



Strål
säkerhets
myndigheten

Swedish Radiation Safety Authority

Survey on skills supply and needs – where do we go?

Klara Insulander Björk, research unit, SSM



Audience interaction

I'll ask you a question, please respond with a gesture...

Have you heard about SSM:s work with national skills supply and needs ("nationell kompetensförsörjning") before?



No



Yes, and I wonder if I will
ever see any results of it

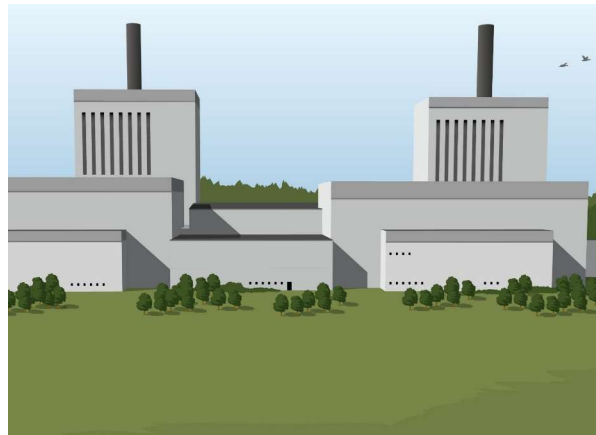


Yes, and there seems to be
some promising progress



Tasks related to national skills supply

- Instruction in the regulation (förordningen) 2008:452
 - "SSM shall contribute to the development of national skills [...] within the agency's area of responsibility."
 - "The authority shall therefore take initiatives for research, education, and studies."
 - Areas of responsibility: Nuclear power, healthcare, etc.
- Government assignments
 - 2018, 2020, 2023, 2024
 - Directed towards nuclear power, especially lately



National skills supply - goals

- **Long-term goal:** A sufficient number of individuals with *radiation safety–related competence* to ensure that all activities are conducted safely

Sub-goals:

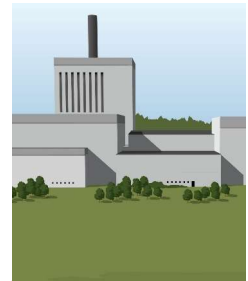
- Overview of competence needs and educational capacity
- Adapted educational capacity
- Interest in studies and work within radiation safety
- Prerequisite 1: Viable research environments
- Prerequisite 2: Collaboration between stakeholders



Mapping of competence needs

- Only *radiation related* competence needs (not welders, cleaning personnel etc.)
- Competence needs within all sectors

- **Nuclear power**
- Medicine
- Others

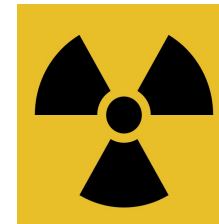


- Competence needs today and in 3 and 10 years' time, taking into account:
 - Different scenarios (for the nuclear power sector)
 - Competence area (several in each sector)
 - Educational level
- Survey sent out to 568 stakeholders (34 within nuclear power)



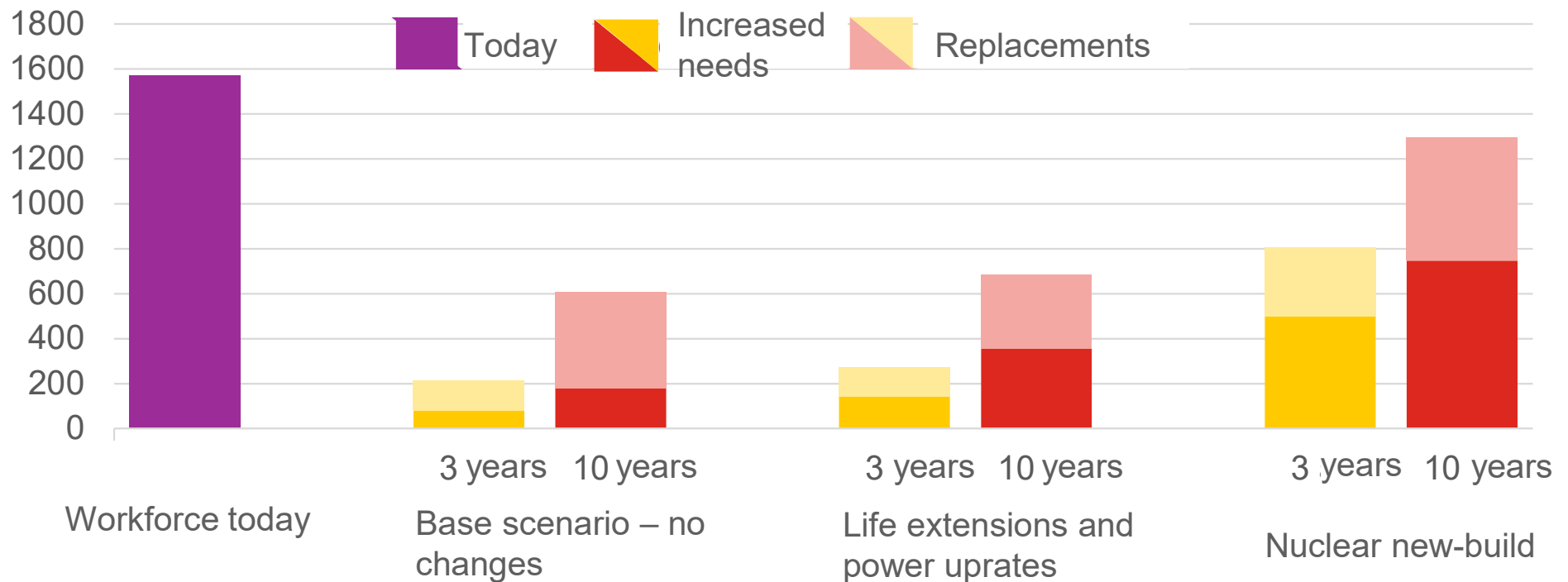
Educational capacity

- Educational capacity within radiation related areas
- Available educational pathways
 - Academic programs
 - Specialised programs
 - General programs with a possibility to specialise
 - Contract education
 - Vocational (Yh) training programs
- Number of admitted and graduated students
- Conditions and needs for adapting educational capacity
- Statistics from Statistics Sweden (SCB) as well as qualitative interviews with the higher education institutions



Mapping of competence supply and needs

- Need to employ about 200 people already within three years, in the base scenario
- Increase to 2100 people within 3 years (+ ~30%) and 2300 within 10 years (+~50%)



What is your spontaneous reaction?



That must be an
underestimate



Just about what
I expected

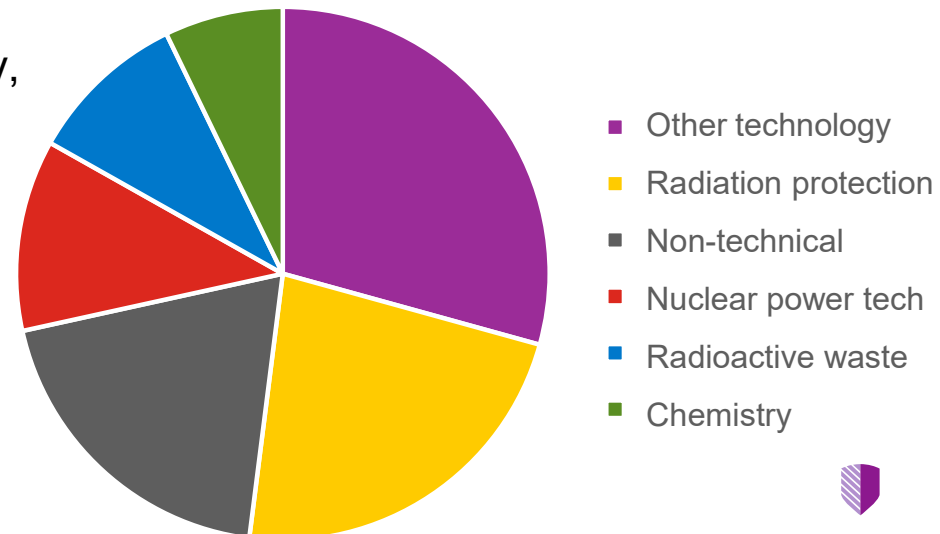


That must be an
overestimate



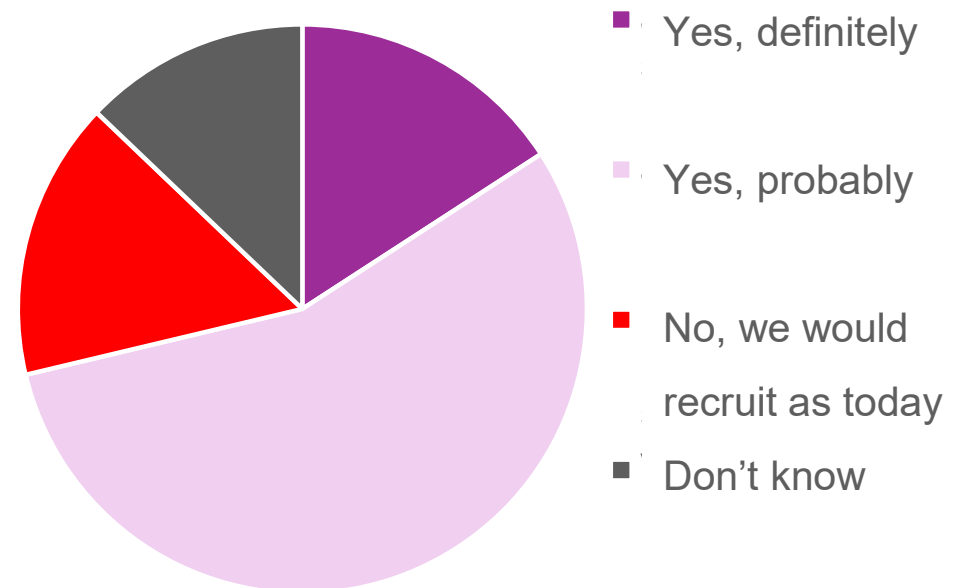
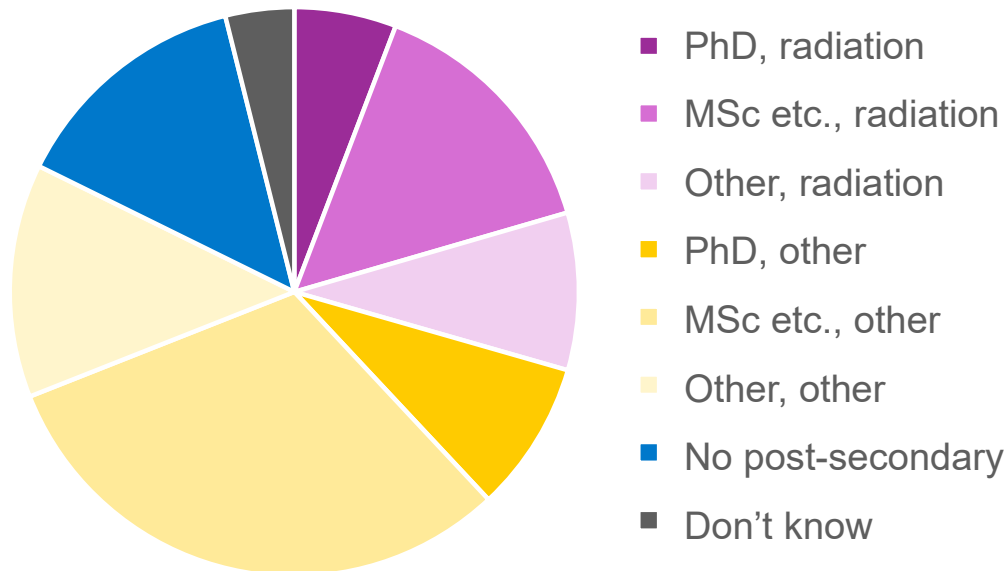
Needs in specific subject areas (3 years, new-build)

- *"Other technology"* (267): Technical competences related to e.g. IT, I&C, construction
- *Radiation protection* (178): Operative radiation protection, radiation protection regulations, dosimetry, environmental radiology, radioecology
- *Competences with non-technical elements* (149): Management, PSA, MTO-issues, nuclear security, nuclear non-proliferation
- *Nuclear power technology* (95): Nuclear fuels, reactor physics, nuclear physics, reactor safety, radiation effects in materials
- *Radioactive waste* (73): Clearance, spent fuel, other radioactive waste, decontamination
- *Chemistry* (45): Nuclear chemistry, severe accident chemistry, radioanalytical chemistry



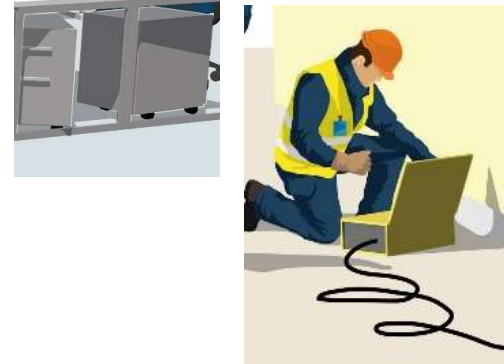
Educational level and specialisation

- The majority has an academic degree
- Just under a third has an education specific to a radiation related area
- Question: "Would you, if possible, to a larger extent than today recruit people with an academic degree specific to a radiation related area?"



How do we meet the needs?

- Preliminary conclusions and draft proposals!
- Workshop with relevant stakeholders for discussion on October 24
- “Other technology” (267):
 - Existing technical programs + specialised courses
 - Continuing education courses (fortbildningskurser)
 - Key issue: Teaching capacity and competition with other fields. How to attract?
- Radiation protection (178) – the largest fully specialised area!
 - Practice-oriented in-house training in operational radiation protection
 - Vocational college (Yh) or bachelor of engineering program?
 - Strengthening/specialisation of the medical physicist program
 - Competence needs in radioecology are often highly specialised - PhD



How do we meet the needs?

- Competences with non-technical elements (149)
 - Existing programs + specialised courses
 - Separate study within nuclear security
 - Non-proliferation and nuclear material control – part of a course – greater need?
- Nuclear technology (95)
 - MSc program at KTH can graduate 50/year, ~ 30 remain in the country
 - Bachelor of Engineering program at UU, capacity ~ 30/year
- Waste management (73)
 - Operational: Vocational college program?
 - Theoretical/academic: Broad field (geology, hydrology, etc.) + specialised courses?
- Chemical engineering (45)
 - Small numbers, but only a few courses available
 - Also in demand within healthcare and emergency preparedness



Do these suggestions make sense to you?



No, but I don't
have any better
suggestions



No, and I have
better
suggestions



Yes, that makes
sense in general.



An updated proposal to the government

- Meeting with a broad panel of stakeholders ("Samverkansplattformen")
- Daniel Westlén: "Just specify your needs and we'll see what we can do"
- Previous product of the meetings with this panel: Proposal for a national strategic direction for Sweden's skills supply in the field of radiation safety
 - Submitted to the government early 2022
 - Not formally adopted by the government
 - Specifically requested by the IRRS (IAEA review)
 - Needs to be updated (change of government, nuclear outlook, security situation etc.)
- An updated version could be
 - What the IRRS requests
 - What the government needs to see to take action



Other conclusions

- Competence is transferable between sectors (nuclear power, healthcare, other)
- Recruitment of foreign labor is challenging because of requirements for Swedish language skills and security clearance, and high demand also in other countries
- Few qualified Swedish applicants for research positions
- Research funding allocated as project grants does not automatically give more education
- Higher education institutions generally prioritise large student groups
- Vocational college programs are lacking but should be able to meet certain needs
- Awareness of and interest in the field need to be increased – but how, and by whom?



Summary

- Great need for competence reinforcement
- The radiation safety field is societally critical but relatively small
- The need for competence exceeds the current educational capacity
- Parts of the need can be met through specialised courses for professionals or for students in more general programs
- For example, radiation protection, nuclear chemistry, and radioecology require extra focus



Thank you for your attention!

