



The Montbéliard experience with managing radon

**Isabelle MERAUX NETILLARD, Sandra BIGUENET – PMA
Jacques LOCHARD, Cynthia REAUD – CEPN**

**14th European ALARA Network Workshop
ALARA in Existing Exposure Situations**



**September 4-6, 2012
Dublin, Ireland**

The Montbéliard Community of Municipalities - PMA

- **29 municipalities : from village to town**
- **125 000 inhabitants**
- **Birthplace of PEUGEOT industry**
- **An hospital with 1200 beds**
- **A university and an engineer school**
- **A council of 68 elected representatives**
- **A set of competences: economic, social, environment, health, education, ...**

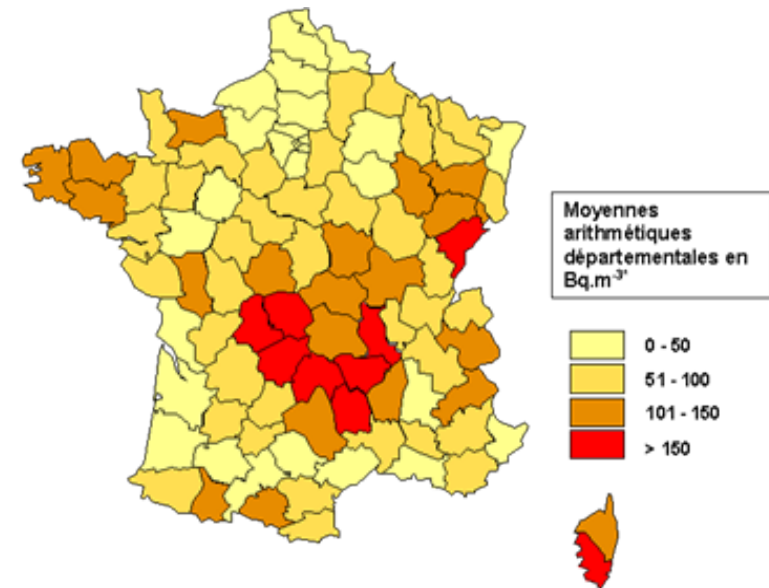


The Montbéliard Radiation Protection Pilot Project

- **Initiated by the Montbéliard Community of Municipalities (PMA) in 2004**
- **Objectives:**
 - **To improve the radiation protection of the inhabitants**
 - **To create a pole of competence in the field of radiation protection**
 - **To develop radiation protection culture among inhabitants**
- **Implemented with a wide range of partners from local, national and international levels**
- **Five components: radon and medical exposures, emergency preparedness, education and training, scientific and technical culture**
- **CEPN acts as facilitator of the Pilot Project**

The management of radon

- With an estimated average radon concentration of 180 Bq/m³, the Pays de Montbéliard is considered as a priority area by the government for reducing radon risk
- Objective of PMA: to reduce and maintain radon exposure ALARA in the Community
- Partners:
 - Local level: university, NGOs
 - National level: ASN, IRSN
 - International level: OFSP, ARRAD (Swiss)
- Implemented by the public hygiene office of PMA



Radon in dwellings (1)

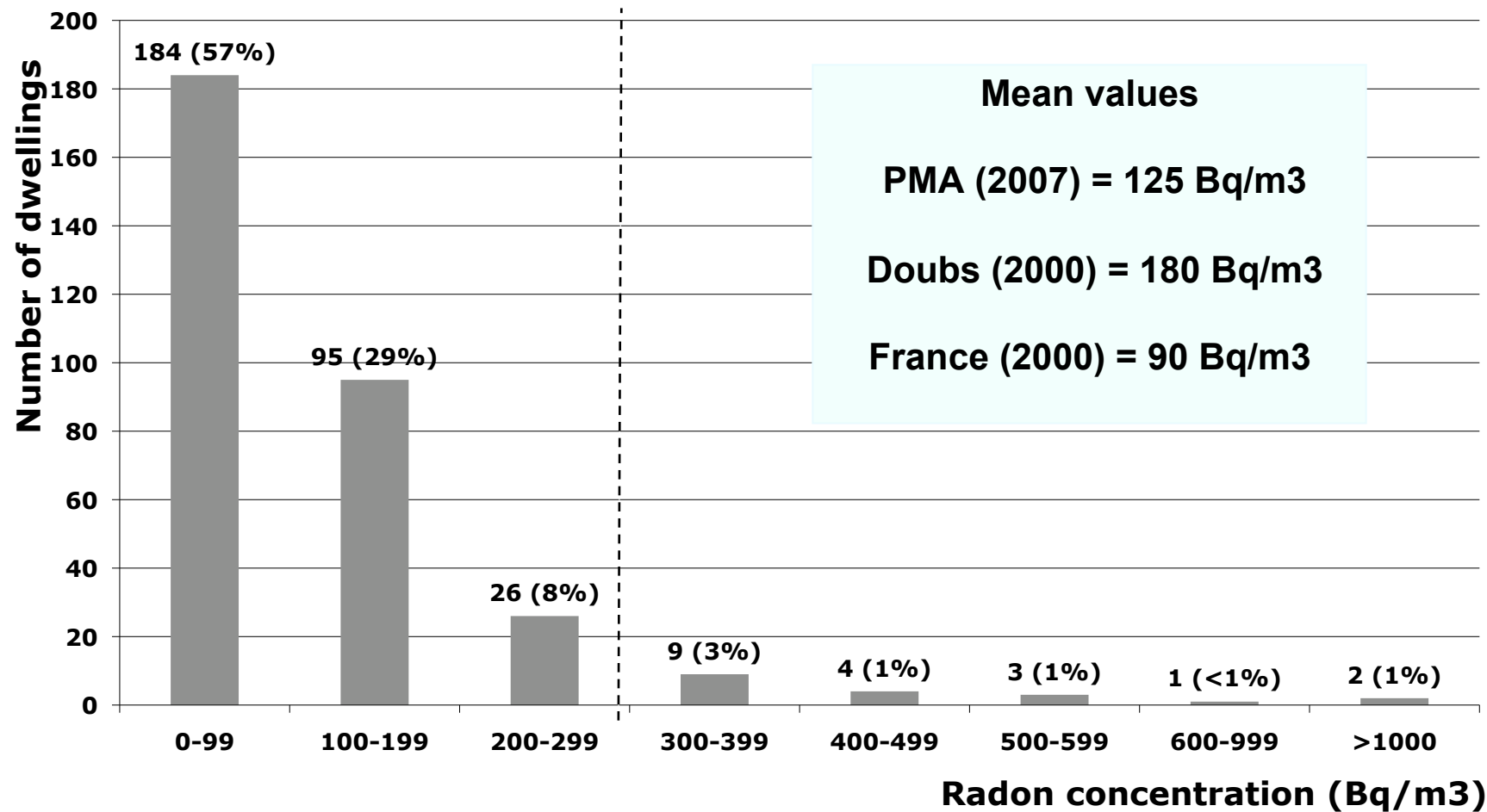
- **Decision in 2005 to launch an awareness campaign on radon risk at the occasion of an “Housing Improvement Programme” proposed by the Franche Comté Region**
- **Winter 2006/2007**
 - **Information meetings on radon risk with the elected representatives of the 29 municipalities of the Community**
 - **Measurement campaign conducted by the public hygiene officers in 350 private dwellings recruited by the municipalities**
- **Spring 2007:**
 - **Presentation of the results to the concerned inhabitants by mayors : mean value 125 Bq/m³, maximum value 2000 Bq/m³**
 - **Decision of the Community to support inhabitants with radon concentration above 300 Bq/m³ in their homes : free diagnostic supported by PMA and free remediation actions through an agreement with the National Agency for Housing Improvement**

Radon in dwellings (2)

- **Summer 2007 : visit of dwellings with radon concentration above 300 Bq/m³ and advice given to the inhabitants to ventilate rooms usually occupied**
- **Winter 2008 : new measurements carried out in dwellings above 300 Bq/m³. Confirmation of high levels in a few houses**
- **Summer 2008: difficulties to find local expertise to carry out diagnostics and to propose remediation actions : support of IRSN (France) and then OFSP (Swiss)**
- **Since the 2007 campaign about 150 people have made requests to PMA for having measurements in their homes**
- **Based on the experience so far the estimated total cost (investment and operation) per dwelling supported by PMA is about 40€**

Radon in dwellings (3)

Results of the 2007 winter radon measurement campaign in dwellings



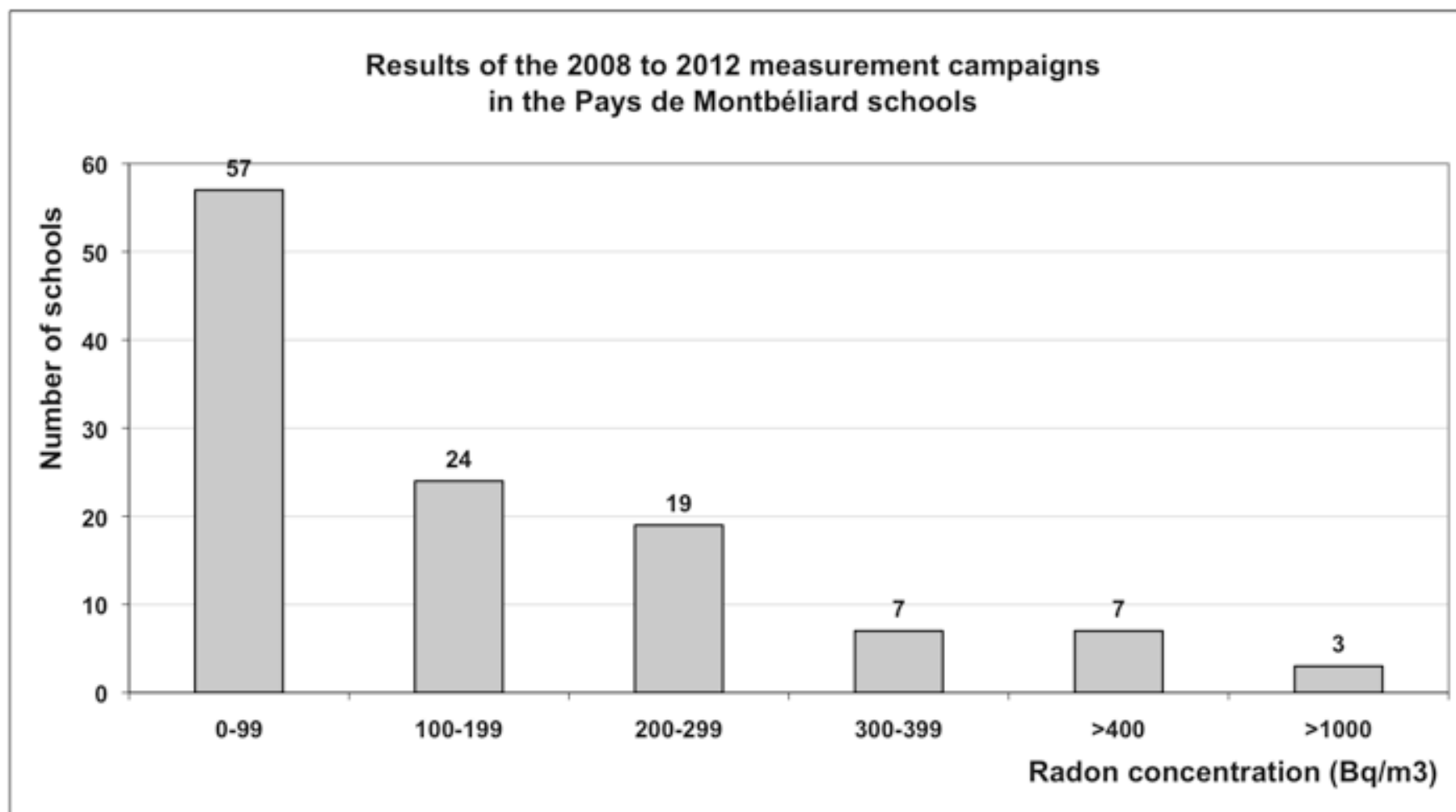
Radon in public buildings (1)

- **Decision in 2007 to measure radon concentration levels in Buildings Receiving Public (compliance with the 22/07/2004 Order) starting with a measurement campaign in schools**
- **An enquiry demonstrated that only 4 schools on 117 had made measurements**
- **PMA searched for a certified organisation as required by the regulation to perform the measurements**
- **In the absence of such organisations at the regional level and the high cost of national organisations, PMA decided to ask for certification of its public hygiene office**
- **Training of five officers and obtaining certification issued by the French Authority (ASN) in 2008**

Radon in public buildings (2)

- **First measurement campaign in winter 2008/2009 in 57 schools : 3 schools with concentration levels above 400 Bq/m³ (action level)**
- **Technical diagnostics performed in the three schools in summer 2009 with the help of OFSP (Swiss) and new measurements during winter 2010 after remediation**
 - **School 1: reduction from 480 to 300 Bq/m³. Total cost < 500€**
 - **School 2: reduction from 1800 to less than 100 Bq/m³. Total cost ≈ 1600€**
 - **School 3: reduction from 1300 to 400 Bq/m³. Cost ≈ 12 300€**
- **Second measurement campaign in winter 2011/2012: 7 schools above 400 Bq/m³. Diagnostic performed in summer 2012.**
- **Based on experience so far the estimated total cost (investment and operation) per school supported by PMA is about 360€**

Radon in public buildings (3)



Next steps

- **The project will continue in three directions:**
 - **For dwellings: launching of a new campaign in autumn 2012 with the offer to inhabitants of a kit to make measurements themselves and receive advice online or on-site**
 - **For buildings receiving public: start a measurement campaign in winter 2012/2013 in other public places than schools**
 - **For workplaces: reflection in 2013 on the process to adopt**
- **Development of local competence of municipalities and building companies (education and training)**
- **Establishment of a monitoring system to follow the development of the « radon culture» in the population**
- **Continue the leading role of PMA in the “Franche Comté Radon Pluralistic Project” implemented by IRSN with regional stakeholders**
- **Integration of feedback experience in the PMA geographic information system : “radon map” of public buildings**

The PMA geographic information system

Intr@Geo Collaborative Suite 4.3

Légende

- Couches
- Légende sur demande
- Gestion de crise
 - a) Mairies (moyens)
 - Itinéraire d'éloignement
 - points de rassemblement
 - Surfaces
- A. Aléa Inondation
- B. Aléa Mouvements de terrain
- C. Aléa Sismique
- D. Aléas technologiques
- E. Aléas Environnementaux
- EE. Radon 2009/2010
 - Actions correctives urgentes (>1000 Bq/m³)
 - Actions simples souhaitables (entre 400 et 1000 Bq/m³)
 - Pas d'actions correctives (< 400 Bq/m³)
 - Z. Ensemble des écoles
- EEE. Nouvelles mesures après travaux
- F. Enjeux populations
- G. Enjeux ERP
- H. Enjeux Economiques
- I. Enjeux Réseau Eau
- J. Enjeux Réseau Electrique
- K. Enjeux Réseau Transport
- L. Enjeux Réseau Gaz
- M. Ressources
- N. Ressources en Soins
- O. Etablissements de Soins
- Système
- Z. Fond de carte

4 résultats sur la couche Pas d'actions correctives (< 400 Bq/m³)

Voir Fiche	Commune	Etablissement	Activité volumique (Bq/m³)
	Arbouans	École primaire	477
	Arbouans	École primaire	156
	Arbouans	École maternelle	138
	Arbouans	École maternelle	106

4 résultats sur la couche Actions simples souhaitables (entre 400 et 1000 Bq/m³)

Rechercher : ERP

First lessons

- Awareness campaigns and actions of the public hygiene officers are welcome by inhabitants and do not raise concerns contrary to fear expressed by some national experts and local elected representatives before starting the project
- There is an obvious need to develop a local competence among building companies on the diagnosis and remediation
- It is also essential to develop a synergy between the management of radon and the management of air quality and energy performance of buildings to promote the sustainable commitment of residents
- So far costs are low – This has to be confirmed with further experience
- Reducing radon exposure ALARA is a long-process (See Figure 4 in ICRP Publication 103, page 113)



Thank you