



Belgian National Radon Action Plan 2026-2030

This national radon action plan has been drafted by FANC after consultation and with contributions of the stakeholders.

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1. Introduction

Radon is a radioactive gas, odourless, colourless and chemically inert, coming from uranium which is present in soil and rocks. In Belgium, it is found in the underground in varying quantities depending on the geological characteristics. Hence, it can penetrate into the buildings by different openings and accumulate in it, leading to concentrations which can be sometimes really high. Radon irradiates lung tissues, which can lead to lung cancer.

The [first national radon action plan](#), developed within the framework of European Directive 2013/59/Euratom (BSS), covered the period 2020-2025. The activities in the plan were evaluated in accordance with the requirements of the BSS and the RD 2001 (Article [72/1](#)). The evaluation is published on the [FANC website](#). The evaluation included a number of findings and recommendations for adjusting this action plan, such as developing new actions, adjusting existing actions, and developing tools to better monitor the effects of prevention and remediation.

2. Requirements of the European Directive 2013/59/Euratom

In application of Article 103 of the Directive [2013/59/Euratom](#), Member States shall establish a national action plan addressing long-term risks from radon exposures in dwellings, buildings with public access and workplaces for any source of radon ingress, whether from soil, building materials or water.

In Belgium, policy and regulations on ionising radiation are a federal competence, with the competent authority being the Federal Agency for Nuclear Control ([FANC](#)). Following the European and international recommendations, FANC has set up a national radon action plan that is in application since 2009. On the [FANC website](#), a specific dossier has been developed on this subject. The plan considers the activities and strategies (for surveys, communication, building protection, remediation, mapping, and management) to develop and put in practice, in order to achieve the general goal (reduce the exposure to radon of the population and workers). The action plan consists, on the one hand, of permanent items, such as strategy, definition of working areas and technical details, completed by variable items

such as actions which are updated for each period, according to the conclusion of the evaluation of the previous action plan

The existing regulatory framework is essentially published in the FANC [Law](#) from 1994, the [Royal Decree](#) of 20 July 2001, the [FANC Decree of 22 January 2022](#) and the [procedures and guides](#) published on the FANC website. The provisions concerning the radon action plan are included in Article [72/1](#) of the RD 2001. The provisions concerning radon in the workplace are included in [Article 4](#) of the RD 2001 (Occupational activities involving the use of natural radiation sources) and include a reporting obligation for radon concentrations and specific follow-up when the reference level is exceeded ([Article 9](#)). The reference level is set at 300 Bq/m³ ([Article 20.3](#)).

3. Objectives of the radon action plan

3.1. Introduction

Since 1990, a considerable effort has been made to determine the distribution of radon in dwellings, public buildings and workplaces in Belgium (early academic surveys in the late 1980 and early nineties (Vanmarcke et al., 1988; Poffijn and Vanmarcke, 1990)), SPRI (Protection Service against Ionizing Radiations) campaigns between 1995 – 2000 (Zhu et al. 1998)). These studies have demonstrated that there are specific radon risk areas on the Belgian territory.

Since 2005, detailed campaigns, in cooperation with different provinces, regions or municipalities have been organized in the areas most affected by radon as well as throughout the country (annual national radon actions since 2013). These campaigns are ongoing and are an important input for further remedial actions, statistics and mapping, and preventive initiatives (Dehandschutter et al. 2009; Cinelli et al., 2011).

3.2. Long-term objectives

- General protection of new buildings by limiting the design level of 100 Bq/m³ (*cf.* §6.2.1). This will reduce the collective dose and will lead to a substantial reduction of lung cancer incidence.
- Stand-still of the exposure situation in low-risk areas. Avoid the increase of the radon concentration due to a decrease in ventilation (low energy construction) or an increase in radium content in building materials.
- Aim for a radon distribution in the most affected areas to approach that of the low-risk areas. This will be assured by protective measures against radon ingress in new buildings and mitigation in existing buildings with high radon levels.

3.3. Short-term objectives

- Training of building professionals (for construction techniques and building material).
- Training of technical and administrative stakeholders.
- General prevention in the most affected areas, to reduce the population's exposure to radon (to reduce the collective dose).
- Trace and remediate all buildings with a radon concentration above and around the reference level (to reduce the individual dose). The number of affected buildings is estimated at around 36,000 dwellings and around 3,600 workplaces in Belgium.

3.4. Graded approach

In order to achieve the objectives of the radon action plan, a graded approach is followed focussing initially on the areas with the highest exposure, and gradually extending to areas and situations that are less exposed. The actions target the following main components:

- Regulations (fixing reference levels, defining radon management in dwellings and workplaces, guaranteeing external collaborations, etc.).
- Communication (raising public awareness and proactivity of stakeholders (publications, brochures, website, training, road-shows, webinars, etc.).
- Measurements and mitigation (different types of campaigns, data management, mapping, inspections, remediation, surveys).

3.5. Evaluation of the national radon action plan

In order to evaluate the effectiveness and impact of the national radon action plan, indicators are defined that quantify the effect of preventive- and remedial measures, inspections and measurement campaigns:

#	Indicator	Definition	Data Source	Target / Benchmark
1	Annual Radon Measurements	Number of radon tests conducted in homes and workplaces	Radonactie.be Actionradon.be Radonatwork.be	Approximately 3000 measurements per year with focus on Class 2 zones
2	Measurement Trend	Change in % of buildings exceeding 300 and 600 Bq/m ³	FANC radon database	Downward trend in high-concentration buildings
3	Remediating Actions Reported	Number of corrective measures taken in response to high radon levels	FANC reports, self-reporting	Increase over the NRAP periods
4	Effectiveness of Remediation	% reduction in post-remediation radon levels	Follow-up measurements	≥80% achieve safe levels (< 300 Bq/m ³)
5	Inspection Findings	% of inspected workplaces complying with standards	FANC workplace inspection reports	>90%
6	Preventive Effectiveness in New Builds	% of new buildings with radon below 100 Bq/m ³	Study by FANC	>90%
7	Public Awareness Metrics	Website visits, detector requests, campaign participation	FANC web analytics, campaign data	Increasing public engagement
8	Training Outputs	Number of professionals trained (e.g., architects, officials)	FANC, Buildwise, EMBUILD, training logs	1 training session per year
9	Geographic Coverage	% of high-risk municipalities covered by campaigns	FANC campaign planning	100% coverage in Class 2 municipalities in the NRAP period
10	Radon Map Updates	Frequency and quality of updates to the national radon map	FANC geodatabase (ArcGIS)	Annual updates with new geological/radon data

This information allows a detailed evaluation of the national radon action plan every 5 years. The present action plan is based on the conclusions of the [Evaluation of the Belgian National Radon Action Plan 2020-2025](#).

4. Strategy for conducting surveys (measurements)

Different types of surveys are organised either on a regular basis (annually) or ad hoc in specific situations when a risk is identified and a study is deemed necessary.

- In order to provide the Belgian population with the possibility to perform low-cost and easily accessible indoor radon measurements, a web-platform has been developed (www.actionradon.be).
- Indoor radon measurements for workplaces are available through the dedicated web-platform www.radonatwork.be.
- At specific requests or after having identified a specific situation, detailed measurement campaigns can be organised in collaboration with local authorities, municipalities, professional organisations, neighbouring countries, *etc.*
- Indoor radon measurement campaigns can be supplemented by soil sampling and/or soil-gas measurement campaigns.

Procedures, background information and guidelines are published on the FANC website www.fanc.fgov.be, for both professionals (workplaces) and general public.

5. Classification of the territory in radon classes (mapping)

FANC has published in the Official Gazette a decree ([FANC decree of 18 January 2022](#)) that classifies the territory in terms of the probability to exceed the radon reference level in buildings. This map is also available of the [FANC website](#) and in a specific [interactive web map](#). The 5 classes defined according to the reference level are:

- Class 0: less than 1% of the houses are above the reference level.
- Class 1a: between 1 and <2% of the houses are above the reference level.
- Class 1b: between 2 and <5% of the houses are above the reference level.
- Class 2a: between 5 and <10% of the houses are above the reference level.
- Class 2b: 10% or more of the houses are above the reference level.

Municipalities where the probability of exceeding the reference level of 300 Bq/m³ is above 5% are considered as radon prone areas (Radon Priority Areas - RPA).

In order to optimize the homogeneity of the statistical data, the classification of the Belgian's municipalities is made based on the radon's concentrations measures (in Bq/m³) that are done in the dwellings, in a living space on the ground floor. These measurements are done in the context of the different measurements campaigns organised by FANC.

For the specific purpose of radon prevention and protection measures in new constructions, a specific radon map has been developed. It represents on a 1x1 km grid the probability of exceeding within this square kilometre the reference level of 300 Bq/m³. This map allows local authorities and builders to check the building site or surroundings in order to identify the specific preventive measures to be applied. This map is available through the different radon websites and through a dedicated [interactive web map](#).

6. Regulation of radon risk management

6.1. Radon risk management in workplaces

FANC has published since 2012 specific [regulations and guidelines](#) for radon measurements in workplaces.

Based on the experience gained during radon measurement campaigns and inspections carried out between 2001 and 2010, the instructions are intended to help concerned employers to comply with current regulations.

The workplaces which have to measure the concentrations of radon and to introduce a notification dossier are the ones situated on a municipality classified in class 2 and listed in §6.1.3.

6.1.1. Reference level

The reference level is defined as the annual average radon concentration above which it is judged inappropriate to allow exposures to occur, even though it is not a limit that may not be exceeded. The reference level for radon in workplaces (and in dwellings) has been fixed at 300 Bq/m³. When reference level is exceeded, a notification has to be submitted to FANC, in application of articles 4, 9 and 20 of the radiation protection regulation ([RD 2001](#)). For the workplaces concerned, corrective measures have to be implemented, unless a risk analysis confirms that the maximum exposure level of 600 kBq/m³ is not exceeded.

6.1.2. Dose conversion coefficients

In order to estimate the (annual) exposure of the population to radon and the related risk, and to manage the health risks related to radon exposure in workplaces, it is necessary to calculate the time integrated exposure and to estimate annual doses resulting from radon exposure. In the EU BSS [2013/59/Euratom](#), this principle is specified in article 35.2, stating the necessity to manage radon in workplaces as a planned exposure (practices), if the exposure of the workers is likely to exceed 6 mSv/y. In order to make this assessment, doses received from radon have to be calculated, based on conversion factors from volumetric radon concentration to time integrated exposure and dose. These dose conversion factors are set by international organisations and committees such as the United Nations Scientific Committee on the Effects of Atomic Radiation ([UNSCEAR](#)), the National Academy of Sciences Biological Effects of Ionizing Radiation ([BEIR](#)) and the International Commission on Radiological Protection ([ICRP](#)).

Belgium (FANC) uses the dose conversion factors published in [ICRP 137](#). In short, the dose coefficient in most indoor exposure situations corresponds to 6.7 10⁻⁶ mSv (Bq h m⁻³)⁻¹. For a workplace,(with a

yearly working time of 2000 h and equilibrium factor $F=0.4^1$), this implies that $1 \text{ mSv} = 80 \text{ Bq/m}^3$ (and 6 mSv corresponds to $\sim 450 \text{ Bq/m}^3$).

6.1.3. Identification of workplaces

Radon measurements have to be carried out in specific workplaces in the municipalities classified in Class 2 (more than 5% of probability to exceed the reference level of 300 Bq/m^3). The measurement protocol and the declaration of the measurement results to the competent authority (FANC) are specified in [guideline documentation](#) on the website and in a [specific document](#). The employer, responsible for the measurements in the workplaces, can order the radon detectors directly through the website www.radonatwork.be, or through the list of radon measurement service providers registered at FANC and published on a [list on the FANC website](#).

In the first place, the following priority workplaces have to measure and report radon concentrations:

- [Educational institutes, day-care centres, medical centres.](#)
- [Public buildings \(post, provinces, municipalities, police, libraries\).](#)
- [Underground workplaces \(galleries and caves open to the public\).](#)
- [Water treatment facilities.](#)

The number of affected workplaces is estimated at around 3,600, or 10% of the affected dwellings (High Health Council 2017). The reference level for radon is an optimisation tool. It is used in particular in workplaces to guide the graded approach to radiation protection. The legal maximum limit level of radon exposure, as specified in [Article 20.3](#) of the regulation on radiation protection (RD 2001), is 600 kBq/m^3 per year. This means that an employee who is exposed to more than 300 Bq/m^3 (reference level of radon concentration) for 2000 hours per year (approximately a full-time job) exceeds the exposure limit and is subject to a reporting obligation and corrective measures ([Art. 9](#) RD 2001).

6.1.4. Corrective measures

If an employer reports that the reference level has been exceeded in a declaration, he is required to implement corrective actions, either directly by reducing the radon concentration (measures such as ventilation of basements or crawl spaces, depression of the basement, installation of controlled mechanical ventilation systems, etc.), or by taking an intermediate step in the form of a risk analysis intended to calculate the different exposure scenarios for workers (Articles 4 and 9 of RD 2001). The latter usually requires a measurement campaign in the workplace premises by active and continuous radon monitors. Guidelines are published on the [FANC website](#).

6.1.5. Assignment of responsibilities

FANC is responsible for the protection of the workers against the effects of ionising radiation (RD 2001, Art. 4, 9, 20.3) on the Belgian territory. Therefore FANC is the competent authority for all matters relating to radon, particularly measurements, follow-up, declarations and inspections in the workplace. FANC ensures that radon measurements in workplaces, reporting of the results, and

¹ The equilibrium factor F is a measure of the disequilibrium which exists between the radon gas and its decay products due to ventilation and deposit on surfaces.

implementation of remedial and corrective measures related to the possible high exposures take place, and sets out responsibilities by the following means:

- Regular meetings with local employers such as municipalities, regional authorities, provinces.
- Joint campaigns with the services for prevention and protection at work (Health&Safety).
- Awareness campaigns for trade unions.
- Consultation with umbrella organisations in healthcare (residential care centres, hospitals), education, water extraction, and notaries.
- Information campaigns through road-shows, professional fairs and exhibition events, mailings, bilateral contacts.
- A yearly inspection program setting out the strategy and procedures to inspect compliance with the regulations of the targeted workplaces.
- Periodic consultation with Mayors/managers of municipalities of radon class 2.
- For institutions that receive members of the public, discuss the legislation relating indoor air quality.

Guidance for the different involved parties and stakeholders is provided through information about the [regulatory system](#), the [procedures for measurements](#) the [procedures for declaration/notification of measurement results](#), measurement [service providers](#), and [technical assistance](#) for implementing corrective measures. The information is also available through dedicated brochures available from local stakeholders (medical, preventive, local authorities, etc.) and on the [FANC web site](#).

6.2. Radon risk management in dwellings

6.2.1. Reference level

The reference level for radon concentrations in dwellings is based on the information available from different surveys on the territory. It is important to note that it serves as a tool for optimisation of the protection of the public (and the workers). The reference level for dwellings and for workplaces is 300 Bq/m³.

Exposure levels should be optimised both in buildings where concentrations are below this reference level and in those where it is exceeded, in order to reduce exposure to as low a level as reasonably achievable (ALARA) and to move towards the target of 100 Bq/m³.

(Fig. 1).

Above the reference level, 600 Bq/m³ is defined as the intervention level, above which corrective measures have to be put in place as soon as possible. Above the reference level, FANC provides detailed information on remedial actions and offers free control tests (detectors) to evaluate the effectiveness of remediation.

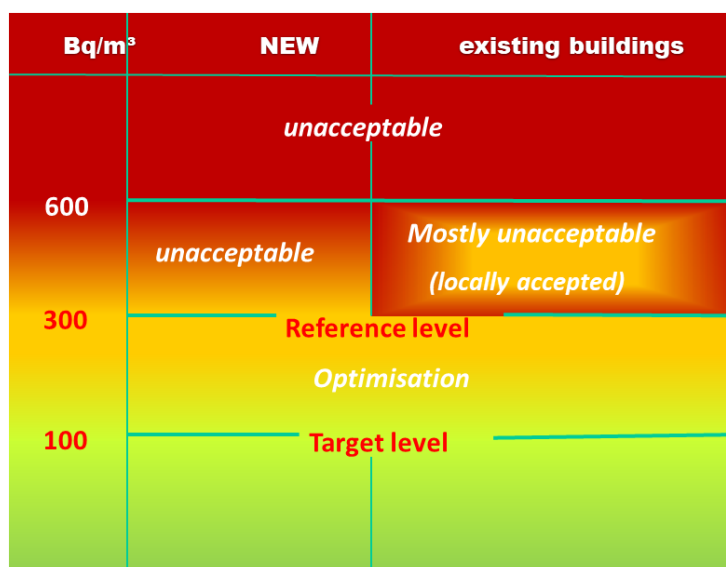


Fig. 1 The use of the reference level as a tool for optimisation of the radiation protection.

For new buildings, the target level is 100 Bq/m³, which no new building should in principle exceed, provided that the correct preventive measures have been implemented.

Based on the available data from the radon surveys, the distribution of radon concentration in Belgium is as follows:

Table 1. Average radon exposure of the Belgian population (population data for 2010). AM: arithmetic mean, MED: median, GM: geometric mean, GSD: geometric standard deviation. Values are in Bq/m³. RPA: radon prone areas. % gives the percentage of single family houses above the indicated radon concentration (in Bq/m³).

	Population	dwellings	AM	MED	GM	GSD	% >100	% >200	% >300	% >400	% >800
Belgium	10584534	3742000	57	44	46	1.7	10.0	2.1	0.9	0.6	0.2
Wallonia	3435879	1325000	84	60	75	1.7	26.0	4.5	2.6	1.6	0.4
Flanders	6117440	2191000	44	37	36	1.2	3.2	0.1	0.05	0.0	0.0
Brussels	1031215	226000	44	37	36	1.2	4.0	0.1	0.1	0.0	0.0
RPA	376568	130000	220	127	137	1.9	43.0	33.0	17.0	13.0	4.3

Based on this information, the number of buildings affected by the different radon concentration levels can be estimated as follows:

Table 2. Estimate of the number of dwellings (single family houses) in the different categories of radon exposure (Bq/m³).

	dwellings	>100	>200	>300	>400	>800
Belgium	3742000	360000	84000	36000	21000	5600
Wallonia	1325000	280000	79000	35000	21000	5600
Flanders	2191000	70000	some	some	0	0
Brussels	226000	9000	5000	some	0	0
Radon prone areas	130000	56000	43000	22000	17000	5500

The number of dwellings exceeding the level of 300 Bq/m³ is around 36000. These data were published in 2017 by the [Superior Health Council](#).

6.2.2. Assignment of responsibilities

FANC is the competent authority for the protection of the population and the environment against ionizing radiation in the event of exposure to radon ([Art. 1](#) of RD 2001). One of its tasks is to control the dose due to radon received by the population ([Art. 70](#)) and to reduce these doses, if necessary ([Art. 20.2](#) and [72/2](#)). Therefore, FANC's mission is to act as the coordinating authority and to help organize activities aimed at implementing the regulations, complying with the obligations and raising awareness of the actors involved in radon. Therefore FANC strives for close collaboration with the following actors: the federal and regional public services responsible for Employment, Health, Housing and Environment, the provinces, the municipalities, professional organizations (in the medical field, prevention services, construction professional organisations, etc.), academic and institutional organizations (universities, Scientific and Technical Center for Construction - BUILDWISE, construction federation – EMBUILD, the Belgian Nuclear Research Centre - SCK-CEN, National Institute of Radioelements - IRE, etc.), foreign and international organizations (European Union - EU, Dutch Authority for Nuclear Safety and Radiation Protection - ANVS, German Federal Office for Radiation Protection - BfS, French Nuclear Safety Authority - ASNR, Heads of the European Radiological protection Competent authorities - HERCA, European Radon Association - ERA, International Radiation Protection Association - IRPA, Joint Research Centre - JRC, etc.) and the general public.

The coordinating role of FANC is important in order to centralise all radon actions and to ensure consistency in approaches, messages, measures and interventions throughout the territory. In addition, this ensures compliance of all actions with the recommendations and current conclusions of international bodies in the field of radiation protection. Centralized coordination is the only way for good management and statistical and scientific analysis of all data relating to radon (screening measures, control measures, remediation, cartography, epidemiology, etc.).

Guidance for the different involved parties and stakeholders is provided through information about the [regulatory system](#), the procedures for [measurements](#), measurement [service providers](#), and technical assistance for implementing [corrective measures](#). The different information is also available through dedicated brochures available from local stakeholders (medical, preventive, local authorities, etc.) and on the [FANC web site](#).

6.2.3. Remediation of existing buildings

In the framework of the annual radon measurement campaigns (www.actionradon.be), home-owners are encouraged to carry out remedial actions using the following approach:

- Proposal of remedial actions for measurements around the reference level, through [brochures](#) and the publication of a list of [trained radon professionals](#).
- Proposal of radon inspection and diagnostic services by FANC in collaboration with local authorities for all measurements exceeding 600 Bq/m³ (cf. §6.2.1).
- Proposal of free control measures after remedial actions (cf. §6.2.1).
- Financial intervention by the [regional government](#) for remedial actions.

In order to increase the number of measurements and (effective) remediations, the following additional actions will be taken as part of this action plan:

- Conducting a survey on remediations (types, effectiveness, obstacles, etc.).
- Developing guidance on various remediation techniques.
- Developing a tool for monitoring remediation measures (database).
- Raising awareness in the health sector through general practitioners and continuing medical education programmes.
- Raising awareness through programmes aimed at school pupils.
- Communication initiatives (see §7).

Above the reference level, in the case of existing buildings, sometimes it will be impossible or too difficult to reasonably reduce the radon concentration below the reference level. In such cases, evaluated on a case-by-case basis, exposure situations can be locally accepted (Fig. 1). Finally, for communication purposes, the reference level can be represented on a continuous scale ranging from low risk to high risk (Fig. 2).

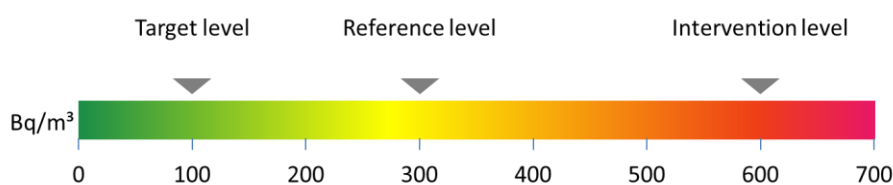


Fig. 2. Radon Reference level on a continuous scale from low health risk to high health risk.

6.2.4. Prevention in new buildings

The protection of new buildings against radon ingress is very important in order to achieve the general long term objectives of the radon action plan. In order to prevent radon ingress in new dwellings, awareness campaigns are organised to inform the public on the radon risk and on the protective measure to take during the construction of the building. Besides informing the public by [publications](#), and [interactive mapping](#) applications, training of building professionals and local governmental administrations is essential. Including regulations on radon protection in the building codes, a regional competence, is essential in order to implement radon protection in a structural and sustainable way. Concertation with the regional authorities on the implementation of these protective measures in the building codes is essential in attaining the goals. The regional construction code of the Walloon Region requires that the building permit application includes a description of the protective measures against radon planned by the responsible architect (Case 6 in [Annex 4](#) of the [Walloon Building Code](#)).

To gain a better understanding of preventive measures, this plan specifically provides for:

- conducting a study (survey) on the level, effectiveness and techniques used in preventive measures in the various risk zones.
- a more thorough training of construction professionals thanks to the use of new teaching techniques such as e-learning modules and webinars.

6.3. Radon from building materials and from drinking water

Radon coming from building materials is managed through the regulatory framework for radioactivity in building materials ([Royal Decree](#)). The Activity Concentration Index, which limits concentrations of Ra-226 (300 Bq/kg), Th-232 (200 Bq/kg) and K-40 (3000 Bq/kg) in all building materials, guarantees low radon levels (around 100 Bq/m³ or lower) inside dwellings under normal ventilation conditions. Similarly, limiting the radon concentration in drinking water (limit of 100 Bq/l, [2013/51/Euratom](#)) will guarantee low radon levels (around 100 Bq/m³ or lower) indoor under normal ventilation conditions.

7. Raising public awareness, communication and stimulating proactivity

7.1. Communication Plan

A communication plan has been defined by FANC in 2014, aiming at effectively inform the public, workers, employers and building professionals and to communicate essential messages stimulating the stakeholders to measure, mitigate and protect themselves, their families, and their employees. Communication with specific professional target groups such as lung-cancer specialists, general practitioners, architects, building research and administration, etc. aims at progressively inform and stimulate protective/preventive activities.

Specifically, the following points will be addressed in this 2026-2030 action plan:

- The communication plan will focus on aspects related to increasing the involvement of the various target groups. More measures must be taken to encourage remediation and prevention, not only among the population, but also in the construction sector and among the competent authorities (regional, local).
- Interactive communication will be strengthened, in particular through webinars, information evenings, presence at trade fairs and events, etc.
- Increase the role of social media and try to reach specific target audiences.
- Distribute awareness-raising material (texts, brochures, webinars, etc.) to municipalities for the information of residents and building applicants.
- New information campaign targeting mayors of radon class 1 and 2 municipalities.

7.2. Interaction with the indoor air quality programme

The overall management of Indoor Air Quality and related requirements include radon as a pollutant and human carcinogen, and are treated in the [Advice 8794](#) document of the Superior Health Council published in 2017.

Consideration will be given to strengthening cooperation with indoor air quality programmes run by the Regions (FPS Public Health, Flemish Care Department, SPW Environment, Brussels Environment).

7.3. Public Awareness

Increasing awareness about the risks and solutions related to radon exposure among the public, the workers, the employers and the relevant professionals is essential. Specific actions on this subject are defined in section §7.1.

7.4. Training programmes

Details on training courses for professionals such as architects, builders, medics, local authorities, specific students etc. are published annually on the FANC website.

7.4.1. Building professionals

Specific teaching material has been developed in collaboration with the Belgian Building Research Institute ([BUILDWISE](#)) and training courses are organised as part of a collaboration between [FANC](#), [BUILDWISE](#) and the Walloon building confederation [EMBUILD](#). The building professionals who have received specific training on radon and who are active in the radon field are [listed on the FANC website](#).

As part of this action plan, new training tools will be developed and implemented:

- Webinars
- Online learning modules
- Participation in continuing education programmes

7.4.2. Administrations

Local administrations (regions, provinces, municipalities, school administrations, prevention advisors, labour inspection, occupational medicine, etc.) are being trained and informed during specific workshops, meetings or conferences, and webinars.

8. Data management

In order to evaluate, monitor and map the exposure of the Belgian population, all the measurement results, as well as effectiveness of mitigation and protection measures have to be documented, managed and archived in an appropriate and effective database management system. Currently, data are managed in a geodatabase allowing for regularly updated radon maps and statistics. The radon action plan strives for the development and implementation of a performant data base management system that links all the available information concerning radon in Belgium and that allows a thorough and detailed analysis and evaluation of the effectiveness of the Belgian radon Action Plan.

9. Conclusions

The following actions are planned and published annually in order to achieve the objectives of this action plan:

- Organisation of training courses.
- Information and measurement campaigns in dwellings and workplaces.
- Monitoring radon activity in water and building materials.

In practice, these actions translate into :

- Reinforced collaboration with the Walloon Government concerning the Walloon regional action plan and the demands of BSS 2013/59/Euratom Art. 103 regarding new building protection.
- Training courses for building professionals in collaboration with the involved organisations.
- Organisation of the National Radon Action in October (www.actionradon.be), encouraging the public to measure and mitigate, supported by press releases and road shows.
- Participation in construction trade fairs to raise awareness of the dangers of radon.
- Measurement campaign in workplaces (www.radonatwork.be).
- Round table and webinar sessions for occupational physicians and prevention advisors.
- Refining and updating the radon mapping in high risk areas based on new measurements carried out in the subsoil (geology, karst, ...).
- Evaluation of radon in water and building materials, measurement campaigns.
- Continuous evaluation of changes in building techniques (low energy building, ventilation,...) on the indoor radon concentrations.
- Update, if relevant, of the regulatory documents : Royal Decree, FANC Decree, FANC procedures, recommendations and Specifications.
- Continuous international collaboration with the neighbouring countries (FR, LU, GE, NL) for mapping, harmonisation and public awareness, as well as with international organisations (HERCA, JRC, ERA).

Furthermore, within the framework of this action plan, specific work will be carried out on

- Developing an online tool for monitoring corrective measures.
- Conducting a survey (questionnaire) on corrective measures.
- Conducting a survey (questionnaire) on preventive measures.

10. References

2013/51/Euratom Council Directive of 22 October 2013 laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption.

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11. Glossary

ALARA: As Low As Reasonably Achievable

ANVS: Dutch Authority for Nuclear Safety and Radiation

ASNR: French Nuclear Safety and Radiation Protection Authority

BEIR: National Academy of Sciences Biological Effects of Ionizing Radiation

BfS: German Federal Office for Radiation Protection

BUILDWISE: Scientific and Technical Center for Construction

EMBUILD: Walloon Building Confederation

ERA: European Radon Association

FANC: Federal Agency for Nuclear Control

HERCA: Heads of the European Radiological protection Competent authorities

ICRP: International Commission on Radiological Protection

IRE: National Institute of Radioelements

IRPA: International Radiation Protection Association

JRC: Joint Research Center

SCK CEN: Belgian Nuclear Research Centre

SPRI: Protection Service against Ionizing Radiations

EU: European Union

UNSCEAR: United Nations Scientific Committee on the Effects of Atomic Radiation