



OASEES D1.3. Ethics and Gender Aspects

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LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation/Acronym	Description
DAIaaS	Decentralized Intelligence as-a-Service
DAO	Decentralized Autonomous Organization
DApps	Decentralized Applications
DCC	Digital Curation Centre
DM	Data Manager
EIC	European Innovation Council
ERA	European Research Area
EU	European Union
GDPR	General Data Protection Regulation
GEP	Gender Equality Plan
HITL	Human-in-the-Loop
IM	Innovation Manager
IoE	Internet of Everything
MGA	Model Grant Agreement
PC	Project Coordinator
PoC	Proof-of-Concept

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Abbreviation/Acronym	Description
R&I	Research and Innovation
RRI	Responsible Research Innovation
SDG	Sustainable Development Goal
SDG	Sustainable Development Goal
SwafS	Science with and for Society

EXECUTIVE SUMMARY

This deliverable, part of Task 1.4 in WP1, focuses on ethics and gender aspects within the OASEES project. It brings together essential principles such as reliability, honesty, respect, and accountability to ensure our research methodology aligns with the European Code of Conduct for Research Integrity and complies with relevant international, EU, and national laws. Task 1.4 is dedicated to monitoring and examining the Research Ethics, Gender Equality, and Legal requirements throughout the project's activities. This includes overseeing personal data processing for research purposes and evaluating how the project solutions impact these areas. The monitoring is done using designated audit forms and questionnaires and involves participation in meetings across various work packages to ensure compliance and address any arising issues. Deliverable D1.3 specifically examines the challenges and opportunities for accelerating gender parity in sectors and job families expected to experience high growth, particularly within the IoT context. It provides recommendations for initiatives aimed at driving system-wide transformation towards gender equality.

This document also addresses data management practices, covering the collection, storage, processing, retention, and destruction of data in alignment with General Data Protection Regulation (GDPR) policies. It ensures that informed consent documents, procedures, and information sheets are in place and meet all necessary regulatory standards. Throughout the project's duration, activities will be closely monitored to adhere to the established guidelines, ensuring non-biased selection procedures for research participants, proper informed consent processes, and strategies to mitigate the potential misuse of research outputs. The ethical, gender, and legal considerations will be reviewed continuously, with the goal of maintaining high standards and integrity in all project activities.

1 INTRODUCTION

1.1 OASEES PROJECT OVERVIEW

The massive increase in device connectivity and generated data has resulted in the proliferation of intelligent processing services to create insights and exploit data in a multi-modal manner. Currently, the most powerful data processing operates in a centralized manner at the cloud, which provides the ability to scale and allocate resources on demand and efficiently. Centralized processing and cloud hosting, bound and limit their services and applications to operate in a resource restricted manner, relying usually on large single entities to provide, i) Authentication, ii) Data storage, iii) Data processing, iv) Connectivity, v) Vendor-locked environments for development and orchestration. This significantly limits the user from its data governance and even identity management. Similarly, existing solutions for edge device authentication require a centralized entity to trust them and authenticate them, rendering a non-portable identification paradigm. OASEES aims to create an open, decentralized, intelligent, programmable edge framework for Swarm architectures and applications, leveraging the Decentralized Autonomous Organization (DAO) paradigm and integrating Human-in-the-Loop (HITL) processes for efficient decision making. The OASEES vision is to provide the open tools and secure environments for swarm programming and orchestration for numerous fields, in a completely decentralized manner. An important aspect in this process is identification and identity management, in which OASEES targets the implementation of a portable and privacy preserving ID federation system, for edge devices and services, with full compliance and compatibility to GAIA-X federation and IDSA trust directives and specifications. This situation solidifies the need for an integrated enabler framework tailored to the edge's extreme data processing demands, using different edge accelerators, i.e. GPU, NPU, SNN and Quantum.

Over the past years, several platforms, including open-source ones, have emerged, focusing mainly on the management and orchestration of edge infrastructure and services. However, in order to fully exploit the potential of edge processing, there is a need for a more holistic solution, embracing the entire compute continuum, including central infrastructures (public clouds and networks) as well as smart devices. While it is recognised that the future of cloud computing will be distributed and heterogeneous¹, there is a lack of open management frameworks to address this dispersion and heterogeneity. Commercial solutions for hybrid core/edge management, such as Azure Edge Stack², indeed exist, but these are closed, restricted to specific deployment scenarios and only provided as managed services, i.e., not suitable for private (fully on-premises) deployments.

Another gap to be addressed is related to the ease of access from the side of the data scientists and engineers. Public clouds already provide user-friendly abstractions (notebooks, simplified administration interfaces, graphical workflow designers, etc.) to data experts, so that the latter can concentrate on the management of the data and the selection and optimisation of the ML/AI algorithms, rather than on the management of the physical and virtual resources which are needed and committed. This is a feature currently missing from edge orchestration solutions.

Security is an equally important aspect; edge infrastructures can be highly dynamic, involving ad-hoc onboarding of edge nodes and smart devices, possibly under different ownership (multi-actor environments). In such a volatile

¹ Ericsson Technology Review 2020, The Future of Cloud Computing, <https://www.ericsson.com/499e1f/assets/local/reports-papers/ericsson-technology-review/docs/2020/the-future-of-cloud-computing.pdf>

² Microsoft Azure Stack Edge, <https://azure.microsoft.com/en-us/products/azure-stack/edge/>

context, in order to guarantee data privacy and availability, there is a need to continuously verify the integrity of both infrastructure and services across the compute continuum.

The OASEES project aims to directly address these challenges, by delivering and promoting a European, fully open source, decentralized and secure Swarm programmability framework for edge devices and leveraging various AI/ML accelerators (FPGAs, SNNs, Quantum), while supporting a privacy preserving Object ID federation process.

More specifically, OASEES will be built leveraging existing open-source edge orchestration solutions and will be capable of:

- Managing the lifecycle of services across the compute continuum by orchestrating heterogeneous resources in the cloud, WAN, edge and smart device domains. Resources from CPUs, GPUs, NPUs, FPGAs bespoke chips (e.g., for Spiking Neural Networks acceleration) and Quantum processors will be pooled and jointly managed to optimise ML at the edge for maximum performance and energy efficiency. While the focus will be on managing the edge and smart device domains, adaptors to popular public clouds will also be integrated, for supporting end-to-end services with the appropriate QoS guarantees at WAN network level (i.e., core-edge interconnect).
- Promoting the development of decentralized ML/AI edge services by means of an SDK and in the form of Decentralized Applications (DApps) in a user-friendly notebook-style abstractions for data scientists and engineers. The “serverless” fashion for Swarm deployment will make use of distributed ML platform capabilities and a Distributed Data Fabric; This will essentially realise the vision of Decentralized Artificial Intelligence as-a-Service (DAIaaS), an essential component towards a smarter Internet of Everything (IoE).
- Supporting multi-actor/multi-domain deployments, by i) enforcing security and trustworthiness, ii) enabling the federation with peer OS instances in other administrative domains (multi-domain operation) and iii) fostering monetization by advertising/trading capabilities and resources in third-party Marketplaces (including the Marketplace of the European Open Science Cloud).

OASEES will be fully open-sourced, and its capabilities will be demonstrated in a diversity of proof-of-concept (PoC) deployments in six highly relevant vertical applications. The Open-source community will also be invited to leverage its capabilities for building and managing innovative edge services. OASEES envisions a holistic approach for edge data processing, aiming to disrupt current practices which heavily rely on non-European cloud AI data processing, and push AI training and inference at the edge of the network, while being vertical agnostic.

1.2 WP1 OVERVIEW

WP1 (Project Coordination) deals with the overall coordination of the project consortium and technical activities, the contractual and reporting tasks and the communication with the EC and the supervising Member States.

The main objective of this WP is to ensure the achievement of the OASEES project’s objectives, on time and within budget, throughout effective management of all legal, financial, administrative, contractual and, if any arising, ethical aspects entailed by such an ambitious workplan.

This breaks down into the following aspects:

- Manage and review all technical and innovation tasks for successful achievement of the project goals, with reference to the objectives in term of concept definition, design, performances, timely delivery, and exploitation.
- Ensure a timely financial monitoring and control of the project according to Contract terms and conditions.
- Define and monitor quality standards for the whole project.

- Define and implement internal communication procedures within the project, organize project meetings.

In addition, Task T1.4 (Ethics and Gender aspects) will foresee, monitor, and examine the Research Ethics, Gender Equality and Legal requirements within the project activities and will monitor the personal data processing for research purposes within the project. This task will also examine the extent to which the project solutions and products affect Research Ethics, Gender Equality and Legal data protection issues. The monitoring of the requirements regarding ethical, Gender Equality and Legal data protection issues throughout the project lifetime will be achieved by means of designated audit forms and questionnaires and participation in meetings of other WPs as required.

2 GENDER AND ETHICS ACTIONS IN HORIZON EUROPE

The EU Gender Equality Strategy delivers on the von der Leyen Commission's commitment to achieving a Union of Equality. This strategy presents policy objectives and actions aimed at making significant progress by 2025 towards a gender-equal Europe. The goal is to create a Union where women and men, girls and boys, in all their diversity, can pursue their chosen paths in life, have equal opportunities to thrive, and can equally participate in and lead European society.

Ethics are integral to research from beginning to end, with ethical compliance seen as pivotal for achieving true research excellence. Scientific integrity is recognized as essential for quality work in international frameworks. Promoting integrity and deterring misconduct within all components of research and project development are key drivers for ensuring social and technical excellence.

Despite progress under the Horizon 2020³ programme, better implementation of EU gender equality objectives by research and innovation organizations across the EU is still needed. The challenges include increasing women's participation in research and innovation programmes, better integrating the gender dimension in research and innovation projects, enhancing participation of EU widening countries in gender equality actions, and expanding gender equality policies to address intersections with other grounds for discrimination such as ethnicity, disability, and sexual orientation.

The Commission is addressing these challenges through Horizon Europe, aligned with the Communication "A New ERA for Research and Innovation"⁴ and the new Gender Equality Strategy 2020-2025⁵. Horizon Europe sets gender equality as a cross-cutting principle and aims to eliminate gender inequality and intersecting socio-economic inequalities throughout research and innovation systems, including addressing unconscious bias and systemic structural barriers. Key novelties include:

- From 2022 onward, to qualify for Horizon Europe funding, public bodies, research organizations, and higher education institutions must have a Gender Equality Plan (GEP) established. This requirement aims to adopt lasting institutional transformation.
- Funds will be allocated specifically to support the creation of comprehensive gender equality plans in research and innovation institutions across Member States and associated countries. This financial support falls under the "Widening Participation and Strengthening the European Research Area" section of the program. Additionally, dedicated funding will be provided for gender studies and intersectional research, particularly within Pillar II Cluster 2 - Culture, Creativity, and Inclusive Society.
- Integration of the gender dimension into research and innovation content, which includes sex and gender analysis, will become a standard requirement throughout the entire program. For further details, please refer to the 'Gendered Innovations'⁶ policy report.
- Special emphasis will be placed on ensuring gender balance in evaluation panels and other pertinent advisory bodies, such as boards and expert groups. Encouragement for gender balance among researchers

³ https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-2020_en

⁴ https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1749

⁵ https://commission.europa.eu/strategy-and-policy/policies/justice-and-fundamental-rights/gender-equality/gender-equality-strategy_en#gender-equality-strategy-2020-2025

⁶ https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/gendered-innovations-2-2020-11-24_en

engaged in projects will be prioritized, and it will be factored into the assessment of proposals of equal rank.

- Key initiatives and actions under the European Innovation Council (EIC) to promote gender equality include setting targets such as inviting 40% women-led companies to pitch their projects, aiming for 50% representation of women among members of advisory structures, introducing a prize for women innovators, and establishing a dedicated initiative to support women-led start-ups.

Provisions within Horizon Europe that promote gender equality align with and complement initiatives in other programs like ERASMUS+, promote strong synergies with the transformative agenda for higher education institutions and European Universities alliances, as well as with Cohesion Policy Funds and the Rights and Values Programme. These efforts are anticipated to directly contribute to achieving the United Nations' Sustainable Development Goal (SDG)⁷ on Gender Equality and Women's Empowerment, and to all SDGs, recognizing gender equality as a foundational element across sustainable development objectives. Within Horizon Europe, gender equality and inclusiveness are paramount, reflecting the priorities outlined in the new ERA framework and the European Commission's vision of a Union of Equality⁸.

Under Horizon Europe⁹, entities such as public bodies, research organizations, and higher education establishments from EU Member States and Associated Countries will need to have a Gender Equality Plan (GEP) in place to be eligible for certain calls for proposals starting from 2022 onwards. A GEP is a structured framework of initiatives aimed at fostering gender equality through institutional and cultural transformations within research and innovation organizations. To adhere to the GEP eligibility criterion, organizations must meet four mandatory process-related requirements, which have been identified through collaborative efforts involving national and institutional research stakeholders, gender equality experts, and insights gained from previous FP7 and Horizon 2020 projects.

- **Publication:** a formal document that must be publicly available on the institution's website by top management.
- **Dedicated Resources:** a firm commitment of both resources and expertise toward advancing gender equality to effectively execute the plan.
- **Data Collection & Monitoring:** the systematic gathering of sex/gender-disaggregated data on personnel (and students, where applicable) and regular reporting based on these indicators.
- **Training:** the allocation of dedicated resources and expertise specifically aimed at implementing the gender equality plan.

A GEP should address the following five thematic areas using concrete measures and targets:

1. Work-life balance and organizational culture.
2. Gender balance in leadership and decision-making.
3. Gender equality in recruitment and career progression.
4. Integration of the gender dimension into research and teaching content.
5. Measures against gender-based violence, including sexual harassment.

To ensure the GEP is relevant, it must account for national laws, regulations, and funder requirements. It should be tailored to the organization's mission, history, and context. A clear senior lead responsible for developing and implementing the GEP is essential. An internal audit of gender equality, including a review of organizational data,

⁷ <https://sdgs.un.org/goals/goal5>

⁸ <https://ec.europa.eu/commission/presscorner/home/en?keywords=&dotyp=1,4,7&commissioner=990>

⁹ https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

existing policies, practices, and feedback, can be a first step. Establishing a model of change for the GEP by considering the causes of gender inequalities, the aims, and the required actions is crucial. Engaging the entire organization in its development and implementation is necessary, with leadership support and staff engagement, as well as the wider community, including students and other stakeholders. Continuous monitoring and review are essential for improving the organization's work.

There is extensive knowledge and numerous resources available for the development of Gender Equality Plans (GEPs) in research and innovation (R&I) organizations, supported by the European Commission, like the GEAR tool¹⁰, which provides step-by-step guidance along with a variety of online resources and good practice examples. Over 200 research performing, and research funding organizations have been supported to implement GEPs through 30 collaborative projects under FP7 and the Horizon 2020 Science with and for Society (SwafS) work program. These projects have generated a wealth of knowledge, good practices, innovative measures, resources, and tools. Additionally, ongoing GEP projects are underway, and links to all GEP-related projects funded under Horizon 2020 or under FP7 are accessible through CORDIS¹¹.

2.1 GENDER PLANS IN EUROPEAN RESEARCH

Gender equality stands as a basis of the European Union¹² and is protected by the fifth UN Sustainable Development Goal (SDG). It's not only a fundamental right¹³ within the EU but also a key principle of the European Pillar of Social Rights¹⁴. Moreover, fostering gender equality not only promotes job creation and productivity¹⁵ but also aligns with the requirements of green and digital transitions and addresses demographic challenges. While progress has been made in advancing gender equality in research and innovation (R&I) across Europe through various policies and measures at EU, national, and institutional levels, significant gaps remain. Despite nearing parity in doctoral studies, women continue to be underrepresented in technical fields, particularly STEM and ICT technologies, as well as among inventors.

The European Research Area (ERA) has placed a strong emphasis on gender equality in research since 2012, aiming to achieve this through gender mainstreaming (European Commission, 2012). This is reflected in the three key areas of focus outlined under ERA priority 4 on gender equality: (i) Promoting career progression for women in research. (ii) Ensuring a balanced representation of genders in research decision-making processes and (iii) Integrating gender

¹⁰ <https://eige.europa.eu/gender-mainstreaming/toolkits/gear>

¹¹

[https://cordis.europa.eu/search?q=contenttype%3D%27project%27%20AND%20\(programme%2Fcode%3D%27H2020-EU.5.b%27%20OR%20programme%2Fcode%3D%27FP7-SIS%27\)%20AND%20\(%27structural%20change%27%20OR%20%27gender%27%20AND%20%27equality%27%20AND%20%27plans%27\)%20AND%20\(%27gender%20equality%27\)&p=1&num=50&srt=Relevance:decreasing](https://cordis.europa.eu/search?q=contenttype%3D%27project%27%20AND%20(programme%2Fcode%3D%27H2020-EU.5.b%27%20OR%20programme%2Fcode%3D%27FP7-SIS%27)%20AND%20(%27structural%20change%27%20OR%20%27gender%27%20AND%20%27equality%27%20AND%20%27plans%27)%20AND%20(%27gender%20equality%27)&p=1&num=50&srt=Relevance:decreasing)

¹² As it is defined in the Article 8 of the Treaty on the Functioning of the European Union https://eur-lex.europa.eu/eli/treaty/tfeu_2012/oj

¹³ This right is mentioned in Articles 2 and 3(3) TEU, Articles 8, 10, 19 and 157 TFEU and Articles 21 and 23 of the EU Charter of Fundamental Rights

¹⁴ https://commission.europa.eu/publications/european-pillar-social-rights-booklet_en

¹⁵ By 2050, enhancing gender equality could boost the EU's GDP per capita by 6.1% to 9.6%, translating to an increase of €1.95 to €3.15 trillion. <https://eige.europa.eu/newsroom/economic-benefits-gender-equality>

considerations into the content and programs of research and innovation (R&I). The European Commission's Gender Equality Strategy 2020-2025 [1] builds upon this foundation by outlining specific policy actions. These actions include:

- **Eligibility Requirement:** A Gender Equality Plan (GEP) is mandatory for public bodies, research institutions, and universities seeking to participate in European Framework Programmes.
- **Award Criteria:** Integrating a gender dimension into research and innovation proposals is a baseline expectation and can also be a factor for receiving additional funding. Proposals are evaluated under the excellence criterion, with consideration given to how gender is addressed.
- **Ranking Criteria:** The EU strives for gender parity in Horizon Europe-related boards, expert groups, and evaluation committees, aiming for 50% female representation. Additionally, proposals with well-balanced research teams receive higher ranking when scores are otherwise equal.

Each partner involved in OASEES adapts its Gender Equality Strategy, reflecting unique policies and organizational structures. It's urgent for the consortium to prioritize gender equality and non-discrimination, ensuring equal opportunities and treatment for all participants and mitigating all forms of discrimination, especially gender-based discrimination.

2.2 ETHICS ACTIONS IN EUROPEAN UNION

Ethical issues must be integrated into research from start to finish, and compliance to ethical standards is required for all research, innovation, scientific, and technological activities funded by Horizon Europe. Conducting ethical research means applying fundamental ethical principles and relevant legislation to all scientific research domains, ensuring the highest standards of research integrity as outlined in the European Code of Conduct for Research Integrity [2].

The 2023 Revised Edition of this code has been particularly updated to maintain its relevance and effectiveness across diverse disciplines, emerging research areas, and evolving practices. Recognized by the European Commission as the primary benchmark for upholding research integrity in EU-funded projects, it also serves as a model for national and institutional codes of conduct, funding criteria, training programs, and specialized standards. For instance, it forms the basis for responsible Open Science guidelines crafted by project under Horizon funding and provides essential principles for promoting the responsible use of generative AI in research, as seen in the initiatives of the European Research Area Forum. The revisions in the 2023 edition reflect an enhanced understanding of the critical role of research culture in fostering integrity and good practices. They emphasize the shared responsibility of all stakeholders in upholding these values, considering evolving sensitivities in the research community regarding discrimination, exclusion, and the promotion of equity, diversity, and inclusion. Furthermore, the updated edition addresses changes in data management practices, compliance with the General Data Protection Regulation (GDPR), and advancements in Open Science and research evaluation methods.

As an institution based in a member state, the OASEES Coordinator, NCSR D, aligns its values and principles with those of the European Union (EU). Article 2 of the EU Treaty¹⁶ establishes the foundational values of the Union, including respect for human dignity, freedom, democracy, equality, the rule of law, and respect for human rights, including the rights of individuals belonging to minorities. These values are shared among member states, adopting

¹⁶ Consolidated version of the Treaty on European Union (26-10-2012) https://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF

a society characterized by pluralism, non-discrimination, tolerance, justice, solidarity, and gender equality. The guiding principles concerning ethics in Horizon Europe are outlined in

- Article 19 - Regulation (EU) 2021/695 establishing Horizon Europe¹⁷:

‘The Programme should support all stages of R&I especially within collaborative projects and in missions and European Partnerships, as appropriate. Fundamental research is an essential asset of and an important condition for increasing the Union's ability to attract the best scientists in order to become a global hub of excellence. A balance between basic and applied research should be ensured in the Programme. Coupled with innovation, that balance will support the Union's economic competitiveness, growth and jobs’

- Article 14 - Model Grant Agreement (MGA)¹⁸

14.1 Ethics The action must be carried out in line with the highest ethical standards and the applicable EU, international and national law on ethical principles

14.2 Values The beneficiaries must commit to and ensure the respect of basic EU values (such as respect for human dignity, freedom, democracy, equality, the rule of law and human rights, including the rights of minorities).

14.3 Consequences of non-compliance If a beneficiary breaches any of its obligations under this Article, the grant may be reduced.’

Based on these premises, the NCSR D has endorsed a code of Ethics that outlines a set of values and principles designed to inspire and guide the ethical conduct of its members in their activities. In line with these core principles of research integrity, the OASEES Project is dedicated to maintaining several fundamental principles. This cover ensuring the reliability and quality of research, including thorough analysis and responsible use of resources; promoting honesty throughout the research process, from development and review to communication, in a transparent, fair, and unbiased manner; showing respect for research colleagues, wider society, ecosystems, and the environment; and taking responsibility for research activities in all phases, considering their broader impacts.

Under these principles, OASEES is committed to following the fundamental values and rights, such as human dignity, freedom, democracy, pluralism, solidarity, integrity, and non-discrimination, explicitly outlined in the Charter of Fundamental Rights [3] of the European Union. This charter establishes essential personal rights and freedoms had by EU citizens into a legally binding document, which has been in force since December 2009 alongside the Treaty of Lisbon.

¹⁷ <https://eur-lex.europa.eu/eli/reg/2021/695/oj>

¹⁸ https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/agr-contr/unit-mga_he_en.pdf

3 GENDER EQUALITY IN PROJECT OASEES

3.1 GENDER DISTRIBUTION IN OASEES

The promotion of gender equality in research and innovation is a key commitment of the European Commission, with gender being a cross-cutting issue in Horizon 2020. The guide "Gender Equality in Horizon 2020" (European Commission, 2014¹⁹) outlines three objectives that support gender equality activities within the program:

- Achieving gender balance in decision-making processes.
- Ensuring gender balance in research teams at all levels.
- Integrating the gender dimension into the content of research and innovation (R&I).

The OASEES project is and will be implemented in accordance with these principles. Gender aspects in the OASEES project were evaluated from various perspectives during the proposal preparation stage, concluding that no gender-related dimension is present in the research or technical content of the project, as its findings do not appear to impact individuals or groups based on their gender.

The project aims to directly address the challenges arising from the massive increase in device connectivity and data generation. These challenges include the limitations of centralized cloud processing, the need for decentralized edge device authentication, and the demand for portable and privacy-preserving identity management. By delivering and promoting a European, fully open-source, decentralized, and secure Swarm programmability framework for edge devices, the project leverages various AI/ML accelerators (FPGAs, SNNs, Quantum) and supports a privacy-preserving Object ID federation process.

OASEES is generally gender-neutral in all its activities: requirements gathering, design and implementation, demonstration, dissemination, and communication. However, OASEES acknowledges that, given the lower labor-force participation rate of women, the absence of focus on gender equality in some high-growth industries (including ICT), and the possibly unequal exposure to technological change for male- and female-dominated occupations, the current progress toward gender parity is precarious.

In this context, OASEES will investigate the impact that the “democratization” of edge AI in various industries, as promoted by the OASEES solution, may have on women. It will explore how this can become a chance to reap the diversity dividend through innovation in high-growth sectors, while preventing further widening of gender disparities. Specifically, the ML abstractions/notebooks approach, MLOps, and SDK offered by OASEES make edge computing more accessible to “pure” data engineers and software developers, positions which have significantly higher female participation than hardware and IT engineers. Any gender aspects arising during the project implementation will be identified and handled under Task 1.3.

Regarding personnel engagement, the OASEES consortium is committed to promoting equal employment opportunities and aims to establish a program of actions to make the Horizon Europe gender and equality policy fully effective.

Beyond this obligation, the OASEES Consortium is dedicated to achieving true equality among individuals, regardless of their gender, sexual orientation, religion, or any other form of unlawful discrimination (although some of these aspects are beyond the scope of this deliverable). This commitment is integral to building a better, fairer, and more equitable society. Consequently, gender-related aspects, such as gender balance and equality, are prioritized within the Project.

¹⁹ <https://horizoneurope.ie/>

OASEES seeks to promote equality by encouraging balanced participation of women and men in management, research, innovation, and all other aspects of the project. Special attention is given to ensuring women's active involvement and participation. Gender balance within the project's management structures is also actively promoted.

Considering the gender composition by Month 18 of the OASEES team women are actively involved across all partners, 29 as depicted below:

Table 1: Participant gender involved in OASEES consortium

TOTALS	Total People	Total women	Total Non-Binary
NCSR	5	1	0
IMEC	2	0	0
TEC	5	0	0
CEA	6	3	0
FOKUS	3	0	0
DST	6	2	0
NKUA	5	0	0
ROBOT	3	1	0
INQBIT	4	1	0
INFRA	1	1	0
EMOT	5	1	0
ASMT	6	4	0
ADRE	4	2	0
IHB	4	3	0

TOTALS	Total People	Total women	Total Non-Binary
SENSO	3	1	0
INFI	11	3	0
SCM	5	2	0
CAP	9	2	0
SPH	6	0	0
OTE	2	1	0
AXON	5	0	0

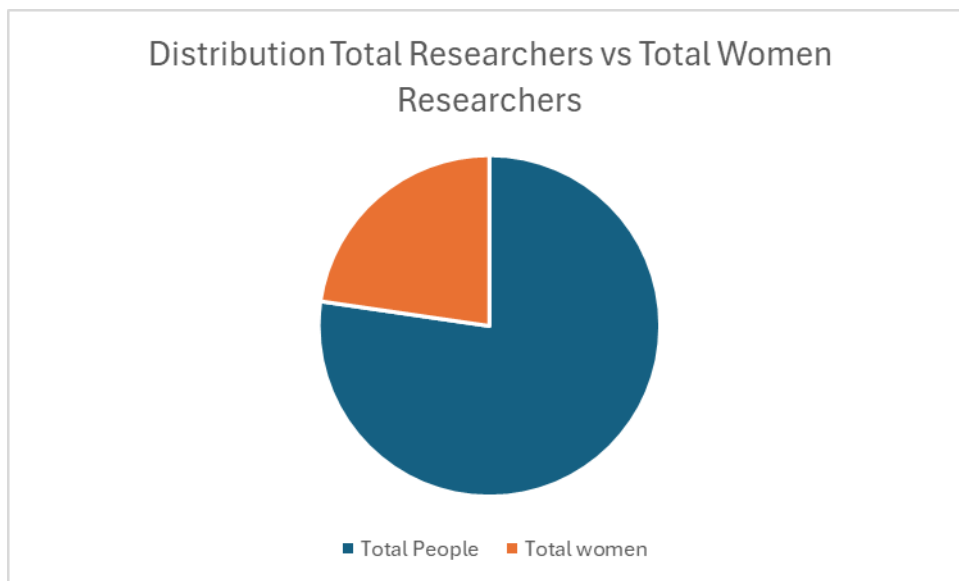


Figure 1 Distribution of Gender among OASEES consortium

The gender distribution for Project OASEES across various teams shows a significant disparity in representation. Out of 94 total participants, there are 29 women and no non-binary individuals, which constitutes approximately 29.8% of the total participants. Teams such as ASMT and IHB have the highest representation of women at 66.7% and 75% respectively.

The gender balance situation may change throughout the project's duration. However, the Project Coordinator and the General Assembly are committed to working together to ensure gender balance and absolute respect among all individuals in the OASEES Project. Gender balance will be addressed by the partners as part of the internal reporting process. Additionally, all partners involved in OASEES provide equal opportunities for women and men,

specifically encouraging women's participation in all project activities. Generally, all partners in the Project are expected and encouraged to adhere to the following principles:

- Encouraging gender balance within the project team
- Promoting equality between women and men in decision-making processes
- Providing equal and fair working conditions for both men and women
- Opposing all forms of unlawful and unfair discrimination
- Promoting inclusiveness and preventing any form of sexism, prejudice, or discrimination based on sex, including implicit sexism and sexual harassment or assault

By adhering to these principles, the OASEES Project aims to create an inclusive and fair environment that supports diversity and fosters respect for all individuals involved.

3.2 GENDER PRINCIPLES IN OASEES

The OASEES Project is deeply committed to ensuring fairness and inclusivity for all individuals involved, regardless of gender. Recognizing the critical importance of diversity in research, the Project adopts a comprehensive approach to address any potential gender inequalities that may arise. While the project does not establish specific measures or targets for the representation of men or women, it actively considers how gender dynamics might influence research activities. This proactive approach helps ensure that the outcomes of the project are equitable and accessible to everyone.

Aligned with the EU's principles of equality, the project is firmly committed to treating all individuals equally and with respect. It actively promotes the utilization of talent irrespective of gender and adheres to established guidelines and actions to support these principles. In addition to supporting existing Gender Equality Plans, the OASEES Consortium develops its own tailored plans to reduce gender bias. These plans include ensuring that project resources are lacking any gender stereotypes and encouraging balanced participation across all genders.

Throughout the duration of the project, measures to promote gender equality are integrated at every stage. The project maintains severe ethical and legal standards and remains aware of identifying and addressing any potential instances of gender bias. Finally, the goal is to organize research in a manner that fully embodies the EU's commitment to fairness and equality

High ethical standards are crucial for strong research. They ensure research quality and maximize its positive impact on society, aligning it with public needs and expectations. Ethics are directly tied to a researcher's responsibility towards individuals and society.

These ethical principles include fundamental rights and freedoms, such as autonomy, human dignity, bodily integrity, privacy, and property, while also aiming to promote well-being, happiness, and trust, and safeguarding against harm to individuals, property, and the environment. Fairness principles, including justice, equality, and non-discrimination, are also integral. Furthermore, ethical behavior includes working towards positive character traits such as honesty, tolerance, integrity, diligence, and respect. Ethical assessments of innovations enable the identification of potential ethical concerns in new technologies and their applications, empowering researchers to make informed decisions about development, promotion, and distribution in an equitable and environmentally responsible manner. Research ethics codes serve as vital guidelines for collaborative research projects, emphasizing honesty, objectivity, integrity, meticulousness, openness, respect for intellectual property and personal data, non-discrimination, competence, legality, and social responsibility, thereby fostering essential values for collaborative work such as trust, accountability, mutual respect, and fairness

For the OASEES Consortium, addressing ethical considerations throughout the project is vital. This involves screening reports for potential ethical issues and handling any ethical inquiries that may arise after the initial review. Ethical considerations are essential for protecting the fundamental human rights and privacy of all project participants. To achieve this, partners will establish procedures compliant with all relevant regulations. They will also uphold the core principle of research integrity as outlined in the European Code of Conduct for Research Integrity. This code promotes best practices in research activities, emphasizing reliability, honesty, respect for colleagues and society, and accountability. In essence, all research within the OASEES Project will adhere to the highest ethical standards, ensuring proper data protection for sensitive information gathered during the Project.

Although the creation of exploitable datasets is not among the primary project objectives, the implementation of the PoCs and the use cases brought by third parties is expected to yield useful data. Such data includes time series data (PoC 2, PoC 4), images/videos (PoC 1, PoC 3, PoC 5, PoC 6), logs (PoC 4, PoC 6), and trained ML models (all PoCs). These data will be accordingly managed under Task 7.2, under the Data Management Plan to be produced. Data which can be publicly released (some of them after curation and always in line with EU privacy and data protection regulations) will be published in open repositories (including Zenodo) in the appropriate metadata and the proper formats so that they can be directly ingested (e.g., CSV for time series data, MP4/H265 for videos, raw text for logs, etc.). As for the project reports and results (software code), the vast majority will be made public, as described in the section to follow. The project will comply with and use the FAIR principles as a directive and basis for its sharing of scientific, business, and other innovation results and outcomes. Additionally, the project will utilize a knowledge management tool to ensure the smooth running of activities. This tool will create an environment where data and information can be systematically organized, enhancing its value for various purposes and ensuring easy accessibility for use and reuse.

This holistic Data Management approach will consider the principles of Responsible Research Innovation (RRI) and follow the recommendations of the Digital Curation Centre (DCC). The Project Coordinator (PC), responsible for ethics, the Innovation Manager (IM), and the Data Manager (DM) will maintain research integrity concerning privacy and data protection. The Data Manager will also oversee the release of the open technologies of OASEES in a publicly available repository (e.g., GitHub, GitLab) and ensure their availability and maintenance after the project's completion.

5 CONCLUSIONS AND IMPLICATIONS

The OASEES consortium is dedicated to promoting gender equality and adhering to high ethical standards throughout the project. This commitment is reflected in our Gender Action Plan and ethical guidelines, which have been seamlessly integrated into all aspects of the project. All partners prioritize gender issues and try to increase women's participation in technical and managerial roles, providing support to address work-life balance challenges.

While the OASEES project does not specifically focus on gender issues within its research topics, it actively considers gender dynamics in both practical and theoretical aspects. Each participating organism ensures the inclusion of every gender in the project, not only in administrative roles but also as experienced researchers within the research teams. Both gender equality and research ethics are ongoing priorities within the consortium and our broader community of interest. These aspects will be continuously monitored and evaluated throughout the project to measure our progress in achieving gender equality and maintaining high ethical standards, thereby ensuring robust results and meaningful conclusions for the OASEES project.

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