

SPRING 2023 HEV TCP NEWSLETTER



57th HEV TCP EXCO MEETING



The fifty-seventh meeting of the Executive Committee for the Hybrid and Electric Vehicle Technology Collaboration Programme (HEV-TCP) was conducted in Brussels, Belgium on April 20-21, 2023 at the European Commission facilities, with in-person and remote participants in a hybrid format. Ms Roselinde van der Vlies, Director, Clean Planet Directorate, DG Research & Innovation, welcomed the ExCo delegates and gave an overview of the mission of the European Commission's DG Research & Innovation.

New country delegates from Denmark (Mr Toke Rueskov Madsen), Ireland (Ms Emer Barry), Italy (Mr Federico Karagulian) and the United States (Mr Michael Weismiller), as well as a new alternate delegate from the United Kingdom (Mr Sam Denyer), were welcomed by the ExCo Chair.

Task 40 (Critical Raw Materials for Electric Vehicles) completed its work. A written final report has been submitted, and the Task was officially closed by the ExCo. For all the other ongoing Tasks, updates were presented and discussed.

A new Task on “EV Battery Re-Use” was approved. The Task was proposed by South Korea and will be led by the University of Ulsan. Interested countries should contact the Task Manager, Mr Ock Taeck Lim. The Task will begin in spring 2023 and conclude at the end of 2025.

Elizabeth Connelly, the IEA Desk Officer for HEV TCP, gave an update on recent IEA activities. She described recent IEA reports and publications relevant to HEV TCP, the development of new tools for life cycle analysis and total cost of ownership, and planned new IEA initiatives.

The ExCo voted unanimously to pursue the process of seeking IEA approval for a new five-year term, beginning in March 2025. The Executive Committee also elected Mr Michael Weismiller (USA) as a Vice Chair, replacing Ms Joscelyn Terrell who is taking a new position and leaving the HEV TCP.

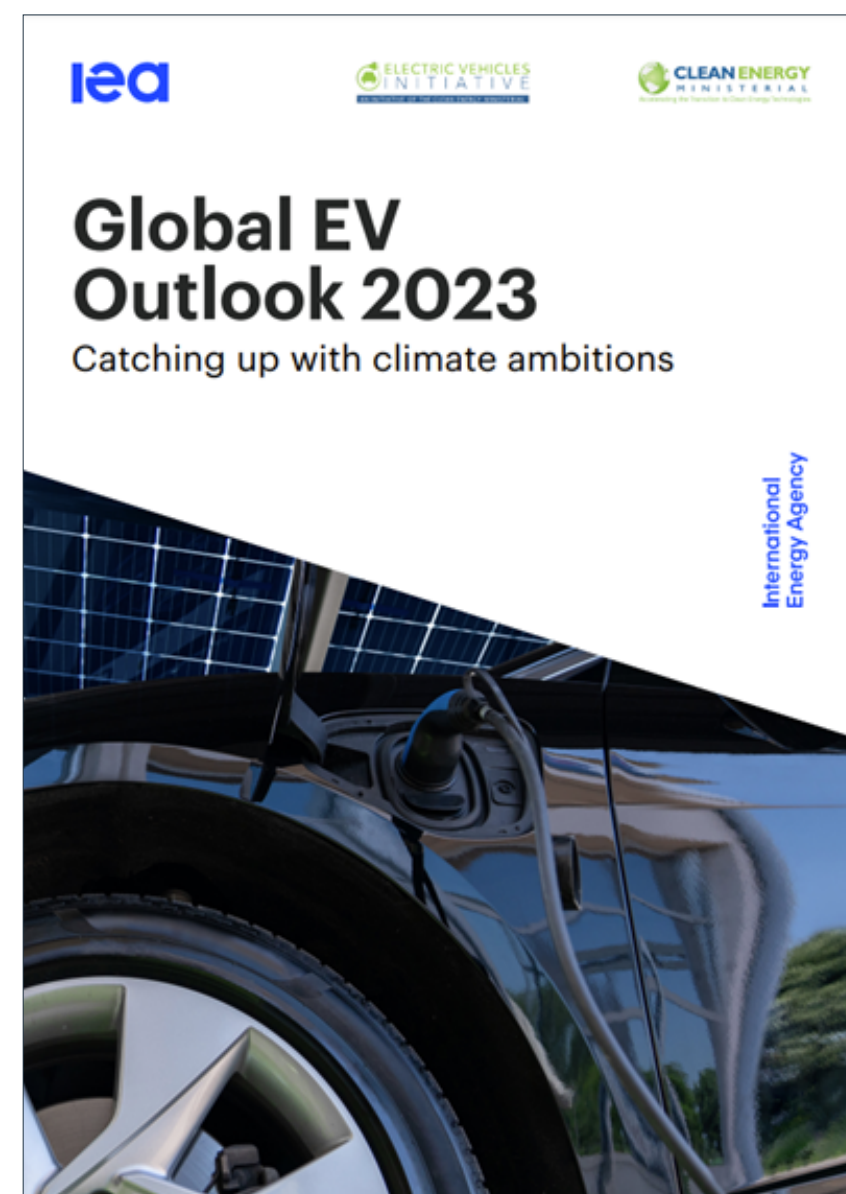
In-person attendees of ExCo 57 also attended an insightful tour of the Toyota Technical Center, which is home to Toyota Motor Europe’s research & development, purchasing, and production engineering operations, as well as the European design and engineering functions. This tour was followed by the Task 1 Knowledge Sharing Workshop, during which presentations were given by the 2Zero Partnership, BATT4EU Partnership, and representatives of the European Commission. Country updates were also offered by delegates from Germany, Italy, Canada, and Belgium.

The ExCo 58 meeting (fall 2023) will be hosted by Sweden at the Swedish Energy Agency’s facilities in Eskilstuna, Sweden during the week of October 9th, 2023.



RELEVANT RELEASES

THE IEA'S 2023 GLOBAL EV OUTLOOK



In April 2023, the IEA released the Global EV Outlook 2023 report.

Developed collaboratively with members of EVI, and with a number of HEV TCP members being contributors, this annual publication examines recent developments made in electric mobility, of which there were many in the past year.

The report explores how in 2022, electric car markets experienced strong growth, with sales exceeding 10 million vehicles. In the first quarter alone, there were about 25% more electric car sales than in the same period the year previous. As a whole, the electric car market was dominated by SUVs and large cars.

Rises in sales growth can be in part attributed to new policies and legislation coming

into effect in numerous countries, which are increasingly promoting EVs as a major component to achieving reductions in carbon emissions and wider climate targets.

The Global EV Outlook shows how policymaking around EVs is more and more focused on supply chains, as manufacturing capacity and resilience is a shared imperative across national and regional contexts. This growing policy ecosystem has been met with an increase of global spending on electric cars, which rose by 50% from 2021. EV consumers continue to comprise most of this spending, with government support making up only 10%.

There has also been promising growth in emerging EV markets, notably India, Indonesia, and Thailand. All this goes to show that the momentum for electric mobility is only strengthening.

The release of the 2023 edition of the report also marked the release of two online data tools from the IEA: the Global EV Data Explorer and the Global EV Policy Explorer – both of which allow users to track the development of policy measures and statistics.

For more information on the tools, and to access the work of HEV TCP contributors, the [full report is available on the IEA's website.](#)

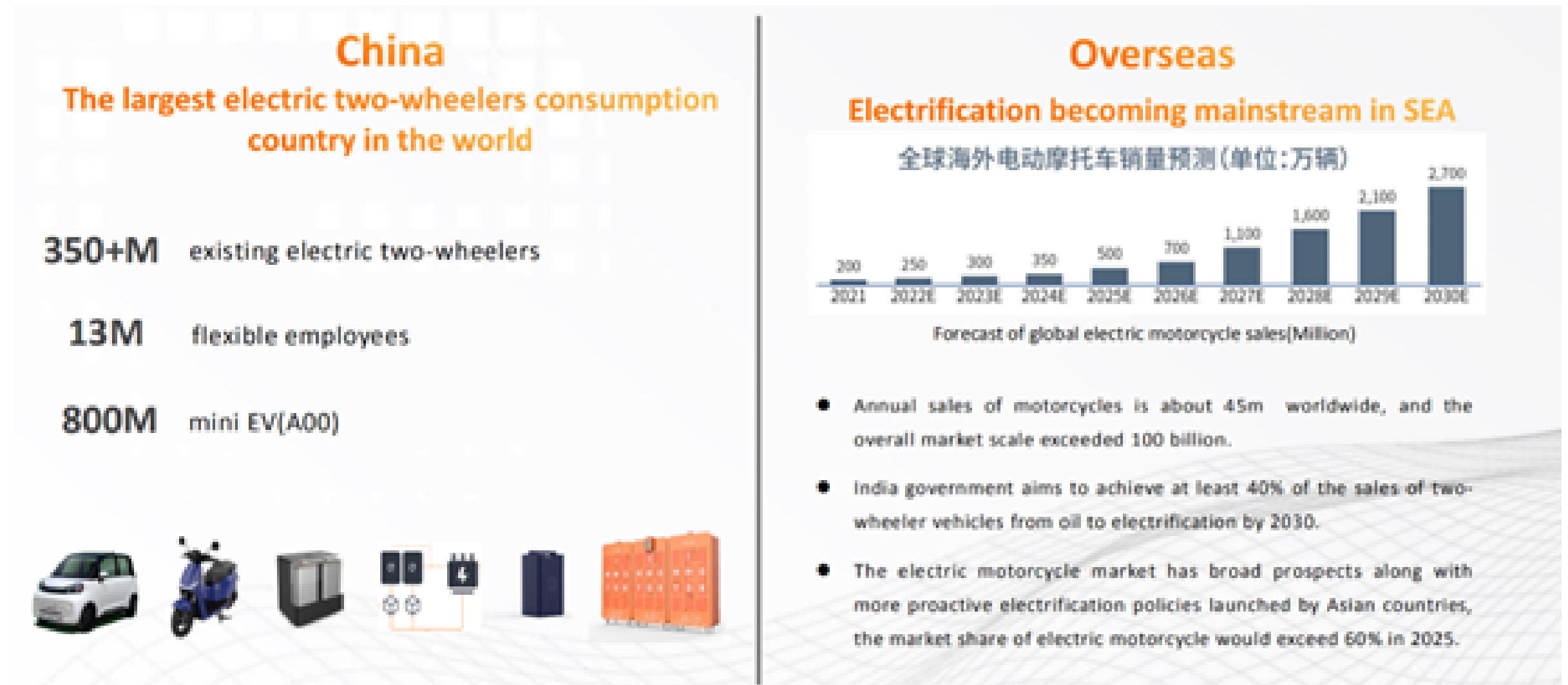
TASK 48 UPDATE ONLINE EXPERTS WORKSHOP

Task 48 looks to investigate the influences of battery swapping employment on battery chemistry, grid infrastructure, environment, and business models, in an effort to strengthen the global information exchange on battery swapping technology.

The aim is to help the formation of a battery swapping ecosystem and traceability mechanism, and offer suggestions for policy makers and stakeholders.

On March 30, 2023, Task 48 organized a workshop on “Battery swapping in electric two and three wheelers”. In addition to the existing members, some new and well-known institutions in the industry also made speeches at the conference, including Immotor (CN), Biliti Electric (USA), Zhizu (CN), Phyllion (CN), Vammo (Brazil), and Swap (Indonesia).

The workshop also attracted more than 40 representatives from China, UK, Norway, Korea, Italy, Germany to participate.



Some of the experts' opinions to emerge from the workshop include the following:



As the scale of battery swapping expands, **unit economics** becomes more challenging. How should choices between **scalability and profitability** be made?

Terry Yin,
Phylion



Battery swapping presents the most probable resolution to combat Indonesia's electric **two and three-wheelers range anxiety**. There is huge potential for battery swapping in the Southeast Asian electric two and three-wheeler markets.

Kevin Phang,
Swap



Standardize battery components for interoperability.

Mayrhofer Enrico Maria,
Piaggio



It is important to understand the main drivers impacting the cost dynamics for large companies, which aim for a **low carbon footprint and reduced costs for deliveries** in electric two and three-wheelers.

Rajarshi Rakesh Sahai,
Biliti Electric



Developing APP enables users to manage battery control and swapping applications, whilst the **infrastructure is integrated with the secure IoT system**. This allows for timely cloud accessibility and helps **ensure superior safety standards**.

Xuejun Li,
Zhizu



The market of **Portable Energy Storage (PES)** is growing rapidly with huge demand in certain areas.

Hangjun Liu,
Immotor



Motorcycles sales grew just under 20% across LatAm in 2022, yet electric represented <0.5%. **Latin America saw sales of 10 million two-wheelers in 2022**, highlighting a promising market with potential for further growth. In terms of the energy dynamics involved in potentially powering these growing vehicle segments, Brazil's grid is currently the most renewable amongst G20 countries.

Billy Blaustein,
Vammo

TASK 43 UPDATE

WORKSHOP TO REEVALUATE VGI BARRIERS



The overarching objective of Task 43, which began in 2019, is to investigate the means for facing the technical, economic, regulatory and social challenges of vehicle-grid integration (VGI).

This workshop explored the evolution of barriers and challenges in the VGI space and the progress to meet them. The first panel provided a transversal look at the status of VGI projects through examination of three ongoing projects (FLOW, SCALE and EV4EU). The second panel continued exploring barriers, progress and best practices for managing VGI with a deep dive into the status in the UK, challenges in Canada and policy perspectives from the EU. Through presentations and discussion, this workshop represented a nice opportunity for international engagement and exchange of knowledge and ideas in the rapidly evolving e-mobility space.

CHINA POLICY AND DYNAMICS OF BATTERY SWAPPING IN THE CHINESE MARKET

In 2023, the Chinese government implemented policies to support the development of the battery swapping.

On April 21, the National Development and Reform Commission, National Energy Administration, and National Standards Committee jointly issued the "Guide to Construction of a Carbon-Driven Peak Carbon Neutral Standard System." The document states that standards for electric vehicle systems, charging and battery swapping systems, etc. should be accelerated and improved.

Local governments have also introduced corresponding policies to support the battery swapping model.



Jiangsu Province will develop the pilot application of Nanjing's battery swapping model, promote the construction of battery swapping stations, and build a system of interoperable, city-wide battery swapping networks. Henan Province will improve the layout of charging and switching facilities along motorways and deploy battery swapping stations. Ningxia Hui Autonomous

Region will support the construction of public infrastructure such as charging piles, replacement power stations, gas filling stations, and hydrogen filling stations. Inner Mongolia Autonomous Region will accelerate the construction of charging piles, the innovation of battery swapping mode, and build a charging network system. Wuxi will explore a mobile battery swapping model

for new energy heavy trucks, and relevant departments will provide policy support.

Chinese electric vehicle (EV) manufacturer, Nio, is aiming to establish 1,000 battery swapping stations across China this year, with a goal of expanding its total number of facilities to 2,300 by the end of 2023, according to Nio Founder and Chairman William Li. Nio intends to construct 400 battery swapping stations near highways and the remaining 600 in urban areas, with a significant focus on third- and fourth-tier cities and counties, as per Li's statement on Nio's social media platform on Tuesday.

Taiwan's micro-mobility firm, Gogoro, has joined forces with Italy's Enel X to create a virtual power plant by merging thousands of battery swapping stations. They claim that the VPP currently houses 1,300 'GoStations,' with 1,200 more scheduled for deployment soon. By mid-2023, the partners plan to incorporate all 2,500 stations in Taiwan to balance the grid's stored batteries through adding or receiving excess energy.



TASK 23 UPDATE

RESULT OF TASK 23 WORK BECOMES MANDATORY IN THE EU BY SEPTEMBER 2024



As a result of Task 23 coordination work around governmental requests (EU Mandate 468 and others), local government needs, and industry abilities, after 10 years, the standardization has now matured and the long sought after solution has been set for pedelecs (EPACs) as a mandatory requirement for being qualified to fulfil the CE Conformity requirements.

The transition period will end by September 2024. From then on, the CE reference, EN 15194, with its Amendment A1, is exclusively requesting energy transfer for charging the energy storage via the IEC TS 61851-3-Series System.

This will enable consumers to have more convenience, considering that public parking and charging infrastructure will allow them to safely park and charge their vehicles at dedicated locations. The mandatory safety standard will help reduce the likelihood of safety hazards due to battery fires. The mandatory application of the EN 50604-1 Battery safety standard will also help relocate potentially hazardous charging locations—of

which are common today with peoples' usage of apartments' staircases to charge LEV batteries—towards outdoor charging while parking.

The first sample trials of parking stations as well as vehicles that apply these standards were showcased within a city pilot in Stuttgart and Schwäbisch Gmünd, as part of the EU-cofounded project, CME iEMS, which is under the leadership of the City of Arnhem in the Netherlands. Several cities and regions are now preparing tenders based on these new legal boundary conditions.

This harmonized interface will save millions of taxpayer funds, since the investment into infrastructure will be decoupled from the vehicle manufacturer. It will also help open up competition and accelerate the mobility transformation, with overall better sharing and private vehicle parking opportunities. In terms of continuing the progress, Task 23 will continue to work on the last item on its agenda, which is to establish LEV parking and charging within its areas within 2024.

NEW TASK: TASK 51

“EV BATTERY RE-USE”

“Think Future Energy when Driving the Vehicle of the Future!”

The topic of EV Battery Re-Use was raised as a focus for this new task, as the increasing use of EVs around the world is expected to cause new issues, including the management of these vehicles’ resulting battery waste. The use of EVs in 2030 is predicted to increase significantly in terms of units, and critically, this increase must also be followed by increased utilization of the Re-Use EV Battery and EV Recycling opportunity, in effort to overcome the impact of the waste generated.

The high utilization of re-use batteries must also establish and encourage strict management and control mechanisms. Some of the current issues around using re-use batteries are:

- The establishment of a legal institutional framework for sustainable scrap systems and management for used EVs.
- There is little policy research to enable and support new approaches to business models for utilizing EV battery re-use.
- There is a necessity for related business and policy support to activate businesses’ utilization of used batteries for EVs.

EV battery recycling and re-use activities have been carried out in various countries. China has set National Standards for Recycling waste batteries, of which include aspects such as specification, registration, collection, packaging, transportation, and demolition. The European Union has enforced new EU Battery Regulation. Another example is the US’s investment in battery recycling infrastructure and aiding electric vehicle and battery companies. Japan has also begun work to optimize batteries as storage for electrical energy, in order to be reused as a light source

Basic Approach to Engagement

- System & technology providers
- Research institutions
- Providers of transportation service(s)

Action Items

- Creating a Roadmap for the next 5 years
- Sharing the information of the related technology with stakeholders through workshops and conferences.

at night or when there are blackouts.

Understanding EV battery re-use requires several analysis and process stages. If the EV battery can be repaired, it is likely to be sent to EV manufacturers for direct resale. If it cannot be repaired, then it must go through the process of repair, remanufacturing, and refurbishing before it can be resold to EV manufacturers.

Task 51 is expected to be material for discussion and sharing of experiences about intensive handling of re-use EV battery.

If you are interested in getting more information, please get in touch with the Task 51 Task Manager:

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