Solena Fuels: Waste to Jet & Diesel Fuel

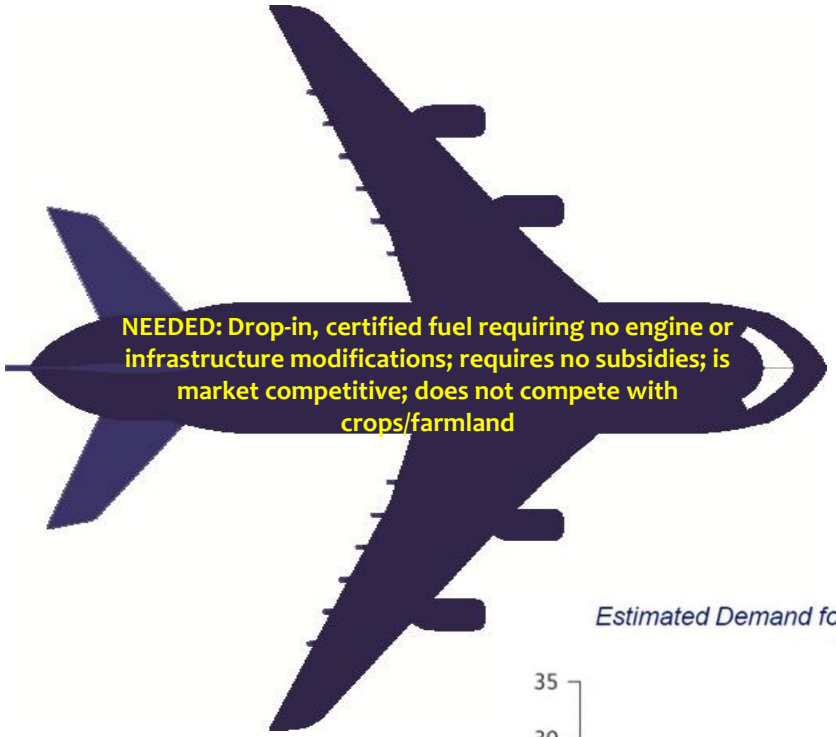
Opportunity

Berlin Air Show

May 19-21, 2014

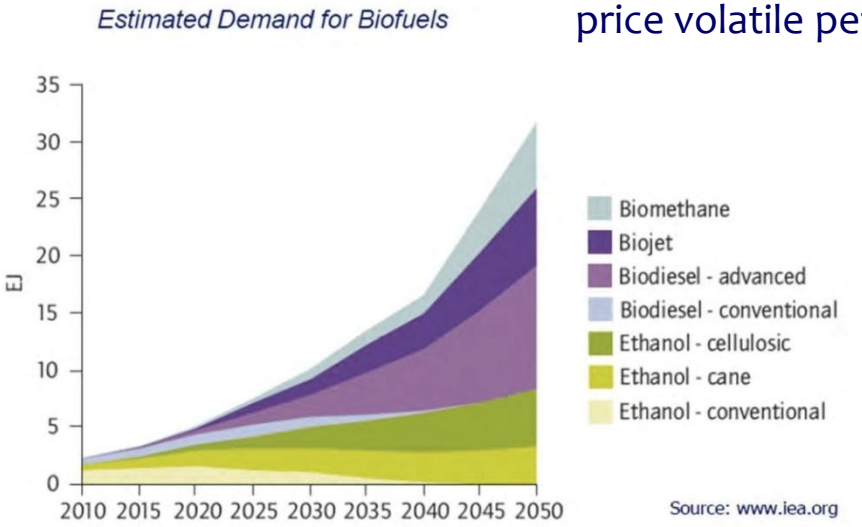
The Challenges for Aviation Industries

Increasing Demand for Sustainable Jet Fuel in a Market with Limited Supply



Global Biofuel Shortage:

- demand is estimated to be above **1,000 bio-refineries** worldwide in total
- CO_2 reduction schemes not achievable without biofuels
- Jets are not able to switch to non-liquid sources of energy
- Jetfuel currently derived from expensive, price volatile petroleum



Commercial Industry Response

Industry is embracing new means of addressing the challenges & risks

BRITISH AIRWAYS

- Co-developing project with Solena in London
- 10 yr, take-or-pay, spot contract ($500 million at today's spot) and construction investment

DELTA

- $220 million purchase/commitment of/to a petroleum refinery in attempt to capture crack spreads
- Demonstrates the significance of jet fuel market dynamics
- Does not address sustainability

QATAR AIRWAYS القطرية

- Invested in alcohol to jet company
- Rights to fuel production

SOLENA FUELS

Commercial Industry Response

Industry is embracing new means of addressing the challenges & risks

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Signed onto Solena platform to purchase sustainable fuels:

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Solena Commercialization

Projects in Pipeline - Europe

Berlin

Site: PCK Industry Park Schwedt/Oder with its unparalleled concentration of biofuel production technologies, know how and vast synergies between traditional refinery and Industry Park Residents
Feedstock: proximity to Poland/ RDF from Germany/Poland
Fuel Logistics: 80 km to the new Berlin Brandenburg Airport

Istanbul

Announced: by Turkish Airlines in Summer 2013, Solena was chosen by the fast growing airline as partner for a Solena IBGTL facility in Istanbul
Feedstock: 1 million of the 6 million tonnes per year produces and mostly landfilled in Istanbul
Location: The biorefinery is planned to support the third and new airport in Istanbul with sustainable jetfuel projected to be the largest in the world

Lufthansa SOLENA FUELS

TURKISH AIRLINES SOLENA FUELS

GreenSky London

What is it?

- World's first advanced technology waste biomass to biojet fuel plant
- Input: residual derived fuel (post recycled municipal & commercial waste)
- Output: sustainable, drop-in jet & diesel
- Site selected: Old Coryton Refinery East of London

BRITISH AIRWAYS

SOLENA FUELS

GreenSky London

Why is British Airways doing it?

- Primary driver – reducing emissions
- Waste to liquid biorefinery – uses waste destined for landfill
- Abundant source of waste
- Meet the total sustainable fuel needs of London City Airport

BRITISH AIRWAYS

SOLENA FUELS

Solena GreenSky London

Solena's flagship project provides an attractive investment opportunity supported by blue chip counterparties

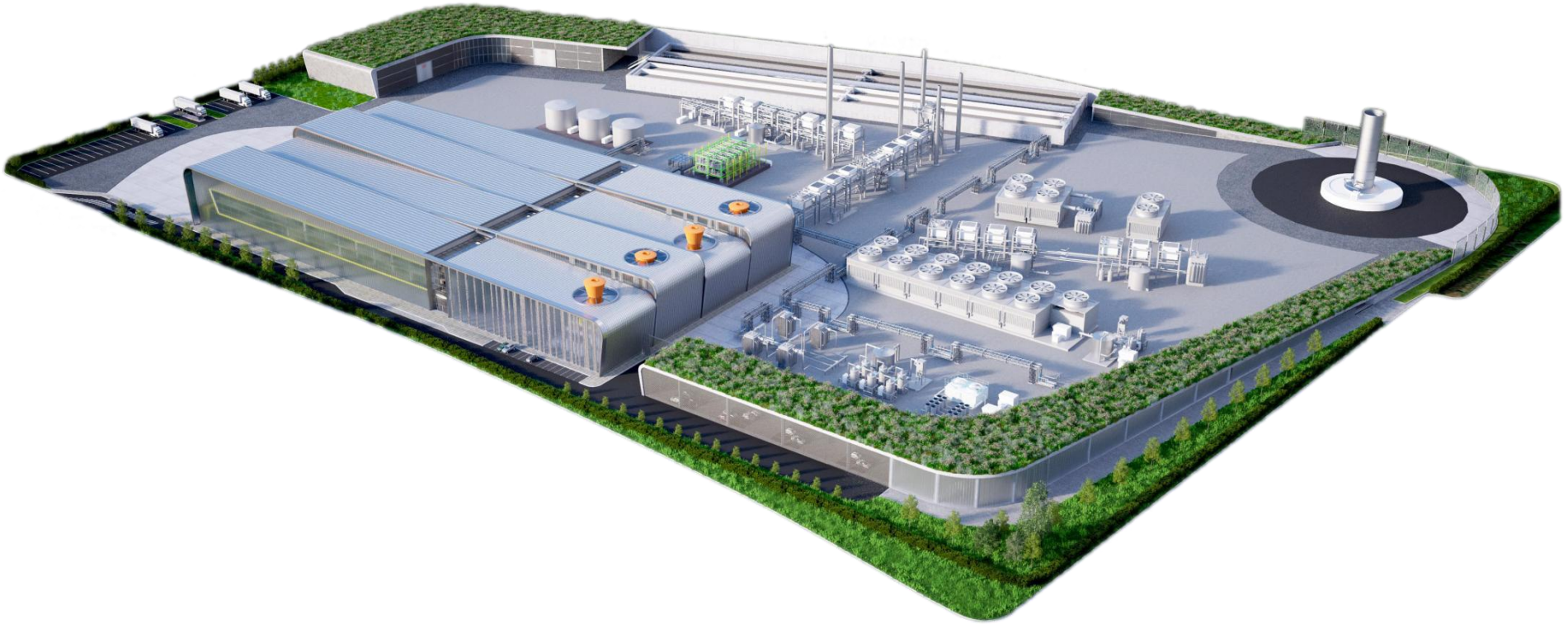
Key Metrics

- **Estimated EPC cost:** US $550m, subject to completion of FEED and negotiation of EPC contract
- **Estimated annual output:** 120.000 MT
- **Feedstock requirements:** c. 575k tonnes per annum of Refuse Derived Fuel
- **Contracted Bio Jet Fuel Offtake:** British Airways (S&P Credit Rating: BB). **Naphtha/Diesel Offtake:** (Heads of Terms received, S&P Credit Rating: A)
- **Debt:** ECA has produced a competitive letter of intent to provide long dated senior debt for 70 % of the total cost
- **Equity:** BA committed to senior construction and mezzanine funding

A rendering of project: Consent architecture work has begun, pre-FEED has been completed and the next phase of engineering to begin in 2Q2014

GreenSky London

The Vision



BRITISH AIRWAYS

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British Airways Recent Press Release

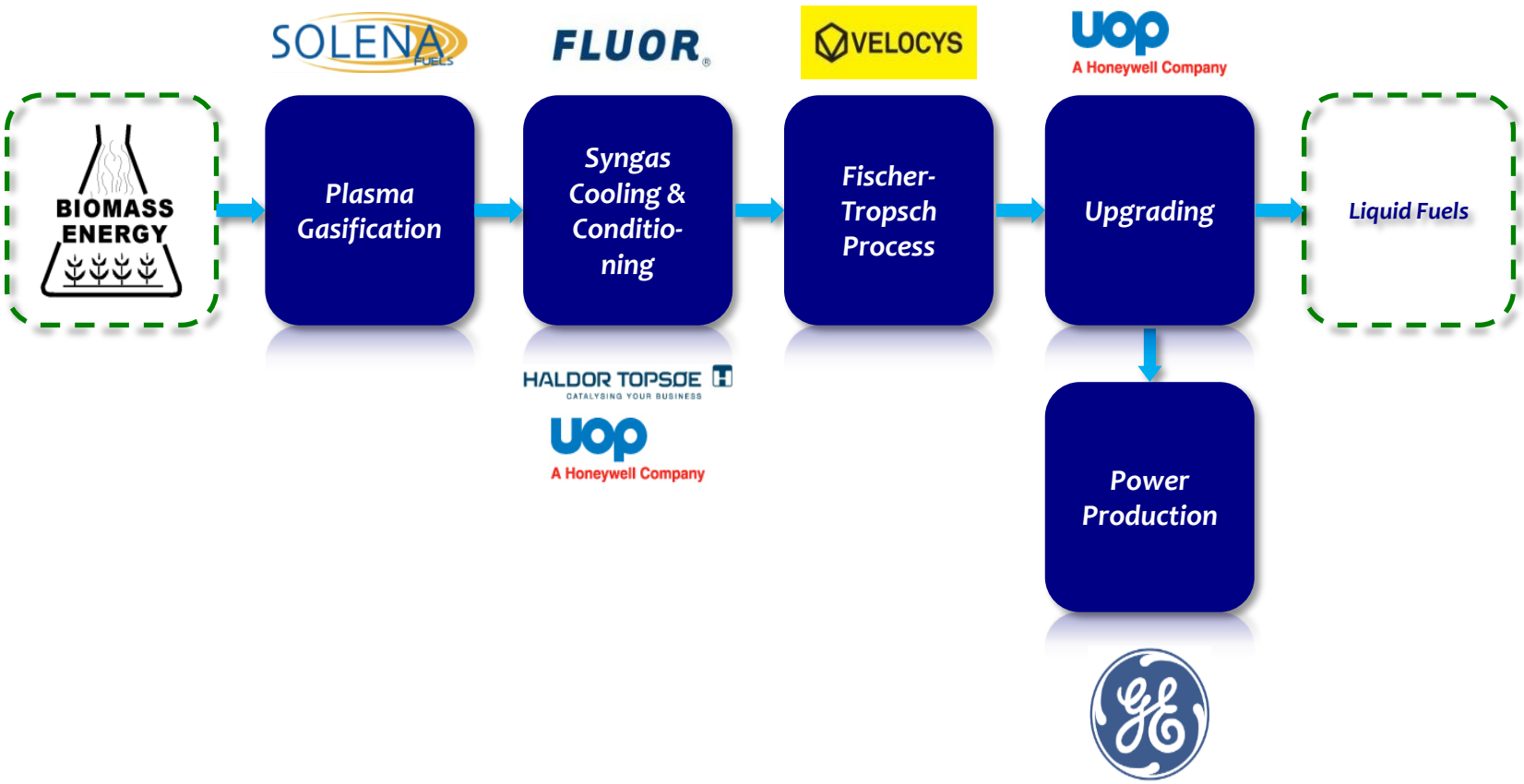
British Airways - Fueling the future

Press Release

Introduction

The Technology

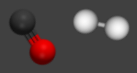
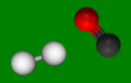
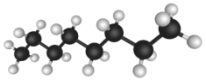
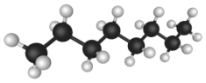
Biorefinery



Introduction

Solution Fundamental

The coal- and gas-to-liquids industry, in extensive use today, produces over 400,000 barrels per day of FT products, including jet and diesel fuels, from non-petroleum, fossil fuel sources per year. Sasol (NYSE: SSL) is the pure play industry leader. Solena is extending the platform by integrating its gasification system that is optimized for sustainable waste feedstock

	Coal-To-Liquids	Gas-To-Liquids	Solena IBGTL
Input / Energy Source	Coal	Natural Gas	Sustainable Waste Feedstock
Conversion Technology	Fluidized Gasification	Reformation	Proprietary High Temperature Gasification
Intermediate Product	 SynGas ($CO + H_2$) 		
Conversion to Liquid Fuels	 Fischer-Tropsch & Upgrading to Liquid Fuels 		
Implementation	sasol reaching new frontiers  Sasol Synfuels, Secunda, SA	قطر للبترول Qatar Petroleum  Pearl GTL, Qatar	SOLENA FUELS GreenSky London

SOLENA IS EXTENDING EXISTING FT INDUSTRY TO INCLUDE SUSTAINABLE SOURCES

Fischer Tropsch Industry

Making Drop-In Jet & Diesel for Decades

FLUOR

Sasol II, Coal-To-Oil Complex – Fluor EPC
(Secunda, South Africa)

- Solena's engineering partner, Fluor, has helped to develop most of the major Fisher-Tropsch plants in operation today
- Fluor has executed more than 20 gasification projects globally and performed more than 150 gasification feasibility studies

VELOCYS

- Velocys' microchannel FT reactors offer a much higher yield (defined as conversion multiplied by selectivity) and stability compared with conventional systems resulting in a high productivity per unit volume

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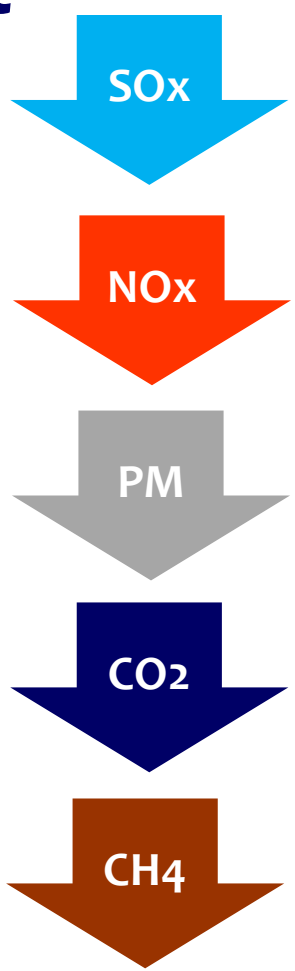
Project Key Benefits

Groundbreaking Project

- Improves air quality vs. fossil fuel
- Provides an alternative to incineration (reduction in ash and emissions) and landfilling (reduction in methane)
- Supports further recycling of waste
- No conflict with food supply chain
- No land use change
- In compliance with water usage/management/ indirect land use requirements
- FT fuel is covered by FAA, ASTM, & DEFSTAN aviation fuel requirements and has been used for decades in aviation, no testing necessary



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Summary Project Key Strengths

- ✓ Ability to use negative cost feedstock and sell fuel at market prices
- ✓ First of its kind
- ✓ Unique combination of high temp plasma gasification and FT tech
- ✓ Top industry technology consortium
- ✓ Meets the EU requirements to Carbon Emission reduction (RSB & RED)
- ✓ Fuel is drop in, certified and require no change in fuel infrastructure
- ✓ Biorefinery is considered environmentally benign

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