

Emeritus Professor Mary O’Kane
Review of the CRC Program

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Dear Emeritus Professor O’Kane,

I found the Review’s *Report* extremely useful to explain the CRC system’s institutional rationale and historical path dependence (pp. 36, 51). Below, I briefly outline some opportunities worth further discussion and exploration given your terms of reference 1b, 1c and 2 (p. 76), summarised in an appendix table on phases to realise benefits from CRCs, including *Report* suggestions.

Our understanding of government-funded initiatives and complex collaboration in response to “market failure” and other issues of national significance (pp. 39, 53, 56), and intervention/reform options, has expanded considerably since Professor Ralph Slatyer’s original proposal on CRCs.

The “auxiliary program” (p. xvii) is crucial to clearly define problems, list critical assumptions and formulate provisional solutions—and must have a “forward view” that is risk-seeking. Rather than “react quickly to emerging priorities” (p. 52) CRCs and other institutions in the National Innovation System must be able to anticipate and pre-empt issues before they become “wicked problems”. Academics, analysts and practitioners offer a repertoire of ‘due diligence’, foresight, innovation and other exploratory methods which competition policy and industry/sectoral development may further contextualise. The “public benefit” (p. xiii), “significant challenge” (p. xiv) and “pre-competitive and pre-applicative problems” (p. vii) will clarify the problem type, scale and impact to be considered. Universities can accelerate this phase through more public profiles of their research teams and expertise, perhaps modelled on social networks such as Facebook and LinkedIn.

The “fit for purpose” (p. xvi) and “appropriateness” (p. 39) tests highlight the importance of market, mechanism and institution design for new CRCs. From personal experience, all the *Report*’s tests will work most effectively if they are part of day-to-day research management. Harvard University’s Al Roth and Cass R. Sunstein (formerly University of Chicago), and Stanford University’s John McMillan have done important work here that new CRCs could learn from, notably on the post-partisan balance of government funding and market mechanisms required to realise and diffuse benefits to others beyond the CRC research communities. Intermediaries similar to “fund of funds” in financial services might help coordinate the parties for joint ventures during the pre-bid phase for new CRCs. Auctions or similar competitive mechanisms might reduce search and transaction costs.

Collectively, the *Report*’s recommendations highlight the coordination challenges which CRCs face as multi-stakeholder organisations. Each phase is vital for success: purpose (R2i, R2ii), organisational design (R3.1i, R3.1ii), problem formulation (R4), staffing (R5), CRC investment mix (R6), management and risk-return (R7), and collaborative links (R8). My initial submission to the Review (602-Alex Burns) dealt primarily with the efficiency issues raised in R3, R7.1.2ii and 7.1.2iii and suggests market-based instruments as partial solutions similar to DARPA’s research tournament (p. 73).

The *Report* notes several common and recurring problems or “anti-patterns” in CRC funding, management and audit processes. These include end-users “staking a claim” (pp. 33, 36) to funding and intellectual property rights, integration barriers (p. 48), gaming the audit review process (p. 49), “rebidding” that exploits information asymmetries in the CRC bid process (p. 53-54), gaps in market-based management for R&D commercialisation (p. 54), and concerns over joint venture incorporation and board corporate governance (p. 58). This leads critics of the CRC system to suggest that it may be prone to “market failure” due to problems in coordination, resource allocation and knowledge diffusion. Rather than “epiphenomena these” problems are probably second- and third-order effects of the market, mechanism and institution design issues mentioned above, particularly if incentives such as government funding are used for non-core activities. Macroeconomic factors might include industry cyclicity, structure and trajectory; Cournot and Stackelberg dynamics; and the entry barriers constructed for new and emerging markets.

The *Report* discusses several commercialisation options. The Capital Markets CRC (p. 43) exemplifies the potential for market mechanisms and institution design: a focussed ratio of university and commercial end-users, a clear value proposition in the dynamic industry of financial engineering, and a separate company for research commercialisation. Hawker de Havilland’s experience (p. 33) highlights coordination at operations, process and project management levels through targeted R&D to scope the industry whitespace, concurrent projects with real options models to delay choice, and prototype demonstrators. Perhaps the CRC Association could document “best practices” from such cases, and design an end-to-end process architecture for research management, such as problem formulation to CRC bid, or research publication to end-user benefit realisation. Given the *Report’s* emphasis on joint ventures the commercialisation benefits of new CRCs might include industry alliances that establish standards and design new markets for products and services.

Finally, CRC benefits realisation could be integrated into CRC reporting and performance assessments. This might occur through more robust counterfactual reasoning of alternative investment choices at pre-CRC bid (p. xii); weighting CRC outputs and managerial performance against alternative use of participant’s capital; metrics other than ROI (p. 33) for projects (e.g. ROA, ROCE, NPV ‘hurdle’ rates, DCF, EVA, and Real Options); and exception reports for cost variance and sensitivity analysis. This would align CRCs with best practices in management accounting for joint ventures, and enable comparison with the earlier estimates by Allen Consulting, Insight Economics and the Productivity Commission (pp. 41-44). This could provide the basis for longitudinal tracking of CRC outputs and research careers. Further, it may create the space for intermediaries at pre-bid stage to lower search costs, similar to the emergence of “fund of funds” in financial services.

I hope you find this *Report* feedback constructive for your Review of the CRCs Program.

Sincerely,

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Appendix Table 1: A Phased Approach to Realised Benefits from New Cooperative Research Centres (CRCs)

Phase	Challenges	Examples	Solutions	CRC Review 'Tests'	Phase Outcome
Major National Issue	Coordination, Externalities, Market Failure potential, Cycles (issues-attention, policy, stakeholders), Wicked Problem	Competition failure, High transaction costs, New market with few investors, Technology change, Outsourcing challenge, Patent overpricing	Auxiliary program for strategic analysis and innovation mapping Methodologies repertoire Institution, mechanism and market design	Pre-competitive and pre-applicative problems, Significant Challenge, Scope (National, New Industry)	Clear problem definition scoped with critical assumptions, national effects and industries/stakeholders listed
Pre-Bid Requirements Analysis for New CRC	Business Case Development, Coordination, Incentives, Institution design	Counterfactual reasoning, Industry co-evolution/whitespace, Time Value of Money	Anticipate emerging priorities, Incentives, Intermediary ("fund of funds" style investment)	Appropriateness, Fit for Purpose, Pre-competitive and pre-applicative problems	Business Case scoped and requirements clearly identified for all CRC stakeholders
New CRC Bid	Bid Proposal selection, Bid Proposal partners, Management team, Research Program priorities and scope	Funding mix (government, stakeholder, end-user), Rebidding excessively, Staking a claim, Institution capture, Trust	Auction model or other market mechanism, Common knowledge for applications, Lower search/transaction costs	Appropriateness, Fit for Purpose, Joint Venture potential to succeed, CRC Investment portfolio, Risk-Return	CRC Bids selected and "lessons learnt" captured for future funding rounds
New CRC Operations	Research Program execution, Process architecture, Staffing, Management, Reporting, Auditing, Intellectual Property	Alignment, Coordination problems between partners, Gaming the auditor, "Heavyweight" reporting, IP issues, Special interests	Alignment, Balanced Scorecard reporting, Integration, IP flexibility, Market design, Standards, Performance Assessment	Audits, Performance Assessments, CRC Investment Mix, Risk-Return	CRC operational as "joint venture" (incorporated or unincorporated) with dynamic research program and portfolio
Benefits Realisation	Triple Bottom Line (Economic, social & environmental benefits), IP commercialisation, Knowledge diffusion	Costing variances, Reporting metrics (ROA, ROCE, NPV 'hurdle rates', DCF, EVA, Real Options), Weak spillovers	Sensitivity analysis for quantification models, Longitudinal tracking of outcomes, Market intermediary for diffusion	Public Benefits Rapid Breakthrough Business Transformation	Benefits realised and diffused to end-users IP revenue streams