PCAST Workshop on Federal-State R&D Cooperation

Aerospace: A case study of sustaining a mature sector

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GE Aircraft Engines

July 29, 2004

imagination at work

GEAE In 2003

$10.7B in revenue

4 major markets

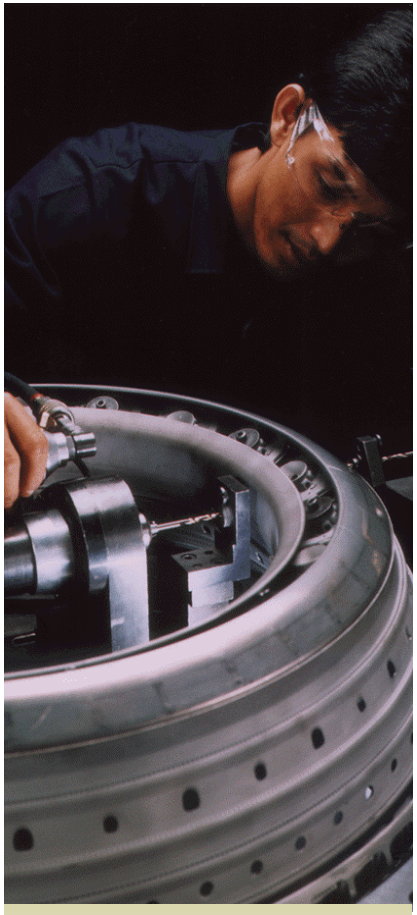
The World's Leading Provider of Aircraft and Aeroderivative Propulsion Systems and Services

GEAE Markets

Commercial

Military

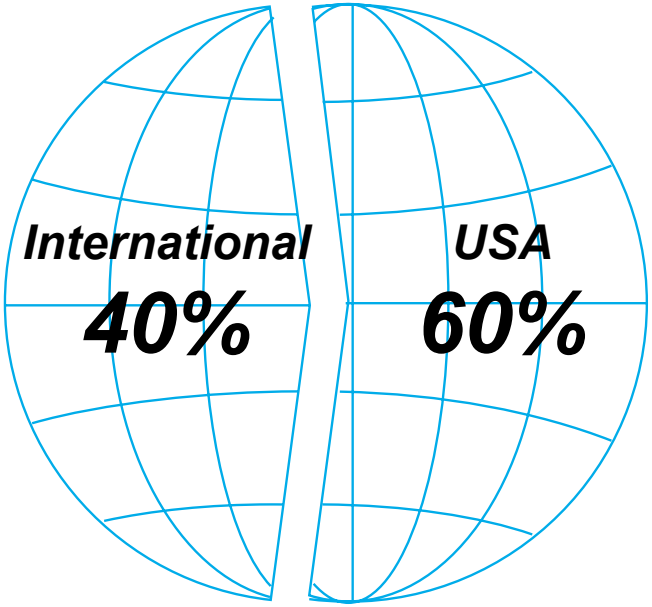
Marine & Industrial

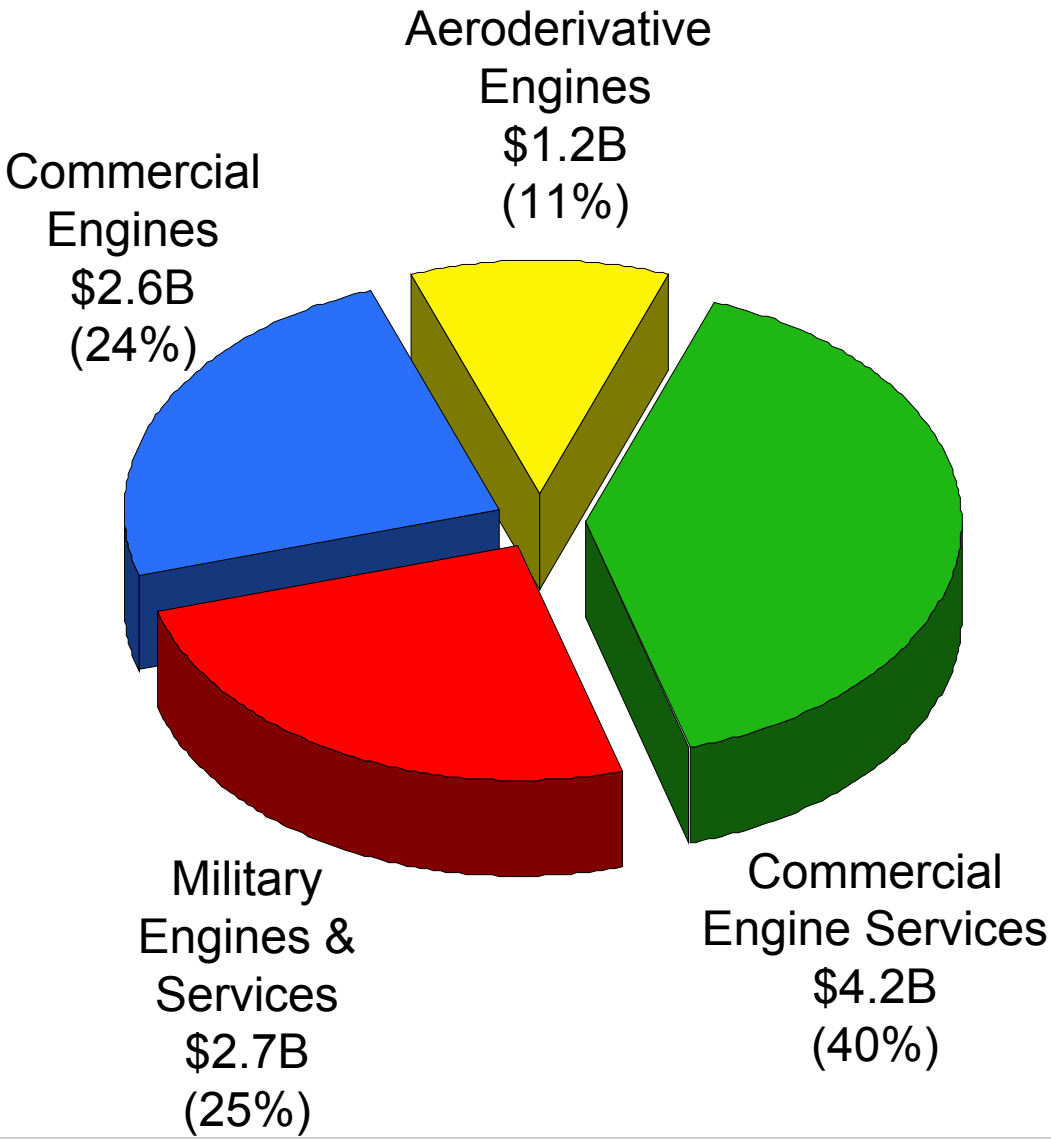


Engine Services

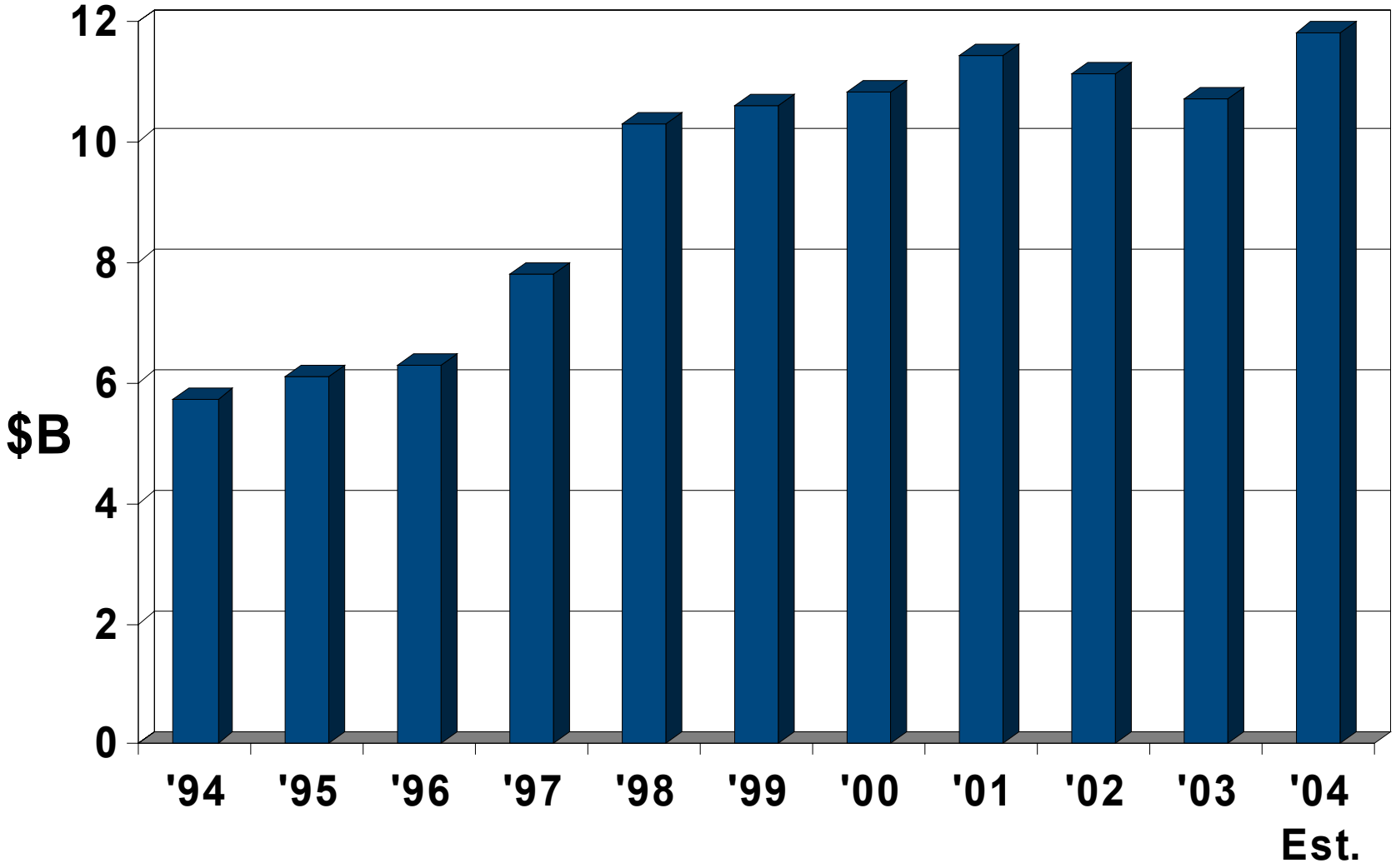
2003 GEAE Revenue

$10.7B Total

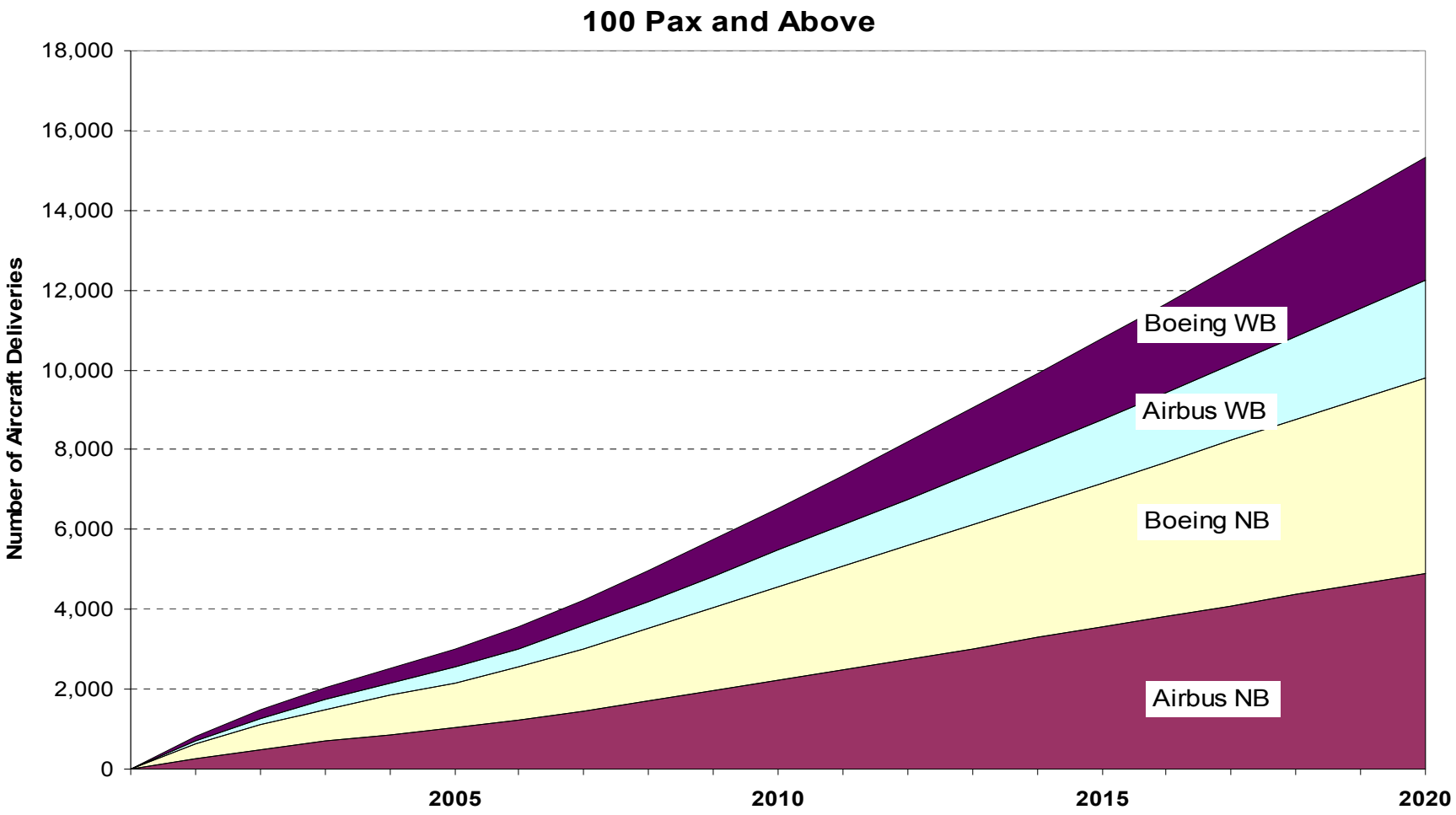




GEAE Revenue



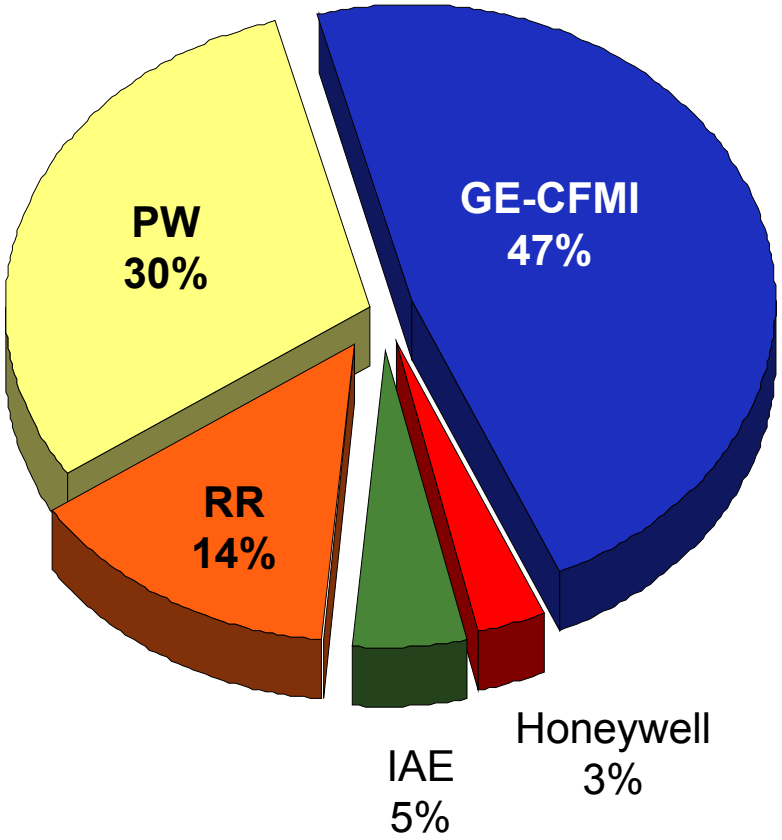
Commercial Market Requirements



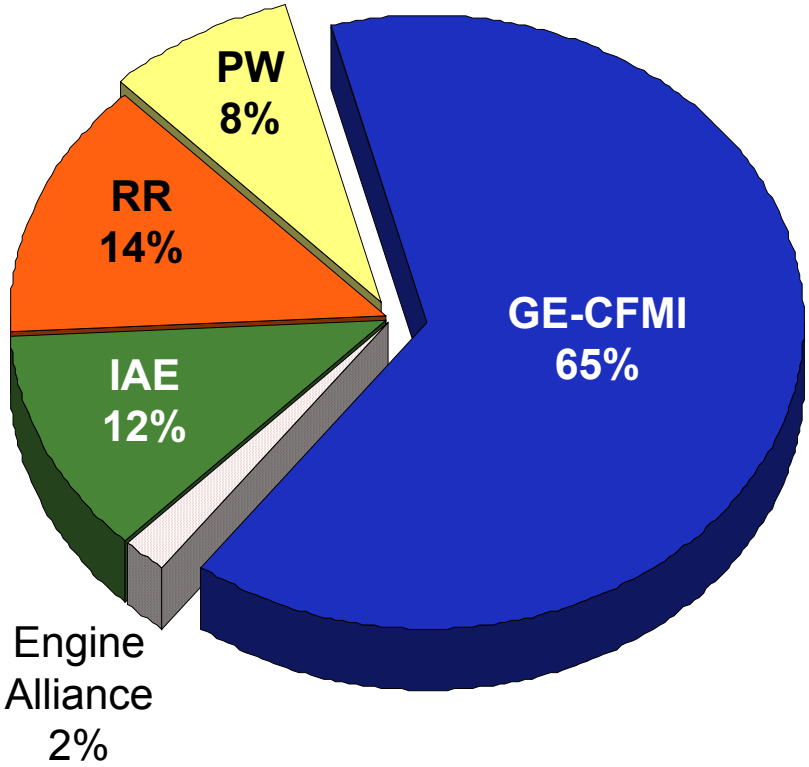
1/3 WideBody -- 2/3 NarrowBody demand distribution

GEAE Installed Base

Delivered Engines



Backlog



50 Pax+ Stage III Commercial Jets

Commercial Power

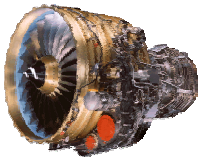
Regional jets
CF34® family

Bombardier CRJ200/700/900

EMBRAER 170/175/190/195

ACAC ARJ21

Single Aisle
CFM56* family



Boeing 737

Airbus A320

Twin Aisle
CF6 family

Boeing 767

Airbus A300

Airbus A310

Airbus A330

Jumbo Twin Aisle
CFM56, CF6, GP7000**, GE90

Airbus A340-200/-300

Boeing 747

Airbus A380

Boeing 777

Turboshaft & Turboprop
CT7/T700 family

EH101

S 92

Saab 340

IPTN CN235

*CFM International is 50/50 joint venture with Snecma Moteurs
**GE-P&W Engine Alliance is a 50/50 joint venture with Pratt & Whitney

OIF – GE powered 27+ Major Weapon Systems

Flew Major Portion of Battlefield & Support Missions

USAF

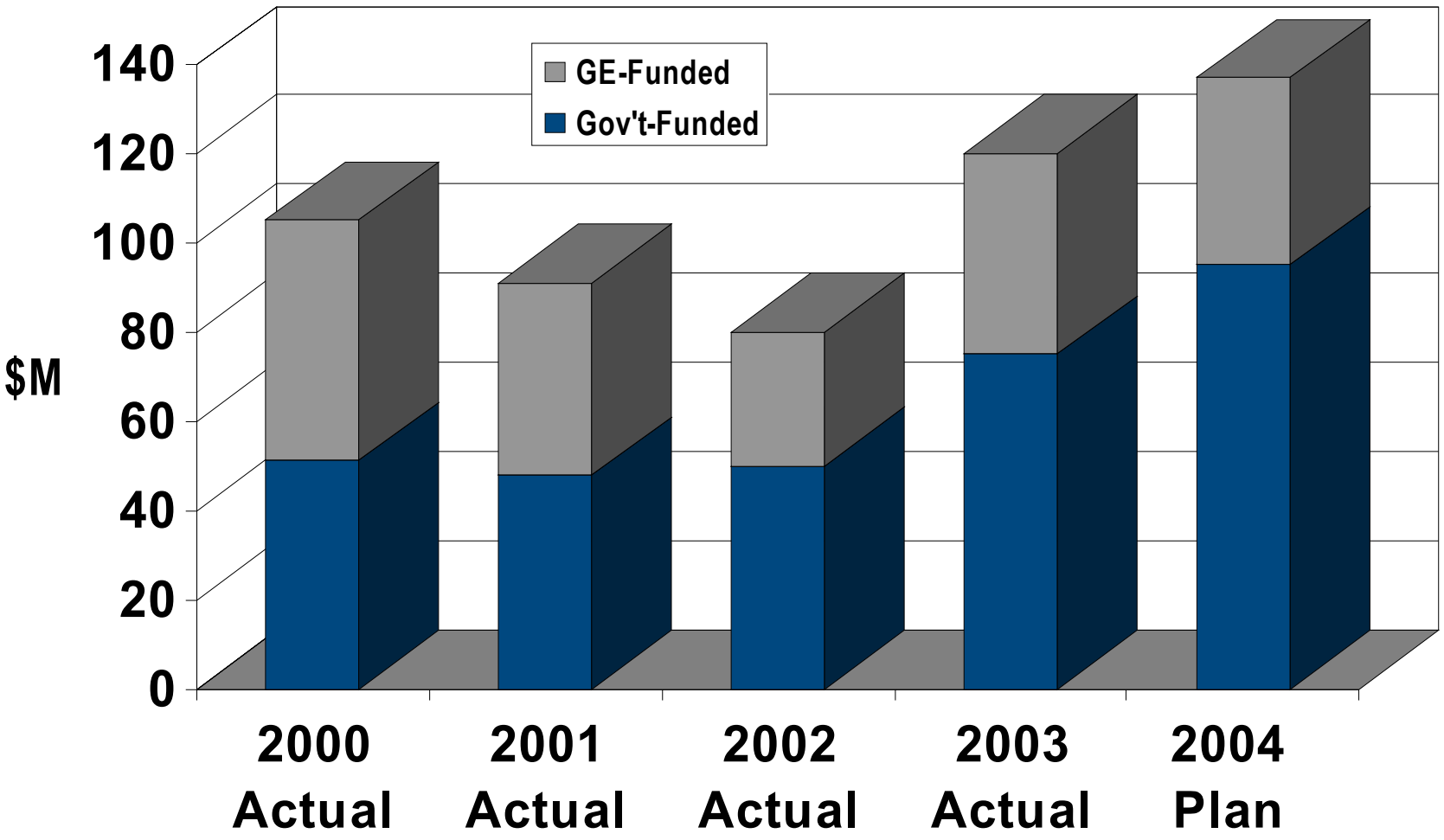
USN/USMC

US Army

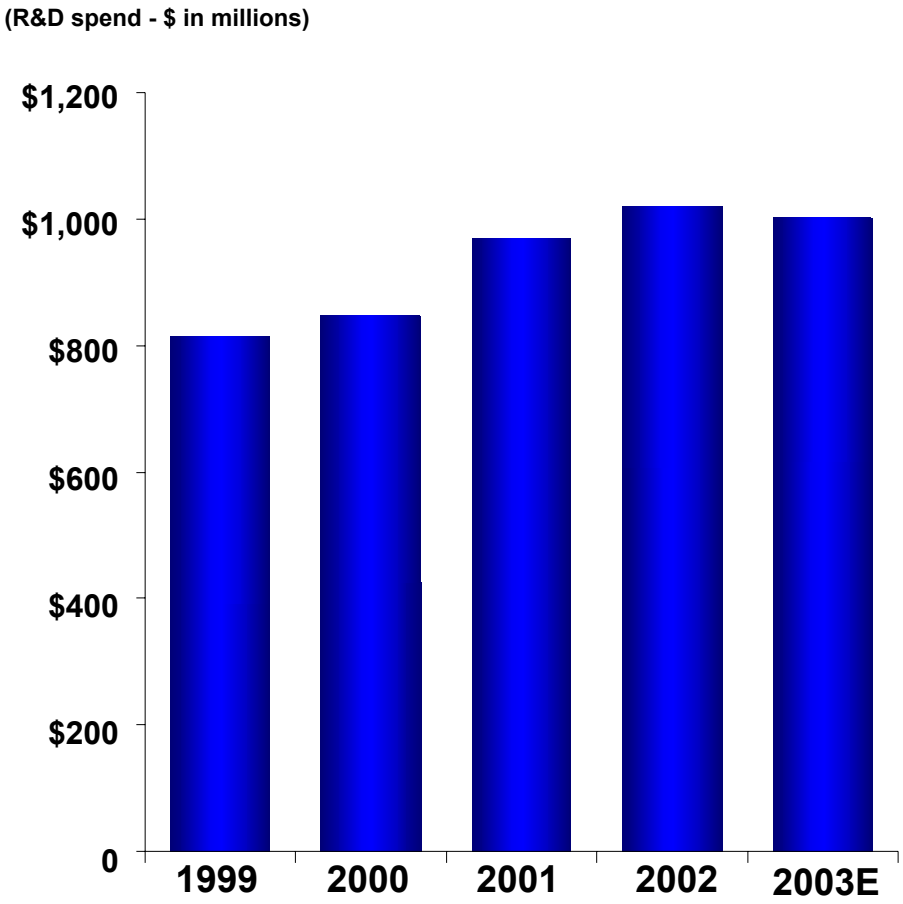
US Navy-ships

Bringing Technology to the Battlefield

Technology Funding History



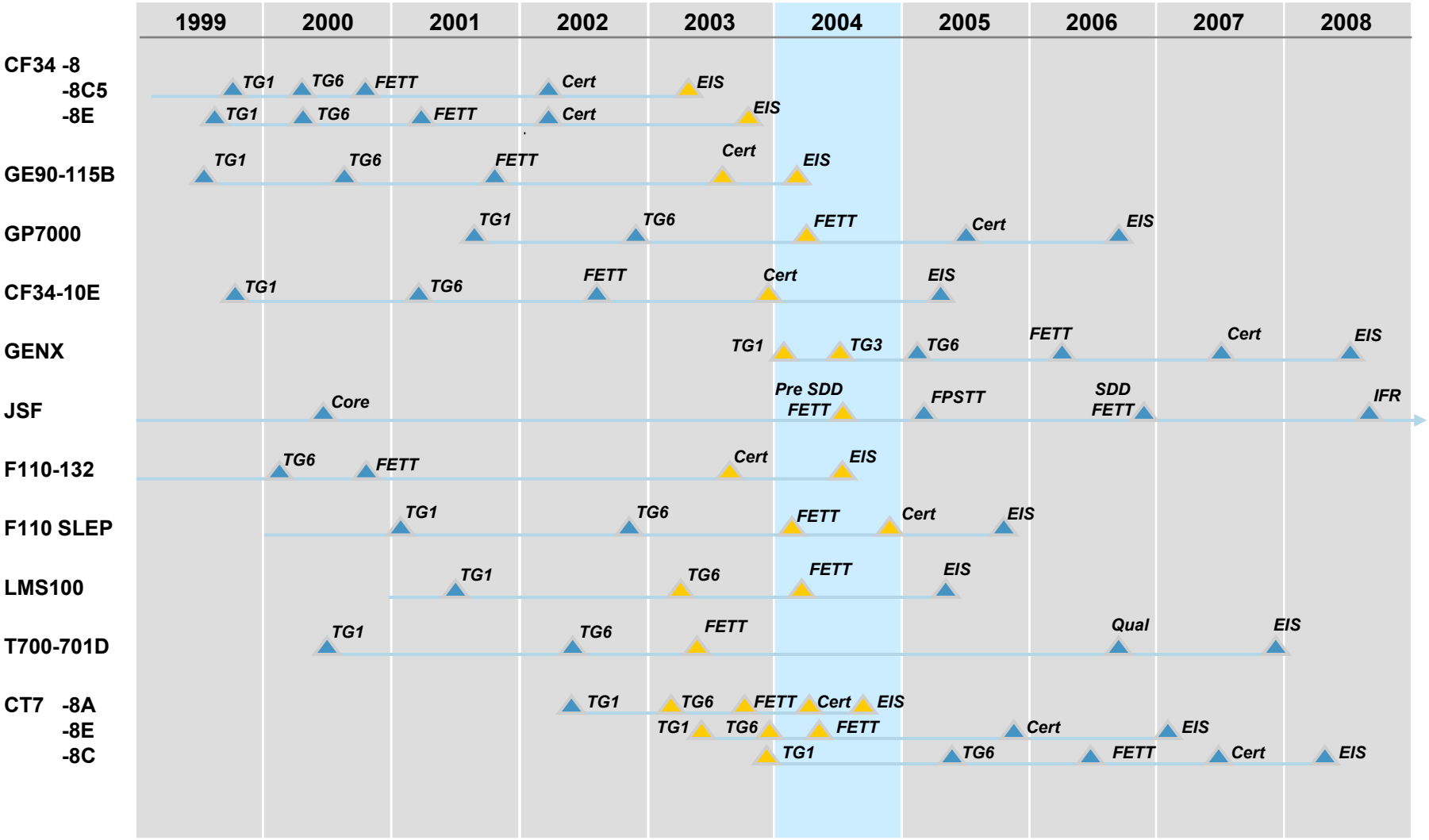
Investing in Technology



Technology Insertion:

Next Generation of Engines … Ready for the Upswing

New Engine Development Programs



Largest Product Creation Effort In GEAE History

Strategy for Sustained Success

Technology! … Technology! … Technology!

Needs cooperation between
Industry, Academia, and Government

Model for success is cooperation between:

State Government
Ohio Center for Propulsion & Power (OCAPP)

University Support

Federal Labs
Propulsion 21

University & Industry Support

The OCAPP Partnership

The Ohio Center for Advanced Propulsion and Power

OCAPP Universities

- University of Cincinnati
- University of Dayton
- University of Akron
- Case Western Reserve Univ.
- Ohio State University
- Air Force Institute of Tech.

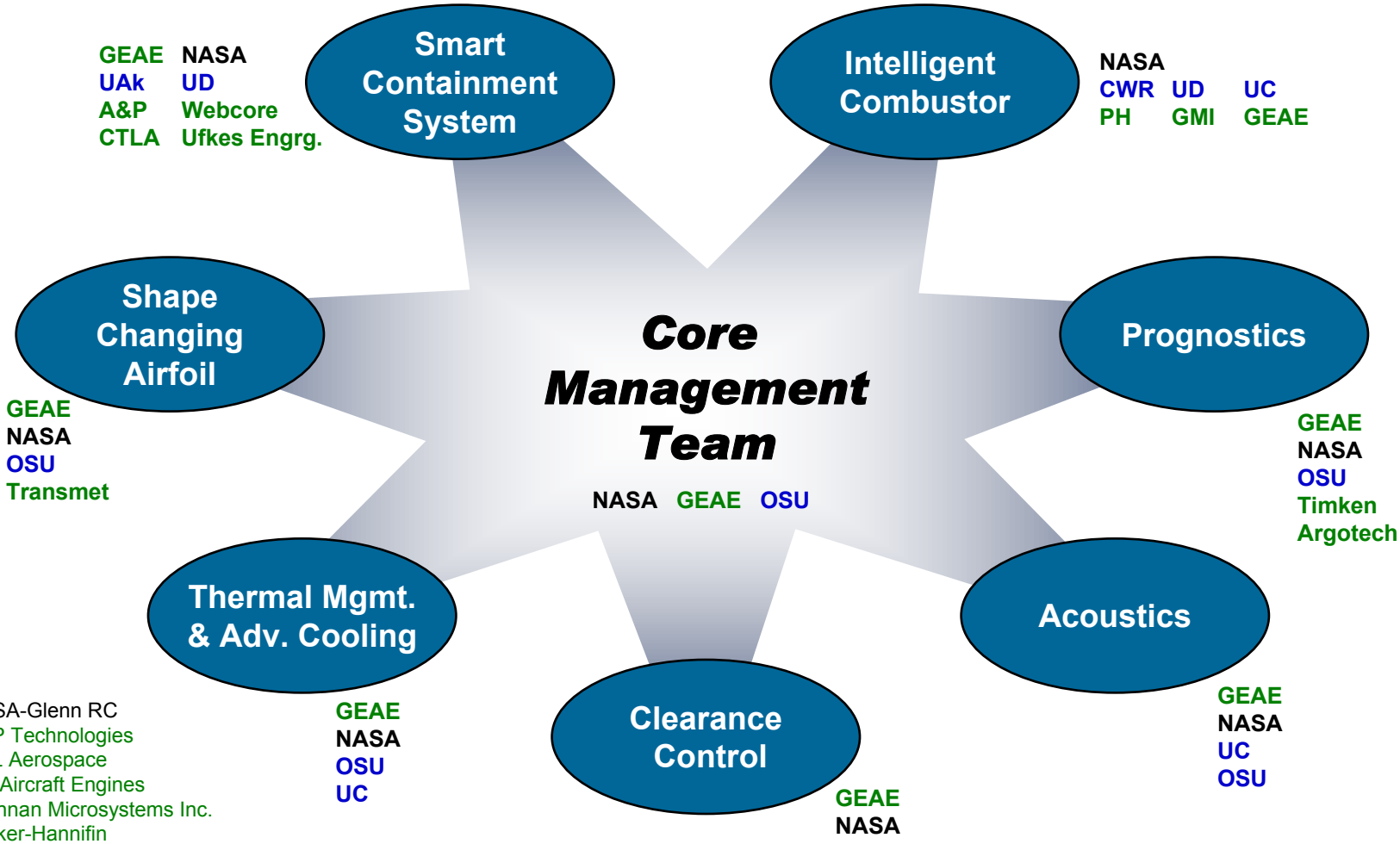
Industry Partners

- GE Aircraft Engines
- Parker Hannifin
- Glennan Microsystems
- WEBCore
- Timken
- ARGO Tech

Federal Labs: NASA GRC, AF WPAFB

An Industry-University-Government Cooperative Initiative

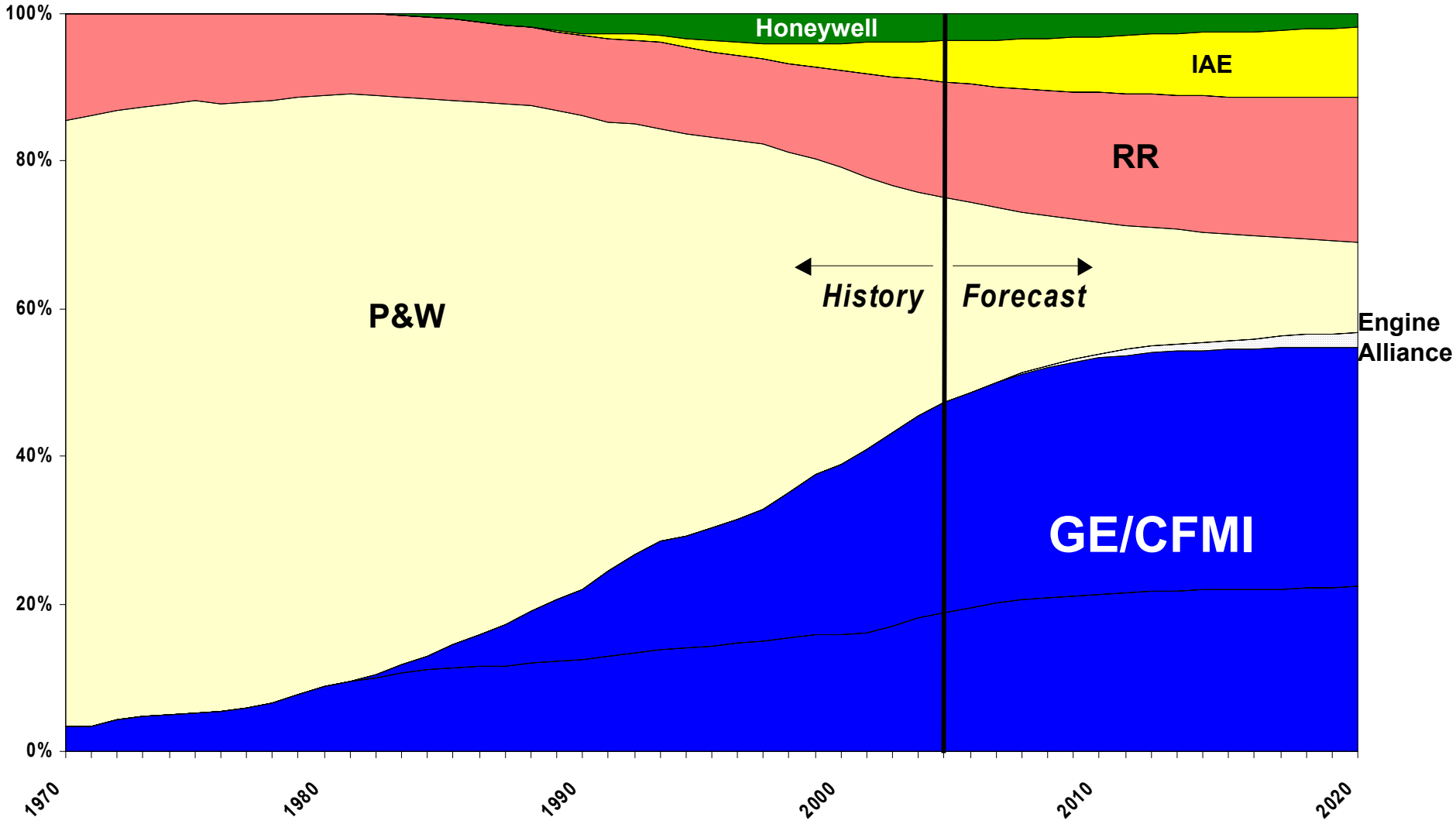
Propulsion 21



NASA	NASA-Glenn RC
A&P	A&P Technologies
CTLA	CTL Aerospace
GEAE	GE Aircraft Engines
GMI	Glennan Microsystems Inc.
PH	Parker-Hannifin
CWR	Case Western Reserve Univ.
OSU	Ohio State Univ.
UAk	Univ. of Akron
UC	Univ. of Cincinnati
UD	Univ. of Dayton

Industry / NASA / University Team Approach

Engines-in-Service by Engine Manufacturer



Technology Key to Market Preeminence

Propulsion Vision for the 21st Century

Academia

LOCKHEED MARTIN

Honeywell

PRATT & WHITNEY DEPENDABLE ENGINES

BOEING

Industry

Government

Key to Success is Strong Cooperation Between Academia, Industry, and Government Agencies