ECONOMIC COMMISSION FOR EUROPE UNITED NATIONS**

Michael Hurwitz HEAD OF COMMERCIAL INNOVATION **TRANSPORT FOR LONDON**

Alexander Law PUBLIC AFFAIRS MANAGER **MICHELIN**

Florent Menegaux CHIEF EXECUTIVE OFFICER **MICHELIN**

Robert Missen DEPUTY DIRECTOR-GENERAL FOR INVESTMENT, INNOVATIVE & SUSTAINABLE TRANSPORT **EUROPEAN COMMISSION**

Jean-Luc di Paola-Galloni GROUP CORPORATE VICE-PRESIDENT FOR SUSTAINABILITY AND EXTERNAL AFFAIRS **VALEO**

Izabella Teixeira CO-CHAIR **INTERNATIONAL RESOURCE PANEL, UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)**

Rashmi Urdhwareshe

MYRIAM BARIL-TESSIER

AN EXAMPLE FROM INDIA

"The Circular Economy is a concept rooted deep within the Indian ethos," says **Rashmi Urdhwareshe,** director of the **Automotive Research Association of India**. As a result, however, of the approximately 200 million vehicles on Indian roads, nearly 35 million are 15 years and older. The Automotive Research Association of India wants the government to undertake a one-time cleanup of Indian vehicle fleets, then set up a system to regularly retire unfit vehicles. Over a decade ago, India's government converted the entire bus fleet of Delhi to compressed natural gas (CNG). "CNG is doing its bit, and it's showing what is possible. I see a great need for regulating this industry," she concludes.

WORKING SESSION

“INTERVENTIONS CAN BE MADE AT EVERY LEVEL OF POLICY THAT WOULD MAKE A DIFFERENCE. BUT WHAT CAN YOU DO TO COLLABORATE, TO DEMONSTRATE THAT YOU’RE PREPARED TO TAKE A PERCENTAGE HIT ON PROFITABILITY OR MARGIN FOR THE SAKE OF A GREATER PURPOSE?”

Michael Hurwitz DIRECTOR OF TRANSPORT INNOVATION
TRANSPORT FOR LONDON

ALLEN MCEACHERN

FORGING SUSTAINABLE PARTNERSHIPS

Making products more eco-friendly requires a new approach to the analysis of value chains and lifecycles, but perhaps even more important is to seek out and form new partnerships.

SPEAKERS

Ronald Chalons OPEN INNOVATION MANAGER **SAINT-GOBAIN**

Jocelyn Doucet CEO **PYROWAVE**

Christophe Durand BUSINESS DEVELOPMENT MANAGER, BIO-SOURCED MATERIALS, CHEMICALS AND SPECIALTIES **MICHELIN**

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Dominique Labilloy DIRECTOR OF INNOVATION DEVELOPMENT, HIGH PERFORMANCE SOLUTIONS **SAINT-GOBAIN**

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Nicolas Seeboth RESEARCH DIRECTOR, POLYMERS AND CHEMICAL ADDITIVES **MICHELIN**

Jerome Petigny MANAGER, SUSTAINABILITY **DELOITTE CANADA**

The Circular Economy is all about reintroducing recycled materials into the chain of production powered by renewable energy and resources — all this in addition to limiting loss and waste. The challenge facing companies today is the switch from a linear business model to creating partnerships with suppliers that may belong to entirely different sectors. This approach involves collaboration between stakeholders with divergent interests, so a shared vision is essential.

MAKING THE RIGHT MOVES

Christophe Durand — business development manager, Materials, Chemicals and Specialties for **Michelin** — believes we need to analyze the value chain and lifecycle of a product in order to uncover the most potent strategies for adopting a pro-CE business model. That way, you can pinpoint potential losses and gains across all levels of production and forge partnerships with suppliers that best meet your needs.

"Tires are an excellent case study," Durand tells us. "If you want them to be sustainable, the focus needs to be on service life." If you use more eco-friendly supplies, you can reduce your environmental impact. If the final product doesn't last, however, you're simply shifting the problem further down the road in the form of increased waste, i.e., used tires. Based on their longevity, Michelin tires are nearly 90% sustainable.

On the opposite end of the spectrum, you would want to use more biodegradable ingredients to produce, say, a plastic cup and lessen the environmental consequences. "It's all about compromise based on analyzing impact — then mitigating said impact," concludes Durand.

INVESTING IN SUSTAINABILITY

The principal objection certain companies have to using eco-friendly suppliers is the high cost of recycled and reused materials. **Jocelyn Doucet** — CEO at **Pyrowave** — explains that reusing plastics is more expensive than refining raw materials. His company reintroduces mixed plastics like polystyrene into the production of new ones. "Our products are more cost-intensive for the manufacturer, so solutions to alleviating production costs are certainly necessary," he reports.

This is where public authorities could swoop in and finance the transition to a more circular economic model. They're already doing it for certain industries, such as supporting the reuse of raw materials for beverage production.

AGNIESZKA STALKOPER

COOPERATING FOR THE FUTURE

If the Circular Economy means forging new business ties, it also means that the benefits need to go all the way around the table. Every partner has to delve into analyzing their needs, expectations and what they can bring to the table. That way, two competitors can support the development of a single eco-friendly product supplier and both end up reaping the rewards. For example: if each party finances a portion of the supplier's R&D, one might lower its prices and the other its carbon footprint.

Participant solutions

- → **Be equipped with good metrics;**
- → **Find common ground;**
- → **Build trust;**
- → **Know your limits;**
- → **Acknowledge that the solution is a collective one;**
- → **Determine what's shareable and what's not.**

WORKING SESSION

"USING RENEWED AND RECYCLED MATERIALS DOESN'T MEAN YOUR COMPANY IS SUSTAINABLE."

Christophe Durand BUSINESS DEVELOPMENT MANAGER, BIO-SOURCED MATERIALS, CHEMICALS AND SPECIALTIES **MICHELIN**

AGNIESZKA STALKOPER

CLOSING THE LOOP

How circular is your company? New and better metrics are giving management teams a common language to describe their progress in adopting sustainable business practices.

"The Circular Economy doesn't just mean making do with less or doing things in moderation; it means we have the opportunity to do things smarter, and that's an uplifting message," says **Carolien Van Brunschot**, Circular Economy expert with the **World Business Council for Sustainable Development (WBCSD)**. The organization, based in Geneva, develops ideas to replace old "take, make, waste" paradigms of the past with "smarter," circular "tame the waste" alternatives.

MEASURING CIRCULARITY

WBCSD's latest initiative is a set of straightforward, step-by-step procedures being developed into an online tool that companies of any size and within any industry can use to calculate their percentage of circularity. A working group co-chaired by Dutch multinational **DSM** and the WBCSD, with support from **KPMG**, has developed a methodology to gather data at various phases of a product's lifespan — from materials procurement to manufacturing, to eventual disposal of finished items. The data is then fed into mathematical formulae that calculate a company's "circular performance."

"We wanted to develop a framework based on material flows through a company, which gives you an idea of where you are now, where you want to go in the future, and gives you a way to track your progress in getting there," explains Van Brunschot.

SPEAKER

Carolien Van Brunschot MANAGER, CIRCULAR ECONOMY

WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (WBCSD)

THERE ARE FIVE MAJOR PROCESS STEPS:

→ **Scope the review:** Set parameters for an evaluation's breadth and depth, and what you hope it will achieve;

→ **Select indicators:** Evaluate material flows within a set time frame or product cycle, including how your company treats material waste;

→ **Collect and analyze data:** Gather and evaluate information (typically from procurement departments and other internal sources, along with suppliers and clients);

→ **Analyze and interpret results:** After defining a percentage of circularity for your company, look deeper at material streams going into the calculus;

→ **Identify opportunities:** Improve your score by pinpointing ways to scale up renewable and recycled content inflows.

The methodology, adds Van Brunschot, "is truly a measure of circularity — not necessarily how sustainable companies are." By adopting a uniform metrics-based approach, companies can not only improve their own processes, but benchmark their achievements compared with business partners and competitors. WBCSD is now running focus groups whose feedback will be used to refine and launch an online tool set for companies by the end of 2019.

CALCULATE YOUR PERCENTAGE OF CIRCULARITY

Circularity represents the balance between "circular inflows" (e.g., recycled, renewable or responsibly grown material) and reduced-waste "circular outflows" versus linear inflows/outflows (virgin, non-renewable materials destined for landfill).

"WE AS REGULATORS MUSTN'T FORGET THAT IT'S THE ROLE OF INDUSTRY TO MAKE A PROFIT. IT'S NOT OUR ROLE TO THINK OF RULES TO MAKE INDUSTRY MORE EFFICIENT. NOBODY LIKES REGULATORS. NOBODY LIKES RULES, BUT THE REALITY IS THAT THERE IS A ROLE FOR POLICYMAKERS BECAUSE RESPONSIBLE INDUSTRY NEEDS AND WANTS A CERTAIN AMOUNT OF REGULATION."

Robert Missen DEPUTY DIRECTOR-GENERAL FOR INVESTMENT, INNOVATIVE & SUSTAINABLE TRANSPORT **EUROPEAN COMMISSION**

WORKING SESSION

THE RIGHT DOSE OF POWER

To foster the development of electric vehicles, adding charging stations is not enough. Battery charging must be optimized and made smart.

The **BMW Group** estimates that a quarter of the western car fleet will be electric or hybrid by 2025. To promote this adoption, the manufacturer is focusing on two pillars of the Circular Economy: renewable energies and the reuse of materials.

SPEAKERS

Axel Kaltwasser MEDIA AND PUBLIC RELATIONS MANAGER **BMW GROUP**

Ursula Mathar VICE-PRESIDENT OF SUSTAINABILITY AND ENVIRONMENTAL PROTECTION **BMW GROUP**

MATHIEU DUNBERRY

Ursula Mathar

ARIANNE BERGERON

SMART CHARGING

One of the main issues in the electrification of transportation is, of course, battery charging. It is their capacity to store enough power that dictates the electric vehicle's autonomy and, consequently, its appeal. "The questions that need answers for the customers are 'How far can I drive, where can I charge, and how long does it take?'" points out **Axel Kaltwasser**, public relations manager for the BMW Group. If people don't use their vehicles for commuting to and from work, the charge required is minimal compared to when a battery is drained after a long trip. "If the battery doesn't need to be charged from empty to full, the time spent at the charging station is reduced," he explains.

To manage energy supply and demand, the sharing of data between users, vehicles and charging stations is proving to be quite promising, as seen in the pilot project ChargeForward that took place in California from 2015 to 2018, and included 350 participants. In partnership with **Pacific Gas & Electric**, BMW has created a smart charging program using solar power during the day and wind power at night. This can alleviate demand on the power grid during peak periods and provide electricity at better rates. In some cases, this program has made it possible for vehicles to travel using 80% renewable energies.

A SECOND LIFE FOR BATTERIES

For its factory in Leipzig, Germany, the auto manufacturer has put in place a storage farm of renewable energy from wind turbines. Electricity is stored in 700 batteries, equal to what would be needed for a BMW i3 to travel 100,000 km. What's remarkable here is that some of these batteries are on their second life, since they come from old vehicles of this model, not to mention that they cost about half as much as new ones. What's more, BMW is contributing to the stability of the city's power grid by transmitting its surplus electricity.

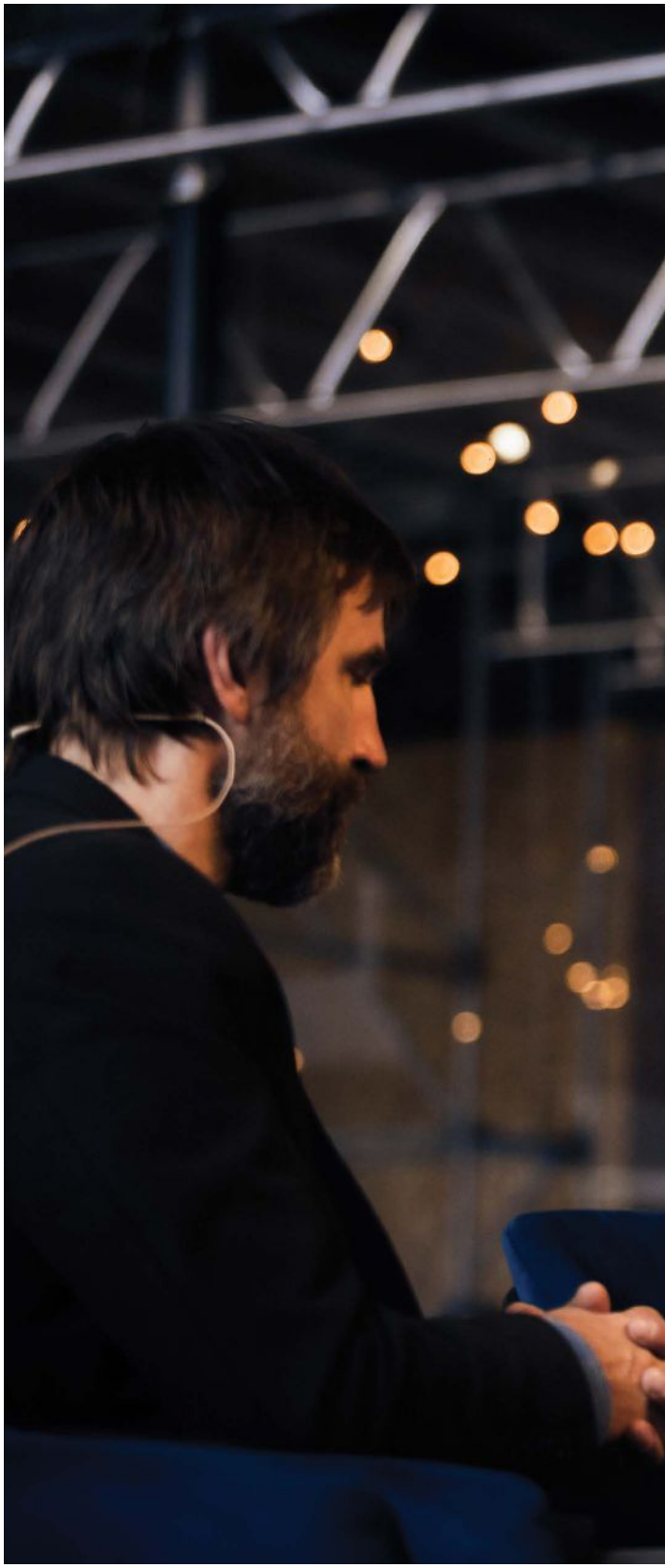
THE ROAD AHEAD

The challenge now is to develop the necessary infrastructure for large-scale smart charging. The BMW Group is campaigning for an increase in public charging stations, according to **Ursula Mathar**, vice-president of Sustainability and Environmental Protection. She says that companies must also get involved. "The business case for companies to install charging stations for their employees is nonexistent. So it's got to be something else. That's where fiscal incentives come in," she concludes.

WORKING SESSION

“THE CIRCULAR ECONOMY IS ALSO FOUND IN THE MOBILITY CHAIN. WE HAVE TWO STRATEGIES: REDUCE THE IMPACT AND INCREASE ACCESSIBILITY THROUGH INTELLIGENT AND SUSTAINABLE MOBILITY.”

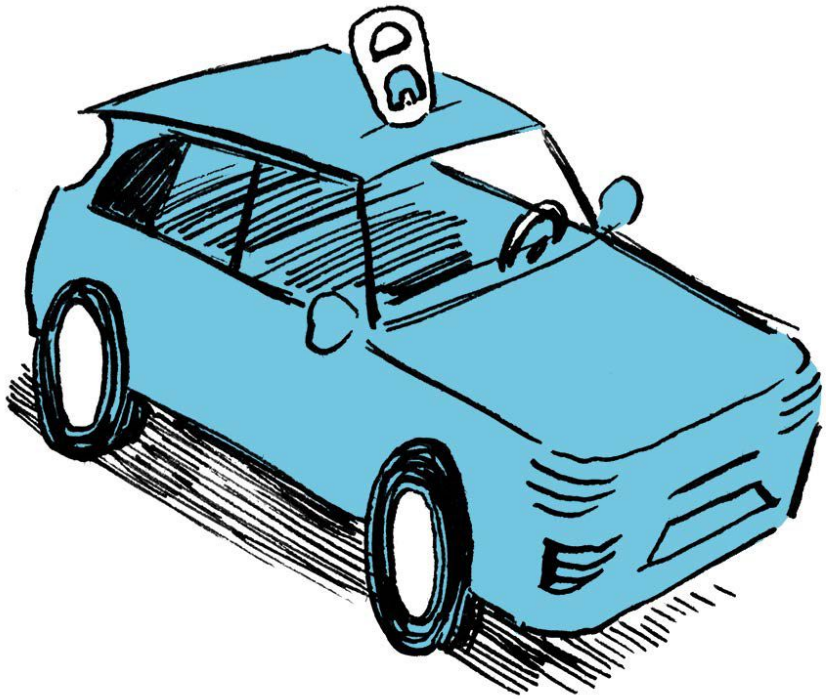
Arnaud Leroy PRESIDENT
AGENCE DE L’ENVIRONNEMENT ET DE LA MAÎTRISE DE L’ÉNERGIE (ADEME)



MYRIAM BARIL-TESSIER

IDEAS THAT CAN GO FAR

Some initiatives based on the Circular Economy.



SHIFTING METALS

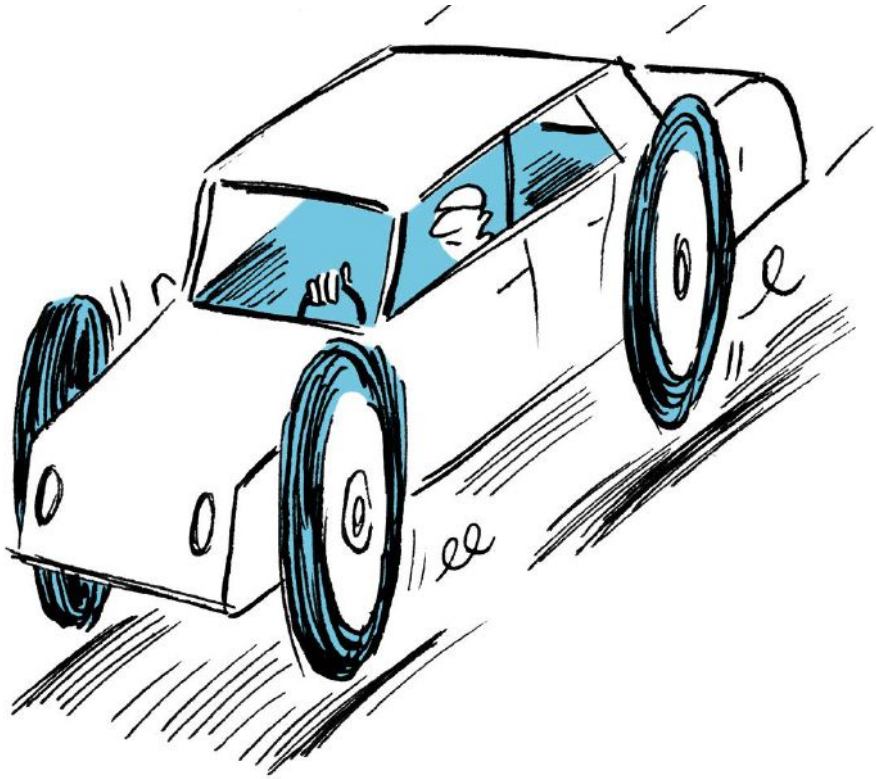
Jaguar Land Rover, seeking carbon-emissions reduction, shifted from steel to lighter aluminium bodywork for some of their models, but found that aluminum is more energy- and carbon-intensive to produce. The solution was to create a new supply chain to recycle aluminum from scratch in the United Kingdom. The carmaker now builds vehicles from 50% recycled metal (expected to increase to 75% by 2020), with further savings on materials and reductions in tail-pipe emissions.

CIRCULAR SOLUTION: SWEDEN'S ELECTRICITY

The ElectriCity program in Gothenburg, Sweden — in partnership with **Volvo** and others — is a prime example of the positive effect of circularity. The city is deploying all-electric buses in certain areas, including two new all-electric mobile library buses. "Electrifying something like a library implies a different way of thinking about how to use new forms of mobility within an urban context," says **Carl Bäckstrand,** deputy CEO at **White Arkitekter.** Once the three-year pilot project ends, the batteries will be removed from the buses then reused as storage for solar-derived electricity that will power a local housing project.

SECOND LIFE

Worldwide, only 12% of plastic waste is recycled. The Canadian company **Pyrowave** has set itself the challenge of increasing this percentage by developing a technology to dissolve it into a resin used to produce new containers. Plastics from both sorting centres and manufacturers can be recycled indefinitely using their technology, without causing the GHG emissions associated with the extraction of the raw material.



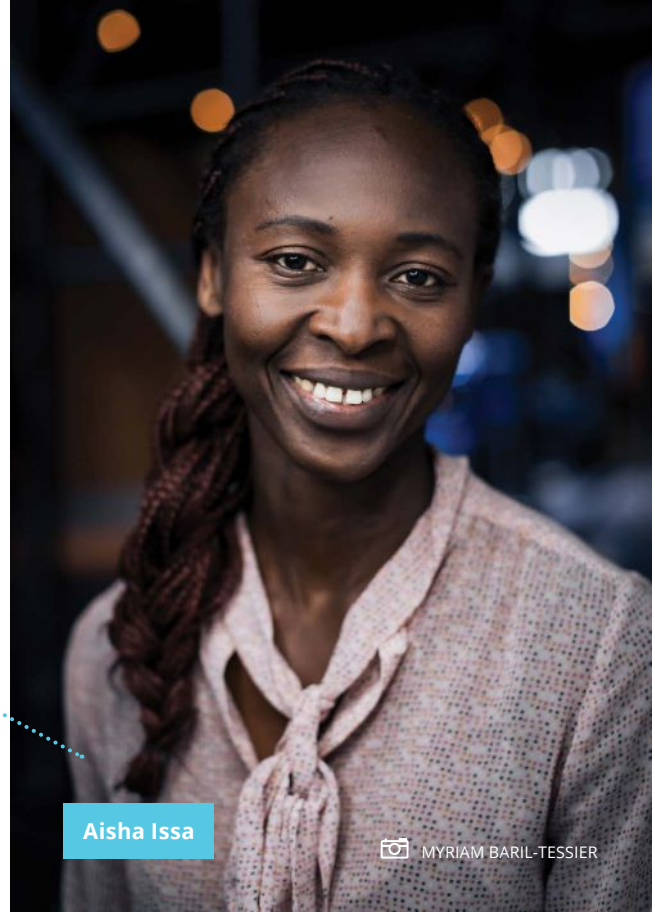
VAST POTENTIAL

Solvay is currently developing a material to increase tire life by 20%. Imagine the optimization of resources if this advance is applied to the 500 million tires that are produced each year!

CIRCULAR SYNTHESIS

Enerkem, headquartered in Montreal, operates the world's first commercial biorefinery that economically and sustainably converts non-recyclable municipal solid waste into renewable fuels and chemicals through a process that's a thermochemical alternative to petroleum. Enerkem's technology extracts carbon from solid garbage, turning otherwise non-recyclable waste into what the company calls "syngas," then, through a further catalytic synthesis process, into biofuels, as well as ethanol, a raw material used to make thousands of consumer goods. Its Edmonton plant is gearing up to produce 38 million litres of ethanol annually, which could fuel 450,000 cars per year.

TODAY'S YOUTH LOOK TO TOMORROW



Aisha Issa

MYRIAM BARIL-TESSIER

Five representatives of the new generation attended the conferences and working sessions at the 2019 Movin'On Summit. Here is what Polytechnique Montréal doctoral student **Aisha Issa** thought of the Circular Economy theme.

WHAT THE 2019 MOVIN'ON SUMMIT TAUGHT ME

I was quite influenced by participants' capacity to imagine, create and transmute business models that value collaboration between various social and economic bodies. I learned that Circular Economy initiatives are generally grouped together within ecosystems of geographic proximity or economic affinity. At a time of trade internationalization, worldwide supply chains, illegal trade of waste and major exploitation of resources in countries in the southern hemisphere, the Movin'On Summit makes it possible to ideate disruptive and inclusive business models by offering innovative conceptual and operational frameworks. It also speaks to the mobilization of the international community when dealing with climate issues. Geopolitics and financial appetites have been the driving force of our socioeconomic models and these should consequently be examined in light of the Circular Economy.

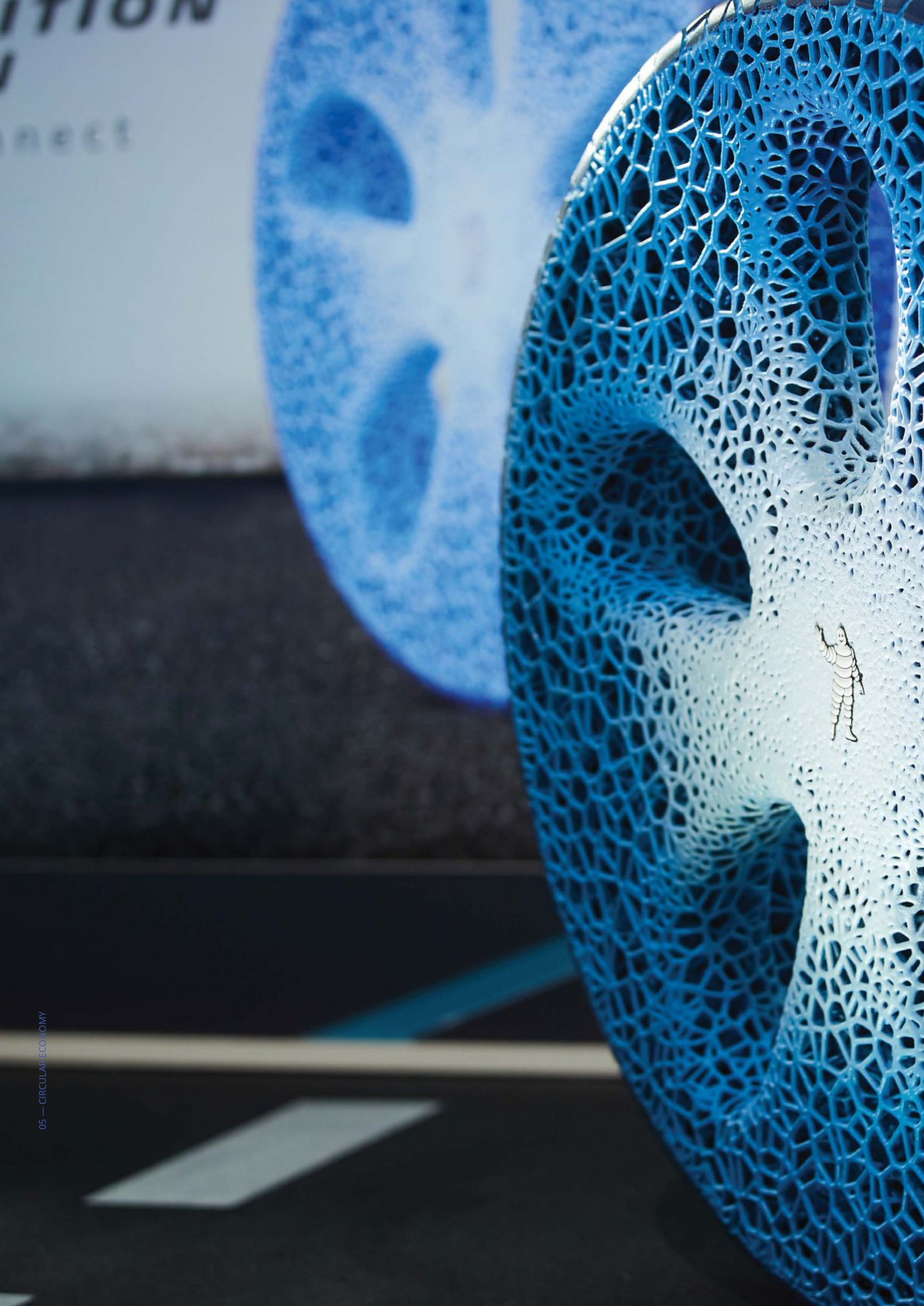
THE PRESENTATION THAT MOST INTERESTED ME

I found the conference entitled "Putting circularity at the core of new mobilities" particularly stimulating. The three guest speakers — Brazilian minister of the environment **Izabella Teixeira,** vice-president of the Thai conglomerate **SCG Sakchai Patiparnpreechavud** and founder of Tel Aviv-based **iKare Innovation Anne Baer** — presented varied perspectives and sociocultural experiences. The discussion brought out the importance of developing region-specific solutions while taking the planet's limited resources into account. Technology is a key element of the solution. The conclusion that stays with me is an Izabella Teixeira quote: "Wastefulness is not accidental; it is the result of a decision."

THE INITIATIVE I WOULD LIKE TO SEE ACHIEVED

While some cities are experiencing demographic growth (for example, in China, India and Nigeria) and significant urbanization, others, mainly in the West, are facing aging populations. Consequently, mobility needs are not universal. Moreover, the fact that a third of food produced worldwide goes to waste shows a business logic in conflict with the optimal use of resources and the distribution of wealth. In line with sustainable development goals set forth by the United Nations, economic expansion should not be separated from environmental issues. The idea of managing resources differently through a bottom-up approach aimed at sustainability and inclusion, with the help of technological leverage, is a project I support. Long supply chains are the driving force of this sustainable change.

Aisha Issa is an agro-economist with more than 20 years of experience in management and marketing in the agri-food, retail, and public transportation industries. She is currently completing a doctorate in industrial engineering and operational research on the transparency of supply chains related to regulations and sustainable production.



A 3D-printed tire, biodegradable and puncture-proof, developed by Michelin.

ARIANNE BERGERON

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See you next year

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TO BE HELD IN MONTREAL, JUNE 3-5.

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