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# The European Battery Alliance

## A European success story

European Energy Forum  
15<sup>th</sup> March 2021

## Agenda

- 1. European Battery Alliance impact since October 2017 [4 slides]**
- 2. Still, work to do and gaps to fill: How to go about them [3 slides]**

**A successful European story so far .... with even brighter future**

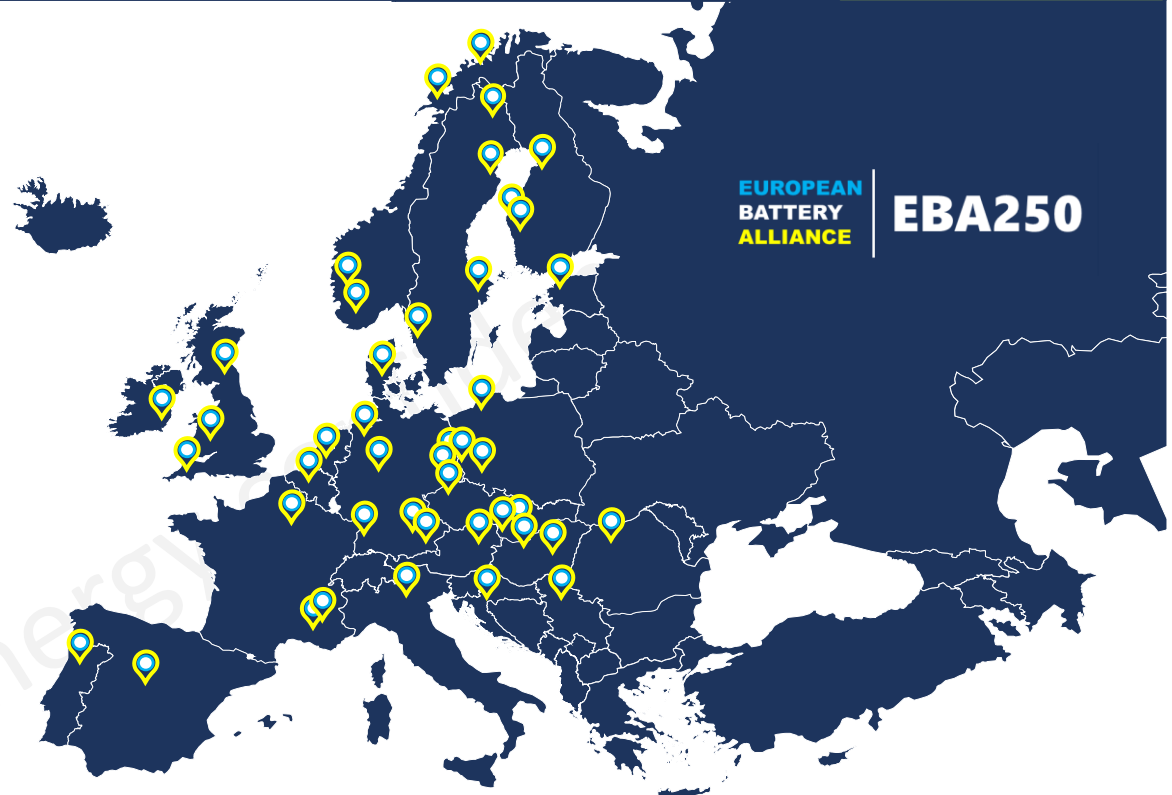
# EBA harvest since October 2017 (1/4)

## Industrial projects all across the value chain in 22 countries

2

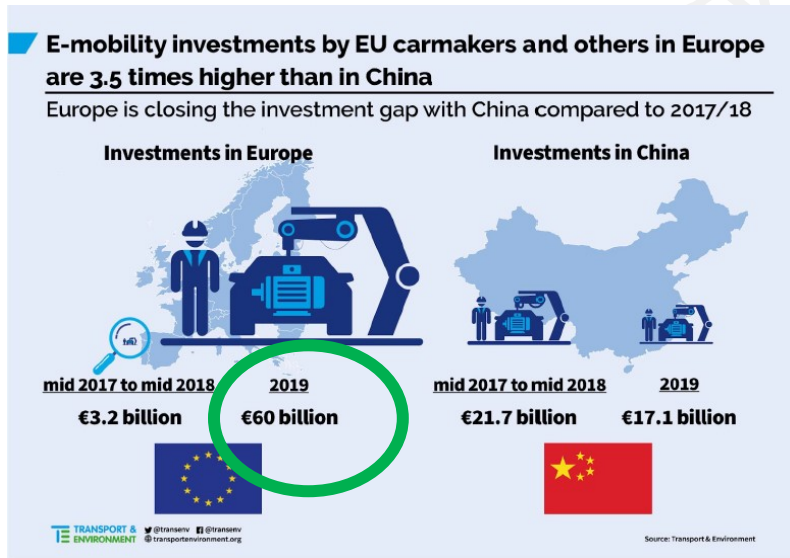
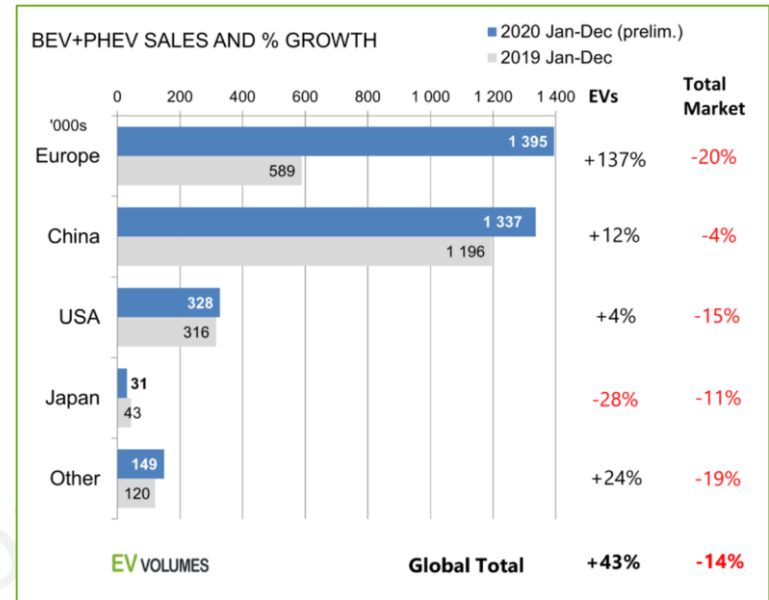


<b>AUSTRIA</b> - Raw materials: EUROPEAN LITHIUM (lithium) - Application & Integration: MAGNA STEYR (E-mobility), CYBERGRID (ESS)	<b>ITALY</b> - Battery Production: FAAM/LITHOPS - Application & Integration: ENEL (ESS)
<b>BELGIUM</b> - Active Materials: UMICORE, LEYDEN-JAR - Recycling: UMIICORE	<b>NETHERLANDS</b> - Active Materials: LEYDEN-JAR
<b>CROATIA</b> - Application & Integration: RIMAC (e-mobility)	<b>POLAND</b> - Active materials: UMICORE - Battery manufacturing: LG CHEM
<b>CZECH REPUBLIC</b> - Raw materials: CINOVEC (lithium), EURO MANGANESE (manganese) - Battery Production: MES	<b>PORTUGAL</b> - Raw materials: SAVANNAH (lithium)
<b>DENMARK</b> - Application & Integration: DTU (ESS), LITHIUM Balance (BMS)	<b>ROMANIA</b> - Application & Integration: ROMBAT
<b>ESTONIA</b> - Battery Manufacturing: SKELETON (supercaps)	<b>SLOVAKIA</b> - Battery Production: INOBAT, SK Innovation
<b>FINLAND</b> - Raw Materials: KELIBER (lithium) - Active materials: BASF - Recycling: Fortum/BASF/NORNICKEL	<b>SPAIN</b> - Raw Materials: Infinity, LITHIUM IBERIA (lithium)
<b>FRANCE</b> - Battery Production: ACC, VERKOR - Recycling: SNAM/HONDA	<b>SWEDEN</b> - Raw Materials: TALGA, VOXNA (graphite) - Active Materials/Battery manufacturing/Recycling: NORTHVOLT - Applications: EPIROC (Industrial), SEEL (IPCEI)
<b>GERMANY</b> - Raw Materials: VULCAN (lithium) - Active Materials: BASF - Battery manufacturing: ACC, NORTHVOLT/VW, TESLA, CATL, VARTA, BMW, CELLFORCE, AKSAOL, MICROVAST, FARASIS - Recycling: VW, PROMOBIOUS	<b>NORWAY</b> - Active Materials: SKALAND and ELKEM (graphite anodes) - Battery manufacturing: MORROW and FREYR
<b>HUNGARY</b> - Battery Production: SAMSUNG, SKI Innovation	<b>SERBIA</b> - Raw materials: RIO TINTO, NEOMETALS (lithium)
<b>IRELAND</b> - Raw materials: INTERNATIONAL LITHIUM (lithium)	<b>UK</b> - Raw Materials: Cornish Lithium - Battery Manufacturing: ENVISION, BRITISHVOLT



Industrial projects all across Europe, creating jobs and growth

**Europe sold more eVs than China in 2020, with a 137% growth**



**Europe captured 3,5 times more investment than China in 2019 & 2020\***

# EBA harvest since October 2017 (3/4)

## The means: A “Fit for purpose” ecosystem built from scratch

4



Raw materials	Active Materials	Battery Manufacturing				Application			Recycling & 2nd life	
<ul style="list-style-type: none"> <li>EIT Raw Materials</li> <li>Finnish Minerals Group</li> <li>Fin. Network for Sust. Mining</li> <li>European Lithium</li> <li>Magnis/Allocate</li> <li>Prince Erachem</li> <li>Aura Energy</li> <li>Outotec</li> <li>Cobalt Institute</li> <li>Copperalliance</li> <li>Keliber</li> <li>Albemarle</li> <li>EUROMINES</li> <li>Trafigura</li> <li>Rio Tinto</li> <li>GTK</li> <li>Crisolteq</li> <li>Aurubis</li> </ul>	<ul style="list-style-type: none"> <li>Leading Edge Materials</li> <li>European Metals Holdings</li> <li>European Copper Institute</li> <li>Gov. of Western Australia</li> <li>Fennoscandian Resources</li> <li>Infinity Lithium</li> <li>Eramet</li> <li>DERA</li> <li>Boliden</li> <li>Cobalt</li> <li>FLSmidth</li> <li>KGHM</li> </ul>	<ul style="list-style-type: none"> <li>Nanomakers</li> <li>3M</li> <li>Elkem</li> <li>Umicore</li> <li>Imerys Graphite &amp; Carbon</li> <li>Solvay</li> <li>LOTOS</li> <li>BASF</li> <li>Arkema</li> <li>SGL Group</li> <li>Heraeus</li> <li>Nanomakers</li> <li>Wacker Chemie</li> <li>OXIS Energy</li> <li>Phillips 66</li> <li>Evonik</li> <li>Tribotec</li> <li>Höganäs</li> <li>RGS Development</li> </ul>	<ul style="list-style-type: none"> <li>Nawa Technologies</li> <li>Grupa Azoty</li> <li>EMIRI</li> <li>Ganomat</li> <li>Leyden-Jar</li> </ul>	<ul style="list-style-type: none"> <li>Saft</li> <li>KLIB</li> <li>Northvolt</li> <li>LION Smart</li> <li>LION E-Mobility</li> <li>CustomCells</li> <li>EAS Batteries</li> <li>Terra E</li> <li>Lithops</li> <li>Leclanché</li> <li>Liacon</li> <li>Electrovaya</li> <li>Litarion</li> <li>Varta</li> <li>Hoppecke</li> <li>Envites Energy</li> <li>BELENOS</li> <li>Forsee Power</li> <li>MES</li> <li>InnoLith</li> </ul>	<ul style="list-style-type: none"> <li>Akasol</li> <li>Tata Steel Plating</li> <li>EM Micro-electronics</li> <li>HE3DA</li> <li>EV Battery</li> <li>Akkurate</li> <li>Delfort</li> <li>Videoton</li> <li>EoCell Inc</li> <li>CAEC</li> <li>Cleantron</li> <li>Skeleton</li> <li>Clean Power Technology</li> <li>Passion</li> <li>Motorbike Renata</li> <li>Batteries</li> <li>Dassault Systems</li> <li>Blue Solutions</li> <li>Freyr</li> </ul>	<ul style="list-style-type: none"> <li>Freudenberg</li> <li>Manz</li> <li>MW group</li> <li>Thyssen Krupp</li> <li>PEC</li> <li>FAAM FIB srl</li> <li>MG Energy</li> <li>Honeywell</li> <li>ABB</li> <li>Coperion</li> <li>NXP Semiconductors</li> <li>Vaisala</li> <li>CEGASA</li> <li>Tungfram</li> <li>Gestamp</li> <li>Swatch Group</li> <li>BMZ</li> <li>Schäffer AG</li> </ul>	<ul style="list-style-type: none"> <li>Sonnen</li> <li>ErlingKlinger</li> <li>PSA Groupe</li> <li>Renault SA</li> <li>Daimler AG</li> <li>NISSAN Automotive</li> <li>Einride</li> <li>Jaguar Landrover</li> <li>TESLA</li> <li>Ford</li> <li>VolvoCars</li> <li>Volvo</li> <li>Continental AG</li> <li>Bosch</li> <li>Siemens</li> <li>Stihl</li> <li>Honda R&amp;D Europe</li> <li>Danfoss</li> </ul>	<ul style="list-style-type: none"> <li>CNH Industrial</li> <li>Volkswagen</li> <li>VESTAS</li> <li>RIMAC</li> <li>FCA - EMEA</li> <li>FIAT</li> <li>Centro Ricerche FIAT</li> <li>Ambibox</li> <li>Innogy</li> <li>Red Electrica</li> <li>cyberGRID</li> <li>Albufera Energy Stor</li> <li>Streetscooter</li> <li>PKN ORLEN</li> <li>AMPS Power</li> <li>Fortum</li> <li>Nordex</li> <li>TOYOTA Tsusho EU</li> </ul>	<ul style="list-style-type: none"> <li>BMW</li> <li>Epiroc</li> <li>Portliner</li> <li>Ampere Energy</li> <li>Cargotec</li> <li>Cummins</li> <li>Rafako</li> <li>ENEL</li> <li>TERNA</li> <li>EDF</li> <li>ENEDIS</li> <li>Total</li> <li>Vattenfall</li> <li>EDP Inovacao</li> <li>OIG</li> <li>CAF</li> <li>Alpiq</li> <li>FPT Powertrain Tech</li> </ul>	<ul style="list-style-type: none"> <li>Veolia</li> <li>Suez</li> <li>Revatech</li> <li>EBRA</li> <li>RECHARGE</li> <li>Stena metall</li> <li>Stena Recycling International</li> <li>AkkuSer</li> <li>Interseroh</li> <li>Bee Planet</li> <li>ARN</li> <li>envirobat</li> <li>Umicore</li> </ul>

500+ stakeholders, capturing a common goal



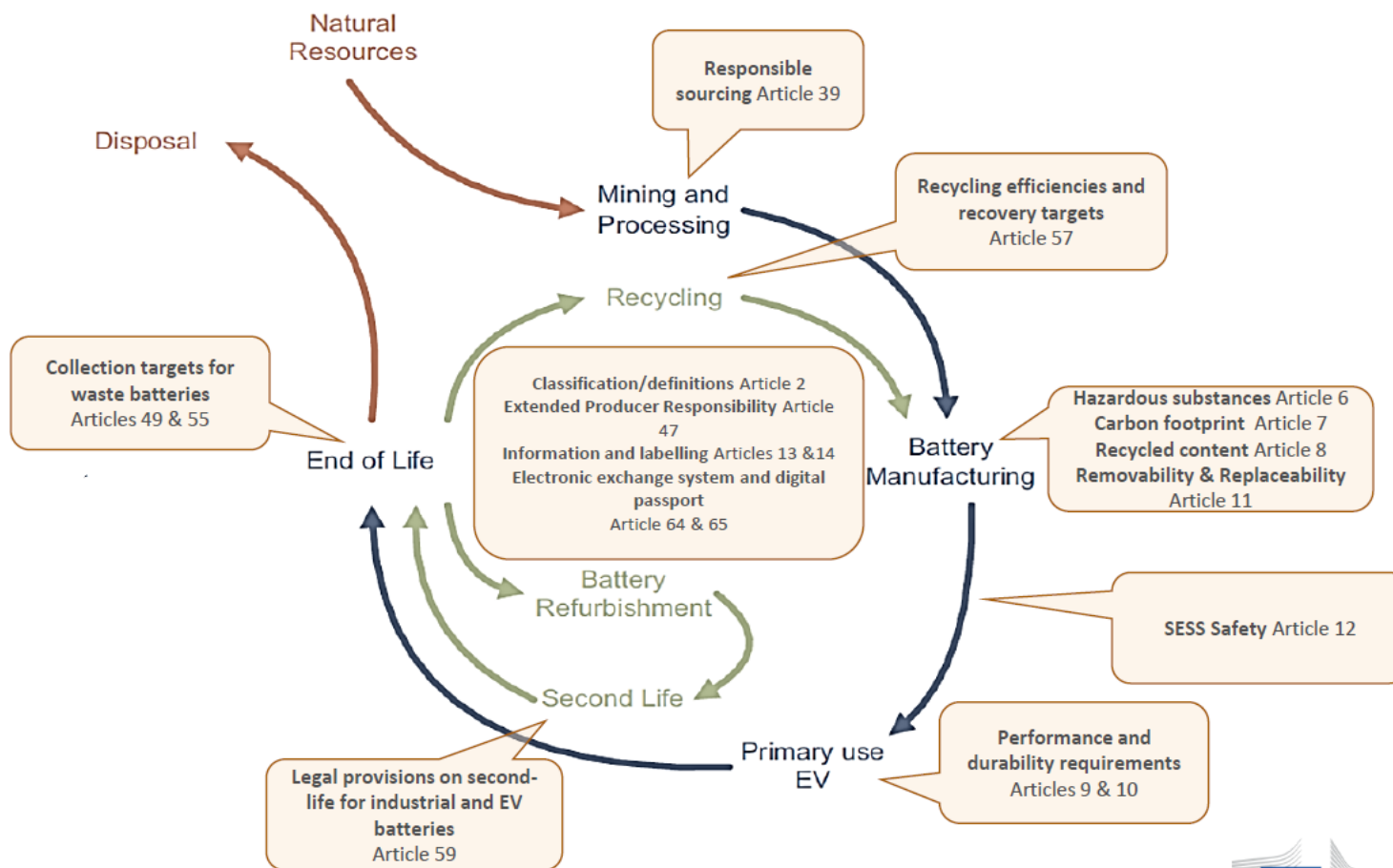
250B€

Impact

Research and associations active in large parts of the value chain	<ul style="list-style-type: none"> <li>Fraunhofer</li> <li>Inst. Chem. Slovenia</li> <li>Munster Uni</li> <li>smartEN</li> <li>MCI</li> <li>DENA</li> </ul>	<ul style="list-style-type: none"> <li>CEA</li> <li>Innovate UK</li> <li>CIC</li> <li>DNV GL</li> <li>Valuad</li> <li>GART</li> </ul>	<ul style="list-style-type: none"> <li>SINTEF</li> <li>Faraday Inst</li> <li>TU Braunschweig</li> <li>TUV SUD</li> <li>AVERE</li> <li>Business Finland</li> </ul>	<ul style="list-style-type: none"> <li>AIT</li> <li>Uppsala Univ</li> <li>Aalto Univ</li> <li>AVL</li> <li>ADS</li> <li>VASEK</li> </ul>	<ul style="list-style-type: none"> <li>VITO</li> <li>VUB</li> <li>ERRIN</li> <li>RISE</li> <li>BVES</li> <li>GigaVaasa</li> </ul>	<ul style="list-style-type: none"> <li>ENEA</li> <li>CEPS</li> <li>EASE</li> <li>ifu</li> <li>A3PS</li> <li>Amiens</li> </ul>	<ul style="list-style-type: none"> <li>AVL ITALIA</li> <li>UTBM</li> <li>EUROBAT</li> <li>CEFC</li> <li>Zabala</li> <li>Invest in Lithuania</li> </ul>	<ul style="list-style-type: none"> <li>CNR</li> <li>FEMTO</li> <li>T&amp;E</li> <li>VDMA</li> <li>AMMA</li> <li>RVO</li> </ul>	<ul style="list-style-type: none"> <li>ANIE</li> <li>INST. ITALIANO</li> <li>EUCAR</li> <li>VDE</li> <li>TNO</li> <li>RSE</li> </ul>	<ul style="list-style-type: none"> <li>Politecnico Milano</li> <li>CIDETEC</li> <li>EGVIA</li> <li>CEN/CENELEC</li> <li>ACEA</li> <li>CLEPA</li> </ul>	<ul style="list-style-type: none"> <li>CATCH</li> <li>SFEM Stora</li> <li>Federchimic</li> <li>Instituto Tec Energia</li> <li>VG-Colab</li> <li>CEEP</li> </ul>	<ul style="list-style-type: none"> <li>ECOS</li> <li>Not innovated here</li> <li>CEFC</li> </ul>
Financial Institutions involved in EBA	<ul style="list-style-type: none"> <li>EIB</li> <li>EBRD</li> <li>PFR</li> </ul>	<ul style="list-style-type: none"> <li>BPI</li> <li>Société Générale</li> <li>KFW</li> </ul>	<ul style="list-style-type: none"> <li>DEMETER</li> <li>Equinor</li> <li>LBW</li> </ul>	<ul style="list-style-type: none"> <li>LB</li> <li>Lazard</li> <li>San Paolo Intesa</li> </ul>	<ul style="list-style-type: none"> <li>BNP Paribas</li> <li>Credit Agricole</li> <li>Goldman</li> </ul>	<ul style="list-style-type: none"> <li>ING</li> <li>HSBC</li> <li>DZ Bank</li> </ul>	<ul style="list-style-type: none"> <li>Total VC</li> <li>Macquarie</li> </ul>					

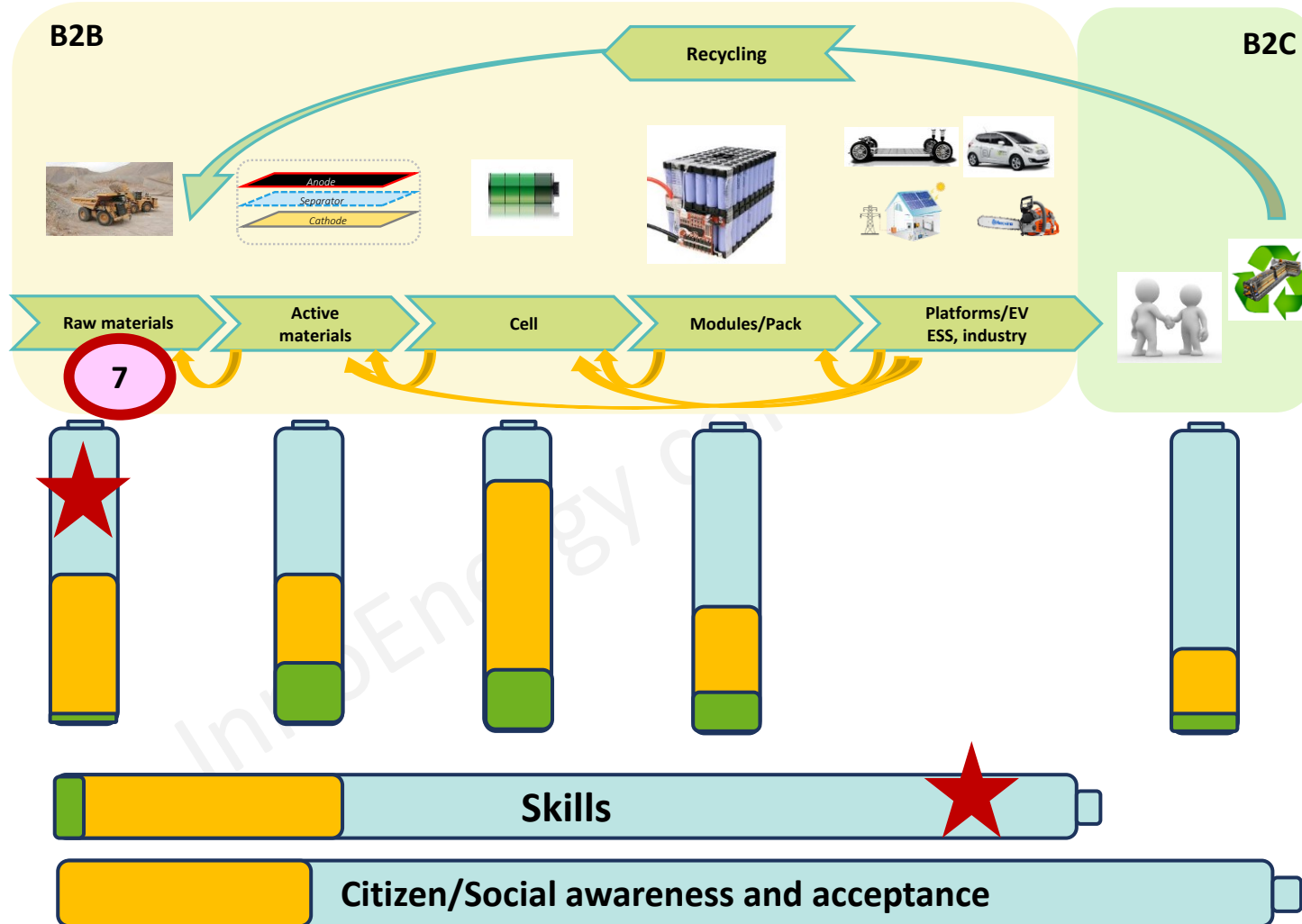
3-4M jobs

EBA: Institutions from most European countries, acting together, with an ambitious goal, lead from “Brussels”



**Traceability, sustainability, circularity and .... ambitious Europe setting the reference ww for the battery supply chain**

### Gap between **existing + committed** and **needed capacity** (for 2025)

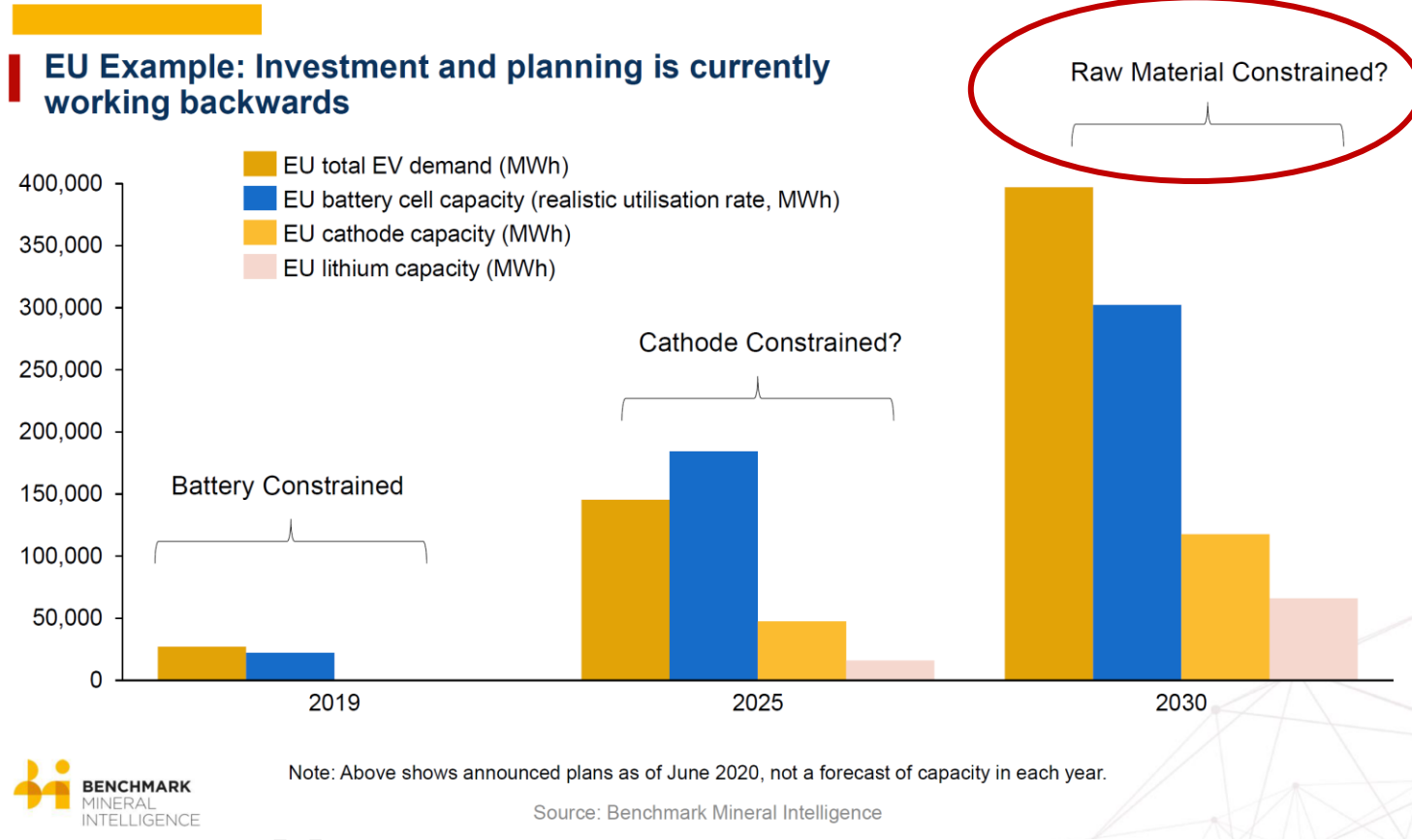


**Resilience building up, yet more speed needed**

# Still work to do and gaps to fill (2/3)

## Raw materials: Acceleration urgently needed

7

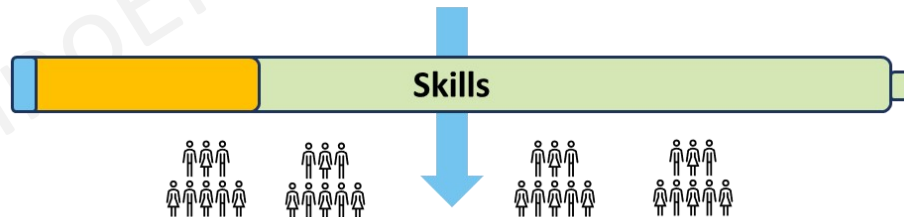
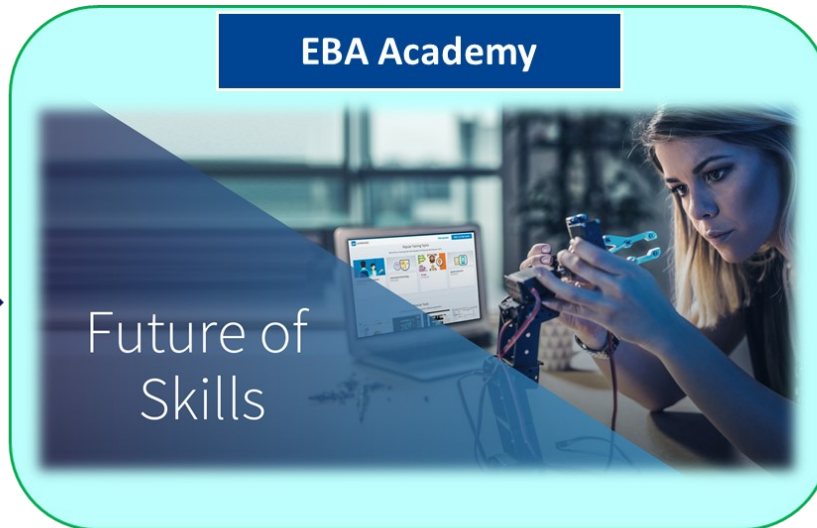
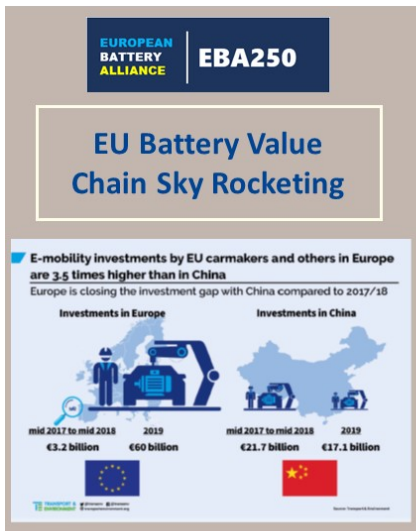


**A major structural deficit in upstream ... round the corner**

**Europe should not go from dependency in O&G to dependency in materials**



# Training 800.000 workers by 2025



**800.000 trained by 2025, 160.000 per year**  
Average cost/worker=1.000€

**Thank you for your attention!**



**Diego Pavia**  
CEO



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