A strategy for innovation-driven growth

SMART SPECIALISATION STRATEGY [S3]

for the Hunter Region

Regional Development Australia HUNTER

Australia's First Smart Specialisation Strategy

The Smart Specialisation Strategy (S3) is an integral part of RDA Hunter's economic development agenda to advance the region's innovation network and grow the Hunter's international competitiveness. Smart specialisation is an OECD framework implemented widely across the European Union to deliver regional economic transformation through analysis of local competencies and discovery of new areas of opportunity. The Hunter's S3 identifies, builds on and promotes the region's smart strengths and most promising fields for entrepreneurship so that public resources can be concentrated on sustainable economic development. The S3 initiative complements two RDA Hunter Innovation Scorecards by identifying the region's competitive advantages, preparing the region for future opportunities and challenges, and developing innovation activities that exploit the region's distinctiveness to create economic value.

An Australian Government Initiative

NSW GOVERNMENT

A NSW Government Initiative

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Introduction

REGIONAL DEVELOPMENT AUSTRALIA HUNTER

With internationally competitive gateways, significant resources, a large urban centre, sophisticated infrastructure and a skilled workforce, the Hunter region of Australia is well positioned to take advantage of opportunities for future growth.

The Hunter's economy is complex and robust. It is valued at around $38.5billion and is the largest in regional Australia. It is increasingly reliant on smart industries and highly skilled people. There's a pro-active business environment with experience in the global market and a commitment to innovate and be a world leader.

Building on the Hunter's capabilities and strengthening the economy for the future is key for Regional Development Australia (RDA) Hunter, the region's peak economic development organisation.

Established by the Australian and NSW governments to advise them on critical issues affecting the Hunter, we provide leadership on a range of opportunities and challenges to help drive economic growth and improve productivity in the region.

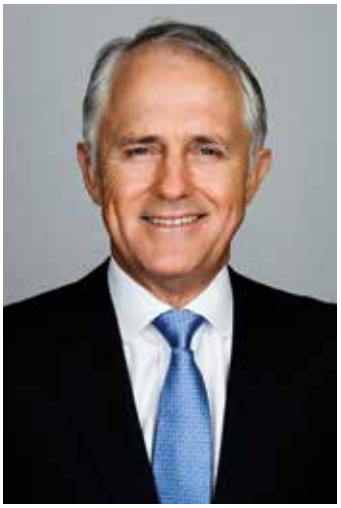
Forging a path for the Hunter that maximises our competitive advantages and strengthens our capabilities as a region is of vital importance for the future.

Our new Smart Specialisation initiative will help drive this work by developing a blueprint for strong and focused economic growth.

The Board of RDA Hunter would like to acknowledge the contribution of key stakeholders in preparing the Smart Specialisation Strategy for the Hunter Region including: Professor Ian Chubb AC, formerly Australia's Chief Scientist; Professor Mary O'Kane, NSW Chief Scientist and Engineer; The Delegation of the European Union to Australia; The Embassy of the Federal Republic of Germany, University of Technology Sydney (UTS) Business School and RDA Hunter staff.

Mr Michael Slater
Chairman, Regional Development Australia Hunter

Forewords



PRIME MINISTER OF AUSTRALIA

Innovation is at the heart of my government's plan to deliver a modern, dynamic, 21st century economy.

Innovation drives growth and prosperity, underpins productivity and will help deliver the jobs of tomorrow.

Each is critical for Australia to remain a prosperous first-world economy, where our standard of living – our wages – continue to grow.

The Australian government is investing $1.1 billion in a National Innovation and Science Agenda to promote a culture of innovation right across the economy.

The Agenda will make it easier for innovators to attract investment to grow their business and help researchers and businesses collaborate. It will also ensure our kids have the skills they need in technology, maths and science for the jobs of tomorrow.

It's fantastic to see Regional Development Australia Hunter investing in innovation through their Smart Specialisation initiative. It builds on the Hunter region's competitive strengths and will enable areas with the greatest potential to succeed.

Regions are significant contributors to the national economy and RDA Hunter is showing great leadership by delivering positive change, new ideas and new opportunities to the communities that make up the Hunter region.

I commend RDA Hunter for its agility and the enormous opportunity this initiative presents for the prosperity of the region.

The Hon Malcolm Turnbull MP
Prime Minister of Australia

DELEGATION OF THE EUROPEAN UNION TO AUSTRALIA

The European Union (EU) and Australia are two like-minded partners. The relationship is rooted in common interests, values and heritage.

The EU single market is Australia's largest source of foreign direct investment (A$170 billion in 2014), as well as its biggest trading partner in services (A$26 billion in 2014, ahead of the US) and third-largest trading partner in goods (A$56 billion in 2014), representing more than 12 per cent of Australia's total trade.

In a world of rapid technological changes and creative disruption, the EU is deeply convinced that investment in research and innovation will pave the way for the future and provide a key to unlocking economic growth and job creation.

With only 7% of the world's population, the EU is a world leader responsible for 24% of global expenditure on research, 32% of patent applications, and hosts 25 of the world's top 100 universities.

The European Union is working to realise an "Innovation Union", focusing on major areas of interest for its citizens and ensuring that innovative ideas can be turned into products and services that create growth and jobs, including in SMEs.

"Smart Specialisation" is a strategic approach employed by the EU to achieve economic development, targeting support for innovation and research. The strategy is implemented across the EU to identify niche areas of competitive strength, solve major societal challenges and create demand-driven innovation partnerships.

Through the Regional Development Area (RDA) the Hunter is the first Australian region to look to use smart specialisation as a tool to identify its own competitive advantages, set strategic priorities and make use of smart policies to maximise its knowledge-based development potential.

The Hunter Region is a trail blazer in the innovation space and keen to learn more about how European Union regions are addressing the need to reinvent themselves and respond to a decline in their traditional industries.

I congratulate RDA Hunter for this initiative, and I look forward to further deepen our collaborations with RDA Hunter in leading the way for Australian – EU engagement, especially in growing trade, and pursuing exciting research and innovation opportunities.

H.E. Sem Fabrizi
European Union Ambassador
to Australia and New Zealand

REGIONAL DEVELOPMENT AUSTRALIA HUNTER

In a global market there is increased competition and opportunities. It's imperative that the Hunter region leverages its competitive advantages to ensure that we not only change with the times but grow new jobs that are of high value and worth.

The Hunter has the best of both worlds. We have vibrant and successful traditional industries as well as a growing knowledge based economy, but in order to grow our industry sectors further we need to innovate.

In other countries, regions have successfully redefined themselves by complementing their traditional strengths with new jobs in knowledge based industries. An example is the Ruhr region in Germany, whose traditional industries were steel making and coal mining. It has undergone a transition which has seen knowledge and high-tech industries grow and the service industry become the largest driver of the economy.

Smart Specialisation is an innovation plan for future growth and regional leadership and that's why RDA Hunter has developed Australia's first. It gives the Hunter the opportunity to work with policy makers, industry and researchers to concentrate resources on innovation and development priorities that are future focused and create value.

Our Smart Specialisation Strategy for the Hunter Region plays a key role in the Hunter's future and we are very pleased to present it to you.

Mr Todd Williams
Chief Executive Officer

1 Executive Summary

The Smart Specialisation Strategy identifies actions to deliver innovation-driven growth of the Hunter and implement programs in support of the Region's seven key areas of competitive advantage

1.1 RDA Hunter and Smart Specialisation

RDA Hunter has identified innovation, investment and infrastructure as essential strategic areas for the economic development of the region. RDA Hunter has a track-record of commitment to innovation through initiatives including the Hunter Innovation Scorecard, Hunter Innovation Festivals, the ME Program and the Business Innovation Hub.

The Smart Specialisation Strategy (S3) for the Hunter is RDA Hunter's new initiative that aims to boost regional competitiveness for economic growth and job creation. Its purpose is to:

- Inform policy to ensure effective and efficient spending of research and innovation funds.
- Identify regional priorities based on current strengths and competitive advantages that support high value-add activities and offer the best chances for strengthening competitiveness.
- Recommend potential areas for future competitive advantages, entrepreneurship and growth.
- Encourage partnerships (locally and beyond the Hunter) in governance, project delivery, monitoring and evaluation.
- Support productive research and innovation activities for smart, sustainable and inclusive growth of the Hunter.

The Strategy builds on a large volume of material already available on Hunter growth prospects, including the Hunter Innovation Scorecards published in 2013 and 2014, the strategic economic study, Prospects and Challenges for the Hunter Region (2013), and in the Hunter Investment Prospectus 2016. S3 for the Hunter also reflects on the knowledge, business, and education attainment indicators (2015) prepared by the Office of the Chief Economist, and summarised in Attachment 1.

RDA Hunter applied the smart specialisation framework as a catalyst for new activities to strengthen the economic development of the region. The framework helps define our competitive advantages and establish priorities for investment and research that maximise the distinctiveness of the region through innovation and collaboration.

The development of a Smart Specialisation Strategy embraces the process of entrepreneurial discovery – an interactive process in which market forces and the private sector are discovering and producing information about new activities, and public organisations – governments, research and teaching organisations – to empower those actors most capable of realising the potential to grow.

Smart specialisation has a focus on enabling knowledge-based assets, both public (e.g. education, public research) and private capability within and across industries. This 'upstream' approach gives more of a role for the market to identify and lead on 'downstream' choices. It is much more than the linear 'commercialisation of research' approach.

Smart specialisation recognises an absence of perfect information, different stages of advancement of a given activity, and the relative risks for policy. It thus focuses on helping entrepreneurs identify their knowledge-based strengths in a more exploratory approach in which public decision makers participate through networks and collaboration.

To these ends, a key initiative in the Strategy is the formation of the Hunter Innovation Network.

RDA Hunter commenced researching and planning for a Regional Smart Specialisation Strategy in December 2014. Following an extended period of consultation, the entrepreneurial discovery process culminated with a Smart Specialisation Summit in Newcastle on 16 December 2015. Attachment 2 presents a summary of RDA Hunter's consultations during the smart specialisation process.

The Summit, attended by over 150 people from business, the University of Newcastle and Hunter TAFE, government agencies and community leaders, was addressed by Senator Arthur Sinodinos, Professor Roy Green (Dean, UTS Business School) and Ivano Casella (Head of Trade, EU Delegation to Australia and NZ).

The Summit identified seven areas of strengths and potential growth that will be important for the Hunter's future.

These are:

- Advanced Manufacturing;
- Creative Industries;
- Defence;
- Food and Agribusiness;
- Medical Technologies and Pharmaceuticals;
- Mining Equipment, Technology and Services;
- Oil, Gas and Energy Resources.

1.2 Implementation and Delivery

At the Smart Specialisation Summit in Newcastle on 16 December 2015, Todd Williams (RDA Hunter's CEO) outlined three areas for RDA Hunter to continue to progress.

Leading further engagement with the EU is the first of these areas for RDA Hunter to progress. In particular, building stronger partnerships with European regions for Hunter businesses, researchers and innovators to collaborate with and increase the share of our region's trade in Europe.

Secondly, increase the pool of the Hunter's STEM skilled workforce. During consultations with local leaders from many fields, the people of the Hunter were identified time and again as one of the region's key strengths. Hunter people are skilled workers dedicated to doing the best job they can, they are committed to getting it right the first time, clever, innovative, smart and resilient people.

RDA Hunter continues encouraging Hunter students to gain knowledge and skills in STEM – science, engineering, technology and mathematics. And through RDA Hunter's Mini-ME Program and ME Program, students gain industry experience along the way.

Future developments of these programs include educating more students in entrepreneurialism and business acumen, for professions and trades; and extending digital literacy which encourages businesses to embrace digital transformation as a foundation for growth and development.

STEM, entrepreneurship and digital literacy form an essential bundle of skills to address changes in demographics, economies in transition and for the Hunter workforce to be equipped for the globally competitive jobs of the future.

And thirdly, leadership. As we identify the specific areas where the Hunter has distinctive capabilities – especially in assets, knowledge, and networks, RDA Hunter provides leadership and facilitates coordination of implementation by:

- Supporting local participation in the Commonwealth's Industry Growth Centres initiative.
- Attracting funding through the National Innovation and Science Agenda and forthcoming State Government initiatives.
- Appointing working groups to take responsibility for each element in the Strategy.
- Tasking working groups to further articulate the strategic actions and establish implementation and delivery arrangements, project plans, and key milestones.
- Building, extending and leveraging external connections with business, as well as national and international research and teaching organisations.
- Developing, coordinating, and promoting investment priorities for the planning, delivery, and maintenance of urban and regional infrastructure assets within the Hunter.
- Establishing a coordinated approach across governments and business associations to inwards business investment attraction and location within the Hunter.
- Refine the strategy with key action plans and projects, and
- Establish a process for annual review, refinement, and re-commitment.

The overall objectives are to bring together the contributors to the Hunter's innovation system, turn our competitive advantages into global strengths and be equipped to reap the benefits of opportunities.

The Strategy aims to go further by presenting a range of actions and initiatives. These are summarised on the following pages. The rationale for each initiative is canvassed in Section 4.

1.3 Strategic Actions – Summary

The Smart Specialisation Strategy identifies actions to deliver innovation-driven growth of the Hunter and implement programs in support of the region's seven key areas of competitive advantage.

As a priority, an Innovation Network needs to be established to assist RDA Hunter to progress implementation of the Strategy and deliver economic development outcomes.

Develop inclusive leadership for the Hunter Innovation System

1. RDA Hunter to facilitate the formation of the Hunter Innovation Network as the vehicle for linking businesses and entrepreneurs to services, facilities, and stakeholders to accelerate their innovation and growth, thereby maximising wealth creation in the Hunter Region.
2. RDA Hunter to invite education institutions, industry associations, businesses and individuals in the Hunter to nominate candidates for appointment to the Board of the Network.
3. RDA Hunter to seek $1m in annual funding from the Commonwealth and State Governments to facilitate the operation of the Network and assist RDA Hunter to progress the smart specialisation strategic actions.

The Hunter Innovation Network will develop initiatives, programs and activities to:

Encourage entrepreneurship

4. Encourage schools, TAFE and Universities to offer education and training in entrepreneurship as part of their broader course offerings.
5. Establish a profile of courses and programs in entrepreneurship available to students and business leaders in the Hunter Region.

Develop the skills for innovation

6. Facilitate a partnership between Business and Business Organisations, the University of Newcastle, Hunter TAFE, private RTOs, Schools, and the Community, to develop an integrated skills development program that meets the requirements of businesses.
7. Engage with education and training organisations outside the region who are in a position to bring high level skills development and training to the region.

Support university-business research collaboration

8. Assist businesses to identify research projects that might be suitable as a basis for collaboration with the University of Newcastle and other universities with connections to the Hunter.
9. Work with tertiary education careers offices to identify a broad range of work based learning opportunities for undergraduate and post graduate students.

Build the Hunter Innovation Initiatives Investment Fund

10. Scope and develop the guidelines for a Hunter Innovation Initiatives Investment Fund.
11. Engage key stakeholders, including financial institutions, business organisations, and the State and Commonwealth Governments in the development of the Fund.

Further, the Hunter Innovation Network will work with RDA Hunter to:

- **Coordinate Commonwealth, State and Local policies and regional programs, and**
- **Communicate the strategy.**

Strategic actions for the Hunter Innovation Network in these categories are:

12. Assist RDA Hunter to continue to advocate a collaborative approach to policy and program development across Commonwealth, State and Local Governments with a view to achieving greater consistency, coherence, efficiency and effectiveness in government services delivery.
13. Assist RDA Hunter to develop a comprehensive and integrated marketing and communication plan to promote awareness and engage commitment to the Smart Specialisation Strategy for the Hunter.

Smart Specialisation helps define our competitive advantages and establishes priorities for investment and research

1.4 Strategy Map

The 'strategy map' below indicates the importance of strategic actions in each of the priority growth areas for the Hunter:

SMART SPECIALISATION STRATEGY FOR THE HUNTER							
Strategic Directions and Actions	Strategic Growth Areas						
	Advanced Manufacturing	Creative Industries	Defence	Food and Agribusiness	Mining Equipment, Technology and Services	Medical Technologies and Pharmaceuticals	Oil, Gas and Energy Resources
Inclusive Leadership							
Encourage Entrepreneurship							
Develop Skills for Innovation							
Coordinate Polices and Regional Programs							
Establish a Hunter Regional Innovation Initiatives Fund							
Communicate the Strategy							

High importance Important Moderate importance

2 Strategic Context

The Board of RDA Hunter provides strategic leadership for the economic development of the region. RDA Hunter actively facilitates collaboration between business, tertiary education and government to ensure knowledge sharing, technical development and a positive attitude to new ideas – key principles for an innovative business environment.

2.1 The Hunter's Innovation and Investment Framework

Innovation thrives in an Innovation System – the relationships and interactions between knowledge creating organisations, teaching institutions, knowledge adopters, and government (in its policy, funding, enabling, and regulatory roles).

The Hunter Innovation System includes a world-class university, two internationally acclaimed research institutes, a highly regarded TAFE institution, and a resilient school system. It also includes a number of large businesses that develop and apply scientific and technical knowledge, and a large number of small but fast growing technology businesses.

The three levels of government have a presence in the Hunter, as well as a number of business organisations and intermediary organisations that assist in facilitating connections between people and organisations in the system.

There is scope for improvement in collaboration and coordination between the entities in the innovation system that make expenditure and resource allocation decisions as a way of improving development options, addressing challenges, and responding to needs.

Growth is principally sourced from investment by businesses – investment in new capacity to make more goods and services. While investment in economic and social infrastructure, new buildings and factories, and sophisticated equipment remains important, it is the investment in developing the knowledge, skills, and capabilities of people that is the new foundation of economic growth. Increasingly, it is smart people who drive economic growth.

Whilst governments and research organisations can enable innovation, investments are ultimately business decisions, made by Boards and CEOs in the light of assessments of costs, returns and risks. It is now well recognised that a well-functioning innovation system can help manage and mitigate risk.

Australians are good at the development of new ideas, whether through scientific discovery, technological invention or the ingenuity of clever people. The Hunter must capture value from ideas through adoption and implementation in a way that secures prosperity, higher living standards, and resource sustainability.

There is no shortage of people in the Hunter who have these capabilities. But taking an idea from invention to market requires dedication, commitment and determination.

CASE STUDY

NEW ELECTRONIC LIFEJACKET BUOYED BY INVENTOR'S COMMITMENT

By Peta Doherty, Newcastle Herald, July 6, 2014

He built it to save lives and today the Newcastle inventor said he was ''overjoyed'' to finally put his electronic lifejacket on the market.

''I started this for a purpose,'' said David Ashard, after launching his Electronic Body Buoyancy System. ''I want to save as many lives as I can and now that it's come to fruition, it's very rewarding.''

The Electronic Body Buoyancy System, or EBBS, is a safety garment for children that inflates when it senses water of depth. Mr Ashard, was inspired to build the vest after he saw a young couple on the news who had just lost a child in a pool drowning.

''Being an inventor it triggered something in me and I thought, 'I'm going to try and help','' he said.

Within a few weeks he had built a prototype but ''that was the easy part''. It is one thing to make something in your shed but quite another to mass-produce and market it, said Mr Ashard.

His determination to maintain the integrity of his invention has seen him turn down an offer of ''several millions'' from a multinational company and produce the garment himself.

''It's never been about the money for me. I came up with it to save lives and if I wasn't in control, it could have gone in any direction,'' he said.

He hopes the product will help eliminate drownings around the world.

In the interest of quality control, all the electronic components are currently manufactured locally in (Newcastle suburb) Lambton.

The vest, which is designed to be worn under clothing, will inflate when it senses the wearer has fallen into a body of water and immediately float them to the surface.

http://www.theherald.com.au/story/2398617/new-electronic-lifejacket-buoyed-by-inventors-commitment/

2.2 Smart Specialisation Strategy for the Hunter

In 2014, the Hunter Innovation Scorecard made the link between innovation and international competitiveness by referencing The European Innovation System. This insightful comparison provided the Hunter with a global benchmark and a blueprint for how to consolidate and improve.

The strategic approach to economic development taken by RDA Hunter progressed in 2014 and 2015 with implementation of the smart specialisation strategy (S3) framework. The OECD's development of S3 in partnership with the EU created a framework to design better public policies for boosting innovation-driven growth.

The Hunter is challenged to identify new sources of growth and productivity in a post-mining boom economy. It is not a matter of finding alternatives, but building on the strong knowledge base in mining, energy, agriculture and medical research.

Through advances in digital and other enabling technologies, mining, energy and agriculture are now 'high tech' and service oriented with an increasing need to develop and apply knowledge and technical expertise. They require the development of specific products, software, and other smart digital solutions, as well as the ability to operate and maintain them in a working environment.

The Hunter must be able to respond to and capture the opportunities of changing patterns of international trade. The close economic ties with the USA, European Union (EU) and Japan have been joined by stronger trade relationships with China, India, South Korea and the Middle East. The Hunter must also discover how it can best address the challenges from climate change, urbanisation, demographic shifts and the need to secure a sustainable energy future.

To address these issues, RDA Hunter has embraced a smart specialisation strategy (S3). The strategy involves harnessing science, technology, and innovation initiatives to drive economic development, growth and jobs.

2.3 National Innovation and Science Agenda

In December 2015, Prime Minister Turnbull, announced the National Innovation and Science Agenda (NISA). The Agenda aims to drive economic growth throughout Australia. The Agenda provides opportunities for individuals and businesses across Australia to innovate, commercialise new ideas, create more jobs, and to better support our communities.

NISA complements existing efforts on regional Australia, including the $1 billion National Stronger Regions Fund, to fund priority infrastructure in regional communities. The Commonwealth recognises that regional Australia holds diverse opportunities for innovation and that Regions can build on their competitive advantages—physical assets, transport linkages, amenity and human capital—to drive unique, region-specific innovation.

Commonwealth Government messages on innovation, regional Australia and industry represent an endorsement and a challenge for the Hunter to commit to growth through innovation and contribute to Australia's national innovation and growth objectives.

RDA Hunter is profiled in NISA as an exemplar of regional leadership in innovation. By embracing innovation and research, RDA Hunter is helping to grow the region's international competitiveness and through the Smart Specialisation Strategy, build on Hunter strengths to drive unique, region-specific innovation. Also recognised in the Agenda is RDA Hunter's ME Program, which is building a smarter workforce for the future by improving the Hunter's uptake of STEM subjects by Hunter high school students.

NISA acknowledges the existence of a vibrant regional university network which works in conjunction with national research institutions including the CSIRO and Cooperative Research Centres.

Regional Development Australia HUNTER | me program An initiative of RDA Hunter

NATIONAL INNOVATION & SCIENCE AGENDA

2.4 Australia's Industry Growth Centres

Five of the Commonwealth supported Industry Growth Centres are industries where the Hunter* has identified competitive advantages.

CASE STUDY

INDUSTRY GROWTH CENTRES FOR AUSTRALIA

The Industry Growth Centres Initiative is an industry-led approach to drive innovation, productivity and competitiveness by focusing on areas of competitive strength and strategic priority. This will help Australia transition into smart, high value and export focused industries.

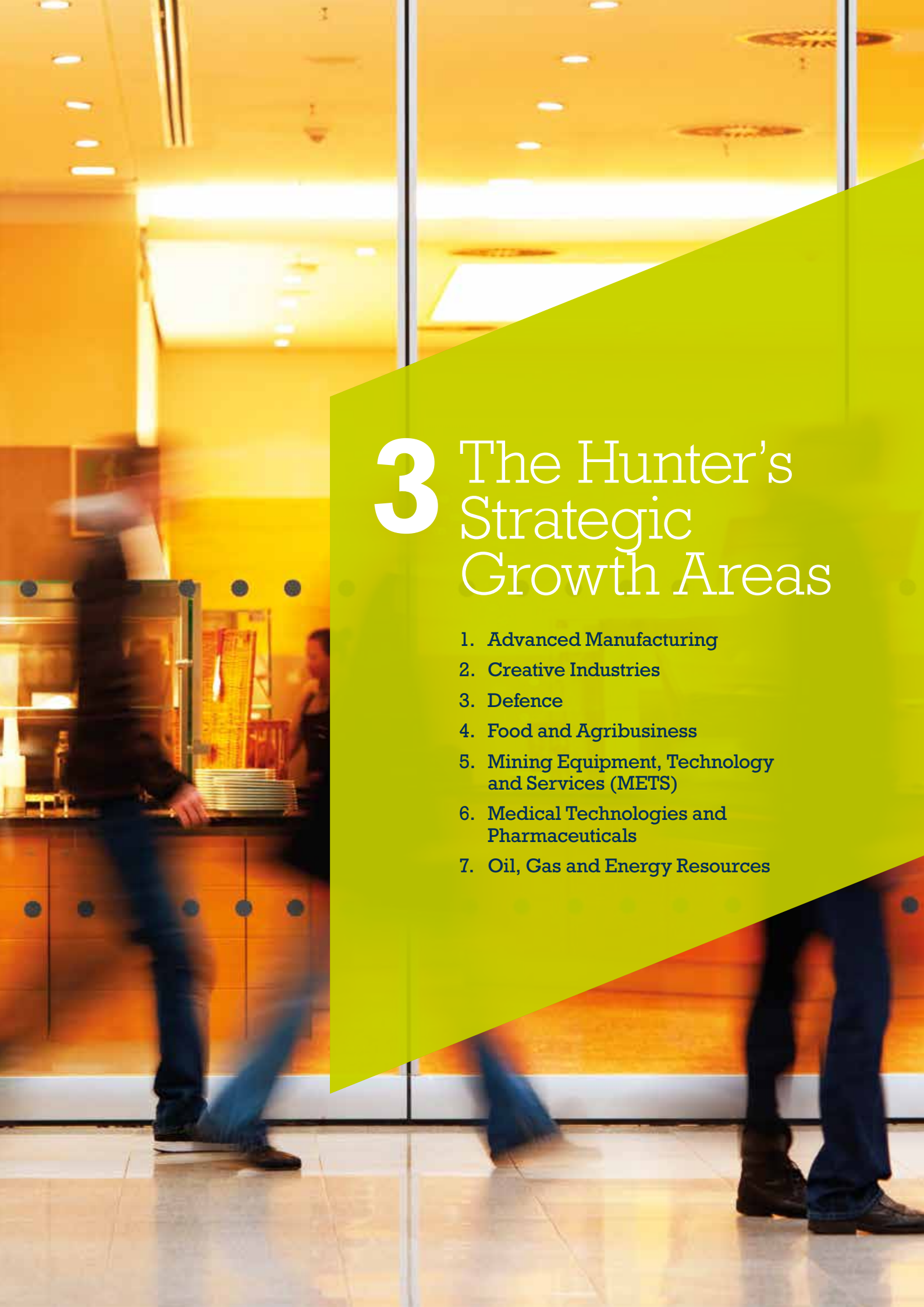
The Initiative will enable national action on key issues such as deregulation, skills, collaboration and commercialisation. It will drive excellence, not dependence and create an economy that ensures Australia's ongoing prosperity.

Growth Centres are being established in six industry sectors of competitive strength and strategic priority:

- Advanced Manufacturing*;
- Cyber Security;
- Food and Agribusiness*;
- Medical Technologies and Pharmaceuticals*;
- Mining Equipment, Technology and Services*; and
- Oil, Gas and Energy Resources*.

The Growth Centres will also facilitate engagements between enabling services and technologies, such as Information and Communications Technology.

http://www.business.gov.au/advice-and-support/IndustryGrowthCentres/Pages/default.aspx



3 The Hunter's Strategic Growth Areas

1. Advanced Manufacturing
2. Creative Industries
3. Defence
4. Food and Agribusiness
5. Mining Equipment, Technology and Services (METS)
6. Medical Technologies and Pharmaceuticals
7. Oil, Gas and Energy Resources

3.1 Advanced Manufacturing

Advances in manufacturing technologies create opportunities for the development and growth of manufacturing businesses that adopt and apply advanced technologies such as 3D printing, new materials, and embed technology product design.

The priorities for Advanced Manufacturing identified by the Industry Growth Centre are:

- Improving engagement with international markets and access to (almost universally digital) global supply chains;
- Improving managerial and workplace skills;
- Increasing engagement between research and industry, and within industry, to achieve commercialisation outcomes; and
- Removing unnecessary and over burdensome regulations.

The Advanced Manufacturing Growth Centre says that every manufacturer can, and should, become advanced through changes to mindset, value chain scope and processes.

Whiteley Corporation, one of Australia's leading manufacturers of disinfectants for healthcare and industrial cleaning products, experienced success after moving their operations to the Hunter.

CASE STUDY

LUMO SOLUTIONS

Lumo Solutions Pty Ltd is a new and dynamic Australian company focused on providing quality, unique Glow In The Dark safety guidance components and systems.

Lumo safety guidance components have been developed and are manufactured wholly in Australia. The manufacturing process is an in-house trade secret using specially formulated ingredients and unique purpose built, Australian made machinery.

With over two years of research and development several components for diverse applications have been created. The components have highly durable properties with five to 50 years' life expectancy, depending on traffic and climate, are ergonomically designed and pleasing to the eye.

The company owners aim to be a global leader in the manufacture and distribution of in the dark safety guidance components. They do this through innovation, environmental awareness and the development of a global distribution network. Lumo's vision is to provide people in the world with some security in the dark both in times of emergency or when in need of recreational pedestrian guidance.

http://lumosolutions.com

In 1995, Whiteley Corporation transferred its manufacturing to a purpose built, world class facility at Tomago, Newcastle from its original Sydney site. Managing Director, Greg Whiteley commented: 'The move to Tomago has been the debut for a period of unrivalled success for the business. The company has grown from its small roots to more than 10 times its turnover.'

Whiteley Corporation is now a Therapeutic Goods Administration (TGA) and SAI Global licensed plant that exports to more than 20 countries. As part of the continuing expansion into Research and Development and new product technologies, Whiteley Corporation has a number of collaborative research projects with several universities and tertiary institutions, and continues to add new patents to its technology portfolio.

Advanced Manufacturing was identified by 25 per cent of people attending the Smart Specialisation Summit as a priority for industry growth. The Hunter has already made progress with the Manufacturing Innovation Cluster, which is an important foundation for the creation for the promotion of Advanced Manufacturing in the Hunter.

CASE STUDY

HUNTER MANUFACTURING INNOVATION CLUSTER

Manufacturers are facing increasing competition. Some companies' traditional markets have evaporated and gone overseas and may never come back. Many others are comfortable in supplying the coal mining industry but this demand has softened. For some there is a compelling need to reinvent themselves but they do not know how.

This network has been formed to bring about a group of likeminded (yet different) manufacturers and engineers who, within the confines of protection of confidentiality, might be prepared to exchange stories and experiences about reinvention or new invention in their business. Members can spark off each other and create more new ideas.

Another aim is to grow collective wisdom about how companies can have a significant place in "the smart economy" of the future which could be useful in providing a spotlight on the future for others in the industry.

Meetings of the Cluster follow an informal structure over refreshments where people can meet; offer a bit about themselves and their business and exchange ideas with each other.

www.aigroup.com.au

3.2 Creative Industries

The Hunter, and Newcastle in particular, are recognised as 'hot spots' for creative industries. Creative businesses are typically not large, but they undertake business in a highly distributed basis, with the potential to generate significant levels of income for the region.

In aggregate creative businesses can be substantial employers. They also make significant value contributions to other business through the development of design and creative content for marketing, product positioning and branding.

Hunter-based arts and creative industries are engaged and regenerate local communities through the Renew Newcastle project. Marcus Westbury founded this urban renewal initiative in 2008 by finding short to medium term uses for unoccupied and underutilised buildings in Newcastle's CBD.

In Creating Cities (2015), Marcus Westbury wrote: "What has always impressed me about creative people is less their role as trendsetters or tastemakers than their resourcefulness and resilience, their entrepreneurialism and their open-ended willingness to back an idea."

Creative businesses typically work in the 'freelancer' economy'. Many businesses have the opportunity to grow and prosper with support through business networks, mentoring and access to business and resource management capabilities. As higher speed broadband is rolled-out, Creative Industries will be able to take advantage of greater commercial reach.

One of the more significant creative industries is software development which has applications across a wide range of industries, including manufacturing, defence, food and agriculture, mining technologies, and energy.

There is a growing number of software companies located in the Hunter. Several operate under license agreements with global software organisations – Bohemia Interactive Solutions, for example, which provides virtual reality 'war games' to the Australian Defence Force.

There are also issues for many small but growing creative businesses such as how to enter global markets and value chains, how to price services, how to secure fair and equitable contracting, human resource management, and protection of employee rights.

Despite these issues, the Region's Creative Industries are important contributors to vibrant communities, the expression of Hunter values and essential for sustainable economic diversification. This diverse collection of businesses will be part of the Hunter's future economic growth, exports, innovation and competitiveness.

CASE STUDY

HUNTER ARTS NETWORK (HAN)

The Hunter Arts Network, is a non-profit incorporated membership of artisans from the Hunter. Rising from the idea that Newcastle and the Hunter are full of creative people producing high quality art, craft and design-based work, HAN was established to give representation to these people. HAN fosters communication and collaboration between all art groups in the Hunter. HAN facilitates opportunities for promotion of members and their work through Art Bazaar, social media, newsletter, blog and artist page on their website.

http://hunterartsnetwork.org/

ARTS UPPER HUNTER

A member of Regional Arts NSW, Arts Upper Hunter is backed by five Councils, to provide, support and promote opportunities for all people in the Upper Hunter to participate creatively in the lives of the communities they live in. Their guiding principles are: all people have a right to participate in the arts; participation in the arts contributes to the social, cultural and economic well-being of individuals and the communities they live in; and, best arts practice supports and celebrates difference.

http://www.artsupperhunter.com/

3.3 Defence

The Hunter is home to significant Australian defence bases and establishments:

- Royal Australian Air Force (RAAF) Base Williamtown, Australia's premier fighter pilot training base and future home for most of the F-35 (JSF) Joint Strike Fighter aircraft;
- Army's Singleton Military Area in the Upper Hunter, co-located next to Lone Pine Barracks;
- Myambat, Australia's largest and most comprehensive ammunition storage depot near Muswellbrook in the Upper Hunter.

Over many years, the Hunter has developed a strong capability in the provision of services and maintenance of technologies for the defence industry.

Hunter TAFE has a strong output of skilled students in areas such as welding, fitting and diesel mechanics, which helps meet the needs of Defence and the defence industry. In addition, RDA Hunter's schools-based pathway program, the ME Program is a teaching initiative which combines STEM subjects (science, technology, mathematics and engineering) relevant to Defence and defence industry needs with vital on the job experience and additional education, delivered by leading local manufacturers.

Many defence contracting companies have a presence in the Hunter, including BAE Systems, GE Aviation, Lockheed Martin and Raytheon. There are also opportunities for smaller 'niche' businesses.

The location of the JSF project at Williamtown will, in time, create opportunities in various aspects of maintenance, repair and logistics.

RDA Hunter is co-ordinating the Hunter Strategic Defence Group with HunterNet, the Hunter Business Chamber, NSW and Federal governments, the Defence Department and industry to leverage defence opportunities such as the JSF and planned major re-equipment programs to capture economic and employment outcomes for the Hunter.

CASE STUDY

ATSA DEFENCE SERVICES

ATSA Defence Services provide leading edge electronic support for business and government – locally, nationally, and globally. It is based in Newcastle, NSW; Australia's largest regional port facility.

ATSA provides excellence in support for the world's most advanced electronic systems. A combination of expertise and innovation delivers integrated support solutions for a range of technological applications. The full life-cycle of all electronic systems is covered, from initial development through to production, technical support and training. They are a supporter of the local technical community and of the wider defence community as a member of HunterNet, the Hunter Business Chamber Defence Industry Committee, Australian Business Limited Defence Industry Unit, Australian Industry Defence Network and the Defence Recognised Supplier Scheme.

The company has developed close partnerships with Original Equipment Manufacturers such as SAAB Underwater Systems (Sweden). ATSA invests above industry-average amounts in Research and Development, including PhD research sponsorship, to grow and improve its business.

http://www.atsa.com.au/company_profile.asp

3.4 Food and Agribusiness

The Hunter has strong capabilities across agribusiness and food. It has particular strengths in wine, beef production, and grains.

There are opportunities for businesses to connect with the Food Innovation Growth Centre to develop and grow Hunter businesses. The Growth Centre, known as Food Innovation Australia Limited (FIAL), is headquartered at Werribee in Victoria, and will create a national network across Australia.

FIAL will leverage and build on CSIRO's national network of researchers and collaboration partners to improve engagement between researchers and businesses and drive innovation across the value chain. FIAL will also ensure businesses from across Australia can participate in and benefit from the Growth Centre's range of activities.

FIAL is positioned as a catalyst and facilitator of a competitive market through cultural, business and transformative change. It takes a position in the industry as the only organisation that has a holistic, integrated and national approach.

With markets and business conditions changing with increasing speed, it's no longer possible for food and agribusiness companies, whether large or small, to rely on just their own capabilities. The knowledge and skills of others are powerful assets to help keep pace and fast track solutions through tapping into their experience, connections and skills. In effect this expanded network makes your business larger, more agile and current.

Business networks and more formal arrangements for collaboration between businesses are an important opportunity for the Hunter for growth and development in the food and agribusiness sector.

The strength of the Hunter in the wine industry is well known – nationally and globally. What is less well known is the opportunity to learn about viticulture in a highly regarded Hunter TAFE facility.

CASE STUDY

VITICULTURE AND WINE COURSE

Regardless of experience, you can study a viticulture course at the Kurri Kurri campus of Hunter TAFE which comes complete with a vineyard and wine making equipment. These courses are especially for people interested in wine making, wine industry operations, vigneron and grape growing or wine and there is no better region than the Hunter wine region to start a career in viticulture. There are a range of qualifications and courses of various lengths including short courses and TVET courses for high school students.

http://www.hunter.tafensw.edu.au/pages/default.aspx

3.5 Mining Equipment, Technology and Services (METS)

Today's mining industry is knowledge-intensive with rising rates of R&D and innovation. The key trajectory of innovation is based on information technology (IT): smart technology rather than physical technology.

Through the Newcastle Institute for Energy and Resources (NIER), the Hunter is actively involved in the National METS Growth Centre, known as METS Ignited. To strengthen the competitive advantage of the Australian mining equipment, technology and services industry nationally and globally METS Ignited has commenced:

- Developing a 10 year strategic plan for METS through a Sector Competitiveness Plan.
- Developing a METS brand and vision to promote Australian METS companies.
- Working with the Cooperative Research Centre for Optimising Resource Extraction to ensure positive research outcomes.
- Working with research organisations, miners and the METS industry to develop a framework for stronger engagement and collaboration.
- Identifying the skills and management capabilities required to support future growth in METS.
- Identifying global opportunities and world leading companies in Australia and bringing them together.

These activities directly support a broader smart specialisation strategy, particularly in the area of collaboration and skills development. Moving along this trajectory is becoming more important as the global mining industry goes through fundamental changes.

Recent research indicates that Australia's METS sector is now at a key stage of evolution.

The Hunter region, through NIER is a METS innovation hub. The multidisciplinary research capacity of NIER is addressing issues concerned with next generation energy, energy storage, energy management, smart energy integration and resources production and distribution. Sixty per cent of NIER funding is from industry.

In 2014, the Hunter became home to the NSW Energy Innovation Knowledge Hub, based at NIER. This hub leverages the Hunter's innovative strengths in the energy sector and will boost competitiveness with better access to world class research, information sharing and collaboration.

In 2016, NIER has 169 PhD students, including 46 from overseas, indicating strong international linkages. It has purpose-built state-of-the-art facilities for 300 researchers and scope for building international connections through the Alumni network.

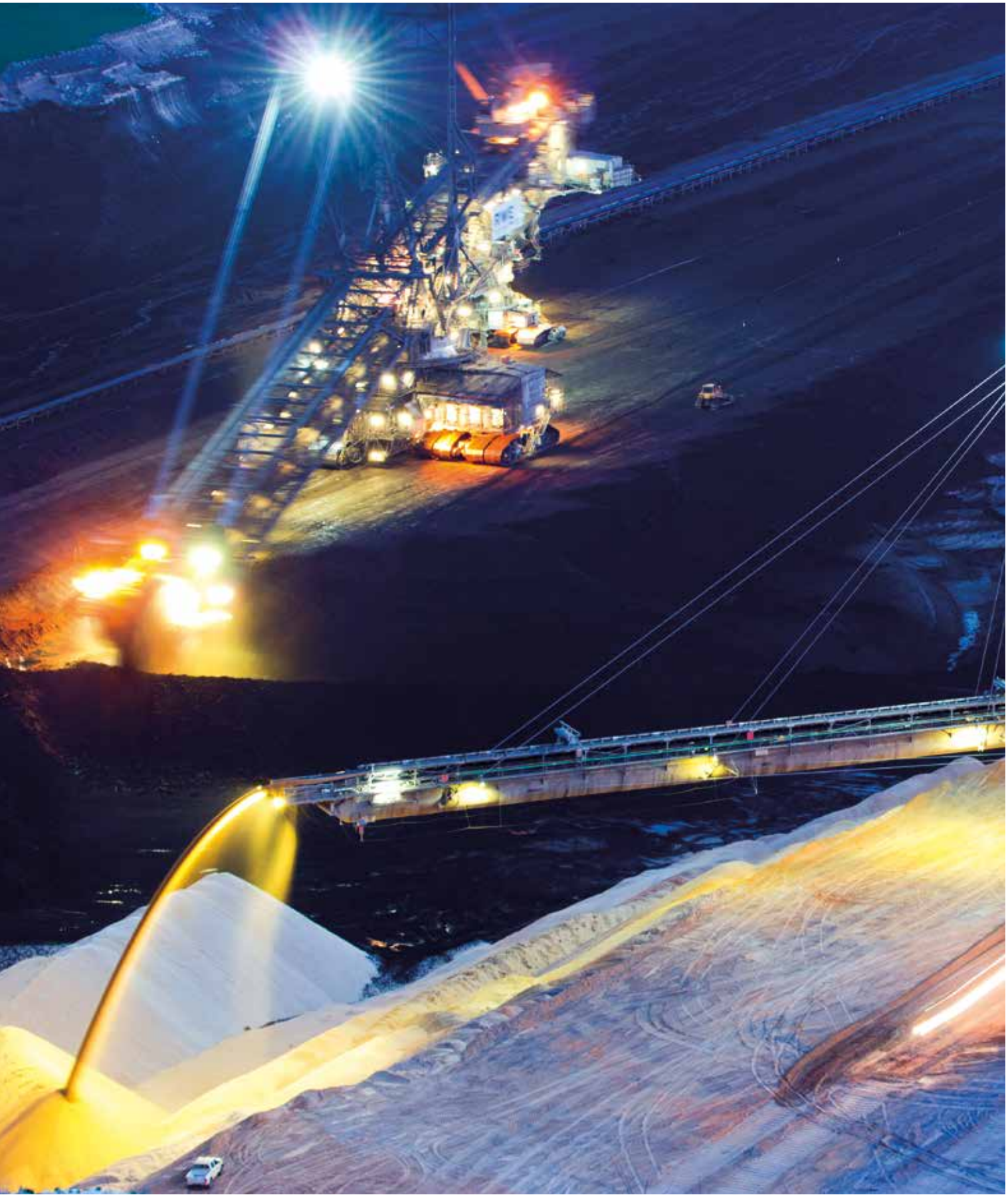
CASE STUDY

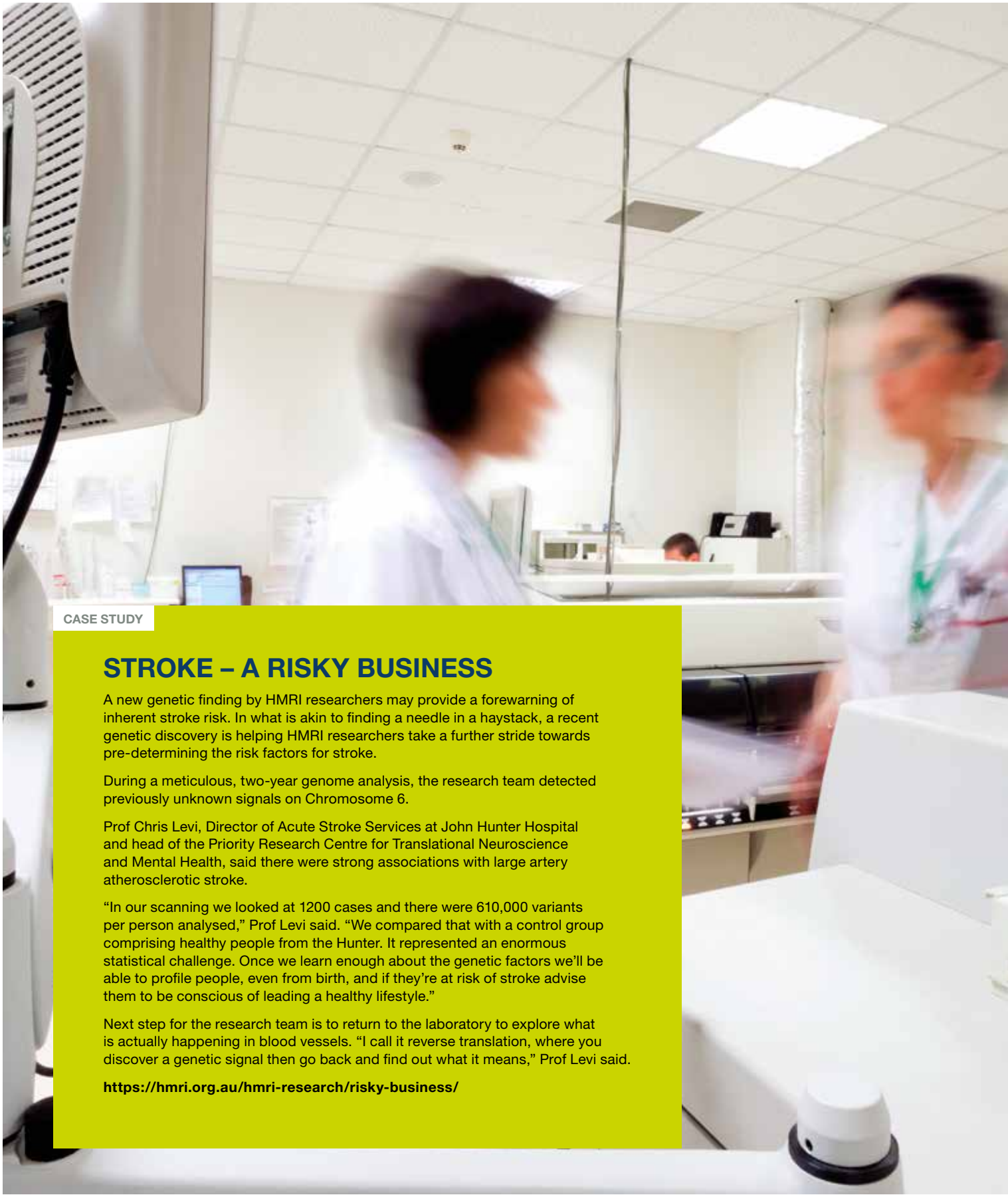
HOW ABOUT THOSE METS

Leveraging Australia's mining equipment, technology and services sector

Many firms, including relatively small firms, are internationalising rapidly through exports and the opening of offshore offices. Many firms are transforming their strategies, structures and organisational arrangements to support future growth. At the same time, difficulties in attracting capital and shortages of skilled personnel, including engineers, managers, IT and marketing professionals, pose impediments to growth.

http://www.minerals.org.au/file_upload/files/publications/mca_how_about_those_METS_FINAL.pdf





CASE STUDY

STROKE – A RISKY BUSINESS

A new genetic finding by HMRI researchers may provide a forewarning of inherent stroke risk. In what is akin to finding a needle in a haystack, a recent genetic discovery is helping HMRI researchers take a further stride towards pre-determining the risk factors for stroke.

During a meticulous, two-year genome analysis, the research team detected previously unknown signals on Chromosome 6.

Prof Chris Levi, Director of Acute Stroke Services at John Hunter Hospital and head of the Priority Research Centre for Translational Neuroscience and Mental Health, said there were strong associations with large artery atherosclerotic stroke.

“In our scanning we looked at 1200 cases and there were 610,000 variants per person analysed,” Prof Levi said. “We compared that with a control group comprising healthy people from the Hunter. It represented an enormous statistical challenge. Once we learn enough about the genetic factors we’ll be able to profile people, even from birth, and if they’re at risk of stroke advise them to be conscious of leading a healthy lifestyle.”

Next step for the research team is to return to the laboratory to explore what is actually happening in blood vessels. “I call it reverse translation, where you discover a genetic signal then go back and find out what it means,” Prof Levi said.

https://hmri.org.au/hmri-research/risky-business/

3.6
Medical Technologies and Pharmaceuticals

The Hunter has a proven track-record in medical research, with particular capabilities in translational research programs of Brain and Mental Health, Cancer Research, Cardiovascular Health, Information Based medicine, Pregnancy and Reproduction, Public Health, and Virus, Infections/Immunity, Vaccines and Asthma (VIVA).

The Hunter Medical Research Institute (HMRI) supports the Hunter's internationally recognised health and medical research, education and training. Established in 1998, HMRI facilitates collaborations between researchers translating scientific advances into better clinical care, competitive commercial products and improved health care guidelines.

There have been a number of commercialisation successes arising from HMRI research, but there is potential to secure a greater return on the very substantial investment in research through collaboration and partnerships.

World-class pharmaceuticals and medical break-throughs for veterinary applications are also part of the Hunter's competitive advantages.

The Hunter is also home to Jurox, Australia's most innovative veterinary pharmaceutical manufacturer that markets in excess of 120 proprietary animal health products and employs over 100 staff in Australia and New Zealand. Jurox invests 15% of sales in research and development, much of which is carried out on the group's own research stations. With an expanding export base and growing domestic business, Jurox markets products throughout Australia, New Zealand, Asia, the Middle East, the United Kingdom and Europe. Jurox is now turning its attention towards North America.

The world's second largest Thoroughbred Horse breeding industry in the Upper Hunter is supported by the Scone Equine Hospital. Widely recognised for its innovations in equine reproduction Scone Equine Hospital has delivered numerous success stories for Hunter Valley thoroughbred breeders.

Over the past 50 years Scone Equine Hospital has developed in partnership with the Thoroughbred Horse industry, sharing research, training and people with equine practices around the world. This exchange of skills and experience combined with the knowledge and qualifications means Scone, the "Horse Capital of Australia" is one of three international centres of Thoroughbred breeding excellence in the world.

3.7 Oil, Gas and Energy Resources

The Newcastle Institute for Energy and Resources (NIER) was established with a clear agenda, to provide a multidisciplinary model for transformational research in energy and resources. Driven by a vision of global leadership, NIER addresses challenges of the rapidly emerging issues of resource sustainability, productivity and competitiveness associated with energy and resources infrastructure.

This is becoming more important as Australia's energy supply gradually shifts from traditional sources to renewable sources. Smart energy initiatives open up a new future for energy distribution and consumption. For example, the 'intelligence' of smart networks combined with advances in low carbon fuel sources, energy storage, electric vehicles and the proliferation of smart appliances has the potential to transform the way energy is consumed.

The NSW Energy Innovation Knowledge Hub housed at NIER is leveraging the sector's strengths and developing a new market for smaller scale energy efficiency technologies that provide significant opportunities for small and medium enterprises (SMEs).

The Hunter is the location for the CSIRO Energy Centre and hosts the solar field and energy research hub.

CASE STUDY

CSIRO AND ENERGY SECURITY

Australia's economy depends on reliable and cost competitive energy. Energy is also the major contributor to our nation's greenhouse gas emissions. The CSIRO Energy Centre is conducting research to address the challenge of maintaining energy security and affordability while reducing negative environmental, economic and social impacts.

The Energy Centre's goal is to deliver science and technology options by 2020 that will enhance Australia's economic competitiveness and regional energy security; enable Australia to transition to a lower emissions energy future; unlock $100 billion of in-situ value from our energy resources, and contribute 32 mega tonnes per annum of greenhouse gas abatements by 2030. Themes to progress the goals include:

- Developing distributed generation and efficient options model.
- Uptake of enhanced mining technologies and transfer of coal preparation technologies to mines.
- Patent solvent technologies and membrane and solid adsorbent technologies.
- Pilot-scale demonstration of synfuel production from natural gas and stored solar heat.

The Energy Centre has achieved a world-first by producing supercritical steam (very high temperature and pressure steam) from solar energy alone. Today's most efficient steam turbines require supercritical steam to produce electricity. This is yet another step towards lower cost renewable energy.

Another important study measured the implications of the 5-Star Energy Efficiency Standard for residential buildings. CSIRO found that 5-star homes consume up to 56 per cent less energy for heating compared to 3.5 to 4-star homes (depending on the city). This work helps homeowners and builders better understand how the energy efficient star ratings work and what its actual costs and benefits are.

http://www.csiro.au/en/About/Our-impact

The Australian Research Council Centre of Excellence for Geotechnical Science and Engineering (CGSE) is pioneering new scientific approaches to geotechnical engineering design to underpin Australia's energy and transport infrastructure, resulting in increased productivity and sustainability of the nation's major export industries.

The Hunter is well placed to develop and exploit these opportunities though collaborations with research organisations and the major energy suppliers.

4 Strategic Directions and Actions

The Smart Specialisation Strategy identifies actions to deliver innovation-driven growth of the Hunter and implement programs in support of the region's seven key areas of competitive advantage. As a priority, an Innovation Network needs to be established to assist RDA Hunter to progress implementation of the Strategy and deliver economic development outcomes.

4.1 Develop Inclusive Leadership – the Hunter Innovation Network

Regional economic development is about people – people working together to achieve aims, develop opportunities, and overcome barriers.

Leadership is vital for regional development. RDA Hunter is working with Ministers for Industry, Innovation and Science in Canberra and Sydney, Innovate Australia, Austrade, Invest Australia, the Australian and NSW Departments of Industry, Australian Industry Group, Hunter Business Chamber, Hunter Business Enterprise Centre, HunterNet, the University of Newcastle, UTS, RMIT, Invest Bavaria, Hunter TAFE, and others to promote economic development in the Hunter.

RDA Hunter would like to take the next step and work with all organisations that can make, or would like to make, a contribution to economic development and prosperity through a formally constituted Hunter Innovation Network. This can be modelled on other successful network arrangements, including the Canberra Regional Innovation Network.

The purpose and operation of the Network is consistent with aims and objectives of the Commonwealth's National Innovation and Science Agenda.

CASE STUDY

CBR INNOVATION NETWORK (CBRIN)

The CBR Innovation Network (CBRIN) is an open collaboration of innovators, dedicated to developing a thriving and diverse innovation ecosystem within the Australian Capital Territory. The network includes The ANU, University of Canberra, Canberra Institute of Technology, NICTA, CSIRO, and UNSW Canberra.

The Network links businesses and entrepreneurs to services, facilities, and stakeholders to accelerate their innovation and growth, maximising wealth creation in the ACT.

The Network takes a central role in growing the innovation ecosystem in the ACT, providing practical insights to policy development at a Territory and Federal level, and building individual and corporate capability.

A Board that includes a ministerially appointed Director governs CBRIN. Members of the Chief Minister, Treasury and Economic Development Directorate have the right to observer status at all Board meetings.

The ACT Government has played a crucial part in the establishment of the network, and continues to provide on-going base-financial and other support. It has provided $1.1m base funding per annum for five years.

http://cbrin.com.au/#weare

The purpose and operation of the Network is consistent with aims and objectives of the Commonwealth's National Innovation and Science Agenda.

STRATEGIC ACTIONS

1. RDA Hunter to facilitate the formation of the Hunter Innovation Network as the vehicle for linking businesses and entrepreneurs to services, facilities, and stakeholders to accelerate their innovation and growth, maximising wealth creation in the Hunter Region.
2. RDA Hunter to invite education institutions, industry associations, businesses, and individuals in the Hunter to nominate candidates for appointment to the Board of the Network.
3. RDA Hunter to seek $1m in annual funding from the Commonwealth and State Governments to facilitate the operation of the Network and assist RDA Hunter to progress the smart specialisation actions.

4.2 Encourage Entrepreneurship

The entrepreneur sees a potential business opportunity, or a situation where resources can be recombined for potential profit. An entrepreneur will develop these opportunities through the creation of a product or service that will be provided to customers. Entrepreneurs secure resources, design organisations (or other modes of opportunity exploitation) and develop a strategy to exploit the opportunity for a financial return.

Entrepreneurship involves turning an innovation into a business that has customers. This means searching for and pursuing new opportunities, focussing on execution and delivery, and engaging the energies of others.

Starting an enterprise involves risks. But risks can be mitigated and managed through the development of business and management skills. Education and training in entrepreneurship can help in developing these skills.

CASE STUDY

UNIVERSITY OF NEWCASTLE BACHELOR OF INNOVATION AND ENTREPRENEURSHIP

The Bachelor of Innovation and Entrepreneurship encourages students to think distinctively, creatively and critically in a business environment. The degree provides the skills required to develop entrepreneurial ideas into successful new ventures, or work within existing businesses in an innovative way.

The work-ready skills gained from this degree give graduates a substantial edge in the jobs market. This contemporary degree provides the academic knowledge and practical experience needed to become highly competitive in a rapidly changing regional, national and global economies and communities. Embedding business, innovation and entrepreneurial knowledge into a combined degree program with practical experiences will give a substantial edge when applying for jobs in both the public and private sectors.

Strong industry connections underpin the program, and offer the practical, workplace opportunities needed when starting a career.

http://www.newcastle.edu.au/degrees/bachelor-of-innovation-and-entrepreneurship-exit-award/why-study-with-us

There are many courses and programs in entrepreneurship offered by other education and training organisation in the Hunter and on-line by universities and Registered Training Organisations. For example, the MBA in Entrepreneurship at the University of Technology Sydney (UTS) is a path-breaking initiative.

As the workplace changes and more people leave tertiary education to start their own businesses, the call for entrepreneurship to be embedded across a broader range of courses and disciplines is strengthening.

An important aspect of skills development is 'design thinking' – a methodology to solve complex problems, and find solutions through logic, imagination, intuition, and systemic reasoning, to explore possibilities, and create outcomes that benefit the end user.

It is generally agreed that a vital part of Australia's future innovation fabric will be in industries that can successfully adopt and apply digital technology. Jobs will increasingly require an ability to leverage the digital technology that underpins the modern economy. This means being digitally literate.

STRATEGIC ACTIONS

The Hunter Innovation Network will develop initiatives, programs and activities to:

4. Encourage schools, TAFE and Universities to offer education and training in entrepreneurship as part of their broader course offerings.
5. Establish a profile of courses and programs in entrepreneurship available to students and business leaders in the Hunter Region.

4.3 Develop the Skills for Innovation

Smart businesses require smart people. While technical and scientific capabilities are recognised as critical, there is a growing awareness that innovation also requires people who understand business, systems, culture, and the way society uses and adopts new ideas.

Business innovation and productivity therefore requires the interaction of a broad range of technical and non-technical capabilities.

The World Economic Forum in The Future of Jobs (WEF, 2016) identified a core set of 35 work relevant practical skills and abilities that are widely used across all industry sectors. These are represented in Figure 1.

FIGURE 1.

WORLD ECONOMIC FORUM THE FUTURE OF JOBS REPORT – CORE WORK RELATED SKILLS

ABILITIES	BASIC SKILLS	CROSS-FUNCTIONAL SKILLS	
Cognitive Abilities • Cognitive flexibility • Creativity • Logical reasoning • Problem sensitivity • Mathematical reasoning • Visualisation	**Content Skills** • Active learning • Oral expression • Reading comprehension • Written expression • ICT literacy	**Social Skills** • Coordinating with others • Emotional intelligence • Negotiation • Persuasion • Service orientation • Training and teaching others	**Resource Management Training** • Management of financial resources • Management of material resources • People management • Time management
Physical Abilities • Physical strength • Manual dexterity and precision	**Process Skills** • Active listening • Critical thinking • Monitoring self and others	**System Skills** • Judgement and decision making • Systems analysis	**Technical Skills** • Equipment maintenance and repair • Equipment operation and control • Programming • Quality control • Technology and user experience design • Troubleshooting
		Complex Problem Solving Skills • Complex problem solving	

Source: World Economic Forum, based on O*NET Content Model.

These practical skills will be subject to accelerating change and significant disruption in the immediate future. On average, by 2020, more than a third of these practical core skill sets for most occupations will be comprised of skills that are not yet considered crucial to the job today.

It follows that whilst capability and competency in technical skills are important for people to be considered for job openings, employers are interested in the broader skill sets relating to 'cognitive abilities', 'basic skills' and 'cross functional skills'.

There is a shortage of these skills across Australian businesses – large and small. Regions that can develop these skills, and create skilled talent pools, will have a competitive advantage.

The Hunter can develop a regional advantage by committing resources for the development of business, management, and workplace skills that are attractive for businesses to grow and proposer. There are opportunities to build on RDA Hunter's successful ME Program.

STRATEGIC ACTIONS

The Hunter Innovation Network will develop initiatives, programs and activities to:

6. Facilitate a partnership between Business and Business Organisations, the University of Newcastle, Hunter TAFE, private RTOs, Schools, and the Community, to develop an integrated skills development program that meets the requirements of businesses.
7. Engage with education and training organisations outside the region who are in a position to bring high level skills development and training to the region.

4.4 Support University – Business Research Collaboration

Tertiary education institutions have a major role in the innovation system through their responsibilities in research and education. That role is defined within their overall mission, purpose and operating frameworks. A range of specific purpose and conditional funding arrangements established by the Commonwealth Government has a strong influence on the operating frameworks.

Businesses often make reference to difficulties in working with universities. But, many are also supportive of the way relationships have developed and are maintained. There are, for example, strong relationships established over many years, in the mining, energy, agriculture and health/medical sectors. But collaboration is less apparent in manufacturing, and particularly small and medium sized business manufacturing. This is an important issue to address with the high priority given by the community to Advanced Manufacturing.

Collaborative innovation through stronger tertiary education-business relations requires longer-term engagement and partnerships in a 'business to business' strategic and joint venture environment. This will require each sector understanding the business of the other, and building high levels of trust.

Aspects of the research being undertaken in universities might be of little interest to Hunter businesses that have only a small commitment to R&D. At the same time however, undergraduate and graduate students working with business through specific projects, work experience, or internships can often meet important research assignments for businesses.

CASE STUDY

VENOM CENTRE SUPPORTED AS PART OF $18.5 MILLION HEALTH RESEARCH BOOST

The Hunter is home to Australia's first Centre of Research Excellence (CRE) for venom and antivenom, which was established with $2.5 million funding from the National Health and Medical Research Council (NHMRC).

Led by renowned toxicologist Professor Geoffrey Isbister from Calvary Mater Newcastle, the CRE for venom and antivenom represents a major advancement for venom research in Australia.

Professor Isbister said strong collaboration internationally within the CRE would also improve global health outcomes and provide research capacity in parts of Asia. "The CRE brings together leading venom scientists from around the globe to conduct clinical trials, improve understanding of antivenom dosage and investigate envenoming in high risk countries. Importantly, the CRE is a way to translate evidence in a clinical speciality previously driven by anecdote and expert opinion," said Professor Isbister. Monday, 9 November 2015

https://www.newcastle.edu.au/newsroom/featured-news/venom-centre-supported-as-part-of-$18.5-million-health-research-boost

CASE STUDY

HUNTER BRINGING TRANSPARENCY TO TRANSLATION

Translation means a direct connect between researcher and patient

For some, "translation" simply involves the development of new drugs and devices between the bench and bedside; others see it as being policy-based for holistic community benefit. Arguably, it is both and more.

Research can happen under a microscope or when real people follow a particular intervention. To be truly successful, though, research must embrace a fluid discussion back and forth between the community, clinicians and scientists.

Fortunately we live in the most demographically diverse but tight-knit health district in NSW, which is also home to an elite group of medical researchers from the University of Newcastle and Hunter New England Health.

It has long been known here that optimal health care arises from team efforts. We've been functioning this way since 1991 when John Hunter Hospital opened; HMRI's formation in 1998 further cemented the translational bridge between HNEH and the UoN.

Having gained a head start, the Hunter has been perfecting the formula ever since. We're now working on "Translation 2.0". Under the care model of 2014, scientific researchers have direct linkages with clinical service delivery in hospitals while clinicians gain early access to research innovations. Community health needs drive the translational cycle and our outcomes benefit those who support it.

It is vital that researchers remain inquisitive about what can be discovered for the ultimate benefit of the patient.

6 November, 2014
https://hmri.org.au/2014/11/hunter-bringing-transparency-translation/

STRATEGIC ACTIONS

The Hunter Innovation Network will develop initiatives, programs and activities to:

8. Assist businesses to identify research projects that might be suitable as a basis for collaboration with the University of Newcastle and other universities with connections to the Hunter.
9. Work with tertiary education careers offices to identify a broad range of work based learning opportunities for undergraduate and post graduate students.

4.5 Build the Hunter Innovation Initiatives Investment Fund

Funding for potential start-up companies in the Hunter is available through Newcastle based Slingshot Accelerator. Slingshot follows the standard venture financing model which supports start-ups that aim to produce something that has high margins and an expectation of being profitable in two to three years. Only a selection of new technology businesses can meet these criteria.

Most businesses grow slowly, and are financed through internal funds, principally cash flow and soft loans from family and friends. The Australian Government's National Innovation and Science Agenda (NISA) has facilitated access to funding through crowdfunding arrangements.

A broader funding base is required to build support for business innovation, enterprise development and growth. A Hunter Innovation Initiatives Investment Fund, with an aim to build and sustain capability in entrepreneurship, collaboration, and new business formation would provide this broader base.

The Fund would invest in collaborations between universities, other research organisations, VET providers, business groupings, and individual businesses where a strong business case has been made. It would work closely with Industry Growth Centres, and aim to leverage support for initiatives in the Hunter. The Fund would combine financial support with expert advice, assistance and mentoring. Funding would be made available on the basis of loans.

This scope of the Hunter Innovation Initiatives Investment Fund would cover:

- Attracting highly skilled talent and professional capability, particularly people interested in starting and growing a business – including assistance in fast tracking visa applications.
- Initiatives in skills development and training that is appropriate to the emerging industry profile of the Hunter Region.
- Promoting access to Innovation Australia and Austrade business development support.
- Encouraging the location of global R&D intensive corporations in the Hunter in collaboration with Commonwealth and State investment attraction agencies.
- Supporting investment proposals for hard infrastructure projects, including broadband, high speed rail, airport development, purpose-designed buildings, 'smart' rental housing and community facilities.

Funding should encourage the further development of initiatives underway and support and capture diversity in the innovation system. It should reward innovation and entrepreneurial initiative. The Fund would identify funding categories, but invite submissions on a business and value capture basis – rather than a rules driven 'categorical' framework.

The Fund would complement the other proposed actions and initiatives outlined in the Smart Specialisation Strategy for the Hunter Region.

STRATEGIC ACTIONS

The Hunter Innovation Network will develop initiatives, programs and activities to:

10. Scope and develop the guidelines for a Hunter Innovation Initiatives Investment Fund.
11. Engage key stakeholders, including financial institutions, business organisations, and the State and Commonwealth Governments in the development of the Fund.

4.6 Coordinate Policies and Regional Programs

A key role for smart specialisation is to inform policy to ensure effective and efficient spending of research and innovation funds. In 2015-16 the Commonwealth spent $9.7 billion on science, research and innovation. Austrade will spend a further $378m. The regional allocation of this funding is not known.

In addition, State Government agencies also make a commitment to research and innovation, particularly through the Department of Industry, Department of Agriculture and the Department of Education. Local Governments in the Hunter also make significant commitments to innovation.

Under its charter, RDA Hunter is required to:

- consult and engage with communities;
- promote and participate in regional programs and initiatives;
- provide information and advice on their region to all levels of government; and
- support informed regional planning.

RDA Hunter has a strong interest and involvement with the Commonwealth Government's National Innovation and Science Agenda, part of which has a strong regional development focus.

For example, NISA provides for an Incubator Support Programme which will focus on regional areas and sectors with high innovation potential, such as those identified as an industry growth centre or a Science and Research Priority. A number of other measures, including further funding to inspire students and the community with digital technologies and STEM is intended to create more opportunities for regions.

STRATEGIC ACTIONS

12. The Hunter Innovation Network will assist RDA Hunter to continue to advocate a collaborative approach to policy and program development across Commonwealth, State and Local Governments with a view to achieving greater consistency, coherence, efficiency and effectiveness in government services delivery.

4.7 Communicate the Strategy

The Smart Specialisation Strategy and proposed actions and initiatives must be communicated within the Hunter as well as nationally and globally. This is essential for building local commitment and endorsement.

STRATEGIC ACTIONS

13. The Hunter Innovation Network will assist RDA Hunter to develop a comprehensive and integrated marketing and communication plan to promote awareness and engage commitment to the Smart Specialisation Strategy for the Hunter Region.

5 Monitoring and Review

RDA Hunter will report annually to stakeholders on progress and achievements under the strategy.

Reports will relate to progress of Strategic Actions and project implementation. Priorities will be assigned baselines and targets linked to output and result indicators. Monitoring will be supported by appropriate data collection, to verify how the activities in the Strategy are delivering the output and result targets.

The policy mix and pilot projects will be revised as a result of the monitoring exercise.

Insofar as Commonwealth funding is received by RDA Hunter for delivery of the Smart Specialisation Strategy for the Hunter Region, the relevant contract Agreement will specify all reporting requirements.

Consideration will be given to the appropriateness of employing the European Commission smart specialisation platform's "RIS3 Assessment Wheel". This provides a way to visually represent a vast amount of information regarding progress, assisting analysis of areas of strengths and weakness which will inform future activity.

http://s3platform.jrc.ec.europa.eu/ris3-assessment-wheel

6 Conclusion

The economic and industrial framework of the Hunter is in the course of fundamental change, redevelopment and renewal. This is occurring not only in the pattern of industrial production, production technologies, and the demand for services, but also in patterns of employment where employer demand and new business opportunities are emerging for people with different skills, knowledge and capabilities.

The Smart Specialisation Strategy does not set out to direct or 'pick winners' in the course of economic and industrial growth. On the contrary, it seeks to establish a framework where industry sectors identified at a national level, together with other sectors considered to be important for the region can grow and prosper through collaboration between industry, research and teaching organisations and government.

The overall goal of smart specialisation is to grow through trade and participation in global value chains. International trade, to tap into large and growing international markets, has always been at the centre of economic growth and development.

The Australian domestic market at 24 million, or the Hunter market at 650,000 (with integrated planning for growth to one million by 2050), is small in comparison to the Asian and European markets.

RDA Hunter has identified the European market as an avenue to open up. Many of those opportunities will be developed by fast growing small businesses that use smart technologies applied by smart people and marketed by smart organisations through global supply chains.

Many businesses will go through a transformation and internationalisation process to capture these opportunities. This can be seen to be happening in the automotive sector as global car assemblers pull out of Australia.

Capturing trade opportunities requires collaboration and partnership between businesses and between business, research and teaching organisations and government. This collaborative mindset has been a feature of Smart Specialisation Strategies in Europe. RDA Hunter has established a partnership with the EU with the aim of developing and updating implementation projects identified in the Smart Specialisation Strategy process.


The overall goal of smart specialisation is to grow through trade and participation in global value chains.

Attachment 1:
Knowledge, Business, and Education Attainment Indicators in the Hunter and Adjacent Regions

Region	Hunter	Central Coast	North Coast	Sydney	Total NSW/ACT
Population	614,737	309,890	528,301	4,127,229	7,333,896
Innovation indicators					
Patents (total)	237	76	141	2,604	3,621
Patents (per 10,000 inhabitants)	3.9	2.5	2.7	6.3	4.9
Trademarks (total)	488	309	520	11,618	14,509
Trademarks (per 10,000 inhabitants)	7.9	10	9.8	28.1	19.8
Business activity indicators					
New business entries (total)	5,508	3,071	5,651	67,845	99,852
New business entries (per 10,000 inhabitants)	89.6	99.1	107	164.4	136.2
Business Research and Development Expenditure ($m) (median value 2008-2011 only)	79.3	17.3	459.3	2,754.0	5,710.7
Education attainment (total, 2011)					
Postgraduate Degree Level	10,372	4,312	6,539	194,575	264,199
Postgraduate/10,000 inhabitants	168.7	139.1	123.8	471.4	360.2
Graduate Diploma and Graduate Certificate Level	5,851	2,834	5,640	53,419	93,649
Bachelor Degree Level	48,320	21,490	38,550	579,471	847,877
Bachelor/10,000 inhabitants	786.0	693.5	729.7	1,404.0	1,156.1
Advanced Diploma and Diploma Level	36,454	19,577	31,304	298,928	487,438
Certificate Level	115,436	57,812	96,098	479,806	1,023,911
Diploma, certificate/10,000 inhabitants	2,471	2,497	2,412	1,887	2,061
Total Tertiary	216,433	106,025	178,131	1,606,199	2,717,074
Tertiary/10,000 inhabitants	3,521	3,421	3,372	3,892	3,705
Year 12 or equivalent	173,808	89,672	142,630	1,863,743	2,845,543
Year 12/10,000 inhabitants	2,827.4	2,893.7	2,699.8	4,515.7	3,880.0
Did not go to school	2,104	757	1,362	45,673	56,440
Counts of businesses					
Accommodation and Food Services	1,942	247	2,973	17,028	30,295
Administrative and Support Services	1,182	52	3,920	15,438	31,212
Agriculture, Forestry and Fishing	1,139	144	2,701	12,249	29,793
Arts and Recreation Services	3,455	672	1,777	8,513	23,502
Construction	2,682	454	1,715	10,976	25,881
Education and Training	1,689	342	2,411	7,942	22,294
Electricity, Gas, Water and Waste Services	1,785	280	3,277	12,883	31,083
Financial and Insurance Services	2,914	940	2,126	14,977	29,687
Health Care and Social Assistance	1,378	293	1,833	10,060	23,128

Region	Hunter	Central Coast	North Coast	Sydney	Total NSW/ACT
Counts of businesses (continued)					
Information Media and Telecommunications	1,764	112	4,085	19,247	32,454
Manufacturing	1,888	478	1,744	12,946	26,555
Mining	2,892	1,379	1,759	13,380	38,584
Professional, Scientific and Technical Services	762	639	4,334	14,718	35,384
Public Administration and Safety	976	322	2,171	13,748	31,418
Rental, Hiring and Real Estate Services	3,291	643	1,633	9,854	25,539
Retail Trade	2,425	330	1,404	12,815	24,283
Transport, Postal and Warehousing	5,746	224	6,737	25,609	55,749
Wholesale Trade	4,819	788	3,012	9,562	27,502
Total Businesses	**42,729**	**8,339**	**49,612**	**241,945**	**544,343**
Count of University Campuses (2015)	2	3	5	35	68
Count of TAFEs (2015)	13	3	16	41	150
Count of Research Institutes (2015)	4	0	4	50	119
Businesses per 10,000 inhabitants					
Accommodation and Food Services	31.6	8.0	56.3	41.3	41.3
Administrative and Support Services	19.2	1.7	74.2	37.4	42.6
Agriculture, Forestry and Fishing	18.5	4.6	51.1	29.7	40.6
Arts and Recreation Services	56.2	21.7	33.6	20.6	32.0
Construction	43.6	14.7	32.5	26.6	35.3
Education and Training	27.5	11.0	45.6	19.2	30.4
Electricity, Gas, Water and Waste Services	29.0	9.0	62.0	31.2	42.4
Financial and Insurance Services	47.4	30.3	40.2	36.3	40.5
Health Care and Social Assistance	22.4	9.5	34.7	24.4	31.5
Information Media and Telecommunications	28.7	3.6	77.3	46.6	44.3
Manufacturing	30.7	15.4	33.0	31.4	36.2
Mining	47.0	44.5	33.3	32.4	52.6
Professional, Scientific and Technical Services	12.4	20.6	82.0	35.7	48.2
Public Administration and Safety	15.9	10.4	41.1	33.3	42.8
Rental, Hiring and Real Estate Services	53.5	20.7	30.9	23.9	34.8
Retail Trade	39.4	10.6	26.6	31.0	33.1
Transport, Postal and Warehousing	93.5	7.2	127.5	62.0	76.0
Wholesale Trade	78.4	25.4	57.0	23.2	37.5
Total Businesses	**695.1**	**269.1**	**939.1**	**586.2**	**742.2**

Attachment 2:
Summary of RDA Hunter's consultations to develop Smart Specialisation Strategy for the Hunter Region

AGL
Ai Group
Ampcontrol
APP Corporation
Armor Composite Engineering
ATSA Defence Services
Aurecon
AusIndustry
AusPsych
Austrade
Australian Work for the Dole Services
Australia's Chief Scientist
Business Council of Australia
Callaghan College
CBA
Central Japan Railway Company
City of Newcastle
Colliers
Compass Housing
Dantia Pty Ltd
Dept of Premier and Cabinet (NSW)
Dept Infrastructure and Regional Development
Downer
Doyle Partners
EDC Consultants
Eighteen04
Engineers Australia
European Commission Regional Policy & Innovation (Brussels)
EU Delegation to Australia and NZ
German Embassy Canberra
Good Eye Deer Productions
Growthwise
H & M Accountants
Howard Partners
Hunter Medical Research Institute
Hunter Business Chamber
Hunter Development Corporation
Hunter Research Foundation
Hunter TAFE
Hunter Trade College
Hunter Valley Coal Chain Co-ordinator
Ideation At Work
Invest Bavaria
JeanBas
Lake Macquarie City Council
Lumo Solutions Pty Ltd
Maitland Business Chamber
McLean Management Consultants
ModFab
Muswellbrook Shire Council
NAB Business
Newcastle Herald
Newcastle Now
Newcastle Permanent Building Society
Newcastle Innovation Ltd
Newcastle Institute for Energy and Resources
Newcastle Trades Hall Council
NineWays Business Centre
NSW Business Chamber
NSW Chief Scientist & Engineer
NSW Department of Industry
NSW Department of Primary Industries
NSW Trade and Investment
OECD
Office of Minister the Hon. John Barilaro
Office of the Minister for Industry, Innovation and Science
Orica
Pedersen Engineers
Peter Evans and Associates
PKF
Port of Newcastle
Port Stephens Council
PricewaterhouseCoopers
RPC Technologies
RMIT
SafeWork NSW
Senator for NSW, the Hon. Arthur Sinodinos, AO
Singleton Chamber of Commerce & Industry
Singleton Council
Slingshot Accelerator
State Training Services
Sticky
Strategy Hunter Consultants
Terrarossa Consulting
Tourism Hunter
University of Newcastle
University of Technology Sydney (UTS) Business School
UrbanGrowthNSW
Varley Group
West Wallsend High School
WesTrac
Wests Newcastle
Youth Express

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