SOME FACTS ABOUT CIEMAT

Public Research Institution (OPI) dealing with Energy and Environment pertaining to the Ministry of Science and Education

Annual budgeted expenses

about 70 million euros



65% transferred from the State



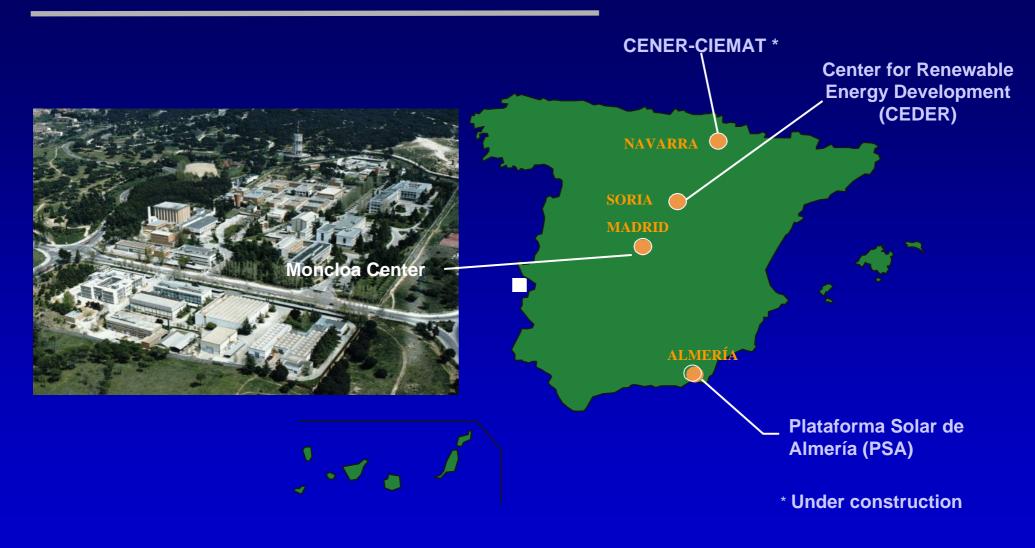
Remaining revenues from R&D activities and technical services

Human Resources 1,200 workers about half of which have university degrees 30% civil servants 70% contracted





CIEMAT RESEARCH CENTERS







R&D ACTIVITIES AT CIEMAT

- ⇒ Renewable Energies
- ⇒ Fusion by Magnetic Confinement
- ⇒ Radiation Protection and Radiation Dosimetry
- ⇒ Materials Behaviour in Power Plants
- ⇒ Radioactive Waste Management
- ⇒ Environmental Behaviour of pollutants
- ⇒ Molecular and Cellular Biology
- ⇒ Combustion and Gasification Technologies
- □ Computing and Communications Technologies
- ⇒ Experimental High Energy Physics
 - ✓ International collaborations at:
 - CERN
 - DESY: Mark-J at PETRA & TESLA500
 - NASA
 - ✓ Applied Superconductivity Laboratory CIEMAT-CEDEX



RESEARCH PROGRAMME

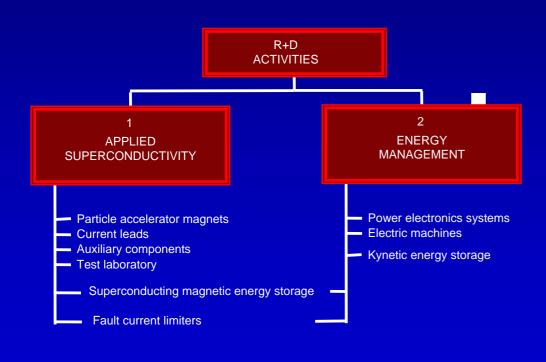
SUPERCONDUCTIVITY AND ELECTROMAGNETIC POWER APPLICATIONS





OBJECTIVES

To develop know-how, techniques and applications of superconductivity and electric power systems.









APPLIED SUPERCONDUCTIVITY

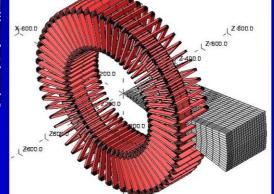
- ✓ Particle Accelerator Magnets and Associated Components.
 - Calculation and design of particle accelerator magnets and accessories.
 - ➤ Prototype fabrication.
 - ➤ Characterization and testing.
- ✓ Electric Power Systems: Fault Current Limiter.
 - ➤ Characterization of high critical temperature superconductors.
 - ➤ Design and fabrication of current limiters prototypes.



Combined Magnet for TESLA500 (DESY)



600 A hybrid current lead for LHC corrector magnets



Inductive current limiter model





ENERGY MANAGEMENT

- ➤ Design, fabrication and tests of prototypes on...
 - ✓ ... power electronics and its control systems.
 - ✓ ... electric machines.
 - ✓ ... kynetic energy storage systems.
 - ✓ ... superconducting energy magnetic storage units (SMES).



Switched reluctance machine parts



Modular control system based on µPs CAN network



1 MJ SMES tests





SPANISH COLLABORATION SCHEME FOR CTF3

INDUSTRY CIEMAT Elytt Energy (Design) Applied Superconductivity Group+ ANTEC (Magnet Fabrication) Fusion Department * TTM (Magnet Fabrication & UHV) JEMA (Power Supplies) * CERN CTF3 Collaboration

ADMINISTRATION

"Complementary Action" within the National Programme of Particle Physics







SPANISH COLLABORATION DELIVERABLES TO CTF3

ITEM	DESCRIPTION	DEADLINE	COST ESTIMATE			
Correctors	33 H/V Orbit Correct Magnets for the Delay Loop and Transfer Lines. (Existing design)	July -2005	97.300 €			
Septa	2 Double Septa Magnets for the Delay Loop (Only a reference design)	Dec-2005 ???	321.500 €			
Kickers	2 "Stripline" Extraction Kickers (Only a reference design)	Oct-2006 ???	181.500 €			
TBL Quads	15 Quadrupole Magnets with motorised support structure for the Test Beam Line	Mid-2007	390.000 €			
PETS	1 Power Extraction Transfer System Prototype	Dec-2006	221.500 €			





Luis Garcia-Tabarés CTF3 Collaboration Meeting, 24/11/2004

SPANISH COLLABORATION WORKINGPLAN



Ciemat Corm de Investigaciono. Energitaus, Modoumbiena y Terrològica

TASKS	2004	2005					2006						2007				
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0.1 "COMPL. ACTION" REQUEST																	
0.2 " COMPL. ACTION" APPROVAL																	
CORRECTORS																	
1.1 DRAWINGS & TOOLING																	
1.2 FABRICATION																	
SEPTA																	
2.1 DESIGN																	
2.2 DRAWINGS & TOOLING																	
2.3 FABRICATION																	
KICKERS																	
3.1 CALCULATION																	
3.2 DESIGN																	
3.3 DRAWINGS & TOOLING																	
3.4 FABRICATION & TESTS																	
TBL QUADS.																	
4.1 MAGNET DESIGN																	
4.2 STRUCTURE DESIGN																	
4.3 MAGNET DRAWINGS																	
4.4 STRUCTURE DRAWINGS																	
45 MAGNET FABRICATION																	
4.6 STRUCTURE FABRICATION																	
4.7 ASSEMBLY & TESTS																	
PETS																	
5.1 CALCULATION & DESIGN																	
5.2 DRAWINGS																	
5.3 FABRICATION OF ONE OCTANCT																	
5.4 FABRICATION OF A PROTOTYPE																	