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14 March 2014

Energy White Paper Taskforce
Department of Industry GPO Box 1564 CANBERRA ACT 2601
By email: EWP@industry.gov.au

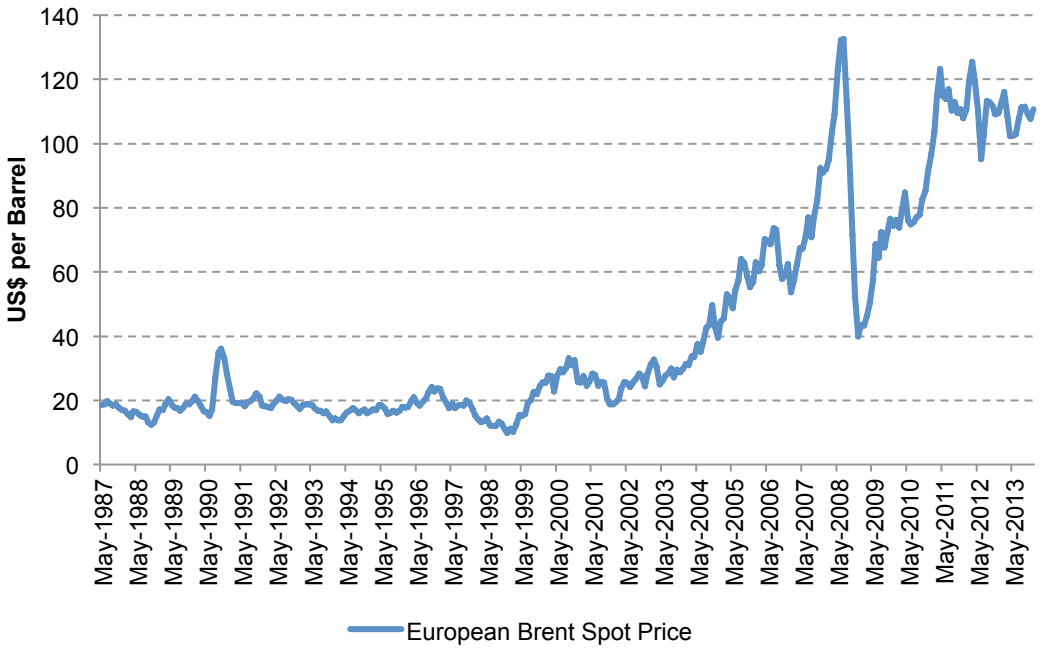
Dear Taskforce Members,

Re: AISAF Supplementary Factual Submission to The Energy White Paper Issues Paper

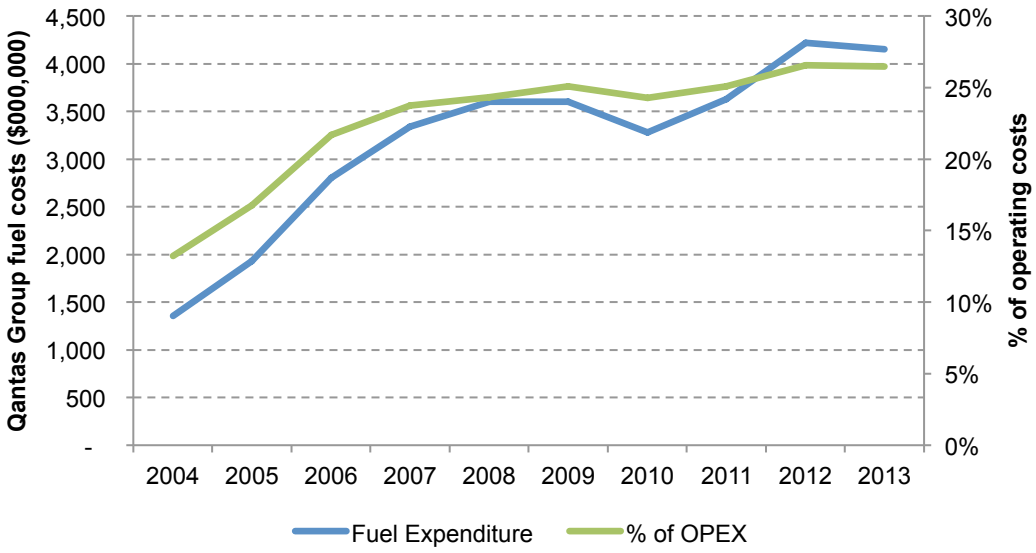
On 07 February 2014, The Australian Initiative for Sustainable Aviation Fuels (AISAF) forwarded its submission the Energy White Paper Issues Paper. Because some of the individual members of AISAF were not in a position to make their own submissions, AISAF welcomes the opportunity to submit the following supplementary factual information.

Aviation Industry Challenges

The Energy White Paper is timely for the aviation industry as the cost of fuel represents a key challenge facing airlines. With fuel prices close to record highs (as illustrated on the chart below), aviation fuel represents a major, and growing component an airline's cost base.



As a result of the significant increase in the price of oil, fuel now represents the single largest operating cost for Australian airlines. In 2012/13 the Qantas Group spent $4.1 billion on fuel and Virgin Australia about $1.2 billion, accounting for 26 per cent and 30% of operating costs respectively. This compares to just 14 per cent of operating costs ten years ago for Qantas.



The aviation industry has taken significant measures to reduce these costs largely through a strong focus on fuel efficiency. Over the past four decades aircraft fuel efficiency has improved 70%, with 23% taking place in the last 10 years[1].

Typically, an airline's journey regarding fuel efficiency has targeted:

- Continued investments in new, fuel efficient aircraft such as the Boeing 787, 777 and Airbus A350;
- A relentless focus on fuel use management; and
- Partnering with airports and air navigation service providers to improve the efficiency of aviation infrastructure (including airspace).

However it is important to recognize that unlike other sectors of the economy, including other segments of the transport industry, airlines are subject to a set of unique limitations when addressing fuel management. Airlines are constrained by (1) a single primary source of energy (Jet A-1/Jet A); (2) the capital intensity of aircraft; and (3) regulatory and infrastructure constraints that are outside the control of an airline, such as air traffic management.

Beyond fuel efficiency, the development and use of sustainable aviation fuels (SAF) is the only way in which the aviation industry can materially reduce emissions, address fuel costs and price volatility, while continuing to grow the industry. This is in stark contrast to land transport. In addition to biofuels, the land transport sector has a number of options to reduce emissions and address fuel costs (including hybrid-electric technology, electrification and alternative fuels such as LNG, LPG, CNG and hydrogen).

Sustainable aviation fuels have physical and chemical properties that are identical to those in petroleum jet fuel but have lower carbon emissions and meet all other sustainability criteria.

[1] Remarks at the World Business Summit on Climate Change in Copenhagen, Giovanni Bisignani, IATA CEO, 24 May 2009

Because jet aircraft have limited energy options, airlines are investing significant time and effort to understand and help facilitate the commercialization of SAF production in Australia.

Action by Australian airlines to facilitate the development of the SAF Industry

Virgin Australia

Virgin Australia was a founding member of the Australasian Chapter of the Sustainable Aviation Fuel Users Group that commissioned a study into the potential for a sustainable aviation fuel industry in the region – "Pathways to Sustainable Aviation"[2] – that makes a compelling case for a Australian and New Zealand bio-derived jet fuel industry over the next 20 years.

Utilizing the results of this study, Virgin Australia formulated a renewable jet fuel strategy that focuses on advancing the establishment of a fuel supply chain from refinery to aircraft by supporting and working with the aviation industry as well as the supply chain proponents on shared issues such as sustainability criteria, critical research, fuel certification, government engagement and commercialization strategies.

To date Virgin Australia has supported two Australian projects that support critical aspects of renewable fuel supply chains.

In 2011 VA signed an MoU with the Future Farm CRC, GE, Dynamotive and Airbus to support work being undertaken into building a renewable fuel supply chain based on mallee eucalyptus grown in the Wheat Belt of WA. A favourable sustainability and life cycle assessment of this supply chain, funded by Airbus, has been recently completed and a roadmap has been established to produce commercial volumes by 2021.

Also in 2011, Virgin Australia entered into a MoU with NSW-based biofuel company Licella to support the commercialization of a unique process that converts woody biomass into bio-crude that can be subsequently processed into aviation fuel.

Virgin Australia, Brisbane Airport Corporation and Dutch company SkyNRG have teamed up on the Brisbane BioPort project with the ultimate goal of establishing a reliable supply of SAF to Brisbane Airport.

The Brisbane BioPort is a commercially driven partnership focused on breaking thresholds that currently deter investments in the SAF industry. The three project partners have complementary objectives and a depth of experience in SAF.

The team will undertake an objective assessment, including the selection of the most optimal feedstock and technology combination in Queensland, working with the selected feedstock and technology players, initiate R&D where needed and perform an in-depth economic and sustainability analysis.

The approach is unique in that there is no pre-committing to a specific feedstock or technology upfront. A dedicated "supply chain development team" with capabilities covering commercial interaction, legal structuring, financial structuring, government involvement, supply chain contracting and bio-energy techno-economic will focus on determining the most promising supply chain set and securing a go/no go investment decision.

[2] http://www.csiro.au/science/Sustainable-Aviation-Fuels-Road-Map

Qantas Airways

In April 2012, Qantas operated Australia's first commercial SAF flights from Sydney to Adelaide, which was followed a few weeks later with a Jetstar flight from Melbourne to Hobart (a world first for a low cost carrier). Both flights were operated with a 50 per cent blend of SAF with traditional jet fuel in one engine. The purpose of both flights was to raise awareness and highlight the need for a SAF industry in Australia.

Prior to the first flight in Sydney Qantas also announced, in partnership with Shell Australia, a feasibility study to understand the economic conditions under which the SAF industry in Australia could be viable, using existing supply chain and refining infrastructure.

The study, which was supported by a $575,000 grant from the Australian Renewable Energy Agency (ARENA), was launched in November 2013 and represents the most detailed investigation to date regarding the commercial viability of the end-to-end SAF supply chain in Australia[3].

The study assessed the commercial viability of a 3,000 tonnes-per-day reference facility, which would produce approximately 20,000 barrels of renewable hydrocarbons (diesel, SAF, naphtha and refinery gas) per day. Capital expenditure is approximately A$1 billion (2012), which is consistent with industry cost values when considering that the construction of additional, as opposed to the conversion of existing, refining equipment is required in Australia. Depending on the process configuration and bio-refinery size, the SAF fraction was between 5% and 35% of Qantas' current domestic fuel demand when certified in a 50:50 blend.

The study found that, while technically feasible, there are a number of challenges that need to be addressed in order to make the SAF industry in Australia commercially viable. Of particular importance is the need to address feedstock volume and economics as well as government policies to help incentivize and avoid dis-incentivizing production of SAF.

The policy settings as they stand were found to provide a strong incentive for producers to target biodiesel or renewable diesel over SAF when making investment decisions. The modelling commissioned by Qantas and Shell, and conducted by SKM, illustrated the size of the incentive. The study found that:[4]

> *...the Cleaner Fuels Scheme increases the incentive to produce renewable diesel... This analysis shows that the NPV[5] for a bio-refinery is improved by approximately $1 billion with a grant to renewable diesel when the refinery is configured to produce maximum diesel. This provides a significant incentive for any supplier to maximize renewable diesel over SAF[6] when contemplating investment of capital...The Cleaner Fuels Scheme therefore reinforces a techno-economic tendency towards diesel, and thus away from SAF.*[7]

[3] A copy of the study can be downloaded at www.qantas.com.au/infodetail/about/environment/aviation-biofuel-report.pdf
[4] Qantas Airways, Shell Company of Australia (2013) *Feasibility Study of Australian feedstock and production capacity to produce sustainable aviation fuel,* pg. 8-65, figure 41.
[5] Net Present Value
[6] SAF: Sustainable Aviation Fuel
[7] Qantas Airways, Shell Company of Australia (2013) *Feasibility Study of Australian feedstock and production capacity to produce sustainable aviation fuel,* pg. 8-64

Despite aviation fuel not being subject to excise[8], an analysis of the case to extend a $0.38 per litre production grant for SAF raises the following considerations:

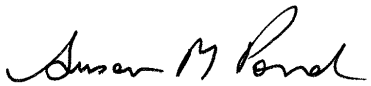
- Excise relief represents forgone revenue and is ultimately a cost to government
- In the absence of excise on aviation fuel, providing a grant of $0.38 per litre for SAF is equally a cost to government
- From a whole-of-market perspective, the production of SAF will compete initially for the same feedstock used to produce biodiesel and renewable diesel[9]. Therefore a litre of SAF produced in Australia, will displace a litre of biodiesel or renewable diesel produced
- It is unlikely that SAF will be produced in Australia within the next 3-5 years. However, policies that attract long-term investment into SAF production will facilitate planning and development of commercial, at-scale projects in Australia

AISAF is interested in ways to:

- Encourage a lower emissions energy supply for aviation that avoids market distortions or causes increased energy prices
- Implement cost-effective measures, beyond mandatory targets or grants, to encourage further development of SAF and its effective integration into the wider energy market
- Avoid or remove barriers to increasing uptake of SAF
- Ensure security of fuel supply for aviation in Australia by diversifying sources of aviation fuel and increasing domestic production. SAF addresses both of these issues.

AISAF looks forward to working with the government on forward-looking, long-term energy policy for the aviation sector.

Yours sincerely,



Dr. Susan M Pond AM FTSE
Chair, Australian Initiative for Sustainable Aviation Fuel (AISAF)

[8] Excluding the carbon price, aviation fuel is subject to $0.03556 per liter levy, which is collected to fund the Civil Aviation Safety Authority.
[9] The same will hold true for ethanol once ASTM certifies the alcohol-to-jet production pathway. This certification is expected in 2014