



**ERA-Instruments WP 2**  
Measures for existing Research Infrastructures

**Task 2.3**  
Establishing a directory

**Deliverable D2.4**  
Pilot survey of cutting edge instrumentation

**Task leader**  
GACR

**November 2009**



**ERA-Instruments**  
**An ERA-Net initiative for promoting infrastructure**  
**funding in the life sciences**

## **Deliverable D2.4**

Pilot survey of cutting edge instrumentation

**November 2009**

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## 1 Executive summary

One of the important tasks of the ERA-Instruments network is to map existing middle size cutting edge instruments in the biomedical research area across Europe. While there are some databases of these instruments on the national level, there is only incomplete information available at a European level for such instruments.

ERA-Instruments has chosen the area of magnetic resonance (NMR, MRI) relevant for biological applications for conducting a first dedicated survey and data analysis. The resulting inventory aims at providing information for a large community of scientists as well as for programme managers at the partner organisations. Special attention was given to a very high completeness for instruments that are of more than local relevance, i.e. NMR spectrometers with at least a proton frequency of 750 MHz and MRI scanners with field strength of at least 4 Tesla.

In the first phase, the effort was concentrated on collection of the data about the existing instruments through on-line questionnaires by the French partner CNRS. The final set of questions enabled to collect a large set of data concerning the instruments, their important functional parameters and the scope of research areas that the specific instrument is used for.

In the second phase, the collected data were transferred and imported into a web accessible database that enables online search based on given parameters. The database was built for web access using different internet browsers in order to allow access to the database for users with different computer operating systems. A great effort was given to create a user friendly environment of the application and to enable search options based on criteria such as functional characteristics of the instruments, geographical location or experimental methods used.

In the final version of the NMR/MRI database (as of 1 June 2009) there is information available about 486 instruments from 195 responses gathered in 22 European countries. Though the list is not exhaustive, it depicts to a substantial extend and especially in the high field range a map of magnetic resonance centres across Europe which allows the identification of relevant NMR or MRI facilities.

This NMR/MRI database could be thus an important tool not just for collaboration but also to enable better use of the existing scientific instruments. It gives the researchers a unique opportunity to easily contact research groups with similar scientific interests and take advantage of cooperation across the whole Europe. Also for the science funding bodies it could provide important information to prevent unnecessary duplicity in instruments purchasing.

The database will provide the planned service to its users only if it is kept up-to date and also if the data available cover most of the existing scientific instruments. The added value for the scientists themselves should provide one of the driving forces to fulfil this goal.

The database is easily accessible at: [www.gacr.cz/era-instruments-database.html](http://www.gacr.cz/era-instruments-database.html)

## 2 Introduction

It has become increasingly obvious that concepts and strategies for Research Infrastructure (RI) funding should be harmonised and coordinated within the European Union (EU). European Strategy Forum on Research Infrastructures (ESFRI) has determined requirements for European RI funding and has presented a roadmap. Growing attention is paid to life sciences that rely on RIs of a less centralised, but more networked dimension. There is a clear need for action in the interdisciplinary area between physics, chemistry, biology and medical sciences as cutting edge instrumentation becomes increasingly expensive and, yet, indispensable for world-class research.

However, promotion of research policies, apart from the ESFRI projects, has been restricted so far to national efforts without managing these actions with a European view. Funding and research organisations cannot afford to remain at the national stage with worldwide competition for the best scientists and the most promising projects. Frontier research is international since long and funding organisations have to follow scientists to the European level.

ERA-Instruments aims at initiating coordination and a sustainable network of 16 partners including ministries, research councils, funding agencies and charities active in funding of life science RI. This European platform of relevant stakeholders will set up comprehensive tools for adequate treatment of instrumentation related topics enabling conclusions for research policies on both a national and European levels. The ERA-Net will focus on bio-analytical instrumentation (incl. post-genomic highthroughput techniques) such as NMR, mass spectrometry, microscopy, micro-array platforms etc. Midsized equipment has become a strategic essential strength for European countries. Promotion of RI funding in FP7 and support for new member states will also strengthen the position of European research.

## 3 About the work package 2

### 3.1 Objective

The basic objective of work package (WP) 2 is to create an inventory of cutting edge instrumentation for life science research. This pilot project shall result in detailed analysis of the European state of the art. Based on experience gained, the initiative will be expanded to other medium-sized Research Infrastructures and instruments.

### 3.2 Approach

Up to now, only national reviews on specific instrumentation exist (e.g. NMR in France) that are mostly dedicated for personal use. On a European scale, EU and European Science Foundation (ESF) have conducted more general surveys on RI with rather limited use when specific techniques are concerned. The first meeting of ERA-Instruments revealed that most partner organisations are keen to get more detailed overview on the distribution of instruments across disciplines and countries. It was decided that the first pilot inventory will be dedicated to NMR and MRI equipment since some preliminary national data already exist and cooperation with EU funded networks can be envisaged. It was agreed to attempt a complete or nearly complete mapping of all biomedical centres in magnetic resonance that operate NMR or MRI at the cutting edge, i.e. more than 700 MHz for NMR and more than 3 Tesla for MRI. Further equipment of a more general kind was also included, however, with no claim to completeness.

A discussion with the Scientific Advisory Board (SAB) has meanwhile defined further instrumentation being sufficiently outstanding and relevant for an EU inventory: Based on the experience gained during the pilot inventory the next inventory will be on next generation sequencing and will be performed with optimized procedures.

Any organisation planning to perform a survey of a more specialised nature could draw on the tools and procedures developed during our survey and we would naturally share our experience not only within ERA-Instruments.

The WP 2 consists of four parts:

Task 2.1 Establishing a procedure

Task 2.2 Collecting data for the survey

Task 2.3 Establishing a directory

Task 2.4 Access to infrastructure

#### **4 About the task 2.3 Establishing the directory**

The key objective of this task consists of two components: the first one being analysing and processing the data collected by means of the online questionnaire built by tasks 2.1 and 2.2 (conducted by CNRS) followed by presenting gathered information in the form of a web database.

##### **4.1 Establishing the directory-database**

###### **4.1.1 Preparatory stage**

The work on the inventory was based on information gained within the task 2.2 – Collecting data for the survey. Data were collected by means of the online questionnaire built by the CNRS. In order to better synchronize the work and create joint strategy for collection, transfer and processing the data the GACR closely collaborated with the French partner from the initial preparation stage of the questionnaire. To accomplish those tasks the partners operated mainly through e-mail except one bilateral meeting organized in Prague on October 1, 2008.

Its aim was to achieve better collaboration and to establish the best procedure for all the technical aspects regarding the data made by the questionnaire, with the objective to define what would be the best method to use the data once they have been collected.

Followed by several stage consultations between ERA partners and Scientific Advisory Board using BETA versions the questionnaire was finally launched on October 23, 2008.

The partners have been requested to forward the questionnaire inquiry to the NMR resp. MRI centres of their respective countries. Additionally, magnetic resonance centres in other European countries have been identified. The whole approach has been assisted by input from the Scientific Advisory Board. The criteria of who should be considered to participate in the questionnaire have been discussed at the workshops in Madrid and Santorini. It has been agreed that the questionnaire should focus on bio-relevant application of magnetic resonance. This implicates an emphasis on the high-field MRI instrumentation. However, the questionnaire was also open for data entries in the medium- or even low field range as MRI centres usually run a broader range of instrumentation.

Several reminders have been sent in order to gain a good coverage of replies. However, in some cases missing data of relevant MR centres have been added manually by the partners based on public information about the equipment.

More information on establishing the survey procedure and on collecting data for the survey can be found in the ERA-Instruments reports D2.1 and D2.3, published in April 2009.

The GACR made the first preliminary analysis of provided data and started to prepare the outline and the philosophy of the future database. There were options regarding the file format, the software used, the lay-out used or simply the size of the final file.

The GACR developed the special algorithms for the transformation of the surveyed data to format best suitable for dynamic web presentation. The convergence of the data proceeded in series of consecutive steps before the targeted form and format was reached.

The first pilot version of the database was prepared after receiving the first batch of data from our French partner CNRS during April 2009. Testing version was circulated among WP 2 partners for comments in May and June 2009. Some useful comments, remarks and new ideas came and were incorporated into the pilot version. Final data from the CNRS were provided on July 17, 2009 and after this date the work on the final version started. Cooperation between IT departments of both partners was on very professional basis for the whole duration of the task. The task was successfully finished on time in October 2009.

The database is easily accessible at: [www.gacr.cz/era-instruments-database.html](http://www.gacr.cz/era-instruments-database.html)

###### **4.1.2 Structure of the database**

The database is specifically designed to meet the needs of researchers as well as funding organisations. The main concern was to create simple and well arranged structure which provides “users friendly” environment.

The first survey was focused on NMR and MRI equipment. Sets of detailed information about both types of equipment were gathered by means of the questionnaire and afterwards compiled to the database.

The main page provides a side of the basic information about ERA-Instruments project, short description of the survey itself including the method used for data collection and analysis of the collected data in form of the main significant figures.

The fact that NMR and MRI instruments are often used by various scientific communities lead to the solution that the database itself is divided in two separate parts, one for NMR, the other for MRI. The most important information about the particular equipment, its owner and technical parameters are designed to fit on one screen. The detailed description about research connected with each equipment as well as useful contact details of responsible personnel are given in separate windows.

#### **4.1.3 Criteria for searching**

Finally, the criteria for searching which are used in the database were identified and agreed after a broad discussion. In the consultation phase several groups were involved: researchers from different areas and countries, ERA-Instruments partners and SAB members, too. Four most important criteria for searching in the database were determined: country, type of application, research themes and frequency/ field.

Even broader search options for the users were enabled by incorporation of Java script to the application. This tool allows maximal use of information currently made available on the web due to the simple but complex filtration of the presented data according several parameters simultaneously.

The number of records which meet requested parameters are specified for comfort use of the database. All the responses are continuously listed on page and can be viewed on screen by scrolling.

#### **4.1.4 Technical aspects**

The pilot version was developed and tested to be running on MS Windows OS platforms (i.e.: W2K, WinXP, Vista) in 3 most commonly used web browsers: MS Internet Explorer, Mozilla Firefox and Opera. The test runs indicated serious incompatibilities when running in Safari web browser on Apple's Mac OS platform and therefore major adjustment of data format and also the whole web application was needed to broader use of the database.

#### **4.1.5 Update**

This survey provides an up-to-date overview of existing MRI and NMR Research Infrastructures used in life science. In addition to basic technical maintenance, the continuous effort to ensure the timely and regular update of existing database is required.

The existing data should be continually updated as new data becomes available.

### **4.2 Data analysis**

#### **4.2.1 Data reliability**

It is necessary to emphasize that the data on which this report is based were collected only within the framework of the ERA-Instruments project. Only information available from the answers of the questionnaire was processed. The results are strongly dependent on willingness of respondents to provide information and the current situation in number of equipment may be different from results presented within the database. Participation in the survey was on a voluntary basis. The data accuracy has been checked by the ERA-Instruments steering committee partners by personal knowledge. However, it must be stressed that it is not an exhaustive and fully representative list of the equipment, especially for instrumentation of only local relevance.

For instance the number of NMR equipment identified in France (161) and in Germany (84) is significantly higher in comparison with those in the other countries. The countries involved in the ERA-Instruments project had the National contact point (NCP) which was responsible for distribution of information about the survey in the scientific community in its country. Support of the NCP and their different coordinating approach just could lead to differences in number of obtained replies.

#### **4.2.2 General summary of results**

The main figures:

- **195** responses
- **486** pieces of equipment identified (414 NMR, 72 MRI)

For this survey on NMR/MRI 29 countries have been contacted (27 EU states, Iceland and Switzerland). Twelve countries from the total number of 29 were countries of the ERA-Instruments project partners: Austria, Belgium, Czech Republic, Estonia, France, Germany, Greece, Iceland, Italy, Netherlands, Spain and United Kingdom. All partners except Iceland provided information about NMR or MRI equipment. Replies of these countries represent 85.1% of all received responses. Several approached countries did not reply at all – Cyprus, Iceland, Latvia, Lithuania, Luxembourg, Malta and Romania.

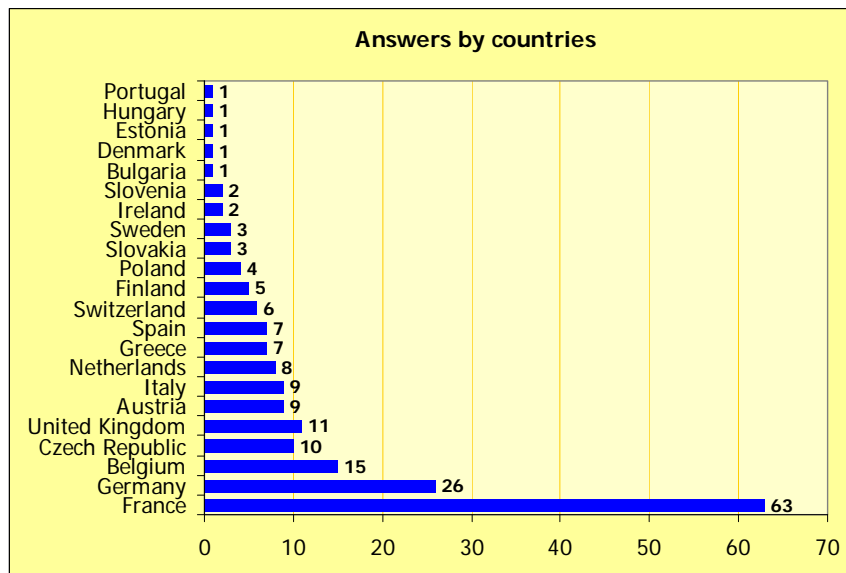


Figure 4.1 – Answers by countries

The database contains information from 195 answers from 22 European countries. It has to be underlined that 45.6% of replies were collected from two large EU countries: France (63) and Germany (26). Participation was not equally high in other large countries e.g. Italy, Spain or UK. On the other hand small countries such as the Belgium or the Czech Republic provided relatively high number of replies. Rather low feedback came from Bulgaria, Denmark, Estonia, Hungary and Portugal.

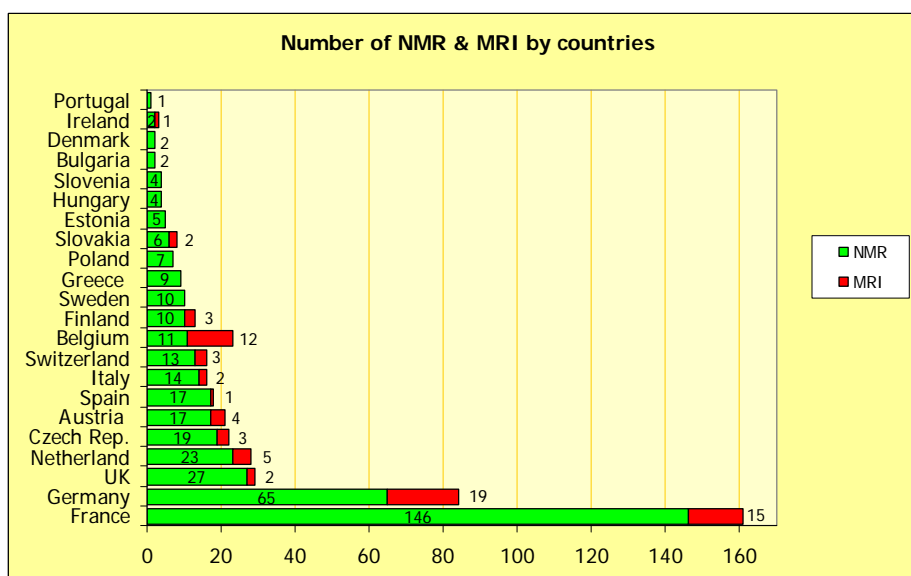


Figure 4.2 – Number of NMR and MRI by countries

As far as the number of equipment is concerned 486 instruments were identified. The trend of equipment distribution corresponds with the number of replies. More than one half of instruments (50.4%) is placed in two countries: France (161) and Germany (84).

### 4.2.3 NMR summary

In the NMR part of the survey 414 pieces of equipment were identified.

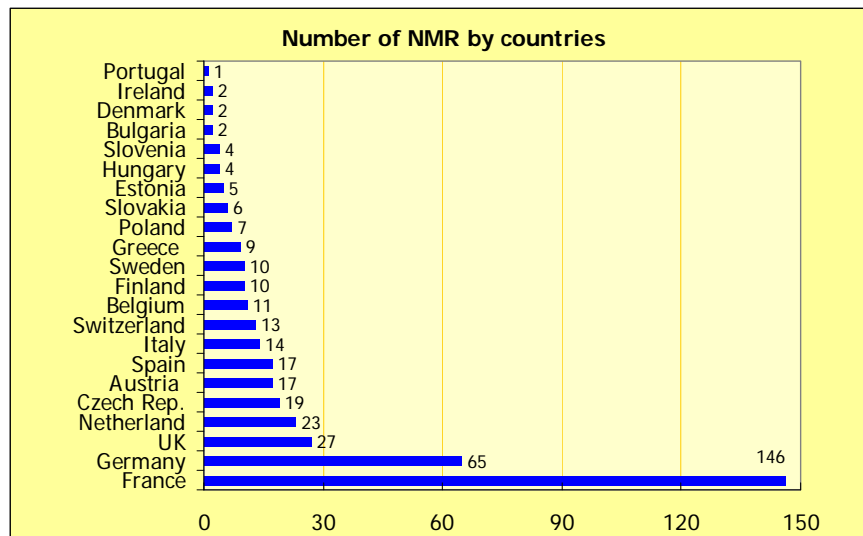


Figure 4.3 – Number of NMR by countries

Germany and France represent 211 pieces of equipment which means 51% of all the identified NMR.

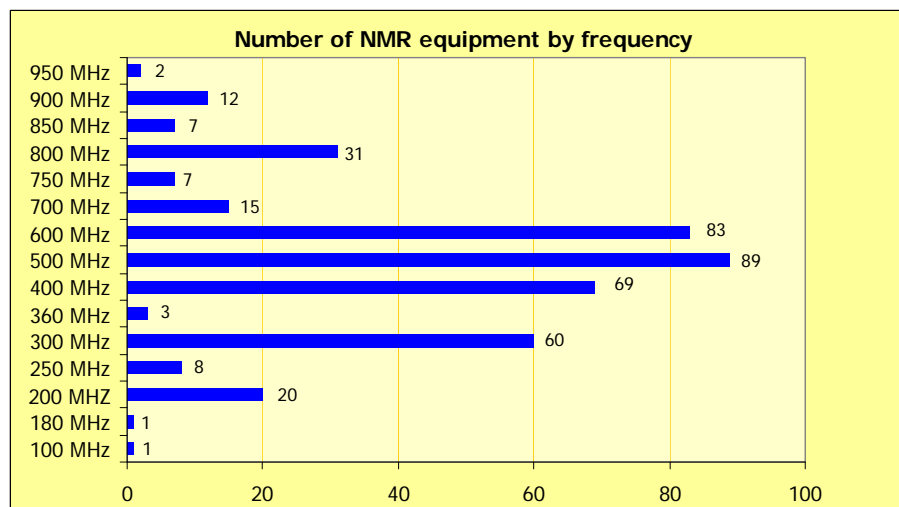


Figure 4.4 – Number of NMR equipment by frequency

The quality of NMR instrument can be beside other parameters also classified by frequency in MHz. According to the Figure 4.4 three groups with similar types of NMR instruments were determined: up to 360 MHz; then 400–700 MHz and then 750–950 MHz. The analysis of gathered data shows that the most commonly used instruments operate at the frequencies 500 and 600 MHz.



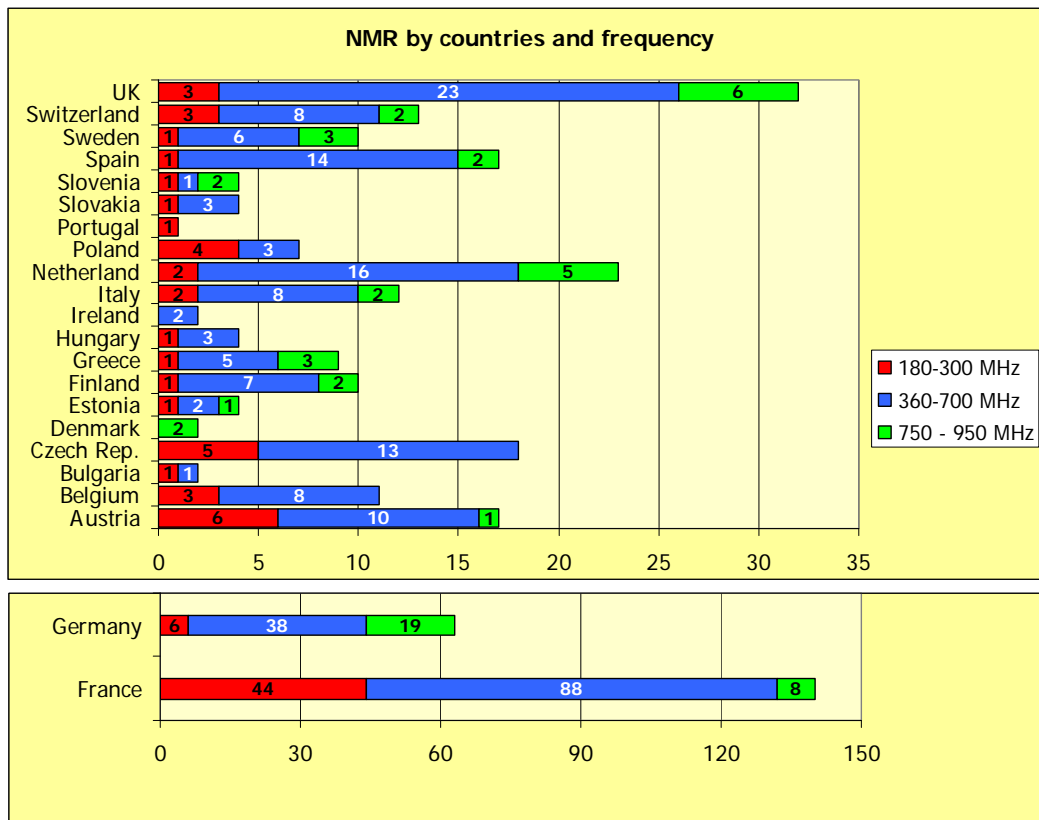


Figure 4.5 – Overview of NMR by countries and frequency

In the framework of the survey two top end NMR instruments with frequency 950 MHz were identified. One is placed in Germany and one in France. Both were purchased in 2008. Equipments with frequency 900 MHz frequency were identified in 12 places in 7 countries: Germany (5); France (2); Sweden (1); Netherlands (1); UK (1); Italy (1) and Switzerland (1). Detailed distribution of localities of NMR is given in Annex 1.

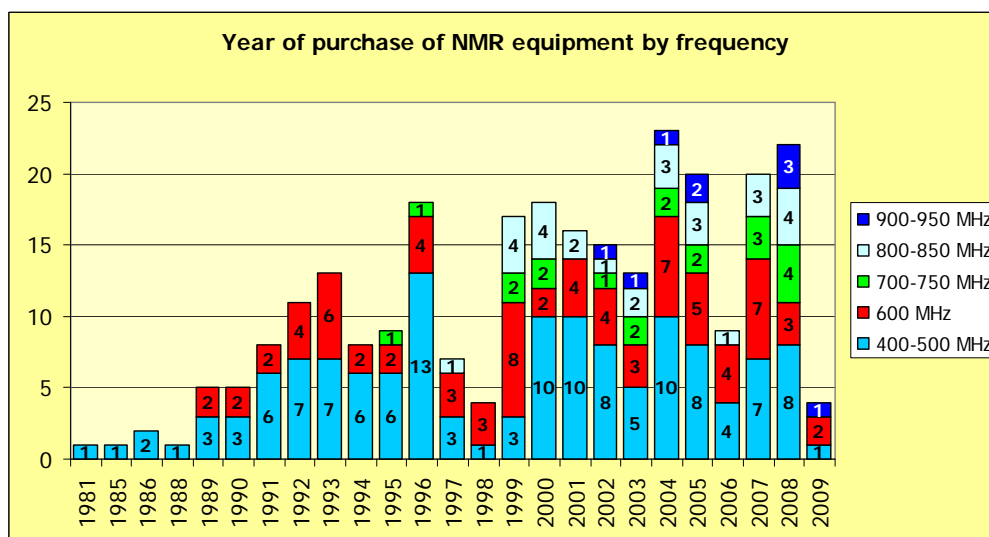


Figure 4.6 – Year of purchase of NMR equipment by frequency

Figure 4.6 shows year of purchase for 270 pieces of NMR equipment for frequencies higher than 400 MHz. As far as the year of purchase is concerned data are available only for 348 pieces of equipment from the total number of 414. Detailed analysis of these data shows that 41.2 % of equipment was bought in time period 1991–2000 and 47.3 % in 2001–2009 (not shown in Figure 4.6).

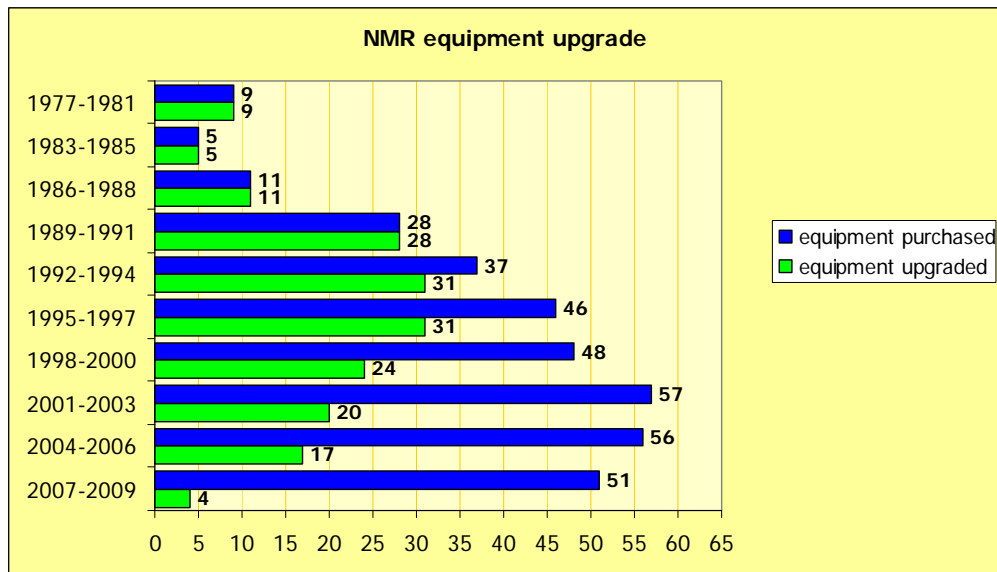


Figure 4.7 – NMR equipment upgrade

More than half of purchased equipment (52%) has been already upgraded. From the figure 4.7 is clearly visible that all of the instruments purchased until 1991 have been already upgraded.

#### 4.2.4 MRI summary

In the MRI part of the survey 72 pieces of equipment were identified.

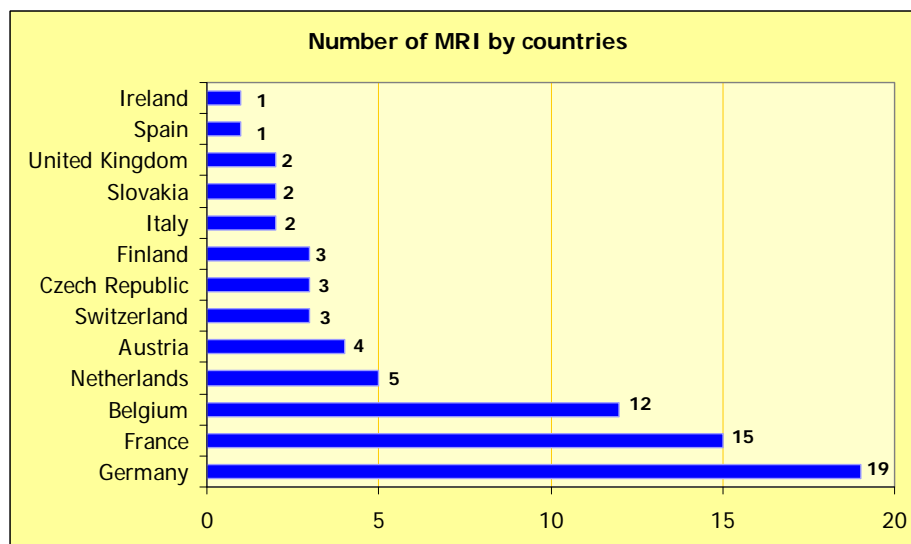


Figure 4.8 – Number of MRI by countries

The trend in equipment distribution tends to be similar to NMR. France and Germany are again countries with the majority of them. These two countries represent 34 pieces of equipment which means 47.2% of all MRI equipment identified.

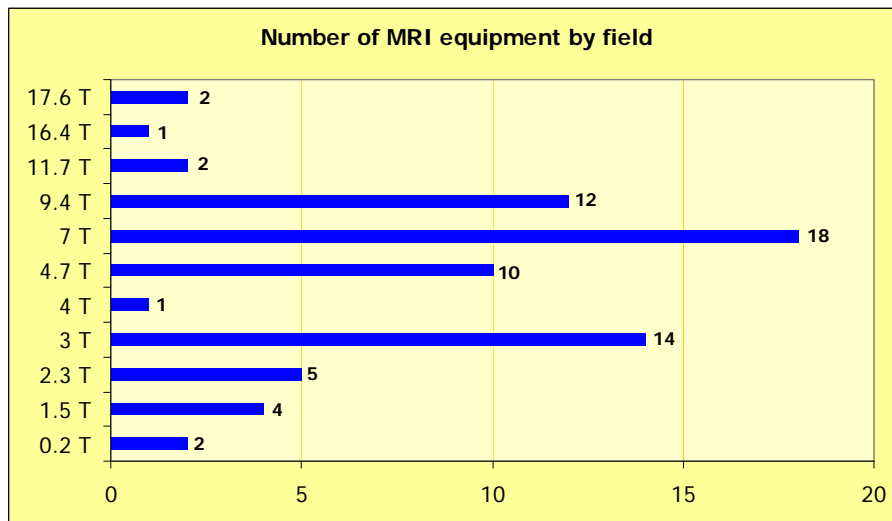


Figure 4.9 – Number of MRI equipment by field

The analysis of gathered data has to consider that the MRI instruments contain scanners for human applications as well as for animal and in-vitro imaging. In the later case a smaller bore diameter restrict the use to small animals and in-vitro samples (including materials research).

For human applications 3 Tesla is a kind of advanced clinical standard, 4 T is an exception that was commercially not successful whereas 7 Tesla are high-field research instruments not currently used in clinical settings.

4.7 T and above are mostly used for animal imaging with a number of high-field research instruments at 7 T as well as two ultra high-field human scanners at 9.4 T (both in Germany).

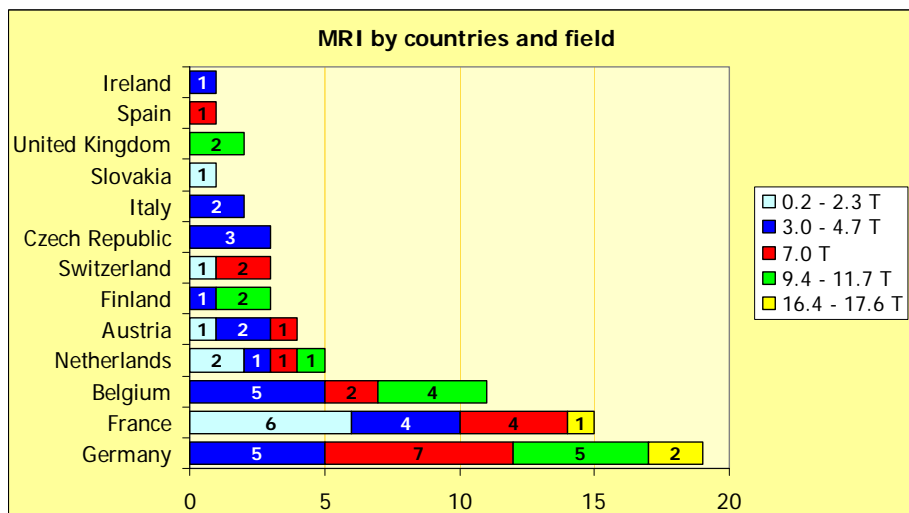


Figure 4.10 – MRI by countries and field

The yellow parts of the figure show that three pieces of top end equipment in interval from 16.4 T to 17.6 T were identified. Two top range MRI instruments with the field 17.6 T were reported. One is located in Germany and was purchased in 2002. The second one is placed in France and its purchase was indicated in 2004. The last top-end equipment at 16.4T is also in Germany.

Detailed distribution of localities of MRI is given in Annex 2.

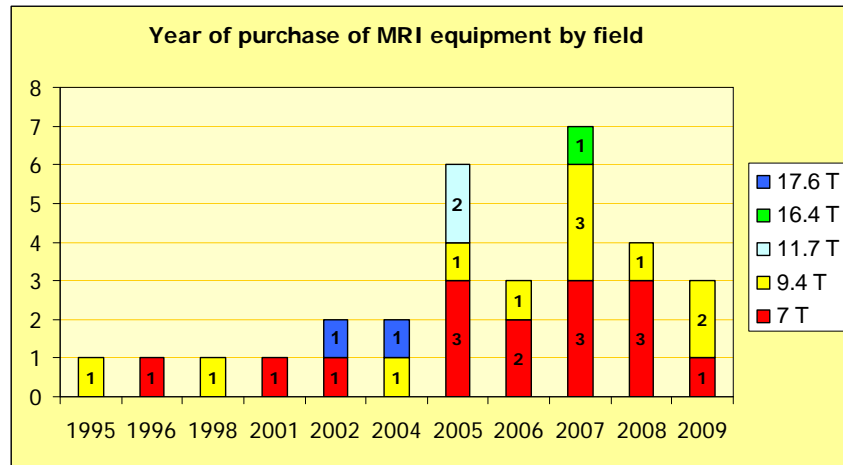


Figure 4.11 – Year of purchase of MRI equipment by field

Figure 4.11 provides information only about 31 pieces of equipment in top range interval 7–17.6 Tesla. Information about date of purchase is available for 64 pieces of equipment from the total number of 72. Detailed analysis of these data shows that in the last decade between years 2001–2009 was purchased 79.7% of all MRI equipment identified (not shown in the Figure 4.11).

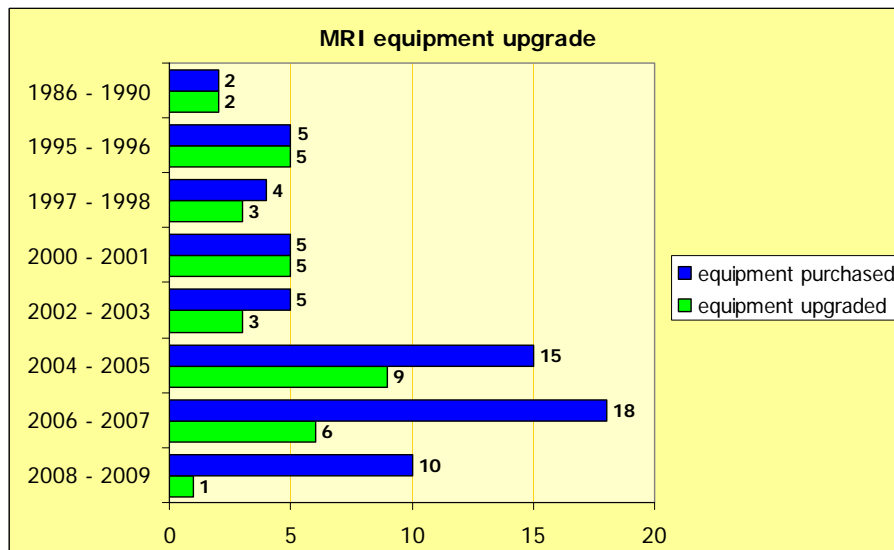


Figure 4.12 – MRI equipment upgrade

More than half of purchased equipment (53.1%) has been already upgraded at the date of the data collection. From the figure 4.12 is evident that only with one exception all of the instruments purchased until 2001 have been already upgraded.

## 5 Conclusion

One of the goals of the ERA-Instruments is to create the overview of the midsize cutting edge instrumentation for life science research in Europe. It had been decided that the first pilot survey will be dedicated to NMR and MRI equipment since some preliminary national data already exists and cooperation with EU funded networks can be envisaged.

The results of the task 2.3 can be summarized in the following points:

- The whole task is based on data gained by the questionnaire that was available for gathering information for 7 months, from October 23, 2008 until June 1, 2009.
- The first run of survey resulted in feedback of 195 responses from 22 countries, which represents 486 pieces of equipment (414 NMR and 72 MRI).
- Only information available from the answers of the questionnaire was processed. The results are strongly dependent on willingness of respondents to provide information and the current situation in number of equipment may be different. Thus this analysis does not represent the full mapping of European instruments. However, the data entries cover to a substantial amount NMR and MRI instrumentation relevant for biological applications with a very good coverage at very high fields.
- Four most important criteria for searching in the database were determined: country, type of application, research themes and frequency/field.
- The detailed analysis provides information about number of answers per country; number of NMR and MRI equipment by country; number of NMR equipment by frequency; number of MRI equipment by field and additionally about year of purchase and upgrade of NMR or MRI equipment.
- Though not exhaustive, the collected data provides valuable information about NMR and MRI equipment across Europe.
- The collected data should be periodically updated in order to meet the needs of the scientific community and all organisations participating in ERA-Instruments project.

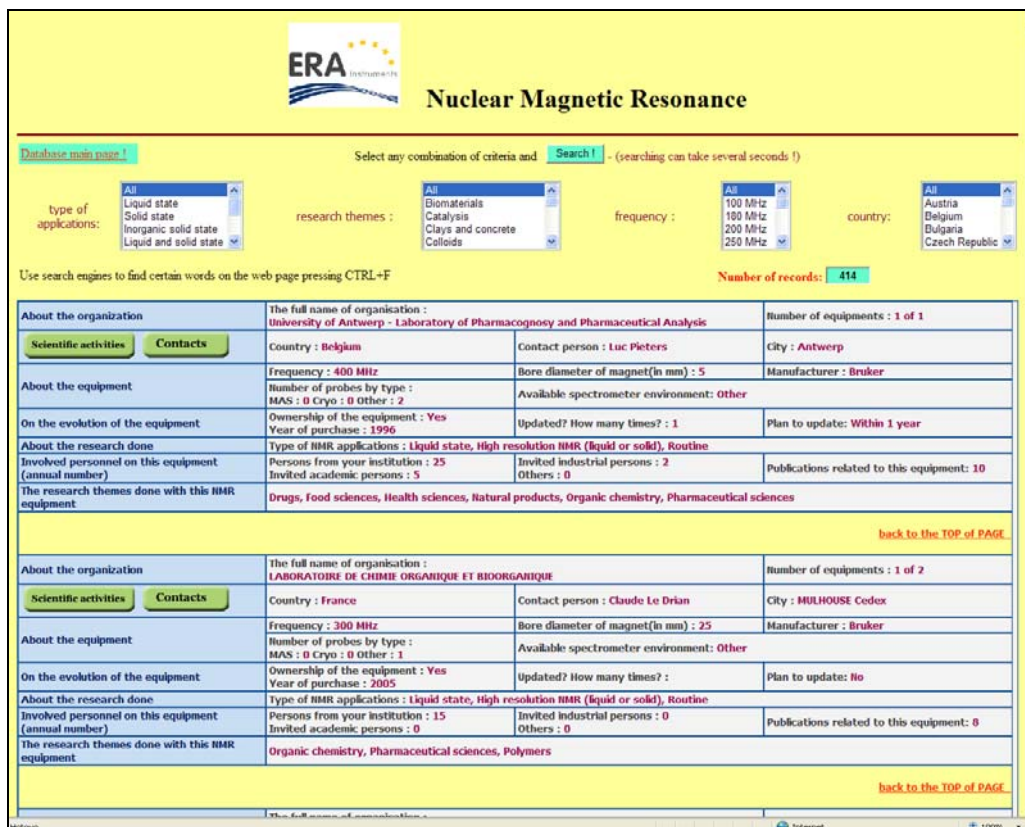
## 6 Snapshots from database web-site

### 6.1 The main page


The main page provides the direct access to the database, the basic information about ERA-Instruments project including short description of the survey itself.



### 6.2 Nuclear Magnetic Resonance



### 6.3 Magnetic Resonance Imaging



## Magnetic Resonance Imaging

[Database main page](#) | Select any combination of criteria and **Search!** - (searching can take several seconds!)

type of applications:

- All
- Living tissue
- Animal studies
- Human studies
- Animal and human studies

research themes:

- All
- Clinical routine
- Clinical research brain
- Clinical research cardio
- Clinical research skeletal muscles

fields:

- All
- 0 x T
- 1 T
- 2 T
- 3 T

country:

- All
- Austria
- Belgium
- Bulgaria
- Czech Republic

Use search engines to find certain words on the web page pressing CTRL+F Number of records: **72**

<b>About the organization</b>	The full name of organisation : GIP Cycleron		Number of equipments : 1 of 2
<b>Scientific activities</b>	Country : France		City : Caen
<b>Contacts</b>	Contact person : Bernard Mazoyer		Manufacturer : Bruker
<b>About the equipment</b>	Fields of the MRI : 7.0 T	Bore diameter of magnet (in mm) : 19	Position of the magnet : Horizontal
<b>On the evolution of the equipment</b>	Number of coils (MRI) by type : Surface coils : 0 Bird cage type : 1 Combined : 0	Ownership of the equipment : Yes	Updated? How many times? : 1
<b>About the research done :</b>	Year of purchase : 2005		
<b>Involved personnel on this equipment (annual number)</b>	Type of MRI applications : Animal studies		
<b>The research themes done with this MRI equipment</b>	Persons from your institution : 10		
	Invited academic persons : 2		
	Invited industrial persons : 1		
	Others : 1		
	Publications related to this equipment: 2		
	Diseases cancer, Neurodegenerative diseases, Small animals research, functional MRI, Imaging molecular, Imaging flow, Imaging functional, Angiography, Contrast agent development		
	<a href="#">back to the TOP of PAGE</a>		

<b>About the organization</b>	The full name of organisation : GIP Cycleron		Number of equipments : 2 of 2
<b>Scientific activities</b>	Country : France		City : Caen
<b>Contacts</b>	Contact person : Bernard Mazoyer		Manufacturer : Philips
<b>About the equipment</b>	Fields of the MRI : 2.3 T	Bore diameter of magnet (in mm) : 60	Position of the magnet : Horizontal
<b>On the evolution of the equipment</b>	Number of coils (MRI) by type : Surface coils : 1 Bird cage type : 2 Combined : 0	Ownership of the equipment : Yes	Updated? How many times? : 1
<b>About the research done :</b>	Year of purchase : 2005		
<b>Involved personnel on this equipment (annual number)</b>	Type of MRI applications : Animal and human studies		
<b>The research themes done with this MRI equipment</b>	Persons from your institution : 50		
	Invited academic persons : 20		
	Invited industrial persons : 5		
	Others : 0		
	Publications related to this equipment: 20		
	Clinical research brain, Diseases cancer, Neurodegenerative diseases, functional MRI, Imaging flow, Imaging functional, Angiography, Tractography, Contrast agent development, Magnetic resonance spectroscopy in vivo, Methodology, Software development		
	<a href="#">back to the TOP of PAGE</a>		

## 7 Annexes

*Annex 1 – NMR by localities*

<b>NMR – 950 MHz</b>	
	<b>town (number of equipment)</b>
<b>GERMANY</b>	Frankfurt (1)
<b>FRANCE</b>	(1)

<b>NMR – 900 MHz</b>	
	<b>town (number of equipment)</b>
<b>GERMANY</b>	Frankfurt (1)
	Munich (1)
	Göttingen (1)
	Berlin (2)
<b>NETHERLANDS</b>	Utrecht (1)
<b>SWEDEN</b>	Göteborg (1)
<b>FRANCE</b>	Villeurbanne (1)
	Villeneuve d'Ascq (1)
<b>UNITED KINGDOM</b>	Birmingham (1)
<b>ITALY</b>	Florence(1)
<b>SWITZERLAND</b>	Zurich(1)

<b>NMR – 850 MHz</b>	
	<b>town (number of equipment)</b>
<b>GERMANY</b>	Frankfurt (1)
	Mainz (1)
	Göttingen (1)
<b>NETHERLANDS</b>	Nijmegen (1)
<b>UNITED KINGDOM</b>	Coventry (1)
<b>GREECE</b>	Ioannina (1)

<b>NMR – 800 MHz</b>	
	<b>town (number of equipment)</b>
<b>GERMANY</b>	Halle (1)
	Frankfurt (3)
	Bayreuth (1)
	Jülich (1)
	Heidelberg (1)
	Göttingen (2)
<b>FRANCE</b>	Gif sur Yvette (1)
	Grenoble (1)
	Fontenay aux Roses (1)
	Villeneuve d'Ascq (1)
<b>GREECE</b>	Ioannina (1)
<b>AUSTRIA</b>	Vienna (1)
<b>UNITED KINGDOM</b>	Leicester (1)
	Edinburgh (1)
	London (1)
	Birmingham (1)
<b>SWEDEN</b>	Göteborg (2)
<b>FINLAND</b>	Helsinki (2)
<b>NETHERLANDS</b>	Nijmegen (1)
<b>SWITZERLAND</b>	Zürich (1)



<b>DENMARK</b>	Copenhagen (1)
<b>ESTONIA</b>	Tallinn (1)
<b>SPAIN</b>	Madrid (1)
	Barcelona (1)
<b>SLOVENIA</b>	Ljubljana (1)

<b>NMR – 750 MHz</b>	
	town (number of equipment)
<b>NETHERLANDS</b>	Leiden (1)
	Utrecht (1)
<b>GERMANY</b>	Leipzig (1)
	Munich (1)
<b>FRANCE</b>	Orléans (1)
<b>GREECE</b>	Ioannina (1)
<b>DENMARK</b>	Copenhagen (1)

<b>NMR – 700 MHz</b>	
	town (number of equipment)
<b>GERMANY</b>	Bayreuth (1)
	Göttingen (1)
	Frankfurt (1)
	Mainz (1)
	Aachen (1)
<b>FRANCE</b>	Villeurbanne (1)
	Gif sur Yvette (2)
	Montpellier (1)
	Paris (1)
	Toulouse (1)
<b>UNITED KINGDOM</b>	London (1)
<b>SWEDEN</b>	Stockholm (1)
<b>NETHERLANDS</b>	Utrecht (1)
<b>SWITZERLAND</b>	Zurich (1)

**Annex 2 – MRI by localities**

<b>MRI – 17.6 T</b>	
	<b>town (number of equipment)</b>
<b>FRANCE</b>	(1)
<b>GERMANY</b>	Würzburg (1)

<b>MRI – 16.4 T</b>	
	<b>town (number of equipment)</b>
<b>GERMANY</b>	Tübingen(1)

<b>MRI – 11.7 T</b>	
	<b>town (number of equipment)</b>
<b>GERMANY</b>	Würzburg (1)
<b>UK</b>	Hull (1)

<b>MRI – 9.4 T</b>	
	<b>town (number of equipment)</b>
<b>BELGIUM</b>	Leuven (1)
	Diepenbeek (2)
	Antwerp (1)
<b>FINLAND</b>	Kuopio (2)
<b>GERMANY</b>	Tübingen(1)
	Berlin (1)
	St. Ingbert (1)
	Jülich (1)
<b>NETHERLANDS</b>	Eindhoven (1)
<b>UK</b>	London (1)

<b>MRI –7 T</b>	
	<b>town (number of equipment)</b>
<b>AUSTRIA</b>	Vienna (1)
<b>BELGIUM</b>	Antwerp (2)
<b>FRANCE</b>	Bron (1)
	Caen (1)
	Gif sur Yvette (1)
	Orsay (1)
<b>GERMANY</b>	Bremen (1)
	Berlin (1)
	Essen (1)
	Heidelberg (1)
	Leipzig (1)
	Magdeburg (1)
	Würzburg (1)
<b>NETHERLANDS</b>	Eindhoven (1)
<b>SPAIN</b>	Madrid (1)
<b>SWITZERLAND</b>	Lausanne (1)
	Zurich (1)