



**RadoNorm**  
Managing risks from radon and NORM

## NEW CITIZEN SCIENCE PROJECTS TO STIMULATE RADON REMEDIATION

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- **RadoNorm European Project: “Towards effective radiation protection based on improved scientific evidence and social considerations - focus on radon and NORM”**
- Aim: To reduce uncertainties in the field of scientific, technical and societal knowledge with regard to Radon and NORM
- **WP6: Societal Aspects** – includes a task dedicated to
  - **The establishment of a citizen science incubator for radon prone areas and establish a network of citizen science projects to address radon testing and mitigation**
    - Pilot Projects to elaborate, test and evaluate Citizen Science Models
    - Open Call to create a network of Citizen Science Projects
    - Develop recommendations for empowering CS initiatives

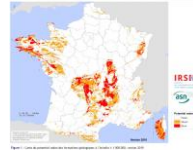


## Pilot projects: France, Ireland, Norway

- Each one has a specific rationale and objective
- Different levels of participation across the 4 pilot initiatives
- Different target groups depending on the country:
  - Citizens who have not tested
  - Citizens who have tested but did not remediate
  - Interested individuals
- All countries have assessed in advance the compliance of the Project with ECSA 10 principles
- Involvement of local authorities, experts and industry (and communication experts from and outside RadoNorm)

- **Context:**

- Low diagnosis & remediation rates in France after radon measurement campaigns
- Key reasons: lack of diagnosis /remediation professionals, costs, psychological aspects



- Development of a “Buildings self-evaluation tool”

- Available on line on a website dedicated to radon (<https://jurad-bat.net/>)
- Provides users a guide to describe their house and identify the potential radon pathways
- Provides recommendations for remediation actions



- Feed-back from some users of the building self-evaluation tool:

- Sometimes complex to use/understand for non-experts
- Improvements needed in the design and features of the tool

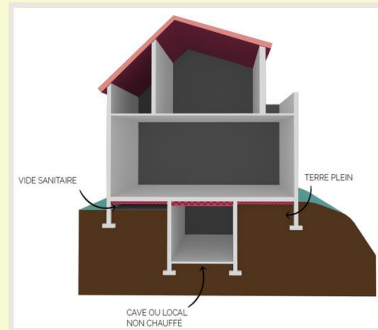


## Exemple of self-evaluation tool questions

1. Identify radon infiltration pathways from the ground into the building

Is there a crawl space in the basement of your building?

OUI  NON



*Les différents types de soubassement (©jurad-bat)*

*Vide sanitaire, cave en terrain naturel, sous-sol enterré ou semi-enterré et construction sur terre-plein*

If Yes : 5 actions are detailed

1. Ventilate the crawl space
2. Isolate the access hatch
3. Put the crawl space in overpressure
4. Put the crawl space in depression

- **Why a Citizen Science Project ?**

- Recognizing that the common knowledge and perception of end-users is essential
- Need to create places of dialogues and experience sharing between citizens and expert (mutual learning)

- **Objectives of the pilot project**

- Co-construction of the **specifications for an effective and user-friendly self-evaluation tool**, to be used by inhabitants **to guide the diagnosis and remediation actions** after a radon measurement in their home

- **Main Partners**

- Building/radon experts who built the first content of the self-evaluation tool (CEREMA, HEIA)
- Pays de Vesoul-Val-de-Saône : A Group of municipalities that implemented radon measurement campaigns in 2019 and 2020
- Regional branch of “Atmo” association (network for indoor air quality and radon will be in charge of the Jurad-Bat website and the tool from July 2022)

## ● Target Group of Citizens – Recruitment mode

- Contact of a group of inhabitants (N=170) from Pays de Vesoul-Val-de-Saône, who made measurements in their home during winters 2019 and 2020.
  - Invitation to participate to the project, sent together with a synthesis report of the measurement campaign
- Objective : N=10 Citizens

## ● Co-construction process

- Citizen Science Project “level 3: participatory research”
- Citizens invited to test the tool and complete an evaluation questionnaire
  - Understanding of the questions, technical information, recommendations integrated in the tool
  - Perception of the global layout of the tool, the design aspect, ...
  - First proposal for improvements, next steps, ...
- 2 to 4 local in persons meetings bringing together citizens and experts to further elaborate the specifications for the tool evolution
- 1 (or more) building diagnosis ‘in the field’ by an expert to compare with the tool diagnosis process (tool vs. human expert)



## ● Challenges / issues

- Finding citizens volunteering to take part in the Citizen Science project
- Investment in time from the citizens and potential erosion of the motivation => 'only' 2 meetings as a first step
- Finding an adequate timing for the expert and citizens to meet => proposal for evening on week days
- Considering the replicability (or not) of the evaluation tool in other contexts/countries

## ● Next Steps

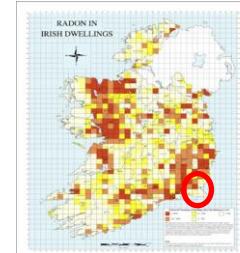
- May – July 2022: Creation of the group of citizens, test of the tools and technical meetings
- September 2022: (1) Feedback from the CS pilot project and (2) Finalisation of new specifications
- Study of the possibilities of a new citizen science project in 2023 to pursue the tool evaluation
- A potential development of the tool in 2023 with adaptation to other countries



# Pilot Project in Ireland /1

- **Context**

- Testing location: County Wexford – radon priority county
- ~500 homes tested above 200 Bq/m<sup>3</sup>
- ~400 of these not yet remediated
- **Target Group:** Citizens who borrow digital monitors in any of the 5 Wexford libraries and find high levels but have not yet remediated



- **Why a citizen science project?**

- Opportunity for citizens and radon experts to work together on a Do-It-Yourself (DIY) approach for remediation
- Build on the partnership between EPA, radon contractor, Wexford local authorities, local libraries and Healthy Wexford group



- **Research Questions / Objectives**

- To co-create a “toolkit” (name to be defined jointly)
- To establish if a DIY approach increases remediation rates
- In parallel, to increase awareness of radon and remediation within a community through the availability of monitors and remediation toolkit

- **Target Group of Citizens – Recruitment mode**

- Volunteers from a focus group organised Q1 2022 to identify barriers and facilitators to remediation
- Organisation of a public meeting in a Wekford Library to promote the loan scheme of digital monitors

- **Co-construction process**

- Citizen Science Project “level 3: participatory research”
- Citizens will be invited to :
  - Participate in a workshop to co-design the DIY toolkit,
  - Test the DIY toolkit in their homes;
  - Provide feedback on how it can be improved.

## ● Toolkit content :

- Information for householders about remediation options
- The materials needed to install an active radon sump to remediate a home (fan, pipe, cover etc)
- A video for householders setting out, step-by-step, how to use this radon sump activation kit to complete a ‘do-it-yourself’ remediation
- Professional support of a radon contractor
- Other supports to be identified by citizen scientists
- Two passive detectors to confirm that radon levels have been reduced following remediation



- **Challenges / key issues**

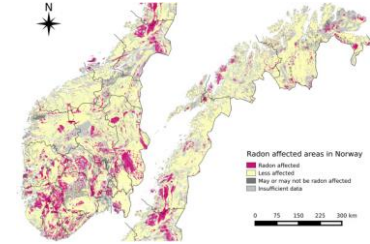
- Finding citizens to take part in the Citizen Science project => organisation of public meeting delayed due to COVID context.
- Investment in time from the citizen scientists and potential erosion of motivation to use a DIY approach to remediation.

- **Next Steps**

- May-July 2022: Public meeting to recruit a group of citizen scientists
- Aug-October 2022: Workshop & test of the toolkit, collect of feedback
- New toolkit provided by end of year 2022

## ● Context

- 21% of the population has tested radon in private homes
- Municipalities are responsible for local information and can offer measurements to locals at discount rate
- Barriers to remediation: cost, difficulty in finding a professional, lack of knowledge about mitigation measures and their effectiveness



## ● Partners

- Norwegian University of Life Sciences (NMBU)
- DSA (Norwegian Radiation and Nuclear Safety Authority)
- Gjøvik municipality, city lab, environmental health group and local library

- **Objectives of the Project**

- To increase awareness on radon
- To increase measurement and remediation rates
- To investigate how citizens want to be involved in radon matters

- **Approach for the Citizen Science project**

- A Citizen Science Project level 4 : Bottom up approach to let people define the citizen science project themselves
- The pilot project will start with an open workshop at the local library, where citizens will be invited to discuss the barriers to remediation and decide what the scope of the project will be.
- Citizens will be invited to choose to what extent they would like to be involved in the actions identified to improve remediation

Radon-prosjekt på Gjøvik



- **Challenges / key issues**

- Recruiting citizens volunteering to take part to the Citizen Science project
  - ⇒ Call for participation launched on the website
  - ⇒ Press-release to be distributed to local news channels
  - ⇒ Organisation of public meetings under preparation

- **Next Steps**

- May 2022: promotion and recruitment of citizens
- End of May - beginning of June 2022: public meeting
- June-October 2022: follow-up meetings if needed (TBD by the citizens)

- **Citizen Science Projects** to improve radon testing and remediation:
  - A rather long process to built a meaningful projects with high level of citizen contribution
  - Cooperation with various actors is essential (researchers, radon experts, authorities, local actors, ...)
  - The recruitment of citizens is not so easy to organise, furthermore during a pandemic period!
- Next month will allow **to test on the field the contribution of citizens** and the benefits of these contributions for the elaboration of remediation tools or processes
- Lessons learned from these projects will be used **to develop further citizen science initiatives** related to radon exposure, notably in the context of the Open Call for Projects that will be launched by RadoNorm by the end of 2022.



**THANK YOU  
FOR YOUR  
ATTENTION**

