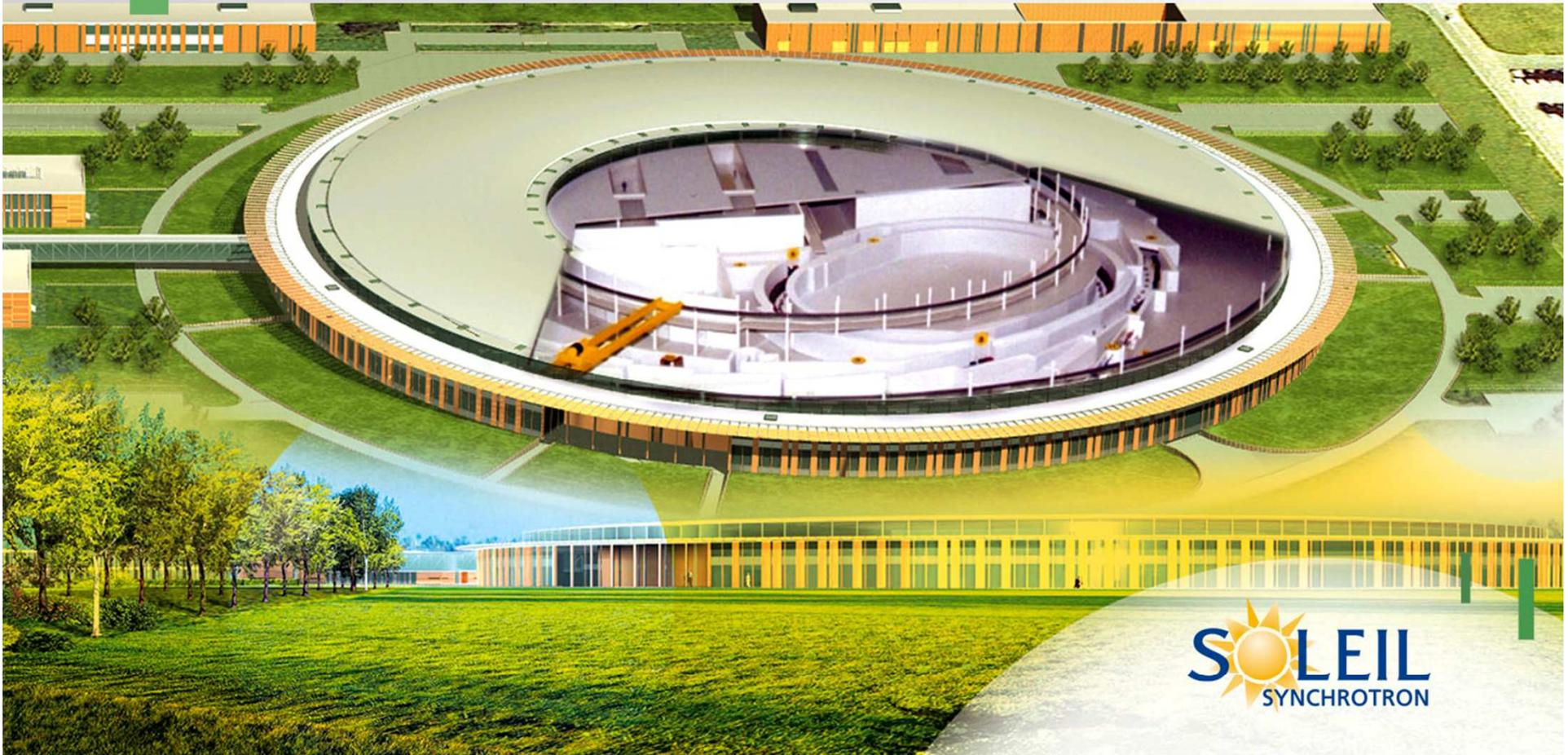
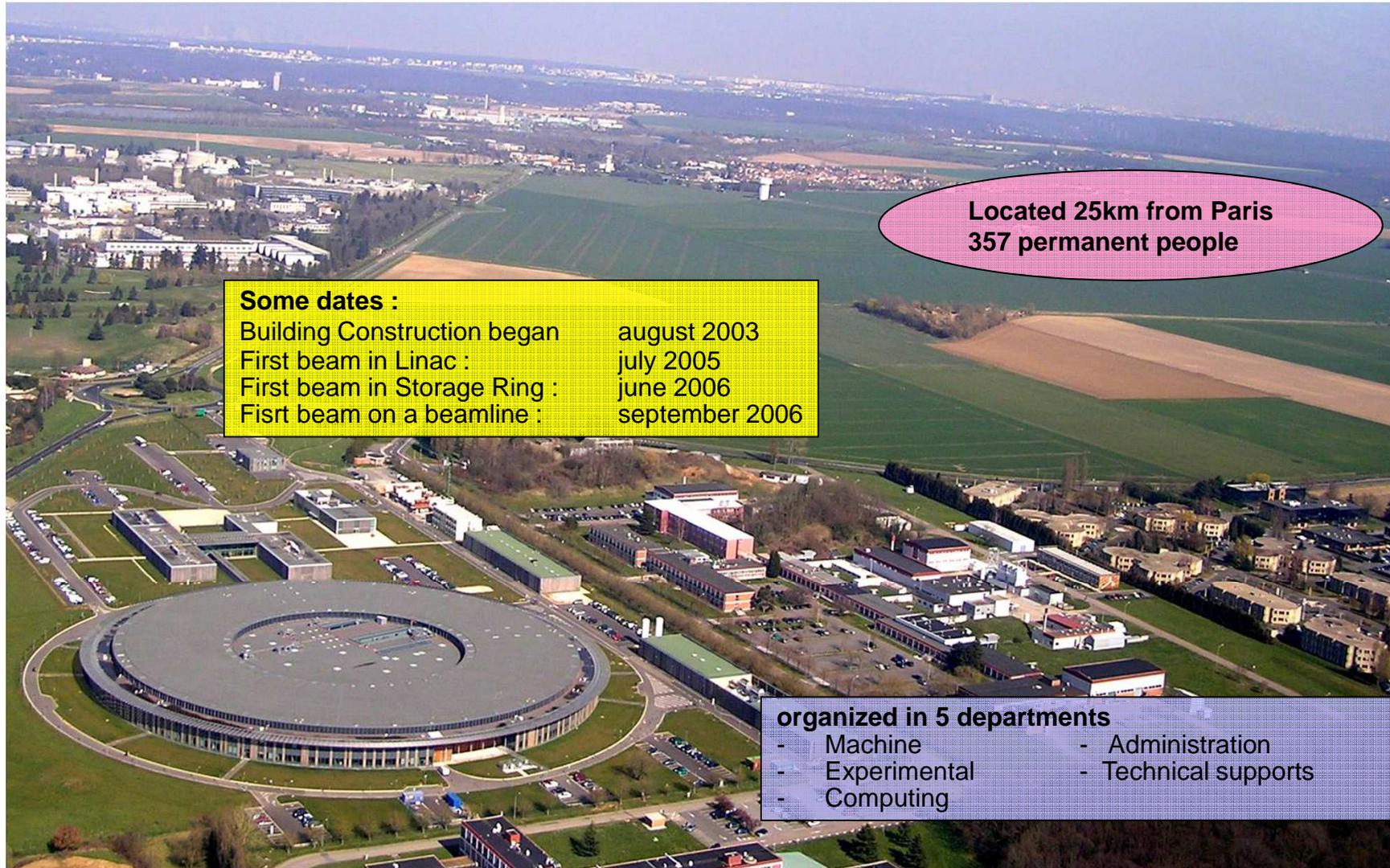


Maintenance & reliability management

SYNCHROTRON SOLEIL

A light source to explore matter





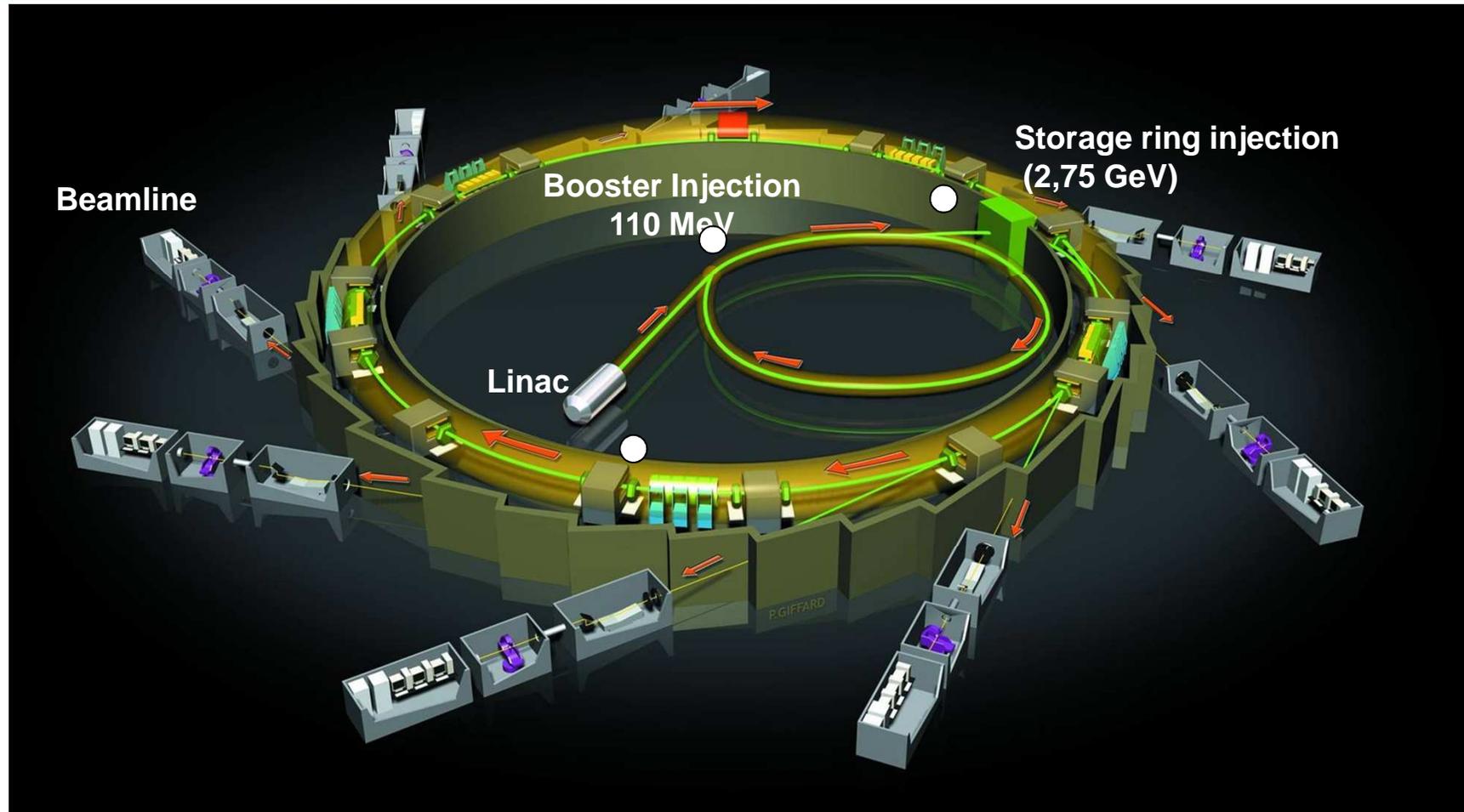
Located 25km from Paris
357 permanent people

Some dates :

Building Construction began	august 2003
First beam in Linac :	july 2005
First beam in Storage Ring :	june 2006
Fisrt beam on a beamline :	september 2006

organized in 5 departments

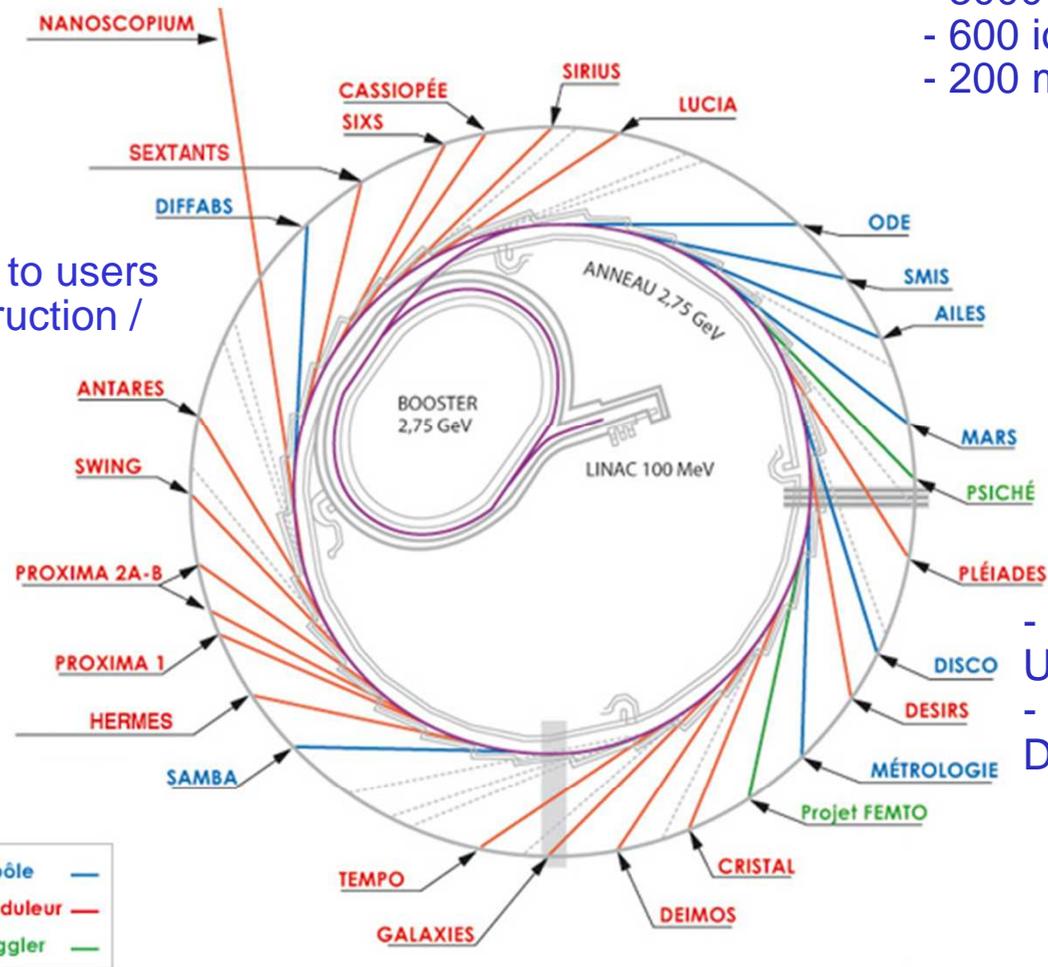
- Machine
- Experimental
- Computing
- Administration
- Technical supports



A 354 m circumference storage ring

- 3000 RF amplifiers
- 600 ion pumps
- 200 magnet power supplies

- 1 source
- 20 beamlines open to users
- + 6 BLs under construction / commissioning
- Utilities



- 200 AHU (Air Handling Units)
- 40 Electricity Distribution panels

- More than :
- 1200 motors
 - 200 PLCs

janv 2012	févr 2012	mars 2012	avr 2012	mai 2012	juin 2012	juil 2012	août 2012
dim 01	mer 01	jeu 01	dim 01	mar 01	ven 01	dim 01	mer 01
lun 02	jeu 02	ven 02	lun 02	mer 02	sam 02	lun 02	jeu 02
mar 03	ven 03	sam 03	mar 03	jeu 03	dim 03	mar 03	ven 03
mer 04	sam 04	dim 04	mer 04	ven 04	lun 04	mer 04	sam 04
jeu 05	dim 05	lun 05	jeu 05	sam 05	mar 05	jeu 05	dim 05
ven 06	lun 06	mar 06	ven 06	dim 06	mer 06	ven 06	lun 06
sam 07	mar 07	mer 07	sam 07	lun 07	jeu 07	sam 07	mar 07
dim 08	mer 08	jeu 08	dim 08	mar 08	ven 08	dim 08	mer 08
lun 09	jeu 09	ven 09	lun 09	mer 09	sam 09	lun 09	jeu 09
mar 10	ven 10	sam 10	mar 10	jeu 10	dim 10	mar 10	ven 10
mer 11	sam 11	dim 11	mer 11	ven 11	lun 11	mer 11	sam 11
jeu 12	dim 12	lun 12	jeu 12	sam 12	mar 12	jeu 12	dim 12
ven 13	lun 13	mar 13	ven 13	dim 13	mer 13	ven 13	lun 13
sam 14	mar 14	mer 14	sam 14	lun 14	jeu 14	sam 14	mar 14
dim 15	mer 15	jeu 15	dim 15	mar 15	ven 15	dim 15	mer 15
lun 16	jeu 16	ven 16	lun 16	mer 16	sam 16	lun 16	jeu 16
mar 17	ven 17	sam 17	mar 17	jeu 17	dim 17	mar 17	ven 17
mer 18	sam 18	dim 18	mer 18	ven 18	lun 18	mer 18	sam 18
jeu 19	dim 19	lun 19	jeu 19	sam 19	mar 19	jeu 19	dim 19
ven 20	lun 20	mar 20	ven 20	dim 20	mer 20	ven 20	lun 20
sam 21	mar 21	mer 21	sam 21	lun 21	jeu 21	sam 21	mar 21
dim 22	mer 22	jeu 22	dim 22	mar 22	ven 22	dim 22	mer 22
lun 23	jeu 23	ven 23	lun 23	mer 23	sam 23	lun 23	jeu 23
mar 24	ven 24	sam 24	mar 24	jeu 24	dim 24	mar 24	ven 24
mer 25	sam 25	dim 25	mer 25	ven 25	lun 25	mer 25	sam 25
jeu 26	dim 26	lun 26	jeu 26	sam 26	mar 26	jeu 26	dim 26
ven 27	lun 27	mar 27	ven 27	dim 27	mer 27	ven 27	lun 27
sam 28	mar 28	mer 28	sam 28	lun 28	jeu 28	sam 28	mar 28
dim 29	mer 29	jeu 29	dim 29	mar 29	ven 29	dim 29	mer 29
lun 30		ven 30	lun 30	mer 30	sam 30	lun 30	jeu 30
mar 31		sam 31		jeu 31		mar 31	ven 31

-> Objectives:

- 5500 h of operation per year
- Beam available 24 hours /day, 7 days a week since 2007
- 2500 external users

-> Context :

- The allocation of beamtime is scheduled in time slots
- Any breakdown strongly disrupts the schedule
- Shut-down periods for maintenance and upgrades are scheduled on a regular basis
- Interventions must be tracked

↩ To ensure high reliability (Operation / Maintenance)

- MAINTIMEDIA (TRIBOFILM)
 - WBS: geographical tree / functional tree
 - Inventory
 - Localization
 - Technical description of the Hardware (configuration control)
 - Maintenance, repairs, upgrades (history of moves)
 - Job orders
 - Work orders (or work sheets)
 - Brief reports
 - Process sheets
 - Purchasing / Management of consumables
 - Purchasing requisition
 - Stock management
- ↗ The Computer-aided Maintenance Management System is the key aspect of the organization

- 2002-2004
 - Request from the Building & Infrastructures group for a CMMS software
 - Inventory of the needs
 - Choice of a software : MAINTIMEDIA

- 2005
 - First deployments ; first uses

- 2006
 - Generalization of the “job orders” functionality (for the requests to the support groups)

- Since 2008 : using by several groups
 - Topologies and data sheets input → 71000 topologies
 - Works follow-up (to track enhancement requests)
 - Works scheduling
 - Generalization of the “purchasing requisition” functionality
 - Stock management (chemistry lab)

- 2009
 - Settlement of the CMMS working group (to define procedures)

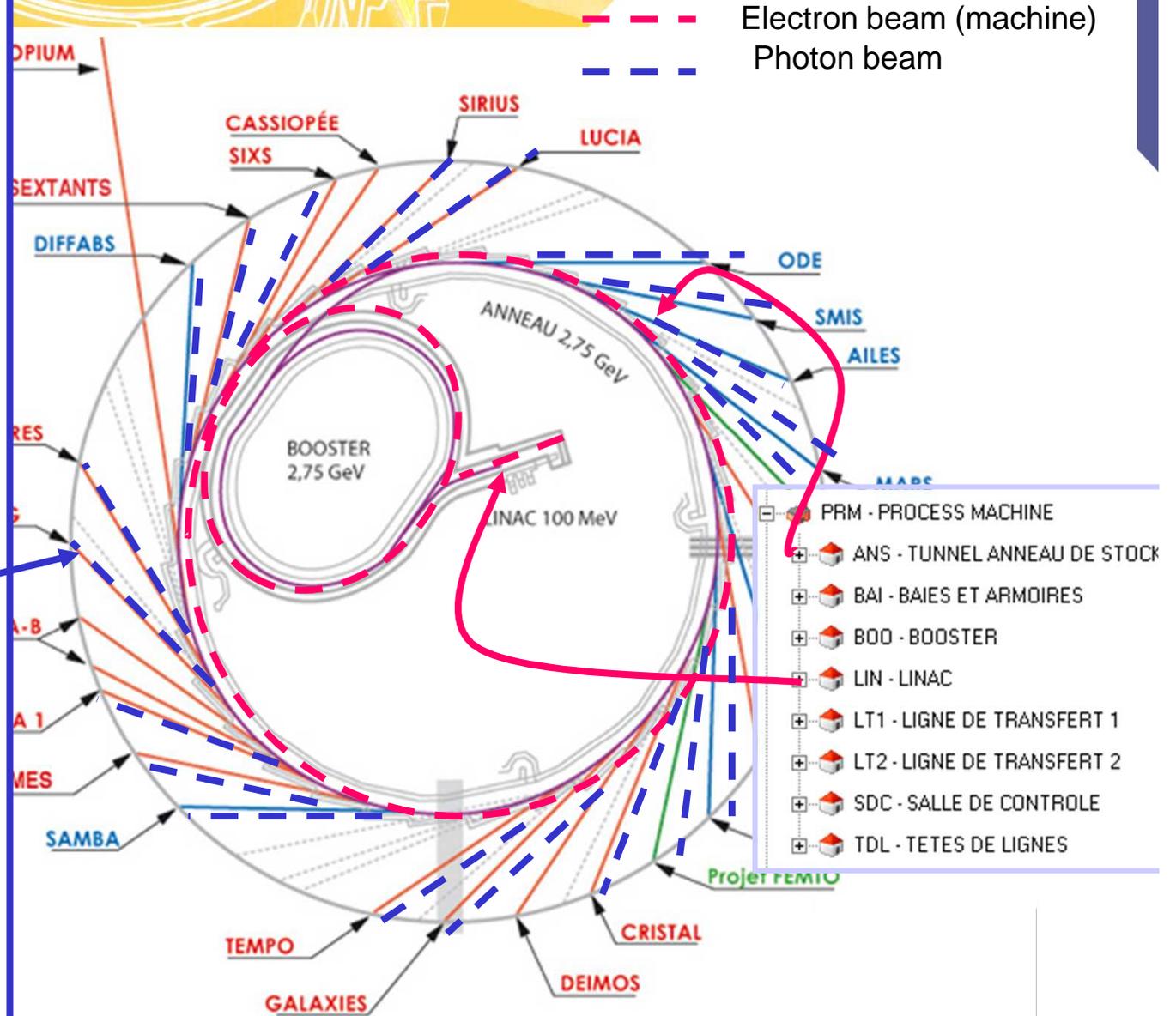
Soleil Work Breakdown Structure Geographical coding

Topologies

- Representation: geographical functional
- Sorted: by code by description
- Look rejecting topologies

PRL - PROCESS LIGNES DE LUMIERE

- + D01-1 - LIGNE ODE
- + D02-1R - LIGNE SMIS
- + D03-1 - LIGNE MARS
- + D03-1R - LIGNE AILES
- + D04-3 - LIGNE DISCO
- + D05-1 - LIGNE METROLOGIE
- + D09-1 - LIGNE SAMBA
- + D13-1 - LIGNE DIFFABS
- I03-C - LIGNE HAUTE PRESSION
- + I04-M - LIGNE PLEIADES
- + I05-L - LIGNE DESIRS
- + I06-C - LIGNE CRISTAL
- I07-C - LIGNE GALAXIES
- + I07-M - LIGNE DEIMOS
- + I08-M - LIGNE TEMPO
- + I10-C - LIGNE PROXIMA 1
- I10-M - LIGNE PROXIMA 2
- + I11-C - LIGNE SWING
- + I12-M - LIGNE ANTARES
- + I14-C - LIGNE SIXS
- + I14-M - LIGNE HF MICROFOC
- I15-C - LIGNE SIRIUS
- + I15-M - LIGNE CASSIOPEE
- + I16-M - LIGNE LUCIA
- + PRM - PROCESS MACHINE

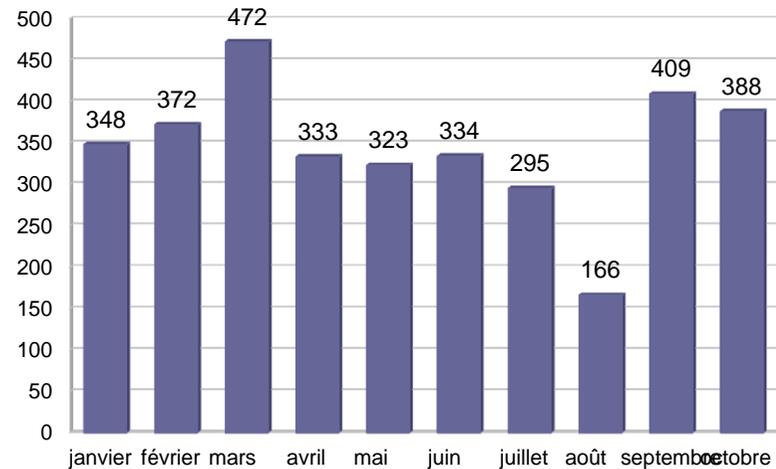


- Data extracted directly from the CMMS
 - What happened in a particular place during a specific period
--> useful during operation on critical problems
 - Equipment failure information
--> used to anticipate problems and to plan maintenance tasks

- Data extracted with BusinessObjects Infoview
 - Consolidated CMMS information
 - Personalized information

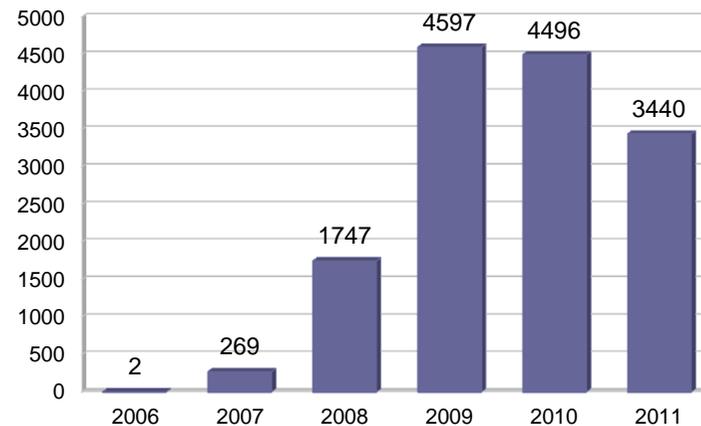
Number & distribution of purchasing requests

Mois	Nbre DA
janvier	348
février	372
mars	472
avril	333
mai	323
juin	334
juillet	295
août	166
septembre	409
octobre	388



Nombre DA 2011

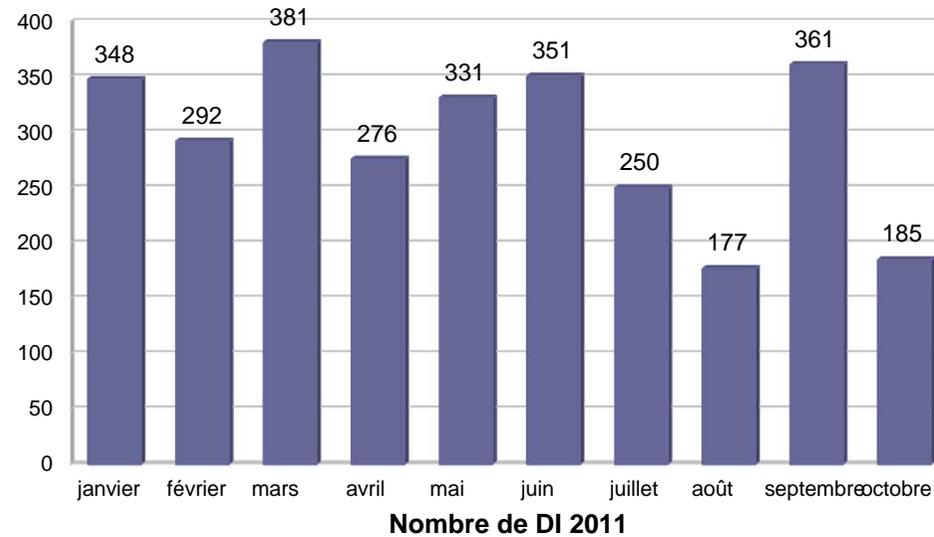
Année	Nbre DA
2006	2
2007	269
2008	1747
2009	4597
2010	4496
2011	3440



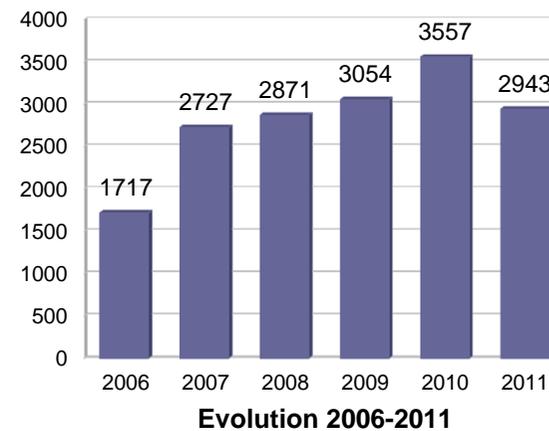
Evolution DA 2006-2011

Number & distribution of job orders

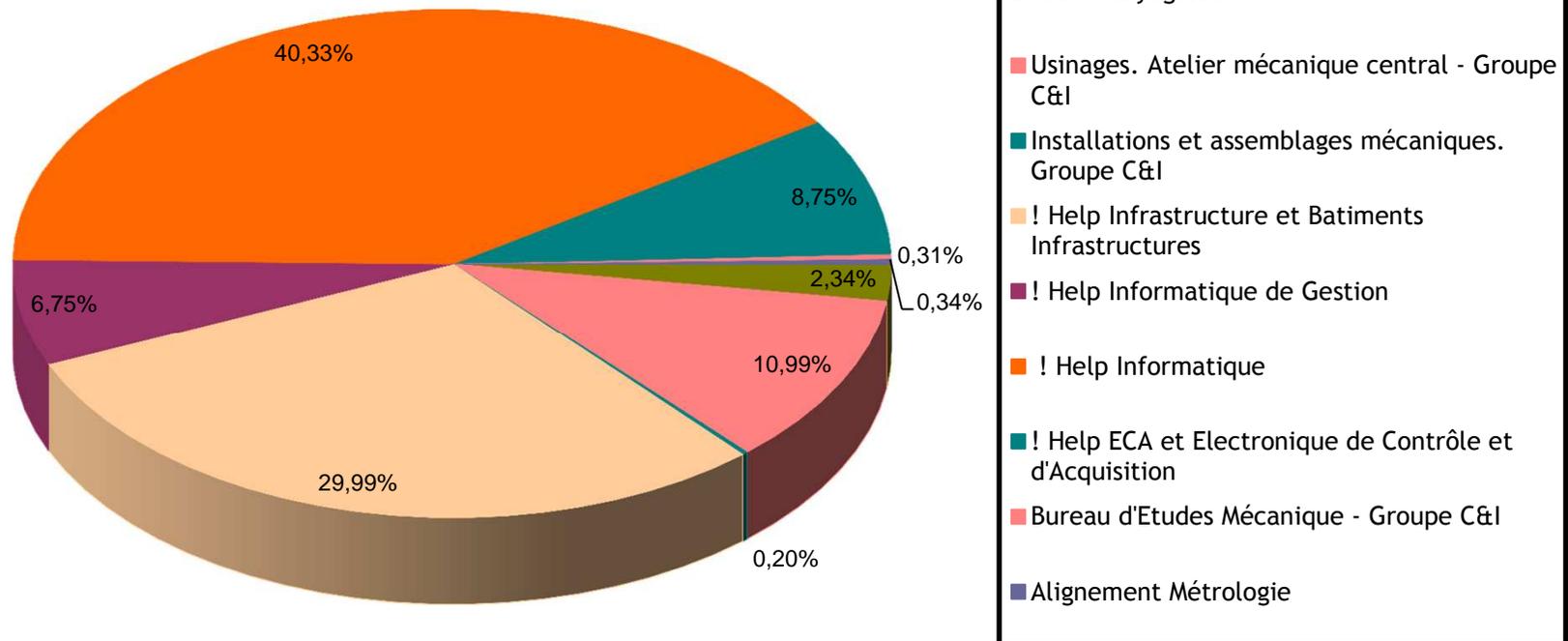
Mois	Nbre DI
janvier	348
février	292
mars	381
avril	276
mai	331
juin	351
juillet	250
août	177
septembre	361
octobre	185



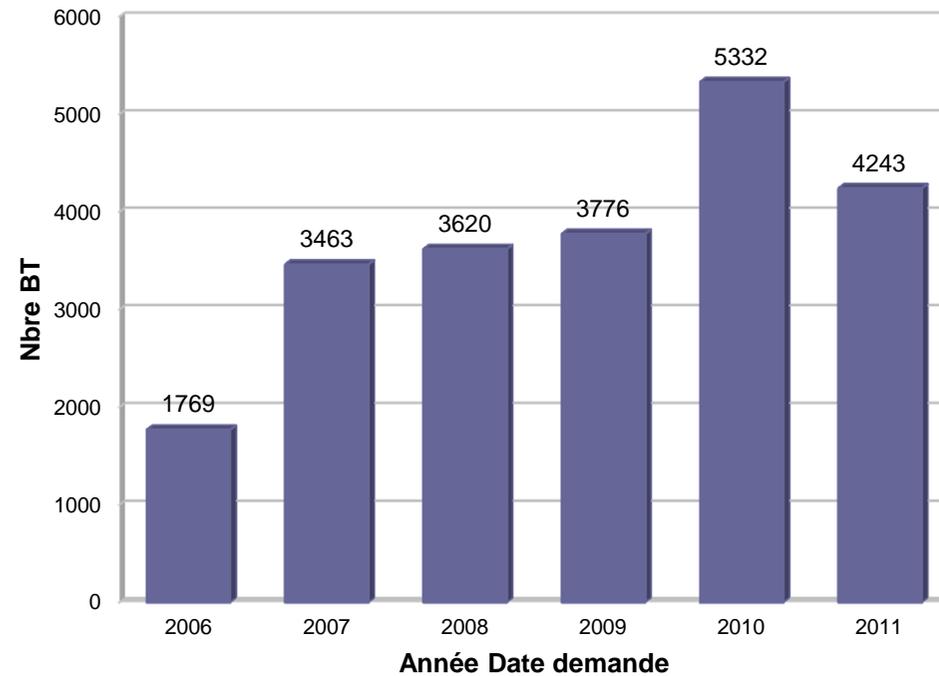
Année Date demande	Nbre DI
2006	1717
2007	2727
2008	2871
2009	3054
2010	3557
2011	2943

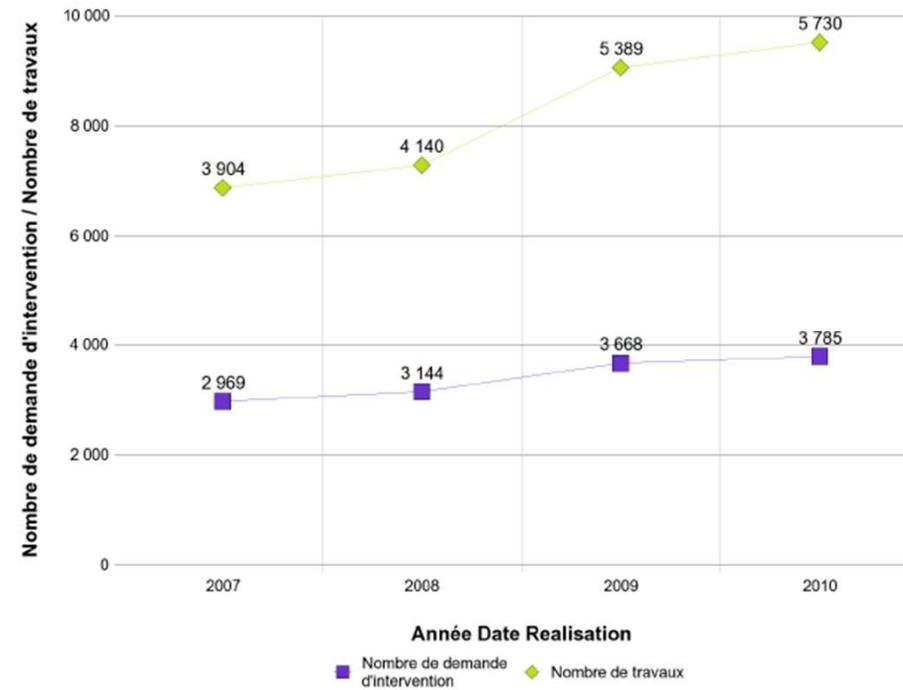
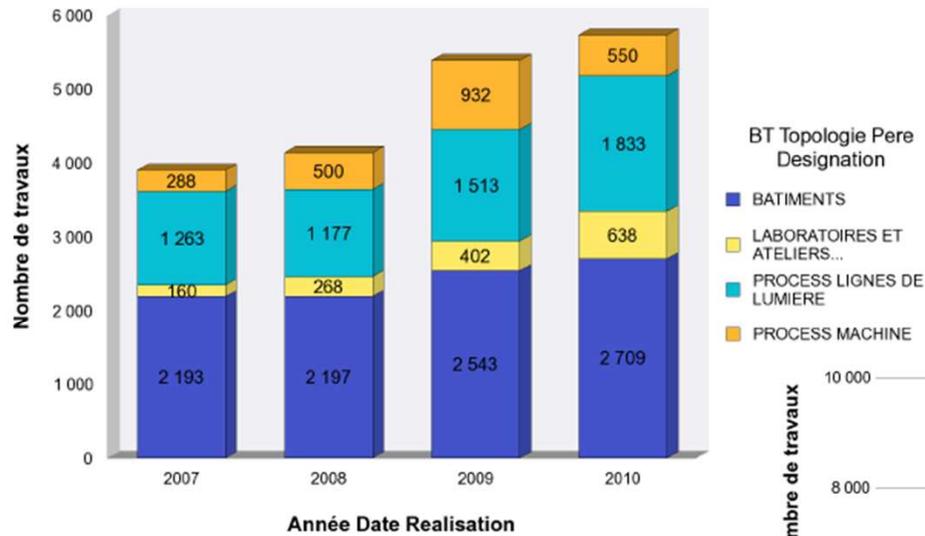


Distribution of job orders for 2011 per team

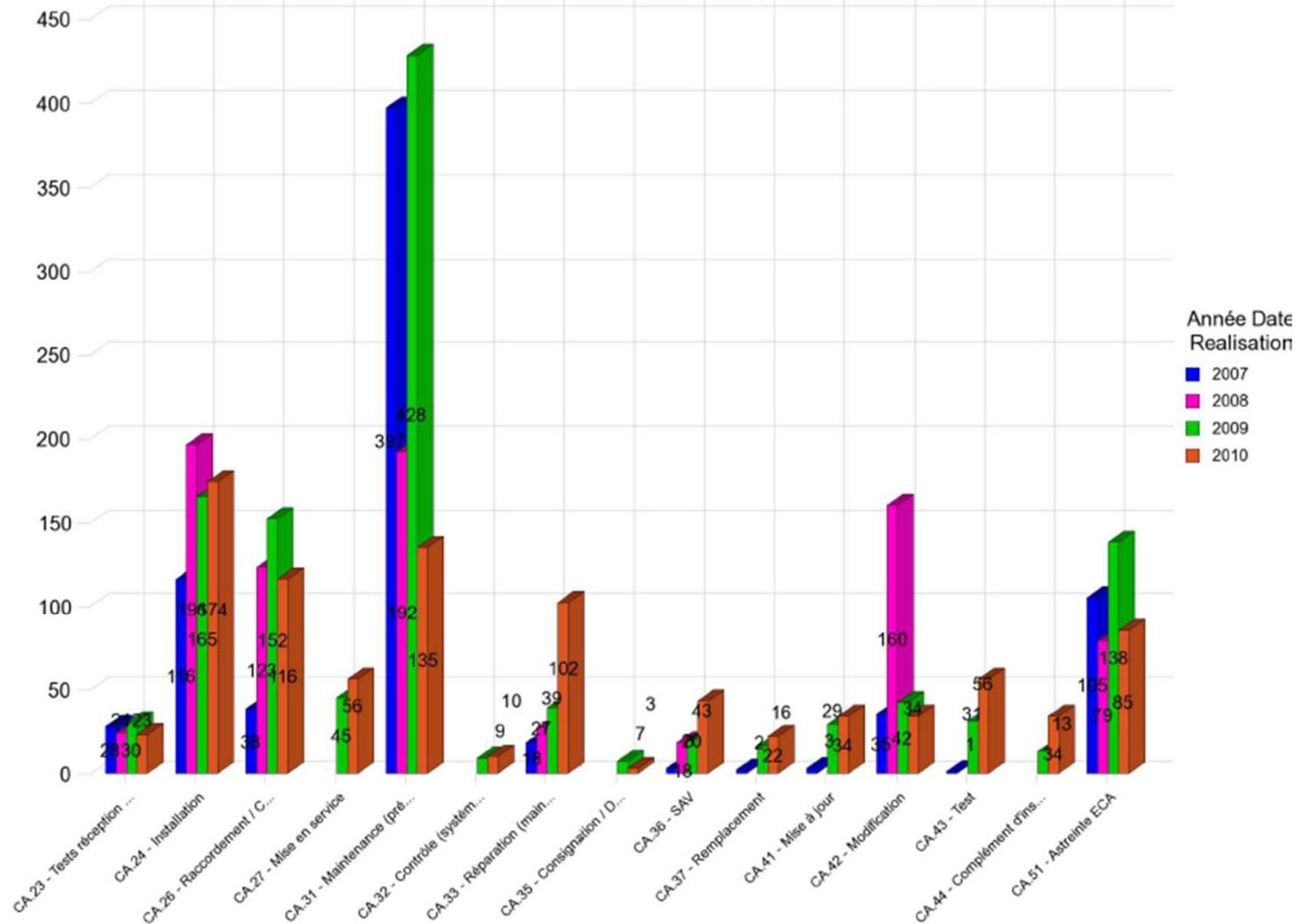


Année Date demande	Nbre BT
2006	1769
2007	3463
2008	3620
2009	3776
2010	5332
2011	4243





Number of interventions per year dedicated to installation and operation for ECA group



- Software deployment and operation
 - Data management group

- Working group
 - One CMMS user representative per division + 1 contractor for 3 years
 - To get a homogenous CMMS structure:
 - Define the WBS coding (topologies)
 - Define the procedures for use
 - Train the CMMS users
 - Interface with the CMMS developers (TRIBOFILM)
 -
 - To share experience

- Steering committee
 - Representatives of the board of directors
 - Representatives of the working group
 - To give feedback on difficulties encountered
 - To validate project progress

- **Technical difficulties**
 - Slowness of the database (but improvements in progress)

- **Management difficulties**
 - Difficult to convince each group to use the CMMS
 - Difficult to discipline CMMS users into following the procedures

- **Significant workload**
 - Thousands of parts entered in the database (~ 30,000 items)
 - CMMS deployed in the whole installation

- **Maintenance and Reliability workshop**
 - To share the issues and working methods on the maintenance organization and the used tools

Thank you for your attention