IRSN
INSTITUT
DE RADIOPROTECTION
ET DE SÛRETÉ NUCLÉAIRE

Faire avancer la sûreté nucléaire

ESOREX-Platform: European Platform for Occupational Radiation Exposures

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Contents

- Introduction: context and motivation
- Main objectives of the ESOREX-Platform
- Methodology and timetable of the project
- General structure of the Platform
- Functions and end-users
- Conclusion

Introduction: context and motivation

ESOREX (**E**uropean **S**tudy on **O**ccupational **R**adiation **Ex**posure)
Project initiated by the European Commission in 1997

- Overview on national arrangements for radiation worker's monitoring, dose reporting and recording
- European database on occupational exposure
- First attempt to harmonise data collection
  - Common data reporting format
  - Categorisation of professional work activities

➔ **A recommendation to develop a sustainable Platform emerged during the last ESOREX Symposium in Prague, May 2010**

Main objectives of the ESOREX-Platform project

3-years European project (Dec. 2012 - Dec. 2015) funded by the EC
Contractor = IRSN, France

- To develop a Plateform which allow representatives from national dose registries and dosimetry services to discuss emerging issues, assess dose trends and exchange experience

- To establish working relationships with other relevant international organisations and bodies (in particular with UNSCEAR, HERCA, IAEA, NEA, EURADOS)

- To develop appropriate mechanisms and establish the appropriate infrastructure to enable the sustainable continuation of operation of the ESOREX platform beyond the 3-years project, without further European Commission financial support

Methodology and Timetable of the project

Jan. 2013 — Sept. 2013 — Feb. 2014 — Sept. 2014 — Jul. 2014

Definition of the structure of the Platform and of the corresponding required data.

Development of a prototype.

First collection of data and test of the prototype.

1st workshop, Paris
16-17 Sept. 2014

Development of the final ESOREX Platform and collection of the global data.

2nd workshop, Paris
June or July 2015

General structure of ESOREX-Platform

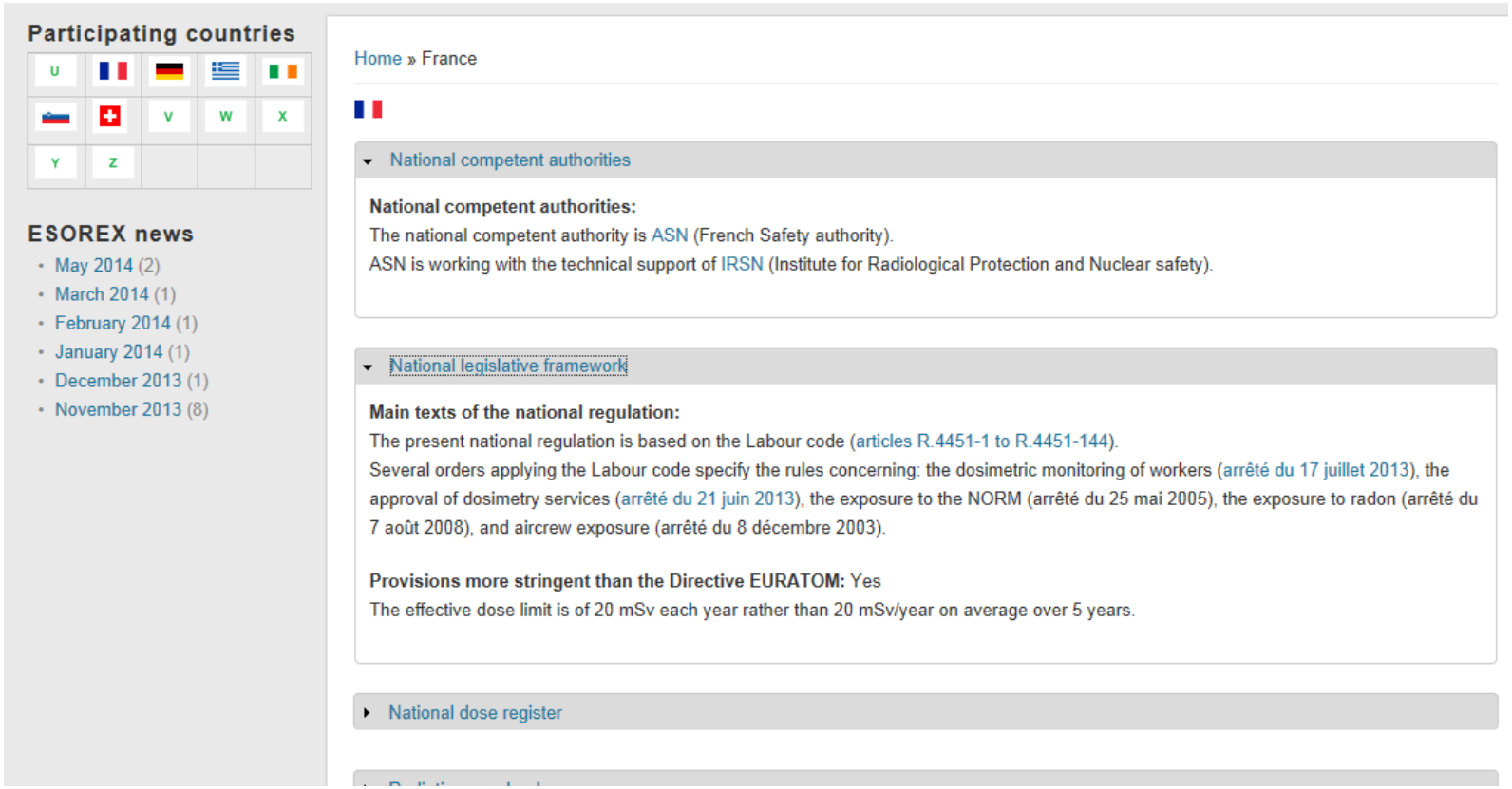
- A dedicated website including 2 main tools :
  - A "Database" dealing with:
    - national arrangements for occupational radiation exposure monitoring (national regulation, practises in worker's monitoring, dosimetric methods used…);
    - results and trends of occupational exposure by domain/sectors of activity, for some occupations, in EU member states and associated states.
  - A "Collaborative tool" allowing some exchanges between national experts in occupational RP

Database : national arrangements (1)

- 9 relevant ‘regulatory topics’ have been retained
  - Identification of the national competent authority
  - Description of the national legislative framework
    - *Main texts of the national regulation*
    - *Provisions more stringent than the Directive EURATOM*
  - Organization of the national dose register
    - *National body responsible for national statistics*
    - *Type of recorded data*
    - *Access to the register data*
    - …
  - Description of the implementation of radiation passbook
  - Approved dosimetry services
  - Description of the techniques or procedures used for individual monitoring
    - *external exposure*
    - *internal exposure (including committed dose calculation)*
    - *aircrew exposure*

Database : national arrangements (2)

- Information concerning national arrangements are
  - accessible on website by topic for each country (also friendly printable)



Database : results and trends of exposure

List of the main parameters considered into the database

- *Country*
  - → *all countries participating in the platform, not limited*
- *Year of exposure*
  - → *annual data (> 2010)*
- *Type of exposure and related dosimetric quantities*
  - → *whole body (external (γ+β), external (neutron), internal committed dose, and effective dose = sum of the 3)*
  - *skin*
  - *extremities*
  - *lens of the eye*
- *Field, sector or subsector of activity*
- *Occupation*
  - → *More representative occupations of each sector/subsector*
- *Parameters of exposure*
  - → *collective dose*
  - *average dose per caput*
  - *number of workers*

Data for activities and occupations

- A unique list for activities and occupations of interest including fields, sectors, subsectors, occupations

- 7 main activity fields have been retained
  - Medical field
  - Industry (without nuclear industry)
  - Nuclear field
  - Transport
  - Research and education
  - Natural sources
  - Other fields

- In each field of activity, relevant sectors and subsectors have been listed and relevant occupations in these sectors/subsectors have been retained
  - to limiting the complexity of the matrix
  - to focusing on the main situations for which workers are generally more exposed

Example for the medical field

Field	Sector	Subsector	Occupation
Medical field	Diagnostic radiology		Physician (diag. radiology) Radiographer (diag. radiology)
	Interventional radiology		Physician (cardio./interv. radiologist) Nurse (interv. radiology) Radiographer (interv. radiology)
	Radiotherapy	Teletherapy only Teletherapy + brachytherapy	
	Nuclear medicine	Diagnostic unit only	Physician (nucl. med diag) Nurse (nucl. med diag) Radiographer (nucl. med diag)
		Therapeutic/diagnostic unit	Physician (nucl. med) Nurse (nucl. med) Radiographer (nucl. med)
	Dental radiology		
	Veterinary units		
	Other medical activities		

Example for the nuclear field

Field	Sector	Sub-sector	Occupation
Nuclear field	Military activities	Weapon manufacturing	
		Propulsion	
	Uranium ore extraction/processing		
	Enrichment and conversion		
	Fuel fabrication		
	Nuclear power reactors		See next slide
	Reprocessing		
	Dismantling		
	Waste management facilities		
	Nuclear logistics and maintenance		

Occupations in the nuclear power reactors

- Scaffolder
- Insulator
- Valve mecanic, plumber
- Welder
- Pipe fitter, boilmaker
- Diver
- Decontaminor

Database : exposure parameters

- Collective dose
- Average dose per caput
  - all monitored workers
  - Measurably exposed workers (dose > recording level)

EXPOSURE	PARAMETERS OF EXPOSURE		
	DOSE (D)		
	COLLECTIVE DOSE (CD)	Dose per caput (monitored workers)	Dose per caput (measurably exposed workers)
WHOLE BODY	CD wb *man.Sv*	CD wb / M wb *mSv*	CDwb/ (Mwb - NE wb) *mSv*
SKIN	CD s Σ Hp 0.07 skin *man.Sv*	CD s / M s *mSv*	CD s / (M s - NE s) *mSv*
EXTREMITIES	CD ext Σ Hp 0.07 ext *man.Sv*	CD ext / M ext *mSv*	CD ext / (M ext - NE ext) *mSv*
LENS OF THE EYE	CD le Σ Hple *man.Sv*	CD le / M le *mSv*	CD le / (M le - NE le) *mSv*

Database : exposure parameters

Number of workers per dose bands

- Whole body exposure

EXPOSURE	PARAMETERS OF EXPOSURE										
	DOSE (D)			*NUMBER OF WORKERS*							
	COLLECTIVE DOSE (CD)	Per CAPUT (monitored workers)	Per CAPUT (measurably exposed workers)	TOTAL monitored	TOTAL PER DOSE BANDS						
WHOLE BODY	CD wb *man.Sv*	CD wb/ M wb *mSv*	CDwb/ (M wb - NE wb) *mSv*	Mwb *mSv*	D < RL NE wb	RL < D < 1mSv	1 mSv < D < 5 mSv	5 mSv < D < 10 mSv	10 mSv < D < 15 mSv	15 mSv < D < 20 mSv	D > 20 mSv

- Lens of the eye exposure (same dose bands- the new limit of 20 mSv has been considered

Database : exposure parameters

Number of workers per dose bands

- Skin exposure
- Extremity exposure

EXPOSURE	PARAMETERS OF EXPOSURE							
	DOSE (D)			*NUMBER OF WORKERS*				
	COLLECTIVE DOSE (CD)	Dose per caput (monitored workers)	Dose per caput (measurably exposed workers)	TOTAL monitored	TOTAL PER DOSE BANDS			
SKIN	CD s Σ Hp 0.07 skin *man.Sv*	CD s / M s *mSv*	CD s / (M s - NE s) *mSv*	Ms	D < RL NE s	RL < D < 150 mSv	150 mSv < D < 500 mSv	D < 500 mSv
EXTREMITIES	CD ext Σ Hp 0.07 ext *man.Sv*	CD ext / M ext *mSv*	CD ext / (M ext - NE ext) *mSv*	Mext	D < RL NE ext	RL < D < 150 mSv	150 mSv < D < 500 mSv	D < 500 mSv

Collaborative tool of ESOREX-platform

- A forum where experts can discuss and exchange information
- Three “sub-forum” have already been created *(these should be enriched over time with new topics)* for discussions
  - about technical or practical aspects of the platform
  - about data of exposure, updating data…
    (information on display of new data for example)
  - about transposition of the European BSS Directive

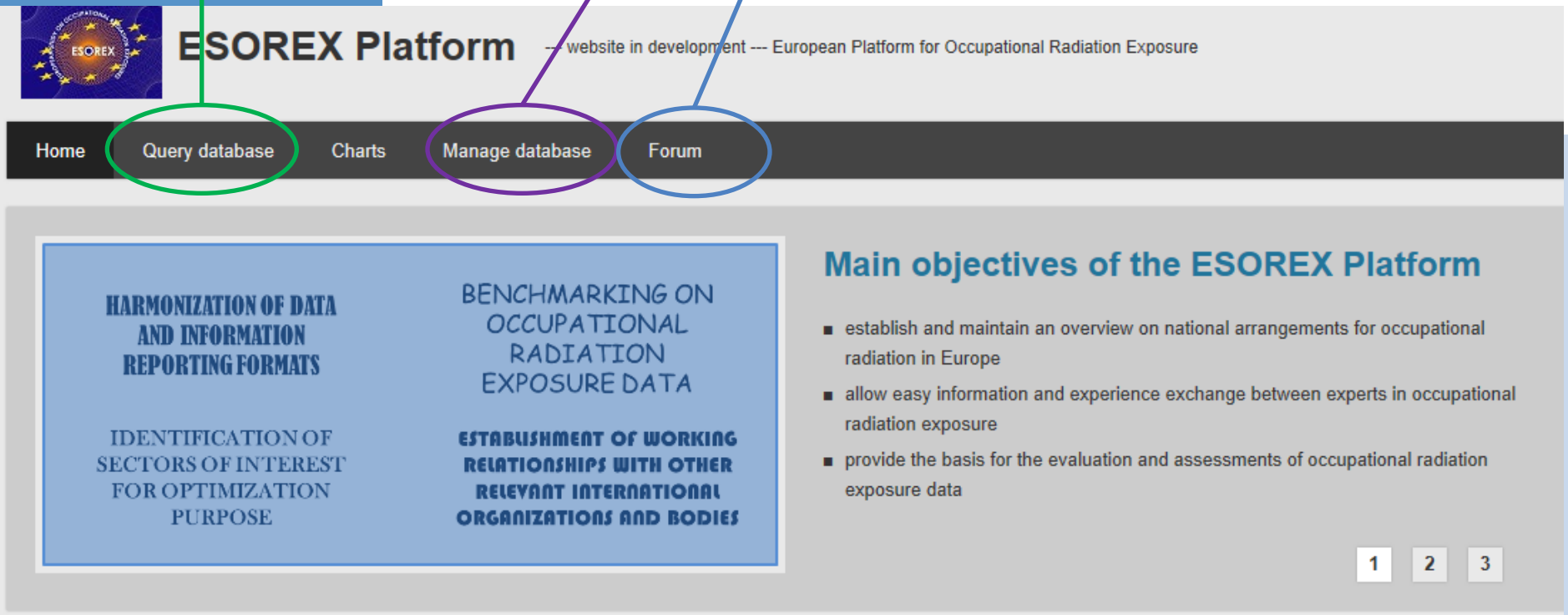
Functions and End-users

	National administrator	ESOREX correspondents	Experts of countries or international organizations	Public
Administration of national access rights	+	-	-	-
Database : Description of the national arrangements				
Input of data	+	+	-	-
Consultation (predefined pages)	+	+	+	+
Database : Data of occupational exposures				
Input of data	+	+	-	-
Consultation level1 (predefined pages/figures)	+	+	+	+
Consultation level 2 (database requests)	+	+	+	-
Collaborative tool				
Writing	+	+	+	-
Reading	+	+	+	-

Query database (data of exposure/country/year/ type of data/activity field or sector)
▶ **National correspondants and experts**

Input and update data (national regulation and data of exposure)
▶ **National correspondants**

Exchange between correspondants and experts
▶ **National correspondants and experts**



ESOREX Platform

--- website in development --- European Platform for Occupational Radiation Exposure

Home | Query database | Charts

▶ Public, national correspondants and experts

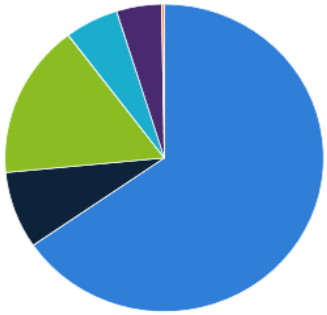
Monitored workers and collective dose per field

Country: All countries

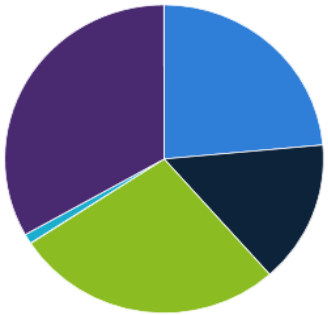
Year: 2013

Apply

Monitored workers per field



Collective dose per field (man.Sv)



ESOREX Platform

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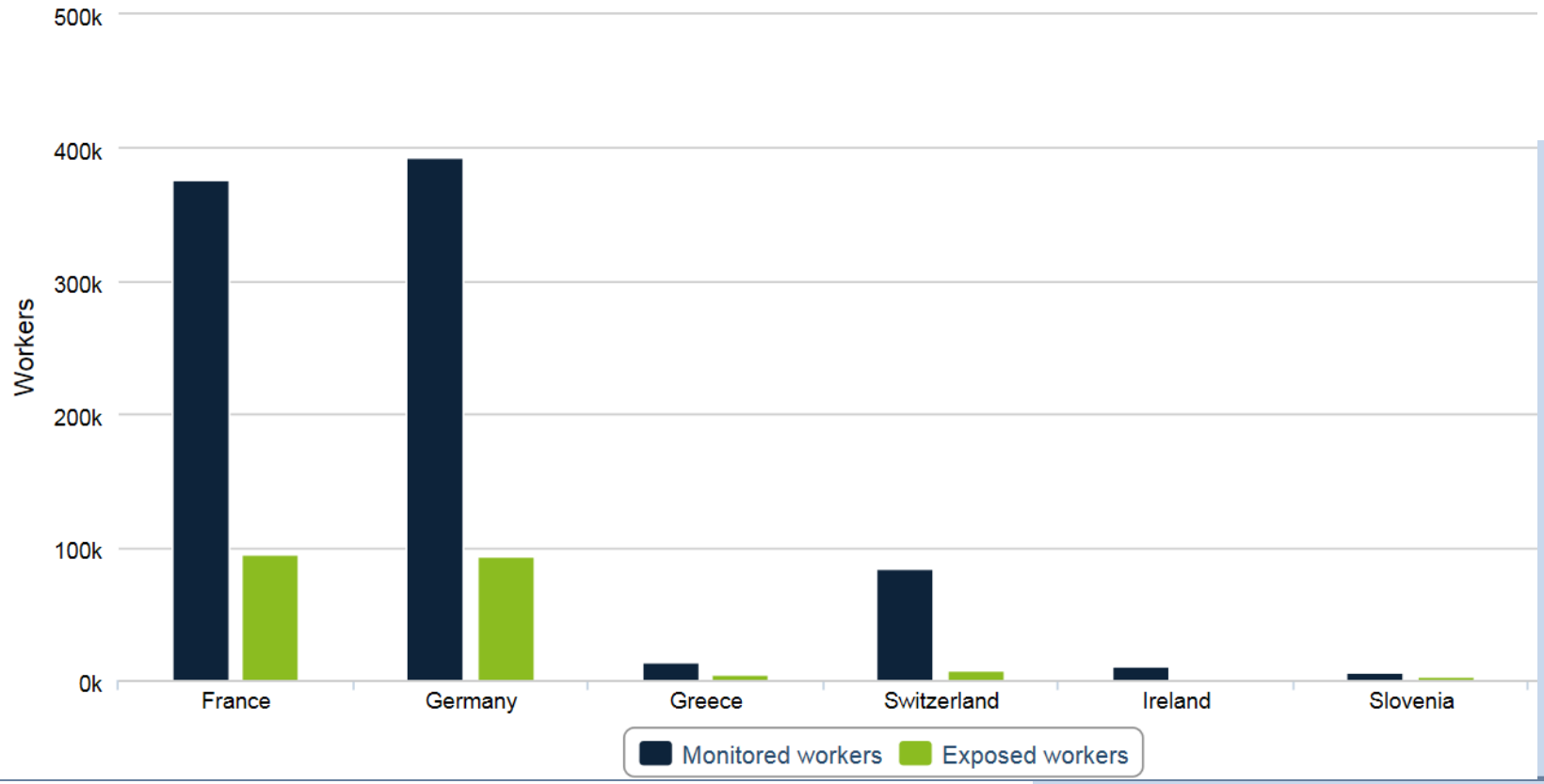
▶ Public, national correspondants and experts

Monitored and exposed workers per countries

Year

2012



ESOREX Platform

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▶ Public, national correspondants and experts

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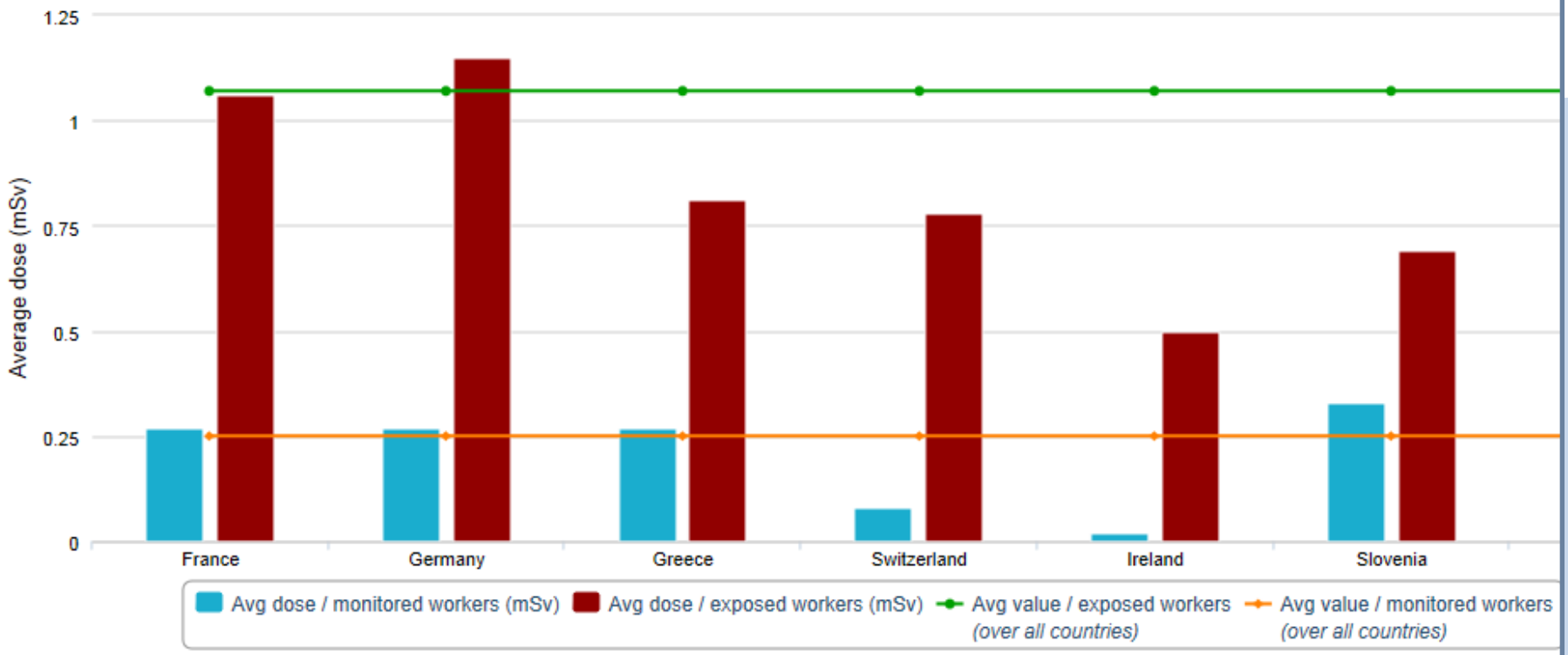
Average individual dose per countries and average values over all countries

Year

2012



Conclusion

- ESOREX-Platform :

A new tool dedicated to occupational exposures has been developed

  - It is NOT ONLY a **database**
  - BUT ALSO a **forum** for exchange of experience
  - **Web based competence center** for national practices of ORP in Europe
  - **Network** for central dose registers and regulatory bodies

- Its sustainability will depend on the support of the national competent authorities in Europe and on the involvement of the end-users

Thank you for your attention!