



**Chief Scientist
& Engineer**

NSW R&D Matchmaking Platform

Scoping Paper: Building an online R&D Marketplace Platform for Matchmaking

August 2021

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1. Background and Introduction

In January 2021, the NSW Premier launched the [Turning ideas into jobs: Accelerating R&D in NSW Action Plan](#). The Hon. Gabrielle Upton MP, Parliamentary Secretary to the Premier prepared the Action Plan guided by an Advisory Council, chaired by David Gonski AC, which included eminent leaders in innovation, business, government and the tertiary sector. The Action Plan recommends five Priority Actions and 16 Supporting Actions that will accelerate the rate at which ideas are translated into new industries, jobs, products and services, and will help make NSW the R&D leader in Australia and a world-class contributor.

The fifth Priority Action is establishing an online R&D matchmaking platform to better connect research ‘sellers’ and ‘buyers’ and link researchers to research infrastructure and expertise. The Action Plan outlined the objectives of the platform which is to facilitate better collaboration where:

- researchers work closely with government and industry to solve problems and translate ideas into new products, services and jobs
- industry, government, start-ups, scale-ups and SMEs gain easy access to the best technology, research infrastructure and expertise
- research infrastructure and services across NSW are identified, promoted and better utilised to address the problems and needs of researchers, government and industry.

The Action Plan envisaged that such a platform can enable improvement in knowledge, visibility and transparency of all parts of the R&D ecosystem and better connect universities and research providers to government, industry and investors. By reducing the transactional complexity and uncertainty for sellers and buyers of R&D, the platform can support the NSW R&D ecosystem for higher and faster rates of commercialisation and the creation of new products, services and jobs.

The NSW Government committed \$2 million funding over two years for the development of the platform and tasked the Office of the NSW Chief Scientist & Engineer Office (OCSE) and R&D NSW within Investment NSW to establish the platform. Building the platform as an integrated solution that services the needs of everyone is challenging so OCSE will co-design the platform with the R&D community to address their core problems and urgent needs.

This paper presents findings from the project scoping stage including initial stakeholder consultation (Section 2), platform’s function and services through preliminary market discovery (Section 3), design of the initial pilot platform (Section 4), and the next steps for the platform development (Section 5).

2. Initial Market Discovery

As a first step to better understand the problems the R&D community is facing and how the platform can help them meet their needs, OCSE conducted initial stakeholder consultation with over 50 individuals, groups and organisations. These stakeholders include NSW government agencies and R&D divisions, universities and research organisations, Startup community and scaling up services, platform owners and developers and R&D networks. A full list of stakeholders consulted is in Appendix 1 and this scoping paper has greatly benefited from their insights. There are a wide variety of opinions on the need and value of an R&D online platform, although there was general agreement that a single effective platform would be useful for the whole community.

Key contributions from the initial stakeholder consultation include:

- the broad scope described in the Action Plan makes it challenging to provide a solution that fits all purposes, at least initially.
- identifying elements of the platform with the most value for early user groups is critical for the platform's uptake and success, however each stakeholder group has its view on what the platform should target first and how to achieve those outcomes.
- the platform might not be able to solve some fundamental issues around collaboration but can improve visibility and connectivity within and between stakeholder groups.
- there are existing platforms used by stakeholders but views on their value for money and use rate are mixed.
- without sophisticated algorithms, unsatisfactory matching and ineffective relationship building may occur. Tailored customer service may assist with mitigating against this as well as lack of response to avoid poor user experience and low use rate.
- the platform should look at how to support groups already undertaking a few of the platform objectives and how to leverage those platforms.
- the platform should trial, test and learn from an initial pilot with a small number of priority industries and key technologies to drive commercialisation outcomes.
- driving collaboration opportunities may be assisted by promoting the use of expertise, equipment, infrastructure, etc. There is a need for a marketing strategy, stakeholder events and financial incentives to attract users and to support an ongoing budget to maintain and promote the platform.

User stories were developed based on feedback from each stakeholder group to reflect their views on the purpose and benefits of the platform from a potential user's perspective:

- *As an R&D division of NSW Government agency, I want to use the platform to promote our R&D capabilities with searchable information of research infrastructure, expertise and their availabilities, so that the industry and research sector know what we can offer and who to contact for collaboration projects.*
- *As a NSW Government agency that has investment attraction responsibilities, I want to use the platform to showcase NSW R&D capabilities to my stakeholders and provide them with information on areas of their interest, so that I can help my stakeholders navigate to the right contact in the research sector and starting the relationship building.*
- *As a university researcher, I want to find funding and partnership opportunities as well as startup supporting services so that I can progress my research work and career.*
- *As a university knowledge exchange officer, I want to use the platform to connect faculties and researchers with external partners in industry, government, so that I can help to build new partnerships and develop new businesses.*
- *As a startup, I want to use the platform to find scaling up services, networks, mentors so that I can have the services and expertise to support me progress my idea/startup to the next stage.*
- *As an accelerator or incubator, I want to use the platform to match and connect startups with investors, services providers and successful startups/companies so that the community is well connected for knowledge sharing, mentoring and networking.*

- As an *investor and industry commercialisation officer*, I want to use the platform to find technical solutions to my challenges or matched R&D capabilities so that I can invest and purchase the technologies for business profit.
- As an *existing R&D platform or new platform underdevelopment*, I want to see the platform as a shopfront of all platforms, so that my platform will have new users and an increased traffic volume being directed from it.

3. An Online R&D Marketplace Platform

The platform could overtime be an R&D Marketplace Platform based on insights from initial stakeholder consultation. It could be a one-stop shop for all sellers and buyers to list, find and match their R&D supplies and needs in technology, research infrastructure, Intellectual Property, expertise, SME scaling up service, and opportunities of investment, collaboration and partnership among the innovation community in NSW and globally.

Marketplace platforms are becoming powerful e-commerce business models within the digital economy and there are many successful private-owned marketplaces. An online marketplace focuses on matching multiple buyers and sellers of goods and services and facilitating the trade for a service fee. The marketplace owner administrates and connects the two sides of selling and purchasing while sellers take care of their inventories. This online marketplace model has been successfully applied to many industries including some designed for R&D in Australia and globally.

The benefits of building a digitalised marketplace are to maximise the visibility and connectivity of products and services without the limitation of geographical borders. As such the platform will have open access to all R&D communities in Australia and globally for data sharing and information exchange. As a NSW Government initiative funded by taxpayers, the platform will promote the state's capabilities and provide bespoke services for NSW R&D communities with no service fees.

Reflecting on user stories, it was proposed that the platform will have functionality and services to the NSW community:

- **A NSW R&D Database** that consolidates NSW science and research activities that can generate information for the needs of government, industry and research stakeholders. All online marketplaces start with a database that collects information of buyers, sellers and their products and services. A state-based R&D database can be a powerful tool in many ways a source of statistics and information to inform strategic directions and policy development.
- **A NSW Science Capability Directory** that provides information on NSW's research centres, institutions, research infrastructure, innovation precincts, hubs networks and other research organisations across the state. The directory systematically showcases the state's R&D capabilities as well as serves as a search engine for users looking for products and services in NSW. For example, Queensland Government has maintained a [Queensland Science Capability Directory](#) and NSW has an [Interactive NSW Research Map](#) hosted by the OCSE website that can be built on.
- **Matchmaking Services** that provide recommendations for matched R&D products and services based on user's needs and make the first connection between 'buyer' and 'seller'. The matchmaking function will need the support of well-designed analytic algorithms ensuring an

‘aggregated matching’ as unbiased and transparent services for the NSW R&D community. Artificial Intelligence-powered matchmaking could provide users with well-curated recommendations and a real-time update on their requirements.

- **Relationship Building Services** that provide NSW-based research, startups, SMEs and industry with customised services to facilitate coordination and collaboration. This is the most cost-effective marketing strategy for an online marketplace platform to grow the customer base and increase transactions. This will tap into established networks in NSW and leverage the existing relationship-building services offered by the R&D community.
- **Analytics and Reporting Services** that can provide users with in-depth analysis of their products, services and customer-base based on data and information collected by the platform to inform their business decision-making.

The above services will be brought online in a sequential order starting with the R&D database which will be the foundation for other functions. The platform will initially be a Business to Business marketplace targeting user groups of government agencies, universities, private organisations and networks. Business to Person and 2P or P2P services will be considered as the platform further develops.

Securing and growing the customer base from both supply and demand sides is critical for the success of the platform. The general approach of building a two-sided market is focusing on the supply side first so that sellers can build the inventories of products and services to attract customers. Using the model of ‘online shopping’, Figure 1 is the use case diagram that demonstrates how each user group interacts with the platform and proposed services.

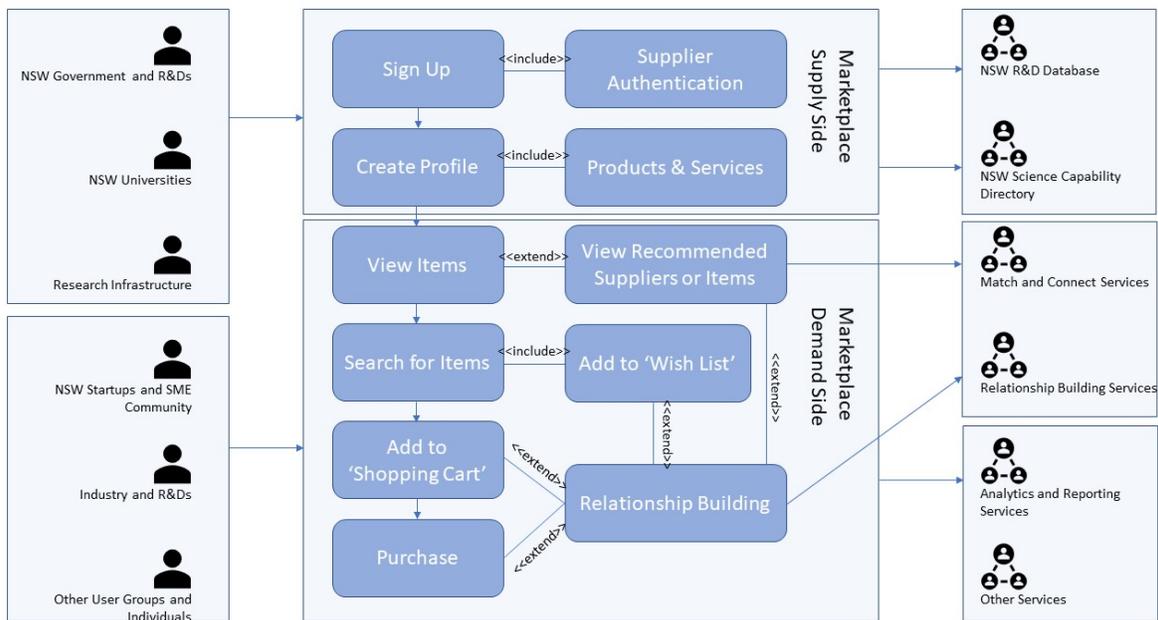


Figure 1 Use Case Diagram

As an interactive media for NSW R&D communities, the platform could support other actions under the Action Plan for their implementation. Taking the turbocharge precinct action as an example, place-based

matchmaking through the platform will match the interest and need of investors with the R&D capabilities of each innovation precincts to attract investment for precinct-alignment technology development. On the other hand, the platform could benefit from other actions to build a new customer base, for example, launching government and industry missions and challenges through the platform could help a challenge-based capability building that brings new database and users for the platform.

4. Platform Initial Product Design

Building a new digital platform is not a project with a defined timeline but rather a process that could take years to mature and scale up from an initial product. This initial product, Minimum Viable Product (MVP), should have enough features to attract early user groups and solve their core problems.

Guided by insights from initial stakeholder consultation, OCSE has conducted research and assessment through a few scoping activities. These include

- a preliminary product scan of existing platforms in Australia and overseas with a gap analysis of their function and services.
- mapping exercises of stocktaking NSW R&D landscape (Map 1) and industry development opportunities (Map 2) with qualitative and quantitative assessment, including:
 - o Map 1.1 Research infrastructure supported or funded by NSW Government
 - o Map 1.2 Startups communities and scaling up services
 - o Map 1.3 NSW Government policies and programs supporting R&D
 - o Map 2.1 Priority sectors and R&D capabilities of selected industries
 - o Map 2.2 Regional industry profiles and development opportunities
 - o Map 2.3 Innovation precincts and innovation networks

These scoping activities helped us develop the design of MVP as well as build the foundational database for the MVP. The key findings of scoping activities were presented in Appendix 2.

The MVP will incorporate the following design and content features:

- o [Content] Building the supply-side first. Using existing data on NSW R&D capabilities to build the supply-side of the marketplace first. This will have a focus on the capability content below and illustrated in Figure 2.
 - Priority sector-focused. Focusing on technology groups of the five priority sectors and two enabling capabilities that have the most significant benefits in building new economies, attracting investment, and developing regional NSW.
 - Commercialisation-driven. Prioritising areas where NSW has strong R&D capabilities and emerging disruptive technologies at the demonstration or near commercialisation stage for their industrial translation success.
 - Infrastructure and expertise first. Building a database of public-funded research infrastructure and NSW expertise first will have the most value for money with a manageable size of data.
 - Government levers. Listing new and existing government policies, grants programs and funding opportunities to build the customer base.
- o [Design] New, Integrated and Linked Services.
 - New Services. Creating bespoke services and databases for NSW R&D communities. For example, sharing information of research infrastructure

funded and owned by the NSW Government around their capability and capacity so that they can be used for researchers in other organisations.

- Integrated Services. Integrating existing R&D platforms owned by NSW Government into the MVP for consolidated services and databases. For example, the NSW Waratah Research Network’s [Research Connections Portal](#).
- Linked Services. Linking well-established Australian and international platforms. For example, IP Australia’s [Source IP Portal](#).
- [Design] Place-based matchmaking. Adopting a place-based approach to match and connect R&D supply and demand with a focus on innovation precincts in NSW.
- [Design] Working with early users. Testing, validating and improving the design concept through working with early user groups, such as the NSW Waratah Research Network, Government R&D functions, innovation networks, and research translation and industry engagement officers in universities.

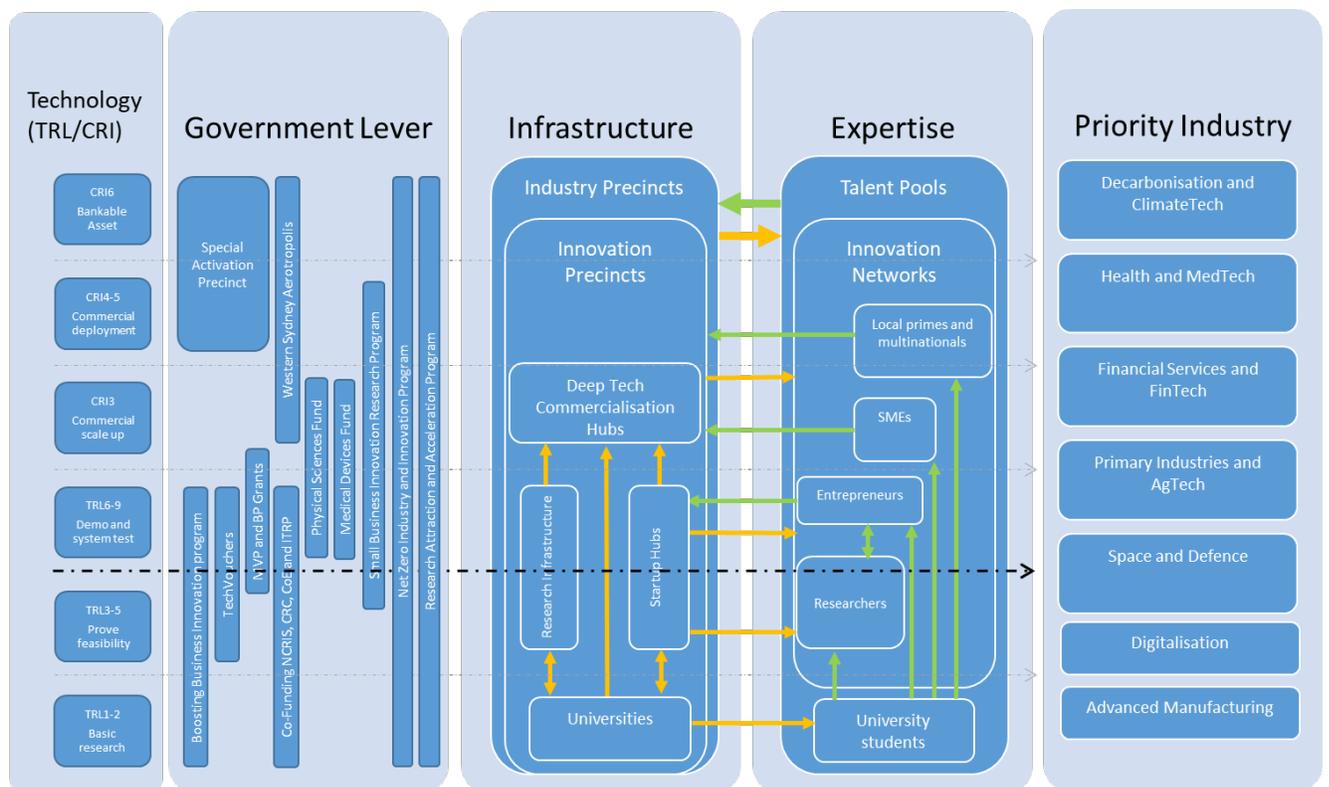


Figure 2 Illustration of MVP content features

5. Platform Development Plan and Next Steps

OCSE has adopted a staged plan for the platform's development and implementation.

- Stage 1 Scoping. This is a preliminary market discovery phase undertaken by OCSE to understand the needs of the NSW R&D community and how the platform can create value for them. Key findings were presented in this scoping paper.
- Stage 2 Market Discovery, Product Design and Procurement. A more comprehensive market discovery phase to engage platform developers, potential users and key stakeholders to test and validate findings from the scoping paper. This phase will be carried out through an innovative procurement process that will translate the MVP design into demonstrable products and select suitable vender/s for MVP implementation.
- Stage 3 MVP Development and Implementation. The preferred vender/s will develop the MVP to be tested, validated and improved by user groups and key stakeholders.
- Stage 4 Marketplace Platform Development and Implementation. Building on the MVP, more content and design features will be validated and brought to the platform to fulfil implementation requirements in the Action Plan.

With the delivery of this scoping paper, the project will enter Stage 2 to engage the market, explore ideas and procure vender/s for the platform development and implementation. Non-traditional market engagement approach will be considered for outcomes-based trials to encourage innovative solutions. This will stimulate new ideas and encourage suppliers to look at how they can deliver the MVP collaboratively. OCSE will engage and work closely with NSW Government ICT Partners that have extensive expertise and experience in ICT services, procurement and implementation for Stage 2. Potential early platform users and the NSW R&D community will be engaged to test, validate and improve the MVP and platform.

Appendix

Appendix 1. Stakeholder List

To ensure the platform is customer-centric, OCSE held public consultations with a wide range of stakeholders across NSW R&D communities during the project scoping phase. OCSE has benefitted greatly from the engagement and feedback from these stakeholders. Their input has provided OCSE with a holistic view of the R&D landscape as well as how the platform can best meet the needs of potential users. A full stakeholder list is below. Feedback was received both in person through individual meetings, group workshops and in some cases through emails. OCSE thanks stakeholders for their participation in this initial consultation process.

Organisation	Stakeholder Group
CSIRO Platforms	Platform Owner and Developer/Government/Research
Physical Science Fund Expert Panel and Subcommittees	NSW Government/Startups and SME Communities/Research
MatchBoard	Platform Owner and Developer
IdeaSpies	Platform Owner and Developer
Sydney Startups Community (RamenLife)	Platform Owner and Developer
NSW Innovation and Productivity Council	NSW Government/Startups and SME Communities
Cicada Innovations	Startups and SME Communities
Sydney School of Entrepreneurship	Startups and SME Communities
Sydney Startups Hub	Startups and SME Communities/NSW Government
University of Wollongong	Research
Southern Cross University	Research
ANSTO	Research/Research Infrastructure
NSW Treasury	NSW Government/Startups and SME Communities
NSW Department of Primary Industries (DPI)	NSW Government/Research/Research Infrastructure
Austrade (Health)	Research/Startups and SME Communities
NSW Waratah Research Network	Research/NSW Government
Stone & Chalk	Startups and SME Communities
SEARTEN	Platform Owner and Developer/Research

Organisation	Stakeholder Group
NSW Department of Planning, Industry and Environment (Environment, Energy and Science Division)	NSW Government/Research Infrastructure
NSW Health and OHMR	NSW Government/Research Infrastructure
CSIRO Labs of the Future	Research Infrastructure
Boosting Business Innovation Program Networks	Research/Startups and SME Communities
Western Sydney Startup Hub	Startups and SME Communities/NSW Government
Innovation networks established by OCSE	Startups and SME Communities/Research
CSIRO SMEs Collaboration Survey	Startups and SME Communities/Research
NSW Department of Customer Service	NSW Government/Platform Owner
GEmaker	Platform Owner/Research
Australian Research Data Commons	Research/Platform Owner/Government

Appendix 2. Summary of Scoping Activities and Key Findings

Scoping Activity 1 – Preliminary product scan

OCSE conducted an initial product scan of existing platforms with analysis of their service strength and limitation. There are a few well-developed platforms in Australia that can deliver some objectives of the platform. For example, CSIRO has developed multiple R&D platforms on expert, innovation precinct, IP and R&D products with a commercialisation focus. Another example is Sydney Startup Hub's Startup Community that connects startup community and provides mentorship opportunities. There are some international platforms used by NSW universities and industries.

Successful platforms have built their business models with well-developed data sourcing mechanisms, matching algorithm, customer services, engagement and promoting models to meet the need of their platform users. To maximise the value of government investment, these platforms should be leveraged to establish the online R&D marketplace for NSW and wider innovation communities outside the state. Given the diverse R&D products and services, there are service gaps among existing platforms. For example, there is no well-developed platform for sharing information about research infrastructure and facilities and promoting their utilisation by other organisations.

Scoping Activity 2 – Capability Mapping

OCSE conducted an extensive mapping exercise to take stock of the state's innovation landscape, including the R&D ecosystem (Map 1) and industry development opportunities (Map 2), with the support of qualitative and quantitative assessments. Key findings were summarised below. Given the dynamic and complexity of the innovation ecosystem, these maps are not intended to be definitive but to provide information for scoping the NSW R&D platform.

Map 1 R&D Ecosystem

Map 1.1 Research Infrastructure

- This stocktake presents information about major research infrastructure funded or supported by NSW Government. This is required by the ARDAC Action Plan as a first step for the infrastructure element of the R&D platform.
- NSW Government has co-invested in national research infrastructure in building the state's research capability and infrastructure portfolio. These include research infrastructure and facilities under the National Critical Research Infrastructure Strategy (NCRIS) and Australian Research Council Centre of Excellence, Cooperation Research Centres and Industrial Transformation Centres/Hubs.
- There are substantial investments made in research infrastructure, facilities and laboratories owned by NSW Government agencies particularly in the health, primary industry and environment sector.
- National public-funded research infrastructure, CSIRO and ANSTO, have unique research infrastructure located in NSW with world-leading capability in nuclear, medical research, physical science, space and energy.

Map 1.2 Startup Supporting Services

- This stocktake presents information about supporting services provided to NSW startups by the public and private sector as well as those scaling up services hosted by NSW universities.
- NSW startups are supported by a range of services, policies and programs from the idea stage through to the growth stage by industry, government and universities. There is a need to reduce the navigational complexity for startups seeking services and support provides.

Map 1.3 NSW Government R&D Policy and Funding Support

- This stocktake presents information about NSW Government's recent strategies, policies, grant and funding programs that support R&D and commercialisation.
- NSW Government agencies are pulling policy levers and making a targeted investment in R&D and industrial translation across sectors and industries. There is a need to connect universities and industries with their capabilities to those opportunities with an integrated portal.

Map 2 Industry Development

Map 2.1 Priority Industries and R&D Capabilities

- This stocktake identifies priority industries and technology groups and assesses NSW universities' R&D capabilities in those industries.
- Five priority industries are underpinned by recent state-wide strategic planning and policies by NSW Government in the perspective of regional development, investment attraction, economic

planning and challenges imposed by the global crisis. These priority industries and technology groups are Decarbonisation and ClimateTech, Health and MedTech, Financial services and FinTech, Primary industries and AgTech, Space and Defence industry. Two technological enablers, Advanced Manufacturing and Digitalisation, are identified based on their cross-sectorial benefits in accelerating R&D and building new industries.

- NSW universities have well-developed capabilities in priority industries and enabling technologies. Taking hydrogen as an example for Decarbonisation and ClimateTech, the University of NSW (Sydney) and the University of Newcastle has leading capabilities across the hydrogen value chain.

Map 2.2 Regional Industry Profiles and Development Opportunities

- This stocktake presents a combined qualitative and quantitative assessment of the capability and potential of NSW regional industries based on their economic size, infrastructure support, workforce and innovation activities. It also presents information on major new industrial precincts and renewable infrastructure development, including Special Activation Precincts, Regional Job Growth Precincts, Renewable Energy Zones and Hydrogen Hubs. Results are visualised in Figure 3.
- Building on the strength of established industries, NSW regions are diversifying their industry portfolio and building capacities in priority industries. The realisation of economic opportunities of these new and emerging industries are underpinned by innovation as well as infrastructure and workforce.

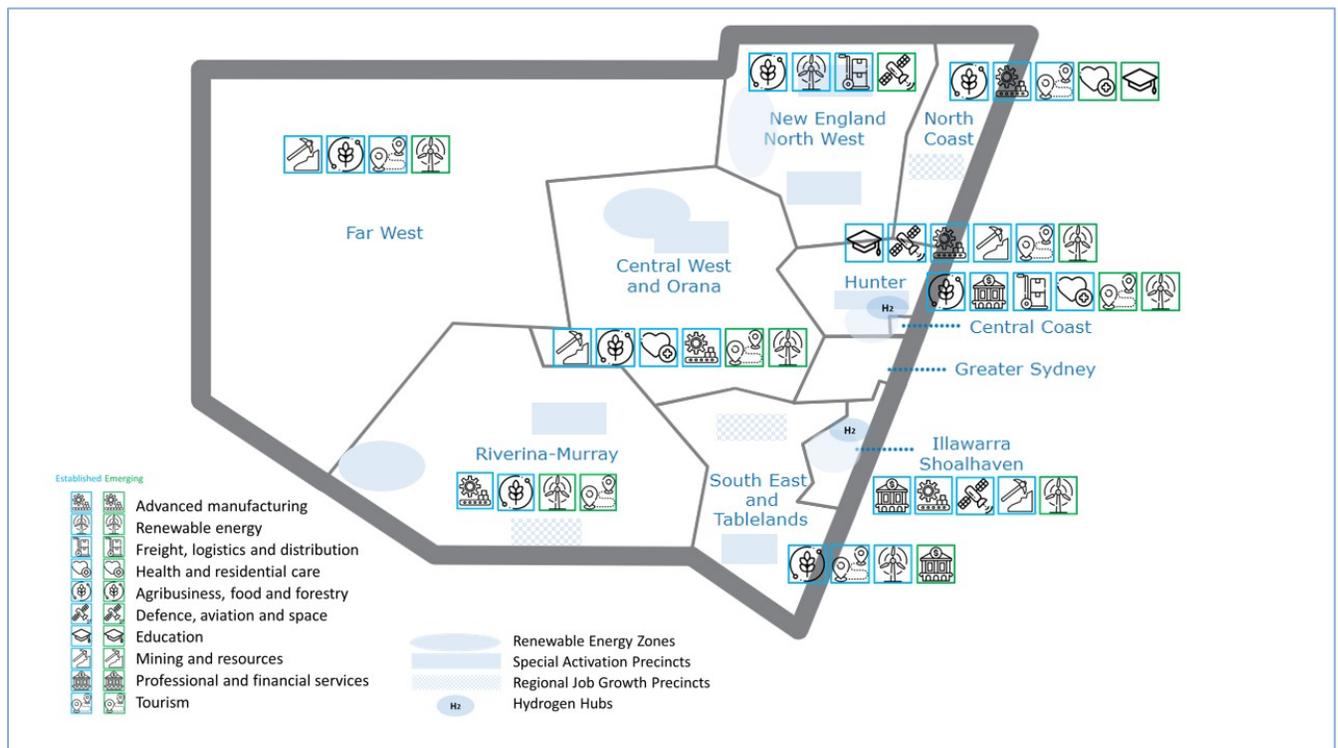


Figure 3 NSW regional industry development opportunities and major infrastructure

Map 2.3 Innovation Precincts and Innovation Networks

- This stocktake presents information and assessment about NSW's physical and virtual innovation clusters, as Innovation Precincts and Innovation Networks respectively.
- There are over 40 active and planned innovation precincts across NSW under the priority industries and enabler technology groups. These innovation precincts build on existing assets and capabilities including universities and research, major infrastructure, local workforce and competitive industries.
- Innovation networks, research hubs and knowledge hubs are adopted by NSW Government to catalyse the collaboration of R&D and their industrial translation in priority areas. These virtual networks complement the innovation precincts and their physical infrastructure through knowledge sharing and relationship building.

Attachment List

Attachment A – Platform interactions with actions under the Action Plan

Attachment B – Preliminary product scan of matchmaking platforms

Attachment C - Map 1.1 Research infrastructure supported or funded by NSW Government

Attachment D - Map 1.2 Startups communities and scaling up services

Attachment E - Map 1.3 NSW Government policies and programs supporting R&D

Attachment F - Map 2.1 Priority sectors and R&D capabilities of selected industries

Attachment G - Map 2.2 Regional industry profiles and development opportunities

Attachment H - Map 2.3 Innovation precincts and innovation networks