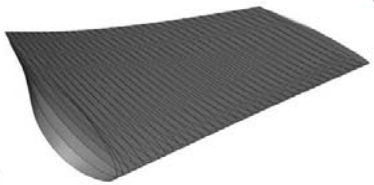
ULTRALIGHTS



COMPOSITES

LIGHT SPORT AIRCRAFT

AMPHIBIANS

PARTS

Developing the Frame for FP7 participation in Hungary

Clustering, diversification, networking

Brussels 22nd, May 2007

Mihaly Hideg
Chairman
HAIF

Agenda

1. The Hungarian Aerospace Industry
   - Past
   - Present - Segmentation of the Hungarian Aerospace Industry
2. Introducing the Hungarian Aerospace Cluster
   - Creation of the Cluster
   - Objectives
   - Main Characteristics
   - Main Partners
3. Creation of the Hungarian Aerospace Research Platform
4. Hungarian Participation in Transport FP6 projects
5. Plans towards FP7
6. Attachments

1. Introducing the Hungarian Aerospace Industry

The Past...

- During WW II several hundred fighters were manufactured in Hungary
- After ’56 aerospace engineering training has been terminated and even sailplane manufacturing was forbidden
- Only 2 maintenance and repair facilities remained operational in the civil sector: Malév and MÉMRSZ
- During the 90s
  - MÉMRSZ had collapsed
    but
  - Aeroplex has emerged (Lockheed-Malev JV)
  - Opening toward the West
    NATO, EU
  - By the end of the 90s an English speaking aviation community emerges and takes over the lead
- From 2000 - new, modern companies starting to emerge

Messerschmitt Bf 109 fighter 1944

GEES Veresegyház 2000

Hungarian Aviation Industry Foundation

Debut of new prototypes by **Composite One ltd.** and **Waterfly ltd.** – **July 2007** **2007**

Creation of **HAC** and **HARP** by **HAIF** and others **2006**

HAC Hungarian Aerospace Cluster HARP

Corvus Aircraft ltd. introduces its first composite aircraft **2005**

HAIF launches the Aerospace Supplier Initiative **2004**

Six aeronautical managers established **HAIF** **2003**

HAIF Hungarian Aviation Industry Foundation

2002 Greenfield sites by **Hungaerotech ltd.** and **Flamespray ltd.**

2001 Establishment of **LH Technik Budapest ltd.** and **Elektrometall ltd.**

1999 **Halley ltd.** introduces its first **Apollo** ultralight aircraft

1999 **GE Engine Services** launches its greenfield sites

1992 Establishment of **Aeroplex ltd.** a Lockheed - Malév joint venture to repair and overhaul western aircraft types

Rebirth of our industry was driven by part manufacturers and small aircraft developers

Hungarian Aviation Industry Foundation

GEES Veresegyház

- Greenfield site – 100% GE
- Repair activity
- 15M$ middle size investm.
- SME/Supplier category
- Not airport dependent
- Established in 2000
- Employes 160 people
- Engine component repair
- FAA/JAA certified

Lufthansa Techn. Budapest

- Greenfield JV site-15% Malév
- Overhaul activity
- 17 M$ middle size investm.
- Integrator category
- Airport location
- Established in 2001 as a JV
- Employes 340 people
- Airbus320/Boeing737overhaul
- JAR-145 certified

Elektrometal Paks Ltd.

- Greenfield site-100% German
- Component manufacture
- Small size investment <10m$
- SME/Supplier category
- Not airport dependent
- Established in 2001
- Employes 200 people
- Airbus wire harness manufact.
- ISO 9100 certified

Hungaerotech Debrecen

- Greenfield site-100% Dutch
- Component manufacture
- Small investment <10M$
- SME/Supplier category
- Not airport dependent
- Established in 2002
- Employes 40 people
- Turbine parts manufacture
- AS 9100 certified

Alcoa-Köfém Nemesvámos

- Privatizat./Acquis.-100% US
- Component manufacture
- Middle size investment ?M$
- SME/Supplier category
- Not airport dependent
- Established in 1997/2002
- Employes 110 peolpe
- Aerospace fastener manufact.
- AS 9100 certified

Flame Spray Ltd. Gödöllő

- Greenfield site - 100% Italian
- Thermal spray (APS, HVOF), slurry diffusion, honeycomb brazing
- SME / Supplier category
- Not airport dependent
- Established in 2002
- Employes 30 people
- ISO 9000 certified

Four out of six foreign investors are in the turbine technology business

Hungarian Aviation Industry Foundation

Apollo Fox '99 - Eger

UL certified in 6 countries

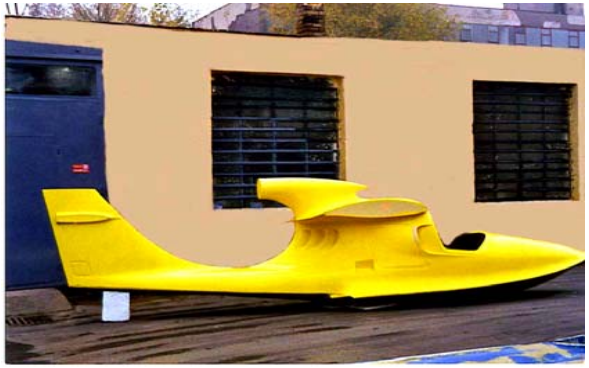
Corvus Corone '05-Balloszog

2 seat full composite LSA

Composite one '07 - Tököl

5 seat full composite turbopr.

Waterfly '07 - Miskolc



2 seat compos. amphibian

Apollo A3 '08 - Eger

2 seat ultralight

Hungarocopter '09

5 seat composite diesel

The small aircraft manufacturing sector is growing across the country…

Hungarian Aviation Industry Foundation

Production of Hungarian designed Corvus Corone full composite aircraft started in 2006

1.4. The Present

Design/Development	10
Component manufacturing	8
Small a/c manufacturing	5
Parachute manufacturing	1
Air Ballon manufacturing	1
Maintenance/Overhaul	80
Training	4
Consulting	2
Parts sale	1
Tools manufacturing	3
Calibration	1
Engineering	3
HR services	2
Modification	1
Marketing	2
Industrial organizations	3

In order to increase the number of component manufacturers HAIF has launched the Aerospace Supplier Initiative Programme in December 2004.Mainly automotive component manufacturers are involved in the programme. More than 20 companies were interested in aerospace diversification.

In March 2006 HAIF initiated and organized the establishment of the **Hungarian Aerospace Cluster.** Now it has 4 founders and 17 members

Total 128 organizations, 2100 people with a few component manufacturers

2. Introducing the Hungarian Aerospace Cluster

2.1. Creation of the Hungarian Aerospace Cluster

Organized by HAIF, founded in March 2006 by four small aircraft developer:

1. **Corvus Aircraft Ltd. –** *UL & LSA manufacturer*
2. **Halley Ltd. –** *UL manufacturer*
3. **Composite One ltd.-** *small aircraft design & prototype developer*
4. **Hungarocopter Ltd. –** *small helicopter designer*

Joined members:

1. **Design & Engineering companies (6)**
   Waterfly Ltd. – small aircraft design&prototype developer
   Edag Hungary Ltd. – finite element analyses
   eCon Engineering Ltd. – finite element analyses
   CAD-Terv Engineering Ltd. – CAD&Catia design
   Delta-Tech Engineering Ltd. – special tool&machine design
   H4 Aerospace Ltd. – design of systems, upgrades

HAC was established to provide an organizational framework for faster growth

2.1. Creation of the Hungarian Aerospace Cluster – cont.

2. **Prototyping companies (2)**
   Varinex Informatics Plc. – rapid prototyping
   Technoplast Ltd. – rapid prototyping

3. **Part manufacturing companies (7)**
   Hungaerotech Ltd. - machining
   Dendrit Ltd. - machining
   Borsodi Műhely Ltd. - machining
   High Tech Composite Ltd. – composite parts
   Produktum Ltd. – aluminium stands
   Ostorhazi Ltd. – special coatings
   Elektro-Metall Paks Ltd. – wire harnesses

4. **System integration and testing (1)**
   Naturen Ltd.

5. **Software development (1)**
   Allied-Visions Ltd. – simulator training softwares

2.2. Objectives of the Cluster

1. *Speed up the development of the Hungarian Aerospace Industry*
2. *Diversification of the best part manufacturers to aerospace*
3. *Creation of a network of aerospace and related industries*
4. *Development of new Hungarian designed small aerospace vehicles*
5. *Organize the production of these vehicles internationally*
6. *Organize and develop complementary capabilities among Hungarian firms to be able to manufacture higher assemblies for large aircraft*
7. *Achieve sinergies and economies of scale using networking in the fields of design, development, training, logistics, quality (AS 9100), IT, marketing and certification*
8. *Introduction of modern management methods and principles to the SME sector – six sigma, lean manufacturing*
9. *Develop new supplier relationships with other countries*
10. *Replace expensive foreign suppliers with low cost ones*
11. *Increase the Hungarian participation in EU founded aerospace projects*

2.3. Main Characteristics of the Cluster

- *100 % privately owned -16 Hungarian, 5 foreign subsidiaries*
- *100 % SMEs*
- *Focusing on product development*
- *Good engineering background*
- *Equipped with modern softwares – Catia, Solidworks, Ansys*
- *Young, dynamic management*
- *Supported by HAIF, HARP and ITD Hungary*
- *Collaboration with Pannon Automotive Cluster, Aviation Valley Poland and Hanse-Aerospace*

Basic organizational structure, communication, relationships are established

2.4. Main Partners

PANAC July 2006

Aviation Valley Sep 2006

Hanse Aerospace Sep 2006

PANAC
Pannon Automotive Cluster

AVIATION VALLEY

HANSE-AEROSPACE

In January HAC joined ECARE+ the European aerospace SME organization

3. Creation of the Hungarian Aerospace Research Platform

Created:
September 2006

Founders:
- *1 University (BUTE)*
- *1 Research organization (KFKI vibration lab)*
- *2 Companies (Bonn Hungary, Slot Consulting)*
- *Hungarian Aviation Industry Foundation*

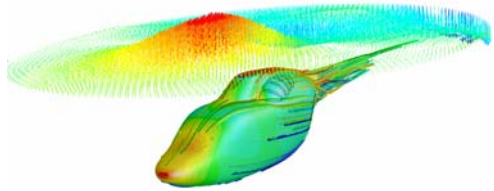
Objectives:
- *To provide organizational framework for Aerospace research in Hungary*
- *To help the best research organizations to diversify into aerospace*
- *To support HAC in product development*
- *To launch complex research projects with integrating members' capabilities*
- *To participate in FP7 and other EU research programmes*
- *To establish new R&D relationships with EU countries*

HARP
Hungarian Aeronautical Research Platform

3. Hungarian Aerospace Research Platform – cont.

Candidate members:

- *BUTE Department of Fluid Mechanics*
- *BUTE Department of Mechatronics, Optics and Instrumentation Technology*
- *BUTE Department of Transportation Automatics*
- *BUTE Department of Energy Engineering*
- *BUTE Department of Control Engineering and Information Technology*
- *Miskolc University Department of Chemistry*
- *Research Institute of Technical Physics and Materials Science – (MTA-MFA)*
- *Humic 2000 Ltd.*
- *Admatis Ltd.*
- *Enviro-Pharm Ltd.*
- *Aviatronic Ltd.*
- *ODIN Budapest Ltd.*
- *Naturen Ltd.*



Finalization of memberships will be completed by the end of summer 2007

4. Hungarian participation in the FP6 Transport programs - contracted

	IP	NoE	STP	CA	SSA	Total	EU Financed (th. €)
Aeronautics			4	1	2	**7**	**700**
Multimodal			3	1	2	6	400
Rail	2	1	2			5	700
Road	1	1	4			6	900
Water			1			3	100
Total	**3**	**2**	**14**	**2**	**2**	**27**	**2800**

Source: NKTH

Aeronautics had surprising activity compared to the small weight of it in transportation

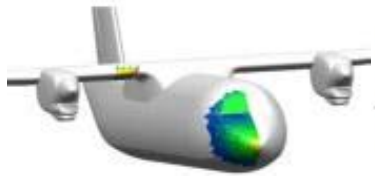
5. Plans towards FP7

- **HARP organized an FP7 information day -** Budapest November '07
- **HARP** management established in May '07 - started to elaborate org. procedures
- **HARP** website - is hosted by **HAIF** site at: http://haif.org/HARP.html

- **FP7** 1st call - 15 submitted proposals (preliminary estimation)
- **FP7** 2nd call - finalization of **HARP** memberships for organizations before the call
  - for Phd. students free membership will be available

- **Clean Sky Joint Technology Initiative (JTI)** – **HAIF**, **HAC** and **HARP** organizations all expressed their support of the initiative





- Collaboration will be initiated with the newly established Hungarian Space Cluster

Main focus on General Aviation, systems, materials and air traffic management

Contact :

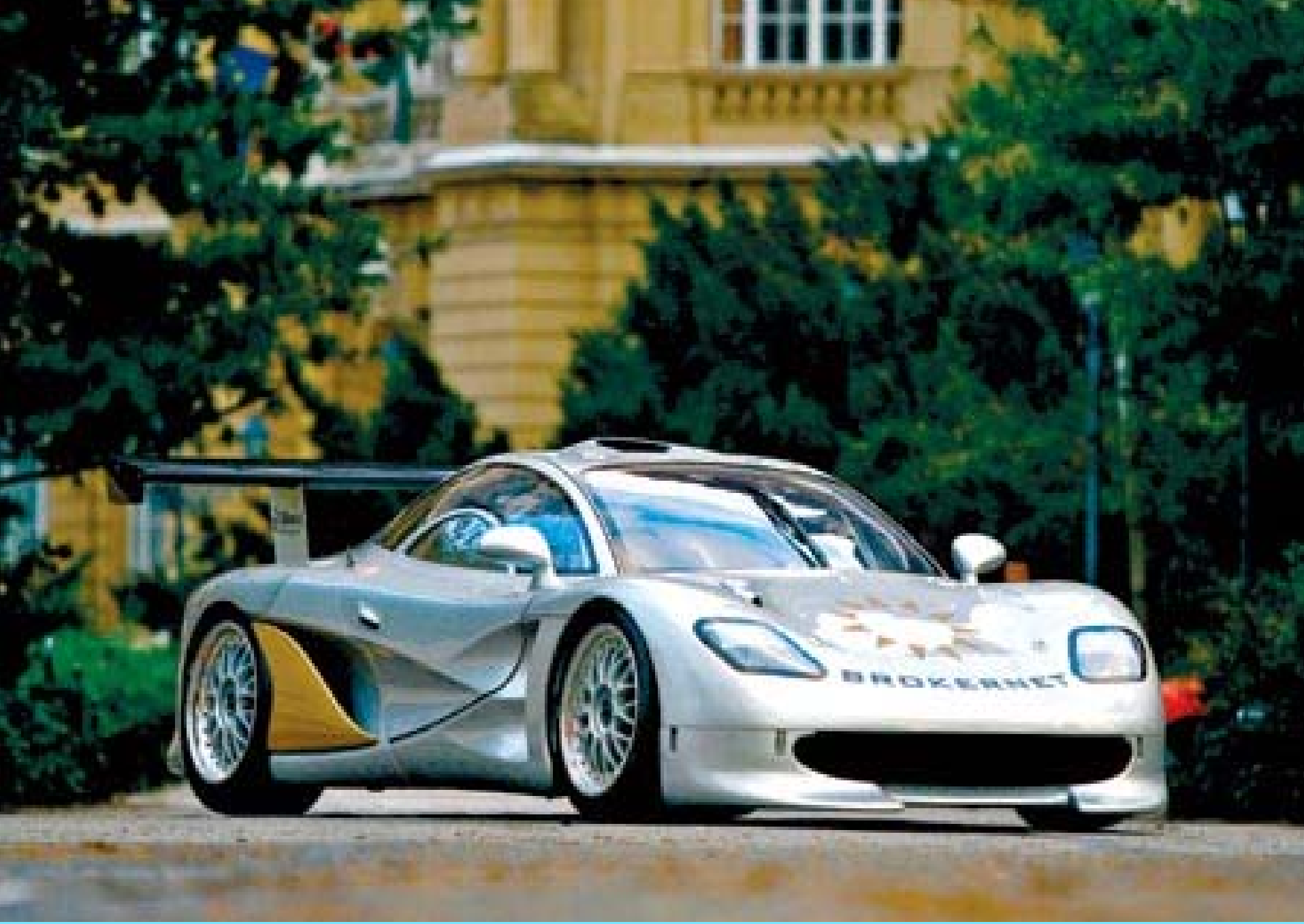
Mr. Mihaly Hideg M.B.A. M.Sc.
Chairman

Tel:+36 1 2941351
Fax:+36 1 2941351
Mob:+36 30 3748145
Email:mihaly.hideg@t-online.hu
Web:www.haif.org

6. Attachments

Evolution of the Hungarian industry results in various locally designed modern vehicles

The newest model of a 200 Hp Corvus Corone Light Sport Aircraft debuted in 2007



The new composite Silver Sting racing car designed in Hungary - spring 2006