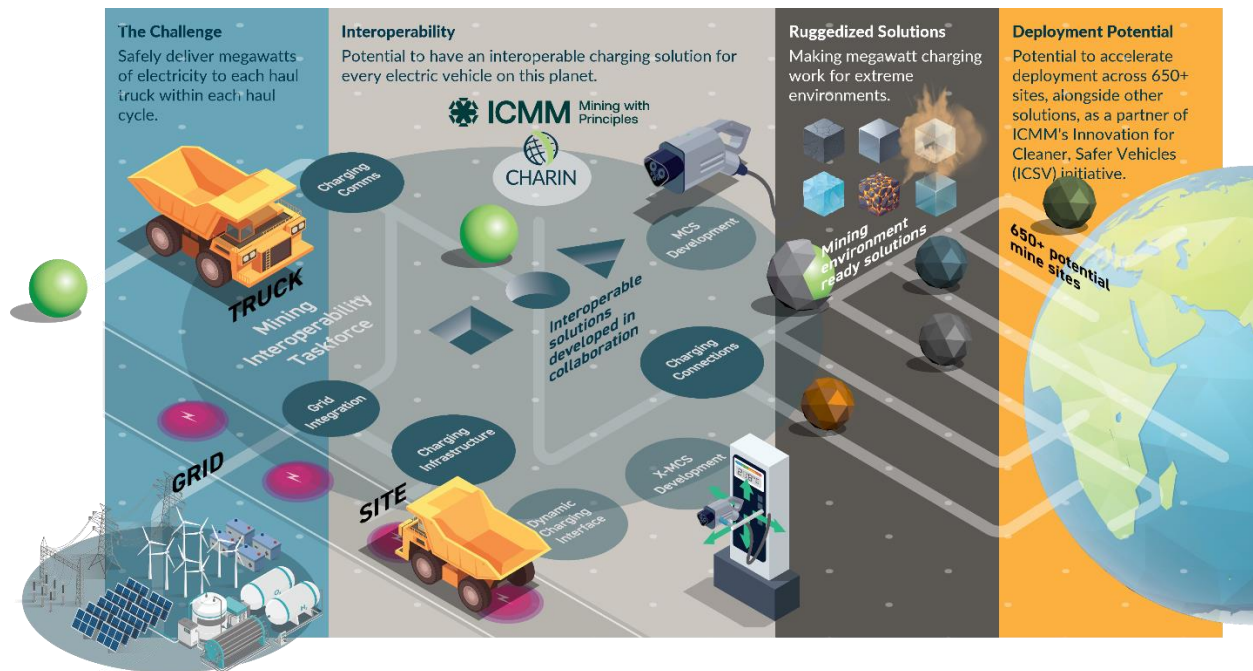


Celebrating the first year of the ICMM CharIN Mining Task Force

As we celebrate the first-year of [the Mining Task Force within ICMM's ICSV & CharIN](#), we can look back with a sense of achievement.

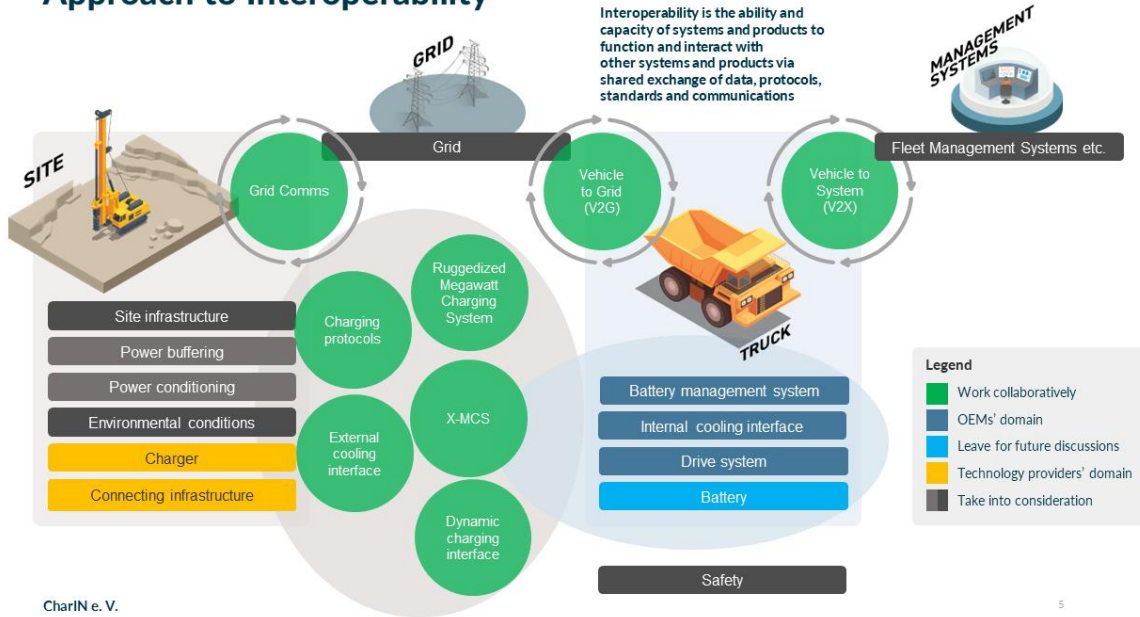


From a base of 16 companies¹, we have grown the member participation to 82 companies and 203 individual Taskforce members. From within our early model on interoperability we highlighted six key areas in which we needed to deliver a pathway to the mining industry, developed work plans for each and have delivered the key initiatives within these work plans.

¹

BHP, Rio Tinto, GHD, Komatsu, ABB, Black and Veatch, Caterpillar, Cavotec, Cummins, Hitachi Energy, Siemens, Shell, Staubli, Roy Hill, Grivix, Codelco

Approach to Interoperability

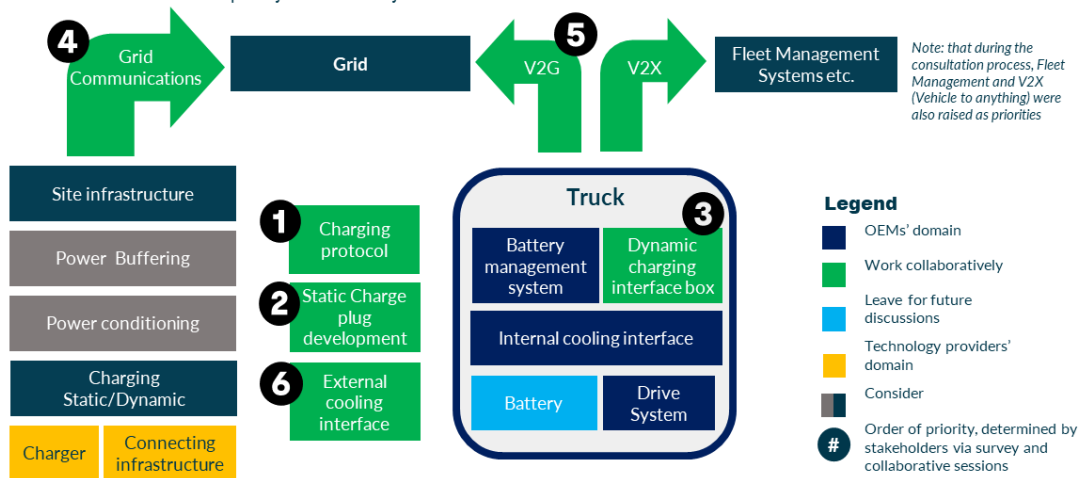


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Elements of interoperability

This diagram was co-created by the project team to illustrate a need for industry collaboration on key interface points to deliver interoperability. Numbers indicate the order of priority determined by stakeholders.



Element 1. Charging protocol - This stream has relied heavily on the work conducted by CharIn on the ISO 15118 protocol, which is recognised by the industry as the protocol we need to adopt. However, work is needed to fully integrate the structure and underlining broadcasting conventions within the mining industry. As battery equipment within mining becomes more of a reality, we intend to establish a team in 2024 to conduct a full assessment and provide clear recommendations to the industry.

Element 2. Static charge plug development - This body of work has delivered real clarity this year with the development of the ruggedised Megawatt charging system (MCS) plug from within the bounds of the MCS plug and the publishing of an industry white paper. We would like to acknowledge the vast amount of work done by the team and the excellent leadership of the groups chair Marc-Andre Beck and the amazing efforts of our former chair Robert Doel.

The XMCS plug working group led by Christian Ebert continues to take shape well with the key parameters now well aligned and work commencing on the physical architecture and shape of the plug about to commence.

Element 3. Dynamic charging interface - The working group has been focusing on the technical and functional requirements for the interface where the power connector (e.g., pantograph, current-collector, or electrical pick-up) connects to the haul truck's electrical system. We also would like to acknowledge the excellent work done by the working group led by Kwan Lee, with first version of the white paper having received all the necessary approvals for publication (early in 2024). The working group will resume meeting in early 2024, to commence work on a second version of the white paper.

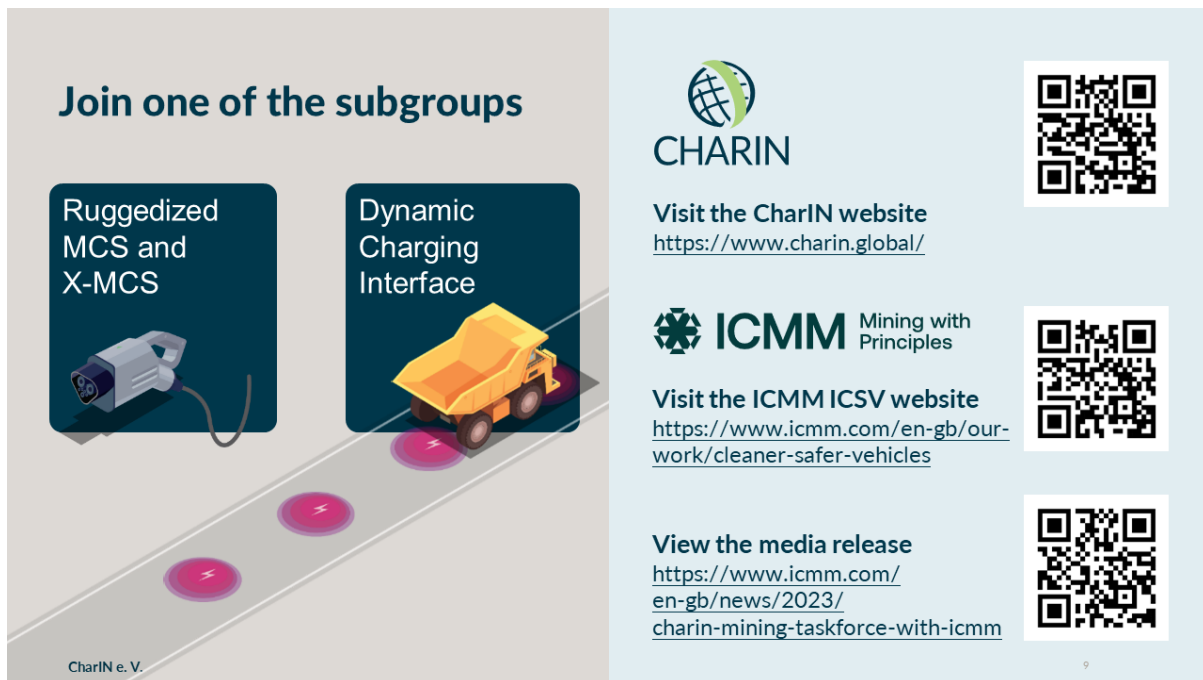
Other outstanding work this year has been delivery of the interoperability message at the E-Mine conference in Tucson Arizona by BHP and Rio Tinto and the huge support received from the large cohort assembled at the conference. A small contingent from both the major haul truck OEM's and several Mining Companies also attended the CharIN Festival in Cleveland, Ohio to physically see the progress and understand the challenges seen within the on-highway deployment of large electric vehicles and the implementation of the MCS plug within that environment.

As the mining community continues to mature in this space, we will look to elements four and five of the model in the new year at the Electric Mine Conference (Perth, May 2024).

Element 4 - Grid Communication will seek to understand the Open Charge Point Protocol (OCPP) and how we may adopt that within the mining community if appropriate for charging systems to be able to communicate with grid resources.


Element 5 - V2G / V2X will further investigate the applicability of the J1939 protocol and the relevant on highway Parameter Group Numbers (PGN's) to determine their relevance to build out key information for dispatch systems widely used across mining.

As we enter our second year, we are looking forward to continuing our work and expanding our scope to cover more aspects of electrification, such as battery technology, safety, and regulation. We are also looking for more industry members to join and support our working groups and initiatives. If you are interested in being part of this exciting and impactful group, please contact semih.tetik@charin.global from CharIn or follow the link.




Join one of the subgroups

Ruggedized MCS and X-MCS



Dynamic Charging Interface






CHARIN

Visit the CharIN website
<https://www.charin.global/>

ICMM Mining with Principles

Visit the ICMM ICSV website
<https://www.icmm.com/en-gb/our-work/cleaner-safer-vehicles>

View the media release
<https://www.icmm.com/en-gb/news/2023/charin-mining-taskforce-with-icmm>

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Learn more about [ICMM's](#) Innovation for Cleaner, Safer Vehicles (ICSV) initiative in the latest [briefing note](#) "*Insights: Accelerating the Adoption of Zero-Emission Haul Trucks in the Mining and Metals Industry*"

- An overview on the importance, challenges, and opportunities of decarbonising Surface mining equipment, specifically haul trucks.
- Background on ICMM's ICSV initiative and how it is creating a space for collaboration to help better understand the necessary conditions to innovate at speed and scale.
- Approach and partnerships for reducing GHG emissions (Including the collaboration with *CharIN e.V.*, which is focused on overcoming the global challenge of charging interoperability)
- An outlook on the transition to zero-emission haul trucks, with an outlook on various areas, such as operational, infrastructural, and cultural aspects.
- Current ICMM perspective on the indicative path forward towards surface mining equipment decarbonisation, since half a decade of the ICSV initiative's launch.