

Climate change transition: Risks and opportunities in Queensland's Agriculture sector

3 April 2019

Scope overview

Objective

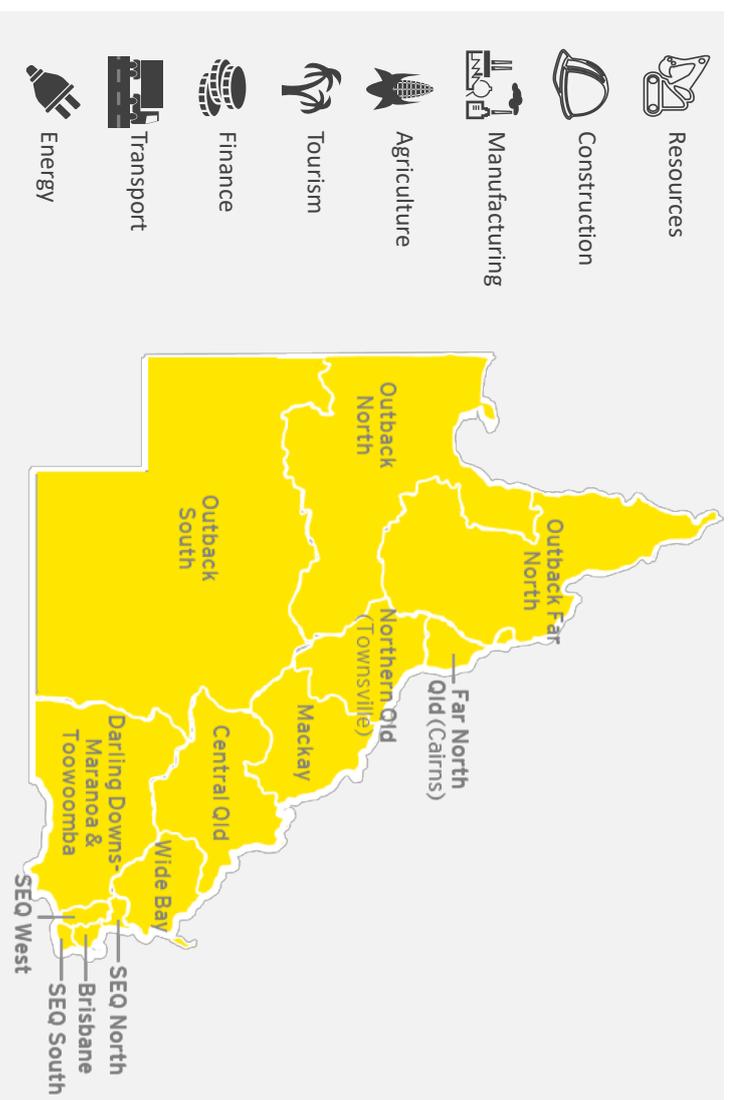
Map the implications and opportunities for Queensland economy and regions under two different scenarios – Business as usual (“BAU”) and Two-degree scenario (“2DS”) until 2050.

Scope of work

Climate change risk and opportunity assessment for eight industry sectors across 13 different regions*, aligned to previous work conducted by the DES and DSDMIP.

Key considerations

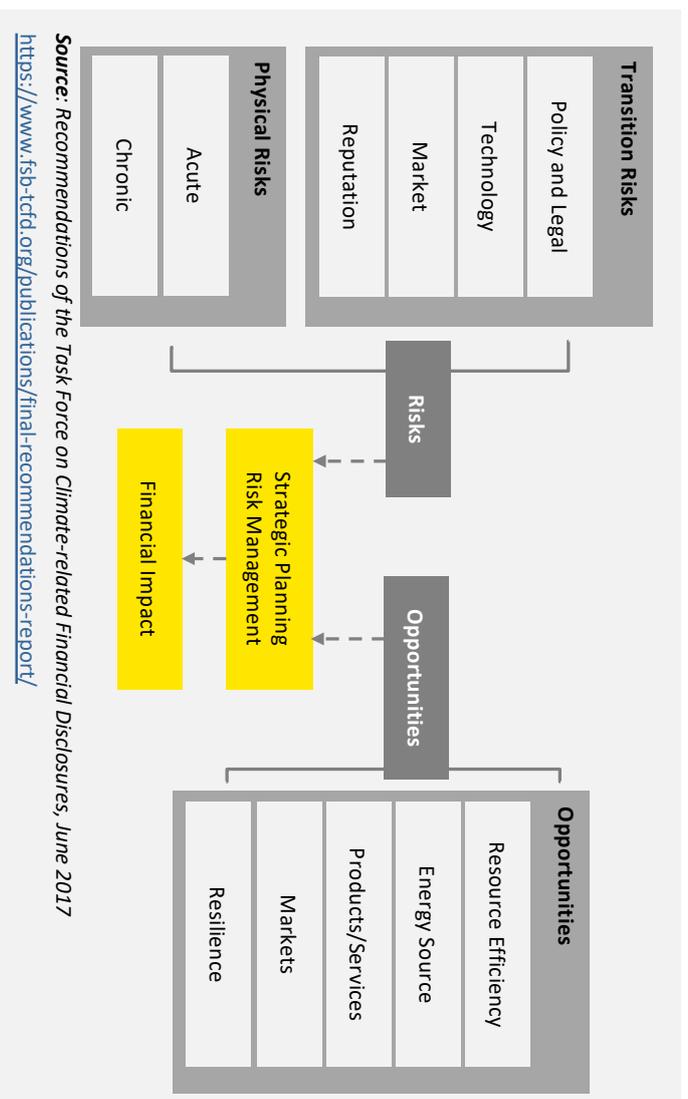
The framework and methodology include the analysis of physical, policy, economic, technological, social and environmental drivers at regional, national and international scales, including Paris Climate Agreement (COP21), Queensland Renewable Energy Target, international markets, technology disruption and consumer behaviour.



*Regions align to previous work conducted by the Queensland Government: including 10 Statistical Area 4 (SA4) regions and three Statistical Area 3 (SA3) regions in the outback regions for additional granularity. Source: Australian Statistical Geography Standard (ASGS). [http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Australian+Statistical+Geography+Standard+\(ASGS\)](http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Australian+Statistical+Geography+Standard+(ASGS)) Appendix A details the the products and services considered for each sector.

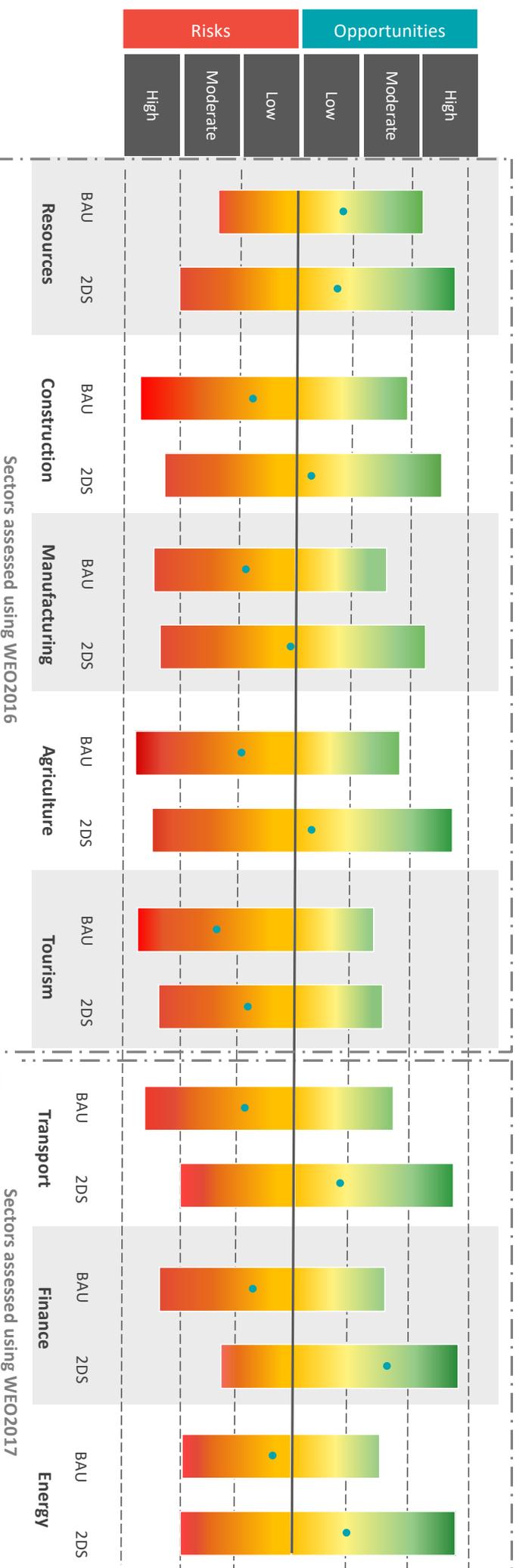
Transitional risks and opportunities

The climate change risk and opportunity assessment was based on the framework set out in the Taskforce on Climate-related Financial Disclosures (TCFD). The Recommendations of the TCFD aim to improve organisational understanding of the impact of climate risks and reduce the risk of a systemic financial shock on the economy, due to climate change. Importantly, the TCFD provides a framework that seeks to enable climate change to be considered in financial filings as an economic risk and transition, rather than just an environmental risk impacting infrastructure or business continuity.



Overview of climate risks and opportunities in Queensland under BAU and 2DS

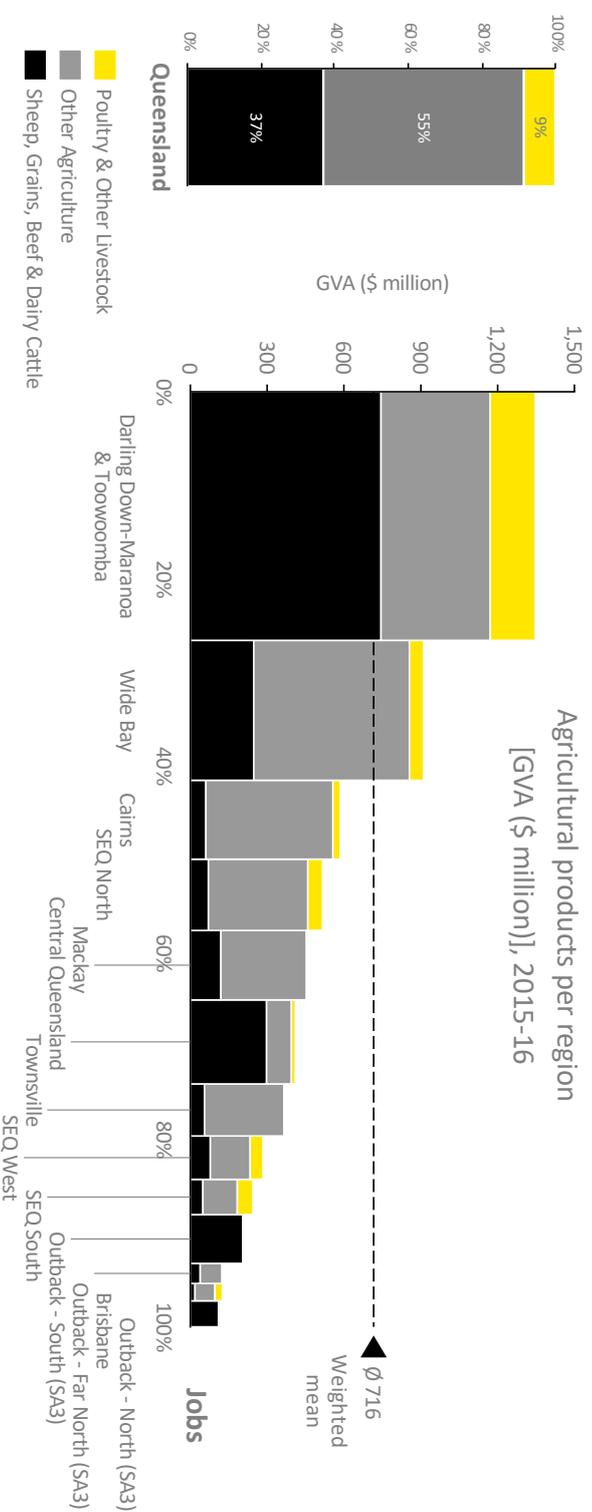
- ▶ Our analysis identified more opportunities than risks under a two-degree scenario, compared to a business as usual (BAU) scenario.
- ▶ Opportunities include reputational benefits, resource efficiency, increased resilience, and reduced physical impacts from climate change.
- ▶ In general, risks are lower under a two-degree scenario than they are under a business as usual scenario, predominantly due to lower physical risks (e.g. impact of extreme weather events and droughts) under a two-degree scenario.
- ▶ The resources sector faces higher risks under a 2DS largely due to the regulatory changes required under this scenario (i.e. transition risks).



Agriculture

- ▶ Darling Downs-Maranoa & Toowoomba (22%), Wide Bay (16%) Cairns (10%) were the top three contributors of GVA from agricultural activities to Queensland economy in 2015-16.
- ▶ Other agriculture activities made up to 55% of total GVA from agricultural activities in Queensland, followed by Sheep, Grains, Beef & Dairy Cattle (37%)
- ▶ The width of the columns refers to share of agriculture sector jobs in Queensland

- Top three GVA contributor per sub-sector in Queensland:
- ▶ **Poultry & other livestock:** DD-M & Toowoomba, SEQ South and SEQ North
 - ▶ **Other agriculture:** DD-M & Toowoomba, Wide Bay and Cairns
 - ▶ **Sheep, grains, beef & dairy farming:** DD-M & Toowoomba, Central Queensland and Wide Bay



Poultry & other livestock includes:

- ▶ Poultry, deer, horse and pig farming
- ▶ Beekeeping

Other agriculture refers to:

- ▶ Nursery and floriculture production
- ▶ Turf growing
- ▶ Fruits and vegetables
- ▶ Cotton and sugar cane growing

Sheep, grains, beef & dairy cattle include:

- ▶ Sheep-Beef Cattle Farming
- ▶ Grain-sheep or grain-beef cattle farming
- ▶ Rice & other grain growing – i.e. includes wheat, maize, cereals, sunflower
- ▶ Dairy cattle farming



Opportunities for Agriculture sector under 2DS

Risk/ Opportunity	Description	Implications
<ul style="list-style-type: none"> • Products and Services 	<ul style="list-style-type: none"> • Biofuel demand from transport industry as a transition fuel creating opportunities to monetise organic waste and by-products • Opportunities for cultivating new types and varieties of crops based on new climate conditions • Increasing demand for lower-emissions alternative protein products – e.g. kangaroo, lentils, soy 	<ul style="list-style-type: none"> • Reduced exposure to potential fossil fuel price increases and changes in the cost of carbon • Increased revenue from new products and international reputation of high quality offsets • Increased revenues from new products, supported by research and data sharing • Increased revenue through demand for lower emissions products • Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
<ul style="list-style-type: none"> • Markets 	<ul style="list-style-type: none"> • Carbon sequestration and abatement in pastures, agricultural land and tropical areas • Implementation of technology, including 'smart' monitoring of soil, crops and livestock, and efficient farm management practices • Provision of accurate climatic data and weather forecast data to small and medium-sized enterprises (SMEs) in response to changing climate conditions 	<ul style="list-style-type: none"> • Reputational, economic, environmental and social benefits • Increased revenues from emerging markets • Increased production capacity • Improved resilience (e.g. more resilient environment) • Increased costs for higher cost production systems
<ul style="list-style-type: none"> • Resource efficiency • Energy source 	<ul style="list-style-type: none"> • Onsite, off grid renewable electricity generation 	<ul style="list-style-type: none"> • Reduced exposure to future electricity price increases • Potentially reduced operating costs

Opportunities

Risks for Agriculture sector under 2DS



Risk/ Opportunity	Description	Implications
<ul style="list-style-type: none"> Physical risks 	<ul style="list-style-type: none"> Change in temperature and rainfall patterns and increasing severity of extreme weather events Water resources may be affected by sea level rise (salinity infiltration in coastal areas), water contamination and soil degradation 	<ul style="list-style-type: none"> Decreased production capacity (e.g. crop loss from drought or heat stress in livestock) Costs to adopt new practices, processes and technologies to minimise impacts on productivity Increased capital costs to adopt higher cost production systems Increased operating costs (e.g. due to inadequate water supply) Increased insurance costs
<ul style="list-style-type: none"> Market 	<ul style="list-style-type: none"> Competition with other sectors for land, water and transport infrastructure – i.e. biofuels and mining operations Changing consumer behaviour shifting to alternative protein sources 	<ul style="list-style-type: none"> Increased operating costs (e.g. inadequate water supply) Increased production costs due to changing in energy and water prices Reduced domestic demand of meat balanced out by increasing demand in Asian markets

How can the Agriculture sector position itself for a net zero emissions economy?

Attract investment

To attract investment in the agriculture sector, the Queensland government can:

- ▶ Develop strategies and programs to attract funding through different financial instruments such as grants, green bonds, philanthropy capital and venture capital, for developing and disseminating efficient and sustainable agricultural practices, tools and technologies.
- ▶ Position Queensland as an innovation hub of bioproducts.

Facilitate growth

To facilitate growth of the agriculture sector, the Queensland government can:

- ▶ Improve dialogue and collaboration with the industry through developing peer support networks and using clear and consistent language.
- ▶ Facilitate the provision of granular and usable climate and weather data to farmers, with accompanying decision-support tools and assistance.
- ▶ Encourage the implementation of efficient and sustainable agricultural practices and products.
- ▶ Address connectivity and communication issues which prevent smaller agricultural companies from applying existing information and tools.

Government

To attract investment in the agriculture sector, industry can:

- ▶ Understand and use existing support and tools to take up carbon market opportunities.
- ▶ Engage with researchers and government to attract financing to develop biofuels and bioproducts, and assess the viability of leveraging these opportunities.

To facilitate growth of the agriculture sector, industry can:

- ▶ Promote 'green innovation' for farming activities through automation and robotics and the biofutures industry through biofuels, biochemicals and bioplastics.
- ▶ Develop business planning capability for small and medium enterprises to address climate risks and opportunities, especially through incorporating long-term weather forecasts and diversifying into new streams of revenue, such as carbon farming.

Industry

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