

General Aviation and Small Regional Transport Aircraft - Czech Republic on the Move

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GA Market Overview

- Characteristics of the aircraft in operation
 - Various aircraft and type of operation
 - 161 067 (77%) aircraft are piston engine powered
 - 145 975 (70%) aircraft are operated as a personal aircraft
 - **Aging aircraft**

Aircraft Type	Engine Type	Seats	Average Age in Years
Single-Engine	Piston	1-3	36
		4	33
		5-7	28
		8+	43
	Turboprop Jet	All	12
		All	31
Multi-Engine	Piston	1-3	36
		4	33
		5-7	33
		8+	37
	Turboprop Jet	All	26
		All	28
All Aircraft			31

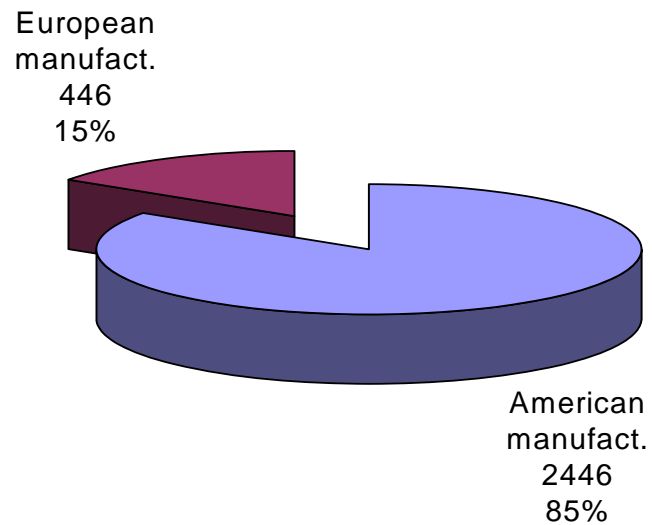
Source: GAMA

GA Aircraft Manufacturer Overview (2004)

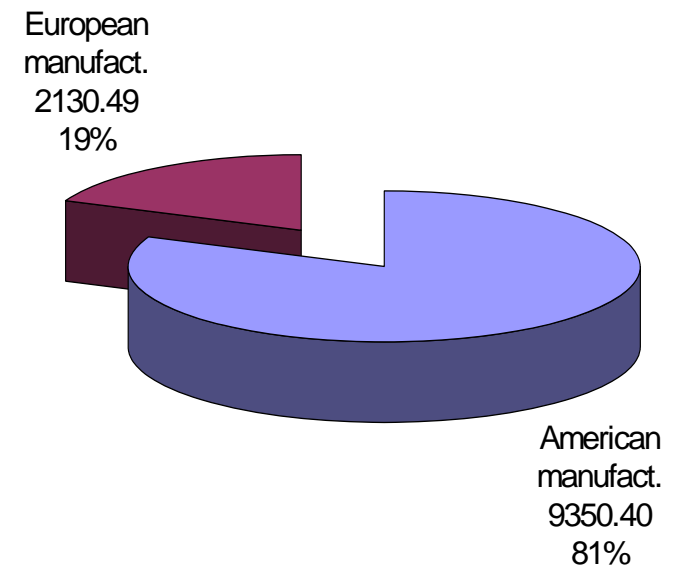
Producer	Billings (USD)	Difference regarding 2003 (%)	Aircraft produced	Difference regarding 2003 (%)	Billing Range
OMF Aircraft	140 000	-94.7	1	-93.75	0 – 10 mil. USD
Maule Air	3 374 568	-8	27	-15.63	
Aviat	8 000 000	0	42	-10.6	
Pacific Aerospace	10 300 000	+468	16	+800	10 – 100 mil. USD
American Champion	10 616 600	+61.2	94	-49.2	
Mooney	16 525 775	+8.3	37	+2.8	
Lancair	35 050 000	+88	78	+53	
Diamond Aircraft	59 680 000	+44.8	261	+14.5	
Socata	85 506 980	-17.4	36	-51.3	
Piaggio	86 200 000	+37.7	16	+33.3	
The New Piper	101 302 396	-4.9	189	-17.5	100 – 250 mil. USD
AvCraft Aviation	132 000 000	+27.5	9	0	
Cirrus Design	210 179 048	+52.8	553	+17.9	
Pilatus	222 250 000	+14.8	70	+14.8	Over 1 bil. USD
Raytheon Aircraft	1 402 677 000	+18.5	310	+17.9	
Dassault	1 676 850 000	+39.7	63	+28,5	
Cessna Aircraft	1 780 854 915	+4.2	899	+6.9	
Bombardier	2 637 680 000	+70.4	129	+84.3	
Gulfstream Aerospace	3 012 000 000	+2,3	78	+5.4	

European vs. American Manufacturers (2004)

Number of Shipped Aircraft



Billings – mil. USD



Czech Aerospace Industry - Brief Historical Overview

- At the end of 1980s there were almost 40 000 employees working in the Czech aerospace industry
- Manufacturers produced gliders, piston powered training aircraft, small turboprops and military jet training aircraft
- The main manufacturers were:
 - LET Kunovice – gliders and small turboprops (L-13 Blanik, L 410)
 - Aero Vodochody – military jet training aircraft (L-29, L-39)
 - Moravan Otrokovice – piston powered aircraft (Zlin aircraft family)
- There was a very large network of suppliers producing landing gears, navigation and communication equipment, components for the aircraft hydraulic system, piston and turboprop engines, propellers ...
- Aeronautical research and development activities were concentrated at the Aeronautical Research and Test Institute in Prague and at Czech technical universities in Prague and Brno
- Every aerospace company had its own R&D department

Czech Aerospace Industry - Present Overview

- Today there are almost 10 000 employees working in the Czech aerospace industry
- There are many new aircraft manufacturers – especially in the light aircraft segment
- "Traditional" manufacturers have lost their markets and their aircraft are not competitive any more
- After stagnation during 1990s the Czech aeronautical research and development is recovering
- New aircraft projects:
 - **VUT100 Cobra**
 - **EV-55 Outback**

- In the near future the Czech aerospace industry will have the most competitive offer of the general aviation aircraft among the new EU member states
- The suppliers are actively involved in the international cooperation improving their products
- Research and development potential has survived at its traditional centers (Aeronautical Research and Test Institute and universities)
- Industry turnover about EUR 300 million

Main Development Projects

- 2-seat light aircraft
- VUT100 Cobra (4 to 5-seat single-engine)
- Ae270 Ibis 2 (10-seat turboprop)
- EV-55 Outback (10 to 14-seat twin-engine turboprop)
- EV-55 Outback – float/amphibian version
- New 19-seat turboprop – stretched version of The Outback?

These types of aircraft represent about 80% of all the aircraft sold in General Aviation markets



2-Seat Light Aircraft

- The Czech Republic is a significant manufacturer of light aircraft on a world-wide scale
- Several hundreds units per year are produced
- Overwhelming majority of them is exported abroad
- Chance for Czech manufacturers to succeed in the US market – creation of a new S-LSA category, as if “tailor-made“ for Czech aircraft
- Typical and very successful representants of light aircraft are teamEurostar, SportStar, Rapid (Sova) and Sting



VUT100 Cobra

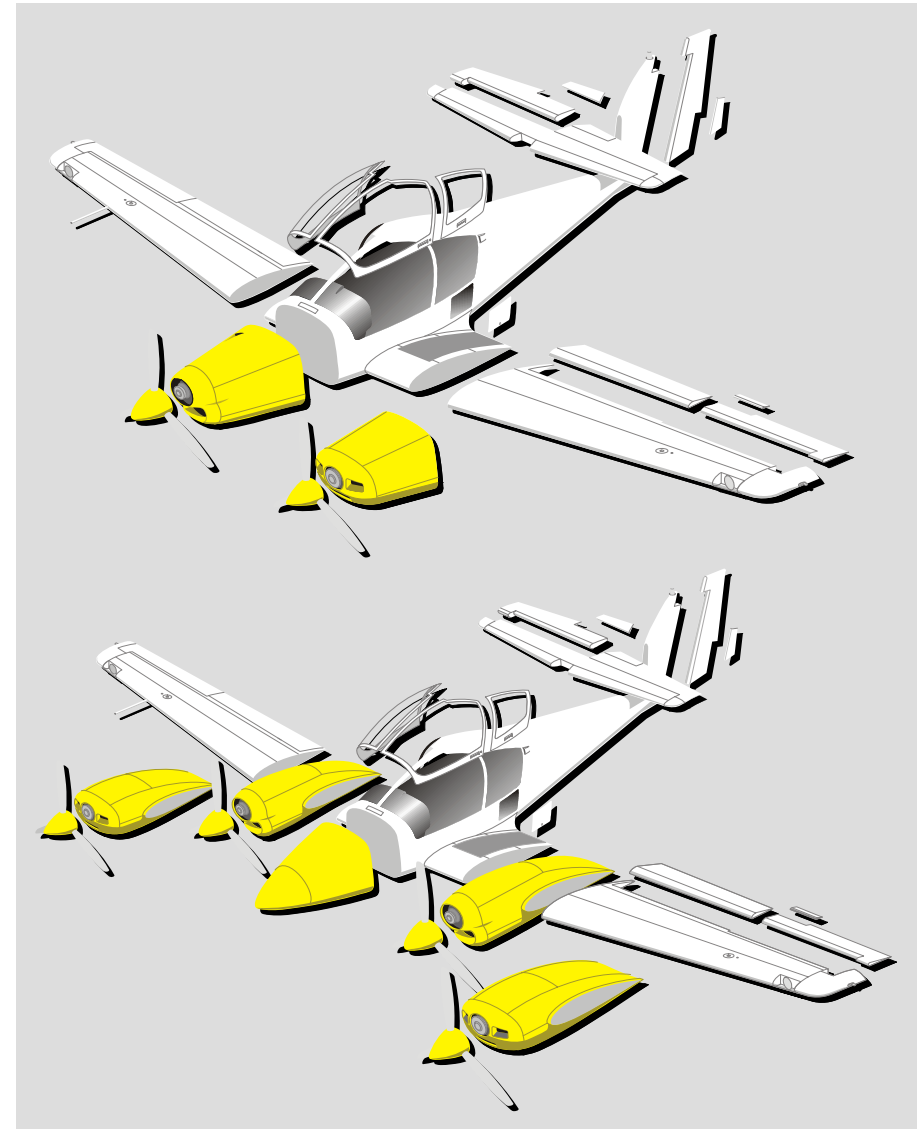
- New generation of 4 to 5-seat, all-metal aircraft with retractable landing gear
- Designed for VFR and IFR flights, convenient travelling, sports flying and also for pilot training in accordance with JAR FCL
- Low operation costs, excellent flight characteristics, spacious and the ergonomically solved cockpit
- Project is being implemented in cooperation with Aviation Institute of VUT in Brno and with a support of Czech Ministry of Trade and Business



Cobra Aircraft Family

From the very beginning, the Cobra was designed to be modular so that the same systems and parts can be combined like LEGO parts to produce a wide range of new and different aircraft.

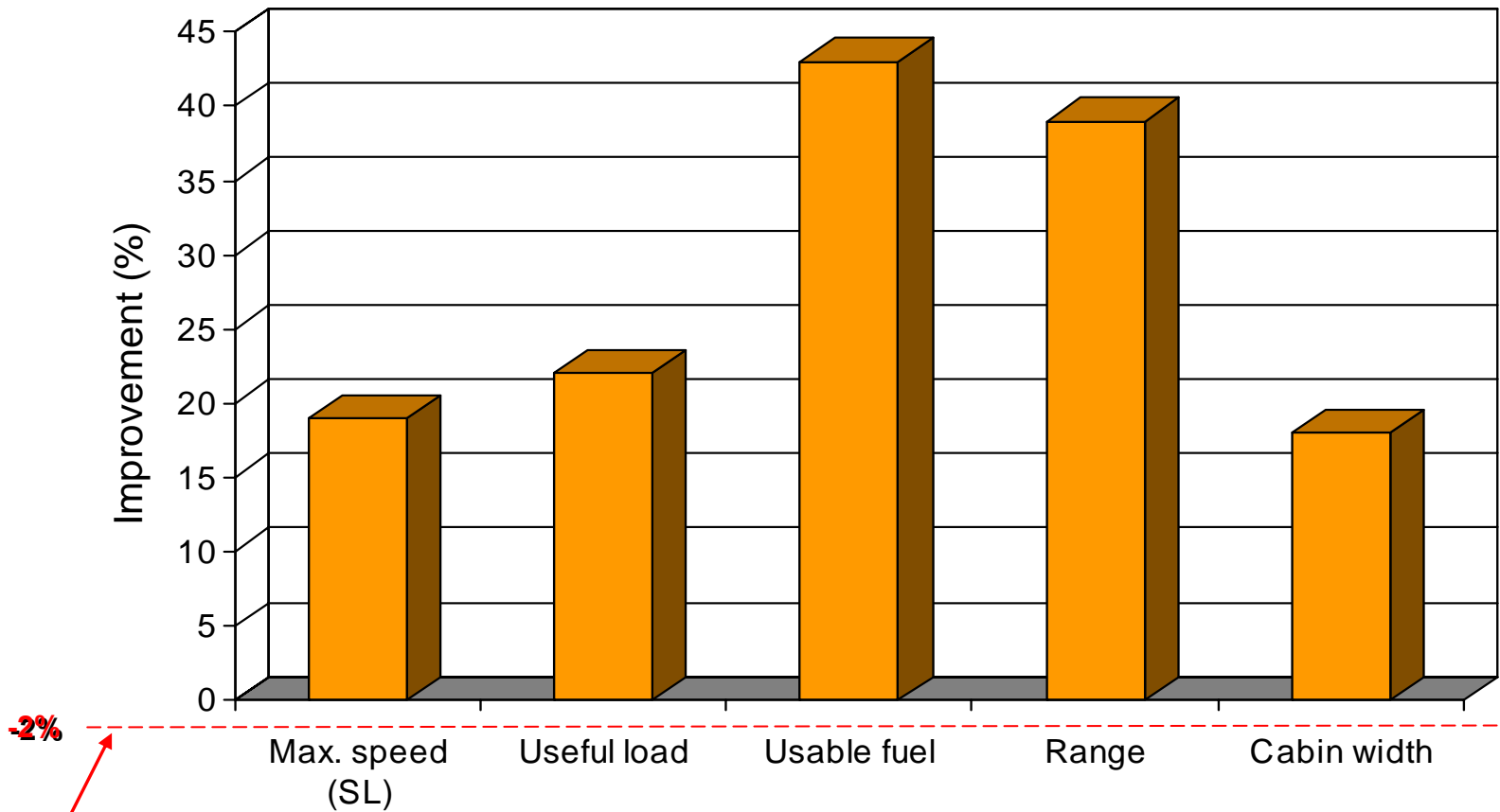
- ❖ **VUT100-120i Cobra** – initial model
4-seater, single 200 HP Lycoming
- ❖ **VUT100-130i SuperCobra**
4-seater, single 315 HP Lycoming
- ❖ **VUT100-120TDi DieselCobra**
4-seater, single turbocharged diesel engine
- ❖ Possible to produce several new 4 to 7-seat piston, diesel or turboprop powered single and twin engine aircraft, quickly and economically.



Airplane Comparison

Cobra (200 hp) versus market average

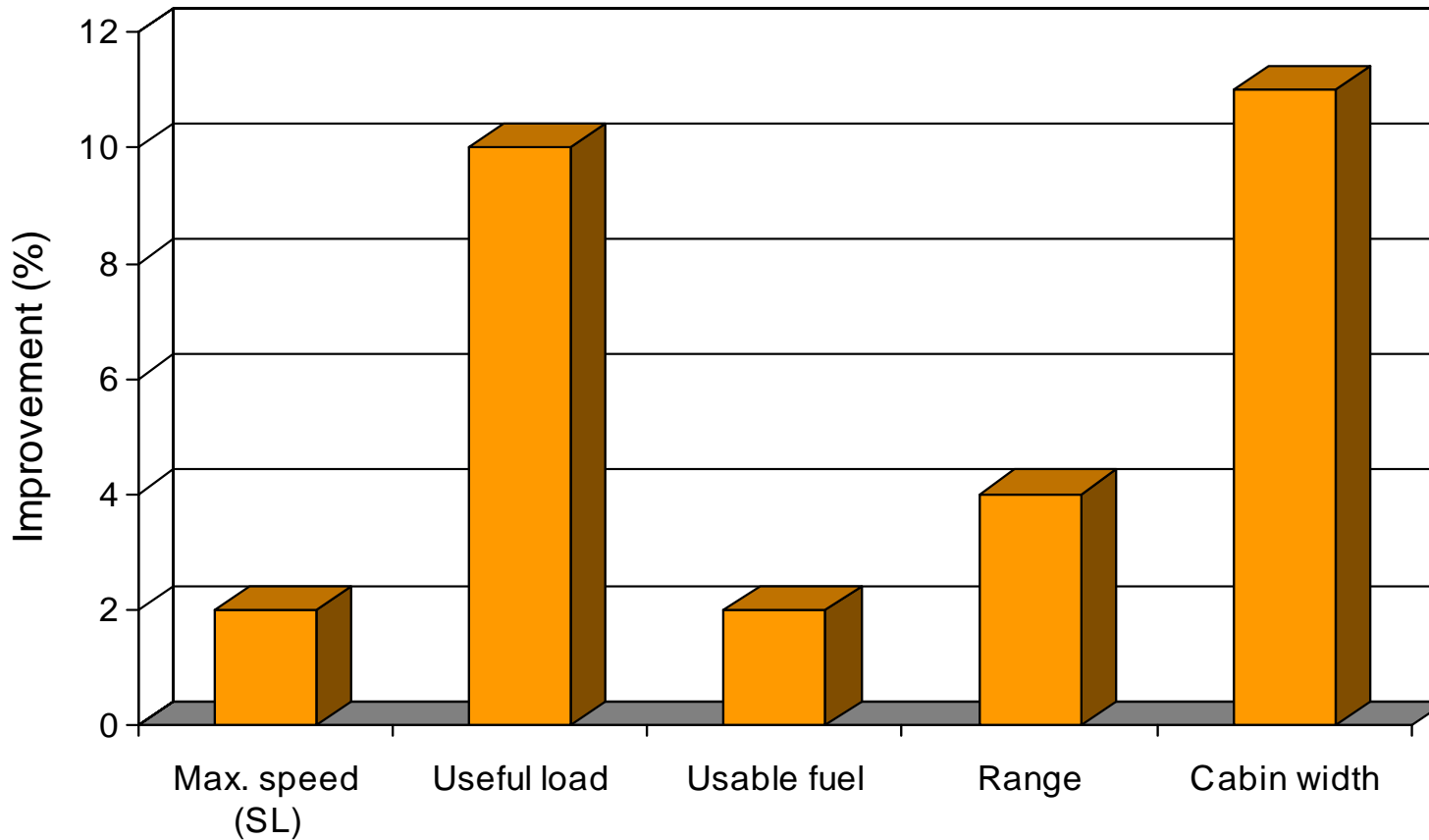
Market average:
 Cessna 172SP
 Piper PA-28R
 Socata TB10
 Cirrus SR 20



Cobra price – 2% below market average (200 hp model)

Airplane Comparison

SuperCobra (315 hp) versus market average



Market average:
 Cessna T182 Turbo
 Socata TB20
 Cirrus SR 22

-15%

SuperCobra price – 15% below market average (315 hp model)

IBIS Ae270

- The Ae270 is a single-engine turboprop aircraft with the pressurized fuselage designed for a wide scope of operation types, including transport of passengers, cargo or combined transport
- The aircraft will be available in the following interior configurations
 - Version for VIP transport (luxury interior, 4 passengers)
 - Version for passenger transport (up to 9 passengers)
 - Version for transport of patients (2 patients on beds + 2 accompanying persons)
 - Version for combined transport of persons and cargo
 - Version for special use (photogrammetric, surveillance version, etc.)



EV-55 Outback: Multipurpose Aircraft of New Generation

- **The only new twin-engine turboprop aircraft in the market!**
- **Multipurpose aircraft** for transport of passengers and cargo (9 to 14 passengers or up to 1 824 kg cargo)
- **Versatile aircraft** – operation on unpaved runways, STOL characteristics (take-off run of 420 m)
- **Powerful aircraft** – driven by two turboprop engines
- **Fast aircraft** – cruising speed over 400 km/h
- **Economical aircraft** – low operation and maintenance costs

- **The most spacious cockpit in its category of aircraft** – up to 12.7 m³
 - Passenger compartment of 9.5 m³
 - Baggage compartment of 3.2 m³
 - Baggage volume per passenger up to 356 litres
 - Cabin volume bigger by 18% than with the Cessna Grand Caravan



Seaplane / Amphibian

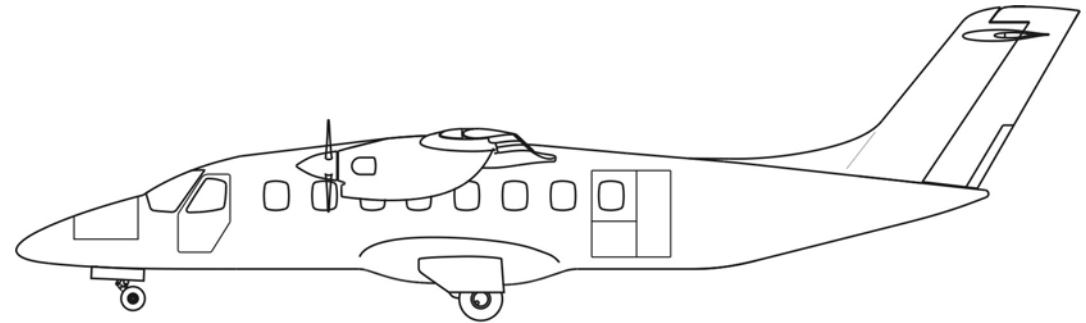
- The only twin turboprop airplane in a float version on the market
- Unmatched cruising speed of 195 kts (361 km/h)
- Huge payload of 3 080 lbs (1 397 kg)
- Outstanding range of 1 000 nm (1 850 km)



EV-55 Outback – Stretched 19 Pax. Version

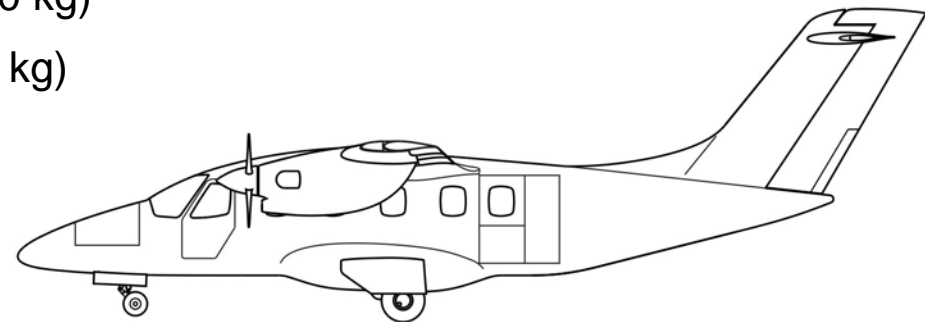
- Possible stretched version
- There is no modern 19 pax. aircraft in the market today
- Both aircraft shares design of the many parts – essential reduction of development and production costs

Stretched 19 pax. version



- Fuselage stretched by 8.66 ft (2.640m)
- Wing span extended by 5.74 ft (1.750m)
- Max. take-off weight 14,220 lb (6,450 kg)
- Max. payload 5,290 lb (2,400 kg)

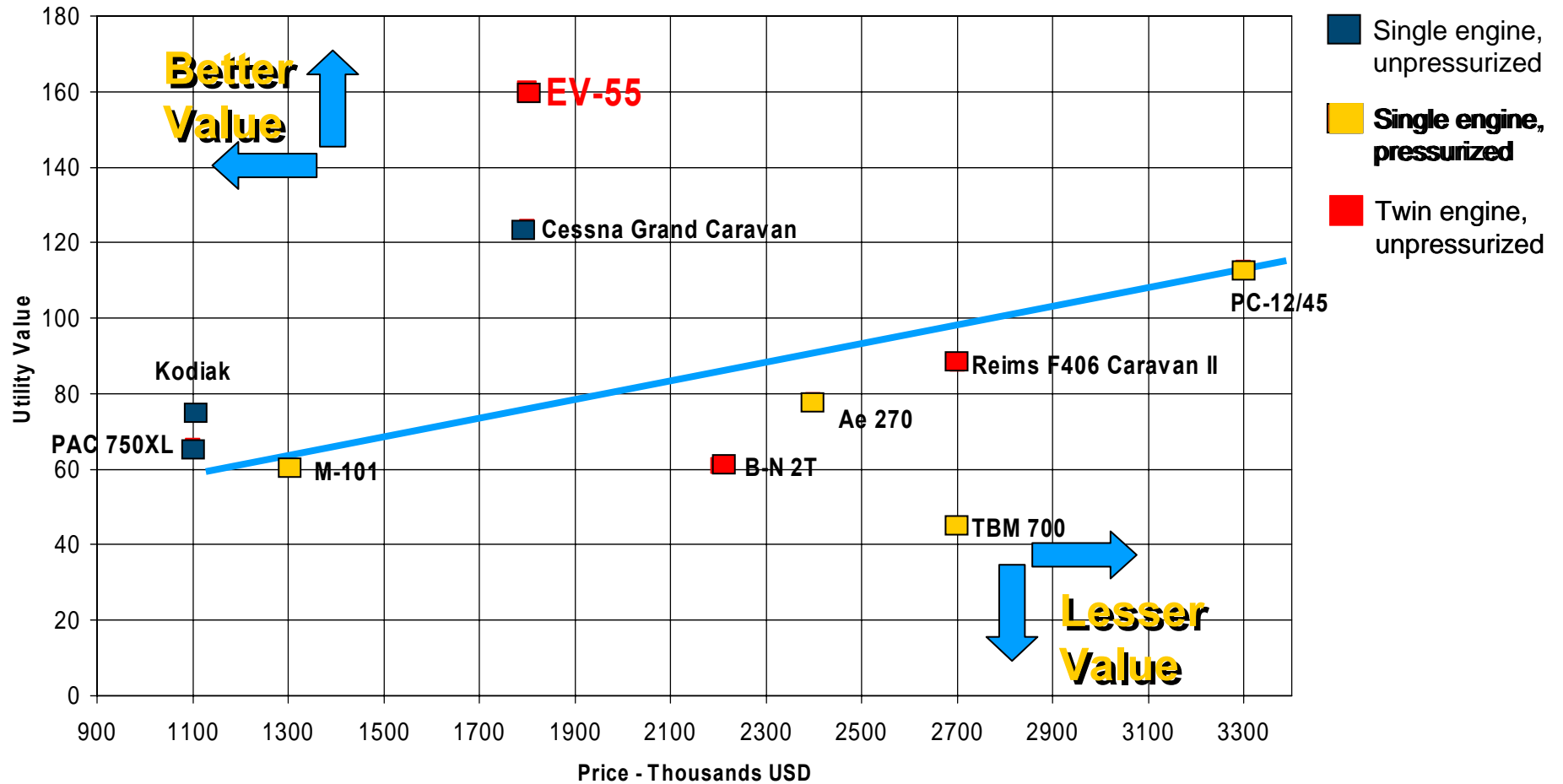
9 pax. version



EV-55's Position on the Market

$$\text{Utility Value} = (\text{kts} \times \text{ft}^3 \times \text{useful load}) / (2 \times \text{T.O. over 50 ft} \times \text{total power})$$

plus 20% for either multi engine or pressurized



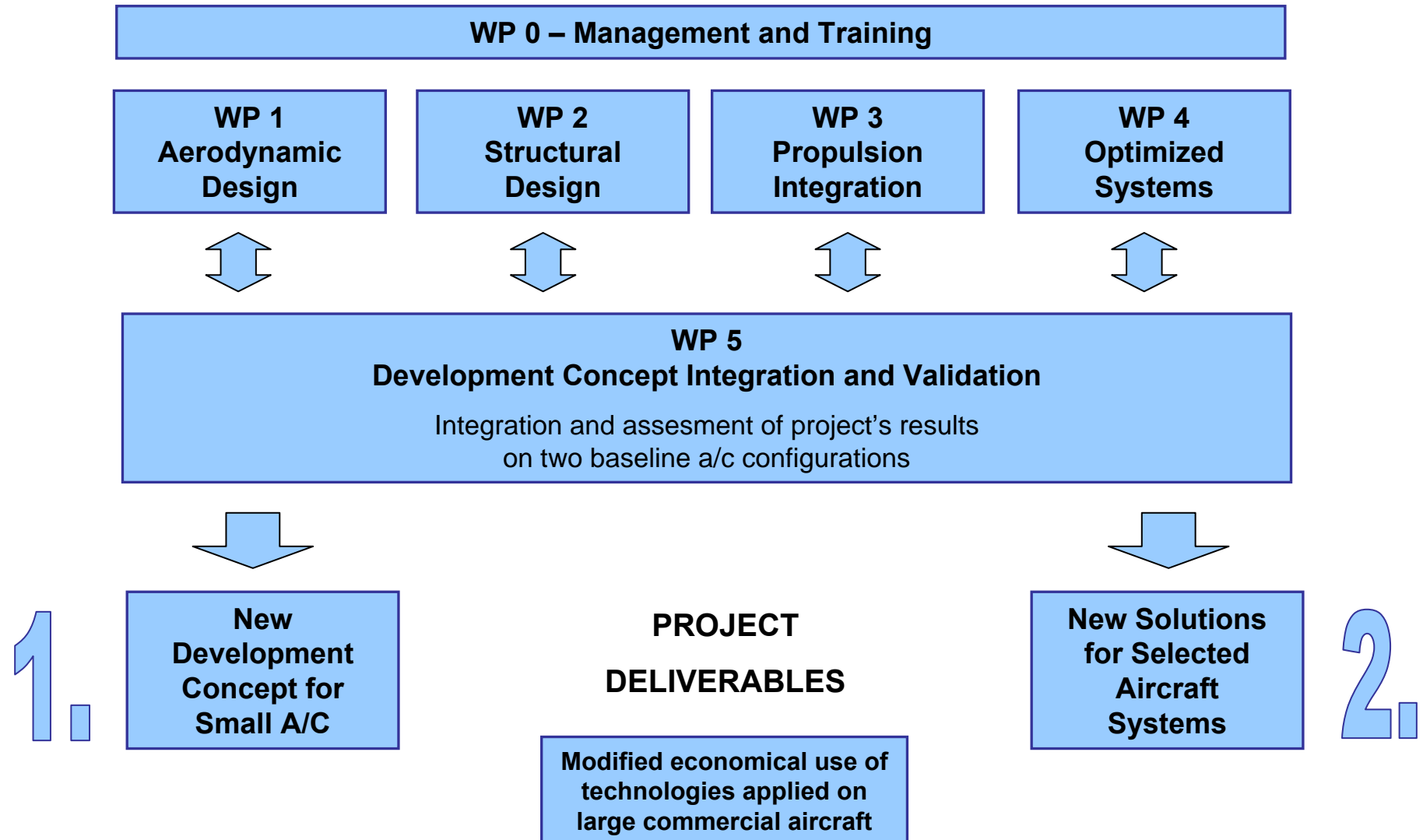
Czech Government Support to Aeronautical R&D

- Support of research and development in the Czech Republic is exercised through IMPULS and TANDEM supporting programs
- Grants are provided every year and individual projects suitable for support are assessed by the selective committee
- In 2006 the Czech government supports the aeronautical R&D programs by over 200 million CZK (7,2 million Euro)

CESAR – Cost Effective Small Regional Aircraft

- CESAR will be realized within the scope of EU's Sixth Framework Programme for Research and Technological Development
- CESAR focuses on small-size commercial aircraft providing manufacturers with an enhanced ability needed to become fully competitive in the world market
- The project consists of five RTD areas sufficiently covering the complexity of the aircraft design process, namely aerodynamic and structural design, propulsion integration, aircraft system optimization and design integration aspects.
- Another important part of the project is technological development for aircraft subparts and systems.
- The activities also include the integration of the latest technologies already applied to large commercial aircraft and their modified economical use within the category of small-size commercial aircraft
- The CESAR aspires to provide technologies and knowledge for advanced wing, competitive and environmentally acceptable propulsion unit and new technologies for selected aircraft systems to reduce aircraft operating costs and improve safety.

Scope of CESAR



Financial Limits of Involvement of the New EU Member States in EU R&D Programs



- Traditional EU member states:
 - Contribution to EU R&D programs: 8 - 11 thousand Euro per employee per month
big companies 14 -16 thousand Euro per employee per month
- New EU member states
 - Contribution to EU R&D programs: 5 - 6 thousand Euro per employee per month
- Companies with the bigger costs receive bigger contribution from the EU funds than the companies with lower costs. This isn't dependent on the results of development, i.e. same development made by bigger company is more expensive
- EU R&D programs are well adjusted for big companies from the traditional EU member states
- **Solution of this problem may be a reduction of financial contribution to EU R&D programs for the companies from the new EU member states or evaluation of the result of the work**

Concept of the new EU small regional transport aircraft

Association of the Czech aircraft manufacturers works on the project of the small regional transport aircraft

- Marketing analysis for small regional aircraft – 9 – 30? passengers
- Using the new technical solutions and technologies (new optimized wing and propulsion system, eco-design, using new advanced materials)
- The first draft of the concept will be prepared till 11/2006
- Participation other EU national associations and producers in this project is welcomed



Thank You for Attention