Australian Workplace Innovation and Social Research Centre

THE STRETTON CENTRE

PLAYFORD PROSPECTS

CHALLENGES AND OPPORTUNITIES

Kate Barnett and John Spoehr

June 2013

A report for The Stretton Centre funded by the Department of Sustainability, Environment, Water, Population & Communities

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

CITY OF Playford

THE UNIVERSITY of ADELAIDE
AUSTRALIAN WORKPLACE INNOVATION AND SOCIAL RESEARCH CENTRE

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The Australian Workplace Innovation and Social Research Centre (WISeR) *focuses on work and socio-economic change. WISeR is particularly interested in how organisational structure and practices, technology and economic systems, policy and institutions, environment and culture interact to influence the performance of workplaces and the wellbeing of individuals, households and communities.*

WISeR also specialises in socio-economic impact assessment including the distributional impacts and human dimensions of change on different population groups and localities. Our research plays a key role in informing policy and strategy development at a national, local and international level.

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FOREWORD

The Stretton Centre is seeking transformative change in the social and economic strength of communities living in and near the City of Playford. To do this, it is important that a range of factors driving change – locally, nationally and on a global scale – are understood, along with the challenges and opportunities embedded in each.

This report for the Stretton Centre is designed to stimulate and inform strategic thinking, planning and decision making in collaboration with stakeholders. It provides a preliminary overview of the landscape in which the Centre is operating as a foundation for discussion of short and medium term priorities.

Accordingly, an overview of the policy context in which the Stretton Centre is situated is presented in *Section* 1. The policy directions discussed reflect the need to respond to major drivers of change, particularly those affecting our environment, our economy, and our population, and the over-arching need to develop sustainability.

Sections 2 and *3* explore key drivers of change – population ageing, climate change and technological change – first from a futurist perspective and then in the light of existing trends.

Section 4 explores a number of industry and workforce development opportunities linked to major changes taking place. This is not intended to be an exhaustive list but rather a developmental one upon which a more comprehensive program of opportunities is constructed. Further detailed analysis will be undertaken by WISeR to augment this initial work including studies of the economic and workforce impacts of major urban development projects, minerals and energy resource development and wider research on industrial diversification and value adding in manufacturing and horticulture.

1 THE POLICY CONTEXT

1.1 SUSTAINABLE POPULATION STRATEGY

The Stretton Centre is an outcome of the Australian Government's focus on sustainability, a commitment which is articulated in the national *Sustainable Australia Sustainable Communities - A Sustainable Population Strategy for Australia (2011).*[1] Australia's first sustainable population strategy is a response by the Commonwealth Government to the challenges and opportunities associated with population growth. Sustainability is seen as requiring multiple interventions and coordination across portfolios, including in relation to health services, water provision, skills education and training, and infrastructure reform and investment.

The 2011-12 Budget provided funding for four measures to support a sustainable population in Australia:

- Sustainable Regional Development;
- Promoting Regional Living;
- Measuring Sustainability; and
- Suburban Jobs.

The **Sustainable Regional Development program** is designed to support better sustainability planning in regions that are experiencing high growth, through strategic assessments under national environmental law in up to seven additional regional and coastal growth areas.

The **Promoting Regional Living** program recognises that a number of regions are experiencing rapid growth with can lead to pressures on housing affordability and livability in these locations, while other regions are experiencing declining population growth. The Australian Government is providing $11.5 million over four years to non-capital cities that can demonstrate the potential for future growth. These cities will be eligible for support to market themselves as good places to live, work and build a future.

The **Measuring Sustainability program** aims to deliver 'reliable, relevant and accessible' information on the economic, environmental and social dimensions of sustainability through a set of sustainability indicators for Australia. Public reports against the indicators, to be produced by an independent National Sustainability Council, will highlight key trends and emerging issues to support decision-making and planning by governments, business and communities across Australia.[2]

1.1.1 SUBURBAN JOBS INITIATIVE

The $45 million *Suburban Jobs Program* was announced as a measure under the *Sustainable Australia - Sustainable Communities Strategy* in 2011. The objective of the Suburban Jobs Program is to support state and local governments to plan and provide for increased local employment opportunities in the outer suburbs of Australia's major capital cities that are subject to growth pressures.[3] The *Suburban Jobs Program Guidelines* (October 2011) note that growth in the outer suburbs of major capital cities in Australia has not always been matched by growth in local employment, resulting in long commute times to and from work for many residents, and a range of costs other than travel-related including personal health, family relationships and workplace productivity. This is the context for the Program.

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[1] http://www.environment.gov.au/sustainability/population/index.html
[2] ibid
[3] http://www.environment.gov.au/sustainability/suburbanjobs/

> *To address these challenges and create sustainable employment hubs where people live we need to better understand how to create a sense of place, attract and retain business investment, and deliver the infrastructure and capital works to build enduring employment opportunities. We also need to capture the opportunities of the digital economy which will have a significant implication for employment right across the country as the National Broadband Network (NBN) is rolled out.*

The *Suburban Jobs* program focuses on communities in outer suburban locations, supporting changes that attract and retain jobs closer to where people live. Appropriately designed and targeted employment opportunities will also help to reduce the environmental impact of economic activity and supported improved quality of life for these communities. The Program seeks to support projects that combine the delivery of –

> *… public good infrastructure with other outcomes in areas such as planning, research, communications and community engagement, data collection or the demonstration of the opportunities of the digital economy to increase access to jobs in suburban locations so that Projects deliver real and lasting benefits for the communities concerned.*

1.2 The Stretton Centre

One of three national flagship projects funded by the *Suburban Jobs* program, the Stretton Centre is a partnership between the City of Playford, The University of Adelaide's Australian Workplace Innovation and Social Research Centre (WISeR), the Urban Renewal Authority and the South Australian and Federal Governments.

The Centre has the overarching aim of playing a strategic role in supporting the region to maximise local industry and employment opportunities. Core objectives are to:

- Facilitate an environment for the creation of local jobs.
- Enable integrated policy and strategy development.
- Undertake collaborative industry/workforce research and evaluation.
- Enable transitions to local employment.
- Develop sustainable industries in the area and
- Support community learning.

The establishment of the **Stretton Centre** will generate a range of important benefits for different populations in the catchment area. In the short term employment and training opportunities for local residents will flow from the construction of the Centre. The development of local industry and employment opportunities through strategic collaborations between industry, government, NGOs and researchers is a priority focus of the Centre.

Once established the Centre is designed to be a hub for integrated industry, workforce and urban development in the region.

1.2.1 Socio – Economic Challenges

In the wake of the Global Financial Crisis, Australia has managed to sustain economic growth at a rate that has contained unemployment to levels that are considerably below those of other OECD nations. In South Australia employment grew over the ten years to March 2002 by around 126,000 jobs (Government of SA 2013). Despite this the GFC has had significant negative impacts on vulnerable industry sectors and regions. Generalised negative impacts were initially experienced in the construction sector (relieved to a significant degree by the Australian Government's Stimulus Package) and subsequently in manufacturing, largely as a consequence of a persistently high Australian dollar, declining global demand and the rise of low cost manufacturing operations in Asia.

Around 30,000 jobs have been lost in manufacturing in South Australia since the GFC. Recent announcements by General Motors Holden of job losses of 500 at the Elizabeth and Melbourne operations have generated widespread concern in the region about the future of the automotive industry in South Australia, intensifying efforts by the South Australian and Australian Governments to resource efforts that assist with the diversification of the component supplier base in order to increase its resilience to future shocks.

Analysis undertaken by WISeR in the preparation of the *Playford Profile* (2013) reveals a number of inter-related industry and employment challenges facing the region. These are illustrated by the following selected findings:

- Manufacturing plays a critical role, but one which is under pressure. At the 2011 Census -
  - Some 5,200 residents were employed in the manufacturing sector, contributing 7 per cent of South Australian workers in the industry.
  - 1 in 5 jobs in Playford were in the manufacturing sector, compared to 1 in 10 for all of South Australia.
  - About half of these manufacturing jobs (2,437) were in the automotive industry in 2011. In 2013, 400 jobs were lost from GMH Holden.
- The other main industries of employment are retail trade (4,018 residents), health care and social assistance (3,599 residents) and construction (2,478 residents).
- Between 2006 and 2011, the number of residents increased by more than 9,000 while there was a net increase of only 629 jobs. During this time, the number of manufacturing jobs available in the City of Playford declined by 1,780 positions or 29 per cent of manufacturing jobs in the LGA.
- Around 70 per cent of employed Playford residents have to travel outside of Playford to work.
- Local industries employing the highest number of people (manufacturing, retail trade and health care and social assistance) provide jobs for about 4,500 Playford residents and bring just over 7,800 people into the region for work.
- 9.5% of residents report being unemployed, nearly double that of Greater Adelaide (Hordacre *et al,* 2013, *City of Playford Socio-demographic, Employment and Education Profile*).

There is, therefore, significant strategic work for the Stretton Centre in relation to increasing local employment opportunities, and feeding into these, increasing education and training opportunities for Playford residents.

- Playford residents have a lower level of school achievement compared with people across Greater Adelaide. At the 2011 Census, approximately one quarter had a non school qualification, compared with more than a third of Greater Adelaide residents.

Employment, education and training opportunities also need to address a range of other needs experienced by Playford residents, including the following:

- The median weekly personal income was about $100 less than that for Greater Adelaide. Nearly a third of Playford residents have a weekly personal income below the poverty line.
- Premature deaths are higher than for the SA average, and Playford residents rate their health lower than most South Australians, and rates of smoking, obesity, chronic diseases and psychological distress are higher.
- Playford has 5,500 sole parent families, most of these with a maternal head of family.

- The City's population has a high proportion of young people, with a quarter of residents aged between 15 and 29.
- Population and household increase of 13% in the 5 years since the 2006 Census, double the rate of increase for Greater Adelaide. There are now 79,118 residents in Playford (WISeR 2013, *City of Playford Socio-demographic, Employment and Education Profile*).
- Population projections indicate that the Playford population will reach 140,000 by 2026 and approximately 200,000 by 2050 (City of Playford, State of the City Report 2011).

An *Economic Profile* of the City of Playford prepared by WISeR will help to contextualise these findings as well as providing an overview of the investment and workforce outlook for the region over the next five years. This will include modeling of the impact of infrastructure investment decisions on short and medium term growth prospects.

1.3 South Australian Policy Context

There is a considerable body of South Australian Government economic, industry and workforce development strategy/policy in place at a State level that requires the careful consideration of regional stakeholders. Of particular note are *The 20 Year Plan for Greater Adelaide* (2010), *South Australia's Strategic Plan* (2011), *Manufacturing Works* (2012), *Skills for Jobs* (2012), *Economic Statement* (2013) and the *Playford Growth Area Structure Plan* (2013). Collectively these are among the key foundational documents that inform regional strategy development in the City of Playford. Developing a better understanding of the inter-relationship between these is an important strategic challenge.

1.3.1 Strategic Plan

South Australia's Strategic Plan has been developed as an overarching strategic framework for the states social, economic and cultural development. Key elements of *South Australia's Strategic Plan* are reflected in the *Playford Plan.* Table 1 summarises some of the important relationships that exist between the two plans.

Table 1: The Stretton Centre and South Australian and City of Playford Strategic Plans

SA Strategic Plan	Playford Community Plan
To generate a sense of belonging by increasing the use of public spaces by the community. Increase social inclusion and connectedness.	A strong, cohesive and connected community that is socially inclusive and healthy.
Strong families help build the community by increasing lifelong learning.	A community that is engaged in lifelong learning and employment. A region that embraces lifelong learning and employment.
Increase participation in social, community and economic activities by 2020.	A community with access to quality services for all. A community that values and participates in learning. Improve the economic prosperity of the region.
To have a skilled and sustainable workforce – all South Australians to have job opportunities.	A growing new market and investment opportunities for business. Local jobs for local people.
Overcome distance by using digital economy.	A connected city with world class infrastructure that underpins future economic growth. A better place to do business.

At the time of preparing this report the City of Playford was undertaking a major revision of its strategic plan, taking account of recent developments and new aspirations.

1.3.2 Greater Adelaide Plan

The **30-Year Plan for Greater Adelaide** was launched on 17 February 2010.[4] The Plan seeks to balance population and economic growth over the next 30 years, with the protection of the environment and preservation of history and heritage in Greater Adelaide. It is described as a 'spatial expression of South Australia's Strategic Plan (2007)', and is integrated with a range of other specialist plans, including the State Natural Resources Management Plan (2006), the Housing Plan for South Australia (2005) and the Strategic Infrastructure Plan for South Australia (2005-06) (Govt of SA 2010: 6).

The 30-Year Plan now guides the preparation of Development Plans by councils. Regional Implementation Plans, of which one is focused on the Northern Adelaide region, are being developed by State and Local governments, and demonstrate major land use and infrastructure priorities. With regard to **Northern Adelaide,** the 30-Year Plan contains the following targets:

- ☑ 169,000 additional people
- ☑ 67,600 additional dwellings
- ☑ 10,150 additional affordable housing dwellings
- ☑ 79,000 additional jobs (Govt of SA 2010: 160).

The employment target for Northern Adelaide is the largest set for all regions in South Australia, the next largest target being 50,000 additional jobs for the City of Adelaide. The Northern Adelaide regional target represents 28 per cent of the 281,700 total for Greater Adelaide, and highlights the important role of the region for South Australia. The table below presents the targets for Greater Adelaide by industry sector.

Table 2: Additional Job Targets for Greater Adelaide by Key Industry Sector

Industry sector	Additional jobs target
Services	84,900
Community	52,400
Manufacturing	52,400
Retail	44,100
Transport/Logistics/Warehousing	25,200
Construction	20,000
Primary production	2,000
Mining	700
Total	281,700

Source: Government of South Australia (2010) The 30-Year Plan for Greater Adelaide, Table D2, page 104

The release of the *Playford Growth Area Structure Plan* (2013) provides further detail on the implications of 30-Year Plan for the City of Playford. The Structure Plan makes provision for an additional 38,000 dwellings and 43,000 jobs in the City of Playford. Realising this vision in practice will require close integration between urban, industry and workforce development strategies over a sustained period of time. Harnessing the local industry and workforce opportunities associated with the proposed growth of the region represents a significant challenge and opportunity.

The Structure Plan provides considerable detail in relation to the urban development dimensions of the vision with a particular focus on land availability for a range of different purposes. While provision is made for industry sector growth in areas including services, manufacturing, retail, transport, construction, primary production and mining there remains a need to undertake a more detailed examination of existing and potential drivers of growth in these areas.

[4] See http://www.dplg.sa.gov.au/plan4adelaide/index.cfm

1.3.3 Advanced Manufacturing Strategy

> **Advanced manufacturing** improves existing or creates entirely new materials, products, and processes via the use of science, engineering, and information technologies; high-precision tools and methods; a high-performance workforce; and innovative business or organisational models.[1]

South Australia is an economy in transition, with traditional manufacturing facing significant challenges in the face of cheaper overseas production but much promise in the potential contribution of advanced manufacturing. To inform decision making to support this transition, the State Government sought the advice of international manufacturing and innovation expert Professor Göran Roos, who became South Australia's 20th Thinker in Residence in 2011. Professor Roos highlighted the need to broaden our industry base within a modern, advanced, high-value manufacturing sector, and the role of government in achieving this outcome (Roos 2012). Also informing the directions set was the *Manufacturing Green Paper* (DMITRE 2012a) which in turn fed into the design of the South Australian Government's ten year Manufacturing Strategy – *Manufacturing Works* (DMITRE 2012b).[5]

The State government has identified advanced manufacturing as one of its seven primary focus areas and established the Advanced Manufacturing Council to implement the Strategy.[6] With guidance from the Council, three new programs have been implemented for companies operating in sectors facing critical technology change. Together the programs are intended to raise awareness and understanding of new manufacturing technologies, to provide opportunities for firms to experiment with new technology and to encourage scale-up and application. The programs are:

- **Manufacturing Transformation Technologies Program** – this program will focus on nanotechnology, photonics, biotech-based production, digital and additive manufacturing (3D printing), and ICT systems, particularly for the defence and mining sectors.
- **Medical Technologies Program** – this program will focus on the development of medical and assistive health devices.
- **Cleantech Program** – this program will focus on the development and application of environmentally sustainable technologies.[7].

All of these programs are of great significance to industry and workforce development in the City of Playford, responding to the significant pressures on the region to build a more resilient manufacturing base linked to the production of high value goods and services for local and global markets. *Manufacturing Works* highlights the importance of efforts designed to improve productivity including the adoption of high performance workplace practices and leadership development within firms. Responding to this in practical ways through local institutions and partnerships between firms is an important strategic priority and a foundation for sustained innovation.

1.3.4 Age-Friendly Adelaide

South Australia's population is the 'oldest' of all mainland States and Territories and recent policy reflects the importance of ensuring that people of all ages can participate in local community activities. Following on from the recommended directions of the 2012-2013 Thinker in Residence (Dr Alexandre Kalache), the South Australian government, in

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[5] http://www.dmitre.sa.gov.au/manufacturing_works
[6] http://www.advancedmanufacturingsa.com.au/
[7] http://www.dmitre.sa.gov.au/why_south_australia/industry_sectors/advanced_manufacturing

collaboration with the Local Government Association of SA, is promoting the concept of age-friendly cities and local areas.

The WHO *Global Network of Age-friendly Cities and Communities* was launched in 2007 with the publication of the 'Global Age-Friendly Cities Guide' (WHO 2007) which was designed to assist cities (governments, voluntary organisations, the private sector and citizens groups) to achieve enhanced age-awareness and age-friendliness.

> *It uses the needs and wants of older people as a lens to view the urban environment and see how it may be reconfigured in a manner that benefits all ages. [It] … is very deliberately titled 'age' friendly, not 'senior' or 'old-age' friendly, because the intention is to stimulate change that will result in more useable environments for people of every age. If a bus is easier to get in and out for an older person, and safe to take him or her from A to B or Z, it will be easier and safer for a person of whatever age and functional status to use it. Using the 'ageing lens' means creating a society for all ages (Kalache 2013: 69).*

An Age-Friendly City of Playford is one that would seek to integrate its services, programs and infrastructure development, so that older people are one of many groups within a healthy and productive community. It is one where ageing and aged care policy for the Playford community is designed not as a separate stream, but as part of a connected series of appropriately targeted policies designed to support the community as a whole. This means articulating closer linkages between social and physical infrastructure development to meet cultural inclusivity, community wellbeing, sustainable communities, healthy ageing and industry/workforce development objectives.

There is a need to better understand the industry and workforce development implication of population and workforce ageing. Ageing has an impact on the demand for a wide range of goods and services, particularly assistive devices and services that enable older people to stay in their homes as long as possible. More broadly public and private institutions will need to better accommodate the needs of an ageing population, with implications for the design of building and transportation infrastructure in particular.

1.3.5 Skills for All

Significant policy change has occurred in South Australia's vocational education and training (VET) system as a result of the *Skills for All* initiative which is designed to increase the number of people with post school qualifications and in employment (Government of South Australia 2011). An extra $194 million over six years has been committed to provide an additional 100,000 training places. This includes a focus on people facing barriers to participation in learning and work – for example, early school leavers, the long-term unemployed, those returning to work after caring and those with language, literacy or numeracy issues.

A key feature of *Skills for All* is that it is demand-driven - students are able to select the training provider of their choice and funding subsidies are allocated to them rather than to training providers. As the market evolves it is planned that there will be an increasing emphasis on customised training for both individual learners and for employers.

Employers in key target industries are able to co-invest with government in the *Skills in the Workplace* initiative to upskill employees as part of overall workforce development. Employers are also able to access government endorsed, independent workforce development advisors to help identify workforce development needs and broker relevant training and support (Government of South Australia 2011).

The *Skills for All* initiative offers significant scope for upskilling of Playford residents and local workforces, linked to growth opportunities discussed later in this report.

2 The Wisdom of Foresight

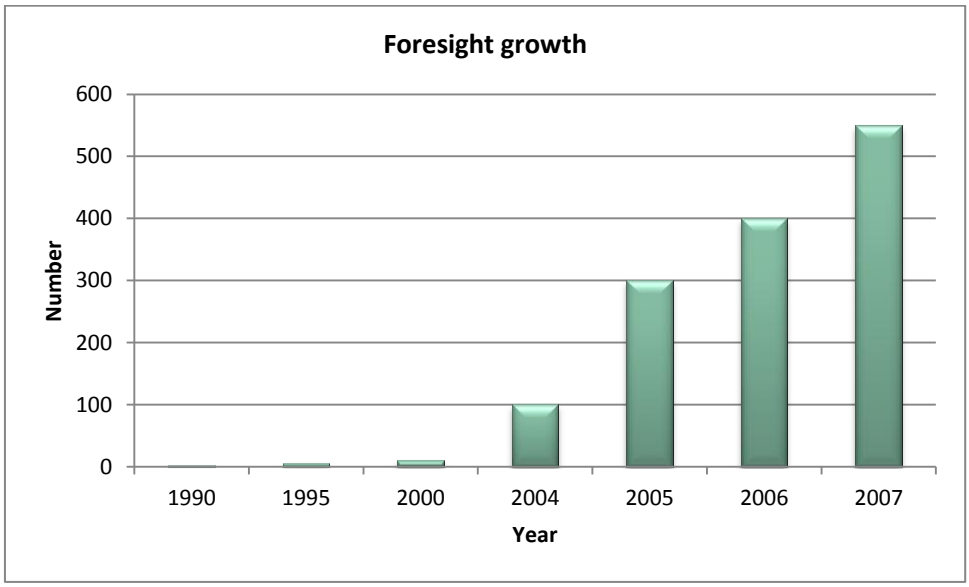
Although this report explores known drivers of change (see *Section 3*), it is also important to explore anticipated future directions and the relationship between both. This section draws on the findings of a number of researchers who have applied foresight methodology, and presents those findings about which there is common agreement.

> *Foresight aims to explore, analyse and describe future events using verifiable and creative methods. Foresight studies typically involve a blend of evidence and imagination….*
>
> *Foresight involves crafting evidence based narratives about the future that are designed to help individuals, groups and organisations make wiser choices (Hajkowicz et al 2012: 23).*

2.1 The Foresight method

'Foresight' is different from 'Forecasting' which has been defined as assuming one possible future and using a timeframe of 5 to 10 years, whereas Foresight assumes there can be multiple futures and works within a 10 to 20 year timeframe (Johnston 2011). One of the better known components of the Foresight narrative is scenario building while another involves predictive modeling. Less familiar are the components of 'Megatrend' (a cluster of social, economic or environmental activity that occurs at the intersection of multiple trends) and 'Megashock" (a major and sudden hard-to-predict event that causes far reaching change). Foresight also includes identification of 'Disruptive Technology' (a new technology with significant change-making capacity). The use of Foresight methodology has increased significantly in the past decade, as the figure below depicts.

Figure 1: Growth in the use of foresight



Source: Johnston 2011

The CSIRO has formed a research team called *CSIRO Futures* in response to external demand for evidence based strategy and foresight consulting, and it produces a flagship publication *Our Future World*[8]. Their recent work (Hajkowicz *et al* 2012) is used to frame the discussion which follows.

[8] http://www.csiro.au/en/Portals/About-CSIRO/Who-we-are/Executive/Innovation-Imperative/Our-Future-World.aspx

Foresight analysis by CSIRO and other future specialists has identified that the following six megatrends are expected to shape our lives for the next two decades. The CSIRO team describes those megatrends as:

- ***More from Less,***
- ***Going, going … gone?***
- ***The Silk Highway,***
- ***Forever Young,***
- ***Virtually Here*** and
- ***Great Expectations.***

The six megatrends are mutually influencing, as the diagram below illustrates.

FIGURE 2: THE SIX GLOBAL MEGATRENDS

Source: Hajkowicz et al., 2012

2.2 MEGATREND 1: MORE FROM LESS

Supplies of the food, water, minerals and energy essential for our survival are being depleted while population growth and economic growth (in both advanced and developing economies) place upward pressure on the demand for those resources. Signposts for this trend include the following:

- **Global population growth** - In October 2011 global population reached 7 billion and this growth is projected to reach 9 billion people by 2025.
- **Increased demand for natural resources** - Population and economic growth bring increasing demand for water and for energy. Global water demand is forecast to increase by 55 percent between 2000 and 2050, with the largest increases coming from manufacturing, electricity and domestic use. Water scarcity is exacerbated by climate change. Worldwide energy usage is forecast to rise by 40 percent between the years 2009 and 2035.
- **Increased carbon emissions** - Rising energy consumption is associated with a 20 percent global increase in carbon emissions. This is forecast to cause a long term average global temperature increase of 3.5 degrees Celsius.

- **Increased demand on food production** - Based on assumptions about population growth, changing diets and agricultural systems, the Food and Agriculture Organization (FAO) forecasts that food production needs to increase by 70 percent by the year 2050 to meet demand**.** In parallel is the trend for an annual loss of 12 million hectares globally of productive agricultural land, capable of producing 20 million tonnes of grain, to land degradation resulting from human activities such as over-cultivation and deforestation (OECD 2012; IEA 2011; Hajkowicz *et al* 2012; FAO 2009; UNCCD 2011).

2.3 Megatrend 2: Going, going ... gone?

The fate of biological diversity for the next 10 million years will almost certainly be determined during the next 50–100 years by the activities of a single species (Paul Ehrlich and Robert Pringle 2008).

Many of the world's natural habitats, plant species and animal species are in decline or at risk of extinction. The *Going, going...gone?* Megatrend identifies a range of signposts but its question mark reflects the hope associated with human response to this threat.

- **Biodiversity depletion** - Decline is evident in the three main components of biodiversity- that is genes, species and ecosystems – in response to the five principal pressures of habitat damage, overexploitation, pollution, invasive alien species and climate change. The rate of loss is not slowing while indicators of pressure - such as, resource consumption, nitrogen pollution, overexploitation and climate change impacts - have increased.
- **Habitat depletion** - Extensive fragmentation and degradation of habitats continues to be a leading cause of biodiversity loss and diminished ecosystem services. Although deforestation persists, it is occurring at slower rates than previously.
- **Global warming -** Warming of the climate has been quantified in terms of increases of global average air and ocean temperatures, widespread melting of snow and ice and rising average sea levels. Global greenhouse gas (GHG) emissions attributable to human activities rose by 70 percent between 1970 and 2004, and are predicted to increase by a range of 25 to 90 percent by 2030.

However, positive human responses are seen in the increased number of protected areas, and the wider application of environmental impact assessment with 170 countries now having biodiversity strategies and action plans (Secretariat of the Convention on Biological Diversity 2010; Butchart *et al* 2010; Parmesan 2006; IPCC 2007; Hajkowicz *et al* 2012).

2.4 Megatrend 3: The silk highway

The 'Silk Road' was an ancient loose network of trading routes that extended from eastern China west to the Mediterranean. The CSIRO Futures Team describes the Silk Road as having evolved into the 'Silk Highway', creating new global directions in the process. Over the next few decades the world economy is described by the CSIRO as shifting 'from west to east' and 'from north to south'. Rapid income growth in Asia and, to a lesser extent, South America and Africa, will see billions of people transition from poverty into the middle income classes. The two nations expected to most significant in the new world economy are China and India, and this trend is already evident. Australia is well positioned geographically, economically and culturally to benefit from this shift (Hajkowicz *et al* 2012: 12).

Among the signposts of this Megatrend are the following:

- **The shifting focus of world economic activity –** the west to east and north to south exchange of influence, and the growing significance of China and India.
- **The rise of China -** According to the OECD (2010), from the early 1990s to the late 2000s China increased its share of the world's steel production, gross domestic product, foreign exchange and gold reserves, trademarks (held by residents) and Internet users.
- **Building a new world economy with BRICS -** China and India have contributed to 20 percent of world GDP over the past 10 years. When combined with Brazil and Russia (to form the BRIC nations), these four countries will have higher economic output than the United States by 2018 (Wilson *et al* 2010). By 2030 the bulk of global GDP will be generated from non OECD countries (OECD 2010). This is a major shift for the world economy.
- **A growing middle-class -** Coming decades will see over one billion people in Asia transition out of poverty and into the middle income bracket. As a result, the composition of imports is forecast to shift away from low value add goods towards high value add goods such as cars, office equipment and technology (Wilson *et al* 2010).
- **Strong economic ties with Asia -** China is Australia's largest trading partner (DFAT 2011) and the growth of Australia's economy is now more closely linked to the growth of China and India's economies than to the growth of the OECD7 – the US, UK, Japan, Germany, France, Italy and Canada (Hajkowicz *et al* 2012: 12).
- **Tourism emerging as a growth export industry for Australia -** China is now the third most common source of short term visitor arrivals into Australia and its people are expected to be the most common source of visitors to Australia by 2016. There has also been a significant increase in the number of Indian residents visiting Australia over the last decade and this too is projected to grow (ABS 2012) (Hajkowicz *et al* 2012: 13).

2.5 Megatrend 4: Forever young

It is well known that Australia's population is ageing, as is the case for many other OECD countries. This brings both challenges and benefits. Two of these challenges include Australia's widening retirement savings gap and rapidly escalating healthcare expenditure. Benefits are associated with the skills, knowledge, and wisdom of older citizens as well as their purchasing powers of a range of services and products.

The *Forever Young* Megatrend explores the likelihood that people will retire later in life, gradually transitioning from full time work in a tapered model of retirement and spending increasingly large sums of money through the healthcare system to combat age related conditions and illnesses (Hajkowicz *et al* 2012: 15; Spoehr Barnett & Parnis 2008). Signposts of this Megatrend include:

- **A new demographic profile -** In 2011, 14 percent of the Australian population was aged 65 years and over (ABS 2011). By 2056 this proportion is predicted to have risen to between 23 and 25 percent (ABS 2008). For the Australian workforce, this means that by the year 2050 there will only be 2.7 people of working age to support every Australian aged 65 or more, compared to 5 in 2010 and 7.5 in 1970 (Australian Government, 2010).

- **Global ageing -** The world population as a whole is ageing. In 2011, 11.2 percent of the world's people were over 65 years old, and forecast to reach 22 percent by 2050 (United Nations 2011).
- **Longer life spans -** One of the reasons for population ageing is longer life expectancy due to advances in medical sciences and healthcare over time. At the turn of the 20th century Australian males lived for 51 years and females lived for 55 years on average. One hundred years later this had risen to 77 years for males and 82 years for females and is projected to keeping rising (Australian Government 2010).
- **Retirement savings gap and changed models of retirement -** An ageing population combined with longer life expectancy brings the challenge already evident as Baby Boomers reach their mid 60s - the retirement savings gap. Superannuation has not been held by most, especially women, for sufficient periods to fund retirement comfortably. Although one outcome could be increased pressure on the Age Pension, the trend to live for longer combined with financial need, could see participation in paid workforce extending beyond what has previously been understood as the age of retirement. However, there will be a need for workplace adjustments to support older people to remain in the workforce (see *Section 3.1.4)* (Hajkowicz *et al* 2012: 15).
- **Lifestyle related illnesses -** Lifestyle related illnesses in Australia and worldwide are increasing, with the portion of deaths from non-communicable diseases, including cancer and cardiovascular diseases, increasing from 59 percent of total deaths in 2002 to 69 percent of total deaths in 2030 (Mathers and Loncar 2006). In Australia the rates of diabetes and obesity are increasing. Diabetes is expected to become the leading cause of disease burden by 2023 (Australian Institute of Health and Welfare 2010).
- **Fitness trend –** However, the diabetes and obesity trend is being countered by a fitness trend with increasing numbers of people investing in fitness. For example, there has been a significant growth in the number of fitness centres (24 percent increase) and their income (131 percent increase) in Australia over the period 2001-01 to 2004-05.
- **Healthcare expenditure -** The ageing population and lifestyle illnesses are drivers of growing healthcare expenditure. Health spending is projected to grow from 4 percent of GDP in 2009-10 to 7.1 percent of GDP in 2049-50 (Australian Government 2010). Over the medium term there is growth in spending on all areas of healthcare: hospitals, medical benefits, pharmaceuticals and private health insurance (Hajkowicz *et al* 2012: 16).

2.6 Megatrend 5: Virtually here

The trend to connect online to access and deliver services and products, to share information and communicate and to work and live is an established change.. Online retail and teleworking in Australia represent less than 10 percent of total retail sales and less than 10 percent the workforce composition. But they are forecast to grow rapidly and there is no widely accepted estimate about when they will plateau. The CSIRO describes both as having the ability to change labour markets, retail models, urban design and transport systems.

The *World Future Society* (WFS) has established a process to track and forecast emerging technologies, initiated in 1990 when their members observed what is now known as the *'Technology Revolution'*. The key finding from this research was an across the board trend for breakthroughs in all fields due to the combined impact of new knowledge and the

accompanying trend known as the *Information Revolution*. The information revolution is thus seen as creating the broader Technology Revolution.[9] One of the most apparent changes has involved the widespread use of computers (now involving mobile telephones) and associated with this, the development of electronic communication and information storage and exchange. The impact of email on the speed and nature of how people communicate, in both their private and working lives, is substantial but the ability of social policy to keep pace with this and other forms of technological change appears to be less responsive.

The move to a networked society has been much discussed and is enhanced by ever changing information and communications technologies. The impact of the Internet has been substantial and will continue to be so, and one of the most interesting projected directions for the World Wide Web involves significant cultural change. The Institute for the Future notes that as Asia emerges as the leading centre of the manufacturing economy, of innovation in select arenas of science and technology, and of new markets for companies worldwide, this will also affect the global Internet. The Institute notes that in China alone, Internet usage has grown by over 300% in the last five years, which means that more than 100 million Chinese people are –

> *… creating their own Virtual China. This 'other Internet' is founded on linguistic, visual, cultural, and regulatory features that differ from today's dominant English language Internet. And as it grows over the next decade, the Chinese Internet will rival what most people in the West think of monolithically as the Internet.*

In the process, the outlook brought by this change will be –

> *…. neither Western nor traditionally Eastern, but something entirely new.* [10]

Some of the signposts of the *Virtually Here* Megatrend follow.

- **Technological change** – the exponential increase in the rate and speed of technological change is predicted with certainty but specific technological developments are less predictable. However, information and communication technologies (ICTs) will continue to grow, making a significant impact on social networks and communication processes, as well as on economies (ICSU 2011: 10; Hajkowicz *et al* 2012).
- **Structural change in the retail sector fuelled by online competition -** Changing consumer preferences, shifting expenditure patterns and growing online sales are all contributing to a structural shift within the Australian economy (RBA 2012, Productivity Commission 2011, Lim *et al* 2012).
- **A consumer trend – collaborative consumption -** Collaborative consumption occurs when many consumers use the same product via some type of sharing arrangement (Botsman and Rogers 2010). This can lead to more efficient resource use and cost savings. An example is car sharing. The first and largest car-share company in Australia, *GoGet*, has been one of the fastest growing car sharing organisations in the Asia Pacific region with membership numbers doubling every year since its launch in 2003 (Frost & Sullivan 2012). Collaborative consumption is boosted by continued development of innovative online transaction platforms (Hajkowicz *et al* 2012: 18).
- **The potential demand for teleworking** – Continuing improvements in virtual communication technologies (such as Skype) support remote and virtual workplaces and enable reduced travel to and from work and therefore, reduced pressure on

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[9] World Future Society, *Futurist Interviews,* www.wfs.org/inthalal.htm
[10] Institute for the Future, *Ten Year Forecast: Asia Focus*, www.iftf.org

resources. By 2020, the Australian Government plans to double the number of teleworkers in Australia so that at least 12 percent of employees have teleworking arrangements (Department of Broadband Communications and the Digital Economy 2011). Chandler and Ross (2012) refer to this trend as the 'Anywhere Working City'. With increasing availability of WiFi in homes, cafes, parks, libraries or other public spaces, these 'third spaces' (being neither home nor office) may become popular venues for knowledge and service workers.

- **Logistics expansion -** The growth in online commerce is reflected in the parallel growth in logistics, evidenced by significant increases in parcel delivery rates and supporting industry data. During the year 2010-11 the number of inbound parcels from other countries increased by 56 percent compared to growth of 28 percent in the previous year (Productivity Commission 2011). The integrated logistics industry - encompassing road, rail and shipping freight - has experienced revenue growth of 6.5 percent per year for the past six years (IBIS World 2012).
- **Offshoring –**the pressure to source labour offshore is expected to intensify as the labour force of the developing world becomes more skilled, and technology enables more jobs to be done remotely (Gereffi and Fernandez-Stark 2010).
- **Virtual crime and cybersecurity threats –** Accompanying the shift to a digital world is the rising threat of cybercrime, which is already estimated to cost Australia over A$1 billion per year (Commonwealth of Australia 2011) (Hajkowicz *et al* 2012: 19).

2.6.1 Collaboration and co-operation arising from technological change

Technology has also had a major impact in facilitating collaboration and cooperation, and some futurists believe that this will overtake competition as a definer of global politics and economics. The Institute for the Future argues that new discoveries across fields – mathematics, biology, psychology, sociology, technology, law and economics - and connections across them suggest a *'… convergence around cooperation and collective action …* 'and that -

> *… responding intelligently to this new world will require a much more sophisticated understanding of cooperation and cooperative strategy ….'. 11*

Open technical standards for connectivity (for example, HTML, XML, WAP) lay the foundation for broad cooperation across organisations, markets, and human activities, in the process fostering new levels of connection between people. Enduring success stories from the 'dotcom era' are companies like Amazon and Google who built businesses that found a workable balance between cooperative and competitive behaviours.[12]

2.7 Megatrend 6: Great expectations

The CSIRO describes this as a 'consumer, societal, demographic and cultural' Megatrend which captures the expectation people have for personalised services that meet their unique needs and wants while being delivered *en masse.* Expectations will be great because on-demand and instant service offerings are increasingly taken as given. Signposts include the following.

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[11] Institute for the Future (June 2004) Towards a New Literacy of Cooperation in Business: Managing Dilemmas in the 21st Century, Technology Horizons Program – www.itft.org

[12] Institute for the Future (June 2004) Towards a New Literacy of Cooperation in Business: Managing Dilemmas in the 21st Century, Technology Horizons Program – www.itft.org

- **Moving upwards through Maslow's Hierarchy**[13] **-** As discussed, in Asia over one billion people are projected to transition from poverty to the middle income classes, and from seeking to meet the basic necessities of life to demanding higher level services and experiences. As people become wealthier they spend more money on activities such as tourism, education and entertainment.
- **Education spending is on the rise -** People and countries tend to redirect discretionary income towards education services as they become wealthier and grow national income. In 2006-07 education expenditure accounted for 5.3 percent of Australia's GDP and in five years it has risen to 7.1 percent in 2010-11 (ABS 2012). Australian households increased education spending from $22 billion (AUD) in 2006-07 to $31 billion (AUD) in 2010-11 while exports of education services from Australia to other countries more than doubled from $8.3 billion in 2004 to almost $18 billion in 2009-10 (ABS 2012).
- **Australians have increased their spending on culture and entertainment -** Over the past two decades Australian households have substantially increased weekly expenditure on art, culture and entertainment. Film, digital media and literature have experienced the biggest increases (Hajkowicz *et al* 2012: 21).
- **Innovative personalisation -** Modern technologies are allowing personalisation to explore new territories. For example, additive manufacturing allows the printing and fabrication of three dimensional objects based on electronic designs. 3D printing is set to change a range of aspects of how we live and work, and will play a key role in the development of the advanced manufacturing industry.
- **The rising importance of moral and ethical dimensions for consumers -** Recent decades have seen a growth in the number of products labeled as environmentally and socially responsible – for example, as seen in the 'fair trade' logo. Although fair trade products still comprise a relatively minor share of all consumer products they are growing rapidly (Raynolds 2009).

However, despite these trends and the growth of the middle class globally, it is important to remember that much of the world's population has, and will continue to have, an expectation for the basic necessities of life (Hajkowicz *et al* 2012: 23).

[13] Maslow's Hierarchy is a well-established and widely cited concept that identifies that people first meet their basic needs (food, water, shelter) and then go on to meet more advanced needs (social networks, self esteem).

3 Present Tense and Tensions

This section takes a closer look at key trends currently shaping the way we live and work.

3.1 Population ageing

As with other developed countries, Australia faces the challenge of an ageing population as well as an ageing workforce and much has been written on this issue. This demographic trend is due to the combined impact of lowered fertility rates and lower infant mortality as well as the large number of births in the post World War II period (producing the cohort known as the Baby Boomers). Ongoing medical and health care advances also contribute to this trend.

3.1.1 The 'ageing of the aged'

Of particular significance, however, has been the fact that Australia has been adding extra years of life to the population aged over fifty. Over the 1901-1972 period, only 2.8 extra years of life were added to Australian men aged 50 years and over and 4.6 extra years for women. However, in the subsequent three decades, 7.6 extra years have been added to the lifespan of men aged 50 years or over and 6.3 extra years for women in this older age group. This represents a very significant change that Hugo refers to as 'the ageing of the aged' (Hugo 2007: 171).

As more people live to older ages of 85 and more, their need for aged care services can be expected to grow given that people in this age group are the most intense users of health and aged care services. For example, 32% of people aged between 65 and 74 need assistance with personal and everyday activities, compared with 86% of people aged 85 and over. Chronic disease is also more prevalent among the oldest age groups. The number of people with dementia is expected to more than treble by 2050 to more than 730,000. Not surprisingly, the proportion of GDP spent on aged care is projected to increase from 0.7 per cent in 2007 to 1.9 per cent by 2046 (Productivity Commission 2008: xvi-xviii, 36, 44-45).

3.1.2 Uncertainties relating to the quality of older lives

While we can be reasonably confident about the association between older age and acquired disability, we are less certain about how healthy older people will be in future generations (leaving medical improvements out of the equation). Although better understanding of preventive health behaviors including diet, exercise and fitness, should enhance longevity and reduce the prevalence of lifestyle diseases, much depends on how widespread these behaviors will be in future generations, and how much of a foundation for healthy older years is being laid down now by mature aged and younger Australians.

Medical technology and advances in treatment regimes are certainly contributing to longevity, but as Hugo points out, there are many people surviving cardiovascular or cerebrovascular disease who are being 'rescued from death' and whose quality of life and health may be compromised and so require significant support and care (2007: 172).

We can be certain that while *quantity* in Australian years of life has increased, we have been less successful to date in matching that with *quality* of life – although this may well improve over the coming decades. The growing field of 'epigenetics' potentially has much to contribute as we better understand the combined impact of environment and genetics on health, disease and longevity.[14]

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[14] Research into what happens in cells now tells us that it is not only genes that influence the traits and functions of an organism but also 'epigenetic' or non-gene factors. These epigenetic factors are features within the cell that can be inherited when cells divide. They do not change the genes themselves but can modify the behavior of genes. Epigenetic

3.1.3 Implications of population ageing

> *Perhaps along with climate change... (ageing was)... the really big social challenge for this decade, that we've got to come to grips with...as we have a population that lives longer ....*
>
> *But we should also think about, in a more positive frame, ways in which older Australians can continue to live healthy, productive lives, where they're able to continue to contribute to society within their family, within their community and at work as well (Minister for Mental Health and Ageing, Mark Butler, Interview on ABC Tasmania Statewide radio on 14 April 2011).*

There are many gloomy predictions made about the impact of the changes in our population structure but it is worth remembering that an ageing population is also a reflection of Australia's success in achieving greater life expectancy and means that our living standards have improved. It is an indicator of progress. It is also important to avoid generalisation. The older population is by no means homogeneous, with great individual differences between and within age groups. There is no comparison between a healthy sixty year old, working part time, participating in a range of social and community activities and a chronically ill eighty year old, with no independent means of financial support who lives an isolated and restricted life.

It is also important to look at what older people contribute as well as what they might need. Older Australians contribute to their society in many ways beyond participation in paid work, particularly as carers, volunteers and community members. Community development policy at the local level has a critical role to play in enabling older people to make this contribution, as does the adoption of 'age-friendly' community design.

One of the outcomes of the changes resulting from population ageing, and changing expectations about how people live their lives is a blurring of the boundary between the end of paid workforce participation and the beginning of **retirement.** At the turn of the 20th century, many older Australian males worked until near death, enjoying a relatively brief retirement. Therefore, workforce ageing had minimal impact on the total labour supply. In the next century, Australians gained about 20 years of extra life expectancy and earned nearly five times more income per capita, which has fundamentally altered expectations about leisure and work.

Older people are likely to continue working, but with a reduced number of hours and with flexible work hours. This is indicated by the trend for people to live longer and with better health, bringing with it an increase in expectations about active lifestyles, as well as an increased capacity and need to keep working.

Recent Australian government policy is setting in place a framework to discourage earlier trends to retire from 55 years onwards, and to encourage prolonged participation in paid employment. While this trend can be expected to continue, and will be supported by many Baby Boomers themselves, it will require significant change in occupational and health and safety regulations, in employer and community attitudes, and inflexible employment practices.

Australian ageing policy now reflects the heterogeneity of the experience of growing older. Where once policy was restricted to making provision for the care and support of frail and dependent people and their carers, in recent years increased emphasis has been placed on 'positive ageing' and on lives beyond the formal care system. The recent *Living Longer, Living Better* reforms (DoHA 2012) promote greater independence for those receiving formal care, driven by the consumer directed care model where funding follows the person rather than the aged care provider, enabling greater choice and control.

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factors have important roles in regulating human disease and development in both plants and animals. For example, a genetic predisposition to Diabetes 2 may not be translated into reality if environmental factors like diet are managed. See http://www.pi.csiro.au/markoliphant-conf/oliphant_epigenetics_info.htm

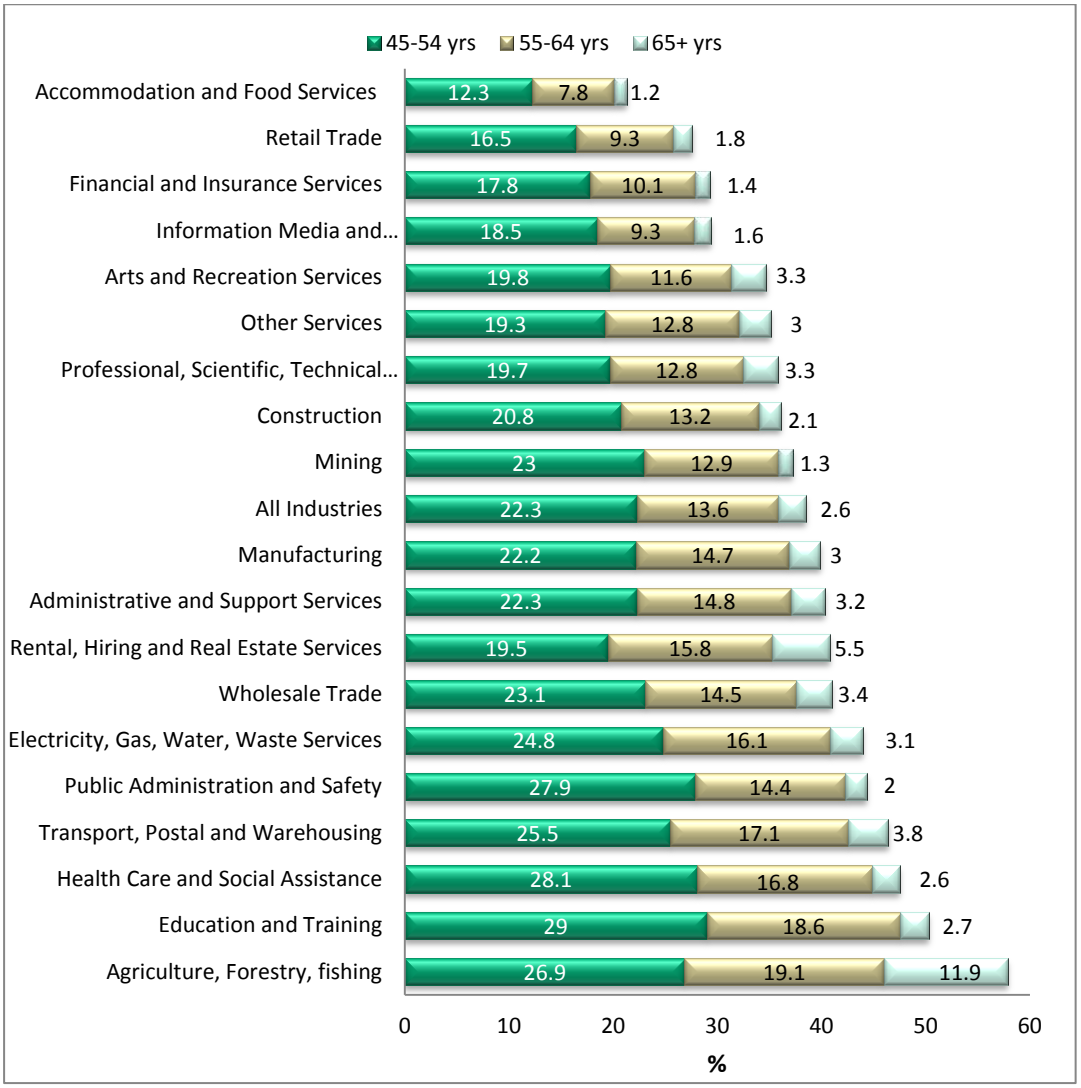
3.1.4 Workforce ageing

Over the three decades between 2011 and 2031, those aged 65 and over are going to grow not only in numbers but as a proportion of the working age population (that is, people aged between 15 and 64). In 2011, this age group represented 21.7% of working aged Australians and is projected to reach 29.3% in 2021 and 37.4% by 2031 (Hugo 2007: 170).

However, it is likely that the upper extreme of what we define as 'working age' will need to change in light of trends among Baby Boomers to reject 65 as the presumed age of retirement and also to reject the notion of complete retirement.

Workforce ageing also varies with industry of employment. The Health Care and Social Assistance sector is 'older' in that it has **47.5%** of its workforce aged 45 or more and has the third highest mature age profile of Australian industries- see *Figure 3.* In 2011, more than one in five workers in the industry (21.2 per cent) were aged 55 years and over compared with 17.6 per cent for the total Australian workforce (CSHISC 2013: 10).

Figure 3: Proportion of employment by industry, Mature age workers (45+ yrs), Australia- 2009

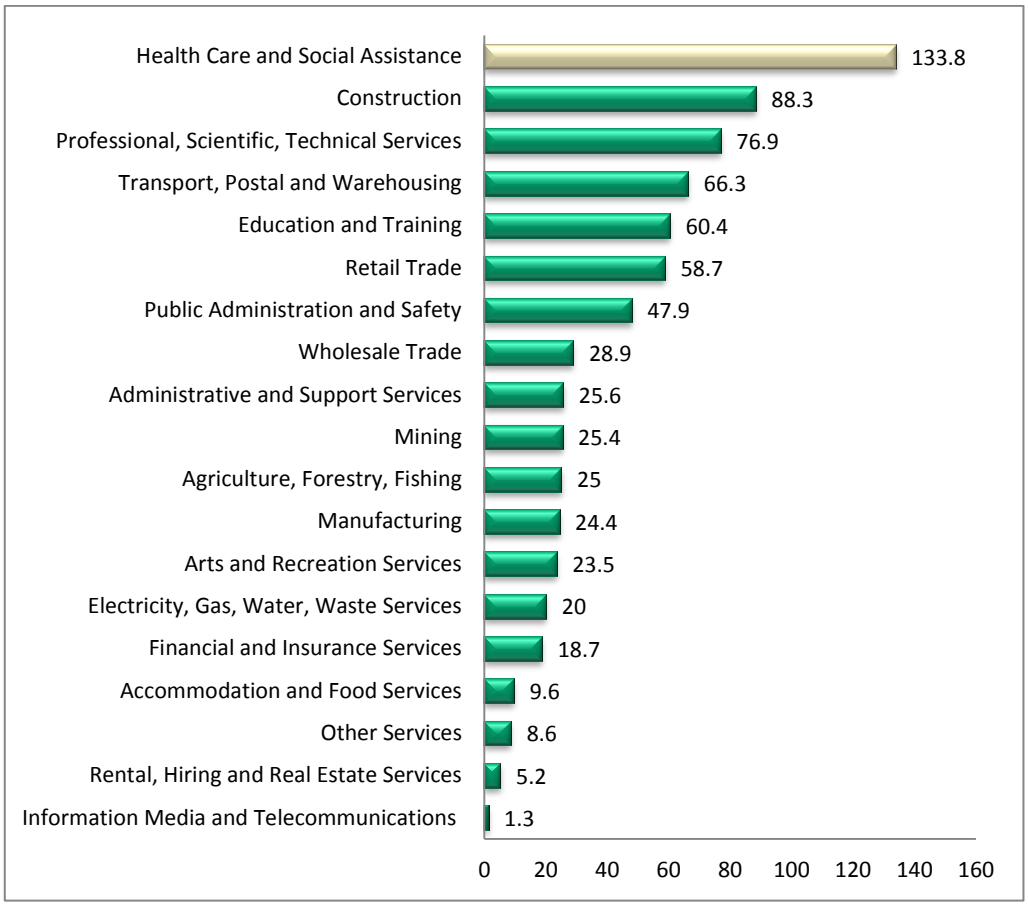


Source: DEEWR (2010), "New jobs: employment trends and prospects for Australian industries", based on ABS LFS, cat no.6291.0.55.003 (four quarter average)

It can be seen from *Figure 4* that across industries, the largest employment growth for mature aged workers (45+ years) occurred in the Health Care and Social Assistance

sector. Employment in the industry is projected to grow by at least 35 per cent over the next ten years (CSHISC 2013: 7).

FIGURE 4: NEW JOBS FOR MATURE AGE WORKERS (45+ YEARS) BY INDUSTRY ('000), 2004- 2009 – AUSTRALIA



Source: DEEWR (2010), "New jobs: employment trends and prospects for Australian industries", based on ABS LFS, cat no.6291.0.55.003 (four quarter average)

AGE MANAGEMENT

As older workers are encouraged to delay retirement, industries like aged care with mature aged workforces will need management strategies that ensure each worker can participate to the maximum of their capacity.

Age management (see box below) is regarded by the European Foundation for the Improvement of Living and Working Conditions (European Foundation) researchers as good practice in the employment of older workers. In the European Union, the development of age management practices has significantly affected the extension of work careers of employees in enterprises adopting these strategies (Ilmarinen 2005: 394).

AGE MANAGEMENT: KEY COMPONENTS

There are seven dimensions identified for structuring age management initiatives –

1. Job recruitment – ensuring that mature workers are not discriminated against and have equal access to available jobs.
2. Learning, training, and development– ensuring that opportunities for training are offered throughout the working life, and positive action is taken to redress past discrimination, creating learning environments in the workplace, and tailoring training to the needs of older workers.
3. Promotion and internal job changes.
4. Flexible working practice – in the hours of work and the offering of reduced hours.
5. Workplace design and health promotion – includes ergonomics, designing jobs and workplaces to prevent or address functional decline.
6. Employment exit and the transition to retirement - in the timing and nature of retirement, including gradual or phased retirement.
7. Changing attitudes to ageing workers within organisations – includes addressing ageism and raising awareness about the benefits of retaining older workers (Taylor 2006: 24).

3.2 Climate change

Governments around Australia face multiple challenges associated with developing effective responses to climate change, including global warming and pressure on water supplies. From a workforce perspective, this includes supporting the development of the skills, training and knowledge required for the transition to a sustainable, low carbon future – often referred to as 'green skills' (see below, *Section 3.2.1*).

> *The last three years particularly have seen considerable momentum in the area of Government policy and initiatives to increase Australia's energy efficiency and reduce its carbon footprint, including considerable Government support for the acceleration of the large scale development, adoption, demonstration and deployment of new, clean energy technologies (ee-Oz 2011: 8).*

Climate change mitigation policies are driving research and investment into new, cleaner energy sources and technologies. At the same time as pressures increase to reduce our carbon footprint, global demand for energy is increasing, and the energy sector is undergoing significant change and restructuring to respond to this dual challenge.

> *… with strong and decisive pollution and climate policies – including a price tag on pollution – close to 34,000 new jobs could be created in Australia by 2030" in response to clean energy investments (Climate Institute: 2011).15*

3.2.1 Green Skills

'Green' skills are defined as –

… the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community.[1]

Late in 2009, COAG endorsed the *Green Skills Agreement* to build the capacity of the VET sector to deliver 'high quality, industry-relevant skills for sustainability', and this commits

[15] Climate Institute (2008) *Defining a national energy efficiency strategy*, Sydney

the Australian and State and Territory governments to working with training organisations and businesses to ensure these skills are an integral part of all VET programs.

The box below summarises key skill sets that support sustainability. These highlight the important role of management in integrating these into overall workforce behavior, and into planning and monitoring processes.

Workforce skill sets for sustainability

Service Skills Australia (2010: 4) identifies this key skill set in supporting sustainability.

- Product knowledge – understanding the environmental credentials and implications of product choices.
- Purchasing and procurement – establishing and implementing purchasing criteria to guide selection of products and services with less or neutral environmental impact.
- Planning and development – design and development of services, facilities and operations in a manner that considers and reduces environmental impact.
- Managing and monitoring – assessing ongoing environmental performance and identifying areas for continuous improvement.
- Developing and implementing workplace procedures - to reduce environmental impact through resource efficient practices, waste minimisation, water conservation, recycling etc.
- Leadership – modeling and encouraging behavioural change in both staff and clients.

Green jobs require training, and this will involve offering new fields of study. Several countries, including Australia, report a skills gap between appropriately skilled workforces and their managers, and the needs of green industries. South Australia's 30-Year Plan includes a target of 15,900 new green jobs by 2025 (Govt of SA 2010: 112).

3.3 Technological change

Apart from the far-reaching consequences of climate change and associated pressures to support people to live and work sustainably, the impact of rapid technological change, and the speed with which this is happening, is another key feature of the present. Ongoing developments in digital infrastructure, services and products as part of the evolving digital economy in Australia will bring their own skill demands. As organisations benefit from the increased bandwidth offered by the National broadband Network, they will need workforces adept in the use of ICTs (Information and Communication Technologies), and there will be a widespread and increasing need for workforce digital literacy. If workers have existing literacy issues, these can expect to be compounded by the demand for digital literacy.

Technological change affects all domains of lives, and one area where its impact is most noticeable is in the provision of health care. This determines how medical records are kept, how diagnosis is made, and how treatment is applied, with improvements in all three areas expected. TechCast predicts that the combined impact of more powerful IT systems and spiraling health costs will drive the widespread growth of telemedicine. IT systems already are being used 30% of the time to diagnose illness, order medication and laboratory tests, monitor patients, and maintain medical records. Interactive video

systems allow physicians to examine and treat patients at a distance and evaluation shows that quality of care is not compromised. Patients with chronic illness can be monitored at home and computerised diagnosis has been found to be more accurate.[16]

3.3.1 Growth in Nano-Technology

Among the different changes being brought by new technologies, one of the most significant is already evident in the field of nano-technology. The 'nanosphere' consists of objects measured in one billionth of an inch and is undergoing its own revolution as research gains increasing control of this tiny world. Objects behave differently at the nano level, for example, electricity flows more easily and materials change properties. The imminent possibility of creating more powerful computers, medical treatments and any type of item has resulted in billions of dollars being devoted to research that is producing daily breakthroughs. 3,000 nanotech patents have been filed since 1996 and there are 1,200 known nanotech ventures around the globe.

Futurist organisation TechCast predicts that nanotechnology will reach mainstream use by 2015. It is expected to make up 40% of all data storage devices by 2011.[17]

Nanotechnology will be used for everything from monitoring the health of soldiers in the battlefield to transforming waste into edible material. Medical therapies based on nanotechnology will reach clinical use before 2025.[1]

3.3.2 Growth in Robotics Technology

As computer capability, artificial intelligence and other enabling technologies mature, smart robots are expected to create a new era of affordable robotic helpers. Already simple versions of mass produced mobile robots are being used for routine tasks and more intelligent versions are rapidly being developed that walk and climb stairs, speak with humans and perform complex tasks.

Various experts believe that from 2010 onwards the boundary between humans and machines will become increasingly blurred and TechCast predicts that mainstream impact will be felt by about 2020, and that by 2025 the robot market will be bigger than the automobile market (and not surprisingly, several car manufacturers in Japan have diversified to focus on the development of robots).

The world leader in robot technology is Japan. Following the lead of Honda, Toyota plans to sell robots that meet the needs of families and old people by 2010 – addressing the need that arises from an ageing population and a reduced availability of family caregivers. Denmark has developed a robot that locates and destroys weeds, eliminating the use of herbicides. The aeronautics and military industries are using robots for a range of tasks and their use is increasingly rapidly.[18]

3.3.3 Impact on Aged Care and Disability Care

The development of new technologies is a key influence on the aged care sector and on the disability care sector, as are assistive technologies designed specifically with the needs of these sectors in mind. For example, GPS can bring significant resource efficiencies for community care (in terms of minimising travel time) and email, skype and social media can reduce social isolation among older people or housebound people with disability. This is discussed further in *Section 4.3.1.*

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[16] TechCast – A Virtual Think Tank Tracking the Technology Revolution – www.techcast.org
[17] TechCast – A Virtual Think Tank Tracking the Technology Revolution – www.techcast.org
[18] ibid

3.4 Economic change

Although affected by the GFC, the Australian and South Australian economies have proved to be relatively resilient, with low rates of unemployment compared to other developed economies. This outcome can be attributed largely to the Federal Government's economic stimulus strategy as well as to ongoing strong demand for resources from China. In 2009-10 alone, the economic stimulus spending in South Australia is estimated to have generated some 11,000 jobs, contributing $1.06 billion to South Australia's Gross State Product.[19] The Stimulus Package, along with South Australian Government spending on infrastructure, generated much needed demand to underpin employment in the construction industry.

Nevertheless, the continued impact of the GFC in the United States and Europe means that global economic instability is persisting, bringing a range of potential challenges and unpredictability for the Australian and South Australian economies. Trading conditions for non-defence manufacturing in South Australia have been difficult, forcing some firms to cut production and jobs and others to close completely. In the past four years, South Australia has lost more than 30,000 manufacturing jobs, some from major factory closures like Bridgestone Tyres in 2009 and others from the loss of supply contracts. As discussed, the automotive industry, and local employment in the City of Playford in particular, has been negatively impacted with General Motors Holden announcing in early 2013 that it would reduce employment at its Elizabeth Plant by 400.

The resources exploration boom has not yet translated into significant mining employment growth in South Australia, and the *30 Year Plan for Greater Adelaide* projects only 700 additional jobs in the mining sector – the smallest number for all key industry sectors targeted in the Plan (Govt of SA 2010: 104). The Board of BHP Billiton revised its proposed $28 billion expansion of the Olympic Dam mine in the north of the State, and is exploring a more cost effective method of mining at the site. However, there are a number of mining projects in the planning stage that have the potential to create significant employment, particularly during the construction phase of new mines.

The 2012-13 State Budget (Government of SA, 2012) included the following assessment of the South Australian economy -

- The unemployment rate was forecast to increase to 5.5% and remain around that level through 2013-2014.
- The SA economy grew by 2.1 per cent in 2011-12.
- The State Final Demand (SFD) increased by 2.1 per cent in 2011-12 in SA.
- Recent SFD figures indicate that new business investment remained strong and was at a near record high, with household spending remaining positive.

South Australia's economy has grown at approximately 50 per cent in real terms since 1990 (Govt of SA 2010: 37). Over this period there have been significant changes in the role and contribution of different economic sectors.

- There has been growth in the **finance and insurance** industry.
- The **manufacturing** industry has declined but the shift to **advanced manufacturing** is the focus of growth in this sector. In the 1950s, one in three South Australian workers was employed in manufacturing compared with one in eight by 2010. In 1990, manufacturing contributed 17.4 per cent of GSP compared with 11.7 per cent twenty years later.

[19] ibid

- Emerging opportunities are evident in new industries, such as, **renewable energy** and **clean technology** – driven by national and international policy responses shaping the type of energy used and the price charged for energy use.
- **Mining** and **agriculture** are strong contributors to the SA economy.
- There has been significant growth in the **defence** industry which makes a major contribution in terms of output and employment, and brings flow-on benefits including the development of high-tech skills and infrastructure. Northern Adelaide provides the location for significant defence operations, with emerging precincts like Edinburgh Parks supporting future growth.
- There has also been significant growth in the **ICT** sector, which is also a major driver of industry growth generally given the reliance on ICTs by most businesses. The availability of high speed internet with the implementation of the National Broadband Network provides the infrastructure for future growth in this industry, and supports greater efficiency across industries (Govt of SA, 2010: 38-39).

4 Applying Foresight: Potential Opportunities

In this section we identify a number of industry and workforce development opportunities to stimulate further discussion and inform strategy development. This is not intended to be an exhaustive list but rather a developmental one upon which a more comprehensive program of opportunities is constructed. These respond to the major demographic, economic, technological and climate related changes identified in this report. Additional opportunities related to advanced manufacturing, horticulture and urban development will be identified in subsequent reports.

4.1 Ageing and Aged Care

Australian aged care providers face a number of workforce-related challenges which reflect the 'triple jeopardy' of having to manage a significant increase in demand for aged care due to wider population ageing[20], while at the same time managing an ageing workforce, at a time when attracting and retaining appropriately skilled workers is becoming more difficult. Aged care is extremely labour intensive, and while new technologies can be expected to play an increasing role, these will be more supportive than labour replacing.

The challenges facing the aged care sector are compounded by broader social and economic changes that are reducing the availability of family carers (in particular, the increasing participation of women in paid work) while Australian aged care for the past two decades has been shifting from a predominantly residential to a predominantly community based model of care, placing greater demand on families to provide or coordinate care in the home. The recent *Living Longer, Living Better* reforms (DoHA 2012) further support this direction.

Carers Australia commissioned the National Centre for Social and Economic Modeling (NATSEM) to develop a model that would project the future demand for and supply of carers of older people in Australia (Percival & Kelly: 2004). In order to measure the availability of carers, NATSEM calculated a ratio of older persons needing care (that is, aged 65 or more with a severe or profound disability and living in private dwellings) to people likely to provide care. Between 2001 and 2031, it is projected that this ratio will fall from 57 primary carers for every 100 older people needing care, to **35 carers for every 100** needing this care. Put another way, by 2031 the percentage of older people in private dwellings needing care but without a primary carer is projected to grow from 57 per cent to **65 per cent** (Percival & Kelly 2004: 30-31). This means that a greater reliance on formal aged care is likely.

Not surprisingly, industry estimates project substantial growth in the formal aged care workforce to meet this demand. The Community Services and Health sector is already Australia's largest industry grouping, employing 9 per cent of the workforce (ABS 2012a) and contributing over $85.3 billion to Australia's national accounts in the financial year 2011-2012 (ABS 2012b).

The Department of Education Employment and Workplace Relations (DEEWR) estimates that the health care and social assistance industry will contribute the most new jobs between 2011/12 and 2016/17. These figures are consistent with those produced by the Australian Workforce and Productivity Agency (CSHISC 2013: 7-8).

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[20] The health and community services sector, of which aged care is part, has been identified as the third fastest employment generator to 2010 (CSH Industry Skills Council: 2005), expanding at a rate of between 2% and 3% per year for the last decade. http://www.cshisc.com.au/load_page.asp?ID=36

OPPORTUNITY #1

Population ageing brings a number of implications for the City of Playford and other local government authorities. On the one hand, there will be growing demand for aged care services and for age-friendly adaptation of infrastructure and programs across Council. On the other hand, the growing numbers of older people are also consumers generating increased demand for goods and services.

This translates into training and employment opportunities which the region should seek to capture to enable a higher proportion of Playford residents to live and work in the region.

The Aged Care Sector is one of the key industries to be targeted by the Stretton Centre, acknowledging the increasing demand for services and a limited supply of workers to meet that demand. It also acknowledges that the health and aged care industry is growing, and is expected to do so for the foreseeable future.

The implementation of DisabilityCare Australia (the national disability insurance scheme) will see a surge in demand for workers, and the disability sector shares with the aged care sector, a limited and uncertain supply of workers. This is discussed further below in *Section 4.2.*

These trends translate into potential employment opportunity. The Stretton Centre will work with representatives from both the aged care and the disability care sectors, to develop training and employment opportunities to meet the needs of older people and those with disability.

In particular, the Stretton Centre will support projects which link end-consumers (and their representatives) with those developing assistive technologies to ensure more relevant product and the addressing of unmet demand. This is discussed further in *Section 4.3.1.*

4.2 DISABILITYCARE AUSTRALIA – NATIONAL DISABILITY INSURANCE SCHEME

The ***National Disability Strategy 2010-2020*** is a ten year national policy framework for improving life for Australians with disability, their families and carers.[21] Formally endorsed by COAG on 13th February 2011, the Strategy identified six priority areas for action to improve the lives of people with disability, their families and carers. One of these provided for the national disability insurance scheme which is known as ***DisabilityCare Australia***.[22]

DisabilityCare Australia has a staged implementation, with South Australia being one of the first site launches in the first phase which will commence from July 2013. Demand for workers to support people with disability is expected to increase under the new scheme.

There is a strong trend, because of medical and treatment advances, for people with disability to now live to older ages, and recent policy in Australia is grappling with the disability-ageing interface and how best to structure programs and funding associated

[21] http://www.fahcsia.gov.au/our-responsibilities/disability-and-carers/program-services/government-international/national-disability-strategy

[22] http://www.ndis.gov.au/

with this interface. The need for more workers to support the growing number of people with disability, the growing number who reach old age, and the growing number seeking support under *DisabilityCare Australia* represents a significant demand for an appropriate workforce.

The opportunity which this presents is discussed above in *Section 4.1.*

4.3 Advanced Manufacturing and New Technologies

Advanced manufacturing is characterised by highly efficient, high technology processes; with high levels of innovation, specialisation and using a highly trained workforce.

High-value manufacturing refers to firms and clusters of firms creating a competitive edge through unique knowledge and expertise, innovation and other means.[1]

As discussed in *Section 1.3.3,* the South Australian government is allocating resources to support the development of advanced manufacturing expertise in a wide range of industry sectors. It will be important for the Stretton Centre to build on this policy and program base, recognising the interrelationship between advanced manufacturing and advanced technologies, and the relationship between these and other industries, in particular, the defence industry, the health and community services industry (*Sections 4.1 and 4.2*), the horticulture industry (*Section 4.4*) and those associated with the 'Green Revolution' (*Section 4.5*). The technological changes discussed in *Section 3.3* are all relevant to Advanced Manufacturing.

The **30-Year Plan for Greater Adelaide** (Govt of SA 2010) provides for both the maintenance of the automotive manufacturing industry cluster at Greater Edinburgh Parks and the development of defence employment opportunities in Adelaide's three existing defence precincts, two of which are in Northern Adelaide (Greater Edinburgh Parks and Technology Park at Mawson Lakes). The third precinct – the maritime cluster of Techport Australia at Osborne is in reasonable geographical proximity.

The Plan also supports and promotes industry clusters in defence, science, and technology with links to high quality transport and telecommunications infrastructure as well as science and technology clusters at Mawson Lakes and at Roseworthy (Govt of SA 2010: 110).

Opportunity #2

The Advanced Manufacturing Sector is one of the key industries to be targeted by the Stretton Centre, acknowledging the growth of this industry and an accompanying continued growth of new technologies. The Stretton Centre's location in Northern Adelaide means that it is ideally placed with its proximity to existing industry clusters to develop industry and workforce development initiatives which build on this infrastructure while supporting regional industry growth.

The Stretton Centre will work with industry and government to support the growth of advanced manufacturing, and advanced technology sectors, through co-investment in industry liaison, industry supply chain development and diversification. The Centre will also work with aged care and disability sector stakeholders to develop initiatives which support the design and delivery of assistive technologies and services – *see Section 4.3.1.*

4.3.1 Assistive Technologies

The World Health Organisation (WHO) defines assistive technology as …

> *… an umbrella term for any device or system that allows individuals to perform tasks they would otherwise be unable to do, or increases the ease and safety with which tasks can be performed (WHO 2004).*[1]

Older people and people with a disability have always needed aids and equipment designed to address functional limitations. However, the combination of this need with technological progress, has seen the development of the field known now as Assistive Technologies (AT). As more people with disability reach older ages, and as our population of older people grows, this is a field which is expanding, and will continue to do so for some time.

> *In the last three decades, technological development has lifted home modification and aids to a highly sophisticated level. Known variously as 'assistive technology', 'telecare' or 'smart house technology' … assistive technology has presented a tantalising glimpse of a complementary care strategy that could potentially reduce hours of care, improve safety and function of the care recipient, as well as reduce the burden of care (McIntosh et al 2012: 3).*

There is no universally agreed framework for categorising the range of ATs available but a major report prepared for the Department of Health and Ageing developed a typology which groups ATs into four key categories:

1. Aids, appliances and equipment
2. Environmental adaptations
3. Remote monitoring devices
4. Integrated systems (Connell *et al* 2008: 23).

These are depicted in the table below, which identifies the types of technologies associated with each category, and provides examples of each.

TABLE 3: ASSISTIVE TECHNOLOGIES BY CATEGORY

Category of Assistive Technology	Types of Assistive Technology	Examples
Aids, Appliances and Equipment	Daily living aids	Bath seats, jar openers, non-slip mats
	Mobility aids	Wheelchairs, walking frames
	Communication and sensory aids	Hearing aids, large print screens
	Cognitive and connectivity aids	Computer and internet access, specially designed user interfaces, talking word processors
Environmental Adaptations	Environmental switches and controls	Remote controlled doors, windows, locks
	Home modifications	Principles of inclusive design, installation of grab rails
Remote Monitoring Devices	Telecare	Level 1: Alarm pendant connected to 24 hour monitoring centre Level 2: Bed sensors, medication reminder systems, fall monitors, 'wander' and motion monitors
	Telehealth	Level 3: 'Remote consultation'/virtual visiting, remote monitoring of vital signs eg blood pressure, pulse
Integrated Systems	Smart Homes, Age Friendly Homes	Integrates telecare, electronic ATs and environmental controls. Involves technology that learns behaviour and reacts to individual needs.

Source: Connell *et al* 2008, Table 2 page 23

The development of ATs, while a growth field in its own right, is also one which is missing a vital link – the co-design of products with end users or their advocates working with technology developers. If a partnered design process can be achieved, there is scope for the AT field to progress even further.

> *…there is concern that the rapid development of assistive technology has risen from the 'push' of technological development, rather than by the 'pull' of the actual needs of carers and care recipients (McIntosh et al 2012: 3).*

This gap was recently acknowledged by a November 2012 *Enabling Assistive Technologies Network* Workshop of the Australian Academy of Technological Sciences and Engineering[23]. That meeting argued that the disconnect between AT research and development and its translation into commercial practice required the establishment of a multidisciplinary network which would engage with a range of stakeholders including consumers, carers, community organisations, investors, researchers, and government to develop innovative and smart technologies that would meet end user need.

[23] The ATSE is an independent body of 800+ eminent Australian scientists and engineers which promotes technological solutions for a better Australia - www.atse.org.au/

OPPORTUNITY #3

The impact of technology on the development of aids and equipment designed for people with ageing-related or disability-related limitations has seen the emergence of the new field known as 'Assistive Technologies'.

There is significant unmet need for Assistive technologies which are designed in collaboration with consumers. It is likely that the implementation of the Consumer Directed Care model in both the aged care sector and in the disability sector via DisabilityCare Australia (the national disability insurance scheme) will see a surge in demand for Assistive technologies.

The Stretton Centre will work with representatives from both the aged c are and the disability care sectors, and from manufacturers of assistive technologies to develop improved and new products.

4.4 HORTICULTURE– CLEAN GREEN GOOD

Fifteen per cent of all Australian jobs are in the food industry (DAFF 2012). The Australian Government's first **National Food Plan** sets the direction for government policy on food over the short, medium and long term. The Plan is a response to a set of challenges that need to be addressed to ensure food security and an identification of opportunities that can be pursued. The Food Plan seeks this outcome:

> *Australian food is the food of choice globally–renowned for its quality and consistency, valued for its safety and sustainable production, and attracting premium prices–whether staple foods like wheat or sugar or luxury items like lobsters and premium wines (DAFF 2013).*

Challenges faced by Australia's food system include climate change, global population growth, increased competition for resources and associated land use conflicts and job losses in the food processing sector. With world food prices predicted to plateau or fall and the costs of land, labour, water and energy likely to rise, there is a need to do more with less and lift current productivity (DAFF 2012, 2013).

However, a number of opportunities also exist. Australian primary producers have enhanced ability to grow food in some of the world's most difficult conditions and the National Food Plan is designed to market Australian expertise in agriculture, water and land use management. Continued growth in Asia brings significant opportunities for Australia's food industry. By 2050 world food consumption is expected to be 75 per cent higher than in 2007, with almost half of this increased demand coming from China.

> *Australian food businesses need to be placed to benefit from these emerging markets. Australia has the expertise to be a trusted supplier of quality staple and high–value foods to an expanding Asian middle class. We must focus on increasing our exports and supporting a thriving food industry while ensuring we meet our food needs sustainably (DAFF 2013).*

Among the range of commitments made in the Plan, the following are of particular relevance to the work of the Stretton Centre:

- ✓ Help small to medium–sized food businesses sell their products overseas through trade facilitation services, including the *Asian Century Business Engagement Plan Grants Scheme, Growth Opportunities and Leadership Development Service,* and the *Export Market Development Grants Scheme.*
- ✓ Invest $5.6 million to build on relationships with trading partners in key and emerging markets by-

- expanding the network of specialists that support agricultural trade in Asia
- having market access liaison officers for key food sectors.

✓ Invest $2 million to develop a brand identity for Australian food and related technology.

✓ Support the skills and workforce needs of the food industry by investing $9 billion over five years from 2012–13 through the states and territories for the National Vocational Education and Training system, and commissioning workforce assessments of the food industry supply chain through the National Rural Advisory Council and Australian Workforce and Productivity Agency.

✓ Invest $1.5 million to support community food initiatives by providing grants to community groups to support the establishment and development of initiatives like community gardens and farmers' markets

✓ Invest $1.5 million to support community food initiatives by providing grants to community groups to support the establishment and development of initiatives like food aid and food rescue organisations.

The Stretton Centre is located in the Virginia and Northern Adelaide Plains (VNAP) area, whose horticultural industry provides a significant economic contribution to South Australia. This has been found to represent:

⇨ double the gross value of production (at the farm gate) than tourists spend on Kangaroo Island
⇨ revenue that is equivalent to that of the Barossa horticultural industry
⇨ revenue that is equivalent to that of South Australia's wild-catch fishing industry (Jensen *et al* 2013: 6).

Horticulture is largely concentrated adjacent to and south of the Gawler River. The areas around Virginia, Angle Vale and Two Wells collectively form the largest greenhouse vegetable production in Australia and significant residential expansion is planned for nearby areas – including Buckland Park, Virginia, east of the Northern Expressway around Macdonald Park, Angle Vale and Two Wells. The horticultural community within the Virginia and Northern Adelaide Plains (VNAP) area is both complex and diverse, with growers from a number of cultural background including Cambodian, Vietnamese, Italian and Greek, running businesses that range from very small, low technology greenhouses to large, multi-million dollar hydroponic greenhouses (Jensen *et al* 2013: 15-19).

The *Virginia and Northern Adelaide Plains Horticultural Framework* provides direction relating to the medium and long-term future of the industry and is designed to secure the long-term sustainability of the horticulture industry in this region. The framework is underpinned by a vision for the region as –

> *… Adelaide's Premium Northern Food Bowl – one that is green and fresh, with produce distributed locally, nationally and internationally, and grown using best-practice, sustainable farming techniques (Jensen et al 2013: 6).*

The Framework has a number of dimensions, some of which focus on training and employment, and among its recommendations are the following, which are designed to build industry capacity in the region, and which need to be taken into account by Stretton Centre activities focused on the horticulture sector:

⇨ Develop an overall training plan for the region that identifies key knowledge gaps, appropriate modes of learning suitable for the target participants, priorities, resources and responsibilities for delivery

- Provide training about the 'ins and outs' of getting produce to market and techniques for securing a higher return.
- Ensure that training is provided locally, and is interactive and relevant to the diversity of growers' needs (Jensen *et al* 2013: 23-24).
- Explore education and training partnerships available through TAFE, local secondary schools and other education and training providers.
- Provide a local training centre/centre for excellence that facilitates 'hands on' collaboration with local industry, research and development.
- Develop a demonstration project to showcase best practice industry approaches and techniques. The demonstration project should be a collaborative one that nurtures and supports local growers and industry stakeholders involved in the project (Jensen *et al* 2013: 61-62).

The **30-Year Plan for Greater Adelaide** seeks an expansion of horticultural production north of the Gawler river using recycled water as well as protection of important primary production areas – the Northern Adelaide Plains being identified as one of these (Govt of SA 2010: 106).

OPPORTUNITY #4

The provisions of the National Food Plan and of the local *Virginia and Northern Adelaide Plains Horticultural Framework* present a range of opportunities for local and regional food producers. These are opportunities with a long term timeframe given global food demands.

The Stretton Centre will work with government and the horticultural sector, to develop a horticultural innovation and development facility based in the City of Playford. This will be closely linked to advanced Manufacturing initiatives to deepen and broaden supply chains and foster value adding in horticulture (see *Section 4.3*).

4.5 THE CLEANTECH REVOLUTION

Cleantech refers to commercial products, services and processes that have a positive environmental impact in industries such as energy, water and waste. Over the past decade, the industry has become a major global business opportunity.

Climate change is transforming industrial production and the form, design and delivery of goods and services. Climate change mitigation policies are driving research and investment into new, cleaner energy sources and technologies, and will see the emergence of new industries and jobs broadly described as the cleantech sector.

> *… with strong and decisive pollution and climate policies – including a price tag on pollution – close to 34,000 new jobs could be created in Australia by 2030 in response to clean energy investments (Climate Institute: 2008).*[24]

The United Nations *Framework Convention on Climate Change* was established in 1992 with 192 members world-wide. Since its implementation a number of initiatives have

[24] Climate Institute (2008) *Defining a national energy efficiency strategy*, Sydney http://www.climateinstitute.org.au/2010pollute-o-meter/media/pdf/TCI%20Policy%20Agenda%20FINAL%20%2815%20July%202010%29.pdf

been ongoing in response to an overall goal of stabilising atmospheric concentration of greenhouse gases at levels required to prevent dangerous climate change. Emission trading schemes and carbon taxes are the key strategies being applied to achieve the goal (Commonwealth of Australia 2011: 15).

The Australian Government's climate change plan *Securing a Clean Energy Future* was released in July 2011 [25] and provides incentives for investment in renewable energy and the use of cleaner fuels and reduced use of energy sources that are polluting. Of particular relevance to the northern Adelaide community are the following provisions:

- Farmers and land managers will receive significant support to pursue climate change action on the land and enhance biodiversity through a suite of measures including the *Carbon Farming Initiative*, the *Carbon Farming Futures* program and a new *Biodiversity Fund*. Emissions from agriculture will not be subject to a carbon price.
- The *Low Carbon Communities* program will be significantly expanded to promote energy efficiency at a local level and among low-income households. It will help local councils and communities improve energy efficiency in community facilities, including a new *Low Income Energy Efficiency* Program.
- The *Jobs and Competitiveness* Program will ensure that businesses that produce a lot of pollution and compete in international markets remain competitive, while still retaining strong incentives to reduce carbon pollution. Almost all emissions-intensive and trade-exposed activities are in the manufacturing sector. The Jobs and Competitiveness program will provide support to activities that generate over 80 per cent of emissions within the manufacturing sector.

Over the next decade, the low carbon economy will build on, and become a major part of the knowledge economy, compounding the impact of both (Levy 2010: 9).

> *Northern Adelaide is well positioned to be a major supplier of the good and services that the low carbon economy and resource sector will demand over coming years. In many ways this is a once in a generation opportunity to provide decent jobs for all in the region with the management of skill shortages rather than unemployment and underemployment becoming the predominant challenge (Spoehr & Barnett 2011: 1-2).*

4.5.1 The Green industrial revolution - cleantech

The clean technology market is a growing one, and is expected to double in size by the mid 1920s (Cleantechnica 2012). South Australia is a world leader in developing clean technologies (cleantech) as we transition to a lower-carbon economy. [26] In 2007, South Australia became the first jurisdiction in Australia, and just the third in the world, to introduce climate change legislation. It was also the first State to introduce a feed-in scheme for solar power and the first and only jurisdiction to introduce payroll tax rebates for large renewable energy projects.

DMITRE is responsible for the State Government's cleantech industry development strategy and has identified business opportunities in sustainable energy, green buildings, water, wastewater and transport. South Australia's *Manufacturing Works* strategy (2012b) also supports a Cleantech program as one of three key funded initiatives (as discussed in *Section 1.3.3*). As part of this strategy, DMITRE provides a range of assistance

[25] see http://www.cleanenergyfuture.gov.au/clean-energy-future/securing-a-clean-energy-future/
[26] http://www.dmitre.sa.gov.au/why_south_australia/industry_sectors/cleantech

to assist companies to achieve cleantech outcomes as well as three programs to support the sector's growth:

- ✓ The *Business Sustainability Alliance* encourages investment in energy efficiency.
- ✓ The *Cleantech Partnering Program* develops new cleantech products and services.
- ✓ The *Eco-Innovation Program* promotes innovative solutions for resource efficiency, waste recovery and new business opportunities.

OPPORTUNITY #5

Growth in demand for clean-tech products and services will drive demand for Green Skills, and employment.

Northern Adelaide can benefit from this demand building on an existing cluster of businesses in the region which bring together automation, systems integration, design, manufacturers of new plant and equipment, ICT and electronics.

Cleantech will become more important in the agricultural and food processing businesses as issues like soil and food security and sustainable food production gain in significance nationally and globally (Rodin Genoff 2012).

The Stretton Centre will work with representatives from the Cleantech sector, to develop training and employment opportunities. This sphere of activity will also be linked to that associated with Horticultural sector (see *Section 4.4*).

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