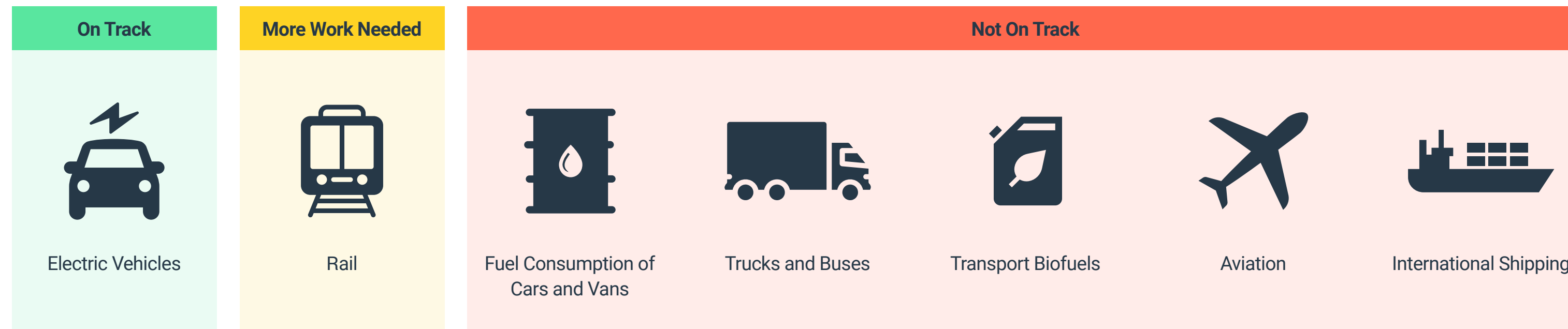


# APRIL 2022 HEV TCP NEWSLETTER



# IEA CLEAN ENERGY PROGRESS SHOWS EVS ON TARGET



Source: IEA, [Tracking transport 2021](#)

**The IEA's Tracking Clean Energy Progress (TCEP) reports, which assess the status of 46 critical energy technologies and sectors, have given EVs a green rating, making them one of the few technology areas to be on target.**

The transport sector itself, however, has received a red rating and still needs to undergo a major transformation, including significantly improving efficiency and shifting from oil to electricity and other low-carbon technologies.

2020 was a big year for electric cars, but the challenge ahead is still huge. Overall, the global electric car stock reached 10 million, with BEVs accounting for two-thirds of the world's electric car fleet. In Europe, registrations more than doubled in 2020 to 1.4 million (a

sales share of 10%), making it the world's leading electric car market for the first time. China had 1.2 million registrations (5.7% of sales), and the United States had 295,000 (2% of sales).

However, all new light-duty vehicles will need to be zero-emissions by 2030 to align with the Net Zero trajectory.

The report highlighted that electrification continues to expand in other modes of transport, such as two-wheelers, e-buses, and e-trucks, with strong policy support as key to the EV car market resiliency during the pandemic.

It is also noted that battery production has increased, lowering the cost of batteries by around 13%. However, current production capacity for 2030 would only cover only 50% of required demand in that year. Furthermore, the report stated solid-state battery technologies need to become commercially available between 2025 and 2030.

Some of the current recommended measures suggest:

- stronger incentives to accelerate early adoption,
- broader and more ambitious policy portfolios to accelerate the transition in the long term,
- ensuring emerging economies also benefit from EV penetration,
- policymakers need to establish appropriate market and price signals for charging infrastructure,
- and the scaling up of battery manufacturing by creating a policy framework that reduces investment risks.

Read more about the TCEP report on electric vehicles: <https://www.iea.org/reports/electric-vehicles>

# TASK 30

## ASSESSMENT OF ENVIRONMENTAL EFFECTS OF ELECTRIC VEHICLES – 10 LESSONS LEARNT



The aim of Task 30 (2016 – 2021) was to analyse and assess environmental effects of EVs on water, land use, resources and air based on LCA in a cooperation of the participating countries in the International Energy Agency (IEA) TCP.

The 10 lessons learnt summarize the results:

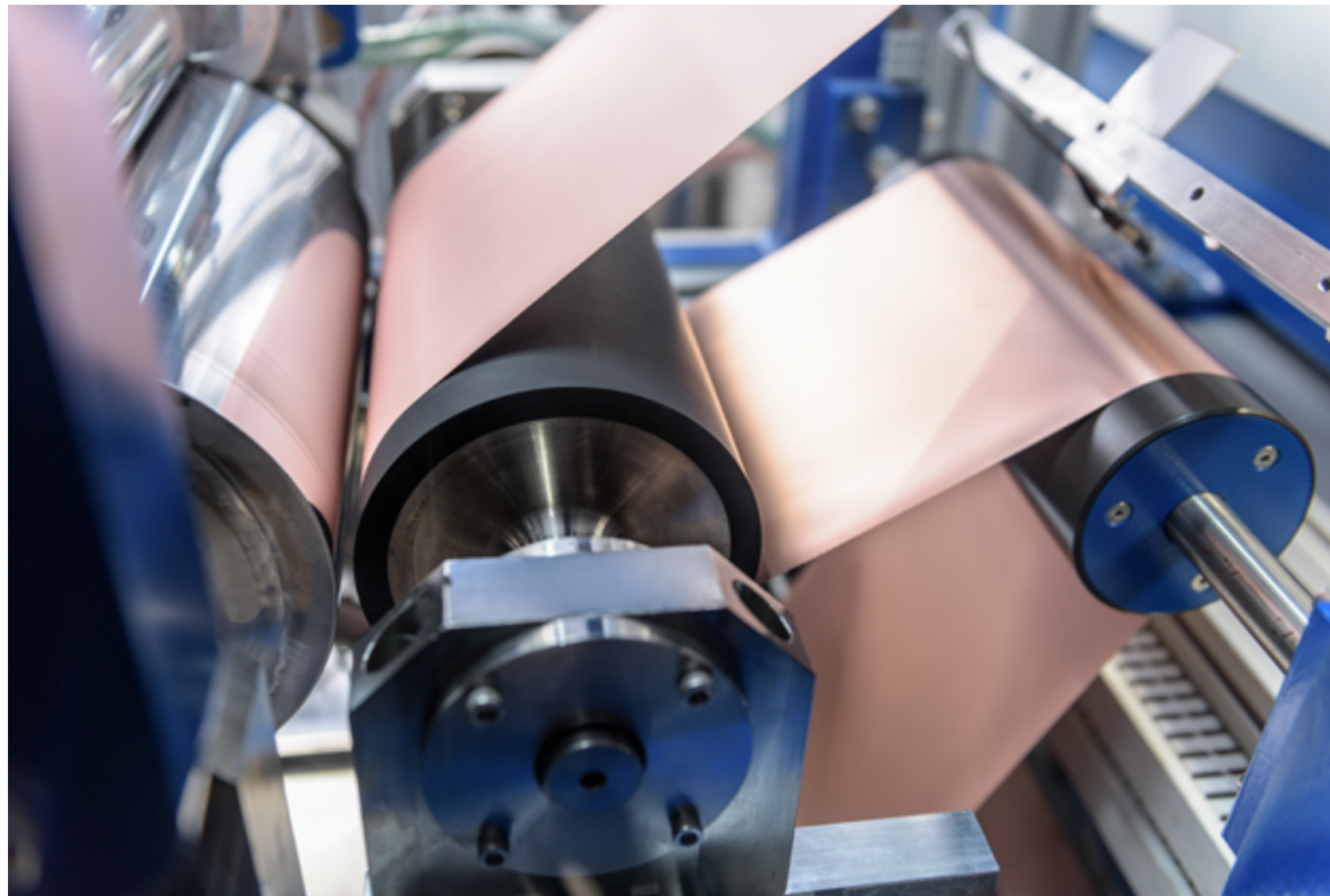
1. Environmental effects can only be analysed based on Life Cycle Assessment (LCA), other methods like Wheel-to-Wheel (WtW) are not adequate as all stages in the lifetime of a transportation system must be covered.
2. The system boundaries in LCA must cover all phases in the lifetime of a vehicles and the supply of energy: production, operation and end of life.
3. The considered transportation systems must be characterised by the type of vehicle, propulsion system, fuel/energy carrier, type of primary energy, state of technology and country/region.
4. The main factors influencing the LCA based environmental effects of EVs are: source of electricity generation and its future development up to 2030/2050, lifetime mileage, energy consumption of vehicle (incl. heating, cooling, auxiliaries), electric driving share for PHEV, battery covering production (country, production capacity, source of electricity), battery capacity and end of life (material recycling or reuse in 2nd life).
5. The way from Inventory Analysis to Impact Assessment is via mid- and end-point indicators. With regard to the geographical scope of the different impacts, the mid-point indicators are grouped for global, regional and local impacts, where global impacts are most relevant in LCA.
6. The minimum requirement in the impact assessment to compare different vehicles are the GHG emissions in CO<sub>2</sub>-equivalent with its share of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O and primary energy demand with its share of fossil and renewable energy.
7. The main water issues in LCA are for ICE (incl. blending of biofuels) the fossil fuel extraction and refining, cultivation of feedstock for biofuels, and the vehicle production. For EVs the electricity generation (e.g. thermal open/closed cycle, hydropower), battery and vehicle production.
8. The main global impacts to be addressed (in future) are climate change, primary energy use (fossil and renewable), resource use minerals and metals, water footprint (inventory level) and land use (inventory level). The results should be documented and communicated for the total but also for the three main phases in LCA.
9. The possible rebound effect can be considered in LCA by the definition of the functional unit and the substitution rate. In reflecting possible rebound effects in comparing the environmental effects of EVs with conventional ICE vehicles the following issues have to be considered: number of substituted ICE vehicles, substituted other transportation modes e.g. public transport and walking, different annual mileage, vehicle lifetime, and driving distance with one charging or refill.
10. Issues on dynamic LCA, e.g. annual environmental effects, become relevant for the rapidly increasing of EV-fleets combined with the additional generation of renewable electricity. The timing of environmental effects is relevant in: the three lifecycle phases, the increasing supply of renewable electricity, and substitution effects and timing of environmental effects of EVs substituting for ICE vehicles. The environmental effects based on LCA should be shown over time.

**The final report of Task 30 will be made available in June 2022 on the IEA HEV webpage.**



## TASK 40

# CRITICAL RAW MATERIALS FOR EVS



Manufacturing lithium ion batteries in a battery research facility

**Task Force 40 "Critical Raw Materials for Electric Vehicles" aims to provide accurate, credible, and up-to-date information on materials that are considered (potentially) critical to the uptake of EVs.**

However, the shift to EVs means that millions of cars will need batteries. Depending on the battery chemistries used, this may require tens of kilograms of potentially scarce materials like nickel, cobalt or lithium that have yet to be mined.

To meet demand of certain critical minerals, significant impacts and risks may occur (supply, environmental, social, cost, geopolitical). Any "faster than anticipated" BEV growth will exponentially aggravate the impacts of the already stretched supply chain. Our analysis shows that nickel demand will outstrip the maximum potential supply in almost all external scenarios. We estimate that a maximum of 1.2-million-ton nickel will be available for batteries by 2030.

Solid-state batteries will eliminate the need for

graphite and are likely to become relevant faster and more significantly than currently projected. In our view, it is possible to achieve a market share of 20 to 40% for solid-state batteries by 2030. Advantages include lower weight, higher storage density, less materials, safer, and (much) higher fast charging capacity.

The potential of sodium (Na) to replace lithium partially / substantially / will mainly become clear in this decade and commercial application will begin in a few years. Although lithium is widely available, current mining capacity is limited and requires considerable effort to keep pace. Even a partial replacement of lithium with sodium will have a large positive impact in reducing the challenges for the lithium supply chain.

Overall, we need to switch to zero nickel/cobalt chemistries. LFP can already be used in most EV applications. For lithium, we need to increase R&D to develop zero lithium solutions, with sodium a very good candidate!

The "holy grail" for batteries for transport is to avoid any use potentially critically materials like lithium, nickel, cobalt, graphite, or manganese. Recent developments show that this holy grail may very well be within our reach and could be the gamechanger needed for the complete transition to electrified transport and renewable energy generation.

# TASK 41

## ELECTRIFYING ROAD FREIGHT OVERCOMING THE DIESEL VEHICLE MINDSET - JOINT 41 & 45 WEBINAR

On December 7th to 9th 2021, the taskforces 41 “Electric Freight Vehicles” and 45 “Electrified Roadways” jointly hosted a webinar on new performance evaluations for electrified road freight.

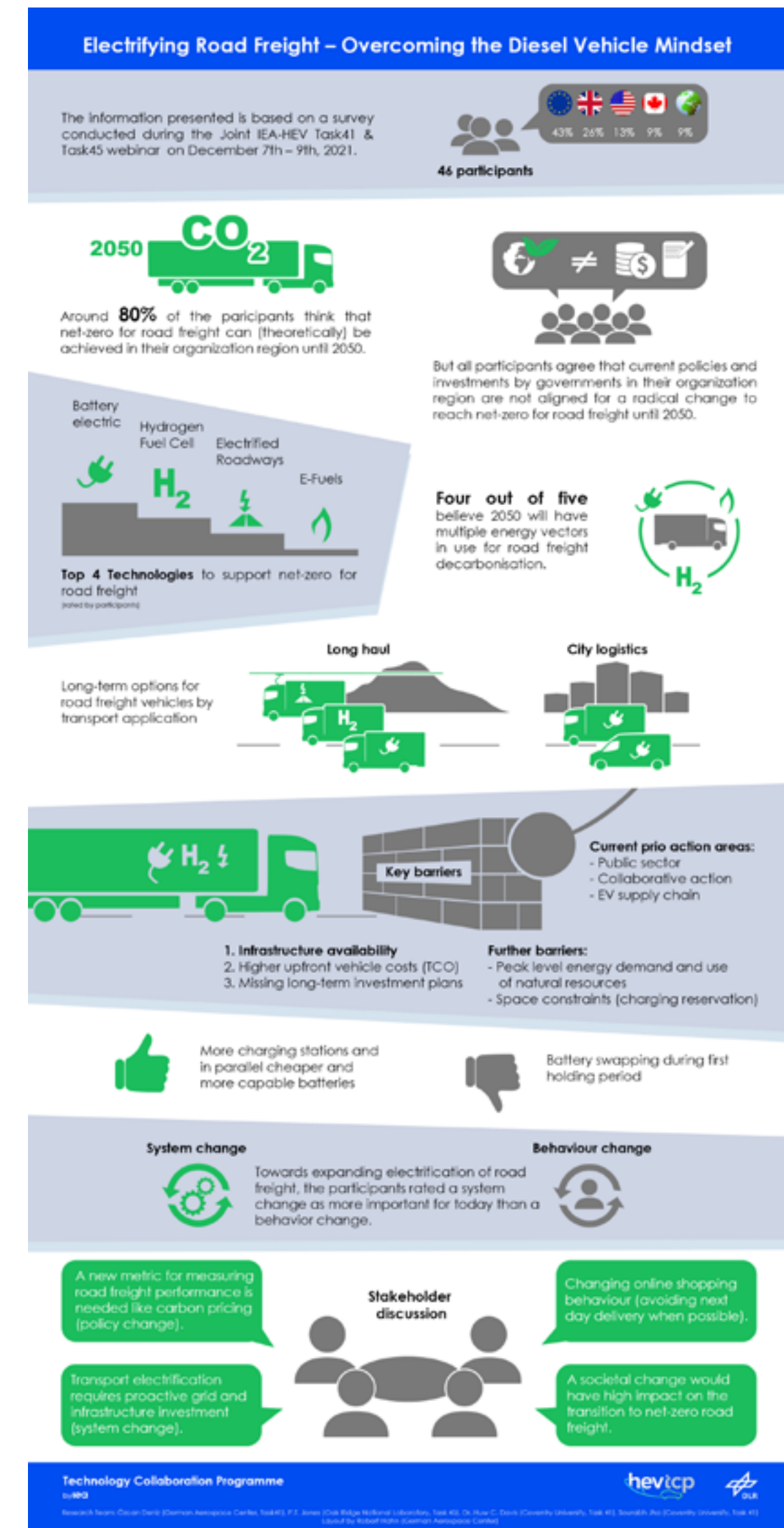
The introductory statement of the three-day workshop was that for the electrification of road freight systems the current existing diesel vehicle mindset needs to be overcome. This was in recognition that the system in which new technology is to be deployed needs to be adapted accordingly if that new technology is to be successful.

The event took the form of a workshop with expert led presentations and panel discussions on electric road freight innovation system (Day 1), in-depth and semi-structured discussions on the topics of electric

freight vehicles and electrified roadways (Day 2), and concluded with an open session on identifying how governments, logistics and industry can be mutually supportive in moving on from the present diesel mindset in freight (Day 3).

During the online workshop, surveys were carried out. The main results are illustrated in the infographic presented here and can also be found at on the [HEV TCP website](#).

A summary of the whole workshop results will be published at the next International Electric Vehicle Symposium & Exhibition (EVS 35) in June 2022.





# IEA NEWS

## GEF-7 PROGRAMME

Work under the [GEF Global E-mobility programme](#), which was launched at COP26, is going ahead. The GEF-7 Global Programme to Support Countries with a Shift to Electric Mobility (the Programme) is a five-year programme funded by the Global Environmental Facility (GEF), which will consist of one global project that will be executed by a number of international organisations including the IEA, Asian Development Bank (ADB) and European Bank for Reconstruction and Development (EBRD) and UNEP, as well as 29 individual country projects. The IEA, will act to execute work on Working Group 1 on Electric Light-Duty Vehicles, and Working Group 4 on Charging, Grid Integration and Batteries.

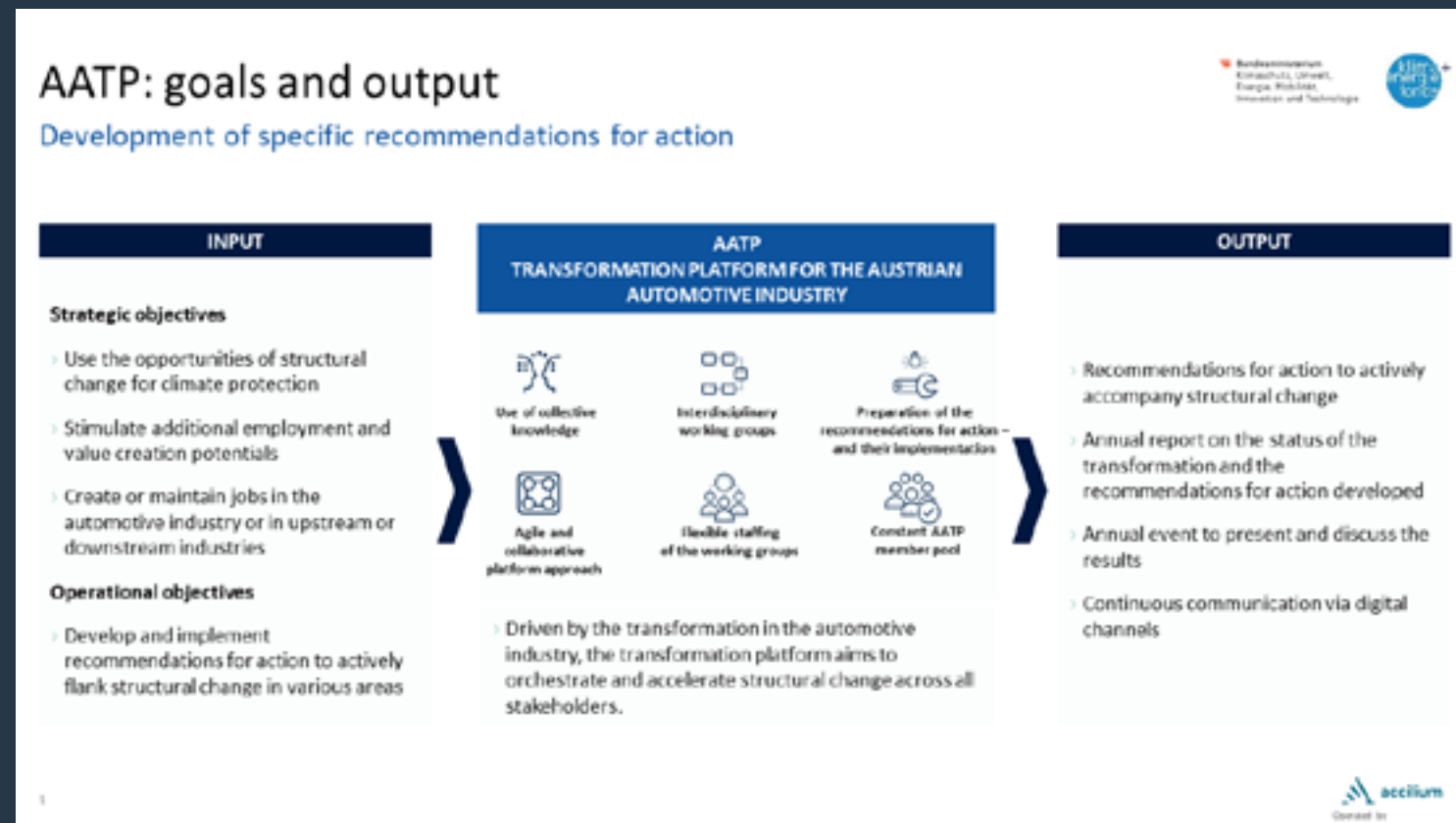
## WORKING GROUP 4

Working Group 4 is preparing its first deliverable, a Policy brief on public charging infrastructure roll-out strategies and regulatory measures to enable successful business models, for publication at the end of the month of April. The report describes five key steps for policy makers to follow to ensure the efficient roll out of public charging infrastructure.

## IEA WEBINAR

Interested readers can have a look at the [IEA webinar on charging infrastructure](#) which feeds into this work, and we invite readers to stay tuned on the IEA website where the report will be published at the end of April! Under the umbrella of the second deliverable of the working group, another webinar was held on 15th of March focusing on [grid integration of electric vehicles](#) – the findings of this webinar will be included in a policy manual to be published in the summer.

# Austrian platform explores future opportunities for its automotive industry



The global automotive and supplier industry is facing an unprecedented challenge. Digitisation and the switch to e-mobility demand a fundamental structural change from the entire industry in the shortest possible time. In the heart of Europe, the [Austrian Automotive Transformation Platform \(AATP\)](#) has set out to match the demand for growth of the industry with the objectives of the country's mobility and climate policy.

In order to promote the transition to e-mobility and reach the overarching national goal of Climate neutrality 2040, the Austrian Ministry for Climate Action (BMK) has established AATP as an expert platform with members from different sub-sectors of the industry as well as from research and public administration. The goal is to get all relevant players in the sector on board - since change can only be successful if all those involved pull together.

The objectives of the platform are:

- To preserve and develop jobs in the automotive industry and supply industries
- To use the opportunities of this structural change for climate protection & make a contribution to the decarbonisation of the transport sector as soon as possible
- To develop recommendations for action to actively support structural change within the framework of working groups on different areas
- To create additional employment and value creation potentials

The AATP members cover the sub-sectors of vehicle & supply industry, charging infrastructure industry as well as operation and servicing of e-vehicle systems. One of their tasks is to develop a catalogue of measures with recommendations for action to actively support structural change in the mobility economy.

## SCIENTIFIC SUPPORT

A recent study paints the thoroughly optimistic picture that decarbonisation constitutes a major opportunity for the Austrian automotive industry. If the transformation succeeds, the value-added and employment potential of the sector could be increased by around 20 percent until 2030. Small and medium-sized enterprises will be the main beneficiaries.



[ieahev.org](http://ieahev.org)