Human Aspects of Nuclear Safety
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Gender Balance in the Nuclear Sector

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"There is only one thing worse than coming home from the lab to a sink full of dirty dishes, and that is not going to the lab at all!"

Chien-Shiung Wu, pioneering Chinese American nuclear physicist

NEA No. 7583

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The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, the United Kingdom and the United States. The European Commission takes part in the work of the OECD.

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The OECD Nuclear Energy Agency (NEA) was established on 1 February 1958. Current NEA membership consists of 34 countries: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, Romania, Russia (suspended), the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, the United Kingdom and the United States. The European Commission and the International Atomic Energy Agency also take part in the work of the Agency.

The mission of the NEA is:

- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes;
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include the safety and regulation of nuclear activities, radioactive waste management and decommissioning, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information. The NEA Data Bank provides nuclear data and computer program services for participating countries.

Cover photos: Gender balance (melitas, Shutterstock).

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Executive summary

Women pioneered the nuclear and radiological fields, and continue to make vital contributions, but female representation in the sector remains limited. This is especially the case in science, technology, engineering and mathematics (STEM) and leadership roles. STEM fields benefit from diversity as it spurs collaboration and productivity. The lack of diversity represents a loss of potential innovation and growth and a critical threat to the future viability of the field.

The OECD Nuclear Energy Agency (NEA) collected data on gender balance in the nuclear sector in NEA countries to understand workforce representation, career trajectories, and challenges facing women in the sector, especially in STEM and leadership positions. In 2021, the NEA polled over 8 000 women in the nuclear workforce in 32 countries, and collected human resources data from 96 nuclear organisations in 17 countries. Based on the findings, recommendations are proposed to support countries working to improve gender balance in the sector.

Key findings

The first comprehensive survey of gender balance in NEA countries substantiates women's underrepresentation in the sector, especially in STEM and leadership roles.

- Women comprise 24.9% of the nuclear workforce, based on data from 17 countries, and constitute only 20.6% of the STEM workforce and 18.3% of senior leadership roles.
- Current recruitment, attrition and promotion rates are insufficient to significantly improve gender balance in the sector.

Challenges to attracting women: Recruitment into the nuclear sector is not gender balanced, although women in the sector would recommend nuclear careers to other women.

- Women are 28.8% of new hires in the nuclear sector, but are better represented in non-STEM hires (40.7% female) than in STEM hires (24.6% female). The percentage of new female hires marks the upper limit of women's future workforce representation. Because STEM roles in the nuclear sector are those that most typically lead to senior management, the low percentage of STEM hires does not point to substantial future change.
- The majority of women surveyed would encourage other women to pursue a career in the sector. However, there is significant ambivalence and regional variation.
- Women rank improving the visibility of women in the sector, including in STEM and leadership roles, as an effective solution for enhancing the attractiveness of the sector for women.
- Increasing career flexibility and developing comprehensive solutions to balance professional and family responsibilities poll strongly as ways to increase the sector's gender balance.

Challenges to women's retention: Retention and attrition trends are insufficient for improving the gender balance in senior leadership roles. Pregnancy and family responsibilities are rated by women as major career impediments. Women experience hostile work environments in the nuclear sector, especially in STEM roles.

- Attrition in the nuclear workforce (women and men) is 8.1%, of which women constitute 23.9%. This is lower than the workforce percentage of female new hires (28.8%) and women in the nuclear workforce overall (24.9%). However, the highest attrition is among women in non-managerial and lower management positions. This signals leakage from the leadership pipeline and will result in a smaller pool of women eligible for senior roles.
- Women surveyed overwhelmingly state that pregnancy, family responsibilities, and/or accommodating a spouse's career have negative impacts on their careers.
- Women experience hostility in the nuclear workplace, including sexual harassment. Accounts are higher for women in STEM roles, women with lower educational attainment and women who are members of minority groups.
- Approximately two-thirds of the women surveyed believe that gender stereotyping, micro-aggressions, unconscious bias and/or male-dominated work cultures negatively impact women's careers in the nuclear sector.
- Over half of the women surveyed indicate that their workplace culture is inclusive, but there is significant regional variation.
- Women report a lack of management commitment to improving gender balance in the workplace and insufficient institutional support. Women ages 25-44 poll more negatively, and there are regional variations. Employees in regulatory organisations poll more positively.
- Women highly rank improving workplace inclusivity through: better training on countering stereotyping and unconscious bias, developing collaborative leadership models and monitoring workplace culture.
- Women highly rank comprehensive solutions to balance family life (including increased workplace flexibility and access to childcare), increased visibility of women, mentoring and cultural change as needed to improve gender balance in the nuclear sector.

Challenges to women's advancement: Women are, on average, paid less than men in the nuclear sector. The female promotion rate is insufficient for significantly improving the gender balance in STEM roles. Women regard opportunities for career advancement as unequal.

- Women in the nuclear sector tend to be paid less than men, based on limited datasets and supported by qualitative survey results. Salary disparities between men and women are lowest in European countries.
- Women are awarded 27.1% of promotions in the nuclear sector, which is higher than the proportion of women in the nuclear workforce (24.9%). Women in positions requiring university degrees and in management roles are being promoted above their proportional workforce representation in these categories. However, female promotion rates for non-STEM roles significantly exceed those for STEM roles, exacerbating trends that concentrate women in non-STEM areas.
- Women surveyed state that they want to progress in their career. However, women do not regard opportunities in the nuclear workplace as equal, and believe that there are tacit or explicit institutional barriers to their retention and advancement. Stereotypes or unconscious bias about leadership characteristics; real or perceived incompatibilities between family and career responsibilities; and workplace cultures unsupportive of women's professional development rate as major hurdles.

- Women constitute 26% of participants in career development programmes. This exceeds their proportional representation in the nuclear workforce (24.9%). However, the qualitative survey of women's experiences indicates that men are perceived to be selected for career-enhancing projects, development opportunities and training at greater rates than women. In addition, women surveyed indicate that programmes to support their professional development, especially at the management level, are not available or not effective.
- Women identified the lack of female role models, mentors, and leaders, as well as social-cultural perceptions that nuclear careers are masculine, as barriers specific to the nuclear sector that need to be changed in order to improve gender balance.

Key recommendations

Comprehensive, co-ordinated policy solutions are recommended to improve gender balance in the nuclear sector.

The following actions are proposed:

- Attract women into the sector through public communications campaigns, enhancing the educational pipeline, and balanced recruitment and hiring;
- Retain and support women in the nuclear sector workforce by eliminating harassment, building inclusive work environments, addressing impacts related to familial responsibilities, assessing unequal impacts on women of policies and programmes, linking executive management performance to progress on supporting and advancing women, and by conducting regular national qualitative surveys on workplace experiences;
- Advance and develop women as leaders and enhance their contributions to the sector by eliminating unequal impacts for women's career recognition and advancement and by conducting regular national surveys on women's participation in the nuclear sector workforce; and
- Provide data and accountability through goal-setting, regular reporting and designating resources and senior-level individuals to implement the above actions.

Chapter 1. Overview of findings and recommendations

1.1. Introduction

1.1.1. *Relevance for the nuclear sector*

Women scientists and engineers pioneered the nuclear and radiological fields, with leaders and innovators such as Marie Skłodowska-Curie and Lise Meitner, among many others, establishing the foundation of modern nuclear science and technology. Many of those female trailblazers challenged the limited opportunities and expectations for women of their times. Today, many countries provide equal rights for women and men. In addition, many countries have made important steps in increasing gender equality in education, employment, entrepreneurship and public life.[1]

Despite this progress, women in science, technology, engineering and mathematics (STEM) remain exceptional not only for their contributions, but also for their rarity. Across member countries of the Organisation for Economic Co-operation and Development (OECD), men outnumber women approximately four to one in engineering and computer science (OECD, 2021).[2] In addition, women are underrepresented in leadership positions and are less likely than their male peers to become CEOs, sit on corporate boards or hold public leadership roles (OECD, 2017b). This is a global problem affecting most countries and many STEM fields to varying degrees.

At the same time, many OECD Nuclear Energy Agency (NEA) member countries face serious skills shortages that must be addressed in the next decade and beyond if nuclear technologies are to be applied safely and effectively. There is a demand for more scientists and engineers with the capacity to support new projects, effective regulation, and advanced research and development, and who can also serve as key leaders in the future. The need is great and the fact that women are severely underrepresented in STEM and leadership roles shows that many countries are losing access to a vast pool of talent.

Adding to this urgency, the world faces a tremendous challenge to alter society, policies, technologies and practices to achieve net zero carbon emissions by mid-century. The nuclear sector has the opportunity to play a vital role in supporting this objective. The sector's ability to contribute to the success of this global effort will require high-performing organisations that are diverse, inclusive and innovative. Improving the gender balance in the sector is key to achieve this, as it is now well understood that diverse teams spur innovation and performance.[3] In addition, the current dearth of women in the nuclear sector is an important element in the gap in

1. OECD countries are adherents to the OECD Recommendations on Gender Equality in Education, Employment and Entrepreneurship (adopted in 2013) and on Gender Equality in Public Life (adopted in 2015). Progress is reported in *The Pursuit of Gender Equality* (OECD, 2017) and the *Report on the Implementation of the OECD Gender Recommendations* (OECD, 2022).
2. As measured by the share of tertiary education graduates in information and communication technologies (21% female) and engineering, manufacturing and construction (27% female).
3. For example, a McKinsey study of over 1 000 companies in 15 countries conducted in 2019 showed that the top quartile companies for gender diversity in executive teams had a 25% higher chance of outperforming their bottom quartile industry peers on profitability.

understanding and perceived values between the sector and the broader society. These gaps raise persistent barriers to the application of nuclear technology despite its attributes and benefits.[4]

In this context, attracting, retaining, and supporting a gender-balanced workforce is highly relevant for the nuclear sector's sustainability and ability to contribute to society. The talents of diverse scientists, engineers and technologists are needed to develop innovative solutions for clean, reliable energy to power economic growth and mitigate climate change. Even more importantly, gender-balanced leadership is essential in the laboratory, in the boardroom and on the public stage. In each sphere, the future of nuclear energy is being envisioned, decided and built. Nuclear leaders in industry, government and civil society must constitute a range of experiences and perspectives. This vibrant, diverse leadership is urgently required to build lasting coalitions for long-term socio-economic decisions and technological solutions that reflect the whole of society and benefit from the contributions of all.

1.1.2. *Report objectives*

This NEA report intends to:

1. Take stock of the current gender balance in the nuclear sector in NEA countries, including in the workforce overall, and in STEM and leadership roles; the gender balance in recruitment and career trajectories in the sector; and women's experiences of working in the sector, including challenges and barriers;
2. Provide the first publicly available, international data on gender balance in the nuclear sector for policymakers and stakeholders to use to understand the challenges, to guide the development of data-driven solutions, and to benchmark progress on improving gender balance in the sector; and
3. Establish a comprehensive, evidence-driven policy framework with recommendations for countries to improve gender balance in the nuclear sector.

1.1.3. *Scope*

The NEA is an intergovernmental agency that facilitates co-operation among countries with advanced nuclear technology infrastructures to assist its members[5] in maintaining and further developing the scientific, technological and legal basis required for a safe, environmentally sound and economical use of nuclear energy for peaceful purposes. For the purpose of this report, the nuclear sector is understood to be the peaceful application of nuclear technologies in NEA member countries. The sector is comprised of a wide range of organisations, including but not limited to: nuclear power plant operators, nuclear fuel cycle organisations, nuclear regulatory bodies, nuclear public sector entities (for example, the nuclear office of an energy ministry), technical support organisations, new nuclear reactor build sites, decommissioned and decommissioning sites, universities, nuclear research and development organisations, original equipment manufacturers and nuclear supply chain organisations. This expansive definition recognises that the nuclear sectors in NEA member countries vary considerably in demarcation, composition, organisation and size. Accordingly, the data contained in this report

4. There is a body of academic literature on differences in women's support for nuclear power in various countries. For an example of a case study focusing on the gender divide over time and at different political levels, see Sundström and McCright (2016).
5. As of 2023, the NEA has 34 member countries: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, Romania, Russia *(suspended as of 11 May 2022)*, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, the United Kingdom and the United States.

represents distinctly different national sectors and great care should be taken when seeking to make comparisons.

1.1.4. *Methodology*

The findings and recommendations in this report were developed under the auspices of the NEA by a task group mandated by the Steering Committee for Nuclear Energy, the Agency's highest governing body. The task group consisted of representatives from member countries with policy-level responsibilities or recognised expertise, and included government officials and experts from industry and research organisations.

This report is the result of the following process:

- A review of existing data on demographics in the nuclear sector and STEM fields in NEA and OECD member countries was conducted in late 2019;
- An initial survey of NEA member countries' policies and initiatives on gender balance in the nuclear sector and STEM fields was undertaken in late 2019. Input was received from ten countries;[6]
- An exploratory meeting was held in December 2019 for NEA member countries to assess the landscape and effectiveness of current efforts to improve gender balance in the sector, and to identify gaps that would benefit from international co-operation;
- Indicators and two survey instruments were developed to measure the current gender balance in the nuclear sector, especially in STEM and leadership roles, and to understand the challenges facing women in the sector. This work was conducted through four international meetings held between February and June 2021;
- A quantitative survey was sent to NEA member countries through a formal request to the Steering Committee for Nuclear Energy and OECD Permanent Delegations to collect human resources data from nuclear organisations. Data on the nuclear sector workforce, new hires, attrition, promotions, salaries and participation in career development programmes was requested, disaggregated by gender, job type (STEM/non-STEM) and management level. The data was collected from 96 organisations in 17 countries[7] between June and October 2021;
- A public survey of women working in the nuclear sector gathered **qualitative data** from over 8 000 women in NEA countries on workplace experiences and possible solutions. The 34-question survey was available from June to August 2021 on the NEA website in eight languages;[8]
- Triannual high-level meetings of country representatives on the NEA task group were held between 2021-2023 to analyse the collected data and develop a policy framework and recommendations; and
- Informal consultations were conducted throughout the process with experts and stakeholders in the nuclear sector, including female executives in the nuclear sector and representatives from the Women in Nuclear (WiN) network, to refine the data collection methodology and policy proposals.

6 Australia, Canada, France, Japan, Ireland, Italy, Poland, the Slovak Republic, the United Kingdom and the United States.

7 Argentina, Australia, Belgium, Canada, France, Hungary, Italy, Japan, Korea, Norway, Poland, Romania, Russia *(NEA membership suspended as of 11 May 2022)*, Slovenia, Spain, Sweden and the United Kingdom.

8 English, French, Italian, Japanese, Korean, Romanian, Russian and Spanish.

1.2. Overview of findings

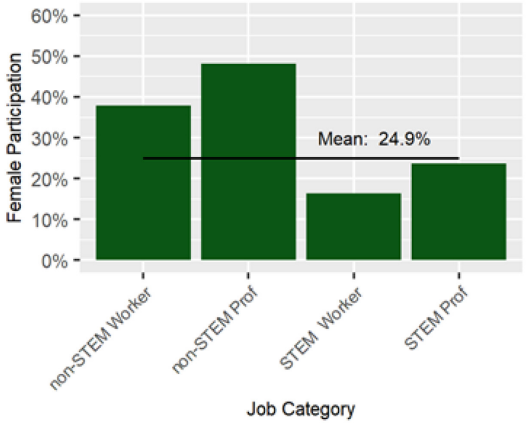
This section provides a summary of the key insights on the current gender balance in the nuclear sector in NEA countries based on data collected in 2021. As detailed in the methodology above, the findings reflect an analysis of quantitative human resources data gathered directly from nuclear organisations as well as qualitative data gathered from a public survey of women working in the nuclear sector. More analysis of the data is available in the report's subsequent chapters. It is important to note that the data is a short-term snapshot and therefore limited in terms of representing long-term trends.

1.2.1. *Gender balance in the nuclear workforce*

Women are 24.9% of the nuclear workforce in NEA countries, based on the data gathered from 96 organisations in 17 countries. This average has been adjusted for national differences in the size of the nuclear workforce. The data collected is estimated to represent at least 50% of the national nuclear sector in over half of the countries surveyed. Only one country in the sample has a majority-female nuclear workforce, but the sample size submitted for this country is fewer than 200 people.

Women are underrepresented in STEM and leadership roles, even when considered in terms of their representation in the nuclear workforce. Only 20.6% of the STEM workforce in the nuclear sector is female, and only 18.3% of senior leadership roles (executive and upper management) are held by women. Figure 1.1 below depicts women's representation in certain kind of positions: STEM versus non-STEM roles, and whether the role typically requires a university degree. Women are significantly better represented in non-STEM positions, which might be expected to include communications, human resources and other support roles. There is a particularly sharp contrast between non-STEM "professional" roles that might entail a university degree (48.2% female) and STEM "worker" roles that do not typically require university education (16.4% female).[9] These trends persist across all countries that submitted data, although in some countries the differences are less marked.

Figure 1.1. **Overall female participation by job category**

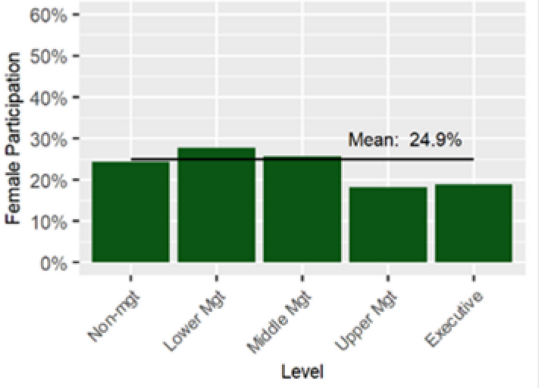


Note: Mean excludes Russia due to the large sample size. "Worker" means a position that does not typically require a university degree. "Professional" means a role that typically does.

9. For further explanation of the job categories and management levels, please see Section 2.1.2.

Figure 1.2 below shows the data disaggregated by management level. Women are best represented at the lower and middle management levels (27.8% and 25.7%, respectively). In the upper management and executive positions, fewer than one in five roles are occupied by women. However, these trends are not necessarily reflected in all countries.

Figure 1.2. **Overall female participation by role level**



Note: Mean excludes Russia due to the large sample size. "Executive" typically means the ten highest-ranked employees in an organisation. Depending on the organisation, "management" positions may or may not entail supervisory responsibilities.

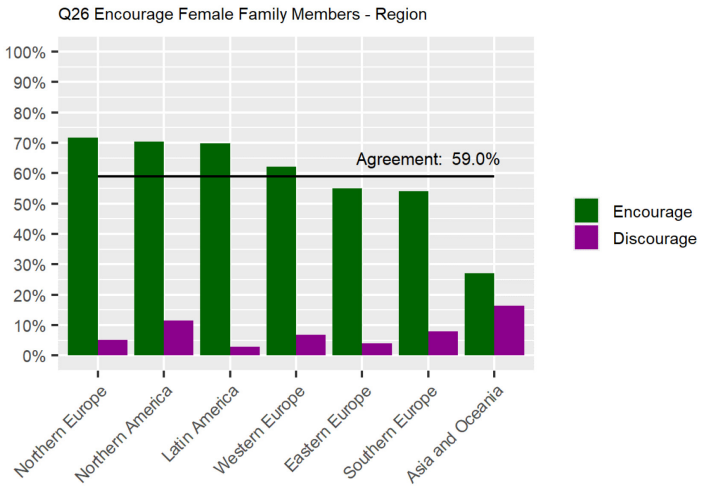
1.2.2. *Recruitment into the nuclear sector*

Women are 28.8% of new hires in the sector. This is higher than the existing workforce (24.9%), but also marks the upper limit of future female representation if the trend continues. Women are better represented in non-STEM new hires (40.7% female) than in new hires for STEM roles (24.6% female). A positive trend is that the rate of female STEM new hires is above the current representation of women in those roles (20.6%). Women are also being hired into management levels at a noticeably higher rate than their current representation in those roles (see Chapter 2, Figure 2.8). Although this represents a positive trend, even the management levels with the highest rate of female new hires remain well below parity. Therefore, the increase will not result in balanced management if current trends continue.

The majority of women in the nuclear sector would recommend it to other women. Attracting women into the nuclear field is a prerequisite for rebalancing the workforce. When asked whether they would encourage or discourage daughters, female family members or close friends to pursue a career in the sector, 59% of the women surveyed responded that they would encourage them. However, there was a significant geographic range, from 72% in Northern Europe who would be encouraging to only 27% in Asia and Oceania, as depicted in Figure 1.3 below.[10] In addition, many responses were ambivalent (neither agreeing nor disagreeing). A significant number (33.27%) of women surveyed indicated that they would neither encourage nor discourage their female friends and family from a career in the sector.

10. Geographic regions per the United Nations M49 Standard (see United Nations Statistics Division, 2022).

Figure 1.3. **Would you encourage female friends and family to join the nuclear energy sector?**



Note: Geographic regions per the United Nations M49 Standard.

Women cite work-life solutions, role models and mentors, pay transparency and career development as important factors to increase the sector's attractiveness for women. The public survey included a section asking respondents to rank proposed solutions for increasing gender balance in the sector. The survey respondents were women already working in the sector with an average age of approximately forty. However, the most popular responses remained largely consistent even among younger women. Female survey respondents considered work-life balance solutions, mentoring and the visibility of female role models to be significant for attracting and recruiting other women. Pay transparency and opportunities for career progression were also highly ranked. These survey findings are incorporated into the recommendations described in the next section (Section 1.3).

The following solutions ranked highest among the women surveyed as possible ways to improve the **attractiveness** of careers in the nuclear sector for women (see Chapter 3, Figure 3.44 for additional rankings):

1. Improving the visibility of women in the sector, including those in STEM and leadership positions;
2. Improving the lifestyle of certain nuclear sector jobs to be more women-friendly, including increased technology, flexibility and/or other accommodation to improve the quality of life for jobs entailing on call and shift work; and
3. Improving the culture of the nuclear energy sector to better support women and value women's contributions.

The preferred solutions to improve gender-balanced recruitment, development and advancement included (see Chapter 3, Figure 3.41 for additional rankings):

1. Providing comprehensive corporate solutions for family responsibilities (corporate childcare, extended maternity leave, etc.);
2. Regularly analysing and reporting on organisational compensation packages and salary increases for disparities between men and women, including for new hires and internal promotions; and
3. Establishing mentoring programmes for women at all organisational levels and for students, and conducting regular longitudinal studies on the impact.

1.2.3. *Women's experiences in the nuclear workplace*

Women experience hostility, including sexual harassment, especially in STEM roles. Over half of women (52.2%) working in the nuclear sector who responded to the public survey reported that they have experienced or heard accounts of behaviour or attitudes that are overtly or tacitly hostile to women in the workplace. Close to half (44.7%) recounted having experienced or heard accounts of sexual harassment of women in their workplace. Women working in STEM positions reported higher experiences of hostility than women in non-STEM roles. For sexual harassment, accounts were highest among female STEM "workers" (roles not requiring a university degree). For both hostility and harassment, the highest responses were recorded from respondents working in Latin America and Northern America, and at power plants or international organisations. Members of minority groups reported experiencing more hostility and harassment than average. In general, respondents with lower educational attainment registered more hostility and harassment. For women over age 25, reports of sexual harassment were largely independent of age. One positive trend is that reports of sexual harassment were lower for women under age 25. Experiences of workplace hostility varied slightly with age and registered at higher rates for women ages 25-44 and over 65.

Workplace culture and stereotypes inhibit women's careers. Over half (58.3%) of women surveyed reported that their workplace culture is inclusive; however, this was much higher in some regions than in others. The level of agreement by survey respondents was over 75% in Northern Europe, and over half in Northern America and Eastern Europe, whereas workplaces in Latin America, Asia and Oceania, and Western and Southern Europe were ranked lowest by the respondents (see Section 3.3.1, Figure 3.6). Regulatory agencies and new nuclear reactor build sites reported the highest inclusivity. Women in roles that do not require a university degree experienced the lowest levels of reported workplace inclusivity. In addition, women surveyed reported that biases about leadership characteristics and a culture that does not sufficiently support the professional development of women impedes their career advancement. Approximately two-thirds of the female survey respondents agreed that "stereotyping, micro-aggressions or unconscious bias" and a "male-dominated work culture that inhibits the full contributions of women" negatively impact women's careers in the nuclear sector.

1.2.4. *Perceptions of workplace policies and management commitment to gender balance*

Women report equal physical working conditions, but a lack of management commitment to gender balance and insufficient institutional support.[11] Women polled in the public survey overwhelmingly agreed (75.9%) that there are few or no differences or disparate, gender-based impacts between men and women in physical working conditions (adequate facilities, equipment, and/or protective gear). However, only 41.7% of women polled believed that their workplace features robust policies to improve gender balance. Older women and those in Northern Europe tended to hold more favourable views. Opinions about management commitment fare poorly. Only 32.5% of women surveyed reported that managers in their workplace express a commitment to improve gender balance and discuss the impact of policies and programmes to achieve this. Responses from Northern Europe and Northern America were more favourable than the average.

When asked about whether policies to improve the gender balance within their organisations helped them to feel satisfied with their career and optimistic about their future prospects, only 43% of women polled responded affirmatively. Agreement by survey respondents was highest in Northern Europe and Northern America, and lowest in Latin America and Southern Europe. Women in regulatory agencies, other government entities and fuel cycle organisations ranked their employers well, whereas women at decommissioned or decommissioning sites and those

11. The survey questions asked about organisational policies in the respondent's workplace, and did not ask specifically about national or governmental policies.

working at original equipment manufacturers or nuclear supply chain organisations scored their employers the lowest.

Women favour collaborative leadership, better organisational monitoring, and training to improve workplace inclusivity. The public survey included a section asking respondents to rank effective measures to create inclusive work cultures that value diverse contributions and leadership. The female respondents ranked the following as the most effective solutions:

1. Regular organisation-wide training on identifying and countering stereotypes, unconscious bias and micro-aggressions;
2. Developing and rating employees on leadership models that centre on collaborative, participatory leadership styles; and
3. Regular surveys of employees and using focus groups of women at different organisational levels to monitor the work culture and to develop new initiatives to address issues and enhance the contributions of women to the organisation.

Further top responses are shared in Chapter 3, Figure 3.42. These findings are incorporated into the recommendations described in Section 1.3.

1.2.5. *Impact of pregnancy and family life on women's careers*

Pregnancy and family responsibilities are overwhelmingly perceived to have a negative career impact, especially on young women and STEM professionals. Pregnancy was widely (70.7%) viewed by women polled in the public survey as having a negative impact on their career trajectory, including promotions. Younger women (ages 18-34) and those in the most junior roles (students and trainees) registered even stronger feelings about pregnancy's negative impact (nearly 80%). STEM "professionals" (positions requiring a university degree) and lower-level managers reported the highest perceptions of negative career impacts of pregnancy. This is significant, since these roles feed into higher leadership levels. An additional question on the impact of family responsibilities, including parenthood and caregiving, elicited an even stronger reaction with 73.5% of women polled perceiving a negative career impact. Women polled who reside in Southern Europe, Western Europe, Northern America, and Asia and Oceania had higher response rates about the negative impact of pregnancy and family responsibilities, but the global variation was not wide. Women belonging to minority groups reported more negative career consequences for becoming parents than average.

In addition, 62% of survey respondents indicated that accommodating a spouse's career, including the inability to relocate, has a negative career impact on women. Menopause, on the other hand, was generally not regarded as having a negative career impact, including among older respondents. However, many responses were ambivalent (neither agreeing nor disagreeing), even among menopausal age groups.

Women want more flexibility, access to childcare and upward career pathways compatible with parenthood. The public survey of women included a section asking about effective interventions for improving work-life balance and retaining women in the nuclear sector workforce, including on the executive track after becoming parents. The following solutions ranked highest:

1. Flexible teleworking options for men and women regardless of parental and family status;
2. Ensuring that there are adequate facilities in the workplace for childcare and lactation, as well as flexible policies to support parents; and
3. Analysing the expected career path for an upwardly mobile manager and identifying possible barriers and challenges caused by parenthood or other family responsibilities. (For example, is promotion to upper management contingent upon certain kinds of jobs that may be difficult for a nursing mother?) Developing accommodations and alternate pathways.

Further top-rated responses are shared in Chapter 3, Figure 3.43. These findings are incorporated into the recommendations described in the next section (Section 1.3).

1.2.6. *Pay parity*

Women are paid less than men in the nuclear sector. There were significant differences between countries, and gender disparities in salaries were found to be highest for non-European countries. The average is based on data collected from 12 countries in Europe, Asia and Oceania, and Northern America and has been adjusted to control for national sample sizes. It should be noted that the datasets were small, with few organisations represented in many of the country samples. The salary differential ranged from 0.7% to -28.3%. Only two countries showed a small positive differential in favour of women.

This negative pay differential, based on an analysis of quantitative human resources data, was consistent with the qualitative public survey results. In the public survey, female respondents perceived that men receive higher salaries than women for similar positions and credentials (53.2% agreement), as well as higher salary increases or bonuses (48.9% agreement). Female managers and non-STEM "professionals" (positions generally entailing a university degree) expressed the most agreement that there are salary disparities between men and women.

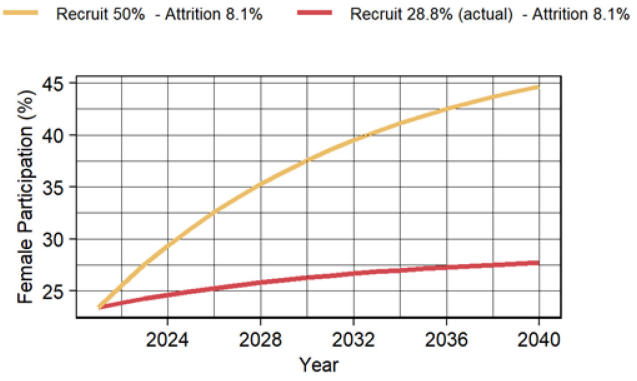
1.2.7. *Retention and career development*

Women constitute 23.9% of the 8.1% attrition rate. In combination with other trends, this is still too high to significantly improve the proportion of women in the nuclear sector at current trends, especially in the leadership pipeline. The female attrition rate was lower than the rate of female new hires (28.8%) as well as the percentage of women overall in the workforce (24.9%). Since a lower attrition rate is a positive trend, this could help improve gender balance in the sector, but only marginally. Retention was proportionately greater for non-STEM "professionals" (positions that typically require a university degree), and this may work against improving the gender balance in technical and scientific roles. In addition, female STEM "workers" (positions that generally do not require a university degree) seem to be leaving at a rate exceeding their workforce representation, enhancing the negative shift. Female attrition at the mid-management level and above was proportionately lower than female representation at these levels of the workforce. This should have a marginal effect in rebalancing across managerial levels. However, the highest rates of attrition were at the non-management and lower management levels. Female attrition at these levels was higher than current female representation in these roles, as well as higher than the average nuclear sector workforce attrition for women. This trend represents leakage from the leadership pipeline and may result in a smaller pool of women eligible for progressively senior positions.

Figure 1.4 below is a simple model projecting future female participation in the nuclear sector, assuming no change in the overall size of the workforce, and attrition at 8.1%, the current rate for the workforce sample of men and women.[12] The red line shows the trajectory if female recruitment continues at 28.8%. The gold line models the scenario if future recruitment were balanced. This is a restricted model, but one that shows the essential features and indicative time scales.

12. Note that the human resources data collected represents a limited, short-term snapshot and may not indicate long-term trends.

Figure 1.4. **Simple projection of gender balance with current and balanced recruitment**



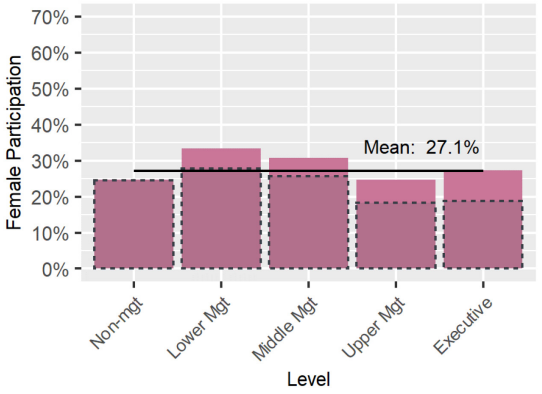
Women want to progress in their careers. Women are more likely to participate in career development programmes, but do not view them as effective and regard opportunities for advancement as unequal. Over two-thirds (66.1%) of women polled in the public survey said that they want to progress and advance in their careers. Furthermore, female representation in career development programmes was measured at 26%, which was above the proportion of women in the nuclear sector workforce (24.9%). There were no significant regional trends between countries with respect to women's participation in these programmes. However, it should be noted that career development programmes may be difficult to compare.

Although the human resources data showed that women participated in career development programmes at rates exceeding their workforce representation, such programmes may be unavailable or ineffective. According to the public survey results, only 30.9% of women agreed that there were accessible and effective programmes available in their workplace to support their professional development, especially at the management levels. In general, female managers were more likely to indicate that such programmes were available and effective. STEM "professionals" (positions requiring a university degree), students/trainees, and "workers" (positions not requiring a university degree) reported the highest dissatisfaction with the availability and effectiveness of such programmes. In addition, 52.2% of women surveyed perceived that men were selected for training or development opportunities (especially those seen as prerequisite for promotion) at greater rates than women.

1.2.8. *Promotions and leadership*

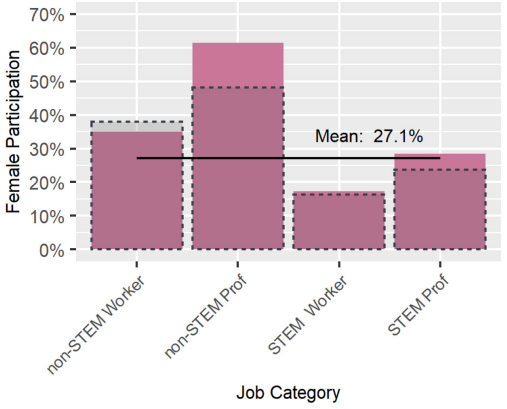
The female promotion rate of 27.1% is insufficient to significantly improve the gender balance in senior leadership roles in the nuclear sector. The promotion rate was higher than the percentage of women in the nuclear sector workforce (24.9%) as measured in the human resources data. In addition, female promotion rates for management positions exceeded women's current representation at those levels (see Figure 1.5 below, with the dotted lines indicating the current female representation). This is a positive trend, but the proportions are still modest. Women in roles generally requiring a university degree ("professionals") were being promoted at rates exceeding their workforce participation in these job categories (see Figure 1.6 below). In particular, women received a strong majority (61.4%) of promotions within non-STEM "professional" staff, significantly above their representation in the workforce. However, this further embedded the technical divide seen in the data, in which women are concentrated in non-STEM roles. Furthermore, the rate of female promotions in non-management roles followed the overall workforce, suggesting that women may remain underrepresented in the long-term leadership pipeline.

Figure 1.5. **Promotions – female participation by management level**



Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

Figure 1.6. **Promotions – female participation by job category**[13]



Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

The public survey results mirrored the human resources trends. While most women surveyed did not necessarily indicate that they have been overlooked for career opportunities and promotions (only 28.4% felt overlooked), they did not necessarily think that career advancement, including promotions, is equal for women (only 47.8% of women thought that it is equal). The women surveyed think that men have been promoted at higher rates than women for similar levels of responsibility and performance (63.3% of the female respondents shared this perception) and that men have received more positive performance appraisals than women for similar levels of performance (51.7% of women surveyed). In addition, 65.3% of the women polled agreed with the statement that "men are being selected for high-profile projects at greater rates than women."

13. "Worker" means a position that does not generally require a university degree. "Professional" means that it does.

Lack of female leaders to serve as mentors and role models, bias about leadership characteristics, and lack of support to balance work and family inhibit women's careers. The results of the public survey indicated that women spend a lot of time thinking about or have strong feelings about their career expectations and challenges, especially promotions. Going further, one question asked about the biggest barriers to the retention and promotion of women in the nuclear sector, based on the respondents' own experiences. The following ranked highest (further top responses are shared in Chapter 3, Figure 3.38):

1. Stereotypes or unconscious bias about leadership characteristics;
2. Perceptions that family life is incompatible with the management track or that family responsibilities preclude women from pursuing management positions; and
3. A culture that does not sufficiently support the professional development of women.

When asked about barriers specific to the nuclear sector, the highest ranked were (further top responses are shared in Chapter 3, Figure 3.39):

1. A lack of women in the sector, including in leadership positions;
2. Social-cultural perceptions that jobs in the nuclear sector are for men; and
3. The nuclear sector lifestyle, including being on-call and shift work, is not attractive or women-friendly.

As described above, the women surveyed reported that a lack of women in the sector, including in leadership positions, is a significant barrier to the retention and advancement of women. Women leaders serve as role models, mentors and trailblazers for other women. In a separate survey question about whether role models and mentors for women are available in their workplace, only 37% of women agreed, with significant regional variation. In general, around half of women polled in Northern Europe and Northern America reported access to role models and mentors in their workplace, while this fell to a quarter or less of survey respondents in Eastern Europe, Southern Europe, Latin America, and Asia and Oceania. Role models were reportedly more available for women working in regulatory agencies, other government offices and international organisations. They were least available for women working at new nuclear reactor build sites, original equipment manufacturers and nuclear supply chain organisations. Students and trainees, senior-level managers and STEM "professionals" (positions requiring a university degree) reported the highest levels of access, whereas the availability was lowest for STEM "workers" (positions not requiring a university degree).

Barely half (50.9%) of women surveyed said that their workplace culture is woman-friendly and characterised by the presence and visibility of women, including in STEM and leadership positions. Northern Europe and Northern America ranked the highest in terms of visibility, and Western Europe and Asia and Oceania were ranked the lowest by the respondents. Opinion varied considerably according to organisation type. High visibility was registered in regulatory and other government organisations. In contrast to the question about mentors and role models, respondents working at new nuclear reactor build sites reported a high visibility of women in their workplaces. Nuclear power plants ranked the least favourably in terms of female visibility. Women who identified as members of a minority group polled similarly to the average in terms of the availability of mentors and role models in their workplace. However, they reported experiencing lower levels of the presence and visibility of women in their workplace.

1.2.9. *Summary of key findings*

Women in the nuclear sector in NEA countries are:

- 24.9% of the nuclear workforce, and less in STEM and senior leadership roles;
- 28.8% of new hires, and less in STEM and mid-to-senior leadership roles;
- 27.1% of promotions, clustered in non-STEM roles;
- paid less than men;[14]
- experiencing workplace hostility and sexual harassment;
- facing negative career impacts from pregnancy and family responsibilities; and
- eager to advance, but inhibited by barriers, cultural biases and lack of support.

1.3. Recommendations

1.3.1. *The "Attract, Retain and Advance" Framework*

The data summarised in the previous section and further detailed in the subsequent chapters of this report show that women are underrepresented in the nuclear sector, especially in STEM and leadership roles. Women face barriers to career progression and are not effectively supported by their workplaces to fully realise their potential. Accordingly, direct, practical and substantive actions are recommended to increase the proportion of women in the sector, support their career development, and enhance their contributions. This guidance is organised as a framework consisting of three pillars and undergirded by a reporting regime for data and accountability:

1. ATTRACT women into the nuclear sector;
2. RETAIN and support women in the workforce (including addressing impacts related to the conduct of familial responsibilities); and
3. ADVANCE and develop women as leaders and enhance their contributions.

The goal of these pillars is to provide an overarching, strategic framework through which governmental institutions and other nuclear sector actors can develop context-specific policies and programmes. Each pillar contains targeted recommendations developed from the data findings to address the needs and challenges of women in the sector. These recommendations are outlined below, organised under each of the three pillars and including provisions for data and accountability.

The framework is designed to help countries implement comprehensive strategies and initiatives at the national level, as well as in organisations over which they have purview. These might include government agencies, contractors, and funding recipients. Since the recommendations have been developed under the auspices of the NEA, an intergovernmental organisation, another important goal of the framework is to align priorities and spur co-ordinated efforts at the international level. This is explicitly articulated with respect to the recommendations on data collection, but could be undertaken in a range of areas. Finally, even if the actions proposed below target governments, it is hoped that the framework will be welcomed by the entire nuclear sector and that a broad range of organisations will aspire to put these recommendations into practice. The challenges are systemic and require the co-ordinated

14. Based on limited datasets.

action of governments working with private and other non-governmental stakeholders to engender meaningful and lasting change.

Countries and organisations face different challenges depending on their unique contexts. Some may have already achieved gender balance, including in STEM and leadership roles. Therefore, some of the below items may be more applicable for certain contexts than others. However, the framework should be useful to all to advance or maintain gender balance, to monitor changes and share learning, and more generally, to contribute to international co-operation to implement and disseminate standards that will promote a globally vibrant sector. Furthermore, the recommendations on data collection will fill a significant information vacuum. High-quality international data will better equip countries to improve policies and tools, and to monitor and report on progress. As an intergovernmental initiative, this will contribute to better opportunities and quality of life for women and men in many countries. Finally, the framework may offer a possible model for adaptation to improve other diversity imbalances in the nuclear sector.

The NEA is an intergovernmental agency within the OECD and consequently builds upon the pre-existing OECD standards on gender equality to which countries adhere. In 2013, the OECD Council adopted the *Recommendation on Gender Equality in Education, Employment and Entrepreneurship* (OECD, 2017a).[15] This international instrument expands upon the significant foundation provided by several United Nations instruments on various aspects of gender equality.[16] It provides an overarching policy foundation and mandate for governmental approaches and research to address gender inequality across sectors. It was followed in 2015 by the more focused *OECD Recommendation on Gender Equality in Public Life* (OECD, 2016). According to the most recent reporting on the implementation of these OECD instruments, the tailored focus of the 2015 instrument on improving a specific aspect of gender inequality has resulted in a visible impact (OECD, 2022). OECD countries have taken targeted action to improve gender equality in public life, and the results are assessable. However, the same report notes the lack of progress on gender equality in STEM, and calls for further policy tools to be developed for STEM fields.[17]

The efficacy of the 2015 instrument offers a useful model as a targeted instrument for measurable impact in a well-defined sector. Such progress is sorely needed in the nuclear field, given its deep gender imbalance and its persistent cultural biases that present unique challenges to women. Change is also well within reach. The nuclear sector is relatively small, clearly demarcated, and composed of a significantly large percentage of agencies and organisations under governmental purview. Accordingly, the below framework and recommended actions have been developed as a solution that is both tailored to the nuclear sector as well as comprehensive of the broader, societal challenges. This nuclear-specific policy framework draws upon and contextualises the existing OECD gender standards and combines them with insights from the new NEA gender data, thereby offering a unique and powerful tool for change.

15. All OECD members as well as Argentina, Kazakhstan, Morocco and Russia are adherents to the 2013 Gender Recommendation.

16. Notably, the principles embodied in the 1979 United Nations Convention on the Elimination of all Forms of Discrimination against Women (CEDAW); the 1995 Beijing Declaration and Platform for Action of the Fourth United Nations World Conference on Women; the United Nations Millennium Development Goals (MDGs); and the United Nations Sustainable Development Goals (SDGs).

17. See OECD (2022).

Figure 1.7. **The three pillars: Attract, Retain and Advance**

1.3.2. *First pillar: Attract women into the nuclear sector*

A. Public communications campaigns

Engage in public communications campaigns to promote gender balance. These communications should be designed to:

- Change gendered perceptions about careers in nuclear fields, including "normalising" science, technology, engineering, mathematics (STEM) and nuclear science and technology as fields for women and girls;
- Explain the social value and impact of nuclear science and technology;
- Highlight attractive opportunities in nuclear careers;
- Showcase women's leadership and contributions to the nuclear field; and
- Target women and men and make the case as to why gender balance benefits the nuclear sector and enriches STEM fields.

B. Enhance the educational pipeline

Undertake specific initiatives and facilitate volunteer efforts to enhance the educational pipeline, including:

- Informing students, parents and teachers on the value and impact of nuclear science and technology; and
- Encouraging girls, especially those at the early stages of schooling, to pursue STEM studies.

These actions may include but are not limited to:

- Creating information packs and/or online educational modules about nuclear science and technology, including women's contributions to the field, and share or partner with educational establishments and teachers on implementation; and
- Introducing students to female STEM role models and nuclear careers by organising career days, mentoring workshops and other awareness events.

C. Gender-balanced recruitment and hiring

Implement policies to identify and eliminate gender-based barriers to improve gender balance in recruitment and hiring.

Actions may include but are not limited to:

- Conducting targeted communications and recruitment campaigns to attract women and prepare them to apply;
- Adopting best practices in using gender-neutral job announcement language and hiring criteria;
- Implementing policies to assure the use of gender-neutral selection criteria, gender-balanced application reviews and selection panels; and
- Regularly reviewing policies, practices and outcomes related to the starting salaries of new hires to assure pay parity.

1.3.3. *Second pillar: Retain and support women in the workforce (including addressing impacts related to the conduct of familial responsibilities)*

A. *Address impacts related to the conduct of familial responsibilities*

Address impacts related to the conduct of familial responsibilities by:

- Providing increased flexibility to support employees with familial responsibilities outside work, such as flexible teleworking for all staff;
- Analysing the need for off-normal hours in nuclear positions (particularly those related to the operation of nuclear facilities) and their relationship to career advancement, clearly explaining their necessity where required, and developing accommodations or alternate career progression pathways;
- Offering or facilitating access to childcare and lactation facilities in the workplace;
- Offering attractive parental and family leave policies and encouraging all employees to take full advantage of these benefits;
- Developing policies and programmes to support employees returning from parental or family leave to re-integrate into the workplace and to mitigate impacts on career and pay progression; and
- Regularly reviewing the above policies and publicly publishing assessments of their impact, including plans to remedy any gaps.

B. *Eliminate harassment and build inclusive work environments*

Develop appropriate institutional measures to eliminate gender-based harassment in the workplace, to create inclusive work environments and cultures, and to address gender stereotypes and unconscious bias. Measures to be considered include:

- Providing regular, organisation-wide inclusivity training, which has been used successfully in many organisations and is recommended as a good practice;
- Implementing targeted strategies promoting allyship and maximising diverse participation, including by men, to foster inclusive work cultures;
- Conducting independent assessments to identify any patterns of harassment and bias, as well as workplace culture strengths and weaknesses with regards to inclusivity, and developing plans to remedy any adverse findings and to build inclusive workplace practices; and
- Encouraging partners with whom the organisation engages to ensure safe working environments free of harassment and to foster inclusive work cultures.

C. Assess gender impacts of policies and programmes

Regularly and independently assess policies and programmes for unequal gender impacts, including but not limited to human resource policies and career development programmes, for example through gender impact assessment tools.

D. Link executive and management performance to progress on gender balance

Link performance and compensation of executives and managers to specific and quantifiable objectives to implement measures associated with progress on gender balance. Executives and managers should be responsible for improving gender balance and building an inclusive work culture.

E. Conduct qualitative national surveys on workplace experiences

Conduct regular qualitative national surveys on workplace experiences and perceptions in the nuclear sector regarding:

- Gender-based harassment;
- Gender-based discrimination;
- Unequal gender impacts in the workplace, including regarding compensation and career advancement;
- Parental leave, including organisational support, workplace culture and attitudes, and career impacts; and
- Other gender-based workplace experiences.

1.3.4. *Third pillar: Advance and develop women as leaders and enhance their contributions*

A. Conduct national surveys on gender participation in the nuclear workforce

Conduct regular national surveys on gender participation in the nuclear workforce, to include:

- Salaries (including for new hires and employees returned from parental leave), salary increases, bonuses and promotions, disaggregated by gender, job function and management level;
- Gender-disaggregated representation in job functions and levels, including time-in-position;
- Gender-disaggregated participation in career development and training programmes, especially those considered prerequisites for promotion to the executive level;
- Career impacts on employees who take parental or family leave, including correlations between time away from the workplace and career progression;
- Policies on promoting gender balance, including pay equity, the availability and use of parental leave, the provision of re-integration supports, and how the effectiveness of policies is measured; and
- Qualitative examples of successes and challenges that can be shared as examples of best practices and lessons learnt.

B. Eliminate unequal gender impacts for women's career recognition and advancement

Identify and eliminate unequal gender impacts for women's career recognition and advancement. In particular:

- Mandate unconscious bias and inclusivity training for all decision makers and interviewers for hiring and promotions;
- Offer leadership and career advocacy training (particularly for, but not limited to, those in STEM areas) that provides a particular emphasis on self-empowerment to all employees, with special sessions targeted to female staff;
- Offer training for managers about how to encourage diverse staff, including those facing gender-based barriers, to actively advance their careers;
- Develop organisational resource groups and networks of all-gender coalitions that include male allies to promote gender equity and foster inclusive work cultures; and
- Conduct regular pay equity reviews to ensure that employees are compensated appropriately based on experience, years of service, scope of work and position.

1.3.5. *Data and accountability*

Undertake data collection, analysis and accountability to ensure the effectiveness and implementation of efforts to improve gender balance. To this effect:

- Set and publicly issue short-term and long-term goals for the actions proposed in this framework, and participate in regular reporting; and
- Designate a senior executive and identify resources to implement activities proposed in this framework.

1.4. References

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Chapter 2. By the numbers: Human resource data on women in the nuclear sector workplace

2.1. Introduction

To improve understanding of women's current representation and experiences in the nuclear sector in Nuclear Energy Agency (NEA) member countries, two surveys were conducted in 2021: the first was a survey of NEA countries' nuclear organisations via their human resources departments, and the second was a voluntary opinion-based survey of individuals. This chapter examines the quantitative data gathered through the former, and the qualitative data gathered through the latter survey is explored in Chapter 3. The human resources survey was developed by the NEA and disseminated to national nuclear organisations via member countries' permanent delegations to the OECD and the Steering Committee for Nuclear Energy representatives between June and October 2021.

2.1.1. *Methodology for the human resources data*

Excel templates[1] (see Annex A) were distributed via NEA member country officials, with a request to survey a significant representative sample, ideally the majority, of the national data. Each template was formed from six worksheets, covering: job categories and levels, new hires, attrition rates, career development, promotion and salaries. In all, 39 data submissions were collected between June and October 2021, from 96 organisations in 17 NEA countries. Countries were asked to provide the most recent data available. Some of the data submissions were compiled at the national level by NEA member country representatives, whereas other data submissions were provided to the NEA at the organisational level.

The submitted worksheets were reshaped and concatenated to form pivot tables for data analysis. Aggregated data were analysed using the statistical programming language R and its associated application RStudio.

This is a collection of data from a wide range of public and private organisations around the world, against a changing employment landscape. The analysis will provide direction and indicators for policy development but should be understood as a snapshot that will inevitably be partial.

A note on averages or means: Countries that contributed to this survey vary considerably in terms of the size of their nuclear sector, their populations, the type of organisations captured, and other less tangible factors. This report sets out to summarise the status of women in the nuclear sector in NEA countries and how that varies with job category, level and geographic region. Mean values are a useful way of summarising data but can hide a large range or be dominated by one contributor. In these cases, extrapolation needs to be carried out with care and in context.

1. The template design was adapted from a survey by Women in Nuclear Canada (see Strategic Policy Economics, 2020).

2.1.2. *Defining job category and management level*

The human resources survey asked the organisations that provided data to categorise their employees into four general job categories and five general management levels. The purpose of this was to make useful comparisons across organisations with very different structures and to understand the percentage of women in roles with core science, technology, engineering and mathematics (STEM) functions as well as the composition of the leadership talent pipeline.

Job category

The job category definitions are generally determined by education requirements and with reference to the International Labour Organisation (ILO)'s International Standard Classification of Occupations (ISCO-08).

1. *STEM Professional:* The position generally requires a university degree in STEM (i.e. in general from the science and engineering faculty of a university). Business and finance are not included in this category. In general, it corresponds with the fourth ISCO skill level and with reference to ISCO sub-major groups 21 and 22, "Science, Engineering and Health Professionals." This job category may also include positions in ISCO major group 1, "Managers."
2. *Non-STEM Professional:* The position generally requires a university degree, but not necessarily in STEM. Positions requiring business and finance degrees are included in this category. In general, it corresponds with the fourth ISCO skill level and with reference to ISCO major group 2, "Professionals", specifically sub-major groups 23-26. This job category may also include positions in ISCO major group 1, "Managers."
3. *STEM Worker:* This position generally requires tertiary education not equivalent to a university degree, such as a vocational school diploma or apprenticeship. In addition, the position should involve handling or operating some form of technology where the technology is the primary purpose of their work. In general, it corresponds with the second or third ISCO skill levels and with reference to ISCO sub-major groups 31 and 32, "Science, Engineering and Health Associate Professionals." This job category may also include positions in major group 7, "Craft and Related Trades Workers," and major group 8, "Plant and Machine Operators and Assemblers."
4. *Non-STEM Worker:* The position does not require a university degree and does not qualify as a STEM position. In general, it corresponds with the first, second or third ISCO skill levels.

Management level

The human resources survey asked responding organisations to divide employees into five categories: non-management level, lower management level, middle management level, upper management level and executive. Aside from specifying that the executive level should be approximately the top ten individuals in an organisation (or fewer, depending on the organisation's size), no further specification was given. Given the wide range of organisations surveyed, from nuclear operators to research organisations to government, management responsibilities may vary from a certain number of supervised staff to oversight of policy and programmes with high visibility and organisational responsibility but few if any direct reports. Therefore, the reporting organisation was asked to determine how to define these levels and categorise staff appropriately. The comparisons between reporting organisations are valid and useful for the goals of the survey, which is to understand the representation of women in leadership roles and the talent pipeline.

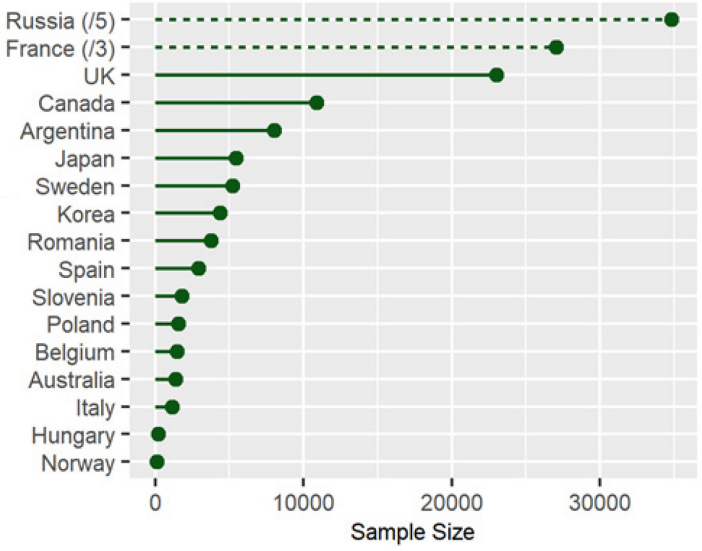
2.2. Labour force representation

2.2.1. *Overall*

The total recorded workforce across all reporting organisations was 326 358. The workforce by country is shown in Figure 2.1. The median country sample size was 3 335. Seventeen countries provided data. Dotted lines (in this and subsequent charts) have been reduced in length to better display the range of values. The scale factors are given with the country name.

Figure 2.1. **Total workforce by country**

(women and men)



The mean values presented in the sections below need to be understood in the context of the weighting of individual country sample sizes. Even so, to prevent the large Russia sample dominating, it is excluded from the calculations of mean values.

The data represents an estimate of at least 50% of the national nuclear sector in over half of the countries surveyed. However, it should be noted that the representativeness of the data varies considerably within and between countries. Nuclear sectors differ significantly in demarcation, composition, organisation and size. In addition, the type of organisations providing data and the percentage of the sector represented from each country is similarly diverse. Therefore, countries are not easily comparable and great care should be taken when seeking to draw conclusions at the country level. (See Annex B for the estimated percentage of the national nuclear sector represented by the quantitative data gathered in the human resources survey for each country that contributed data. A list of organisations that provided data may be found in Annex F.2.)

The tables below show how the reported workforce (women and men) is distributed by "Job category" (Table 2.1) and "Management level" (Table 2.2).

Table 2.1. **Fraction of the total workforce in each job category**

(excluding Russia)

Job category	Job category fraction (women and men)
Non-STEM worker	11.5%
Non-STEM professional	8.2%
STEM worker	33.4%
STEM professional	46.9%

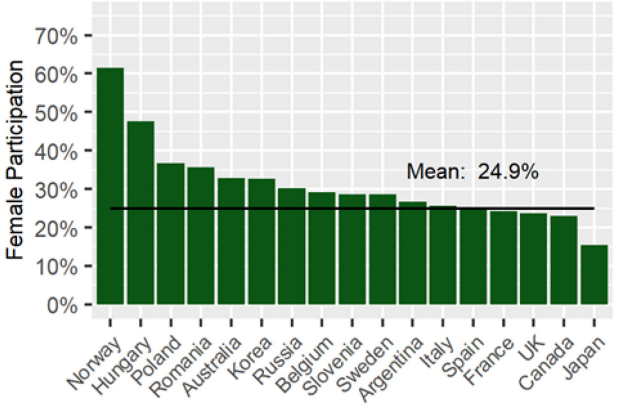
Table 2.2. **Fraction of the total workforce at each level**

(excluding Russia)

Management level	Management level fraction (women and men)
Non-management	53.8%
Lower management	13.6%
Middle management	26.8%
Upper management	5.4%
Executive	0.3%

Across responding organisations, women formed 24.9% of the total nuclear sector workforce (Figure 2.2), but with a wide variation between countries. Although Norway and Hungary reported strong female participation, the sample size in both cases is below 200. In contrast, the United Kingdom, France and Russia each reported over 20 000 employees. The spread in Figure 2.2 may be due to, at least in part, the cross section of organisations captured by different countries.

Figure 2.2. **Overall female nuclear workforce participation by country**



Note: Mean excludes Russia due to the large sample size.

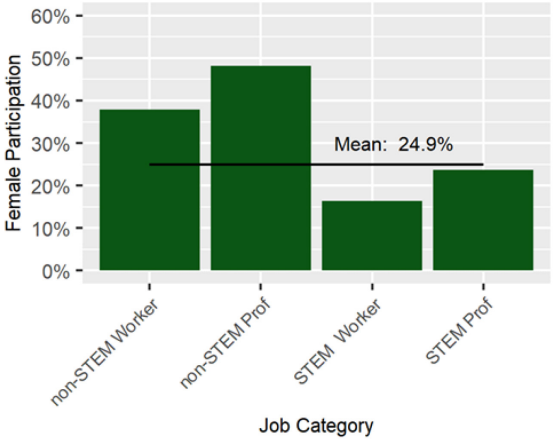
2.2.2. *Gender disaggregation by job category and management level*

The gender balance in the nuclear sector workforce varied across job categories (Figure 2.3), with the sharpest contrast in female participation being between STEM "workers" (16.4% female) and non-STEM "professionals" (48.2% female). An imbalance between scientific/technical roles and other functions appeared as a general feature of the survey results, with women constituting only 20.6% of the STEM workforce in the nuclear sector.

Women were best represented at lower and middle management levels (27.8% and 25.7% respectively, see Figure 2.4). In upper management and executive roles, fewer than one in five were occupied by women (18.3%).

Figure 2.3. **Overall female participation by job category**

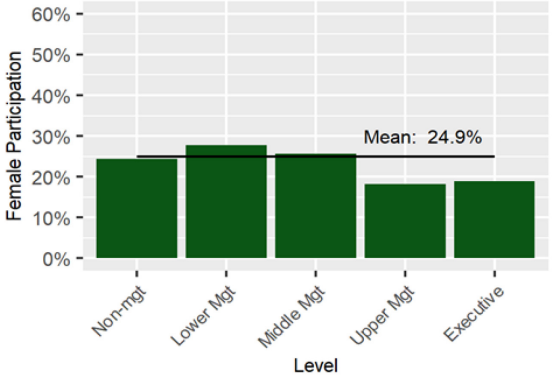
(Identical to Figure 1.1)



Note: Mean excludes Russia due to the large sample size.

Figure 2.4. **Overall female participation by role level**

(Identical to Figure 1.2)



Note: Mean excludes Russia due to the large sample size.

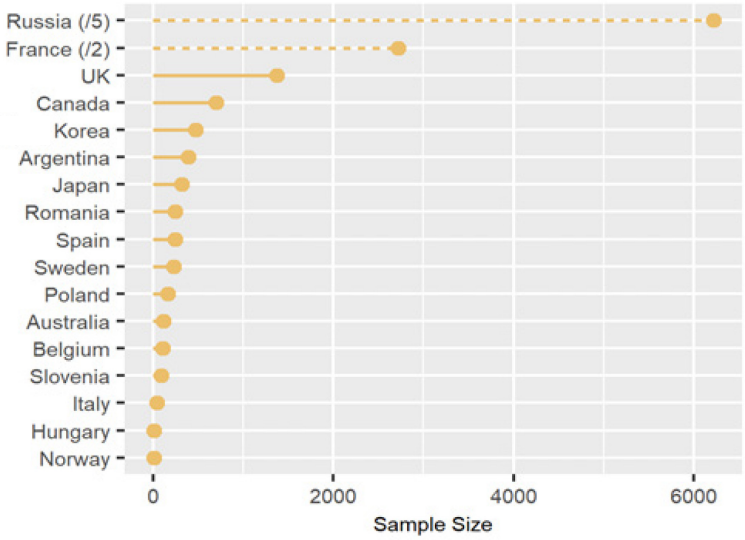
2.3. Career trajectory

2.3.1. *New hires*

A total of 41 056 new hires were reported, representing 12.6% of the overall workforce sample, as shown by country in Figure 2.5 below.

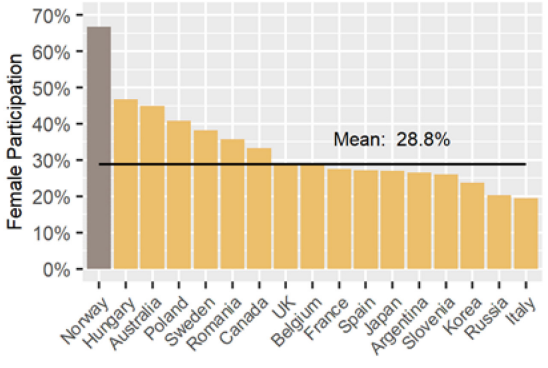
Figure 2.5. **New hires: sample sizes by country**

(women and men)



Overall, 28.8% of new hires were women (Figure 2.6), a higher fraction than in the existing sectoral workforce. However, if the trend continues, 28.8% would also mark the female workforce's long-term limit. Increasing the number of women among new hires would be necessary to achieve gender parity in the nuclear workforce. Note that country sample sizes (women and men) varied from 9 to 31 000. Slovenia, Italy, Hungary and Norway were all under 100.

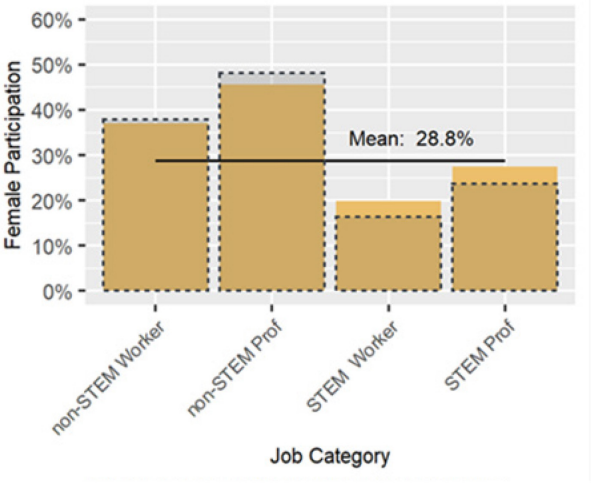
Figure 2.6. **New hires: female participation by country**



Note: Mean excludes Russia due to the large sample size. Grey bar indicates sample size less than 10.

New hires segmented by job categories (Figure 2.7) also show women as significantly better represented among all non-STEM jobs (42.2%) than all STEM jobs (20.6%). The dotted lines show the corresponding fraction of female participation in the existing workforce. Although women are underrepresented in STEM positions, the percentage of new hires for STEM roles is above the current female representation in those roles. This is a positive trend for the increase of women in STEM roles.

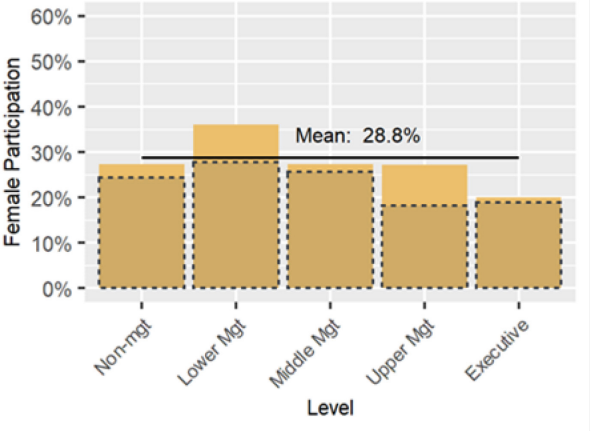
Figure 2.7. **New hires: female participation by job category**



Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

Figure 2.8 shows the same data by disaggregated by management level. With respect to the existing workforce, women are proportionately better represented at lower and upper management levels. The dotted lines show the corresponding fraction of female participation in the existing workforce. Again, the increase in the fraction of female new hires exceeding the current female percentage in all management levels is a positive trend for improving gender balance. However, even the best-performing level is well below gender parity, and the increase in new hires will not raise female participation beyond 28.8% of the workforce, on average.

Figure 2.8. **New hires: female participation by management level**



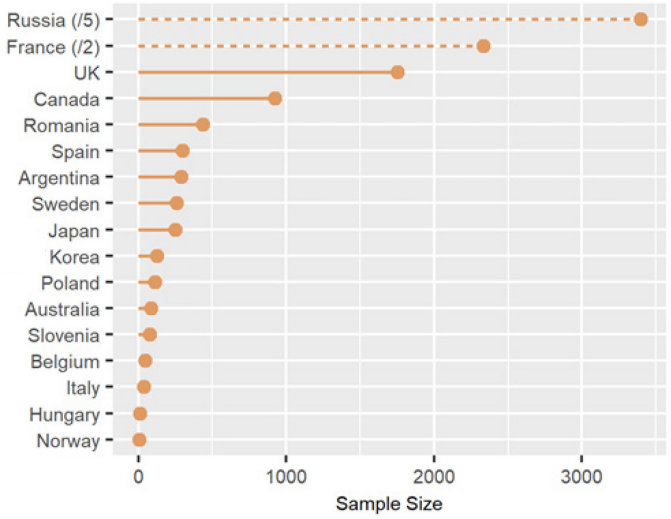
Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

2.3.2. *Attrition*

Attrition is defined as the departure of employees from an organisation for voluntary or involuntary reasons, such as resignation, termination or retirement. A total of 26 378 departing employees were reported, or 8.1% of the overall workforce sample, shown by country in Figure 2.9. Sample sizes from Australia, Slovenia, Belgium, Italy, Hungary and Norway were all below 100.

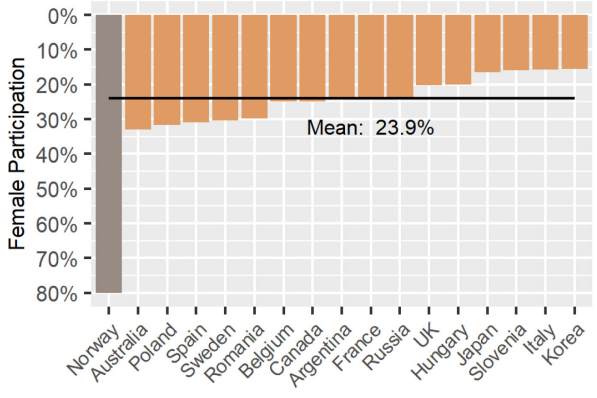
Figure 2.9. **Attrition: sample size by country**

(women and men)



Since the gender balance is exacerbated if a disproportionate number of women leave the sector, attrition data are shown on a negative y-axis (Figure 2.10). An optimistic sign is that only 23.9% of leavers were female, a slightly lower level than their representation in the continuing workforce (24.9%) and also below the level of female new hires (28.8%).

Figure 2.10. **Attrition: female participation by country**

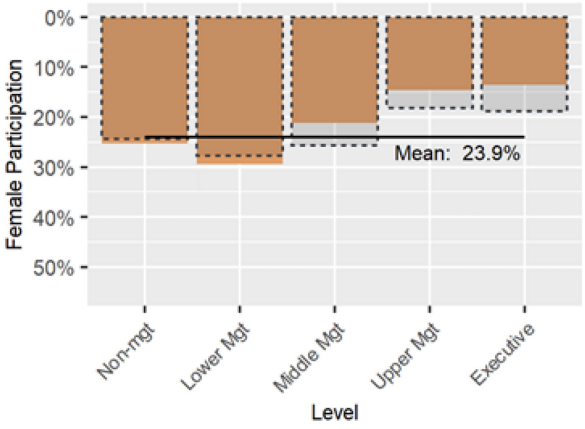


Note: Mean excludes Russia due to the large sample size. Grey bar indicates sample size less than 10.

Some of those leaving will be moving to other jobs in the nuclear sector. Nevertheless, it is assumed that this is a reasonable measure of the gender balance of those leaving the sector altogether.

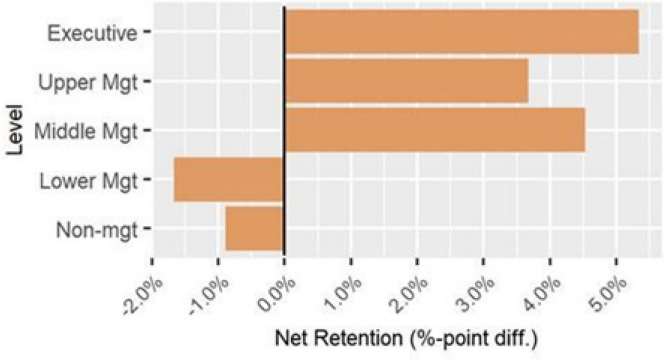
Female attrition at the middle management level and above is proportionately lower than female representation in these levels of the workforce, which is depicted by the dotted lines. (Figure 2.11). This also has a further, albeit marginal, effect in rebalancing across managerial levels. While the lower attrition at higher management levels may appear positive, the highest levels of attrition are at the non-management and lower management levels. Not only is the female attrition at these levels higher than the average workforce attrition for women, but it also represents leakage from the leadership pipeline and will result in a smaller pool of women at the higher management levels. To illustrate this trend, the percentage-point difference between female attrition and female workforce representation in the corresponding management level is shown in Figure 2.12.

Figure 2.11. **Female attrition by role level**



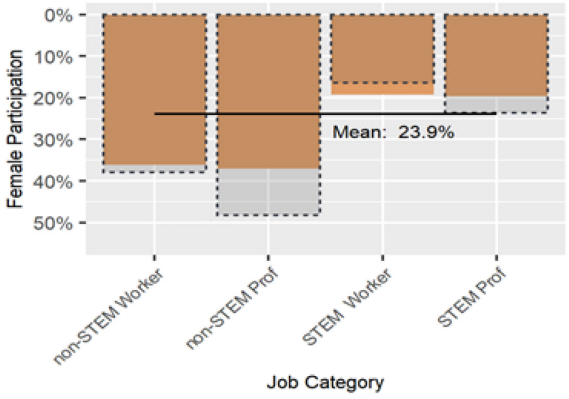
Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

Figure 2.12. **Net female retention by role level – percentage point difference**



The difference in female attrition between STEM and non-STEM job categories (Figure 2.13) largely reflects the composition of the female workforce participation (indicated by dotted lines).

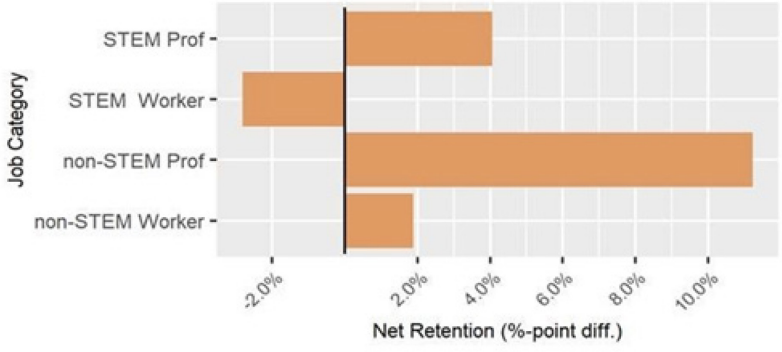
Figure 2.13. **Female attrition by job category**



Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

Retention was proportionately greater for non-STEM "professionals", which will work against improving the proportion of women in technical and scientific roles. Equally, female STEM "workers" (positions that generally do not require a university degree) left at a greater rate, enhancing that negative shift. To illustrate this trend, the percentage-point difference between female attrition and female workforce representation in the corresponding job category is shown in Figure 2.14.

Figure 2.14. **Net female retention by job category – percentage point difference**



2.3.3. *Promotions*

A total of 48 728 promotions were reported (Figure 2.15), or 14.9% of the overall workforce sample. Some countries were unable to provide promotion data.

Figure 2.15. **Promotions: sample size by country**

(women and men)

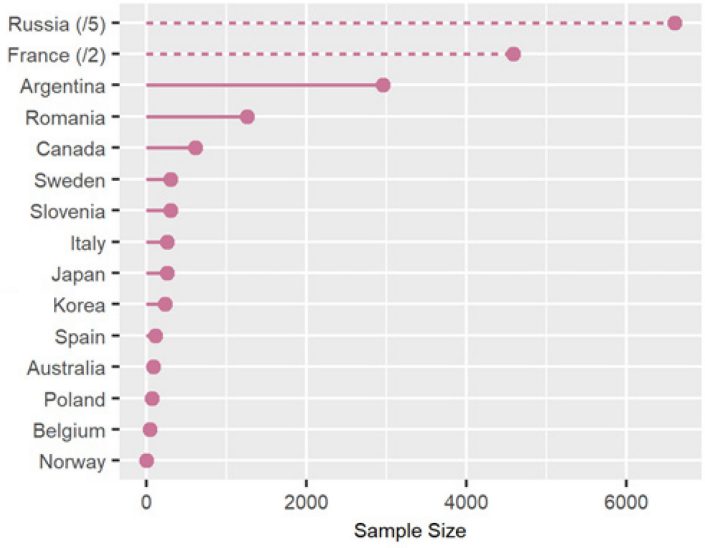
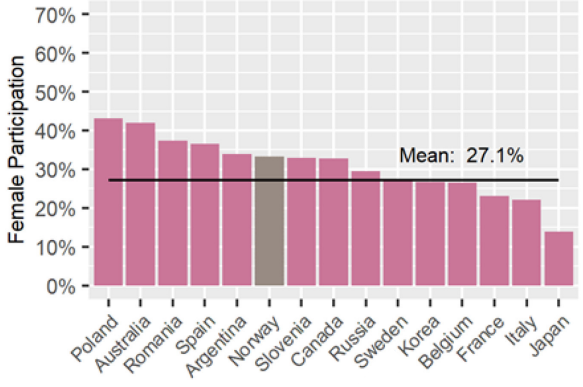


Figure 2.16. **Promotions: female participation by country**



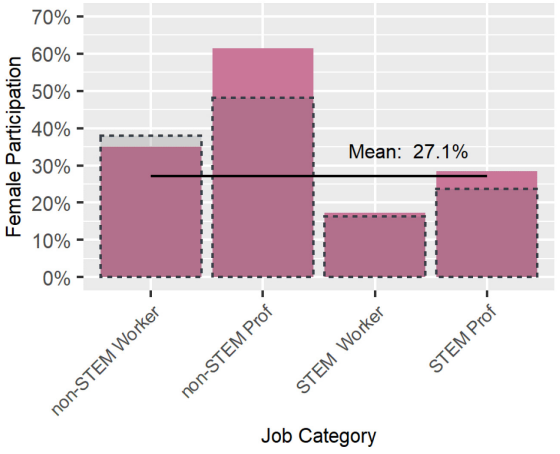
Note: Mean excludes Russia due to the large sample size. Grey bar indicates sample size less than 10.

The number of women's promotions was particularly poor among STEM "workers." In this category, 17.2% of promotions went to women (Figure 2.17) and compares with 35.1% for non-STEM "workers." (Note: "workers" connotes roles that do not require a university degree.) However, this is proportional to the female representation in those roles, as depicted by the dotted line. Women received a strong majority (61.4%) of promotions within non-STEM professional staff, significantly above their representation in the workforce.

Additional data analysis (not depicted below) revealed that for female STEM "workers" (those without university degrees) in lower management positions, 6.9% of promotions were awarded to women. This is in stark contrast to the 52.3% of promotions awarded to women in middle management non-STEM "professional" roles (positions requiring university degrees). This further embeds the technical divide seen in data, in which women were concentrated in non-STEM roles. A positive trend is that women in STEM and non-STEM "professional" roles were promoted at rates exceeding their workforce participation in this job category.

Figure 2.17. **Promotion: female representation in promotions by job category**

(Identical to Fig. 1.6.)

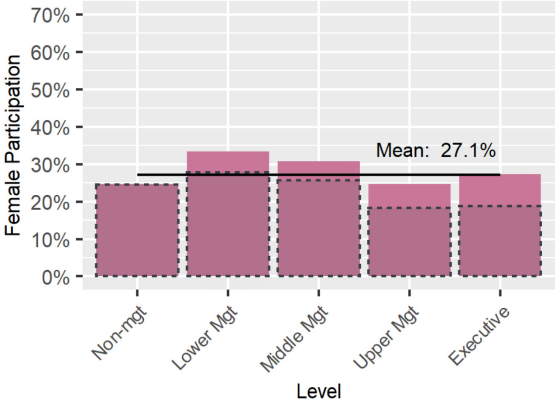


Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

When disaggregated by management levels, promotion rates for women exceeded their representation at each level (as indicated by the dotted line). This trend should improve the gender balance at all levels except in non-management, where it follows the overall workforce (Figure 2.18).

Figure 2.18. **Promotions: female representation in promotions by management level**

(Identical to Fig. 1.5.)



Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

2.3.4 *Career development programmes*

A total of 73 201 employees, or 22.4% of the overall workforce sample were engaged in career development programmes (Figure 2.19). Not all reporting countries provided data on this indicator.

Figure 2.19. **Career development programmes: sample size by country**

(women and men)

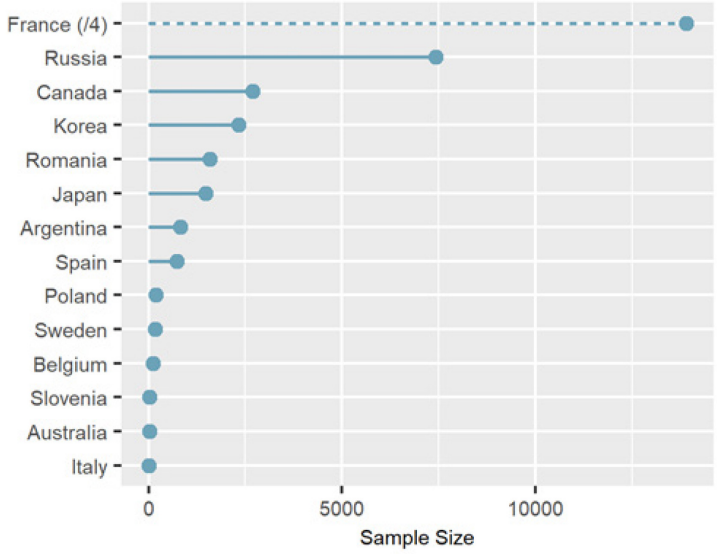
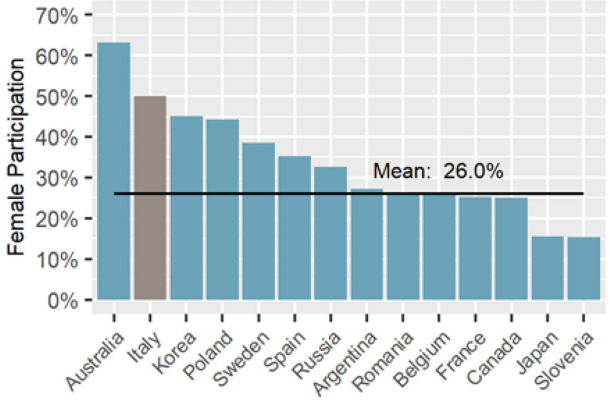


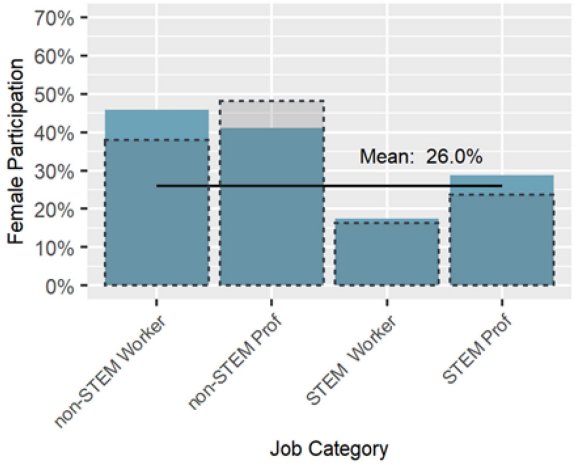
Figure 2.20. **Career development programmes: female participation by country**



Note: Mean excludes Russia due to the large sample size. Grey bar indicates sample size less than 10.

The mean rate of female participation in career development programmes was 26.0%, slightly above the percentage of women in the overall nuclear sector workforce (24.9%).

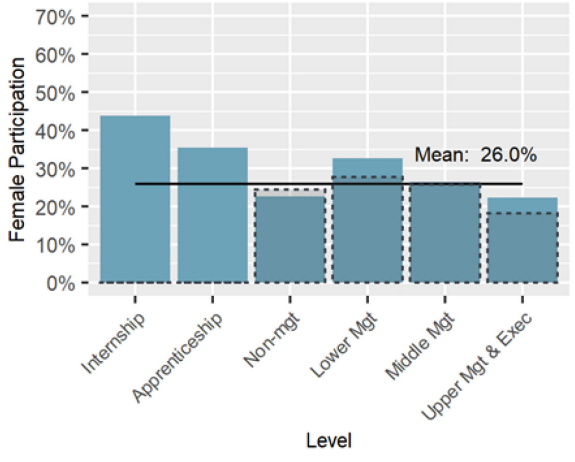
Figure 2.21. **Career development programmes: female participation by job category**



Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

When segmented by role level (Figure 2.22), women's enrolment in career development programmes was noticeably robust at the lower management level. At this level, 32.6% of participants in such programmes were female, which was higher than the main workforce female representation in this level. Women in internships and apprenticeships (for which there are no gender comparators in the main workforce) were at a comparatively high level (43.7% and 35.5% respectively), although absolute numbers were low – interns and apprentices/trainees (women and men) made up only 3.3% of the workforce in career development programmes.

Figure 2.22. **Career development programmes: female participation by level**



Note: Mean excludes Russia due to the large sample size. Dotted lines are current female representation in category or level.

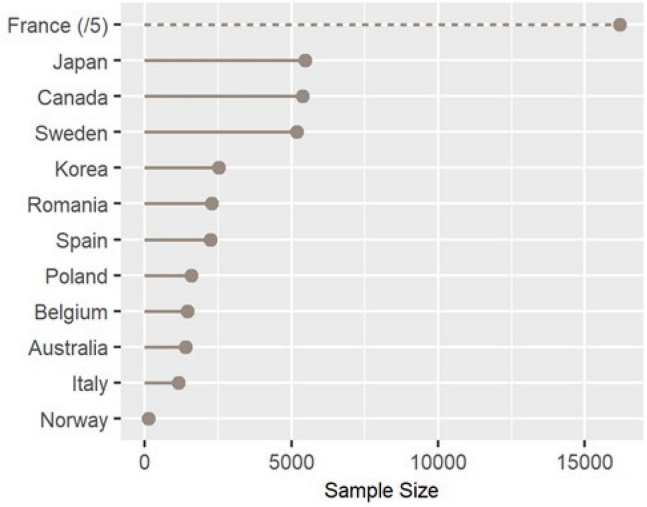
The levels of female engagement in career development programmes was reasonably high (over 40%) in non-STEM roles (Figure 2.21). However, it was lower than could be expected in non-STEM "professional" roles compared to female workforce participation in this job category, as represented by the dotted line. Interestingly, female participation in the non-STEM "worker" category was significantly higher than the rate of female representation in this category. Female STEM "workers" were severely underrepresented in career development, as they are in the workforce in general, suggesting that targeted career development, if it exists, is not widespread.

2.4. Pay parity

Not all countries were able to provide salary data. The datasets received were combined using total workforce figures included specifically for the purpose (Figure 2.23). However, granular analysis by job category and management level necessitated a weighting that was not pay-specific, an approximation that may not hold in all cases.

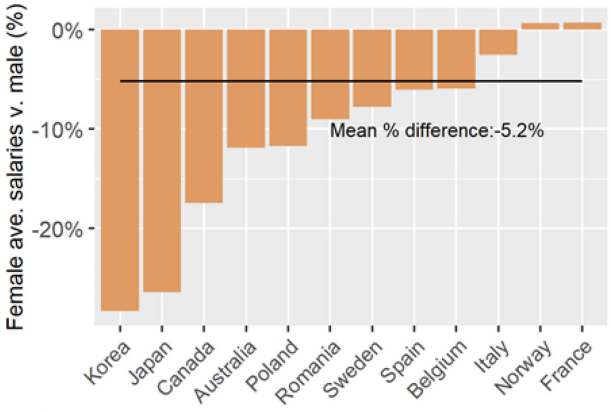
Figure 2.23. **Pay parity: sample size by country**

(women and men)



Across the countries reporting pay information, the average male salary was calculated at USD 56 445, and the female average at USD 53 514 per annum. The difference between male and female pay varied considerably between countries. For France it was small, and slightly favoured female workers. Figure 2.24 shows the disparity by country expressed as a percentage of average male pay. For the countries that reported data, the salary differential ranged from 0.7% to -28.3%. Note that the size of the French sample (Figure 2.23), compared to other countries, strongly influenced the average of women being paid 5.2% less than men. Excluding the French data, women's salaries were 19.5% less than those of men.

Figure 2.24. **Pay parity: the differential between women's and men's salaries**



To properly combine salary data, expressed as averages, requires the weighting to be known in each case (how many staff contributed to the average). The complication of combining at both an organisational and national level means there is more uncertainty in the final analysis than is the case for other data in this report. Nevertheless, the trends should be clear; there are deep disparities in some countries, whereas only a minority are well-balanced. More studies are required to improve accuracy and to understand the environment that gives rise to gender inequality in pay.

2.5. Summary of the key findings from the human resources survey

Women in the nuclear sector in NEA countries are:

- 24.9% of the nuclear workforce surveyed in 96 organisations in 17 countries;
- most likely to work in a non-STEM role requiring a university degree, and least likely to work in a STEM role that does not require a university degree;
- poorly represented in upper management and executive levels, with both under 20%;
- 28.8% of new hires, which is the upper limit of the female nuclear workforce representation if gender-balanced recruitment does not improve;
- 23.9% of job leavers, and more likely to "leak" early in the leadership pipeline;
- being promoted at high rates in non-STEM roles requiring a university degree; and
- paid on average 5.2% less than men (based on limited data from 12 countries), with greater disparities in non-European countries.

2.6. References

ILO (2012), *International Standard Classification of Occupations* (ISCO-08), International Labour Organization, Geneva, www.ilo.org/public/english/bureau/stat/isco/docs/publication08.pdf (accessed 24 May 2022).

Strategic Policy Economics (2020), *Women in Nuclear Canada Member Survey: Findings*, https://strapolec.ca/wp-content/uploads/2020/10/WiN-Canada-Member-Survey-Final-Report-June-2020.pdf (accessed 24 May 2022).

Chapter 3. From the women themselves: Survey data on women's experiences and perceptions of the nuclear sector workplace

3.1. Introduction

To improve understanding of women's current representation and experiences in the nuclear sector in OECD Nuclear Energy Agency (NEA) member countries, two surveys were conducted in 2021: the first was a survey of NEA countries' nuclear organisations via their human resources departments, and the second was a voluntary opinion-based survey of individuals. This chapter examines the qualitative data gathered through the latter, which complements the quantitative data gathered through the former survey that was explored in Chapter 2.

3.1.1. *Methodology for the public NEA Survey of Women in the Nuclear Sector*

Women in the global nuclear sector were invited to complete an online survey between June and August 2021. This opinion-based survey targeted women working in the nuclear sector in NEA countries. It was developed by the NEA using the cloud-based software SurveyMonkey and made publicly available on the NEA website in eight languages (English, French, Italian, Japanese, Korean, Romanian, Russian and Spanish). The survey was promoted by NEA email distribution, website and social media content, as well as through countries' permanent delegations to the OECD, national representatives on the Steering Committee for Nuclear Energy, members of the NEA Gender Balance Task Group, and by nuclear organisations and networks such as Women in Nuclear (WiN). (See Annex C for the survey questions and Annex F.1 for a list of member country representatives.)

Completion of the survey was entirely voluntary, and the answers represent the opinions only of those who responded. No attempt has been made to normalise or weight the data. Rather, the analysis aims at providing a sense of direction to inform the development of strategies and interventions that will, over time, improve gender balance.

The survey comprised 34 multiple-choice questions, of which 8 were required and 26 were optional. Closed-form questions were used to allow semi-quantitative analysis. Questions had either scale answers ("strongly disagree" through to "neither agree nor disagree" to "strongly agree"), or the option to choose up to three options from a longer list.

To conclude whether there was overall agreement or disagreement with a proposition, responses in this report were aggregated to "agreed" and "disagreed" (or in one case "encourage" and "discourage").

In general, each opinion question was stratified by background information from questions two to eleven (summarised below). Only a selection chosen to illustrate significant themes has been captured in this report.

After an initial question asking if the respondent identified as a woman, ten factual questions gathered information relevant to employment and possible gender impacts. For the purposes of this survey, respondents were asked whether they identified as a member of a

minority group, using a definition adapted from the United Nations.[1] The summarised background information of the demographic questions can be found in the Annex E.

The survey targeted women in the NEA member countries and one of the background questions asked about country of residence or where the respondent's most significant nuclear sector work experience took place. Respondents came from 32 NEA member countries, ranging from a handful of responses per country to over a thousand. Therefore, to present a meaningful geographical disaggregation of the data, the responses are grouped according to the United Nations M49 Standard. (See Annex E, Figure E.1, for a chart of the responses by country of identified residence or work experience.)

The survey questions asked about experiences and organisational policies and programmes in the respondent's workplace, and did not ask specifically about national or governmental policies. The results should not be interpreted as an evaluation of any specific national context. Nor do the results represent any official national or governmental policy position.

Finally, it should be noted that the survey was conducted amidst the global COVID-19 pandemic, which may have influenced responses. However, the questions were designed to ask the respondent to consider their experiences in general, rather than the particular impact of the pandemic.

3.1.2. *Overview of the survey questions*

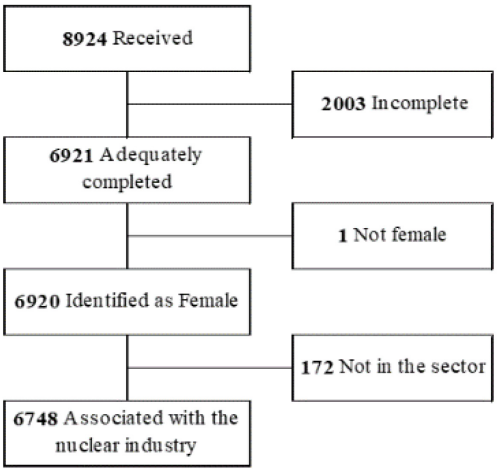
The 34-question survey was divided into the following sections:

- *Questions 1-11:* Background information *(11 questions)* – employment, location, education, age, family and minority status;
- *Questions 12-14*: Perceptions of gender balance in the workplace *(7 questions)* – presence of women in the organisation, culture and policies, management, stereotypes, gender impacts on working conditions, career, salary, and performance review;
- *Questions 15-22:* Aspirations and professional development *(8 questions)* – expectations and challenges, institutional support, and role models;
- *Questions 23-30:* Barriers and challenges that need to be addressed *(20 questions)* – nuclear-specific, entry and advancement, family, pay, and work culture; and
- *Questions 31-34:* Identifying solutions *(4 questions with each up to 23 choices)* – attracting women into the nuclear sector, supporting women's careers, and creating inclusive work environments.

By 1 September 2021, 8 924 responses were received, not all of which were valid to be included in the analysis (Figure 3.1).

1. The current UN definition is set out in the 1992 Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities. The 1977 UN study by the UN Sub-commission on the Prevention of Discrimination and Protection of Minorities is widely quoted and was adapted for the NEA survey: "A minority group is considered to be a group of people within a country who possess ethnic, religious or linguistic characteristics differing from those of the rest of the population and show, if only implicitly, a sense of solidarity, directed towards preserving their culture, traditions, religion or language. Typically, the minority group is in a numerically inferior or non-dominant position compared to the majority of the population."

Figure 3.1. **Received responses, excluded and included**



Using the total workforce and female participation rate estimated from the survey of organisations in Chapter 2, for the purpose of the analysis the estimated total number of women in the nuclear workforce for this survey is approximately:[2]

326 360 *(population of nuclear workforce from human resources survey)* x 24.9% *(female nuclear workforce participation)* = 81 264 *(estimated number of women in participating nuclear workforce)*

This gives a survey response rate of 8.5%, typical for a survey of this type.

3.2. Attractiveness of nuclear sector careers for women

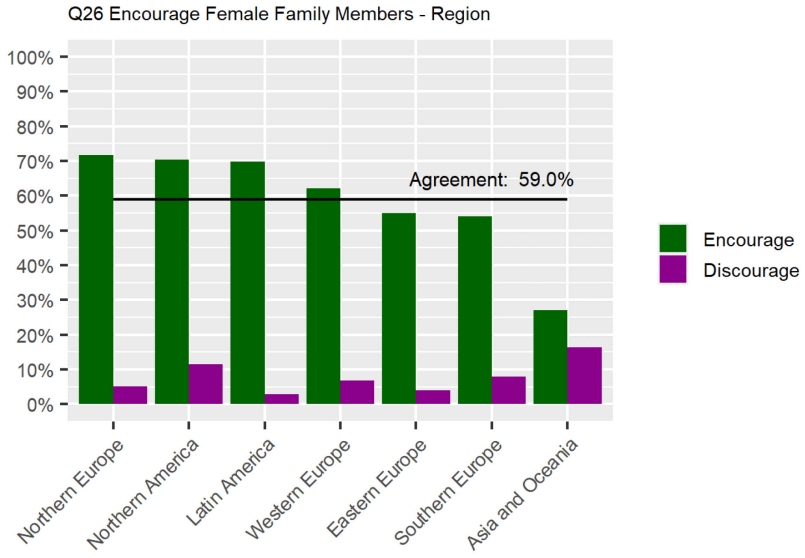
A sector that can attract women is a prerequisite for rebalancing the nuclear workforce, although it depends on several factors. As one measure, survey respondents were asked whether they would encourage or discourage daughters, female family members or close friends to pursue a career in nuclear energy. Overall, 59% responded positively, although this hides a significant range, from 72% in Northern Europe to 27% in Asia and Oceania.

Figure 3.3 shows all answers included in Figure 3.2, including a substantial fraction who neither agreed nor disagreed. Although a majority would encourage other women towards a nuclear career, there was also a degree of ambivalence. This is evidenced by the large number of respondents who answered that they would neither encourage nor discourage their female friends and family to pursue a career in the sector (33.27%), in yellow below.

2. These numbers are for the purpose of testing the validity of the sample size and do not represent an estimate of the nuclear workforce in NEA countries. The population of the nuclear workforce from the human resources survey refers only to the 96 organisations in 17 countries that contributed data. Public survey respondents represented 32 countries and likely worked at more organisations than contributed human resources data.

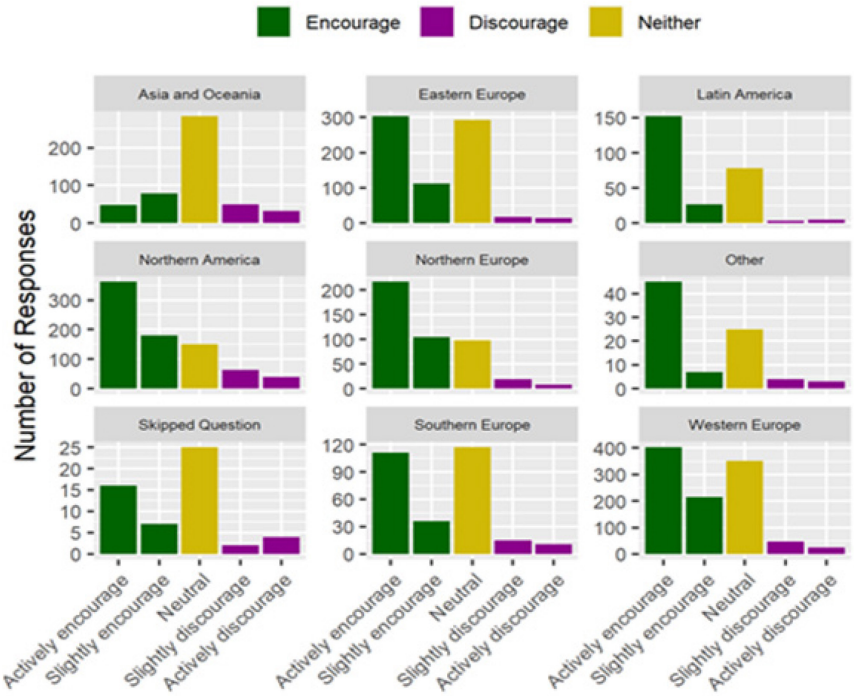
Figure 3.2. **Would you encourage female friends and family to join the sector?**

(Identical to Fig. 1.3.)



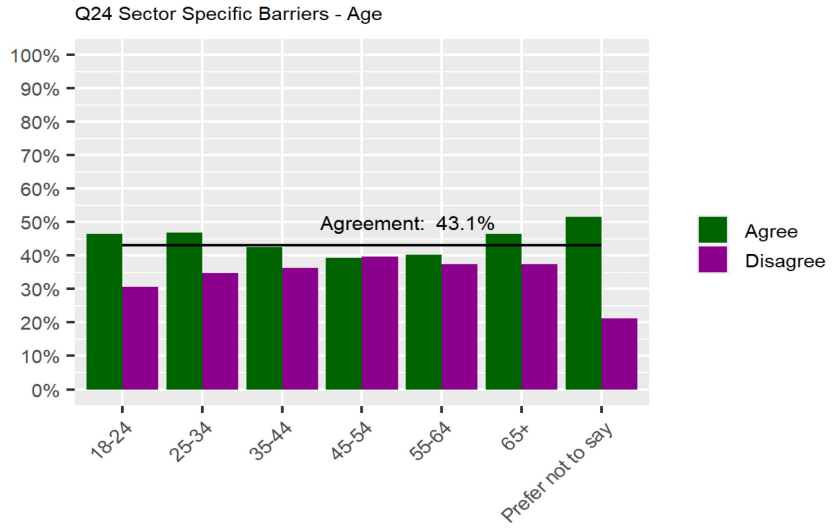
Note: Geographic regions per the United Nations M49 Standard.

Figure 3.3. **Would you encourage female friends and family – showing all answers**



Barriers to women in the nuclear workforce were not generally seen to be particular to the sector, with fewer than half of respondents (43.1%) agreeing that nuclear-specific barriers exist. However, the largest variation in viewpoints was correlated with the age of the respondents (Figure 3.4) and shows a trend towards younger workers recognising sector-specific issues. Since recruitment from this age group is a significant aspect of the nuclear talent pipeline, this is an area that merits attention.

Figure 3.4. **Are there barriers impacting women specific to nuclear?**



Where nuclear sectoral-specific barriers were identified by the survey respondents, the most common were related to cultural and societal factors, including a lack of women already in leadership positions and preconceptions in society that the positions "are male" (see Section 3.5.1, Figure 3.39).

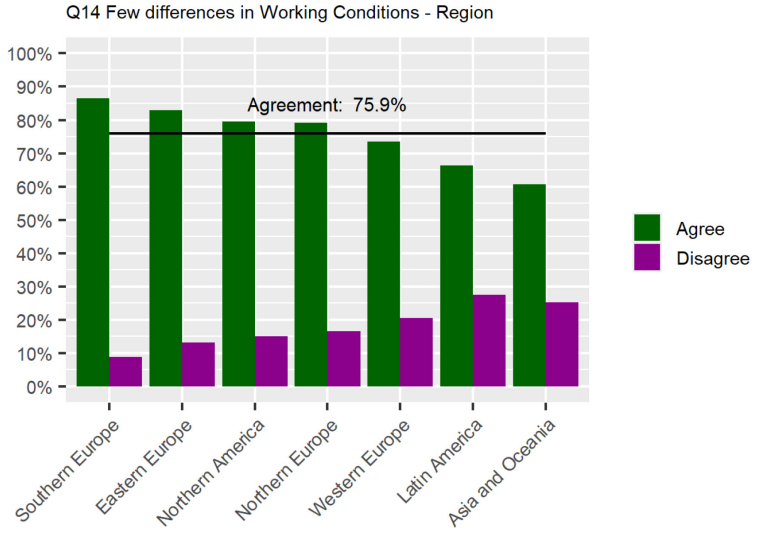
3.3. The nuclear sector workplace

3.3.1. *Working conditions and culture*

For women to remain in the nuclear workforce and for new entrants to find the sector appealing, it is important that the workplace not only be inclusive in practice but also that it be perceived as such. In the survey, the most frequently cited barriers or challenges related to leadership (a lack of female leaders and gender bias about leadership characteristics), balancing family responsibilities (see Section 3.5.1, Figures 3.37 and 3.38), and culture (unsupportive work cultures for women and sociocultural perceptions about the masculinity of the sector). For example, two-thirds of the respondents agreed that stereotyping, microaggressions, unconscious bias, and male-dominated work cultures inhibit women's full contributions and negatively impact their career trajectory. Nevertheless, a clear majority (75.9%) agreed that there were few or no differences or disparate, gender-based impacts with regards to adequate facilities or the provision of equipment or protective gear (Figure 3.5). The response was not uniform, but remained high for all regions, and was largely independent of the type of organisation.

Figure 3.5. **Are physical working conditions equal for men and women?**

(Region)

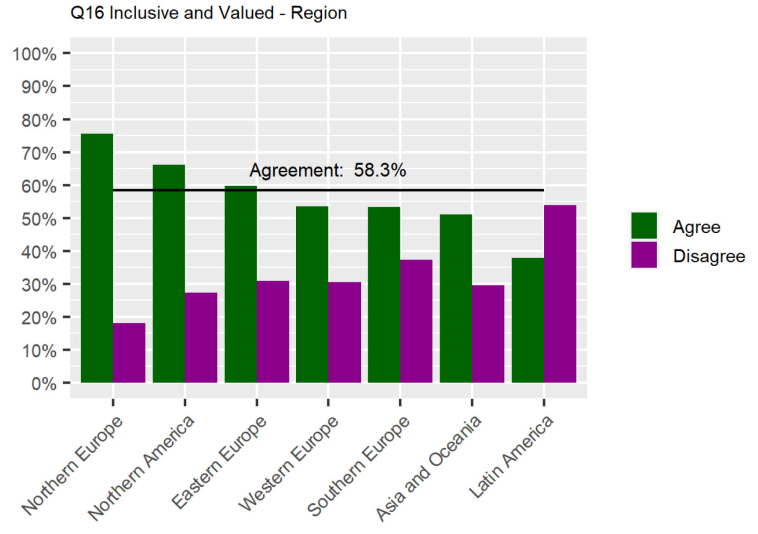


Note: Geographic regions per the United Nations M49 Standard.

When asked whether women are encouraged, valued and respected in the respondent's workplace (Figure 3.6), 58.3% of respondents agreed. However, there was wide geographical variation, from significant agreement (75.6% in Northern Europe) to significant disagreement (only 37.8% of respondents in Latin America felt that women are valued).

Figure 3.6. **Are women fully encouraged, valued and respected in my workplace?**

(Region)



Note: Geographic regions per the United Nations M49 Standard.

The response also varied with organisation type (Figure 3.7). At the lower end, only around half of the female respondents working in power generation or decommissioning felt positively included and valued (50% and 50.5% respectively). Women working in regulation and at new nuclear reactor build sites were the most positive (72.2% and 65.3%).

Given the consequence of attracting early career entrants and retaining women with young families, it is encouraging that there was somewhat more agreement within younger age groups (Figure 3.8).

Figure 3.7. **Are women fully encouraged, valued and respected in my workplace?**

(Organisation type)

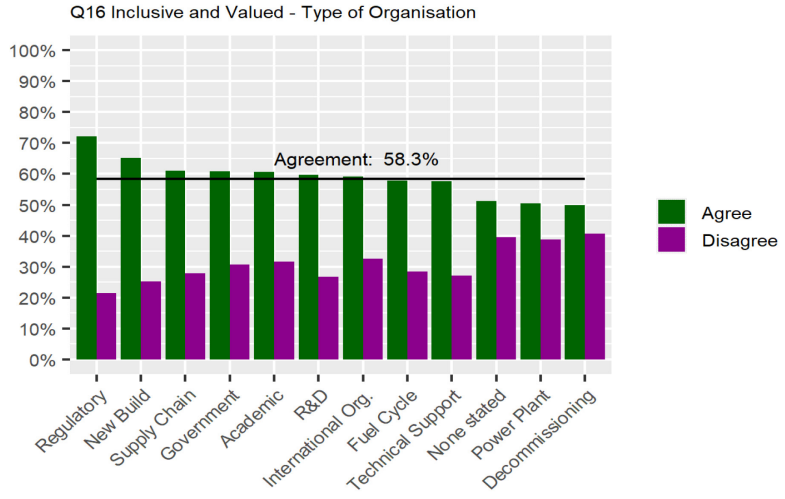
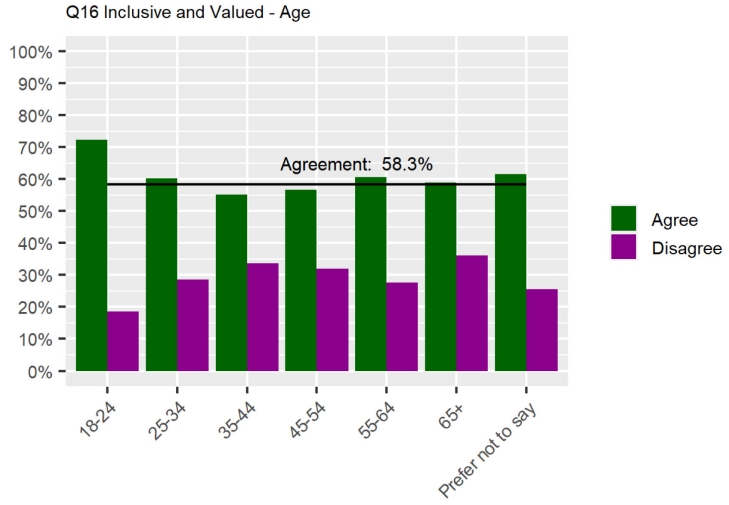


Figure 3.8. **Are women fully encouraged, valued and respected in my workplace?**

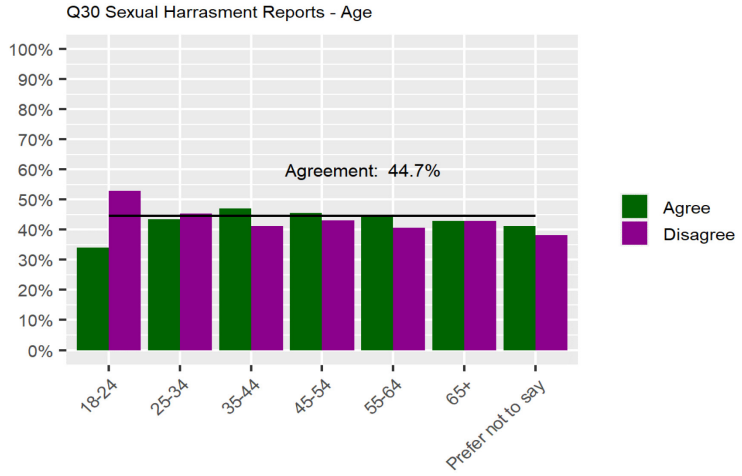
(Age)



Accounts of sexual harassment in the workplace (including personal experiences and second-hand accounts) were reported by 44.7% of respondents (Figure 3.9). For a question that ideally would report zero, this marks a high level. Beyond the unacceptability (and often illegality) of sexual harassment, these reports could act as a further disincentive to women in

the nuclear workforce to remain and to encourage friends and families to seek a career in the sector. An additional question asked about accounts of hostile behaviour or attitudes to women in the workplace, to which over half of respondents responded in the affirmative. Such accounts were particularly acute in Latin America, Northern America, and Northern Europe, at nuclear power plants and international organisations, among minorities, and in STEM roles, especially those requiring fewer educational credentials.

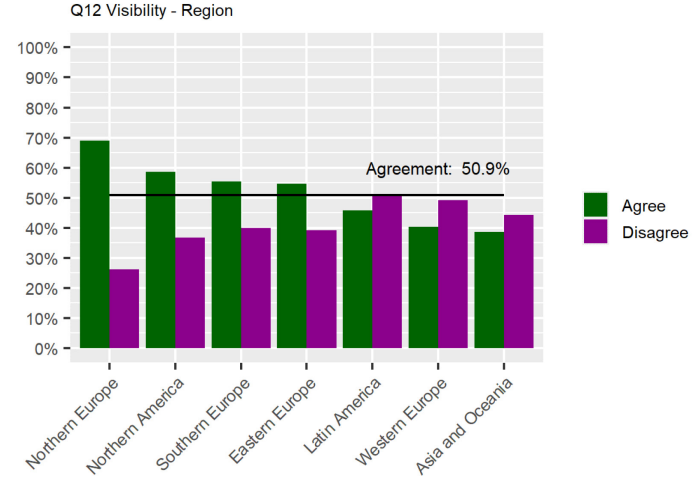
Figure 3.9. **Accounts of sexual harassment in the workplace**



3.3.2. *Visibility of women and availability of mentors and role models*

The visibility of women in the nuclear workforce is a factor in the sector's attractiveness to new entrants. Women in leadership positions serve as role models and mentors, and strengthen gender-balanced policy making. Opinion was divided on the question of how present and visible women are in the respondent's workplace, especially in science, technology, engineering and mathematics (STEM) roles and leadership positions. Overall, 50.9% of respondents agreed that female visibility is widespread, but with considerable variation geographically (Figure 3.10).

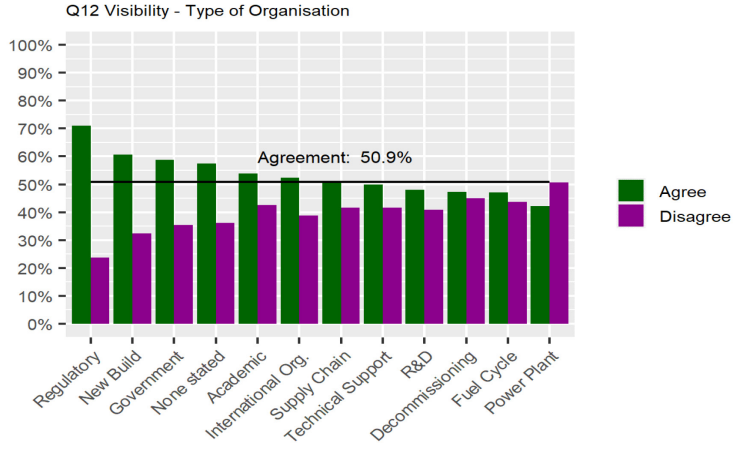
Figure 3.10. **Is the presence and visibility of women widespread in my workplace?** (Region)



Note: Geographic regions per the United Nations M49 Standard.

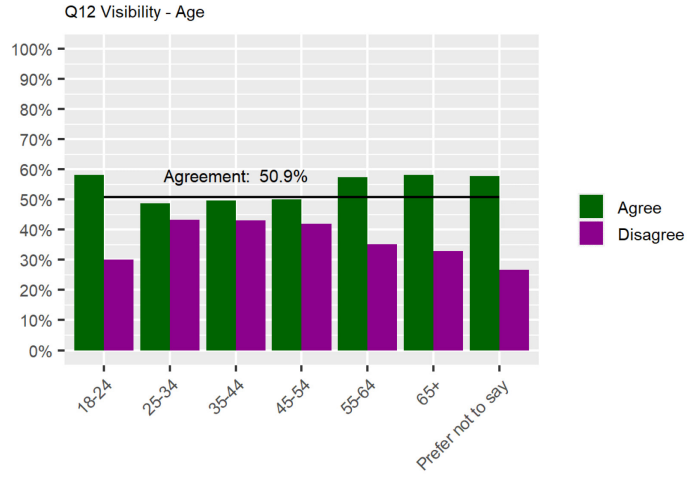
Opinion also varied considerably according to organisation type. The highest female visibility was reported in regulation, new nuclear reactor build sites and government (Figure 3.11).

Figure 3.11. **Is the presence and visibility of women widespread in my workplace?** (Org.)



Stratification by age also revealed a concerning trend, with far greater agreement among respondents over 54 years old and those under 24 years old (Figure 3.12). This trend correlated with time spent in the sector. Female visibility was least obvious to women ages 25-54 who have been working in the sector between 3 and 15 years. This is a crucial demographic for which mentoring and role models would help create a robust pipeline into more senior roles.

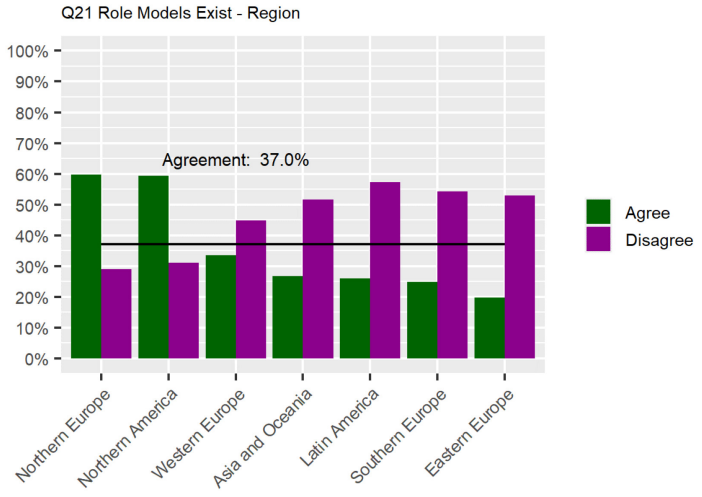
Figure 2.12. **Is the presence and visibility of women widespread in my workplace?** (Age)



A targeted question about the presence of role models elicited a strong response. Only 37% of respondents agreed that role models and mentors exist in their workplace (Figure 3.13), although this masks stark geographical divisions. In Northern Europe and Northern America, agreement averaged well over half of respondents. However, in the rest of Europe, Latin America and Asia and Oceania, the combined average is only around a quarter of respondents, and is especially low in Eastern Europe.

This finding was reinforced in other parts of the survey. A dearth of women in the sector, including in leadership positions, was the most frequently selected nuclear-specific barrier for the retention and advancement of women (see Section 3.5.1, Figure 3.39).

Figure 3.13. **Do women role models and mentors exist in my workplace?**

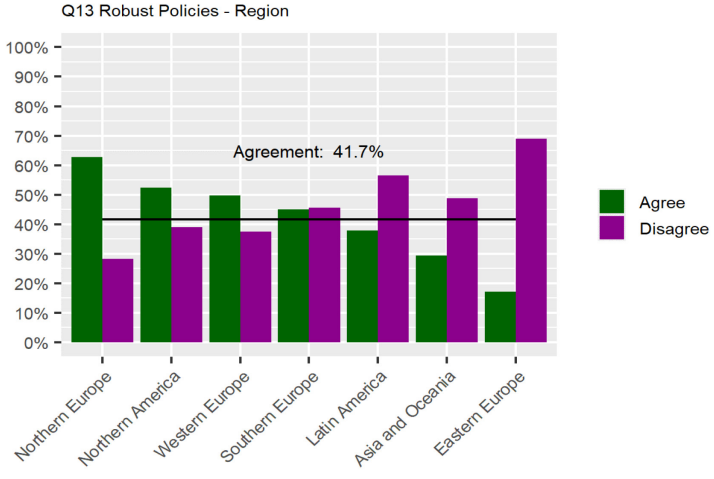


Note: Geographic regions per the United Nations M49 Standard.

3.3.3. *Gender equality policies and managerial commitment*

Managerial commitment sets the tone for the development of the workforce. Attitudes towards existing policies provide a guide to their trajectory and the effectiveness of communications to the incumbent workforce. However, the survey found that only 41.7% agreed that robust policies were in place to support gender balance (Figure 3.14). As with several other measures, there was considerable variation geographically, following the trend of respondents in Northern Europe and Northern America expressing the most positive views.

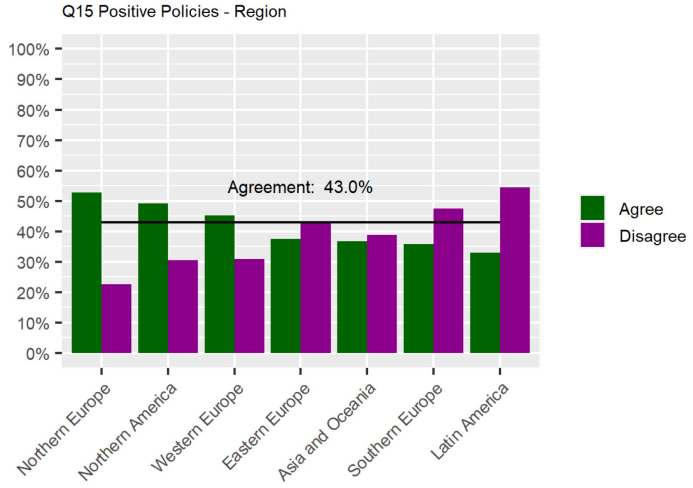
Figure 3.14. **Do robust policies and priorities exist in my workplace to support women?** (Region)



Note: Geographic regions per the United Nations M49 Standard.

A more personally focused question on the extent to which gender policies within the respondent's organisation helped the respondent feel satisfied and optimistic about future career prospects generated a similar overall outcome (Figure 3.15).

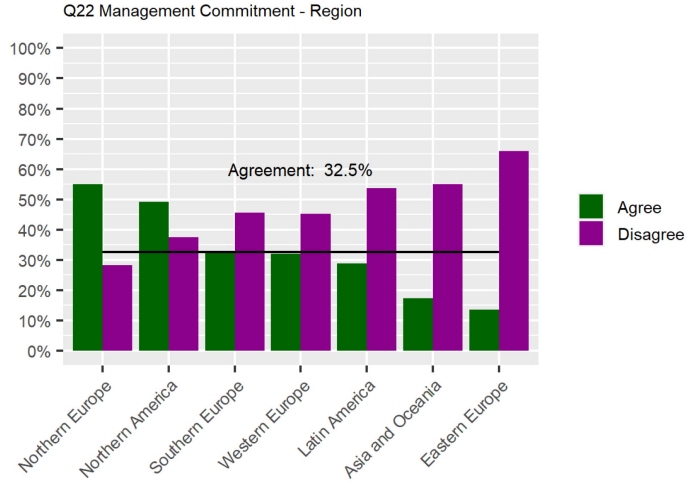
Figure 3.15. **Are the gender polices generating career satisfaction and optimism?**



Note: Geographic regions per the United Nations M49 Standard.

This finding about career satisfaction and optimism might reflect both the absence of clear and effective policies, as well as a lack of management communication and discussion about their impact. Expressions of management commitment to gender balance were only acknowledged by 32.5% of respondents (Figure 3.16), with many outside Northern Europe and Northern America strongly rejecting the premise. Women aged 25-44 polled more negatively than average. There were organisational differences as well: employees at international organisations, regulators, academic institutions and fuel cycle organisations expressed the most agreement, and employees of new build sites the least.

Figure 3.16. **Do managers engage and express commitment to gender balance?**



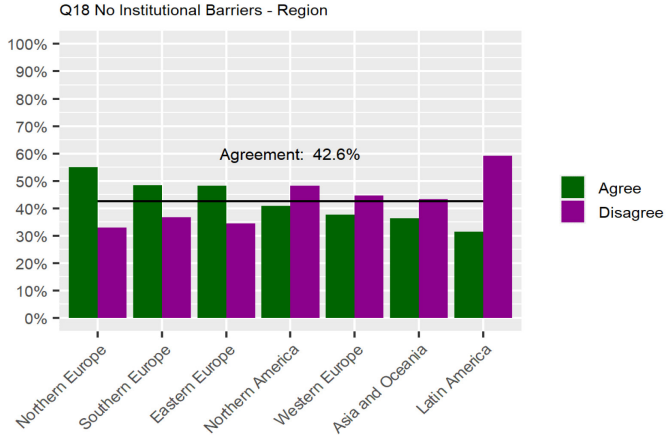
Note: Geographic regions per the United Nations M49 Standard.

3.4. Career trajectories

The opportunity to progress professionally is salient for the attractiveness of the sector and to ensure that gender is balanced at all levels, including leadership positions. In a high skill, safety-critical sector, the accumulation of knowledge and experience is rightly valued. The freedom to fully develop over a career is essential to support equality of opportunity. In addition, retention and development is vital for the robustness of the workforce.

In response to the survey question about institutional barriers to female retention and promotion, less than half (42.6%) opined that no such barriers exist (Figure 3.17). Agreement on the absence of barriers was highest in Northern Europe and lowest in Latin America.

Figure 3.17. **Are there only limited institutional barriers to female retention and promotion?**



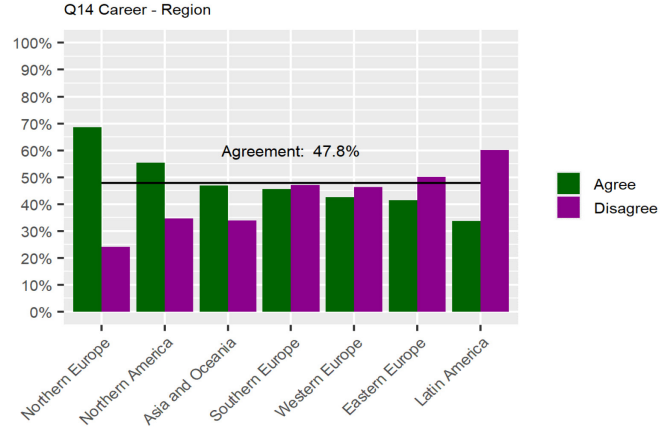
Note: Geographic regions per the United Nations M49 Standard.

3.4.1. *Career opportunities*

As viewed by survey respondents, opportunities for career advancement varied widely by geographic region. In Northern Europe, 68.6% agreed that there was little gender-based difference, but this reduced to 33.7% agreement in Latin America. Globally, most respondents believed that gender-based differences exist in the sector (Figure 3.18).

Figure 3.18. **Are career opportunities the same for men and women in my workplace?**

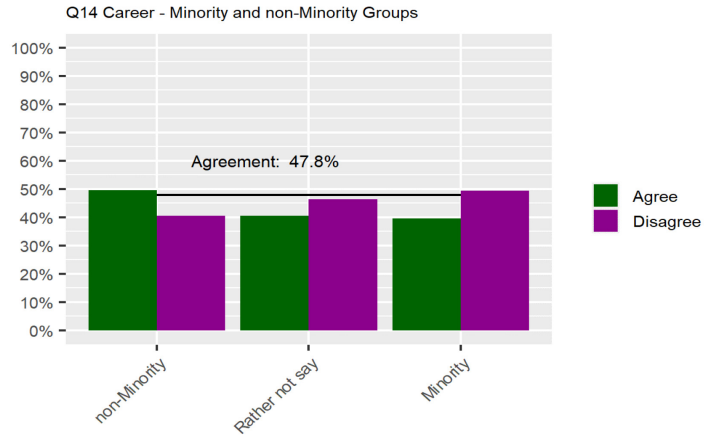
(Region)



Note: Geographic regions per the United Nations M49 Standard.

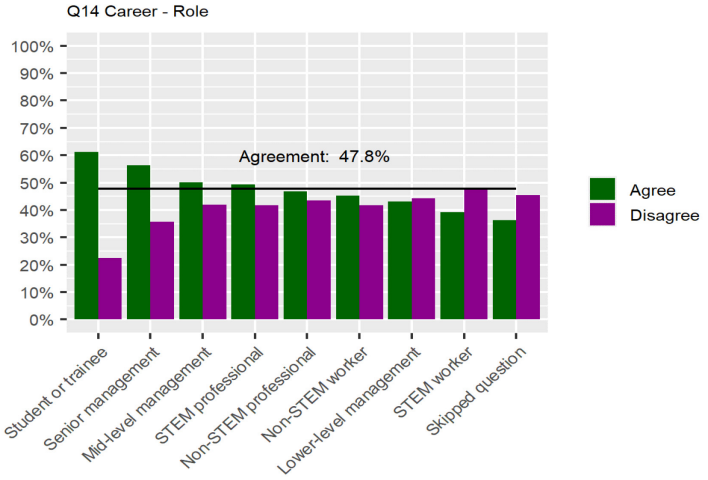
A significant trend was observed with respect to respondents who identified as members of the majority or of a minority group. Those who affirmed that they did not belong to a minority group expressed above-average agreement with the premise that career opportunities are equal. However, respondents who identified as belonging to a minority group agreed far below the average, with only 39.6% recognising no major differences (Figure 3.19).

Figure 3.19. **Are career opportunities the same for men and women in my workplace?**
(Minority and non-minority groups)



Survey respondents who identified as STEM "workers" (role does not require a university degree) rejected in greater numbers the suggestion that career development is equal (Figure 3.20).

Figure 3.20. **Are career opportunities the same for men and women in my workplace?**
(Role)



Note: "Worker" means a position that does not typically require a university degree. "Professional" means a role that typically does.

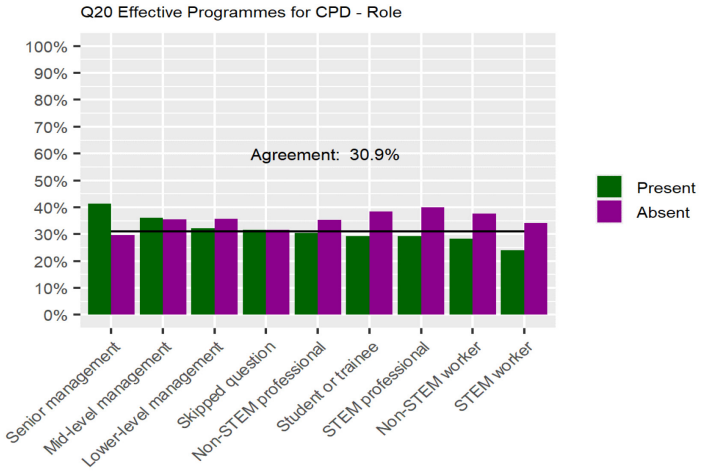
3.4.2. *Programmes for career development*

Continuous professional development (CPD) is a conscious, proactive process to increase skills and knowledge, and as such is another consequential avenue in which women should be able to access the full range of career opportunities. Although often associated with management levels,

the concept implies the availability of calibrated professional development programmes at all levels. Strikingly, the survey found very low agreement that effective development programmes exist (30.9%), with little variation across roles (Figure 3.21). This finding was little affected by organisation type, or age below 65. The result is particularly concerning given the low visibility of women in leadership positions and lack of female role models, as reported in Section 3.3.2. In the long-term, this is likely to negatively impact gender balance in the leadership development pipeline.

Figure 3.21. **Are programmes to professionally develop women available and effective?**

(Role)

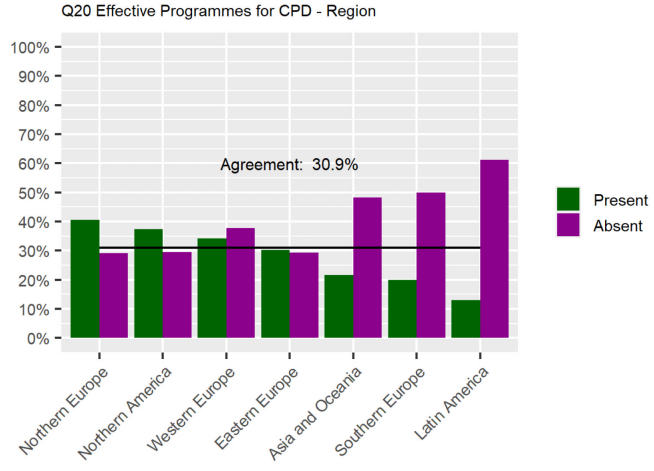


Note: "Worker" means a position that does not typically require a university degree. "Professional" means a role that typically does.

The absence was particularly remarkable in certain regions. Survey respondents in Latin America, Southern Europe and Asia and Oceania reported the least level of access. Continuing the favourable trend seen in other questions, Northern Europe and Northern America fared the best in the polling.

Figure 3.22. **Are programmes to professionally develop women available and effective?**

(Region)



Note: Geographic regions per the United Nations M49 Standard.

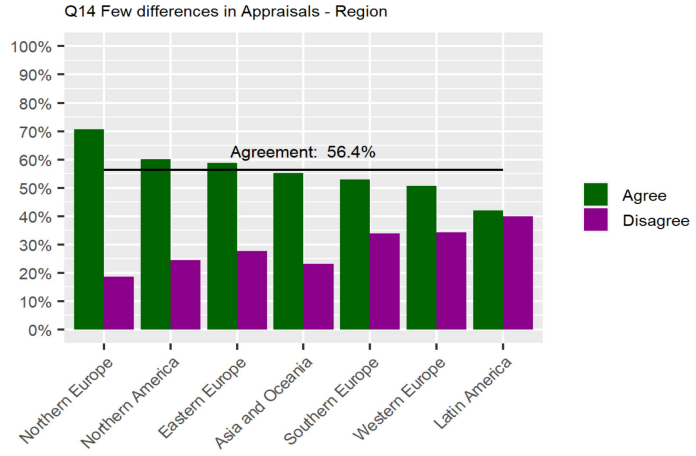
3.4.3. *Work performance appraisals*

Fair work performance appraisals underpin progression, career development, salary parity and general recognition. Only a little more than half of the respondents believed that there are few differences between women and men in work performance appraisals (56.4%). Stratification by region shows a wide range from 42% in Latin America believing that there are no negative gender-based impacts to 70.6% in Northern Europe (see Figure 3.23).

In general, survey respondents expressed confidence that performance appraisals in their workplace are not impacted by gender. The pattern of agreement is similar to views on the equality of career opportunities (Section 3.4.1) with the exception of Eastern Europe. Over half of Eastern Europe respondents agreed that appraisals are gender-neutral, whereas they had disagreed about career opportunities being gender-equal. Respondents in Northern Europe exhibit the highest levels of confidence in the lack of disparate gender impacts.

Figure 3.23. **Are performance appraisals in my workplace the same for men and women?**

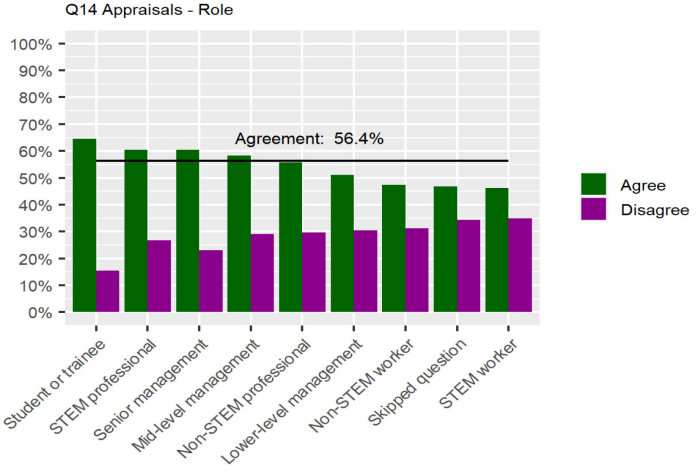
(Region)



Note: Geographic regions per the United Nations M49 Standard.

Figure 3.24. **Are performance appraisals in my workplace the same for men and women?**

(Role)



Note: "Worker" means a position that does not typically require a university degree. "Professional" means a role that typically does.

A link to confidence in appraisals stratified by corporate role is less clear. Managers and "professionals" (roles entailing a university degree) consistently reported higher confidence in fair appraisal processes and career opportunities, while "workers" (roles not requiring a university degree) tended towards the opposite view (Figure 3.24). It may be worth noting that the latter may spend more time undergoing appraisal than carrying them out. However, this does not rule out that disparities may be more common at more junior levels, and since appraisals affect access to higher levels, this could be significant.

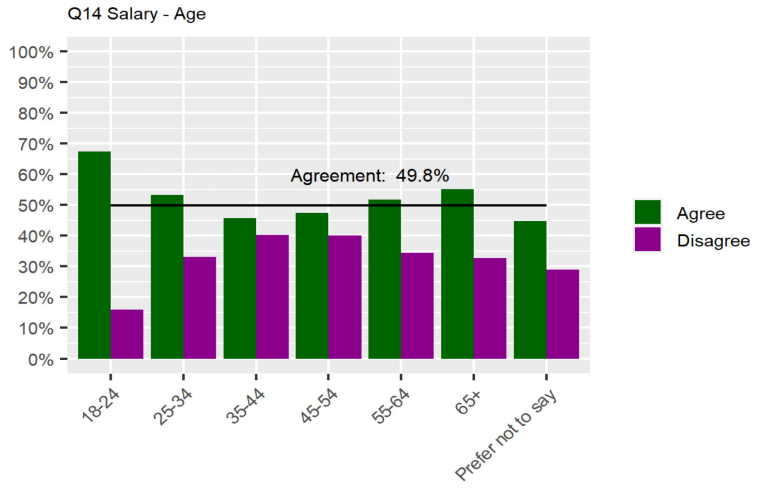
3.4.4. *Salary*

The existence of basic salary parity was accepted by 49.8% of respondents. The most dissatisfaction with fairness in salary was reported by women aged 35-54 (Figure 3.25) and among non-STEM staff and STEM "workers" ("workers" is defined as roles not requiring a university degree) (Figure 3.26).

In many regions, differences in salary were reported by a significant majority, and the international average approached half of survey responses perceiving disparate, gender-based impacts on salaries between men and women. In Western Europe, only 37.4% believed that there were few or no salary differences, and 47.7% believed the opposite. Since Western Europe had the largest regional survey completion size, this was largely responsible for pinning the mean at 49.8%. The high number of respondents in Western Europe were concentrated in France. Interestingly, the human resources data collected from France showed the lowest disparity in pay, and in fact slightly favoured women. Further research would be needed to understand the reason for the contradiction between the public survey responses and human resources data.[3]

Figure 3.25. **Are salary considerations the same for men and women in my workplace?**

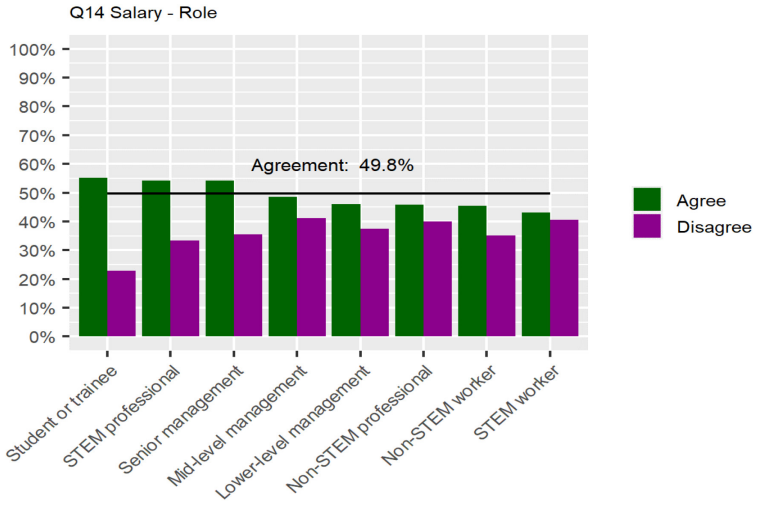
(Age)



3. A possible explanation is that regulation went into effect in France in 2019 requiring companies to annually publish gender pay gaps. This may have resulted in wider awareness of this issue.

Figure 3.26. **Are salary considerations the same for men and women in my workplace?**

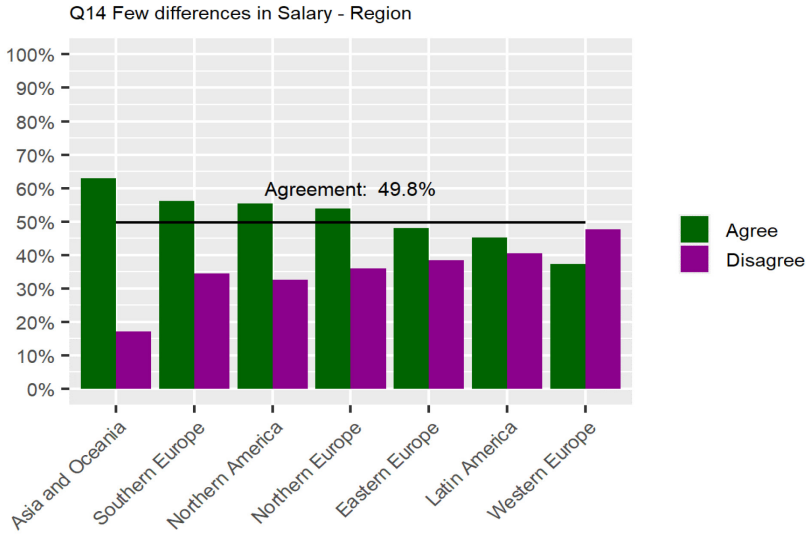
(Role)



Note: "Worker" means a position that does not typically require a university degree. "Professional" means a role that typically does.

Figure 3.27. **Are salary considerations the same for men and women in my workplace?**

(Region)

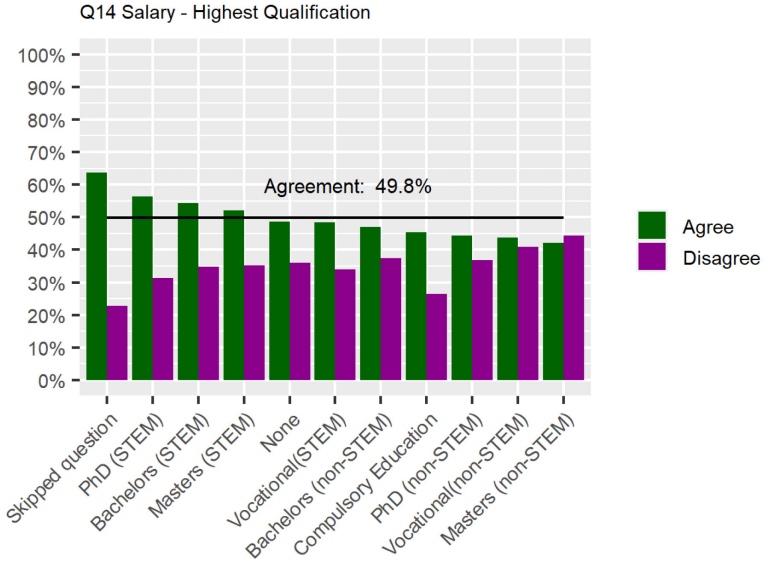


Note: Geographic regions per the United Nations M49 Standard.

There was also a separation when looking at the educational qualifications of the respondents. Those with STEM backgrounds exhibited slightly higher confidence in pay equity than respondents with non-STEM educational qualifications (Figure 3.28).

Figure 3.28. **Are salary considerations the same for men and women in my workplace?**

(Highest qualification)

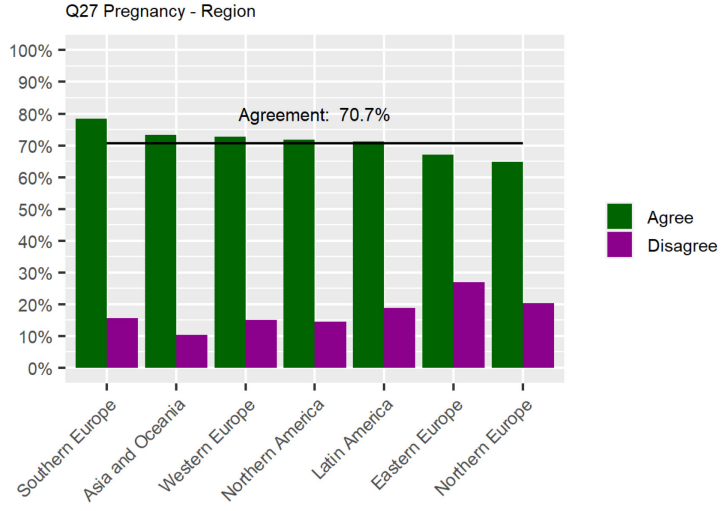


3.4.5. *Impact of fertility and family life*

Pregnancy, parenthood and caregiving might each result in a gender disproportionate impact on day-to-day working life and options for career development. The perceived impact of pregnancy was clear. When asked if pregnancy negatively impacts women's career trajectory, including promotion, 70.7% of survey respondents agreed that it did, with comparatively little variation globally (Figure 3.29).

Figure 3.29. **Does pregnancy/maternity leave negatively impact women's career trajectory?**

(Region)

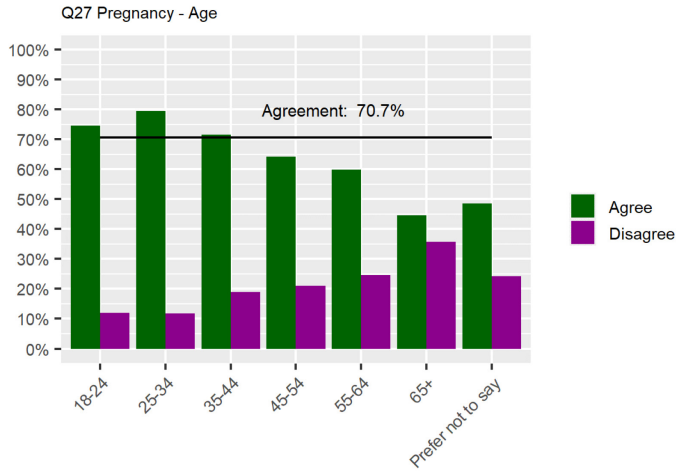


Note: Geographic regions per the United Nations M49 Standard.

Parenthood may be an issue that is more immediate for some respondents than others. In the age range 18 to 34 years old, a negative impact was recorded by over 78.8% (Figure 3.30). Segmentation by job role revealed similar agreement, varying from 60.3% for non-STEM workers to 77.4% for students/trainees. It is cause for concern that younger and more junior women expressed such negative perceptions of the career impact of pregnancy.

Figure 3.30. **Does pregnancy/maternity leave negatively impact women's career trajectory?**

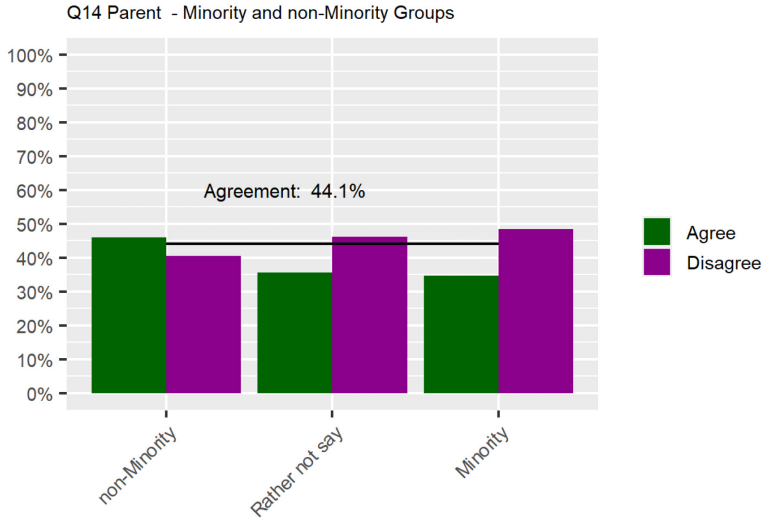
(Age)



A separate survey question asked about the career impact of parenthood. Only 44.1% thought that there was no difference in impact between men and women. This dropped to 34.7% among women belonging to minority groups (Figure 3.31), with 48.5% actively rejecting the proposal and a significant percentage expressing no opinion.

Figure 3.31. **Are the consequences of parenthood the same for men and women?**

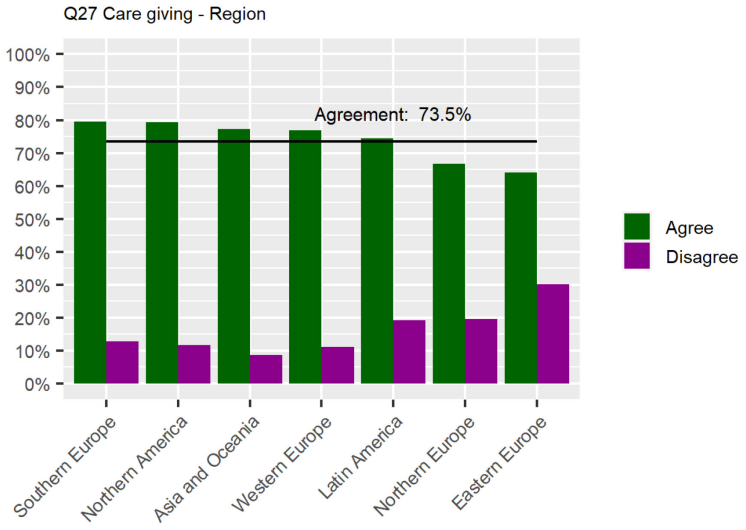
(Minority groups)



The negative impact of caregiving and family responsibilities was widely reported, with 73.5% overall agreement that there was a negative impact (Figure 3.32). The geographical distribution was similar to views on the impact of pregnancy.

Figure 3.32. **Does having a family/caregiving negatively impact women's career trajectory?**

(Region)

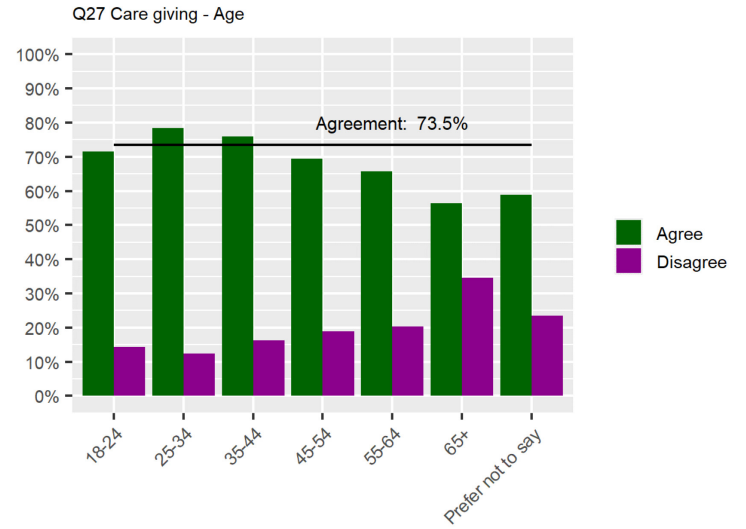


Note: Geographic regions per the United Nations M49 Standard.

The impact remained more keenly felt in younger age groups (Figure 3.33), with the negative perception of the career repercussions of pregnancy extending to that of parenthood. Within older age groups, when support for both grandchildren and older relatives becomes more likely, opinions about the unfavourable impact of caregiving were stronger than those about pregnancy.

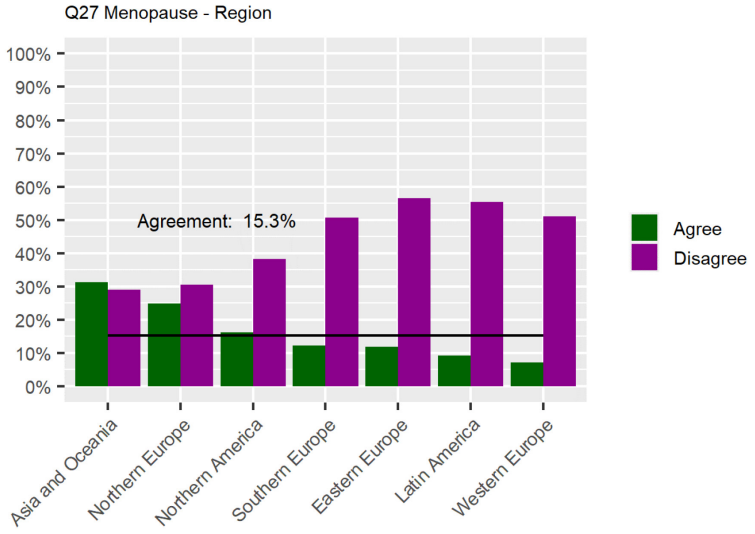
Figure 3.33. **Does having a family/caregiving negatively impact women's career trajectory?**

(Age)



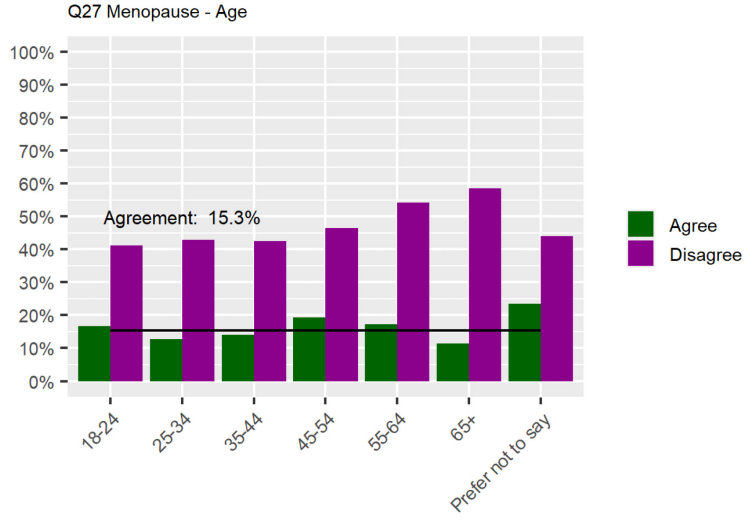
In contrast, menopause was not viewed as problematic in the workplace (Figure 3.34). Curiously, age groups likely to experience menopause either did not perceive a negative career impact for women or had no opinion (Figure 3.35).

Figure 3.34. **Does menopause negatively impact women's career trajectory?**
(Region)



Note: Geographic regions per the United Nations M49 Standard.

Figure 3.35. **Does menopause negatively impact women's career trajectory?**
(Age)



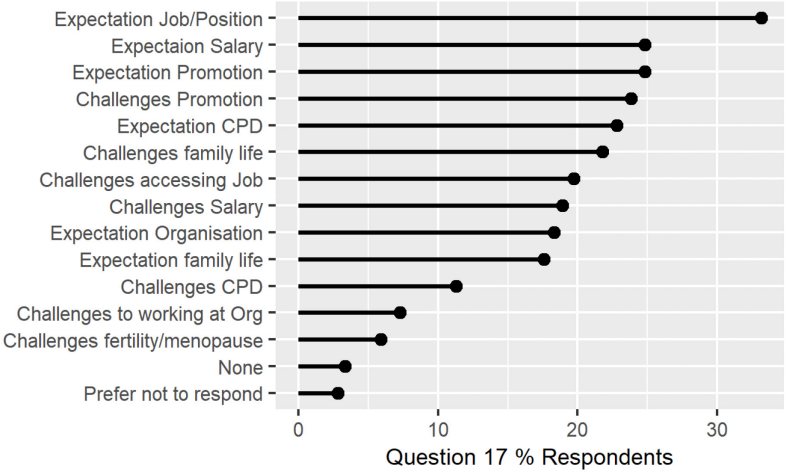
3.5. Women's opinions on career barriers and solutions

Eight opinion-based questions were posed about barriers and potential solutions to achieving improved gender balance in the nuclear sector. Each respondent was asked to choose and rank up to 3 options to represent their priorities from lists of 8 to 23 choices, including the option to select "none of above." The horizontal scale shows the percentage of all of those choosing each option as one of their three. For the full text of the survey choices, please refer to Annex C.

3.5.1. *Barriers*

Figure 3.36. **Career expectations and challenges**

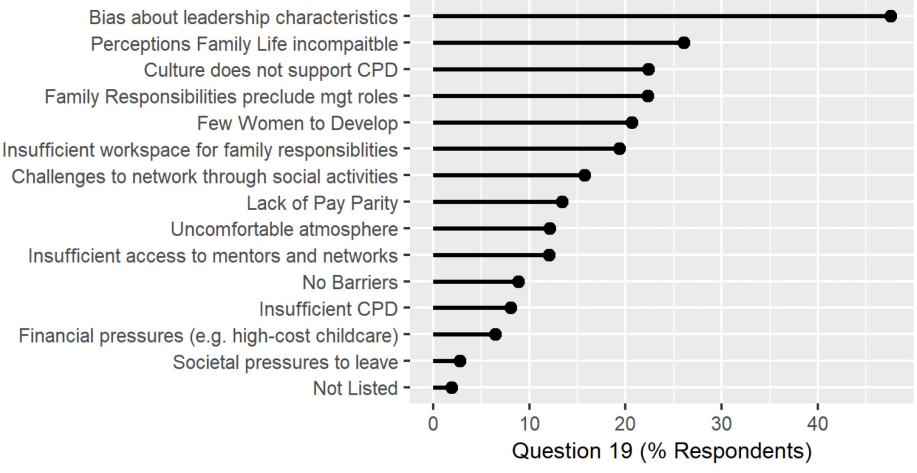
Question 17. "The career expectations and challenges that I have strong feelings about or spend a lot of time thinking about are: (Select no more than three)"



Note: For full text of the answer options, see Annex C.

Figure 3.37. **Barriers to retention and promotion**

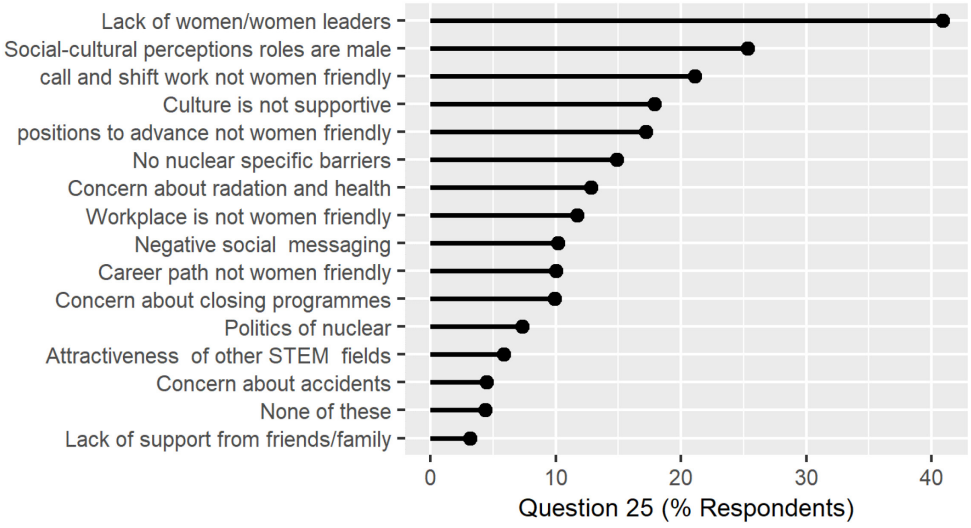
Question 19. "In my experience, barriers to the retention and promotion of women may be most strongly related to: (Select no more than three)"



Note: For full text of the answer options, see Annex C.

Figure 3.38. **Barriers specific to the nuclear sector**

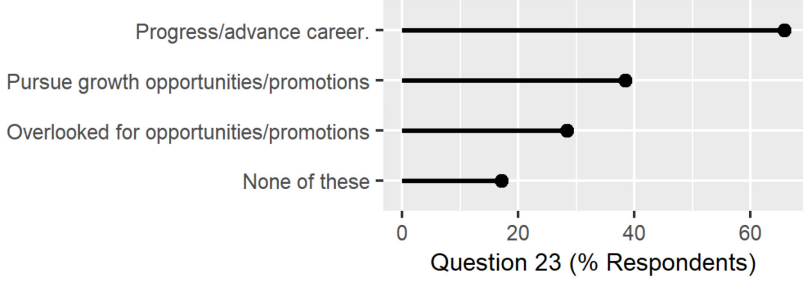
Question 25. "In my experience, the most significant barriers or challenges specific to the nuclear energy sector for the retention and advancement of women are: (Select no more than three)"



Note: For full text of the answer options, see Annex C.

Figure 3.39. **Personal barriers and challenges**

Question 23. "Please check all that apply:"

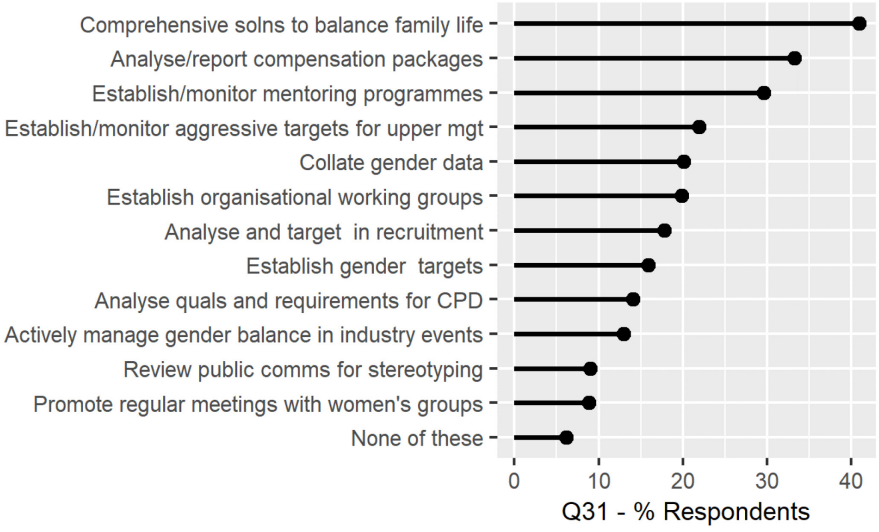


Note: For full text of the answer options, see Annex C. The survey was conducted between June-August 2021, in the midst of the global COVID-19 pandemic, which may have influenced some responses.

3.5.2. *Identifying solutions*

Figure 3.40. **Interventions supporting the recruitment and advancement of women**

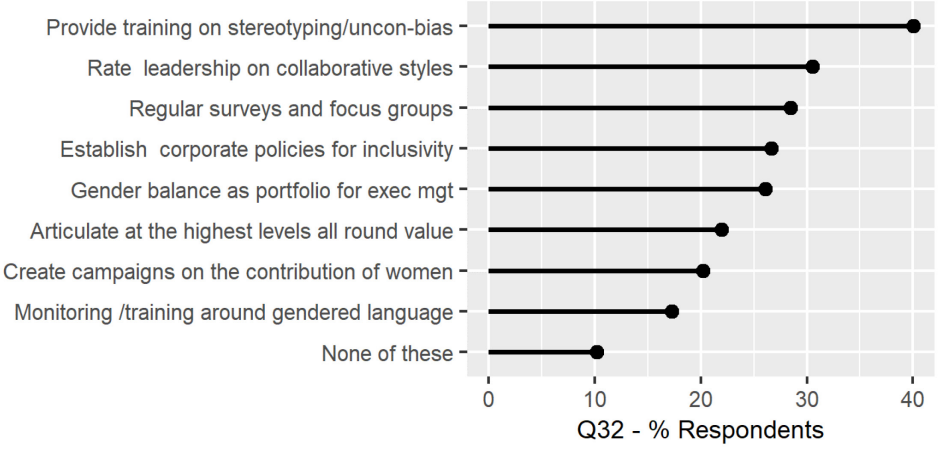
Question 31. "In your opinion, which of the following would be effective to support the recruitment, development and career advancement of women? (Select no more than three)"



Note: For full text of the answer options, see Annex C.

Figure 3.41. **Interventions for inclusive work cultures that value leadership by women**

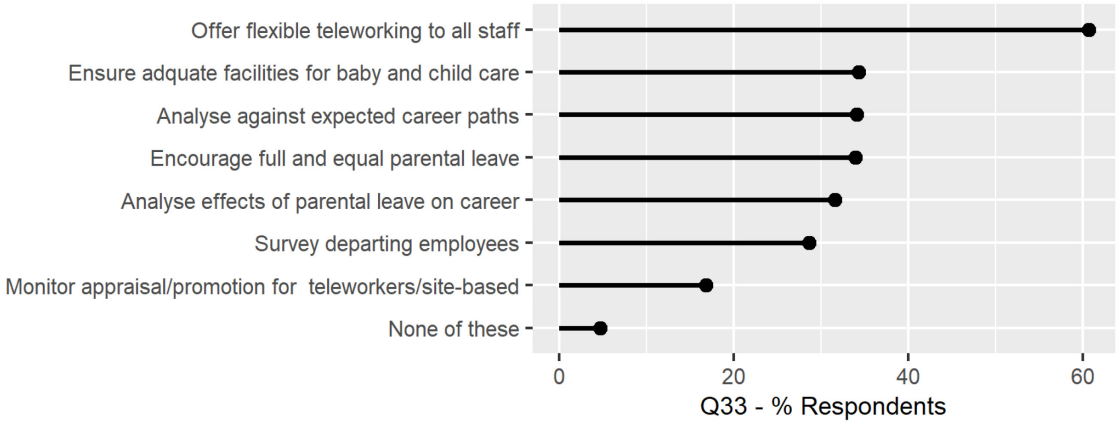
Question 32. "In your opinion, which of the following would be effective to create inclusive work cultures that value diverse contributions and leadership by women? (Select no more than three)"



Note: For full text of the answer options, see Annex C.

Figure 3.42. **Interventions supporting work-life balance and the female staff retention**

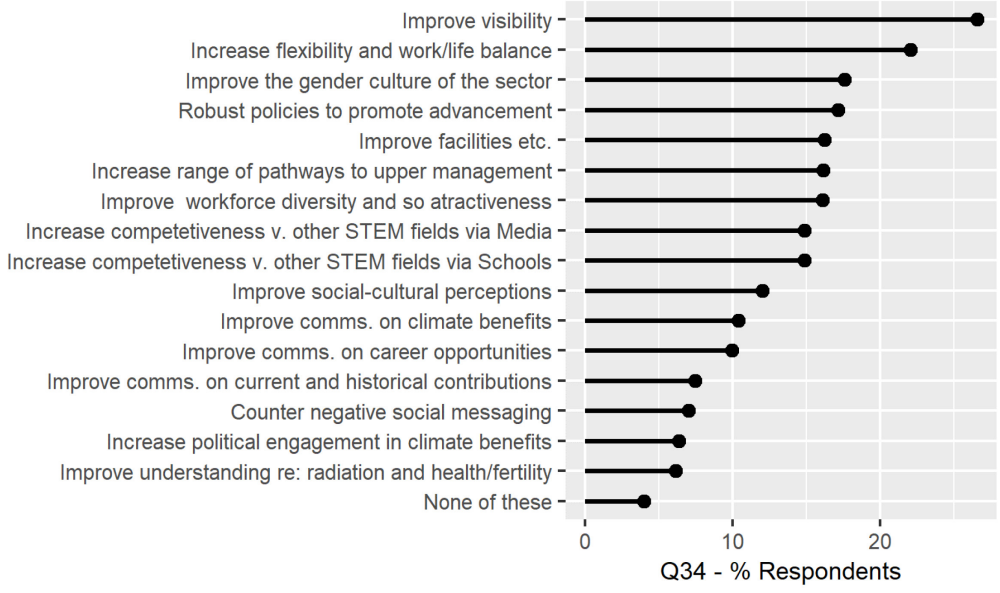
Question 33. "In your opinion, which of the following would be effective for improving work-life balance and retaining women in the nuclear energy workforce, including on the executive track post-partum? (Select no more than three)"



Note: For full text of the answer options, see Annex C.

Figure 3.43. **Effective solutions to improve the attractiveness of nuclear careers for women**

Question 34. "In your opinion, which of the following would be effective solutions to improve the attractiveness of careers in the nuclear energy sector for women? (Select no more than three)"



Note: For full text of the answer options, see Annex C.

3.6. Summary of key findings from the opinion-based survey of women working in the nuclear sector

Women in the nuclear sector in NEA countries:

- would generally encourage female family and friends to join the sector (with some ambivalence, and they are less likely to do so in Asia and Oceania[4]);
- say that basic working conditions (facilities, equipment, protective gear) are equal and without disparate gender impacts (less so in Asia and Oceania and Latin America);
- generally feel included and valued in their workplaces (less so outside of Northern Europe and Northern America, and with variation between organisation type);
- experience workplaces in which accounts of sexual harassment and hostile behaviour and attitudes towards women are not uncommon;
- lack role models in their workplace (especially in countries outside of Northern Europe and Northern America) and find the dearth of female visibility and leadership a barrier;
- rate their organisations and managers as insufficiently committed to gender balance;
- are eager to advance in their careers, but experience sociocultural and institutional barriers, including unequal salaries and performance appraisals;
- do not have ready or meaningful access to effective career development programmes (particularly in Latin America, Southern Europe, and Asia and Oceania);
- perceive negative career impacts from pregnancy, parenthood and caregiving; and
- are more likely to report negative impacts if a member of a minority group.

3.7. Conclusion

The results of the two surveys covered in Chapters 2 and 3 provide new insights into the gender imbalance in the nuclear sector in NEA countries. A major contribution of the data is to establish that women constitute a quarter of the nuclear energy workforce and are clustered in non-technical areas in the sector. Given this benchmark, much remains to be done to achieve a workforce representative of society that is able to make best use of all available talent. Data on attrition rates, promotion and career development show some positive signs and may be early indicators of changing attitudes that have yet to show up in the sectoral workforce overall. However, current trends will not alter the make-up of the workforce quickly. With a recruitment rate of 28.8%, there is no prospect of even reaching 30% in the long term without improved recruiting balances. Continuing professional development and promotion are also essential components in diversifying the workforce at every level. In addition, a lack of role models and women in leadership roles, as shown in both the human resource and individual surveys, may have a long-term negative impact on developing and advancing women from more junior roles.

One interesting measure of diversifying the sector is the readiness of current female employees to encourage the next generation of women to choose a nuclear career. In that regard, the results are ambivalent. More were inclined to encourage female friends and relatives to join the sector than were actively opposed to making this personal recommendation, but a sizeable number were neutral. This ambivalence may be related to limited expectations for positive change, as evidenced from survey respondents' low endorsement of management commitment and

4. Geographic regions are titled and defined per the United Nations M49 Standard (see Annex E, Figure E.1).

polices related to improving gender balance. In addition, a deeply concerning finding is the prevalence of sexual harassment and hostility to women as a feature of the workplace, either through direct experience or second-hand accounts. This is disturbing in and of itself, and is certainly not conducive to recruiting and supporting new and expanded cohorts of women.

The picture overall is one that is not dissimilar in gender diversity performance to other engineering-focused sectors, which may have an overall female participation rate that disguises a greater imbalance in the technical occupations central to the sector.[5] While the immediate working environment may on the surface appear to treat women and men equally, there is a lack of confidence in the commitment of managers to create inclusive work environments, reduce and mitigate disparate impacts on women's career development (especially related to parenthood and family commitments), and improve gender balance across the sector.

3.8. References

Engineering UK (2018), *Briefing: Gender Disparity in Engineering*, The Engineering and Technology Board, www.engineeringuk.com/research/briefings/gender-disparity-in-engineering/ (accessed 24 May 2022).

United Nations Commission on Human Rights (1979), *Study on the rights of persons belonging to ethnic, religious and linguistic minorities/by Francesco Capotorti, Special Rapporteur of the Sub-Commission on Prevention of Discrimination and Protection of Minorities*, E/CN.4/Sub.2/384/Rev.1, https://digitallibrary.un.org/record/10387 (accessed 24 May 2022).

United Nations General Assembly (1992), *Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities*, General Assembly resolution 47/135, www.ohchr.org/en/instruments-mechanisms/instruments/declaration-rights-persons-belonging-national-or-ethnic (accessed 24 May 2022).

United Nations Statistics Division, "Standard country or area codes for statistical use (M49) – Geographic Regions", https://unstats.un.org/unsd/methodology/m49/ (accessed 24 May 2022).

5. For example, in the United Kingdom, only 14.5% of engineers across all sectors are women (see Engineering UK, 2018).

Annex A. Quantitative survey template

The following six tables[1] were used to collect quantitative human resources data from nuclear organisations in NEA countries. They were distributed to NEA countries in June 2021 as an Excel file in English and French. The findings are detailed in Chapter 2.

Figure A.1. Job categories and levels template

Country	0
# of organizations represented	#
% of nuclear sector represented	%
Year of data	#

Gender Distribution among Job Categories and Management Levels

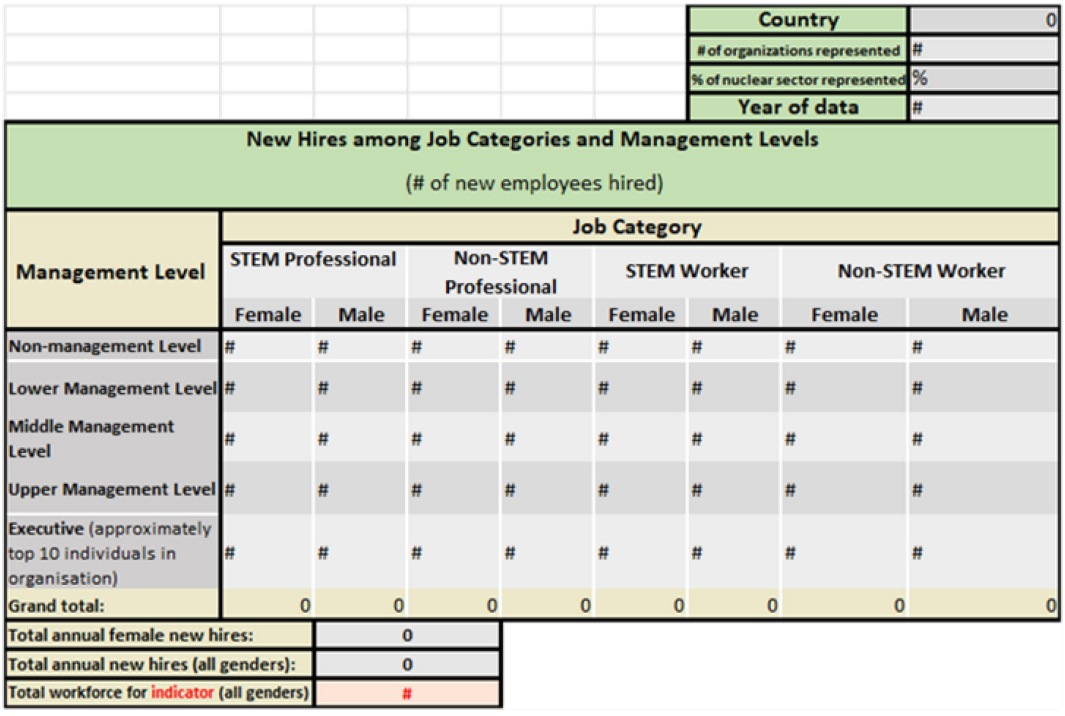
(# of employees)

Management Level	Job Category							
	STEM Professional		Non-STEM Professional		STEM Worker		Non-STEM Worker	
	Female	Male	Female	Male	Female	Male	Female	Male
Non-management Level	#	#	#	#	#	#	#	#
Lower Management Level	#	#	#	#	#	#	#	#
Middle Management Level	#	#	#	#	#	#	#	#
Upper Management Level	#	#	#	#	#	#	#	#
Executive (approximately top 10 individuals in organisation)	#	#	#	#	#	#	#	#
Grand total:	0	0	0	0	0	0	0	0

Total female workforce:	0
Total workforce (all genders):	0

1. The template design was adapted from a survey conducted by Strategic Policy Economics for Women in Nuclear Canada in 2020.

Figure A.2. **New hires template**



Country	0
# of organizations represented	#
% of nuclear sector represented	%
Year of data	#

New Hires among Job Categories and Management Levels

(# of new employees hired)

Management Level	Job Category							
	STEM Professional		Non-STEM Professional		STEM Worker		Non-STEM Worker	
	Female	Male	Female	Male	Female	Male	Female	Male
Non-management Level	#	#	#	#	#	#	#	#
Lower Management Level	#	#	#	#	#	#	#	#
Middle Management Level	#	#	#	#	#	#	#	#
Upper Management Level	#	#	#	#	#	#	#	#
Executive (approximately top 10 individuals in organisation)	#	#	#	#	#	#	#	#
Grand total:	0	0	0	0	0	0	0	0

Total annual female new hires:	0
Total annual new hires (all genders):	0
Total workforce for indicator (all genders)	#

Figure A.3. **Attrition template**

Country	0
# of organizations represented	#
% of nuclear sector represented	%
Year of data	#

Employee Attrition among Job Categories and Management Levels

(# of employees)

Management Level	Job Category							
	STEM Professional		Non-STEM Professional		STEM Worker		Non-STEM Worker	
	Female	Male	Female	Male	Female	Male	Female	Male
Non-management Level	#	#	#	#	#	#	#	#
Lower Management Level	#	#	#	#	#	#	#	#
Middle Management Level	#	#	#	#	#	#	#	#
Upper Management Level	#	#	#	#	#	#	#	#
Executive (approximately top 10 individuals in organisation)	#	#	#	#	#	#	#	#
Grand total:	0	0	0	0	0	0	0	0

Total annual female attrition:	0
Total annual attrition (all genders):	0
Total workforce for indicator (all genders)	#

Figure A.4. **Career development programmes template**

Country	0
# of organizations represented	#
% of nuclear sector represented	%
Year of data	#

Career Development Programmes among Job Categories and Management Levels

(# of employees participating)

Management Level	Job Category								Total women participant	Total participants (all genders)
	STEM Professional		Non-STEM Professional		STEM Worker		Non-STEM Worker			
	Female	Male	Female	Male	Female	Male	Female	Male		
Internship	#	#	#	#	#	#	#	#	0	0
Apprenticeship	#	#	#	#	#	#	#	#	0	0
Non-management Level	#	#	#	#	#	#	#	#	0	0
Lower Management Level	#	#	#	#	#	#	#	#	0	0
Middle Management Level	#	#	#	#	#	#	#	#	0	0
Upper Management Level, including Executive	#	#	#	#	#	#	#	#	0	0

Total workforce for indicator (all genders)	#

Figure A.5. **Promotion template**

Country	0
# of organizations represented	#
% of nuclear sector represented	%
Year of data	#

Promotions among Job Categories and Management Levels

(# of employees promoted)

Management Level	Job Category							
	STEM Professional		Non-STEM Professional		STEM Worker		Non-STEM Worker	
	Female	Male	Female	Male	Female	Male	Female	Male
Non-management Level	#	#	#	#	#	#	#	#
Lower Management Level	#	#	#	#	#	#	#	#
Middle Management Level	#	#	#	#	#	#	#	#
Upper Management Level	#	#	#	#	#	#	#	#
Executive (approximately top 10 individuals in organisation)	#	#	#	#	#	#	#	#
Grand total:	0	0	0	0	0	0	0	0

Total annual # of women promoted:	0
Total annual # promoted (all genders):	0
Total workforce for indicator (all genders)	#

Figure A.6. **Salary template**

Country	0
# of organizations represented	#
% of nuclear sector represented	%
Year of data	#

Average Annual Salaries among Job Categories and Management Levels

(Average annual gross salary in US dollars)

Management Level	Job Category							
	STEM Professional		Non-STEM Professional		STEM Worker		Non-STEM Worker	
	Female	Male	Female	Male	Female	Male	Female	Male
Non-management Level	US$	US$	US$	US$	US$	US$	US$	US$
Lower Management Level	US$	US$	US$	US$	US$	US$	US$	US$
Middle Management Level	US$	US$	US$	US$	US$	US$	US$	US$
Upper Management Level	US$	US$	US$	US$	US$	US$	US$	US$
Executive (approximately top 10 individuals in organisation)	US$	US$	US$	US$	US$	US$	US$	US$

# of women among the 10 highest-paid employees:	#
Total workforce for indicator (all genders):	#

Annex B. Quantitative survey data estimated representation of national nuclear sectors

This table shows the estimated percentage of the national nuclear sector represented by the quantitative data gathered in the human resources survey. These are estimates only and are provided to illustrate the significant variation with regards to the representativeness of the national data. The organisations that provided quantitative data are listed in Annex F.2.

Table B.1. Quantitative survey data estimated representation of national nuclear sectors

Country	Est. % of sector represented	Country	Est. % of sector represented
Argentina	84.8%	**Norway**	17%
Australia	50%	**Poland**	90%
Belgium	Unavailable	**Romania**	60%
Canada	20%	**Russia**	100%
France	37%	**Slovenia**	90%
Hungary	Unavailable	**Spain**	36%
Italy	70%	**Sweden**	90%
Japan	13%	**United Kingdom**	50%
Korea	10%		

Note: The above are estimates only.

Annex C. **Qualitative survey questions**

The following 34-question survey was available on the NEA website from June to August 2021 under the title "Survey of Women in the Nuclear Sector". It was administered through SurveyMonkey and available in eight languages (English, French, Italian, Japanese, Korean, Romanian, Russian, and Spanish). The results are detailed in Chapter 3. A snapshot of the results is available in Annex D.

1. Are you a woman, or do you identify as woman?
   a) Yes
   b) No
2. Are you currently employed in the nuclear sector?
   a) Yes
   b) No, but I used to work in the sector
   c) No, but I intend to work in the sector in the future
   d) None of the above
3. Country of residence or where your current or most recent nuclear sector work experience took place:
   a) [Drop down list of NEA member countries]
   b) Other
4. Type of nuclear organisation where you are currently employed or where your most significant nuclear sector work experience took place:
   a) Nuclear power plan
   b) Nuclear fuel cycle organisation
   c) Nuclear regulatory organisation
   d) Technical support organisation
   e) Other nuclear public sector entity (nuclear office of energy ministry, etc.)
   f) New nuclear reactor build site
   g) Decommissioning/decommissioning site
   h) Nuclear research and development organisation
   i) University or academic institution
   j) Original equipment manufacturer or nuclear supply chain organisation
   k) International organisation
   l) Other

5. Which of the following best describes your current or most recent role?
   a) Senior-level management
   b) Mid-level management
   c) Lower-level management
   d) STEM professional*
   e) Non-STEM professional*
   f) STEM worker*
   g) Non-STEM worker*
   h) Student or trainee

   * Definitions of job categories provided – see methodology section of Chapter 3 for more information.

6. Approximately how many years have you been employed in the nuclear sector?
   a) Less than 3 years
   b) Between 3 and 5 years
   c) Between 6 and 10 years
   d) Between 11 and 15 years
   e) Between 16 and 20 years
   f) More than 20 years
   g) I have no work experience in the nuclear sector
   h) None of the above
7. What is the highest level of education you have completed?
   a) Compulsory education terminating in adolescence
   b) Vocational training or certification in STEM
   c) Vocational training or certification in non-STEM
   d) University bachelor's degree in STEM
   e) University bachelor's degree in non-STEM
   f) University master's degree in STEM
   g) University master's degree in non-STEM
   h) University doctoral degree in STEM
   i) University doctoral degree in non-STEM
   j) None of the above
8. Your current age
   a) Under 18
   b) 18-24
   c) 25-34
   d) 35-44
   e) 45-54
   f) 55-64
   g) 65+
   h) Prefer not to say

9. Which of the following best describes your relationship status?
    a) Single
    b) Married or long-term partnership
    c) Separated or divorced
    d) None of the above
    e) Rather not say
10. Have you ever had dependents living with you while you were working?
    a) Yes, a child or children
    b) Yes, but not a child or children
    c) No
    d) Rather not say
11. Do you identify as a member of a minority group?
    a) Yes
    b) No
    c) Rather not say
12. The presence and visibility of women is widespread in my workplace, especially in science, technology, engineering and mathematics (STEM) roles and leadership positions. My workplace's culture is women-friendly, including visible women role models and few if any spoken or unspoken differing expectations of men vs women.
    a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree
13. My workplace features robust policies and management priorities to support, develop, and promote women, including organisational accountability through monitoring and evaluation. These policies are meaningful implemented and adhered to. There is a top manager responsible for gender policy. Training or other initiatives to counter gender stereotypes, micro-aggressions or unconscious bias are effective.
    a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, I do not know
14. In my workplace, there are very few or no differences or disparate, gender-based impacts with regard to:
    i. Working conditions (e.g. adequate facilities, equipment, and/or protective gear)
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, I do not know
    ii. Career advancement (e.g. opportunities and promotion are the same for women and men)
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, I do not know
    iii. Becoming a parent (e.g. no negative career impacts due to motherhood)
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, I do not know
    iv. Salary
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, I do not know

v. Performance appraisals

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, I do not know

15. Overall, gender policies within my organisation have helped me to feel satisfied with my career and optimistic about my future career prospects.

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

16. Overall, I feel that my workplace is inclusive and women in my workplace are fully encouraged, valued and respected.

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

17. The career expectations and challenges that I have strong feelings about or spend a lot of time thinking about are: *(Select no more than three)*

a) Expectation about the type of job or position that I have or want

b) Expectation about the type of organisation I currently or want to work for

c) Expectation about my salary or other compensation

d) Expectation about mentoring, training, and/or professional development

e) Expectation about promotion and/or career advancement

f) Expectation about the role that family life has or will have on my career

g) Challenges/barriers to obtaining a certain type of job or position

h) Challenges/barriers to working at a certain organisation

i) Challenges/barriers to receiving a certain salary or other compensation

j) Challenges/barriers to receiving mentoring/training/professional development

k) Challenges/barriers to promotion and/or career advancement

l) Challenges/barriers in my career related to family life

m) Challenges or barriers in my career related to fertility or menopause

n) Prefer not to respond

o) None of the above

18. I believe that there are very few or no institutional barriers, tacit or explicit, to the retention and promotion of women in my workplace.

a) Answer options: Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

19. In my experience, barriers to the retention and promotion of women may be most strongly related to: *(Select no more than three)*

a) Culture that does not sufficiently support professional development of women

b) Few women in the organisation to develop and promote

c) Family responsibilities preclude women from pursuing management positions

d) Insufficient workplace accommodation for family responsibilities, such as parenthood

e) Perceptions that family life is incompatible with the management track

f) Gender stereotypes or unconscious bias about leadership characteristics

g) Uncomfortable atmosphere for women

h) Insufficient access to professional development, either formal or informal

i) Insufficient access to mentors and networks for opportunities and advancement

j) Insufficient financial compensation or lack of pay parity

k) Societal pressures on women to leave the workforce

l) Financial pressures on women to leave the workforce (e.g. high-cost childcare)

m) Challenges/barriers to being able to effectively network through social activities compared to male peers

n) In my opinion, there are no barriers

o) Barrier not listed

20. Programmes to support and professionally develop women and improve gender balance in my workplace, especially at the management levels, are available and effective.

    a) Yes, programmes are available and effective

    b) Programmes are available

    c) Programmes are available, but not effective

    d) Programmes are not available

    e) Neither agree nor disagree

    f) I do not know

21. Role models and mentors for women are available in my workplace.

    a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

22. In my workplace, managers express commitment to gender balance and discuss the impact of policies and programmes to support and advance women.

    a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

23. Please check all that apply:

    a) I want to progress and advance in my career.

    b) I actively pursue career growth opportunities, including applying for promotions.

    c) I feel that I have been overlooked for career opportunities and promotion.

    d) None of the above apply to me.

24. I feel that there are barriers or challenges impacting women that are specific to the nuclear energy sector.

    a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

25. In my experience, the most significant barriers or challenges specific to the nuclear energy sector for the retention and advancement of women in the nuclear sector are: *(Select no more than three)*

    a) Lack of women in the sector, including in leadership positions

    b) Culture of the nuclear energy sector is not supportive of women

    c) Social-cultural perceptions that jobs in nuclear energy are for men

d) Negative social messaging about the nuclear energy sector
e) Relative attractiveness and/or social-cultural prestige of other STEM fields
f) Political sensitivity of nuclear energy
g) Lack of support or pressure from family/friends not to work in nuclear energy
h) Workplace environment of nuclear power plant is not attractive or women-friendly
i) Lifestyle, including being on call and shift work, is not attractive or women-friendly
j) Career trajectory in nuclear sector is not attractive or women-friendly
k) Positions necessary for career advancement are not conducive to family life
l) Concern about hazards of radiation on physical health, including fertility
m) Concern about nuclear accidents and emergencies
n) Concern about career as nuclear energy programmes are downsized or closed
o) In my opinion, there are no barriers specific to nuclear energy
p) None of the above

26. Would you encourage or discourage your daughter or a female family member or close friend to pursue a career in the nuclear energy sector?
    a) Actively encourage
    b) Slightly encourage
    c) Neutral
    d) Slightly discourage
    e) Actively discourage
27. In my opinion, the following gender-specific issues <u>negatively impact</u> women's career trajectory, including <u>promotion</u>:
    i. Pregnancy, including maternity leave
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, Not applicable
    ii. Family responsibilities, including parenthood and caregiving
        a) Answer options: Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, Not applicable
    iii. Balancing spouse's career, including inability to relocate
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, Not applicable
    iv. Menopause
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, Not applicable
    v. Inability to fully participate in male-dominated social activities and networking due to gender
        a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, Not applicable

vi. Gender stereotypes, micro-aggressions or unconscious bias

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, Not applicable

vii. Male-dominated work culture which inhibits full contributions

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree, Not applicable

28. In my experience, sometimes there have been meaningful differences between men and women with respect to the following:

i. Men receiving higher salaries than women for similar positions and credentials

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

ii. Men receiving more positive performance appraisals than women for similar levels of performance

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

iii. Men receiving higher salary increases than women

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

iv. Men accessing opportunities due to ability to network through social activities outside of work

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

v. Men being selected for high-profile projects at greater rates than women

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

vi. Men being selected for training or development opportunities seen as prerequisite for promotion at greater rates than women

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

vii. Men being promoted at higher rates than women for similar levels of responsibility and performance

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

29. I have experienced or heard accounts of behaviour or attitudes that are overtly or tacitly hostile to women in my workplace.

a) *Answer options:* Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

30. I have experienced or heard accounts of sexual harassment of women in my workplace.

a) Answer options: Strongly disagree, Disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Agree, Strongly agree

31. In your opinion, which of the following would be effective to support the recruitment, development and career advancement of women? (Select up to three)
    a) Establish gender targets for percentage of applicants, interview candidates, and promotions or new hires for all job categories and management levels, and monitor and report regularly.
    b) Regularly collect and publish data on the percentage of women in different job categories and management levels, especially STEM and leadership positions.
    c) Analyse intake qualifications and participation requirements for corporate professional training and development programmes for disparate gender impacts, and remedy or accommodate accordingly. (For example, would a nursing mother be able to participate in this programme?)
    d) Establish and monitor aggressive targets for women in programmes required for upper management levels.
    e) Analyse recruitment processes for disparate gender impacts and gender balance. Target women in recruitment. Regularly monitor and adjust.
    f) Regularly review public communications and promotional material for gender diversity and gender stereotyping.
    g) Establish mentoring programmes for women at all organisational levels and students. Conduct regular longitudinal studies on the impact.
    h) Regularly analyse and report on organisational compensation packages and salary increases for disparities between genders, including for new hires and internal promotions.
    i) Establish an organisational working group chaired by a member of the senior executive team to develop and monitor organisational policy and programmes to support gender balance. Include women at all organisational levels and men from upper management in this group. Assign the group meaningful resources and executive support.
    j) Include regular meetings with external or internal women's groups as part of the executive agenda.
    k) Monitor and remedy the gender balance in corporate participation in industry events and external programmes.
    l) Provide comprehensive corporate solutions to help women with family responsibilities (corporate childcare, extended maternity leave, etc.).
    m) None of the above.
32. In your opinion, which of the following would be effective to create inclusive work cultures that value diverse contributions and leadership by women? *(Select up to three)*
    a) Provide regular organisation-wide training on identifying and countering gender stereotypes, unconscious bias and micro-aggressions.
    b) Create regular internal and external campaigns promoting the current and historical contributions of women to the organisation and to the nuclear energy field.
    c) Analyse and provide training on gendered language in hiring and performance evaluations, job announcements and other human resource materials.
    d) Develop and rate employees on leadership models that centre collaborative, participatory leadership styles.
    e) Regularly survey employees and use focus groups of women at different organisational levels to monitor the work culture and develop new initiatives to address issues and enhance the contributions of women to the organisation.

f) Identify and regularly articulate at the highest executive levels the measurable and immeasurable value of women to the organisation's financial health and societal impact.

g) Establish corporate gender policies to support a culture of inclusivity (e.g. a code of ethics, an ethics committee as an option for resolving conflicts, including those related to behaviour, harassment, etc.).

h) Establish gender balance as a portfolio for executive management, including regular reporting and accountability.

i) None of the above.

33. In your opinion, which of the following would be effective for improving work-life balance and retaining women in the nuclear energy workforce, including on the executive track post-partum? *(Select up to three)*

a) Survey departing employees to identify organisational blind spots.

b) Offer flexible teleworking options for men and women regardless of parental or family status.

c) Monitor performance reviews and promotion rates for teleworking versus non-teleworking employees. Develop policies and training to avoid disparate impacts for teleworking employees.

d) At the highest management levels and through policies and programmes designed according to behavioural insights, encourage all employees (women and men) to take full and equal amounts of parental leave.

e) Analyse promotions, performance reviews and salary increases for impacts of parental leave on career progression.

f) Analyse the expected career path for an upwardly mobile manager from a gender lens and identify possible barriers and challenges caused by parenthood or other family responsibilities. (For example, is promotion to upper management contingent upon certain kinds of jobs that may be difficult for a nursing mother?) Develop accommodations and alternate pathways.

g) Ensure that there are adequate facilities in the workplace for childcare and lactation, as well as flexible policies to support parents.

h) None of the above.

34. In your opinion, which of the following would be effective solutions to improve the attractiveness of careers in the nuclear energy sector for women? *(Select up to three)*

a) Improve the diversity of the workforce to make nuclear energy careers more attractive as comfortable and vibrant workplaces

b) Implement robust policies and programmes to support women to increase career opportunities, upward trajectories and longevity for women in the nuclear energy sector

c) Improve strategic communications about the career opportunities in the nuclear energy sector

d) Improve strategic communications about the benefits of nuclear energy to reduce global carbon emissions and combat climate change

e) Improve strategic communications about the historical and current contributions of women to the nuclear energy sector

f) Improve visibility of women in the sector, including those in STEM and leadership positions

g) Improve the culture of the nuclear energy sector to better support women and value women's contributions

h) Improve social-cultural perceptions that jobs in nuclear energy are for men

i) Better counter negative social messaging about the nuclear energy sector

j) Better compete on the attractiveness and/or social-cultural prestige vis-à-vis other STEM fields through improved partnerships with schools and universities

k) Better compete on the attractiveness and/or social-cultural prestige vis-à-vis other STEM fields through improved partnerships with media and cultural taste-makers (e.g. television, social media)

l) Increased political engagement on the benefits of nuclear energy

m) Improve nuclear workplace environments to be more women-friendly (for example, adequate facilities, equipment or protective gear for women)

n) Improve the lifestyle of certain nuclear sector jobs to be more women-friendly, including increased technology, flexibility and/or other accommodations to improve the quality of life for jobs entailing on call and shift work

o) Improve breadth of career trajectories with a range of pathways into upper management in the nuclear energy sector

p) Improve communications addressing concern about hazards of radiation on physical health, including fertility

q) Improve communications addressing concern about nuclear accidents and emergencies

r) Improve communications addressing concern about the career impact of nuclear energy programmes being downsized or closed, including promoting long-term career opportunities in decommissioning

s) Offer grants and scholarships for women to study nuclear-related subjects

t) Offer internship and research programmes targeting women

u) Engage young scientists in attractive and innovative research projects

v) Improve communications through better co-ordination with national and international networks promoting opportunities and dialogue for young women about careers in STEM

w) None of the above

Annex D. **Snapshot of qualitative survey results**

This annex contains a snapshot overview of the responses to the 2021 NEA "Survey of Women in the Nuclear Sector". Note that "agree" in these tables is counted for responses "somewhat agree", "agree", or "strongly agree." Please see Chapter 3 for more detail about the survey results and Annex C for the full text of the survey questions.

Table D.1. **Snapshot of qualitative survey results**

Question number	Question	Percentage agreeing/ top three responses
Q 12	Presence and visibility of women is widespread	50.9% agree
Q 13	Policies and management priorities for GB are robust	41.7% agree
Q 14	Adequate working conditions	75.9% % agree
	Equal opportunities for career advancement	47.8% % agree
	No negative career impacts from becoming a parent	44.1% % agree
	Equal salary between men and women	49.8% % agree
	Equal performance appraisals	56.4% % agree
Q 15	Satisfied and optimistic	43.0% agree
Q 16	Inclusive workplace	58.3% agree
Q 17	Expectations and challenges that respondent has strong feelings about or thinks about a lot (top three)	Job/position expectations
		Salary expectations
		Promotion expectations
Q 18	Few or no institutional barriers	42.6% agree
Q 19	Barriers to retention and promotion (top three)	Bias about leadership characteristics
		Perceptions that family life and career are incompatible
		Culture does not support professional development
Q 20	Programmes available to support and develop women	30.9% agree
Q 21	Role models and mentors available	37.0% agree
Q 22	Managerial commitment to gender balance	32.5% agree
Q 23	Want to progress/advance career	66.1% agree
	Actively pursue growth opportunities and promotion	38.6% agree[1]
	Feel overlooked for opportunities and promotion	28.4% agree
	None of the above	16.8% agree
Q 24	Nuclear-specific barriers or challenges	43.1% agree
Q 25	Most significant barriers or challenges specific to the nuclear sector for retention and advancement of women (top three)	Lack of women/women leaders
		Sociocultural perceptions that roles are male
		On-call/shift work is not women-friendly
Q 26	Would encourage female family member to work in nuclear	59.0% agree

1. Responses to this question may have been influenced by the global pandemic.

Question number	Question	Percentage agreeing/ top three responses
Q 27	Negative career impact: Pregnancy/maternity leave	70.7% agree
	Negative career impact: Caregiving/parenthood	73.5% agree
	Negative career impact: Balancing spouse's career	62.0% agree
	Negative career impact: Menopause	15.3% agree
	Negative career impact: Male-dominated networking	46.9% agree
	Stereotyping, microaggressions, unconscious bias	64.8% agree
	Negative career impact: Male-dominated work culture	62.2% agree
Q 28	Equivalent men receiving higher salaries	53.2% agree
	Men receiving more positive performance appraisals	51.7% agree
	Men receiving higher salary increases	48.9% agree
	Men accessing opportunities due to ability to network through social activities outside of work	55.9% agree
	Men being selected for high-profile projects	65.3% agree
	Men being selected for training or development	52.2% agree
	Men being promoted at higher rates	63.3% agree
Q 29	Aware of behaviour or attitudes hostile to women	52.2% agree
Q 30	Aware of accounts of/suffered sexual harassment	44.7% agree
Q 31	Action to support recruitment, development and advancement of women (top three)	Comprehensive solutions to balance family life
		Analyse/report compensation
		Establish and monitor mentoring programmes
Q 32	Action for inclusive work cultures (top three)	Training on stereotyping and unconscious bias
		Rate leadership on collaborative styles
		Regular surveys/focus groups
Q 33	Action to improve work-life balance (top three)	Flexible teleworking to all
		Adequate childcare facilities
		Analyse career paths
Q 34	Solutions to improve attractiveness of careers for women (top three)	Improve visibility of women
		Increase flexibility and work/life balance
		Improve culture of sector to better support/value women

Annex E. Qualitative survey demographics

The "Survey of Women in the Nuclear Sector" was conducted between June to August 2021 and received 8 924 total responses (see Section 3.1.2 for an explanation of response validity). This annex provides an overview of the demographics of the respondents. The survey findings are detailed in Chapter 3.

Figure E.1. **Number of respondents by country and region**

Note: Geographic regions per the United Nations M49 Standard.

Figure E.2. **Current employment in the nuclear sector**

Question 2. "Are you currently employed in the nuclear sector?"

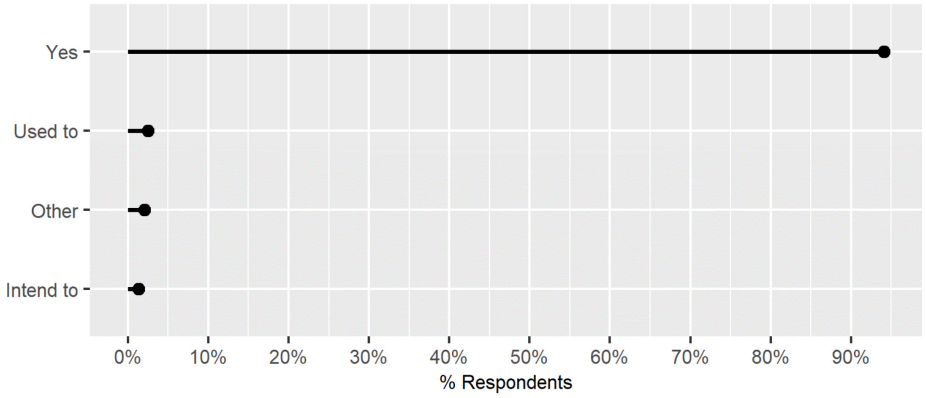


Figure E.3. **Country of residence**

Question 3. "Country of residence or where your current or most recent nuclear sector work experience took place"

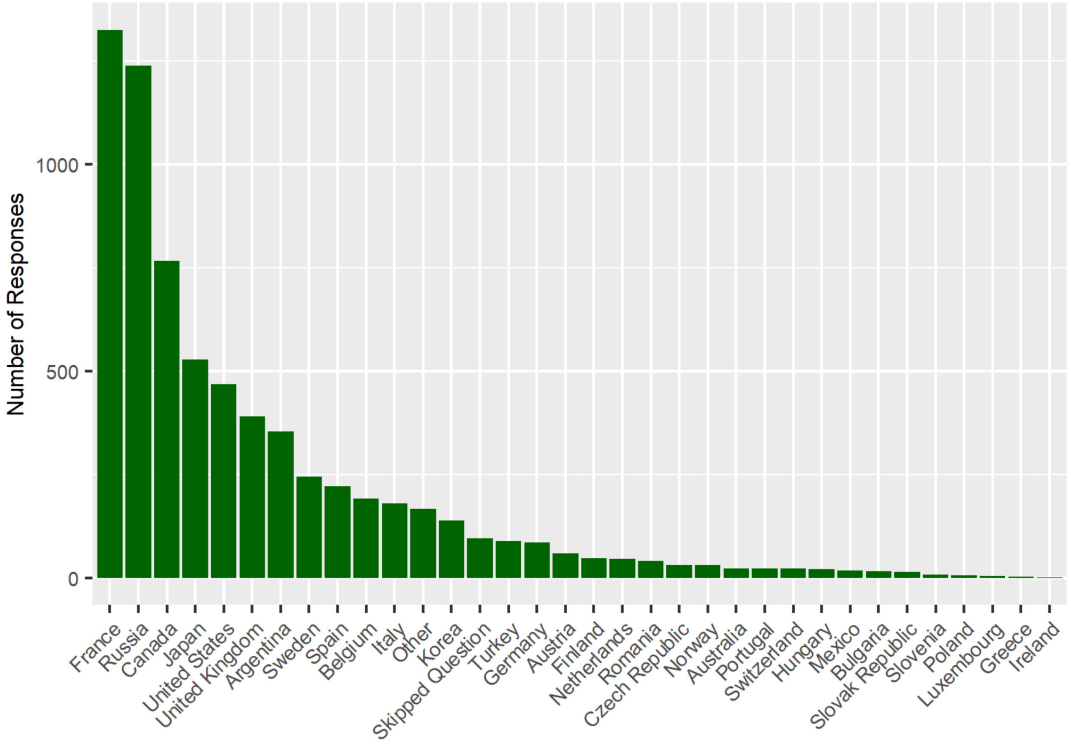
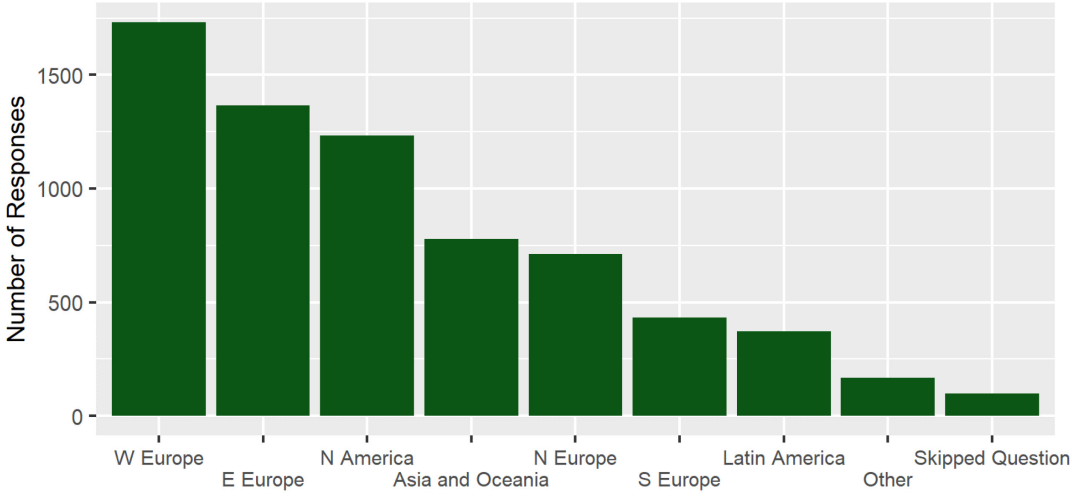


Figure E.4. **Residency by region**

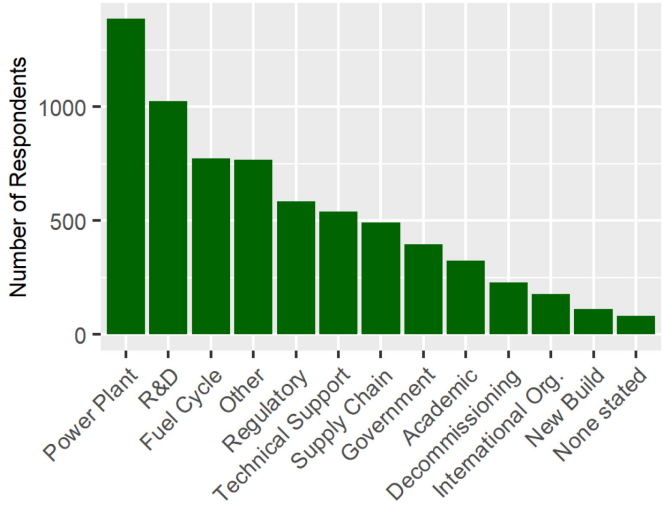
Question 3. "Country of residence or where your current or most recent nuclear sector work experience took place"



Note: Geographic regions per the United Nations M49 Standard.

Figure E.5. **Type of organisation**

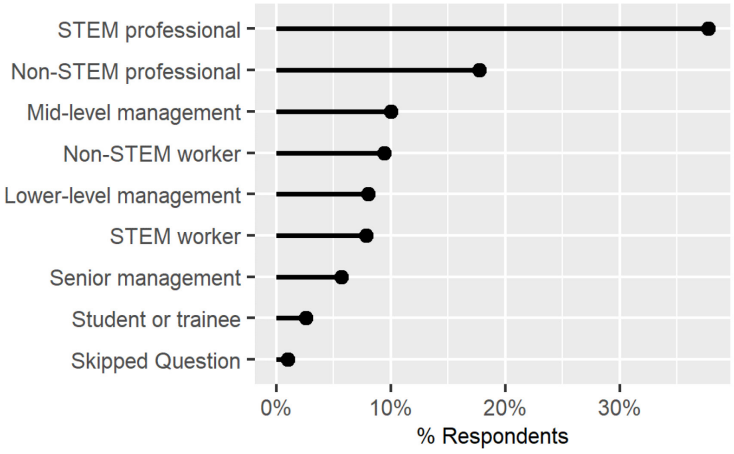
Question 4. "Type of nuclear organisation where you are currently employed or where your most significant nuclear sector work experience took place"



Full text: Nuclear power plant, nuclear research and development organisation, nuclear fuel cycle organisation, other, nuclear regulatory organisation, technical support organisation, original equipment manufacturer or nuclear supply chain organisation, other nuclear public sector entity (nuclear office of energy ministry, etc.), university or academic institution, decommissioning/ decommissioning site, international organisation, new nuclear reactor build site

Figure E.6. **Role**

Question 5. "Which of the following best describes your current or most recent role"



Note: Depending on the organisation, "management" positions may or may not entail supervisory responsibilities. See the methodology section of Chapter 3.

STEM professional: Position generally requires a university degree in science, technology, engineering or mathematics. Business and finance are not included in this category.

Non-STEM professional: Position generally requires a university degree, but not necessarily in STEM. Business and finance are included in this category.

STEM worker: Position generally requires tertiary education not equivalent to a university degree, such as a vocational school diploma or apprenticeship. In addition, the position should involve handling or operating some form of technology where the technology is the primary purpose of the work.

Non-STEM worker: Position does not require a university degree and does not qualify as a STEM position.

Figure E.7. **Time working in the sector**

Question 6. "Approximately how many years have you been employed in the nuclear sector?"

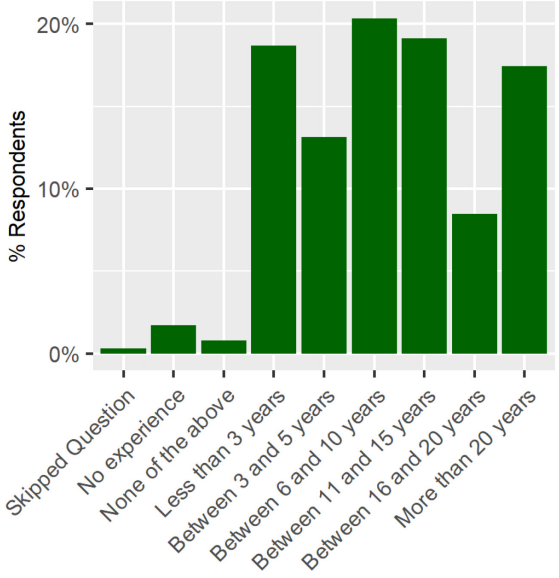


Figure E.8. **Highest qualification**

Question 7. "What is the highest level of education you have completed?"

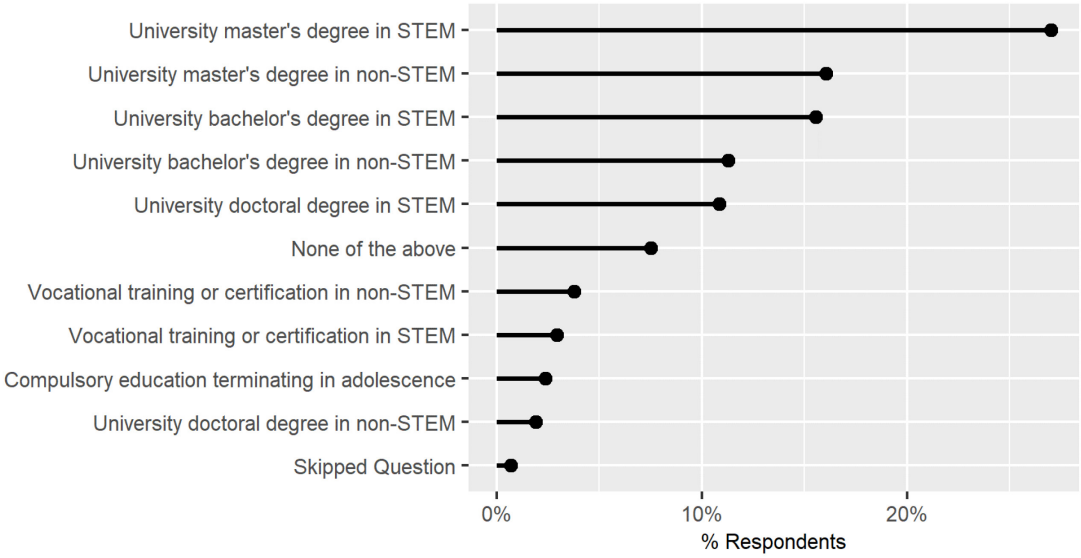


Figure E.9. **Age**

Question 8. "Your current age"

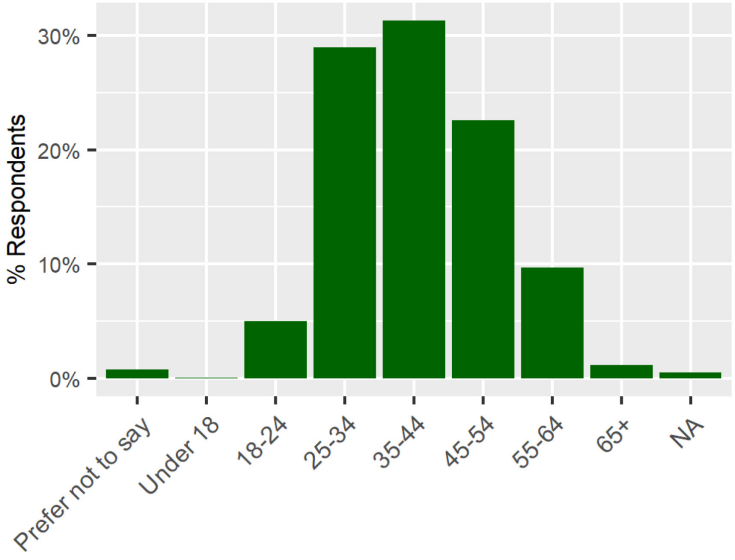


Figure E.10. **Relationship status**

Question 9. "Which of the following best describes your relationship status?"

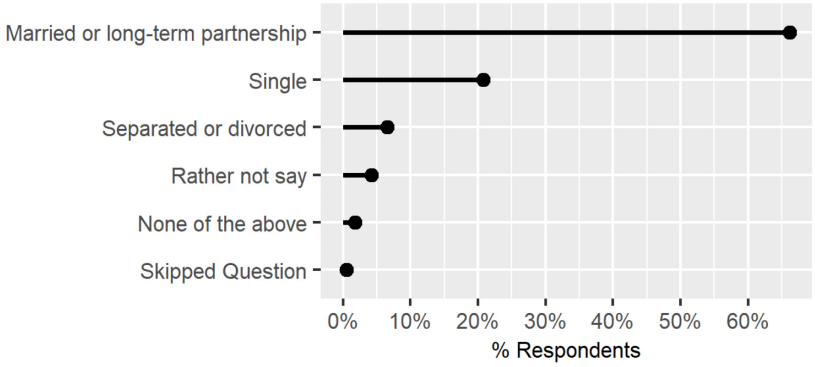


Figure E.11. **Dependents**

Question 10. "Have you ever had dependents living with you while you were working?"

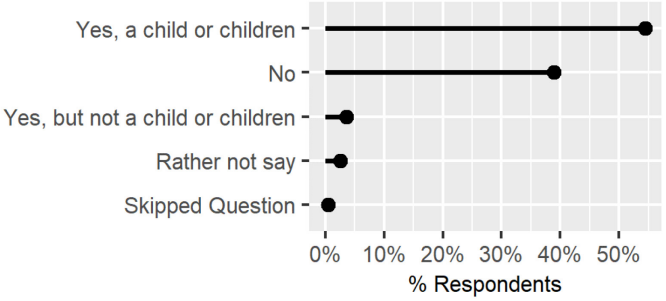
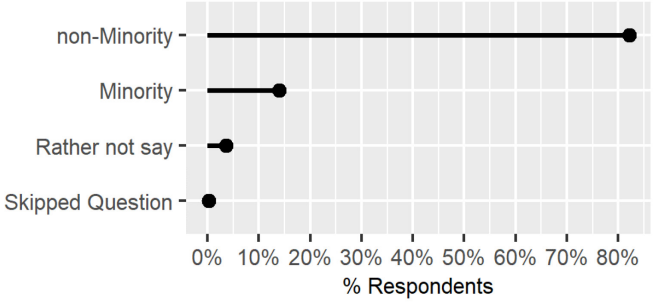


Figure E.12. **Minority group**

Question 11. "Do you identify as a member of a minority group?"



Note: For the purpose of this survey, a minority group is considered to be a group of people within a country who possess ethnic, religious or linguistic characteristics differing from those of the rest of the population and show, if only implicitly, a sense of solidarity, directed towards preserving their culture, traditions, religion or language. Typically, the minority group is in a numerically inferior or non-dominant position compared to the majority of the population. Please refer to the current UN definition as set out in the 1992 Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities.

Annex F. Contributors to this publication

Many people have contributed to the development of this publication.

Below are the names of the country representatives and delegates who participated in the meetings of the NEA Task Group on Improving the Gender Balance in the Nuclear Sector and in the preparatory work. There are also the names of the organisations that provided data as well as a list of other contributors.

The OECD Nuclear Energy Agency thanks them all for their valuable efforts.

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- Rachel LOPER (IAEA)
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* Russian membership in the NEA was suspended as of 11 May 2022.

Organisations

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- Autoridad Regulatoria Nuclear (Argentina)
- Comisión Nacional de Energía Atómica (Argentina)
- Nucleoeléctrica Argentina S.A. (Argentina)
- INVAP S.E. (Argentina)
- Australian Nuclear Science and Technology Organisation (Australia)
- Belgian National Agency for Radioactive Waste and Enriched Fissile Material (Belgium)
- Belgian Nuclear Research Centre (Belgium)
- Federal Agency for Nuclear Control (Belgium)
- National Institute for Radioelements (Belgium)
- Atomic Energy of Canada Limited (Canada)
- Bruce Power (Canada)
- Canadian Nuclear Safety Commission (Canada)
- CANDU Owners Group (Canada)
- Department of Natural Resources (Canada)
- Kinectrics (Canada)
- NB Power (Canada)
- Ontario Power Generation (Canada)
- SNC-Lavalin (Canada)
- Assystem (France)
- Atlantique (France)
- Commissariat à l'énergie atomique et aux énergies alternatives (France)
- Daher (France)
- Egis (France)
- Électricité de France S.A. – Division Ingénierie et Projets Nouveau Nucléaire (France)
- Électricité de France S.A. – Direction de la Production Nucléaire (France)
- Framatome (France)
- GDES (France)
- L'Institut de Radioprotection et de Sûreté Nucléaire (France)
- Naval Group (France)
- NETMAN (France)
- NUVIA Group (France)
- Onet (France)
- Orano (France)

- SETEC (France)
- Spie Nucléaire (France)
- Thomas Thor Associates (France)
- Trillium Flow Technologies (France)
- VINCI Energies (France)
- Hungarian Atomic Energy Authority (Hungary)
- Società Gestione Impianti Nucleari (Italy)
- Japan Atomic Energy Agency (Japan)
- National Institutes for Quantum Science and Technology (Japan)
- Nuclear Regulation Authority (Japan)
- Korea Atomic Energy Research Institute (Korea)
- Korea Hydro & Nuclear Power Co., Ltd. (Korea)
- Korea Institute of Nuclear Nonproliferation and Control (Korea)
- Korea Institute of Nuclear Safety (Korea)
- Korea Radioactive Waste Agency (Korea)
- Korea Institute of Radiological & Medical Sciences (Korea)
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- Polskie Elektrownie Jądrowe (Poland)
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- SN 'Nuclearelectrica' S.A. (Romania)
- Rosatom (Russia)
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Gender Balance in the Nuclear Sector

Female scientists and engineers pioneered the nuclear and radiological fields, with leaders and innovators such as Marie Skłodowska-Curie and Lise Meitner, among many others, establishing the foundation of modern nuclear science and technology. Women continue to make vital contributions to the sector, but their visibility and overall numbers in the sector remain limited, especially in science, technology, engineering, and mathematics (STEM), and leadership roles. The lack of diversity in the sector represents a loss of potential innovation and growth and a critical threat to the viability of the field.

This report features the first publicly available international data on gender balance in the nuclear sector. The data was collected from over 8 000 women in the nuclear workforce in 32 countries, as well as human resources data from 96 nuclear organisations in 17 countries. Based on the findings, a comprehensive, evidence-driven policy framework is proposed with practical recommendations.

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