GEN IV International Forum

Expertise | Collaboration | Excellence

The Nuclear Workforce of the Future Opportunities and Needs for the International Nuclear Sector

Mr. Callum Thomas

Thomas Thor, United Kingdom

31 October 2023

OAK RIDGE National Laboratory

KAERI

cea

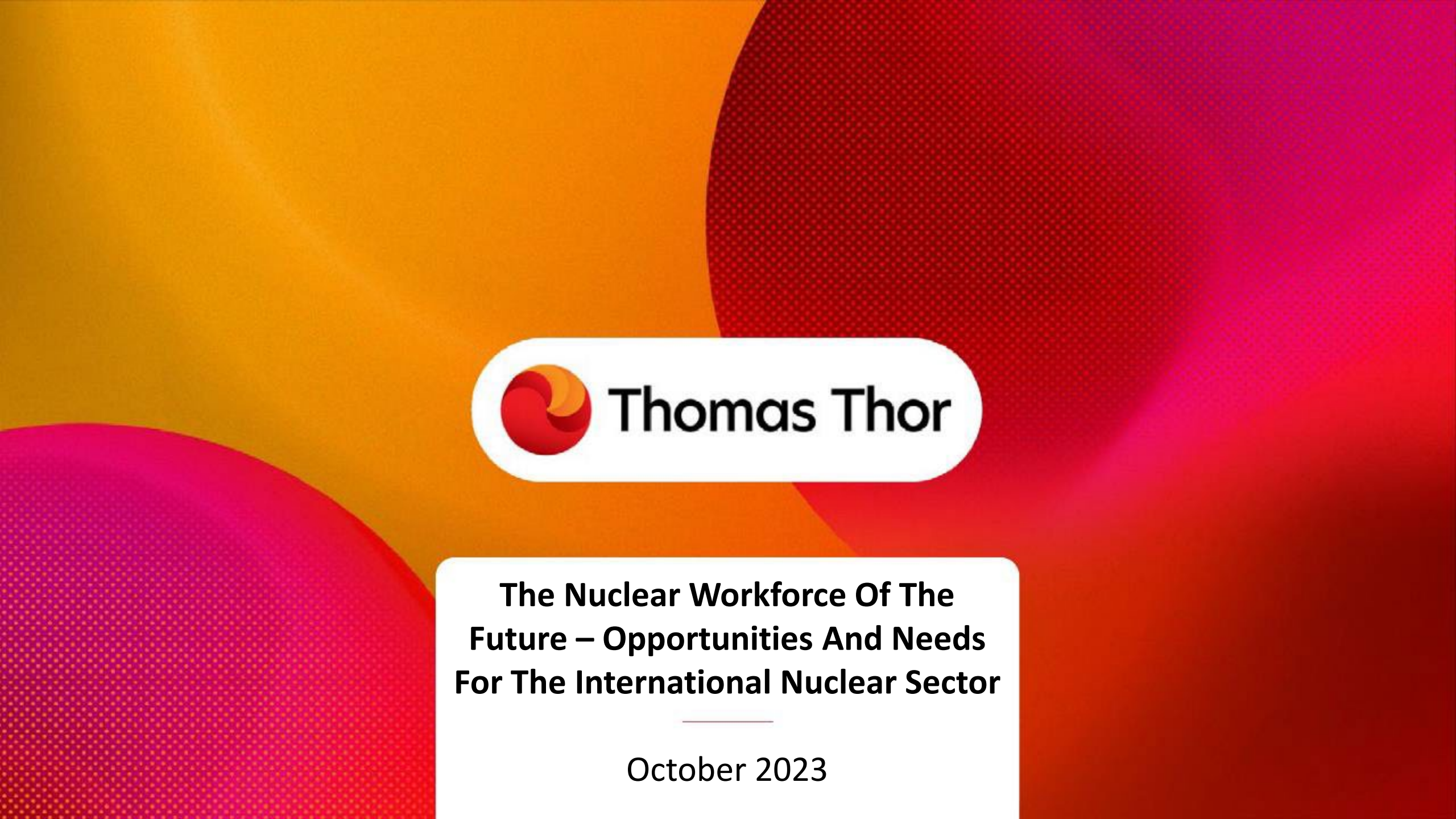
Argonne NATIONAL LABORATORY

Pacific Northwest NATIONAL LABORATORY

NATIONAL NUCLEAR LABORATORY

INL Idaho National Laboratory

Thomas Thor



The Nuclear Workforce Of The Future – Opportunities And Needs For The International Nuclear Sector

October 2023

GEN IV International Forum

Meet the Presenter

Mr. Callum Thomas, is the founder and Chair of Thomas Thor, a recruitment, executive search and HR consulting organization dedicated exclusively to the global nuclear industry and with offices across Europe, North America and the Middle East. He supports governments, regulators, operators, engineering companies, equipment manufacturers and research organizations in building and sustaining a competent and diverse nuclear workforce. His expertise is in attracting, recruiting and retaining the workforce required to build, operate, maintain and decommission nuclear facilities. Having worked in the nuclear industry across more than 30 countries, Mr. Thomas has a global perspective on human resources and capacity building within nuclear. He is passionate about achieving inclusion and diversity in the global nuclear workforce and co-founded the not-for-profit initiative ''Inclusion & Diversity in Nuclear''.

He has also consulted for the IAEA in the areas of Human Resource Development and Knowledge Management. He has been involved in initiatives for member states with existing nuclear power infrastructure as well as member states developing new nuclear power programs.

Email: c.thomas@thomas-thor.com

GEN IV International Forum

Expertise | Collaboration | Excellence

Agenda:

- Introduction – Callum Thomas and Thomas Thor
- The workforce today and in the future – setting the context
- Why join the nuclear sector?
- The role of leaders in attracting and retaining talent
- Practical advice around career planning and how to access international career opportunities
- Practical tips for career management
- Networking and tools for networking
- Mentoring
- Summary and Questions

Thomas Thor

Thomas Thor provides recruitment, leadership search and workforce consulting services to organisations shaping a Net Zero future

Purpose	We believe in a clean energy future and in the power of human ingenuity to create a better future.
Vision	Our vision is to enable the acceleration of Net Zero through the mobilization of knowledge and talent.
Mission	Our mission is to build and sustain the global workforce of critical sectors central to delivery of Net Zero, with a focus on nuclear energy and low carbon solutions
Values	Our company is driven by four values: Excellence, Credibility, Collaboration and Diversity and Inclusion.

Thomas Thor

Context Setting

- Around 800,000 people work directly in the nuclear power sector
- Another 200,000 at least work in other nuclear applications (e.g., medicine, R&D, remediation, but not including defence)
- Another 2m people work ''indirectly'' for the sector – supply chain, manufacturing, services etc.
- The workforce is concentrated in about 32 countries
- Global sector built on cross border collaboration and with a mobile workforce, despite security clearance, visa and language barriers
- Almost all countries experienced an underinvestment from 1990-2005 not only in the workforce but in the nuclear sector as a whole, leaving a gap in the workforce where many experienced people are retiring with limited succession planning
- There is a lack of diversity. e.g., around 20% of the workforce are women
- The sector is growing, so attracting and retaining talent is a key objective in many countries

Thomas Thor

Nuclear Technologies and the UN Sustainable Development Goals

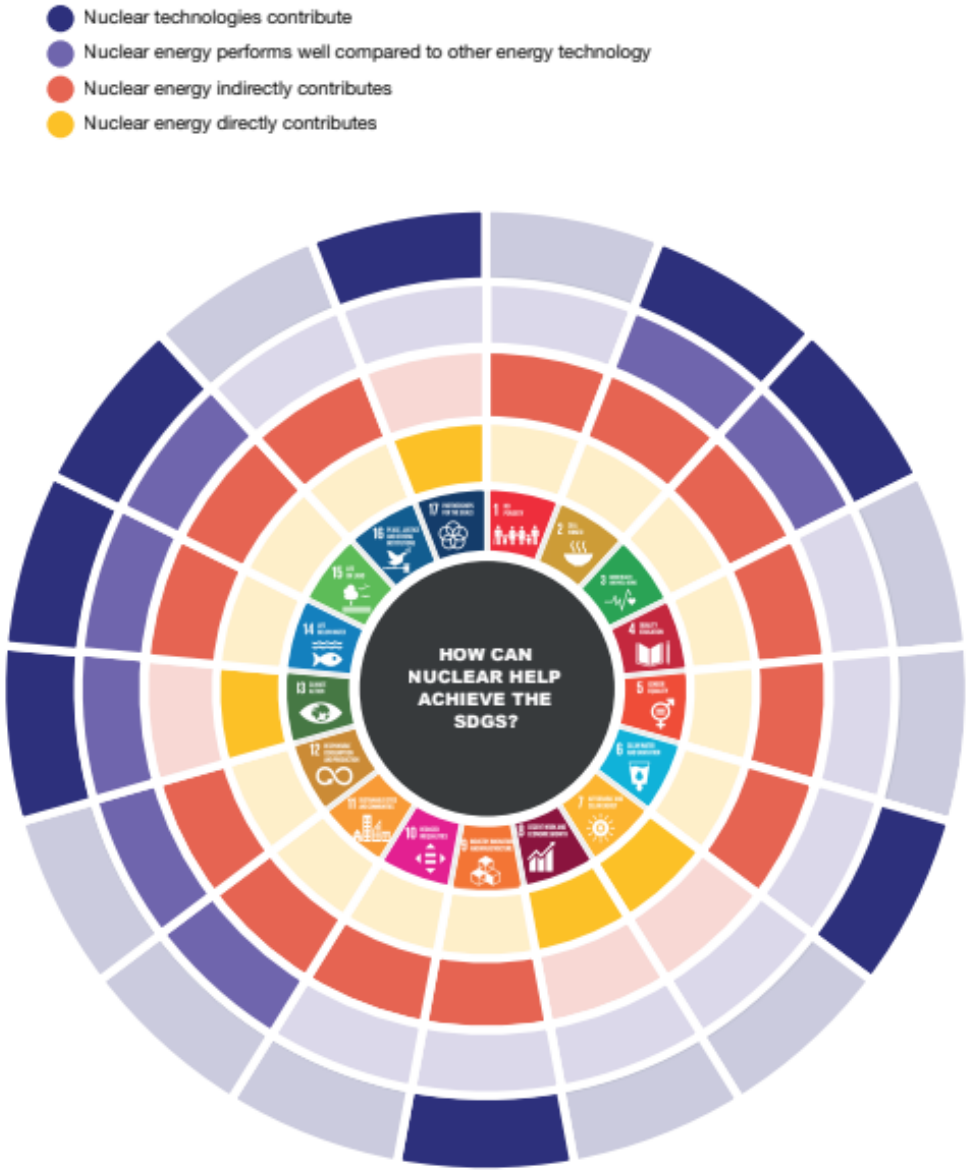
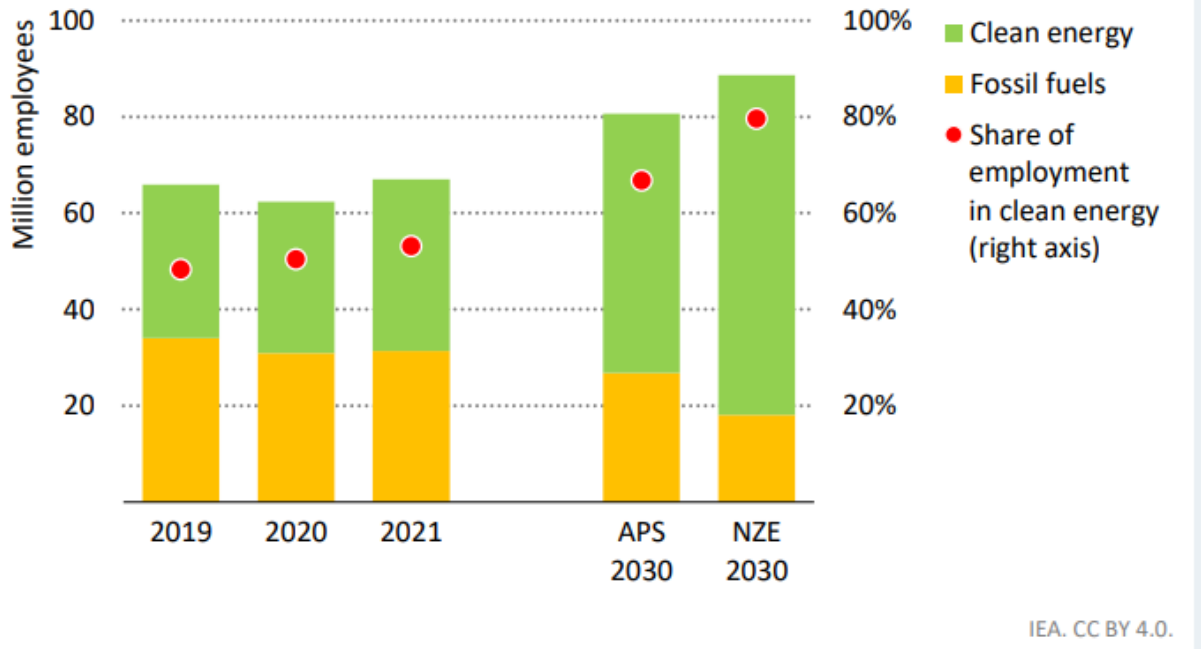


Figure 23. Sustainable Development Goal linkages with nuclear energy and other nuclear technologies. Note: dark colours indicate linkages; light colours indicate no linkages.

Source:
https://www.iaea.org/sites/default/files/21/10/nuclear-energy-for-a-net-zero-world.pdf

IEA World Energy Outlook (WEO) report 2022 – Clean Energy Job Growth

Figure 1.26 ▷ Global employment in fossil fuels and clean energy



Clean energy employment makes up just over half of the energy workforce today and this share rises significantly in both the APS and the NZE Scenario

Announced Pledges Scenario (APS)

Net Zero Emissions (NZE)

[World Energy Outlook](), Report International Energy Agency 2022

Thomas Thor

Why join the nuclear sector?

Thomas Thor

Attraction

Trends	Challenges	Opportunities
Lack of awareness of the nuclear sector generally, the purposeful contribution of nuclear applications and the career opportunities within the sector	Lots of duplication and fragmented efforts in engaging with target audiences. Negative perceptions about nuclear in general.	Collaboration to raise awareness of careers in nuclear and create awareness of the purposeful contribution of nuclear applications to our lives
Focus on attracting people from underrepresented groups	Lack of understanding of how to do this effectively and more talk than action means that progress is slow. Gathering data is challenging.	Increase the talent pool and access new audiences of potential employees
Focus on attracting people from other relevant sectors	Competition is high, especially for people with major project experience	Developing the employer brand for nuclear and optimising working conditions, environment and culture
Employers in most countries are succeeding in attracting people for entry level roles	The most talented STEM graduates and skilled trades people have limited awareness of nuclear, and other sectors are very active in attracting them	Targeted campaigns aimed towards pre-career people such as students and school children

Thomas Thor

Recruitment

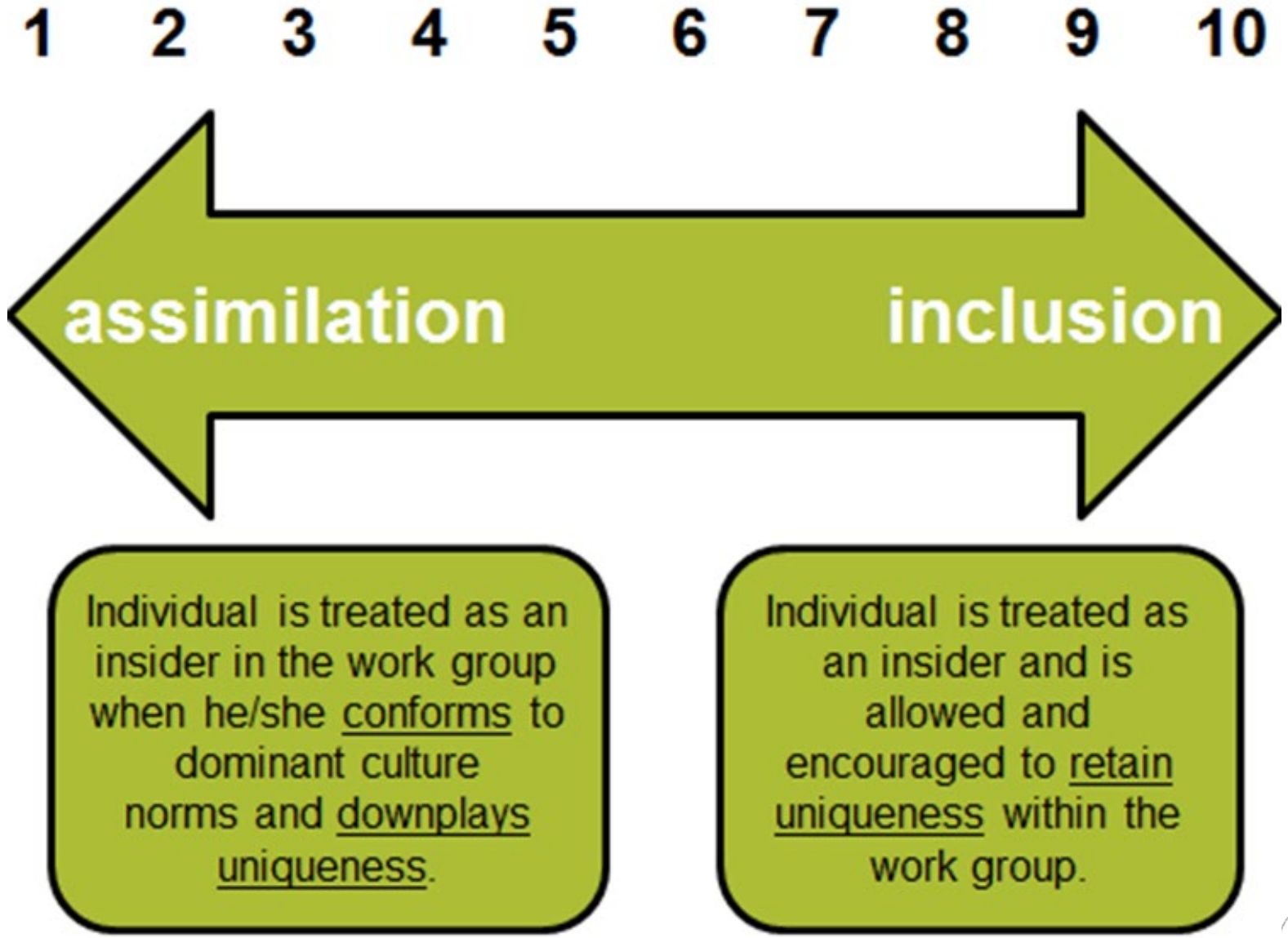
Trends	Challenges	Opportunities
Workforce Planning – both the supply and demand sides of the workforce in the future	Lack of certainty on projects and timing means forecasting demand is difficult.	Scenario planning and proactive preparation so that when recruitment needs to increase there is greater chance of success
Slowly moving towards competence-based interviewing and selection	Managers prefer to hire people with 100% of their desired skills/experience, often insisting on nuclear experience when it is not essential	Competence based approach to hiring means accessing a much larger and more diverse talent pool
Slowdown in international mobility (pandemic, security clearance, visas etc)	Obstacles to international moves, as well as increasing reluctance to relocate	Harmonisation of security clearance requirements, fast track visa processes and relocation support
Evolving candidate needs and preferences, especially around flexible working	Other sectors and employers are adapting more quickly than nuclear to accommodate flexible working. It is not easy for some job roles within nuclear.	To embrace the changes in working culture and attract talent by exemplifying flexible working
Salaries are increasing (as we see in all sectors, but especially those requiring STEM education)	Employers competing for the same rare skills are driving up salaries	Motivating remuneration packages, financial and non-financial rewards

Thomas Thor

Retention

Trends	Challenges	Opportunities
Slow transition to flexible working and evolution of the working environment	The transition is a change process that takes time and faces resistance, especially from people managers	Training and development for those that manage people on the ''why'' and the ''how'' of managing flexible teams
Lack of diversity and inclusion	Organisations attract people from underrepresented groups, but they do not feel included and leave	Greater support for people from underrepresented groups and creating more inclusion
Slow pace of the sector (e.g., funding and regulatory obstacles)	People leave because they are attracted by faster pace jobs and sectors	Challenge the status quo – why does nuclear have to be slow?
High competition from other sectors, especially in major infrastructure projects (a single project can affect the balance of the global workforce)	People with rare skills are targeted and headhunted, especially to high earning roles in low tax geographies	Longer notice periods and provide incentives linked to project milestones to avoid people leaving.

Thomas Thor

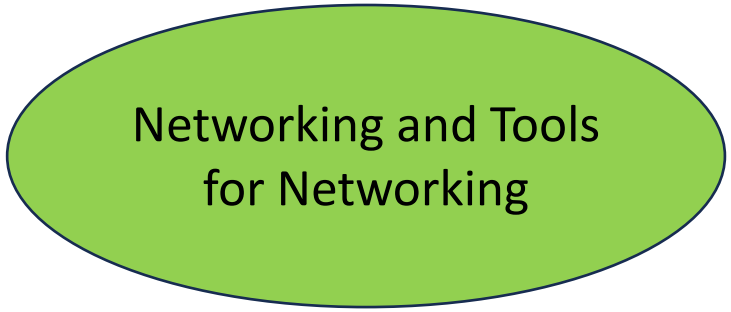

1 2 3 4 5 6 7 8 9 10
assimilation
inclusion
Individual is treated as an insider in the work group when he/she conforms to dominant culture norms and downplays uniqueness.
Individual is treated as an insider and is allowed and encouraged to retain uniqueness within the work group.

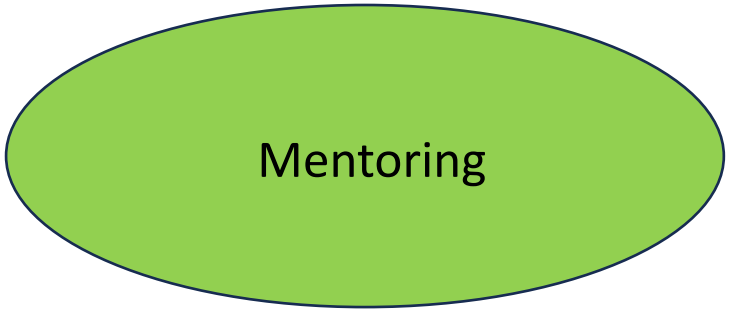
Thomas Thor

Leadership Competences

Thomas Thor

Practical Advice





Thomas Thor

Summary

Q&A

Thomas Thor

Upcoming Webinars

Date	Title	Presenter
02 November 2023	MOOK: The knowledge management method applied to a Gen IV project. The continuation of a successful story	Gilles Rodriguez, CEA, France
18 December 2023	Characterization of U-233 for Thorium Fuel Cycle Safeguards	Madeline Lockhart, North Caroline State University, USA
31 January 2024	Revolutionizing Nuclear Engineering Education: Developing Virtual Labs for Neutron Detection, Geiger Counter, and Reactor Experiments	Jonah Lau, Purdue University, USA