



**DRAFT**  
**Milestones and**  
**Recommendations:**  
**Training and**  
**capacity building**  
**Technology**  
**Roadmap**

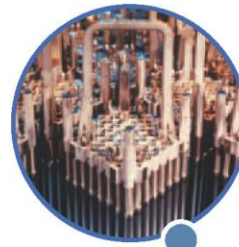
Nuclear Energy

2050

2045

2035

2040





# Milestones / metrics

## ■ Human resource needs during development and construction

- UK Cogent study

- 13 000 per year over 6yrs for construction, 3 200 for manufacturing and 5 000 for operation required for twin-unit reactors

- US National commission 2009

- 14 360 man years per GW installed capacity

- PWC 2011 study for EPR in France

- 2 700 direct jobs, 8 350 including indirect jobs



# Milestones / metrics

## ■ Human resource needs during operation and decommissioning

- Finnish study on nuclear workforce requirements **CASE STUDY?**
  - 3 300 workers today, 2 400 additional workers will need to be trained to cover new jobs and replace those retiring by 2025
- PWC study on job requirements in France for operation of EPR
  - 500 direct jobs and 1 650 indirect jobs



# Recommendations:

	Timeline
Countries should undertake a national skills evaluation to quantify the need for skilled nuclear workforce to maintain operation of existing fleets and for future decommissioning needs, as well as for nuclear new build where relevant. Evaluation should also include requirements for nuclear regulators and researchers as well as for the need to replace those due to retire by 2025 - 2030.	Ongoing to 2020
Newcomer countries should evaluate the need for skilled nuclear workers during the construction and operation phases, as well as for regulatory activities.	2015-2025
Companies and governments should implement programmes aimed at knowledge preservation of those workers who will be retiring in the next decade and a half. Mentoring programmes could be implemented to ensure a transfer of knowledge; lessons learned and best practice amongst operators, regulators, waste management and decommissioning experts.	2015-2030
Newcomer countries should develop local training programmes aimed at developing a nuclear aware and nuclearised workforce and highlighting the importance of safety culture at all levels of nuclear activities.	2015-2025



# Recommendations:

	Timeline
<p>International cooperation is needed to help transfer nuclear training programmes from existing nuclear countries to newcomer countries. Opportunities will be needed for newly trained/educated workers to gain practical experience and develop and maintain skills while waiting for their countries' nuclear power plants to begin operation.</p>	2015-2020
<p>Existing nuclear countries with post graduate nuclear training programmes should develop student exchange programmes aimed at newcomer countries. Where possible these programmes should include a period of practical work experience at a nuclear facility and potentially the creation of equivalent training programmes in the new comer country.</p>	2015-2030
<p>Policies should be implemented to ensure adequate pay conditions for regulators, to maintain and attract competent staff</p>	Ongoing
<p>International collaboration is needed to harmonise training programmes to develop mutual recognition of qualifications at an international level</p>	Ongoing