

10 December 2021

David Varcoe,
State Manager NSW/ACT | National Manufacturing Advisor
Australian Steel Institute.

Dear David,

Response to Questions of Notice - ASI's session with Economics References Committee

We appreciate the opportunity to provide information on the “Steel Research Hub”, specifically in relation to Questions on Notice that the Australian Steel Institute took during the recent Federal Government’s Economics References Committee hearing on the Australian manufacturing industry (6 December 2021). This letter provides responses (reference) to specific Questions on Notice from the Committee’s Acting Chair.

By way of general background, the ARC Research Hub for Australian Steel Manufacturing (Steel Research Hub) is an excellent example of the success of the Industrial Transformation Research Program (ITRP) scheme. This assessment is based on both the extent and significance of the R&D outcomes, and their impact on the Partner Organization’s businesses. The ITRP scheme commenced less than a decade ago and the Steel Research Hub was one of the first. Across all three of its programs, the Steel Research Hub was successful in bringing together many of Australia’s best researchers and industry technologist/managers, across different steel-related fields, to both solve issues and problems currently faced by the national steel industry, and to help train part of Australia’s future workforce. Committed resources from six Australian (and numerous international institutions), and a strong collaboration with innovative national/international steel companies, helped deliver strategic outcomes that were not independently realizable.

Ultimately, the Steel Research Hub delivered innovations to its industry partners and these outcomes have the potential to increase competitiveness across the entire supply chain. They provide opportunities and pathways for long-term viability, resilience and sustainability for Australian steel manufacturing. Some of these are being explored in the new hub: ARC Research Hub for Australian Steel Innovation.

The two specific Questions on Notice (QoN) were:

- *Can you give us some examples of some of the successful projects or initiatives that the Steel Research Hub has undertaken, just so we can understand better from a practical viewpoint as to how important the Steel Research Hub is?*
- *Has any research been done to demonstrate the economic contribution of the Steel Research Hub—for example, trying to work out the value of every government dollar that’s been spent on the research hub—so we can have a better understanding of its importance?*

In relation to the first QoN: A selection of short non-confidential descriptions of outcomes and their potential impact are provided, from each of the three programs:

1. **Product development program**, aiming to develop highly differentiated, market-driven flat steel products for utilization by SMEs;
2. **Metallic coating program**, aiming to enhance current innovative technologies in coating;
3. **Primary steelmaking program**, aiming to transforming the economic and environmental sustainability of iron and steelmaking in Australia.

In the **product development program**, outcomes included:

- Market-attractive alternative Quench & Tempered plate steel products with significantly improved abrasion resistance for higher end wear products in mining etc.
- Potential market growth through a cold formed steel (CFS)-based construction solution that could have significant influence on the residential apartment market sector in Australia. This was based on multidisciplinary research that investigated adaptive facades systems, CFS wall systems, strap-braced shear panels, supply chain and technical design guide.
- Potential future market growth via the provision of initial guidance in the selection and implementation of topographically modified painted steel surfaces for long-term inhibition to the adhesion and growth of fungal spores for such products.

In the **metallic coating program**, outcomes included:

- An improvement to the coating process and hence the coating surface stability was recommended and trialed, based on new fundamental knowledge of liquid alloy properties and a combined numerical-experimental approach.
- A novel Electrochemical Noise Measurement technique and approach was developed for manipulating the surface chemistry of metallic coated steels for improved interaction between the metal surface and subsequent protective layers.

In the **primary steelmaking program**, outcomes included:

- Potentially significant reductions in the cost of ironmaking raw materials through new understanding on the evolution of the mineral phases during sintering.
- Reduction in re-blows and optimization in flux usage for the steelmaking process, through utilizing newly generated thermodynamic and kinetic data in two plant operational models.
- Identification of new opportunities for by-product recycling and improving the environmental footprint through recycling of problematic by-product materials.
- Improved capability to evaluate new operational measures for extending the life of the Liberty blast furnace.


In relation to the second QoN: In completing its final annual report for the ARC, the Steel Research Hub reported a significant anticipated forward benefit. This was one of the ARC's KPIs for transformation hubs.

This anticipated/forward estimate of benefit represented a totalization of individually calculated anticipated/forward estimates i.e. for all 20+ key outcomes from the hub's programs. The estimate was calculated based on conservative assumptions for each specific benefit, such as the proportion of market share increase, the extent of asset life increase, the level of flux consumption reduction, and so on. Many of the assumptions were based on public domain information and/or informed estimates. The totalized estimate was reported to the ARC as an undiscounted cash flow amount. The total amount of government expenditure was approximately \$5M.

Overall, the relative economic contribution of the Steel Research Hub aligned very well with the results recently reported by CSIRO [[CSIRO study on return on innovation](#)].

Please let me know if there is any further explanation required for the responses provided.

Yours sincerely,



Paul Zulli *PhD, FTSE*
Hub Director