

IV Annual Analyst and Investor Day

October 22nd – 23rd, 2008

**R&D and
Innovation**



Contents:

- **Introduction. The Role of R&D and Innovation**
- **External Sources of R&D Funding**
- **R&D Programs and Projects**

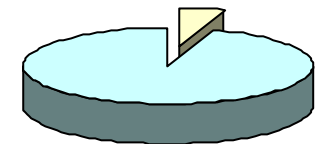
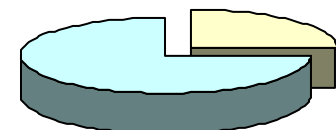
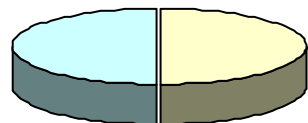
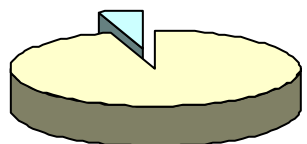
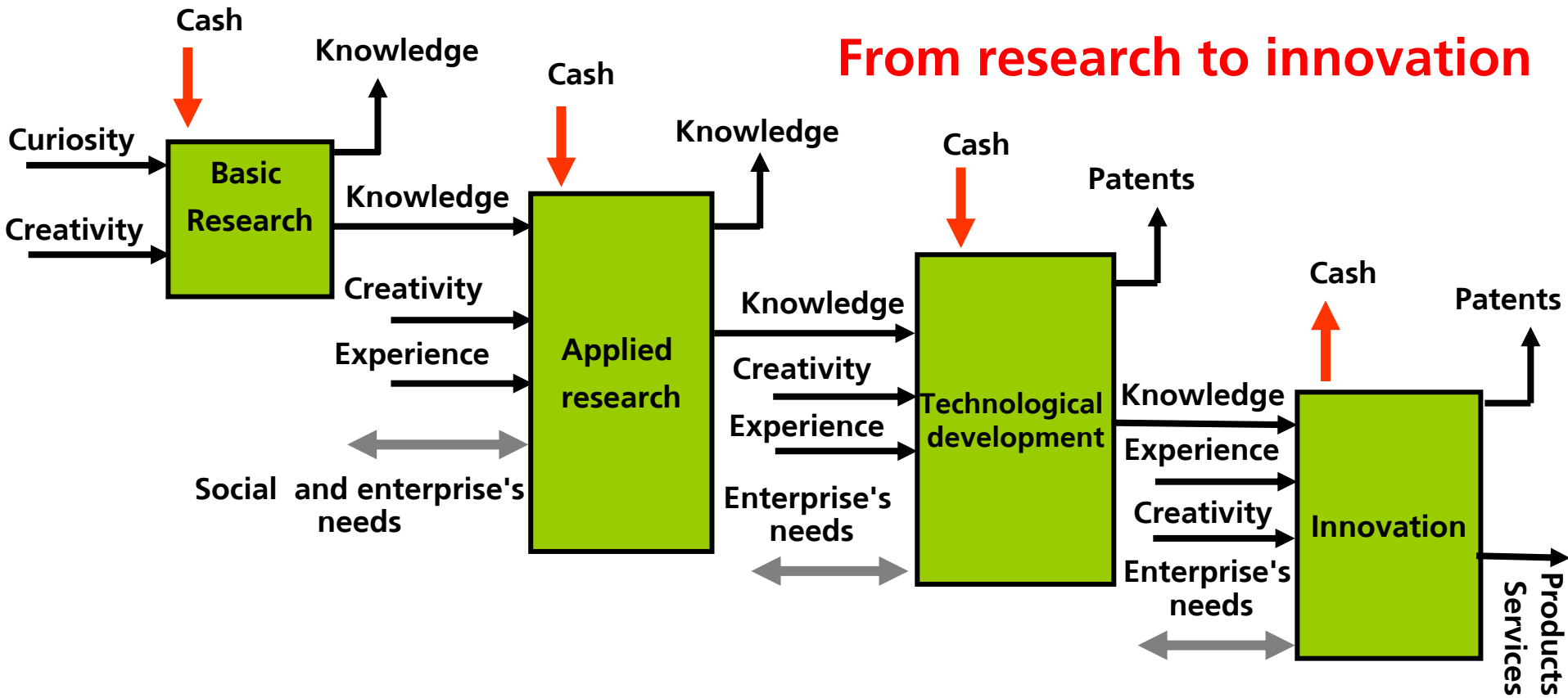
Innovation: source of growth and competitiveness

- **We define ourselves as a technology company applying innovative solutions for sustainable development**
- **Innovation: Any knowledge based change that generates value**
- **Technological Innovation: Transformation of scientific and technological knowledge in new products, processes or services**
- **Experts agree in that 80% (approx.) of long run growth will come from technological achievements**

Technological R&D source of innovation

- **In order to innovate we must generate technological knowledge through R&D. We may also acquire part of this knowledge from universities, research institutions and companies**
- **R&D transforms cash into knowledge. Innovation transforms knowledge into cash**
- **R&D and Innovation are key factors for evolution to a sustainable world with higher levels of welfare for all nations and people**

From research to innovation



Universities and research centers

Companies

R&D: not only a source of external funding




- **Creates competitive advantages for Abengoa**
- **Must lead to results that can be identified**
- **Must be measured and quantified**
- **Allows partnership with leading universities and research institutions**

R&D must be quantified

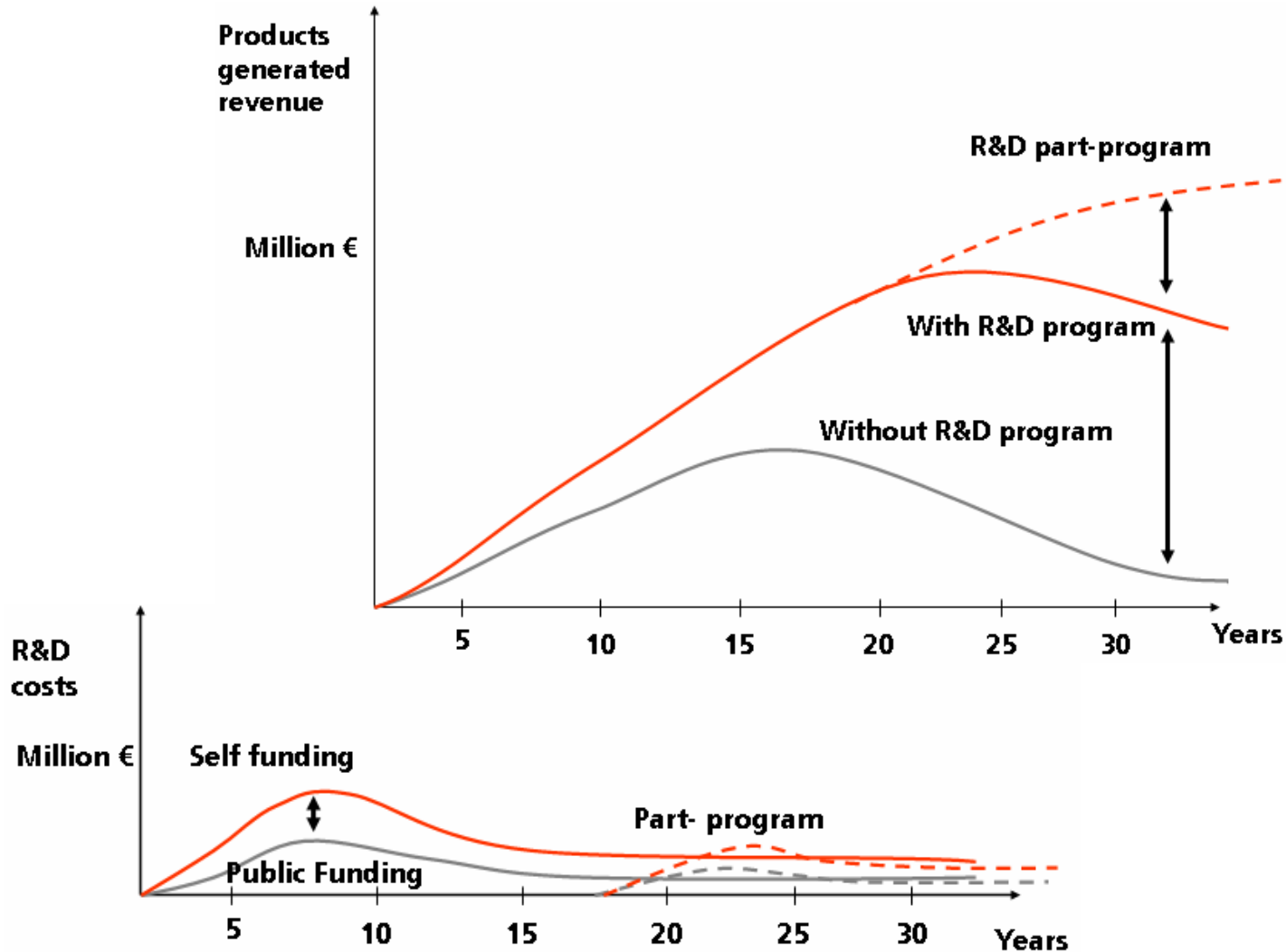
Evaluation based on programs and projects of R&D and innovation

- Leading to a product or service (for instance: desalination plants, Bioethanol production, Hydrogen as transport fuel)

R&D programs and their exploitation :

- Long term programs (30 years), with short term subprograms (10 or less years) and projects (3-4 years)
 - Program expenses (capex, opex) 
 - Funding sources 
 - Self funding
 - Public funding
 - Increasing Cash Flow due to R&D program
 - IRR evaluation
- 
 - Research costs
 - Experience curve
 - Pilot facilities
 - Demonstration facilities

R&D add value



R&D investment

Main Projects	2005		2006		2007		2008 (P)	
	M €	%/ Sales	M €	%/ Sales	M €	%/ Sales	M €	%/ Sales
Solar Energy	31,7		17,4		12,9		38,1	
Biomass conversion to Bioethanol	13,5		26,2		13,1		23,1	
Enhancement Bioethanol efficiency (residual starch)	1,1		1,6		3,4		3,3	
Hydrogen Technology	2,7		2,1		1,8		3,6	
Electricity, environmental, oil and gas control centers	6,8		7,6		8,5		9,4	
Road and rail traffic, and ticketing systems	3,6		5,6		3,9		5,6	
Public Administration support systems	2,1		2,2		4,5		6,3	
Geographic information Systems (GIS)	2,2		2,3		3,0		2,9	
Industrial Waste Management	0,0		0,5		0,5		1,2	
Vitrification	0,0		0,4		0,1		0,3	
Desalination	0,0		1,0		0,8		0,4	
Environmental Technology Center	0,0		0,0		0,1		1,0	
Treatment of wastewater	0,2		0,4		0,3		0,9	
Development of polypropylene	0,0		0,1		0,1		0,8	
Other Projects	2,0		1,1		3,0		4,4	
Total R&D Investment	65,9	3,3%	68,5	2,6%	56,0	1,7%	101,3	2,5%

Abengoa, ranks in the 7th position of the TOP R&D Investing Companies in Spain, and in position 246 in Europe, according to the 2008 EU Industrial R&D Investment Scoreboard (data referring to year 2007). The first six positions in Spain are: Telefónica, Indra, Almirall, Repsol YPF, ITP and Iberdrola. It is emphasized that, in biofuels technology, Abengoa has grown its R&D investment at annual rate of 32.8% over the last three years.

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Corporación Tecnológica de Andalucía (CTA)

- Corporación Tecnológica de Andalucía is a public/private organization for R&D founding and evaluation in Andalusia.
- 50% public leverage of private R&D funds.
- Acts as Junta de Andalucía agent for EU and national funds
- The five Business Groups of Abengoa became associate members of CTA last June
- Besides, Abengoa S.A. will represent in the CTA executive committee all the five Business Groups

Special EU fund for R&D and innovation in Spanish companies, 2007-2013

- Public funding for pilot and demonstration projects in **Andalusia** during the period 2007-2013: **1.000M€**.
- Total investment: **1.333M€**
- Budget per project greater than **5M€**.
- **Abengoa** has already presented letters of intent for ten projects in this program.

National Strategic Technical Research Consortium (Cenit)

- Spanish government projects intended to increase private companies R&D investment in Spain. (Target: Total R&D expenses in Spain = 2% of the GDP in 2010)
- Covering large R&D projects in strategic technological areas
- This year have been awarded 14 projects, two of them leaded by Abengoa
- Period: 4 years
- Projects in cooperation between several companies and research institutions
- The Budget per project is from 20 to 40 M€
- 50% Public financing

Other sources of R&D funding

- USA Department of Energy: Projects in competition for demonstration facilities and new industrial processes. Covering large R&D projects in strategic technological areas.
- EU Framework Program including different special programs.

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ABENGOA SOLAR



Main R&D programs:

- **Concentrating Solar Power:**

- New concepts in thermal energy storage
- New trough and tower technologies

- **Photovoltaics:**

- Thin film technologies
- CPV

ABENGOA BIOENERGY



Main R&D programs:

- New technologies for obtaining ethanol from biomass
- Microalgae biofuels

BEFESA



Main R&D programs:

- **Waste water treatment with zero disposal**
- **Improvement of desalinization technologies**

TELVENT



Main R&D programs:

- Homeland security and mobility
- Intelligent grid
- E-health

ABEINSA



Main R&D programs:

- **Hydrogen production and its use for transport**
- **CO₂ capture.** (Microalgae and other technologies)

Total budget of R&D projects

Cenit program

In Progress: 16,5M€

Starting Oct. 2008: 30,8M€

EU program for R&D and Innov.

Current Applications: 99,4M€

DOE

In Progress: 111MUSD

EU 7th Framework Program

In Progress: 15M€

