THE FIRST EUROPEAN

AIRCRAFT RECYCLING SYMPOSIUM

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Technologies and practical experiences on AC end of life operations from a dismantlers point of view

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Introduction

- Basis of our work in Germany respectively the world is the end of life vehicle ordinance and the „Closed Substance Cycle and Waste Management Act” (Kreislaufwirtschaftsgesetz) with the view of the handling of hazmat materials.
- “Guidelines on the Application of the Waste Catalogue Ordinance” (Abfallverzeichnis-Verordnung - AVV)

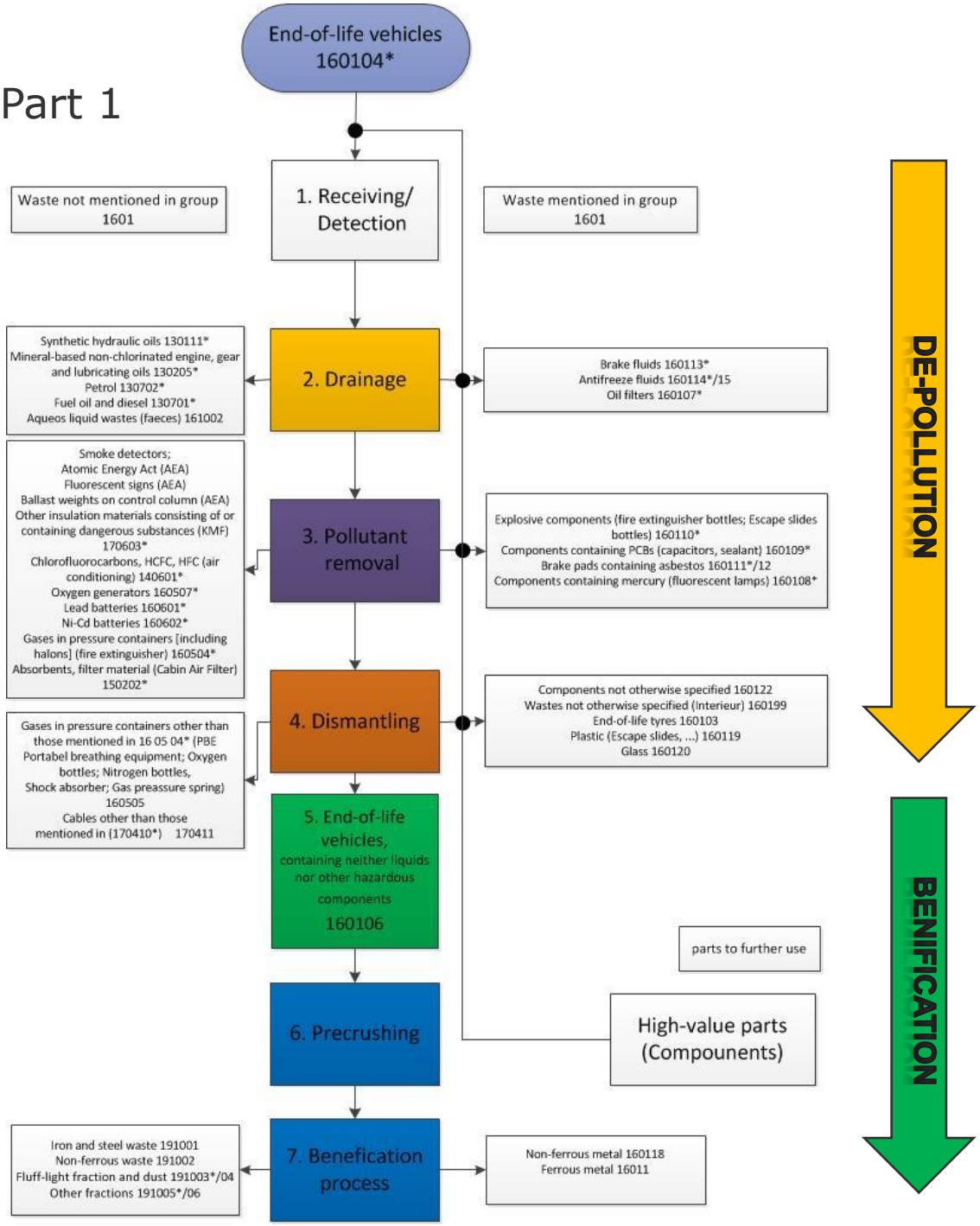
16	**WASTES NOT OTHERWISE SPECIFIED IN THE LIST**

16 01	**End-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**
16 01 04*	End-of-life vehicles *Hazardous components and parts as listed in Group 16 01 below.*
16 01 06	End-of-life vehicles, containing neither liquids nor other hazardous components

- The waste with with a star needs a special handling.
- Best Management Practice for Management of Used Aircraft Parts and Assemblies and for Recycling of Aircraft Materials (BMP3.0).
- Continuous employee training (Hazard identification, Material identification, occupational safety etc.)

http://www.bmu.de/fileadmin/bmu-import/files/english/waste_management/downloads/application/pdf/hinweise_avv_engl.pdf

Adaption Part 1



Receiving/detection of A/C

End of life A/C Audit:

- Clarifying property situation
- Workscope analysis
  - Part out high value parts
  - Recording of the part out parts
- Check the documentation of the A/C
- Check harmful substances
- Check specially country laws
- Check custom affairs
- Check the dismantling area
- Create instructions for the dismantling teams

Polutant removal

Part-out of hazardous components:

- Fuel draining in CTR, Wing, Trim Tank & Pipes
- Fuel tank opening for ventilation
- Fuel draining of Hydraulic system fluid, including alternate brake system and the Lavatory System.
- Pressure relief of all pressure Systems
- Smoke Detector (radioactive)
- Fluorescent Exit Signs , Fluorescent Lamps (radioactive)
- Fire Extinguisher Cartridges (explosive)
- Fire Extinguisher Bottles (explosive)
- Escape slide (explosive)
- Pax Oxygen Generator (oxygen, explosive) → Very hot
- Cooling Units (FCKW)
- Airbrakes , Bracket, Drain Tube (Asbestos)
- Battery dry and wet (acidid)
- First Aid Kids (explosiv, emergency signal munitions)
- Etc.

Drainage and ventialation of the tanks

Defuelling System

Ventilation System

Pollutant removal

Interior part out example

Pollutant removal

Part out example of hazmat glas fibre

Interior and mineral fibre part out

→ Target as little as possible lightweight materials inside

Manufactured glass fibre before 1995 is very toxic like Asbestos

TRGS 905

Pollutant removal

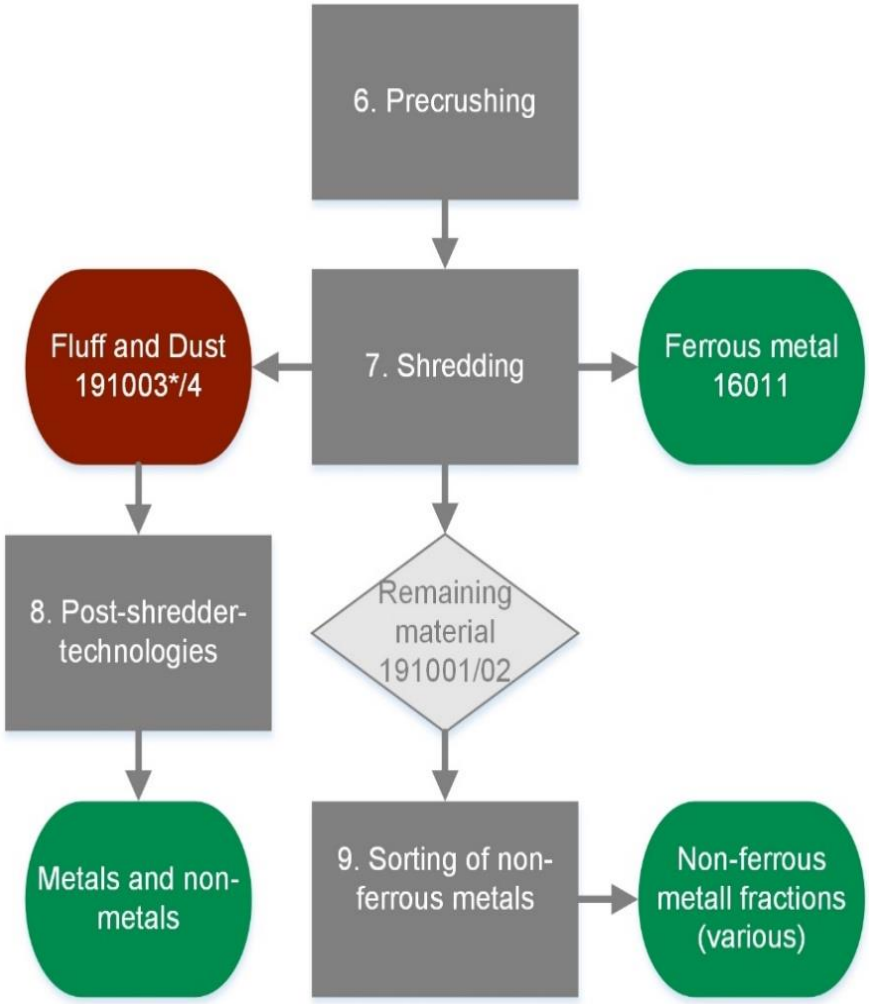
Halon part out example

Smoke detector

Cargo Compartment

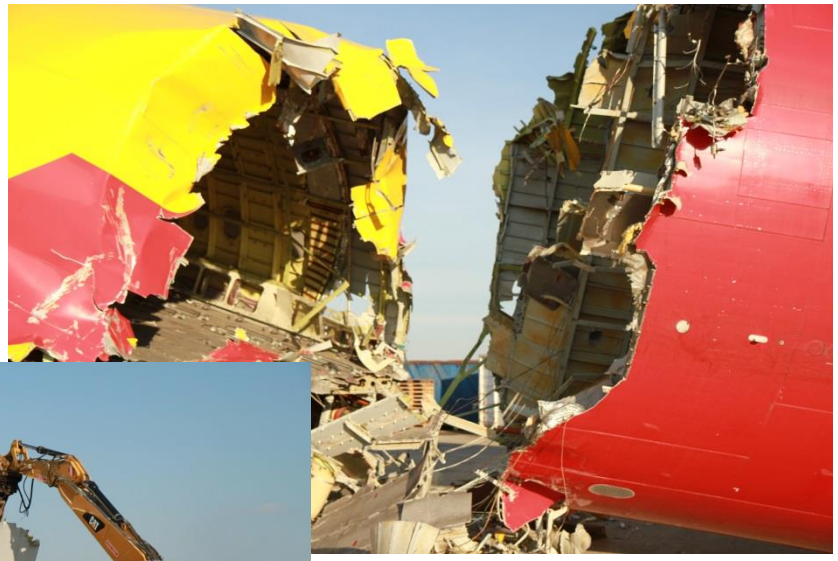
Lavatory bin

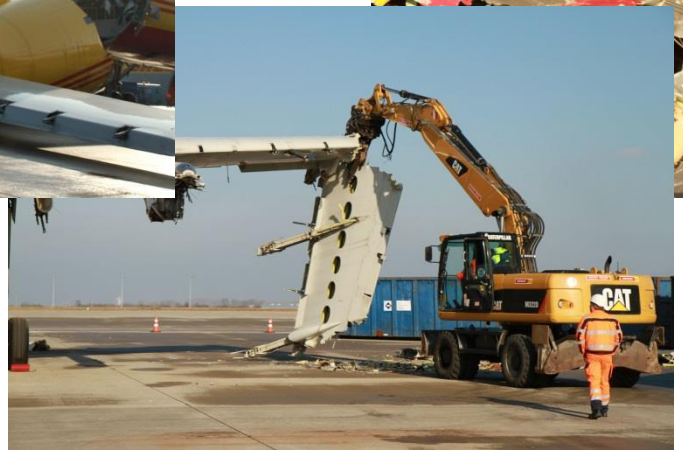
Adaption Part 2



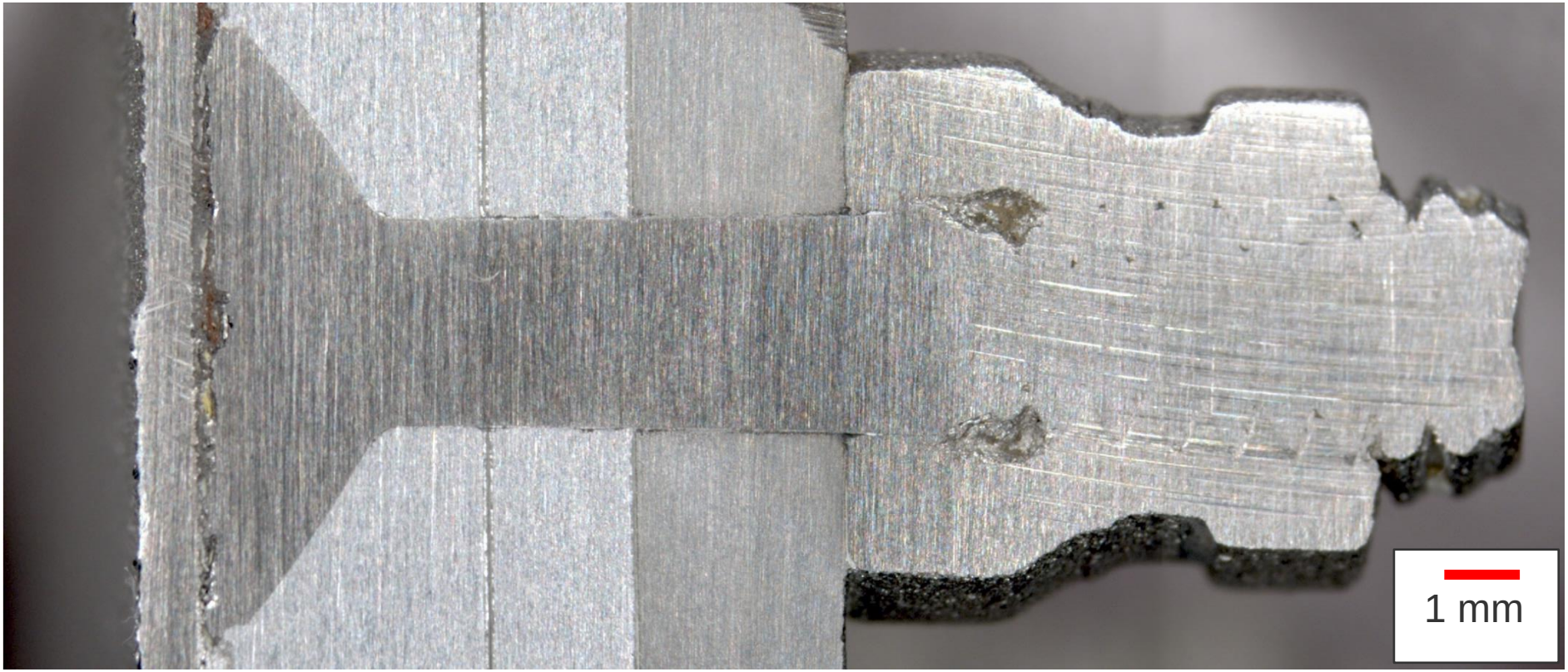
Dismantling and precrushing

- Removal of the vertical stabilizer → Reduced the wind load
- Precrushing of the wings
- Precushing of the fuselage

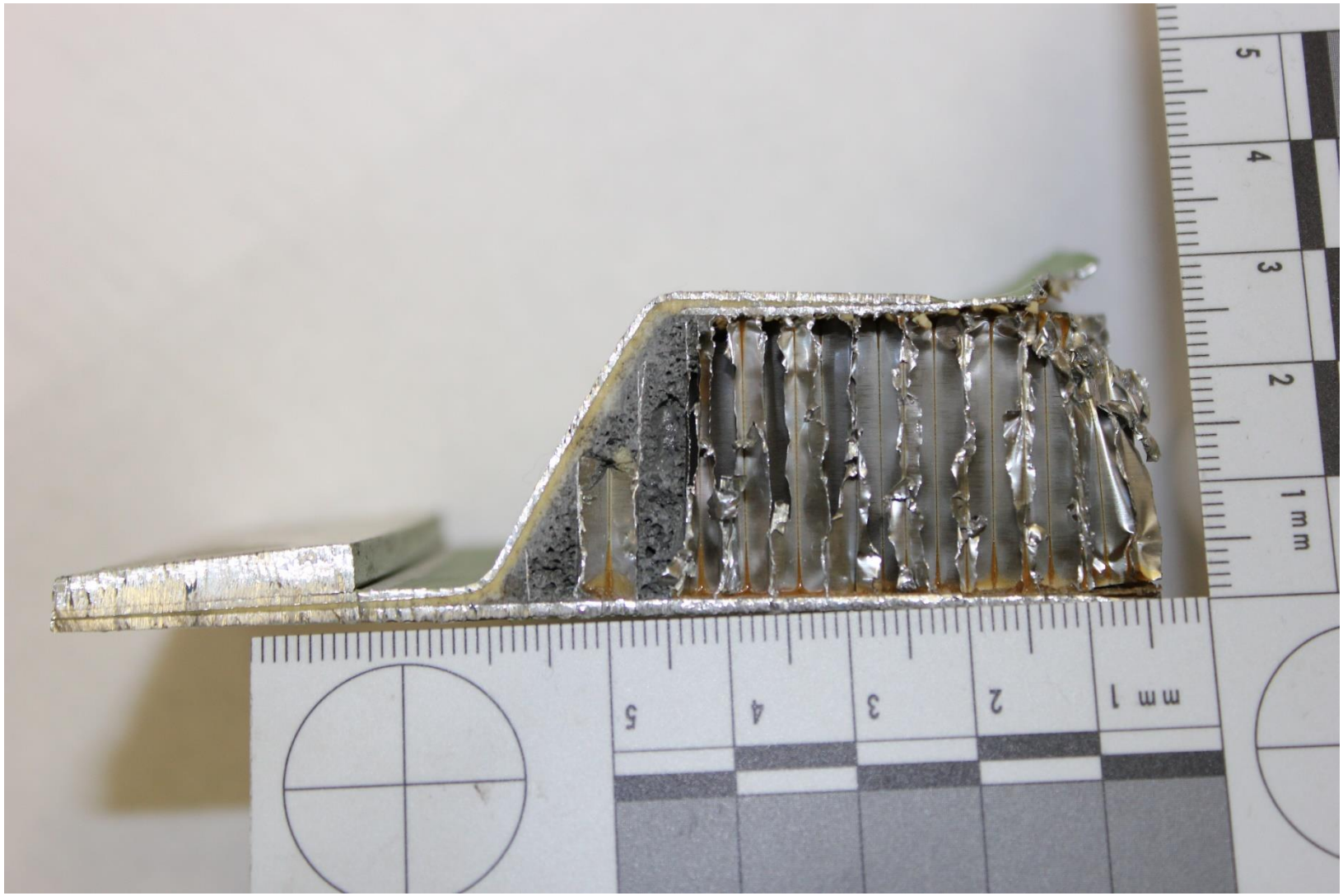




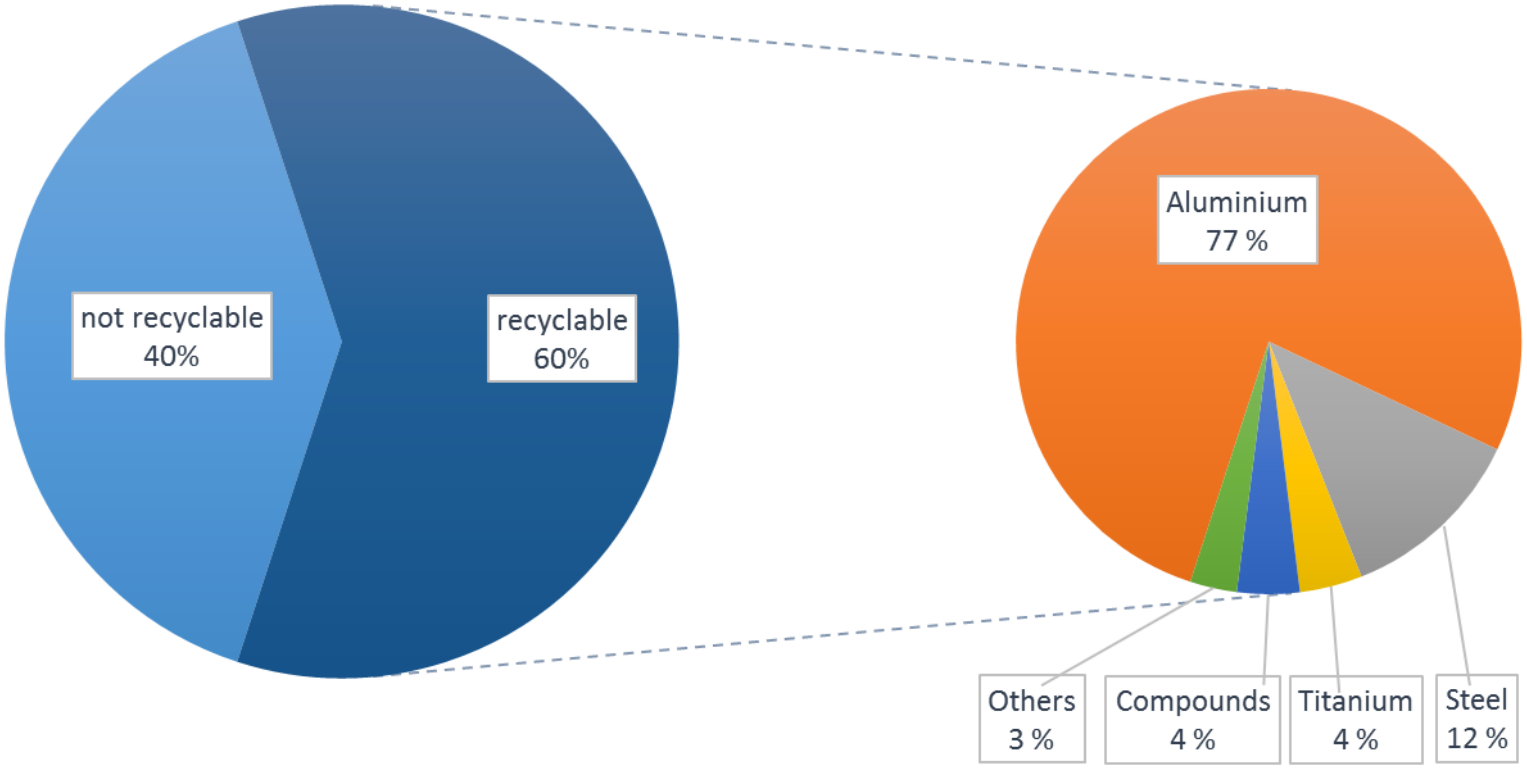
Joint materials to be handled



Joint materials to be handled



Material Mix



MORE-AERO

Clausthal University of Technology
Department mineral and waste processing, waste disposal and geomechanics:
- Materials
- Processing research

www.ifa.tu-clausthal.de

Süderelbe AG:
- Value chain aircraft recycling
- Network management
- Project coordinator

http://www.suederelbe.de/flugzeugrecycling

Keske Entsorgung GmbH:
- Smart dismantling
- Industrial application

www.keske.de

STUTE Logistics (AG & Co.) KG:
- Logistic and process
- Transportation concept

www.stute.de

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MORE AERO

Work package 1:

Development and implementation of a smart & mobile dismantling unit

Work package 2:

Logistical concept for transport & logistics using standard logistic infrastructure

Work package 3:

Feasibility study for recovery of materials from used aircraft

Work package 4:

Development of a competitive value chain for aircraft recycling

Development of a network for aircraft recycling in Germany

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TU Clausthal

STUTE With passion for logistics.

Niedersachsen Aviation

Süderelbe AG Metropolregion Hamburg

Mobile Unit

Conclusion

- All trades have to work together
  - Economic success through attainable market prices
- Recycling-process of ELV can be adapted to a certain extend
- Available raw materials in Europe through aircraft beneficiation in Germany
- Bringing dismantling unit to the aircraft – not the other way around.
- MORE-AERO is just the first step

Thank you very much for your attention.

Open for questions!!!

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