Workshop
Institute of Aviation (IoA)
Warsaw, July 7- 8, 2009

Envirinmentally friendly GA
Any ideas to maximize energy efficiency
and minimize environmental impact of GA

What is the future of II generation biofuels for General Aviation ?

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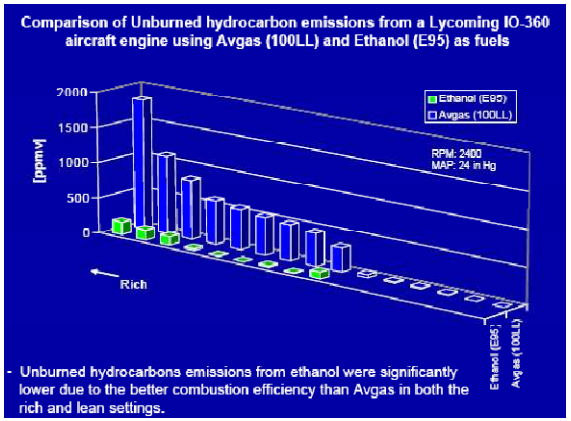
USA

General Aviation > A global challenge needs a global solution

First alcohol fueled transatlantic flight
1989- „Velocity”- Max Shauck



SWIFT FUEL-NEXT GEN BIO

Europe

General Aviation > A global challenge needs a global solution

Poland

BAB LO=76
BABC LO=86

„We are ready to help in any project that will put ethanol in an aircraft tank!" – GRAZIA and MAX

CO = - 67%
HC = - 81%
NOx = 41%

Brazil

General Aviation > A global challenge needs a global solution

50th ethanol-powered Ipanema

T-25A and T-25C fleet
90 aircraft

Scientific American 50 Award
***Flight International* Aerospace Industry Award**
in category General Aviation

Every „Dromader” saves extra 200 000 USD!!!

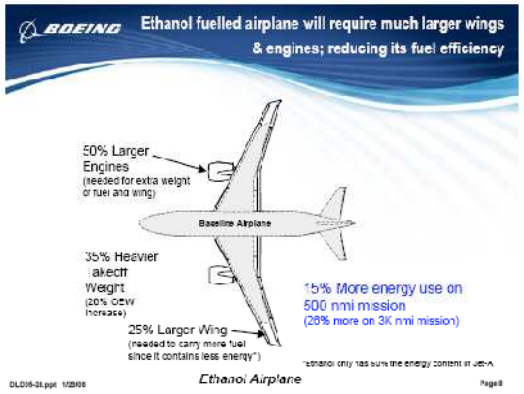
Asz-62-IRm18 – 2000 hours on ethanol !!!

metanamina
(urotropina)

Fuel	Heat of Comb.	Stech. air /fuel.	Spec. Energy.	Heat of evaporation	RON	MON
AvGas	32 MJ/l	14.6	2.9 MJ/kg air	0.36 MJ/kg	130	100
Buthanol	29.2 MJ/l	11.2	3.2 MJ/kg air	0.43 MJ/kg	96	78
Ethanol	19.6 MJ/l	9.0	3.0 MJ/kg air	0.92 MJ/kg	130	112
Methanol	16 MJ/l	6.5	3.1 MJ/kg air	1.2 MJ/kg	136	104

Comparison of 100LL and AGE-85

Property	100LL		AGE-85
Motor Octane Number	100		106 (est.)
Tetraethyl Lead (TEL/L)	0.53		0
RVP (psi)	5.5 to 7.1	6.5 to 8.0	
Min. Net Heat Comb. (Btu/gal.)	112,200		88,200
Density (lb/gal)	6.0		6.3 to 6.5
Max. Sulfur Content (weight %)	0.05		0



Free Fatty Acid		Soya	Rapeseed	Jatropha	Wild flax	Esters °C
	C8:0	-	-	-	-	4
	C10:0	-	-	-	-	-
	C12:0	-	-	-	<0.1	5
MYRISTIC	C14:0	0.21	0.11	0-01	<0.1	18,5
PALMITIC	C16:0	11.24	4.1 -4,3	14,1-15,3	4 -7	30,5
STEARIC	C16:1	0.2	0,2-0.27	-	0.2	0
	C17:1	-	0,1	-		
	C18:0	4.04	1,7-1.8	3,7-9,8	1-3,5	39,5
OLEIC	C18:1	21.93	58,57-60,3	34,3-45,8	10-24	-19
LINOLEIC	C18:2	53.84	20,1- 22.2	29,0-44,2	13-21	-35
α-LINOLEIC	C18:3	7.29	0,6-13,26	0-0,3	30-45 !!!	-57!!!
ARACHIDIC	C20:0	0.36	0,79- 9,8	-	<1	50
	C20:1	0.26	1,4 1.8	-	11.0 – 18.0	-15
	C20:2	-	0,1	-	2-3.0	-
	C20:3	-	-	-	0-3.0	-
ARACHIDONIC	C20:4	-	-	-	<1,2	-
BEHENIC	C22:0	0.45	0.57	-	<0.5	54
ERUCIC	C22:1	-	0.13	-	<3.5	-
	C22:2	-	-	-	-<0,2	-
	C24:0	0.16	0.34	-	<0,5	-
	C24:1	-	0.54	-	<0.8	-

Proposal acronym : **SECOGEN-GA**
II generation biofuels for General Aviation
The Institute of Aviation (IoA)

The primary goals of the SECOGEN-GA proposal are :

•to make a breakthrough in the current market structure of I generation biofuels
•to research and develop cheap and environmentally-friendly aviation biofuel
•to extend the idea of universal fuel for GA

Partners already identified:

Institute of Aviation (IoA), Warsaw, Poland
Warsaw University of Life Sciences (WULS), Warsaw, Poland
Bioenergia Oil Ltd. (BOL), Sieradz, Poland - SME

The partners' complementary knowledge and competencies will allow to research these particular goals, as there will be involved:

- a laboratory staff specialised in testing fuels and biofuels for aviation
-industrial partners, specialised in piston/turbine aviation engines for GA European partner specialized in aeronautical certification
-chemical entities, such as university departments etc.

Partnership size: 10 partners maximum
Budget objective: TBD
Duration: TBD

Thank you
for your attention

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