



# CANADIAN RADON STRATEGY AND ACTION PLAN

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# Overview of the Presentation

- Background
- Cross jurisdictional roles and responsibilities
- Regulation of radon exposure to nuclear energy workers
- Regulation of radon in NORM industries
- National Radon Program
- Achievements and next steps

# Background

- Evidence of lung cancer risk from large epidemiological studies
- Updated WHO and ICRP recommendations for risk assessment and management
- IAEA GSR Part 3, 2014

# Roles and Responsibilities across Canadian Jurisdictions

- Canadian Nuclear Safety Commission (CNSC):
  - radon exposures of nuclear workers (i.e., uranium mines/mills)
- Canadian provinces and territories:
  - workers in NORM industries
  - public health and priorities for action
- Health Canada (HC):
  - National radon strategy

# CNSC – Radon Exposure in Nuclear Workers (1)

- Regulation of uranium mines and mills falls under the jurisdiction of the CNSC
- Radiation protection requirements within *Radiation Protection Regulations (RPR)*
- Current RPR unique treatment of radon progeny (working level; working level month)

# CNSC – Radon Exposure in Nuclear Workers (2)

- Proposed revisions to the RPR:
  - removal of direct reference to radon, radon progeny, working level, working level month
  - current calculation of radon progeny dose to be replaced with new proposed ICRP approach
  - separate consultation on any new dose coefficient
  - CNSC research projects

# CNSC – Radon Exposure in Nuclear Workers (3)

- CNSC-funded study assessed:
  - effect of environmental factors on dose from radon progeny
  - whether the dosimetric approach is feasible at Canadian uranium mines
- Conclusions:
  - dosimetrically relevant data is limited
  - suitable commercial (off-the-shelf) equipment is not currently available
  - uncertainties associated with the implementation of a fully dosimetric approach

# Provinces and Territories: Workers in NORM Industries (1)

- Canadian Guidelines for the Management of NORM (2013):
  - basic principle “same radiation protection standards as for CNSC regulated activities”

Average Annual Concentration	NORM Program Classification
800 – 3000 Bq/m <sup>3</sup>	Radiation Protection Management
200 – 800 Bq/m <sup>3</sup>	NORM Management
Background – 200 Bq/m <sup>3</sup>	Unrestricted



# Provinces and Territories: Workers in NORM Industries (2)

- NORM Program Classification:
  - unrestricted – public dose less than 0.3 mSv/a and worker dose less than 1 mSv/a
  - NORM Management – public and worker doses exceed the 0.3 mSv/a investigation threshold
  - Radiation Protection Management – worker doses exceed 5 mSv/a (formal RP program)  
*In comparison 200 Bq/m<sup>3</sup> ~ 1.4 mSv/a (HC guideline)*

# HC – National Radon Program (1)

- Established to support the implementation of the 2007 guideline of 200 Bq/m<sup>3</sup>
- Developed in collaboration with the Federal, Provincial, Territorial Radiation Protection Committee (FPTRPC)
- National Radon Program is a five component program launched in 2007

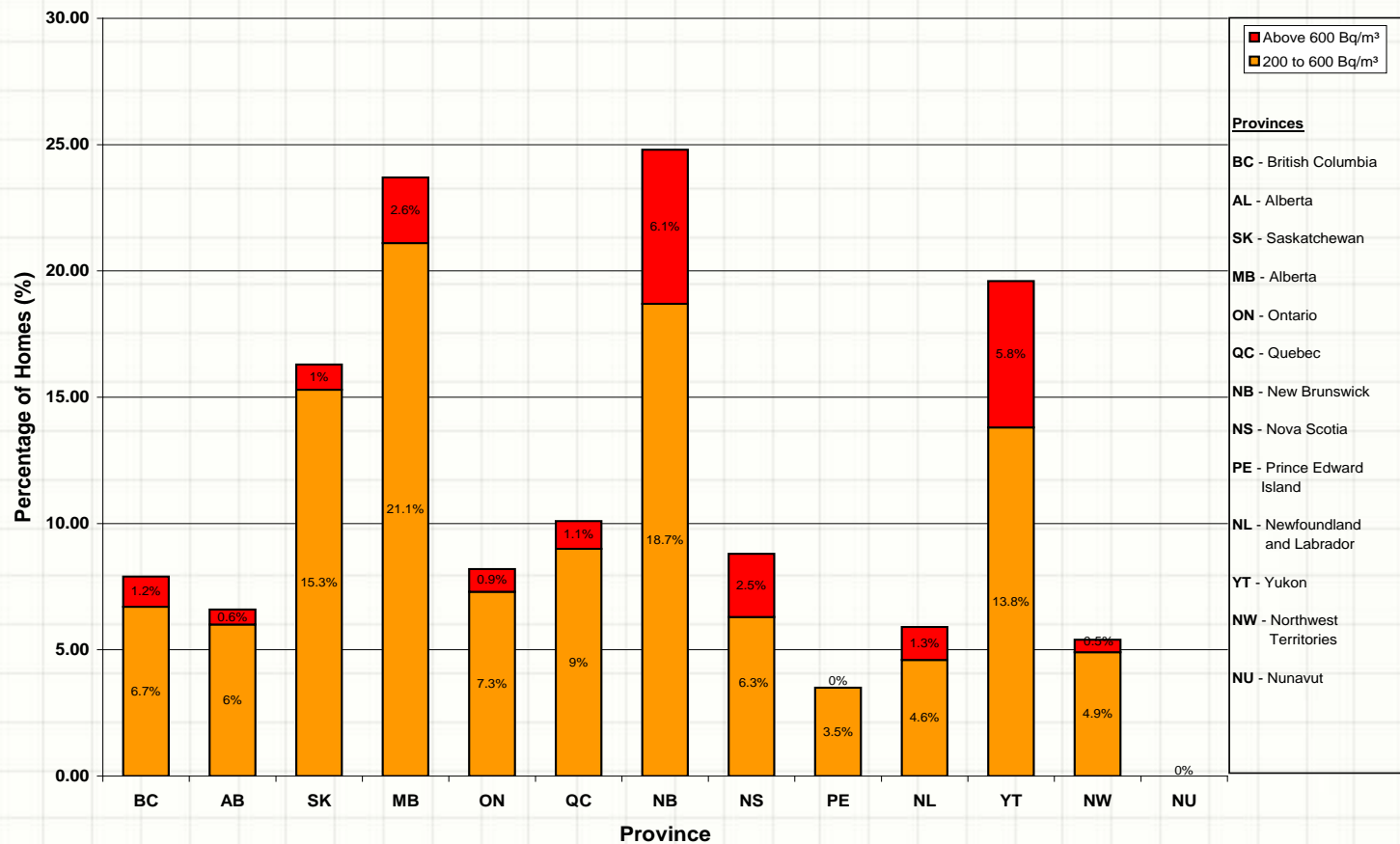
# HC – National Radon Program (2)

- Five components of the program:
  1. Establishment of a national radon laboratory
  2. Radon testing projects
  3. Development and maintenance of a radon database and mapping of radon potential areas
  4. Radon research
  5. Development and implementation of a radon education and public awareness strategy

# HC – National Radon Program (3)

- National Radon Laboratory:
  - Primary function – testing and analysis for HC; technical advice to provinces, territories and the public
  - Achievements:
    - two technical guides (homes and public buildings)
    - radon mitigation guidance document
    - recommendations for revisions to the Canada Building Code
    - Canadian certification Program for radon measurement and mitigation professionals and laboratories
    - several large surveys including a cross-Canada residential survey (roughly 14,000 homes) and more than 15,000 Federal buildings tested

# Percentage of homes exceeding 200 Bq/m<sup>3</sup>



# HC - National Radon Program Achievements (1)

- Two National Standards for Canada:
  - Radon Control Options for New Construction in Low Rise Residential Buildings - CAN/CGSB149.11
  - Radon Mitigation Options for Existing Low Rise Residential Buildings - CAN/CGSB149.12

# HC - National Radon Program Achievements (2)

- Canadian National Radon Proficiency Program (C-NRPP) (launched in April 2012):
  - 155 measurement certifications, 77 mitigation certifications, 11 Analytical laboratory certifications
  - ~10 trainers providing C-NRPP approved courses
  - C-NRPP adheres to Health Canada measurement/mitigation protocols. EPA/ASTM documents are referenced for QA practices or as necessary in mitigation practices.

# HC National Radon Program – Research

- Field studies to assess efficiency of Active sub-slab depressurization (ASD) options
- Residential Mitigation Actions Follow-up study
- Refinement of lung cancer risk estimates
- Burden of lung cancer vs mitigation in homes with radon above guideline of 200 Bq/m<sup>3</sup>
- Mitigation research in conjunction with National Research Council partners



# HC National Radon Program – Education and Public Awareness (1)

- Radon outreach in 2013:
  - 1st annual Radon Action Month
  - health promotion campaign with Dr. Roberta Bondar
  - accredited on-line continuing education (CME) course on radon for health care professionals
  - radon reduction guide for Canadian homeowners
  - radon outreach through Canada Post (Smartmoves)
  - “Distribution of Radon: Another Reason to Quit” fact sheet sent to doctors offices
  - events and conferences

# HC National Radon Program – Education and Public Awareness (2)

- Radon outreach activities 2008-2014:

Years	Outreach Events	Brochures Distributed	Public Inquiries	Web – Pages Views
2008/09	32	0	212	15,000
2009/10	73	166,000	471	23,000
2010/11	71	183,000	759	34,000
2011/12	89	401,000	12	50,000
2012/13	96	900,000	1022	102,000
2013/14	113	1,038,000	790	122,000

# HC National Radon Program – Education and Public Awareness (3)

- 2014 and beyond:
  - Continue to do outreach activities that are working:
    - Post Canada Smartmoves program to new homeowners
    - outreach to health care professionals – physician hotline and CME course
    - Radon Action Month - November
    - targeted outreach to ‘at risk’ populations (smokers, young families, high radon level regions)
  - Grassroots level approach:
    - provinces / municipalities /health authorities
    - health professionals
    - industry – building / construction, real estate

# Conclusions and Next Steps

- Federal, provincial and territorial programs and guidance are well aligned with WHO recommendations and IAEA BSS
- Implementation of ICRP proposed approach to radon dose calculation is being assessed. At the current low radon exposures in Canadian uranium mine workers this is not a high priority area and will require consultation with stakeholders

# For More Information

- Health Canada

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