

CAPITAL MARKETS DAY

2 September 2015

Andaz London Liverpool Street

Recycling

Speaker

Stephan Csoma

*Executive Vice-President,
Recycling*

Agenda



Business group profile



Recycling

Technical
Materials
(TM)



Jewellery and
Industrial Metals
(JIM)



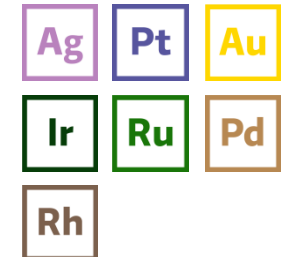
Precious Metals
Refining
(PMR)



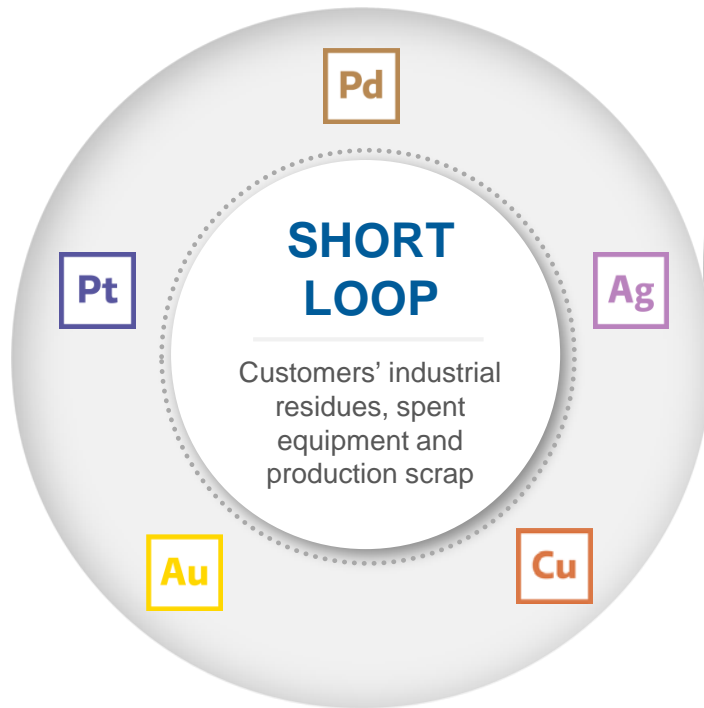
Platinum
Engineered
Materials
(PEM)



Precious Metals
Management
(PMM)

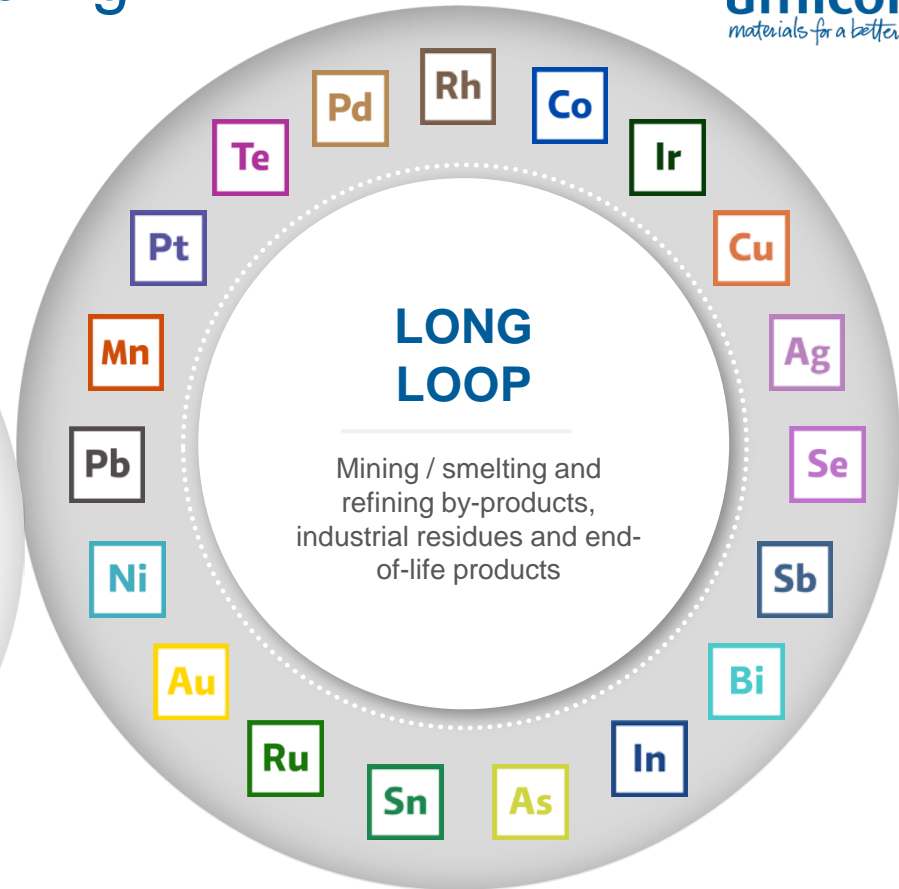


Closing the loop in Recycling



JIM, TM and PEM

High precious metals concentrations, sampling easier, simpler technology, integrated with product offering



PMR

Complex (lower precious metals concentrations, numerous metals), sampling more complex, sophisticated technology

Short closed loop in Recycling



Ag

Technical
Materials

Ag



Jewellery
and Industrial Metals

Ag

Au

Pt

Pd

Cu

Pt



Platinum
Engineered
Materials

Pt

Pd

Rh

Precious Metals Management (PMM) sources
precious metals for industrial business units

Asian presence becoming increasingly important



Growth and profitability drivers

Business unit



Main growth drivers

Jewellery and Industrial Metals

Global demand for jewellery and industries eg. mint or decorative

Platinum Engineered Materials

Evolution in the high-purity glass market and fertilizer industry

Technical Materials

Demand in electrical, automotive and HVAC industry

Precious Metals Management

Demand in Umicore business units and demand for physical delivery of metals



Profitability drivers

Integration of products and recycling services

Product design / innovation and applied technology and closed loop offering

Product innovation, operational excellence and closed loop offering

Metal services and trading

Key takeaways



Integration of short loop offering enhances competitiveness of product activities



Umicore to grow in line with the market and maintain strong performance



Continue the focus on cost competitiveness and regional positioning



umicore
materials for a better life

Precious Metals Refining

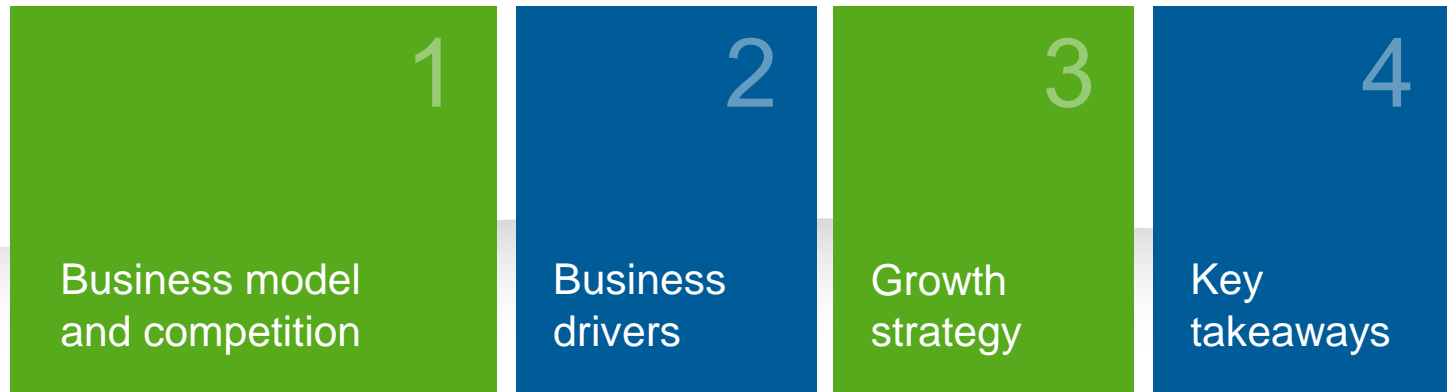
Speaker

Luc Gellens

*Senior Vice-President,
Umicore Precious Metals Refining*

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Precious Metals Refining today

Largest and most complex precious metals recycling operation in the world



Processes more than 200 different types of raw materials



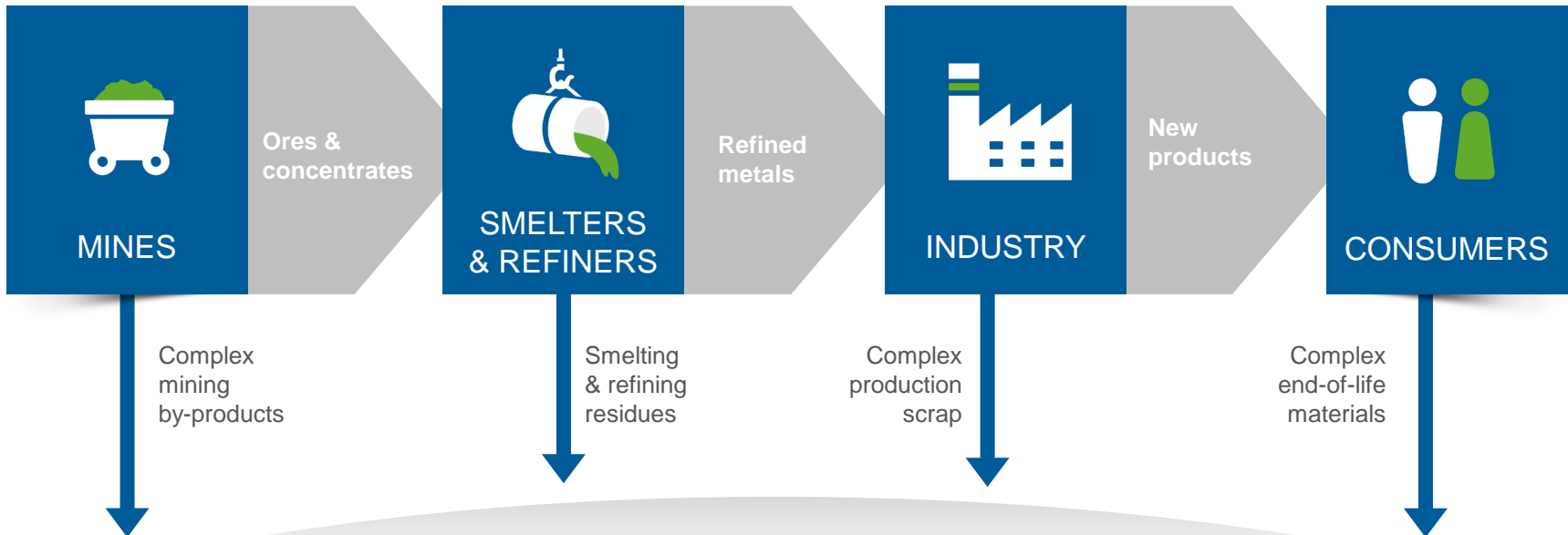
World leading refiner of 20 different metals



World class environmental and quality standards

The value chain of metals

200+ materials to close the loop



Industrial by-products

86%
volume

75%
revenues



Recyclables

14%
volume

25%
revenues

Precious Metals Refining today



How PMR generates revenues



Main revenue drivers

Treatment & refining charges

Treatment charges are determined, among other criteria, by the complexity of the materials.

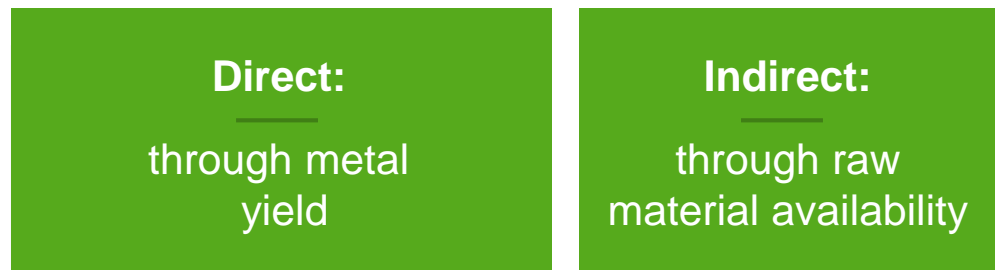
Metal yield

Umicore assumes the risk of recovery above or under the contractually agreed recovery rate.

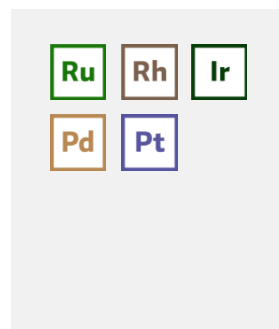
Metal price exposure



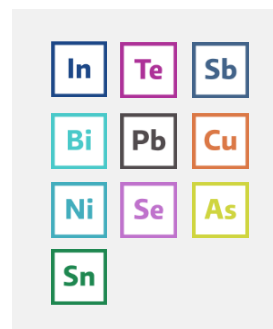
Metal price exposure



Au
Ag



Ru Rh Ir
Pd Pt



In Te Sb
Bi Pb Cu
Ni Se As
Sn

Managing the effects of metal price movements on earnings

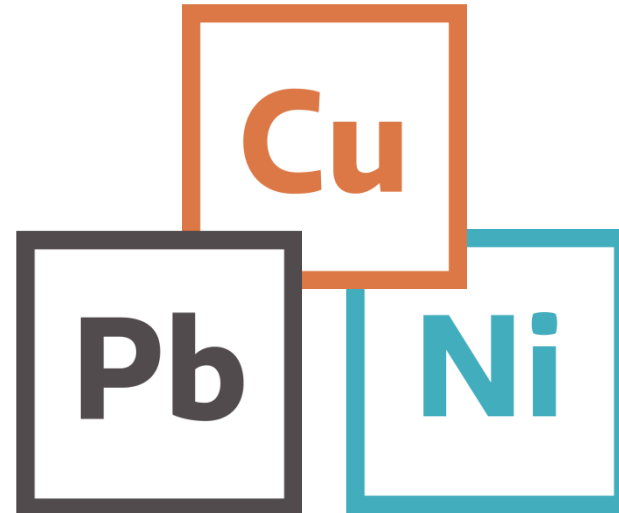
Systematic hedging of transactional exposure (pass through metal)

Depending on market conditions hedging of (part of) structural metal price exposure through contractual arrangement

Impact on working capital is mitigated by toll-refining – metals remain property of the supplier during treatment

Umicore has unique technology

Umicore is unique
due to its proprietary
complex flowsheet that
combines three
metallurgical streams



This enables

Flexibility to treat
a broad range of
input materials

Recovery &
valorization of
the most metals

Ability to optimize
feed and therefore
profitability

Scope to broaden
to new types of
materials in future








Umicore has unique technology

- Umicore technology guarantees **environmentally friendly** processing, a high yield and a more competitive cost
- PMR has invested heavily in **new and advanced processes**
- PMR introduced its unique UHT technology for Battery Recycling four years ago



Competitive landscape

None can take in the wide span of materials and metals

Category	Examples	Products	Degree of overlap
Base metal Refiners	Stolberg, Penoles, Glencore, Tech Cominco, LS Nikko, Brixlegg	Cu, Pb, Zn by-products containing precious metals (PM)	
		Some e-scrap	
Primary PGM Refiners	Stillwater, Amplats	Recyclables: automotive catalysts	
Specialty PM/PGM Refiners	Vale, Impala, Norilsk JMI, BASF, Heraeus, Chimet, Tanaka, Nippon PGM, Sabin, Gemini	By-products rich in PM	
		Recyclables: industrial or automotive catalysts	
Specialized Refining Companies	Dowa, Boliden, Aurubis, Korea Zinc	Cu, Pb, Zn, Ni by-products containing PM	
		Recyclables: electronic scrap and industrial catalysts	

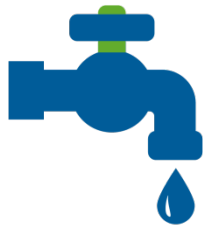
- **Most competitors are customers**
- They usually focus on niches
- No other company can process as wide a scope of materials as Umicore



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Long-term business drivers



Resource
scarcity



Increased complexity
of materials



Eco-efficiency

Capture more value through capacity expansion, unique technologies and new streams of recycling



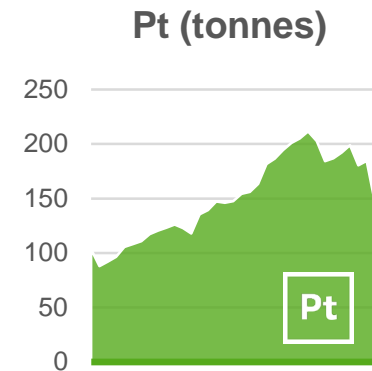
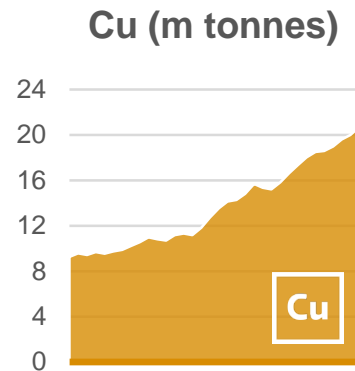
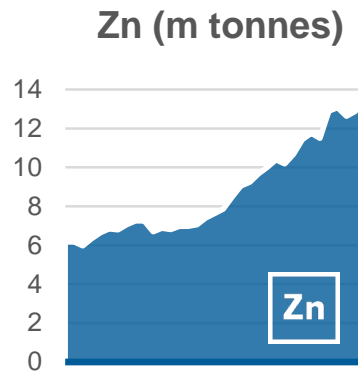
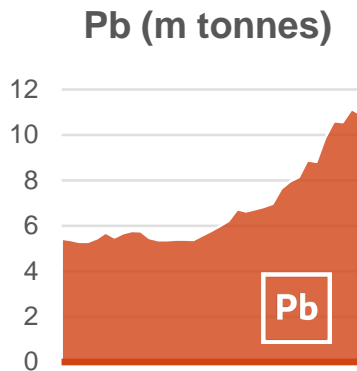
Resource scarcity

Opportunity for PMR to process more materials

Increase of production of metals leads to more by-products from the base metals and PGM industry

Processing end of life products is necessary for a sustainable supply of metals

Evolution of global production level 1980-2014





Increased complexity of materials

Availability to increase for Umicore



- Availability of complex concentrates on the rise which means **higher complexity of by-products from primary refiners**
- Diversity and complexity in the recyclables market **limits processing of these materials** by base metals smelters
- Increased pressure on non-ferrous smelters to comply with **stricter EHS guidelines**

Trading companies like Trafigura, Ocean Partners and others have made significant investments in storage and blending capacity in recent years as the volume of complex concentrates in the market have increased.

Metal Bulletin
Oct 2014

Many of the new mines currently coming on stream are producing concentrates with high levels of impurities.

South American mining company, Reuters
Dec 2014

So we are actively looking at process changes and new technologies in order to cope with the complexity in a suitable manner.

Copper refiner, Metal Bulletin
Apr 2015



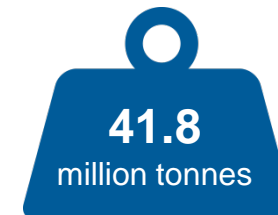
Eco-efficiency

Trend towards higher recycling rates



- Base metal smelters are increasingly obliged to find an outlet for their by-products
- **Recycling markets of end-of-life products to increase**
- Processing complex materials in an environmentally friendly way **will become the norm**

E-waste
generated
in 2014



Only 4 billion people
are covered by national
legislation



That's approximately
4 out of every
7 people



Umicore Precious Metals Refining's outstanding environmental performance and ethical sourcing practices provide an additional competitive edge

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Growth strategy 2015-2020



Increase
in capacity



Continuous
upgrade of fixed
assets base



R&D to maintain
technology
leadership

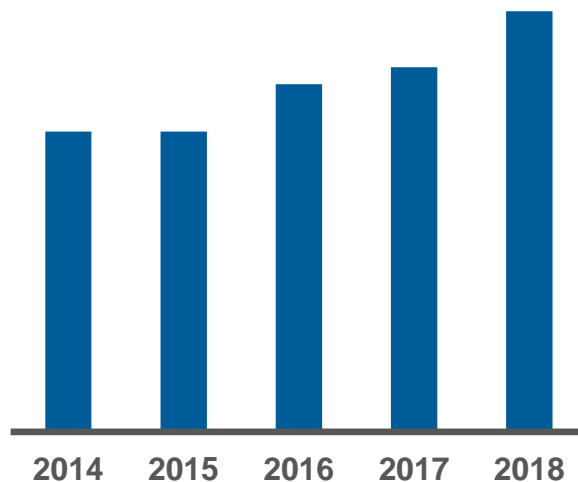


Recycling
development



Capacity increase is key to growth

Projected volume evolution



Investment to increase capacity at Hoboken by 40%

Execution 2014-2015;
ramp-up 2016-2017

Further improvement of competitiveness through **economy of scale**

Refining charges will initially not follow the same pace as volume growth due to material mix



Continuous upgrade of fixed asset base

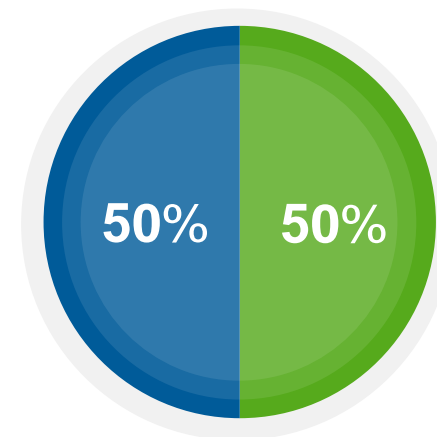
- **Continuous improvement** through investments in fixed assets will continue
- **Innovation remains critical** in guaranteeing strong performance (environment, metal yield, cost)
- Debottlenecking **never stops**





R&D to maintain technology leadership

- PMR continues to **invest heavily in R&D**
- Innovative process technology ensures PMR remains the **leader in complex metallurgy**
- Battery recycling technology, introduced in 2011, is offering **options for future process improvements**



- Hoboken in plant experimentation
- Group R&D

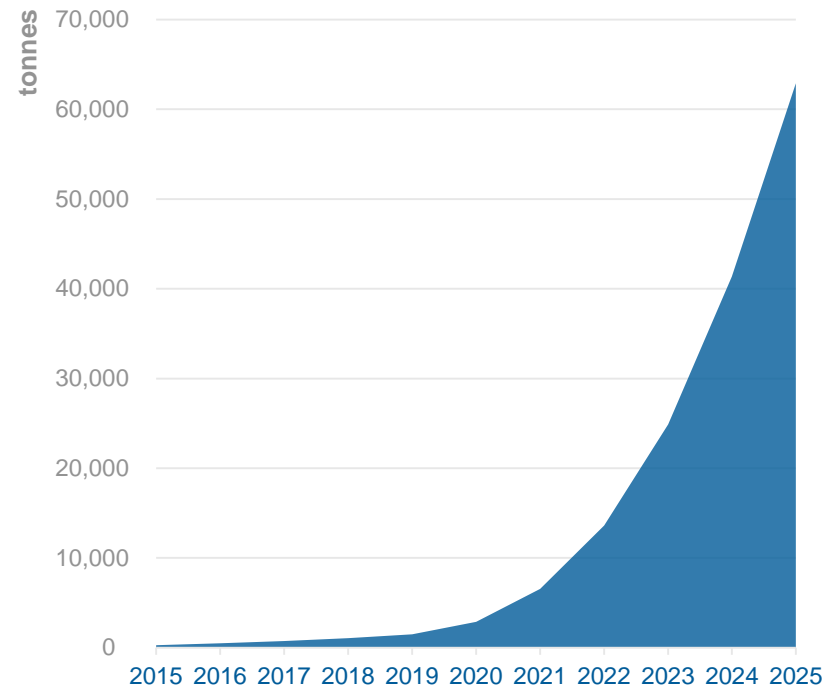


Recycling development

Battery recycling

- The demo plant is operational since 2011. Processing of spent rechargeable batteries optimized and validated
- The market is set to develop strongly in the coming years
- By 2020, Umicore will be ready for scaling-up to a real industrial footprint

End-of-life Li-ion battery market



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Key takeaways



Unique position in complex recycling



Increasing availability of complex materials



Near-term growth driven by 40% expansion of Hoboken facility. Full benefits from 2018.



Active pursuit of growth avenues post 2020, including battery recycling