The Strategic University Steel Technology and Innovation Network Presents

Task 3: Scrap Segregation and Utilisation

Zushu Li, Claire Davis, Ishwar Kapoor (WMG);
Richard Thackray (Sheffield)

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The drivers

to significantly increase the use of scrap in the UK steel production

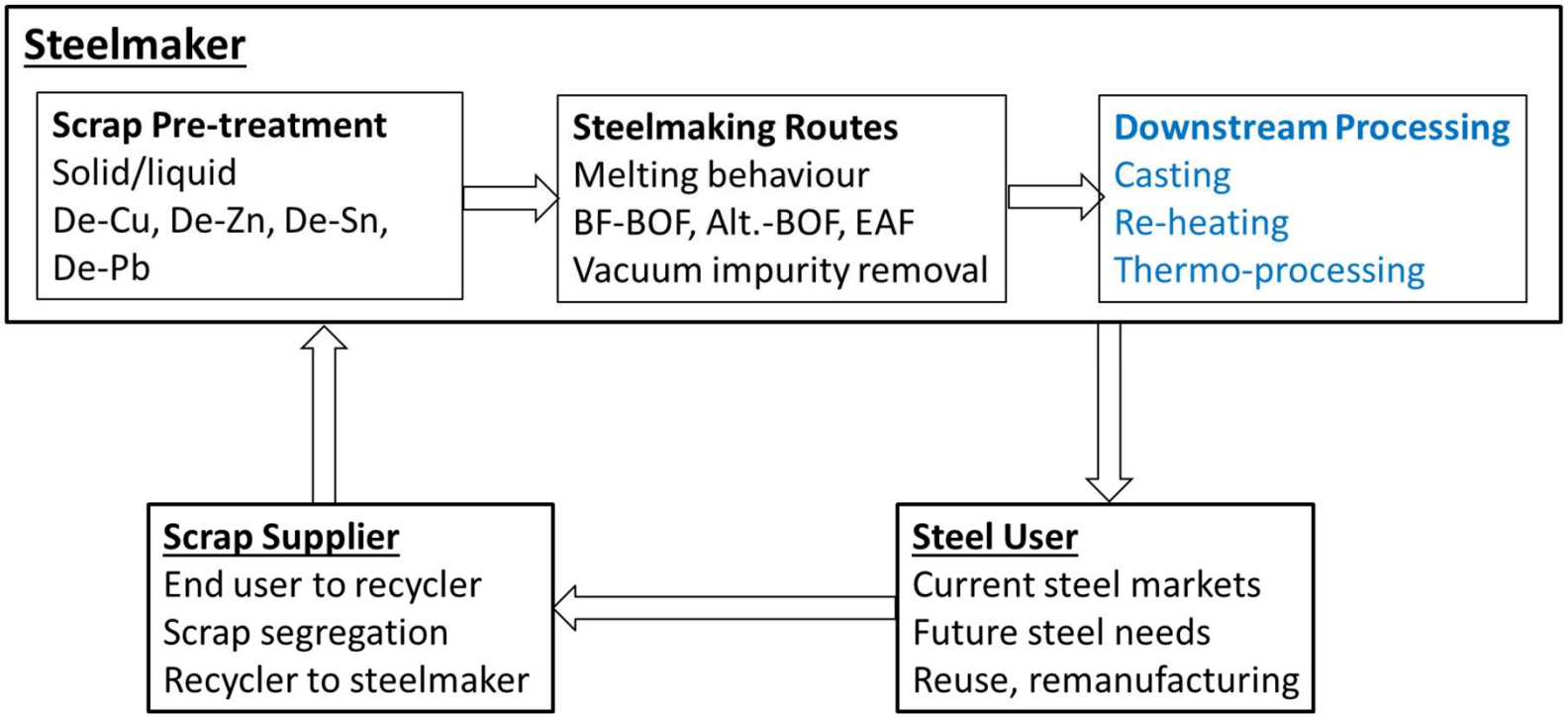
The challenges

to increase the use of scrap in the UK steel production

- One of the biggest challenge is **the impurities** (residual elements) inherited from the steel scrap;
- The problematic scrap (e.g. obsolete scrap) – mixed/coated with other materials (Cu, Sn, Zn, Pb, Sb, Co, glass and plastics); fluctuating chemistry;
- Down-cycled to lower grade steel products;
- Excessive impurities influence the **steel processing** and **service properties** of steel products: hot shortness, surface defects, etc.

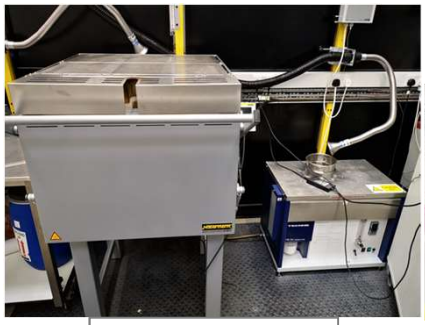
The main objectives

- To reveal effects of impurities and processing parameters on steel processability and product qualities (WMG)
- To assess the economically feasible removal limits (thresholds) of the residual elements and the recovery rates of valuable alloying elements from scrap during processing (Sheffield)



Approach: Lab simulated processes

Melting+ Casting



Heat Treatment

Rolling

Mechanical Testing

Characterisation

- Impurities influence the processability and quality/service properties of steel products.
- Changing process parameters may increase the tolerance of impurity levels without sacrificing the quality/service properties of steel products.
- Life Cycle Assessment of removal limits of residual elements & recovery rates of alloying elements.

Outcomes

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- Advanced knowledge and understanding (improved metallurgical rules) on the effects of impurity elements on steel processability and quality & service properties of steel products
- Recommendations on changes in processing parameters to increase the tolerance of impurity levels in steels without sacrificing steel properties
- Recommendations on new steel design and process improvement in terms of impurity elements
- Recommendations to increase the steel scrap usage in the UK steel production and to produce the high quality steel for the future needs at low costs & less environmental impact
- A framework to assess the economically feasible removal limits (thresholds) of the residual elements and the recovery rates of valuable alloying elements from scrap during processing
- Recommendations to policy makers on the sustainability of steel industry and to the setting of new steel grade standards.

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