WORLD TRAVEL & TOURISM COUNCIL

SUSTAINABLE AVIATION FUEL

Opportunities & Implications for Tourism Destinations

Supported by

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FOREWORD

Aviation is a force for good. It connects families, businesses and communities and has revolutionised our world. The ability to travel safely, quickly and efficiently over long distances has opened up new economic, cultural and social opportunities and is a critical enabler of international Travel & Tourism.

Aviation delivers many benefits, but it also contributes to climate change. WTTC's most recent data shows that in 2019 (pre-pandemic), **Travel & Tourism was accountable for 8.1% of global greenhouse gas emissions (GHG's), with international aviation contributing 13.8% off all Travel & Tourism emissions**. The aviation industry is therefore working hard to reduce its carbon footprint and airlines have already invested billions of dollars in more fuel efficient aircraft, adopted fuel reducing operations and called on governments, including the EU, for Single Skies whereby airlines are allowed to fly more direct routes.

Sustainable Aviation Fuel (SAF) provides an immediate and significant opportunity to reduce aviation emissions, but the scale of transiting from fossil fuels that have served the industry for more than 100 years, to a new generation of sustainable fuels that are not made from crude oil is considerable.

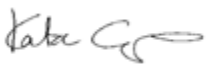
This paper provides a basic introduction to Sustainable Aviation Fuel (SAF) and outlines the benefits and implications for the tourism industry, including the opportunities for tourism destinations to demonstrate climate leadership and enhance local and regional prosperity. It also shows that if the scale up of SAF is not managed well it could present risks to tourism destinations, including potential disruptions to travel demands and impacts to business models, combined with new government regulations for the decarbonisation of transport and aviation that may change over time presenting a level of uncertainty for Travel & Tourism businesses.

To embrace the opportunities presented by Sustainable Aviation Fuel and address the challenges, WTTC and ICF have jointly developed this short paper which recommends **tourism destinations undertake three critical actions** which are to:

1. **Share this paper widely with tourism partners** to improve tourism stakeholder awareness and understanding of SAF.
2. **Collaborate with aviation stakeholders and national travel partners** to call on national governments to create a public/private task force in each country, dedicated to decarbonising transport, with working groups focussed on each mode of travel.
3. **Encourage national governments to undertake a SAF Feasibility Study** as a first practical step to assess the best approaches for SAF development in each tourism specific destination. Where this has already been completed tourism stakeholders can still play an important role in the delivery of actions supporting a SAF implementation roadmap through the pubic/private task force

Through collaboration and innovation, Travel & Tourism can thrive as global leaders in sustainability and create a better future for our sector and the planet. I invite you to commit to supporting the development and implementation of Sustainable Aviation Fuel (SAF) so that your next business trip, or family holiday, can be a more sustainable journey.

Julia Simpson
President & CEO
WTTC



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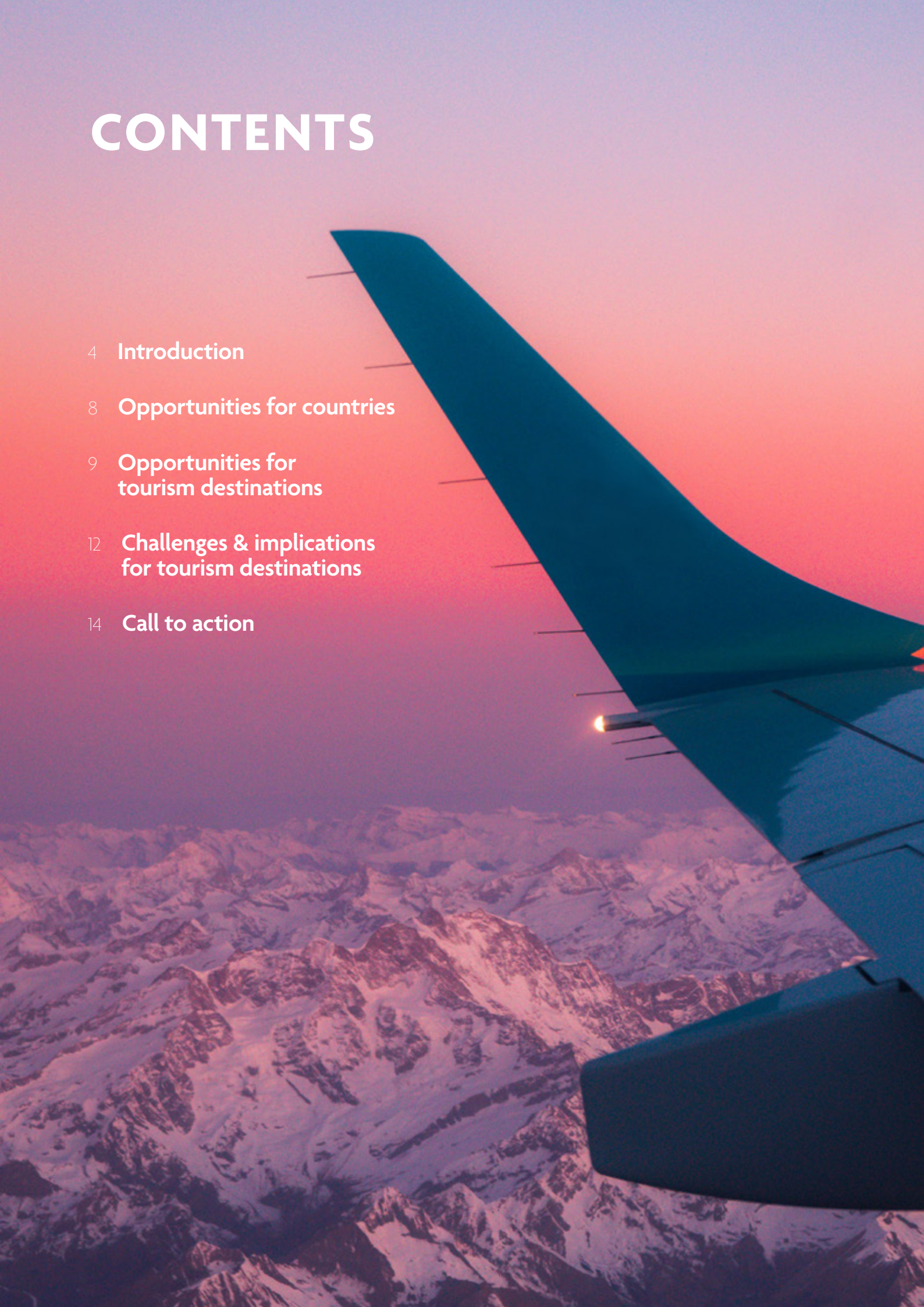


INTRODUCTION

Travel & Tourism is a significant contributor to global economic growth and development. **In 2023 the sector is forecast to contribute US$ 9.5 trillion to the global economy and support 320 million jobs.** However, the sector also has an environmental impact. In 2019 (pre-pandemic) WTTC's data shows that Travel & Tourism accounted for 8.1% of global greenhouse gas (GHG) emissions, with transport being the most significant contributor and **international aviation accountable for 13.8% of all Travel & Tourism emissions**. This paper is therefore the first in a series of new studies from WTTC that will outline effective approaches to decarbonising all major modes of transport for Travel & Tourism.

There are several ways to reduce the climate impact of aviation. All of them are in active research or development, but each of them has significant challenges in terms of scale, cost, technical maturity, or material trade-offs. Approaches to decarbonising aviation include the use of battery or hybrid electric aircraft, hydrogen fuel cells and hydrogen combustion, the use of advanced materials in airframe design and advanced engine performance improvements, as well as some attempts by governments to use taxation or regulation to limit the use of aviation altogether. However WTTC and ICF strongly believe that through innovation and international collaboration it is possible to significantly reduce the carbon footprint of aviation, without the need to limit it in the future.

The most immediately available contribution to aviation decarbonisation is from **Sustainable Aviation Fuels (SAFs)**. These fuels are available, certified to be safe and have already partly powered hundreds of thousands of commercial aviation flights, but are currently only produced in very small quantities when compared to the billions of litres of jet fuel required to power the global aviation industry. SAFs offer a significant opportunity to reduce the carbon footprint of air travel and create a more sustainable Travel & Tourism sector. This paper therefore explores the opportunities and implications of SAFs for tourism destinations. But first, some basic information about what SAFs are, how they are made and why they are labelled as 'sustainable'.

What is Sustainable Aviation Fuel (SAF) ?

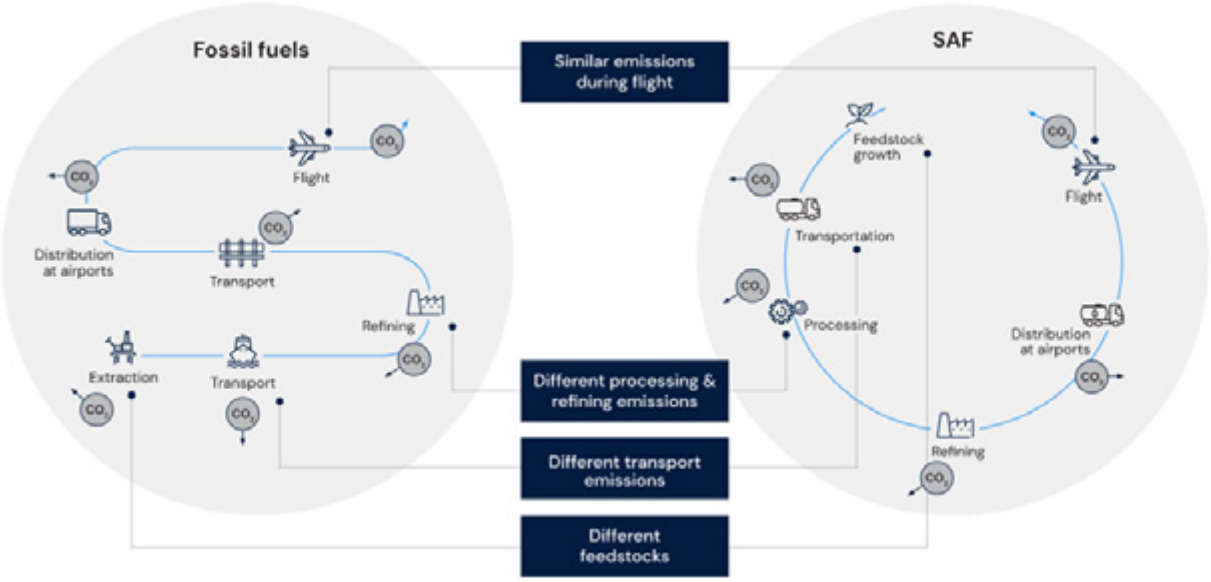
Today's commercial aircraft fly with fuel made from crude oil, whereas **Sustainable Aviation Fuel (SAF) is an 'umbrella term' for jet fuels made from a variety of non-crude oil sources called 'feedstocks'** (such as waste material that is converted to a liquid fuel). SAFs are chemically very similar to conventional fossil-based jet fuels, with only minor differences and are today blended with conventional fossil-based jet fuel to be used in current aircraft with no engine modifications. Depending on the feedstock and technology process used for SAF production, quantities of SAF blended with existing jet fuel vary between 10% to 50%.

Although emissions from SAF are the same as conventional fossil fuels when they are burned, these are compensated through negative carbon emissions during the production phase, making net zero flights possible

However, demonstrations have shown that modern aircraft with improved engine technologies can fully operate on 100% SAF, without the need for any blending with existing fossil based jet fuel[1]. In January 2023 Emirates[2] operated a Boeing 777 with 100% SAF powering one of its engines, whilst in March 2023 Airbus[3] flew a A321neo with both of its engines running on 100% SAF, demonstrating that **100% SAF fuelled flights are safe, viable and already possible**. This is a major advantage of SAF when compared to other decarbonisation technologies as it can demonstrably be used with existing aircraft and airport infrastructure, without the need for modifications, and is therefore termed a 'drop in' solution.

SAFs are labelled as 'sustainable' because they are produced in a way that uses feedstocks and processes which absorb, or recycle carbon, which is already in the atmosphere creating a 'circular' system of carbon use. This contrasts with conventional fossil-based jet fuel which is refined from oil extracted from the ground (and which captured carbon millennia ago and is therefore not considered as 'circular'). Considering the full carbon 'life cycle' of SAF as a circular system (from feedstock growth to combustion in the engine) versus the 'life cycle' emissions for conventional fossil fuel (from oil extraction to combustion in the engine) as a line of increasing carbon emissions, helps to illustrate the differences.

SAF reduce aviation emissions on a Life Cycle Basis



Therefore depending on the feedstocks and production technologies used, **SAF can achieve 100% net carbon emission reductions** (or even higher with carbon capture integration) compared to conventional jet fuel on a 'life cycle basis'. A life cycle is the overall carbon emitted from feedstock growth (for SAF), or oil extraction (for convention jet fuel), through all of the processing stages, to final combustion in the aircraft engine. It is important to note that for SAF this is about achieving **net zero emissions** (not zero emissions), as carbon is still emitted from SAF during combustion in the engine, but is absorbed or recycled during the production phases.

Feedstocks available to produce SAF

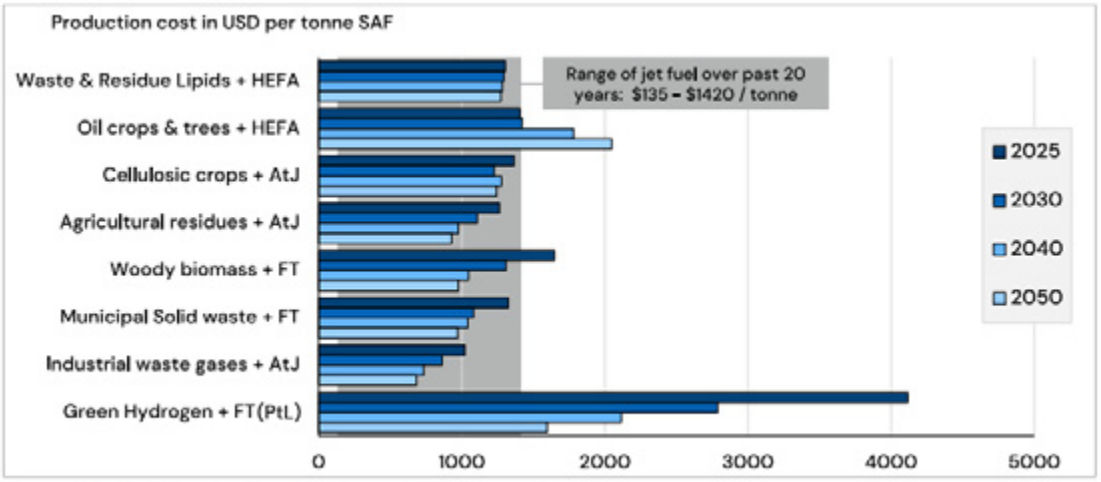
The Commercial Aviation Alternative Fuels Institute (CAAFI) lists over 130 potential feedstocks for SAF production[4]. However these can be simply categorised into two routes: biological feedstocks and non-biological feedstocks.

Biological feedstocks refer to a wide range of organic sources from waste & residue lipids (such as used cooking oil and animal fats), to crops (such as sugarcane, soybean and rapeseed) to municipal solid waste (including 'black bin' and industrial solid waste). These feedstocks present lower emissions when compared to fossil-based aviation fuel, but their land and water requirements are higher. Their availability and access to them is also limited, and with increasing SAF demand, the price of biological feedstocks is expected to increase. Importantly though as the price of SAF produced from these feedstocks is likely to increase as demand outstrips feedstock supply, the cost of next generation SAFs produced from less constrained, often **non-biological feedstocks**, is forecast to decrease substantially from current levels.

Non-biological feedstocks refer to other sources of hydrogen and carbon, which are the fundamental constituents of renewable hydrocarbon fuels (such as SAF). For SAF production, hydrogen and carbon can be supplied from various non-biological sources, such as industrial waste gases, or from captured air, for the carbon and from water (H_2O) for the hydrogen, with electricity to support the process. This pathway, also referred to as e-fuels, or as Power-to-Liquids (PtL) SAF production, requires substantial amounts of renewable energy input and is therefore currently more expensive than SAF made from waste or other biological sources.

SAFs made from biological feedstocks can be made today and offer the quickest route to market for scaling up SAF production. However in the mid-to-longer term their challenges including access to biological feedstocks at huge quantities, with their land and water requirements will make large scale SAF production via this route very challenging. Conversely it is expected that there will be increasing amounts of renewable energy produced around the world, which will significantly reduce the cost of SAF made from non-biological approaches. **WTTC and ICF therefore expects that SAF made from non-biological sources and renewable energy are likely to be the preferred longer term option for SAF production.** The following diagram illustrates the anticipated change in the production cost trends of SAF over time for a variety of feedstocks.

Change in production costs for selected pathways as technologies mature



Source: ICF Analysis, not all production possibilities are shown

Technologies to produce SAF

SAF can be made with different technologies and processes, but **only seven technology pathways for SAF production are currently approved by ASTM International** (American Society for Testing & Materials), the recognised body to approve the suitability of jet fuel for aircraft. But when these seven technology pathways are combined with the very large number of possible feedstocks, it makes hundreds of different ways to produce SAF, yet only a few of them are commercially available today, and currently only a single pathway called HEFA (which produces fuel from feedstocks such as vegetable oils) is commercially available to produce large amounts of SAF, as it is the process currently used to produce renewable diesel for land vehicles.

Tourism destinations and regions of the world will have different feedstocks available to them, from lush vegetation in Asia Pacific for biological SAF production, to all year round sunshine for solar renewable energy and non-biological SAF production in countries around the equator. Once a suitable feedstock is chosen according to the characteristics of the region, SAF can then be produced through different technology pathways as illustrated below.

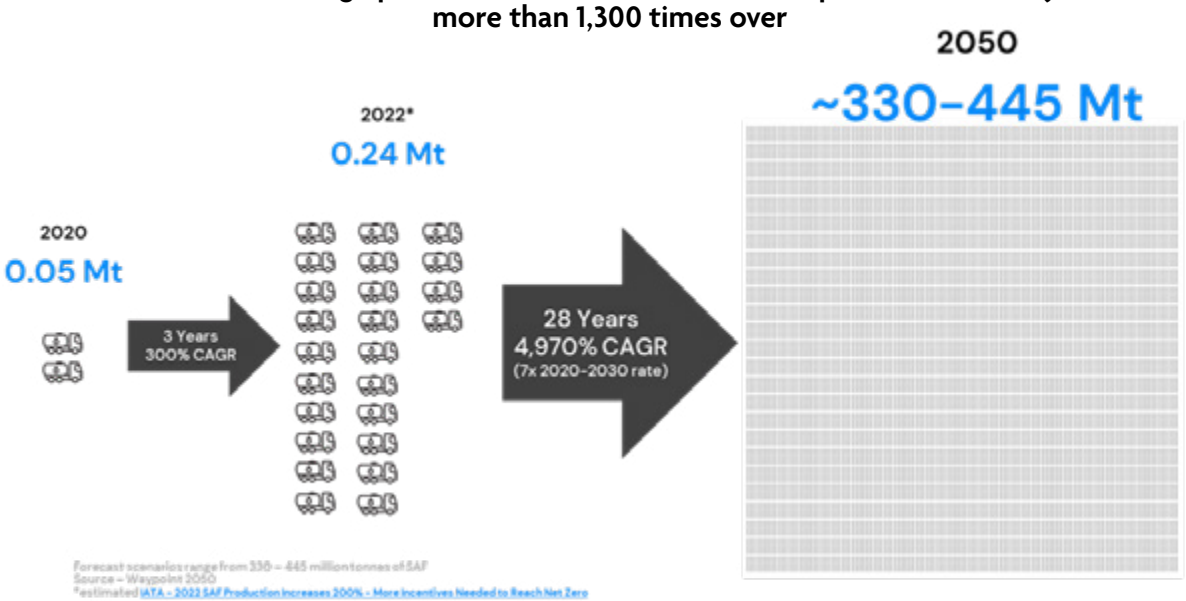
Various feedstocks and technology pathways can be used for SAF production

	Feedstock category		Sub-category	Example feedstocks	Conversion pathway
1	Biological feedstocks	Waste & Residue Lipids		UCO, tallow, tall oil, POME, PFAD	HEFA
2	Biological feedstocks	Non-food crops	Oil Seed crops & trees	Camelina, Jatropha	HEFA
	Biological feedstocks	Non-food crops	Cellulosic cover crops	Miscanthus, Switchgrass	gas/FT or AtJ
3	Biological feedstocks	Agricultural residues		Corn stover, rice residues, bagasse	gas/FT or AtJ
4	Biological feedstocks	Woody biomass		Forestry coppice, slash, thinnings, offcuts	gas/FT or AtJ
5	Biological feedstocks	Municipal Solid waste		Black bin and industrial solid waste	gas/FT or AtJ
6	Non-biological feedstocks	Renewable fuels of non-biological origin (RFNBO)	Industrial waste gases	Waste carbon gases from industrial plants	gas/FT or AtJ
	Non-biological feedstocks	Renewable fuels of non-biological origin (RFNBO)	Power-to-Liquids (H2 from electrolysis & CO_2 from DAC)	Renewable electricity	gas/FT or AtJ

How much SAF is needed and where will it come from?

In the last five years, the production of SAF and announcements of new production facilities has been growing rapidly. The year-on-year growth between 2021 and 2022 was around 300%. However, the volumes in production today, and as a result used on commercial flights, is still incredibly small and woefully inadequate. **Less than 0.1% of all aviation fuel in use today is SAF**, and it is estimated that the **volumes of SAF will need to increase by over 1000 times by 2050** for SAF to be making its required contribution to global aviation decarbonisation. The scale up of SAF is an enormous challenge and will require financial assistance, government policy support and close collaboration between governments and the Travel & Tourism and energy sectors.

Announced scaling up needs to continue and increase production in 28 years more than 1,300 times over



OPPORTUNITIES FOR COUNTRIES

With a wide range of production technologies and possible feedstocks available, a very significant feature of SAF, as compared to conventional fossil fuel, is that SAF can in theory be produced and uplifted onto aircraft anywhere. This makes **Sustainable Aviation Fuel potentially accessible to every country in the world** and reduces the exposure of a country's aviation industry to existing fossil fuel price fluctuations from global geo-political matters.

For example, tourism destinations in small countries and islands, who may have a challenge of disposing of increasing amounts of waste in landfill, could turn that waste into SAF, while larger countries with substantial agricultural waste products could turn that into SAF. Alternatively countries with greater solar or wind exposure could couple renewable energy with Power-to-Liquid (PtL) production technologies to make SAF. Whilst there are different capital and operating costs for each pathway, as well as technical and regulatory considerations for each, the appeal of SAF to all countries in terms of its production versatility is real and **SAF should be considered by countries as a national strategic asset to be developed.**

SAF can also help create new industries, grow local economies and support a country's energy independence, as well as provide for the long term sustainable future of their aviation industry, whilst reducing a country's reliance on the existing concentrated supply chain of jet fuel, which is centred around limited oil extraction sites, then transported and distributed over great distances which generates significant carbon emissions.

Case Study

Warming ocean waters are causing record levels of seaweed in the Caribbean, which are washing up along white sandy beaches, clogging sea ports and impacting countries attractiveness to tourists.

Researchers from the US National Renewable Energy Laboratory (NREL), Fearless Fund and Universities of Puerto Rico and Carolina State are therefore investigating if seaweed and wood waste could be converted into Sustainable Aviation Fuel (SAF) and graphite, a key material used in electric vehicle batteries.

The research team believes up to 1.24 million tons of seaweed could be harvested annually from Caribbean coastlines and if blended with 75% wood waste could produce up to 300 million litres of SAF every year, with an additional 61,000 tons of graphite per year for electric vehicle batteries.

"We are researching mitigating waste streams on coastal communities, creating new jobs, and helping countries to meet energy independence goals"
Lead NREL Researcher Jacob Kruger

OPPORTUNITIES FOR TOURISM DESTINATIONS

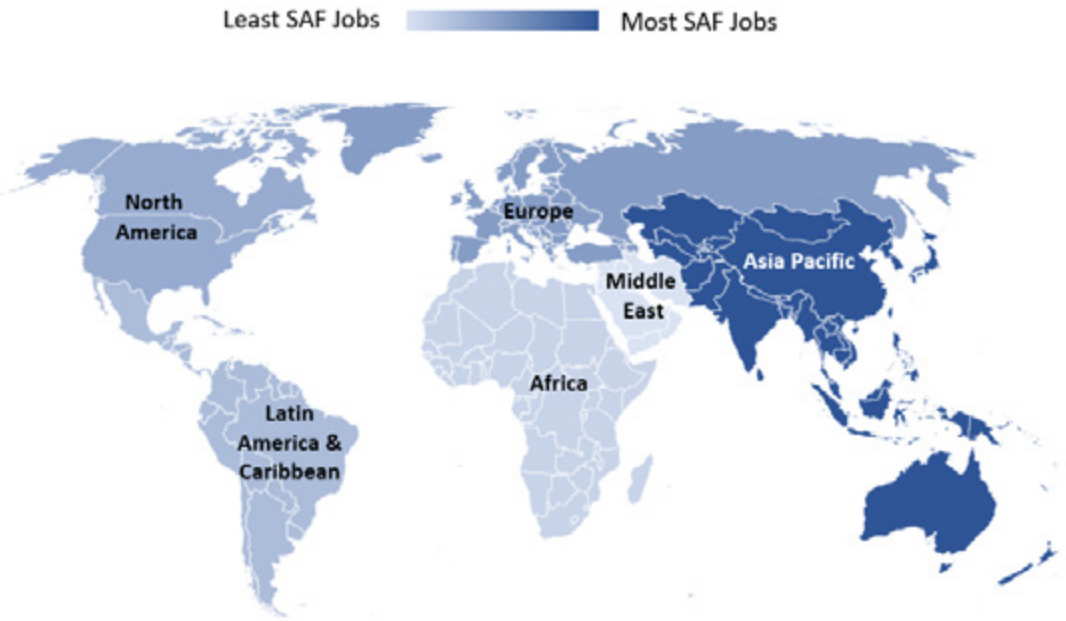
International air travel is critical for tourism, with many destinations heavily reliant on air connectivity to attract and service visitors. The benefits and opportunities of SAF for tourism destinations therefore include the following areas:

1. Climate leadership & competitive advantage

By supporting and accelerating the transition from fossil fuels to SAFs, **tourism destinations can reduce their carbon footprint** and contribute to global efforts to combat climate change. Moreover, as travellers continue to become more environmentally conscious, the use of SAF by a country's national or regional airline(s) can become a **source of competitive advantage for tourism destinations** by visibly demonstrating a real commitment to sustainability.

2. Economic prosperity

SAFs offer an opportunity for tourism destinations to develop new industries and economic opportunities. For example land that may have historically been unsuitable for food crops, may now be suitable for SAF crops, generating jobs and prosperity for a region and potentially rejuvenating neglected land areas. However it is important that crops for SAF do not lead to deforestation. SAF can be a powerful tool to create new jobs and economic growth in tourism destinations, whilst also promoting local sustainable development. **ICF's Fuelling Net Zero report[5], prepared for the Air Transport Action Group (ATAG), estimates that up to 14 million jobs could be created, or sustained by the emerging SAF industry**. As demand for SAF increases, tourism destinations that invest in the production and distribution of SAFs can achieve economic prosperity and become major players in the future global aviation industry. The following diagram illustrates the anticipated global spread of SAF industry jobs (by regional grouping).



The Netherlands is a leading example of a tourism destination that is taking advantage of the opportunity presented by SAF. The Dutch government has set a target of 14% of all aviation fuels used in the Netherlands to be sustainable by 2030. The country has already made significant progress towards this goal, with KLM, the national airline, conducting flights partly fuelled with SAF, from Amsterdam Schiphol Airport to various destinations. The Dutch government has also invested in local SAF production, with a new facility in Rotterdam set to open in 2024 that will produce SAF in large quantities from sustainable biomass.

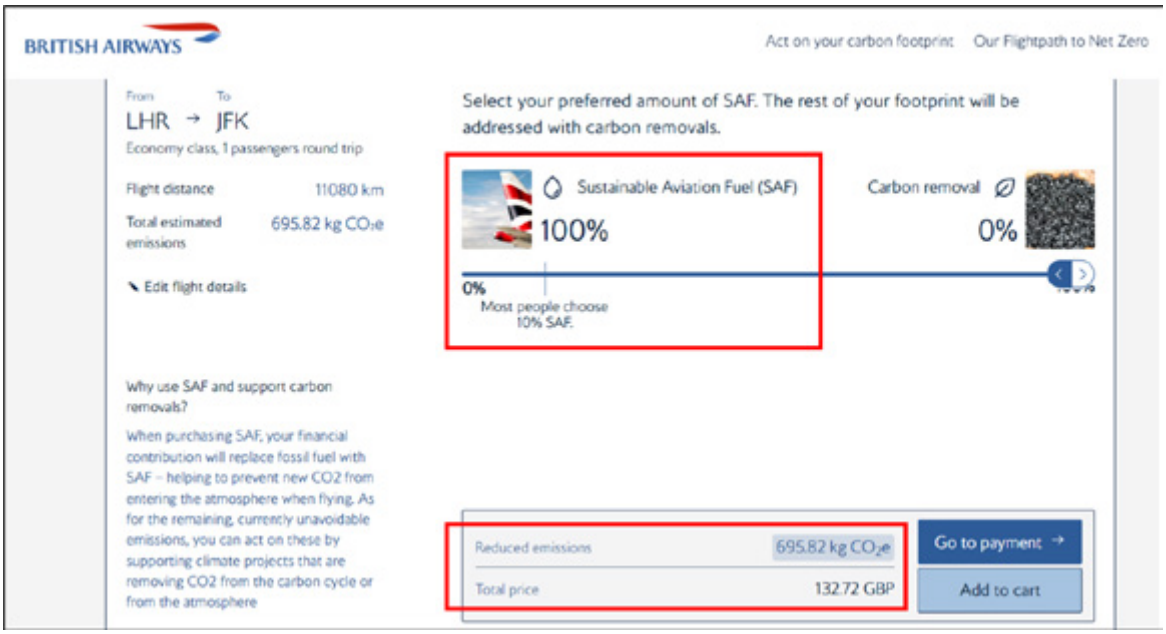
The Netherlands' approach to SAF has created economic opportunities for the country, with local companies investing in SAF production and supply chains. The country's commitment to sustainability has also helped to position it as a leader in sustainable tourism, attracting environmentally conscious visitors who prioritise sustainable travel. **SAF can therefore benefit national tourism and be an economic multiplier for a destination.**

3. Investment opportunities for good

All climate change projections indicate that a mix of public and private sector investments will be required for the world to reach net zero by 2050 and to keep global temperatures below 1.5°C. For any tourism company considering where to invest in the planets future, an **investment in SAF is a good choice as it helps to fight climate change, supports the production scale up of SAF and delivers benefits directly back to the Travel & Tourism sector.**

A full scale analysis of investment opportunities is beyond the scope of this short paper, but at a high level can take **one of two main paths – either the purchase of SAF from an airline during the booking process, or direct investments in projects related to SAF R&D, production or distribution.** The role of clear and coherent government policy is crucial for both and WTTC and ICF encourage governments to establish effective frameworks for the management of all investments in climate solutions to ensure their benefits are realised.

An example tourism private sector operating expenditure (OPEX) investment in SAF is illustrated below. In this example a tourism business is purchasing SAF for one of their employees who is travelling on a flight from London to New York (return) in economy with British Airways. This purchase of SAF costs £132 (approx. US$ 160) and saves 695 kg of CO_2e from being emitted into the atmosphere. This could be purchased alongside a normal ticket either by a traveller, or by their company and is directly contributing to fighting climate change and the Travel & Tourism sector's efforts to reduce emissions. Similarly any private traveller, or business operating in any other sector, could also purchase SAF via this route to reduce their own climate impact of travel.



Source : British Airways CO2llaborate Platform [6](accessed on 05/04/2023)

On a much larger scale, there are also wholesale **'offtake agreements'** (which are usually large scale pre-purchases of SAF at a fixed price) that can be signed by airlines, airports, or businesses directly with SAF producers and at the largest end of the investment spectrum, there is direct capital investment in SAF production, refining or distribution capacity.

Typical SAF production plants are considerably smaller in scale than traditional oil refineries and therefore the capital expenditure required per SAF plant runs into the hundreds of millions of dollars, versus the billions of dollars which can be required for an oil refinery. Even so, to globally achieve 4000 (or more) new SAF plants, which are requ**ired to produce the volumes of Sustainable Aviation Fuel required for global aviation by 2050, ICF estimates a worldwide capital expenditure (CAPEX) need of US$ 1.1-1.5 trillion dollars.** This is beyond the financial reach of the Travel & Tourism private sector alone and therefore requires financial assistance from governments and other parties such as development banks.

CHALLENGES & IMPLICATIONS FOR TOURISM DESTINATIONS

While SAFs offer many opportunities and benefits for tourism destinations, there are also potential risks and implications that must be considered and addressed. These include:

1. Distortion of travel demands & business models

One of the **main risks to tourism destinations is the cost of SAF**, which is currently higher than traditional aviation fuels. This can create challenges for tourism destinations that rely heavily on air travel, especially low cost or regional/domestic air travel, as higher fuel costs can lead to higher airfares and potentially reduced demand for air travel. It is widely expected that the cost of SAFs, relative to conventional jet fuel, will decrease over time as the industry scales up production, so **WTTC and ICF encourage tourism destinations to work with their national government and private sector partners to rapidly encourage local SAF industries**. Where local SAF production is not viable, tourism destinations should encourage their governments to partner with energy suppliers, airlines and other stakeholders to create Sustainable Aviation Fuel supply chains for their country or destination.

2. SAF usage regulations & mandates

An increasing number of governments around the world are implementing, or considering, regulation that would mandate the use of SAF at certain volumes between now and 2050 and applying specific conditions on aircraft re-fuelling with SAF to prevent 'tankering' (that is taking on more fuel than is necessary for a flight, because it is cheaper at the departure airport, than at the arrival airport). This aims to reduce unnecessary CO_2 as heavier planes cause more emissions, but this also presents logistical challenges for the aviation sector whilst the SAF industry is still in its infancy and could present a risk to tourism destinations that do not have an adequate supply of SAF.

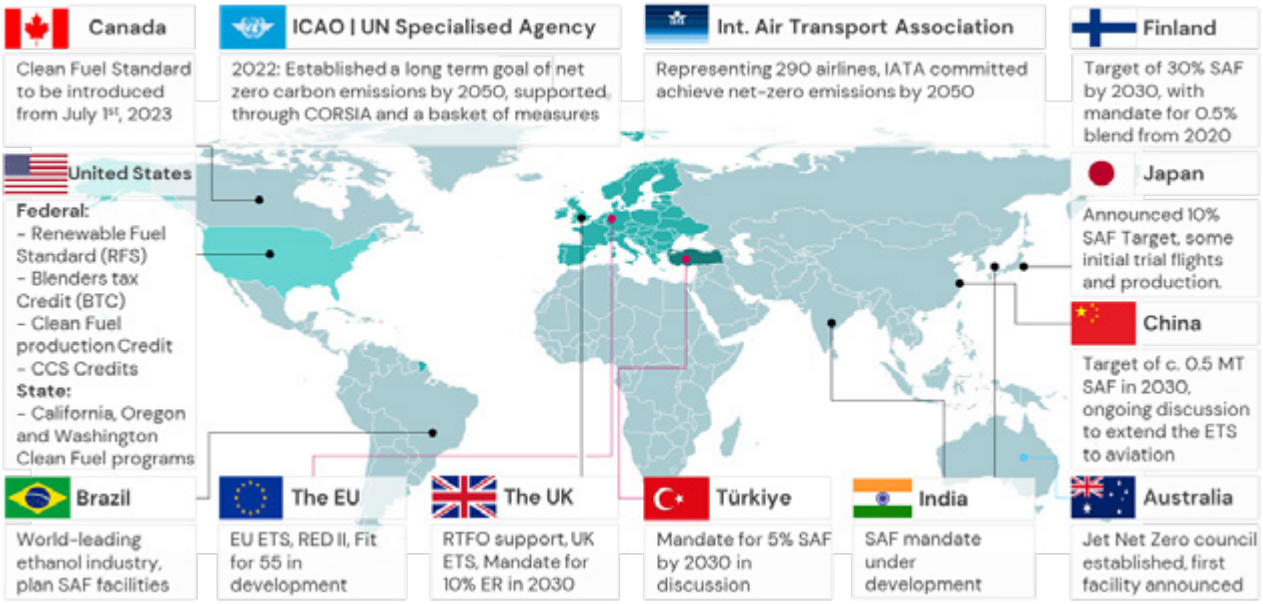
To partly address this are emerging programmes called **'book and claim'** schemes that facilitate the separation of the physical fuel from its environmental attributes, allowing fuel producers and airline users to meet different regulatory requirements and obligations in different countries. Today this is achieved by using 'SAF certificates' which record the volume of SAF delivered and corresponding carbon lifecycle emission savings, but there is currently no independent verification system, or formal regulatory oversight of this activity (as of early 2023).

In theory, a 'book and claim' system would allow SAF to be produced and used in one place, while paid for and accounted for in another, significantly increasing the economic possibilities for SAF industry scale up. Challenges around verification, duplication and consistent technical standards are significant, but are actively being reviewed to find solutions and in 2022 Amex GBT, Accenture and Shell piloted a book and claim system for business travel called Avelia[7] which offered approximately 1 million gallons of SAF at its launch. If a global book and claim system was to be established, the opportunity for tourism destinations would be significant, growing the potential customer demand pool for any SAF that is produced in a destination, with the ability to credibly apply SAF related carbon savings to a tourism destinations carbon footprint, even when the physical fuel is not used on flights to or from that destination, as long as the SAF was produced in the destination. **WTTC and ICF therefore encourage tourism destinations to promote a globally harmonised 'book and claim' scheme for SAF with their national governments**.

3. Government decarbonisation policies

While many countries and regions are positively promoting the use of SAF through policy measures, such as financial incentives, the global regulatory landscape for transport decarbonisation is still evolving. The USA and Europe are two of the most mature, but even there the legislative environment is still in regular flux. **Tourism destinations should therefore be prepared for government policies and the regulatory system to change over time** and WTTC will continue to call on governments to internationally co-ordinate and harmonise regulations across borders as much as practically possible.

Nations and airlines have committed to scaling up SAF through various policies and strategies



In the USA, the 'SAF Grand Challenge' of producing 3 billion gallons of SAF per year by 2030 was announced in late 2021 as a joint initiative by the US Departments of Transportation, Energy and Agriculture, and has subsequently received support through the US Inflation Reduction Act basket of incentives. WTTC and ICF applaud this joined up government approach and the USA currently produces and uplifts onto aircraft the most SAF of any country, which is largely attributed to the economically advantageous range of financial incentives available. For example SAF production is supported through SAF Tax Credits which offer $1.25 (increasing up to $1.75) per gallon of SAF that achieves lifecycle emission reductions above 50% when compared to convention fossil based jet fuel. But even within the USA, state level programmes vary widely, with the California Low Carbon Fuel Standard (which regulates the carbon intensity of fuel used within the state) and California's other decarbonisation measures often seen as a positive template for managing emissions and now being adapted by several other US states.

In Europe, the ReFuel EU programme has issued an EU-wide mandate for the percentage of SAF that must be uplifted onto aircraft. This steadily increases the share of SAF that must be supplied by fuel producers to airlines serving this market between now and 2050. A specific sub-requirement for non-biological SAF (such as SAF made with renewable energy) is also included, which aims to encourage investments in innovative technologies for 'next generation SAF' that would not be constrained by limited agricultural feedstocks.

Tourism destinations are encouraged to stay abreast of major international SAF policy announcements and work with their national governments to create an enabling environment for the development and use of SAF in their location. To support global awareness of SAF developments, the International Civil Aviation Organization (ICAO) maintains a daily record of SAF news at : https://www.icao.int/environmental-protection/pages/SAF.aspx.

CALL TO ACTION

Sustainable Aviation Fuel (SAF) offers a significant opportunity for tourism destinations to reduce their carbon footprint, promote sustainable development, and create new economic opportunities. But the scale-up challenge is real and requires a joined up combination of a clear and supportive regulatory framework, and effective collaboration with public and private sector stakeholders to ensure that appropriate SAF solutions are identified, developed and invested in.

WTTC and ICF recommend that tourism destinations focus on three key activities:

1

Share this paper

Share this paper widely to enhance knowledge & understanding of Sustainable Aviation Fuel

2

Collaborate with partners

Encourage a national public/ private task force to be established in each country that is dedicated to transport decarbonisation

3

Undertake a SAF feasibility study

Encourage the national public/ private task force to conduct a SAF feasibility study to identify the SAF opportunities for each tourism specific destination

1. Share this Paper

The importance of SAF, with its risks and benefits to the whole Travel & Tourism industry has been laid out in this paper, but is a topic that is not well understood outside of the aviation community. **WTTC and ICF encourage the wide sharing of this paper throughout the Travel & Tourism sector and with colleagues, industry partners, government departments and other relevant stakeholders to enhance awareness, knowledge and understanding of Sustainable Aviation Fuel (SAF)** and its benefits and implications for global Travel & Tourism.

2. Collaborate with Partners

A joined up, co-ordinated, whole of government approach, in partnership with the private sector is required to address climate change and **WTTC and ICF encourage the Travel & Tourism industry to call on their national governments to establish a public and private sector task force in each country dedicated to the decarbonisation of transport, with working groups focussed on each mode of travel**. As a minimum these task forces should include officials from the government Tourism, Travel, Finance and Energy Ministries, with senior representatives from the Travel & Tourism and solution provider industries.

Good practice examples include the UK 'Jet Zero Council'[8] which brings together Government Ministers and Chief Executive Level representatives from industry, with the aim of achieving 10% SAF by 2030 and zero emission transatlantic flights within a generation, or the Singapore 'International Advisory Panel for a Sustainable Air Hub'[9] which brings together the Singapore Government with CEO level industry and technology partners from around the world to address how aviation can be made more sustainable, including exploring an ASEAN regional 'buyers club' for SAF to support early adopters, such as business travellers, or air cargo operators.

In the UAE a public and private sector 'SAF Committee' was established, led jointly by the UAE Ministry of Energy & Infrastructure (MOEI) and General Civil Aviation Authority (GCAA). It brought together experts from the aviation, energy, academia and finance sectors and was supported by ICF to produce a roadmap for the annual production 700 million litres of SAF by 2030[10].

3. Undertake a SAF Feasibility Study

WTTC and ICF recommend the best, first practical step for any tourism destination after establishing a nationally co-ordinated task force is to **conduct a 'SAF Feasibility Study' for their destination/country which will identify the available feedstocks, the local fuel infrastructure, barriers and solutions and can include the development of a SAF implementation roadmap.**

In 2017 the International Civil Aviation Organization (ICAO) – the UN agency responsible for aviation - conducted four SAF feasibility studies in the Dominican Republic[11], Trinidad & Tobago[12], Kenya[13] and Burkina Faso[14] and has published them on the ICAO website which can be viewed as reference examples. ICAO plans to do many more feasibility studies from 2023 onwards through joint funding initiatives and **tourism destinations wishing to participate in these activities are urged to encourage their national government to join the 'ICAO ACT SAF' programme with other like-minded countries and organisations** (ICAO ACT SAF[15] = The Assistance, Capacity Building & Training programme for SAF). At the time of publication of this paper more than 100 countries and international organisations, including WTTC, have joined the ICAO ACT SAF platform and are working together internationally and collaboratively to advance SAF and decarbonise aviation. **Tourism destinations can also work with international consultancies, to undertake SAF Feasibility Studies and develop wider SAF implementation strategies.** Where feasibility and implementation studies have already been undertaken, tourism stakeholders can still be an important part of the delivery of actions from these studies and be a valuable contributor to more sustainable Travel & Tourism.

In conclusion, by embracing the opportunities that Sustainable Aviation Fuel (SAF) presents and by collectively overcoming the challenges through innovation and co-ordination with partners, SAF enables tourism destinations to position themselves as leaders in environmental protection and create a more sustainable future for travellers and the industry.

ACKNOWLEDGEMENTS

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