

The Strategic University Steel Technology and Innovation Network Presents

Welcome and Introduction

Professor David Worsley



Engineering and
Physical Sciences
Research Council



Swansea
University
Prifysgol
Abertawe

Can it really be 25 years?



Steel Today....



STEEL FACTS

Over
75%
of the 3,500 steel grades in use today did not exist 20 years ago.

worldsteel.org



STEEL FACTS

—
The amount of steel in use in the world today is equal to more than
200
kg per person.

worldsteel.org

Steel Tomorrow....



STEEL FACTS

There would be no electric mobility without **steel.**

Electrical steel is an essential material in the construction of generators and motors for electric vehicles.

worldsteel.org



STEEL FACTS

The industry is working together on many initiatives to develop breakthrough steelmaking technologies that could reduce CO₂ emissions by more than

50%

potentially revolutionising the way steel is made.

worldsteel.org

Steel Underpins UK Manufacturing

Construction

£88.7bn



Transport

£14.5bn



£5.2bn



£8.0bn



£12.5bn



Energy Security

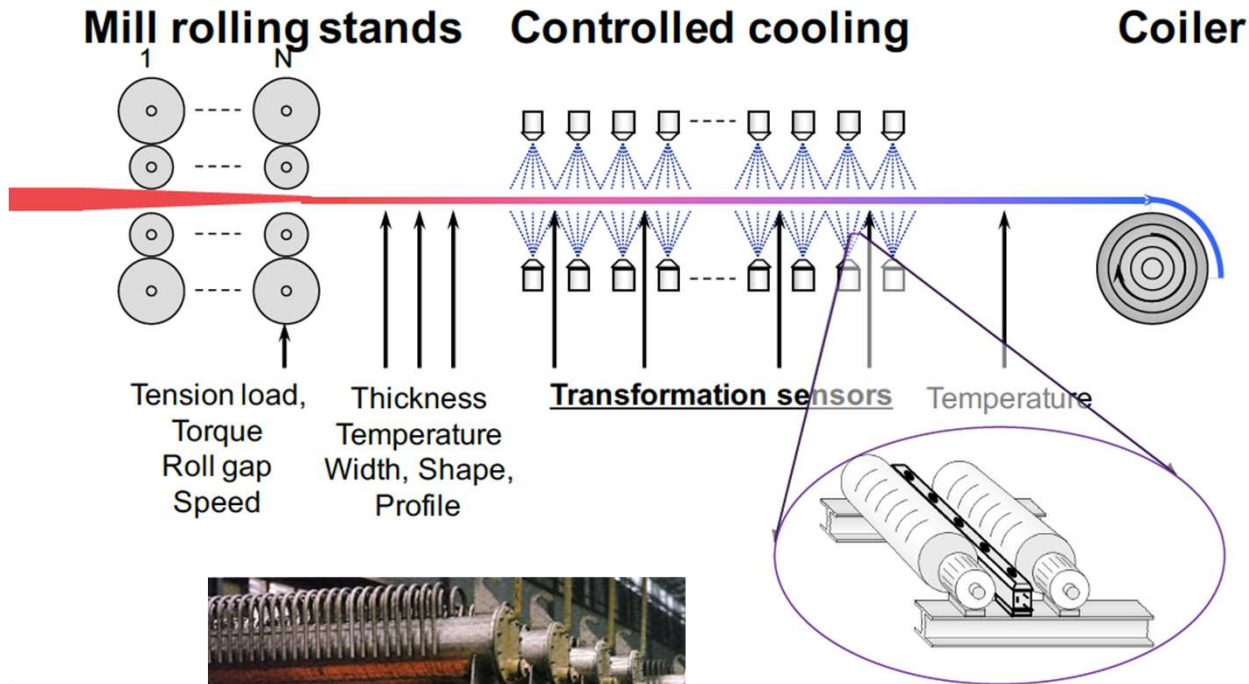


£18.4bn

Engineered Goods



Steel Research with Impact

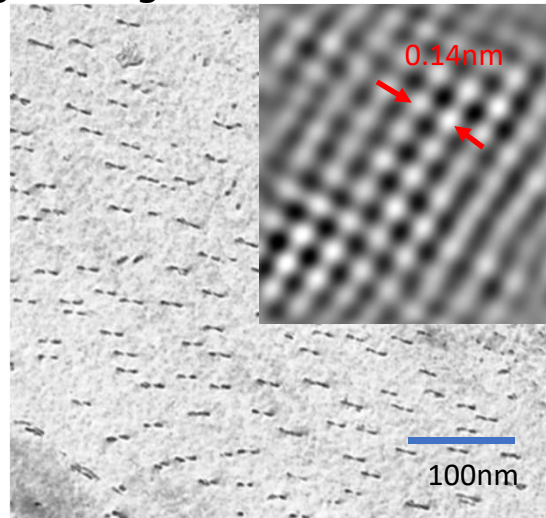
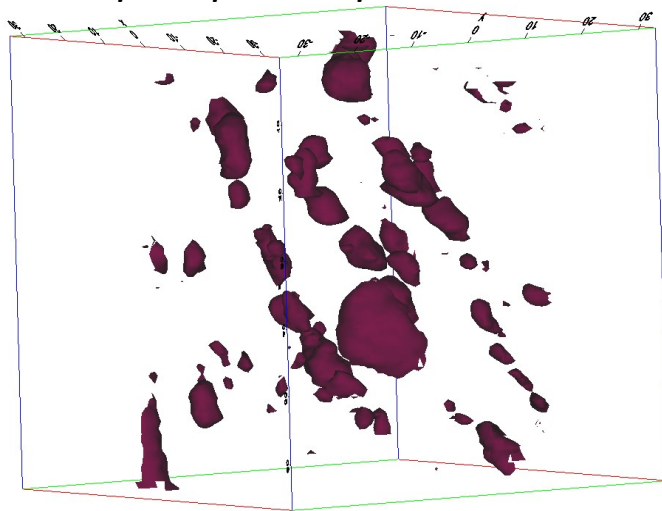


State-of-the art sensor technology developed in UK deployed in the Tata Steel Ijmuiden hot strip mill

Steel Research with Impact

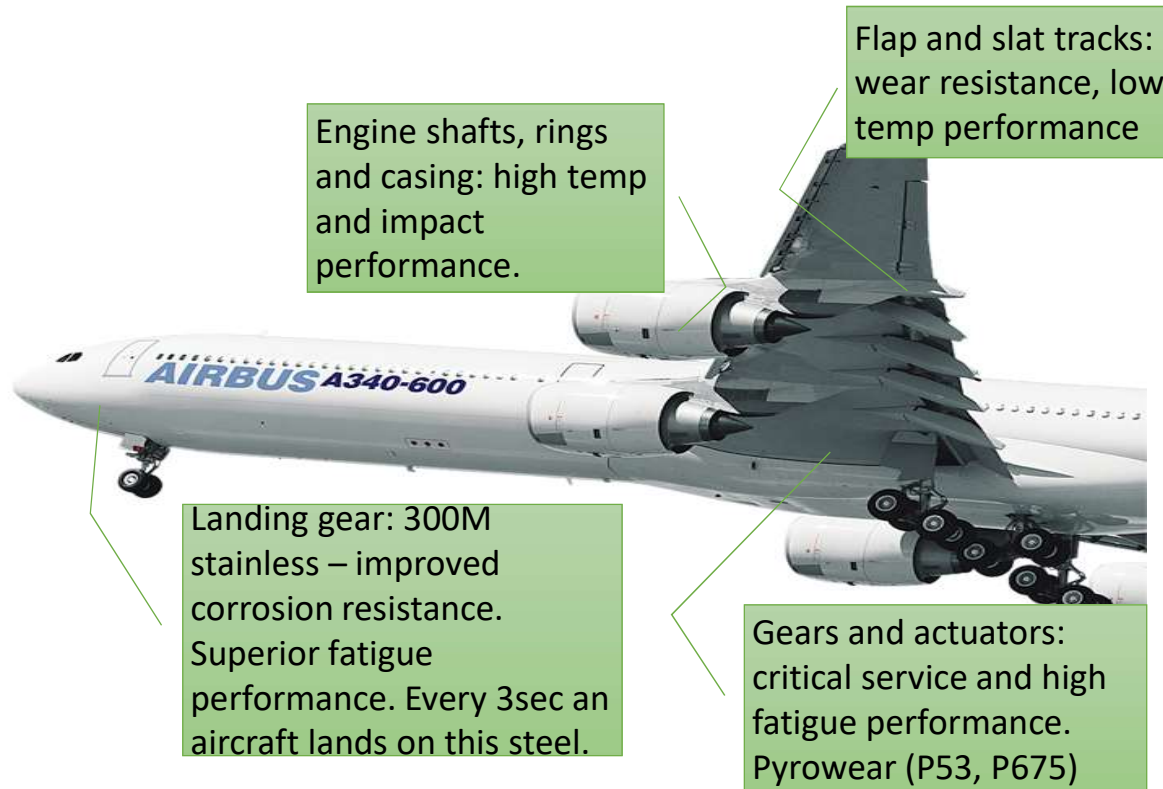


5nm precipitates provide the strengthening

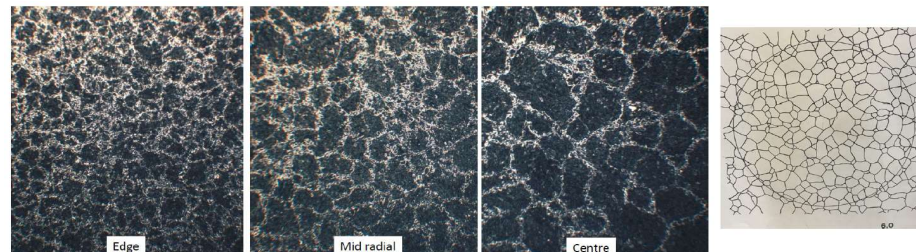


***Novel formable
high strength steels
developed through
EPSRC research
underpin 5* NCAP
performance***

Steel Research with Impact

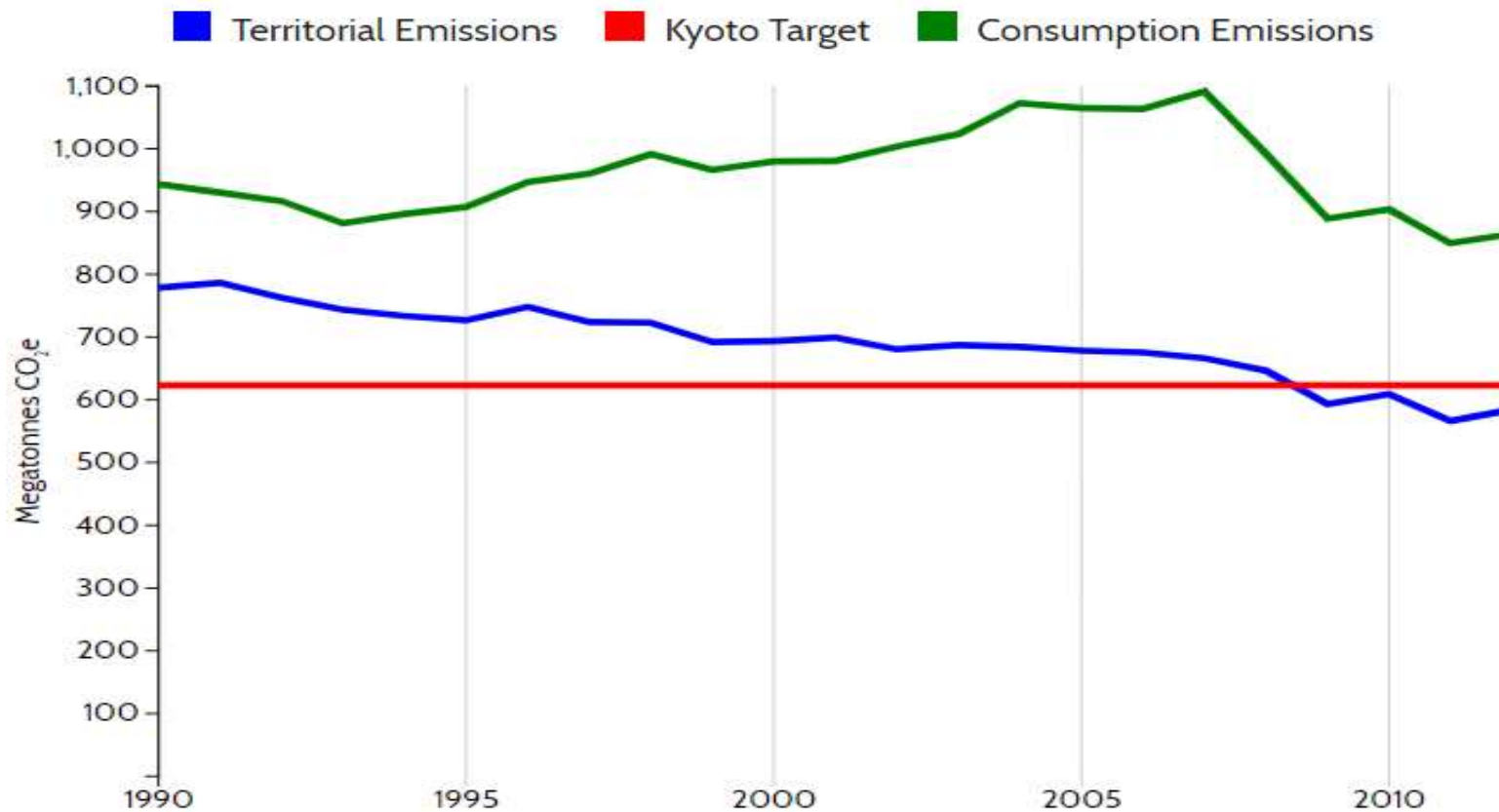


- Pyrowear: Chemistry, rolling, heat treatment control
- New methods of grain size assessment



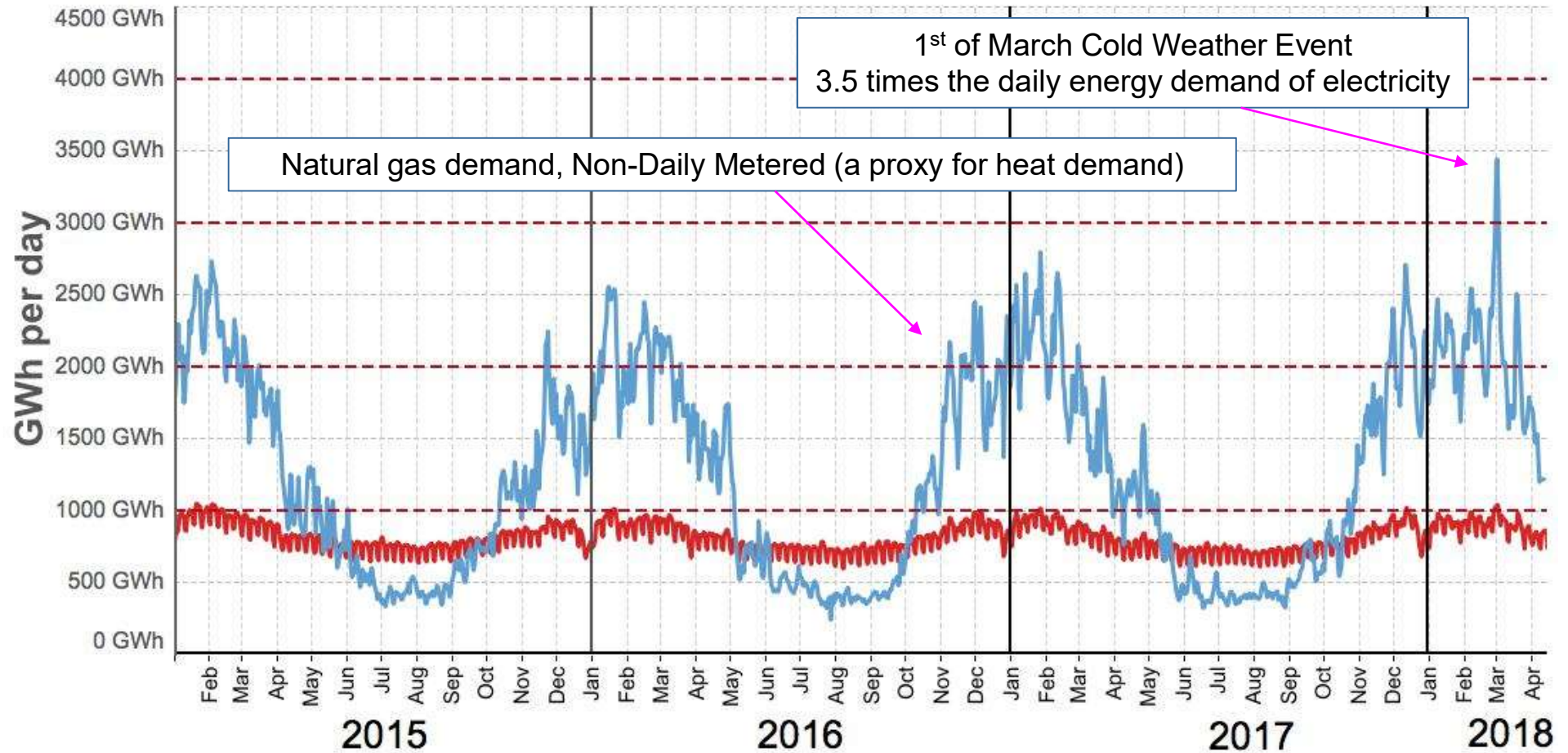
UK Crisis: Climate

- We are offshoring not decarbonising



Source: Leeds Sustainability Research Institute <http://www.emissions.leeds.ac.uk/>

UK Crisis: Energy



Data are from National Grid, Elexon and BEIS. Charts are licensed under an Attribution-NoDerivatives 4.0 International license
Charts can be downloaded from <http://bit.ly/energycharts>



by Dr Grant Wilson grant.wilson@sheffield.ac.uk

UK Crisis: Waste



Source: DEFRA

Steel Solutions not Problems

- Steel can be part of the solution by:
 - Valorising Internal Waste (Heat T6, Gas T1, Solid By-Products T2)
 - Reprocessing External By-Products T2
 - Becoming decarbonisation hubs T1
 - Increasing Scrap Recycling T3

This will provide a solid base on which to build a smart steel future by:

- Integrating conventional modelling and data science T4 & T5
- Game changing sensing technologies (T8).
- Novel metallurgical processing (T9).

Transforming Steel Manufacturing



Climate change & sustainability

GCRA 1



Capability

GCRA 2



TATA STEEL

Capacity & future skills

Informed Investment



UK Steel

HENRY ROYCE INSTITUTE



specific

MPI Materials Processing Institute

CATAPULT High Value Manufacturing

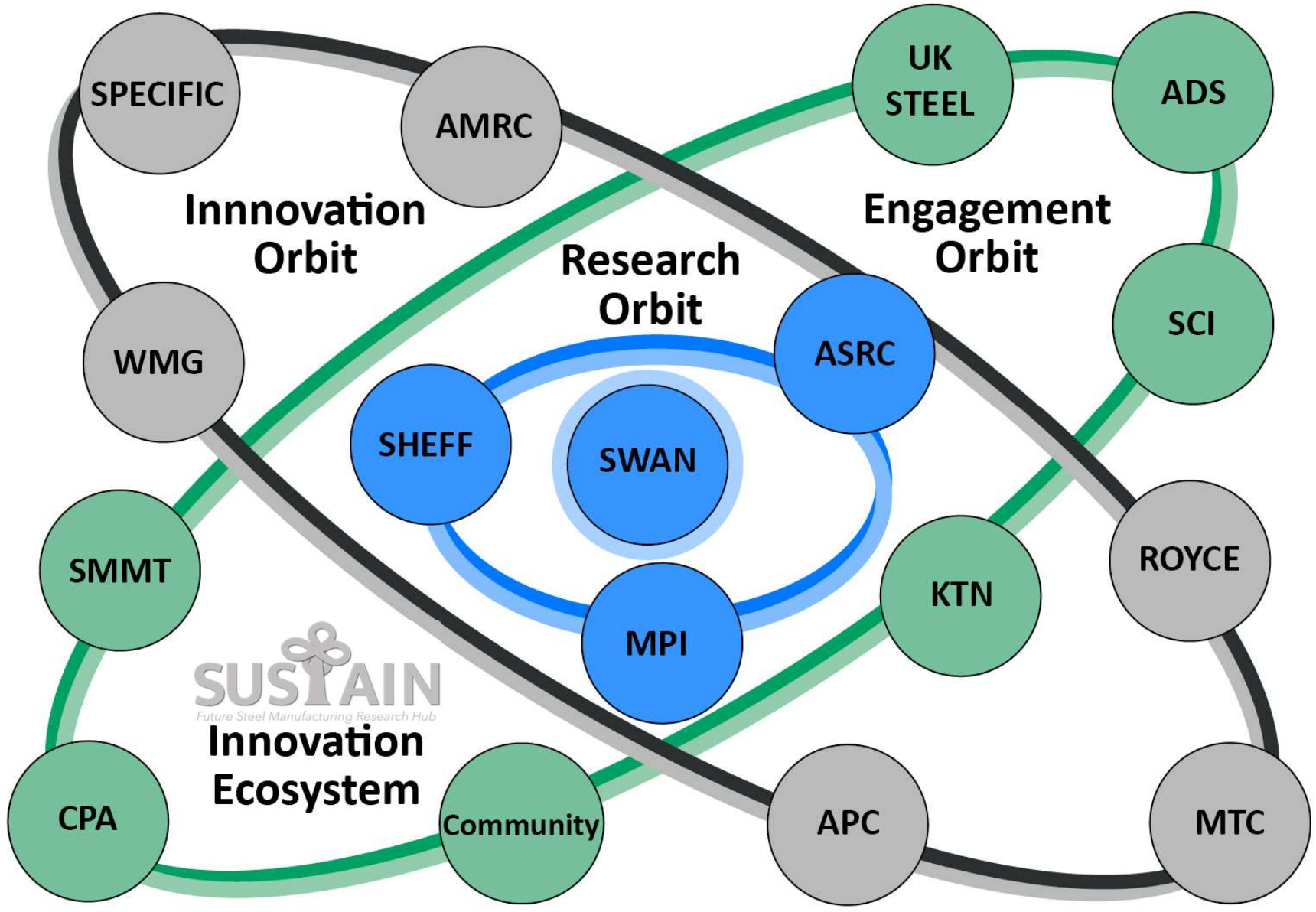


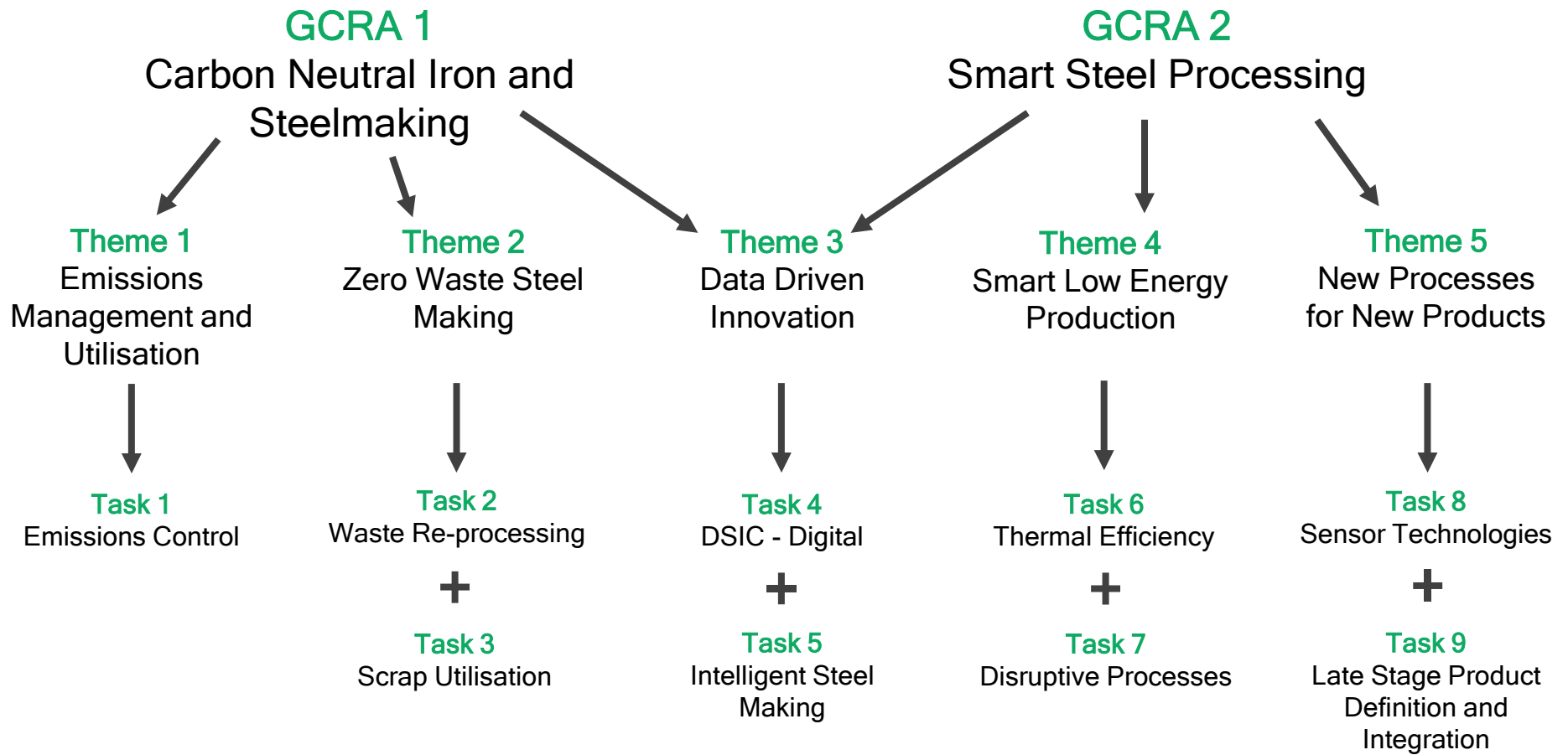
Carbon neutral iron & steel making 2040

£2.4bn GVA, 15% productivity boost & 35,000 jobs by 2030

World leading intelligent infrastructure by 2030







How can you Collaborate?



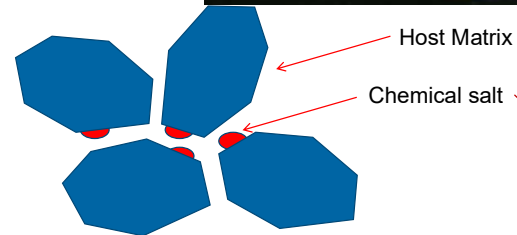
-
- We have allocated £1m to external calls.
 - Recognition of broad range of disciplines and ideas required.
 - Opportunity to become part of the Hub Team.
 - 1st Feasibility Call Summer 2020 circa £50k
 - Further rounds and larger calls for follow on for activity up to 3 years duration.

What's the aim for today?



-
- 1st we'll tell you what we're doing.
 - Opportunity to discuss with Tasks leads during the break.
 - Workshops to explore complimentary activity and opportunities.
 - Meet the technical directors of the businesses
 - The outputs of today will form the basis for our first funding calls out to the wider research community.

Steel Solutions not Problems



For example...

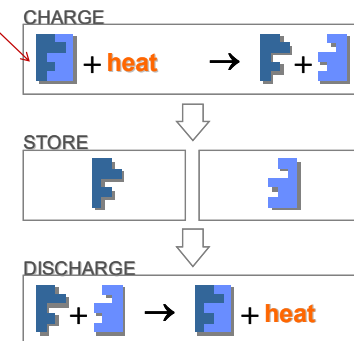
Charge



Discharge



EXOTHERMIC REACTION HEATS AIR PASSING OVER SIM



Steel Solutions not Problems



- New solutions for insulation
- Old materials used in new ways
- 'Circular' economy



Steel Solutions not Problems



- Steel PV and heating eliminates fuel poverty and provides electric mobility



The
University
Of
Sheffield.



Engineering and
Physical Sciences
Research Council



Swansea University
Prifysgol Abertawe



SUSTAIN

Future Steel Manufacturing Research Hub



CELSA
STEEL UK

SHEFFIELD FORGEMASTERS
INTERNATIONAL



LIBERTY
STEEL

TATA STEEL