

Regional Australia 2030

Megatrends, scenarios and implications

Strategic Foresight for Regional Australia

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A Strategic foresight approach

Exploring plausible futures

- Strategic foresight is a growing field
- Helps guide better choices
- Described as ‘both an art and a science’, combining
 - Data
 - Theory
 - Robust analysis
 - Narrative development
 - Deep stakeholder engagement

Four stages of strategic foresight

1. Scanning the horizon

- Review what has been shaping regional Australia
- Considering historical conditions and how they are evolving

2. Validating and aggregating trends

- The research identified 34 separate trends validated through evidence
- These were grouped into 5 megatrends (comprising around 7 interrelated trends)
- Brought together with input from reference group and stakeholders

3. Identifying the key axes of change and developing scenarios

- Considering which dimensions are most useful for thinking ahead
- Draft scenarios discussed and further developed in a 2-day stakeholder workshop

4. Refining the scenarios and identifying implications

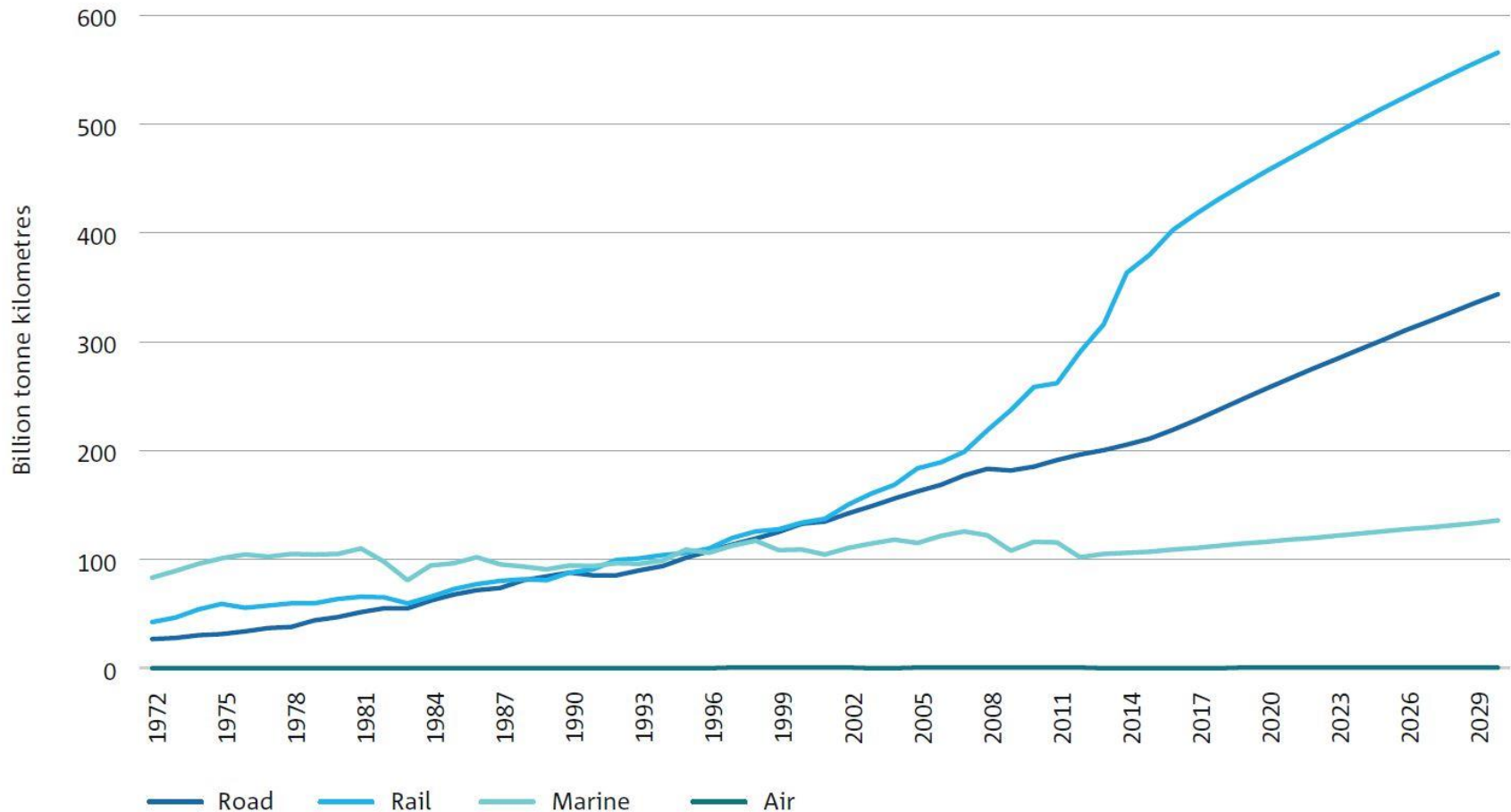
- Filling in gaps, seeking additional input
- Communicating the scenarios
- Discussing implications

Megatrends influencing regional Australia

1. Defeating distance (and time)

- Infrastructure continues to improve, resulting in:
 - reduced travel time
 - reduced freight costs
- Rural populations still commute twice as far as urban populations
 - But the gap in commuting times is reducing
- Total freight volumes have quadrupled since 1970s
 - Rail freight is expected to double again in Australia by 2030
 - Road freight is also increasingly steadily

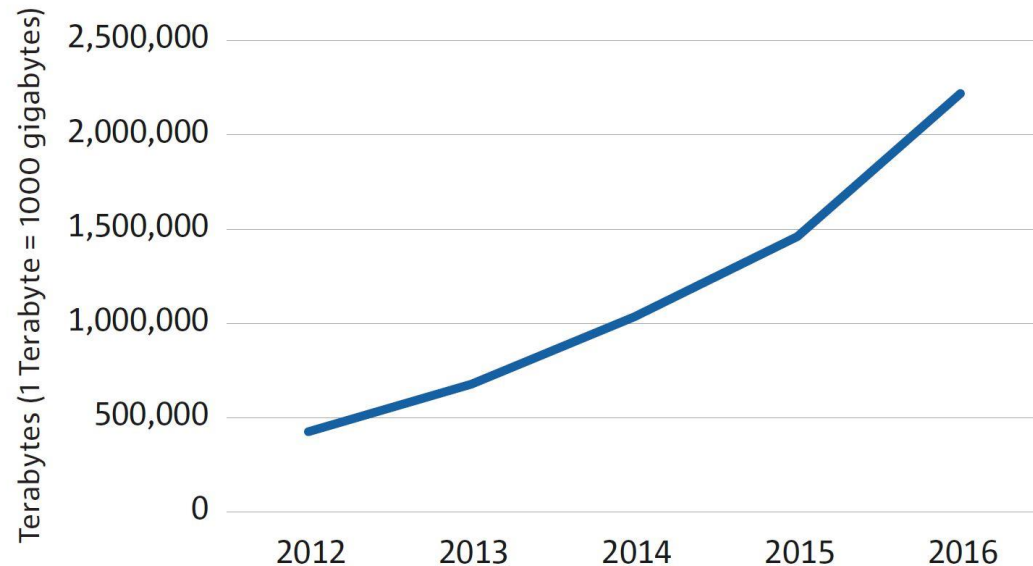
Freight projections to 2030



Adapted by CSIRO from BITRE 2014, Freightline 1 – Australian freight transport overview, Canberra

1. Defeating distance (and time)

- Communication and digital technology is changing rapidly
- Movement patterns are being altered by changes in technology
- Social media opens new opportunities to reach markets
- Digital inclusion remains an issue
 - The gap between rural and urban areas has narrowed
 - But there are exceptions



Total volume of data downloads in Terabytes, Australia
Compiled by CSIRO based on ABS data

2. Global exposure

- Export markets have shifted substantially over the last 50 years
 - Asia-Pacific now dominates export markets (87%)
 - And imports (62%)
- Agriculture has increased in absolute numbers
 - But not as fast as mining
 - Therefore declined as a share of exports
- Services (in-bound tourism) have increased substantially
 - Both in terms of absolute numbers and percentage terms
- Mining and energy have substantially increased
 - Conventional 'boom-bust' patterns have been disrupted

Mining continues to dominate exports

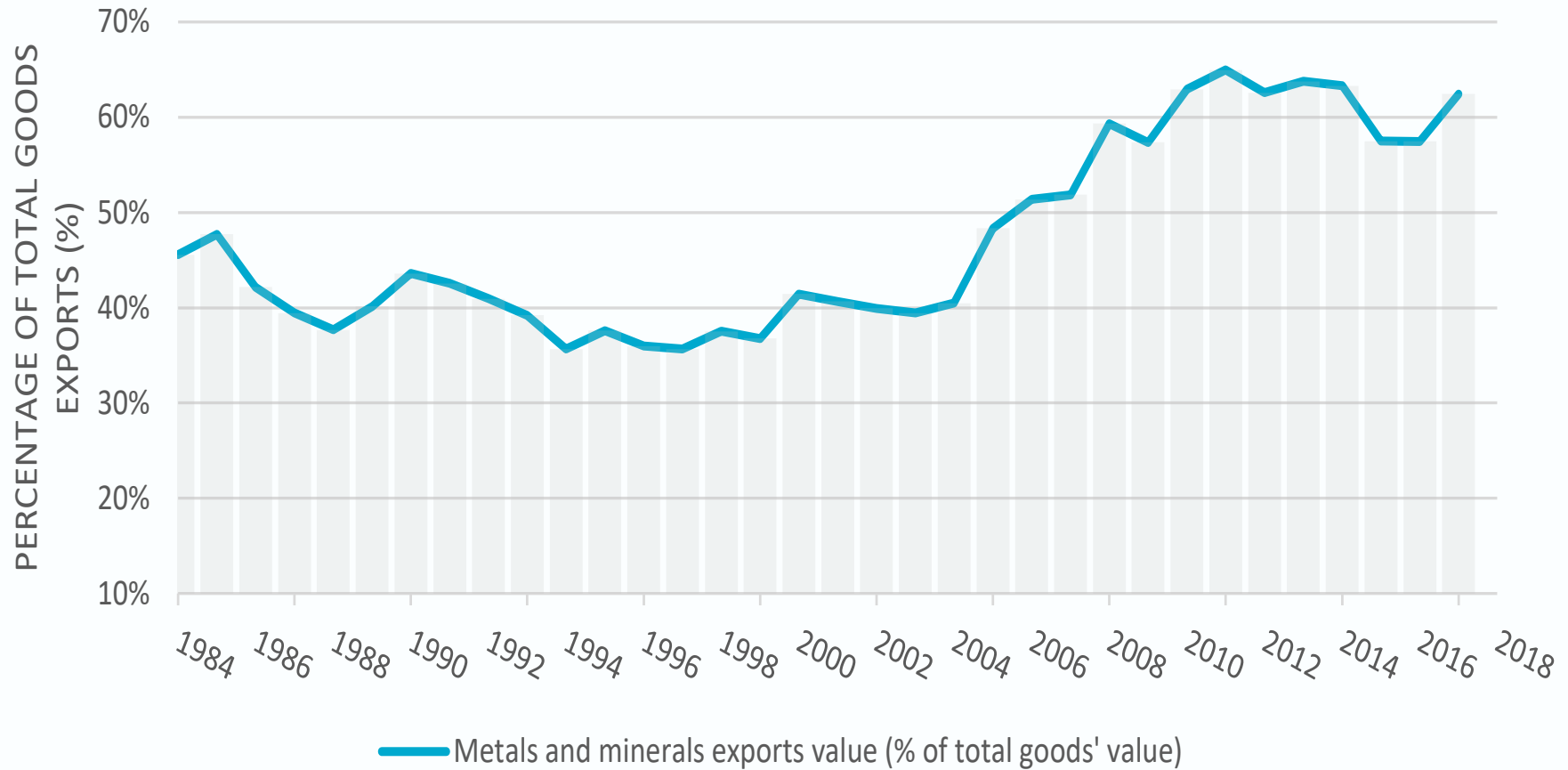


Chart by CSIRO based on ABS data 2018

2. Global exposure

- Australia continues to help feed a growing world population
- Global population forecast to reach 8.5 Billion by 2030
 - Including growing middle class
- Demand for food is expected to grow enormously
- Diets are changing, especially in Asia
- In particular: growing demand for:
 - Meat
 - Seafood
 - Fresh fruit and vegetables

Market liberalisation has seen growing capital investment from overseas

Proportion partially or fully foreign owned 2010
(%)

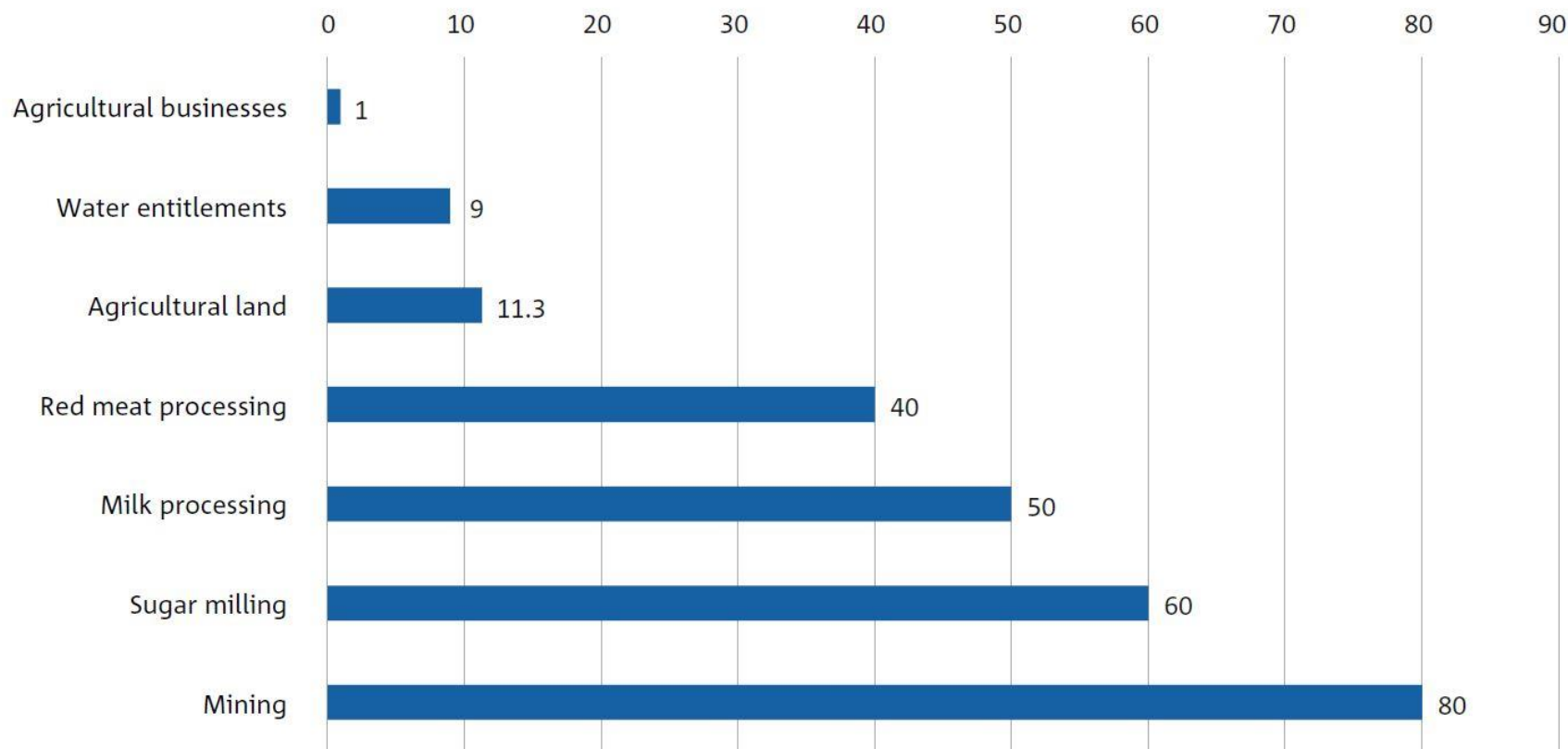


Chart by CSIRO with data from Moir 2011, Gregory 2012

3. Diverging places

- Demographic trends will continue to influence regional Australia
- Long term decline in small towns (up to 1,000 people) is expected to continue
 - Rural youth in particular are moving out
- Regional centres and cities have grown considerably over this time
- Growth in mining regions
- Growth in 'amenity' regions
 - Scenic areas - close to close to major cities
 - Attracting commuting workforces (working in other regions and cities)

Spatial distribution of net population change

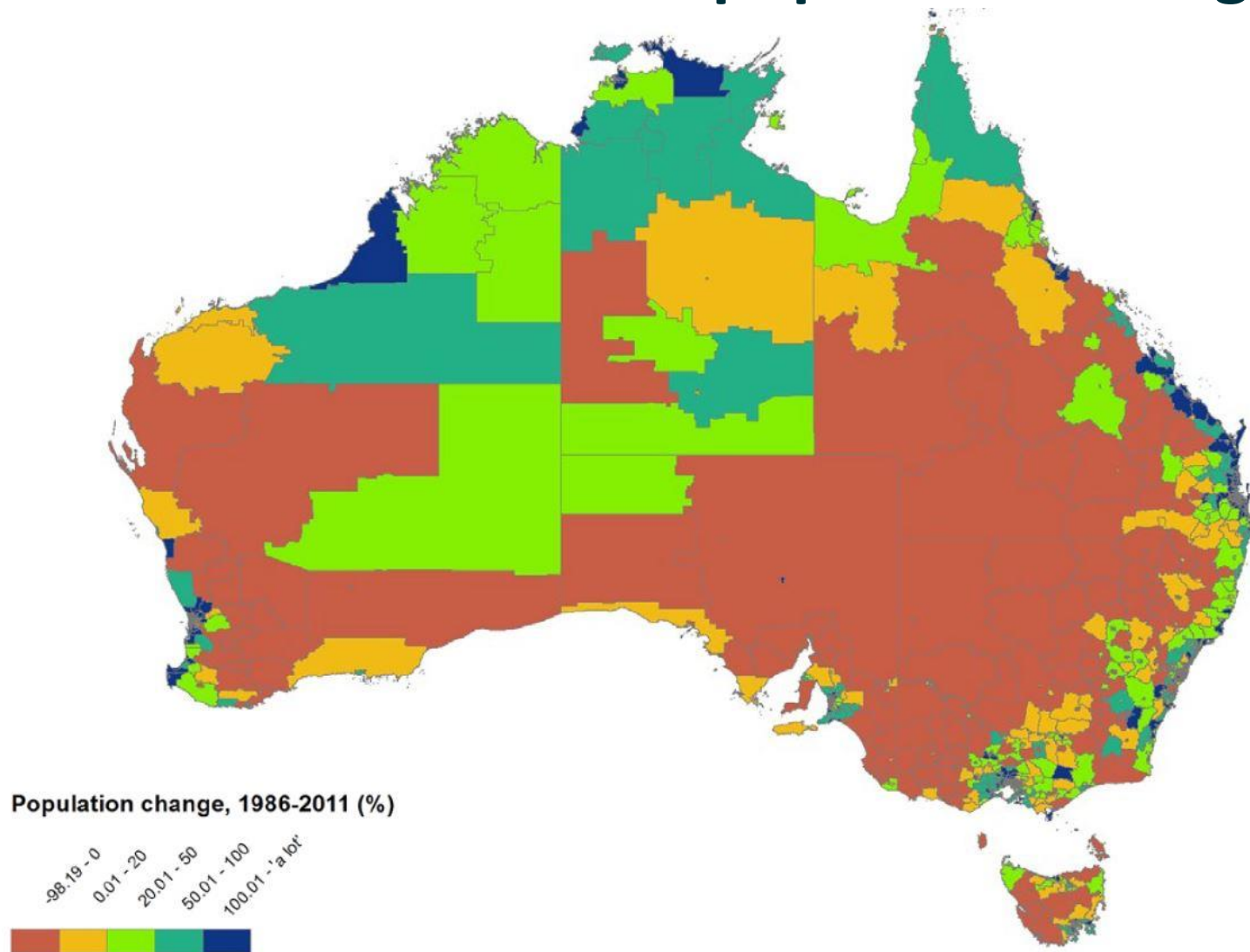


Chart by CSIRO based on ABS data

Income inequality varies across regions

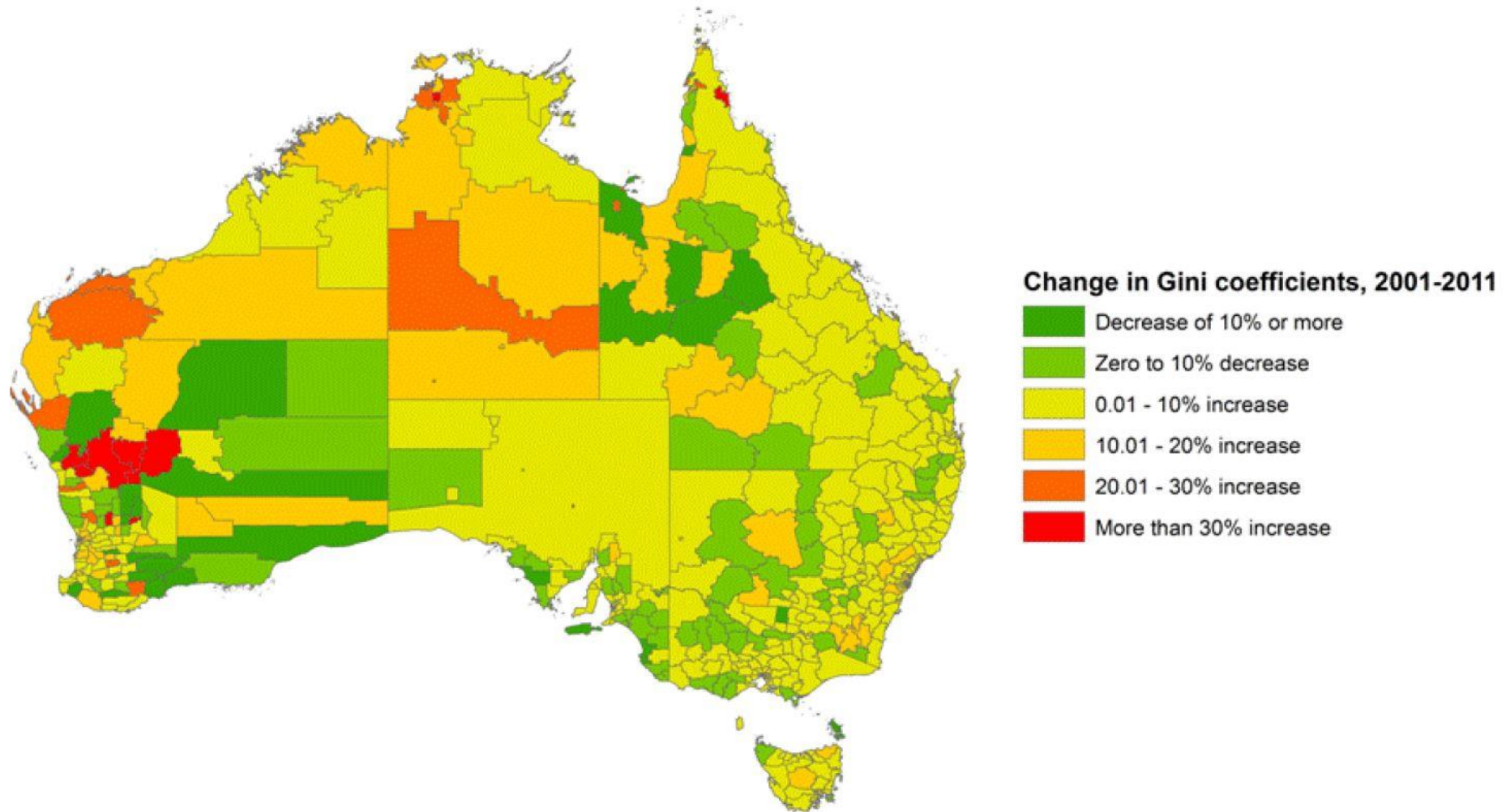
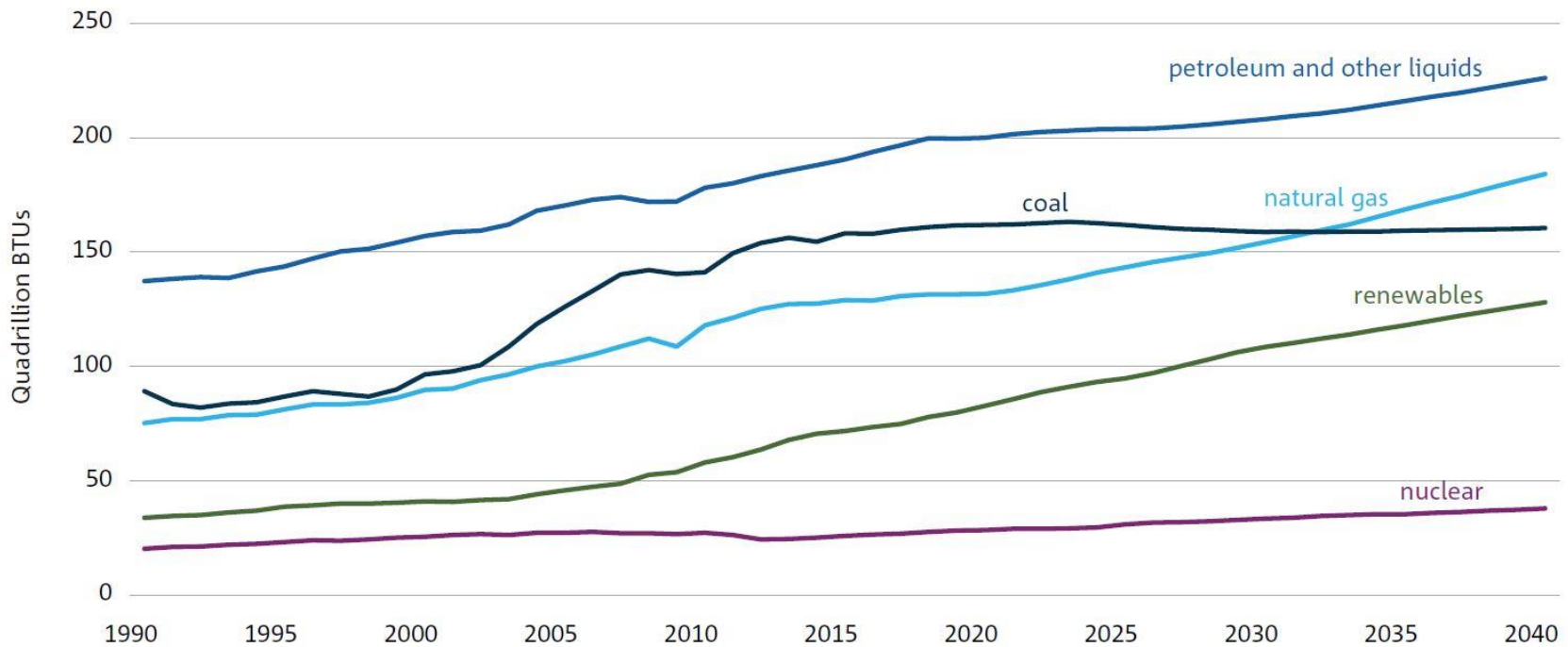


Chart by CSIRO based on ABS data

4. New economies

- Increasing *global and domestic* demand for cleaner energy will change Australian regions

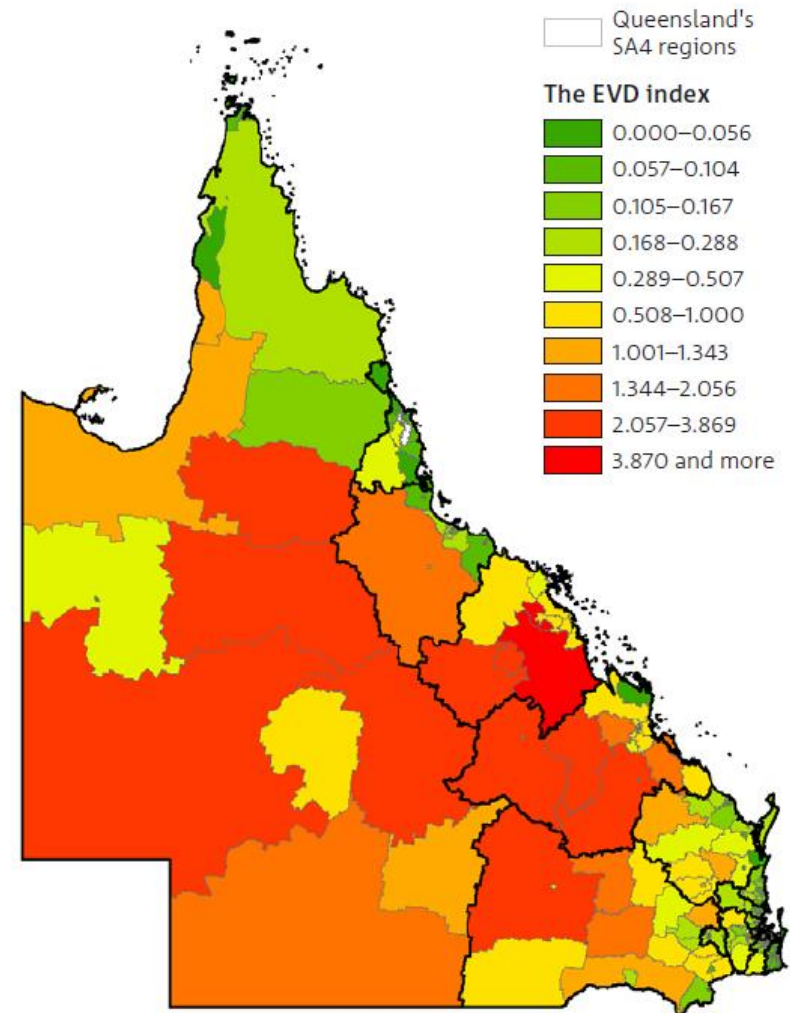


Projected world energy consumption by commodity to 2040 Energy Information Administration, 2017

Chart adapted by CSIRO from Energy Information Administration. 2017.

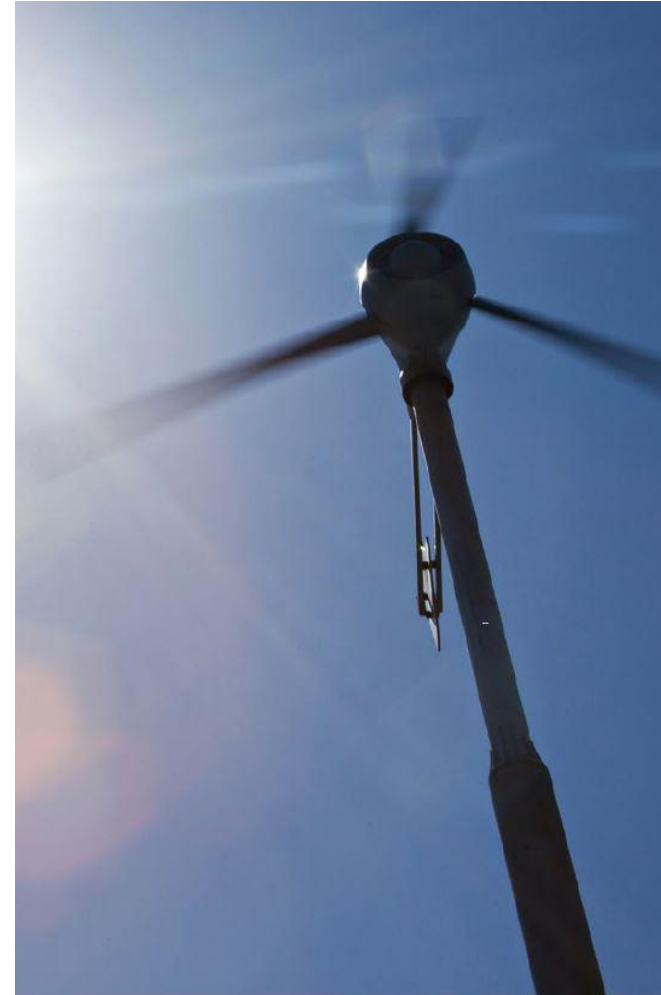
Effects of emissions reduction

- Emissions reduction will affect regional economies in different ways e.g.
- Regions with high dependence on carbon intensive industries
- Compared with regions with low carbon economies
- We need new strategies and tools to work through implications.
 - E.g. Latent economic vulnerability to emissions reduction Index (LEVER)



Growth in renewables in Australia

- Renewables have the highest projected growth of all energy sources
- In 2018 there were around 200 established utility-scale projects (wind and solar)
- Over 300 new projects were at various stages of development
- Particularly: large scale solar PV facilities
 - Located close to electricity infrastructure and population centres
- But we need to understand more about how renewables contribute to regional economic growth



4. New economies

- We have already seen driverless vehicles used in the mining industry
 - One mining company operated 72 autonomous haul trucks from 2016
 - Expansion to automated rail freight, drilling
 - Can be up to 82% cheaper than manual labour forces
- Current estimates are that 40% of existing Australian jobs are likely to be substituted by automated processes by around 2040
- Particularly low skilled roles

4. New economies

- Expected growth in operators for:
 - remote vehicles
 - unmanned aerial vehicles (drones)
- Also growth in sales and servicing of these
- Services provided through drones
 - surveying
 - mine safety inspections
 - crop monitoring



5. Environment as risk

- Regional Australia will continue to be affected by climate change and extreme events
- The frequency of extreme heat days is on an upward trend
- Longer fire seasons
- Changes to rainfall distribution are expected to continue
 - Increased in northern Australia
 - Less winter rain in southwest Australia
- Represents risk when demand for agricultural water is expected to increase by 80% to 2050

Upward trend: frequency of extreme heat

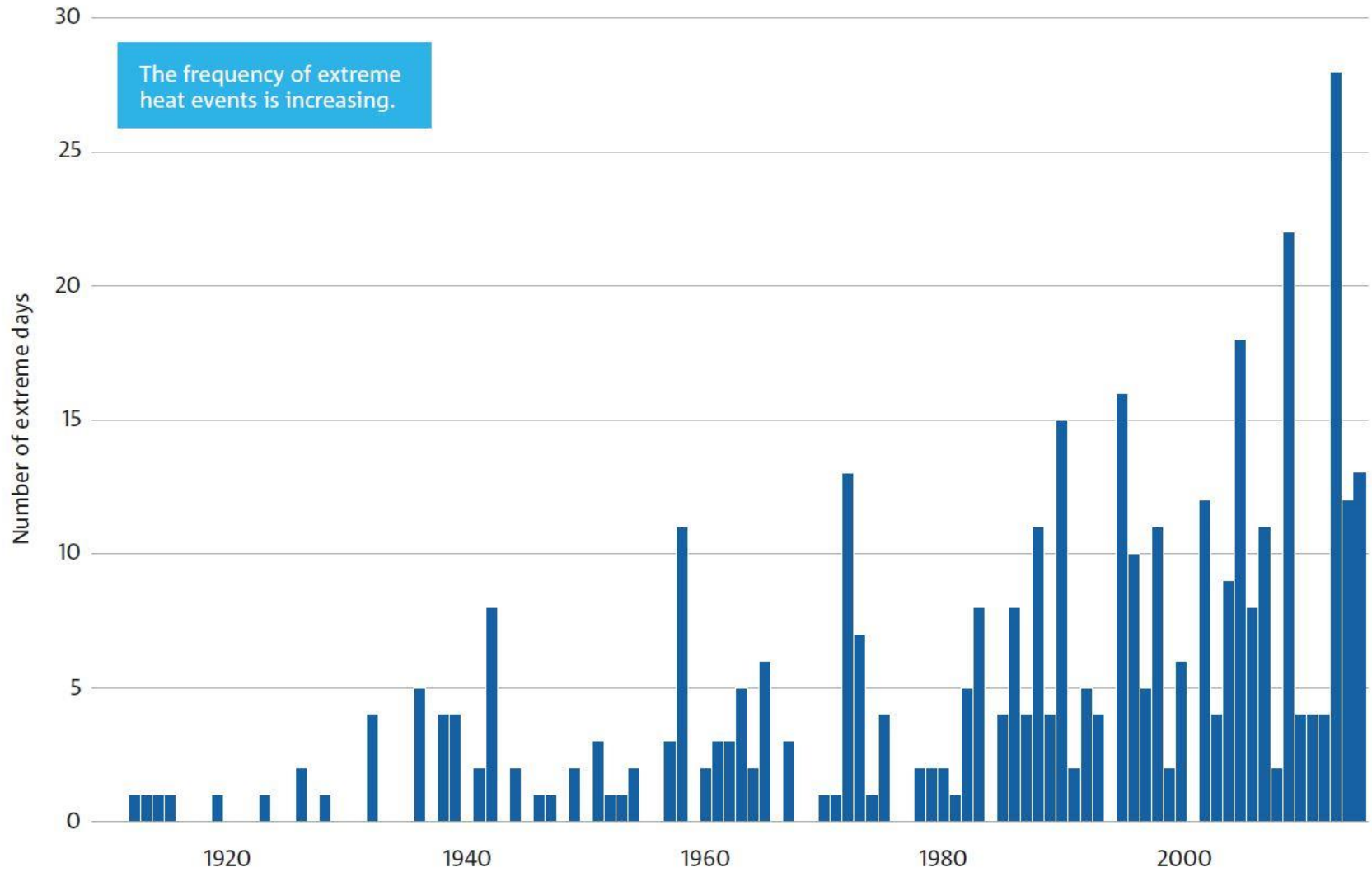


Chart by CSIRO based on data from BOM 2017

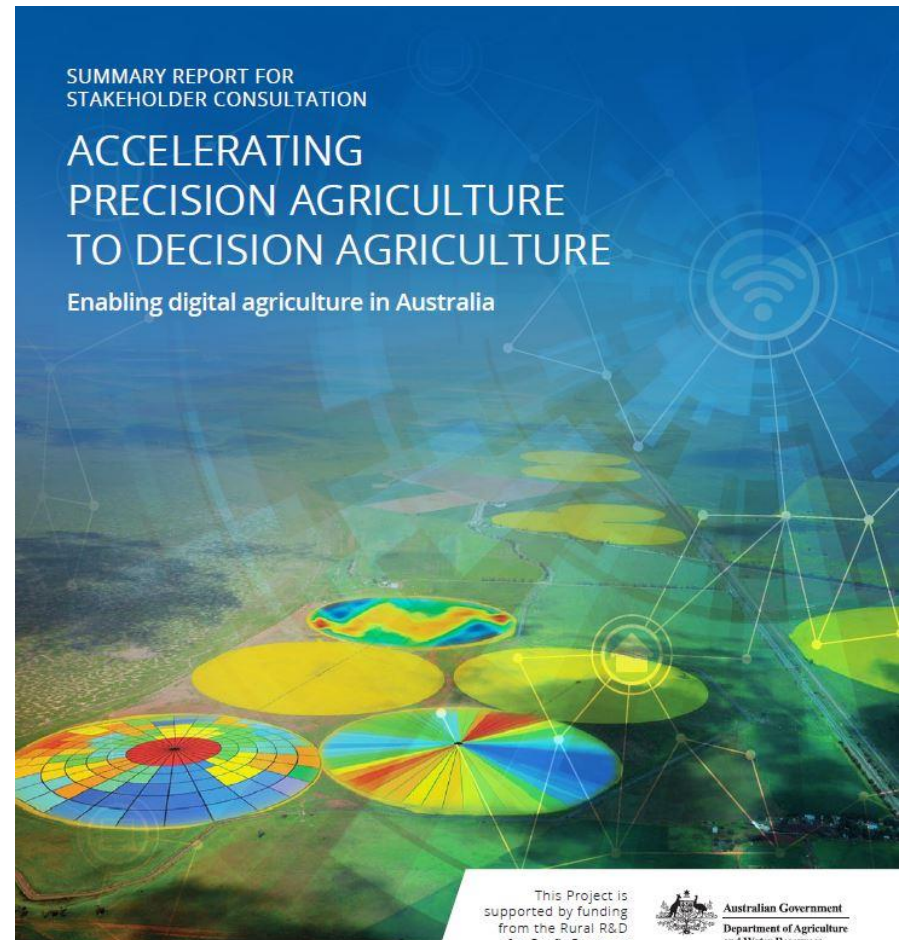
5. Environment as risk

- Increased risk to biosecurity from growing international mobility
 - To maintain agricultural productivity
 - Forest industries
 - Biodiversity conservation
- Past approaches to bio-security may not be sufficient



Managing risk: enabling better decisions

- Manage risks through transformative advances in:
 - digital technologies
 - sensing systems
 - big data analytics
- Digital agriculture has potential to increase GDP by \$24 billion per year (Leonard et al 2017)



<http://farminstitute.org.au/p2dproject>

Image credit Australian Farm Institute

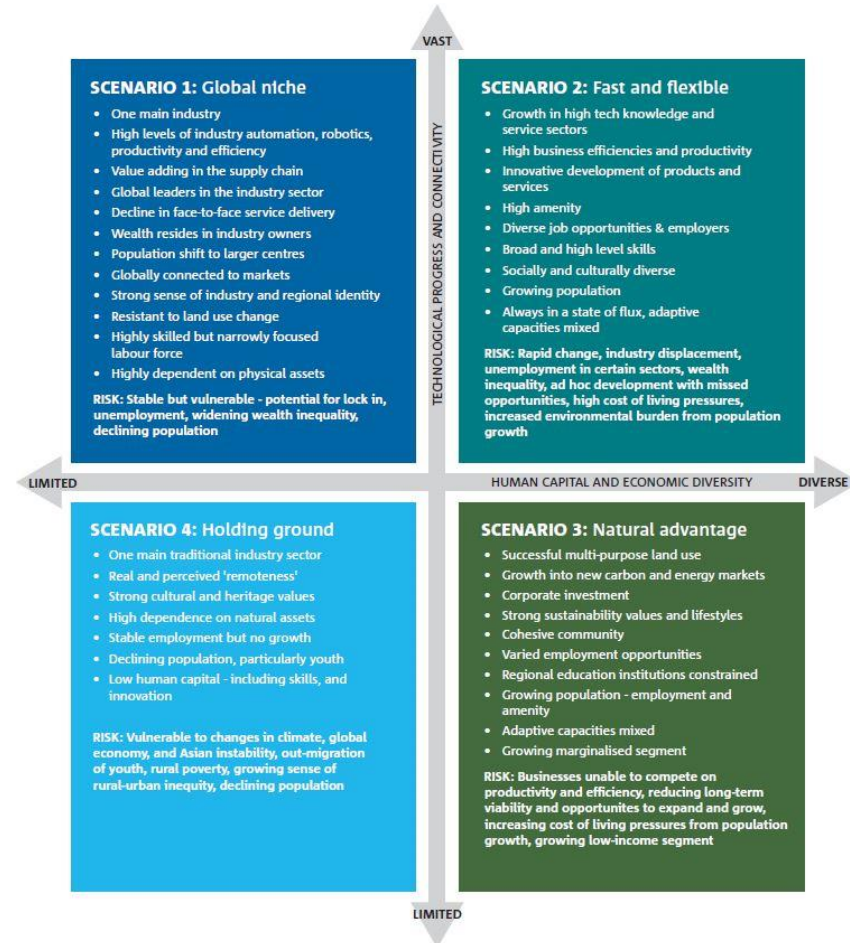
Scenarios for regions

Scenarios as plausible alternative futures

- Objective is to stimulate discussion about what type of future is possible and preferable
 - Thereby helping to guide actions in the near term towards that future

The two axes are:

1. Extent of technological progress and connectivity
2. Level of human capital and economic diversity



Scenario 1: Global niche

- Vast technological progress
- Limited human capital and economic diversity

SCENARIO 1: Global niche

- One main industry
- High levels of industry automation, robotics, productivity and efficiency
- Value adding in the supply chain
- Global leaders in the industry sector
- Decline in face-to-face service delivery
- Wealth resides in industry owners
- Population shift to larger centres
- Globally connected to markets
- Strong sense of industry and regional identity
- Resistant to land use change
- Highly skilled but narrowly focused labour force
- Highly dependent on physical assets

RISK: Stable but vulnerable - potential for lock in, unemployment, widening wealth inequality, declining population

Living in a 'global niche' region

LIVING: effective digital delivery of services

WORKING: strong skilled employment in high-tech roles

INVESTING: public-private partnerships, healthy R&D



Scenario 2: Fast and flexible

- Vast technological progress
- Diverse human capital and economy

SCENARIO 2: Fast and flexible

- Growth in high tech knowledge and service sectors
- High business efficiencies and productivity
- Innovative development of products and services
- High amenity
- Diverse job opportunities & employers
- Broad and high level skills
- Socially and culturally diverse
- Growing population
- Always in a state of flux, adaptive capacities mixed

RISK: Rapid change, industry displacement, unemployment in certain sectors, wealth inequality, ad hoc development with missed opportunities, high cost of living pressures, increased environmental burden from population growth

Living in a 'fast and flexible' region

LIVING: excellent services, high population turn over, increasing cost of living, risk of tension between different older and newer residents

WORKING: Wide range of employment options, high mobility and commuting for work

INVESTING: local and international investors, venture capital



Scenario 3: Natural advantage

- Diverse human capital and economy
- Limited technological progress and connectivity

SCENARIO 3: Natural advantage

- Successful multi-purpose land use
- Growth into new carbon and energy markets
- Corporate investment
- Strong sustainability values and lifestyles
- Cohesive community
- Varied employment opportunities
- Regional education institutions constrained
- Growing population - employment and amenity
- Adaptive capacities mixed
- Growing marginalised segment

RISK: Businesses unable to compete on productivity and efficiency, reducing long-term viability and opportunities to expand and grow, increasing cost of living pressures from population growth, growing low-income segment

Living in a 'natural advantage' region

LIVING: strong social cohesion & sense of community, high amenity, aging population, expensive services, strain on infrastructure

WORKING: growing economic diversity e.g. carbon farming, renewable energy and tourism, Indigenous-owned enterprises

INVESTING: multi-national agribusiness and energy companies, self-funded SMEs



Scenario 4: Holding ground

- Limited human capital and economic diversity
- Limited technological progress and connectivity

SCENARIO 4: Holding ground

- One main traditional industry sector
- Real and perceived 'remoteness'
- Strong cultural and heritage values
- High dependence on natural assets
- Stable employment but no growth
- Declining population, particularly youth
- Low human capital - including skills, and innovation

RISK: Vulnerable to changes in climate, global economy, and Asian instability, out-migration of youth, rural poverty, growing sense of rural-urban inequity, declining population

Living in a 'holding ground' region

LIVING: affordable housing, but lower incomes, fewer services, unreliable connectivity, youth move out

WORKING: manual labour, aging workforces, out-door work more difficult in hotter conditions

INVESTING: some investment for ecosystem services, limited business investment, infrastructure and services mostly government funded



Implications

Implications

- Need to tailor policies and investments to regional conditions and advantage
 - Uniform policy settings won't work in all contexts
- Planning helps regions move towards their preferred future
 - Prepare for a diverse range of risks and opportunities
 - Respond to changing values, automation, new services
 - Foster local scale foresight processes
- Investing in connectivity and infrastructure
 - Regions are becoming increasingly connected
 - Foster the return of skilled individuals to regions
 - Digital connectivity needs to be affordable

Implications

- Need to support inclusion and liveability
 - Changes to employment may be unevenly distributed
 - Providing affordable services will be crucial
- Strong potential for collaboration
 - Across and between regions
 - Jointly address opportunities and challenges



Key messages



Thank you

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