



Duncan Ivison
Deputy Vice-Chancellor (Research)

28 March 2019

Dr Alan Finkel, Chief Scientist, Co-Chair
Mr Mark Cully, Chief Economist, Australian Department of Industry, Innovation and Science, Co-Chair
The Innovation Metrics Review
By email: InnovationMetricsReviewTaskforce@industry.gov.au

Dear Dr Finkel and Mr Cully,

Innovation Metrics Review

The University of Sydney welcomes the opportunity to be part of the Innovation Metric Review's public consultations to help develop a new set of innovation indicators fit to serve Australia's interests over the next decade and beyond.

The motivations and purpose of the Review are strongly supported while its comprehensive, evidence-based and consultative approach is most welcome. As you note in your foreword to the Review's first consultation paper, 'innovation matters; indeed, hardly anything else matters as much in raising the well-being of Australians over the long run.' Yet as you highlight, current global approaches to measuring and comparing levels of innovation within economies may not reflect accurately the true extent and nature of innovation in Australia at the national, state or regional levels. We welcome, for instance, your acknowledgement that Australia's performance on conventional international benchmarks of business-researcher collaboration does not ring true.

The goals you have established for the Review (Consultation Paper, p.4) make sense and will help guide its work and recommendations to the Government. We strongly agree that the development of any new data and measurement infrastructure must be underpinned by a sound conceptual framework. We agree that it is highly desirable for Australia's future suite of innovation metrics to provide an evidence-base for measuring the impact of government policy initiatives on innovation.

In terms of the Review's proposed guiding principles (p.5) while the economic impacts of innovation are incredibly important, it would be a shame if by focusing on this area the Review missed the opportunity to develop a suite of robust metrics to measure the impacts of innovation on human and environmental health and wellbeing more broadly defined. There may be value, for example, in your Review seeking to ensure strong alignment with the Australian Government's commitments to the United Nations' Sustainable Development Goals (SDGs) and with the effort currently underway across federal agencies to ensure Australia's approach to the implementation of the United Nations' 2030 Agenda for Sustainable Development is well coordinated. The February 2019 report and recommendations of the Senate Foreign Affairs Defence and Trade References Committee on these issues may be a useful reference point for the Review.

The innovation metrics framework (p.8) developed jointly by the Taskforce and the Australian Academy of Technology and Engineering (ATSE) is a helpful conceptual tool. As a comprehensive research-intensive university, we operate as part of the innovation ecosystem depicted by the inner rings, while our activities are influenced by each of the policy levers identified in the framework's outer ring.

We note that to date the Review has examined metrics from a wide range of domestic and international data sources, assessing each metric against a range of performance criteria. We have staff with considerable knowledge and expertise regarding metrics relevant to the research system, human capital, distribution of knowledge, application capabilities and impacts components of the framework (p.9). If it would assist the Review, we are sure that, with more details about the metrics mapped and assessed, we and other universities would be able to provide helpful feedback about the quality and utility of existing metrics in these domains, measurement gaps and potential and/or possible emerging indicators.

Our responses to the Consultation Paper's three question are included in the attachment and we look forward to continuing to be part of this Review as it looks to finalise its report to Government by the end of June 2019.

Yours sincerely,

(Signature removed)

Professor Duncan Ivison
Deputy Vice-Chancellor, Research

Attachment University of Sydney responses to the Department of Industry, Innovation and Science's Improving Innovation Indicators, Consultation Paper, March 2019 three consultation questions

The University of Sydney responses to the Department of Industry, Innovation and Science's *Improving Innovation Indicators*, Consultation Paper, March 2019

Feedback on issues emerging from the targeted stakeholder consultations

1. Do you agree or disagree with the key messages received from targeted consultations to date? Why?

It is difficult to disagree with the content of the summary of key messages received from the targeted consultations to date. We agree that innovation is a means to an end and are pleased to see that delivering social and environmental benefits through innovation has been recognised as important alongside the pursuit of economic benefits. We agree that Australia's future innovation metrics framework needs to provide a robust evidence base that:

- enables comparison of innovation performance between Australian and international jurisdictions and industry sectors
- helps determine how well our innovation system is working, where it is strong and where improvements can be made
- informs the development of sound policy and programs to foster innovation
- supports the evaluation of the effectiveness of policy and programs and decision-making about the relative effectiveness of investing in innovation compared to alternative avenues for government investment.

2. Are there any other issues that fall within the parameters of the Review but which have not been raised in targeted consultations to date?

The Consultation Paper's summary covers a broad range of issues relevant to the task of developing a new robust framework and set of innovation metrics fit to serve Australia's interests over the next decade and beyond. From our perspective, we believe the following issues raised by stakeholders in the targeted consultations are significant in terms of Review's goals:

- Compared to some competitor countries, Australia's economy has relatively less 'absorptive capacity' to commercialise new technologies developed by its universities and other publicly funded research organisations. It would be useful to have an improved measurement, through domestic and international benchmarking of the "absorptive" capacity of the commercial R&D sector. There is a significant capacity issue in Australia because our SMEs tend to be small and often have limited understanding of or capacity for R&D. The presence of PhD-trained employees in SMEs benchmarked internationally would be highly useful for identifying areas of weakness and to inform policy development.
- Being a fast adaptor and adopter of innovations and new technologies is important but a nation's capacity for adaptation depends on the availability of highly educated and skilled workers who understand the technology or have the capacity to acquire that understanding quickly. In many fields, Australia needs to have its own cutting-edge R&D capacity in order to develop the human capital required for effective adoption and adaptation (p.13).
- Collaboration metrics are important, but more collaboration is needed between business and publicly funded research organisations to determine the best metrics for capturing accurately levels of collaboration between the sectors (p.14 & p.17).
- Better metrics are needed to quantify the extent of spill-overs from R&D undertaken by publicly and privately funded Australian organisations.
- Improved metrics about innovation infrastructure, benchmarked internationally would be valuable.
- Improved data on the quality of labour, levels of education and extent of participation in life-long learning would be helpful.

- There would be value in quantifying the Return on Investment resulting from innovation, particularly innovation made possible by Government policy or funding.
- Better metrics on innovation transfer and networks are needed.
- Better metrics are needed on publications and citations, though we would question that the current data are as weak as indicated in the paper (p.15).
- Definitions of R&D (Frascati Manual etc) need to be applied consistently (p.17).
- Australia can make better use of non-traditional data sources.
- The ANZSIC, the ANZSRC and the NSRC should be reviewed to determine their continuing relevance (p.18 & p.19).
- Developing better quality data on start-up and entrepreneurship would be helpful.
- It would be helpful for R&D Tax Incentive (R&DTI) data to be available with sectoral and geographic breakdowns (p.19).

3. Where do you believe the Review should focus its efforts? Why?

Allowing for improved benchmarking of innovation between jurisdictions

As a general principle, we see value in the proposed new metric framework presenting data about innovation capacity, performance, activity and outcomes in ways that allow for meaningful benchmarking between Australian jurisdictions and geographic regions, and appropriate comparator countries and jurisdictions overseas. For example, we strongly support and contributed to the development of NSW's first Innovation and Productivity Scorecard by the NSW Innovation and Productivity Council in 2018. That initiative is a work in progress, with the scorecard's methodology and metrics intended to be improved over time. It would be excellent if this Review resulted in stronger collaboration and strategic alignment between Federal, State and Territory agencies' efforts to map and measure innovation inputs, outputs and outcomes.

Improving data about the nature, location and type commercial R&D undertaken in Australia

There would be enormous value in the making available, or developing, metrics that enhance the understanding of policy makers and entities operating in the innovation ecosystem about where listed and private companies operating in Australia are investing in R&D, the fields and type of R&D they are undertaking. For example, the R&DTI represents the Federal Government's single largest investment in R&D and the innovation system. Improving the availability of data about the type of research the R&DTI is supporting would help ensure that these funds are being targeted appropriately. Making such data available by firm size, industry sector, geographic location and other variables would assist Federal, State and Territory governments with policy development, and universities and other public research organisations by helping them to understand where to target their research collaboration and knowledge diffusion efforts.

Looking beyond OECD patent data

The Review should seek to go beyond the OECD patent data as the main source of innovation analysis. While these data are prolific in the academic and industry literature, they do not offer strong proxy indicators for innovation and are often confounded by flawed assumptions about the meaning of the underlying data.

Other potential key areas of interest we would be pleased to discuss further with the Review include:

- strengthening data about human capital and talent flows
- improving metrics about business/university research collaboration
- developing data about Australia's performance in key emerging global industries and areas of research that align with the National Research Priorities
- building metrics to inform the evaluation of the effectiveness of government policy interventions in terms of improving innovation and its economic, social, environment and other impacts
- strengthening data about levels of public and private investment in innovation infrastructure – both human and capital.