

sra

Sugar Research
Australia



Strategic Plan 2013/14 – 2017/18

Sugar Research Australia Limited

Head Office: 50 Meiers Road, Indooroopilly, Queensland, 4068, Australia
Mailing Address: PO BOX 86, Indooroopilly QLD 4068, Australia
Phone: 07 3331 3333
Fax: 07 3871 0383
Email: sra@sugarresearch.com.au
Web: www.sugarresearch.com.au
ISSN: 2203-4307

© Copyright 2014 by Sugar Research Australia Ltd. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of Sugar Research Australia Ltd.

Disclaimer: In this disclaimer a reference to 'SRA', 'we', 'us' or 'our' means Sugar Research Australia Ltd and our directors, officers, agents and employees. Although we do our very best to present information that is correct and accurate, we make no warranties, guarantees or representations about the suitability, reliability, currency or accuracy of the information we present in this publication, for any purposes. Subject to any terms implied by law and which cannot be excluded, we accept no responsibility for any loss, damage, cost or expense incurred by you as a result of the use of, or reliance on, any materials and information appearing in this publication. You, the user, accept sole responsibility and risk associated with the use and results of the information appearing in this publication, and you agree that we will not be liable for any loss or damage whatsoever (including through negligence) arising out of, or in connection with the use of this publication. We recommend that you contact our staff before acting on any information provided in this publication.

Table of Contents

1.0 Executive summary	1
2.0 Introduction	3
3.0 Context	4
4.0 Operating environment	6
4.1 Industry snapshot	6
4.2 Situation analysis	7
4.3 R&D trends	11
4.4 SWOT analysis	11
5.0 Roles and responsibilities	14
5.1 Core responsibilities	14
5.2 SRA research	15
5.3 Development	15
5.4 Professional Extension and Communication	15
5.5 Research funding	16
6.0 Stakeholder relationships	17
7.0 Consultation	18
8.0 RD&E priorities	20
8.1 Priority alignment	20
8.2 Industry priorities	22
8.3 National Sugarcane Industry RD&E Strategy	23
8.4 Collaboration	24
9.0 Strategic framework	26
9.1 Translational research	26
9.2 Corporate strategies	27
10.0 Strategic intent	29
10.1 Vision, purpose and values	29
10.2 Key focus areas, strategic outcomes and key performance indicators	30
11.0 Strategic and operational imperatives	32
11.1 Key focus areas	32
11.2 Corporate and operational imperatives	44
12.0 Balanced portfolio	45
13.0 Investment, income and expenditure forecast	47
13.1 Priority weightings	47
13.2 Investment by key focus areas	48
13.3 Forecast operating result	50
14.0 Monitoring and evaluation	51
14.1 Performance monitoring	51
14.2 Performance evaluation and reporting	52
Attachment 1: Alignment to industry and government priorities	54
Attachment 2: Outline of SRA's proposed Performance Evaluation Framework	56
Attachment 3: Abbreviations and acronyms	57

1.0 Executive summary



Our vision

Delivering valued solutions for a growing Australian sugar industry

Outcomes

Industry growth

Profitability

Economic viability

Sustainability

Diversification

Our key focus areas

Our objectives

1. Optimally-adapted varieties, plant breeding and release

To deliver a world-class variety development program that produces varieties that:

- provide increased cane and sugar yields; and/or
- are more tolerant of adverse climatic conditions (drought, frost, etc.); and/or
- are more resistant to pests and diseases; and /or
- require reduced inputs (nutrients, water, etc.); and/or
- provide improved ratoonability.

To enhance the variety breeding, selection and release program through:

- increased collaboration with growers, millers and productivity services groups; and
- increased regional commercial sized trials and regional releases; and
- earlier communication and dissemination of appropriate variety trait and performance information.

To promote a collaborative, interdisciplinary and systems approach to research, development and technology

2. Soil health and nutrient management

To understand and improve soil health issues that may be negatively affecting sugarcane productivity. This will include R&D covering crop nutrition; soil biology; soil fertility; regional soil factors; chemical utilisation; and reduction of soil pathogens and nematodes.

To understand the impact of on-farm practices on water quality.

To develop improved methods and tools to enable, or improve, cane production on poor performing or marginal soils.

3. Pest, disease and weed management

To proactively support an enhanced biosecurity capability for the Australian sugarcane industry.

To minimise the economic and environmental impacts of pests, diseases and weeds through targeted research.

4. Farming systems and production management

To conduct research into farming practices leading to the optimal use of inputs with specific emphasis on water management (including irrigation and drainage) and mitigating the impact of rising energy costs.

To conduct research on planting technologies, ratoonability, break-crop and fallow practices to optimise yields.

To facilitate the practical application of the value chain model to enhance grower, harvester and miller interfaces and improve the adoption of harvesting best-practices.



Our purpose

Undertaking targeted RD&E solutions for the sugar industry

- Our values**
- Customer and outcome focused with a dedication to industry success
 - Integrity and transparency across all that we do
 - Deliver what we promise
 - Collaborate for the good of quality research outcomes
 - Respect for our sources of funding and associated obligations

Our key areas of focus

Our objectives	5. Milling efficiency and technology	6. Product diversification and value addition	7. Knowledge and technology transfer and adoption	8. Capability development, attraction and retention
	<p>To review logistics management (particularly harvester and transport scheduling) to reduce operational costs and improve mill capacity utilisation.</p>	<p>To facilitate and conduct ongoing research to identify and/or develop alternative products or uses for sugarcane and determine the basic requirements for adoption.</p>	<p>To improve the coordination among different extension service providers, advisers and researchers to create an environment that optimises innovation and adoption at the farm level and encourages research that meets the needs of the industry.</p>	<p>To conduct a review of current and future RD&E skills and capacity needs for the sugarcane industry, in collaboration with DAFF.</p>
	<p>To identify and/or develop new or improved processes, technology and/or infrastructure to increase mill processing efficiency.</p>	<p>To facilitate or undertake economic feasibility studies of identified industry by-products, their use and likely market viability.</p>	<p>To ensure research proposals have extension mechanisms in place, where appropriate, to facilitate transfer of knowledge and technologies to industry members.</p>	<p>To actively promote and facilitate the development and retention of current industry participants, as well as attract new participants to the sugarcane industry.</p>
	<p>To undertake research into quality issues (such as trash, fibre content and impurities) to identify possible solutions – at the variety development, harvesting and processing sectors of the value chain.</p>		<p>To develop and implement communication tools and mechanisms to inform industry members on research projects, progress made on the projects and results of the research efforts.</p>	<p>To foster collaboration for cross-industry and cross-sectoral skill development, innovation and networks.</p>
			<p>To assess the uptake of developed technologies and evaluate the effectiveness of technology transfer tools.</p>	
			<p>To develop appropriate technology transfer tools to disseminate research findings to end-users to facilitate their uptake by growers and millers.</p>	

2.0 Introduction



Sugar Research Australia Limited (SRA) was established on 1 July 2013 as an industry-owned company that invests in and manages a portfolio of research, development and extension (RD&E) projects that drive productivity, profitability and sustainability for the Australian sugar industry.

SRA's establishment was the result of the determination, hard work and support provided by the industry, and the Australian Sugar Industry Alliance (ASA) in particular, to modernise the industry arrangements for RD&E by providing for more focused and coordinated RD&E through an integrated industry-owned company.

Under its formation, SRA acquired the assets, functions and services previously provided by BSES Limited and the Sugar Research and Development Corporation (SRDC). Both of these organisations have officially wound up and ceased operations. SRA also acquired the milling research coordination function that was previously undertaken by Sugar Research Limited (SRL).

Following SRA's establishment as a company limited by guarantee under the *Corporations Act 2001* (Cth), SRA was declared on 5 August 2013 as the Industry Services Body for the Australian sugar industry under the *Sugar Research and Development Services Act 2013* (Cth). As such, SRA is responsible for the direct provision of RD&E as well as the ongoing management and investment of funds received from industry levy payers and government, for the benefit of the sugar industry and for the wider public good.

SRA's main sources of funds come from a statutory levy paid by sugarcane growers and millers, matching funds from the Commonwealth Government and investments from the Queensland Government. The sugar industry levy is calculated on the basis of 70 cents per tonne of sugarcane processed or sold for processing. This levy is shared equally between growers and millers (35 cents per tonne each). SRA also receives minor income from other sources, such as royalties for the use of intellectual property and payments for the provision of SRA services (e.g. scientific testing and analysis).

SRA acknowledges the important supportive role the Commonwealth and Queensland governments play in providing significant public funding towards RD&E that will drive step-change improvement in the sugar industry and deliver economic, social and environmental benefits to the general community.

With respect to managing and investing funds from levy payers and government matching funds, SRA has entered into a Statutory Funding Agreement (SFA) with the Commonwealth Government. Under this agreement SRA is required to prepare, on an annual basis and in consultation with industry stakeholders, a Strategic Plan that addresses industry and government priorities. An Annual Operational Plan (AOP) is also required to be developed to implement the Strategic Plan. The implementation of the Strategic Plan will be monitored and reported in accordance with a Performance Evaluation Framework.

To guide SRA during its establishment and transition period, an Interim Strategic Plan and Interim AOP were put in place. The Interim Strategic Plan was based on the *Transitional Operating Plan 2013-2015*, *Interim Strategic Plan and SRA Formation Record* prepared by ASA in May 2013 and was viewed as a short-term transitional plan only. Its purpose was to provide general guidance to SRA until a comprehensive and consultative strategic planning process could be completed.

Over the period of November 2013 through to January 2014, SRA engaged with levy payers, industry representative bodies, research organisations, federal and state government and other industry stakeholders in the development of its inaugural Strategic Plan. This highly consultative and participatory planning process provided SRA with a thorough understanding of the issues and challenges facing the sugar industry and the priority RD&E areas that the industry and government would like SRA to focus on. The strategies that SRA will employ to address these issues, challenges and RD&E expectations are outlined within this document.

This document (the "Strategic Plan") replaces the Interim Strategic Plan. An AOP will be developed by 30 June 2014 to outline the activities and resourcing to be undertaken during 2014/15 to deliver on this Strategic Plan. In the meantime, the Interim AOP will remain in place.

3.0 Context



This inaugural Strategic Plan for SRA shapes a new organisation, while setting in place longer-term directions for an enduring industry-owned company – one that will play a significant role in ensuring SRA can fulfil the expectations of its levy payers and other stakeholders.

This plan sets out SRA's vision, purpose and the values and strategies that will underpin all that we do. To achieve our vision, SRA will collaborate with levy payers, industry representative bodies, government, productivity services, extension providers, other industry stakeholders, researchers and international peers and partners. SRA will work to facilitate and deliver innovative technology and best-practice to the sugar industry through a disciplined RD&E development and investment program and practical and effective knowledge exchange that translates research and development (R&D) into practice.

The context for this plan is primarily based on the issues and RD&E priorities of the sugar industry and, more broadly, the priorities of the agricultural sector and government. The intent is to deliver RD&E solutions that will advance Australia's sugar industry and benefit the community as-a-whole.

Some of the issues currently facing the industry are long-standing and have been the focus of previous strategies and plans of both BSES and SRDC. These long-standing issues reflect the mature nature of the Australian sugar industry. Whilst successes have been achieved through the development and implementation of new and innovative technologies, processes and practices, the issues still persist and fundamental changes to approaching RD&E are necessary if effective step-change is to result.

Although the key areas of focus covered in this plan have not changed from those covered under the plans of SRDC and BSES in previous years, SRA will tackle the objectives with a different approach and mindset. One that demonstrates an integrated approach to problem solving and is:

- Outcome focused;
- Customer (levy payer) focused;
- Consultative; and
- Collaborative with industry, RD&E partners and international peers.

This plan signals that we are a new company altogether – one that is industry-owned and, more importantly, industry focused. In order to build a sustainable company that contributes to a sustainable industry, SRA is committed to listening to our levy payers, understanding their needs and responding to these needs with innovative RD&E solutions that are successfully adopted and deliver true benefits to the industry and the broader community.

In doing so, SRA must establish itself as a trusted service provider and adviser to the sugar industry. This Strategic Plan outlines how SRA intends to build credibility and capacity around our RD&E and knowledge transfer activities, whilst maximising outputs from a combination of internal and external strategic investments.

First and foremost, we will ask our customers what they need and expect from us and respond accordingly – rather than us suppositioning and telling them what we think they need and want. Secondly, we will provide strategic foresight and advice on leading-practice innovation and development that may benefit our customers and the industry as-a-whole.

In other words, we will keep a watching-brief on technology developments so that when our customers ask us for solutions we are prepared with innovative options to put forward. We also intend on using novel ways to identify and analyse gaps in existing RD&E and seek to find innovative solutions that the industry may choose to adopt. Research and development will not be done in isolation and knowledge transfer mechanisms and communication channels will be put in place to ensure research knowledge is shared appropriately and aligns with other research and development projects wherever possible.

SRA recognises that in order to successfully deliver outcomes and facilitate step-change improvement across the industry, an integrated approach to developing RD&E solutions and maximising value for the industry is required. We recognise that the realisation of benefits relies on the uptake of industry research and development outputs and knowledge and the translation of these outputs into practice.

We need to understand and consider the 'big-picture' when trying to resolve the issues and challenges facing the industry and provide innovations to drive the industry towards improved productivity, profitability and sustainability. Whilst the cause for some issues may be relatively easy to isolate and appropriate RD&E solutions can be readily identified and acted on, some issues may be more systemic in nature and require a more disciplined approach to resolving. In such cases, SRA will adopt a holistic and integrated approach to identifying the possible causal factors, performance drivers and interdependencies that pertain to the issue and collaboratively work towards providing an innovative solution or solutions.

This multi-disciplinary, whole-system approach is dependent on identifying and bringing together all relevant information on the factors that are contributing to the issue at hand and engaging, communicating and collaborating as broadly as necessary to deliver appropriate and effective RD&E.

Although SRA is a new company, it has been established on the back of internationally recognised expertise that has been developed over many years. As such, SRA has ready access to world-class researchers and established relationships with national and international research organisations.

SRA intends to leverage-off its relationships with other industry owned companies (IOCs) and research and development corporations (RDCs), research institutes and universities, and international competitors and peers, to identify and improve access to leading-edge innovation and technological advancements.

In short, SRA's approach to RD&E delivery centres around frequent and meaningful two-way communication with our levy payers and RD&E partners and a deep understanding of how all elements in the sugarcane production process, physical and operating environment and value chain impact each other. With this understanding front-of-mind, SRA is better positioned to respond to industry RD&E issues, improve the uptake of research and development outputs, achieve its strategic objectives and contribute to the broader industry outcomes.

Our integrated and participatory approach to delivering on this Strategic Plan is further outlined in Section 9 of this plan.

4.0 Operating environment



4.1 Industry snapshot

Sugarcane is produced in tropical and semi-tropical environments ranging from the wet tropics to frost-prone, rain-fed, dry-land conditions. Farms range from small one hectare farms in the developing world to large commercial operations well in excess of 15 000 hectares, such as in Brazil. Processing of the crop varies from small family-owned mills to facilities with a cane-crushing capacity well in excess of two million tonnes per year. The crop is processed mainly for sucrose and molasses, but modern mills are fully fledged biorefineries with zero wastage of biomass and significant biofuel and electricity generation.

- Australia is the world's third largest supplier of raw sugar, behind Brazil and Thailand.
- 80 per cent of Australian sugar is exported, with a yearly export value of nearly \$1.5 billion.
- Australia's sugar industry is located predominantly along the eastern coastline, spreading over more than 2000 kilometres from northern New South Wales to far north Queensland.
- Approximately 95 per cent of Australia's cane production is in Queensland and the remainder in New South Wales.
- The industry consists of approximately 4000 cane farming businesses, supplying 24 mills owned by 7 milling companies.
- The industry controls \$7.4 billion in land and \$4.5 billion in infrastructure assets.
- Approximately 75 per cent of Australian sugar milling capacity is currently foreign owned.

Source (right): SRA, CANEGROWERS and Australian Sugar Milling Council (ASMC).



4.2 Situation analysis

4.2.1. World market and trade

With approximately 80 per cent of Australia's sugar production being exported, the profitability of the industry relies heavily on world sugar prices and exchange rates.

Although Australia is the world's third largest exporter of raw sugar, the Australian sugar industry accounts for just two per cent of world sugar production and is therefore a price taker in the world market. Whilst the world sugar market is highly competitive, it is dominated by Brazil, the world's largest sugar producing country, both in terms of supply and market pricing.

The world sugar price has been extremely volatile over the last few years with prices reaching as high as US 36 cents per pound and falling, more recently, to below US 15 cents per pound. The recent duration of lower prices has been due, in the main, to the ongoing surplus of world sugar stocks, along with a stronger performing US dollar and a weakening Brazilian Real.

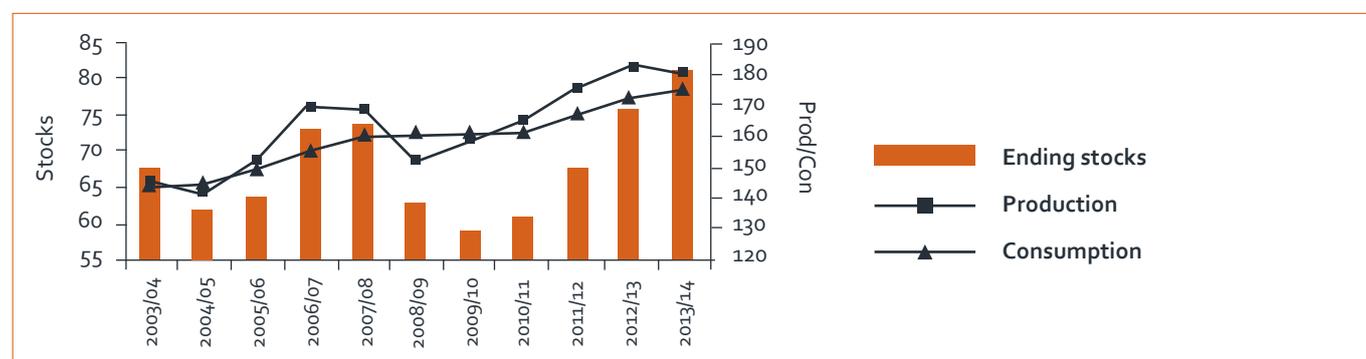
Reflecting the fall in world sugar prices, the average sugar price received by the Australian industry in 2013/14 will be lower than the previous year. The changes in Queensland Sugar Limited (QSL) pool prices provide one indicator of the likely size of the price decline. For example, in 2012/13 QSL's Discretionary Pool returned AUD 438.55 per tonne of sugar. Unless there is a significant improvement in market conditions, the QSL Discretionary Pool in 2013/14 is likely to return something in the order of AUD 395 per tonne. For Australian cane growers, the average farm-gate return in 2013/14 is expected to be \$38 a tonne, down from \$44 a tonne in 2012/13. This largely reflects the forecast lower world sugar prices in 2013/14. However, an assumed lower Australian dollar is expected to partially offset the effect of lower world prices on grower returns.¹ It should be noted however that the abovementioned forecasts are subject to high volatility given the sugar market's susceptibility to movement in economic factors, government policy and the impact of climatic events.

The export earnings of the Australian industry are also expected to continue to be affected over the next few years by world sugar supply, trade agreements, import tariffs, protected markets and government subsidies.²

World sugar consumption is forecast to increase by 2.2 per cent in 2013/14 to 176.8 million tonnes, reflecting the combined effects of lower sugar prices increasing sugar affordability, population growth and income growth, particularly in China, India and Indonesia.

Whilst current lower market prices are supporting positive consumption growth, the expectation for 2013/14 is that world sugar production will exceed consumption for the fourth consecutive year, resulting in a predicted surplus of 4.4M tonnes in 2013/14. The sugar market is expected to move closer to equilibrium over the next couple of years with continued growth in consumption, especially from Asian countries.³

World sugar balance



Source: World Sugar & Ethanol Outlook 2014, *International Sugar Journal*, Vol.114, Issue 1380, F.O. Licht.

1 *Agricultural Commodities*, Vol. 3 No. 4, ABARES, December Quarter 2013.

2 *Sugar Cane Growing in Australia*, IBISWorld Industry Report A0151, May 2013.

3 World Sugar & Ethanol Outlook 2014, *International Sugar Journal*, Vol. 114, Issue 1380, F.O. Licht.

With a forecast outlook of world production and consumption moving closer to balance and thereby reducing, or even eliminating, the world sugar surplus, the long-term price expectation is for marginal growth, with world sugar prices expected to increase from the second half of 2014 onwards.

On another positive note, significant growth in the sugar market is forecast to occur across the Asian region over the next decade, on the back of increased production capacity and consumption. This growth is supported by upward trends in personal income and preferences for western-style foods, government subsidies and the liberalisation of trade agreements.

With respect to trade agreements, the Australian Government has recently secured a Free Trade Agreement with South Korea. Under this agreement, tariffs will be phased-out over the next 15 years on a range of Australia's export commodity products, including sugar. The Australian Government is also seeking to create further opportunities for commodity exports under the Trans-Pacific Partnership, which is aimed at removing barriers to trade amongst countries bordering the Pacific Ocean.

The Australian sugar industry is well-positioned to benefit from free trade agreements with South Korea and, potentially, other East Asian countries such as Japan and China. Australia already predominantly exports its sugar to Asian markets, with around 75 per cent of exports going to South Korea, Japan and Indonesia. With its close proximity to these markets and subsequent lower freight costs, Australia has a strong competitive advantage against other sugar supplying countries, particularly Brazil which is the largest exporter to Asia/Pacific.

Over the long-term, the expected growth in sugar consumption in developing countries across Asia is expected to offset forecast lower demand for sugar in developed countries.⁴ In addition, the forecast consumption growth across Asia is expected to outpace production, particularly in China and Indonesia, resulting in a sizeable deficit by 2020 and thereby providing further trade opportunities for sugar exporting nations, such as Australia.

The growth in investment by Asian-owned companies in the Australian milling sector also provides opportunities for Australia to build on its current strength as a supplier to the region.⁵

That said however Australia faces a threat of competition for the Asian market from Thailand, with continuing growth in Thai exports to Indonesia, Japan, South Korea and China. Thailand's production is expected to increase by 50 per cent by 2020, with the aid of government incentives and subsidies, such as the current Thai government scheme to expand cane plantation by encouraging rice farmers to switch to growing sugarcane for better economic returns.

In order for the Australian sugar industry to be competitive and capitalise on these market and growth opportunities throughout East Asia, the industry will need to ensure that export volumes grow to match the rising demand.

Rabobank forecasts that by 2020/21, Australia's sugar production will need to increase by around 40 per cent from current levels to more than 5.7 million tonnes of raw sugar. At present, the Australian sugar industry only has the capacity to produce between 4 million to 5 million tonnes.⁶ Substantial capital investment and significant step-change improvement in productivity is required in order to achieve such an increase in production.

4.2.2. Australian production

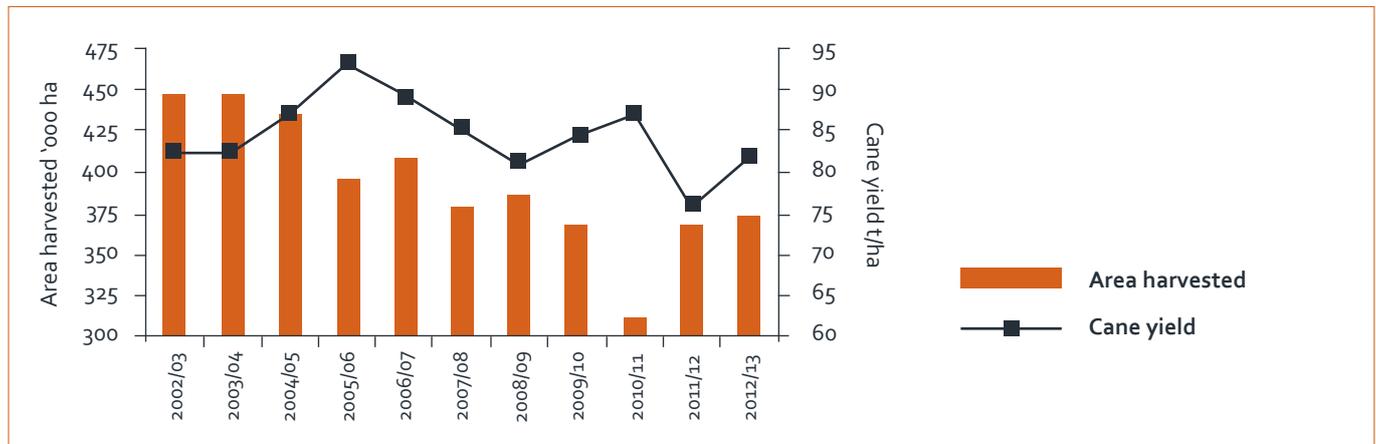
After a period of decline, Australia's sugarcane production has shown signs of recovery over the last two seasons. A total of just over 30.5 million tonnes of sugarcane was crushed during the 2013 season with an average cane yield of 83 tonnes per hectare, resulting in more than 4 million tonnes of sugar being produced. This was up slightly from the 2012 harvest of 30.4 million tonnes.

⁴ *Sugar Cane Growing in Australia*, IBISWorld Industry Report A0151, May 2013.

⁵ *Global Sugar to 2021*, Rabobank, 2013.

⁶ *Global Sugar to 2021*, Rabobank, 2013.

Australian yield trend



Source: Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES).

Looking forward, the industry is expecting to achieve in excess of 30-31 million tonnes in 2014, with a view to working towards returning to a yearly production of 36 million tonnes or more by 2017.

The main barrier to future industry growth in Australia will be limited sugarcane supply. To compete in the international market in the long-term and meet future demand levels, the Australian sugar industry will need to expand production, both horizontally and vertically.

In the short-term, an additional 2000 to 3000 hectares of land under cane is expected to come into production for the 2014 harvest. This will include new land being brought into cane production as well as former cane land being turned back into production after recently being used for timber plantation schemes.⁷

This does not include the potential for sugarcane production outside of the traditional cane-growing areas of the country. In the Ord River Irrigation Area of Western Australia over 13 000 hectares of land is currently under lease for future sugarcane production, including a proposed sugar mill. There is also a potential further 40 000 hectares of land being proposed for sugarcane production near Etheridge in Queensland, including a proposed 4.8 million tonne sugar mill. Both of these projects are yet to commence.

There are also currently projects proposed for the development of new mills and ethanol production facilities, such as the proposed sugar and bioenergy complex being considered for development south of Ingham. The proposed plant is expected to produce up to 330 thousand tonnes of sugar per annum, have an ethanol distillery capacity of between 90 and 200 kilolitres per day and generate more than 100 megawatts of power from bagasse and green waste. The need for increased cane supply and mill throughput will increase if these projects are successfully commissioned.

To encourage production growth and optimise milling capacity, milling companies are incentivising growers to bring new land into cane production and undertake earlier harvesting. Milling companies have also sought to increase vertical integration and improve cane supply by proactively acquiring land. Growers are also seeking to improve margins by expanding their respective production areas by purchasing cane land from retiring neighbours, resulting in the size of the average cane business having scaled-up over recent years.⁸ This activity is expected to continue into the future as growers and millers seek to leverage economies of scale and maximise mill throughput.

Whilst land under cane is expected to increase marginally by about 3 per cent over the next few years, such horizontal growth will be constrained by the low availability of agricultural land and the increasing high cost of inputs, particularly electricity, water and labour. Any material increase in output will also therefore be dependent on improved productivity and higher sugar yields.⁹

⁷ Source: CANEGROWERS.

⁸ Source: CANEGROWERS and *Sugar Cane Growing in Australia*, IBISWorld Industry Report A0151, May 2013.

⁹ *Sugar Cane Growing in Australia*, IBISWorld Industry Report A0151, May 2013.

Although the increased production will come mainly from existing cane farmers and millers expanding their land holdings and improving productivity, the industry will need to attract new growers if it is to be sustainable in the long-term. This is particularly important given the current socio-economic factors impacting the industry, namely the ageing grower base, lack of proactive succession planning and competition for labour from the mining sector.

Australia's sugarcane production and viability is expected to be further hampered by:

1. Long-term monoculture practice – Sugarcane in Australia has been grown as a long-term monoculture. The key impacts of having land under cane for prolonged periods of time include: yield decline; build-up of diseases and pests; increased soil acidification from high nitrogen-based fertiliser use; soil compaction; and depletion of nutrient and organic matter.
2. Increasing legislative and environmental compliance requirements – In recent years, the sugar industry has been under increasing pressure from environmental groups and government to minimise the impact of herbicide, pesticide and chemical use on the environment off-farm, particularly on the water systems and Great Barrier Reef. Legislative restrictions and compliance requirements have been introduced to provide greater control over the type and quantity of chemicals being used by the industry.
3. Extreme weather events, including cyclones, droughts and floods.

To combat the impact of these factors, the industry is continually seeking new and improved technologies to support more productive and environmentally responsive farming systems that will ultimately drive the industry's economic viability, profitability, sustainability, diversification and growth.

4.2.3. Australian consumption

The domestic sugar market takes up approximately 20 per cent of Australia's total production. The market is mainly made up of sugar refiners who process and on-sell sugar to industrial users, namely: food and beverage manufacturers; grocery wholesalers; and supermarket chains. To a lesser extent, sugarcane by-products, such as molasses, sugarcane juice, bagasse, mill ash and mud are also marketed by milling companies for sale to agricultural and industrial users.

Similar to other developed nations, sugar consumption in Australia has been contracting over recent years. With Australia's relatively low projected population growth coupled with growing consumer health awareness and associated changes in dietary intake, per capita sugar consumption is expected to continue to decline or remain static over the longer-term. However, this downward trend in Australian consumption is expected to be offset by the rising demand for sugar from developing countries where consumption is trending upwards in line with increasing disposable incomes and associated discretionary spending. In short, the limited growth opportunities in the domestic market will mean Australia's sugar industry will continue to be supported in-the-main by its participation in the international sugar markets.

4.2.4. External competition

The Australian sugar industry currently has no direct competition from other domestic crops for the production of raw sugar in Australia. Whilst sugar can also be produced from sugar beets, these are not presently grown on a commercial scale in Australia. The sugar industry is however at threat from competition in the manufacturing end of the supply chain. In particular, the Australian sugar refiners and manufacturers face growing competition from the manufacturers of sugar substitutes.

The use and price competitiveness of alternative natural and artificial sweeteners (such as high fructose corn syrup (HFCS), stevia, aspartame, saccharin and xylitol) is expected to continue to rise in the coming years in response to increased public health consciousness, the growing swell of negative publicity regarding sugar consumption and the associated trends in consumer dietary preferences. Looking ahead, there is a real likelihood of significant impact on Australia's sugar industry if the Australian Government pays heed to the growing calls from some political bodies and health groups, such as the Australian National Health and Medical Research Council and World Health Organisation (WHO), to introduce legislation or taxation regimes to limit the consumption of food containing added sugars.

With domestic consumption being limited by slow population growth and a more health-conscious consumer base, the future growth of the Australian sugar industry will be dependent on the industry's ability to successfully compete in the world sugar export market and value-add through diversification of its product base.

4.2.5. Diversification

Australia's sugar industry is very much reliant on high-quality raw sugar production for revenue. With this reliance on a single product, comes a higher exposure to the volatility in world sugar prices. By increasing diversification into different and commercially viable revenue streams, the industry can reduce its reliance on raw sugar production and thereby mitigate its exposure to global volatility.

Current technological trends in alternative sugarcane products include advanced biofuels, such as cellulosic ethanol and biobutanol, and innovative polyphenol-based biodegradable plastic products.

Whilst Australia's milling sector strongly supports diversification and actively pursues alternative products, current technology and economic viability issues render most projects unfeasible at this time. SRA will continue to work with the industry to identify further diversification options and, where economically viable for the industry, will seek to develop the R&D to underpin these opportunities.

In addition, SRA will also look to support the industry in limiting its exposure to risk by continuing to undertake R&D into genetically-modified (GM) cane that will provide the industry with more hardier and productive cane varieties.

To further limit risk in the long-term, industry consideration should also be given to possible expansion into co-products that support sugar production, such as sugar beet crops.

4.3 R&D trends

The RD&E focus around the world varies greatly and reflects the different needs of the sugar industry's heterogeneous production and processing systems.

The three areas receiving most attention today are: broadening of the sugarcane germplasm base to drive further enhancements in productivity; better resource and input utilisation; and diversification in utilisation of sugarcane biomass.

Current trends in on-farm technological innovation include:

- Geo-spatial technologies, ground-based sensors, laser scanners and 3D crop-modelling to provide crop, soil and climate data to assist growers in managing the application of fertilisers and chemicals, crop protection, climate and yield forecasting and harvesting.
- GPS-based precision auto-steering and farming machine control.
- Productivity applications that support manual in-field data entry via on-machine or hand-held devices.
- Robotic and drone technology for crop monitoring and weed control.
- Advancements in computer regulated irrigation systems.

Historically, sugarcane RD&E has been in the hands of industry- and government-owned institutions with modest contributions from universities and private R&D companies. This has changed drastically in the past five years with many major agribusinesses now heavily involved in varietal improvement and improved farming systems. In some instances, linkages between industry-owned entities and these agribusinesses have been formalised.

Australia is recognised widely as the leader in conventional sugarcane breeding and development of fully mechanised farming operations, especially for the medium-sized, family-owned farming system common in Australia. Sugar yields and sucrose recovery in Australia's milling operations are the international benchmarks.

4.4 SWOT analysis

As the Australian sugar industry-owned RD&E company with global reach, SRA operates within a business environment of current and emerging market, political, economic, social, technological, legislative and environmental trends, issues and opportunities. These driving forces have been considered and addressed, where necessary, in our strategy development process and provide context for this Strategic Plan.

The achievement of the objectives outlined in this plan will largely depend on how SRA enhances its internal strengths, exploits opportunities and manages the weaknesses in both its own operations and that of the industry, while controlling those factors that pose a threat to the achievement of its planned programs and associated outcomes. A summary of the Australian sugar industry and SRA's key Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis is provided below.

	Industry	SRA
Strengths	<ul style="list-style-type: none"> • Well established and mature industry. • Proven production and marketing system. • Structured grower, miller and industry organisations. • High-quality, reliable sugar exporter. • Strong agronomic research and development capacity. • Established network of service providers and advisors. 	<ul style="list-style-type: none"> • Established multi-disciplinary RD&E expertise, capacity and facilities. • Well regarded and recognised nationally and internationally. • Local presence and access to industry. • Good relationships with industry representative bodies and individual growers and millers. • Established links and networks with national and international research and commercial bodies. • Collaborative business model.
Weaknesses	<ul style="list-style-type: none"> • 'Price taker' environment. • Long-term monoculture practice. • Sugar-centric. • Economic viability and feasibility of alternative products. • Age profile of industry participants and lack of succession planning in the field sector. • Ability to attract suitably skilled personnel. • High-cost of capital investment. • Inherent conflicts and inefficiencies in industry supply chain, such as differing value drivers between growers, harvesters and millers. • Extensive lag between RD&E investment and industry benefits and outcomes. 	<ul style="list-style-type: none"> • Industry perception that there is a lack of appropriate engagement and communication. • Research and development results and technology not broadly adopted or applied in practice, particularly with respect to smaller growers. • Lack of succession planning and professional development for young researchers. • Lack of staff with milling R&D expertise. • Lack of awareness of SRA achievements.
Opportunities	<ul style="list-style-type: none"> • Potential for horizontal and vertical expansion. • Unutilised mill processing capacity. • Corporatisation and consolidation of farms providing improved economies of scale and productivity. • Increased foreign investment in land and mills. • Improving access to markets with opening-up of trade agreements. • Geographically well-positioned to supply growing Asian market. • Step-change productivity improvement. • Diversification into value-added product streams. • Expansion of cogeneration of electricity. 	<ul style="list-style-type: none"> • Development of high-yielding and stronger performing sugarcane varieties. • Development and transfer of improved farming, harvesting and milling practices and technologies. • Identification and development of technologies for diversification into value-added product streams. • Supply chain efficiency improvements. • Collaboration and networking with national and international research institutions. • Increase linkages between researchers and industry. • Expansion of capacity building and knowledge transfer.

	Industry	SRA
Threats	<ul style="list-style-type: none"> • Ongoing increases in production costs, particularly electricity and water. • Knowledge and labour loss due to ageing workforce and competition with other sectors. • Exposure to volatility in world sugar supply and prices. • Extreme weather events. • Increasing environmental compliance and community scrutiny of industry's environmental performance. • Disease and biosecurity outbreaks. • Changing patterns of consumption and consumer attitudes towards sugar. • Product competition from alternative sweeteners. • Industry competition from expanding low-cost producers. • Lack of diversification. • Loss of a single marketer and associated impact on growers – i.e. growers' knowledge and ability to make pricing and marketing decisions. 	<ul style="list-style-type: none"> • Loss of existing talent and core competencies through staff leaving and lack of retention and succession planning. • Major international milling companies may choose their own RD&E investment pathways outside of SRA.

For SRA to successfully advance its national and international standing as a leading sugarcane RD&E organisation, it must:

- address its weaknesses
- manage potential threats
- capitalise on opportunities and existing and emerging strengths in its RD&E disciplines
- gain value in how these disciplines translate into success for the Australian sugar industry.

5.0 Roles and responsibilities



The SRA Board is responsible for the overall governance and decision-making framework of SRA. This includes setting and overseeing the strategic direction to ensure the company is positioned and focused to address industry's strategic imperatives and deliver the desired outcomes to the Australian sugar industry. The Board also set SRA's processes and policies with regard to employees, risk management, financial management and legal conduct, and ensure that SRA always operates in an ethical and professional manner. The Chief Executive Officer is responsible for the overall management of SRA on behalf of the Board.

5.1 Core responsibilities

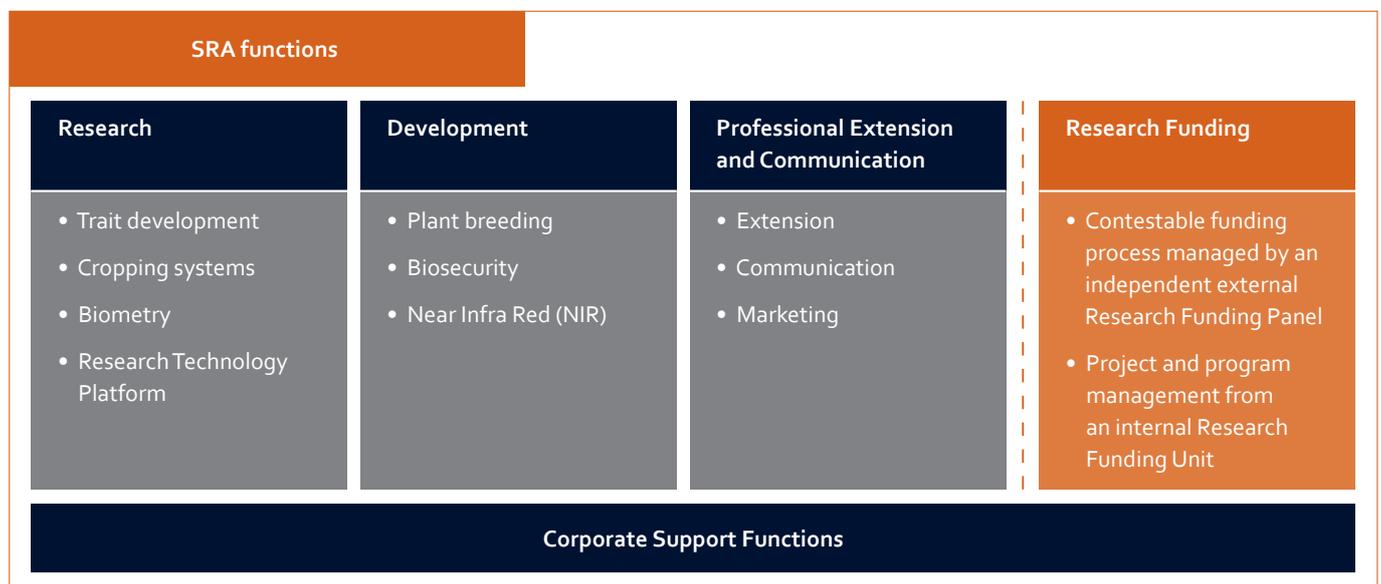
As laid down in SRA's Constitution, the core responsibilities for the company are:

- Delivering cost-effective R&D services to the Australian sugar industry to enhance its viability, competitiveness and sustainability.
- Carrying-out, coordinating and providing funding for R&D activities in relation to the Australian sugar industry.
- Facilitating, dissemination, extension, adoption and commercialisation of results of R&D activities.
- Supporting and developing industry research capacity.

SRA is both a funder and provider of RD&E to the Australian sugar industry. In addition to facilitating and investing in targeted RD&E that addresses industry priorities, SRA has its own team of researchers who carry out work that builds the capacity and security of the industry. They also provide analytical operational support to our multi-disciplinary teams and collaborative RD&E projects.

We work in partnership with leading domestic organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), universities, government and other industry groups such as regional productivity services, growers, millers, harvesting contractors and manufacturers, and natural resource management companies. We also reach out to international sugarcane research organisations to create collaborative opportunities and capability enhancement for the benefit of the Australian sugar industry.

In line with our core responsibilities, our business is structured to provide value to our levy payers through three specialist RD&E functions and an independent research funding function that manages SRA's contestable RD&E investment process. These core functions are supported by corporate services that are focused on governance and enterprise-wide frameworks and systems that align with SRA's strategic direction.



5.2 SRA research

The trait development program applies conventional breeding, plant molecular biology, transgenic technology and plant functional biology approaches to develop sugarcane with new and commercially important traits. These traits include pathogen and pest resistance, herbicide tolerance, drought tolerance and more efficient water and nutrient use.

Developing and implementing advanced micropropagation technologies to accelerate variety release and adoption is a major thrust of this program. The evaluation of molecular markers for marker-assisted selection is also a priority focus. This program is conducted in collaboration with DuPont, Syngenta, CSIRO, The University of Queensland, the International Consortium for Sugarcane Biotechnology and international collaborators.

The improved cropping systems program focuses on developing farming systems that improve the economic and environmental sustainability and supply security of our customers. By investigating the use of innovative technologies and practices for use on-farm, including the optimal use of sugarcane varieties, the program develops better management principles for industry success.

Best-practice nutrient management is essential for minimising the risk of losses in productivity and maintaining sustainable farming systems. SRA works with industry to instil a better understanding of soil types, the nutrient properties of soil and how best to manage nutrient processes and losses.

Many of SRA's Research function's activities are undertaken in collaboration with other organisations, including individual growers or grower-groups, productivity services, millers, harvesting contractors and manufacturers, the National Centre for Engineering in Agriculture (NCEA), Australian universities, Queensland government departments, CSIRO, natural resource management groups, commercial companies and international partners.

5.3 Development

The SRA sugarcane breeding program is a fully integrated conventional and molecular breeding activity. Our selection program uses optimal genetic evaluation systems to select parents, crosses and clones to deliver new sugarcane varieties that are more productive, disease resistant and adapted to local conditions and constraints. Variety introduction and variety exchange programs, at both a domestic and international level, enhance the germplasm used for breeding and varietal development.

Exotic diseases and pests represent a significant threat to the continued security of cane supply for the Australian sugar industry. Cooperating with federal and state government departments to prevent entry of these pests and to prepare for possible incursions is a high priority for the SRA biosecurity program. In collaboration with our variety improvement activities, our biosecurity program aims to breed disease and pest-resistant varieties and support quarantine and disease-free seed cane programs.

SRA's Research and Development functions are closely aligned. To deliver more productive and sustainable farming systems, a combination of improvements in technology and processes relating to: varieties; soil health; cropping; pest, weed and disease management; harvesting; environmental and climate management; and so forth is required. Appropriate communication and extension tools and processes are also essential for promoting and fostering adoption of innovations.

5.4 Professional Extension and Communication

SRA is the recipient of levy funds from growers and millers for the purpose of investing in RD&E activities that enhance the productivity, profitability and sustainability of the Australian sugar industry. The Professional Extension and Communication (PEC) unit has an integral role within SRA, having two discrete but related functions.

Firstly, as the link between the R&D, advisor and grower communities, SRA's PEC unit offers specialist extension support and provides information and products that lead to better outcomes for growers and millers. These products and services are in the form of publications, decision-support tools, workshops and events, and are made available across different mediums.

In doing this, SRA aims to encourage the adoption of innovative R&D findings, practical outcomes and new technologies on the farm and at the mill, to improve industry productivity, profitability and sustainability.

The second function of the PEC unit is to convey to members and levy payers the value obtained through the investment of their levy payments. This is achieved through communication and promotion of SRA's R&D outcomes, investments and achievements using a variety of methodologies appropriate to the audience.

5.5 Research funding

In addition to our in-house research and development functions and expertise, SRA operates an open contestable funding process designed to encourage researchers and research organisations from the broader sugar research community and other academic and agricultural sectors, to bring their best ideas to our industry.

The contestable funding process is managed by the Research Funding Panel (RFP), an independent skills-based Panel appointed by the SRA Board. The RFP ensures that through a rigorous and robust evaluation of all applications, only high-quality RD&E projects that address industry and government issues and priorities are funded.

The total investments by SRA in research and industry capability cover research, development and extension projects, postgraduate scholarships for education and training purposes, capacity building opportunities for industry personnel and on-farm participatory projects to enhance the sharing of knowledge and adoption outcomes at the local level.

With accountability for all SRA-funded projects, every dollar invested in research and development will be aimed at producing knowledge and practices that can be adopted on-farm and at the mill. Successful projects are expected to demonstrate a significant industry return on the project investment and contribute to triple-bottom-line benefits.

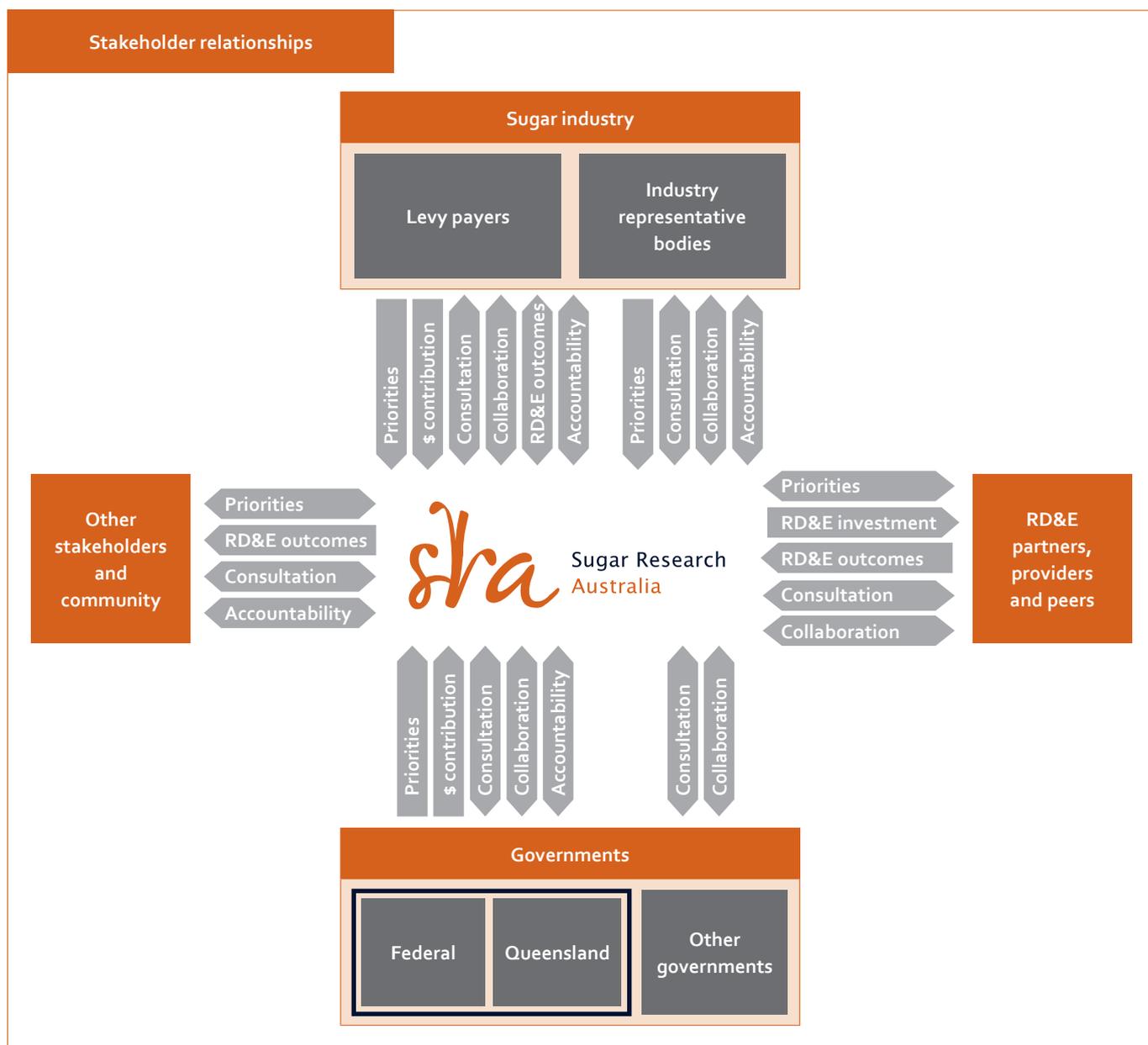
The overall management of the RD&E investment process, and the day-to-day project management of the suite of SRA-funded projects, is conducted by the Research Funding Unit (RFU). The RFU is an internal body which conducts its' activities independently of all other SRA functions and reports through to the RFP.

6.0 Stakeholder relationships



SRA is committed to open, accountable and responsive decision making, informed by effective communication, consultation and engagement with our stakeholders.

The diagram below depicts the linkages and flow between SRA, industry and government stakeholders.



SRA will continue to work closely with industry and government stakeholders to ensure the activities outlined in this plan address their needs and priorities, and, more importantly, deliver outcomes that return significant RD&E value for the benefit of the industry as-a-whole and the broader Australian community.

7.0 Consultation



SRA is committed to a positive, proactive and responsive consultation approach that ensures industry stakeholders and government interests, issues and priorities are identified, heard, valued and, most importantly, considered in the development of SRA's Strategic Plan.

SRA's Strategic Plan has been developed on the back of a comprehensive participatory and collaborative consultation and engagement program with industry and government stakeholders.

To ensure all sectors of the industry were included in the consultation process, SRA provided an open-invitation to levy payers, industry representative bodies, smaller industry organisations, RD&E organisations and other interested stakeholders.

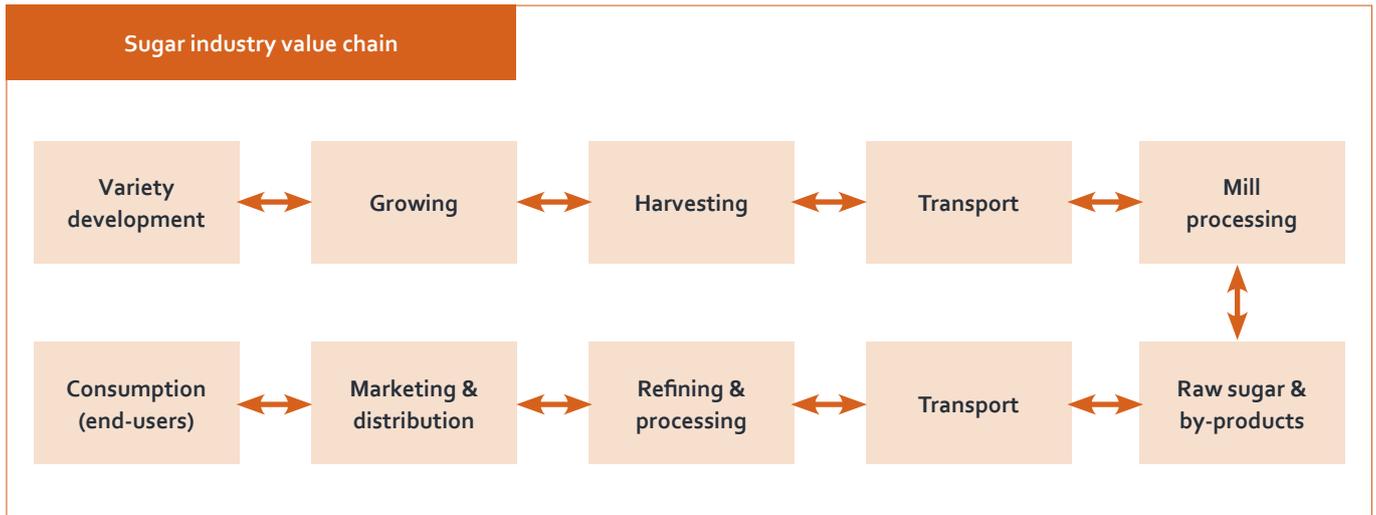
A range of activities was included in the consultation process to augment industry involvement and encourage as broad a collection of industry-wide viewpoints and feedback as possible. The consultation and engagement activities included:

- industry forums
- online industry stakeholder survey
- face-to-face and telephone consultations
- website and media communications
- written submissions.

The primary activity of the consultation program was a series of industry forums that were undertaken during November and December 2013 and facilitated by an industry-experienced independent facilitator. A total of nine forums were held – seven Regional Forums, one Young Industry Participants' Forum and one Researchers' Forum. The Regional Forums were held in the sugar industry regions of Ballina, Bundaberg, Mackay, Ayr, Ingham, Tully and Gordonvale. The Young Industry Participants' Forum (with participants nominally less than 35 years of age) was held in Townsville and the Researchers' Forum in Brisbane.

Over 270 people attended the forums – with attendance ranging from 22 to 50 people at each forum. A good cross-section of industry attended with growers (including small, medium and large growing businesses), milling staff (both management and operational staff) and a number of harvester operators, fertiliser company representatives, productivity services officers and industry representative body staff attending. Whilst the forums had a good mix of industry representation, it should be noted that the total attendance represents only a small proportion of the total number of industry participants.

During the forums, the industry value chain (as depicted below) was analysed to identify current issues, challenges, and opportunities for SRA to consider and address through appropriate RD&E over the coming years. Detailed information was gathered through group interaction with and between the participants.



The output from the forums, along with the completed industry surveys and other industry input received during the consultation process (including submissions from industry representative bodies and government), has been synthesised and provides the basis for the priority issues and key areas of focus for RD&E addressed in this plan.

8.0 RD&E priorities



8.1 Priority alignment

As the declared industry services body for the Australian sugar industry, SRA is charged with responsibility for providing RD&E solutions that not only meet the needs and priorities of the industry but also those of government and the wider Australian public.

SRA recognises that in order to deliver on this responsibility, it needs to be cognisant of all industry and government RD&E priorities and ensure that our key areas of focus, and associated RD&E activities and investments, are informed by and align with these priorities, where consistent with SRA's Constitution and SFA.

The Australian and Queensland governments are significant contributors towards RD&E funding for the Australian sugar industry and, as such, it is imperative that the RD&E investments and activities undertaken by SRA demonstrate appropriate returns and outcomes, including benefits for the public good.

To this end, SRA has ensured that this Strategic Plan addresses the industry priorities identified during SRA's strategic planning consultation process aligns with, and gives effect to, the broader RD&E priorities of the sugar industry representative bodies and government stakeholders.

In particular, the key areas of focus outlined in this plan are informed by and align with the principles, strategies and priorities set out in the following strategic documents:

- *Statement on Priorities for Research 2011–2014, ASA, 2011*
- *National Primary Industries RD&E Framework and Guidelines, Department of Agriculture*
- *National Sugarcane Industry RD&E Strategy, 2010*
- *Strategic Research Priorities, Australian Government, 2013*
- *Rural Research and Development Priorities, DA, 2007*
- *Queensland's Agriculture Strategy, Department of Agriculture, Fisheries and Forestry (DAFF), 2013.*

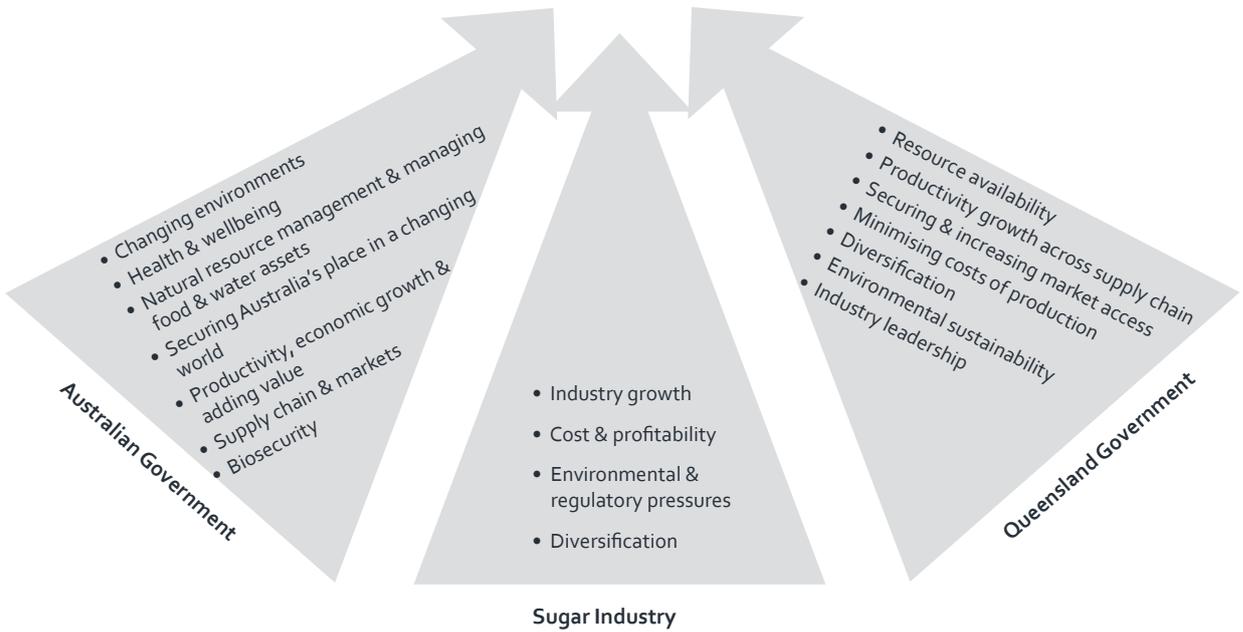
The main priorities that underpin these key strategic documents are highlighted below, along with the overarching outcomes that will benefit the sugar industry and provide broader public good.

Value drivers

Outcomes



Industry and government priorities



These priorities, along with the more tactical priorities identified during our consultation program with industry and detailed below, provide the foundation for the key areas of focus and associated activities that SRA will undertake over the plan period. A matrix detailing the alignment between SRA's key areas of focus and the industry and government priorities is provided in Attachment 1.

8.2 Industry priorities

The depth, breadth and overlap of the issues and themes that were raised by industry during the development of this plan are demonstrated below by way of a thematic word cloud. The larger the word, the more frequently it was raised during the consultation process.



In general, there was a convergence of industry views on the major issues, drivers, constraints and emerging RD&E opportunities facing the industry. The main themes or priorities that generally stood-out and had consensus during the industry consultation were the need to:

1. Increase yield, productivity and profitability:

- Provide more robust varieties that suit local conditions.
- Improve soil health, nutrient management and control of pests, diseases and weeds.
- Limit the cost of production, particularly input costs such as electricity, water and chemicals without compromising yield.
- Continue development of GM canes.
- Increase grower involvement in the breeding process with earlier adoption of varieties and more regional trials.
- Provide more comprehensive information/data on varieties to growers, including the specific needs and care of particular varieties.
- Improve ratoonability.
- Increased use of remote sensing, climate forecasting and Precision Agriculture (PA).

-
- Implement harvester best-practice to limit cane and sugar losses.
 - Improve milling technology and process efficiency.
 - Increase product diversification.

2. Increase adoption of R&D:

- Improve transfer of R&D and best-practice across the industry.
- Increase SRA staff interaction at the grass-roots level and more ongoing communication and collaboration between SRA and the industry.

3. Increase industry capability:

- Increase cross-industry and cross-sectoral collaboration, both nationally and internationally.
- Address industry social issues relating to aging workforce, knowledge retention and attraction of suitably skilled workers.

In short, the message from industry is clear. SRA needs to focus on RD&E that can assist the industry to improve production efficiency, accelerate the transfer of R&D into practice and forge stronger strategic relationships and collaborations with industry and RD&E organisations.

During the industry consultation, it was recognised that a lot of good industry R&D work had been completed in the past and successfully adopted, particularly by the larger sugarcane producers, however the technologies were not necessarily adopted by all sectors of the industry. SRA will look to review examples of where past R&D was not taken up and work with the industry to identify the barriers to adoption. SRA will also look to establish appropriate collaborative mechanisms for knowledge and technology transfer to enable the intended benefits and outcomes of industry RD&E to be achieved broadly across the industry.

It was also made very clear to SRA during the consultation process that the industry does not want to see the 'wheel reinvented' unnecessarily with respect to particular R&D areas. It was acknowledged that significant R&D has been undertaken over the years to address some of the above issues and that researchers should be cognisant of this past R&D to avoid duplication and to look for opportunities to extend or build on this previous work.

The intent of this plan is to ensure that industry priorities are clear and that RD&E resources and investment are directed towards achieving the desired outcomes, both current and future, for the sugar industry and the broader community.

SRA will continue to consult and engage with industry on the above issues and priorities and how they are being addressed through the delivery of this plan. In particular, SRA will meet regularly with industry representative bodies to discuss industry RD&E issues, priorities and how SRA, and the industry, are tracking with respect to achieving the objectives and outcomes for this planning period.

8.3 National Sugarcane Industry RD&E Strategy

Under the *National Primary Industries RD&E Framework* and the SFA, SRA is designated, alongside DAFF, as the lead agency responsible for the review and development of the *National Sugarcane Industry RD&E Strategy* (the 'Strategy'). This Strategy outlines the principal objectives for cooperation, collaboration, capability development and knowledge sharing by industry stakeholders and RD&E providers.

Given the extensive RD&E structural reform process that the sugar industry has undergone since the Strategy was first published in 2010, there is a pressing need to undertake a comprehensive review and rewrite of the Strategy. To this end, SRA and DAFF have agreed to work closely together during 2014, in collaboration with industry representative bodies and RD&E organisations, to develop a new, robust and contemporary Strategy. The new Strategy will provide the foundation for improving and maintaining the RD&E capacity, capability and extension required for the industry to effectively respond to priority issues and deliver sustainable benefits.

A Strategy Steering Committee (comprising representatives from SRA, DAFF and ASA), supported by a Strategy Working Party (comprising national representation from industry representative bodies, universities and RD&E organisations), will be established in early 2014. The first order of business for the Committee will be to agree on the Strategy's Terms of Reference and project timeline.

One of the critical projects to be undertaken in developing the new Strategy will be a comprehensive industry skills and capability assessment, with a view to understanding capacity and capability issues facing the industry (both current and future) and to identify critical capability gaps across the industry supply chain, including the RD&E sector.

8.4 Collaboration

In addressing the priorities of our stakeholders and meeting the objectives within this plan, SRA recognises the importance of working with industry, partners, collaborators, government and other organisations to leverage synergies and enhance capability. In doing so, SRA will seek to undertake:

- Greater focus and effort towards industry and cross-sectoral collaboration.
- Active facilitation and support for capability development and maintenance in sugarcane RD&E, including working with other researchers, universities, CSIRO and the private sector, both nationally and internationally.
- Identification of, and negotiation with, alternative investors and/or research providers for investment in RD&E (particularly translational research and extension).

SRA will also undertake cross-sector collaboration and invest with other IOCs and RDCs to undertake collaborative RD&E that will benefit the Australian sugar industry and the broader Australian community. In particular, SRA will participate, where appropriate, in cross-sectoral strategies that fall under the *National Primary Industries RD&E Framework*.

SRA participation in collaborative activities and cross-sectoral strategies is based on the SRA Board's assessment of the following criteria:

- 1) The quantum of funding, if any, that SRA is required to contribute.
- 2) Alignment of the strategy with the SRA Strategic Plan.
- 3) Direct relevance and benefit of the strategy to the Australian sugar industry.
- 4) SRA having active involvement and influence in the strategy implementation.
- 5) Availability of SRA in-house expertise to contribute to the strategy implementation.
- 6) Capacity building opportunities for SRA.
- 7) Capacity building and/or retention opportunities, outside of SRA, in specialist or short-skilled areas that are of significant benefit to the sugar industry (e.g. climate forecasting, milling technology or translational research).
- 8) Meaningful contribution to the broader public good.

SRA currently invests in and collaborates on cross-sectoral R&D in the following strategy areas within the *National Primary Industries RD&E Framework*:

- biofuels and bioenergy
- climate change and managing climate variation
- water use in agriculture
- plant biosecurity
- soils
- occupational health and safety (up to 30 June 2014 only).

Consideration will be given to participate in other cross-sectoral and collaborative activities that meet the above criteria as opportunities arise. For example, SRA will look to opportunities for collaborating with other IOCs on identifying strategies relating to knowledge transfer and adoption. We will also seek to work with other IOCs on addressing the cross-sectoral challenges and social issues associated with the attrition, attraction and retention of appropriately skilled industry workers – in particular, the resulting impact on industry capacity and knowledge from the retirement of older farmers and researchers.

In addition to participation in cross-sectoral strategy implementation, SRA will also continue to pursue strategic partnerships and collaborate with other researchers and international peers on advanced technologies and agricultural practices, including:

- sequencing of the sugarcane genome
- molecular markers for improved plant breeding and selection
- GM variety development
- new planting technologies
- improved sugarcane crop models
- improved water use efficiency
- improved energy use efficiency.

The progress and outcomes of SRA's collaborative partnerships will be monitored on an ongoing basis to ensure that resources and effort are fully productive.

9.0 Strategic framework



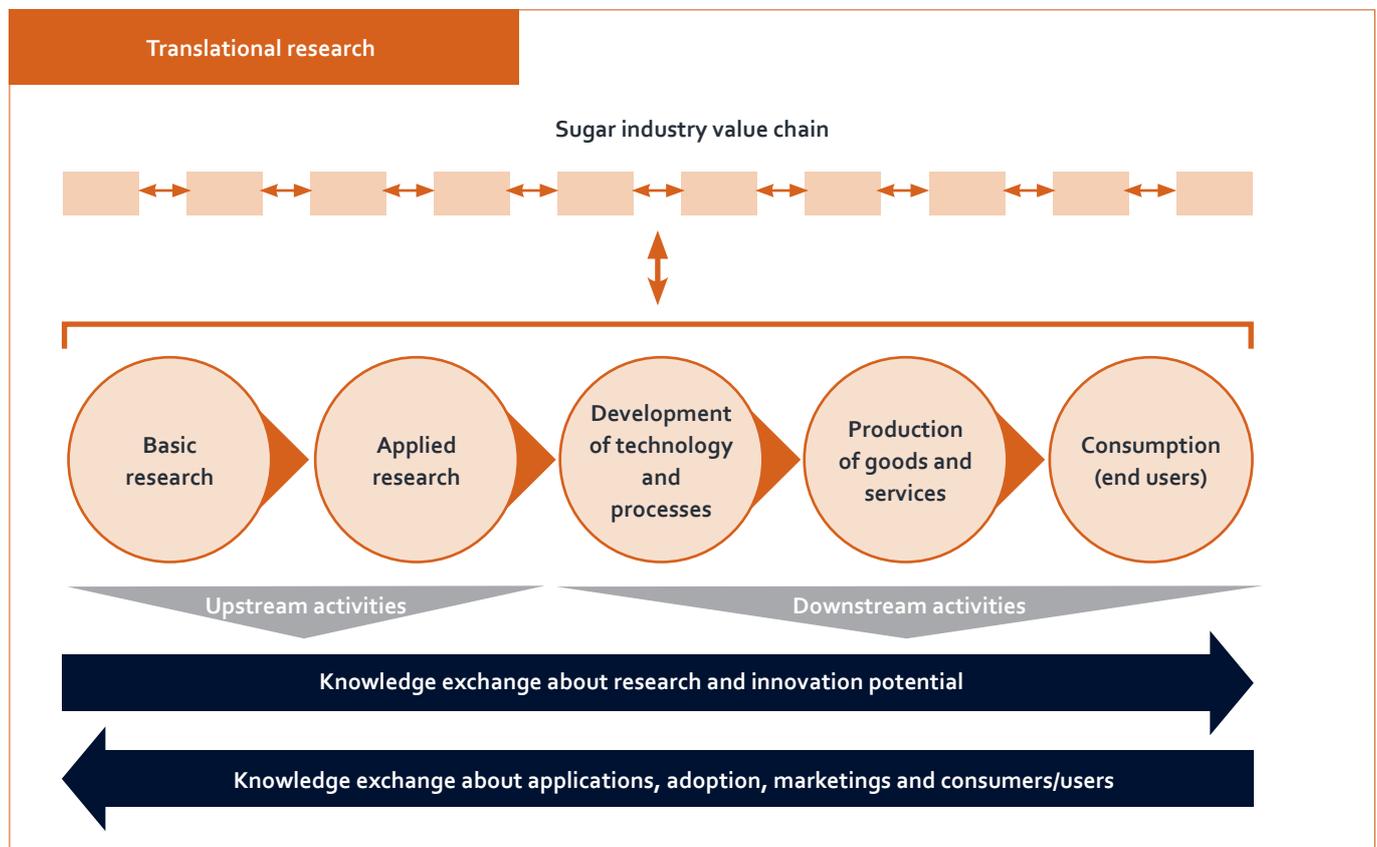
9.1 Translational research

To be effective, the industry's RD&E framework must be focused on delivering outcomes, not just research. The elements of the framework must come together to ensure R&D outputs can be translated into practical outcomes.

SRA is committed to leveraging its RD&E investment and capability to the maximum extent possible for the benefit of the Australian sugar industry. In doing so, SRA will embed a strategic framework that supports an integrated and participatory approach to developing, translating and transferring research and technology.

Translational research is central to closing the gap between R&D and practice and overcoming any barriers to effective dissemination and adoption of new technologies, practices and novel farming and milling practices. It facilitates a pathway from research inception, to development, to awareness, to acceptance, to adoption and then on to step-change improvement.

To succeed, translational research requires an outcome focused, knowledge-driven, collaborative and multi-disciplinary RD&E model. In particular, success is dependent on the interactions between players in the value chain and knowledge flow or exchange both down-stream and up-stream in the value chain.



Source: Adapted from *Translational Research and Knowledge in Agriculture Food Production*, RAND Corporation, 2011.

Under a translational research model, SRA will need to take the R&D from the laboratories or research stations to the farms and mills and transform basic R&D breakthroughs into on-farm and at-mill applications on an appropriate scale. The model emphasises the systemic nature of translational research and knowledge transfer and the need for incorporating interactions across the sugarcane value chain. Knowledge exchange at all phases of RD&E and across the value chain will provide feedback loops that will contribute, and add value, to the R&D and, ultimately, improve the R&D outputs.¹⁰

In short, we will seek and promote the involvement of industry, where appropriate, in the planning phase of individual RD&E projects, the development and implementation phases of the projects, and in ongoing liaison and evaluation regarding the outcomes of the RD&E. In preparing research proposals, researchers will need to have regard to the outputs and outcomes from the research and, more importantly, how the outputs can be disseminated. SRA's PEC unit will then work with researchers and developers (both in SRA and those funded through the RFP contestable process) to determine the appropriate mechanisms for the knowledge or technology to be shared.

For SRA to have the capacity to translate research and technological innovation into practical solutions, appropriate organisational systems, procedures, capacity building and cultural change programs will need to be established.¹¹

9.2 Corporate strategies

In order to enhance research and technology transfer and adoption, SRA will employ the following corporate strategies:



In terms of operationalising these strategies, SRA will undertake to:

- 1) Implement an integrated multi-disciplinary approach to developing research solutions;
 - Address critical industry RD&E issues with a better understanding of the role or impact each element of the sugarcane production system has on performance.
 - Give consideration to all of the causal factors and the associated negative or positive compounding impact they may have on the system.

¹⁰ *Translational Research and Knowledge in Agriculture Food Production*, RAND Corporation, 2011.

¹¹ *Knowledge for purpose: managing research for uptake—a guide to a knowledge and adoption program*, Department of Sustainability, Environment, Water, Population and Communities, Canberra, 2012.

-
- 2) Apply innovative ways to define core problems and identify and analyse gaps in existing research.
 - 3) Identify key areas of focus for RD&E investment to address industry issues.
 - 4) Coordinate investment in RD&E activity through programs addressing quantified industry outcomes within key areas of focus incorporating leading-edge technology with short, medium and long-term focus.
 - Be cognisant of each key priority area in its funding calls and evaluate project proposals for appropriateness, cost effectiveness and practical application.
 - Commission reviews, analyses and conduct workshops, when necessary, with potential research funding applicants and research end-users to identify priorities for investment, based on potential industry benefits and likelihood of success, and the essential component projects.
 - Commission, where appropriate, program plans and specific RD&E work to deliver the essential components, including activity outside of traditional research, such as social, behavioural, economic, feasibility, marketing or translational research.
 - Undertake more than one project call a year, where necessary, so that specific areas of focus are addressed in a timely strategic manner.
 - 5) Include extension and adoption planning in research funding project proposals, with ongoing monitoring and adaption, where necessary, at various project stage-gates.
 - 6) Ensure research is not done in isolation and implement new systems to ensure that research knowledge is shared appropriately and aligns with other projects wherever possible.
 - 7) Apply a strong disciplinary approach to extension with better linkage into research and engagement with a broader base of knowledge transfer, extension and adoption intermediaries.
 - Engage growers, harvesters and millers in research design, development and progression, where appropriate.
 - Embed researchers within adoption/extension activities, where appropriate.
 - Package technologies appropriately to meet regional needs and end-user needs.
 - Develop and deploy appropriate technology transfer tools.
 - Disseminate appropriate technologies to end-users.
 - Promote, coordinate, facilitate, conduct and provide support services to extension programs.
 - Evaluate effectiveness of technology transfer tools.
 - Assess uptake and impacts of developed technologies.
 - Improve the existing feedback mechanism.
 - 8) Leverage relationships with national and international peers and partners.

SRA is committed to improving research translation as the means by which our levy payers, the industry in general and the broader community benefit from our R&D activities.

However, in terms of delivering outcomes to the industry, SRA should be viewed as an enabler and/or contributor only. We cannot deliver the outcomes ourselves – we require the continuing cooperation and collaboration of the sugar industry and our RD&E partners. Our role is to create value by bringing innovative technology, processes and practices to the industry and facilitating the uptake of these innovations. It is up to the sugarcane growers, harvesters, millers, advisers and other stakeholders in the industry value chain to embrace and adopt research innovation so that the industry as-a-whole can deliver the step-change improvements necessary to move the industry forward.

10.0 Strategic intent

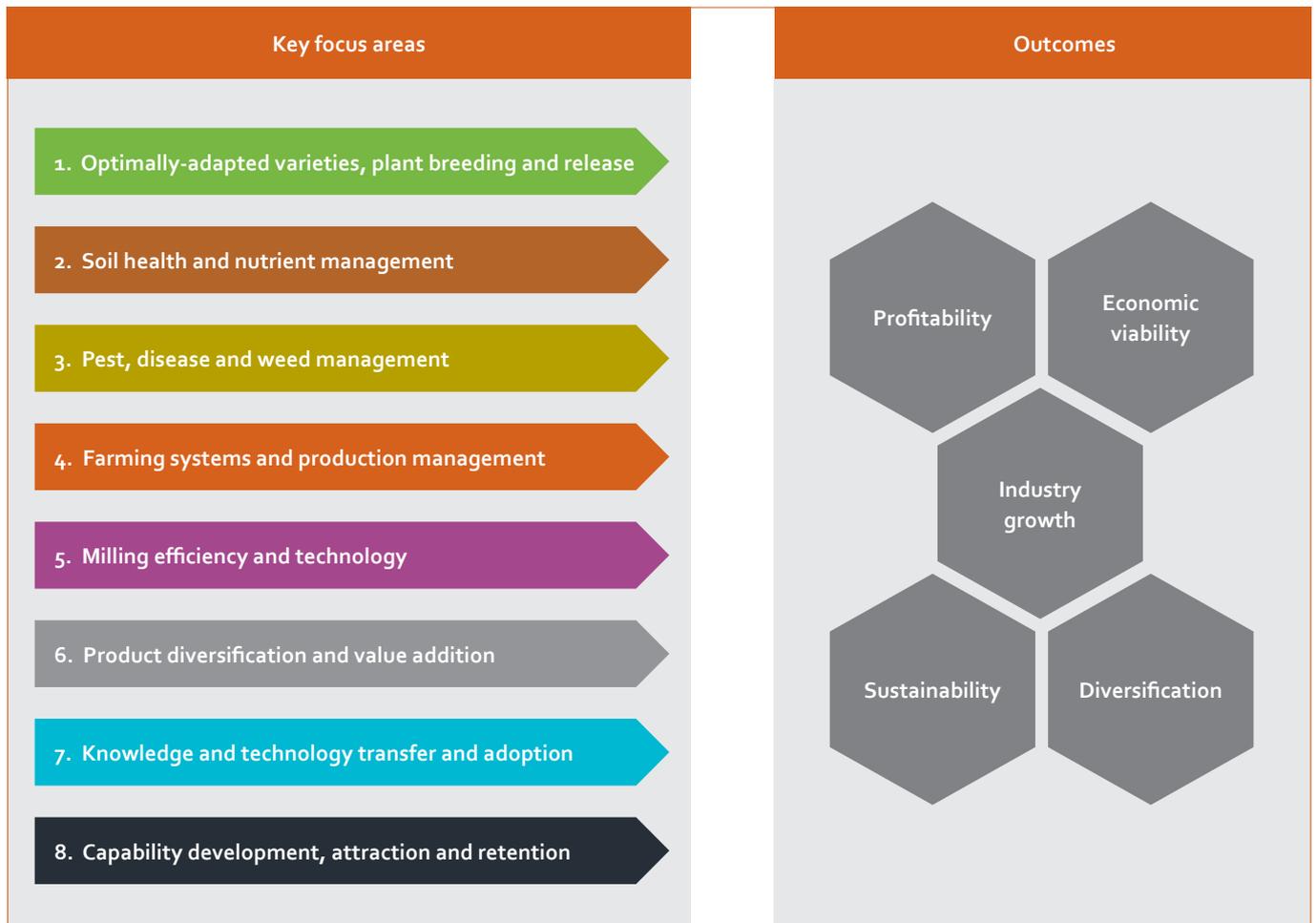


10.1 Vision, purpose and values

<p>Our vision</p>	<p>Delivering valued solutions for a growing Australian sugar industry</p>	<p>The provision of 'valued solutions' relates to SRA's ability to actively anticipate, understand and satisfy the RD&E needs and expectations of our levy payers. The success factors that underpin our vision and ensure we are positioned to create impact and demonstrate value are:</p> <ul style="list-style-type: none"> • customer- and outcome-centric • industry collaboration and alignment • strategic and selective investment, guided by industry prioritisation • innovation and excellence • strong research performance • investment in translational research capability to enhance the progression of research from development to delivery • established trust and respect. <p>In building relationships based on mutual respect, trust and knowledge, SRA will be better able to maximise RD&E related outcomes for the sugar industry.</p>
<p>Our purpose</p>	<p>Undertaking targeted RD&E solutions for the sugar industry</p>	<p>SRA is focused on understanding and addressing the issues faced by our levy payers and delivering appropriate and sustainable RD&E solutions. The measure of our success, or the creation of 'value', will be not only in the solutions that we bring to the industry but in our ability to influence and facilitate the transfer of knowledge, adoption of research and development solutions and the delivery or attainment of benefits across the entire sugar industry value chain.</p> <p>In other words, SRA's success, and that of the industry, is dependent on the cooperation and support of the industry in the uptake of innovations in technology and practice. Improving knowledge transfer and innovation adoption is therefore an essential success element to objectives put forward in this plan.</p>
<p>Our values</p>	<p>Consistent with our vision and purpose, SRA espouses the following values:</p> <ul style="list-style-type: none"> • Customer and outcome focused with a dedication to industry success. • Integrity and transparency across all that we do. • Deliver what we promise. • Collaborate for the good of quality research outcomes. • Respect for our sources of funding and associated obligations. 	

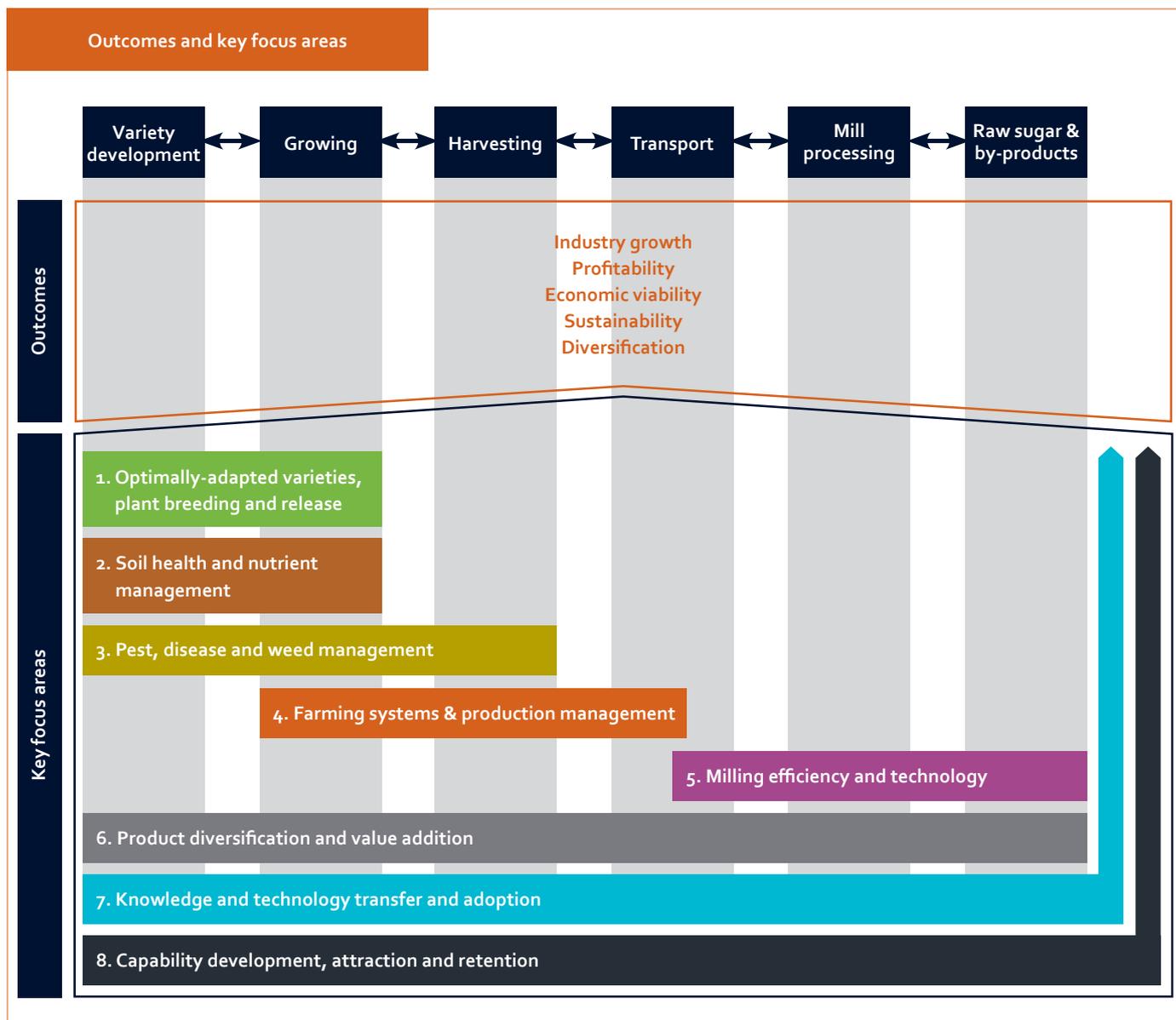
10.2 Key focus areas, strategic outcomes and key performance indicators

Having regard to the issues, challenges and opportunities identified during the development of this plan, the following overarching outcomes and key areas of focus for RD&E for the Australian sugar industry have been identified and underpin this plan.



The above outcomes represent the overarching aspirations the industry, and therefore SRA, are striving towards. SRA's purpose, and reason for existence, is to assist the industry on its pathway to achieving these strategic outcomes.

By focusing on the above key areas of focus for RD&E, SRA can provide targeted, innovative and novel solutions to address the primary productivity and production challenges facing the industry along its value chain and thereby pave the way for the ultimate success and longevity of the industry. Section 11 details how SRA intends to do this.



SRA's success in steering the industry towards the above outcomes and delivering broader social, environmental and economic benefits to the Australian community will be measured by SRA's RD&E contribution to the following key performance indicators (KPIs):

1. Build towards achieving 36 million tonnes per annum of sugarcane by 2017;
2. Maintain average rate of yield improvement per hectare per annum by region;
3. Improve environmental sustainability;
4. Improve industry reputation and community acceptance; and
5. Target an average return on investment of SRA's industry funds.¹²

¹² To be reviewed after first year of implementation of SRA's Performance Evaluation Framework.

11.0 Strategic and operational imperatives



The key focus areas (KFA), strategic and operational objectives and associated delivery strategies, set out in this plan, incorporate the Australian sugar industry and government expectations for SRA and respond to the main challenges and opportunities facing the industry over the next five years and beyond.

This section is essentially the crux of the Strategic Plan and will provide the direction for SRA, the RFP and funding applicants to determine the RD&E projects that should be established to ensure the outcomes can be achieved. SRA will develop an Annual Operational Plan that will detail how this Strategic Plan will be implemented, both through SRA core RD&E and RD&E funded out of SRA's contestable funding pool.

11.1 Key focus areas

KFA 1: Optimally-adapted varieties, plant breeding and release

Background

Australia's sugarcane production has either been static or in a state of decline over the last fifteen years. This has been in spite of significant RD&E efforts across the industry, including the introduction of improved varieties, farming, harvesting and milling technology and practices.

Sugarcane varieties are central to helping make the Australian sugar industry more productive, sustainable and competitive. The development of new varieties is however becoming increasingly complex with the need to cater for many differing factors, such as sugar and fibre content and tolerance to disease, pests, drought, flood and frost.

In responding to industry needs, SRA has developed world-class crossing and selection systems. With a view to maximising whole-of-industry profitability for sugar production, SRA uses a selection index based on the genetic and economic values of all important traits to optimise breeding outcomes. This index is currently being updated, with appropriate industry input, to ensure it can best address the future needs of the industry. By working and planning with the industry today, SRA can continue to meet industry needs and develop varieties that will have a greater chance of success in the field in the future.

In an effort to enhance genetic diversity and improve the quality of our parent population, SRA conducts variety exchange programs with other sugar-producing countries. These overseas varieties and novel germplasm are usually used as parents in our crossing program and provide access to new genes for productivity, disease and pest resistance and ability to cope with adverse conditions.

A key factor in current conventional variety development and plant breeding is the long lead time between the development of new varieties and the realisation of significant commercial impacts. It takes about 12 to 14 years to produce a new sugarcane variety and another 10 years to bulk-up enough material to have significant commercial plantings. To address some of the constraints of conventional approaches to variety development and plant breeding, SRA is currently exploring alternative biotechnology approaches with the intent to deliver real step-changes in sugarcane production.

The most likely areas that step-change could come from are: development of new varieties with a drastic change in a current trait or a novel trait; a significant reduction in the timeline of variety production (breeding and selection) or deployment of a new variety (bulking and planting technology); and use of novel germplasm.

SRA believes that GM technology will provide the sugar industry with the leverage it requires to achieve the desired step-change in productivity, pest and disease control and better nutrient management in an increasingly environmentally sensitive world. With this view in mind, SRA is currently working, in partnership with the world-class agribusiness and biotechnology company DuPont, on a project that is focused on GM and alternative new planting technologies. SRA's continued participation in this partnership, and in biotechnology research in general, is to be considered by the SRA Board over the coming year.

(Continued)

Background	<p>To assist growers in selecting the appropriate varieties to suit their needs, SRA publishes regional-specific variety of guides and selection tools, such as QCANESelect™, that provides up-to-date information on all available varieties.</p> <p>SRA will continue to collaborate with growers, productivity boards and millers to encourage the adoption of our new varieties.</p>
Objectives	<ul style="list-style-type: none">• To deliver a world-class variety development program that produces varieties that:<ul style="list-style-type: none">> provide increased cane and sugar yields; and/or> are more tolerant of adverse climatic conditions (drought, frost, etc.); and/or> are more resistant to pests and diseases; and /or> require reduced inputs (nutrients, water, etc.); and/or> provide improved ratoonability.• To enhance the variety breeding, selection and release program through:<ul style="list-style-type: none">> increased collaboration with growers, millers and productivity services groups; and> increased regional commercial sized trials and regional releases; and> earlier communication and dissemination of appropriate variety trait and performance information.
Outcomes	<ul style="list-style-type: none">• Comprehensive and efficient variety breeding, selection and release programs responding to yield expectations, environmental constraints, resource scarcity and regional preferences.• Faster varietal adoption using advanced methods for bulking, distribution and planting.
Key deliverables	<ul style="list-style-type: none">• New locally adapted varieties that improve productivity, reduce input costs and minimise losses from diseases and pests.• Improved opportunities for grower input and communication regarding variety development and selection.• More comprehensive and user-friendly information tools to assist growers with variety selection.• More rapid uptake of appropriate varieties.• Diagnostic and advisory services to growers, millers and productivity services bodies.• Enhanced research collaborations that optimise synergies, integrate knowledge and share best-practices.
Measures	<ul style="list-style-type: none">• 3 varieties which meet the above expectations released per 5-year period for each region.• Percent production from new varieties (<7 years since release).• Rate of genetic gain (tonnes of cane per hectare (TCH), commercial cane sugar (CCS), tonnes of sugar per hectare (TSH)).• Weighted average disease ratings for varieties in each region.

KFA 2: Soil health and nutrient management

Background	<p>Good soil health contributes markedly to profitable sugarcane production. Soil health can however be detrimentally impacted by chemical, physical and biological factors that include: reduced organic matter and nutrient levels; accumulation of pathogens; long-term monoculture; aggressive tillage practices; and compaction from heavy machinery used in the harvesting and transporting of cane.</p> <p>Good soil health and appropriate nutrient management can be achieved and maintained through use of sustainable on-farm inputs and practices. This implies profitable sugarcane production with minimal off-site effects. This includes efficient use of irrigation water, adequate drainage and the regular use of legume break crops within the sugarcane crop cycle.</p> <p>Alongside soil health and nutrient management, the industry must understand and appropriately manage any water quality impacts from fertiliser use and related land management practices, particularly the need to control leaching and run-off of nutrients and contamination of soils and water.</p> <p>There is increasing public awareness of environmental issues, particularly water quality and its impact on the Great Barrier Reef. Consequently, the sugar industry is under increasing pressure to reduce nutrient and herbicide losses from farms. Government and environmental groups have set a 60 percent reduction target for certain chemicals (such as diuron, atrazine, hexazinone and ametryn) by 2018 and a 50 percent reduction target in nitrate-N levels in water reaching the Great Barrier Reef Lagoon.</p> <p>The SRA SIX EASY STEPS™ program is an integrated nutrient management tool that enables the adoption of best-practice nutrient management on-farm. Best-practice nutrient management means having the best chance of success in minimising the risk of losses in productivity (loss of yield), profitability (loss of income), nutrients (leaching, run-off and/or gaseous losses) and soil resources (erosion and fertility losses).</p> <p>Increasing soil organic matter is widely regarded as beneficial to soil function and fertility. In agricultural production systems, it is integral to sustainable farming. Many of the farming practices undertaken on cane farms, such as green cane harvesting, growing fallow legume crops and reducing tillage, are aimed at maintaining or increasing soil organic matter levels.</p> <p>SRA continues to provide and update the SIX EASY STEPS™ soil-specific nutrient management guidelines for each of the cane-growing districts in Queensland and New South Wales.</p>
Objectives	<ul style="list-style-type: none"> • To understand and improve soil health issues that may be negatively affecting sugarcane productivity. This will include R&D covering crop nutrition; soil biology; soil fertility; regional soil factors; chemical utilisation; and reduction of soil pathogens and nematodes. • To understand the impact of on-farm practices on water quality. • To develop improved methods and tools to enable, or improve, cane production on poor performing or marginal soils.
Outcomes	<ul style="list-style-type: none"> • Soil health is improved with a resulting positive impact on environment and yield growth. • Improved reputation and relationship between industry and environmental groups.
Key deliverables	<ul style="list-style-type: none"> • Identification of the most important factors affecting soil health within the sugarcane production system. • Development of practices that reduce chemical inputs and nutrient losses. • Improved nutrient-use efficiency (reduced inputs per tonne of sugar produced). • Review of SIX EASY STEPS™ nutrient management package with improvements identified, guidelines amended and R&D undertaken where necessary. • Development of rapid screening technologies to determine general soil health.
Measures	<ul style="list-style-type: none"> • Soil health indicators developed for sustainable sugarcane production. • Guidelines, mechanisms and/or varieties identified for increasing nutrient use-efficiency within plant and ratoon crops. • Guidelines and mechanisms developed for minimising chemical and nutrient losses and understanding water quality. • SIX EASY STEPS™ nutrient management program reviewed with improvements made where necessary. • Guidelines for implementation of PA developed.

KFA 3: Pest, disease and weed management

Background	<p>Endemic/established pests, diseases and weeds are significant constraints on the production of Australian sugarcane. Managing these is expensive and can have unintended off-site impacts. Stopping the entry, establishment and spread of exotic pests, diseases and weeds is vital for the industry's future. If unchecked, yield losses would be high and devastating to industry productivity and profitability.</p> <p>Severe pest and disease outbreaks in the Australian sugar industry have caused heavy losses to productivity. Outbreaks of Fiji leaf gall, orange rust, smut and canegrubs have cost hundreds of millions of dollars and have impacted on-farm management methods as well as the SRA plant-breeding program.</p> <p>With a significant proportion of Queensland's sugar industry laying adjacent to the Great Barrier Reef, SRA is continually evaluating and researching best-practice pest, disease and weed management systems and processes to minimise the environmental effects of cane farming.</p> <p>Managing sugarcane pests by using an Integrated Pest Management (IPM) approach relies on good farm management practices. These include timely agronomic practices such as effective weed-control programs; managing adjacent areas that harbour pests; using fallows and break-crops; harvesting practices that minimise billet loss; and applying any necessary chemicals responsibly and strategically.</p> <p>Disease management involves the development of disease diagnostic testing methods, increased quarantine and protection measures, chemical applications (where appropriate), breeding of resistant varieties and ongoing monitoring of potential threats.</p> <p>Cost-effective weed management is also integral to a profitable sugarcane farming system. This can be achieved by using an Integrated Weed Management (IWM) system that takes a whole-of-farm approach focusing on cultural practices, herbicide use and general farming practices.</p> <p>Being prepared for an incursion of an exotic pest or disease will greatly increase the chances of eradicating the invader, or minimising losses if eradication is not possible. In conjunction with CANEGROWERS, Biosecurity Queensland and Plant Health Australia, SRA has developed detailed incursion management plans for each of the highest risk pests and diseases that give information on the pest and how best to respond in the case of an incursion. Our entomologists and pathologists have obtained first-hand knowledge of the pests and diseases by working closely with scientists in the countries where the diseases occur. SRA is actively preparing for incursions via developing diagnostic tests and identifying effective control strategies such as biological and chemical control and resistant varieties. These activities provide the Australian sugar industry with the ability to cope with incursions and enable rapid responses to any challenge.</p> <p>SRA's entomologists, pathologists, weed agronomists and development officers provide valuable pest, disease and weed identification, monitoring and management services for the industry.</p>
Objectives	<ul style="list-style-type: none"> • To proactively support an enhanced biosecurity capability for the Australian sugar industry. • To minimise the economic and environmental impacts of pests, diseases and weeds through targeted research.
Outcomes	<ul style="list-style-type: none"> • A comprehensive RD&E program that addresses existing and emerging pests, diseases and weeds, allowing sugarcane growers to manage their crops efficiently with minimal environmental impacts. • An enhanced industry capacity to deal with incursions of exotic pests, diseases and weeds.

(Continued)

Key deliverables

- Screening clones in the plant breeding program for endemic and exotic diseases.
- Screening samples from industry for ratoon stunting disease.
- Development of screening methods for nematodes.
- Development of molecular screening methods for the positive identification of diseases.
- Improved pest and weed management strategies in plant cane.
- Further development of more robust integrated pest and weed management systems that potentially reduce reliance on pesticides, using water quality monitoring to benchmark performance.
- Development of control strategies for problem pests and weeds specific to different production areas, including a greater understanding of their ecology.
- Continued development of new technologies that allow for improved targeting of weeds.
- Development of herbicide-resistant sugarcane varieties.
- Risk assessment of and planning for insecticide and herbicide resistance in sugarcane production systems.
- Research activities to monitor, update and examine alternative chemical treatments for key industry pests and pathogens.
- Updated management dossiers on key exotic threats.
- SRA resourced with entomology, pathology and weed expertise that support pest, disease and weed identification, monitoring and management services for the industry.

Measures

- Industry supported through effective pest, disease and weed diagnostic capabilities and awareness and training programs.
- Development and adoption of SRA-developed packages for integrated management of key pests, diseases and weeds.
- Weighted average disease ratings for varieties in each region.
- Up-to-date dossiers to support contingency plans to minimise threats and impacts of key exotics.
- Capability to provide entomology, pathology and weed expertise to meet the pest, disease and weed diagnostic and management needs of the industry.

KFA 4: Farming systems and production management

Background

Planting is a major cost to the industry. It is important to get good plant establishment, as it affects growers' ongoing returns through the crop cycle. Careful attention to the many components of the billet planting system, will ensure a successful strike. In particular, attention should be paid to: seed cane quality; harvester set-up for cutting good quality billets; planting rates; effectiveness of fungicides; placement of billets; and correctly set press-wheels.

The use of water and its cost remain a key part of the production-profitability equation for many cane growers. Over half of the Australian sugarcane crop relies on either full or supplementary irrigation. Water availability varies by district, with the Burdekin region having the most reliable supply with a full irrigation allocation each year. Water allocations in the other irrigated districts, such as the Atherton Tableland and the Central and Southern Regions, are more variable. Furrow, overhead low-pressure systems, including centre pivot or lateral move, and overhead high-pressure systems, including water winches and travelling booms, are the most common irrigation systems in use. However, emerging technologies such as drip irrigation are being seen as a new way to irrigate as they conserve water and lower energy inputs.

Pumping costs are a major component of irrigation costs and energy use. With energy costs constantly increasing, a focus on water-use efficiency and irrigation management is necessary. As environmental and regulatory pressures increase, irrigation research is increasingly examining the role of irrigation in the off-site movement of nutrients and pesticides.

Cane production is affected by both harvesting and field issues which can impact on raw sugar quality and quantity. Both harvesting efficiency and crop presentation affect cane yield, cane quality and ratoonability (ratooning). Harvesting losses are a major cost to the sugar industry; in particular the loss of millable cane via the cleaning system during green cane harvesting. Losses as high as 20 percent have been recorded, but 5-15 percent is more common. A prototype mobile harvesting-loss measurement system, the Infield Sucrose Measurement System (ISMS), has been used industry-wide over recent seasons by SRA's engineering team to measure losses. Losses of \$200/ha to in excess of \$1500/ha have been measured.

Research conducted into harvester performance has developed Harvesting Best-Practice (HBP) guidelines to reduce cane loss, improve cane quality, and reduce stool damage. The HBP guidelines also focus on the impact that crop presentation has on harvesting efficiency. With harvesting impacting on raw sugar quality and crop yields, a HBP approach will ensure the ongoing profitability and sustainability of the entire sugar industry.

Given the extensive research that has already been undertaken on ways to optimise harvesting efficiency, and the findings of the recent Value Chain Analysis report commissioned by ASMC, SRA will seek to facilitate and leverage opportunities for projects to translate the findings of this research and the proposed value chain model into practice, particularly projects that will improve efficiencies and enhance the grower-harvester-miller interfaces at the regional level.

The complete cropping cycle covers the management of the fallow, establishing the new crop and growing the crop. Decisions made during each stage of the cropping cycle have an impact on crop performance and yield and therefore the economic return generated by the crop. In recent years, best crop management practice has included the use of fallow legumes, controlled traffic and reduced tillage. Often these practices are combined with raised beds to form a complete farming system.

A well-managed fallow will improve both the soil biology and soil structure and should increase yields from the following plant and ratoon crops. Works carried out during the fallow can improve drainage, irrigation systems and farm layouts. The preferred option of fallow management is to plant soybeans or other legume crops into either a sprayed out or cultivated fallow. This is an ideal way of improving both the biology and the structure of the soil, reducing erosion potential from the block while adding nitrogen to the soil.

Research into the sugarcane cropping cycle is conducted by both SRA and a range of government and private organisations. Recent research has focused on farming systems, row spacings, legumes and crop rotations, and the fate of nitrogen from fallow legumes.

PA uses targeted farm management options which can significantly reduce production costs, manage environmental constraints and improve grower confidence in the actions they take. For example, PA assists growers in managing variability on sugarcane farmland through the use of technologies such as global positioning systems (GPS), geographic information systems (GIS), remote sensing (RS) and yield mapping. Adoption of PA practices can improve the efficiency and profitability of farming systems. Recent progress in research and development, as well as subsidies for equipment, have made it possible for more sugarcane growers to implement some of these practices.

Yield maps from multiple crop harvests help inform many precision farming decisions. Knowledge of where productivity varies and the extent of variability on a farm can be combined with information about soils, elevation and farm inputs to understand why yield varies. This information can be used to increase productivity in areas with higher yield potential or to increase efficiency and maximise profitability in areas where productivity is unlikely to increase.

(Continued)

Objectives	<ul style="list-style-type: none">• To conduct research into farming practices leading to the optimal use of inputs with specific emphasis on water management (including irrigation and drainage) and mitigating the impact of rising energy costs.• To conduct research on planting technologies, ratoonability, break-crop and fallow practices to optimise yields.• To facilitate the practical application of the value chain model to enhance grower, harvester and miller interfaces and improve the adoption of harvesting best-practices.
Outcomes	<ul style="list-style-type: none">• Growers and harvesters benefit from the ongoing research in productivity improvement, production management and agronomical techniques.• Developed technologies and management practices that enhance productivity and demonstrate a high rate of return on investment.
Key deliverables	<ul style="list-style-type: none">• Development of precision-agriculture techniques, training, guidelines and resources.• More comprehensive and user-friendly information to promote best-practice and assist growers in decision making.• Development of better planting technology.• Improvements in crop establishment.• Facilitation of regional trials and demonstration of the harvesting value chain model.
Measures	<ul style="list-style-type: none">• Methodology for more rapid and efficient bulking of sugarcane varieties.• Adoption of a better sugarcane planting technology.• Improved crop performance over longer cropping cycles.• Better crop management under conditions of water stress (too much and too little).• Adoption of PA technology and techniques.• Adoption of harvesting best-practice.

KFA 5: Milling efficiency and technology

Background	<p>The Australian sugar industry is predominantly focused on the production of one primary product—raw sugar. In general, the sugar mills’ core objectives are to maximise throughput of cane and maximise quality sugar output.</p> <p>Mill throughput is dependent on both cane supply and cane quality. An increase in cane fibre content, particularly because of higher extraneous matter (such as trash and soil), reduces the crushing rate of the mill and has the potential to prolong the crushing season. The practices of growers and harvesters therefore have a direct impact on the crush rate and overall mill capacity.</p> <p>Innovations in mill technology and processing to assist in the removal of extraneous matter, improve sugar recovery and sugar quality and improve energy efficiency will contribute to the long-term sustainability of the milling sector.</p>
Objectives	<ul style="list-style-type: none"> • To review logistics management (particularly harvester and transport scheduling) to reduce operational costs and improve mill capacity utilisation. • To identify and/or develop new or improved processes, technology and/or infrastructure to increase mill processing efficiency. • To undertake research into quality issues (such as trash, fibre content and impurities) to identify possible solutions—at the variety development, harvesting and processing sectors of the value chain.
Outcomes	<ul style="list-style-type: none"> • Optimised mill transport and logistics. • Mill capacity and efficiency is optimised through improved processes, technology and value chain coordination and collaboration.
Key deliverable	<ul style="list-style-type: none"> • Processes and technology to improve mill capital use, operating efficiency and sugar quality.
Measure	<ul style="list-style-type: none"> • Adoption of improved or novel milling processes and technology.

KFA 6: Product diversification and value addition

Background	<p>Breakthrough innovation, product diversification and value addition are key factors in positioning the industry to be more productive, profitable and better able to compete more effectively in the global marketplace.</p> <p>To be truly cost effective and sustainable, the industry should look to extract value along the entire value chain—from optimising relationships and value chain interdependencies, to utilising the entire sugarcane plant to finding viable uses and markets for the by-products produced during the processing of the cane. However, long-term operational efficiency and sustainability is dependent on transforming the industry by-products into additional value streams, such as bio-fuels and bio-chemicals, which can be readily marketed. Ultimately, there must be sufficient demand for the value-add activity and/or diversified product/s to be economically viable.</p> <p>The process of producing sugar generates a number of commercial by-products, including: bagasse; molasses; and mill mud/ash. The bagasse is used to fuel the mill boilers to produce steam which, in-turn, is converted into electricity for use in the milling process (a process known as cogeneration) and, in some cases, feeding back into the power grid. Molasses can be used as animal feedstock and used to produce ethanol.</p> <p>Further expansion and diversification of the sugarcane product base will increase profitability and help to reduce the dependence of the Australian sugar industry on the world sugar market and reduce the risks associated with market fluctuations.</p> <p>SRA will keep a watching-brief on technological and process innovation, as well as advancements in sugarcane by-products and alternative product streams, to identify possible opportunities to improve the competitiveness and sustainability of the industry.</p>
Objectives	<ul style="list-style-type: none"> • To facilitate and conduct ongoing research to identify and/or develop alternative products or uses for sugarcane and determine the basic requirements for adoption. • To facilitate or undertake economic feasibility studies of identified industry by-products, their use and likely market viability.
Outcome	<ul style="list-style-type: none"> • An established research program that monitors, facilitates and develops alternative and innovative uses for sugarcane.
Key deliverables	<ul style="list-style-type: none"> • Analysis of the sugar industry supply chain to assess critical interdependencies, control points, gaps in RD&E and areas where value can be added. • Exploration of alternative processing options and products from sugarcane fibre and other factory process streams. • Feasibility analysis of identified alternative products from sugarcane biorefining processes.
Measures	<ul style="list-style-type: none"> • Sugar industry supply chain analysis completed. • Identification of new opportunities in product diversification and innovation.

KFA 7: Knowledge and technology transfer and adoption

Background	<p>The success of research and innovation is largely dependent on the awareness and adoption of the new technologies.</p> <p>SRA recognises that in order to ensure adequate technology transfer and extension to the industry, research projects must integrate extension at the point of research design. To this end, SRA has embedded this requirement in its research project proposal process, whereby all projects submitted for funding under SRA's contestable funding pool must include plans for the subsequent adoption of the research. In doing this, research findings will be translated into practical application more quickly.</p> <p>SRA must catalyse the process of adoption of improved technologies and processes. To facilitate this, a key difference between SRA and its predecessor organisations is the strategy being used to enhance technology transfer and adoption. This has been characterised by a greater reliance on third-party extension providers to provide one-on-one extension to effectively promote knowledge and adoption of advanced technologies and practices whilst SRA focuses on a more discipline based approach. To this end, SRA will establish partnerships with industry extension providers, advisers, productivity services, trainers and others to build translational capacity and pathways for research and knowledge transfer.</p> <p>SRA will also seek to consult and collaborate with industry participants and RD&E peers, both nationally and internationally, on knowledge transfer and adoption practices.</p> <p>SRA must also develop new and innovative mechanisms to disseminate information and reduces duplication to make research findings more available and deliver them more quickly to meet industry needs. To achieve this SRA will use a variety of traditional methods as well as web-based tools to make information freely available to all industry participants when and where they require it.</p> <p>By combining these approaches, the concept of successful translation of research results into realised benefits for the sugar industry will drive our research and knowledge transfer agenda.</p>
Objectives	<ul style="list-style-type: none"> • To improve the coordination among different extension service providers, advisers and researchers to create an environment that optimises innovation and adoption at the farm level and encourages research that meets the needs of the industry. • To ensure research proposals have extension mechanisms in place, where appropriate, to facilitate transfer of knowledge and technologies to industry members. • To develop and implement communication tools and mechanisms to inform industry members on research projects, progress made on the projects and results of the research efforts. • To assess the uptake of developed technologies and evaluate the effectiveness of technology transfer tools. • To develop appropriate technology transfer tools to disseminate research findings to end-users to facilitate their uptake by growers and millers.
Outcomes	<ul style="list-style-type: none"> • Research results and new technologies are communicated and transferred in an appropriate and timely manner across the industry value chain, supporting increased uptake of best-practice and innovative technology. • A skilled advisory sector that drives the adoption of new technology. • An industry knowledge base that incorporates and makes freely available the most up-to-date production methodologies to industry. • Collaborative alliances, partnerships and networks that optimise synergies, integrate knowledge and share best-practices.

(Continued)

Key deliverables	<ul style="list-style-type: none">• Translational research approach embedded in SRA's business model and operational processes.• Extension and adoption plans included in all relevant research funding project proposals.• Improved extension coverage through collaboration with the industry's extension service providers, advisers and researchers.• In-field demonstrations, training (including 'train-the-trainers' for industry extension officers and advisers), workshops and advisory services to enhance dissemination and adoption of technologies.• A multi-media system in extension programs, including web-based technologies, to transfer and share information with levy payers and stakeholders.
Measures	<ul style="list-style-type: none">• Joint planning of research translation and extension programs with other stakeholders.• Effective delivery of extension messages, as demonstrated through research uptake.• Increased awareness of technological innovations, locally and internationally.• Research outputs' key RD&E messages are promoted in a timely manner through various channels.• Increased support for and participation in SRA delivery networks, events and extension programs.

KFA 8: Capability development, attraction and retention

Background	<p>Attracting and retaining people with requisite skills and capabilities in the sugarcane research, growing, harvesting and milling sectors is a significant issue and one that has been exacerbated in recent years by the ability of employers in the mining and resources sector to offer extremely attractive remuneration packages.</p> <p>The challenge is to offer an attractive career pathway and lifestyle proposition to potential and existing industry participants, particularly those with in-demand capabilities, which will them to choose the sugar industry as a preferred employer over other career options. SRA can play a key role in addressing this challenge by facilitating and providing innovative technologies and process improvement that will ensure the industry remains competitive, profitable and, most importantly, sustainable.</p> <p>The industry's various best-practice management, extension and advisory services and programs provide the main avenue for improving capability across the industry. SRA will continue to play a lead role in developing, facilitating and collaborating on industry knowledge transfer and capability development programs.</p> <p>In developing the new <i>National Sugarcane RD&E Strategy</i> with DAFF, a broad industry RD&E capability assessment will be undertaken with a view to proposing a suite of initiatives to address the development, attraction and retention issues, including succession planning and how the industry can unlock the productive capacity of land owned by older growers.</p> <p>For SRA, the shortage of certain critical skills, particularly in scientific disciplines such as entomology, plant breeding and agronomy is an issue that will be addressed through a multi-faceted program of scholarships, mentoring, professional development and succession planning.</p> <p>In addition to attracting and retaining employees with the required skill sets, SRA also recognises that its ongoing future success is dependent on the ongoing capability of its employees and those in other industry organisations. SRA will continue to value and develop its' staff through appropriate development and recognition mechanisms. SRA is also committed to leadership and management development to ensure that key industry disciplines are led by competent and focused individuals whose values are aligned to SRA's support for equity, fairness and excellence.</p> <p>Maintaining and forming new relationships, collaborations and networks with researchers, scientists and development officers from other national and international research institutions is also recognised as a critical part of SRA's professional development. SRA recognises there is a growing need for more collaboration amongst researchers in the interests of leveraging resources and achieving productivity growth in an increasingly resource constrained and competitive environment.</p>
------------	---

(Continued)

Objectives	<ul style="list-style-type: none">• To conduct a review of current and future RD&E skills and capacity needs for the sugar industry, in collaboration with DAFF.• To actively promote and facilitate the development and retention of current industry participants, as well as attract new participants to the sugar industry.• To foster collaboration for cross-industry and cross-sectoral skill development, innovation and networks.
Outcomes	<ul style="list-style-type: none">• A highly skilled industry workforce with the knowledge and capability to meet current and future needs of the industry.• Connected and respected, both domestically and internationally.• Motivated industry participants who promote an enthusiastic approach to solving industry issues.
Key deliverables	<ul style="list-style-type: none">• Undertake an industry RD&E skills and capability assessment and develop a long-term strategy for attracting, retaining and skilling the current and prospective researcher and technical workforce.• Maintain and promote a structured scholarship program with high-calibre candidates.• Support the development of young and emerging researchers, growers and milling staff through facilitation of networks and regular forums.• Establish participative and collaborative partnerships with productivity services bodies, national and international research organisations, other IOCs, other sectoral and cross-sectoral organisations, where appropriate.• Facilitate training, workshops, demonstrations and advisory services to enhance industry skills and capacity building.• Enhance the capability of SRA's researchers through appropriate succession planning mechanisms.• Disseminate research findings through high quality scientific publications at national and international forums.• Implement a performance management framework.• Positive stories and impacts from motivated industry personnel.
Measures	<ul style="list-style-type: none">• Published results of industry RD&E skills and capability assessment and recommended strategies in National Sugarcane Industry RD&E Strategy.• SRA participation and investment in relevant collaborative and cross-sectoral RD&E programs.• Increased availability of skilled industry personnel.• SRA sponsored Young Industry Participants' Forum held annually.• Development and uptake of new and existing knowledge transfer or training programs or resources.• Scholarships awarded to current and future industry participants.

11.2 Corporate and operational imperatives

The following corporate and operational imperatives have also been identified to support the delivery of SRA services and activities within the abovementioned strategic key areas of focus:

- Establish an outcome and customer-focused culture.
- Enhance governance across all SRA activities.
- Improve accountability and transparency in RD&E expenditure.
- Strengthen consultation and collaboration with industry.
- Continuous improvement in administrative efficiency.
- Enhance capacity for cross-industry skill development and innovation.
- Excellence in SRA research and researchers.
- Establish trust and reputation with our levy payers, collaborators and other financial contributors.

SRA recognises that the skills and capability of our people are critical to implementing this integrated approach to RD&E and achieving the strategic objectives and outcomes laid down in this plan. It is through our people that we will deliver on this plan and achieve industry and international recognition for our RD&E activities and outcomes. It is therefore incumbent on SRA to continually develop and support the capabilities of our employees.

To this end, SRA is committed to investing in the knowledge, skills and capability development of our employees through appropriate training, education, peer-networking, workforce planning and organisational culture programs.

During the Strategic Plan period, SRA will strive to nurture an organisational culture that is customer-focused, puts a premium on innovation and research excellence and has the capacity for fostering effective collaborative partnerships.

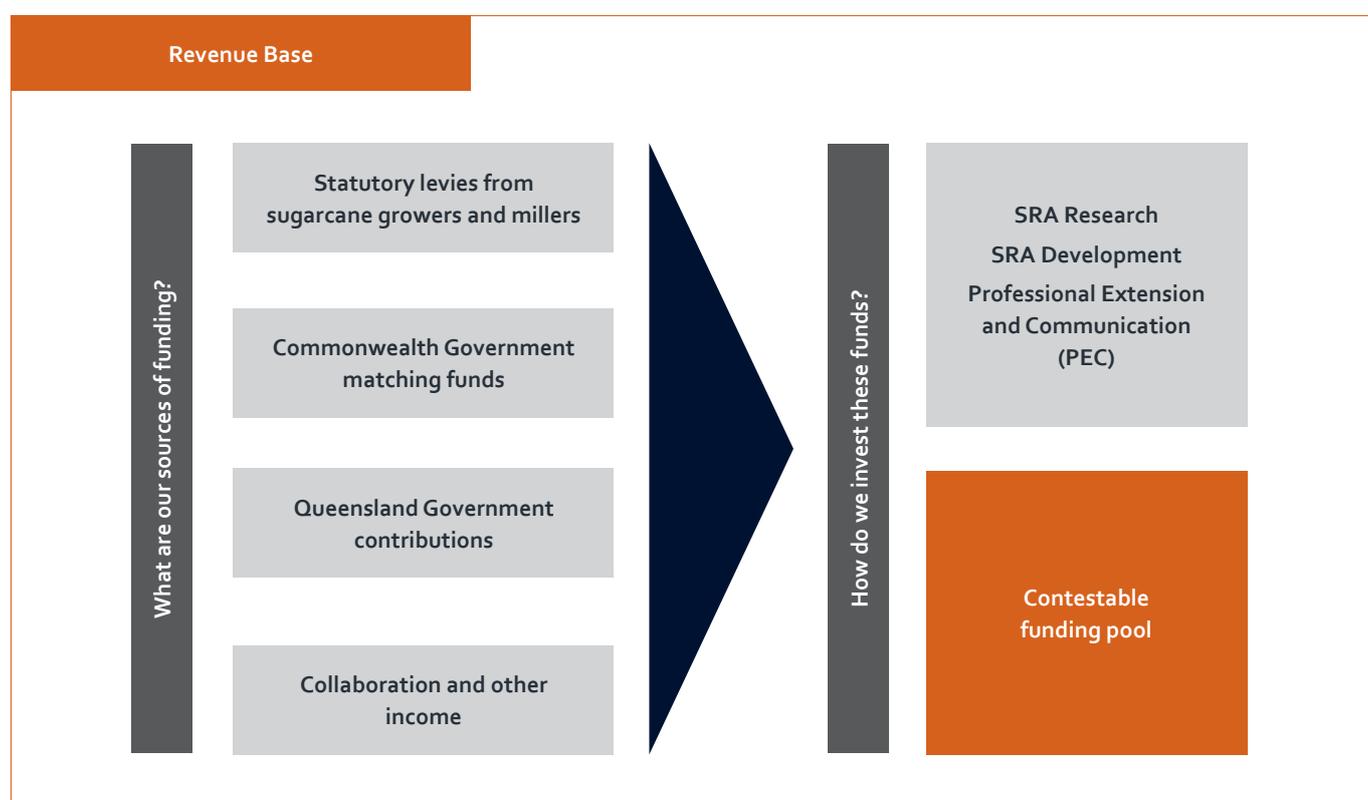
The strategic, corporate and operational imperatives will be included in SRA's Annual Operational Plans that will be produced during the Strategic Plan period, along with project, resourcing and budgeting details for the relevant financial year.

12.0 Balanced portfolio



SRA is committed to ensuring it invests, manages and participates in a balanced portfolio of RD&E activities that are appropriate to the industry, whilst providing the best possible return on investment.

As a provider of and investor in RD&E activities, our project portfolio is made up of projects that are funded out of a contestable funding allocation and projects that are funded out of SRA's operational expenditure.



An independent skills-based Research Funding Panel (RFP) has been established to conduct the contestable research investment process and associated review and evaluation of funded projects. The primary objective of the RFP is to ensure transparent, independent and robust review of all research and development projects funded from SRA's contestable pool of industry and government funds for sugar industry RD&E. In this way, all projects will be selected for investment based on merit, but also against industry priorities. That is, the RFP selects projects where the best research outcome can be achieved for the investment.

The RFP also has the responsibility of providing the SRA Board with advice and recommendations regarding research investment, improvement of investment approaches, risk management pertaining to the research investment, intellectual property management and protection and commercialisation and adoption strategies.

The Research Funding Unit (RFU) will provide systems for the efficient contracting and managing of the research portfolio, including RD&E project monitoring, project evaluation and reporting to meet member, industry, DAFF and Council of Rural Research and Development Corporations (CRRDC) requirements. The RFU will operate independently of other SRA functions in order to ensure that the investments and contracts are managed objectively and without bias or conflict of interest.

In delivering a balanced portfolio of RD&E activity, the RFP will undertake to:

- Identify short, medium and longer-term projects for funding on merit against industry priorities, government priorities and the SRA Strategic Plan.
- Address current weaknesses in the existing research portfolio.
- Increase return on investment.
- Focus on industry benefit and the adoption of research outcomes.
- Foster leading-edge, 'blue sky' and longer-term research.
- Provide competitive, independent, unbiased investment assessment.
- Increase transparency.
- Increase industry participation in RD&E.

To support the Australian sugar industry to remain competitive and sustainable in the long-term, and continue to hold an international reputation for quality product and world-class research, SRA will continue to encourage and support, where appropriate, innovative, 'blue sky' research that can potentially create breakthroughs or step-change in sugarcane productivity and reap significant long-term outcomes for the industry.

In short, the RFP will assess future investment projects on the basis of delivering benefits against the key areas of focus outlined in this plan and for their likelihood of achieving outcomes and impacting the industry's value drivers – industry growth, profitability, economic viability, sustainability and diversification.

Through the RFP, SRA will endeavour to ensure the RD&E investment portfolio has an appropriate mix of low- to high-risk and short- to long-term projects. The low-risk and shorter-term projects include those that focus on the people and social science aspects of the industry, such as knowledge transfer and capability building. The medium-term projects include those that target improvements in farming systems, whilst the medium- to longer-term and higher-risk projects include the biotechnology and plant breeding projects. It must be recognised that whilst some projects may be completed within the short- to medium-term, the benefits to the industry may not necessarily be accrued or demonstrated until well into the future.

13.0 Investment, income and expenditure forecast



13.1 Priority weightings

To ensure industry and government priorities are addressed appropriately and to guide the RFP in the investment allocation process, priority weightings are applied to the key areas of focus for RD&E investment. The priority weightings have been determined on the basis of industry and government sentiment and expressed needs and will ensure future investment in RD&E will deliver the best possible impact for the sugar industry and broader community.

The following table details the priority weightings to be applied to the allocation of future contestable investment funds. It should be noted that continuous improvement in productivity and innovation underpin all of the key focus areas.

Key focus areas ¹³	Priority weighting
1. Optimally-adapted varieties, plant breeding and release	45%
2. Soil health and nutrient management	5-10%
3. Pest, disease and weed management	5-10%
4. Farming systems and production management	15-20%
5. Milling efficiency and technology	10-15%
6. Product diversification and value addition	5-10%
7. Knowledge and technology transfer and adoption	1-5%
8. Capability development, attraction and retention	1-5%

It should be noted that the project portfolio to be funded over the next five years, through SRA's contestable funding pool, includes projects that were approved by SRDC and inherited by SRA as part of the establishment of SRA and associated transfer of assets from SRDC. Whilst these projects have been retrospectively aligned to SRA's key focus areas, there is some associated skewing of the allocation of forecast investment expenditure against the priority weightings over the next few years. This skewing will be corrected in time as the current projects are completed and the RFP assesses future project portfolios on the basis of the above priority weightings and delivering benefits against the key areas of focus and industry value drivers.

It should also be noted that the allocation of projects to the key areas of focus is approximate only as the outcomes to be derived from these projects may overlap the areas of focus in some circumstances. For example, new sugarcane varieties are developed to improve yield performance and bred for better pest and disease resistance, whilst undertaking extension activities for trialling harvesting best-practice benefits production management and knowledge transfer and adoption.

¹³ It should be noted that innovation and continuous improvement in productivity underpin all of the key focus areas.

13.2 Investment by key focus areas

13.2.1 Contestable project portfolio

	Contracted investment	1. Optimally-adapted varieties, plant breeding and release		2. Soil health and nutrient management		3. Pest, disease and weed management		4. Farming systems and production management		5. Milling efficiency and technology	
		\$k	%	\$k	%	\$k	%	\$k	%	\$k	%
2013/14	Non-SRA	1,675	25%	507	46%	520	19%	933	80%	1,023	98%
	SRA	4,910	75%	599	54%	2,156	81%	235	20%	16	2%
	Total	6,585	46%	1,106	8%	2,675	19%	1,168	8%	1,039	7%
2014/15	Non-SRA	1,491	22%	335	42%	785	38%	925	61%	1,085	100%
	SRA	5,250	78%	461	58%	1,286	62%	588	39%	-	0%
	Total	6,740	50%	796	6%	2,071	15%	1,513	11%	1,085	8%
2015/16	Non-SRA	1,824	26%	316	45%	778	40%	1,000	49%	1,279	100%
	SRA	5,309	74%	388	55%	1,175	60%	1,035	51%	-	0%
	Total	7,134	50%	704	5%	1,953	14%	2,036	14%	1,279	9%
2016/17	Non-SRA	2,445	32%	389	41%	529	40%	1,063	42%	1,633	100%
	SRA	5,150	68%	556	59%	784	60%	1,482	58%	-	0%
	Total	7,595	49%	945	6%	1,312	8%	2,546	16%	1,633	10%
2017/18	Non-SRA	2,179	30%	389	41%	389	37%	1,038	41%	1,577	100%
	SRA	5,012	70%	556	59%	674	63%	1,482	59%	-	0%
	Total	7,191	48%	945	6%	1,063	7%	2,520	17%	1,577	11%
Priority weightings		45%		5-10%		5-10%		15-20%		10-15%	

Continued

	Contracted investment	6. Product diversification and value addition		7. Knowledge and technology transfer and adoption		8. Capability development, attraction and retention		Total	
		\$k	%	\$k	%	\$k	%	\$k	%
2013/14	Non-SRA	1,033	75%	31	100%	443	98%	6,165	43%
	SRA	349	25%	-	0%	10	2%	8,274	57%
	Total	1,383	10%	31	0%	453	3%	14,440	100%
2014/15	Non-SRA	555	72%	54	43%	311	100%	5,542	41%
	SRA	221	28%	74	57%	0	0%	7,879	59%
	Total	776	6%	128	1%	311	2%	13,420	100%
2015/16	Non-SRA	348	47%	91	41%	281	100%	5,918	41%
	SRA	388	53%	129	59%	-	0%	8,426	59%
	Total	736	5%	220	2%	281	2%	14,343	100%
2016/17	Non-SRA	389	41%	130	41%	318	100%	6,895	44%
	SRA	556	59%	185	59%	-	0%	8,713	56%
	Total	945	6%	315	2%	318	2%	15,608	100%
2017/18	Non-SRA	389	41%	130	41%	315	100%	6,406	43%
	SRA	556	59%	185	59%	-	0%	8,466	57%
	Total	945	6%	315	2%	315	2%	14,871	100%
Priority weightings		5-10%		1-5%		1-5%			

Please note the above table represents contracted investment only, i.e. the investment portfolio that is allocated under SRA's contestable funding pool. SRA's non-contestable or core operational expenditure is provided below.

13.2.2 SRA operational portfolio

SRA operational investment	1. Optimally-adapted varieties, plant breeding and release		2. Soil health and nutrient management		3. Pest, disease and weed management		4. Farming systems and production management		5. Milling efficiency and technology	
	\$k	%	\$k	%	\$k	%	\$k	%	\$k	%
2013/14	6,731	39%	378	2%	1,035	6%	824	5%	171	1%
2014/15	6,664	34%	75	0%	2,237*	11%	74	0%	192	1%
2015/16	6,819	37%	77	0%	856	5%	76	0%	196	1%
2016/17	6,980	38%	78	0%	876	5%	78	0%	201	1%
2017/18	7,189	38%	81	0%	902	5%	80	0%	207	1%

Continued

SRA operational investment	6. Innovation, product diversification and value addition		7. Knowledge and technology transfer and adoption		8. Capability development, attraction and retention		9. Corporate and governance		Total	
	\$k	%	\$k	%	\$k	%	\$k	%	\$k	%
2013/14	92	1%	2,363	14%	1,029	6%	4,527	26%	17,150	100%
2014/15	-	0%	3,773	19%	2,100	11%	4,431	23%	19,545	100%
2015/16	-	0%	3,886	21%	1,800	10%	4,564	25%	18,274	100%
2016/17	-	0%	4,003	22%	1,500	8%	4,701	26%	18,417	100%
2017/18	-	0%	4,123	22%	1,500	8%	4,842	26%	18,924	100%

* Includes \$1.4 m for YCS. YCS is funded under the contestable funding pool in 2013/14.

13.3 Forecast operating result

	2013/14	2014/15	2015/16	2016/17	2017/18
Income	(\$k)	(\$k)	(\$k)	(\$k)	(\$k)
Statutory Levy	21,000	21,000	21,700	22,400	23,100
Commonwealth Government matching payments	5,500	5,500	5,500	5,500	5,500
Queensland DAFF contribution	3,950	4,050	4,150	4,150	4,150
RD&E partnerships	1,732	1,100	1,100	1,100	1,100
Interest	750	847	820	828	822
Other	608	700	700	700	700
Total income	33,540	33,197	33,970	34,678	35,372
Less RD&E partnerships ¹⁴	1,732	1,100	1,100	1,100	1,100
Total income less RD&E partnerships' income	31,808	32,097	32,870	33,578	34,272
Expenditure	(\$k)	(\$k)	(\$k)	(\$k)	(\$k)
Sugar industry research investment					
Contracted – non SRA	6,165	5,543	5,918	6,756	6,406
Contracted – SRA	8,274	7,878	8,426	8,597	8,466
Total sugar industry research investment	14,440	13,420	14,343	15,353	14,871
SRA operational expenditure					
Governance	3,225	3,090	3,183	3,278	3,377
Research Funding Panel and Unit	1,302	1,341	1,381	1,423	1,465
SRA development	7,642	7,841	8,024	8,213	8,459
Professional extension and communications	2,363	3,773	3,886	4,003	4,123
SRA research capacity funding	2,618	1,800	1,500	1,200	1,200
SRA commissioned research	-	1,700	300	300	300
Total SRA expenditure allocations	17,150	19,545	18,274	18,417	18,924
Total expenditure	31,590	32,966	32,617	33,770	33,795
SRA operating result for the year	218	(869)	253	(192)	477

14 This represents collaboration income and/or service fee income directly related to SRA's operational programs and has been taken out so that SRA's operational expenditure can be reflected at a net level.

14.0 Monitoring and evaluation



14.1 Performance monitoring

SRA is committed to maximising the returns on industry and government investment by facilitating, delivering, investing in and managing RD&E that succeeds. In doing so, SRA operates through an annual cycle of planning and accountability at all levels in the organisation. The cycle includes interlocking processes of strategic and operational planning, budgeting, implementation, evaluation, performance review and accountability to our levy payers and government investors.

SRA is currently in the process of establishing a comprehensive and robust Performance Evaluation Framework that is consistent with industry and government expectations and will enable it to:

- Assess, monitor and report on the progress of investment projects.
- Clearly demonstrate valued return on investment to our levy payers and government.
- Enable comparison of performance with other RD&E IOCs and institutions.

In establishing its Performance Evaluation Framework, SRA will put in place processes that will ensure:

- Results are delivered and achieved.
- Strategic alignment with priorities.
- A single RD&E project review pathway.
- Robust and efficient program management.
- Good governance and transparency of process and projects.
- Industry-wide benefits.
- Collaboration within industry and across industries.

Under the framework, SRA will incorporate rigorous, cost-effective procedures and priorities for monitoring and evaluating, both qualitatively and quantitatively, the impact our research and that of our research partners has in terms of meeting strategic objectives and delivering benefits to the industry.

In addition to existing project reporting mechanisms, more econometric based measurement and reporting processes for SRA's RD&E portfolio will be developed during the first 18 months of this plan period. SRA is specifically looking to adopt an econometric based evaluation framework that will enable meaningful measures for return on investment to be calculated and reported on. To this end, SRA is considering adopting the evaluation framework that is presently being developed by the CRRDC.

The CRRDC framework recognises that the evaluation of benefits accrued from RD&E projects is often difficult due to the long lags between undertaking the investments and realising the benefits. Where impacts of RD&E can be quantified in monetary terms, a cost-benefit analysis will be used as the primary tool for evaluation. Where projects result in environmental or social impacts, a more qualitative evaluation tool may be used.

Under the CRRDC framework, detailed cost-benefit analysis will be applied to a selection of projects each year. The selection of projects will include:

- RD&E in which SRA is the sole investor.

-
- RD&E in which SRA has invested in collaboration with another research organisation or other research funding organisation.
 - RD&E investments made through collaboration with other IOCs/RDCs.

It is expected SRA's evaluation framework and associated metrics and reporting mechanisms will be finalised and implemented for 2014/15. In the meantime, SRA will monitor and report on performance via the performance measures in this plan and the project reporting evaluations undertaken by the RFP.

An outline of the elements to be included in SRA's evaluation framework is provided in Attachment 2.

14.2 Performance evaluation and reporting

The Audit and Risk Committee of the SRA Board will review, on an ongoing basis, a suite of reports that cover SRA's operational and strategic performance. The suite of performance reports that will be considered by the Audit and Risk Committee include: SRA operational reports, such as Finance, Workplace Health and Safety and Risk Management; RFU reports on the investment project portfolio; and SRA's Performance Report, which will provide a snapshot or 'scorecard' of SRA's progress against delivering on the Strategic Plan. Where required, the Audit and Risk Committee will provide the Board with recommendations for remedial action to be taken to ensure SRA's operational and strategic performance remains on-track.

SRA will regularly communicate its performance information with levy payers, government and other stakeholders and use it to continually improve the quality of our research and investment processes, programs and activities.

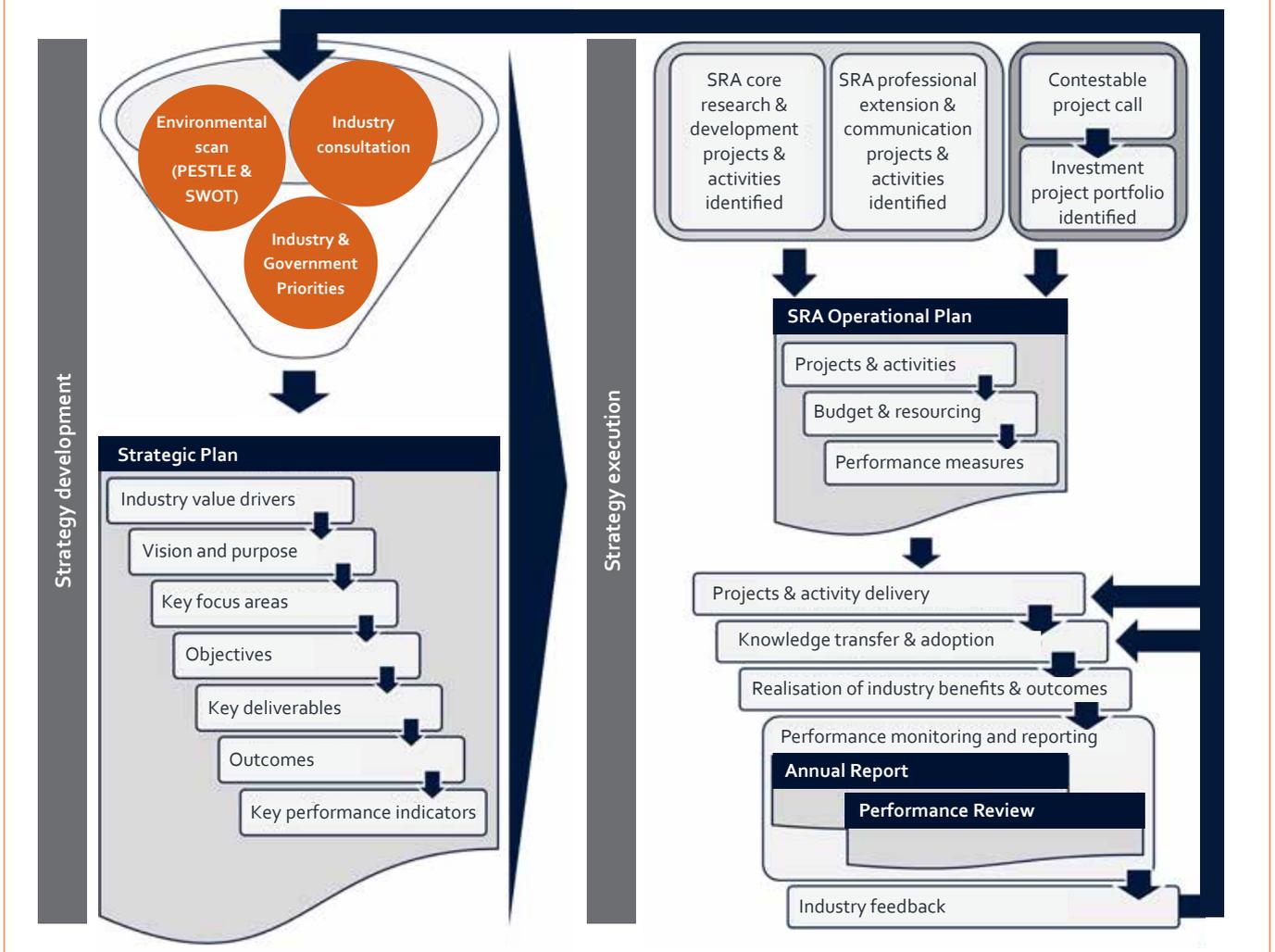
SRA will provide industry with a Performance Scorecard on a regular basis. The scorecard will provide 'traffic-light' reporting against a selection of measures and key deliverables.

Each year, SRA will publish an Annual Report that will include a review of progress towards implementing the objectives set out in this plan and demonstrate strong positive returns on investment.

As required under the SFA, SRA must also undertake an independent Performance Review every four years, with the first Performance Review to be completed by February 2017. The Review will assess the performance of SRA against the objectives, deliverables and outcomes laid out in this plan.

SRA's strategic planning and performance monitoring process is iterative in nature, with output from performance evaluations feeding back into strategy review and development. The figure below depicts how SRA's strategy development, execution and evaluation processes come together to represent SRA's overarching value chain.

SRA value chain



SRA's value chain starts with identifying the sugar industry's RD&E needs and priorities and ends with meeting these needs. SRA's value chain is therefore a cycle rather than a linear process.

Attachment 1

Alignment to industry and government priorities



Stakeholder priorities	SRA key areas of focus							
	1. Optimally-adapted varieties, plant breeding and release	2. Soil health and nutrient management	3. Pest, disease and weed management	4. Farming systems and production management	5. Milling efficiency and technology	6. Product diversification and value addition	7. Knowledge and technology transfer and adoption	8. Capability development, attraction and retention
Statement on Priorities for Research 2011-2014 – Key Issues for Research Action¹⁵								
1. Industry growth: need to stop decline and build to 36Mtpa, including by RD&E to increase yield and achieve step-change in productivity								
2. Cost and profitability: of cane and sugar production, across different farm types and mills, including by RD&E on efficiency along the value chain								
3. Environmental and regulatory pressures: including by RD&E into water, chemicals and technologies/systems to lift environmental sensitivity								
4. Diversification: biomass, fuel and new products								
Strategic Research Priorities¹⁶								
1. Living in a changing environment								
2. Promoting population health and wellbeing								
3. Managing our food and water assets								
4. Securing Australia's place in a changing world								
5. Lifting productivity and economic growth								

¹⁵ Statement on Priorities for Research 2011-2014, Australian Sugar Industry Alliance, 2011.

¹⁶ Strategic Research Priorities, Australian Government, 2013.

Stakeholder priorities	SRA key areas of focus							
	1. Optimally-adapted varieties, plant breeding and release	2. Soil health and nutrient management	3. Pest, disease and weed management	4. Farming systems and production management	5. Milling efficiency and technology	6. Product diversification and value addition	7. Knowledge and technology transfer and adoption	8. Capability development, attraction and retention
Rural Research and Development Priorities¹⁷								
1. Productivity and adding value								
2. Supply chain and markets								
3. Natural resource management								
4. Climate variability and climate change								
5. Biosecurity								
6. Innovation Skills								
7. Technology								
Queensland's Agriculture Strategy – Pathways to Growth¹⁸								
1. Securing and increasing resource availability								
2. Driving productivity growth across the supply chain								
3. Securing and increasing market access								
4. Minimising the costs of production								
National Sugarcane Industry RD&E Strategy – Goals¹⁹								
1. A growth industry, successfully competing in the world market, through profitable businesses								
2. Successful diversification into related sugarcane products, using world-class research and development								
3. Global leaders in environmental sustainability								
4. Dynamic and cooperative industry leadership								

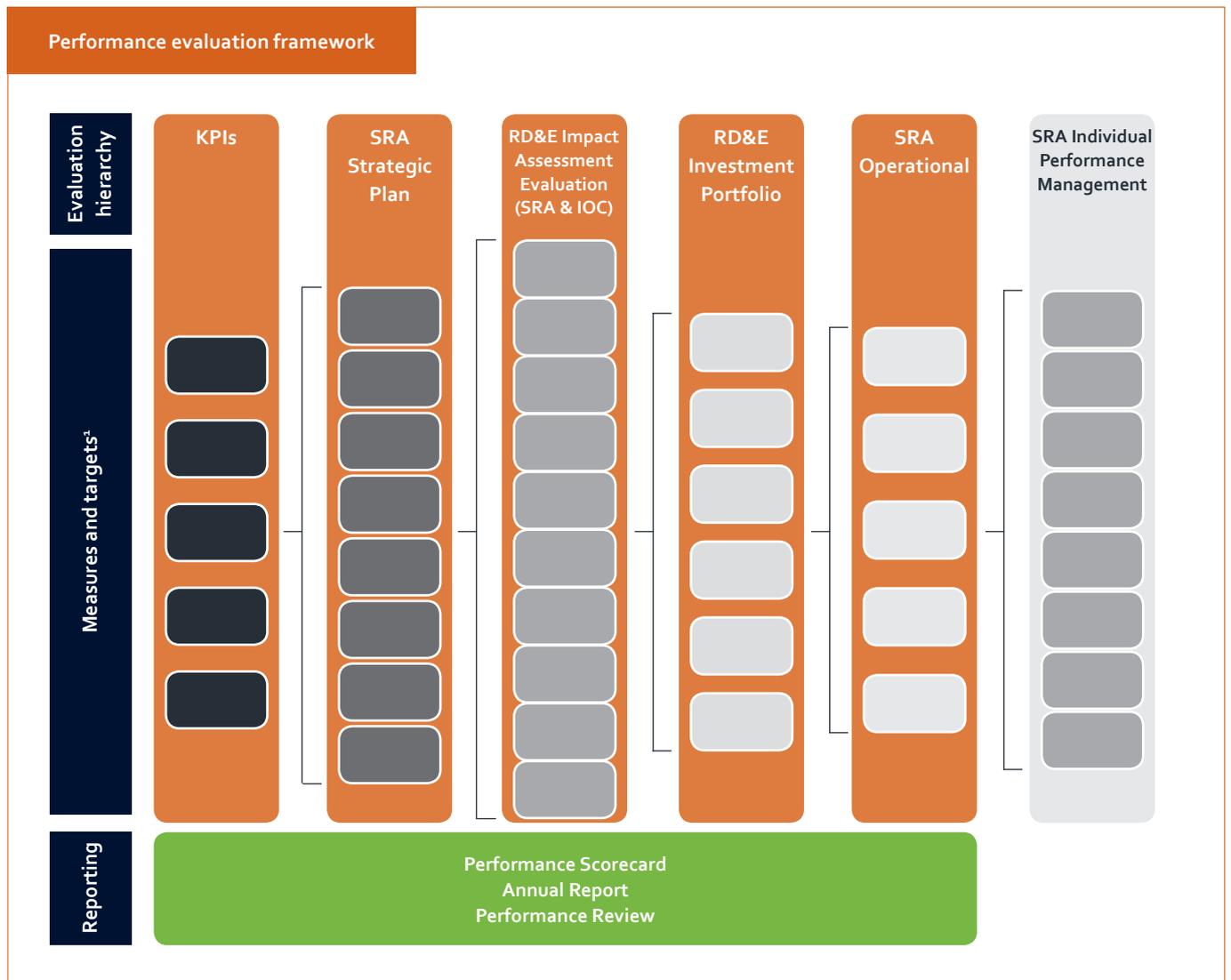
17 Rural Research and Development Priorities, Department of Agriculture, 2007.

18 Queensland's Agriculture Strategy, Department of Agriculture, Fisheries and Forestry, 2013.

19 National Sugarcane Industry RD&E Strategy, 2010.

Attachment 2

Outline of SRA's proposed Performance Evaluation Framework



¹ Complete suite of performance measures and targets to be finalised for 2014/15.

Attachment 3

Abbreviations and acronyms



ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ACIAR	Australian Centre for International Agricultural Research
AOP	Annual Operational Plan
ASA	Australian Sugar Industry Alliance
ASMC	Australian Sugar Milling Council
B	Billion
BMP	Best Management Practice
BSES	BSES Limited
Con	Consumption
CCS	Commercial Cane Sugar
CRRDC	Council of Rural Research and Development Corporations
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cth	Commonwealth
DA	Department of Agriculture (Commonwealth)
DAFF	Department of Agriculture, Fisheries and Forestry (Queensland)
DEHP	Department of Environment and Heritage Protection (Queensland)
GIS	Geographic Information System
GM	Genetically Modified
GPS	Global Positioning System
ha	Hectare
HBP	Harvesting Best-Practice
HFCS	High Fructose Corn Syrup
IOCs	Industry Owned Companies
IPM	Integrated Pest Management
ISMS	Infield Sucrose Measurement System
IWM	Integrated Weed Management
K	Thousand
KFA	Key Focus Areas
KPIs	Key Performance Indicators
M	Million
Mtpa	Million Tonnes per Annum
N	Nitrogen

NIR	Near Infrared
PA	Precision Agriculture
PEC	Professional Extension and Communication
Prod	Production
Qld	Queensland
QSL	Queensland Sugar Limited
R&D	Research and Development
RDCs	Research and Development Corporations
RD&E	Research, Development and Extension
RFP	Research Funding Panel
RS	Remote Sensing
SFA	Statutory Funding Agreement
SNP	Single Nucleotide Polymorphism
SRA	Sugar Research Australia Limited
SRDC	Sugar Research and Development Corporation
SRL	Sugar Research Limited
t	Tonne
TCH	Tonnes of Cane per Hectare
TSH	Tonnes of Sugar per Hectare
WHO	World Health Organisation
YCS	Yellow Canopy Syndrome

Sugar Research Australia Ltd
ABN 16 163 670 068

Head Office
50 Meiers Road
Indooroopilly QLD 4068
Australia

Postal Address
PO Box 86
Indooroopilly QLD 4068
Australia

Tel 07 3331 3333
Fax 07 3871 0383
Email sra@sugarresearch.com.au
Web sugarresearch.com.au