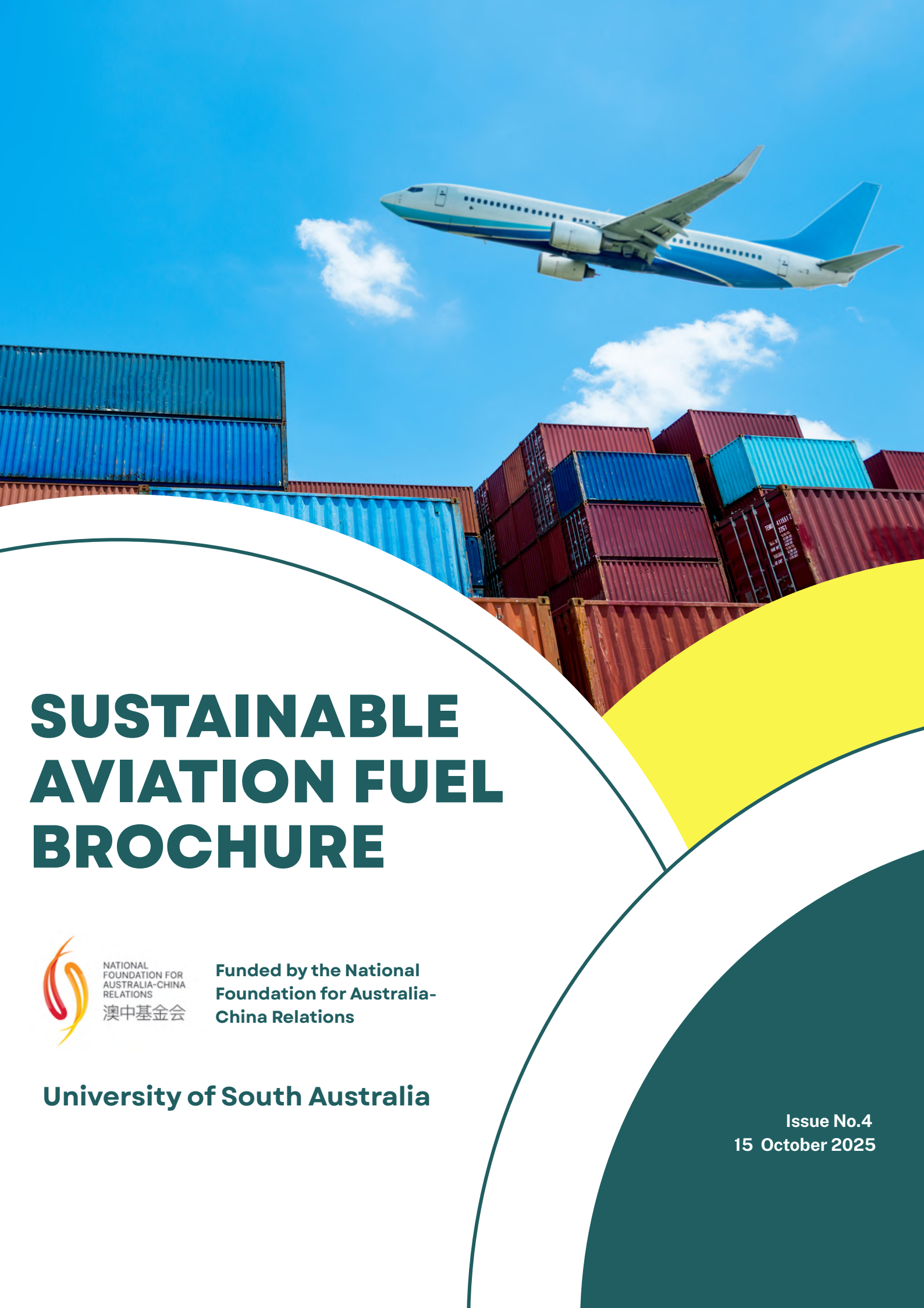




# SUSTAINABLE AVIATION FUEL BROCHURE



NATIONAL  
FOUNDATION FOR  
AUSTRALIA-CHINA  
RELATIONS

澳中基金会

Funded by the National  
Foundation for Australia-  
China Relations

University of South Australia

Issue No.4  
15 October 2025



# FOREWORD

”

Achieving net zero by 2050 is a common goal across all transport modes. Currently, the aviation industry contributes approximately 3% of global emissions, but this figure could rise to 22% by 2050 as air travel increases while other sectors decarbonise more rapidly. Unlike ground transportation, aviation faces limited alternative fuel options. Sustainable Aviation Fuels (SAF) have the potential to reduce carbon emissions by up to 80%, making them crucial for achieving net-zero greenhouse gas emissions in Australia by 2050.

As of 2024, SAF account for less than 1% of global jet fuels, largely due to their cost, which is three to five times higher than traditional fuels. However, regions such as the European Union, Japan, Singapore, and the UK are progressing towards mandating SAF use in the coming years.

There is significant potential for SAF production in Australia and China, given both countries' abundant bio feedstock and untapped market. Over the next two years (2024-2026), our research team will collaborate with airlines, airports, and other stakeholders in Australia and China to promote the production and adoption of sustainable aviation fuels, aiming to reduce carbon emissions in the aviation sector.

”

## OUR RESEARCH TEAM



**Professor Shane ZHANG**

Shane is a Professor of Aviation at the University of South Australia (UniSA). He has published in leading economics and transport journals on economics of air transport regulation and deregulation, airline mergers and consolidations, airline pricing and competition, and aviation sustainability.

He has undertaken various aviation and logistics projects funded by the World Bank, APEC, Meat & Livestock Australia, Queensland Government, the Civil Aviation Safety Authority of Australia, and the Economic Research Institute for ASEAN and East Asia. His research have been published in the top journals, including Transportation Research Part A, Transportation Research Part D, Transport Policy, Journal of air transport management, Journal of Transport Geography and more.



**Professor Alec ZUO**

Alec is a Professor and ARC Future Fellow at Flinders University. As an applied economist specialising in agricultural, environmental, and resource economics, Alec's work has significantly contributed to understanding the impacts of climate change on irrigation farming, farmer adaptation strategies, and market-based instruments for water resource management.

His research has been published in leading international journals, including Global Environmental Change, the American Journal of Agricultural Economics, the European Review of Agricultural Economics, and Energy Economics. His research has been funded by the Australian Research Council, the Australian National Commission for UNESCO, among others.



**Assoc. Prof. Paul LEE**

Paul is an Associate Professor at the UniSA. His research focuses on Aviation Human Factors and Aviation Safety. Paul's current research interest is in the use of Artificial Intelligence (AI) to further improve Aviation Safety.

Before joining UniSA STEM Paul's last appointment was an Aviation discipline leader (Acting) at the University of Southern Queensland (USQ). Prior to becoming an academic, he was a flight instructor at Massey University in New Zealand where he instructed in Single-Engine and Multi-Engine aeroplanes under Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) as well as conducting night and aerobatic flight instructions. Paul was also an internal flight examiner conducting various flight exams within the flight practicums embedded within the Bachelor of Aviation. Paul holds an Australian Commercial Pilot Licence with a Grade 2 instructor rating and a Remote Pilot Licence.



**Dr Xin DENG**

Xin is a Senior Lecturer in Economics at UniSA Business. Her research encompasses a wide range of areas in applied economics and management. Her current research focuses on sustainability and diversity, with special attention to gender issues and corporate social responsibility.

She has led projects funded by UN Women, Australian government and industrial partners to address real world problems such as promoting gender equalities in the workplace and understanding the implications of globalisation on the labour market. She is a regular commentator for SBS radio's Mandarin program on Economic and Finance issues, and has provided commentary to many media outlets such as ABC and China Daily.



# OUR PROJECT



**The purpose of this Project is to raise awareness among Australian and Chinese stakeholders about opportunities for growing sustainable aviation fuel (SAF) industries through seminars, workshops, presentations and publications and prepare Australian farmers and investors to capitalise on emerging SAF business opportunities.**

## OUR FUNDING ORGANISATION



The National Foundation for Australia-China Relations is an Australian Government initiative established in 2020 to strengthen understanding and engagement between Australia and China.

The Foundation brings together government, business and communities to find and support ways to engage constructively with China, across greater China and to involve our diverse stakeholders and communities. It demonstrates the Australian Government's commitment to a mutually respectful relationship with China, one that is shaped by a strong sense of Australia's values and national interests, as well as mutual benefit.

## OUR RESEARCH TEAM



**Dr Yifei CAI**

Yifei is a Lecturer with a PhD degree in Economics. His research expertise focuses on aviation economics, aviation finance, energy economics, and applied econometrics. His recent publications have been featured in prestigious academic journals, including Energy, Energy Economics, Scottish Journal of Political Economy, Journal of Environmental Management, Transport Policy, Applied Economics, and more.



**Dr Zhifang WU**

Zhifang is a Lecturer in UniSA Business with a PhD degree in Economics and Management. Her research interests lie in environment sustainability, sustainable water management, work-integrated learning, and behaviour economics. Her research has been published in top journals, including the Journal of Cleaner Production, Journal of Environmental Management and more.



**Ms Zahra JAFFARY**

Zahra is a PhD student at UniSA, where her research focuses on aviation sustainability, with particular emphasis on the utilisation of hydrogen and Sustainable Aviation Fuel within airport operations. She also serves as an airline representative for Air New Zealand at Adelaide Airport.



**Mr Yuchao XU**

Yuchao is a PhD student majoring in aviation management at UniSA. His interests lie in policies on decarbonisation and sustainability. Before moving to Adelaide, he worked as a student research assistant at the Energy Studies Institute in Singapore.



# PROJECT SUMMARY

The project team will organise and deliver a series of eight events in Australia and China to facilitate knowledge exchange on sustainable aviation fuel (SAF) and promote cooperation and partnerships among industry and policy stakeholders. This initiative aims to capitalise on business opportunities associated with the commercialisation of SAF.

## **Stage 1: April - September 2024 (completed)**

**Roundtable in Adelaide:** Host a roundtable in August 2024 with industry stakeholders from the aviation, tourism, and agricultural sectors, Tourism Australia, government agencies, and aviation scholars to review and evaluate the e-brochure before its final release in September 2024.

## **Stage 2: October 2024 - April 2025 (completed)**

**Beijing Forum:** Partner with the local university to explore SAF production cooperation and partnership opportunities between Australia and China (9 November 2024).

**Adelaide Forum:** Host a special SAF forum at the 34th Chinese Economic Society Australia Annual Conference on 27 November 2024, organised by the University of South Australia.

**Shanghai Forum:** Collect views and opinions from the Chinese aviation industry on the factors and barriers affecting SAF adoption and estimated future demand.

## **Stage 3: May - September 2025 (completed)**

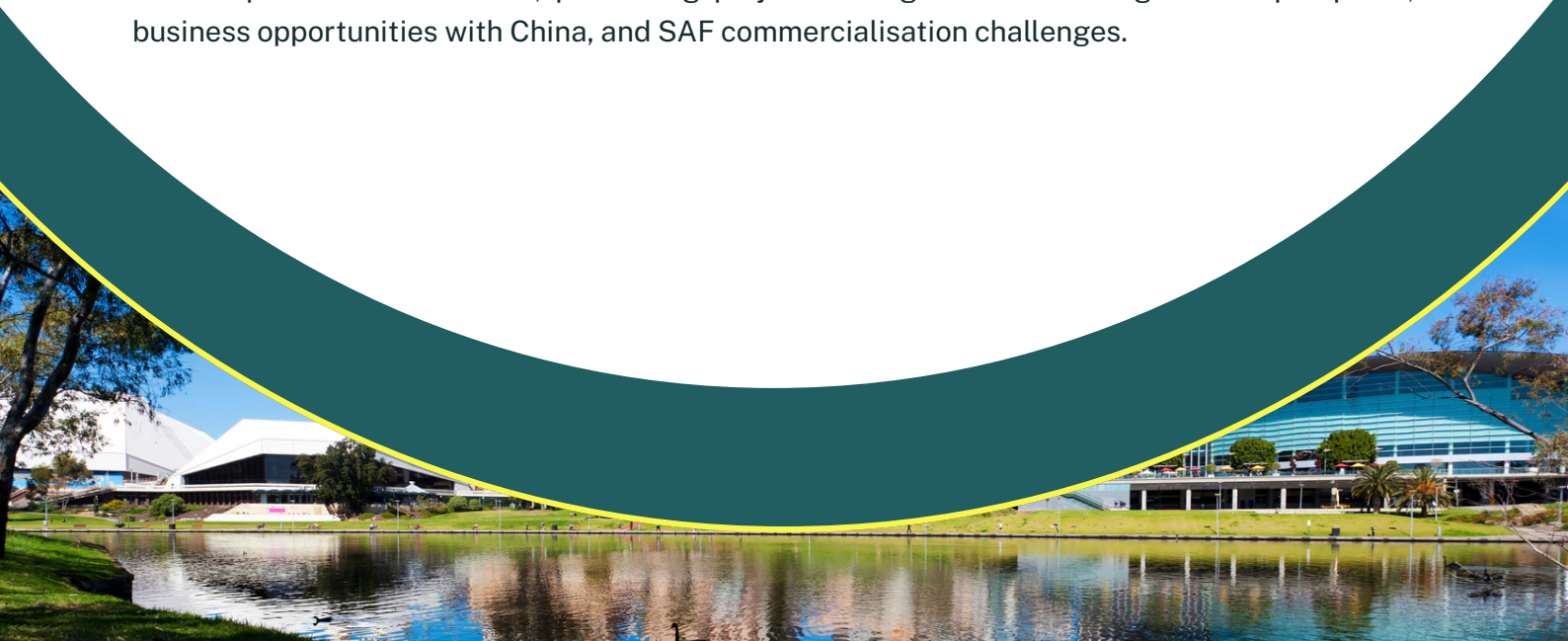
**Hong Kong Forum:** Partner with the Hong Kong Polytechnic University to host a special SAF session, inviting Cathay Pacific, Hong Kong Airlines, and other stakeholders.

**Guangzhou Forum:** Partner with National University of Singapore (Guangzhou) to discuss sustainability criteria for SAF and related policy and regulatory issues in July 2025.

## **Stage 4: Proposed November - December 2025**

**Chengdu Forum:** Partner with Sichuan Tianzhou to host a one-day seminar, engaging with airlines, airports, and SAF producers.

**Melbourne Forum:** Partner with Swinburne University of Technology to deliver a one-day workshop in November 2025, presenting project findings and discussing market prospects, business opportunities with China, and SAF commercialisation challenges.



# SCHEDULES



**Adelaide**  
**August, 2024**



**Beijing**  
**November, 2024**



**Adelaide**  
**November, 2024**



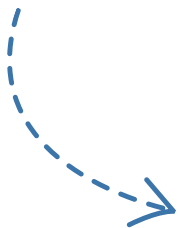
**Hong Kong**  
**July, 2025**



**Guangzhou**  
**July, 2025**



**Shanghai**  
**April, 2025**



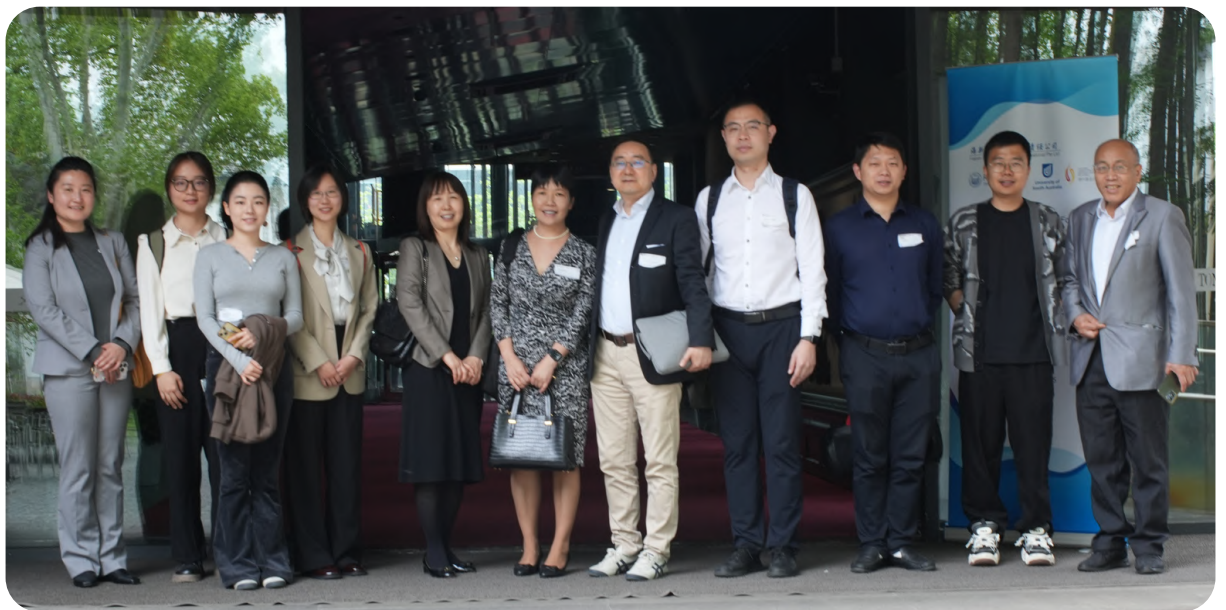
**Chengdu**  
**November, 2025**



**Melbourne**  
**November, 2025**



## SUMMARY OF ACTIVITIES (SHANGHAI)



**On 17–18 April 2025**, the UniSA SAF Project Team successfully hosted the SAF Forum in Shanghai, in collaboration with Tongji University's College of Transportation and Haixin International. **The first-day event** began with inspiring opening remarks that set the tone for a day of insightful dialogue. Throughout the sessions, speakers from academia, industry, and international organisations shared perspectives on advancing SAF development, decarbonisation strategies, and opportunities for global cooperation. The discussions highlighted the importance of innovation, partnerships, and standardisation in driving sustainable aviation forward. We extend our thanks to Professor Xingyi Zhu and Professor Linbo Li for their invaluable support.

**The second-day event** included visits to Shanghai Aircraft Manufacturing Co., Ltd. (SAMC) and the PAC Laboratory. Our sincere appreciation goes to Mr. Huang Zuhuan, Ms. Shen Tong, and their teams at COMAC, along with Mr. Samuel Wong, Ms. Cynthia Chen, and colleagues from PAC, for their warm hospitality and insightful discussions.

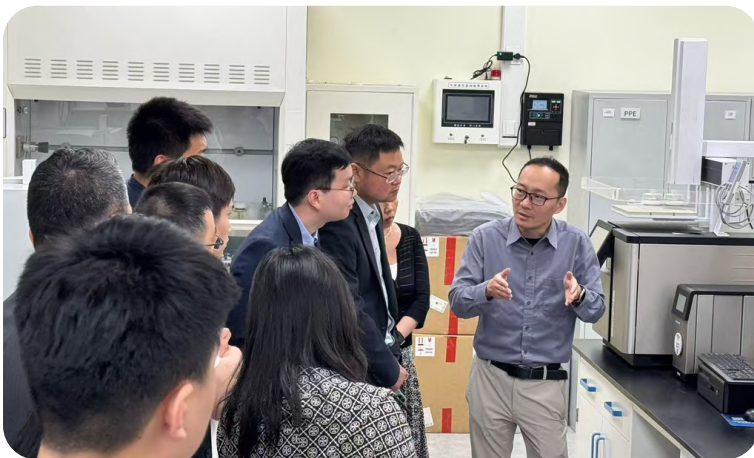
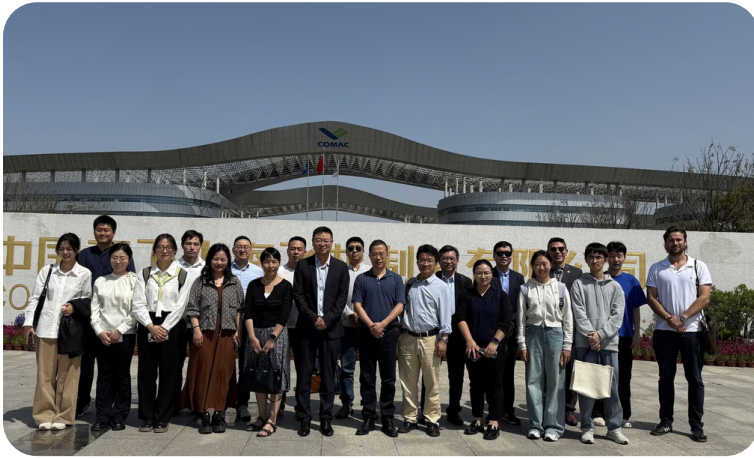
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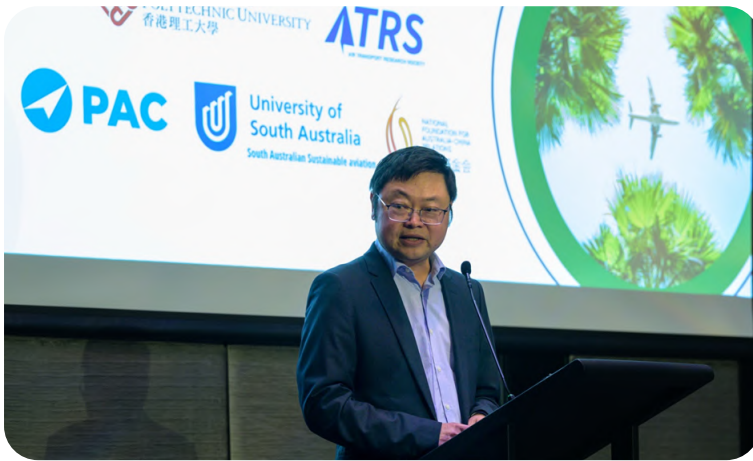
# SUMMARY OF ACTIVITIES (HONG KONG)



**On 2 July 2025**, we successfully hosted the SAF Forum in Hong Kong. We were honoured to welcome distinguished guests, including Deputy Consul-General Bing Liu, Consul Ted Goener, Alice Jim (Government of South Australia), Willy Yu (Hong Kong Environment and Ecology Bureau), and representatives from Austrade. The forum commenced with inspiring remarks from Consul Ted Goener and Ms Margy Osmond, highlighting Australia–China collaboration in sustainable aviation and climate action. Speakers from industry and academia shared insights on SAF development, market trends, policy frameworks, and decarbonisation pathways across the Asia-Pacific region. Discussions underscored the importance of innovation, investment, and cooperation in advancing sustainable aviation.

A networking buffet followed, featuring imported ingredients from South Australia and promoting premium Australian food products to the audience in Hong Kong. We sincerely thank all speakers and guests for their invaluable support.

# SUMMARY OF ACTIVITIES (HONG KONG)



## SUMMARY OF ACTIVITIES (HONG KONG)



## SUMMARY OF ACTIVITIES (HONG KONG)



# SUMMARY OF ACTIVITIES (GUANGZHOU)



**On 10 July**, we proudly hosted the inaugural Sustainable Aviation Forum in Guangzhou with the National University of Singapore Guangzhou Research Translation and Innovation Institute (NUS GRTII). This landmark event focused on **SAF** and the **low-altitude economy**, driving vital discussions on aviation decarbonisation.

Experts including Samuel Wong, Heather Bone, Nikola Xing, and Lindsey Liu explored SAF's lifecycle challenges, infrastructure barriers, and policy incentives, while Celia Lao, Margy Osmond, and Zhou Qiang highlighted industry strategies and regional impacts. In the low-altitude sessions, Li Chuxin, Wu Weiwen, and Zhao Dongjie showcased innovations in logistics and drone applications. The day concluded with a lively panel and networking session. We sincerely thank NUS GRTII, PAC, Argus, and Iris Zhang (Government of South Australia) for their invaluable support.

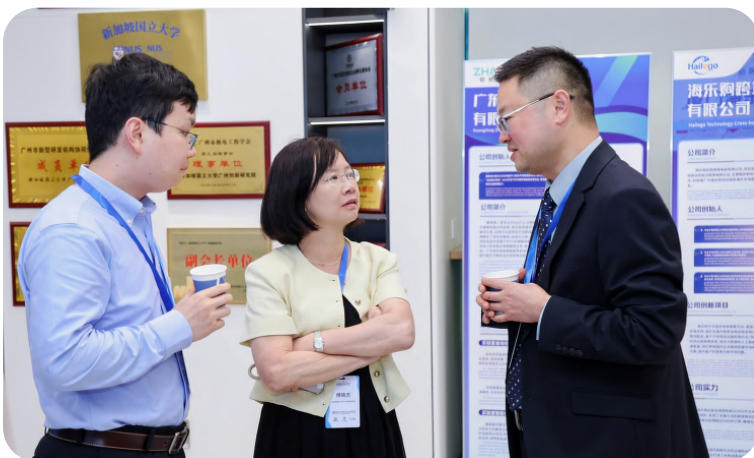
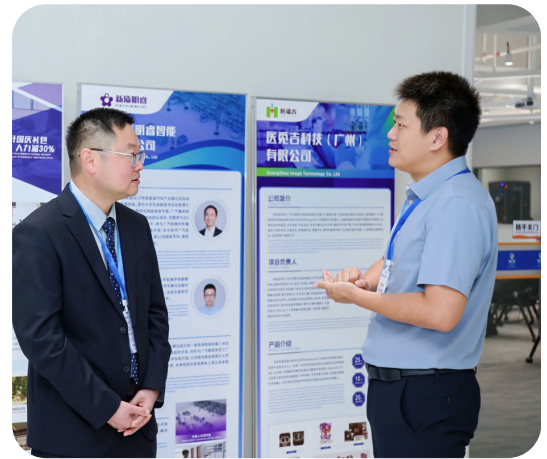
# SUMMARY OF ACTIVITIES (GUANGZHOU)



## SUMMARY OF ACTIVITIES (GUANGZHOU)



# SUMMARY OF ACTIVITIES (GUANGZHOU)



# OUR SPEAKERS & PANELLISTS

IN OUR SHANGHAI, HONG KONG, GUANGZHOU FORUM



**Prof Xingyi ZHU**

Deputy Dean of School of Transportation at Tongji University, Shanghai



**Blake Yaoguang LI**

Executive Director and CEO, Haixin International



**Hanwei ZHOU**

Director of the Green Development Centre at The Commercial Aircraft Corporation of China Ltd.



**Dr Lucas TISDALL**

Managing Director and CEO of Flight One Group



**Dr Louise BROWN**

CEO of HydGene Renewables



**Jinjin XU**

Sustainability Lead, Boeing China



**Yuanrong ZHOU**

Senior Researcher, International Council on Clean Transportation



**Dr Wei CONG**

CIO of VariFlight



# OUR SPEAKERS & PANELLISTS

IN OUR SHANGHAI, HONG KONG, GUANGZHOU FORUM



**Raven CHANG**

Vice President, China  
Eastern Airlines Industry  
Investement Co., Ltd



**Yifeng MAO**

General Manager of the  
Planning and Development  
Department, Spring Airlines



**Lindsey LIU**

Senior Analyst, Argus



**Samuel WONG**

Vice President, PAC



**Charlie YIN**

Director, Surfers Group



**Prof Linbo LI**

Professor, Tongji University



# OUR SPEAKERS & PANELLISTS

IN OUR SHANGHAI, HONG KONG, GUANGZHOU FORUM



**Consul Ted GOENER**

Australian Consulate-General in Hong Kong



**Jason CHENG**

CEO, Kerogen Capital



**Yixian LI**

Hong Kong Airlines



**Celia LAO**

Vice President, NexusDMC



**Heather BONE**

Director of ESG for Team Global Express



**Margy OSMOND**

Chief Executive Officer of the Tourism & Transport Forum Australia



**Johnny WEI**

Cathay Pacific



**Alvin CHEW**

Argus Singapore



# OUR SPEAKERS & PANELLISTS

IN OUR SHANGHAI, HONG KONG, GUANGZHOU FORUM



**Xiaofang FU**

Associate Dean,  
National University of  
Singapore (Guangzhou)



**Nikola XING**

Head of Climate Action



**Chunxin LI**

Director, NUS GRTII



**Weiwen WU**

Deputy General Manager,  
Guangzhou Development Zone  
Low-Altitude Industry  
Development Co., Ltd.



**Qiang ZHOU**

General Manager, 9 AIR



**Dongjie ZHAO**

Qingdao Shitian  
Innovation Aviation  
Technology Co., Ltd.



**Nathan ILIC**

Consultant,  
Sustainability

*Disclaimer on Speakers and Panellists: While our project team greatly appreciates the presence of our guest speakers and panellists, we would like to clarify that their views do not necessarily represent those of their respective affiliations or indicate any official endorsement of our project.*









Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Journal of the Air Transport Research Society

journal homepage: [www.elsevier.com/locate/jatrs](https://www.elsevier.com/locate/jatrs)



### Sustainable aviation fuels: A meta-review of surveys and key challenges

Sebastian Wandelt<sup>a</sup>, Yahua Zhang<sup>b</sup>, Xiaoqian Sun<sup>a,\*</sup>

<sup>a</sup> School of Electronic and Information Engineering, Beihang University, Beijing, China

<sup>b</sup> UniSA Aviation, STEM unit, University of South Australia, Adelaide, SA, Australia

#### ARTICLE INFO

##### Keywords:

Sustainable aviation fuel  
SAF  
Feedstock  
Emissions  
Meta-review

#### ABSTRACT

Sustainable aviation fuel (SAF) offers various pathways to mitigate the aviation industry's significant carbon footprint. Over the past years, the SAF research landscape has seen a proliferation of overview/survey papers across diverse domains, driven by an increasing number of primary studies. The fragmentation of these papers across disciplinary boundaries, however, has a strong potential to prevent a comprehensive understanding of SAF state of the art and advancements. In this meta-review, we synthesize insights from the extant SAF survey literature. By systematically analyzing over 60 survey/overview papers on feedstock production, fuel synthesis technologies, lifecycle assessments, policy frameworks, economic viability, and intersections thereof, our review identifies recurring themes and emerging technologies regarding SAF research. Our meta-review also underscores the need of orchestrated future research efforts, by consolidating the top-10 fragmented SAF challenges across all surveys. We highlight feedstock availability problems, opportunities for scaling up production while maintaining sustainability criteria, fostering cooperation, and harmonizing SAF certification standards, among others. Our meta-review seeks to serve as a navigational tool for researchers, policymakers, and industry stakeholders alike, laying the foundation for a more effective and impactful orchestration of future work towards decarbonizing global aviation.



## Journal of Air Transport Management

journal homepage: [www.elsevier.com/locate/jairtaman](https://www.elsevier.com/locate/jairtaman)



### The impact of network optimization on airline financial performance: Evidence from China domestic routes

Yueer Zhou<sup>a,b</sup>, Wenliang Ma<sup>c,1,\*</sup>, Yuchao Xu<sup>d</sup>, Xiangru Wu<sup>e</sup>, Linbo Li<sup>f,\*\*</sup>

<sup>a</sup> College of Civil and Architecture Engineering, Shaoyang University, Shaoyang, China

<sup>b</sup> Key Laboratory of Green Construction of Intelligent Monitoring in Southwestern Hunan for Regular Higher Educational Institutions of Hunan Province, Shaoyang, China

<sup>c</sup> College of Business Administration, Capital University of Economics and Business, Beijing, China

<sup>d</sup> UniSA Aviation, STEM Unit, University of South Australia, Adelaide, SA, Australia

<sup>e</sup> School of International Trade and Economics, University of International Business and Economics, Beijing, China

<sup>f</sup> Key Laboratory of Road and Traffic Engineering of Ministry of Education, Tongji University, Shanghai, China

#### ARTICLE INFO

##### Keywords:

Network optimization  
Hybrid network design  
Financial performance  
Self-regulated ant colony optimization algorithm  
China domestic routes

#### ABSTRACT

Network structure is a crucial strategic factor influencing airline revenue. A hub-and-spoke network can reduce airline costs due to economies of scale; however, it may lead to passenger leakage when alternative transportation modes are available. On the other hand, a point-to-point network offers greater convenience for passengers but is generally less profitable for airlines. This paper develops an optimization algorithm (Self-Regulated Ant Colony Optimization) to design a hybrid airline network that can simultaneously optimize route design and frequency setting. Then, applying a case study of the airline network of China Southern Airlines, we find that the designed hybrid network generates better financial performance, manifesting as higher revenue and larger load factors compared to the original network. At the same time, the airlines' operating time is significantly reduced. The results also indicate that following network optimization, airlines tend to use smaller



Contents lists available at ScienceDirect

## Case Studies on Transport Policy

journal homepage: [www.elsevier.com/locate/cstp](http://www.elsevier.com/locate/cstp)



# Developing sustainable aviation fuel to deepen south Australia's green economy: A BERTopic-enhanced SWOT analysis

Yuchao Xu<sup>a</sup>, Yahua Zhang<sup>a,\*</sup>, Xin Deng<sup>b</sup>, Seung-Yong Lee<sup>a</sup>, Kun Wang<sup>c</sup>

<sup>a</sup> UniSA STEM, University of South Australia, Adelaide, Australia

<sup>b</sup> UniSA Business, University of South Australia, Adelaide, Australia

<sup>c</sup> Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong, China

### ARTICLE INFO

#### Keywords:

SAF  
SWOT analysis  
BERTopic  
South Australia  
Green economy  
Decarbonisation

### ABSTRACT

Sustainable aviation fuel (SAF) is a key solution for reducing aviation carbon emissions and is expected to contribute over 65% towards the industry's net-zero target by 2050. However, the gap between production capacity and potential demand remains significant. This paper analyses 225 inputs from 14 sustainability experts using BERTopic to enhance the analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT) to evaluate the feasibility of developing an SAF industry in South Australia. It has been found that South Australia possesses several unique comparative advantages in creating the SAF industry to further elevate the scale and quality of its green economy. The analysis shows that there is an urgent need for government collaboration with industry and research institutions to accelerate progress. Key initiatives proposed include establishing a research centre of excellence and providing supply-side incentives such as joint investment, tax credits, and low-interest loans. These measures will support research, coordinate stakeholders, build skilled workforce, reduce upfront costs, and ensure stable feedstock supplies. On the demand side, government procurement, airline credits, and



journal homepage: [www.elsevier.com/locate/tranpol](http://www.elsevier.com/locate/tranpol)



# From hero to zero: Barriers to achieving IATA's 2050 sustainability targets

Xiaoqian Sun<sup>a</sup>, Stefan Baumeister<sup>b</sup>, Luis Martin-Domingo<sup>c</sup>, Ian Douglas<sup>d</sup>, Marina Efthymiou<sup>e</sup>, Mark Hansen<sup>f</sup>, Julia Herget<sup>g</sup>, Katsuya Hihara<sup>h</sup>, Xibei Jia<sup>i</sup>, Ang Li<sup>j</sup>, Kam Hung Ng<sup>j</sup>, Mikio Takebayashi<sup>k</sup>, Yahua Zhang<sup>l</sup>, Sebastian Wandelt<sup>a</sup>

<sup>a</sup> School of Electronic and Information Engineering, Beihang University, Beijing, China

<sup>b</sup> University of Jyväskylä, School of Business and Economics, Finland

<sup>c</sup> Faculty of Aviation and Aeronautical Sciences, Ozyegin University, Istanbul, Turkey

<sup>d</sup> School of Aviation, University of New South Wales, Sydney, 2052, NSW, Australia

<sup>e</sup> Dublin City University, Business School, Glasnevin, Dublin 9, Ireland

<sup>f</sup> Department of Civil and Environmental Engineering, University of California, Berkeley, United States

<sup>g</sup> Frankfurt University of Applied Sciences, Frankfurt, Germany

<sup>h</sup> Department of Tourism Science, Tokyo Metropolitan University, Hachioji-City, Tokyo, Japan

<sup>i</sup> Department of Transport and Regional Economics, University of Antwerp, 2000, Antwerpen, Belgium

<sup>j</sup> Department of Aeronautical and Aviation Engineering, Hong Kong Polytechnic University, Hong Kong, China

<sup>k</sup> Graduate School of Maritime Sciences, Kobe University, Higashi-nada, Kobe 658-0022, Japan

<sup>l</sup> UniSA STEM, University of South Australia, Adelaide, Australia

### ARTICLE INFO

#### Keywords:

Air transport  
Sustainability  
IATA  
Net zero  
Survey

### ABSTRACT

Sustainable operations have become essential for mitigating the environmental impact of air transport and ensuring the long-term viability of the industry. Accordingly, achieving existing sustainability goals is crucial for reducing carbon emissions within the sector. This study presents an evaluation of the International Air Transport Association's (IATA) ambitious sustainability goals for 2050, focusing on the potential challenges and barriers that may impede their successful realization. Through a comprehensive survey circulated among carefully selected air transport sustainability researchers attending the Air Transport Research Society (ATRS) World Conference 2025, our study gathers independent academic expert perspectives on feasibility of IATA's commitments. The survey, structured around six categories, namely estimation of goal completion, economic



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## Journal of the Air Transport Research Society

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### Sustainable aviation fuels: A meta-review of surveys and key challenges

Sebastian Wandelt<sup>a</sup>, Yahua Zhang<sup>b</sup>, Xiaoqian Sun<sup>a,\*</sup>

<sup>a</sup> School of Electronic and Information Engineering, Beihang University, Beijing, China

<sup>b</sup> UniSA Aviation, STEM unit, University of South Australia, Adelaide, SA, Australia

#### ARTICLE INFO

##### Keywords:

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#### ABSTRACT

Sustainable aviation fuel (SAF) offers various pathways to mitigate the aviation industry's significant carbon footprint. Over the past years, the SAF research landscape has seen a proliferation of overview/survey papers across diverse domains, driven by an increasing number of primary studies. The fragmentation of these papers across disciplinary boundaries, however, has a strong potential to prevent a comprehensive understanding of SAF state of the art and advancements. In this meta-review, we synthesize insights from the extant SAF survey literature. By systematically analyzing over 60 survey/overview papers on feedstock production, fuel synthesis technologies, lifecycle assessments, policy frameworks, economic viability, and intersections thereof, our review identifies recurring themes and emerging technologies regarding SAF research. Our meta-review also underscores the need of orchestrated future research efforts, by consolidating the top-10 fragmented SAF challenges across all surveys. We highlight feedstock availability problems, opportunities for scaling up production while maintaining sustainability criteria, fostering cooperation, and harmonizing SAF certification standards, among others. Our meta-review seeks to serve as a navigational tool for researchers, policymakers, and industry stakeholders alike, laying the foundation for a more effective and impactful orchestration of



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## Transport Policy

journal homepage: [www.elsevier.com/locate/TRANPOL](http://www.elsevier.com/locate/TRANPOL)



### Bibliometric analysis and literature review on sustainable aviation fuel (SAF): Economic and management perspective

Yuchao Xu<sup>a</sup>, Yahua Zhang<sup>a,\*</sup>, Xin Deng<sup>b</sup>, Seung-Yong Lee<sup>a,c</sup>, Kun Wang<sup>c</sup>, Linbo Li<sup>d</sup>

<sup>a</sup> UniSA Aviation/STEM, University of South Australia, Adelaide, Australia

<sup>b</sup> UniSA Business, University of South Australia, Adelaide, Australia

<sup>c</sup> Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong, China

<sup>d</sup> Key Laboratory of Road and Traffic Engineering of Ministry of Education, Tongji University, Shanghai, China

#### ARTICLE INFO

##### Keywords:

Sustainable aviation fuel  
SAF  
Power-to-Liquid  
Decarbonisation  
Feedstock

#### ABSTRACT

Sustainable aviation fuel (SAF) is a key contributor to the aviation sector's efforts to achieve net-zero targets. This article presents a bibliometric analysis and literature review of 243 SAF-related publications from social science and quantitative disciplines, covering the period from 2014 to 2024. It highlights the latest research trends on the economic analysis of technological pathways, feedstocks, and policy interventions. Although SAF usage in commercial aviation is below 0.1% as of 2024, its decarbonisation potential could exceed 60%, particularly for medium- and long-haul flights. While biomass-based SAF faces constraints due to feedstock availability, the power-to-liquid pathway may offer a long-term solution. Five key themes have been identified in the literature: (1) sustainable certification of pathways and feedstocks, (2) economic simulations of alternative solutions, (3) economic feasibility of pathways and feedstocks, (4) supply chain dynamics and involvement of multiple stakeholders, and (5) policy interventions. Future studies could focus on economic simulations of airline

# CONTRIBUTIONS TO POLICY CONSULTATION



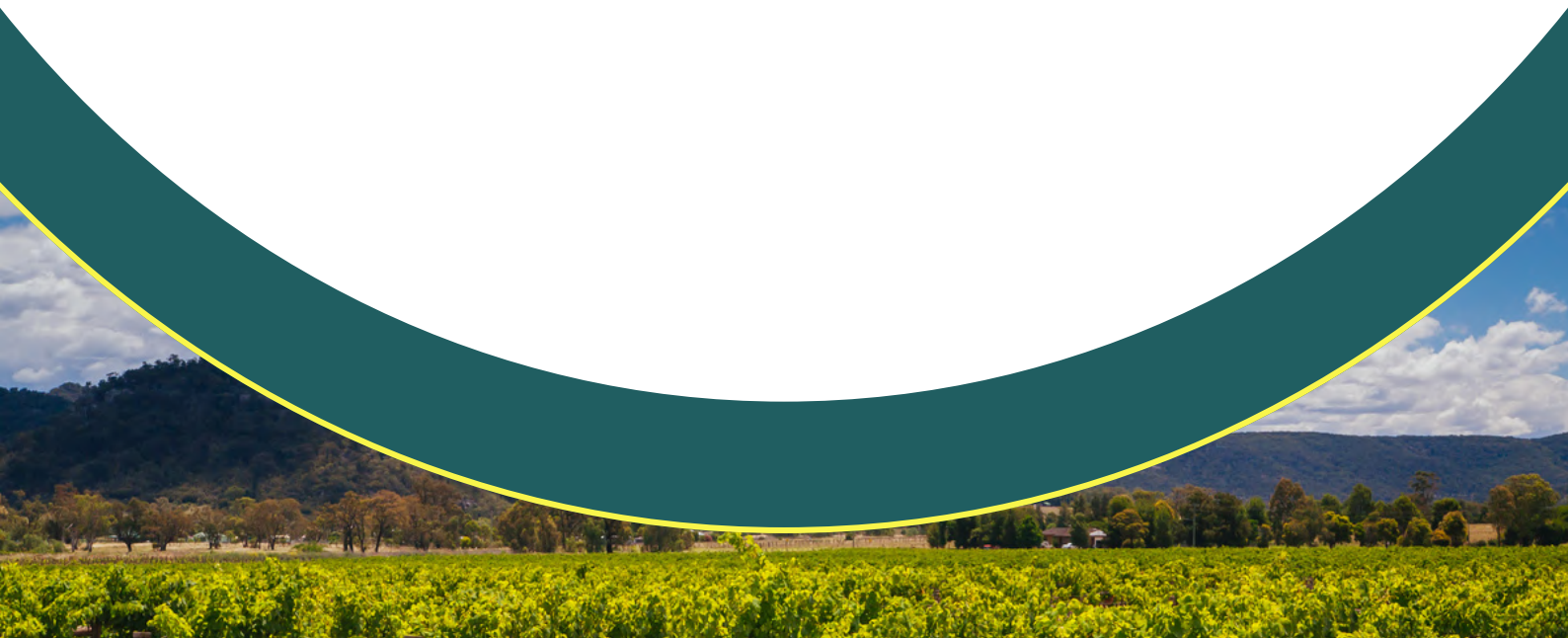
**Australian Government**  
**Department of Agriculture,**  
**Fisheries and Forestry**

HAVE YOUR SAY

[Consultation hub](#) > National Bioenergy Feedstock Strategy

## National Bioenergy Feedstock Strategy

The South Australia Sustainable Aviation group engages industry stakeholders to stay at the forefront of Australia–China developments in sustainable aviation, while actively contributing to policy discussions. In October 2025, the group submitted a consultation paper to the ‘National Bioenergy Feedstock Strategy’ open call for input and looks forward to collaborating with a range of stakeholders.



October 10, 2025

Department of Agriculture, Fisheries and Forestry

**Re: National Bioenergy Feedstock Strategy: Discussion Paper**

Dear Sir/Madam,

Thank you for the opportunity to provide feedback on the National Bioenergy Feedstock Strategy: Discussion Paper.

We present this submission to the Department of Agriculture, Fisheries and Forestry on behalf of the South Australian Sustainable Aviation (SASA) Research Group, led by Professor Shane Zhang. Our group has been working on a project funded by the National Foundation for Australia-China Relations, aiming to raise awareness among Australian and Chinese stakeholders about opportunities for developing Sustainable Aviation Fuel (SAF) industries and to prepare Australian farmers and investors to capitalise on these opportunities. Since 2024, we have run six events engaging multiple stakeholders in the SAF industry in both Australia and China, and published several research papers in this area. This submission draws on the knowledge and insights gained from those events and research.

We note that this discussion paper is one in a series of consultations, including Low Carbon Liquid Fuels – A Future Made in Australia (2024) and the recently published Net Zero Plan. The discussion paper raises crucial questions on how to develop biomass feedstock in Australia to harness the opportunities arising from the rapid growth in Low Carbon Liquid Fuels (LCLF) and to support Australia's net-zero goals.

This submission focuses on three questions raised in the discussion paper:

- What are the main barriers—commercial, logistical, regulatory, or environmental—to developing reliable and sustainable feedstock supply chains for domestic bioenergy production?

In our opinion, there are at least two barriers requiring urgent action.

Barrier 1: Risks associated with demand for feedstocks. Investment in feedstocks can be substantial and usually takes a long time to materialise. Several demand-side uncertainties can further deter investment: (1) Potential buyers: There is not yet an established market for many feedstocks, and farmers may be unable to find buyers for their products. (2) Price volatility: Prices can fluctuate considerably.

Barrier 2: Domestic policy vacuum on the demand side. Many countries have introduced SAF mandates to level the playing field for airlines and provide clear policies to develop domestic LCLF industries. The Australian Government, however, has not yet explicitly committed to any policy to support domestic LCLF development. The Future Made in Australia initiative is a good start, but funding without clear and measurable goals is less effective in facilitating the growth of bioenergy feedstocks. Australia is also disadvantaged by its distance from major markets. Relying solely on export markets for feedstocks adds additional transport costs, which is neither financially nor environmentally sustainable.

- What opportunities exist to improve feedstock supply chain efficiency and reduce costs?

The year 2025 marks the start of a golden era for LCLF industries, with multiple countries and regions introducing SAF mandates and the International Maritime Organization officially announcing its net-zero commitment, which will be achieved mainly through LCLF. Demand for LCLF will increase considerably and steadily over the next two decades, creating an unprecedented window of opportunity to be part of the growing international market.

With its vast land, abundant agricultural biomass, and waste resources, Australia is well positioned to take this opportunity by becoming a major supplier of bioenergy feedstock. Strengthening domestic supply security for bioenergy feedstock and fuel aligns with national interests. However, it requires thorough planning, bold policy measures, and coordinated actions for Australia to fully reap the benefits of this opportunity.

- Which feedstocks, or mix of feedstocks, should be prioritised for immediate deployment, and which require further research and development across the short, medium, and long term?

It is a sound strategy to pursue a diverse range of feedstocks, but Australia also needs to look beyond those identified in the CSIRO report and explore new feedstocks that offer unique comparative advantages.

In our opinion, ideal feedstocks for Australia should meet at least three criteria:

1. Utilise marginal land. Australia has one of the lowest proportions of arable land globally, and it is not practical to grow feedstocks on already limited arable land. Feedstocks using arable land attract lower carbon credits and are therefore less valuable in terms of emission reduction. Furthermore, growing bioenergy feedstocks on existing arable land could limit food supply, drive up food prices, and potentially threaten food

security.

2. Have secure buyers. Feedstock production is at the very beginning of the LCLF supply chain. Ideally, Australia should establish a complete ecosystem for LCLF—from feedstock production to end users—including associated services such as technology support and carbon accounting. Such an ecosystem would provide greater investment security and generate economic and employment benefits. If that is not immediately achievable, government and industry should build mechanisms to ensure demand security, particularly during the early stages, to mitigate demand-related risks.

3. Be climate resilient. Climate change will intensify in the coming decades, and bioenergy feedstock planning must take this into account to ensure adaptability to increasingly challenging environmental conditions.

- How can government and industry support the utilisation of a diverse range of feedstocks, including resources like residues, woody biomass, and other novel feedstocks?

Government and industry can work together to design and foster a domestic LCLF ecosystem and play pivotal roles in the following areas:

1. Education and information flow. LCLF is a relatively new area, and scepticism and uncertainty are common when new technologies are introduced. Government, industry, and research institutions should collaborate to provide reliable information and educate stakeholders, enabling them to participate confidently.

2. Risk mitigation. In addition to education, government can reduce demand-side uncertainties through:

- Reducing transaction costs by bridging the gap between buyers and producers. LCLF producers may lack knowledge of available feedstocks, while farmers may not be aware of demand. Partnerships between government and industry can help establish feedstock markets and facilitate information exchange.

- Providing policy incentives to mitigate risks associated with market fluctuations. Feedstock prices can vary considerably depending on global conditions, and government support can help encourage early adopters of selected feedstocks.

3. Support for research and policy development. Support can take several forms:

- Providing targeted research funding in priority areas.
- Sharing knowledge generated through research—for example, by running public events and hosting findings on a dedicated, publicly accessible website.

- Improving transparency in government funding allocation and publishing relevant information regularly.

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UniSA respectfully acknowledges the Kaurna, Boandik and Barngarla First Nations Peoples and their Elders past and present, who are the First Nations' Traditional Owners of the lands that are now home to our campuses in Adelaide, Mount Gambier and Whyalla

