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The Mind:SHIFT

A Compendium of Future Mobility and New Urbanism Trends

Berlin | March 2022

Analysis Design

This study presents current and brand-new topics in the field of Mobility & New Urbanism. The selection is based on the FirstSignals® trend and topic early detection method developed by pressrelations.

All selected individual topics were bundled into the following thematic trend clusters:

1. E-Mobility
2. Software & In-Car-Tech
3. Mobility & Sustainability
4. New Urbanism
5. Logistics

About the selection criteria of the Individual Topics:

Trending Topic: High media awareness and high topicality. The topic is at the center of discussions about the mobility of the future and is closely linked to major social and economic issues such as the climate crisis, e-mobility, sustainability, AI and digitization..

New Perspective: The topic is highly multifaceted or offers a new perspective, which is why it introduces a broad discourse space for experts, business, politics and the general public and thus could garner particular attention within the spectrum of mobility topics.

New Topic: The topic is brand new and carries a high trend potential because important opinion leaders promote it, it has a high potential for an industry shift, or because it affects several different areas of mobility to the same extent.

Analysis Design

The analysis of the respective topic clusters consists of three parts:

01. **The Insights in a Nutshell** section offers an editorial classification of the relevance of the current topic trends per cluster.

02. Every **individual topic** is presented and described editorially.

03. **Measurement of the media awareness** of the individual topics in the last 12 months in comparison between English-speaking (UK, USA) and German-speaking (DACH) sources.
(Basis: approx. 15,000 online sources incl. leading media excluding so-called "news slingers").
The number of sources is distributed roughly equally between the two language areas, which ensures good comparability.

The data are presented as a topic benchmark per topic cluster and in a comparison of the media response of German-language and English-language sources.

Topic identification, topic selection and editorial classification are based on research of content-rich articles from the following media over the past six months:

German:

Frankfurter Allgemeine Zeitung für Deutschland
Handelsblatt
DER SPIEGEL
t:n
Süddeutsche Zeitung
DIE ZEIT

English:

FINANCIAL TIMES
WIRED
The New York Times
The Economist
Forbes

The detailed examination of the individual topics is preceded by a **measurement of the media awareness** of ten **"long-term" top issues** that have been dominating the discussions about mobility for years and have achieved a certain media latency. These include, among others, synthetic fuels, the transformation of transport, charging infrastructures and climate neutrality in connection with mobility. This approach is aimed to provide an overview of the general media situation in the field of Mobility & Urbanism.

Management Summary

Management Summary - Editorial Classification Trend Topics

01 E-Mobility: This segment basically revolves around three topics:
The central topic is a **charging infrastructure** that can cope with the explosive growth of the e-mobile market. According to **Wired**, a new market worth billions is being created around fast-charging stations with expensive **DC technology** based on the old principle of gas stations, while city planners are calling for as many urban charging points as possible with inexpensive but slow **AC technology** in a bid to make better use of the cars' long idle times for charging. Other central topics include new **battery technologies** for **faster charging times** and, somewhat surprisingly, a new class of **mini EVs** that seem to be outpacing popular e-SUVs both in the media response and sales statistics. .

02 Software and In-Car-Tech: The technological revolution in vehicles is now taking place in the interiors, in terms of comprehensive **infotainment offerings** that feature fantastical design. According to consultancy **Oliver Wyman**, they are becoming a key selling point. Although **Mercedes' Hyperscreen** has caused a stir, German manufacturers have some need to catch up in this segment – particularly in **China**. Another key factor for future viability are software and hardware one-stop solutions that control everything from safety and infotainment to driver assistance – updateable and available by subscription. New competitors such as **Sony** and **Apple** are bracing themselves, the latter being the "most dangerous company" for the automotive industry, according to **former Mercedes Tech board member Sajjad Khan.**

03 Mobility & Sustainability: **Circularity**, i.e., new circular economy concepts such as **cradle-to-cradle**, became hype in the light of global raw material shortages, international protectionism, and a **supply chain crisis**, especially in the automotive and construction sectors. Here, the concept is driving a materials revolution. Either recycling is to be conducted on a large scale or **bio-based materials** are to be used. The automotive industry is also working intensively on **battery recycling**, which should soon ensure that 95% of a battery is recyclable. Until then, used batteries will be given a **second life as electricity storage** for peak loads in energy grids.

04 New Urbanism: Three urban planning paradigms are in focus: These include the **smart city**, the **livable city** given a significant exodus to the countryside, and **climate adaptation strategies** to protect cities, particularly against **overheating**. Currently, the biggest problem is that all three approaches are complementary, all unleash an enormous innovation dynamic, but are hardly thought through in a holistic manner. Meanwhile, the construction industry is offering innovations to combat the housing shortage with **tiny houses, serial construction** and **3D printed houses**.

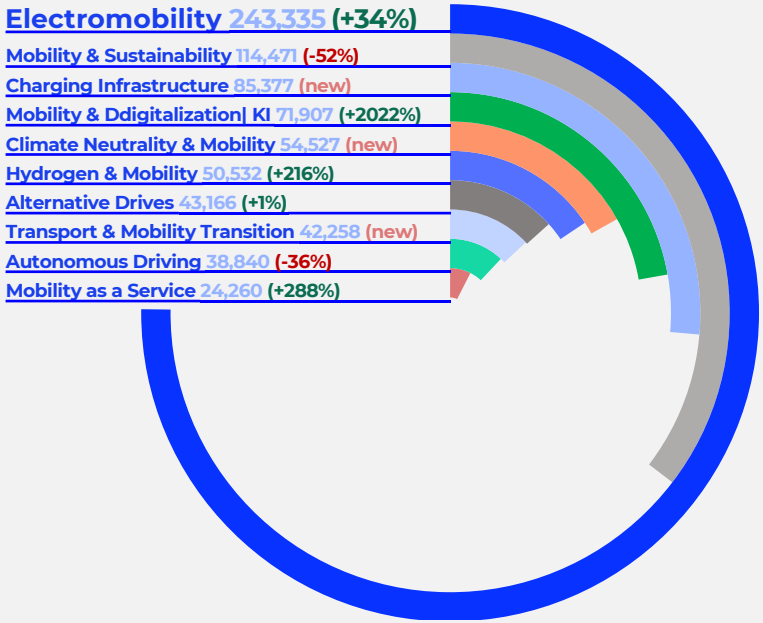
05 Logistics: **Quick Commerce** and the **Instant Economy** will decentralize **last-mile logistics** and greatly increase delivery intervals. Numerous **micro-depots, pick-up stations, micro-shops** are emerging. The classical 3.5-ton truck is increasingly unsuitable for this, which is why the future belongs to innovative **cargo bikes** and **delivery robots**. At the same time, sharp new conflicts over the use of bike paths and the available urban space will emerge.

Top10 “Long-Term Top Topics” February 2021 - February 2022

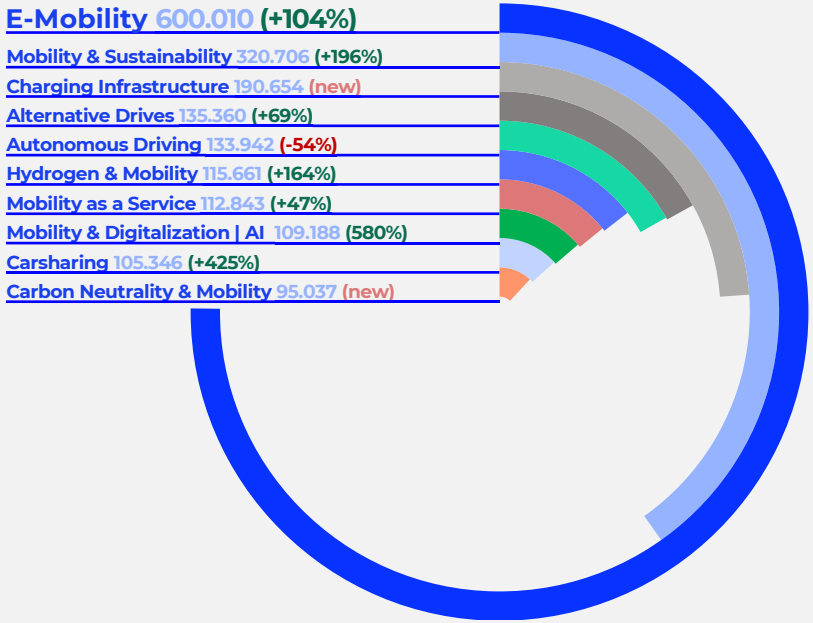
Top topics in total
By number of articles
(percentage change compared to previous year)

1. Electromobility 843,000 (+79%)
2. Mobility & Sustainability 435,000 (+25%)
3. Charging infrastructure 276,000 (new)
4. Mobility & Digitalization | AI 181,000 (+800%)
5. Alternative Drives 179,000 (+48%)
6. Autonomous Driving overall 173,000 (-51%)
7. Hydrogen & Mobility 166,000 (+177%)
8. Climate Neutrality & Mobility 150,000 (new)
9. Mobility as a Service 137,000 (+67%)
10. Carsharing 122,000 (+239%)

German Media



English Media



Explanation Based on a media panel of **approx. 15,000 German/English online sources**. So-called "news slingers" not offering an editorial department were not considered.

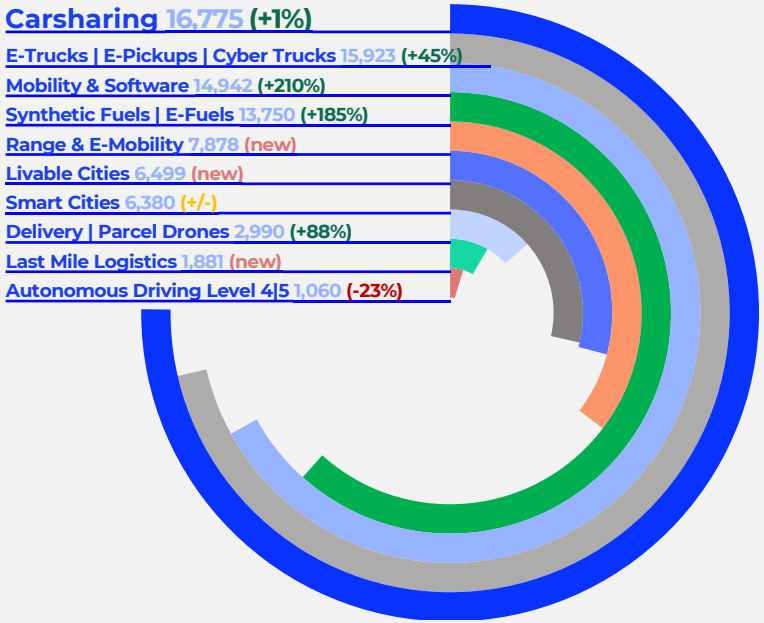
For data collection, the topics presented were queried **in all different spellings** and **including synonyms** and terms closely related in content. Each topic therefore represents a **content-consistent query cluster of terms**.

Top11-20 “Long-Term Top Topics” February 2021 - February 2022

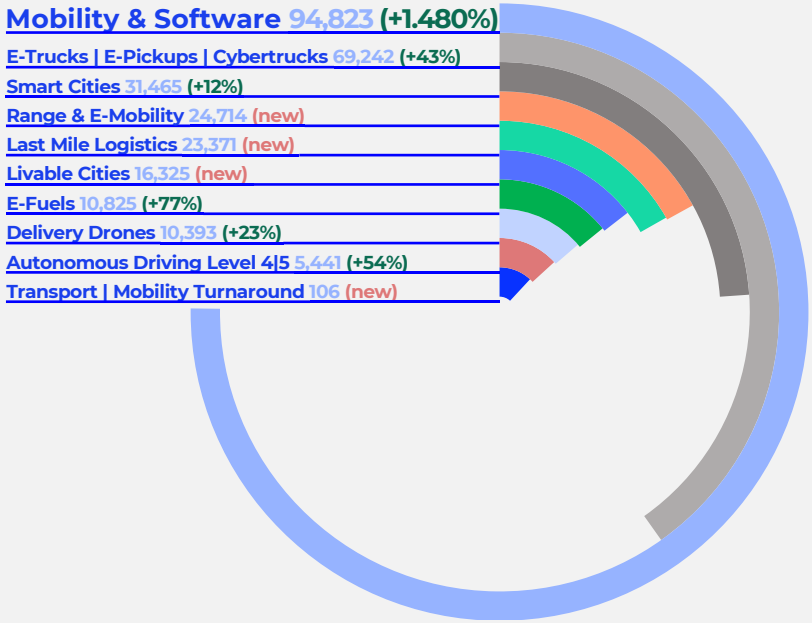
Top topics in total
By number of articles
(percentage change compared to previous year)

11. **Mobility & Software**
    110,000 **(+1.000%)**
12. **E-Trucks | E-Pickups | Cyber Trucks**
    85,000 **(+44%)**
13. **Transport | Mobility Turnaround**
    42,000 **(neu)**
14. **Smart Cities**
    38,000 **(+12%)**
15. **Range & E-Mobility**
    33,000 **(neu)**
16. **Last Mile Logistics**
    25,000 **(neu)**
17. **Synthetic Fuels | E-Fuels**
    25,000 **(+127%)**
18. **Liveable Cities**
    23,000 **(neu)**
19. **Delivery | Parcel Drones**
    13,000 **(+30%)**
20. **Autonomous Driving Level 4|5**
    7,000 **(+40%)**

German Media



English Media



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Top10 “Long-Term Top Topics” in the Last 12 Months

Top10 topics

Electromobility
Mobility & Sustainability
Charging Infrastructure
Mobility & Digitalization | AI
Alternative Drives
Autonomous Driving overall
Hydrogen & Mobility
Climate Neutrality & Nobility
Mobility as a Service
Car Sharing

The Top20 “Long-Term” topics ranged across both language areas subject to analysis (German/English) between 843,000 articles (top spot: electromobility) and autonomous driving level 4/5 (20th rank: 7,000 articles). Compared to the previous year, the number of articles on electromobility has thus almost doubled.

As a new topic among the long-term topics, charging infrastructure achieved a 3rd place (276,000 articles).

In the German-language media, **electromobility** has replaced **sustainability** as the top topic of the previous study. It trails at a clear distance, again followed by the newly included top topic of **charging infrastructure** ranked in third place.

The **traffic or mobility turnaround** exists as a sociopolitical narrative only in the German-speaking world. It was newly included for the current study and, with around 42,000 articles, directly achieves a respectable 8th rank.

In English-language media, electromobility has replaced autonomous driving as the top topic of the previous year, which drops to fifth rank with a comparatively halved number of articles. In the English-speaking world, the newly included topic of charging infrastructure also directly achieved the 3rd rank.

Mobility as a Service (Maas) has gained 50% in media response in the English-speaking world compared to the same period last year - which is a remarkable increase in awareness for a cultural area that relies more heavily on individual transportation than Germany.

For **car sharing**, the surge is even greater, coming from just under 20,000 articles in the previous year to around 105,000 articles in the current study..

Remarkable:

There has been an almost explosive increase in reporting in the German-speaking world on digitization in connection with mobility – up from around 3,200 to around 72,000 articles. The English-speaking world recorded an almost equally strong increase from 16,000 to 109,000 articles.

In both language areas together, the topic therefore improved from ninth to fourth place.

The topic of **software & mobility** also achieved a similar increase – up from around 10,000 news reports in the previous year to 110,000 now. However, because significantly more was written on mobility topics overall, it still slipped out of the top 10 to 11th place.

Hydrogen in connection with mobility was the top topic of the new trend topics last year with around 60,000 news reports in both language areas. As a new long-term topic, hydrogen managed an increase to 166,000 news reports and finished in sixth place in both language areas.

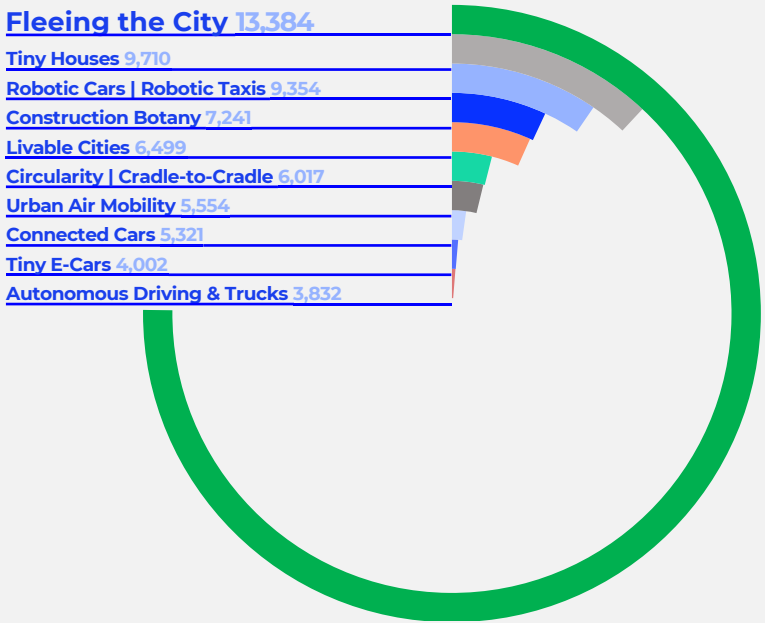
Conversely, the topic of autonomous driving halved from 354,000 articles in 2020 to 173,000 articles in 2021 and slipped from second to sixth place.

Top10 Trend Topics Identified in the Last 12 Months

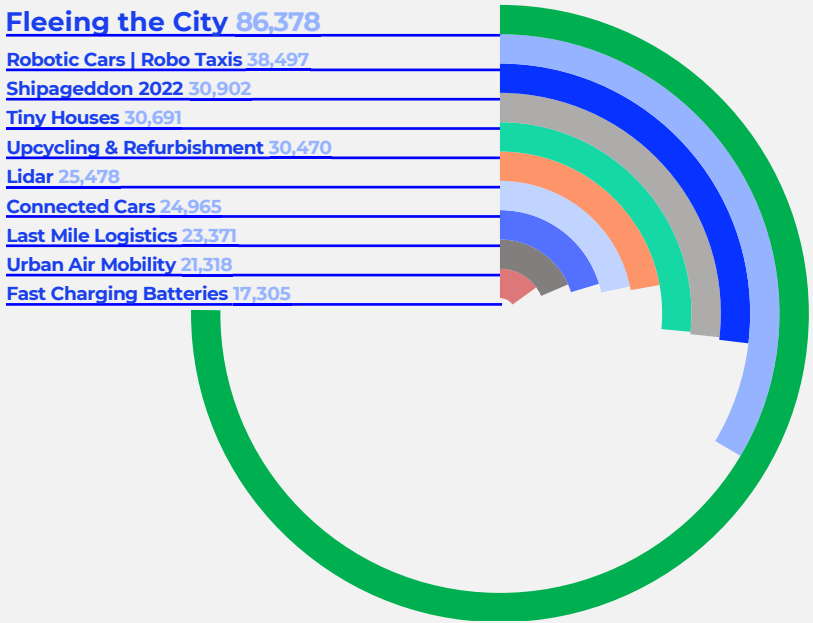
Trend topics total by number of articles

1. **Fleeing the City** 100,000
2. **Robotic Cars | Robo Taxis** 48,000
3. **Tiny Houses** 40,000
4. **Upcycling & Refurbishment** 32,000
5. **Shipageddon 2022** 32,000
6. **Connected Cars** 30,000
7. **Lidar** 29,000
8. **Urban Air Mobility** 27,000
9. **Last Mile Logistics** 25,000
10. **Livable Cities** 23,000

German media



English media



Explanation Based on a media panel of approx. **15,000 German/English online sources**. So-called "news slingers" not offering an editorial department were not considered.

For data collection, the topics presented were queried **in all different spellings** and **including synonyms** and terms closely related in content. Each topic therefore represents a **content-consistent query cluster** of terms.

Top10 Trend Topics Identified in the Last 12 Months

Top10 trend topics

Fleeing the City
Robot cars | Robotaxis
Tiny Houses
Upcycling & Refurbishment
Shipageddon 2022
Connected Cars
Lidar
Urban Air Mobility
Last Mile Logistics
Liveable cities

The Top10 of current trend topics **ranges in total, i.e., across both language areas subject to analysis (German/English), between 100,000 articles (top spot: fleeing the city) and 23,000 articles (10th rank: the concept of a livable city).**

In stark contrast to the previous study, where all of the Top10 trending topics were on par with the Top10 "Long-Term" trending topics in terms of media awareness, none of the trending topics would have made it into the Top10 Long-Term topics this year, where Car Sharing reaches the 10th place, eliciting 122,000 articles.

In **German-language media**, **Tiny Houses** emerged as runner-up with 9,700 articles, ranking just behind **Fleeing the City / Urban flight** with 13,400 news pieces – a topic that was only present in specialized media two years ago.
The **Circularity anglicism** denoting the **Circular Economy** reached a 6th rank in the German-language media 6,000 articles, while it failed to reach the Top10 in its area of origin, the English-speaking countries.

In **English-language media**, **Fleeing the City** also dominates the trending topics with 86,000 articles. **Robocars** are clearly trailing behind with 38,500 articles.
Upcycling and Refurbishment are actually contextual topics within the overarching theme of **Circularity** or the **Circular Economy**. The fact that they have overtaken their own superordinate topic in the English-speaking world is because the real estate industry in cities is the driver of the topic here, ahead of the automotive industry.
Eliciting around 16,000 articles, the topic of **Livable Cities** just missed out on entry into the Top10.

Remarkable:
The are no longer a marginal topic in both language regions. phenomenon of **Fleeing the City**, or Urban Migration, is discussed with high and similar intensity in both language areas. The fact that this phenomenon exists and that it is also significant in real numeric terms has now been clearly proven by surveys and data.

Although the paradigm of the **Livable City** only made it to the 10th rank in the list of trending topics with a total of 23,000 articles, it is precisely this claim towards cities that stands behind the reports on Urban Migration. In addition, the topic has experienced a steep media career over the course of the last 12 months, as before only a few hundred articles on this topic were published.
It is thus coming quite close to the **Smart City Paradigm** that has dominated urban future concepts for years, ranking 14th among the long-term top topics with 38,000 posts in both language areas.

Surprisingly strongly represented in the German media area is **Construction Botany** with 7,200 news pieces – a topic that, apart from a few barely practice-oriented lighthouse projects, has hardly found its way out of the research laboratories of leading universities such as the Technical University of Munich.

Also surprising is how relatively little is said about the key technology for autonomous driving, **Lidar**, which garnered around 3,000 news articles in the German-speaking world. In contrast, it is ranked in the English-speaking world as it was last year, eliciting 25,400 articles.

The media analysis also shows that **Tiny Houses.**

Topic 01: E-Mobility

Insights in a Nutshell

E-Mobility

Software & In-Car-Tech

Mobility & Sustainability

New Urbanism

Logistics

MindShift:

Thinking in terms of conventional gas stations and refueling stops doesn't quite fit with e-mobility

The market for e-mobiles in Europe has eventually become a mass segment in 2021. The share of e-mobiles in new vehicle sales rose from 4% in 2019 to 23% in 2021.

Because e-mobiles are now no longer strangers in the street scenes, the topic of **charging infrastructure** is moving to the center of future debates. Unfortunately, however, not in a positive way. Criticisms include a confusion of technical standards and electricity tariffs, too few fast-charging stations and charging points overall, long charging and waiting times, charging that is harmful to the grid, and disproportionately high costs for permits and investments in charging points and grid development. According to the **Economist**, the (Western) world is running into a **dramatic shortage of charging points.**

Moreover, some sort of a religious war is going on about slow AC charging points or fast-charging DC charging stations. The latter carry the old gas station principle of "filling up" into the E-age. Advocates of the much cheaper but slow AC technology consider this as old thinking. Instead of large filling stations, e-mobility would rather need many small touchpoints in everyday life to be able to charge wherever you are, without having to drive to extra stations for full charging.

Not least because they have long since implemented **800-volt electrical systems** for fast charging, premium vehicle manufacturers are tending toward charging stations based on the old service station principle. In addition to DC fast chargers, they rely on **Premium Convenience** for waiting times. A concept which is similar to the principle of Deutsche Bahn's lounges.

The leading technology medium **Wired** sees a new megamarket in the making due to the complexity of the issue in network management and the construction of charging points, which will be characterized by highly innovative and specialized providers and startups - both for power management and for new service, entertainment and lounge concepts, including **Metaverse** and **virtual reality**.

Meanwhile, Tesla - like Apple in the past with its iPhone and IOS system - is creating its own world of smoothly running super-chargers, and meanwhile is entering the energy market to market its e-mobiles as a kind of energy cloud of electricity storage on a power exchange called Autobidder.

In addition to charging infrastructure, **range-extending technologies** are the second biggest trend area in e-mobility. First, there is a plethora of new materials and production forms that all have one objective: to increase the energy density of batteries. The **solid-state battery** is probably finally on the verge of market maturity, with ranges of up to 1,000 km. In addition, conventional but **3D-printed Li-ion batteries** and **novel flux cells made of nanotubes** with **bipolar plates** made of **high-tech polymers** promise longer ranges.

In the vehicle itself, silicon carbide chips and hairpin drives contribute significantly to improving energy efficiency.

Individual Topics

E-Mobility

Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Topic:

Quantum Batteries | Nano-Batteries

The prerequisite for quantum mechanical batteries is **superabsorption**, i.e., the ability of molecules to absorb light. Until now, this has been nothing but theory, but now researchers with the **University of Adelaide** have succeeded in achieving a kind of proof-of-concept in a concrete practical application. The advantages of these batteries built with **nanotubes** compared to lithium-ions in terms of energy efficiency, range and charging speed could be several orders of magnitude. This is because such batteries harvest and store light energy directly from the solar cell with virtually no loss of time or energy.

Redox Flow Batteries | Flow Cell Car

This form of battery already exists in practice. Its energy density and charging time are superior to lithium-ion technology. As a result, flow cells should be able to provide ranges of up to 4,800 km.

The problem so far:

Manufacturing price, durability, and size. In the meantime, however, carbon-based electrodes can be combined with low-cost electrolytes made of manganese or sulfur, making them far cheaper and more durable at EUR 20 per kWh. **Fraunhofer** researchers have also succeeded in making the installed **bipolar plates** smaller and, above all, more flexible by using a novel polymer mixture, in a manner that the space in a vehicle can be used more efficiently. Giessen, Germany-based high-tech company **Schunk** is already working on industrial applications.

New Topic:

Fast-charging batteries and range chips

Better energy management and reduced charging times are currently key objectives in lithium-ion-based e-mobility. **Bosch** is one of the companies to work on this with new types of **silicon carbide chips**, as are start-ups such as the British company **Nyobolt**, which uses **niobium tungsten oxide** as anode material in Li-ion cells. The goal is always to reduce the heating of energy systems. The Nyobolt cell heats up to a maximum of only 40 degrees, which enables higher charging current. The Bosch chips avoid waste heat in the fast-charging 800-volt systems, which saves a lot of power and enables shorter charging times, too.

New Perspective:

Solid state cell

In terms of heating, energy density, charging times, environmental impact and flammability, the solid-state cell is considered the best and most obvious Li-ion alternative. Many automotive companies have invested considerable resources in this area. However, following several inconsequential announcements of cells ready for series production, disillusionment has recently set in.

Now **the Fraunhofer ISC Würzburg** has announced that it will produce a solid-state battery ready for series production in 2022. And practical tests at **VW, BMW** and **Ford** have recently been very satisfactory. Nevertheless, **Professor Maximilian Fichtner** of the **Helmholtz Institute** in Ulm and the automotive industry do not expect to replace the current batteries with solid-state systems until 2025.

Individual Topics

E-Mobility

Software & In-Car-Tech

Mobility & Sustainability

New Urbanism

Logistics

New Perspective:

Gedruckte Batterien

Swiss-based **Blackstone Resources AG**, together with research institutes **EMPA (Switzerland), Bern University of Applied Sciences, Fraunhofer** as well as the **Technical University of Braunschweig**, is demonstrating that there is still plenty of scope for Li-ion batteries.

The use of **3D printing technology** is expected to reduce manufacturing investments by 70% and production costs by 30%, while the energy density of printed batteries is expected to increase by 30%. “Even future solid-state batteries with up to 70% more storage volume can be printed with it, rendering possible battery capacities of up to 170 kWh and a six-fold increase in charging power,” said **Blackstone CEO Holger Gritzka**.

New Topic:

Premium charging points and exclusive charging stations

A lack of charging points and too slow charging currently constitute the biggest bottleneck of e-mobility. Simultaneously, premium providers such as **Porsche** and **Audi** are working on **premium fast charging stations** with up to 320 kilowatts of charging power, a lounge, and a reserved plug. The plug is booked in advance via an app and swings out automatically as a kind of **charging robot**.

No awkward handling, no dirty hands, no waiting or queuing for a free charging point. While charging, there is a toilet, snacks and coffee in the lounge. Startups like **Dérive** are also focusing on premium offerings while charging, in this case using an **augmented reality** art, entertainment and communication platform.

New Perspective:

Snack Charging and Inductive Charging

When it comes to charging infrastructure, a systemic question is currently arising. Fast complete charging with **DC networks** at mobility hubs according to the filling station principle or short, slower partial charges via AC networks, but as often as possible at many places in our daily lives. The latter is known as **snack charging**. Because a vehicle is only moved for an average of 85 minutes per day, it is ideal when parked, at work or while shopping. **The AC charging points** required in very large numbers also cost only one-twentieth of a DC fast charging station.

With the growing expansion of the DC fast-charging infrastructure and its very high charging voltage, **inductive charging** is also becoming an issue again. Until now, it has failed due to the costs, the low transmission power and the very high charge loss of up to 20% during transmission.

However, a breakthrough has now been achieved at **Volkswagen's Knoxville Innovation Hub** in the USA in collaboration with the **Oak Ridge National Laboratory (ORNL)**. This is because up to 98% of the charging energy was reached by the battery of a Porsche Taycan. The charging power was also increased from 6.6 watts to 120 watts.

In Brunswick, e-buses are already being inductively charged at 200 kw. VW is aiming for 300 kw here. This would charge a Taycan to 80% in 10 minutes. The technology is particularly suitable for **fast intermediate charging** in parking lots, at red lights, or for electric buses at bus stops.

Individual Topics

E-Mobility

Software & In-Car-Tech

Mobility & Sustainability

New Urbanism

Logistics

Trending Topic

Bidirectional charging (vehicle-to-grid) and Tesla's Autobidder

The intermediate storage of electricity to compensate for load peaks and wind lulls, known as **power-to-X**, is one of the Achilles' heels of the so-called energy transition. But charged e-cars could serve as intermediate storage and power source by means of **vehicle-to-load technology (V2L).** Using this approach, e-cars will form an **energy cloud** of **quasi-microgrids** in the future, as storage or a component feeding into the grid (**vehicle to grid**).

The more e-mobility becomes a mass market, the more likely e-cars will become a factor here. This is the reason why Elon Musk and **Tesla** have suddenly entered the energy market.

With his **"Autobidder,"** he wants to establish a system based on **machine learning** that overcomes the biggest hurdle, complex power management, and feeds the energy stored in car batteries back into the power circuit or back into the e-vehicle at exactly the right time with the right quantity.

Tesla describes Autobidder as a "real-time platform" that "provides value-based asset management and portfolio optimization." The advantage for Tesla customers is, above all, an enormous cost reduction. The partner for Europe is **Octopus Energy**, an electricity and gas supplier based in the UK.

Trending Topic

Hairpin electric motors

In the context of e-mobility, the talk is almost exclusively about charging infrastructure, charging times and new battery technologies. **Hairpin technology** shows that the electric motors themselves also hold potential for innovation.

The copper wire winding is optimized in the stator of the electric motor - by means of angular copper wires that look like hairpins and are welded together by laser beam. This allows the copper elements in the motor to be packed together more tightly and the filling in the stator to be increased, resulting in a significant increase in power or significantly lighter motors..

Trending Topic

Electric microcars and mini Evs

According to the industry service **Electrive.net**, four microcars were among the top10 best-selling e-mobiles in 2021, including the VW e-Up (No. 2), the Renault Zoe (No. 4), the Smart Fortwo (No. 6) and the Fiat 500 (No. 9).

Small cars are the boom segment of e-mobility

Novel two-seater light vehicles or **mopeds in the L6e class**, such as the **Opel Rocks-e**, which is somewhere between an electric scooter and a small electric car, are now set to expand the successful segment downwards.

However, not so in Europe. There is a lack of subsidies here, which makes them unattractive in terms of price. Asia, with its huge metropolises and their lack of space, is considered a boom market for this segment. Nevertheless, many startups such as the Swiss **Micro Mobility Systems** or the Italian **XEV** are emerging in Europe.

Measuring Media Awareness

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Explanation

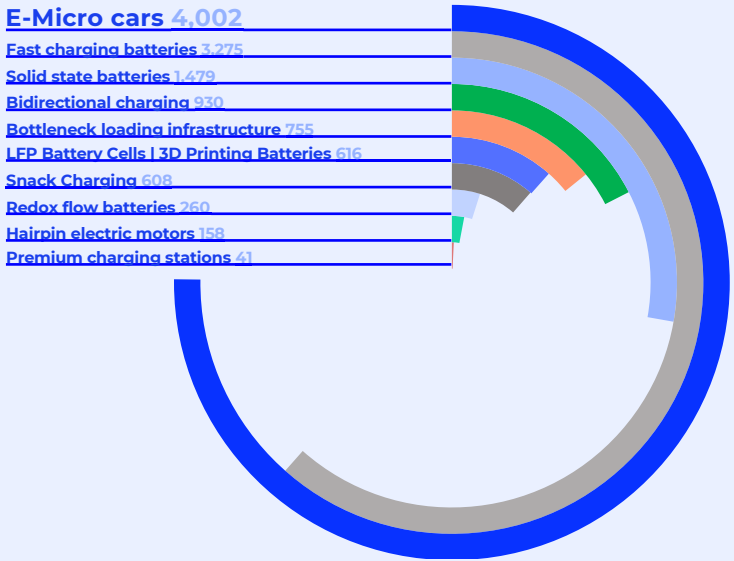
Based on a media panel of approx. **15,000 German/English online sources**. So-called "news slingers" not offering an editorial department were not considered.

For data collection, the topics presented were queried **in all different spellings and including synonyms** and terms closely related in content. Each topic therefore represents a **content-consistent query cluster** of terms.

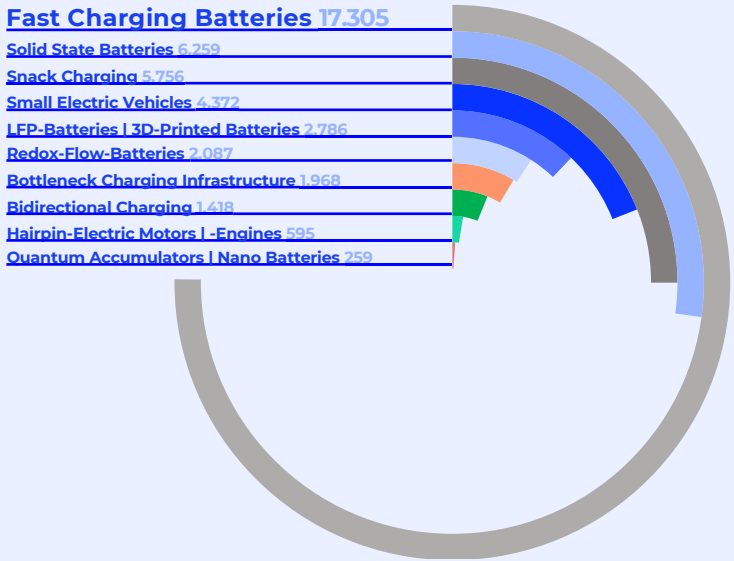
Annotations:

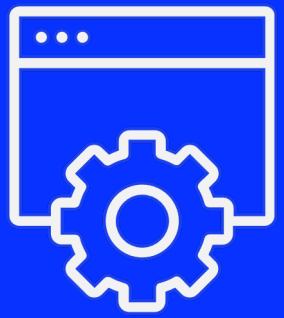
Electric microcars, including top sellers such as the **VW e-UP**, the **Smart** and the **Renault Zoe**, surprisingly dominate the top trends in the e-mobility segment. This is because the main segment of this class of car is actually still below the types mentioned and is therefore of interest primarily to the Asian markets. **Fast-charge batteries** and the **solid-state cell** as the most likely successor technology to lithium-ion batteries follow as top topics in the German-speaking countries. Fast-charging batteries are also by far the top topic in English-language media. The solid-state cell follows clearly behind in second place among the top topics.

German Media:



English Media:





Topic 02: Software and In-Car-Tech

Insights in a Nutshell (I)

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

MindShift:

Infotainment becomes a key purchasing argument

According to management consultancy Oliver Wyman, infotainment and better access to digital services are a reason for 40% of Europeans and 80% of Chinese to switch their car brands.

According to **Peter Schiefer, head of the automotive division at chip manufacturer Infineon**, this is why "90 percent of innovations in cars come via electronics**." Car commerce, in-car purchasing** and **infotainment**, i.e., shopping, gaming, streaming, chatting and paying in the car, are becoming key competitive factors, supplemented by subscriptions to add-on features for a better driving experience. This will require **5G**, fast hardware and software, and a user experience that is "seamless" and fun. "Meanwhile, digital functions are actually more important to many customers than the clearance between parts." (**Spiegel**).

Among German premium manufacturers, there is currently some light here, but still a lot of shadow.
"We would never have dreamed of the hype that this hyperscreen would trigger," said **Mercedes development boss Markus Schäfer** at the beginning of 2022 about the technology flagship EQS. The fact that the **EQS** also sets standards in terms of range is almost a side note. When it comes to infotainment, German automakers are still considered too boring across the board (Handelsblatt).

This is now becoming a serious problem in China, as the Oliver Wyman study reveals. Car buyers there are turning away from German manufacturers because of the lack of infotainment offerings. **"In terms of information and network technology, German manufacturers are lagging behind local Chinese automakers," Zhang Xiang, an automotive expert at the North China University of Technology, told Handelsblatt.**
Also in **Handelsblatt, Kang Jun, market analyst at LMC Automotive in Shanghai**, complains that it is **"not particularly convenient to operate the systems of a Mercedes or BMW."**
Meanwhile, Chinese manufacturers are considered leaders in this field - alongside Tesla. "No other Western manufacturer is as far in connectivity" (**Patrick Hummel, auto industry analyst at Swiss bank UBS**).

To this end, manufacturers are fully committed to developing the hardware as a powerful and energy-efficient overall system. The coming vehicles are rolling data centers with 100 million program codes and more than 600 GB of data every day. That is because, according to **Infineon**, more than 100 microsensors and microcontrollers are now installed in a premium model. This number will grow even more with autonomous driving, it is no longer just a matter of proprietary software but, as with **Tesla**, proprietary chips.

Apple is lurking in the background, which, according to **former Mercedes Tech executive Sajjad Khan**, is the "most dangerous company" for the automotive industry.

Insights in a Nutshell (II)

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

(...)

Following the advent of **autonomous driving** by the latest, hyperscreens will no longer be sufficient. Then, **completely new spatial and driving experience concepts** will be required, because the car is set to become a living room. **Holistic approaches that focus on well-being, family-friendliness and a coherent overall concept of flexible interior design, light and sound for relaxation, get-togethers and entertainment will be most successful.**

And this is probably exactly why unsporting vans will replace the currently still popular SUVs as the most popular vehicle segment.

Similarly, with autonomous driving, **safety should also be established as a holistic concept in the vehicle**. The recent case of a man from Bavaria who took control of 25 Teslas via **car hacking**, shows how important this is. After all, infotainment and connectivity are not only the focus of car developers, but also of car hackers, because they are considered a gateway par excellence for **cyberattacks**.

The **Consumer Loss Barometer** from **KPMG** shows how important this issue is: **56% fear a hacker attack on their car; 82% would even hesitate to buy cars from a manufacturer that has already been the victim of a cyberattack.**

The next technological milestones will exacerbate the problem: **bidirectional charging** with the e-mobile as an integral node of the **Internet of Things (IoT)** and the complete networking of cars with each other are starting in 2022.

The acronyms **IoV (Internet of Vehicles**) and **V2X (Vehicles-to-Everything**) stand for the complete networking of cars with each other and with their physical environment. They represent technological advances, but also new gateways for cyberattacks.

A **delay-free human-machine system design** for the current semi-autonomous **Level 3** is the top topic in **autonomous driving** in 2022. A particular focus are **seals of approval** and **test procedures**, such as those offered by **TÜV Nord** or the **Fraunhofer Aisec Institute**.

The numerous accidents with Tesla's Autopilot raise the system question here, because inexpensive camera technology is now considered to have little future viability. The safe laser radar system **LIDAR**, on the other hand, is still too expensive and is only worthwhile for large **robo-taxis**. These are eventually in the starting blocks for mass operation in 2022 – particularly in the United States.

After all, 2022 began with a flood of positive reports and concrete billion-dollar commitments to **electric flying vertical takeoff air cabs (eVTOL)**. Doubts about their technical feasibility thus no longer seem to exist. And although important approvals are pending, the UAM market for “ecological high-speed means of transport” (**Lilium founder Daniel Wiegand**), which is expected to grow to $241 billion by 2035, is considered open this year.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Trending Topic:

Car Commerce and In-Car-Purchase

GM alone expects to generate revenue ranging from $20 billion to $25 billion from in-car digital services by 2030 per year. VW also expects this segment to account for a third of total sales by 2030.

For automakers, it emerges to be a key business model of the future: **subscriptions for additionally bookable and unlockable driving features** and digital enhancements around **infotainment**, navigation, and lights. These include Drive Recorder, an extra tighter turning circle at an additional charge, distance cruise control, Autopilot, or **location-based services s**uch as local traffic jam warnings and restaurant bookings. Camera recordings of the beautiful coastline you are passing are also to be booked at an extra fee.

The cars now coming onto the market generate sales in the same way as the **in-app purchases** familiar from smartphones. Shopping tours from inside the car, real-time traffic visualization, satellite images in the navigation system, video or music streaming, premium 5G connectivity - all bookable with a click, called **In-Car-Purchase**. **Mercedes' e-payment platform**, for example, will enable **native payment** by fingerprint from spring 2022 onwards.

Such services require **updateability** of as many functions as possible in the vehicle, which is why extensive hardware is already built into the vehicle as standard equipment, while comprehensive software is needed for concrete activation and control. This is precisely why VW has founded the software subsidiary **Cariad**, and it is precisely here, in the software, where the major revenues of the future for car manufacturers will be generated.

New Topic:

Hyperscreens

The curved “mega-matt screen” (**SZ**) with a diameter of 141 cm and the **MBUX** operating system in the **Mercedes EQS** is still causing a stir even today. For once, **Tesla** doesn't seem to be setting the pace in infotainment. **BMW** followed with the **iX electric SUV** and the Chinese start-up **NIO** with the **ET7**. The **Skysphere** from the **Audi** study will be found in the new **A6 e-tron**.

In 2022, hyperscreens will be the central interface for offering numerous **infotainment services**. The technology in the background mostly comes from chip giant **Nvidia**, which has been able to establish a major technological lead with energy-efficient **teraflop processors** and AI software. **Sony, Apple, Uber, Amazon** and **Google** play a decisive role in the actual user applications.

Trending Topic:

Lidar

The laser radar system **Lidar** is becoming the key technology for autonomous driving, the past year has shown. It is far superior to camera systems and can even detect dark objects at a distance of up to 400 meters. The race to find the best technology is expensive, but in the end, only efficiency and technical superiority count, according to **Mobileye manager Johann Jungwirth**, which is why only a handful of companies remain in this market in the end. The top companies here include **Google's Waymo, Continental, Qualcomm, Bosch, Delphi Automotive, Intel|Mobileye, Infineon Technologies, Valeo, Luminar, Tomtom** and **Nvidia**.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Perspective:

Car Convenience and "Mindfulness Driving"

Car commerce and hyperscreens will not be sufficient for the autonomous vehicles of the future. Holistic concepts for a new driving experience are in demand. .

With its "**Mindfulness Car**," Ford was able to cleverly link the top topic of Gen Z|Gen Y, **mindfulness** and **self-care**, with a car that's quite unfavorable within this generation. The car is set to become an "oasis of relaxation," according to **Ford developer Carsten Starke**. Assistance systems for the head, body and soul rather than for driving are being developed, and new room designs invite gymnastics and power napping.

CO2 sensors linked to the air conditioning system are also being deployed, as are systems for air purification and ionization of germs and viruses.

However, even more decisive in the future will be completely new room concepts, such as those in the **Audi Grandsphere study** - rolling luxury lounges or family-friendly living rooms for six.

Trending Topic:

Voice Commerce

Voice control has arrived in everyday life, with 55% of the population using such applications. But the market has come to a standstill – apart from the automotive sector. According to a recent representative study by German **pollsters YouGov**, two-thirds of Germans think voice applications in cars will play a very important role in the future.

New Topic:

Security by Design

Today, some 25 percent of all vehicles are connected to the Web, with about 300 serious **cyberattacks** on smart cars worldwide each year. By 2035, 93% of all vehicles will be "connected."

The race against hackers therefore remains in full swing. The core problem is outdated software codes, which are often found in a wide variety of high-tech parts from suppliers and in infotainment, according to **Professor Dr. Hans-Joachim Hof from the Security in Mobility research group at the Technical University Ingolstadt.**

Other vulnerabilities include over-the-air updates and the charging infrastructure. If vehicle manufacturers are working on holistic mobile ecosystems, this holistic thinking should also be applied to the security architecture, says **Dr. Tamir Bechor, an Israeli security expert and co-founder of Cymotive in Tel Aviv**.

Such a concept takes all security aspects into account as early as the product development stage and accompanies the vehicle throughout its life cycle through **incident monitoring and response** to identify new risks and vulnerabilities in good time.

Tesla is actually a pioneer in this regard. A Model 3, for example, receives over 120 software updates in two years. Nevertheless, as the latest cyberattack shows, that's still not enough. And the problem is getting worse as e-mobiles become central nodes in the **IoT network** via **bidirectional charging**.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Perspective:

Connected Cars and Sensor-Driven Mobility

Leading technology medium **Wired** predicts three trends in connectivity over the next five to ten years: **edge computing, 5G** and **vehicle-to-anything (V2X)** or **Internet of Vehicles (IoV)**.

As an initial step, **edge node sensors** will start to be installed along roads worldwide in 2022. The advantage of edge computing is that data processing moves closer to the original data source, thus reducing latency - necessary for future **location-based services**, but also for real-time control of traffic according to local traffic volumes. Local edge nodes are the central interfaces where the physical world interacts with the data analysis of the computing world. In combination with 5G and V2X, it is the precondition for controlling autonomous vehicles as a networked overall system.

Trending Topic

Autonomous Driving and Robotaxis

Mercedes is the first automaker in the world to be authorized to sell **autonomous driving vehicles reaching level 3**. “This is an exciting step because for the first time the driver is no longer responsible at all times,” **Christoph Stiller, director at the FZI Research Center Karlsruhe**, told Die **Zeit**. Thus, the development focus turns to the interface between man and machine. That's because humans are overburdened with their co-pilot role and handing control back to the driver is highly risky, according to **Davide Maggi** of the **Institute for Transport Studies at the University of Leeds** in **Der Spiegel**. “The fact that the driver takes the steering wheel again does not mean that he is fully capable again.” Which is why autonomous driving could still take a while.

Things look better for **robotaxis. Google subsidiary Waymo** has been offering a robotaxi service in **San Francisco** since 2021, which can be considered a milestone due to the enormously difficult road conditions there. Intel subsidiary **Mobileye**, a technological leader in sensors for autonomous driving, plans to put 12 to 14-seat robotaxis on the road in the U.S. in 2024 and is currently testing this approach with **Sixt** in Munich. Chinese tech giant **Baidu** wants to have robotaxis driving in 65 cities by 2025.

Trending Topic

Flying Taxis (UAM)

Volocopter is launching its first commercial air cab operation with about 20 planes in Singapore in 2024, receiving $1 billion in fresh capital **from Aviation Capital Group (ACG)** to build its fleet. In addition to Marina Bay and Sentosa, nearby destinations in Malaysia and Indonesia will be served by the electric vertical takeoff aircraft (eVTOL).

Embraer subsidiary Eve won an order for 200 air cabs by 2026 from **Halo**, a British helicopter service. **Boeing** is investing $450 million in a flight cab startup. **Rolls Royce** plans to operate an all-electric small aircraft with 8 to 18 seats by 2025.

The entire market is expected to generate $241 billion in sales by 2035, half of which will come from passenger transportation, starting at 110 to 280 km/h and about 250 km range. Based on current reports, this now seems more realistic than before.

Measuring Media Awareness

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Explanation

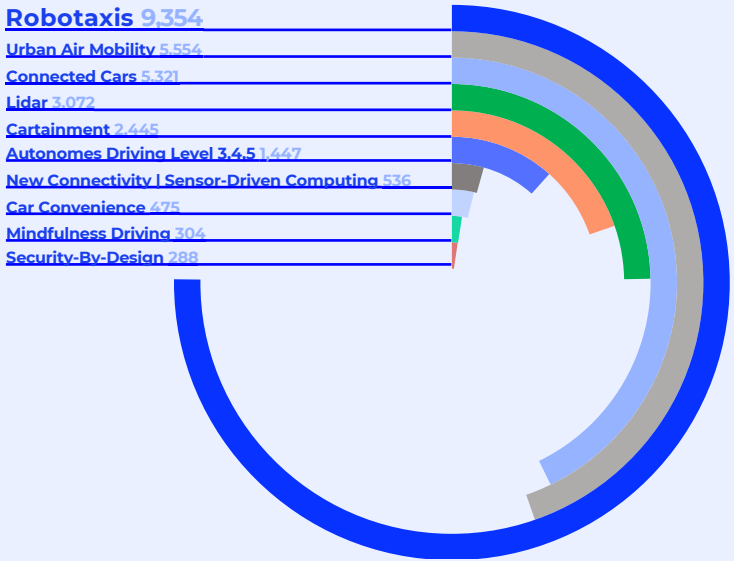
Based on a media panel of approx. **15,000 German/English online sources**. So-called "news slingers" not offering an editorial department were not considered.

For data collection, the topics presented were queried **in all different spellings and including synonyms** and terms closely related in content. Each topic therefore represents a **content-consistent query cluster** of terms.

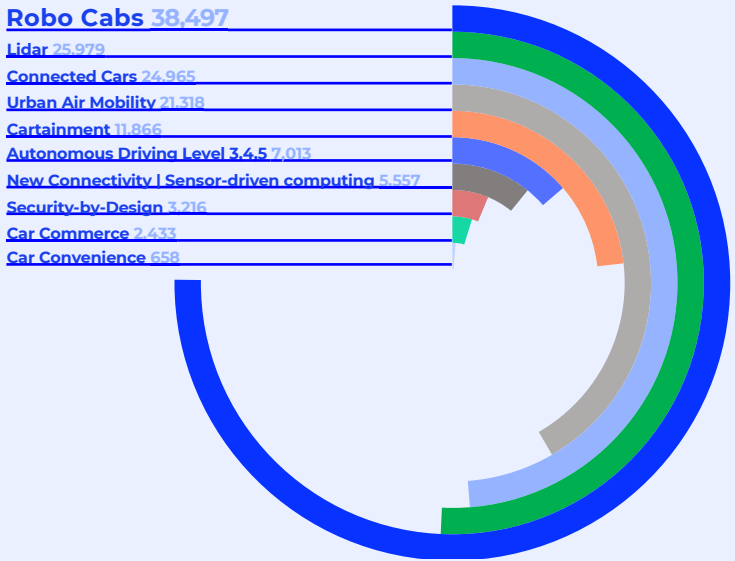
Annotations:

As the world's largest technology companies are investing huge amounts of money in this area and have also recently made major technological advances, **robotaxis** are clearly dominant in both language areas. Since the robotaxis in the **USA**, like those of technology leader **Waymo**, rely on the expensive but now mature light radar **LIDAR**, this core technology is also strongly present in the context of robotaxis in the English-speaking media. **Urban Air Mobility (UAM)**, on the other hand, is much more present in the media in German-speaking countries, since the technology leaders such as **Lilium** and **Volocopter** come from Germany.

Deutsche Medien:



Englische Medien:



Topic 03: Mobility and Sustainability

Insights in a Nutshell (I)

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

MindShift:

Concepts based on the principles of the circular economy will lead to a materials and production revolution in vehicles and real estate

In addition to climate change, plastic waste is the biggest single global environmental problem, and it continues to grow dramatically. In addition, the input of micro- and now also nanoplastics into the environment and our bodies keeps increasing. On top of this, growing international protectionism is increasingly leading to raw material shortages.

This makes circular economy approaches under the term “circularity” a current megatrend - especially for the material-intensive automotive and construction industries.

The latter now relies heavily on circular economy. Everywhere, large building complexes are being planned according to the **cradle-to-cradle** principle, which means using materials in such a way that they can later be separated by type, deconstructed, free of pollutants and recycled to a high quality, **Steffen Szeidl, Spokesman of the Board of Drees & Sommer**, a construction consulting company, told **Börsenzeitung**.

Wood is therefore also experiencing a renaissance as a basic construction material. Soon, specially hardened wood will even be able to replace concrete and steel beams. Circularity will therefore spur a materials revolution, such as **Carbon Capture and Utilization (CCU) - building materials** that, for example, as **CO2-absorbing concrete**, store more CO2 than their production consumes.

Bio-concrete, on the other hand, is to be produced microbacterially instead of being baked. In addition, **biobased plastics** are becoming more important, some produced by genetically modified bacteria from waste of all kinds in bioreactors, or as **high-performance bioplastics** based on **biopolymers** or **polylactides** - or as 3D-printed **fiber additives (biopowder)** for coatings and later even as replacements for paints. “It's an exciting time for innovation,” says **Russell Hill, chief technologist at U.S. startup Solidia Technologies.**

Automakers are also accelerating the trend. According to CEO **Zipse**, **BMW** wants to become the world's most sustainable automaker with this approach. **Mercedes CEO Källenius** argues that circularity counts as the third top topic alongside e-mobility and autonomous driving, if one believes the topic suggestions in his LinkedIn survey.

Batteries are a particular focus. In principle, 90% of the materials could be recycled. But this is extremely costly because recycling was not taken into consideration in the design process. **Tesla's** bonded cells, for example, are particularly difficult to recycle.

BASF, but also **Volkswagen** in its future battery production facility in Salzgitter and **Mercedes** from 2023 onwards, are planning recycling rates of up to 95% using new chemical processes. Until then, the **2nd Life Battery** approach is important as an interim solution. The term denotes the **upcycling** of batteries that can still be used as large-scale storage at the end of their life cycle in the car.

(...)

Insights in a Nutshell (II)

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

(...)

Climate Tech **is the fastest-growing future industry of them all. According to a study by PWC, some $87 billion in venture capital flowed into this sector since 2020, more than ever before.**

Larry Fink, CEO of Blackrock, the world's largest investment company, also predicts in daily **F.A.Z.** that the next 1,000 unicorns with a valuation of more than $1 billion will also come from this sector. 18% of these startups, the second largest group after Energy, are developing **smart mobility solutions**.

Global aviation and shipping currently account for only about 3% of global greenhouse gas emissions each, roughly equivalent to the emissions from the Internet's server infrastructure. They were left out of the 2015 **Paris climate agreement** due to unclear national responsibilities. **Felix Creutzig** of the **Mercator Research Institute on Global Commons and Climate Change (MCC)** says in **Der Spiegel** that without a change in direction, "CO_2 emissions from both sectors [will] increase massively in the coming decades."

As a result, they are now under pressure to strive for climate neutrality.

In the run-up to the most recent 2021 Climate Summit in Glasgow, the two global associations **ICS** and **IATA** therefore had initiated a turnaround by pledging to reduce emissions to zero by 2050.

For the aviation sector, the **International Aviation Climate Ambition Coalition**, including the U.S., U.K., France, Spain and Turkey, wants to implement **climate-friendly (bio)fuels** and compensation systems.

In shipping, 20 industrialized countries, including Germany, want to establish climate-neutral routes between different ports in the next few years. Although **Greenpeace** levelled criticism at this approach, arguing it was "too late, too little," **Ingrid Irigoyen** of the **Aspen Institute** considers it a "necessary first step in the transformation." Major shippers such as **Amazon, Ikea** and **Unilever** want to ship climate neutrally as early as 2040. In addition, a fuel levy is expected to generate $500 million annually for research into eco-fuels using methanol and ammonia.

In any case, public pressure and specific goal-setting will bring massive progress in developing carbon-neutral aircraft and ships in the coming years. Technically, says MCC expert Creutzig, **decarbonization** was feasible **until 2050**.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Trending Topic:

Circularity and Cradle-to-Cradle

In the past 12 months, the anglicism **circularity** has surpassed all other sustainability paradigms in the media response. The **Boston Consulting Group** predicts sales of €800 billion by 2030 for Europe alone and a 75% circular-enabled economy that can reduce CO2 consumption by 45%, according to calculations by the **Ellen McArthur Foundation**. According to **Manager Magazin**, the main driver of the development is not politics but the industry itself, especially the material-intensive construction and automotive sectors. Shortages of raw materials and international protectionism are cited as reasons, along with environmental protection. **BMW**, for example, has created a new Circular Economy division and aims to achieve a 50% recycling rate by 2025. **Mercedes CEO Källenius** also emphasizes in **Handelsblatt** that the closed-loop economy should be implemented quickly. And **Covestro** turns CO2 back into carbon, which is then reused for car seats.

The basic paradigm of circularity is called **Cradle-to-Cradle (C2C)**, literally "from the cradle to the cradle," and was contrived by **chemist Michael Braungart**. C2C certification is considered the most important seal of quality in the Circular Economy, because it requires that recyclability has already been accounted for in the planning of the product and production process, and that composites, for example, are not being used.

New Topic:

Bio-based raw materials and vegan materials

In addition to recycling, the prerequisite for a **Circular Economy** is the use of non-fossil, renewable and therefore **bio-based** raw materials, which are biodegradable, whose production is CO2-neutral and which substitute plastic in particular. Thanks to the genetic engineering technology **Crispr**, it is now possible to breed bacteria that eat any kind of waste and in the end consist of 90% biopolymers.

At the same time, research is being conducted worldwide, including at the **IfBB Hannover**, on **PLA bioplastics** for high-performance applications in the automotive industry, which is driving the circularity revolution due to its enormous demand for raw materials. **BMW** is considered a pioneer with its i **Vision Circular** concept study made entirely from recycled and **natural materials**.

Even leather can be replaced by vegan materials. Californian start-up **MycoWorks** has developed a leather substitute based on fungal spores.

The construction sector is hoping for **CO2-neutral bio-concrete**. This is because concrete production alone is responsible for 8% of global CO2 emissions. Bioconcrete is not fired for consolidation but produced by **microbiologically induced calcite precipitation (MICP).** However, no processes exist yet for the production of large-format load-bearing components.

On the other hand, processes are nearing industrial maturity that could be used to replace steel with **high-tech wood**. For this purpose, it is pressed after the plasticizers hemicellulose and lignin have been removed. Subsequently, it is harder than steel and biodegradable.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Trending Topic:

Second Life Battery and Upcycling

According to **Andreas Radics, partner at Berylls Strategy Advisors**, the batteries of e-mobiles will soon result in millions of tons of hazardous waste, because after a short time they are no longer suitable for heavy-duty use, even though they have residual capacities of up to 80%.

In order to at least delay disposal until appropriate recycling processes are technologically mature, new **upcycling** recycling concepts are currently being developed.

RWE and **Audi** are testing further use as large-scale storage units in power grids that may provide used batteries a second life for up to 10 years. According to RWE, the **second-life market** will grow to 76 gigawatt hours by 2035.

New Topic:

Climate-Tech-Start-ups and Climate Consumer Brands

Alongside fintechs, crypto and blockchain startups, they are considered the most important asset class for venture capital in Europe, with an investment volume of €10 billion in 2021: the currently 1,100 **climate tech startups** and **climate consumer brands**. The latter plan their business model from the outset with local, climate-neutral on-demand production and short, climate-neutral transport routes.

Climate Techs offer new solutions for the energy, mobility, and real estate industries. Among the fastest growing startups in Europe, according to **data analyst Dealroom**, are **e-truck companies** such as Sweden's **Volta** and **Einride**, UK's **Tevva Motors,** and the Netherland's **Lightyear** with solar vehicles and **GO Sharing** for e-mopeds.

Auch zwei deutsche Start-ups, **Enpal** und **Zolar**, sind darunter. Sie bieten Solardächer zum Mieten. Star der Szene ist das schwedische **Batterie-Start-up Northvolt**. Es konnte seit 2006 3,3 Mrd.$ einwerben.

New Perspective:

Climate-neutral flying

For distances of up to approx. 500 km and up to 20 passengers, air taxis are set for the future. In China in particular, startups such as **HT Aero** are also working on **electric flying cars** that can drive as well as fly. According to **Morgan Stanley**, this market will be worth $1.5 trillion in 20 years. For large passenger planes, that leaves only hydrogen turbines, as **for Airbus' E-Zero models**, which are expected to fly by 2035 and whose engines Airbus now wants to manufacture itself. Storing and transporting hydrogen is expensive and time-consuming. The U.S. start-up **Universal Hydrogen** is therefore developing conversion kits for tanks of conventional aircraft, and the U.S. start-up **H2 Clipper** wants to develop small airships for hydrogen transport.

According to **Airbus CEO Faury**, the biggest hurdle is not technology, but competition for energy. Plant-oil-based **biokerosene**, mainly from algae, is seen as an interim solution because it offers high yields and no land competition with food crops. This is expected to reduce emissions by 80%, according to industry association **IATA**. Practicality seems within reach, as 45 airlines have already gained experience and contracts for 14 billion liters of **Sustainable Aviation Fuel (SAF)** have been signed. By 2050, biokerosene is expected to reduce emissions by 50%. The **WWF** and **the Natural Resources Defense Council** support the sustainable production of biofuels. The **German government**, on the other hand, is focusing entirely on hydrogen.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Perspective:

Green Sea Thinking and Low Carbon Sailing

Currently, some 95,000 freighters transport two-thirds of all goods worldwide. This number is expected to triple by 2050. Their share in greenhouse gas emissions would then amount to 9%.

According to an analysis by **ETH Zurich** (Swiss Federal Institute of Technology) in the trade magazine **nature energy**, electric drives are considered viable for short distances and inland shipping, especially on autonomously operating **robotic ships**. For distances of 10,000 nautical miles, however, only **climate-neutral fuels** remain. The most suitable fuels are hydrogen-generated **e-fuels** made from methane, methanol or ammonia.

The bottleneck here is also the availability of green electricity. Its consumption would increase by 4-8% through e-fuels shipping.
This represents an opportunity for coastal cities like Hamburg, as they could locate hydrogen production by wind power and fuel production directly in the port. Currently, offshore wind farms in the vicinity still produce huge surpluses of electricity.

If only propellers provide the propulsion, the operating costs for e-fuels shipping will increase two- to sixfold by 2030, according to **ETH Zurich**. According to the **Financial Times**, the solution therefore is to be seen in the addition of **high-tech telescopic wind sails** up to 80 meters high, such as those deployed by Sweden's **Oceanbird**. Smaller ships could be supported by the **Flettner rotor**. Wind systems, says **Johann Köhler** of the **Fraunhofer Institute for Systems and Innovation Research**, can reduce operating costs by as much as 30%.

Measuring Media Awareness

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
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Explanation

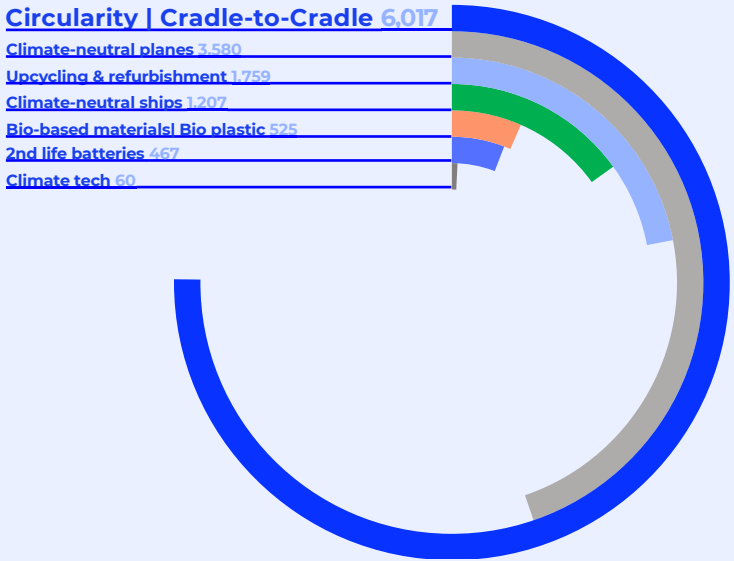
Based on a media panel of approx. **15,000 German/English online sources**. So-called "news slingers" not offering an editorial department were not considered.

For data collection, the topics presented were queried **in all different spellings and including synonyms** and terms closely related in content. Each topic therefore represents a **content-consistent query cluster** of terms.

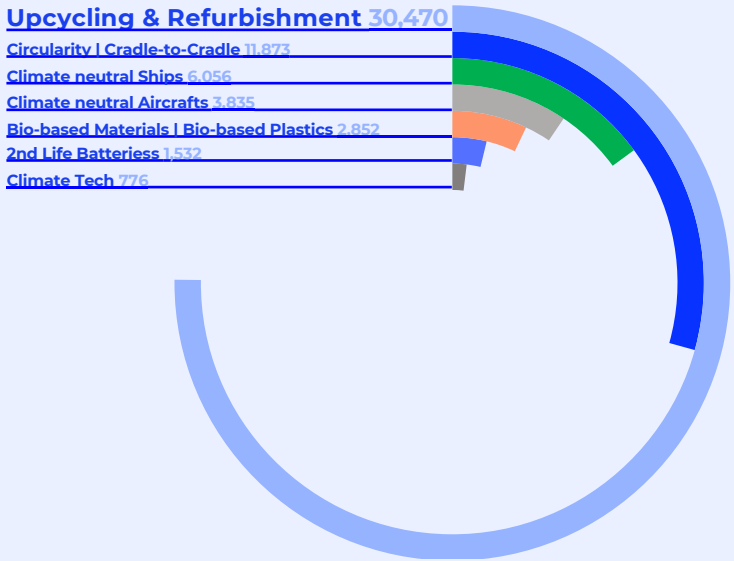
Annotations:

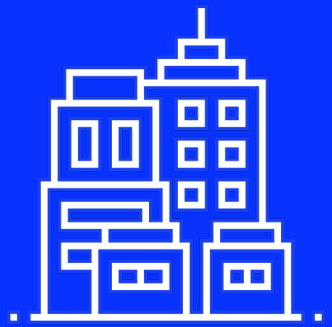
The somewhat clumsy sounding term **circular economy** has received a kind of modernization boost from the **USA**. Originating from across the pond, the anglicism **Circularity** or **Circular Economy** has also established itself in German-speaking countries and has clearly taken the lead among the new sustainability topics that have emerged in the last 12 months. In this context, topics such as **upcycling, refurbishment** (for real estate) and **bio-based materials** are also trending. The fact that **climate-neutral aircraft** dominate in the German-speaking region is primarily due to the **hydrogen aircraft** from **Airbus** and some German start-ups operating in this segment.

German Media:



English Media:





Topic 04: New Urbanism

Insights in a Nutshell

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

MindShift:

There is no good future for cities without an entire transformation of themselves, towards being smart, inclusive, livable, climate-proof

A higher urban quality of life thanks to car-free city centers, short distances and high neighborhood quality is one of the central demands of our time. The high-tech smart city and its smart infrastructure are the most popular future concept in the media.

But people do not want a smart “city without a heart” (**Süddeutsche Zeitung**). Moreover, “high-tech one-size-fits-all solutions contradict the diversity and complexity” of cities, according to **Harvard researcher Julia Watson**. On the other hand, smart cities, packed with sensors of all kinds and with **edge computing** that works locally and without delay, can better control traffic, with priority for cyclists at traffic lights, as in Hamburg. But they also measure air quality or temperature development in heat hotspots that are dangerous for people and can autonomously initiate measures against pollution and extreme weather.

The concept of a **smart city** can therefore play a decisive role in making cities cleaner, quieter, safer, more climate-sensitive and thus more livable.

Currently, however , the concepts of livable, climate-resilient cities and smart cities tend to stand side by side, even though they are complementary. Therefore, they urgently need to be combined in a holistic approach. Otherwise, the success principle of the big city, which has evolved over centuries, will reach its limits, reports the **Süddeutsche Zeitung**.

This success principle is already under massive pressure: with negative net migration in many major cities, a veritable **urban exodus** is under way since the Corona pandemic, as there is a newly discovered **love of the countryside** thanks to digitization. That’s because now a significant number of people can live where they want (and can afford) instead of where they work.
“Families are leaving these cities with flags flying,” according to a 2022 report by the **Central Real Estate Committee (ZIA),** which confirms the trend toward the new Landliebe (love of the countryside).

The city of the future must solve two problems to remain attractive. It must become more inclusive and tackle housing shortages and rising living costs. And it must become **climate resilient**, especially on the issue of **overheating**.

That is due to the fact that overheating is the main problem and has already claimed many victims. It has increased dramatically due to climate change. Whereas in 2005, 18,570 working days were lost due to “damage caused by heat and sun,” in 2019, this number stood at 73,941. That's why **Eleni Myrivili** serves in **Athens** as Europe's first **chief heat officer**, and Vienna is planning a district cooling network.

According to **Prof. Thomas Auer** of the **Technical University of Munich**, white facades, drinking fountains, misting showers or steles with a spraying function, and playgrounds with water elements also help to combat urban **heat islands** and their consequences for people..

Insights in a Nutshell

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

(...)

In terms of both quality of life and climate adaptation, innovative cooling concepts such as mini-forests are at the heart of urban transformation.

To achieve this, cities need to invest substantially in clearing land, shading streets, greening facades, roofs and roads, building fountains, and intelligently directing waterways and fresh air corridors. As little as 20 to 25% green space generate massive cooling effects.

Progressive **building botanical** approaches with living facades and green roofs, as well as the concept of the water-permeable **sponge city**, support climate adaptation and have become highly popular in Europe in 2021.

Affordable housing and addressing the challenge of housing shortage will also become more feasible in the future, with new high-tech concepts such as **3D house printing**, Lego-based **serial construction**, and **Tiny Houses**.

As a combination of quality of life, **climate resilience** and cheaper living costs, the concept of the **edible city** is currently causing a stir. It consists of two core areas. **Fraunhofer institutes** are conducting research on **urban gardening**, which goes far beyond the hobby approaches of urban hipsters, and there are EU-wide funding and research programs worth billions.

Vertical farming, on the other hand - highly automated and highly efficient agriculture on several floors in old factory buildings - is being developed by the agricultural industry.

The objective is to make food available in a climate-neutral way, locally and at low prices, instead of importing it at high costs and in a climate-damaging way.

By 2030, for example, **Singapore** wants to produce one third of its own food via vertical farming in warehouses and via urban gardening on roofs and building facades. According to the **National Geographic**, the world's largest vertical farm is currently being built in **Dubai**. It is expected to produce three tons of fruit and vegetables a day. The edible city is not just a romantic dream.

One big question, however, remains: how do you get private cars out of the city? The **car-free city center** and traffic-calmed neighborhoods are central goals of the livable city. Which is why car ownership, and its space requirements constitute the biggest problem. Although restrictive measures are being taken against it around the world, even in the U.S., policymakers are at the same time massively encouraging the purchase of private e-mobiles, according to the **Economist**.

This schizophrenia, the Economist continues, politicizes car ownership, and makes it the essential social conflict of the future. And technology alone won't solve the problem of crowded cities. **Autonomous driving**, as scientists at **Boston's MIT** and **Porsche subsidiary PTV** recently found using the example of Cologne's university district, initially exacerbates the problem of congested cities because autonomous vehicles drive more defensively and thus more slowly.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Perspective:

Sensor-Driven Infrastructure

Edge Computing using **5G** and local **hybrid cloud** networking, as well as sensors in the physical infrastructure, are key to the **smart city**, according to **Jens Kühner, senior manager** at **Red Hat**.

It meets demands for a better quality of life by improving citizen services, optimizing parking management and directing traffic flows to reduce noise. In disaster management, it autonomously controls flexible structural protection elements to protect against heat or flooding. And it is a prerequisite for **networked driving**, since traffic lights, for example, are directly connected to the navigation systems of the cars parked there. **Hamburg** wants to become a pioneer and digital model city, says **Transport Senator Anjes Tjarks**.

In addition to millions of sensors for traffic control in every meter of road, but also for measuring air quality and temperature, **digital twins**, virtual replicas of the city, are being created, as in the model city **District 2020 in Dubai**. Sensors and additionally drones feed them with data from the city and buildings in real time to control the consumption of energy and water as well as temperature and air quality. This can help optimize the performance of technical systems and reduce energy consumption.

However, expert Jürgen Reers of Accenture warns, "There is a big gap between what is technically possible and what is feasible in the reality of cities today."

Trending Topic:

Climate Adaptation and Urban Climate

According to the **European Environment Agency (EEA)** report in February 2022, **extreme weather** has killed about 140,000 people in Europe over the past 40 years. Costs of €510 billion were incurred. 10 million heat-related deaths worldwide between 1991 and 2018 can be attributed to climate change, according to **Die Zeit**. The 2003 heat wave alone killed 70,000 people. Extreme heat in cities accounts for 91% of extreme weather deaths.

Even if the **climate goals of the Paris Agreement** are met, cities will have to prepare for extreme weather such as droughts, storms, heavy rains, and heat waves. Due to insufficient green space, lack of fresh air, dark building materials and concrete, cities are up to 10 degrees warmer than their surroundings; individual heat islands are even above that figure.

Climate adaptation and **climate resilience** are therefore at the center of construction and planning considerations for a sustainable city, even ahead of climate neutrality. Measures include sustainable water management, flexible, cooling, or porous building structures against overheating and flooding, neighborhood care support for vulnerable people (**buddy system**), targeted risk distribution, app early warning systems, smart traffic and energy control and the strengthening of nature systems (**Dumb City**). All measures should be closely intertwined with **smart infrastructure solutions** to increase efficiency and effectiveness.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Topic

Mini Forests and Urban Forests according to the Miyawaki Method

The method of urban **mini-forests** or **tiny forests** was invented by the Japanese **plant sociologist Akira Miyawaki**. In 2006, he was awarded the **Blue Planet Prize**, some sort of Nobel Prize for environmental protection. The climate adaptation method for fallow land of all kinds has long been established in Asian megacities and is now also being seen in the Western world as a means of combating **heat islands**. With a multi-layered high-density setting of plants, areas as small as 60 square meters can be transformed into a mini-forest 30 times denser than conventional plantings in 20 instead of 200 years.

It filters pollutants and fine dust, binds CO2 and rainwater, increases **biodiversity**, and it cools the environment. While 1,000 such forests are already growing in the Indian **megacity** of **Chennai**, Germany's first Miyawaki forest is currently being created in the **Hamburg** suburb of Bönningstedt.

New Perspective

Building botany, living architecture and green roofs

Düsseldorf's Kö-Bogen II is considered a lighthouse project eliciting worldwide attention. It is a shopping temple whose stepped rear side is completely planted with tall shrubs. Due to the **climate crisis**, **construction botany** is experiencing a renaissance - and a new interpretation: **Ferdinand Ludwig** of the **Technical University of Munich** has researched **living architecture**, where building structures literally merge with plants, to practical maturity. Trees are integrated into architectural structures as **living facades** or even load-bearing parts – "plants replace concrete" (**WirtschaftsWoche**). In **Leipzig**, the **Helmholtz Center** has built 2,000 apartments on 25 hectares according to the principles of building botanics.

Rain seeps onto the intensively greened roofs, which cool the house and surroundings, and then flows into watering troughs and underground water reservoirs. The goal of building botany is the same as that of Miyawaki forests: Air purification, water storage, CO2 sequestration and cooling.

Trending Topic:

„Sponge Cities" soaking up water like a sponge

The 2021 flood disaster in the western parts of Germany made it a hot topic - the currently most important **climate adaptation concept**, which also originates from Asia. It can both be used to contain **land sealing** and against **flooding**, while it also serves as a green space "sponge" against heat and, conversely, as a rain reservoir during periods of drought.

Copenhagen, a European leader in this approach, has absorbent sidewalk slabs and deeper parks and sports fields that can be flooded. Streets are smartly controlled to become canals to channel water to the harbor.

Singapore has been completely retooled as a sponge city, with underground water storage and infiltration areas.
Amsterdam and **Rotterdam** are experimenting with heat-absorbing vertical green spaces.

Hamburg, **Leipzig**, **Wuppertal**, and **Berlin** also want to become sponge cities with **infiltration-capable streets** and surfaces and drainage valves and sluices controlled by weather apps.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Topic

Serial construction and 3D buildings

According to the **Federal Statistical Office**, prices for new buildings in Germany rose by 12.6% in 2021 – corresponding to the highest increase since 1970. The reason is that construction is too slow and expensive, especially in cities. Two approaches to industrial manufacturing logic, however, promise improvement: **serial construction** and houses from the **3D concrete printer.** The former no longer have anything to do with the infamous GDR-like "slab construction", because the buildings created in line with the **Lego principle** are high-tech.

The software of the **Austrian start-up Gropyus**, for example, plans the modules and directly calculates construction costs, construction time and the CO2 footprint. The fully automated production by robot and the assembly on site take a few days.

3D house printing is taking off from the experimental phase straight into a boom phase and is also ideal for serial construction. One floor, including interior fittings, can be completed within three days. **Waldemar Korte** from the **architectural firm Mense+Korte** expects the first complete 3D housing estates in 5 years - climate-neutral and without construction waste.

HeidelbergCement devoted years of research to create pressurized concrete dubbed **"i.tech 3D"**. **Christoph Gehlen** from the **Technical University of Munich** carried out the material testing. Work is underway on other "inks" consisting of wood or steel fibers with concrete – and on a **translucent facade element** that offers light transmission, thermal insulation and protection against sun, sight, sound, and weather all in one. The pressure granulate is to be made from old PET bottles.

Handelsblatt considers serial construction using 3D printing as one of the top 20 trends for the coming years.

Trending Topic:

Tiny Houses

Tiny houses were developed to combat the housing shortage and the global fight against homelessness in cities. They are five to 40 square meters in size, very inexpensive, ecologically advanced and can be linked together to form modular, temporary units.

Large Tiny House developments are springing up all over the world. In **California**, for example, state-built 58,000 Tiny Houses have provided homeless people with a roof over their heads again.

In **Tokyo**, **Ikea** rents out such **microflats**, some kind of "living to go" (**F.A.Z.**). As luxurious part-time apartments for hip **digital nomads** on a **workation trip**, they are currently becoming a megatrend.

New Perspective

Urban Mining

As part of the **circularity boom**, the concept is changing the way we look at cities. Instead of being a source of waste, they are being viewed as a supplier of raw materials, e.g., for houses made entirely of recycled construction waste. Demolished buildings still end up in landfills and recycling in house construction remains a niche.

Climate change is currently leading to a rethink process, as 38% of global CO2 emissions originate from construction, according to **UNEP**. Clinker, steel, aluminum, and concrete are ideal. The biggest problem, on the other hand, is adhesives and sealants. In the **cradle-to-cradle building project Moringa** in **Hamburg**, everything is therefore plugged or screwed.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Trending Topic:

The livable city

The **15-minute city** in **Paris**, the **superblocks** of **Barcelona**, **gender planning** in **Vienna, "low-traffic neighborhoods" (ltns)** in the **UK**, **car-free city centers** in **Copenhagen**, **Hanover** and **Amsterdam** by 2030. All of them follow the goal of a **livable city** - diverse, inclusive, climate-smart, green and traffic-calm, with short distances and high neighborhood quality.

Researchers are calling for more far-reaching solutions in urban planning, towards a holistic **life-centered design** based on indigenous models, such as **futurologist Monika Bielskyte** or **Julia Watson, Harvard professor**, with her book **"Lo-TEK. Design by Radical Indigenism".** For **sociologist Heinz Bude**, cities should be planned as sheltering and manageable **micro-homes**. **Sebastian Gallander, a Harvard graduate** and lecturer at the **Hertie School of Government**, wants to bring the "village back to the city".

Handelsblatt spoke to architects, urban planners, mayors, and real estate experts around the world for a major report in 2021 and comes to a clear conclusion:

"The city of the future is ecologically sustainable in a bid to offer a high quality of life in all neighborhoods. It must be more livable than ever for people from different income levels and age groups."

In terms of media response, the livable city as a paradigm has almost caught up with the dominant future concept of the **smart city**.

Trending Topic:

Urban flight and new country love

The coronavirus pandemic has exposed the lack of space and poor inclusion and quality of life in metropolitan areas, increasing the flight to the countryside. Researchers refer to this as the **Spill Over Effect**. **New York** lost 5% of its residents in the first Corona year, 478% more than in 2019, and a 2022 study by the **Central Real Estate Committee (ZIA)** confirms the trend for Germany. Experts like **Catherina Hinz, director of the Berlin Institute for Population and Development**, are convinced: the phenomenon of urban flight will outlast Corona thanks to **digitalization**, which enables **workation** and **hybrid work**.

And it began even before the pandemic: in 2014, net migration in Germany's seven largest cities was negative for the first time in 20 years, which is why **star architect Kengo Kuma** talks in **Handelsblatt** about how "we're returning from cities to nature because living in metropolises doesn't give us happiness." The **Süddeutsche Zeitung** is certain that the future "belongs to the provinces" with nature, a low cost of living and high-tech companies. The **future atlas** of the **Prognos Institute** serves as proof.

This creates new problems in rural areas. Some speak of a new **gentrification**. The **overtourism problem** is also likely to be exacerbated by the **telemigration** of **digital nomads** and **travel bubbles**. And it's not just the cities that are becoming deserted. The already least attractive of the rural areas will also suffer.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Perspective

The edible city

Experts with the Food and Agriculture Organization (FAO) are talking about an agricultural revolution in cities. Die Zeit sees a humus revolution “fit for grandchildren” with climate protection beds. Historical gardens are becoming agricultural experimentation fields of the **Fraunhofer institutes** or the **EU research project Keres**.

Urban gardening on former fallow land, inspired by the guerrilla gardening of the noughties, is the norm across the board in **New York**.

Microagriculture is practiced on thousands of roofs in **Berlin**.

And **Düsseldorf** has its own official contact point for urban gardening.

Germany’s federal government has tripled its funding to €900 million in 2021.

The industry has also discovered the segment. **Bayer** wants to turn old factories into multi-story greenhouses for local supply of “high-tech vegetables” (**National Geographic**). **Wal-Mart** is also investing in such approaches, called **vertical farming**, which create optimal conditions with maximum land use, sensors, and AI control, and with no pesticides at all and minimal water consumption. According to Bayer, such automated **indoor farms** increase efficiency a hundredfold and produce ten times the harvest with only a tenth of the resources - in a climate-neutral way. That's because the factories are powered by **renewable energy** and strawberries and peppers no longer need to be hauled over thousands of kilometers.

The goal of all these efforts are edible cities worldwide, representing environmentally sound, local and socially fair food systems.

New Topic:

Gondolas and ropeways as public transport supplements

At the beginning, **Bolivia** was ridiculed for this idea. Today, the world's largest **ropeway network** of 27 km is located in its capital **La Paz** and makes a decisive contribution to a functioning public transport system. In **Mexico City** and **Bogota**, as well as other South American cities, ropeways are also a central component of the public transport system. This is because they cost only a third of subways, do not exacerbate the space problems of large cities, can be built quickly, and are climate-friendly and reliable to operate.

Just how seriously this alternative is now also being taken in consideration in Europe is demonstrated by the **German Ministry of Transport**, which has commissioned a study to serve as a guide for planning ropeway projects. And it has included ropeways as eligible projects in municipal transport funding. **Sebastian Beck** of **consulting firm Drees & Sommer**, the contractor for the BMDV study, emphasizes that ropeways are about closing, relieving, extending, and bridging gaps. **Berlin** is the first city to plan to integrate an existing ropeway in the east of the city into the public transport system. **Munich**, **Cologne** and **Bonn** are also planning concrete projects.

The increased interest in public transport ropeways is also already leading to technical innovations. In the **ConnX hybrid ropeway** from the Italian company **Leitner**, the gondolas have a chassis and can continue to travel in road traffic in the same way as buses, although not quite as flexibly, as their size would mean they would require their own track.

Measuring Media Awareness

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Explanation

Based on a media panel of approx. **15,000 German/English online sources**. So-called "news slingers" not offering an editorial department were not considered.

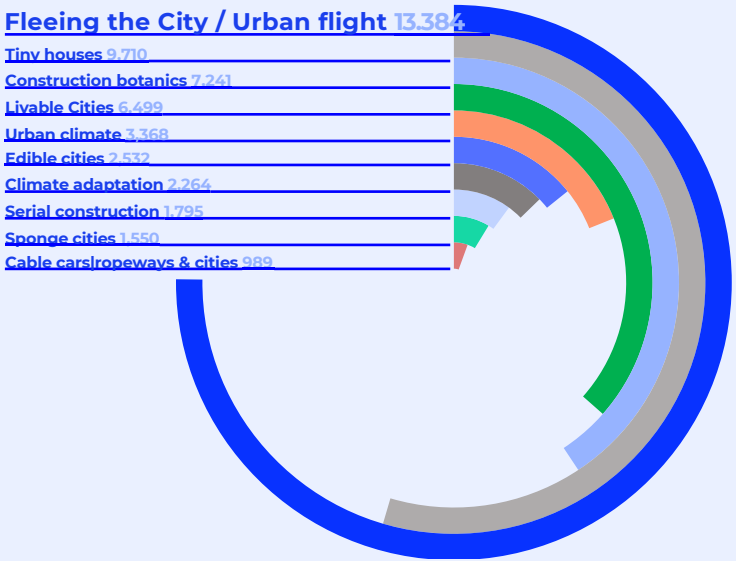
For data collection, the topics presented were queried **in all different spellings and including synonyms** and terms closely related in content. Each topic therefore represents a **content-consistent query cluster** of terms.

Annotations:

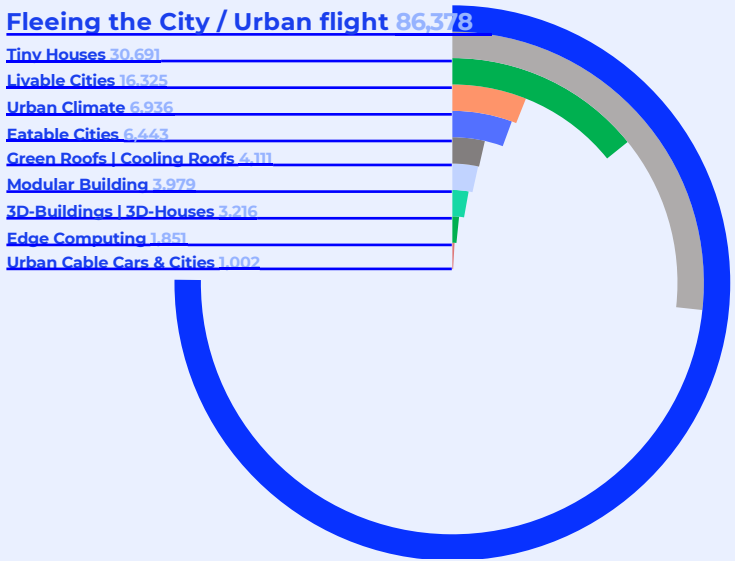
The **urban flight** and **new country love** taking the top spot among the trend topics in this area reflect the great media astonishment at the magnitude of this phenomenon, accompanied by the amazement that this phenomenon is not simply due to Corona, but marks a more fundamental social upheaval associated with digitization, hybrid work and new life models.

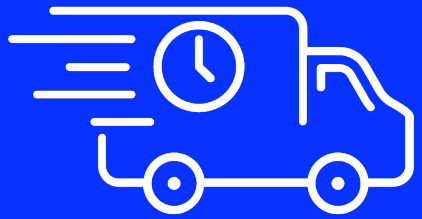
The **tiny houses** represent a conceptual standpoint that is schizophrenic in a positive sense. They are the focus of reports both as a housing solution for the lower social classes and as a hip luxury offering for digital nomads. Their actual future significance is not yet reflected in the media response to topics such as **urban climate** and **climate adaptation**.

Deutsche Medien:



Englische Medien:





Topic 05: Logistics

Insights in a Nutshell (I)

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

MindShift:

The instant economy, autonomous technologies and the global supply chain crisis are changing the entire logistics landscape

Robotaxis and delivery robots will shape the face of cities in the future, Johann Jungwirth of Intel subsidiary Mobileye and McKinsey analyst Kersten Heineke said at the CES Las Vegas 2022. Non-industry companies alone have invested more than €30 billion in this segment in the past two years.

Due to the real-time availability of all logistics data and the explosion of technological advances in automation via Big Data, IoT and AI, logistics will be robotized from packing to delivery at the door. Even stairs will no longer be an obstacle. The trends at CES 2022 support this impression. In addition, cross-carrier depots will have to be built in cities for ecological and efficiency reasons.

Until then, **e-cargo bikes** and **XXL cargobikes** such as the **Megaliner** from the Hamburg-based company **CargoCycle** will be the current means of transport for the climate-neutral last mile. More and more companies, such as the drugstore chain **DM**, want to deliver goods by **cargobike**. Sales of commercial cargobikes in Germany rose accordingly from 15,000 (2016) to 170,000 (2021).

However, the next conflict is already looming. In many cases, the network of bike paths is barely sufficiently developed to accommodate cyclists and cargo bikes to the extent that will be necessary in the future.

Double-digit e-commerce growth every year and the new **ultra-fast delivery** will lead to decentralization and an exponential increase in the delivery intervals of last-mile logistics. This, in turn, will lead to an explosion in demand for **urban storage systems** in the form of inner-city **micro depots**, pick-up stations and **micro-|nano warehouses**.

For inner cities, this is the major challenge of the future due to intensifying competition for use.

Experts say that the international **supply chain crisis** will persist due to growing international protectionism – the keyword here is **connectivity wars**. As a result, **nearshoring** and **backshoring** will lead to more local supply networks.

New technologies will also create substantial risk management that is resilient to **cyberattacks** and creates redundancy and resilience through autonomous rescheduling IT and decentralized structures.

(...)

Insights in a Nutshell (II)

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

(...)

Due to the trends of **instant economy**, autonomous delivery, digitalization and supply chain crisis, the entire logistics industry is moving towards **platformization** and decentralization. Delivery drivers in cities are becoming mobile robotics platforms, and digital **end-to-end logistics platforms** for global scheduling and order picking are also growing.

Such transparency platforms are currently experiencing a true boom. Market leaders are the U.S. companies **Project44** and **Fourkites** and the French company **Shippeo**. They offer cloud-based platforms for shippers and logistics providers. The goal is comprehensive visibility, says **Michael Wallraven** of **Project44**.

Project44 and Shippeo alone network about 140,000 shippers each. Fourkites has seen a doubling of new customers, 105% growth in revenue and 35% in network growth. 2,800 ports and 2.5 million assets tracked globally in 2022.

Retail giants like Amazon and Ikea are driving another end-to-end strategy due to the supply chain crisis. They are trying to organize the entire chain themselves, more secure, easier to plan and, above all, cheaper, as they can operate this segment without the need for returns.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Topic:

Instant Economy and Quick Commerce

The term **Instant Economy** was coined by the **Economist** in a cover story at the end of 2021. There are basically three trends behind it, which will change our entire logistics.

1. **Quick Commerce**: fast delivery services such as Gorillas will soon be delivering not only groceries, but also fashion. Real-time delivery will gradually cover all sectors.

2. **On Demand Logistics**: according to the consultancies Deloitte, Gartner and Oliver Wyman, the global real-time availability of all logistics data (container sensors, cloud and blockchain) will lead to managing them more autonomously, fluidly, small-scale, and flexibly using AI control. It allows much faster "on demand" supply chains.

Instead of large warehouses, there will rather be small hubs where the "demand" is – that is, in settlements and cities. According to Forbes, corresponding investments in Germany and the UK were up 80%.

3. **Consumer-to-Manufacturer**: according to **Accenture** and **Fraunhofer IAO**, consumers are turning into **prosumers**, as they directly influence the end product prior to production. The trend originates in **China**, where collaborative online platforms are used to create products together or configure furniture and fashion individually using **virtual reality**. Such on-demand products decentralize supply chains as they reduce delivery units and multiply delivery intervals.

Trending Topic:

Shipageddon – the supply chain crisis

Mark Leonard, director des European Council on Foreign Relations, recently referred to international protectionism as Connectivity Wars in the Financial Times. Die Zeit calls it "the great entrenchment", which is expressed in currently 354 bilateral trade agreements compared to 38 in 1994. Companies are therefore increasingly turning to **nearshoring**, the local concentration of the supply chain across as few national borders as possible, or **backshoring**, where production is brought into the customer country. According to **McKinsey**, 71% of global fashion companies plan to increase their share in nearshoring. The €250 billion worth **European Battery Alliance** for gigafactories in Europe is also considered a backshoring project.

Shipaggedon, coined in 2020 for last-mile capacity issues, now means the global supply chain crisis, according to **Forbes**, in addition to protectionism triggered by too little shipping and port capacity, skyrocketing transportation prices, non-resilient infrastructure in the event of energy outages, pandemics and **cyberattacks**, and global congestion from rapidly growing e-commerce.

All these factors are also emerging as massive drivers for the Circular Economy.

Individual Topics

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

New Perspective:

Urban Logistics on the Last Mile

Due to the newly emerging **on-demand** services, but also because of the increasing congestion on the roads caused by conventional parcel delivery services, intraurban logistics will be organized via closely connected **logistics hubs** distributed throughout the city - **microdepots** with areas ranging between 10-500 square meters.

For example, in **Ireland** the parcel giant **UPS** and **Apcoa Parking** are planning **microhubs** in parking garages, where container loads will be distributed on cargo bikes for last mile delivery. In addition, an increasing number of small **pick-up stations** and small **convenience stores** of large retail chains will be built, e. g. by **Carrefour** in Paris.

The core problem will be a new competition for space and area with other users. This is not just about spaces, but also parking areas for the cargo bikes and access to charging points.

In this regard, there are already such strong disputes under way with the residential population that major Dutch cities are banning microdeposits of fast delivery services from the city centers again. **Hamburg**, on the other hand, is testing **smart charging zones** for parcel delivery services, with reservations for charging points via app to avoid congestion and noise there.

For the future, cities are planning **mixed-use buildings** as neighborhood solutions. They offer logistics space to shift the space requirements and noise of delivery services inwards. In addition, offices, apartments, and gastronomy shall arise. According to **Handelsblatt**, ecologically compatible and inexpensive **refurbishment** of existing buildings represents a solution for this purpose.

Trending Topic:

Delivery drones and autonomous delivery

The business magazine **Brand eins** has polled scientists, associations and consultancies, including the **German Logistics Association**, about the most important logistics trends They are convinced that electric **delivery and transport drones** that drive or fly autonomously through the streets will soon take over the last mile. Chinese retail giant **Alibaba** is already planning to use them for its entire future last-mile logistics.

A typical **LSEV (Low Speed Electric Vehicles)** or **Purpose-Built Vehicle** is the car from the U.S. start-up **Nuro**, which is currently entering mass production. Half the size of a small car, it has a load weight of 225 kg and a cooling or heating function. Using a touchscreen on the car, orders can even be placed directly at the roadside.
For door-to-door deliveries to the elderly, LSEVs are being created in box size to deliver food or medicine. They can even climb stairs to the front door, like the vehicle from Spain's **Cartnet**, a **Volkswagen innovation hub** developed with the **University of Catalonia** and the **Institute of Robotics and Industrial Informatics (IRI)**. **Hyundai spin-off Mobis** also unveiled an intermodal autonomous mobility system at CES that can cope with staircases.

In delivery drones, German start-up **Wingcopter** is considered a leader. **U.S. air rescue company Air Methods** now wants to use its drones to build a U.S.-wide network for medicines and hard-to-reach areas. **Japanese airline ANA** is planning to do the same. The electric drones can fly for several hours and carry about 100 kg.

Individual Topics

E-Mobility
Software & In-Car-Tech
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New Urbanism
Logistics

New Topic:

Megaliner and XXL cargo bikes

In **Hamburg**, a giant e-load bike has been on the road for some time now, covering the last mile. A total of 40 of the 6.50 m long **Megaliners** from the start-up **CargoCycle** are now each driving 5-6 loads a day for **DB Schenker**. They hold up to three pallets and can carry half a ton at 25 km/h.

Parcel delivery services consider such **XXL cargo bikes** as an option to replace the 3.5-ton delivery trucks, which are not very environmentally friendly and inefficient in congested cities - until they can rely on proven autonomous **LSEVs**.

Because these **cargo bikes** just fit on bike lanes, they can bypass car traffic to deliver from **microdepots** to doorsteps. Combined with lightweight e-trucks that bring goods to the depots, one megaliner can replace two 7.5-ton diesel trucks every day.

New Topic:

Tunnel rail

Space constraints for parcel delivery services in cities are bringing even exotic-sounding transport concepts into the focus of serious planners. The **Swiss government** is now backing the large-scale **Cargo Sous Terrain** (freight below terrain) project. A **mini-subway network** over 500 km in length shall be used to transport freight over the last mile.

In **Hamburg**, the **Smart City Loop** logistics initiative is planning a nearly 4 km long, €100 million tunnel tube with a diameter of 4 m from the port of Steinwerder to a 3,000 sqm city hub on the trade fair exhibition grounds in Hamburg Mitte.

New Perspective:

E-trucks, robot trucks and platooning

The **Mercedes eActros** entered serial production at the end of 2021. Although three times as expensive as diesel, it achieves cost parity over its life cycle in Germany at current fuel prices. Swedish start-up **Volta** aims to bring trucks weighing 7.5 to 16 tons onto the market by 2025. **DB Schenker** has already ordered 1,500 units. The special feature is that for the chassis, the e-design was used in such a way that ensures better all-round visibility without blind spots. The significantly more expensive e-trucks are expected to pay for themselves through a **truck-as-a-service (TaaS)** offering.

Meanwhile, **Volkswagen's** Swedish commercial vehicles subsidiary **Scania** is testing autonomous trucks with U.S. start-up **TuSimple** in **Sweden**. **Volvo**, **Mercedes**, and **Iveco** are doing the same with **UPS** and **FedEx** in the **U.S.**

According to WirtschaftsWoche, the future market for **robot trucks** is currently booming even more than for **robotaxis**. Corresponding startups have raised $6.5 billion by December 2021 – fivefold the amount of the previous year.

The appealing idea is that 93% of trips take place on highways, which are easy for autonomous technology to handle by using **platooning**. Here, a truck with a driver drives ahead of a networked convoy without a driver. This allows driving times to be increased from 29% to 78% compared to standing times. **McKinsey** therefore expects cost savings of up to 45% compared to trucks with drivers. **Ravi Shanker, an analyst with U.S. bank Morgan Stanley**, is certain that the first **Level 4 vehicles** will be heavy-duty trucks.

Measuring Media Awareness

E-Mobility
Software & In-Car-Tech
Mobility & Sustainability
New Urbanism
Logistics

Explanation

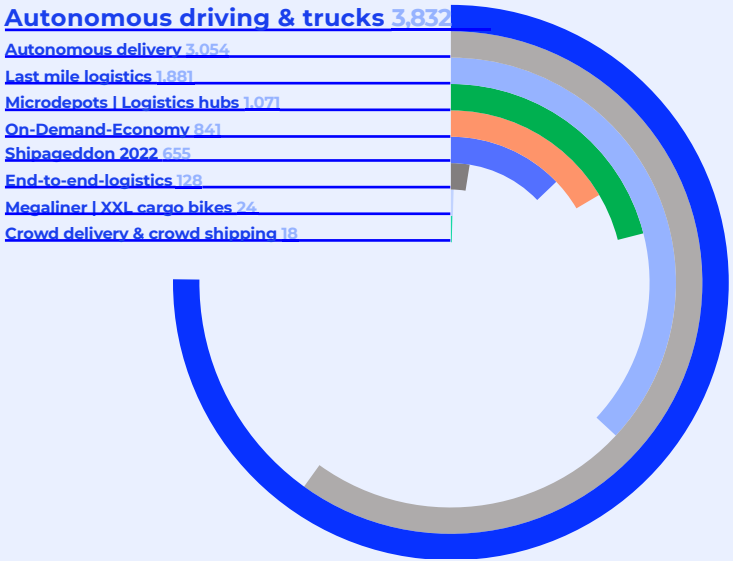
Based on a media panel of approx. **15,000 German/English online sources**. So-called "news slingers" not offering an editorial department were not considered.

For data collection, the topics presented were queried **in all different spellings and including synonyms** and terms closely related in content. Each topic therefore represents a **content-consistent query cluster** of terms.

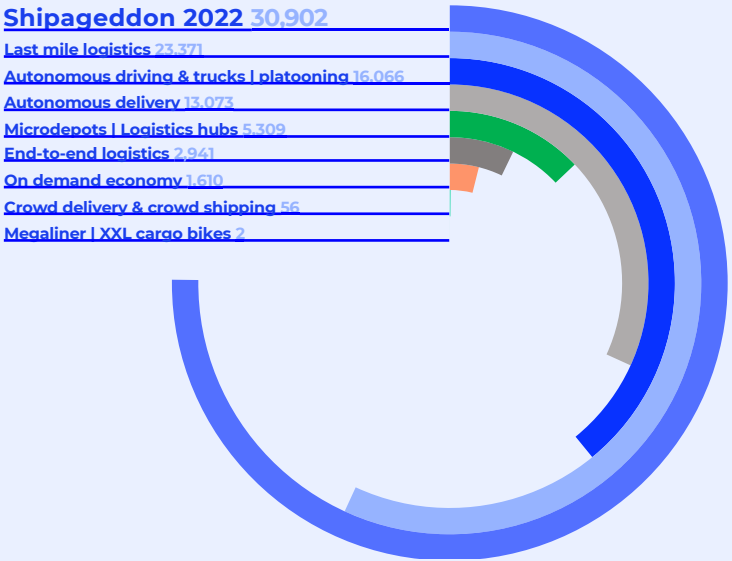
Annotations:

With **Volkswagen** and **Daimler Trucks**, two of the world's five largest truck manufacturers come from **Germany**. Accordingly, the currently most important technological field of the future - **autonomously controlled trucks** networked as a convoy via **platooning** - dominates the German media. English-language media in particular have coined a catchy buzzword for the global **supply chain crisis**, **Shipageddon**, which accordingly dominates the media. The other topics in the field of logistics that dominate the media all deal in some way with the transformation of supply structures over the **last mile**.

German Media:



English Media:



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FirstSignals® discovers new topics and trends. To achieve this, experienced analysts evaluate content- and opinion-rich articles from top global media regarding new “buzzwords” on a daily basis. In addition, a qualitative panel of top online media is subject of evaluation, which have also established themselves as lead media with their excellent editorial teams. All media titles represent editorial focuses in the areas of business, society/politics, or technology.

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