An innovative value chain for sustainable products

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AMAP colloquium, 16 Nov 2017, 4pm

EUROPEAN ALUMINIUM

Presentation outlines

1/ Who we are
2/ The Aluminium sector in Europe and the main applications
3/ Our vision, the sustainability roadmap and the Innovation Hub
4/ The main R&D challenges along the value chain
5/ Some examples of collaborative EU projects
6/ Conclusions

1 / Who we are

80+

members

approx. **600** **plants**

in 30 European countries (EU 28, EFTA and Turkey)

1 **million +** Direct and indirect jobs across Europe's value chain

€39.5

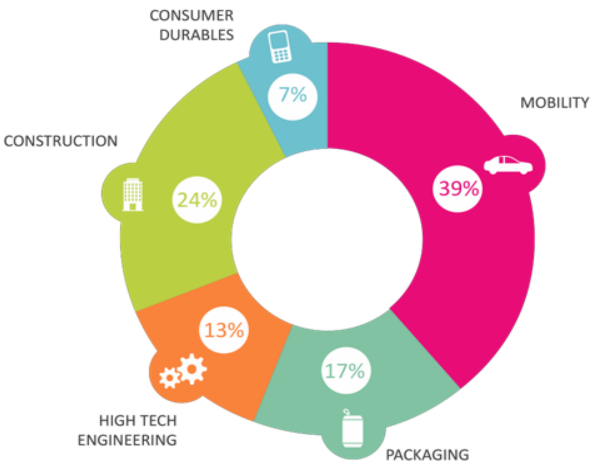
Billion annual turnover [2015]

Founded in

1981

European Aluminium represents the entire value chain of the aluminium industry in Europe

An innovative value chain serving EU key markets



90%

of aluminium is recycled in construction and automotive in Europe

Europe produces

16%

of worldwide aluminium, half of which from recycled sources

*Status: October 2017

1 / Our members*

3A Composites
ABB
Aluminium France
Alcoa
Aleris
ALFED Aluminium Federation
Alinvest
alteo
alu.ch
aludium premium aluminium
aluminium Danmark
alufoil European Aluminium Foil Association e.V.

Alumil
aluminio
Aluminium Association of Greece
Aluminium Center Belgium
Alusigma
AMAG Austria Metall
Arconic
aseral
Assan Alüminyum
ASSIRAL Associazione Italiana Raffinatori Alluminio
BAGR

Befesa
BOAL Extrusion
Bridgnorth Aluminium Limited
Centroal Centro Italiano Alluminio
Coil Adding Value to Aluminium
Constellium
DIK
Elval Hellenic Aluminium Industry S.A.
EMAX Sustainable Aluminium
EP-AL-ME S.A. Aluminium Recycling Industry-Billets
Estal
Etem
Eural Gnutti S.p.A.

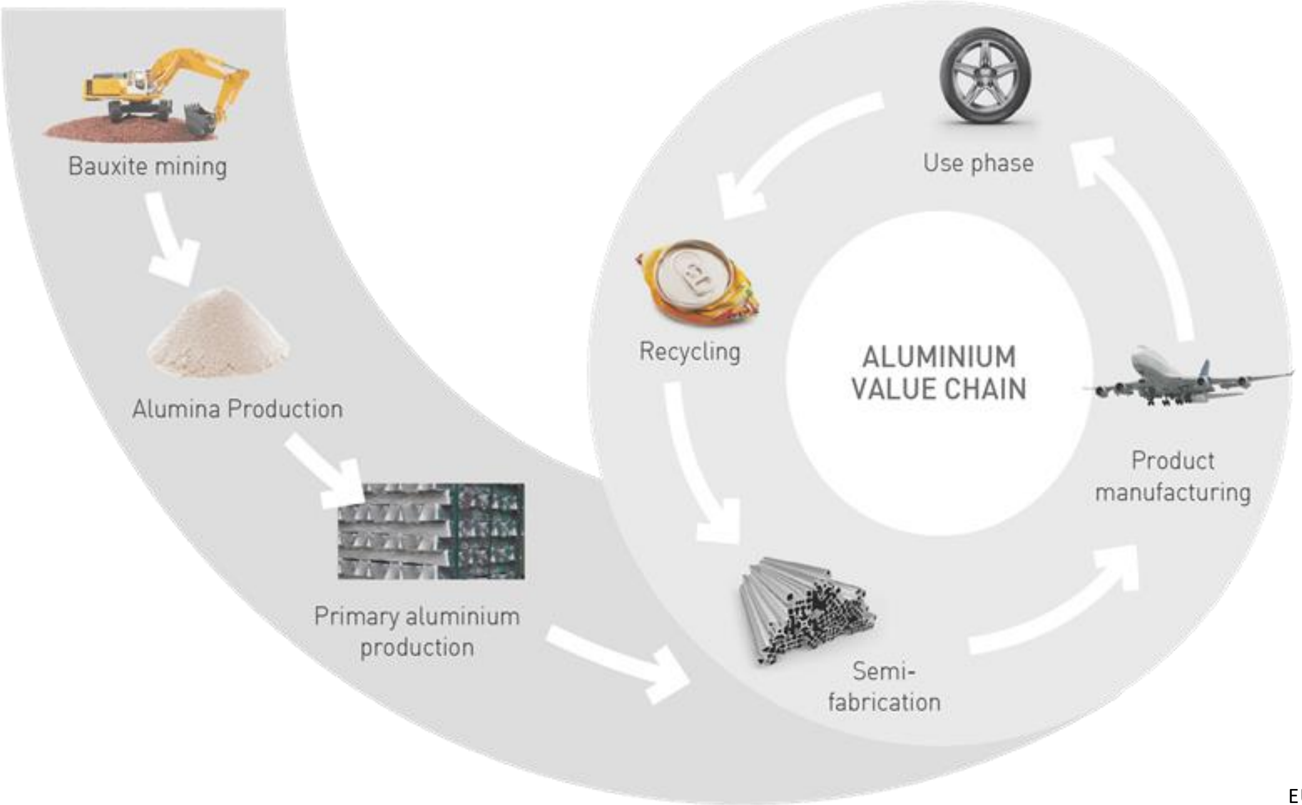
GDA Gesamtverband der Aluminiumindustrie e.V.
Gränges
HAI Hammerer Aluminium Industries GmbH
HAP
Hydro
idalsa
alu igora.ch
impexmetal s.a. Aluminium Konin
impol Aluminium Industry
Intals
Kawneer
Kubal

Kuusakoski Recycling
Liberty British Aluminium
Mäkelä Alu
Metal Exchange Corporation
Metra
Mytilineos
Norðurál Century Aluminum
Novelis
Polst Poland Smelting Technologies
Prodigo Source of Potential
Profil Gruppen.
Profils Systemes

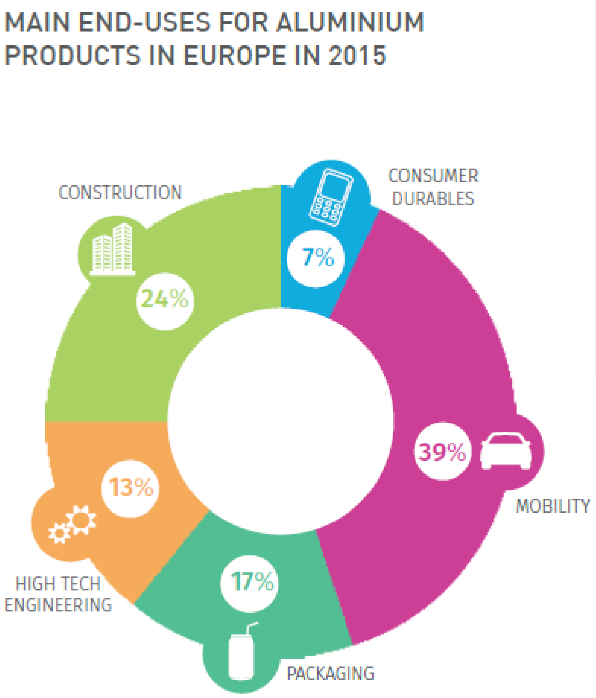
Purso
RM Raffineria Metalli Capra spa
Raffmetal The Aluminium Evolution
Real Alloy
Reynaers Aluminium
RioTinto
RVA Respectons notre environnement
Sacal Società Alluminio Carisio
Samal
sapa:
Wicona Technal domal
S.A.V. S.p.A.
Scepter Tatabánya Kft.

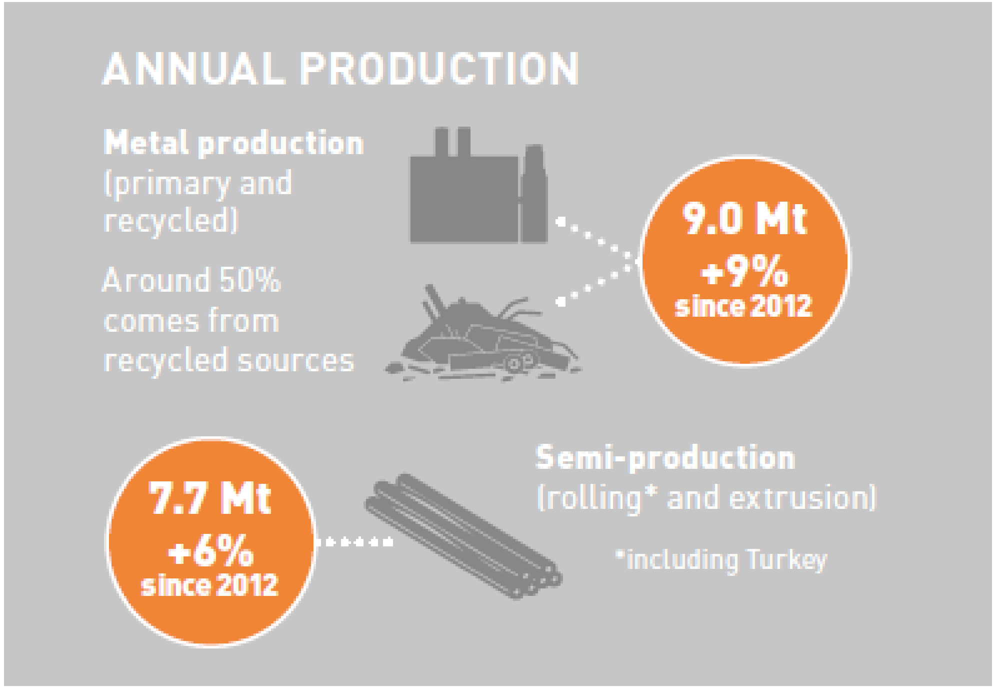
ScholzAlu Stockach
Schüco
Slim Aluminium
Slovalco
Stena Aluminium
STEP/G
Svenskt Aluminium
TALSAD Türkiye Alüminyum Sanayicileri Derneği
Talum
trimet
vimetco alro
vimetco extrusion
VNM
WKO Fachverband NE-Metall

1/ The aluminium value chain

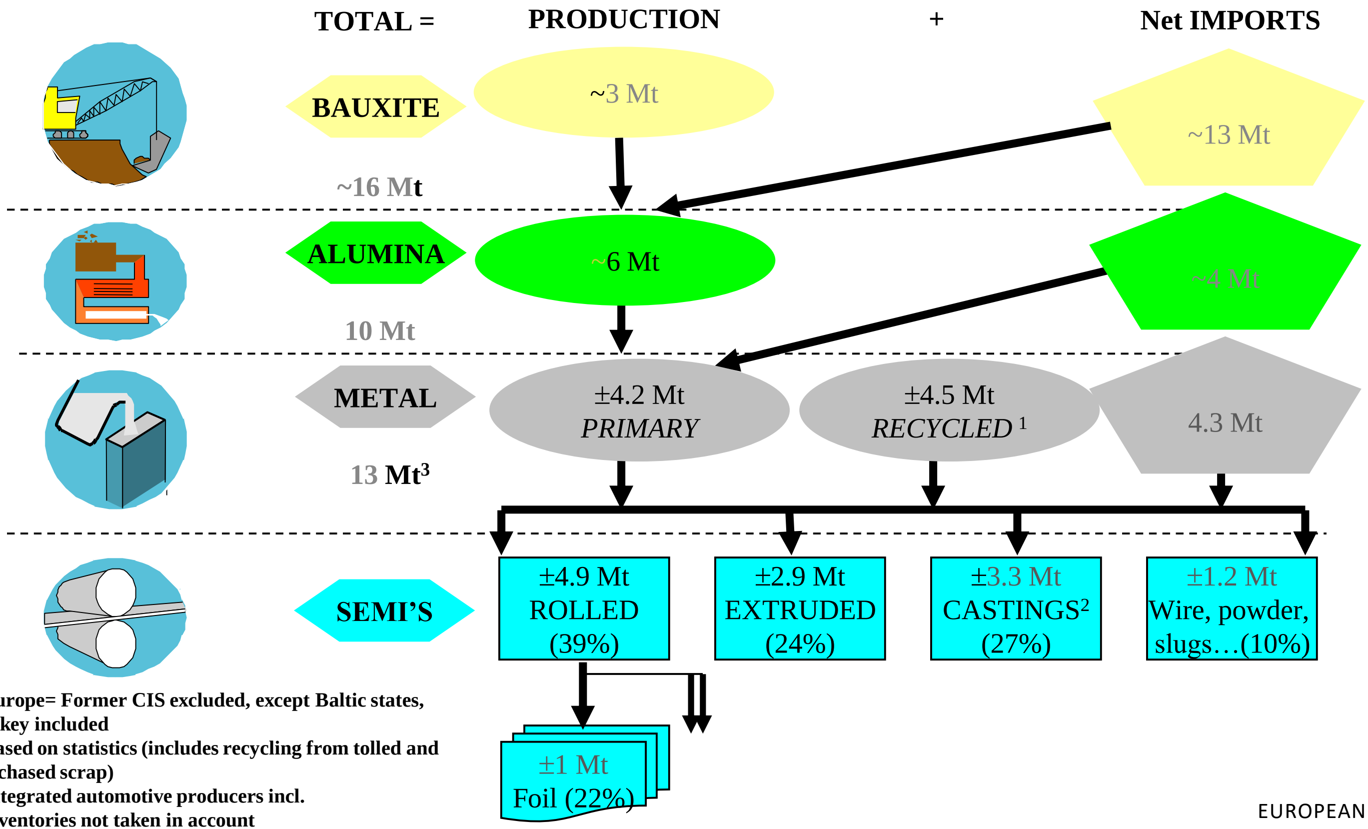


2 ⁄ Aluminium Markets & production in Europe



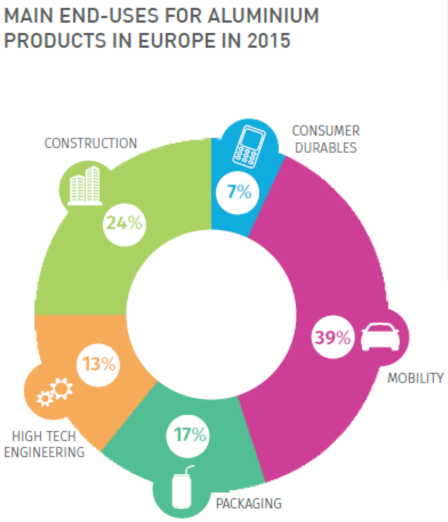


2 ╱ Aluminium Sector in Europe*, 2015



*** Europe= Former CIS excluded, except Baltic states, Turkey included**
1 Based on statistics (includes recycling from tolled and purchased scrap)
2 Integrated automotive producers incl.
3 inventories not taken in account

2 ⁄ Applications



Key-attributes:

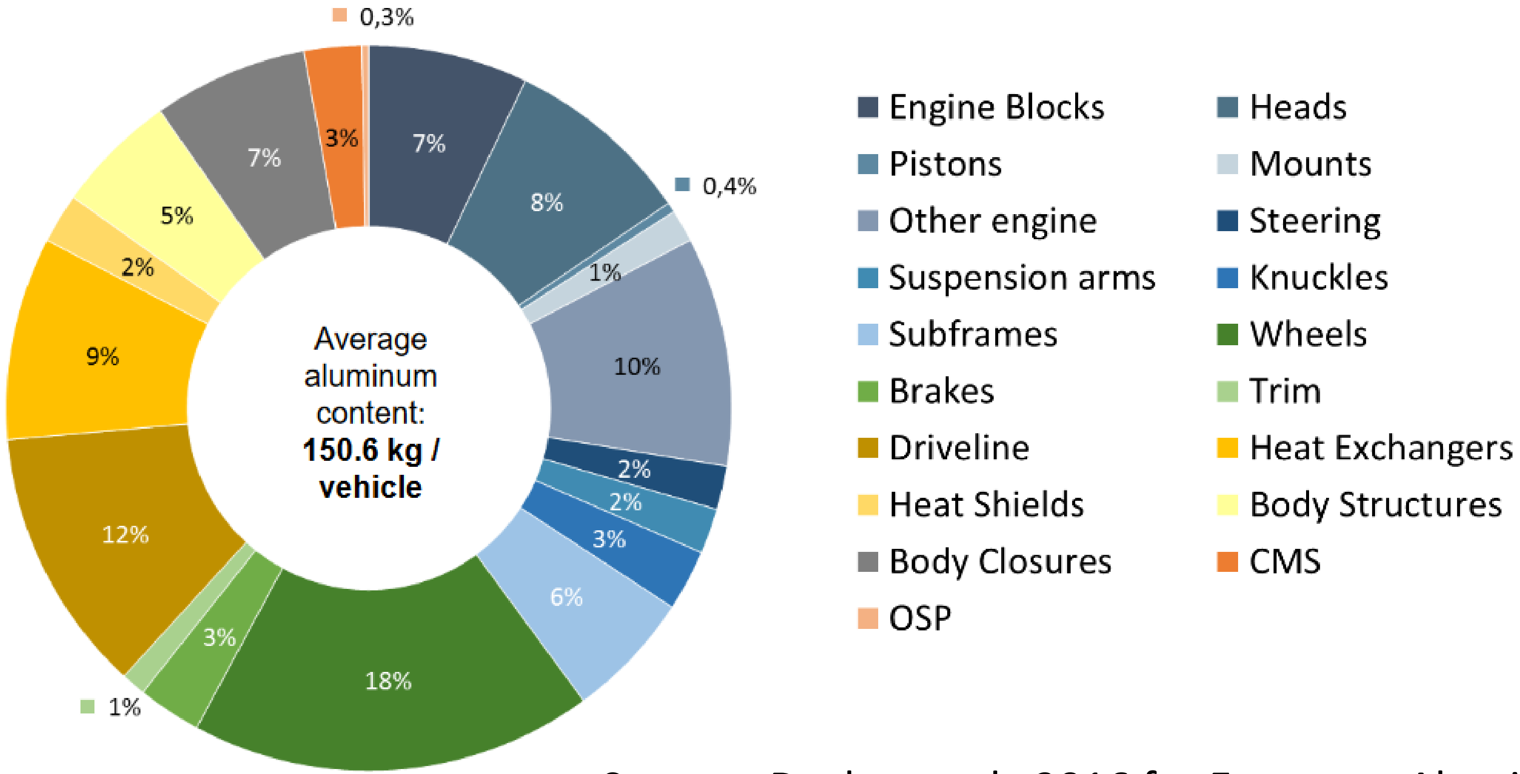
- Lightweight
- High mechanical resistance to weight ratio
- Corrosion-resistance
- Crashworthiness
- Dimensional stability
- No ageing
- Formability
- Barrier property
- Aesthetics

2 ⁄ Aluminium in mobility

Aluminium's low density, high strength-to-weight ratio, dimensional stability, corrosion-resistance, formability, recyclability and crash resistance is a key driver of lightweight, safe vehicles that contribute significantly to fuel savings and safety in transport.

Average component content per vehicle 2016

- Total European car production -



Source : Ducker study 2016 for European Aluminium

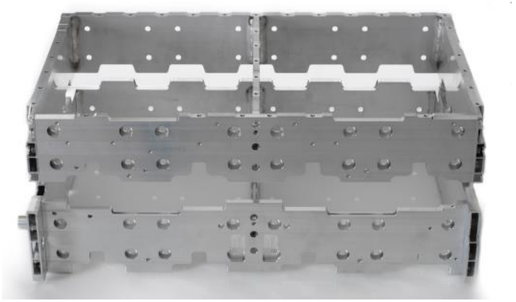
CMS = Crash Management Systems
OSP = Other Small Parts

2 / Aluminium makes Electric vehicles lighter and safer

- ✓ Many electric vehicles are aluminium intensive
- ✓ Telsa Model S has the highest safety rating

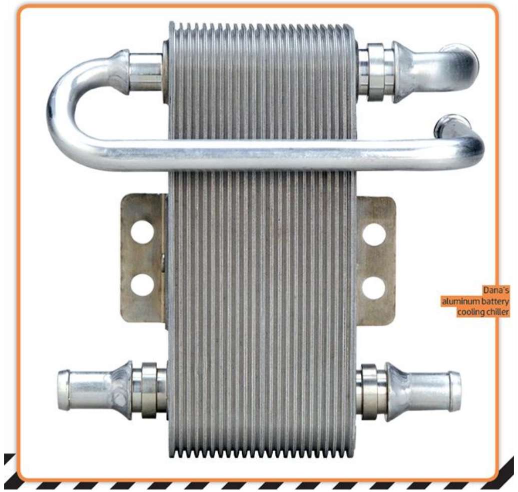
2 / Aluminium is also used in battery systems

Aluminium extrusions in battery frames



Aluminium cables

Aluminium for battery cooling



2 ╱ Aluminium in construction

Aluminium offers dimensional stability, high strength-to-weight ratio, corrosion resistance, durability and recyclability. These key assets stimulate the development of products that directly contribute to sustainable buildings, through natural lighting, energy savings, air tightness and energy production through solar heating and photovoltaics.

2 ⁄ Aluminium in packaging

The unique intrinsic properties of aluminium – high formability, lightweight yet strong, attractive metallic appearance, providing a total barrier to light, gases and moisture and recyclability - make it a preferred packaging material for food and drink.

2 ╱ Aluminium in Consumer durables and electronics

Aluminium's dimensional stability, light weight, durability, conductivity and recyclability are key assets in making aluminium an ideal material in electronics and consumer durables, particularly in premium products.

3 / Our Vision

« Aluminium is a key enabler of Europe's transition to sustainability and responds to today & tomorrow's societal needs»

Endlessly recyclable

Corrosion free and durable

Strong yet light

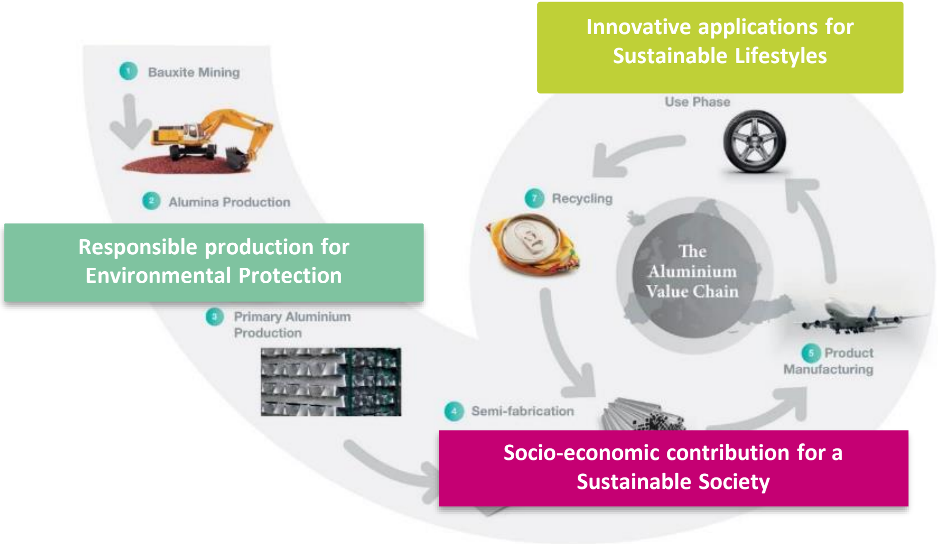
Energy Saver

Incredibly versatile

Total barrier

3 ⁄ The European aluminium industry’s Sustainability Roadmap 2025

“The Roadmap is born from our belief in the fundamental need to reconcile sustainability and growth objectives in Europe” Pierre Vareille, European Aluminium Chairman, April 2015



3 ╱ The European aluminium industry is committed to sustainability

The 2025 Sustainability Roadmap

- Covering the entire value chain
- Setting voluntary targets in three areas
- Engaging members in exchanging best practices, sharing expertise and developing joint projects
- Monitoring progress regularly through the Sustainable Development Indicators
- Integrating input from external experts

https://www.european-aluminium.eu/policy-areas/sustainability/

3 / Innovation Hub as key enabler

OUR GOALS

- Building a proactive community of innovative companies across the value chain
- Triggering research projects that advance a sustainable future and tackle technological challenges
- Connecting with the EU innovation agenda and relevant funding opportunities
- Engaging with the Public Private Partnerships that define the EU's research agenda and priorities

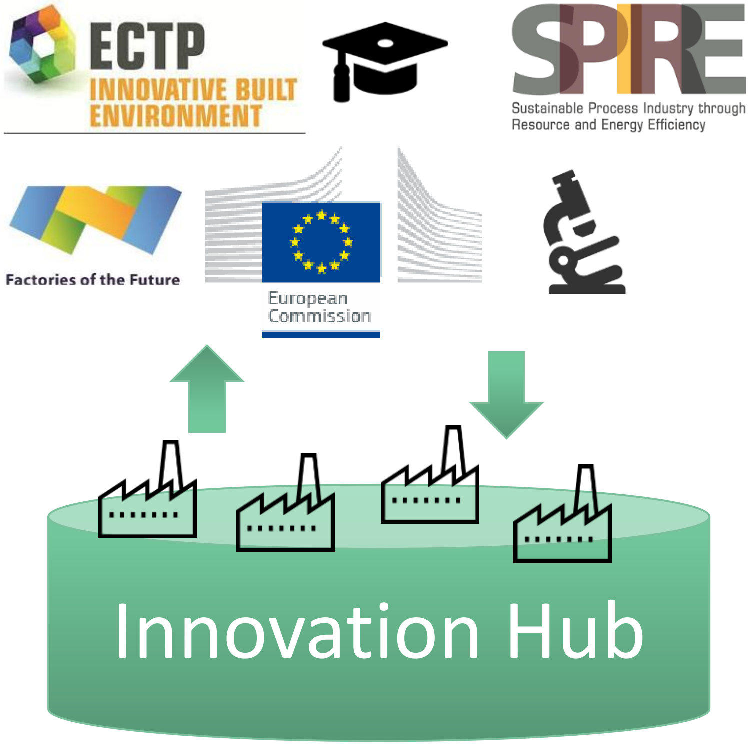
7 INNOVATION OBJECTIVES

1. Higher energy efficiency and reduced CO_2 emissions
2. Greater resource efficiency
3. Lower environmental impact
4. Optimal process technologies
5. New materials
6. Better enabling technologies
7. Improved skills and education

2025 SUSTAINABILITY ROADMAP

3 « Innovation Hub » : What is it?

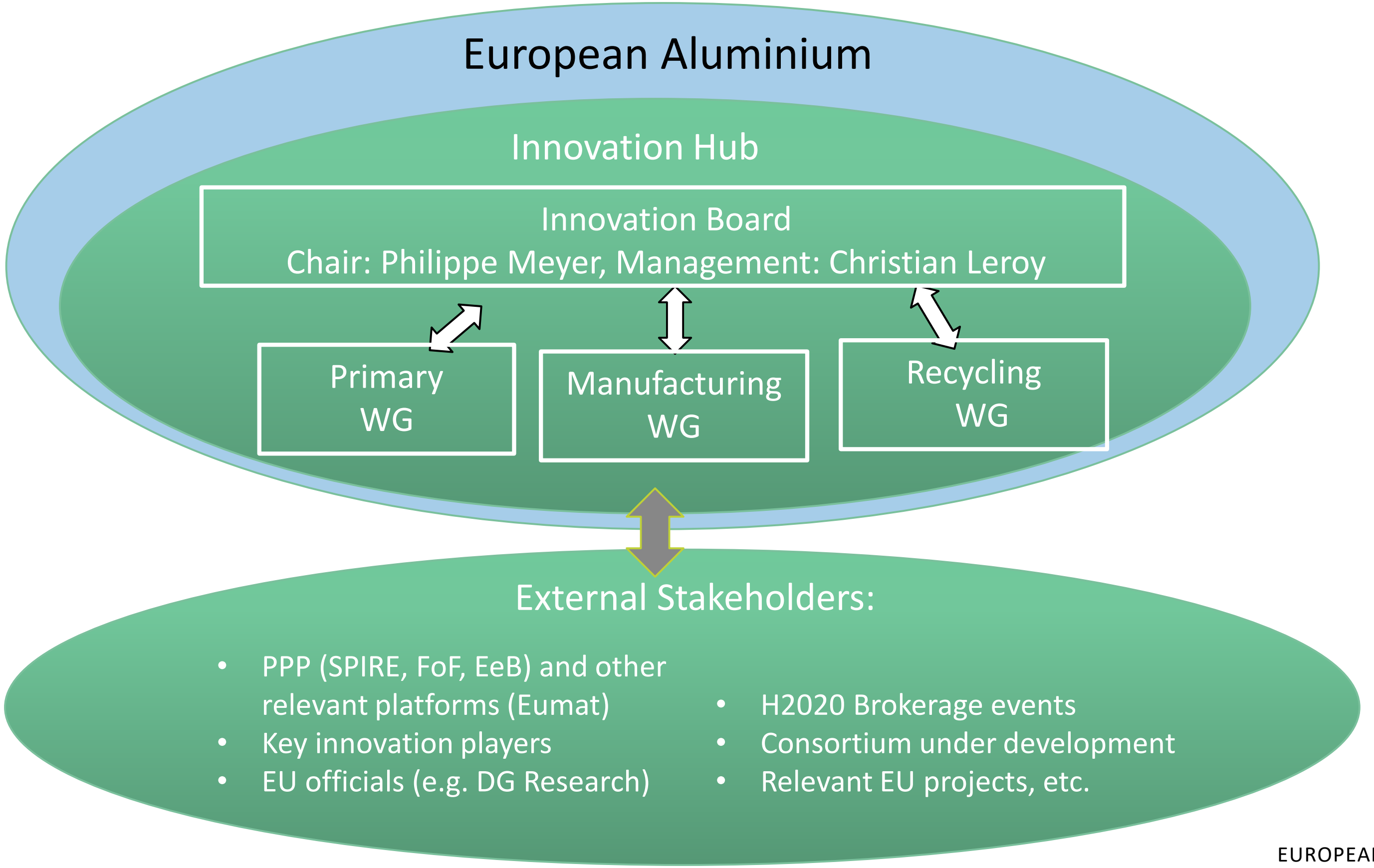
- Based on a long history of European Aluminium's involvement in education and technology
- Based on some excellent past projects, e.g. VIR* projects, SuperLightCar project, and current projects, e.g. E2Vent
- Officially initiated in 2015 following a strong recommendations of top executives
- It is a coordinated industrial platform where European aluminium companies are committed on a voluntary basis
  - To collaborate together on key RTD topics and innovations
  - To collaborate with other key stakeholders in Europe, e.g. RTOs, other industrial sectors, policy makers, etc.



3 ╱ Innovation Hub: main Objectives

- **Framework objectives**
  1. Providing a European-wide view on the technology and R&D needs for developing a coherent approach to R&D along the aluminium value chain.
  2. Acting as a key stakeholder in the most relevant European Private Public Partnerships (PPPs), including Sustainable Process Industry through Resource and Energy Efficiency (SPIRE), Factory of the Future (FoF) and Energy Efficient Buildings (EeB).
  3. Developing a Innovation Hub Community by stimulating networking and cooperation between the Aluminium industry and the R&D community, e.g. by organising innovation workshop targeting calls and topics of key EU funding programs, e.g. the Horizon 2020 program
- **Project objectives**
  1. Initiating and facilitating the development of EU funded R&D projects directly addressing the aluminium value chain
  2. Facilitating the members participation in those projects
  3. Joining EU project when relevant.
- **Communication objectives**
  Positioning Aluminium sector as a key player in the EU Innovation landscape

3 The « Innovation Hub » concept



3 / 14 Companies and 2 MG engaged in 2017

EUROPEAN ALUMINIUM
Building Group

EUROPEAN ALUMINIUM
Automotive & Transport Group

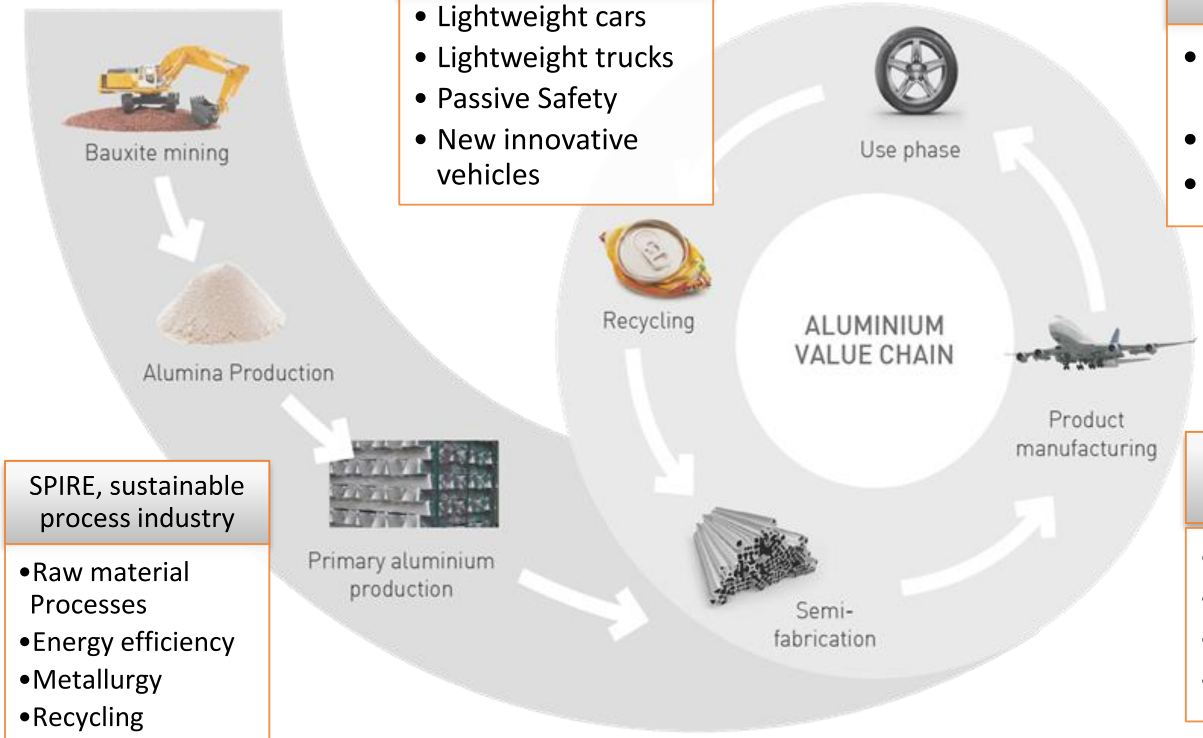
3 / Engagement in key innovation platforms & markets

Automotive & Transport

- Lightweight cars
- Lightweight trucks
- Passive Safety
- New innovative vehicles

Energy Efficient Buildings

- Smart envelop systems
- Windows
- Facade



SPIRE, sustainable process industry

- Raw material Processes
- Energy efficiency
- Metallurgy
- Recycling

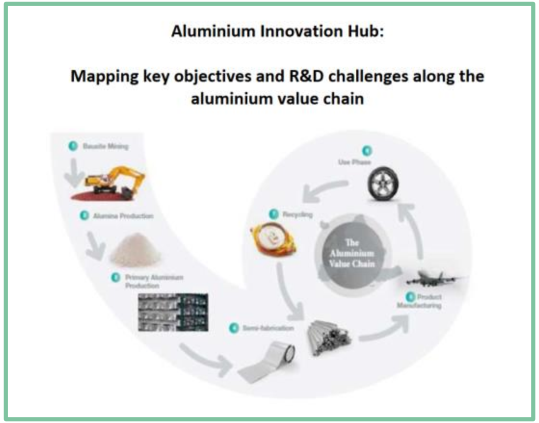
Factories of the Future

- Recycling
- Sorting
- Forming
- Joining

3 ⁄ Stimulating joint projects & knowledge sharing

KULeuven workshop on 31 May 2016

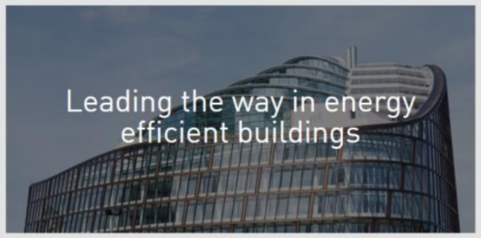
- First major event
- > 50 experts and innovation leaders from company members, Academia & Research & technology organisations (RTO)
- Successful for better connecting aluminium industry with RTO and potential partners.
- Publication of the mapping report.

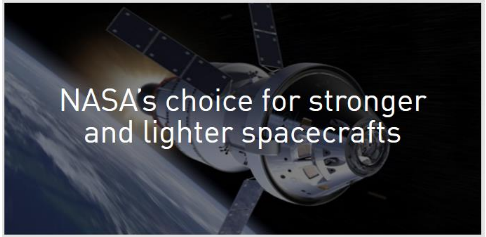


3 / Developing the community: Leaflet

3 / Highlighting Innovation stories

http://www.european-aluminium.eu/about-aluminium/stories-of-innovation/





3 ⁄ Aachen-AMAP Workshop – 21 June 2017

60 participants
More than 20 presentations
Good networking, some project ideas initiated, one EU project idea on bottom ash

Time	Topic	Speaker
9:30 – 9:45	Welcome by European Aluminium & AMAP	Gerd Götz, Director General Berndt Friedrich, Professor
9:45 -10:15	Innovation Hub: Introduction, objectives and status	Philippe Meyer, Chairman of innovation TF Christian Leroy, Hub manager
10:15–10:45	From raw material to semi´s – Aachen contributions for a sustainable process chain	Berndt Friedrich, Professor
10:45- 11:00	Presentation of the parallel sessions organisation and objectives	Christian Leroy, Hub manager
11:00 -11:15: Coffee break		

11:15 – 15:15 Parallel sessions: initiating project ideas (see next page for details)

	Room 1	**Room 2**	**Room 3**
	Recycling & Melt purification	Primary and alumina	Manufacturing
11:15 – 12:40	Session I	Session I	Session I
12:40 -13:30	**Sandwich Lunch break**		
13:30 -15:10	Session II	Session II	Session II

15:15 -15:30: Coffee break

15:30 – 16:30 Plenary session - Wrap-up and next steps - - plenary **room XX**

15:30 – 16:00	Reporting from parallel sessions	Facilitators
16:00–16:30	Debriefing, gaps analysis, next steps and actions	Christian Leroy

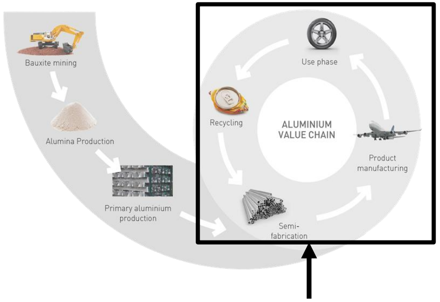
3 Aachen WS – 21 June 2017 – Topics of the parallel sessions

	Room 1- Recycling	Room 2 - Primary production	Room 3 - Manufacturing & Materials
Session I 11:15 – 12:40	Recycling & Melt purification Facilitator: Magdalena Garczynska, European Aluminium	Primary production – Process optimisation Facilitator: Thymis Balomenos, Aluminium of Greece	Manufacturing - Forming Facilitator: Bruno Chenal, Constellium
	Session Introduction and guidelines - H2020 opportunities for recycling - Magdalena Garczynska (20')	Session Introduction and guidelines – Thymis Balomenos (15')	Session Introduction and guidelines - H2020 opportunities for manufacturing - Christian Leroy (10')
	Impact of organics in Al-scrap on process and efficiency Pr. Bernd Friedrich- IME -RWTH (35')	H2020 opportunities for the primary production and Rethink-Al project proposal - Arne Petter Ratvik -SINTEF (40')	Rolling and further processing of flat products at the IBF Author: Stephan Hojda - IBF (25')
	Removing of Fe from the melt through high sheer processing technologies – Geoff Scamans – Brunel University (30')		Texture-based metal plasticity modelling– Philip Eyckens - KULeuven (25')
		Pragmatic Modelling in Aluminium Electrolysis Stein T. Johansen - SINTEF (30')	Innovating methods for industrial issues: examples in joining, shape forming, and characterisation for Al alloys- Laurent BEDEL & Etienne BOUYER – CEA-tech (25')
12:40 -13:40 - **Lunch break**			
Session II 13:40 – 15:10	Recycling & Melt purification Facilitator: Andy Doran, Novelis	Primary production – Learning from other sectors Facilitator: Luc Demange, Rio Tinto	Manufacturing - surface & Joining Facilitator : Peter Von Czarnowski, Elval
	"Closing the dross loop" – Dr Morten Onsøien - SINTEF" (25')	Heat recovery and storage for industrial processes, Example of the Smartrec project -- Laurent BEDEL & Etienne BOUYER – – CEA tech (25')	Corrosion and surface properties of recycled aluminium – Iris de Graeve - VUB (25')
	"Dross control and utilization" - Pr. Gabriella Tranell - NTNU (25')	DISIRE project - Integrated Process Control Based on Distributed In-Situ Sensors – Opportunities for Al industry - Aleksandra Lewandowska – Fraunhofer (25')	Joining of high strength (6000) Al alloys Simon Olschok – ISF (25')
	"Aluminium recycling from bottom ashes" – Pr. Mario Grosso – Polytechnic of Milan (25')	Main learnings from ULCOS project(s) – Jean-Pierre Birat, IF Steelman Consulting (25')	Joining challenges for the implementation of high strength Al Alloys in high volume automotive production - Michael Ölscher – Ford (25')
	Session summing-up – All + 2 facilitators (15')	Session summing-up - All + 2 facilitators (15')	Session summing-up - All + 2 facilitators (15')

3 / RECALSE: RECycling-friendly wrought ALuminium value chain for a Sustainable Europe (rejected by EC in June 2017)

Main objective: enable the integration of at least 20% of post-consumer scrap as sourcing of the value chain of wrought products

- 3 automotive components (e.g. door, B-pillar and battery box) will be produced for demonstration purposes



Making wrought alloys more recycling friendly

N°	Partners of the project	Country
1	Ciaotech-PNO	IT
2	Aleris	DE
3	Assan	TR
4	Constellium	FR
5	Elval	GR
6	European Aluminium	BE
7	Hydro	NO
8	Novelis	UK
9	Sapa	SE
10	Manchester University	UK
11	VUB-Brussel	BE
12	Brunel University	UK
13	IKA-RWTH	DE
14	IRT-M2P	FR
15	SWEREA-KIMAB	SE
16	NTNU-SIM Lab	NO
17	KULeuven	BE
18	International Al Institute	UK

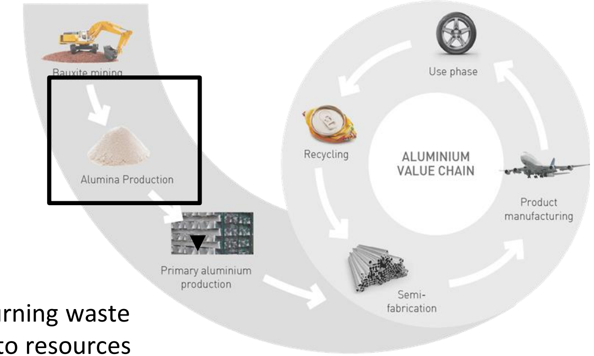
Project Duration: 48 months

Estimated EU contr.: 12.500.000 €

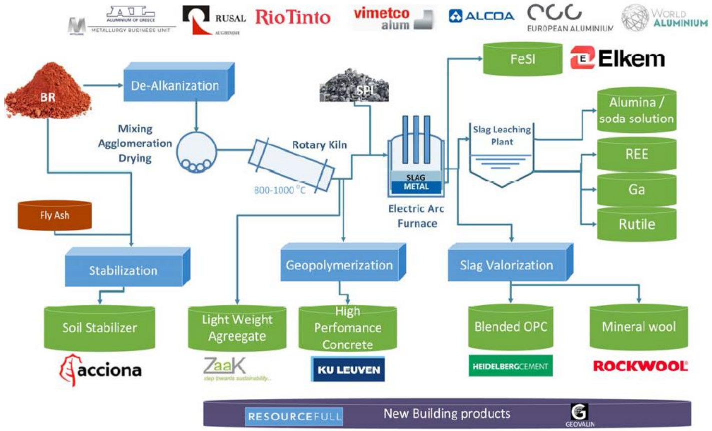
3

RemovAL: Removing the waste streams from the primary Aluminium and other metallurgical sectors (SC5-14-2017)

- Objective: Deliver and validate a complete feasibility study for valorising Bauxite Residue (BR) along with other industrial by-products, taking into consideration waste characteristics, logistics and potential for symbiosis with other plants in the geographical vicinity.
- 13 M€ EU funding requested, 4 years project
- 27 partners including: Mytilineos S.A.(formerly Aluminium of Greece), Rio Tinto, Alcoa, Alum, European Aluminium and IAI



Turning waste into resources



4 ╱ The mapping exercise of the Innovation Hub


EUROPEAN ALUMINIUM

Aluminium Innovation Hub:

Mapping key objectives and R&D challenges along the aluminium value chain

Version 1 – May 2016

Define the innovation needs and priorities of the European Aluminium Industry along the value chain

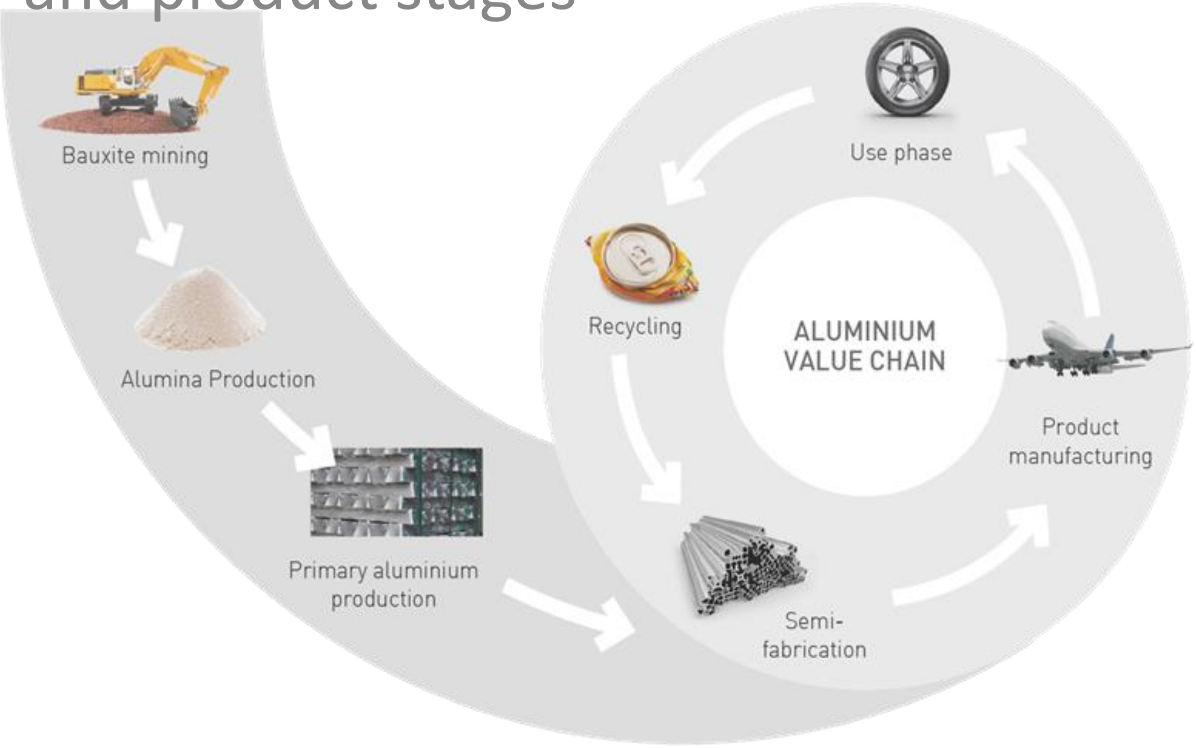
First consolidated report published in May 2016

4 ⁄ Seven generic objectives

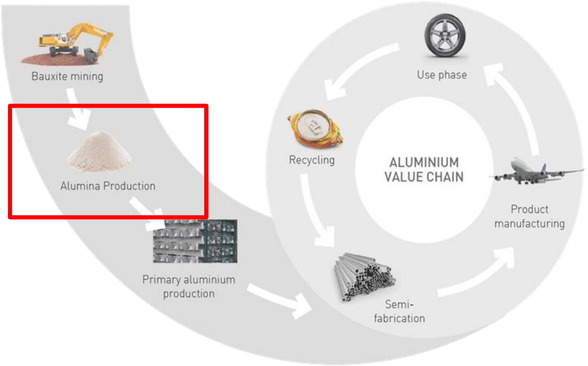
have been identified for
supporting the sustainability of Aluminium industry
&
delivering innovative solutions

1. Improve energy efficiency and reduce CO2 emissions
2. Improve resource efficiency
3. Reduce environmental impact
4. Optimise process technologies
5. Develop new materials
6. Develop and optimise enabling technologies
7. Develop the industrial competence, skills and aluminium knowledge

4 ╱ The aluminium value chain & key process steps and product stages

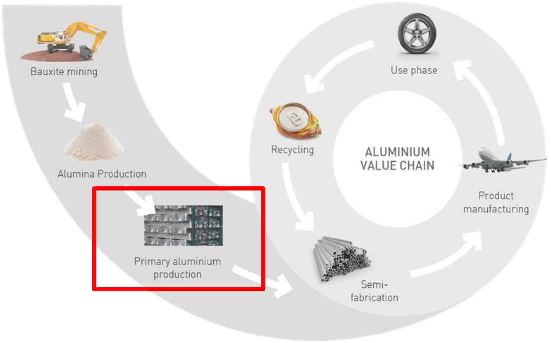


4 ⁄ Alumina - Key objectives



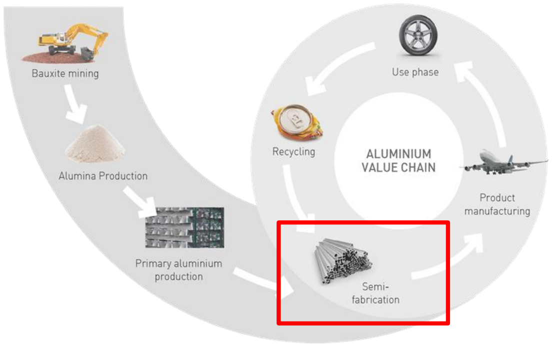
Generic objectives	Specific objectives	R&D challenges
Improve energy efficiency and reduce CO_2 emissions	Reduce by 20% the energy use or/and the CO_2 emission of the alumina process	Further optimise leaching and calcination process
		Develop low-temperature heat recovery technologies
Improve resource efficiency	Use of lower-grade bauxite	Develop bauxite pre-treatment process to reduce transformation costs and residue storage
Optimise process technologies	Increase the life time of the plant	Improve maintenance techniques and durability of materials (e.g. reduce caustic embrittlement).
Reduce environmental impact (air)	Reduce NO_x and particles air emissions	Develop and implement more advanced burner and abatement technologies
Reduce environmental impact (solid waste)	Develop sustainable bauxite residue storage or use of residue	Develop maintenance-free storage solutions
		Use bauxite residue as ingredient of products, e.g. construction products
		Develop technologies to convert bauxite residue into valuable resources, e.g. extracting vital raw materials.

4 / Primary production (Precompetitive R&D)



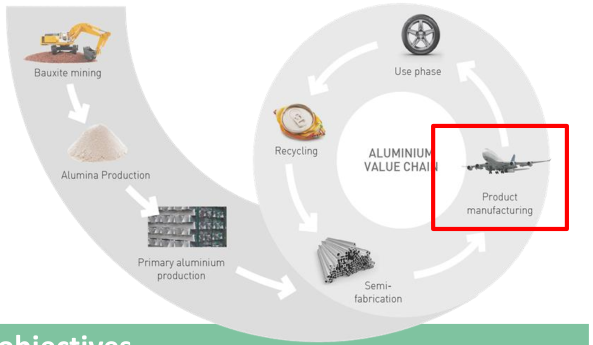
Generic objectives	Specific Objectives	R&D challenges
Improve energy efficiency and reduce CO_2 emissions	Reduce direct CO_2 equivalent emission	Use of biomass as raw material in anode production – bio-anodes
Optimise process technologies	Develop extended-life pot lining (> 5,000-day life)	Eliminate or improve control of cathode erosion
	Improve alumina dissolution behaviour in the pots	Dissolution mechanisms understanding (behaviour in bath, and alumina characteristics)
Reduce environmental impact (solid waste)	Discover alternative techniques to turn aluminium process waste into usable feedstock/products	Qualify recycled refractory materials obtained from spent pot lining and bake furnaces
	Address industry excess salt bath short to mid-term trend	Shared project/evaluation with the bauxite & alumina stream on alumina soda content
Improving overall performance on HSE aspects	Improving the overall performance on Health and Safety	Decrease human exposure to health and safety hazards by improving plant automation and process control

4 / Semi-fabrication



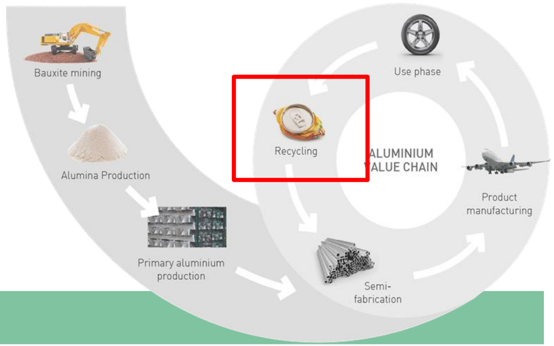
Generic objectives	Specific objectives	R&D challenges
Improve energy efficiency and reduce CO_2 emissions	Reduce thermal energy and electric consumption of furnaces	Optimise further processing route to reduce cycle time and energy consumption e.g. at pre-heating and homogenisation
Optimise processing technologies	Increase fabrication efficiency through better control of the aluminium deformation process and improved tool performances	Maximise tooling life through new surface treatment or new materials for extrusion dies or rolling rolls
	Improve knowledge for more cost effective and robust processing routes	Better understanding of microstructure evolution along the process chain
	Develop modelling capabilities for more cost effective and robust processing routes	Develop real-time predictive modelling tools
	Increase manufacturing efficiency through better monitoring via sensors and measurements	Develop new or improved non-contact sensors and surface inspection devices
New processing routes for more performing products	Use of continuous casting technologies	Develop continuous casting technologies and associated alloys
	Develop further alloy capabilities and performances through non-conventional processes	Develop a cost efficient process routing to make powder-metallurgical products, routed via rolling feedstock, via extrusion feedstock, via net shape manufacturing technologies

4 / Product Manufacturing



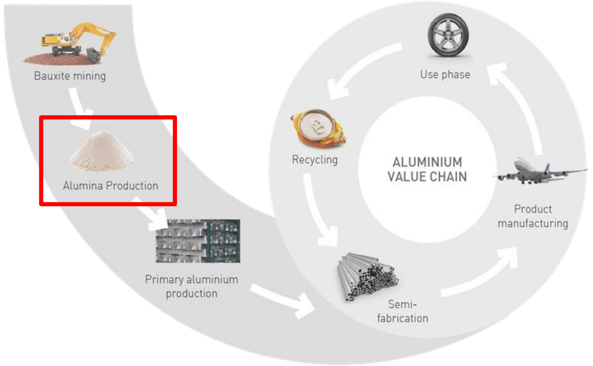
Area	Generic objectives	Specific objectives
Forming	Optimise process technologies	Better control and predict forming behaviour
		Develop further forming technologies
Joining	Optimise process technologies	Develop advanced joining techniques that reduce impact on material properties
		Develop low cost joining techniques for dissimilar materials and hybrid solutions
Machining	Optimise process technologies	Optimise machining processes for more eco-efficiency
Surface & coatings	Reduce environmental impact	Develop alternatives to chromate coatings
	Optimise process technologies	Develop aluminium product with tailor-made and functionalised surface properties
Additive manufacturing	New disruptive technologies	Additive manufacturing for tailor-made aluminium products (bulk) or surface properties
Product Design	Optimise design technologies	Use of numerical methods for analysing and guiding robust and eco-efficient design of products
		Optimise design for light weighting & crash management
All	Skills and knowledge	Secure proper expertise along the product value chain.
	Education	Improve the level of knowledge and expertise in downstream industry and in engineering education

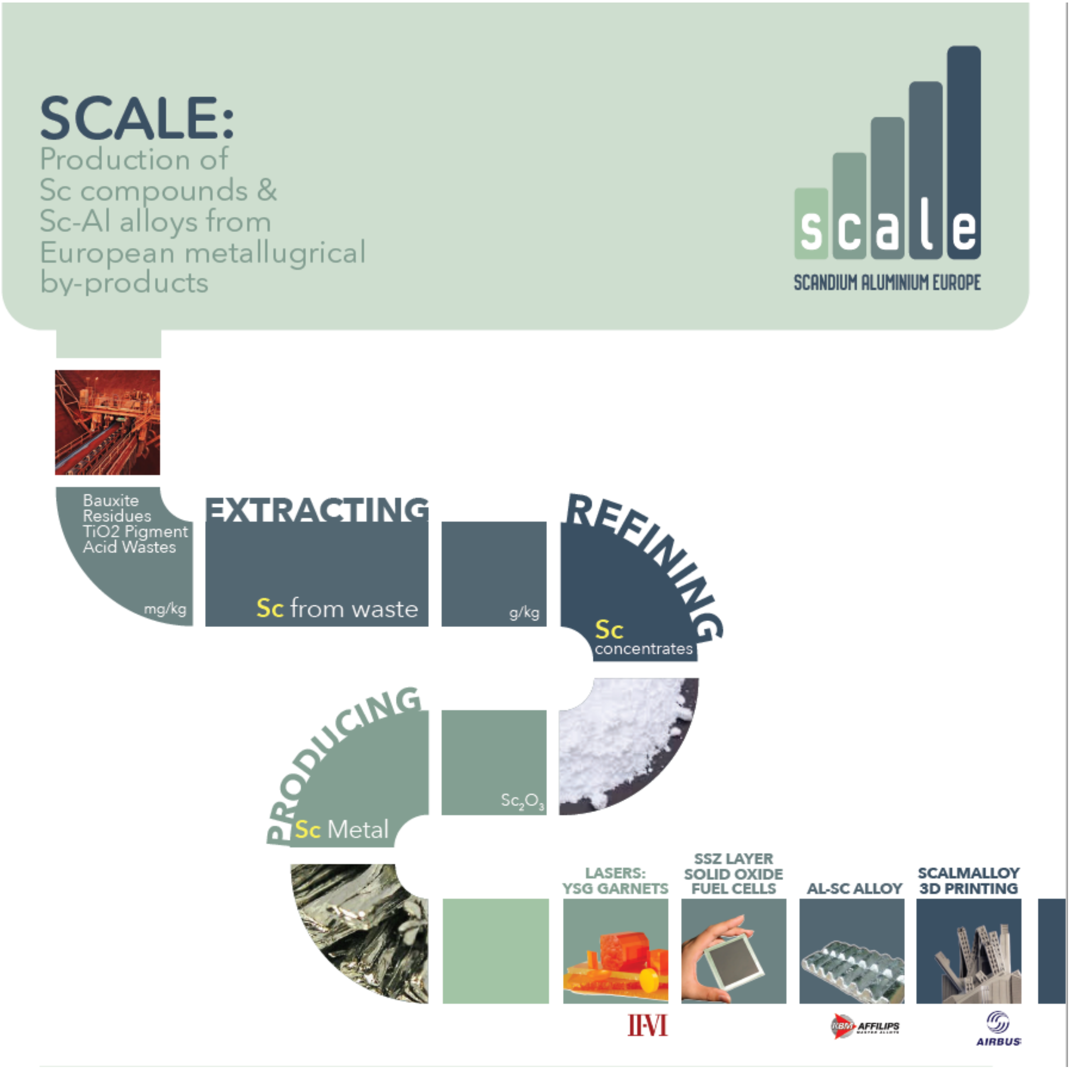
4 / Recycling



Area	Generic objectives	Specific objectives
Scrap & raw materials	Improve resource efficiency	Generate high quality aluminium scrap flow from contaminated or mixed scrap flows
		Facilitate closed loop recycling within alloy groups
	Improve process efficiency	Increase performance of raw materials, master alloys, grain refining agents
Melting & solidification	Improve energy efficiency and reduce CO_2 emissions	Reduce the energy consumption of the melting furnace and associates CO_2 emission by 20%
	Improve resource efficiency	Reduce the oxidation rate in refining furnaces by 50%
	Improve resource efficiency	Increase service life of furnaces by 50%
	Optimise process technologies	Increase quality and composition of the melt before casting (analysis)
Products & alloys	Material development	Expand the applications of recycled aluminium by better management of impurities
	Material development	Develop new high performance alloys based mostly on recycled aluminium
Horiz.	Improve safety	Significantly reduce the risk of fire and explosion
	Optimise process technologies	Better control recycled aluminium quality

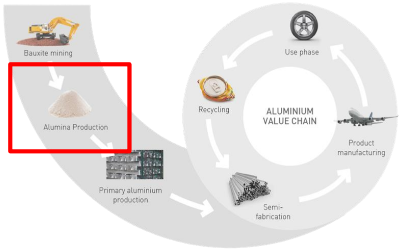
5 / SCALE project (2017-2020)

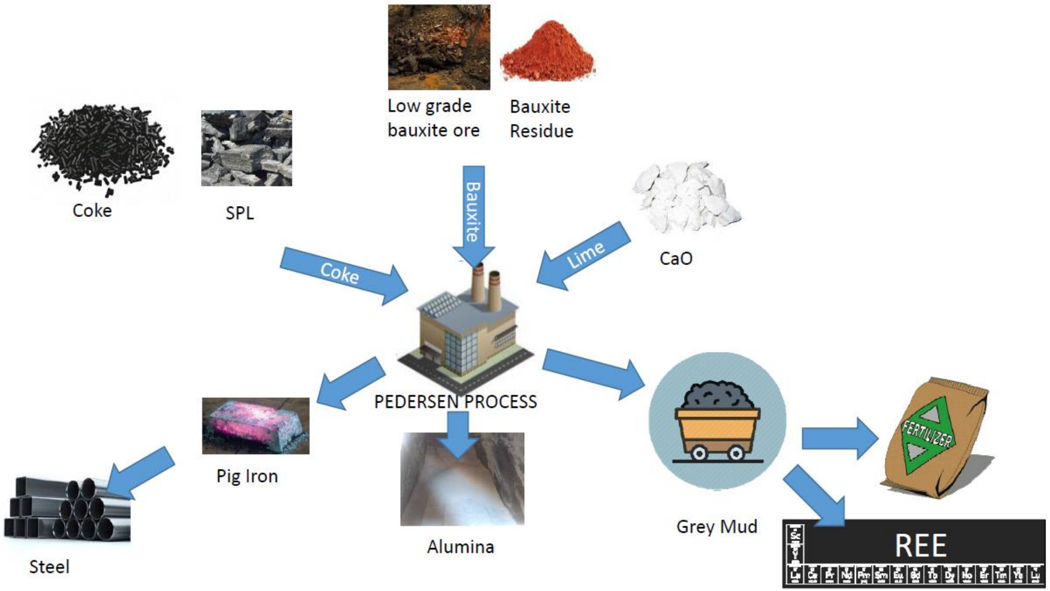




5 ∕ ENSUREAL project (2017-2020)

ENSUREAL
SUSTAINABLE ALUMINA PRODUCTION

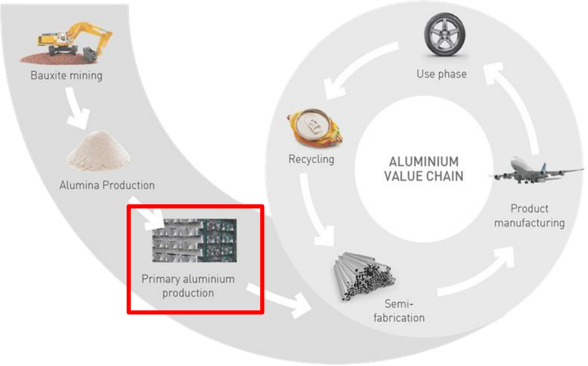




The **ENSUREAL project** aims to demonstrate a modified version of the Pedersen process for the production of alumina. The main advantages of the process are:

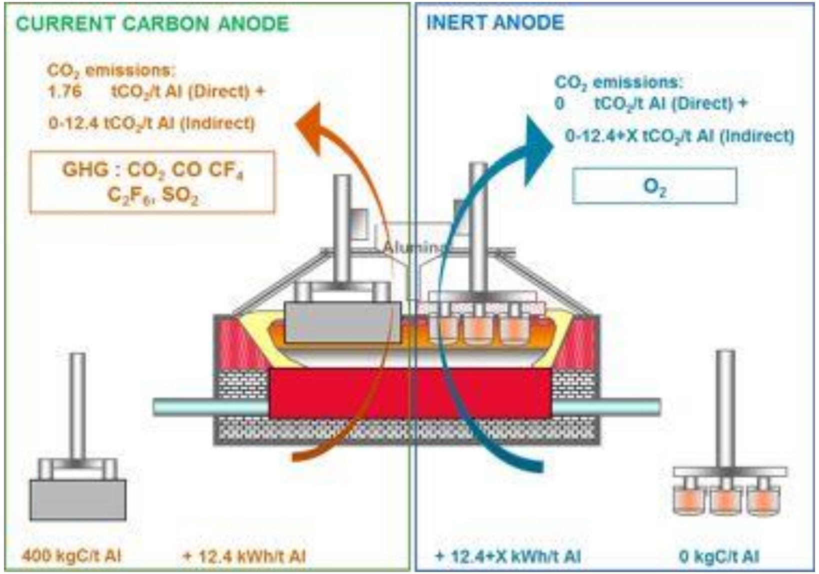
1) Zero waste: No red mud, only useable by-products like pig-iron and limestone.
2) A wider range of bauxite qualities can be used (more efficient mining, less tailings, better profitability for the mine, and security of supply for Europe since European bauxite qualities generally have a lower quality

5 / AGRAL project (2015-2018)

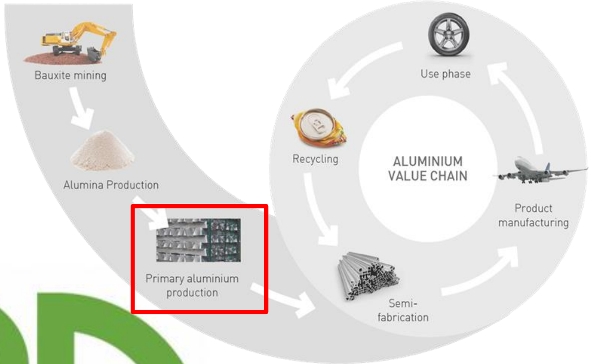


<u>Objectives:</u> Developing the manufacturing technologies of a specific anodic material that has shown at lab scale outstanding properties in high temperature and corrosive media of the aluminium electrolysis.

<u>Benefits:</u> The use of inert anode in the aluminium production would decrease by a minimum of 50% the CO2 emissions as compared to the current process with carbon anode.



5 ∕ Monsoon project (2016-2019)



MOdel based coNtrol framework for Site-wide OptimizatiON of data-intensive processes

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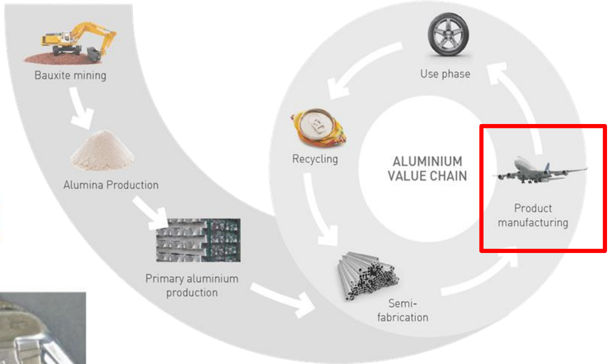
The ***MONSOON*** project - ***MO****del-based co****N****trol framework for* ***S****ite-wide* ***O****ptimizati****ON*** *of data-intensive processes* - aims to establish **data-driven methodology** to support identification and exploitation of optimization potentials by applying **model-based predictive controls** so as to perform plant and site-wide optimization of production process. The ambition of ***MONSOON*** project is shared by 2 significant **process industries** from the **sectors** of **aluminium** and **plastic.**

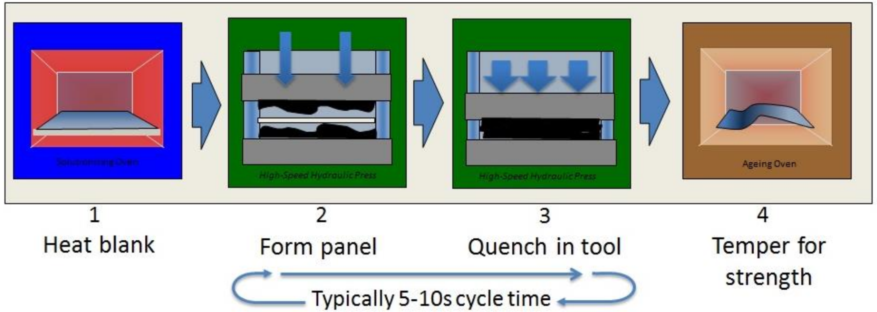
5 / LoCoMaTech project (2016-2019)



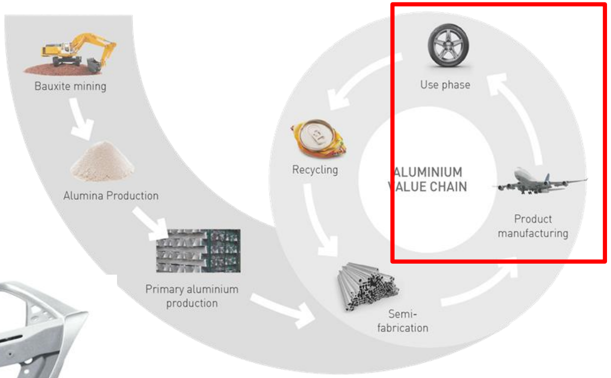
LoCoMaTech

Full name: Low Cost Materials Processing Technologies for Mass Production of Lightweight Vehicles
Objective: to enable the novel HFQ® process, (solution Heat treatment, cold die Forming and Quenching) patented by ICL, (TRL4), to be used for the manufacture of lightweight, high strength body and chassis structures and components for low-cost vehicles, by establishing a prototype, full scale pilot production line (TRL6)

HFQ® Heat Treatment Forming and cold-die Quenching system for high-strength aluminium alloys



5 / ALLIANCE project (2016-2019)



AffordabLe LIghtweight Automobiles AlliaNCE

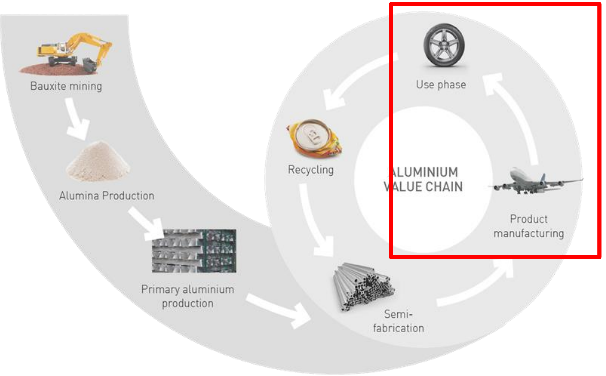
- Effective and affordable lightweighting requires a holistic approach;
- High complexity of this optimisation makes lightweighting one of the most challenging tasks of modern automotive designers and engineers.

An International Hub For Lightweight Innovation

ALLIANCE has the ambition to become a central hub for innovation in lightweight design in Europe. To do so, it will establish an open inclusive framework towards external centres and clusters in this field, involving them in the project through an Open Lightweight Design Contest and dedicated workshops.

5 ⁄ E2VENT project (2015-2018)

- Objective: development of an Energy Efficient Ventilated Facades for Optimal Adaptability and Heat Exchange enabling low energy architectural concepts for the refurbishment of existing buildings
- Principle: external thermal building refurbishment solution with an external cladding and an air cavity that embeds different breakthrough technologies
- European Aluminium is partner in this project



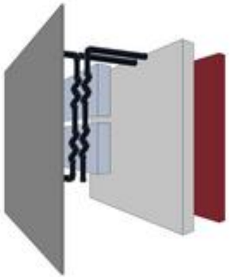


Fig 1: E2VENT system

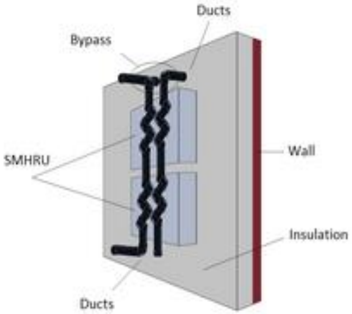


Fig 2: SMHRU Smart Modular Heat Recovery Unit

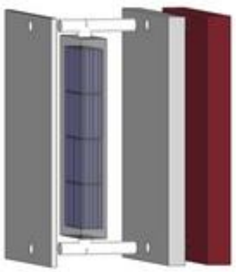


Fig 3: LHTES Latent Heat Thermal Energy Storage

6 / Conclusions

- Aluminium has several unique properties to support smart sustainable solutions
- The European Aluminium industry is committed to its sustainability roadmap 2025 and to make aluminium a key-enabler to the low carbon society and circular economy.
- The Innovation Hub is the collaborative platform to coordinate pre-competitive research efforts supporting the sustainability roadmap.
- Any interested stakeholders is invited to join the community (innovation@european-aluminium.eu)

- Thank you for your attention

/ More info

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