FOREWORD TO THE POSITION PAPER ON EDUCATION AND SKILLS BY THE CHAIR OF BATTERIES EUROPE

Skills are a crucial factor for success in batteries field and ensuring technological leadership.

What was our starting point when clean energy transition accelerated and the European Battery Alliance was launched? The EU has a well-established market position in traditional battery manufacturing, especially in lead-acid batteries for engine starting, UPS (uninterrupted power supply) and forklifts. The EU is also strong when it comes to nickel batteries - batteries intensively used in high end industrial sectors, such as rail transport and aviation. When it came to lithium batteries, SAFT and Varta were important global players for high-end niche applications such as applications in defence and space sectors or hearing aids, as well as the first hybrid cars and buses. However, as the main Li-ion mass markets were linked to computers, cell phones and other portable devices, mass production was essentially established close to the production sites of these consumer electronic devices: in Asia, i.e. in Japan, followed by Korea and China. In 2020, Europe hosted only 6% of the world's battery manufacturing capacity, but represented more than 20% of the global battery demand. As batteries have become a key enabling technology to decarbonize both the transport sector and the power system, and as the demand for batteries, mainly lithium-based technologies for the next decade, will grow exponentially, Europe has recognized the urgent need to spur the establishment of a competitive, sustainable value chain for mass production of lithium batteries. Along with technology, innovation and investment capacity, one major challenge is to ensure the provision of a skilled workforce.

How did we embark in mass production of lithium batteries? One of the first-moving newcomers on mass production of lithium batteries in the EU, Northvolt, started by hiring its core team of battery specialists from abroad. Saft and Varta, in turn, could benefit from the expertise of home-grown top-notch specialists in high-end lithium battery technologies and manufacturing. A shift of workforce from established, traditional battery technologies only occurred in a very limited manner: the demand for lithium batteries comes in addition to existing (and still growing) traditional markets which means existing workforce is not made redundant. The required skills set is quite specific and different than the ones for the lithium technology as such, for battery electronics, for highly automated

mass production lines, and for new applications in the electromobility and electricity infrastructure sectors. Even if synergies obviously exist with conventional electrochemistry, with other electric and electronic components industries and even food industries used to deal with clean rooms, liquids, coating and other similar processes, the main challenge consists of ramping up the number of trained workforce across all areas of the value chain, from raw materials processing, to cell manufacturing and system assembly and integration, embracing research and development, manufacturing and end-user industries and businesses.

How did the training offer adjust to the new needs in the battery production sector? The EU education sector started gradually adjusting their offer to embrace the need for new specialists as well as the need for reskilling/upskilling existing specialists. Notably relevant higher education courses and programmes have been launched recently, along with a number of professional programmes and online courses. Additionally, some Member States have taken certain steps to address the need for vocational training programmes. Reskilling/upskilling effort has been supported through EU level programmes, including Erasmus+ Sector Skills Alliances Programme. It funds the ALBATTS project (The Alliance for Batteries Technology, Training and Skills), which has a purpose to design a blueprint for competences and training schemes of the future in the battery and electromobility sector.

We've gone far but more is needed. It is clear we need to do more to be able to meet the ever-growing demand for batteries with a competitive and sustainable offer of EU-manufactured batteries. The training, reskilling/upskilling and research will mostly take place locally, but certain EU-level facilitation is clearly needed to foster cooperation, exchange of knowledge and synergies. Therefore the recent proposal of EBA250 Academy – facilitated by EIT InnoEnergy - comes as a welcome step. The document developed by the Batteries Europe Task Force on Skills analyses which skills are most needed and how we can obtain them within a reasonable time frame.