HILT CRC

HEAVY INDUSTRY
LOW-CARBON
TRANSITION
COOPERATIVE
RESEARCH
CENTRE

P3 FACILITATING TRANSFORMATION

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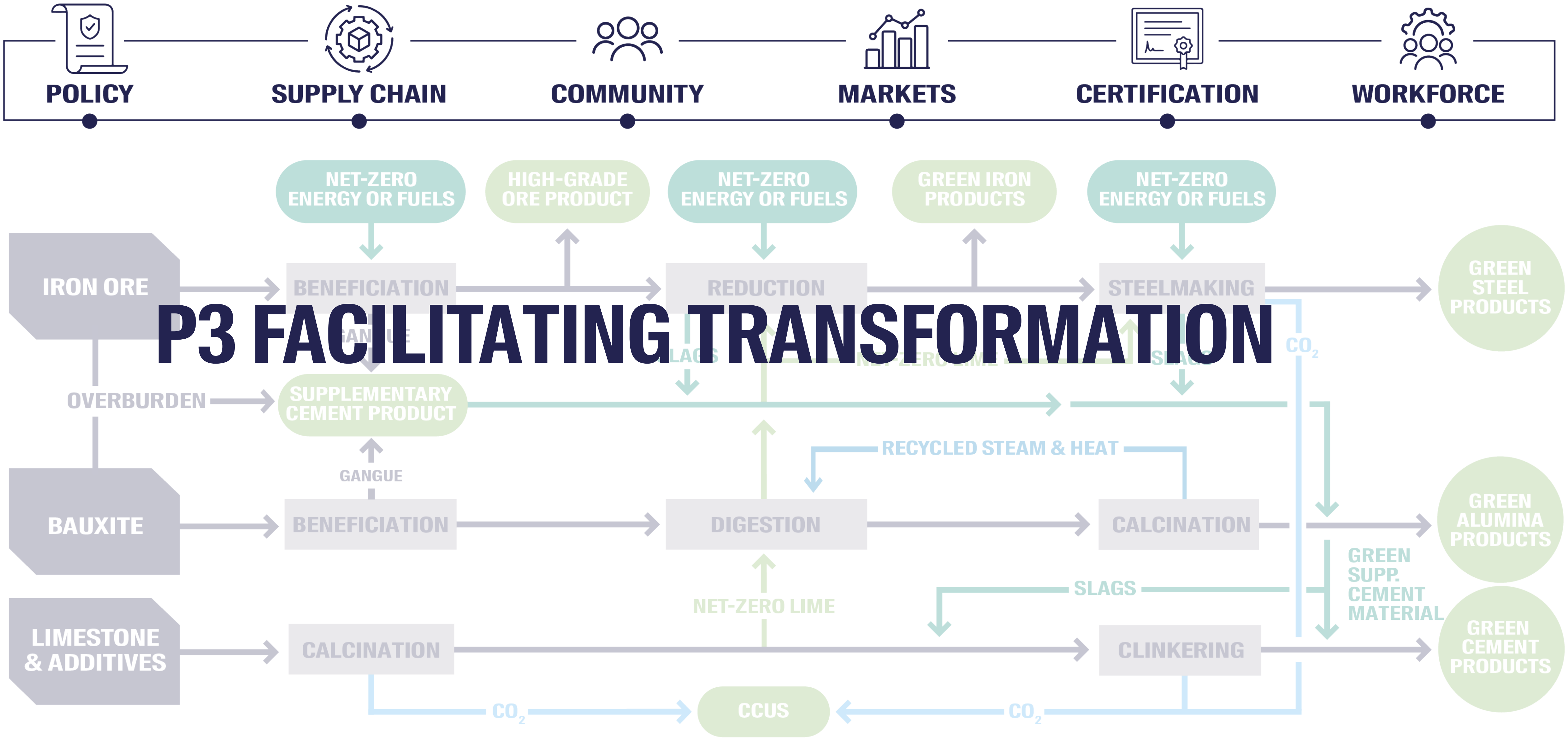
PATHWAYS TO DECARBONISE HEAVY INDUSTRY

P3 FACILITATING TRANSFORMATION



P3 FOCUS 2024/25

- Strategic positioning, leveraging unique HILT capabilities: in-depth research and expertise in both policy and technology AND access to broad stakeholder perspectives
- Pathways to impact:
  - Timing is critical to feed into policy development. Understand and prepare for policy development pipeline
  - Synthesise HILT research into tailored outputs for key stakeholders incl government (e.g. submissions to consultations)
- Grounded in evolving understanding of technological pathways for decarbonisation: Ensuring relevance by encouraging transdisciplinary research and cross program links

PROGRAM 3
FACILITATING TRANSFORMATION

Developing supporting frameworks for emerging low-carbon technologies

Assessing barriers and policy enablers for the production and trade of low-carbon products and commodities

Enabling facilities and infrastructure

IDENTIFYING KEY ISSUES

through research and stakeholder engagement:

- Availability of competitively costed net-zero emission energy/infrastructure.
- Uncertainty in markets for green commodities: When/where will they emerge? Will they support a green premium?
- Policy uncertainty – Need for long-term, bipartisan policies to build a business case for decadal decarbonisation plans.
- Government support to derisk the large investments needed to decarbonise. In what form?
- Efficient regulatory and approval processes need to be consistent and co-ordinated across state and federal government.

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ADDRESSING KEY ISSUES: P3 PROJECTS

Finalised quick start projects

Regional hubs for net zero heavy industry

Options and advantages of net-zero industrial hubs

Lifecycle analysis of heavy industry

Benchmarking emissions in heavy industry supply chains

Review of trade and regulatory implications

State of play of international trade of key commodities, identifying competitors, trade barriers, and subsidies. Is it a level playing field?

3.009
Green iron and steel export analysis

Ore and location specific techno-economic model for evaluating green supply chains from Australian mines to steel plants around the globe. **Follow on cont. to 2027**

RP3.005
Green iron and steel market & cost factors

Identifying barriers and enablers for green Australian iron and steel, through expert elicitation and analysis of policy and future markets. **Finalised**

RP3.008
Policy roadmap

Mapping domestic and international policy landscape for Australian heavy industry; assessing gaps, industry concerns, and potential fixes. **End Q1 2026**

Longer term flagship projects:

RP3.007
Energy infrastructure investment

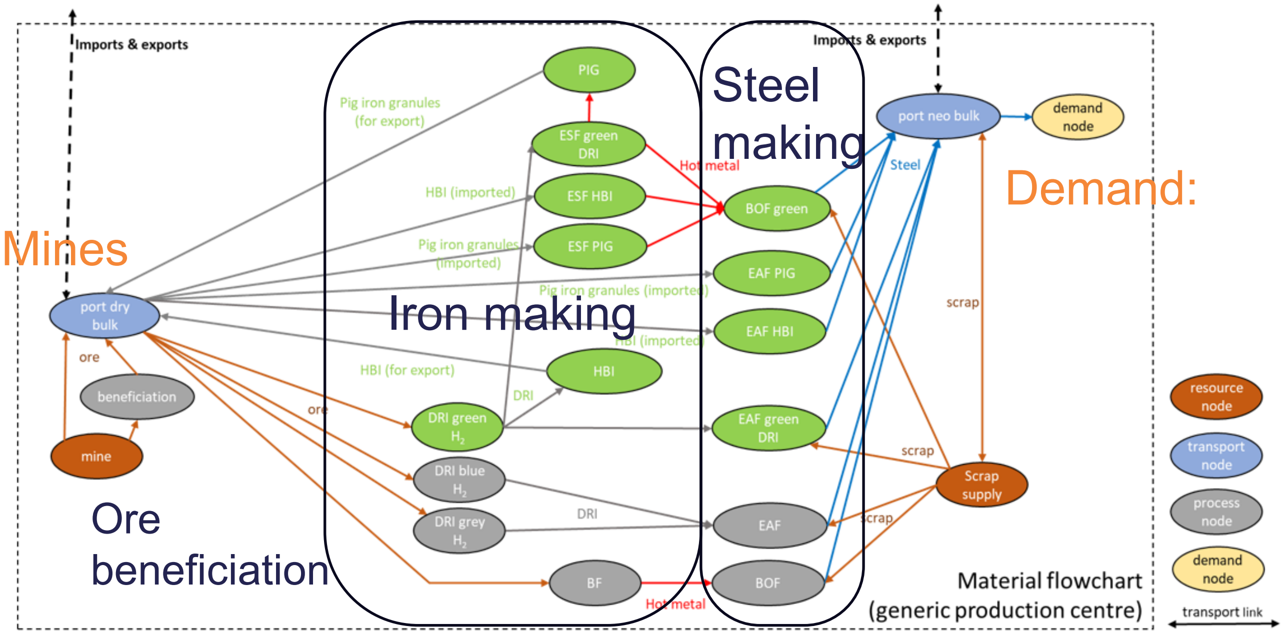
Developing industry informed decarbonisation pathways, assessing optimal supply of net-zero energy, and least-regret infrastructure investment options

RP3.006
Green certification

Understanding emissions accounting frameworks for certification; to enable industry to engage in the development of an efficient and effective Australian scheme.

MODELLING GLOBAL GREEN STEEL SUPPLY CHAINS:

RP3.004: ECONOMIC AND EMISSIONS ANALYSIS OF AUSTRALIA-CHINA GREEN STEELMAKING VALUE CHAINS Dr Jorrit Gosens (ANU)



Unique technoeconomic supply chain model, combining

- optimises whole supply chain to meet steel demand at lowest cost– including choosing location of different processing steps
- mine specific costs and ore details (from commercial database)
- ore dependent process modelling based on HILT

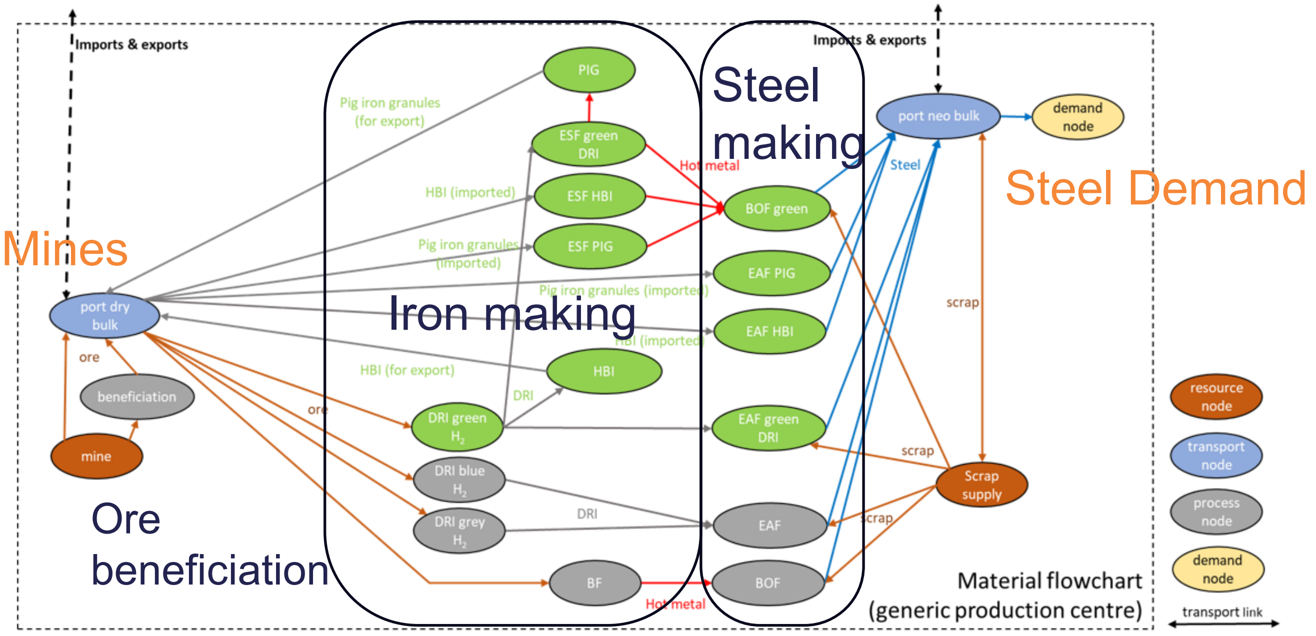
Key outcomes of 3.004:

- Green steel production routes could cut lifecycle emissions by 70-95%, but could increase emissions in Australia if iron is made domestically.
- Decarbonisation in China will likely reduce iron ore consumption due to lower steel demand and increasing use of scrap.
- A shift to green steelmaking reduces demand for Australian iron ores more than high-grade ores from our competitors in Brazil, Guinea, etc.
- Australia's competitiveness as a supplier of green iron to China depends on achieving green hydrogen production costs below Chinese production costs.
- Electric smelting furnace (ESF) technology is

MODELLING GLOBAL GREEN STEEL SUPPLY CHAINS:

Follow on project RP3.009: MODELLING GLOBAL MARKETS IN A DECARBONISED STEELMAKING INDUSTRY

Dr Jorrit Gosens (ANU)



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Key aims of 3.009:

- Identify global markets for, and assess competitiveness of Australian iron ore, green iron, and green steel exports.
- Evaluate driving factors to promote competitiveness of future Australian iron ore and green iron exports.
- Identify key leverage points for Australian policy makers

Engage with key stakeholders to design modelling scenarios and identify key research questions such as:

- **What are the projections for Australian green iron exports under different steel demand and scrap supply forecasts, or as ESF performance improves?**
- **How may concessional finance for investment in green iron production affect export outlook?**

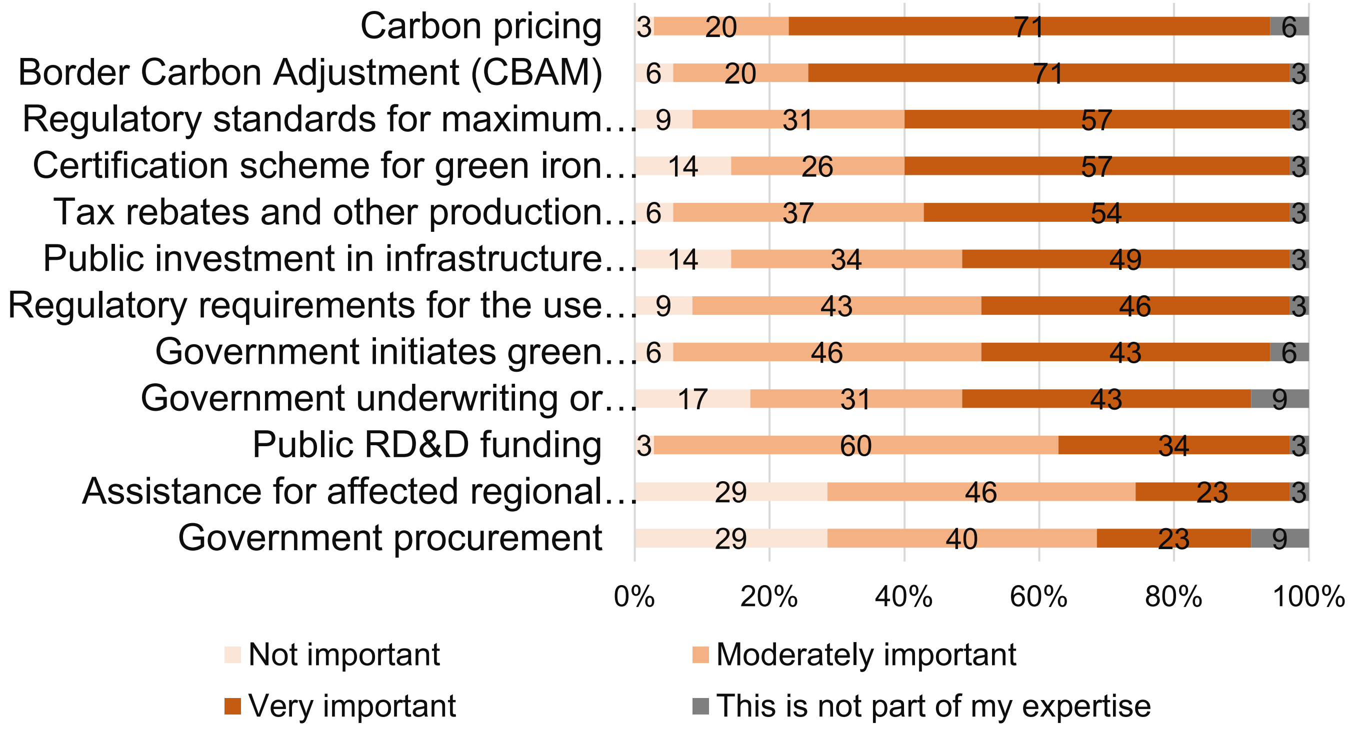
POLICY MECHANISMS TO PROMOTE GREEN STEEL IN AUSTRALIA

RP3.005: MARKET, COST AND LOCATIONAL FACTORS FOR GREEN IRON AND STEEL IN AUSTRALIA

Prof Frank Jotzo (ANU)

Expert elicitation of enabling measures to facilitate the development of green iron and steel industry in Australia

- Views of 42 experts across gov, industry, NGOs, academia
- Complex picture – many enablers identified as materially important.



Assessing policy enablers:

- Australian green iron/iron ore would largely be exported, need to consider distribution of benefits and costs between countries.
- Supply-side policy support may be effective in helping establish green iron/steel industries
- **but** subsidies will largely benefit international customers of the products and owners of the production capital,
- **and** scale of the iron ore industry much larger than available public funds for subsidies
- Suggests that Australian policy support should focus on **reducing investment and market risk for early movers** and other enablers (suitable regulatory frameworks, skilled labour and shared infrastructure).
- Australia has a vital interest in demand-side policy measures in resource importing countries. (e.g. carbon pricing coupled with border carbon adjustments)

MAPPING RELEVANT POLICY LANDSCAPE

RP3.008: A POLICY ROADMAP FOR AUSTRALIA'S HEAVY INDUSTRY LOW-CARBON TRANSITION – Dr Anthony Kosturjak (UoA)

International trends

Policy–target gaps: existing policy measures often insufficient to meet aspirations

Carbon pricing of industrial emissions remains quite uneven across countries, but is expanding

Carbon Border Adjustment Mechanisms are being phased in or considered

Recognised need for stronger, holistic policy response

Longer forms of support are emerging

Domestic policy issues

Delays in approvals are slowing renewables rollout

Safeguard Mechanism promotes decarbonisation but has some frictions

Not clear if legislated support mechanisms (e.g. HPTI) will overcome green premium

Varied targets across jurisdictions

Some regulatory overlaps in planning and environmental approvals processes in some states

Policy choices depend on policy objectives

Project provides evidence and analysis

Assessment of options for policy reform under consultation

(incl. specific recommendations for Safeguard Mechanism

P3 PROJECT OVERVIEW

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HILT CRC

Australian Government
Department of Industry, Science and Resources

AusIndustry
Cooperative Research Centres Program