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AMG ADVANCED METALLURGICAL GROUP

# ENABLING THE CIRCULAR ECONOMY

AMG INVESTOR DECK – OCTOBER 2022



AMG ADVANCED  
METALLURGICAL GROUP N.V.



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# AMG LITHIUM

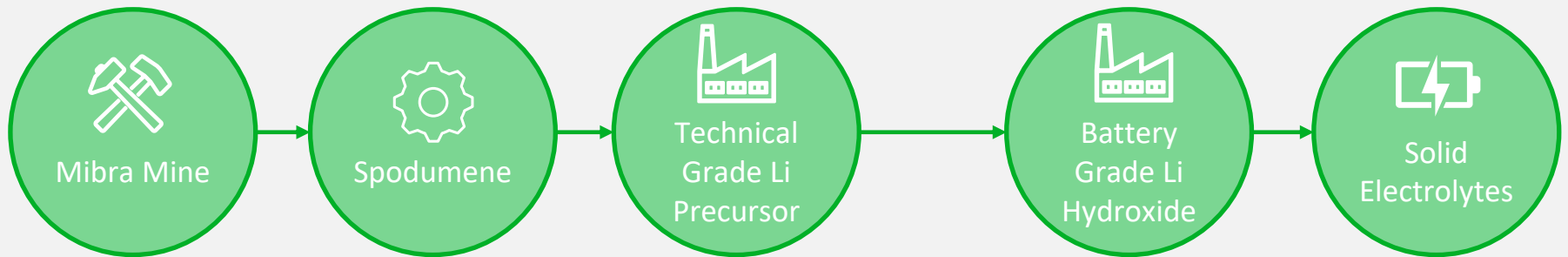


# AMG LITHIUM HAS A SIGNIFICANT FIRST MOVER ADVANTAGE IN EUROPE

## *From mining through to next generation lithium products*

Upstream - Brazil

Downstream - Germany



*Spodumene production in operation since 2018*

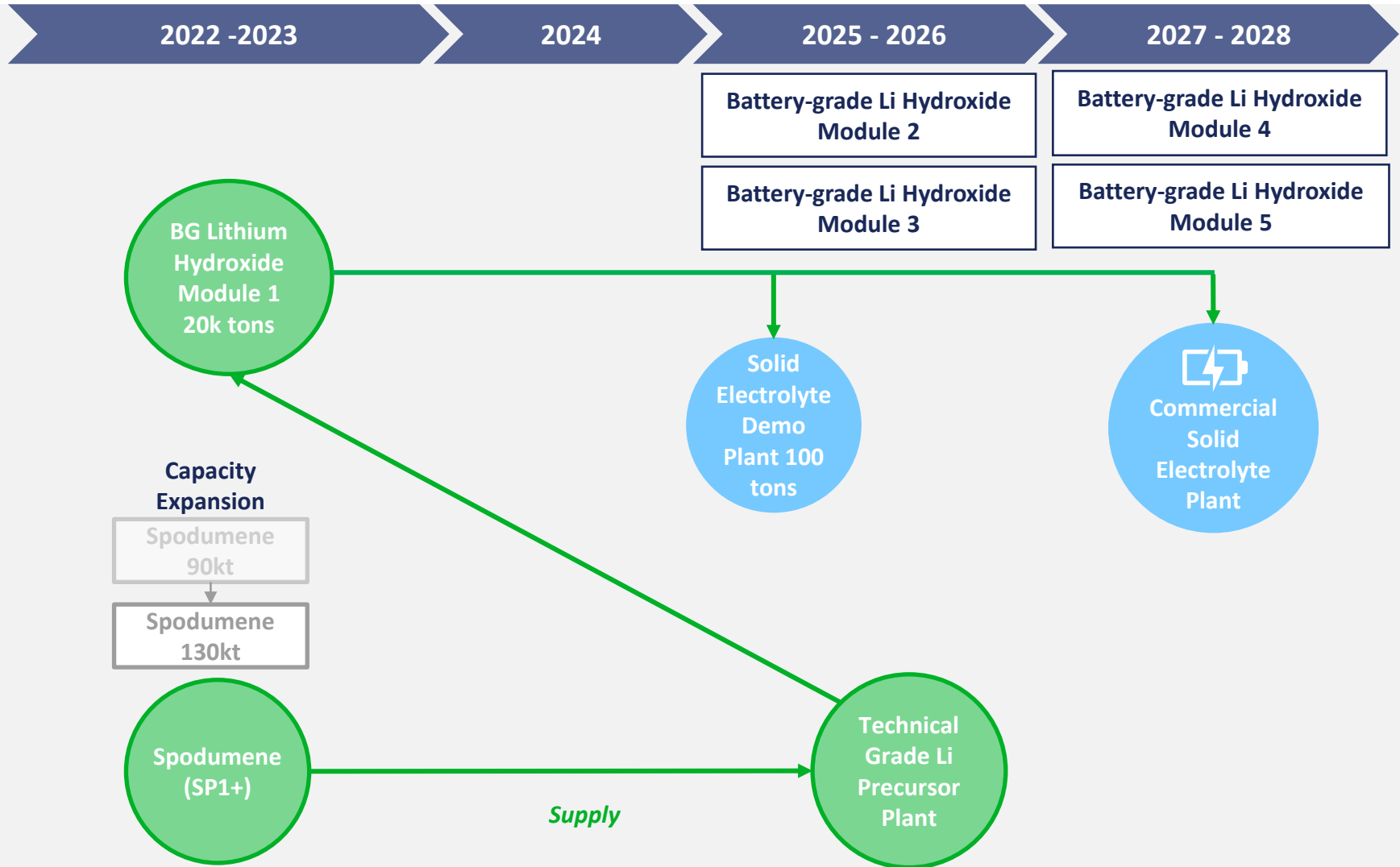
*Expansion underway*

*Under basic engineering*

*First European battery-grade hydroxide plant starting up in Q3 2023*

*Current Lab-scale production & sampling*

# MODULAR EXPANSION PLANS TO MEET GROWING DEMAND

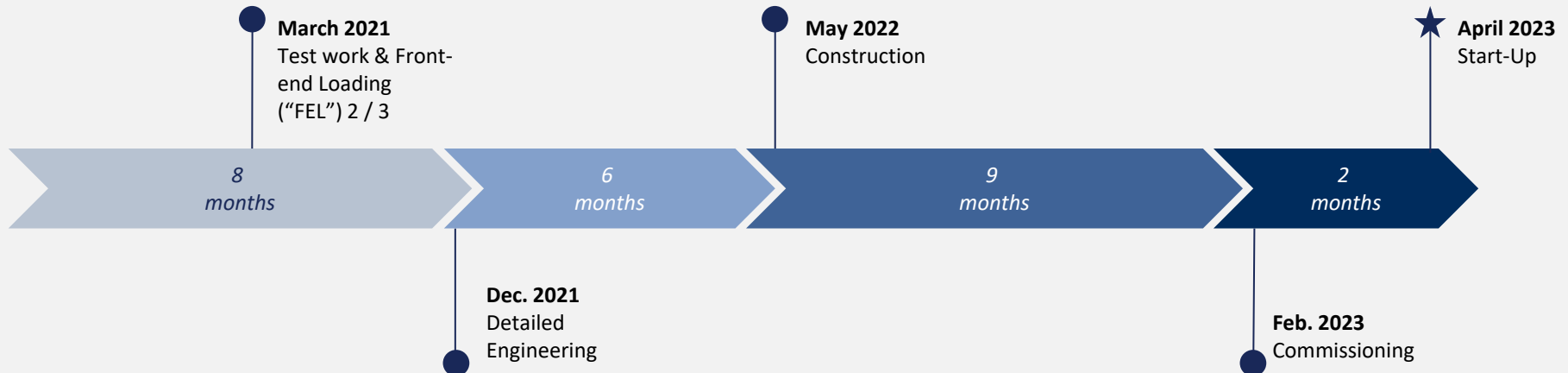


# LITHIUM CONCENTRATE EXPANSION OVERVIEW (SPODUMENE 1+)

## Spodumene Plant Expansion

- Capacity increase from 90 ktpa to 130 ktpa
- Absence of technical risk
- Expected operational improvements

## Execution Timeline

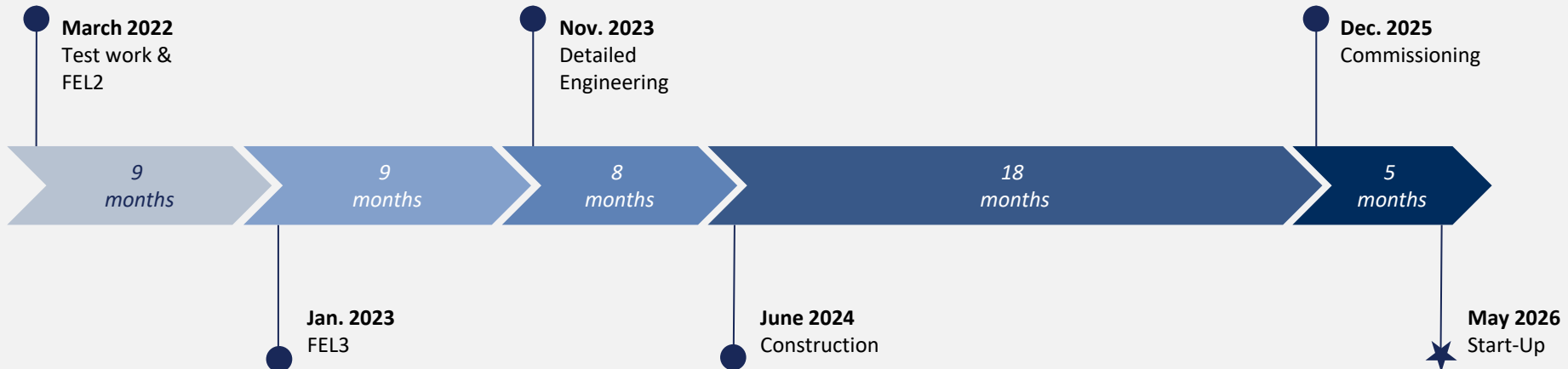


# TECHNICAL GRADE LITHIUM PRECURSOR OVERVIEW

## Technical Grade Lithium Precursor Plant

- Basic engineering underway
- Target capacity of 16.5 ktpa
- Focus on producing an interim technical lithium precursor material

## Execution Timeline



# AMG MIBRA MINE'S ESG COMMITMENT

## Environmental

- Energy storage materials provides substantial productivity enhancement to renewable energy production
- Business plan includes fundamental CO<sub>2</sub> reductions per ton
- Recently updated structural review of tailings dams and has satisfied the Church of England Mining and Tailings Safety Initiative
- ISO 14001 certified

## Social

- **Recently celebrated 1,000 days without a lost time workplace accident**
- Leading producer of 'conflict-free' raw materials
- Significant investments made into the local community

## Governance

- Complies with the strict requirements laid out by its third-party ISO 9001 (Quality Management System), 14001 (Environmental Management System), and 45001 (Occupational Health and Safety Management System) certifications



# AMG EXPLORATION

***AMG is uniquely positioned to help develop and commercialize lithium deposits globally***

## Technical Expertise

- ✓ Operational experience
- ✓ De-risking project development
- ✓ Downstream value chain expertise



***AMG possesses the know-how from first ore through construction and operations***

## Commercial Access

- ✓ Project financing expertise
- ✓ Vertical integration

Lithium Concentrate (Spodumene) Conversion

Spodumene Refining into Technical Li Precursor

Technical Grade Li Precursor Upgrading into Battery Grade Li Hydroxide

***AMG has expansion capabilities in all areas of the covered lithium value chain***

# LITHIUM HYDROXIDE UPGRADER

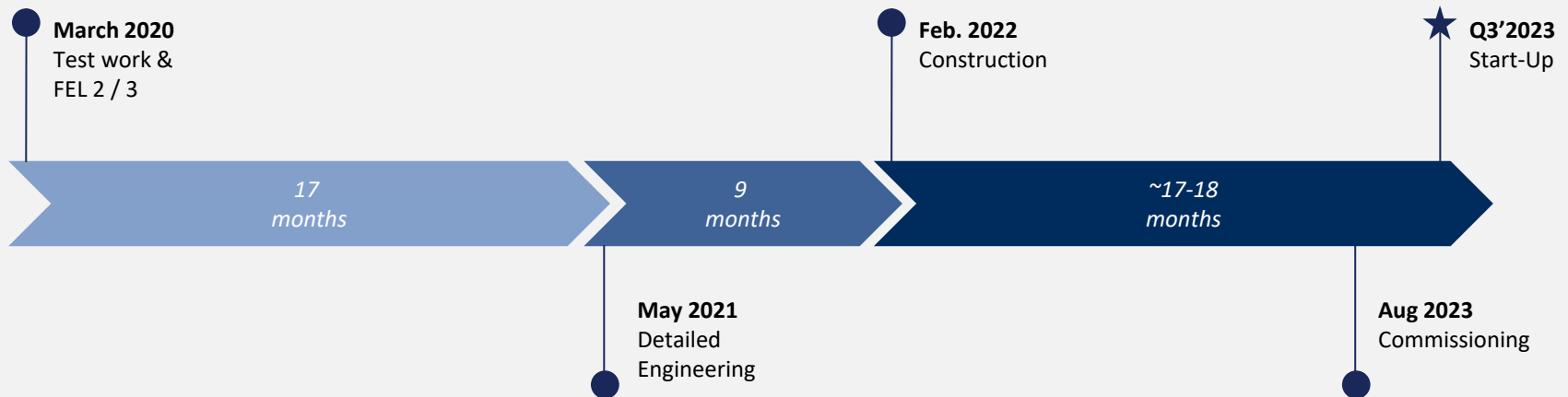


*Groundbreaking ceremony was held on May 11th for the first European lithium refinery, and commissioning for the first module of the battery grade lithium hydroxide upgrader will commence in the third quarter of 2023.*

# OVERVIEW OF LITHIUM UPGRADING FACILITY IN GERMANY

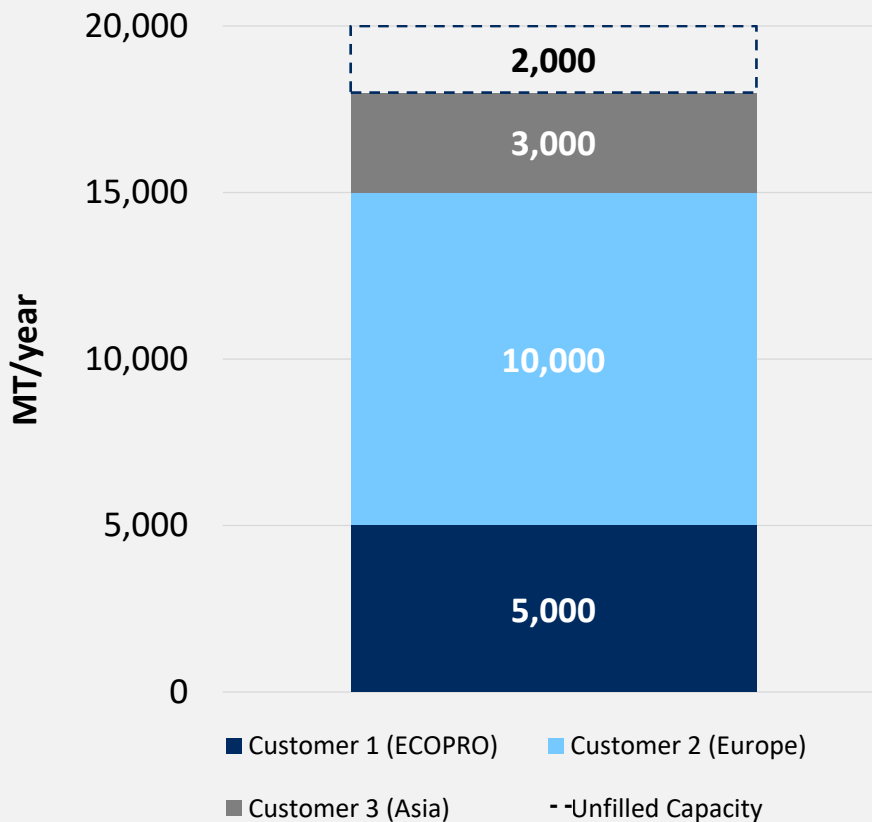
- Production of highly-refined, battery-grade Lithium hydroxide
- Located in Bitterfeld/Germany in an industrial chemical park
- Module 1 with 20,000 MT capacity, further modules up to 100,000 MT
- Expected capex of \$140 million for module 1, \$75 million per modules 2-5

## Execution Timeline



# LITHIUM HYDROXIDE OFFTAKE ARRANGEMENTS: 90% OF CAPACITY CURRENTLY UNDER MOU

## Existing offtakes/MoUs:



- AMG has signed a binding supply agreement with EcoPro for an initial three-year term to deliver a minimum of 5,000 tpa of battery-grade lithium hydroxide to EcoPro BM's cathode materials production plant in Debrecen, Hungary
- Executed MoUs cover up to 90% of module #1 capacity
- Discussions with all key European Cathode Active Materials producing plants are ongoing



# LITHIUM INDUSTRY OVERVIEW

# PUSH POLICIES ARE CREATING TAILWINDS FOR ELECTRIC VEHICLES...

## United States

Up to \$7,500 grants for BEV purchases

## United Kingdom

£3,000 for BEVs priced < £50,000

## Spain

Up to €6,500 grant for BEV purchasers

## France

€7,000 grant on the purchase of BEVs priced below €40,000 with €5,000 scrapping incentive

## Norway

BEVs are not subject to an import tax or the 25% VAT on motor vehicles

## Germany

€9,000 grant on the purchase of BEVs priced below €40,000







## China

Up to ¥22,500 (~\$3,500) grant for BEVs

## Italy

€6,000 BEV purchase incentive with an additional €4,000 if an ICE vehicle is scrapped

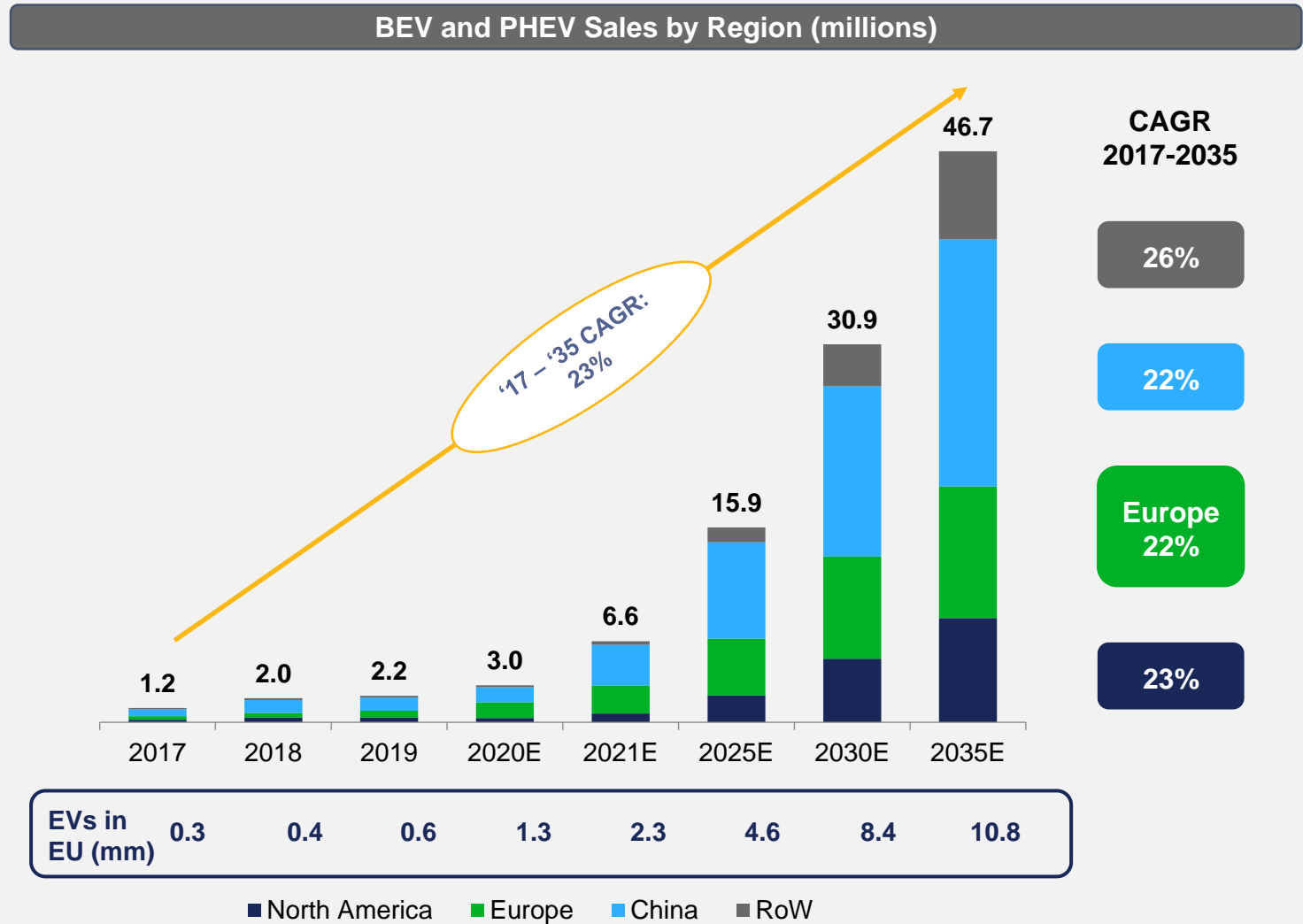
## Automotive Manufacturers Have Identified Electric Vehicle Targets

Group	2020	2025	2030
DAIMLER	2%	50%	100%
 FORD	1%	na	100%
STELLANTIS	7%	na	100%
TESLA	100%	100%	100%
VOLVO	29%	50%	100%
 RENAULT NISSAN MITSUBISHI	16%	65%	100%
 VW	11%	30%	70%
 TATA	9%	30%	60%
BMW GROUP	17%	na	50%
 TOYOTA	5%	na	50%
 HYUNDAI	4% <sup>(1)</sup>	na	36%
<b>Median</b>	<b>9%</b>	<b>50%</b>	<b>100%</b>

[x%] OEM Announcements

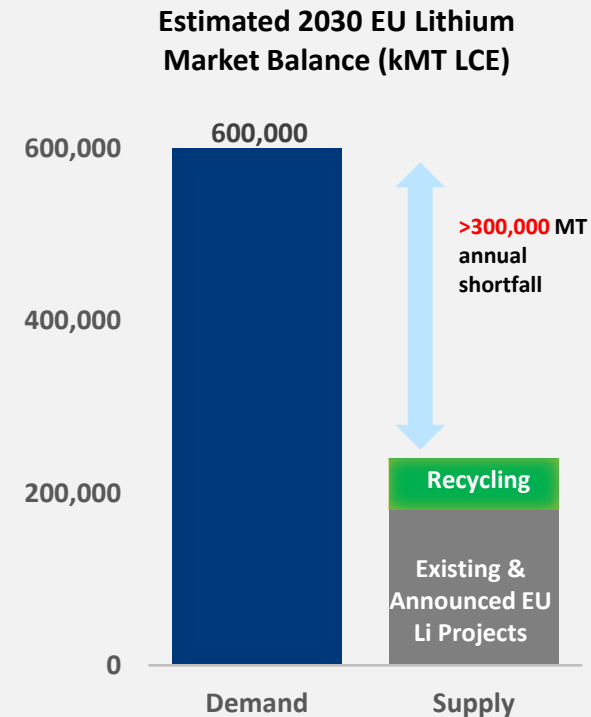
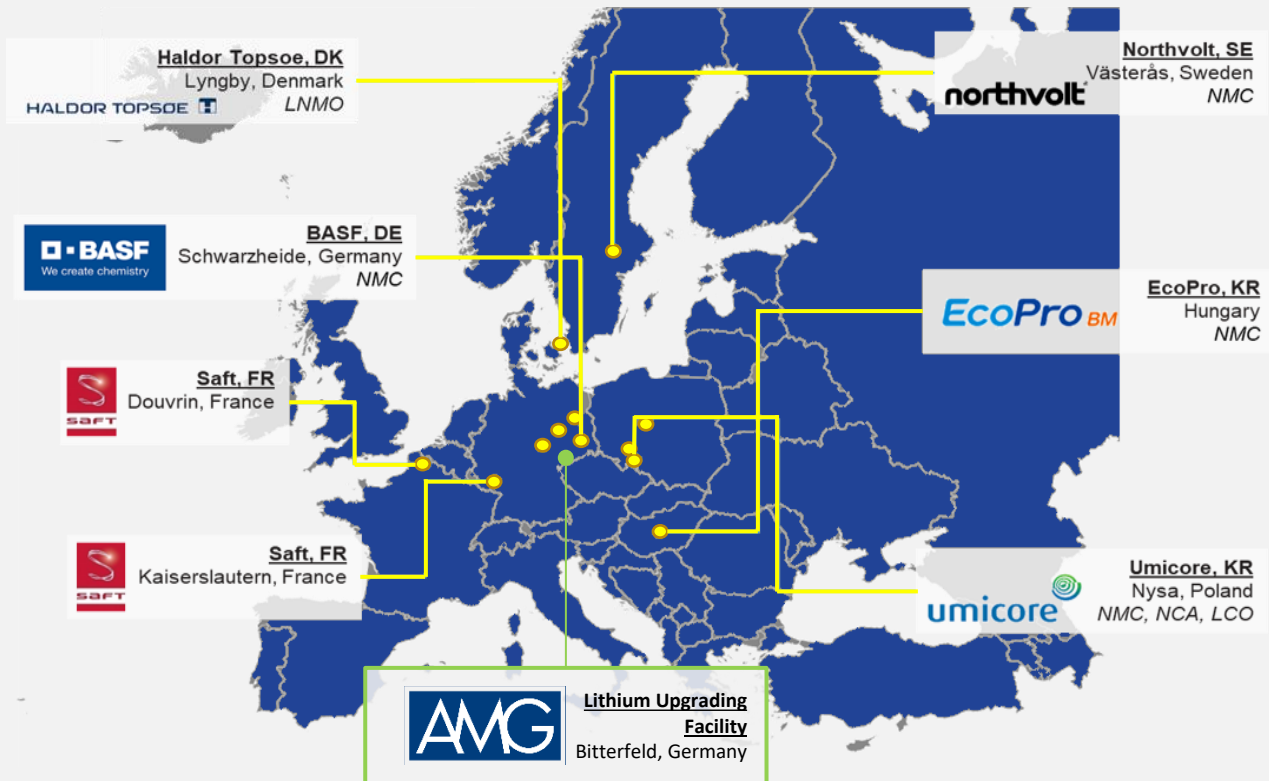
# EUROPEAN EV PRODUCTION IS EXPECTED TO GROW 22% OVER THE NEXT DECADE

- In 2021 EVs accounted for nearly 1 in 20 passenger car sales (1 in 10 including hybrids)
- The European EV market grew significantly in recent years due to favorable government policies coupled with changing consumer attitudes
- The EU's recently-announced EV penetration target of 30 million+ cars by 2030 creates further upside
- Since 2015, the price gap between EVs and internal combustion engines (ICEs) has narrowed by ~65%, supporting higher EV adoption moving forward



# EU MARKET TO REQUIRE SIGNIFICANT AMOUNT OF BATTERY- GRADE LITHIUM HYDROXIDE

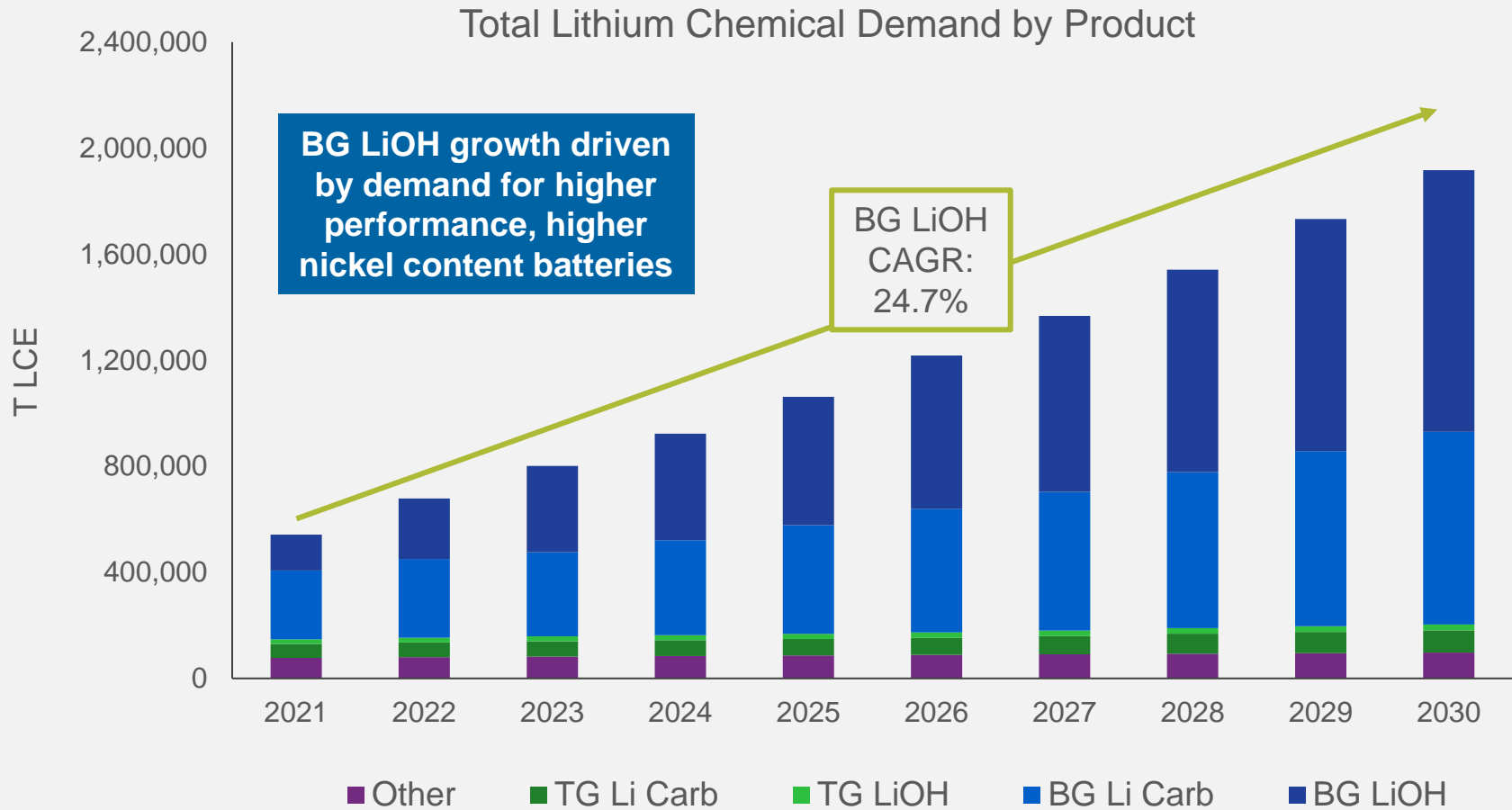
***AMG will be the first European battery-grade lithium hydroxide producer serving the growing EU cathode material market...***



***...which is significantly short by 2030***

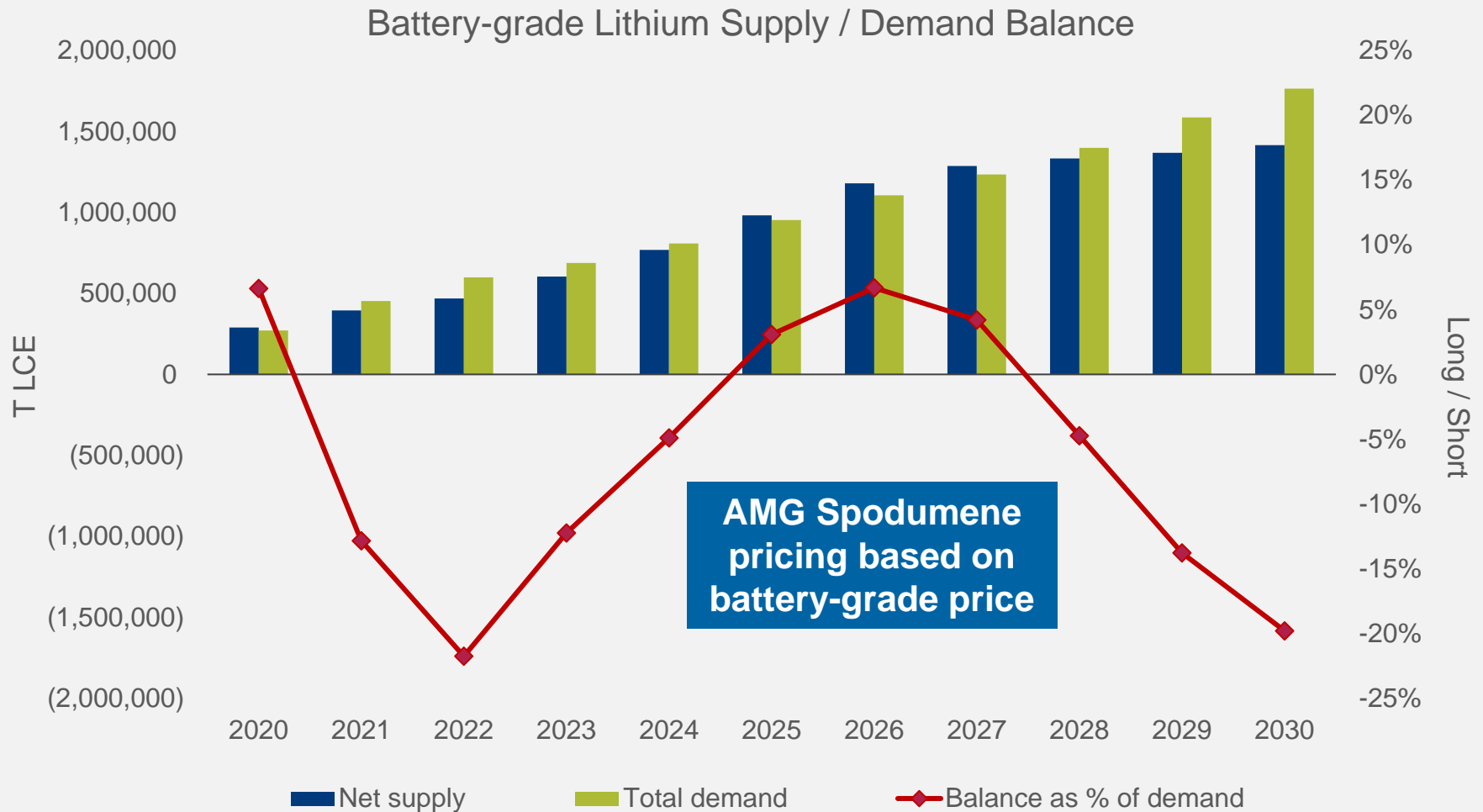


# BATTERY-GRADE LITHIUM HYDROXIDE (LIOH) IS THE FASTEST GROWING LITHIUM CHEMICAL PRODUCT



**AMG Lithium Bitterfeld plant focused on battery-grade hydroxide**

# THE BATTERY-GRADE LITHIUM CHEMICAL MARKET IS EXPECTED TO REMAIN LARGELY BALANCED



# AMG SPODUMENE CONTRACT PRICE IS DIRECTLY TIED TO SPOT PRICE FOR LITHIUM CARBONATE AND HYDROXIDE

## AMG Spodumene Contract Components

**Component  
I**

Average Index Spot Price<sup>1</sup>:  
*(Lithium Carbonate + Lithium Hydroxide) / 2*

**Component  
II**

Total Cost =  
*Minimum Spodumene Price + Conversion Cost*

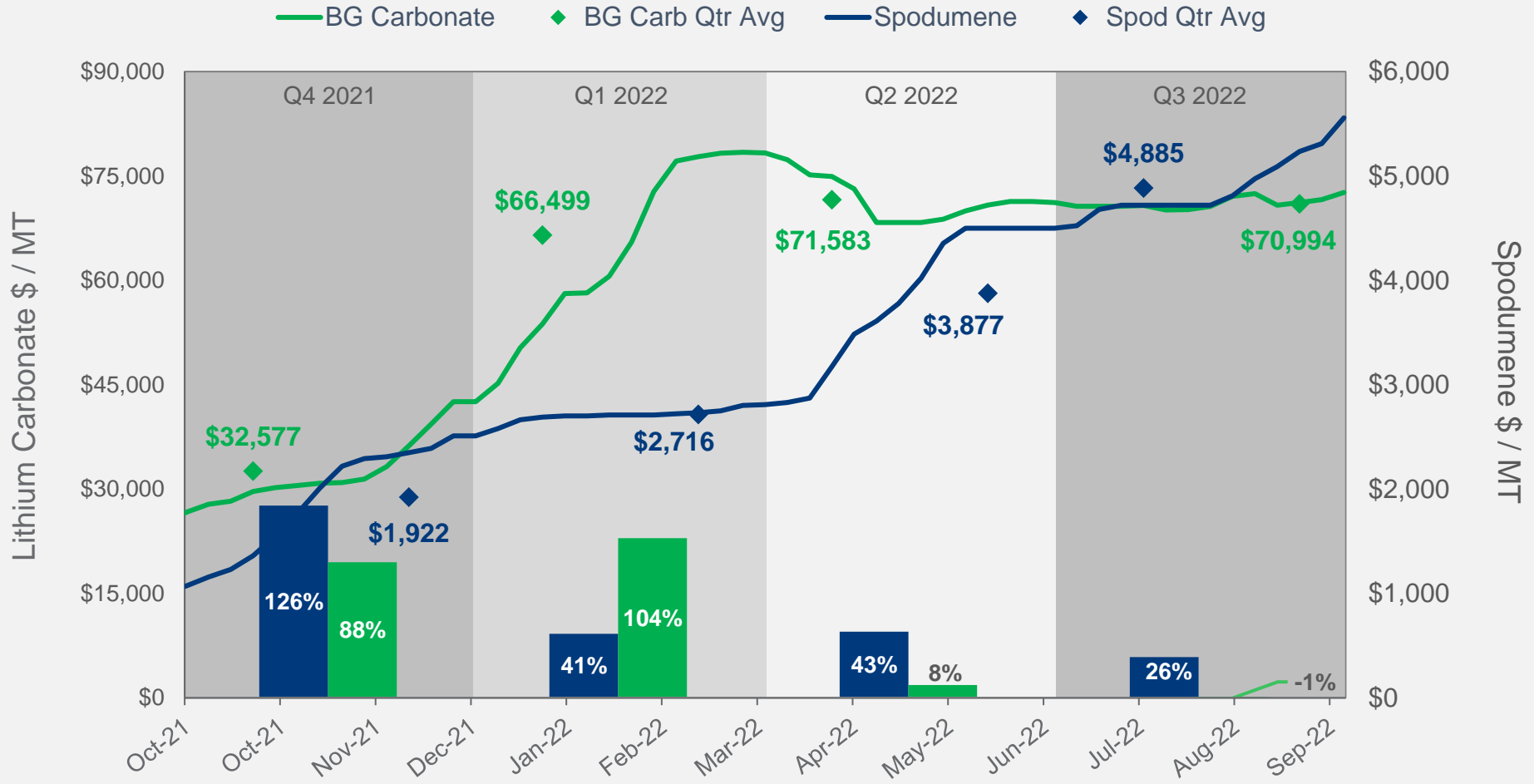
**AMG  
Spodumene Price**

*(I – II) % + Minimum Price*

<sup>1</sup> Asian Metal Market spot price

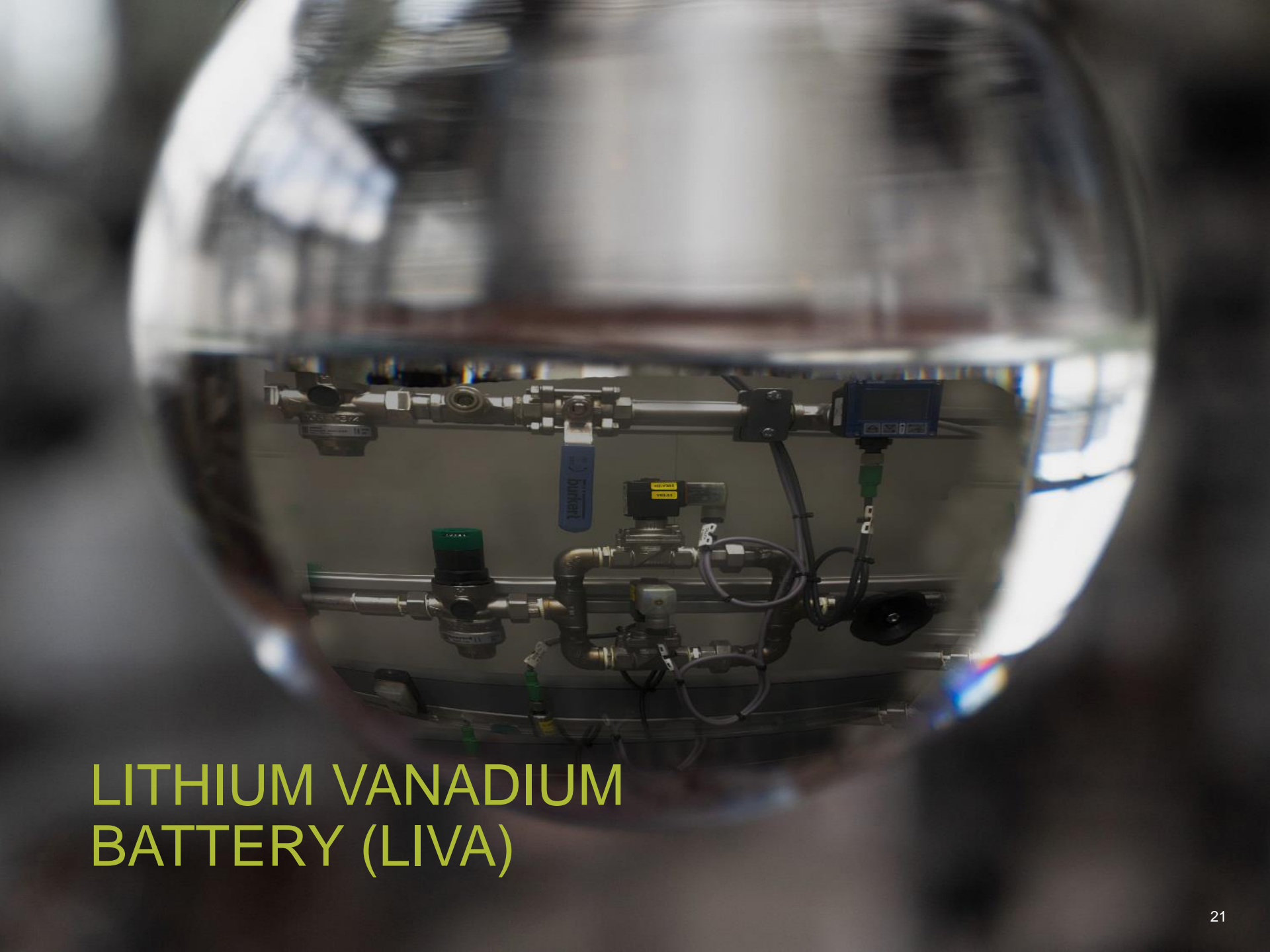
# LITHIUM CARBONATE VS SPODUMENE PRICES

(ASIAN METAL MARKET SPOT)



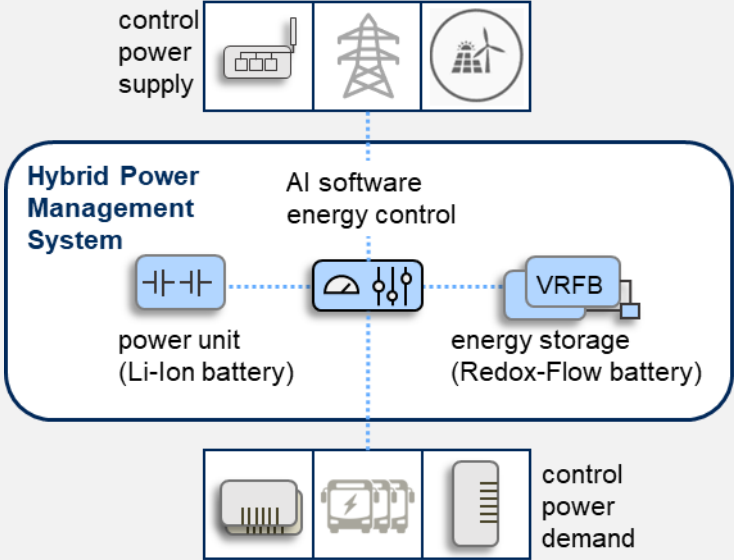
**Notes**

- Prices are shown as weekly averages taken over the period October 1, 2021, through September 30, 2022
- Pricing Indexes: Asian Metal's Spodumene Li<sub>2</sub>O 6%min CIF China USD/mt; and Asian Metal's Lithium Carbonate 99.5%min China RMB/mt, converted to \$/mt

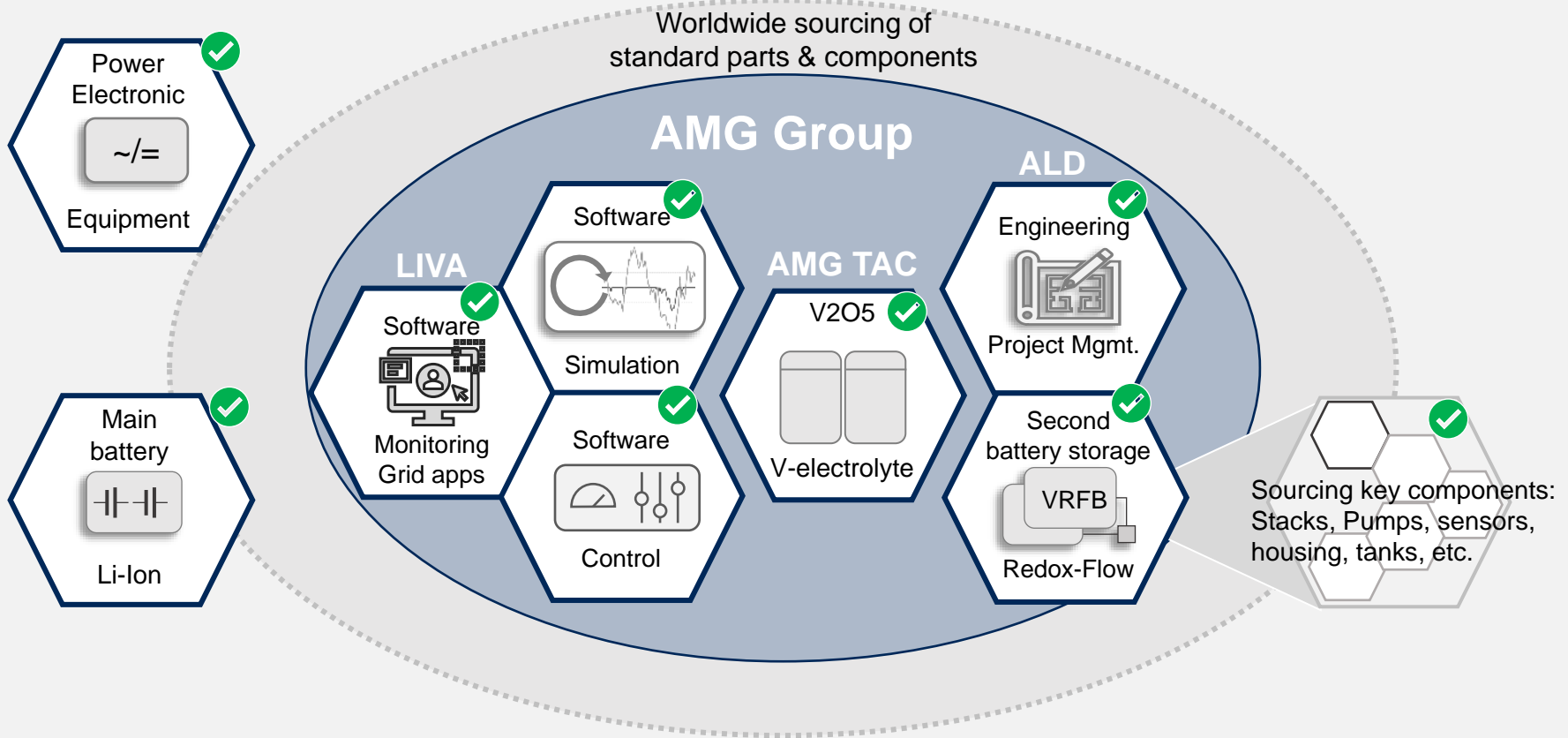


LITHIUM VANADIUM  
BATTERY (LIVA)

# THE AMG LITHIUM & VANADIUM BATTERY (LIVA)



# VALUE CHAIN & CAPABILITIES OF AMG GROUP



# SHELL & AMG RECYCLING B.V. (SARBV)





# SHELL & AMG RECYCLING B.V.'S (SARBV) KEY ACCOMPLISHMENTS

November 2019



## MOU with Ministry of Investment (MISA)

- Formerly the Saudi Arabian General Investment Authority (SAGIA)
- Establish to support and attract investment projects to the Kingdom
- Facilitates project development, site selection, financing, etc.

September 2021

## United Company for Industry

- Subsidiary of Aljomaih Holding
  - Established in 1936
  - 6,000 Employees, >\$1.7B in revenue and \$2.7B in assets
- Focused on Chemicals and Manufacturing
- Member of the Shareek program

## MOU with United Company for Industry (UCI)

- Establish a local partner
- Access to domestic financing and incentives in the Kingdom of Saudi Arabia (KSA)
- Local support for in-Kingdom project localization

July 2022

## Joint Venture / Shareholders Agreement with UCI



## Sales Agreement with Saudi Aramco

- Long Term Offtake Agreement of vanadium-bearing gasification ash from the Jazan Refining Complex

# WORLD-CLASS METALS RECLAMATION FACILITY

The SARBV Supercenter

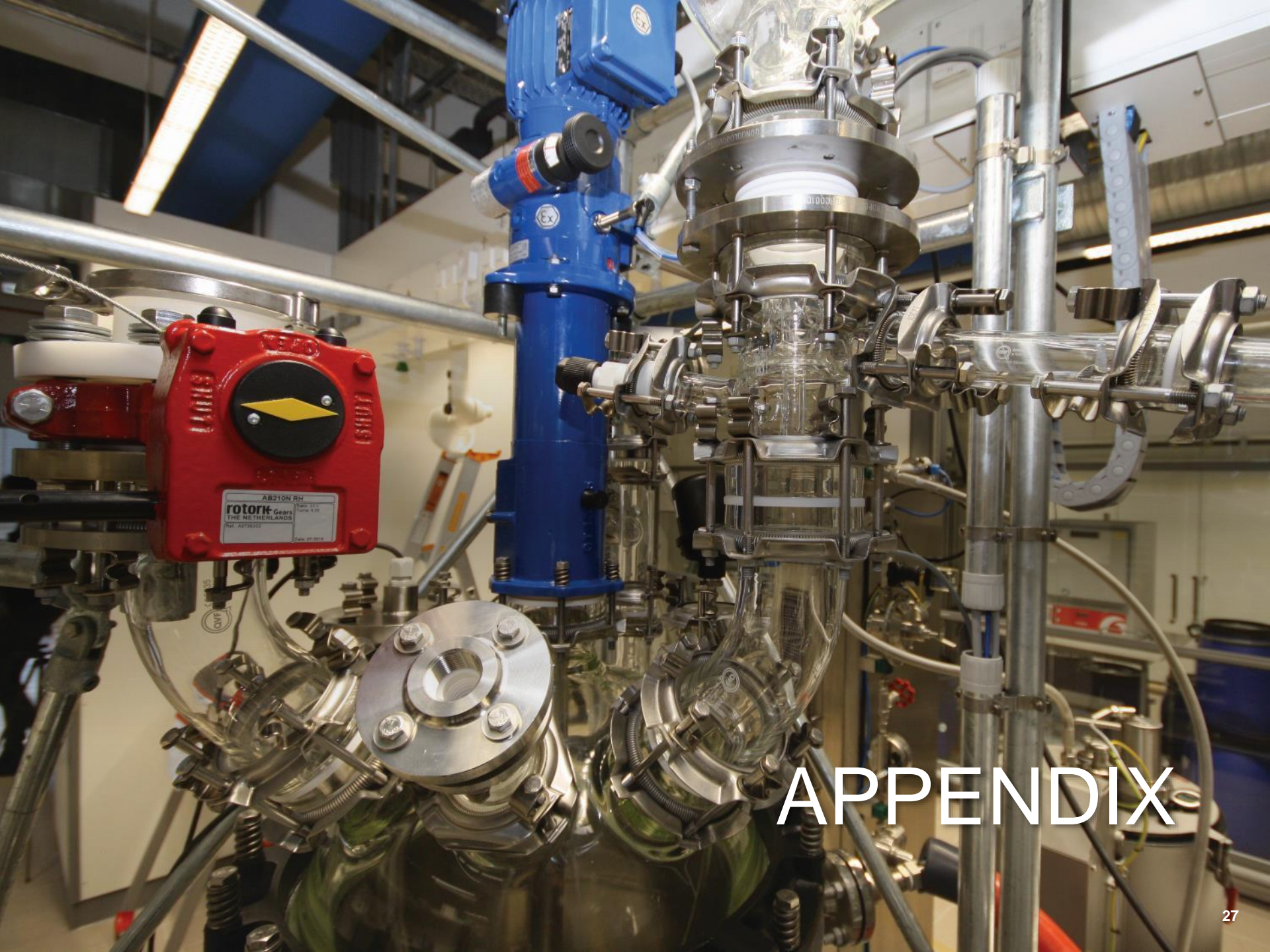
Project 4: Mass Energy Storage  
Technology Provider:  
AMG LIVA



Project 3: Fresh Catalyst Manufacturing  
Technology Provider:  
Shell Catalysts & Technologies

Project 1: Gasification Ash  
Technology Provider:  
AMG TAC

Project 2: Spent Catalyst  
Technology Provider:  
AMG Vanadium



# APPENDIX

# EBITDA BY ORIGIN AND DESTINATION

