



Sugar Research
Australia

REQUEST FOR EXPRESSIONS OF INTEREST

FEASIBILITY STUDIES TO ASSESS THE
ECONOMIC VIABILITY OF PRODUCING
HYDROGEN FROM BAGASSE AND
BIODEGRADABLE BIOPLASTICS FROM
SUGARCANE JUICE

Closing date: 5:00pm 12 May 2021

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1. BACKGROUND

1.1 SUGAR RESEARCH AUSTRALIA LIMITED OVERVIEW

Sugar Research Australia Limited (SRA) is an industry-owned company that was established in 2013 by Australia's sugarcane growers and millers to deliver Research, Development and Extension (RD&E) activities and services that drive productivity, profitability, and sustainability for the Australian sugarcane industry.

The Australian sugar industry leads the world in terms of productivity per hectare, but despite this advantage, it continues to struggle with profitability. Margins are under constant pressure, and it appears that continuing to direct most future efforts to on-farm, logistics and milling productivity improvements will deliver only incremental gains to what is an already efficient production system.

Fortunately, the industry also finds itself now approaching a period of opportunity emerging through the increasing global momentum of the bio-based economy. This represents an opportunity to break away from the current dependence on the global sugar price, a commodity whose production is subsidised and/or protected in many countries and whose consumption has plateaued or dropped in many markets.

In the current context, the sugarcane industry is extraordinarily well-placed to become a significant contributor in this emerging bio-based economy. New opportunities for diversification and value-adding exist throughout the supply chain, including new options for feedstock production, biomass processing, and both intermediate and end-product manufacture.

Following an on-going market and technology watch exercise, hydrogen and compostable bioplastics were identified as two potentially attractive diversification opportunities for the sugar industry. However, little is known about the potential applicability of these diversification opportunities to the Australian sugar industry. SRA is therefore seeking assistance to investigate and determine the potential application of these technologies and identify any investment barriers. The next step therefore is preliminary technical and economic investigation to determine if further investment in these areas is warranted.

2. TERMS OF REFERENCE

To support SRA in further development of these diversification opportunities, SRA is seeking EOIs from a suitably qualified organisation/individual to help it assess the potential commercial application of two technologies and to identify potential investment barriers to:

- (i) produce hydrogen from sugarcane bagasse; and
- (ii) produce compostable bioplastics such as polyhydroxyalkanoates (PHA) from sugarcane juice, to add value to the Australian sugar industry. The study will cover aspects of production, technology, economics, logistics, intellectual property, and industry attitude for each of these opportunities, and with respect to bioplastics, the production of PHA from cane juice will be compared to alternative sugarcane-derived bioplastics. It will assist SRA and the industry with assessing the potential commercial application of these technologies, taking account of the strengths and constraints of the entire sugar industry supply chain, and providing advice to SRA on the intellectual property ownership and technical feasibility/readiness of the technologies available.

2.1 ACTIVITY LANDSCAPE

- a) The 2019 Diversification Review commissioned by SRA recommended maintaining a technology and market watch to design future investments, and this has been actively undertaken by the RFU and SRA management. Two sugarcane biorefinery opportunities were identified through a technology and market scanning process - hydrogen and compostable bioplastics.
- b) Today, around 70 million tonnes of hydrogen are produced globally, used across an array of sectors – fertilizer, refining, petrochemicals, solar panels, and glass manufacturing. In the future, hydrogen will have a role to play in decarbonizing the global economy, especially in hard-to-decarbonize sectors. According to energy market analysts, green hydrogen could become the most sustainable and cheapest form of transformative fuel. There is increasing interest in hydrogen from both Federal (through ARENA program and the National Hydrogen Roadmap) and Queensland Governments (as outlined in the Queensland Hydrogen Industry Strategy 2019-2024). Furthermore, there is already international interest in producing green hydrogen through gasification of sugarcane bagasse, and Australia risks falling behind its competitors if there is not investment in this diversification opportunity.
- c) Biomass gasification is a mature technology pathway that uses a controlled process involving heat, steam, and oxygen to convert biomass to hydrogen and other products, without combustion. These requirements suggest that co-localisation with a sugar mill is logical. Because growing biomass removes carbon dioxide from the atmosphere, the net carbon emissions of this method can be low, especially if coupled with carbon capture, utilisation and storage in the long term. Sugarcane bagasse offers numerous advantages with respect to its low ash content compared with other crop residues such as rice straw and wheat straw and is a richer solar energy carrier due to its higher yields in mass per unit area of cultivation and its annual regeneration capacity.
- d) Compostable plastics currently only account for around 0.1% of plastic packaging on the market in Australia amidst growing interest from both consumers and our customers. In 2018, Australia established the 2025 National Packaging Targets to create a new sustainable pathway for the way we manage packaging in Australia. One of the four key targets to be achieved by 2025, is, 100% reusable, recyclable, or compostable packaging; so, the market is expanding and demand for compostable plastics is increasing.
- e) Increased awareness of environmental sustainability with associated environmental regulations has encouraged the pursuit of novel materials to replace conventional petroleum-derived plastics. Already, sugarcane-derived non-compostable bioplastics are being imported into New Zealand for milk bottle production, which provides direct evidence for the existing market. There is, therefore, an opportunity to enter an expanding market for a high-value compostable, alternative product from sugarcane.

2.2 EOI OUTPUTS

The activities and outputs for this work will include a stage-gate process and ***therefore each output should be priced independently***. SRA will review its commitment after each stage before proceeding to the next stage.

STAGE ONE:

Output 1 - By 2 June 2021, the project will deliver to SRA-RFU, a draft report structure and detailed work plan for approval. This will include:

- a list of industry and technical contacts for consultation
- a report structure for the final report
- a clear indication on the type of economic modelling likely to be used for analysis.

Go/No-go decision by SRA.

STAGE TWO:

Output 2 - By 3 September 2021, a presentation will be made by the project team to SRA detailing the results-to-date and seeking feedback.

Go/No-go decision by SRA.**STAGE THREE:**

Output 3 - By 10 December 2021 a final report will be provided with:

- (i) complete economic feasibility assessment for both diversification options
- (ii) identification of any R&D gaps that need to be filled to make the processes more economically viable.

2.3 TIMEFRAMES FOR EOI SUBMISSION AND COMPLETION OF STAGE ONE

DATE	ACTION
19 April 2021	Expressions of Interest sought by SRA.
12 May 2021	Closing date for submission of Expressions of Interest.
21 May 2021	SRA consultancy agreement finalised and signed.
28 May 2021	Inception meeting – project planning, confirming input requirements (including access to documentation, personnel, and potential stakeholders), confirming output requirements and timeframes.
2 nd June 2021	Project Plan agreed and signed by the Executive Manager, Research Missions and Strategy

3. SUBMISSION REQUIREMENTS AND INFORMATION**3.1 PROPOSAL REQUIREMENTS**

Expressions of Interest must address the following:

1. Methodology	Provide a detailed description of the proposed approach and methodology to be undertaken in addressing each of the requirements in the Terms of Reference.
2. Experience and qualifications	<p>Provide details of the core multi-disciplinary team (names, roles, qualifications, relevant experience, and knowledge) to be allocated to the project. Along with strong core credentials and capabilities in undertaking market opportunities assessments it is vitally important that consultants in this project have (and deliver with) relevant credentials and experience in the following areas:</p> <ul style="list-style-type: none"> • the ability to work at the nexus of economics, strategy and finance and perform complex modelling to support micro and macro-economic analysis

	<ul style="list-style-type: none"> • through delivery of projects with a similar scope, significant recently acquired knowledge of bio-opportunities and markets, coupled with expertise in regional economic development • understanding of the diversification challenges of the Australian sugarcane industry • understanding of agriculture value chains • the ability to access scientific expertise to provide an independent assessment of relevant technologies and technology readiness • demonstrated understanding of intellectual property.
3. Capacity and resources	Provide project management details to demonstrate capacity to commence and manage the project within the required timeframe.
4. Pricing	<p>Provide a costing and payment schedule.</p> <p>A detailed description of the basis for pricing must be included and justified. It must contain a schedule of rates and times for all team members and any external parties engaged.</p> <p>The SRA consultancy agreement will be a fixed price contract, with payments made on achievement of agreed milestones as per an agreed plan.</p>

3.2 CONFLICT OF INTEREST

Expressions of Interest are required to include details of any known or likely conflict of interest. Your approach to the management, assessment, and disclosure of any known or likely conflicts of interest, and any conflict of interest that may arise during the period of engagement should also be detailed in the EOI document.

3.3 PROFESSIONAL INDEMNITY AND PUBLIC LIABILITY INSURANCE

Details of professional indemnity and public liability insurance must be provided at commencement of services.

3.4 SRA CONSULTANCY AGREEMENT

The successful party will be required to enter into a formal consultancy agreement with SRA. A copy of the SRA consultancy agreement is provided in Attachment 1.

3.5 CRITERIA FOR SELECTION

SRA will use an evaluation panel to assess all submissions. All proposals will be reviewed for completeness and the extent to which they address the assessment criteria (below). Clarification of issues identified may or may not be undertaken. Non-conforming proposals or those containing insufficient information to properly assess their ability to satisfy the EOI will not be considered further.

The following assessment criteria will be used to evaluate submissions:

- organisational capability and resources of the applicant to deliver within the timeframe required.
- qualifications and technical skills of the proposed project team
- degree of understanding of the project to be delivered within the proposal

- demonstrated experience in conducting similar projects including standard of outputs; completion on time including meeting milestones and deadlines; completion within agreed budget; achievement of quality aspects
- suitability of the proposed methodology to meet the requirements of the Terms of Reference
- cost-effectiveness and value for money: including the total proposed fee, structure, and rates.

3.6 SRA RIGHTS

SRA reserves its rights at law or otherwise to:

- cease to proceed with or suspend the EOI process
- alter timing of the EOI process
- vary the EOI structure
- vary any time or date specified in the EOI
- require additional information or clarification from the applicant
- enter negotiations or discussions with more than one applicant
- request a new EOI
- reject any EOI received after the closing date as described in this document
- reject any EOI that does not comply with the requirements as described in this document negotiate and enter final contractual documentation with respect to the project with any counterparty without prior notice
- not attribute any reasons for actions or decisions taken, including on the exercise of any or all the above-mentioned rights; and
- take such other action as they consider appropriate in relation to this Research Funding Panel process.

3.7 CONDITIONS OF LODGEMENT

The applicant agrees, by lodging an Expression of Interest, that it is bound by these conditions:

- all Expression of Interest documents become the property of SRA upon lodgement
- all information in the EOI is accurate and complete
- it has declared any actual or potential conflict of interest
- it will bear all costs for preparing the EOI submission, including any meetings that may be required related to the submission prior to the contracting stage
- it will keep confidential any confidential information provided by SRA in connection with the EOI
- it will make any inquiries relating to the EOI process only through the contact details provided; and
- pursuant to the *Privacy Act 1988* (Cwth) it will be bound by the Australian Privacy Principles in respect of any act done or practice engaged in by the respondent in connection with this EOI process.

Expressions of Interest are to be submitted to SRA **by 5.00pm on 12 May 2021** as follows:

Electronically by email to smudge@sugarresearch.com.au with the subject heading ***“EOI: Feasibility studies to assess the economic viability of producing hydrogen from bagasse and compostable bioplastic from sugarcane juice”***.

3.8 SRA CONTACT

Requests for further information or clarification in relation to this request for Expressions of Interest should be directed to:

Dr Stephen Mudge
Manager, Research Missions
Email: smudge@sugarresearch.com.au

3.9 ATTACHMENT 1

SRA consultancy agreement template



Consultancy%20Agreement%20-%20SRA%



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