



**Policy
Series**



**GENDER
ACTION**



Policy Series

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GENDER IN HORIZON EUROPE

AN UNFINISHED BUSINESS

The European Commission has launched a proposal for the next EU Research & Innovation Programme (2021-2027), called “Horizon Europe”. This Briefing Paper is a call to action towards a proper integration of gender mainstreaming in Horizon Europe based on the evidence provided by official reports and recommendations regarding Gender in Research & Innovation from gender experts and stakeholders across Europe. The aim is to strengthen gender equality in the ERA community and structures as well as to innovate gender equality policy implementation in the scientific field.

Gender in Horizon 2020 and Horizon Europe: Challenges in the transition

Horizon 2020 has become the Framework Programme for R&I that made gender mainstreaming visible and real in the European scientific policy. Horizon Europe faces the challenge to continue with this effort on a three-fold foundation:

- Gender balance in the research teams, careers and decision-making
- Structural changes in Research Performing and Funding Organisations towards gender equality
- Integration of the sex/gender analysis in the research content

Horizon 2020 has been a reference model for national policies on women, gender

and science. It included gender issues as a cross-cutting issue and included research topics which explicitly addressed gender dimension in the research content. The two-fold strategy developed until now to mainstream gender equality consisted of: 1) rules of procedure to integrate sex/gender analysis in research proposals and to promote gender balance, and 2) specific topics to fund the implementation of gender equality policies in research institutions and research on gender issues in R&I to bring evidence-base for gender equality policies. The impacts include more and better Gender Equality Plans in research institutions across Europe, a modest reduction of the leaky pipeline (see ERA Progress Report, 2017) and increasing gendered innovations in the European scientific production. Moreover, there is

Horizon 2020 Interim Evaluation of Gender Equality, 2017

25% women among
project leaders

50% women in advisory groups

14% funded projects
with a comprehensive
integration of the
gender dimension

greater awareness in the scientific community and among policy makers on the importance of gender diversity in research teams, evaluation panels and boards. This advancement towards gender equality has contributed to changing the way we think about research and innovation but there is still much room for improvement.

Lessons learned from gender expertise

Horizon Europe has the unique opportunity to take a leading position on gender mainstreaming and integrate in this new Framework Programme some of the most salient recommendations pointed out by the Helsinki Group and by the EC Report on the Interim Evaluation of Gender Equality as a Crosscutting Issue in Horizon 2020, particularly the need to:

- Attain gender balance in research teams and high-level positions (only 25% women project leaders)
- Develop a detailed system of gender indicators to monitor the R&I workforce
- Improve gender balance in decision-making (now 50% in advisory groups, but 37% in evaluation panels)

- Better integration of the gender dimension in research content (only 14% of funded projects show a comprehensive integration of gender)
- Develop more detailed key performance indicators on the integration of the sex/gender analysis into research
- Increase gender training within funded projects
- Reinforce institutional change (Gender Equality Plans) and other projects (RIAs, CSAs, ERA-Nets) for gender equality

Recommendations to strengthen Gender in R&I

The goals of Horizon Europe will only be accomplished if gender equality is properly integrated because:

- **To strengthen the EU's scientific and technological bases** requires **sex/gender analysis methods to eliminate gender bias**.
- **To boost Europe's innovation capacity, competitiveness and jobs** implies a **high-quality Human Resources policy**, that is, not wasting the talent of half of the population.
- **To deliver on citizens' priorities and sustain our socio-economic model and values** requires **gender balance in decision-making, work-life balance and the elimination of barriers facing women in the research field**.

Moreover, since Horizon Europe aims to achieve the UN Sustainable Development Goals, special attention should be given to **SDG 5 "Achieve gender equality and empower all women and girls"** in the production of knowledge and innovation in Europe.

Thus, general recommendations for a better inclusion and visibility of gender equality goals and the gender dimension in R&I content include:

- To add **gender equality as a specific area of intervention – and funding** – in the cluster *Inclusive and Secure Societies* (Pillar II “Global Challenges and Industrial Competitiveness”)
- To effectively integrate **gender as a cross-cutting issue** in the Framework Programme
- To reinforce **gender balance and gender in research content in the Rules of Procedure** for Horizon Europe
- To review the formulation and application of the **evaluation criteria** from a gender perspective
- To ensure that **gender expertise** is included in expert groups, research teams, evaluation panels and advisory groups, and more urgently, in the negotiations of Horizon Europe
- To guarantee the **participation of women and gender equality stakeholders** in the consultations with the civil society to define the Horizon Europe “Missions”
- To maintain a specific **funding line for Gender equality** issues in “Strengthening the European Research Area” Pillar

Pillar II Global Challenges and Industrial Competitiveness

Cluster Inclusive and Secure Societies

Democracy

Social and economic transformations

Gender equality

Protection and security

Cultural heritage

Disaster-resilient societies

Cybersecurity

Conclusions

The design of Horizon Europe has given great importance to the links between inclusive societies, R&I and global challenges. The gender dimension is crucial to design inclusive societies as well as to produce responsible R&I, and constitutes a global challenge in itself as stated in the UN Sustainable Development Goals. **Horizon Europe should not lose this momentum to advance gender equality in order to make R&I investments shape a more inclusive future based on better science and innovation.**

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GENDER AS A GLOBAL CHALLENGE AND A KEY DRIVER FOR INNOVATION

Horizon Europe PILLAR II: Global Challenges & Industrial Competitiveness

Cluster 1 Health and

Cluster 2 Inclusive and Secure Societies

The European Commission has launched a proposal for the next EU Research & Innovation Framework Programme (2021-2027), “Horizon Europe”. The present 2nd Briefing Paper is a call to action towards a proper integration and visibility of gender issues in Pillar II *Global Challenges & Industrial Competitiveness* (as a whole and within the 2 first clusters, 1 *Health* and 2 *Inclusive and Secure Societies*).

What is Horizon Europe Pillar II on *Global Challenges & Industrial Competitiveness* about?

Pillar II focuses on the **2nd specific goal of Horizon Europe: to strengthen the impact of research and innovation in developing, supporting and implementing Union policies, and support the uptake of innovative solutions in industry and society to address global challenges** (the Sustainable Development Goals - **SDGs**).

Gender Equality, as SDG5, requires a specific intervention area; in addition, the integration of sex/gender analysis as a cross-cutting issue across all the clusters and intervention areas in Pillar II of Horizon Europe is a key driver for better EU science and higher innovation potential.

Therefore, it will fund research and innovation activities to be implemented in and across **five clusters** aimed at integrating main challenges and opportunities to EU and global policy and competitiveness: 1) **Health**; 2) **Inclusive and secure societies**; 3) **Digital and industry**; 4) **Climate, energy and mobility**; and 5) **Food and natural resources**. Additionally, **each cluster is organised in several intervention areas**, designed to incentivise cross-disciplinary, cross-sectoral, cross-policy and international collaboration by means of calls, missions and partnerships.

Why is gender so relevant to Horizon Europe Pillar II?

1) First of all, since **UN SDG #5** is to **"Achieve gender equality and empower all women and girls"**, and Horizon Europe 2nd Pillar is focused on SDGs, this is the crucial place to address gender equality explicitly, and make visible the main specific challenges and opportunities for advancing gender equality in the EU and worldwide across different life domains. This will stimulate R&I activities aimed at fostering innovative solutions to EU and global challenges in an evidence-based and gender sensitive manner. The logical solution is to explicitly include **gender equality as a specific Area of Intervention** in Cluster 2 on Inclusive and Secure Societies.

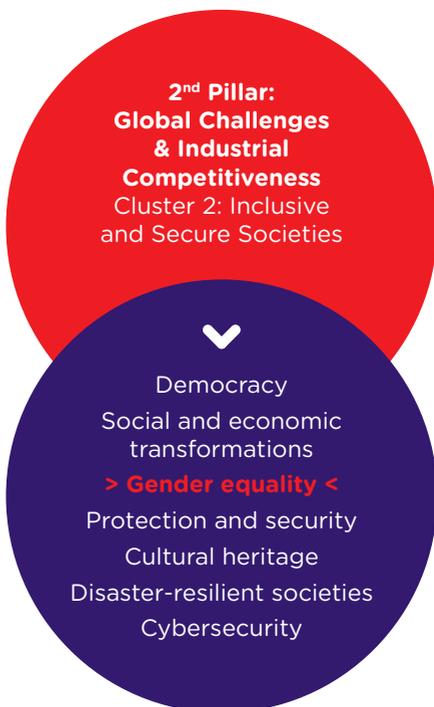
2) It is also crucial **to guarantee proper integration of sex/gender analysis in R&I content as a cross-cutting issue** because it is a key driver for scientific quality, impact and innovation potential of R&I activities to be implemented **in and across all the clusters and intervention areas of Pillar II**.

General recommendations for Pillar II

- Since each Cluster of Pillar II contributes towards several SDGs, but there is no

one that mentions **SDG5 "Achieve gender equality and empower all women and girls"**, SDG5 should be explicitly recognized in Horizon Europe as a key and strategic challenge in itself and also contributes to achieve other SDGs and EU sectorial policies.

- **Sex/gender analysis and reporting results by sex and gender** should be required in every Cluster and Area of intervention as a cross-cutting issue of Pillar II in order to produce non-biased and more inclusive knowledge, impact and innovation. All of them are gender relevant because necessarily have to deal with human activities and involve human beings, directly or indirectly as beneficiaries, users, etc. For instance, how climate policies can affect groups of women and men differently.



Recommendations for Gender in Cluster 1 Health

- The Cluster “Health” should explicitly address the challenge of taking into account the **particular characteristics, needs and social conditions of diverse populations groups, including sex and gender groups**, when improving and protecting the health of citizens, as well as when making public health systems more equitable, efficient and innovative.
- To address explicitly **gender and/or sex as relevant variables** for the broad lines of research in all Intervention Areas in this Cluster. For instance, sources, treatment and consequences of poor mental health on women and men; sex and gender differences in the health needs of adolescents (including sexual and reproductive health needs); and the use of gender representative samples when piloting innovative treatments or studies that review treatment guidelines under gender considerations aimed at boosting more inclusive and safe methods.

Recommendations for Gender in Cluster 2 Inclusive and Secure Societies

- Horizon Europe needs to explicitly recognize that strengthening the **European democratic values implies necessarily to address gender equality** and the important role that European women play in the economic transformations that will contribute to inclusion and growth.
- **Gender equality needs to be considered as a specific Area of Intervention** in this Cluster because it is a sectorial policy of the European Union and a global challenge (SDG5) that requires specific gender studies research. This

will allow to bring strategic research and innovation broad lines that put the focus on EU gender equality policies (for instance providing gender knowledge-based evidence about the impact of these policies) and innovative approaches to address main targets to attain SDG5 (for instance, to address all forms of gender-based violence and discrimination against women and girls, and to find better strategies for the empowerment of women and girls in all spheres of cultural, social and economic life, including the recognition and value of care work).

- To address explicitly **sex and/or gender as cross-cutting issues** for the broad lines of research in the remaining intervention areas of this cluster. For instance, the links between women’s and men’s roles and disaster-resilient societies; the role of women and gender diversity in social and economic transformations; the impact of gender-based violence on security for our societies; gender differences in labour markets, poverty and working conditions; digitalization, use of IT and digital citizenship; mobility and migration; and other societal challenges.

Conclusions

Addressing gender in Pillar II, both as a specific Area of Intervention and as a cross-cutting issue, will help to support better EU and global policies for attaining the SDG #5 and the remaining UN SDGs. It will also help to boost EU’s innovation, competitiveness, security and inclusiveness. Consequently, it is highly recommended that Horizon Europe Pillar II add gender equality as a specific Area of Intervention in Cluster 2 Inclusive and Secure Societies and explicitly integrate gender as a cross-cutting issue in and across all the clusters and Areas of Intervention of Pillar II.

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THE ECONOMIC MODEL ENVISIONED BY HORIZON EUROPE

A GENDER PERSPECTIVE TO NATURAL RESOURCES AND INDUSTRY

Horizon Europe PILLAR II Global Challenges & Industrial Competitiveness

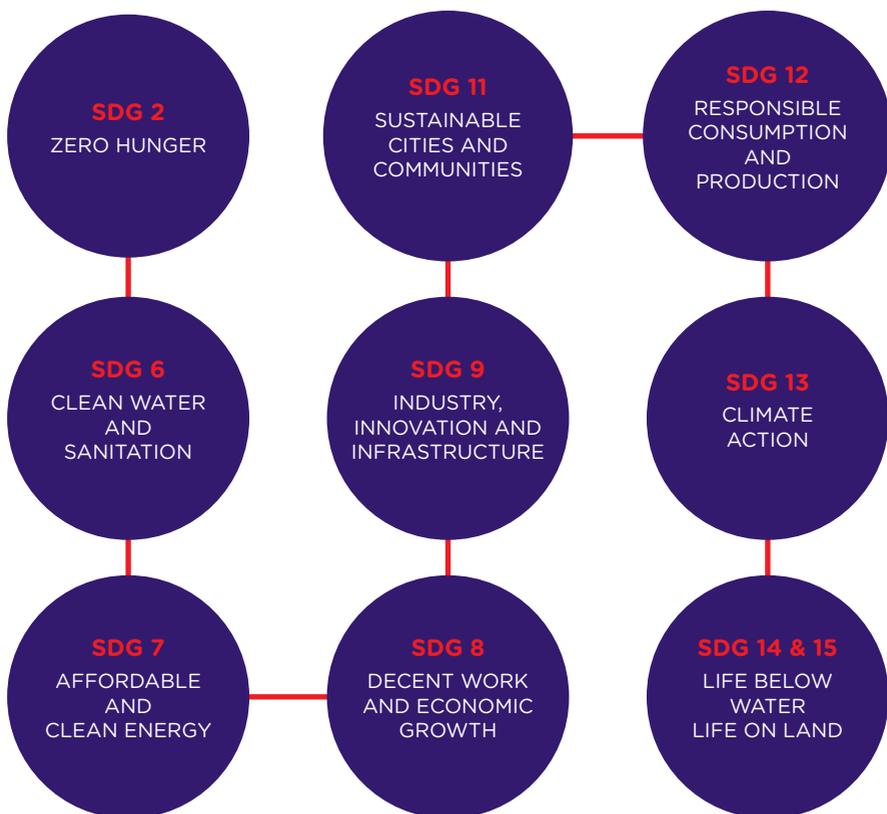
Cluster 3 Digital and Industry; 4 Climate, Energy and Mobility; and 5 Food and Natural Resources

The European Commission has launched a proposal for the next EU Research & Innovation Programme (2021-2027), called “Horizon Europe”. This 3rd Briefing Paper is a call to action towards the integration of the gender dimension in Clusters 3, 4 and 5 of Pillar II as well as towards the design of gender equality goals in the use and distribution of resources. See the previous Briefing Paper no. 2 which focused on Clusters 1 and 2 of this Pillar.

UN SDGs and the economic model of Horizon Europe

Clusters 3 Digital and Industry, 4 Climate, Energy and Mobility, and 5 Food and Natural Resources of Pillar II in Horizon Europe are crucial because they **envision an economic model for the future Europe**, as can be seen in the Areas of Intervention:

- **3 Digital and Industry:** manufacturing technologies; key digital technologies; artificial intelligence and robotics; next generation internet; advanced computing and big data; circular industries; low-carbon and clean industries; space...
- **4 Climate, Energy and Mobility:** climate science and solutions; energy systems and grids; buildings and industrial



facilities in energy transition; communities and cities; clean transport...

- **5 Food and Natural Resources:** environmental observation; biodiversity and natural capital; agriculture, forestry and rural areas; sea and oceans; food systems...

The Areas of Intervention included in these Clusters 3, 4 and 5 together **refer explicitly to ten UN Sustainable Development Goals** related to the economic and environmental rights of citizens.

However, none of these areas mentions so far the gender dimension of these SDGs to bring into consideration the different baselines in the socio-econom-

ic situation of women and men as well as gender drivers and gender impacts of the innovative solutions for those SDGs.

Natural resources and industry from a gender perspective

Decisions on the use of natural resources, the design of cities and industries, as well as the planning of economies transition towards more sustainable energy and consumption models are not gender-neutral. Instead, they **should be done in a gender-responsive way**.

For instance, addressing agriculture and food systems without a gender perspective means to leave the gender division of

labour and women's unpaid labour out from the discussion.

Moreover, it is important **to stress the potential role of women in technological, digital, social, cultural and territorial governance innovations**. In other words, women's participation in decision-making should be ensured in fundamental sectors such as agriculture, fish harvesting, energy, digitization and infrastructure provision.

Recommendations for Gender in Cluster 3 Digital and Industry

To ensure that **gender dimension is integrated in all the stages of the R&I cycle** for the EU digital and industrial development. For instance this will require:

- To integrate the **sex/gender analysis in data management and data applications**.
- Since nanotechnologies, advanced materials, manufacturing technologies, etc., are moving towards greater involvement of target groups **in formulating problems and solutions, the different needs of women and men groups need to be reflected** in the process.
- To **avoid the reproduction of gender bias** and gender stereotypes in the

design of **robotics, artificial intelligence and ICT** technologies.

Recommendations for Gender in Cluster 4 Climate, Energy and Mobility

To **ensure that crucial gender issues addressing the SDGs** related to climate, energy and mobility **are explicitly mentioned** in the specific programme. For instance:

- To develop **Climate Science and Solutions** as an Area of Intervention from a gender perspective means to consider the gendered aspects of climate change drivers, impacts, mitigation solutions and adaptation patterns, including the effects of disasters in cities.
- The difference between women's and men's **energy needs, choices and consumption** must be taken into consideration when designing energy plans.
- To explicitly recognize that **mobility and transport solutions** for communities and cities have to respond to the complexity of women's and men's needs.

Recommendations for Gender in Cluster 5 Food and Natural Resources

- To include the **empowerment of women in agriculture** as a broad line within the Area of Intervention on agriculture, forestry and rural areas
- To **highlight gender factors involved as cross-cutting issues for better solutions** in the food and natural resources SDGs. For instance: The different conditions facing **women and men in rural areas**, the impact of evolving gender roles on activities in the primary sector, **sex/gender analysis on the effects of pesticides, antibiotics and antimicrobial resistance, the nutrition status of women and men** when developing sustainable and healthy diets, etc.

TO REMEMBER

In the previous Briefing Paper No. 2, June 2018:

Gender Equality is recommended to be considered both as a specific Area of Intervention in Cluster 2 and as a crosscutting issue for all Clusters and Areas of Intervention in Pillar II of Horizon Europe.

CONCLUSION

Clusters 3, 4 and 5 of Pillar II envision an economic model for Horizon Europe. The gender dimension needs to be considered when deciding on the use and distribution of resources as well as in the design of communities and cities of the future and the necessary technologies for this.

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GENDER FOR HORIZON EUROPE RESEARCH & INNOVATION MISSIONS

ENSURING A FAST-TRACK TO BETTER FUTURE FOR ALL

The European Commission has launched a proposal for the next EU Research & Innovation Framework Programme (2021-2027), “Horizon Europe”. The present 4th Briefing Paper is a call to action towards a proper integration of gender issues in the Horizon Europe new *mission-oriented approach* within Pillar II on *Global Challenges and Industrial Competitiveness*.

What does Horizon Europe plan for its new *mission-oriented* approach?

- **A limited number of highly visible R&I upcoming missions on ambitious goals within a set timeframe**, to increase impact on EU policy priorities and UN Sustainable Development Goals.
- To be defined **from the SDGs framework and focused on areas with a transformative potential for society, science, technology or industry**.
- Two mission types: those aimed at **accelerating progress** (social, technological or industrial) and those aimed at **transforming an entire system** (social or industrial).
- Each one will include a **portfolio of projects** open to benefit from other actions in the Programme and beyond, **across clusters**, improving cross-sectoral, cross-disciplinary, cross-policy and international cooperation.
- **Missions will be decided and co-designed during a strategic planning process through collaborative effort** including relevant stakeholders. **Citizens and end-users will participate in co-design and co-creation**. Citizens and stakeholders will **also** be involved **in the monitoring of missions**.
- **Mission Boards** and **Mission Managers** might be set up or recruited by the Commission. The former to be appointed through open calls for expression of interests, and balance criteria such as expertise, **gender**, age and geographical distribution, but existing governance structures might be considered when appropriate.

To accelerate progress and to transform systems towards SDGs in a responsible and efficient way, the EU R&I upcoming missions need to appropriately integrate the gender dimension and ensure gender balance in mission development.

Why gender needs to be well integrated in the Horizon Europe mission-oriented approach?

Gender issues need to be properly taken into account when it comes to prioritising and designing the progress we want to accelerate or the social and industrial systems we want to transform for a better future that benefits all.

Accelerating progress on gender equality directly relates to SDG5 *Achieve gender equality and empower all women and girls*, and requires profound transformations in the existing social and industrial systems. It is **also a crucial driver for the transformations required by other SDGs**. And **the gender impact of these other transformations needs to be analysed to avoid gender biases**.

According to the Eurobarometer on Gender Equality 2017, more than 80% of respondents say that promoting gender equality is important for: a fair and democratic society (91%), the economy and the companies (87%) or themselves personally (84%).

Both gender balance and the gender dimension need to be well integrated in the whole mission-oriented approach cycle, that is, in the ways Horizon Europe

missions are going to be defined, selected, implemented, monitored and evaluated.

On the one hand, diversity in teams, including **gender diversity and gender balance**, facilitates innovative solutions. And on the other hand, the **incorporation of the gender dimension into R&I content** (which requires gender expertise) guarantees that R&I processes and outputs benefit all segments of population without gender bias. For instance, the World Economic Forum has recently estimated that many of the jobs that will be lost due to digitalization are performed by women.

Recommendations for Gender Balance and Gender Diversity in missions

- Gender balance is already one of the criteria for the recruitment of **Mission Boards**, but it also needs to be considered when an existing governance structure could be appointed (provisions to avoid or solve unbalanced cases).
- **Other leadership and decision-making appointed roles** (*Mission Managers*, expert evaluators, keynote speakers, etc.) must reach gender balance also at mission level and across.
- To include **women's organizations and gender equality mechanisms** at national and European level in the **co-creation, decision-making** and monitoring of missions.
- **Provisions for equal work conditions at missions** should be made (to promote work and family balance, as well as to prevent and properly address any form of gender discrimination and gender-based violence).

Recommendations for the integration of the gender dimension into mission content

- A **specific mission on gender equality SDG5**, aimed at accelerating progress

CONCLUSION

To better accelerate progress and transform entire systems towards SDGs in a responsible and efficient manner, the EU R&I upcoming missions need to appropriately integrate the targets of SDG5 as well as addressing the crucial gender issues in the other SDGs.

and to transform systems towards SDG5 targets.

- **Addressing gender in any mission.** Besides SDG5, gender equality is also an organizing principle of European societies. Gender impact must be addressed in any social and industrial transformation. This requires ensuring that any mission will properly integrate sex/gender analysis methods. Provisions should then be made, *inter alia*, on: **clear gender criteria to select missions; gender experts among evaluators; gender indicators in the monitoring and impact evaluation** of missions.
- Therefore, it is also crucial to ensure the participation of **gender experts** (and gender equality stakeholders where relevant) **in all the stages of the mission cycle**, from strategic planning to monitoring and impact evaluation. For instance, in Mission Boards this will also facilitate a proper integration of gender when advising on: the content of work programmes; co-design with stakeholders and the public; adjustment or termination of actions; selection of evaluation criteria; communication; etc.

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GENDER-RESPONSIVE INTERNATIONAL COOPERATION FOR HORIZON EUROPE

The European Commission has launched a proposal for the next EU Research & Innovation Programme (2021-2027), “Horizon Europe”. This Briefing Paper is a call to action to redefine the proposed model of International Cooperation in Science, Technology and Innovation, known as *Openness to the World*, in light of the Women’s Human Rights principles and UN Sustainable Development Goals. Given that both Gender and International Cooperation are ERA priorities, the European Commission is responsible for taking the lead on mainstreaming gender in international cooperation in STI. Key provisions for it should be specified in Horizon Europe.

The Starting Point

Gender equality and International Cooperation are **cross-cutting issues** in Horizon 2020. Moreover, the ERA Roadmap 2015-2020 adopted by the Council in May 2015 included them among the **6 ERA priorities**, and notes for these two priorities only, **clear transversal links to all other ERA priorities**. Consequently, the Council Conclusions from 1 December 2015 on *Advancing gender equality in the European Research Area* invited the Commission and Member States (MS) to *consider including, among others, a gender perspective in dialogues with third countries in the area of science, technology and innovation (STI)*, while also inviting the Strategic Forum for International S&T Coop-

eration (SFIC) and the former Helsinki Group (now Standing Working Group on Gender in R&I, SWG GRI), **to consider developing joint guidelines on a gender perspective for international cooperation in STI**.

Therefore, SFIC and SWG GRI set up an ad hoc working group to assess the current state of gender mainstreaming in international cooperation in STI, and conducted a survey to that effect which targeted national governments and research funding organizations/programme managers of MS and associated countries (AC). In January 2018 these advisory groups of the European Research Area and Innovation Committee (ERAC) published a joint report, with recommendations for the Commission, MS and AC, highlighting that:

Gender aspects in International STI Cooperation may need to consider specific issues, such as the underrepresentation of women in certain scientific fields and research areas, cultural differences, etc. while at the same time for a number of current societal challenges (climate, poverty, health) the gender dimension is important. International cooperation activities (in bilateral as well as multilateral activities) have the potential to be a positive example for integrating gender aspects.

ERAC SFIC and ERAC SWG GRI,
2018

- The inclusion of gender in formal agreements for STI cooperation (bi-/multi-lateral) is rather low (at governmental and funding/programme level), although some countries are willing to improve it.
- Capacity building is needed through best practice exchanges and sharing examples, special training and increased political support.

SFIC and SWG GRI underscore that **more effort is needed to explain the added value and potential benefits of including gender** in agreements, work programmes and joint activities in international STI co-operations. **The Commission was invited to consider gender equality and gender-related research in projects as issues to be taken up within its future international cooperation initiatives and dialogues, as well as in the context of its internationalization strategy and activities within the next EU Framework**

Programme. The inclusion of “gender aspects” in the evaluation of the calls involving project partnerships with non-EU partners was also encouraged, as appropriate.

To follow up on it, after consulting with the rapporteurs of the joint SFIC-SWG GRI report, GENDERACTION has developed a checklist for policy makers as an efficient way to provide further guidelines on integrating the gender dimension in international cooperation in STI.

International Cooperation in Horizon Europe

International STI Cooperation is planned to be reinforced as a cross-cutting issue in the next Framework Programme, supported and enhanced by means of activities in “Strengthening the ERA”. A greater impact of EU R&I is expected through aligning actions with other nations and regions of the world through international cooperation effort on an unprecedented scale. For mutual benefit, partners from across the world will be invited to join EU efforts as an integral part of initiatives in support of EU action for sustainability, reinforced R&I excellence, and competitiveness.

International cooperation is expected to ensure effective tackling of global societal challenges; access to the world’s best talents, expertise and resources; and enhanced supply and demand of innovative solutions. Horizon Europe will promote an extended openness to association with third countries with good capacity in STI.

However, a well-structured and clear section for international cooperation actions and regulation is missing in the Proposal, addressed mainly in the “Impact Assessment” analysis. There are two other disconcerting aspects which affect gender in the International Cooperation model that need to be improved in a final proposal text:

- The focus is on attracting world's top researchers, ensuring access to facilities and markets worldwide, and exerting more influence in shaping global R&I systems, but the challenge of implementing EU global commitments to Human Rights and SDGs does not appear to be at the core.
- Gender should play a role in all of these aspects but the gender equality objectives are not considered as part of STI International Cooperation. This is a missed opportunity because International Cooperation that does not integrate and promote SDG 5 *Gender equality and empowerment of women and girls* will be a failed one. Many other SDGs (education, peace, good health, decent work, no poverty ...) depend on closing gender gaps in society and on the benefits that come from women's potential, capacities and contributions to society.

Recommendations from a Gender Perspective

The International Cooperation model of Horizon Europe needs to be redefined so as to place **Human Rights and Sustainable Development Goals (including SDG 5)** at the core of this cross-cutting issue in addition to optimising benefits from cooperation and EU competitiveness. For instance, access to the **world's best talents needs to incorporate gender equality** policies (including, *inter alia*, provisions in mobility schemes to tackle protection against sexual harassment and other forms of gender-based violence), as a matter of justice and high-quality human resources strategy to ensure the mutual benefit approach. As Horizon Europe will be open to association of **third countries** according to their STI capacity, **Horizon Europe** requirements on gender provisions can be used **as an incentive to ensure real commitment to actively improve gender equality poli-**

CONCLUSION

It is crucial to mainstream gender in the STI International Cooperation model of Horizon Europe to reach the Sustainable Development Goals (including SDG 5). This will help in the advancement of the EU R&I capacities but also in the attainment of political, social, economic and humanitarian commitments.

cies in STI worldwide, including better accountability mechanisms for it.

More support is needed for conducting specific **research on Women and Gender in International Cooperation on STI** to produce knowledge on the specific links between the two priorities and cross-cutting issues, but some further concrete recommendations can be made based on the GENDERACTION checklist mentioned above:

- To declare **gender equality as a value** in international agreements, programmes and calls of Horizon Europe.
- To incorporate **gender balance in research teams** in international agreements, programmes and calls of Horizon Europe.
- To ensure **gender balance in decision-making** in international agreements, programmes and calls of Horizon Europe.
- To require the **integration of sex/gender analysis** where appropriate in international agreements, programmes and calls of Horizon Europe, especially in any calls involving humans.
- To include **gender-friendly clauses in programme announcements**, calls and

guidelines for applicants that encourage women to apply, such as, *inter alia*, caring responsibilities, maternity/paternity leave, pregnancy, etc.

- To **mainstream gender in the process of proposal evaluation** and funding decisions: gender balance and gender expertise in evaluation panels, training in gender equality, appropriate templates to assess the gender dimension, gender as a criterion for scoring, among others.
- To consider gender equality training, gender expert advice, mentoring activities from a gender perspective and family support services as **eligible costs** of Horizon Europe.
- To collect **sex-disaggregated data** of success rates of applicants, Principal Investigators, research workforce and horizontal segregation in research teams.
- To assess the **impact of gender equality measures** as part of the programme evaluation.

Conclusion

Openness to the World should also mean the commitment to shape the world with a view to attaining Women's Human Rights and Sustainable Development Goals through EU International Cooperation in STI.

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GENDER-RESPONSIBLE RULES FOR PARTICIPATION IN HORIZON EUROPE

The European Commission has launched a proposal for the next EU Research & Innovation Programme (2021-2027), “Horizon Europe”. This Briefing Paper is a call to action to properly integrate the principle of gender equality policies in the Rules for Participation in Horizon Europe. The aim is to strengthen gender equality in the ERA community and structures as well as to innovate gender equality policy implementation in the scientific field.

One of the objectives of the new Framework Programme related to the rules for participation has been summarized as “simpler rules”. The aim is to improve the financial and administrative performance of the new programme. This will be achieved by increasing the use of simplified grant forms where appropriate, and continuing with a single set of rules principle. The EC ensures that the Regulation respects fundamental rights and observes the principles recognized in the Charter of Fundamental Rights of the EU. Moreover, the key elements of the proposal evaluation and selection system of the predecessor programme Horizon 2020 with its particular focus on excellence should be maintained. Former article 16 (Gender equality) of the H2020 Regulation has been redrafted as a paragraph in Article 6 on the Implementation and forms of EU funding as follows:

In order to ensure this new article and also the statement made in the preamble of the Proposal regarding the integration of the gender dimension in R&I content and the monitoring through all stages of the research cycle, GENDERACTION makes the following recommendations for Horizon Europe:

- **To develop Temporary Special Measures (positive action) in the Rules for Participation in order to promote women’s participation in Horizon Europe projects, especially gender balance of project leaders.**

* The Interim Evaluation on Gender in H2020 estimated that only 25% of projects were headed by women.

* The Helsinki Group on Gender in R&I (hereafter HG) asked for a procedure to better monitor funded projects in terms of gender balance in research teams.

The Programme shall ensure the effective promotion of gender equality and the gender dimension in research and innovation content. Particular attention shall be paid to ensuring gender balance, subject to the situation in the field of research and innovation concerned, in evaluation panels and in bodies such as expert groups.

article 6.9. Proposal
for a Regulation

- **To design effective work-life balance measures to be applied in Horizon Europe projects in consultation with gender stakeholders.**

* HG asked for additional funding to recruit a cover post or to extend the research period in cases of family/parental leave.

- **To include an obligation for partner institutions to guarantee equal pay in the proposals submitted for funding.**
- **To strengthen the requirements and monitoring of the integration of the gender dimension in the proposals through sex/gender analysis box in applications and gender expertise within the consortium.**

* The Interim Evaluation on Gender in H2020 concluded that there has been a poor integration of the gender dimension in research content.

* HG asked to explicitly require applicants to develop a sex and/or gender analysis and to include a gender expert

in the consortia for those topics explicitly mentioning gender.

- **To include Gender-Responsible Research & Innovation issues among the award criteria (article 25 of the Proposal for a Regulation) so that proposals shall be evaluated on the basis of excellence, including the integration of sex/gender analysis where research concerns humans or has impact on humans, impact, quality and efficiency of the implementation.**

* The Interim Evaluation on Gender in H2020 concluded that evaluation criteria and the way how they are applied need to be reviewed to avoid gender bias in the assessment of researchers' achievement.

* HG recommended that evaluation forms and monitoring guidelines include questions regarding gender in R&I as well as to consider this a precondition of excellence point awards.

- To ensure **gender balance** in the composition of evaluation committees and evaluators (article 26 of the Proposal for a Regulation), inclusion of **gender experts** among evaluators and **gender training** for evaluators to combat gender bias in evaluation.

* The Interim Evaluation on Gender in H2020 concluded that gender expertise is needed in expert groups, evaluation panels and advisory groups in all scientific fields.

* **HG recommended compulsory gender training required for evaluators as well as the inclusion of gender experts among evaluators for topics explicitly mentioning gender.**

Finally, the Proposal aims to maintain the key elements of the proposal evaluation and selection system of the predecessor programme Horizon 2020 with its particular

focus on excellence. It must be recognized that the **integration of gender dimension in R&I is a crucial element of research excellence**, and without it, R&I offer only partial and often completely wrong solutions and answers, as recent studies confirm.

References

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Helsinki Group on Gender in R&I (2017) *Position paper on H2020 interim evaluation and preparation of FP9.*

European Commission (2017) *Interim Evaluation: Gender Equality as a crosscutting issue in Horizon 2020.*

GENDERACTION POSITION PAPER ON GENDER IN HORIZON EUROPE CO-DESIGN 2021-2024 FOR THE 1ST STRATEGIC PLAN

The present GENDERACTION position paper is aimed at highlighting where gender is considered and where it is not and should be raised in **the EC Orientations towards the first Strategic Plan implementing the research and innovation framework programme Horizon Europe** and in the related **online public consultation for Horizon Europe co-design 2021-2024**. Some of the following comments have already been put forward in the **GENDERACTION policy briefs on Horizon Europe**.

Horizon Europe's greatest role in terms of global challenges, SDGs, and EU policy priorities needs to better target gender equality.

Gender equality is included in the EC "Orientations" document as a Sustainable Development Goal (SDG) and a policy priority but it is not considered as a global challenge. However, gender is included as 1 of the 5 cross-cutting factors¹ in the *Supporting R&I policy priorities, specific issues and coordination of relevant activities through Horizon Europe* section, in the same "Orientations" document: **"Inclusion of gender perspectives will enable better quality and higher societal relevance of research and innovation activities."** In the same section, gender is also considered as 1 of 7 *cross-cutting R&I policy priorities and specific issues*:

"Gender equality is a core policy objective for all European Union activities and a crucial factor in the achievement of sustainable development and inclusive economic growth.

Activities will aim at eliminating gender inequalities throughout R&I systems and the gender dimension will be adequately integrated in R&I content across the whole programme. The latter is particularly relevant for global challenges, including in areas such

1 | These cross-cutting factors range from core EU values to legal and operational provisions.

as health care, artificial intelligence and robotics in which there is a growing worldwide recognition that gender differences, in terms of needs, behaviours and attitudes, play an important role in research design/content, and hence determine the societal relevance and quality of research outcomes.”

Recommendations set 1:

Gender inequalities persist despite gender equality being a core fundamental European value. Gender equality is both an end in itself and a cross-cutting issue for other policy priorities, SDGs and global challenges. Therefore, given what is stated in the General Orientations section, GENDERACTION recommends that gender equality should be explicitly acknowledged and addressed in each Cluster’s global challenge as both crucial factor and specific aim. That is, not only focusing on how gender equality factors can help to better solve a particular global challenge, but also on how approaches to such a particular global challenge can accelerate solutions to gender equality challenges in the EU and beyond.

Gender in the five EU policy priorities

The EC “Orientations” document for Horizon Europe identifies five policy priorities²: Protective Europe, Competitive Europe, Sustainable Europe, Fair Europe and Influential Europe. Of these five, only Fair Europe addresses gender but only in Cluster 2 (Culture, creativity and inclusive society)³ while failing to address gender in Cluster 1 (Health) where gender is of utmost importance.

Hence, gender issues are not addressed at all in “Protective Europe”, “Competitive Europe”, “Sustainable Europe” and “Influential Europe” policy priorities.

Recommendations set 2:

1) A Protective Europe needs to consider the impact of gender-based violence as well as women’s and girls’ specific vulnerabilities in migrant and refugee flows in addressing the improvement of the management of EU external borders and maritime security.

2) For a Competitive Europe, the relevance of the gender dimension needs to be highlighted as a key inclusiveness factor for more appealing and creative jobs in Europe and for the development and uptake of new digital technologies, as well as a market-making factor equally addressing the needs of all populations.

2 | These five priorities are consonant to the four ones in which the EU Council new strategic agenda 2019-2024 (adopted on June 20th 2019) focuses on: protecting citizens and freedoms; developing a strong and vibrant economic base; building a climate-neutral, green, fair and social Europe; and promoting European interests and values on the global stage.

3 | “Reversing socio-economic and **gender inequalities** via strategies of inclusion, non-discrimination, social protection and social investment.”

3) For a Fair Europe, it is of utmost importance to also integrate the gender dimension into the health impact of innovative, technological and digital solutions and services as well as into healthy ways of living and working environments with a view to overcoming the negligence of women's health needs in the past.

4) For a Sustainable Europe, the gender dimension needs to be considered when deciding on the use and distribution of resources as well as in the design of communities, cities and rural areas of the future and the necessary technologies for this.

5) For an Influential Europe, both to increase the influence of Europe and to reach the SDGs, gender needs to be mainstreamed in the STI international cooperation model of Horizon Europe. This will advance EU R&I capacities as well as the attainment of political, social, economic and human rights commitments.

Further input on gender in the targeted impacts from Horizon Europe

Pillar 1 Excellent Science:

Gender is NOT mentioned in the "**Relevant activities in Pillar I – Excellent Science**" section of the EC "Orientations" document.

Recommendations set 3:

Work-life balance measures, protection against sexual and sexist harassment, integration of the sex/gender analysis into the R&I content and other provisions to incentivise gender equality policies in hosting institutions need to be harmonised across Pillar 1 funding lines. Particularly, research infrastructures need to mainstream gender in their core activities and governance systems.

Pillar 2 Global Challenges and European Industrial Competitiveness:

Only 4 out of the 6 clusters in Pillar II consider some gender impacts and only partially in the EC "Recommendations" document, but gender should be (better) considered in all of them:

Recommendations set 4:

Health (Cluster 1): Sex and gender aspects are relevant to and hence must be addressed in all the six health-related challenges, not only in "*Staying healthy in a rapidly changing society*". For instance:

In "Living and working in a health-promoting environment", it must be taken into account that differences have been shown in toxicity studies and that the risk factors mentioned are gendered.

In "Tackling diseases and reducing disease burden", specific attention needs to be paid to knowledge gaps pertaining to women's health conditions and diseases that have been historically marginalised. Specifically, research into antimicrobial resistance must look into sex and gender differences in resistance.

In “Ensuring access to innovative, sustainable and high-quality health care in the EU”, studies show that women tend to receive less attention from medical professionals and that their ailments are treated as less serious (e.g., pain).

In “Unlocking the full potential of new tools, technologies and digital solutions for a healthy society”, there is some evidence that healthcare-related solutions relying on big data analysis may be developed based on skewed samples (e.g., almost entirely male data input). New technologies and digital solutions must take care to avoid the biases that exist in current data sets in order not to reproduce existing biases (gender, race).

In “Maintaining an innovative, sustainable and globally competitive health industry”, attention should be paid to avoid the “male default” in the designing and standardisation processes, as well as in their outcomes, in order to ensure inclusive approaches to the specific characteristics, needs and interests of citizens, patients and care providers of all genders.

Recommendations set 5:

Culture, creativity and inclusive society (Cluster 2): Although activities in this cluster are (*inter alia*) specifically expected to *help reverse social, economic, cultural and political inequalities and their causes and promote gender equality*, it is crucial to highlight that women also need to be considered beyond the role of victims of gender inequalities. This means understanding and supporting the important role women play in the social and economic transformations and enhancing democracy.

It is welcomed that the R&I orientations for Cluster 2 are aimed at elucidating *the societal – including political, ethical, cultural, gender and economic – effects of technological advancements and the impact of drivers of change*, explicitly addressing gender in its 3 intervention areas: “*Democracy and governance*”, “*Cultural heritage*” and “*Social and economic transformations*”. In addition:

- The new Horizon Europe broad line on “*advanced strategies and innovative methods for gender equality in all social, economic and cultural domains, and to deal with gender biases and gender-based violence*” needs to ensure regular annual calls with enough funding for an appropriate number of projects. This broad line will have to stimulate crucial R&I for the implementation and design of better EU gender equality policies (addressing both gender-specific and gender-mainstreaming policy approaches), in addition to bringing innovative solutions to attain main targets of UN SDG5. For instance, it will have to bring focus on issues such as:
 - Innovative solutions and instruments to prevent and eradicate all forms of gender-based violence and discrimination against women and girls worldwide, and the role of new technologies in relation to forms and demonstrations of gender-based violence;
 - Advanced strategies and tools to attain global empowerment of women and girls in all spheres of life, including the recognition of care work;
 - Evidence on how to accelerate progress and improve the impact of EU-specific gender equality policies and enforceable legislation, including the identification of barriers, resistances, and best and promising practices in the implementation of gender equality policies in Europe (e.g., for effective gender-training strategies);

- The role of education in preventing and combating all forms of gender discrimination, as well as in promoting non-traditional careers (e.g., women in ICT, men in social work), through innovative pedagogical practices and inclusive educational contents;
 - Evidence on how gender equality accelerates progress across other EU sectoral (development) and horizontal policies (e.g., agriculture, energy, environment), including the identification of gender barriers to progress in these areas, with a view to facilitating better EU gender-mainstreaming policies in the design and implementation of those other EU policies, instruments and activities that have an effect on UN SDGs beyond gender equality;
 - Identification and anticipation of emerging gender gaps and needs related to present or future EU and global transformations, as well as how to better address them, including present and potential synergies among policies and instruments;
 - Interdisciplinary knowledge base on how (intersecting) gender inequalities are produced, maintained and challenged, as well as to develop innovative methods to fight against gender stereotypes, gender biases, and all forms of (horizontal and vertical) gender segregation related to the asymmetrical gendered division of labour, power, care and domestic work, etc.
- Acknowledging that the EC “Orientations” document puts a focus on intersections between gender and other social categories in the “Social and economic transformations” area of intervention, this needs to be considered in all the other Clusters and in the remaining intervention areas within Cluster 2.
 - In “Enhancing democratic governance”, attention should be paid to gendered impacts of polarisation and extremism and contribute to understanding the current backlash against gender equality in the EU in relation to growing nationalism.
 - In “Promoting cultural heritage”, paying attention not only to women’s contributions to creative sectors, but also to the gendered patterns in the cultural production and sectors and how these can be used to either perpetuate or challenge gender inequalities.
 - In “Management of social and economic transformation”, attention needs to be paid to the gendered impacts of the transition to automation and digitalisation as well as the ways various growth models and welfare state regimes contribute to achieving gender equality. Management of mobility and migration must address the ways in which migration drivers are gendered and effect the social fabric in countries of origin and target countries.

Recommendations set 6:

Civil security for society (Cluster 3): It is welcomed that the EC “Orientations” document mentions the need to take into account the gender dimension as *part of R&I relating to the human and societal context of security and of disaster resilience and response*. However, it fails to mention gender when referring to security, vulnerability, etc., as impacts of a Protective Europe. It must be noted that the **European Parliament legislative resolution of 17 April 2019 on the Specific Programme implementing Horizon Europe** mentioned the crimes based on gender, sexual orientation or racial discrimination in cluster 3, which must be included among the targeted impacts

of security in public spaces and cybersecurity. Finally, women's and girls' specific vulnerabilities in migrant and refugee flows must be considered when addressing the improvement of the management of EU external borders and maritime security.

Recommendations set 7:

Digital, industry and space (Cluster 4) only refers to gender in 1 of its 3 EU policy objectives, particularly in the one devoted to **a major contribution to inclusiveness**, where gender and other diversity issues are expected to be reflected where appropriate regarding the involvement and empowerment of *workers, consumers and firms to make sure that they have access to, and take up, these technologies*. However, it is also important to consider that digitalisation will affect women and men differently and hence gender aspects must be addressed. Equally, artificial intelligence and robotics, big data and machine learning have been shown to reproduce gender biases and gender aspects must be considered. Lastly, the different needs of women and men groups also need to be reflected in the processes of involving target groups for developing other technologies.

Recommendations set 8:

Climate, energy and mobility (Cluster 5): this cluster fails to mention gender aspects although, clearly, consideration must be given to the gendered aspects of climate change drivers, impacts, mitigation solutions and adaptation patterns; the difference between women's and men's energy needs, choices and consumption patterns when designing energy plans; the complexities of women's and men's needs regarding mobility and transport solutions for communities and cities.

Recommendations set 9:

Food, bioeconomy, natural resources, agriculture and environment (Cluster 6): this cluster also fails to mention gender aspects. Explicit attention must be paid to the empowerment of women in agriculture as well as the different conditions women and men are facing in rural areas and the impact of evolving gender roles on activities in the primary sector. Consideration must be given to the nutrition status of women and men when developing sustainable and healthy diets and sex/gender analysis must be performed on the effects of pesticides, antibiotics and antimicrobial resistance.

Recommendations set 10:

Widening Participation and Strengthening the ERA:

The part on *Widening Participation* within the EC "Orientations" document fails to consider gender among its relevant activities, but GENDERACTION policy brief No.11

argues that in implementing Horizon Europe the Commission should adopt concrete measures to incentivise the widening countries to develop gender equality policies in order to bridge the continued significant gap.

Gender equality and other forms of diversity are considered as R&I priorities in the expected impacts of the *Strengthening the ERA* part, which will also improve *international cooperation, ethics and integrity, and scientific input to other EU policies*, but it is vital to improve the funding and provisions for structural change projects aimed at implementing gender equality plans in Research Performing Organisations, to achieve sustainable progress.

Thus, in implementing Horizon Europe, the Commission should adopt concrete measures to incentivise the Widening countries to develop gender equality measures, for example through a dedicated gender-related call for proposals or by topping up Widening project budgets for targeted gender equality measures to be implemented within the project.

Missions areas and partnerships

Missions are one of the main novelties of Horizon Europe, high-ambition, high-profile initiatives that should provide concrete solutions to challenges that European citizens and society are facing. Missions are intended to achieve a measurable goal within a set timeframe, with impact for science and technology and/or society and citizens that could not be achieved through individual actions.

Recommendations set 11:

To achieve appropriate impact for science, society and citizens, the gender dimension has to be explicitly included in each mission area text. A future mission area on gender equality will be crucial for the second period of Horizon Europe to integrate R&I activities of different parts of the Framework Programme addressing SDG 5. Similarly, as social transformations and inequalities have been identified as an area for future partnerships, gender transformations and inequalities will require specific attention within this partnership area.

Pillar 3 Innovative Europe:

Gender is NOT mentioned in the **“Relevant activities in Pillar III – Innovative Europe”** section of the EC “Orientations” document.

Recommendations set 12:

Involving more women and sex/gender analysis methods in the process of innovation will facilitate more competitive products that do not take the male consumer as a default model. For further information, see the policy brief on Gender and Innovation recently launched by the Standing Working Group on Gender in Research and Innovation.

GENDERACTION POSITION PAPER ON GENDER FOR THE IMPLEMENTATION STRATEGY OF HORIZON EUROPE

The present GENDERACTION position paper on gender for the Implementation Strategy of Horizon Europe is aimed at highlighting gender provisions to be considered in the EC **Orientations towards the Implementation Strategy of the research and innovation framework programme Horizon Europe web open consultation** and in the related **online public consultation for Horizon Europe Co-design - Implementation**, which will close on 4 October 2019. Some of the following comments have already been put forward in the **GENDERACTION policy briefs on Horizon Europe**.

Our vision of the future European Research and Innovation (R&I) is a gender inclusive system able to address the needs and concerns of both women and men and to provide innovative solutions that ensure dignity, sustainability and security for citizens of all genders in the EU and beyond. A sustainable transition to a green planet and a digital world cannot be achieved if women's interests and needs are neglected or remain invisible. To boost the excellent R&I that Europe needs for ensuring the prosperity of the planet and improving people's quality of life, Horizon Europe must guarantee that the gender dimension is adequately integrated into the content of all the stages of the performing and funding cycles for R&I actions (including missions and partnerships), and therefore into all phases of the implementation strategy.

In contrast to this, however, the EC "Orientations" document towards the Implementation Strategy of Horizon Europe hardly mentions gender at all. It appears only briefly in the sections on "Model Grant Agreement" and "Reporting and data". Following the main sections of this Horizon Europe co-design survey and its orientations document, as well as prior input on gender issues from the Interim Evaluation of Gender Equality as a crosscutting issue in Horizon 2020 and from the Helsinki Group Position Paper on H2020 interim evaluation and preparation of FP9, GENDERACTION recommendations for the Implementation Strategy of Horizon Europe are as follows:

1. Work Programme design

The design of a Work Programme at the level of an implementation strategy does not have to detail concrete call topics but it must define how to translate the gender priority as a cross-cutting factor into calls and topics to ensure it is properly integrated. The integration of the gender dimension in R&I content is a crucial element of research excellence and impact, and without it, R&I will bring partial and often wrong solutions and answers. The gender dimension is always applicable when projects deal with human beings either as direct participants or as indirect end-users. Consequently, as a rule of thumb, there is no excellent R&I without considering the gender dimension in its content. However, the interim evaluation of gender in H2020 concluded that the integration of the gender dimension in research content had been poor. It also pointed out that the wording of topics was often vague, without explicitly mentioning gender, and applicants often confused the gender dimension in R&I content with gender balance in R&I teams.

Recommendations set 1:

- To ensure that gender-biased projects are not funded, **all topics should be, by default, considered as gender-relevant.** Work programmes should include a clear indication of the relevance of the gender dimension for the call topic and how to interpret it for the three award criteria (“excellence”, “impact” and “quality and efficiency of the implementation”), with examples of concrete gender-related issues to consider (or appropriate reasons for the exceptional cases when the gender dimension is not relevant).
- Consequently, the calls, as a rule of thumb, must explicitly require appropriate integration of the gender dimension across the R&I cycle described in the project proposal, as well as gender expertise in the consortia (e.g., skilled partners or planned gender training) or an appropriate explanation in the event applicants do not consider gender relevant for the specific proposal.
- Gender awareness-raising and capacity building on gender in R&I content for specific fields needs to be ensured for key actors of the Work Programme design process by means of mandatory training on the gender dimension in R&I content for Programme officers, Call coordinators, Mission Boards, EIC Advisory Board, NCPs, topic writers and coordinators of the Advisory Groups. Additionally, supporting materials (including check-lists) on gender in R&I content specifically tailored for these target groups should be disseminated, also to members of the programme committees and applicants.
- Lastly, the participation of gender experts and gender equality stakeholders must be ensured in the design of work programmes for a proper integration of gender.

2. Submission and Evaluation

Some areas for improvement of the current submission and evaluation process in Horizon 2020 to better integrate the gender dimension have been identified, especially regarding the gender expertise of evaluators and moderators as well as the need to require explicit considerations on the gender dimension in the Evaluation Summary Reports (ESRs). Specifically, the interim evaluation of gender in H2020 found *quite a high degree of inconsistency at the time of evaluating the gender dimension in the ESRs* and concluded that *it should not be*

assumed that having more women in panels or expert groups will lead to a more equal and fair selection and/or more gender-sensitive science, therefore suggesting gender expertise as a criterion for group or panel composition. The report also highlighted as a main shortcoming that too few projects really implement a thorough gender and sex analysis, truly developing a gender perspective in research content and project design. And, in fact, according to *She Figures 2018* data, the percentage of EU-28 publications 2013-2017 with a gender dimension in the research content is below 2%, with a too slow increase of 0.05% per year.

Recommendations set 2:

- Proposals on topics that concern humans or have impact on humans should be required to include a specific deliverable in which the consortium will describe how the gender dimension has been integrated into the funded project across all its stages (including missions and partnerships) and what are the main results and outcomes from a gender perspective.
- The evaluation forms and ESRs need to include specific sections for the evaluation of Gender-Responsible R&I issues in the three award criteria for R&I proposals that concern humans or have impact on humans, so that the appropriate integration of sex/gender analysis can be considered a key factor for the *excellence* and *impact* criteria, while the consortium gender expertise can be taken into account for the *quality and efficiency of the implementation* criterion. Moreover, by default, those proposals that do not integrate sex/gender analysis in a gender relevant call topic should fail to receive the threshold point awards in the *excellence* criterion.
- These gender provisions need to be clearly integrated in the evaluation guidelines and briefings, as well as in the self-evaluation forms and grants manual for applicants. Moderators, rapporteurs and panel chairs in the evaluation process must be held accountable for providing appropriate briefing on the gender dimension in R&I content.
- To ensure gender expertise in the evaluation process, a mandatory training on gender in R&I content should be required for key actors of the evaluation process: external experts (including those in Phases 1 and 2), moderators and panel reviewers of gender relevant call topics, and at least one gender expert should be included in these panels.

Additionally, the interim evaluation of gender in H2020 estimated that only 25% of funded projects were headed by women. The interim evaluation of H2020 did not provide a monitoring indicator on how often the gender balance in the consortium was applied as a ranking factor for *ex-æquo* proposals but as it was not among the first ranking factors to be applied, and therefore low impact is expected.

Recommendations set 3:

- Gender training, briefing and information materials on how to combat implicit gender bias in the assessment of applicants' merits should be required for key actors in the evaluation processes. Gender balance should be ensured in the composition of the evaluation groups and panels.

- The rules for dealing with *ex-æquo* proposals need to go beyond the gender balance in the consortium to develop more disruptive gender ranking factors, such as gender balance of WP leaders in the project proposal or the proportion of partner institutions that have ongoing gender equality plans (or the proportion of those which have obtained a gender equality accreditation award). Moreover, in the innovation sector where women are severely under-represented, a ranking factor for women project coordinators could be considered, too. These need to be among the first gender ranking factors to be applied.
- In the proposals submitted for funding, partner institutions should be required to guarantee equal pay, as well as clear guidelines and structures in place to address sexual and gender harassment and other forms of Gender-Based Violence (GBV). Without these requirements, institutions should not be able to apply for funding.

3. Model Grant Agreement (MGA)

According to the EC "Orientations" document, the MGA for Horizon Europe *will cater for the programme specific needs/objectives* which include **gender**, among others, in continuity with H2020. GENDERACTION emphasises that improved provisions for gender obligations and incentives need to be clearly specified for the beneficiary institutions as well as for project officers and reviewers.

Recommendations set 4:

- Improved provisions for gender equality in the working conditions at beneficiary institutions should be made, including those to improve work-life balance and to guarantee gender equal pay as well as those to prevent and properly address any form of gender discrimination and gender-based violence (GBV). But beyond requiring some minimum gender standards like these in the working conditions of the beneficiary institutions and research teams, additional funding for supporting the implementation of Gender Equality Plans and the development of professional gender equality structures in beneficiary institutions, as well as gender expert advice, mentoring activities from a gender perspective and family support services needs to be considered as an incentive.
- Particularly, the present concept of "family" in the H2020 MGA should be extended beyond those linked to the researcher by marriage or equivalent status relationship and dependent children actually being maintained by the researcher, to also include dependent elderly parents. Family allowance costs are considered in MSCA and should be extended to other types of grants.
- MSCA grants are supposed to cover all the costs for the recruitment of researchers, including the contribution to the social security made by the hiring institution. Nevertheless, this only applies when the researcher is actually working. If he or she is on a leave, the social security would pay her/him the salary, but the hiring institution still needs pay its contribution to social security. If a leave is longer than 1 month, the action (MSCA) must be suspended, and this contribution is not covered by MSCA but by the hiring institution.

- Maternity leave is most likely to be the most common example of a long leave (more than a month) during MSCA, so institutions, in order to avoid those “extra costs” during maternity leave tend to prefer hiring men over women.
- During FP7, there was additional funding and the institution that incurred this extra cost could afterwards ask the European Commission for reimbursement, but this changed with H2020. Therefore, it is recommended that Horizon Europe should find a way to reimburse these extra costs to the beneficiary institutions so that this negative gender impact can be avoided.
- Additional funding should be provided to beneficiary institutions in case of family/parental leave, to be able to recruit a cover post or to extend the research period, in collaborative projects. Care facilities and politics of time in beneficiary institutions and grant activities need to be incentivised and supported (at least, additional funding to provide caring costs linked to project mobility, including those for attending project meetings and relevant conferences). Other improved work-life balance measures could be applied to Horizon Europe grants in consultation with other gender stakeholders.
- Moreover, Article 33 “Gender Equality” of the H2020 MGA needs to be improved not only to refer to the promotion of “effective gender equality” (which is a more inclusive wording) instead of “equal opportunities between women and men”, but also to go beyond the aim of “gender balance at all levels of personnel” and its related measures to promote gender equality in the recruitment, promotion and working conditions, to also include the aim of an appropriate integration of the gender dimension into the R&I content, with clear descriptions of the related measures that can be taken by the beneficiary institutions to achieve this. All projects must provide information on the actions taken and results concerning gender balance (including decision-making positions) and equal working conditions (equal pay *inter alia*) in their research teams, as well as the integration of the gender dimension into R&I content, all of this at grant agreement, reviewing and reporting stages. The description of work in the Annex to the MGA should by default require that a clear explanation be included on how the gender dimension is integrated into the content of all the work packages. In areas using the portfolio approach during grant preparation, successful applicants might have to adapt the project content to ensure consistency in the integration of gender issues. Any of the measures described in Chapter 6 of the H2020 Annotated MGA can be applied in case of beneficiaries’ non-compliance.
- These gender provisions need to be integrated in review and reporting templates, as well as in specific guidelines for project officers and reviewers, with special focus on how to appropriately implement the integration of the gender dimension into R&I content. Gender trainings must be mandatory for project officers and reviewers, who must be held accountable for providing appropriate briefing on gender equality concerning both the management of the project human resources and the integration of the gender dimension into the R&I project content. Gender capacity building measures for beneficiaries, especially those on gender in research content need to go beyond eligible costs, to become clearly encouraged and incentivised by means of additional funding and acknowledgment in the reviewing and reporting stages.

4. Dissemination and Exploitation (D&E)

The EC "Orientations" document points out the concern that *D&E activities at project level are less successful comparing to other goals of the projects, and do not yet get the necessary attention by the beneficiaries*. GENDERACTION's concern on this issue highlights the need to ensure gender equality and the integration of the gender dimension in the content of the D&E activities in funded projects. This will also help to maximise the impact and exploit the full potential of R&I outcomes for sustainable policymaking.

Recommendations set 5:

- Gender as a cross-cutting issue must be integrated in the Horizon Europe guidance, collection of best practices and further support resources for D&E activities.
- Particularly, project D&E outputs need to ensure gender-inclusive language and images, as well as specific attention to women's and men's (potential) different characteristics, interests, roles, etc., revealed by the project results and which are or should be taken into account in its applications. Gender stakeholders in the field as well as women from diverse groups related to the project applications sectors should be considered as participants and targets of the D&E activities.
- Additionally, gender balance must be a requirement for keynote speakers, organisational/scientific committees, etc., in D&E activities; for instance, Horizon Europe must not fund "manels" (that is, only men panels).
- The gender considerations for D&E must be integrated in the project grant agreement, review and reporting stages, where beneficiaries must be accountable for the measures taken and results achieved concerning this goal.
- Specific guidelines on gender in D&E activities need to be developed for both beneficiaries and EC personnel responsible to provide supporting resources for D&E activities and to review them. Training activities on these matters should be mandatory for those EC personnel, and incentivised for beneficiaries by means of additional financial support.

5. Data and Reporting

The interim evaluation of gender in H2020 found *monitoring problems due to poorly measured indicators* and one of its general recommendations was *improving monitoring and data collection*, including *the development of more relevant indicators for monitoring the implementation of gender equality*. The EC "Orientations" document section on data and reporting only refers to gender balance in participation, but not to the integration of gender into R&I content. The Helsinki Group Position paper on H2020 interim evaluation and preparation of FP9 argued that in the next framework programme, *there should be monitoring of all gender-related actions and measures used in the FP* and identified several areas for improvement concerning the monitoring of the framework programme, including inter alia the research workforce by categories of researchers and the integration of sex/gender analysis into R&I content. Concerning the latter, the GENDER-NET Plus ERANET Cofund has recently adopted several monitoring indicators to follow-up the integration of the gender dimension in the content of co-funded projects, such as "*Gender experts in the research team (no./% w/m/other)*", or "*The project brings out differences/inequalities between women and men in the field (if any and/or shows there are none)*", inter alia.

Recommendations set 6:

- The appropriate integration of sex/gender analysis across the different stages of the R&I project needs to be monitored by default from grant agreement to mid-term/final project reporting, including key performance indicators.
- The **Horizon Dashboard** should allow to search for gender-specific projects and for those which have effectively integrated the gender dimension into R&I content. Same for the European Innovation Council dashboard.

Recommendations set 7:

- A more detailed system to monitor gender balance in the (research) workforce funded by Horizon Europe, disaggregated by each part of the Framework Programme, particularly highlighting:
 - The different categories of researchers (Scientific Coordinators, WP leaders, Researchers, Postdocs and PhDs).
 - Gender balance in research teams (at proposal, grant agreement and reporting stages).
 - Distinction between scientific and administrative coordinators.
- Additionally, a more detailed system to monitor gender balance in Evaluation Panels by field of research:
 - Specific attention to fields where women are severely under-represented (at less than 25%), where a comparison should be provided by field to show both the proportion of women in the EMM database pool and the proportion of women selected to participate in the evaluation panels.
 - Number and proportion of evaluation panels that fulfil the gender balance criterion, disaggregated also by the different parts of the Framework Programme.
- In the proposal, grant agreement and report templates, non-binary categories of sex/gender should be considered, such as:
 - Sex at birth: woman, man, intersex
 - Gender: woman, man, gender diverse (or non-binary or other).
- The **Horizon Dashboard** should allow disaggregating all data by sex/gender of coordinators/leaders/participants where feasible, and include gender indicators on the success rate of applicants by each part of the Framework Programme. Same for the European Innovation Council dashboard.
- Additional indicators should be included on the number and proportion of *ex-æquo* proposals that have been prioritised in the evaluation process on the basis of the gender ranking factor/s.

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GENDER IN OPEN SCIENCE & OPEN INNOVATION

GENDERACTION will soon release a full report on “*Strategic advice for enhancing the gender dimension of Open Science and Innovation Policy*” which reveals that most analyses and policy documents related to Open Science (OS) and/or Open Innovation (OI) adopt a gender blind approach, especially in the case of OS. The present Briefing Paper aims to highlight key gender issues for Open Science and Open Innovation and a set of recommendations that the full report has laid out. This will lead to a better promotion of gender equality in the ERA community and to innovation of policy design and implementation.

The OPEN discourse and agenda

The ideas related to Open Science and Open Innovation (hereafter OS&OI) have acquired great global relevance in the last years. These ideas are related to a more general openness discourse in society including Free Software/Open Source, open access and open society. The Open movement argues to have a potential not only to enhance efficiency and effectiveness of value production but also to make social processes more democratic, foster diversity, promote civil society engagement and hence contributions from vulnerable groups. Since the Open movement deals with a vision for and role of research and innovation in society, gender issues need to constitute a matter of concern and a field of action.

The OPEN discourse has reached the EU agenda. When the Commission set in 2012 five ERA priorities, the “optimal circulation,

access to and transfer of scientific knowledge” was among them. Consequently, in 2015 Commissioner Moedas launched the challenging concept of **3Os: Open Science, Open Innovation and Open to the World**. In 2016, the Council of the EU approved its **Conclusions on The transition towards an Open Science system**, and the Commission drafted the European Open Science agenda around the following lines: 1) fostering and creating incentives for OS; 2) removing barriers for OS; 3) mainstreaming and further promoting open access policies; 4) developing research infrastructures for OS; 5) embedding OS in society as a socio-economic driver.

Disconnected goals in the ERA

Both gender and openness are included among the 6 priorities of the ERA Roadmap 2015-2020 adopted by the EU Council in 2015. Particularly: 4th *Gender equality and*

Existing policy documents and studies on OS&OI, including those by the EC, reveals zero attention to gender equality.

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gender mainstreaming in research, and 5th Optimal circulation and transfer of scientific knowledge. The ERA roadmap also highlights that the **gender priority has clear transversal links to all other ERA priorities.**

Additionally, *Open access and Data management* as well as *Gender* are cross-cutting issues in Horizon 2020, and also key elements of Responsible Research and Innovation (RRI). In fact, this approach could be considered an antecedent of the OS&OI movement since RRI is aimed at re-configuring the scientific process along the notions of responsibility, public participation and democratization of science.

However, one of the main findings of the upcoming GENDERACTION Report on "*Strategic advice for enhancing the gender dimension of Open Science and Innovation Policy*" (hereafter, GENDERACTION OS&OI Report) is that most analysis and policy documents related to OS&OI adopt a gender blind approach. In other words, gender equality and OS&OI have been treated so far as independent and unrelated topics, including the ERA Progress reports and Horizon 2020. The same gender-blind approach has been found in the scientific literature related to OS&OI as well as in the national ERA roadmaps analysed by GENDERACTION.

This means that important goals of the ERA remain in fact disconnected and thus European research cannot benefit from positive synergies between the two priorities.

Gender implications of OPEN Science

The term **Open Science (OS)** entails ongoing transitions in the way research is performed, researchers collaborate, knowledge is shared and science is organized. OS is based on cooperative work and new ways of knowledge dissemination through digital technologies and new collaborative tools. It increases the number and diversity of stakeholders involved, such as researchers, policy makers, Research Funding and Research Performing Organisations (RFOs, RPOs), citizen scientists, enterprises, and publishers. OS is an umbrella term capturing a variety of practices, such as:

- **Open Access (OA) to Publications and Research Data:** that is, providing online access to scientific information (such as peer-reviewed scientific research articles published in scholarly journals, research data and preprints), free of charge to the end-user as well as reusable. It is aimed at generating greater efficiency, faster progress and improved transparency of the scientific process. The **gender impact of OA policies** needs to be analysed, but, due to the existing disconnection between gender and openness priorities, there is a lack sex-disaggregated data on OA practices by women and men. In addition, **OA to research data deserves a particular focus on how gender-blind vs. gender-sensitive scientific methods are related to data quality and reproducibility.** For instance, data quality and reproducibility are negatively affected by gender biases and prejudices (such as unquestioned male default models, gender stereotypes, etc.) underlying the

techniques and tools that were used to collect such data. On the contrary, sex/gender analysis methods enhance data quality and reproducibility because they allow to properly identify sex/gender differences as well as to avoid over-generalization of results. OA to research data is crucial to facilitate a gender-sensitive **data reuse**, when original studies produced (good) sex/gender disaggregated data but did not (properly) report on results by sex/gender.

- **Open Peer Review (OPR):** an umbrella term as well, OPR refers to open identities in the review process, open reports, open participation, open pre-review manuscripts as well as final version commenting, and open platforms. It has been mainly used in **manuscript peer review**, rather than **grant peer review**. OPR is aimed at facilitating transparency, accountability and quality of scientific evaluations, but opponents claim that it may lead to less critical and rigorous comments. Besides the lack of consensus on OPR, it is clear that both traditional and OPR evaluation practices need to be reconsidered in order to avoid the under-representation of women among peer-reviewers, as well as (unconscious) gender biases (in peer-reviewers and peer-review procedures) that result in greater success rates for men compared to women and in extremely low percentages of publications with a gender dimension.
- **Rewards and Skills:** The current system of scientific rewards and skills that privileges the impact factor of publications and emphasises the individual effort has not adequately rewarded women's and men's contribution to (open) science. The OS career assessment proposes a variety of criteria such as publishing in OA journals, using FAIR data principles

If research claiming sex/gender differences fail the reproducibility test at a later stage, the techniques, tools and conclusions of such research should be questioned.

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OS&OI Report

and open data as well as full recognition of the contribution of others (collaborators, co-authors, citizens...). It seems that a multi-dimensional approach might better avoid indirect gender discrimination in the allocation of rewards to OS practices but research on the gender impact of different OS incentive policies is needed to inform the OS policy-making.

- **Altmetrics and New Generation Metrics:** Research evaluation has increasingly relied on (quantitative) metrics, particularly on citation rates. Concerns have been raised in relation to, *inter alia*: the lack of attention to qualitative aspects of the research career and contributions that cannot be measured, the impact on researchers' choice on publication venues, and the increasing pressures for evaluating public spending on research according to this model. The social impact of research and the views of other stakeholders in addition to scholars are considered to be part of this new research evaluation model which requires an open, transparent and linked data infrastructure. The next generation metrics group of the Open Science Policy Platform (OSPP) points to the need to

assess the benefits and consequences of the introduction of new metrics on the evaluation criteria. This recommendation should be expanded to incorporate the impact of new metrics on gender equality, given the existing findings related to gender bias in evaluation and citations practices

OPEN Gendered Innovations

For the EC, Open Innovation (OI) means the opening up of the innovation process to all active players allowing knowledge to circulate more freely and be transformed into products and services. Firms increasingly rely on external sources for the development or modification of their products and services (called inbound openness). The **user-centric model** gives more relevance to external sources of knowledge and innovation in addition to the manufacturer's perspective. According to this approach, new products and services are co-developed by suppliers and consumers, university, government, private laboratories, competitors and other nations. The EC has embraced Open Innovation 2.0, highlighting the central role of users in value creation and as target of innovation.

Yet, despite the role played by women as users and consumers, they still remain dramatically under-represented in the design of products and services. There is also a gender imbalance in innovation outputs, especially in patent applications for inventions, among the inventors community. **Gender diversity** of contributors needs to be considered **in the co-creation process**. For instance, women's participation in the Open Innovation practice "**citizen science**" (including all the areas and leadership roles) will help to promote women's empowerment (UN SDG5) and women's interests and needs in the policy agenda. At the same time, gender diversity has a positive impact on innovation

Involving more women in the process of innovation could result in more competitive products as well as in products that do not conform to a single stereotype of the male consumer.

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in manufacturing and service firms, and it is associated also with wider economic benefits and the development of a country's national system of innovation.

Besides gender diversity, the Gendered Innovations project has played a key role by presenting an extensive number of case studies and **sex/gender analysis methods** which show how these methods lead to innovation and excellence in research. The Helsinki Group on Gender in Research and Innovation stressed, in its position paper on the European Innovation Council (EIC), the vital need for integrating the gender dimension in technological design and innovation as well as to ensure that funded innovation is not gender-blind to include the needs and interests of women, too.

Recommendations for OS&OI from a gender perspective

The following sets of recommendations refer to different stakeholders, mainly the European Commission (EC), EU Council, member states (MS), RFOs, RPOs, innovative firms as well as researchers.

1st Priority for Action - Gender mainstreaming and policy synergies between

the gender equality and OS&OI agendas in European policy-making [EC, EU Council, MS]:

- To address Priority 4 of the ERA on gender equality as a self-standing issue while mainstreaming gender to other priority areas.
- To invite gender experts to relevant OS&OI expert and advisory groups.

2nd Priority for Action - Advancing **knowledge and awareness of gender issues in OS&OI:**

- To conduct studies on gender issues in OS&OI, such as open peer review, *alt-metrics*, open software and open innovation.
- To include in the *She Figures* sex-disaggregated data on the adoption of open access practices.
- To collect sex-disaggregated data on inventorship by country, sector and field.

3rd Priority for Action - **Evaluation and assessment practices in RFOs and RPOs:**

- To explore to what extent the use of new metrics impacts men and women researchers at different career stages and disciplines differently. [EC, Open Science Policy Platform]

A study of open source software repository GitHub showed that women software developers see their contributions of code accepted more frequently than men but only if they hide their sex.

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Diversity overall and gender diversity specifically contribute to identifying innovative solutions.

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OS&OI Report

- To adopt multi-dimensional evaluation criteria that enhance openness and transparency, including research outputs with a gender dimension. [RPOs, RFOs]
- To ensure that open innovation funded projects integrate sex/gender analysis where appropriate and that the teams respect gender diversity. [EC, MS, innovation funding agencies]
- To examine the adoption of open access practices by men and women to identify potential gender differences. [RFOs, RPOs]

4th Priority for Action - **Publication practices of researchers and RPOs:**

- To encourage the sharing of preprints presenting the results of research on gender and research that integrates gender as a cross-cutting issue. [RPOs]
- To adopt the FAIR management of sex and gender data. [Researchers]

5th Priority for Action - **Innovative processes and firms [stakeholders engaged in setting up participatory innovation projects]:**

- To develop participatory innovation projects that guarantee gender diversity
- To ensure the integration of sex/gender

analysis in order to avoid gender bias and allow all segments of population benefit from innovation processes.

Conclusions

The analysis conducted by GENDERACTION and the resulting OS&OI Report constitutes a first exploration of the inter-linkages between gender and OS&OI and aims to contribute to increased synergies between these two ERA policy priorities. GENDERACTION strongly believes that mutually beneficial synergies can be created from the inclusion of women and gender in every dimension of the OS&OI ecosystem and the OPEN European society in which these goals are framed.

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STRENGTHENING GENDER IN THE ERA

The European Commission has launched a proposal for the next EU Research & Innovation Programme (2021-2027), “Horizon Europe”. This Briefing Paper is a call to action to redefine the proposed model of International Cooperation in Science, Technology and Innovation, known as Openness to the World, in light of the Women’s Human Rights principles and UN Sustainable Development Goals. Given that both Gender and International Cooperation are ERA priorities, the European Commission is responsible for taking the lead on mainstreaming gender in international cooperation in STI. Key provisions for it should be specified in Horizon Europe.

The European Commission has launched a proposal for the next EU Research & Innovation Programme (2021-2027), “Horizon Europe”. This Briefing Paper is a call to action to properly integrate gender equality policies in the “*Strengthening the ERA*” part of the Proposal. The aim is to strengthen gender equality in the ERA community and structures as well as to innovate gender equality policy implementation in the scientific field.

What the EC wants to strengthen through Horizon Europe?

The Horizon Europe “*Strengthening the ERA*” part underpins the three pillar structure by focusing on supporting the 6 ERA priorities (including gender), as an aim in and of itself and as a **way to optimise the Programme’s delivery for increased impact**.

This is planned to be done through two Areas of Intervention:

- **Sharing excellence** (related to the H2020 Spreading Excellence & Widen-

ing Participation) **to fully exploit the potential in less R&I performing countries** through four broad lines (Teaming, Twinning, ERA-chairs and COST).

- **Reforming and enhancing the European R&I System** (related to H2020 Science with and for Society - SwafS), through 11 broad lines, including one on **Supporting gender equality in scientific careers and in decision making, as well as the integration of the gender dimension in research and innovation content**. Gender is also mentioned in the broad line on **attractive career environments, skills and competences** which links the ERA and the European Higher Education Area to modernise universities and other R&I organisations through recognition reward mechanisms and incentives to promote trans-disciplinarity, entrepreneurship, citizen engagement, open science, inter-sectoral and international mobility, **gender equality plans and comprehensive approaches to institutional changes**. Other broad lines, *inter alia*, include: monitoring and

The goal is for an EU where knowledge and a highly skilled workforce circulate freely, research outputs are shared rapidly and efficiently, researchers benefit from attractive careers and gender equality is ensured, where Member States develop common strategic research agendas, aligning national plans, defining and implementing joint programmes, and where the outcomes of research and innovation are understood and trusted by informed citizens and benefit society as a whole.

EC, 2018

evaluating the Framework Programme and disseminating and exploiting results; strengthening the evidence base for R&I policy; supporting enhanced international cooperation (see Policy Brief no.6); as well as other key issues for Responsible R&I (RRI) such as **ethics and integrity as well as citizen science**.

This is the only part of the Horizon Europe proposal that explicitly claims to contribute directly to UN SDG5 Gender Equality.

What is missing and should be strengthened?

The “*Strengthening the ERA*” part is crucial for both the ERA roadmap and the impact of Horizon Europe. However, if we consider the budget as an indicator, the EC has stated that **“the largest share of resources**

is needed for Global Challenges and Industrial Competitiveness pillar, followed by Open Science and Open Innovation, whereas Strengthening the ERA entails only limited budget”. The SwafS community has pointed out that Horizon Europe envisages neither a specific program line nor a sufficient budget dedicated to SwafS activities despite their key role in ensuring smooth transition to more open and inclusive research endeavours (SiS.net, 2018). Actually, although the **Horizon Europe intervention area on reforming and enhancing the EU R&I system includes broader lines than H2020 SwafS, its planned budget is even smaller**. The concern is that without sufficient visibility and funding for specific research and support actions, the goals will be hardly achieved. And to illustrate how can this affect the gender equality priority, it must be noted that H2020 SwafS has been the privileged space to develop gender equality plans, to increasingly put in place gender equality structures within Research Performing/ Funding Organisations (RPOs/RFOs) and also to promote gender-friendly organizational cultures. The call for promoting Gender Equality in R&I (GERI) has been well received by the scientific community in light of the large number of proposals submitted since 2014 and has made possible to translate EU gender equality provisions into concrete measures within RPOs and RFOs.

The cooperation between more and less experienced RPOs and RFOs from different countries, with diverse organizational cultures, and all the projects funded have contributed also to create a supporting community for gender equality in the scientific field. This success of H2020 needs continuing activities and funding to become sustainable gender equality policies. Otherwise, the job will be left only half done after spending public resources, making efforts to breaking barriers and overcoming initial resistances. The Helsinki Group on Gender

Horizon 2020 projects on gender and science (and also those on RRI) have contributed to shape our RPOs and RFOs as well as to generate a supporting community for gender equality in the scientific field.

All the joint efforts made under these projects have become a reference model for other global regions in the promotion of gender equality policies in R&I.



GenderTime
GENOVATE
LIBRA
GenPORT
OpenUP
TRIGGER
GEDII
Hypatia
PRISMA
PLOTINA
EFFORTI
RRI
GENDER-NET Plus
HEIRRI
GENDERACTION
GEECCO
TARGET
GENERA
FoTRRIS
EGERA

in R&I (2017) has highlighted the need to **keep and reinforce the funding line for more effective, harmonized and extended gender equality plans** for institutional change in RPOs and RFOs across EU.

Recommendations on gender equality policies

While Horizon Europe pillars are the privileged space to integrate sex/gender analysis into R&I content, "*Strengthening the ERA*" is crucial to spread EU gender equality policies in R&I as well as to address a key issue to attain gender equality in science research: the organizational culture of research institutions. The Council of the EU (2015) invited the Commission to continue promoting institutional change as well as the implementation, monitoring

and evaluation of all gender equality objectives in H2020 (gender balance in research teams and decision-making, and gender dimension in research content). To do so, "*Strengthening the ERA*" in Horizon Europe must include:

- **Better gender statistics** and qualitative studies from a gender perspective for the monitoring and evaluation of the Framework Programme.
- Dissemination and exploitation of results taking into account **gender inclusive language and image**, as well as women's and men's (potential) different interests, roles and activities.
- Modernising more European universities and other R&I organizations through **innovative gender equality policies** and more effective tools developed by projects on women and science.



Challenges in Strengthening the ERA Centres of excellence of the future

Horizontal structures
Collaborative leadership

Gender balance in
decision-making

Staff participation in design,
implementation and
evaluation of R&I policies

Zero sexual harassment
and sexist behaviour

Non-discrimination based on gender,
race, social class, ability...

Care facilities and politics of time

Reasonable mobility

Professional gender equality structures
and policies

Diversity of career paths:
career break opportunities



- Supporting enhanced international cooperation including gender and **targeting SDG5** (see Policy Brief no. 6 for specific recommendations).
- Science, society and citizens as a work programme that mainstreams gender in every activity and includes a **specific funding line for Coordination and Support Actions to promote Gender Equality in R&I**. The support for these CSAs should ensure that changes towards gender equality in RPOs and RFOs will be sustainable and meet the expectations of the ERA priority.

Conclusions

The activities supported under “*Strengthening the ERA*” address ERA policy priori-

ties, one of them being gender equality and gender mainstreaming. Thus, strengthening the ERA means strengthening gender equality policies in the next EU Framework Programme for R&I. Supporting the implementation of EU recommendations on gender equality structures and plans in RPOs and RFOs with adequate funding is crucial for creating centres of excellence of the future. This will create the conditions for an excellent and open RRI. Such a change at a structural level will not happen accidentally. Moreover, giving gender a central role in “*Strengthening the ERA*” will help to generate and sustain public support for the Programme.

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IMPLEMENTATION OF ERA PRIORITY 4

“GENDER EQUALITY AND GENDER MAINSTREAMING IN RESEARCH AND INNOVATION”

GENDERACTION will soon release its full report on “National roadmaps and mechanisms in ERA priority 4” which analyses different approaches of Member States to the implementation of gender equality in National Action Plans and Strategies (NAPs). The present Briefing Paper aims to highlight key results and a set of criteria which allow identifying good practice NAPs and good practice measures. The aim is to support further development of existing NAPs and thereby to strengthen gender equality in the ERA community and structures.

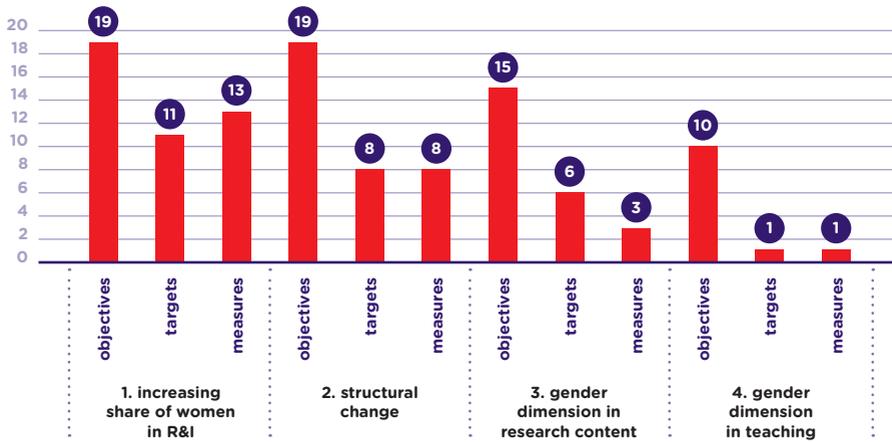
Priority 4 in National Action Plans (NAPs)

European Research Area (ERA) priority 4 focuses on gender equality and gender mainstreaming in research and innovation. The objective is to foster scientific excellence and a breadth of research approaches, by fully utilising gender diversity and equality and avoiding an indefensible waste of talent. Within their national action plans (NAPs) Member States are asked to develop policies which address gender imbalances particularly at senior levels as well as in decision making and which strengthen the gender dimension in research. Member

States should initiate gender equality policies in research performing organisations (RPOs) and research funding organisations (RFO). They should also regularly monitor the effectiveness of such policies and adjust measures as necessary.

The report on the implementation of priority 4 within NAPs is based on two main sources: an analysis of NAP documents and a survey of members of the Standing Working Group on Gender in Research and Innovation (SGW GRI), including Associated Countries which submitted a NAP. The survey was conducted in autumn 2017. A total of 27 countries participated in the survey, which represents a response rate of 82%.

Graph 1: Objectives, targets and measures



Implementation of priority 4 at Member State level

The analysis of NAP documents reveals **different approaches to NAPs** in different countries as well as a **different level of implementation of gender equality policies**. While some countries describe the whole gender equality policy mix in their NAPs, others describe the current focus of gender equality policy or the process by which an existing policy mix is to be further developed. At the other end of the spectrum are countries which formulate a general commitment to gender equality or do not address gender equality in their NAPs at all. The NAPs also differ in the concept of gender equality used. While some countries address all three main ERA gender equality objectives (increasing the share of women in all fields and hierarchical levels of R&I; structural change to abolish barriers for female carriers; integration of the gender dimension in research content and teaching), others focus on only one or two objectives.

The survey results confirm the different level of implementation of priority 4. All countries participating in the survey had either already submitted a NAP or planned to do so. All but one of these NAPs contain gender equality objectives, yet only two thirds of them also contain concrete targets or measures, while half are linked to a specific national monitoring system.

This **gap between objectives and measures** appears for all three dimensions. While 19 NAPs address the objective to increase the share of women in R&I, only 13 contain corresponding measures or policies. The situation is very similar with regard to the objective of structural change (19 NAPs mention the objective; eight contain measures). The gap becomes even more pronounced in the case of the third objective: 15 NAPs address the objective to strengthen the gender dimension in research content but only three contain measures. Ten NAPs mention the objective to integrate the gender dimension in teaching but only one contains measures.

Furthermore, both the NAP documents and the survey show that priority 4 is in most cases conceptualised as an **independent topic**. Only seven NAPs or 29% link priority 4 with at least one of the other priorities. Hence, gender is not integrated as a cross-cutting topic in the NAPs.

The survey reveals **differences between EU15 countries and newer EU Member States** (which joined the EU from 2004 onwards) in several respects:

- For 57% of newer Member States, the NAP is the first policy document on gender equality in R&I; the same holds for only 25% of EU15 countries.
- Priority 4 is more often interlinked with other priorities in EU15 countries (39% versus 14%).
- Newer Member States refer more often to difficulties regarding development of priority 4.
- The survey results also show that the structural change goal of abolishing barriers for women's careers is more present in EU15 countries.

Of those countries which had submitted a NAP, about 60% of EU15 countries and 33% of countries which joined the EU from 2004 onwards mention concrete policies or measures in their NAPs. Respondents were asked to fill in an extra fact sheet for each ongoing or planned policy. In total, 65 policies and measures from 12 countries were received. According to the respondents, 46 of these policies and measures constitute good practices. However, the respondents' assessments of whether a measure or policy constitutes a good practice is based on different criteria (e.g. recently introduced policies, policies that address a topic for the first time, measures with an innovative approach). Hence, the survey results illustrate the need for a discussion of the criteria for good practices. The first GENDERACTION

Mutual Learning Workshop therefore focused on this issue.

Of those countries which have submitted a NAP or plan to do so, 13 (52%) have a national monitoring system for gender equality in R&I which considers further indicators in addition to the main indicator for ERA priority 4 monitoring (women in grade A positions in the higher education sector). If a national monitoring system does exist, the indicators focus in most cases on the share of women in different fields or hierarchical positions (13 cases). In ten countries, monitoring addresses structural change in RPOs, while in eight countries indicators focus on structural change in RFOs. Only two countries have indicators in place that focus on the gender dimension in teaching and research content.

Conclusions and recommendations

The different foci in NAPs could be interpreted as different positions taken by countries in the gender equality policy development process or as the result of a different conceptualisation of gender equality.

These aspects illustrate on the one hand the **need for capacity-building activities for stakeholders involved in the development and implementation of NAPs**. GENDERACTION will provide capacity-building activities that focus on the gender concept that forms the basis for the NAPs and the deviances from the ERA concept of gender equality. Capacity-building activities will also provide support for further development of NAPs, priority 4 within NAPs as well as concrete measures. This includes the development of evaluation competences and self-reflexive competences on the part of stakeholders, to enable them to assess measures and policies, make empirically based decisions, coordinate the implementation of NAPs and involve relevant stakeholders. Capacity-building activities will also

Good practice NAPs

- are based on an empirical baseline assessment,
- contain objectives and targets which are derived from the baseline assessment,
- formulate objectives, targets and concrete measures consistently,
- consider gender in all priorities (gender mainstreaming), thus interlinking priority 4 with other priorities,
- include concrete budgets and resources,
- define responsibility for the implementation of NAPs or specific actions (the responsibility for concrete measures should be assigned to specific stakeholders),
- include a responsibility for the coordination of the six priorities as well as of concrete measures within each priority
- use consultation in writing NAPs (stakeholder involvement)
- include concrete deadlines for implementing measures and actions,
- include a description of monitoring and/or planned evaluation activities.

provide support for stakeholders responsible for priority 4 in mainstreaming gender into other priorities.

Equally, the different priority 4 foci should be taken up in the **gender equality policy discourse at the European level**.

- The different foci in NAPs indicate a need for more coherent guidelines for the development of priority 4 in NAPs. This should be combined with a discourse which focuses on good practice NAPs as well as good practice measures. The identification of good practic-

Good practice measures or policies

- are based on an empirical baseline assessment,
- explicitly aim to contribute to at least one of the three main gender equality objectives,
- formulate concrete targets and target groups,
- are based on a theory of change/ programme theory (a formulated set of assumptions why and how the policy should reach its targets and target groups),
- involve relevant stakeholders in the development of the policy/measure,
- are allocated sufficient and sustainable funding,
- produce results which are sustainable and significant (in terms of coverage, resources, timeframes, etc.)
- develop a dissemination or communication strategy (what has been done, what has been achieved, what worked, what didn't work), and
- are monitored and evaluated on a regular basis with regard to their implementation status and impact.

es requires criteria for the assessment of NAPs and measures. GENDERACTION provides a set of criteria (see the box).

- Specifically, the different interpretations of gender equality should be addressed in the further development of NAPs. Most countries focus on one or two of the three gender equality objectives. The dominant goal is to increase the share of women in R&I. It is important to stress the three-dimensional construct of gender quality in future policy discourse. Furthermore, it is important to shift the focus from women as the main

target group to the underrepresented sex. For instance, only few NAPs address the under-representation of men in female-dominated fields.

- It is equally important to provide a policy forum (e.g. through ERAC) focusing on priority 4 as well as on the integration of gender aspects in other priorities (gender mainstreaming). In addition to such an exchange among Member States, a specific feedback format could be linked to the national ERA progress reports.
- The fact that priority 4 is conceptualised in the majority of NAPs as an independent topic without interlinkages with other priorities means that gender equality is not considered in other priorities. Hence, gender is not mainstreamed, and there is a risk that interventions of other priorities could reinforce existing gender inequalities or imbalances. Therefore, a strong position of priority 4 is needed as well as a strategy that allows stakeholders responsible for priority 4 to address other priorities.
- Lastly, it is evident that a stronger focus on gender in research content and teaching in the NAPs is required. There are only a few examples of policies and measures that focus on this objective. Gender in research and innovation content in the next European framework programme Horizon Europe needs to be emphasised using

a twofold approach: (1) to strengthen the gender dimension in research projects in order to develop good practices on a project level and (2) to develop good practices for transferring the available gender knowledge into targeted, effective policies and measures.

Within the GENDERACTION project, criteria for good practices have been developed in a participatory process (Mutual Learning Workshop). Workshop participants agreed to the criteria but considered them difficult to implement due to a lack of data, human resources, commitment and consistency in databases. They also formulated a need for the integration of gender equality in other priorities as well as a need for specific support and input regarding the mainstreaming of gender in other priorities. The workshop participants stressed the importance of a self-reflexive approach by the implementing institution in addition to external evaluation and the need for sanctions if measures/policies are not implemented as agreed. Furthermore, they argued for provisions to safeguard good practice measures against institutional or political change.

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THE ROLE OF FUNDING AGENCIES IN THE PROMOTION OF GENDER EQUALITY IN R&I

GENDERACTION is a Horizon 2020 project that supports mainstreaming gender equality in the European Research Area. The present Briefing Paper focuses on the role of Research Funding Organisations (hereafter RFOs) with the aim to inspire these key actors of the European R&I system to innovate policy design and implementation for gender equality.

Funding Agencies gain momentum in Europe

The European Commission has promoted for years the inclusion of the gender equality in the European research policy and its Framework Programmes. Although the emphasis has been on Research Performing Organisations (RPOs) such as universities and research centres, increasing attention is paid to Research Funding Organisations (RFOs) given their crucial role in shaping research careers and research priorities in each country.

Both the 2015 Resolution of the European Parliament on women's careers in science and universities and the 2015 Council Conclusions on advancing gender equality in the European Research Area (ERA) stressed the role of RFOs in supporting women's careers in science and gender equality in the ERA through the allocation

of adequate resources for gender equality policies and the elimination of gender bias in research funding.

For instance, the European Parliament Resolution calls on RFOs and other stakeholders to allow more flexibility regarding women's research production following the birth or adoption of a child. **The objective is to attain a consistent alignment between RFO's priorities and EU policy, including the ERA Roadmap priority 4 (Gender equality and gender mainstreaming in research).**

Gender equality in R&I is also linked to participation and success rates in research funding and promotion systems. The success of researchers depends on the evaluation of researchers' grants, as well as on other scientific or scholarly achievements as indicated in a researcher's CV and track record (Science Europe, 2017: 8). The persistence of gender bias in research evaluation,

The Council invites Member States and research funding organisations to provide incentives to encourage research performing organisations, including universities, to revise or develop gender mainstreaming strategies, gender equality plans including the gender dimension in R&I content and programmes and mobilise adequate resources to ensure their implementation.

Council Conclusions on
Advancing gender equality
in the ERA

as studies show, is a threat to the efforts to advance gender equality and retain women in research careers. Moreover, studies from different countries and disciplines show that men researchers receive more research funding than women researchers.

Only the most recent European Structural Change projects for gender equality in research institutions have included RFOs, either in the role of observers or as partners, since it became clear that structural change requires a coordinated policy with those institutions that fund Research & Innovation (R&I).

The Council of the EU has its own leading role in ensuring that National Action Plans and Strategies (NAPs) for the ERA Roadmap address gender equality measures and its monitoring in the evaluation process to move forward ERA Priority 4 implementation and to improve coordination between national authorities and RFOs.

The potential of RFOs in shaping national RI ecosystems

National funding agencies are often the main source of resources for researchers in Europe, especially the public ones. RFOs activities usually focus on the following fields:

- Distribution of resources in R&I systems and thus, management of financing instruments;
- Scientific evaluation of proposals;
- Monitoring of funded projects.

Since most European funding agencies incorporate gender equality at the programmatic level in their core documents, the gender perspective should be considered in all their activities. As in RPOs, gender equality policies need to be professional, consistent, sustainable and tailored to each RFO and its context. **Gender equality structures** (e.g., gender equality officers, committees, unit, etc.) **and mainstreaming, as well as organizational culture and training are priority areas on gender equality in RFOs that are shared with RPOs.** However, there are other lines of action which are specific for RFOs, such as the distribution of resources, the scientific evaluation and the monitoring and evaluation of funded projects.

The **distribution of R&I resources** refers to the core activity of RFOs: managing funds and calls for proposals in scientific fields and societal challenges. This includes both adequate funding of specific interdisciplinary research on gender in order to provide answers to current inequalities between women and men as well as ensuring adequate integration of the gender dimension in the research content as a cross-cutting issue in all the research fields. Funding priorities in R&I should take into account different interests and needs of women and men according to a Responsible Research and Innovation (RRI) perspective. The balanced composition of committees

Integrating the gender dimension in R&I content increases the overall quality and relevance of R&I by avoiding biased studies based on gender stereotypes and on the male default model. It fosters responsible research for sustainable future by improving R&I methods and outputs that take into account the needs and interests of the whole population.

Helsinki Group on Gender in R&I, 2017

«Think equal, build smart, innovate for change»

Innovation and technology provide unprecedented opportunities [...]. From mobile banking to artificial intelligence and the internet of things, it is vital that women's ideas and experiences equally influence the design and implementation of the innovations that shape our future societies.

UN Women theme for International Women's Day 2019

and bodies also guarantees that women and men participate equally in the funding decision-making process.

The **scientific evaluation** of proposals submitted for applicants is another particular field for RFOs to regularly monitor for possible gender bias. The most important challenges in this regard are the introduction of gender-sensitive criteria to tackle the causes of the persistent leaky pipeline and the promotion of the integration of the gender dimension into the funded research content to produce a high quality knowledge that takes into account sex and/or gender differences when appropriate.

Monitoring of funded projects from a gender perspective is becoming a focus of attention. Gender indicators can be used as powerful monitoring tools both on the appropriate integration of gender analysis into research content where relevant, and on gender equality issues such as gender balance among main speakers in project dissemination and communication activities, proportion of women as first au-

thors of research papers, work-life balance measures for team members, etc.

Finally, there is also a new field where Funding Agencies can foster gender equality - **the business enterprise sector**. Public research funding goes to corporations where the proportion of women is lower than in universities and the public research sector, as shown in *She Figures 2015*. Additionally, the role played by women as users and consumers is too often neglected in the co-creation processes. This lack of gender diversity in the European Innovation sector requires a great deal of attention and action through public research funding.

Therefore, RFOs have a key role to foster participatory innovation projects that guarantee gender diversity and allow all segments of population benefit from innovation processes and outputs.

Furthermore, evidence shows that **companies with more balanced gender composition are more likely to innovate compared to those with high concentration of one gender.**

Promising practices among RFOs

Different funding agencies in Europe have pioneered the introduction of gender equality policies in their funding activities and scientific evaluation. A study conducted by Science Europe on the peer review processes and grant management practices in fifteen European RFOs has collected promising practices already in place:

- Gender-balanced composition of scientific evaluation panels and other bodies that take funding decisions.
- Advice by international gender experts to mainstream gender in the organization as well as external observers on evaluation panels, also known as “gender equality observations”.
- Unconscious bias training addressing scientific evaluation panels.
- Monitoring the success rates of men and women applicants among other gender indicators tailored to RFOs.
- Targets for women award holders and positive action ensuring that half of eligible applicants are women.

The Irish Research Council (IRC) has become a reference model for gender equality policies in RFOs. The idea behind this initiative is that gender equality will ensure excellence and maximise creativity and innovation in Irish research. The IRC Gender Strategy & Action Plan 2013-2020 focuses on four main lines of action: support for gender equality in research careers; integration of sex/gender analysis in research content; fostering structural change for gender equality; limiting the potential effect of unconscious gender bias on internal processes. In addition, the IRC is tying its funding for RPOs to holding the Athena Swan Bronze Institution Awards that recognizes a solid foundation for eliminating gender bias and developing a gender-sensitive, inclusive organizational culture, i.e. gender equality plan, diagnosis and structures.

The promotion of gender-diverse composition and balanced distribution of responsibilities and activities within research teams applying for project grants is another measure introduced by the Technology Agency of the Czech Republic through a so-called Gender-Matrix which has shown a positive impact.

Gender equality observations in evaluation panels were introduced in 2008 by the Swedish Research Council, leading to specific gender recommendations on the evaluation process.

Another recommended practice is the design of gender diagnosis reports tailored to RFOs as the one recently conducted by the Spanish State Research Agency with a mix-methods approach that combines

The European Research Council (ERC) shows the Institució CERCA video on unconscious bias to panel members and provides a briefing before remote evaluations and during in person meetings.

Moreover, the ERC has adopted positive action concerning maternity and paternity leaves: the eligibility window in case of mothers is extended by 18 months per child but for fathers it is only the period actually taken.

documental, qualitative and quantitative data with a resulting proposal of fields of action for designing its own gender equality strategy.

Beyond Europe, the Canadian Institutes of Health Research introduced years ago a mandatory requirement for applicants to explain the integration of sex/gender analysis into research (IGAR) in the content of submitted proposals. As a result, the CIHR found an increase in the IGAR performance of the health research they fund.

With regard to the innovation sector, the Swedish Innovation Agency VINNOVA has adopted a gender sensitive assessment process to ensure the highest level of innovation quality and relevance. Women's participation in innovation projects promoted through the overall target of 40% and preference to projects with similar ratings that show a better understanding of gender equality in the whole innovation cycle.

Recommendations for Funding Agencies

RFOs are in a privileged position to introduce measures with the aim to accelerate change in the three priority areas of the EC (research careers, decision-making and the integration of the gender dimension into research content). RFOs in Europe are expected to develop their own gender equality structures and strategies and to consider gender equality in their international cooperation agreements and activities.

Recommendations to **address RFOs structures and decision-making:**

- To establish sustainable and professional gender equality structures and to adopt comprehensive gender equality strategies with the advice of gender experts.
- To guarantee gender balance in funding decision-making bodies and scientific evaluation panels.

- To conduct gender equality impact reports and gender-sensitive budgeting.

Recommendations to **avoid gender bias in the research evaluation process:**

- To tackle the ideal of "objective" evaluators acting on rational arguments without cognitive bias by conducting regular training on gender stereotypes and unconscious bias and its monitoring and evaluation.
- To review the gender proofing of language of call texts with the aim to avoid sexist language and include gender-sensitive and work-life balance provisions.
- To explore how/if the use of new metrics impacts men and women researchers at different career stages and disciplines differently.
- To adopt multi-dimensional evaluation criteria that enhance openness and transparency (including visibility and open access to those research outputs with a gender dimension), and contribute in mitigating against gender bias in research assessment/evaluation procedures.
- To adopt evaluation criteria that take into account parenthood as a potentiality in researchers' lives.
- To foster women Principal Investigators of R&I projects through temporary special measures.
- To critically assess the negative impact on women researchers of informal practices and unstated evaluation criteria.
- To consider the adoption of double-blind review processes where possible in order to avoid gender bias in people-based funding mechanisms, instead of the best project.
- To collect sex-disaggregated data on applicants, average size of grants and review panels by scientific field and funding scheme as well as on

H2020's approaches to gender mainstreaming and incorporating gender perspectives in research should be promoted as good practice in RFOs, RPOs and other international collaborations.

ERA Roadmap
2015-2020

the composition of funding decision-making bodies, as recommended by Science Europe (2017).

- To ensure a gender balance among the nominees in prizes/scientific awards.

Recommendations to **promote gender in research and innovation content**:

- To allocate funds for specific programs on gender studies, aimed at fostering production of new knowledge for a better understanding of gender issues.
- To require grant applicants to indicate whether sex and/or gender are relevant to their research proposal and how the gender perspective will be integrated into the entire research or innovation cycle. When sex/gender analysis is not relevant for the field of study, an explanation should be given by applicants.
- To disseminate guidelines for grant applicants and peer reviewers/evaluators on the integration of the gender analysis into research content, and to support their engagement with gender experts.

The European Commission is the main R&I funder in Europe. Researchers from all EU countries are encouraged to participate

in research project calls. Further recommendations for **the European Commission to become a reference model and supporter of gender equality policies in national funding agencies** include, as recommended by the former Helsinki Group (now ERAC Standing Working Group on Gender in Research and Innovation):

- Increasing gender knowledge and capacity building for key actors in the R&I funding process (advisors, National Contact Points, applicants, evaluators...).
- Monitoring of all gender-related actions and measures used in the Framework Programme.

Conclusions

GENDERACTION is committed to the creation of an ERA community to innovate policy implementation for gender equality. The RFOs are key agents in such a community.

Addressing gender bias in research evaluation is not just a matter of avoiding persistent unconscious bias by evaluators because how women's competences are perceived in the evaluation process is crucial. Funding agencies as organizations, and not only individuals as evaluators, are co-responsible actors in achieving gender equality and thus need to address structural changes in their processes, practices, cultures and structures.

Moreover, RFOs have a critical role in fostering responsible research for sustainable future by ensuring that the methods and outputs of funded projects integrate gender analysis and take into account the needs and interests of the whole population.

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THE FUTURE OF GENDER EQUALITY IN EUROPEAN RESEARCH AND INNOVATION

In recent years Member States, the Commission and research funding and performing institutions have implemented major initiatives to advance gender equality in research and innovation in the European Research Area (ERA). These efforts must continue and expand for research and innovation to contribute to the resilience and quality of our democratic institutions, sustainability and competitiveness in the EU.

The European Research Area post-2020

In 2019, we are celebrating the 20th anniversary of European activities promoting gender equality in research. During that time, **Europe has made great forward strides, and gender equality and gender mainstreaming have become one of the ERA priorities**, with the three objectives of gender balance in research teams, gender balance in decision-making and the gender dimension in research content. Actions have moved from “fixing women” to “fixing institutions” through comprehensive gender equality plans to achieve institutional change and to “fixing knowledge” with Horizon 2020 and several national research funders introducing measures to ensure that new research incorporates sex and gender analysis. The body of scientific knowledge on gender and other forms of inequality in research and innovation (R&I) has expanded greatly.

However, **political consensus about gender equality as a priority of the European Research Area is under threat.**

There is a tendency to reduce gender equality to female participation in research or to ensuring work-life balance. Furthermore, there is a threat to Research Performing Organisations as democratic institutions and their academic freedoms through a wave of anti-genderism coming from right-wing populist and neoconservative regimes on a global scale.

The ERA Roadmap 2015 – 2020 is coming under review in 2020 with a view to developing a new Communication for the period beyond 2020, which should propose revised ERA priorities and ERA monitoring mechanism at national and EU level, to be followed by Council Conclusions on the new ERA advisory structure. The ERA Roadmap has been a catalyst for gender equality policy and measures in many EU countries, especially those where such

measures had not been in place previously (Standing Working Group on Gender in Research and Innovation 2018). GENDER-ACTION Deliverable report 3.1 shows that for 57% newer Member States and 25% of the older Member States, the ERA Roadmap was the first policy document dedicated to gender equality in research. Europe must do more to build a fair, just and equal research and innovation environment that answers the needs of its population.

Other ERA stakeholders, umbrella organisations including LERU, EUA, Science Europe and NordForsk, have taken measures and developed recommendations. Financial support for implementing gender equality plans in Research Funding and Research Performing Organisations at the EU and national levels has been vital to raising awareness, building uptake and implementing concrete measures to change the organisational culture and practices and procedures. This work must continue.

Intersectional approaches to gender equality (an analytical framework examining interlocking intersecting systems of power between gender and other social categories and identities, such as ethnicity and race, gender identity, sexual orientation, socio-economic status and disability) are rarely adopted at policy or institutional level in the ERA, with the exception of a few countries. The experience of the current institutional change projects funded through Horizon 2020 and Framework Programme 7, including most recently experience gathered at the GENDERACTION Mutual Learning Workshop on Best Practice Exchange to Support Institutional Change, suggests that **intersectionality is crucial for addressing the multiple axes of inequality that researchers experience.**

Recommendations

- Gender equality and gender mainstreaming must continue as one of the

policy priorities for the future European Research Area.

- The Innovation Sector should be included in the European Research and Innovation Area with concrete actions and indicators (for more on the Business Enterprise Sector see below).
- The budget for implementing gender equality plans should be increased in Horizon Europe compared to Horizon 2020, given the importance of the added value of European cooperation among institutions. Member States should use European Social Fund to complement these Commission efforts at national level, by supporting institutional changes through gender equality plans or similar instruments.
- The new Horizon Europe broad line on “advanced strategies and innovative methods for gender equality in all social, economic and cultural domains, and to deal with gender biases and gender-based violence” needs to ensure regular annual calls which allow enough funding for an appropriate number of projects, in order to meet the objective of providing innovative solutions for gender equality challenges in the EU and worldwide.
- Policy exchange, mutual learning and coordination among Member States, Associated Countries and the Commission has proven crucial. A dedicated working group of national and Commission representatives must continue, with clear mandate and increased cooperation with other ERA stakeholders, most notably the umbrella organizations gathered in the ERA Stakeholder Platform.
- Intersectional approaches to gender equality must be adopted at institutional, national and EU level, addressing issues of race and ethnicity, including migration and refugees, LGBTQ+ and disability. Gender equality plans fund-



Gender equality and gender mainstreaming must continue as one of the policy priorities for the future European Research Area.

ed by the Commission and at national level should incorporate intersectionality as an obligation. Opportunities for sharing experience among responsible staff, research and other forms of support should be supported both at the EU and MS level.

Measuring equality, bridging the Widening divide

Despite progress, **development remains uneven across the EU**, both for innovation capacity and gender equality (Standing Working Group on Gender in Research and Innovation 2018, ERA Progress Report 2018). The Figures 2018 identifies important improvements but also shows we are still far from reaching equality. The uptake of institutional change through gender equality plans and the integration of the gender dimension in research content, in particular, require significant improvement in action.

The current **ERA headline indicator for gender equality**, proportion of women in Grade A, only reflects the situation in the Higher Education Sector. Importantly, this indicator does not necessarily reflect the working conditions for women and other

disadvantaged groups and may be related more to research and development investment and occupational prestige in a given country. In fact, the Priority 4 headline indicator may be inversely correlated with ERA research excellence indicator and the GBARD as percentage of GDP (ERA Progress Report 2018). Analysis of the National Action Plans and Strategies carried out by GENDERACTION confirms differences among countries in how they conceptualise gender equality and which ERA priorities they address (GENDERACTION Deliverable 3.1), and this was also corroborated by a 2018 analysis of the implementation of Council Conclusions on advancing gender equality in the ERA, carried out by the ERAC Standing Working Group on Gender in Research and Innovation.

This suggests that it is necessary to review the way gender equality is defined, how progress is measured in achieving gender equality and which indicators are used.

Recommendations

- Member States, Associated Countries and the Commission must step up efforts for gender equality and gender mainstreaming as a priority for the European Research Area post 2020, particularly in the Widening countries.
- Specifically, it is necessary to review how progress in this priority is defined and develop adequate indicators which should be complemented by indicators reflecting contextual factors such as R&D intensity. ERAC Standing Working Group on Gender in Research and Innovation should be involved in this process.
- A European study should be commissioned from the Joint Research Centre to examine the correlation among proportion of women among PhD holders, researchers, professors in Grade A and

in the Business Enterprise Sector (BES) and the implementation of gender equality policies as well as the research and innovation intensity.

- In implementing Horizon Europe, the Commission should adopt concrete measures to incentivise the Widening countries to develop gender equality measures, for example through a dedicated gender-related call for proposals or by topping up Widening project budgets for targeted gender equality measures to be implemented within the project.

The Business Enterprise Sector: Taking corporate social responsibility seriously

There is evidence already that gender balance is good for business; experience also shows that measures and actions that benefit women actually benefit all. Still, women make up only 20.2% of researchers in the Business Enterprise Sector (BES), a huge employer of researchers and innovators in the EU. Women are strongly under-represented among patent inventors and there is a strong gender gap in the patent teams where 47% of teams were male only, followed by 37% of one-man inventor teams. Between 2006 and 2016, the majority of research and development expenditure was in the BES, rising from 1.12% of GDP in 2006 to 1.32% by 2016, an overall increase of 17.9% (Eurostat 2018). In contrast, the second strongest Higher Education sector performed 0.47% of GDP but has been stagnant from 2010 onward; the government sector performed 0.23% of GDP and the private non-profit sector 0.02% of GDP, both at the same levels as ten years ago.

While some corporations have developed programmes to increase the participation of women and other under-represented populations, these initiatives

The Innovation Sector should be included in the European Research and Innovation Area with concrete actions and indicators.

rarely address the organizational culture and structures and they are implemented very unevenly in their subsidiaries. Women-led tech SMEs and start-ups are receiving increasing attention yet the 2018 State of European Tech report shows that 93% of all funds raised by European venture capital backed companies in 2018 went to all-male founding teams and 46% of women surveyed declared they experienced discrimination in the European tech sector. Research shows that BES can benefit from higher participation of women both in boardrooms and as owners (Mitchell 2011). One of the recommendations of the Kauffmann Foundation (2016) is to increase SME research funding for women-owned businesses. As BES is taking advantage of public funding for research, public funders can take a proactive stance towards promoting gender equality by making funding contingent on active promotion of gender equality in BES applicants and supporting women-led businesses. This must include the integration of the gender dimension in the research and innovation content, not least in order to avoid financial and prestige losses.

Lastly, it is necessary to change the perception of entrepreneurship and technol-

ogy as a masculine domain. The EU Prize for Women Innovators is a good step toward celebrating successful women entrepreneurs. Such measures should be put in place across the European Research Area, with a view to stimulate the establishment of women-led start-ups and businesses and provide role models.

Recommendations

- The BES, including Small and Medium Sized Enterprises and start-ups, should take their corporate social responsibility seriously, promote institutional changes for equality and diversity internally and address the gender dimension in the research and innovation solutions they develop.
- Public funding allocated to the BES, including SMEs and start-ups, should be made contingent upon gender and diversity measures in place.
- Specific funding should be allocated for tech companies and start-ups led by women and minorities at European Innovation Council and similar national programmes.
- Funding lines for innovation at the EU and MS levels should, as a rule, address the gender and diversity dimensions in innovation, so that gender and other forms of bias are not built into new technologies and innovations. This must apply as well to the European Innovation Council and European Institute of Innovation and Technology.
- The Commission should promote the EU Prize for Women Innovators more widely, to strengthen the brand and awareness in the EU. Member States should join the Commission and incentivise the unique role of women as social innovators and entrepreneurs and enhance their role in driving smart specialisation, by establishing funding schemes, prizes or other similar instruments.

Global challenges for European societies: Addressing intersectional gender-related gaps and needs

The evidence is mounting that integration of the gender dimension in research and innovation leads to better solutions and conversely, when this is not done, the negative impact falls disproportionately on women (Saini 2017, Criado Perez 2019). New evidence also suggests that **racial bias is re-emerging in research**, as racialized nationalism is a resurgent threat across the globe (Saini 2019). In addition, the wake-up call from #MeToo presents a challenge to European research communities to address the extent to which gender based harassment is embedded in global academic culture (Bondestam & Lundqvist 2018). There are no solutions to missions and global challenges without paying attention to the ways they are embedded in power structures and gendered.

As Europe designs its future research and innovation strategies in the face of pressing global challenges, Horizon Europe will link closely to **the 2030 Agenda for sustainable development and Sustainable Development Goals**. The United Nations consider “the systematic mainstreaming of a gender perspective in the implementation of the Agenda” (United Nations 2015) to be crucial; similarly, **Horizon Europe should take further the actions developed in Horizon 2020 to incorporate the gender dimension in the content of research and innovation**.

The Gendered Innovations initiative launched by the Commission and Stanford University in 2011 provided excellent concrete examples of what sex and gender analysis can contribute. Now the Commission is taking this work further with a Gendered Innovations 2 expert group, which will develop new case studies and methodologies which should showcase Horizon 2020 projects that have integrated a gender dimension in their

Horizon Europe and national Research Funding Organisations, including the European Social Fund, should open calls for future research to address the Sustainable Development Goals, including the gender dimension across all the SGDs.

contents and provide recommendations for Horizon Europe. Following the adoption of Horizon Europe, GENDERACTION will explore the gender dimension in Horizon Europe's Missions and Partnerships, to provide recommendations for the integration of sex/gender analysis. A specific Mission on gender equality SDG5 has already been suggested by GENDERACTION in Policy Brief on Gender for Horizon Europe Research and Innovation Missions.

Both gender specific research and the integration of gender into research and innovation contents are crucial for improving EU policies as well as for attaining United Nations Sustainable Development Goals. The lack of gender awareness and gender knowledge at various levels of the R&I systems still requires an effort for capacity building of key actors in order to facilitate the implementation of gender policies in the ERA. More research-based evidence is needed on the gender-related impacts of R&I policies including gender equality and gender mainstreaming policies in the field.

Recommendations

- In implementing Horizon Europe, the gender dimension should be addressed

as a requirement in terms of excellence and impact in all relevant areas linked to the Sustainable Development Goals, requiring applicants to develop sex/gender analysis and include gender experts in the consortia for these topics. Project reporting should require that sex/gender analysis should be specifically addressed. Monitoring of the inclusion of the gender dimension should be improved in Horizon Europe research projects.

- Horizon Europe and national Research Funding Organisations, including the European Social Fund, should open calls for future research to address the Sustainable Development Goals, including the gender dimension across all the SGDs.

International cooperation: Global inequalities, empowerment, resilience and inclusion

Ethical concerns, including gender, economic and ethnic/racial inequality, must be given the highest priority due to unequal power contexts in which we live, globally and within the EU. Poor and at risk areas of the globe and populations must be protected from exploitation for research and innovation purposes (use of resources such as land and indigenous crops, informed consent etc.). Research and innovation must open up further, to ensure stakeholder multiplicity ranging from the usual suspects of governments, researchers and corporations, to NGOs and communities, including women's grassroots organizations and gender equality networks. Without people's subscription, developed solutions will have a hard time succeeding.

The European Commission Strategic European Framework for International Science and Technology Cooperation (2009) highlighted that "special attention should

be paid to promoting and facilitating gender equality and the role of private sector investment in S&T in developing countries". Yet, to date international cooperation in the ERA rarely incorporates gender equality concerns.

In response to the 2015 Council Conclusions on Advancing Gender Equality in the ERA, the Standing Working Group on Gender in Research and Innovation and the Strategic Forum for International Cooperation produced an **Opinion on developing joint guidelines on a gender perspective for international cooperation in STI**. GENDERACTION drafted a **Methodological Framework to Assess Gender in International Cooperation in STI** with a checklist and concrete examples of implementation and **Policy brief no. 6 on Gender-responsive international cooperation for Horizon Europe**.

Recommendations

- The European Commission, Member States, Research Funding and Research Performing Organisations should pay attention to effectively addressing gender equality issues in their new research and innovation collaborations with third countries through bi- and multi-lateral agreements (including JPIs and ERA-Net Cofund schemes *inter alia*), with a view to foster empowerment, inclusion and solidarity across nations.

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GUIDELINES ON CRITERIA OF GOOD PRACTICE FOR STRENGTHENING THE IMPLEMENTATION OF ERA PRIORITY 4

One of the aims of the GENDERACTION project is to support the implementation of the national ERA Roadmaps. This includes the development of new policies as well as advancement of existing gender equality policies in R&I. To support this, GENDERACTION developed specific “criteria of good practice” which can be used to assess national ERA Roadmaps and individual gender equality policies. The criteria of good practice introduced in this policy brief serve as a starting point for reflection on national gender equality policies and measures. They also support efforts at national level to strengthen the efficiency and effectiveness of existing gender equality policies. The application of the criteria of good practice will be illustrated through the reference to an Austrian example.

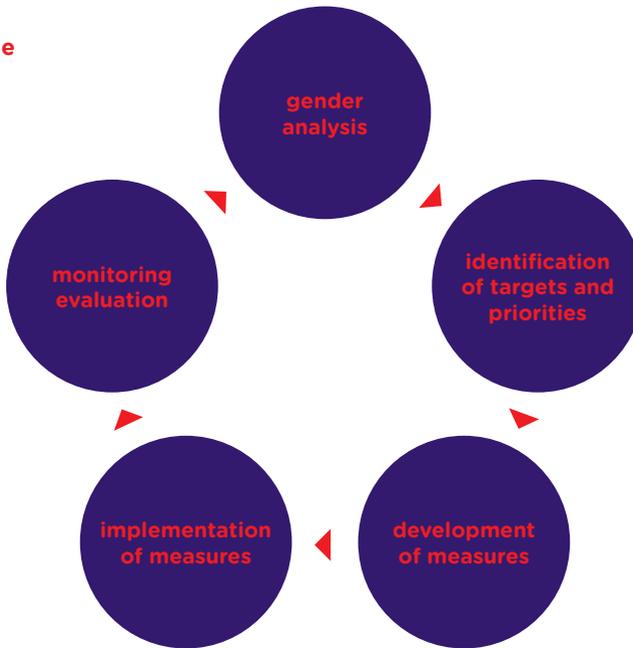
Gender Equality in Science and Research

Through the **ERA Roadmaps**, the EU Member States are required to formulate and implement measures for the attainment of a common European Research Area. Within the framework of Priority 4 of the ERA Roadmap, measures should be implemented to promote gender equality or implement gender mainstreaming in science and research. The ERA Roadmap formulates **three central gender equality objectives**: (1) equal access for women and

men to all areas and hierarchical levels in science and research, (2) the removal of structural barriers to the careers of women and an increase in the percentage of women in decision making and (3) the integration of the gender dimension in research content and teaching.

ERA countries have implemented approximately 100 policies and measures within the framework of the NAPs. They cover a variety of different approaches, pursue different goals and address various target groups. Even though gender equality policies are in place in a number of

Complete policy cycle



countries, progress towards gender equality remains slow, which indicates a need for further development of initiatives. To assess policies as well as potential needs for further development, criteria of good practice have been developed by GENDERACTION.

In the following, criteria of good practice policies or measures are presented. This is followed by examples of how to apply the criteria referring to concrete examples.

Criteria of Good Practice

The development and implementation of equality measures in science and research should be included in a complete **policy cycle** (May, Wildavsky 1978; Bergmann, Pimminger 2004). Austria followed this approach and formulated gender equality policy objectives and priorities based on

an analysis of the status quo with regard to gender equality (gender analysis). The next steps were to design measures for achieving the desired objectives and implementing them. The implementation of these measures was constantly monitored. Ideally, along with the monitoring, there should be an evaluation of the measures – either during, to identify starting points for further development of the measures, or ex-post to measure their effectiveness.

Specifically, in GENDERACTION, the following **criteria of good practice** were identified as gender equality measures. In line with these criteria, measures must:

- be based on an empirical problem analysis (**Gender Analysis**)
- address at least one of the three equality policy **objectives explicitly**
- formulate **precise targets and target groups**

- be based on an explicit **program theory** (i.e. a set of assumptions as to why and how a measure should reach its target and target group)
- **involve relevant groups of participants** in the development and implementation of the measures
- receive sufficient personnel and financial **resources**
- lead to **significant and sustainable results**
- contain a **dissemination and communication strategy** (i.e. feedback is given on activities, results and challenges within, and outside of, the organisation)
- be subject to **monitoring**, based on which feedback on the implementation of the measures is given at regular intervals and
- be **evaluated**

These criteria of good practice can be used by all those involved in the conceptualisation and implementation of measures to reflect upon existing measures, and to identify possible starting points for their further development.

Application of criteria of good practice referring to a concrete example – Performance Agreement

This section outlines the possibilities for the application of these criteria using the example of the Austrian performance agreement 2019-2021 with public universities. A reflection of the policy referring to the criteria (the “criteria check”) points out where improvement is needed. The result of this reflexive process will be used to define further steps which the Federal Ministry, together with the universities, intends to take to strengthen the effectiveness of the gender equality policy and measures.

The Austrian Federal Ministry of Education, Science and Research negotiates

performance agreements for a period of three years with all the 22 public universities. These agreements record relevant targets and initiatives (in this case regarding gender equality) for each organisation. For content-related orientation, the Federal Ministry provides an example performance agreement (working tool) to the universities in advance, based on the Austrian National Development Plan for public universities (2019-2024). In this example, the subject areas to be covered, including social goals, are established.

Throughout the entire course of the performance agreement negotiation process, it is essential to ensure that the criteria of good practice are followed. Below you find the Federal Ministry’s reflection on the instrument “performance agreement” based on the criteria of good practice, which is used to identify where further development is needed.

Positive aspects of reflection: criteria of “good practice” already met

- Ministry specifications are evidence based, for example, for the first time, targets with regard to increasing the percentage of women in professorships and on tenure track (cascade model) were specified according to the share of women in scientific positions (potential), and include coordinated measures
- Objectives and targets address at least one of the three main objectives of the gender equality targets (representation, structure/processes, content in research and teaching)
- University stakeholders are involved in the negotiations (coordination between the Federal Ministry and universities): A communication process between the Federal Ministry and the universities has been established in the form of guided conversations (4-5 sessions per period)

- Target attainment undergoes monitoring through an annual university intellectual capacity report, which also contains gender equality indicators and explanations, for example the indicators for gender representation in appointment procedures for full professors.

Identified needs for further improvement: criteria not yet well-enough established

When reflecting on the instrument of performance contracts, several problematic aspects emerged which represent need for further development.

- The Federal Ministry knows too little about the design and quality of university gender equality measures (for example, on which gender equality concepts are measures based) to assess the underlying program theory.
- The Federal Ministry knows too little about the use of resources when it comes to implementing measures because of the highly aggregated budgeting. Therefore, it is not possible to assess the financial and personnel resources provided for the implementation of gender equality policies.
- The Federal Ministry knows too little about the effects and sustainability of gender equality interventions, as evaluation of gender equality policies at the university level is not yet a standard procedure. Only some universities carry out evaluations in order to continue to develop the measures in the following period.

These evaluation deficits hinder the Federal Ministry in discussing the effectiveness of measures/programmes and stimulating further development to improve performance with individual universities. Such deficits also make it harder to identify “flagship projects”, which should be

Use criteria of good practice for reflection and (further) development of gender equality policies.

presented to the wider public and other higher education institutions as examples.

In 2018, the Federal Ministry first compiled a brochure with a comparative presentation of the status quo of gender equality at universities, and highlighted examples of good practice at these universities. Feedback shows that universities can be motivated by the visualization of their performance.

Conclusions and recommendations

To strengthen the effectiveness of gender equality measures in performance agreements and to support a process of reflection on existing and planned gender equality measures, the Federal Ministry pursues the following strategies:

- **Dissemination** – distribution, discussion and identification of fields of application for the “criteria of good practice” at higher education and research institutions (for example, the Federal Ministry of Education, Science and Research used the criteria for an internal reflection of gender equality policies and introduced them in a broader political context through network meetings with universities, the Austrian Academy

of Sciences and the Institute of Science and Technology, Austria).

- **Reflection** – institutions should reflect on existing gender equality measures based on explicit criteria in order to pinpoint how these can be best developed further, in order to achieve a higher effectiveness.
- **Interaction** – organisation of an exchange of experience across higher education institutions (building a community of practice), for example through moderated workshops (“No need to reinvent the wheel”).
- **Identifying “flagship projects” and making them visible** – an appropriate knowledge resource is a toolbox filled with best practice examples created by GENDERPLATTFORM.¹

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1 | The GENDERPLATTFORM is an association of organisations which, according to the University Act, are entrusted at Austrian universities with the coordination of equality, the promotion of women, as well as gender research and its teaching. The GENDERPLATTFORM Toolbox presents a variety of strategies, programmes, initiatives and projects which have been developed and implemented at Austrian universities in the field of equality. The Toolbox is available online at www.genderplattform.at.

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Annex: Background information on the Austrian NAP context

In Austria, the past few years have seen the development of a wide range of different gender equality policies. Specifically, instruments combining legally formulated gender equality targets with decentralised implementation have been implemented. These instruments include performance agreements, with which specific gender equality targets and measures are agreed upon between the BMBWF, universities and research institutions.

Within the framework of the ERA Roadmap, Austria has pooled the existing gender equality policy activities and institutionalised the collaboration between different departments within the areas of science and research (for example through the ERA Roundtables). When comparing the ERA Roadmaps, Austria is one of the countries which has formulated a comprehensive set of gender equality measures addressing all three ERA equality objectives, and has provided specific steps for their implementation (see GENDERACTION 2018). However, despite the existence of a comprehensive policy mix, gender inequalities are very slow to change (EC 2019). The current ERA progress report ranks Austria in the group of countries with below average progress in the area of gender equality. Therefore, there is a need for further development and strengthening of the implementation of current measures.

TAKING STRUCTURAL CHANGE INTO THE FUTURE

This GENDERACTION Policy Brief presents policy recommendations on structural change for gender equality in Research Funding and Performing Organisations. Developed by GENDERACTION in cooperation with representatives of EU-funded structural change projects, its goal is to summarise compulsory elements of the structural change approach and present recommendations for taking structural change forward in the next framework programme period.

Main messages

- The Commission and Member States are strongly encouraged to maintain and further **reinforce the structural change approach as a policy framework** for promoting sustainable gender equality actions in the research ecosystem. This should be done by increasing and/or introducing **dedicated budget lines**, introducing **temporary special measures as defined by the UN¹** as well as **new forms of disruptive measures**.
- The **uneven implementation** across the EU Member States must be addressed, together with **continued shortcomings** in implementation, including the lack of robust, context specific data and indicators to measure progress in the European Research Area (ERA).
- Structural change must take an **intersectional approach** to gender equality to address race and ethnicity, gender identity and sexual orientation, class and economic inequality, and disability. Without attending to other axes of inequality, structural change projects run

the risk that the needs of e.g. non-white and LGBTQ+ individuals will remain un-addressed.

- Structural change must be applied in the **Business Enterprise Sector (BES)²**. The BES is a crucial R&I employer but shows a continued and severe gender gap among R&I staff. Significant amounts of public funding are spent by the BES. Thus, BES should be included in the structural change effort with a view to

1 | The Committee on the Elimination of Discrimination against Women defines temporary special measures as “positive action, preferential treatment or quota systems to advance women’s integration into education, the economy, politics and employment”.

2 | The term Business Enterprise Sector is used in line with Organisation for Economic Cooperation and Development (OECD), *Frascati Manual 2002: The measurement of scientific and technological activities - Proposed Standard Practice for Surveys on Research and Experimental Development*. OECD, Paris, 2002.

creating fair and non-discriminatory working conditions and addressing the research and innovation needs of all.

Introduction

The European Union has been a privileged space to develop rules and standards for gender equality in Research and Innovation (R&I). Structural change³ is today a dominant approach to fostering gender equality in Research Performing and Funding Organisations (RPOs and RFOs) in the EU. Structural change is a win-win approach, which, ideally, firstly contributes to eliminating persistent gender barriers such as gender bias, sexist and hostile environments and sexual harassment, lack of institutional work-life balance measures, etc. Secondly, as structural change fosters gender diversity and the integration of the gender dimension into R&I content, it also has a positive impact on the excellence, robustness, interdisciplinarity, responsibility and creativity of R&I outcomes. Thirdly, since gender balance in management and board positions is

3 | In this policy brief, the term “structural change” is used instead of the term “cultural and institutional change” or “institutional change”. The term structural change more fittingly describes the complexity of the change process in organisations, which must occur at four inter-related levels: symbolic (cultural), institutional, inter-personal and individual, in order to achieve sustainable impact. Institutional and cultural aspects are only two of the four constitutive parts of the structural change approach. The term structural change is used by EIGE (see <https://eige.europa.eu/gender-mainstreaming/toolkits/gear/why-change-must-be-structural>), by the Commission Expert Group (European Commission 2012) that delivered initial recommendations as well as Members States (e.g. Lithuanian Presidency conference organised with EU funding in November 2013 with the title Structural Change Promoting Gender Equality in Research Organisations).

related to increasing financial benefits, the organisation’s competitive edge, job satisfaction and staff productivity, organisational attractiveness and social responsibility, it also leads to environmental initiatives and eco-innovations (EFFORTI 2017).

Policy framework

In 2010, the Council of the EU (10246/10) highlighted the concept of structural change, aiming at eliminating gender barriers in scientific recognition and career progression. In its 2012 Communication, the European Commission (COM(2012) 392 final) committed to fostering gender equality and the integration of a gender dimension in Horizon 2020 and specifically invited Member States to “engage in partnerships with funding agencies, research organisations and universities to foster cultural and institutional change on gender – charters, performance agreements, awards”. In 2015, the European Parliament (2014/2251(INI)) highlighted the need to fund structural change policies as well as to provide incentives and link funding to gender standards. The Council Conclusions of 1 December 2015 on Advancing gender equality in the European Research Area (14846/15) acknowledged these previous messages and reinforced them further.

Despite the robust policy framework, there is an imbalance in the EU in the uptake of the structural change approach. EU-15 countries as well as higher innovation countries have tended to make structural change a key element of their national policy framework for gender equality in R&I more often than EU-13 countries and lower innovation countries (SWG GRI 2018). Even in countries where structural change is part of the policy framework, there are shortcomings related to its implementation as well as monitoring and evaluation. Furthermore, the structural change approach has so far focused on gender equality with-

out attending explicitly to other axes of inequality; structural change has also been promoted chiefly in the public research and higher education sector and among public RFOs but not in the BES.

Structural change: definition and compulsory elements

- Structural change is far more than just the adoption of a gender equality plan in an institution. It addresses change at four inter-related levels: the symbolic (cultural), the institutional, the inter-personal and the individual. Regular monitoring and evaluation of the actions is necessary so as to understand which actions work and what their impact is.
- Achieving structural change requires a complex and comprehensive set of actions addressing the three main ERA gender equality objectives simultaneously: (1) Removing barriers to the recruitment, retention and career progression of women researchers, (2) Addressing gender imbalances in decision making processes and (3) Integrating the gender dimension in research and innovation content. Reducing gender equality policies to only one of the objectives (e.g. increasing the share of women in STEM) risks that the gender-unequal culture will continue in academia because structural barriers are not tackled and might even be reinforced.
- Gender is socially constructed which means that gender relations are constantly (re)constructed in professional settings, among other social domains, based on gender stereotypes and perceptions that are often unconscious. The prevalence of gender bias and stereotypes in research and higher education is all the more problematic as the academic culture largely builds on the value of meritocracy. However, meritocracy cannot exist in biased systems.

- Gender must always be addressed as intersectional, through an analytical framework that examines interlocking and intersecting systems of power between gender and other social categories and identities, such as ethnicity, migration, gender identity, sexual orientation, socio-economic status and disability.
- Structural change is a complex systemic challenge which will only be successful if top-down and bottom-up approaches meet and complement each other.

Recommendations

Gender mainstreaming of policies

To achieve sustainable change towards gender equality, a gender mainstreaming approach to policy-making is needed, including the retention of gender equality as a policy objective for the ERA. All R&I policies at European as well as national level must consider their potential gender specific impacts. Furthermore, gender has to be considered in all steps of policy implementation including budgeting⁴ and monitoring and evaluation, not only in topics explicitly mentioning gender.

Disruptive measures

Decades of gender equality efforts in the European R&I field have produced some advancement and valuable changes in RPOs and RFOs, but the speed of change is too slow. In order to achieve substantive change in coming years, ambitious temporary special and disruptive measures need to be applied both by the European Com-

⁴ | Importantly, DG RTD has not been doing gender budgeting, failing to implement the 2017 recommendations of the European Parliament (IPOOL_STU(2019)621801).

mission and the Member States through coordinated objectives.

- Temporary special measures such as quotas to increase women's participation in managerial and decision-making positions as well as in fields where they are underrepresented have proven to be effective and need to also take into consideration multiple forms of discrimination.
- Novel disruptive measures such as reverse mentoring or leadership initiatives for women professors should be introduced, together with sanctions for the failure to comply and implement. These measures should be evaluated and lessons learned should feed into structural change initiatives.
- In Horizon Europe, the Commission should include a section on gender (similar to ethics in Horizon 2020) in funding applications covering both human resources and management and the gender in R&I content.
- In the evaluation of Horizon Europe projects, gender balance should be used as a first ranking factor (before SME participation) for ex-aequo proposals. To avoid mere name-dropping, implementation of the gender-related team composition should be checked during the mid-term review.

Budget and incentives

Linking structural change and funding is a strong, if not the strongest, incentive. Provision of financial resources stimulates the uptake of structural change among RFOs and RPOs; financial incentives can also stimulate friendly competition, collaboration and emulation among RPOs and RFOs, as the Athena Swan attests. The importance of the national (and even regional) level must not be under-estimated, and the recommended measures should therefore be implemented both by the Commission

in Horizon Europe and national funding programmes at Member State level, and synergies between them should be created, particularly through the use of the Structural and Cohesion Funds.

Specifically:

- The Commission should continue a dedicated funding line in Strengthening the ERA part of Horizon Europe, with budget allocation significantly increased compared to Horizon 2020.
- The Commission should aim to bridge the gap between countries that are more and less advanced in gender equality (according to ERA Progress Report 2018 only 16.5% of RPOs in EU-13 countries have introduced a gender equality plan, compared to 67.1% in EU-15 countries). This should be done by earmarking dedicated funding for gender-specific structural change projects within the "Sharing excellence" part of Horizon Europe (e.g. via Twinning/Teaming schemes). Also, the Commission should make the Widening funding contingent upon the funded projects including as an obligation structural actions toward gender equality that would be sustained after the implementation of the project.
- In Pillar III of Horizon Europe, the Commission should require applicants to ensure that project management and/or business strategies include gender equality related activities and address the gender dimension of innovation, including SMEs and scale-ups.
- Member States are strongly encouraged to make use of the Structural Funds 2021-2027 to implement structural change projects at national level. This should be done by defining policy objectives, allocating dedicated funding for structural change projects implemented by national RPOs and RFOs and introducing appropriate indicators. For example, the Czech Operational Program Research, Development and Education 2014-2020

contained Priority line 2 Development of higher education institutions and human resources for research and innovation, which *inter alia* provided “support for balance professional advancement of women and men researchers in line with the cultural and institutional change approach for achieving gender equality...”.

- An award scheme like Athena SWAN should be introduced in the entire EU to incentivise RPOs and RFOs to implement, monitor and evaluate structural intersectional gender equality actions, including the differentiated stages (bronze, silver, gold) to allow for a modular approach involving institutions with no actions in place at the moment.
- In funding programmes, RFOs are invited to introduce budget top-up for applicants that address gender equality at a structural change level. Alternatively, a portion of overheads should be ring-fenced for structural gender equality actions.
- RFOs are further invited to introduce specific funding programmes for women in innovation and technology fields. An example of good practice is the Laura Bassi 4.0 programme introduced by the Austria Research Promotion Agency (FFG) which provides R&I funding to women for digitalization related projects.
- Grants focused on fostering excellence should provide a bonus to applicant/hosting institutions with structural change initiatives in place or specifically awarded for their commitment and progress made on gender equality.

Monitoring and evaluation

Comparable data is the baseline for an objective assessment of the current situation and for identifying potential gaps and differences among countries, thus giving them visibility. Currently, there are only few indicators addressing structural change available at European, national or RPO level. Com-

mon standards and internationally comparable statistics must be introduced and further improved. Data serves to demonstrate developments / ongoing changes (“no measurement, no improvement”). Hence, both qualitative and quantitative data is needed, including field- and context-specific data. The She Figures, for instance, are often a starting point and reasoning factor for national authorities to advance gender equality. However, monitoring and information about structural change adoption is currently very limited and unreliable.

- The Commission should learn from the insufficiencies of the current ERA monitoring system for ERA Priority 4 (see GENDERACTION 2018 and especially GENDERACTION 2019) to revise the monitoring system in order to better capture advances in gender equality. The current headline indicator is not appropriate, sends the wrong message and stalls gender equality activities in inactive countries.
- For the future of the ERA, the Commission should set up an expert group to develop recommendations on how to assess the implementation of structural change. This should be done prior to the next edition of She Figures 2021 so that the contract can already reflect this.
- Member States should take up the results of this expert group to revise their monitoring at national level in relation to the structural change and ERA Priority 4 objectives.
- The Commission and Member States should continue to promote the development of gender-disaggregated and intersectional data. This may include exchanges of good practice and mutual learning exercises.
- RFOs, including the European Commission, should increase the time span for monitoring and evaluation of funded structural change projects’ impact in order to assess their long-term impacts.

Sectors covered

Given the tremendous importance of the BES in research and innovation, fostering structural change within the BES would have a considerable multiplier effect. Start-ups and SMEs, in particular, do not have a structural change approach to gender, and the venture capital-industry is not gender-sensitive, with minimal volumes of venture capital invested in women-owned start-ups. The only existing tool at the EU level in this area – the EU prize for women innovators – is not a structural measure. Including all sectors will also broaden the understanding of innovation, extending it towards social innovation.

- The Commission and the Member States are encouraged to fund structural change projects specifically for start-ups and innovative SMEs. Such funding should be “low threshold” in order to stimulate uptake among SMEs.
- A bonus should be introduced in funding programmes aimed specifically at BES, to advance gender equality through implementing structural change processes.
- For Horizon Europe, Article 33 in the current model grant agreement for Horizon 2020 projects is an important legal base and must be kept in a comparable form. SMEs, start-ups etc. must not be exempt from this article.
- The EU prize for women innovators should be extended to also include social innovation.
- The Commission should contract a study on the benefits of structural change on start-ups and innovative SMEs.

Capacity building

The structural change process is a comprehensive process that requires the involvement of various types of stakeholders and specific forms of stakeholder mobilisation and communication. Successful implemen-

tation is contingent upon the availability of capacities and capabilities (knowledge, skills and attitudes). Hence, incentives should continue be provided for exchange, mutual learning and capacity building.

- The Commission and the Member States should further stimulate exchanges on good practice and mutual learning among relevant stakeholders, especially from the BES due to the lack of such initiative in the sector to date.
- Structural change projects should continue to provide funding for mutual learning and training activities, with a view to building capacities at the institutional level of implementing organisations and to share examples of working practices across European institutions and across sectors.

Acknowledgement

GENDERACTION wishes to thank the representatives of the following structural change (Gender Equality Plan) projects funded under Horizon 2020 and FP7 who contributed to discussions through participation in a workshop organised in Berlin in March 2019: GEECCO, TARGET, Baltic Gender, SAGE, EQUAL-IST, LIBRA, GENERA, EGERA, TRIGGER, GENOVATE, GENDERTIME, INTEGER, GENIS LAB, CHANGE, R-I PEERS, SPEAR, SUPERA, GEARING ROLES, Gender-SMART as well from related projects EFFORTI and GENDER-NET. The participants were then invited to comment and contribute to the draft text of the policy brief in July 2019.

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DISRUPTIVE MEASURES FOR GENDER EQUALITY IN RESEARCH AND INNOVATION

This GENDERACTION Policy Brief presents policy recommendations on disruptive measures for gender equality which we consider necessary to initiate substantive changes in R&I, together with inspiring examples at policy, Research Funding Organisation and Research Performing Organisation levels.

Why we need disruptive measures

Decades of gender equality efforts in European R&I have produced some advancement and valuable changes in Research Performing Organisations (RPOs) and Research Funding Organisations (RFOs) as well as at the policy level, but **the speed of change is too slow**. To initiate substantive change for the coming years, **disruptive measures need to be applied both by the European Commission and the Member States through coordinated action**.

The concept of “disruption” has garnered attention in recent years in the STEM field, particularly regarding “disruptive technologies” and “disruptive innovation”. We use this concept in the field of gender equality policies to refer to **measures that have the potential to produce significant and bold changes in the status quo in the short to medium term** and with possible impact on the improvement of the working conditions of underrepresented groups in

R&I (LGBTQ+, ethnic minorities, people with disability, people with lower socio-economic status, etc.).

Substantive equality is one of the main principles of gender equality policies and a women’s right. It means real or de facto equality in opposition to formal equality since mere non-discrimination statements

We argue here that to achieve substantive gender equality in R&I, disruptive measures are required.

in legislation do not lead to substantive equality. First, **the objective of substantive equality gives legitimacy to the need for differential treatment** of social groups that have been subjected to persistent historical discrimination, in this case in the R&I field. Second, **it follows that corrective measures should address existing imbalances.** The “same treatment” approach in the background of the individualistic value system dominant in the R&I precludes a discussion of imbalances in the starting positions as well as structural barriers and biases in the way merit is attributed.

Disruptive measures for Gender Equality in R&I

For the GENDERACTION community, **disruptive measures in the R&I field can take two forms** according to the objective of the measures and the institutional level at which they would be applied:

First, **temporary special measures** aiming at correcting gender imbalances such as women’s underrepresentation among research staff but especially in decisionmaking and leadership positions. According to the CEDAW Committee of the UN¹, **temporary special measures are a means to make substantive equality a reality rather than an exception to non-discrimination norms.** These measures aim to correct women’s underrepresentation - especially those belonging to vulnerable groups that suffer multiple forms of discrimination – in the different areas of the public domain as well as in the distribution of resources and power between women and men. **These measures are conceived as temporal** since they are expected to be suspended once the desired results

¹ | The CEDAW Committee is in charge of the monitoring procedure around the UN Convention on the Elimination of All Forms of Discrimination Against Women.

Two forms of disruptive measures:

- temporary special measures addressing gender imbalances
- ambitious measures addressing structures

have been achieved and sustained for a reasonable period of time. Such special measures would be aimed at reaching a specific, clearly defined objective (read numerical goals achieved within defined time frames). Far from being the exclusive domain of the Public Administrations, they can be voluntarily applied by companies, public and private institutions, and political parties. **It follows that the institutions of the R&I system that can apply temporary special measures include public authorities in R&I, universities, RPOs, RFOs, among others.** This type of disruptive measures can comprise a **double strategy**: 1) quotas for the participation of women or **preferential treatment** in recruitment, promotion and awards in different stages of these processes until the objective is reached; 2) **special programmes or services** for women only such as, inter alia, mentoring programmes with a specific funding line.

Temporary special measures to increase women’s participation in the underrepresented fields and decision-making positions **have proven to be effective** and need to also take into consideration multiple forms of discrimination in an **intersectional perspective.**

Second, **ambitious measures that address formal and informal structures** of

research institutions in a way that power relations are changed substantially. Here, GENDERACTION proposes the implementation of measures towards gender-responsive organisations, such as centres of excellence of the future: **horizontal structures, collaborative leadership, staff participation in R&I policies, new politics of time to make the R&I system compatible with care work, among others**. This second modality of disruptive measures is based on **two assumptions**: a) significant changes in R&I institutions have the power to shape the research system overall and research careers in particular; and b) addressing hierarchical structures in R&I and the aggressively competitive model of a research career are also the concern of gender equality policies in the field.

This second modality of disruptive measures will bring a change in the dominant model of the R&I system, hence **they cannot be considered as being temporary**. Finally, because these disruptive measures entail a qualitative change of the system, they will present difficulties in the design and evaluation of measurable objectives.

What disruptive measures are NOT

For clarification purposes and according to the criteria adopted above, it may be useful to give some examples of what GENDERACTION **does not consider to be disruptive**:

- Adopting **documents** on gender equality (declarations, ethical codes, gender equality plans, protocols on sexual harassment...)
- Developing **gender equality structures** (gender equality commissions, gender equality units...) in research institutions
- Organising **trainings and events** on gender equality as well as publications to make women scientists visible

- **Work-life balance measures** such as flexible hours and care facilities
- **Sex/gender analysis in research content** as an evaluation criterion in research calls

We do not intend to claim that these measures are not part of structural changes or that they are not crucial to advancing gender equality. While they do not have the disruptive potential of producing tangible changes in the short term, all these measures and others tailored to each organisation are the basis for professional gender equality policies and thus provide sustainability to the effects expected through disruptive measures.

Examples to get inspiration

Temporary special measures are not new. **There is a long tradition of positive action measures in the education field to promote women and minority group representation in many countries**. Different institutions have pioneered taking decisive action to promote gender equality in R&I by showing that it is possible to go beyond the more ubiquitous measures:

At Governmental level:

- The **Swedish Government** has required universities to set **quantitative goals for the share of women among newly recruited full professors**. Concretely, a percentage for a 3-year period (2017-2019) is given to each university. For instance, Luleå Technical University has a goal of 33% women among professors recruited in the period, which is a much higher percentage than the share of women among all professors employed at present.
- The **Austrian Federal Ministry of Education, Science and Research** promotes more **gender-appropriate research-mission statements, career**

models and selection procedures at public universities that will take into account the life-phase and biographical circumstances (reconciliation of work/study with care responsibilities, work in the economy or in civil society organisations).

- The **Czech Higher Education, Research and Science Section of the Ministry of Education, Youth and Sports** has introduced a directive on gender balance in advisory boards and evaluation committees. The **target of 40%** of both sexes will be monitored on an annual basis.
- The **Israeli Ministry of Science and Technology**² promotes **scholarships for women** in science and technology in honor of Shulamit Aloni and for women in Engineering Masters Programmes with specific funding to facilitate women's research career in the STEM fields. Moreover, the **Council for Higher Education** offers a limited number of scholarships for women to pursue a postdoctorate outside of Israel, which is usually considered a minimum criterion for a tenure-track position in Israeli universities.

By Research Funding Organisations:

- The **Swiss National Science Foundation** has developed different **career funding instruments targeting women researchers** such as PRIMA Programme and the Gender Equality Grant. Indeed, other disruptive measures are planned for the next period (2021-2024) including a women-only funding instrument at the PhD-level in MINT-disciplines and a minimal quota for women in the National Research Council.

By Research Performing Organisations:

- The **Eindhoven University of Technology**³ has recently launched a special **recruitment programme exclusively for women for a given period**.

- The **Masaryk University** has included a **bonification of projects** with researchers returning from parental leave who will have a key role in the project as part of an internal competition to fund interdisciplinary projects through the University Grant Agency.
- Since 2014, the **CERN** offers a professional opportunity for keen scientific or engineering talent with a common experience: a **temporary absence** from the field for personal reasons such as family, caring responsibilities, or health issues **for at least 2 years**⁴.
- Since 2015, the **Austrian university bodies and boards** are required to have at least **50% of female members**. The quota is monitored annually, as universities have to include an indicator concerning the implementation of the women's quota in their intellectual capital report.
- At **Universitat Politècnica de Catalunya**, a **gender coefficient** has been included in the evaluation of female candidatures for promotion to full professor category (their evaluation is marked up).

The aim of the examples listed above is to provide **practical examples of measures** that have the potential of being disruptive in the field of Gender Equality in R&I. However, a careful and professional evaluation of the outcomes and impact needs to be provided in the coming years.

2 | See our report on National roadmaps and mechanisms in ERA priority 4.

3 | See their website: <https://www.tue.nl/en/news/news-overview/17-06-2019-tue-vacancies-for-academic-staff-exclusively-for-women-for-the-time-being/>.

4 | See their website: <https://diversity-and-inclusion.web.cern.ch/2015/05/post-career-break-fellowship>.

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GENDER PERSPECTIVES IN INTERNATIONAL COOPERATION IN SCIENCE, TECHNOLOGY, AND INNOVATION

Analysis conducted by the Horizon 2020 project GENDERACTION reveals that most EU and non-EU policy documents related to international cooperation in science, technology and innovation (STI) adopt a gender-blind approach, especially in the case of bi- and multi-lateral agreements. The present Briefing Paper highlights key gender issues for international STI cooperation and presents a set of recommendations for better promotion of gender equality in policy design and implementation in STI at the international level.

Gender and international STI cooperation as a policy priority

Gender equality is a **core objective** of [EU external action](#). In line with the EU Gender Equality Strategy 2020-2025, the EU promotes gender equality and women's empowerment in its international partnerships with third countries¹. The next Framework Programme, Horizon Europe, aims at

achieving the Sustainable Development Goals, including targeted impacts for SDG 5 Gender Equality.

In 2015, the Council of the European Union adopted Conclusions on Advancing Gender Equality in the European Research Area which invited *"the Commission and Member States to consider including, among others, a gender perspective in dialogues with third countries in the area of*

1 | "A country that is not a member of the European Union as well as a country or territory whose citizens do not enjoy the European Union right to free movement, as defined in Art. 2(5) of the Regulation (EU) 2016/399 (Schengen Borders Code)" (Source: https://ec.europa.eu/home-affairs/what-we-do/networks/european_migration_network/glossary_search/third-country_en).

For the list of third countries as defined by the European Commission, see: https://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016-2017/annexes/h2020-wp1617-annex-a-countries-rules_en.pdf.

science, technology and innovation (STI)”. The Council also invited the Strategic Forum for International S&T Cooperation (SFIC) and the Helsinki Group on Gender in Research and Innovation (HG) “to consider developing joint guidelines on a gender perspective for international cooperation in STI”.

In response to this invitation, SFIC and the ERAC Standing Working Group on Gender in Research and Innovation (former HG) conducted a survey in 2017 showing that **very little effort was made by the EU Member States (MS) and Associated Countries (AC)² to mainstream gender in international cooperation in STI**. The two groups concluded that:

- EU Member States and Associated Countries should consider taking additional measures with a view to better integrating gender issues in international STI cooperation **at the agreement level as well as operational level** (work programmes, joint calls, evaluation, etc.) for both governmental institutions and research funding / programme management institutions.
- There is a clear scope within the EU collaboration framework to start working on **common guidelines** as many countries would appreciate **best practices, concrete examples, and a common approach**.
- The **European Commission should consider taking up these issues** (both gender equality and gender-related research in projects) in its international cooperation initiatives and dialogues

2 | A non-EU country that benefits from the same conditions of participation to Horizon 2020 as EU Member States. For the list of Associate Countries as defined by the European Commission, see: https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cpart/h2020-hi-list-ac_en.pdf.

and in the context of its internationalisation strategy and activities in the next EU Framework Programme. Moreover, **gender aspects should be addressed in the evaluation of the calls** involving project partnerships with non-EU partners, as appropriate.

To follow up on this work, GENDERACTION developed a **checklist for policy makers** to provide further guidelines on integrating gender issues in international STI cooperation. In addition, in 2019, GENDERACTION:

- surveyed national authorities and Research Funding Organisations for **policy developments** in EU MS and AC regarding gender equality in international STI cooperation;
- reviewed **international literature** on the subject;
- surveyed **Third Country organisations** that focus on women and gender in STI on the needs and priorities regarding international cooperation in STI; and
- organised **mutual learning workshops** to build further knowledge and discuss the emerging recommendations relevant to Third Country concerns.

Why implementing gender perspectives in international STI cooperation is important

It is well recognised that significant global inequalities exist not only in economic and political dimensions but also in the **epistemic** one, which concerns the **opportunities to produce and use knowledge and to have one’s knowledge recognised as authoritative**. These inequalities, often gendered, have been repeatedly shown to be a result of long-term historical, colonial, and postcolonial developments.

International cooperation in STI does not remedy these historical inequalities automatically but **may, in specific cases, rein-**

force them. If researchers from non-Western countries and women in particular are engaged in collaborative research on unequal terms, international cooperation can become unjust and produce inferior knowledge. **This can result in missed opportunities for revising existing concepts and theories and contributing to Sustainable Development Goals in the most effective way.**

Importantly, international cooperation in STI has the power to mitigate inequalities that exist in the collaborating countries and institutions. To achieve this, it is necessary to develop new (kinds of) partnerships on equal footing, making sure that European collaborations do not unreflexively plug into existing power and knowledge infrastructures, including ones relating to gender, whereby they collaterally reproduce them.

Gender and international STI cooperation: still a long way to go

To date, the policies of the EU, EU Member States and Associated Countries on international cooperation in STI **rarely reflect existing knowledge related to gender and other inequalities.** The survey among national authorities and research funding organisations in the EU Member States and Associated Countries carried out in 2019 and the comparison of the survey data with findings from the 2017 SFIC-SWG GRI survey, leads to the following conclusions:

- Gender equality in international STI cooperation received slightly more attention in 2019 than in 2017; it tends to be included as a **value** with the definition of **several objectives to promote women in STI.**
- A significant, though still limited, number of national authorities is willing to **take action** in the future **if adequate support is provided.**

- Efforts are being made by a majority of **Research Funding Organisations** to formulate their programmes and calls in such a way that they **do not discriminate**, directly or indirectly, **against women or researchers with caring responsibilities.**

Despite this, difficulties persist:

- The **inclusion of gender aspects in bi- or multi-lateral agreements in STI cooperation is limited.** The main reason given is that this is addressed on the operational level of programmes and calls.
- There is a **lack of examples and guidelines, support for human resources and availability of financial resources**, and this continues to make it difficult for national authorities to include a gender perspective in STI cooperation (e.g. joint research calls, joint calls for proposals).
- Most national authorities and Research Funding Organisations **do not monitor or evaluate gender aspects in their international STI cooperation** and few are willing to take up monitoring in the future.

The survey among organisations from third countries focusing on women and gender in STI affords a **first glance at non-EU regions' challenges and insights on gender issues in international cooperation in STI.** The survey results were confirmed by exchanges at two mutual learning workshops.

Main messages:

- There are many **obstacles** to women's participation in international STI cooperation that are shared among all the world regions. These include **stereotypes and toxic behaviours** in schools and higher education; **work-life balance issues; economic and material issues;** and **systemic gender discrimination.**

- There is a **lack of information** about whether actions are being taken in international STI cooperation. Around 20% of the respondents think that gender issues are addressed in international STI cooperation between the EU and their country, 37% think that they are not and a full **43% do not know if gender is addressed in their countries' international cooperation in STI**.
- Moreover, when actions are in place, in many cases they are either **not suited to women's situations**, there are **not enough of them**, or they tend to **benefit privileged groups of women**.

The survey respondents made several **propositions** on how to improve the current situation, which were supported at the mutual learning workshops:

- There is a **need for more awareness raising** and **education** among political representatives, industry, youth and society in general.
- **Adequate funding and material support** would ensure that gender issues are considered at all levels (research content, research teams, projects, etc.).
- A **grassroots** and **intersectional perspective** is necessary to prevent the reproduction of discrimination in international STI cooperation.

Although the implementation of gender issues in international STI cooperation is a policy objective, limited efforts have been made by the European Commission, EU Member States, Associated Countries and Research Funding Organisations since 2017 to address the issue in their agreements and funding schemes. These actors have an essential role to play in the making of a fairer, more robust, and effective R&I that will contribute to achieving the Sustainable Development Goals, the Union of Equality and the Strategic Plan for Horizon Europe.

Recommendations

These recommendations build on the objectives of the EU Gender Equality Strategy 2020-2025 in relation to international partnerships and cooperation³ and the ERAC Opinion on the Future of ERA⁴.

For specific recommendations to the European Commission and Horizon Europe implementation, see GENDERACTION Policy Brief No. 6.⁵

Recommendations to all stakeholders:

- 1) Prevent the negative environmental and social impacts of academic mobility:
 - If possible, **international physical mobility should not be mandatory** and **funding should be provided for alternative modes of mobility**, i.e. virtual mobility, as part of the programme and project budgets. This will benefit people with caregiving commitments whose flexibility and mobility may be limited. It also contributes to issues of safety, as international mobility may be putting women at particular risk of gender-based violence. In addition, it contributes to the environmental sustainability of academic practices.
 - Provide **funding for the development and use of high-quality remote/virtual**

³ | The EU Gender Equality Strategy is available at https://ec.europa.eu/info/policies/justice-and-fundamental-rights/gender-equality/gender-equality-strategy_en.

⁴ | The ERAC Opinion on the Future of ERA, published on 23 January 2020, is available at <https://data.consilium.europa.eu/doc/document/ST-1201-2020-INIT/en/pdf>.

⁵ | GENDERACTION Policy Brief No. 6 is available at https://genderaction.eu/wp-content/uploads/2018/07/GENDERACTION_PolicyBrief_FP9_IntCooperation.pdf.

modes of communication, including, if possible, infrastructural, and technical investments.

Recommendations to national authorities and the European Commission:

2) Create a joint strategic approach for gender equality in international cooperation in STI:

In line with the EU Gender Equality Strategy 2020-2025 and the ERAC Opinion call for “a joint strategic approach for international cooperation as well as for regulation mechanisms to reduce policy fragmentation and unnecessary duplication” under future priority 2, and specifically “ensuring closer collaboration between MS and the EU Commission on international cooperation”, future policy for international cooperation in STI should address gender equality aspects as a general guiding principle as well as, as specific areas of cooperation activities.

Recommendations to all Research Funders, including the European Commission:

3) To prevent the reproduction of subordinate integration of third countries’ research teams in consortia and the reinforcement of unjustified global epistemic inequalities, including gender inequalities:

- In the wording of research calls, **encourage appropriate forms of engagement of all research participants involved**, taking into account their expertise and experience, to mobilise the full potential of the whole consortium for analytical and conceptual work.
- Make requirements for a clear statement on the appropriate and legitimate sharing of **Intellectual Property Rights** within the consortium defining a specific mechanism that could be used in the case of conflicts and disagreements. The guiding principles should include equitable access to data and fair authorship allocation within international research teams and consortia.

- Include a **provision in the framework agreement or contract** that participating researchers in comparable positions be employed on the **same salary terms** regardless of their gender.
 - Consider **anonymisation and different career paths (e.g. career breaks)** in hiring processes and funding applications. Also, consider those aspects at the evaluation stage.
 - **Do not apply strict age limits as eligibility criteria, especially in mobility schemes**, as researchers caring for children may only become more mobile in the later stages of their career trajectory.
 - **Provide effective assistance** to researchers and their family **with visa and immigration procedures** once a researcher has been accepted for a position, including researchers’ same-sex partners who may not be officially recognised in the researcher’s home country.
 - Implement **effective mechanisms to report and deal with sexual harassment and gender-based violence** in the receiving EU countries.
- 4)** To strengthen the role of local communities and grassroots civil society organisations:
- Make a **special effort to reach women researchers for collaboration** (see the list of organisations in third countries that deal with women and gender in STI on [GENDERACTION website](#)).
 - Where appropriate, encourage the **inclusion of actors from local communities and civil society organisations**. This should constitute one of the criteria in the evaluation in relevant funding schemes.
 - Where appropriate, reserve a **designated share of the programme or project budget** for actors from local communities and civil society organisations, including women’s organisations.

5) To provide space for a proper negotiation of research objects and interests that will equally benefit all parties involved:

- **Encourage and support project activities aimed at negotiating shared research objects across all parties involved** (including different disciplines, academic and non-academic collaborators, and researchers with different cultural backgrounds). While these activities would probably be most relevant at the beginning of a research project, they should also be iterated throughout to reflect its course. The encouragement and support should best be worded in the call for funding and in budgeting conditions, as well as in the proposal evaluation criteria.
- Do not evaluate the success of a project strictly based on established quantitative bibliometric indicators. **Facilitate and recognise publications in different languages and for various relevant audiences as well as the possible impact on local communities.**

6) To articulate gender and the possible gendered impacts of research and innovation in content:

- Require an **obligatory consideration of gender in research and innovation content** in submitted research proposals.
- **Provide funding to explore and monitor the unintended gendered aspects and consequences of research projects**, as they may emerge in later stages of research.

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HOW TO PROMOTE GENDER IN PARTNERSHIPS

The Committee on Industry, Research and Energy (ITRE) of the European Parliament will discuss in the coming weeks Horizon Europe partnerships. Moreover, the ITRE Committee recently held a structured dialogue with the Commissioner for Innovation, Research, Culture, Education and Youth to discuss the key priorities of the Commission in Research and Innovation (R&I). [GENDERACTION policy briefs on Horizon Europe](#) have aimed to influence the negotiations on every aspect of the new Framework Programme. **This policy brief on European partnerships has been prepared with the target of reaching the discussions at the European Parliament level and supporting members of the ITRE Committee in its commitment to promote gender equality in R&I.**

Horizon Europe Partnerships

The status of gender issues in H2020 Co-fund initiatives has been quite uneven. While some Joint Programming initiatives such as the [JPI Climate](#) have addressed gender issues, others have taken into account neither gender balance nor sex/gender analysis in their joint activities. This is not surprising given that in almost none of the official documents on partnerships, there is a mention of gender issues. The time has come to mainstream gender in the future partnerships of Horizon Europe in a focused and consistent manner. One of the first challenges for future partnerships in Horizon Europe is to close the gap among the more and less experienced partnerships in gender equality policies in R&I.

According to the [Strategic Plan 2021-2024](#), European Partnerships are initiatives

where the EU together with private and/or public partners commit to jointly support the development and implementation of a programme of R&I activities. Partnerships are therefore considered to be in a unique position to address complex challenges that require an integrated approach since they bring together a wide range of actors across countries on the basis of a common vision and a shared roadmap.

The Strategic Plan 2021-2024 has identified 16 co-funded European partnerships and 12 co-programmed partnerships while the one on Pandemic Preparedness may be co-funded or co-programmed. Although there are also institutionalised partnerships based on Article 185/187 of the TFEU, this policy brief focuses on recommendations applicable to most of the actions developed in co-programmed and co-funded European partnerships:

CO-PROGRAMMED

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe.

CO-FUNDED

Based on a joint programme agreed by partners, commitment of partners for financial and in-kind contributions & financial contribution by Horizon Europe.

Source: Shadow SPC. Horizon Europe. Workshop 22 January

How to Promote Gender in Partnerships

GENDERACTION recommends different actions to be considered by the ITRE in their discussions on Horizon Europe partnerships both at the governance level and at the co-funded projects level:

Governance level European Commission

- Co-funded European partnerships have to use the standard Horizon Europe award criteria as **selection criteria for co-funded projects**, that is, “Excellence”, “Impact” and “Quality and Efficiency of the Implementation”. It is crucial that the European Commission (EC) highlight and clarify the necessary gender perspective when considering these selection criteria.
- All partnerships need to establish a monitoring system to track progress towards objectives and impacts (KPI). An EC recommendation to incorporate **gender indicators in partnership KPIs** may well contribute to mainstreaming gender in the whole partnership performance.
- In order to facilitate the process of systematically integrating gender in future partnerships, gender expertise – at least external, ad hoc advice – should

be considered in all the **governance structures and decision-making bodies** of the EC regarding partnerships. Examples of these structures and bodies include the Strategic Coordination Process (SPC), the Partnership Knowledge Hub, the Independent Expert Group that is supporting the SCP in the design of monitoring indicators, the partnership experts committee that will evaluate Horizon Europe partnerships, among others.

- To support **specific joint initiatives on gender research** in order to advance in the alignment of agendas and objectives regarding gender equality in R&I. Gender studies are an interdisciplinary research field with a wide community of specialised researchers in the ERA. The sustainability of co-funded initiatives such as [GENDERNET Plus](#) that covers transnational research proposals with a particular focus on gender and the UN SDGs should be considered.

High Level Group on Joint Programming (GPC)

- The [GPC](#) has established ad hoc cooperation initiatives with the GENDERACTION project in order to give advice on gender equality policies in R&I to the Group. However, a more systematic cooperation between GPC and SWG GRI

may lead to establishing long-term indicators to **monitor the impact of Joint Programming Initiatives** on alignment and added value for science and society also from a gender perspective.

ERA-LEARN

- Data on partnerships and outcomes in a central IT tool will be available with the support from [ERA-LEARN](#). The data structure to obtain detailed proposal level information and more detailed project level information should consider data on gender balance at both levels. The resulting dashboard should have **sex-disaggregated data and gender indicators** when applicable.
 - Templates of co-funded calls should ensure a consistent and comparable data management system for research projects with gender statistics.
- Information on gender equality as a core objective of the EC for R&I should be strengthened in the RRI guidelines provided on the ERA-LEARN website, including updated related files from the EC on gender equality (e.g. factsheets on GE and information on GEPs). Reports on the status of gender equality and the integration of the gender dimension in partnerships as well as **specific guidelines for partnerships** could also be developed with the support of gender experts.

Gender Expertise Within Partnerships

- **Gender expertise** that can give advice on gender equality policies, gender-sensitive criteria, gender bias and intersectionality, should be included **in the governance structure of every partnership**.
- In order to close the gap between the more and less experienced partnerships in gender equality policies in R&I, **mutual learning and sharing of promising practices** should be in place. These

may take the form of regular exchanges among different working groups on gender issues through networks or communities of practices.

Co-funded projects level

Topics

- Research Funding Organisations (RFOs), both public and private agencies and Ministries with competencies in research funding, as key players of European partnerships, should count on gender experts – at least external, ad hoc advice – when defining topics. This is crucial for a proper integration of **sex/gender analysis and the intersectional perspective** demanded by the EC. European Partnerships may consider including gender-specific topics in the joint research calls as well as flagging those topics where the gender dimension is relevant.
 - The report [Gendered Innovations II](#) has recently provided examples of research projects in multiple disciplines that successfully address sex/gender analysis and produce scientific results of a high quality as well as significant innovations.

Research Calls

- Research calls of joint initiatives should **encourage women to apply**, especially in those partnerships with a long tradition of women's underrepresentation among PIs and research teams. The communication action should not be targeting women only, but also potential consortia and beneficiary institutions to include more women researchers in the research teams, particularly young women researchers, and to distribute roles and responsibilities in a fair and equitable manner.
 - [QUANTERA II](#) may well be a promising practice due to its Gender Equality Statement in the 2021 call announce-

ment. Gender is mentioned in the composition of research teams, evaluation panels and as one of the tie-breaking criteria. Consider that quantum technologies is a field with a traditional imbalance.

- For those topics that are flagged as “gender” relevant, **training on the integration of gender analysis into research and innovation** could be considered as an eligible cost in joint research calls as a way to promote this expertise within the co-funded projects. The adoption of inclusive and participatory **Gender Equality Plans** (GEPs) in the beneficiary institutions as eligibility criteria for joint research calls, as established in Horizon Europe, could be discussed. Research funders, that are also beneficiaries of the Framework Programme (for instance in the H2020 SwafS programme as well as in partnerships), could become role models in the adoption of inclusive GEPs.

Evaluation Panel & Criteria

- **Gender balance in evaluation panels** of joint transnational calls is in line with one of the objectives of the EC regarding gender equality in R&I: gender balance in decision-making and experts bodies. While several partnerships have already considered inviting more women as reviewers of proposals, STEM partnerships still face difficulties in achieving gender-balanced evaluation panels due to the underrepresentation of women in some fields.
- Co-funded European partnerships have the possibility of reviewing the three Horizon Europe award criteria from a gender perspective. To give some examples:
 - **Excellent science** avoids any bias in the content of research and produces results that benefit the whole society. Thus, gender and diversity perspectives in the content of research could be list-

ed among the assessment criteria for scientific quality.

- **Research impacts** include socio-economic impact as well as the transfer and communication of results to society at large, taking into account women’s and men’s needs. Gender-sensitive communication, including gender balance in communication and dissemination actions and inclusive language, should be encouraged in funded projects.
- **Quality of the implementation** also refers to fair allocation of resources, tasks, positions, and visibility. To give just two examples: gender balance in the leadership of research teams and in the authorship of academic papers.
- The adoption by partnerships of the recently announced policy of the EC for Horizon Europe that makes **sex/gender analysis a mandate in joint research calls** – where applicable – would mean a qualitative leap. This would provide the necessary coherence to the new Framework Programme in terms of avoiding gender-biased research.

Monitoring & Evaluation

- There is room for improvement in the monitoring and evaluation of co-funded projects from a gender perspective. Although some co-fund initiatives consider basic indicators such as sex-disaggregated data of PIs, there is no proper analysis of the co-funded project performance in terms of gender equality, the gender dimension in R&I content and socio-economic impact from a gender perspective.
 - **GENDERNET Plus** can be a source of inspiration for other ERANET co-funds since this consortium has included 16 gender indicators in its monitoring & evaluation procedure that follows a mixed qualitative and quantitative approach to data collection and analysis of co-funded projects.

Conclusions

European Partnerships are intended to play a key role in achieving the EU's strategic objectives on science, technology, and innovation. Addressing the three main objectives of the EC on gender equality in R&I (gender equality in research careers, gender balance in decision-making and leadership, and gender dimension in research content) through partnerships is of utmost importance for the coherent development of the new Framework Programme in terms of responsible R&I. The ITRE Committee **has the opportunity to influence the design of the new partnerships** that will be launched under Horizon Europe by **stressing the message of gender equality** in the dialogues with the European Commission.

GENDER EQUALITY AND RESEARCH AND INNOVATION PERFORMANCE GO HAND IN HAND

The higher a country scores on gender equality, the higher its innovation potential

- There is a positive correlation between the European Innovation Scoreboard¹, Adjusted Research Excellence Indicator² and Gender Equality Index³. **Countries which are interested in increasing their innovation potential should also invest in comprehensive gender equality policies.**
- No complicated calculations are required: countries that are able to use the whole potential of their population (women/parents included) have a higher return on investment spent on their education and training.

The more gender equality in research performing organisations (RPOs), the more innovation and excellence

- There is a positive correlation between the share of RPOs with gender equality plans (GEPs) and the innovation and excellence indicators.⁴ This means that a higher share of RPOs with GEPs is positively correlated with a country's innovation potential.
- Additionally, a country's Gender Equality Index is strongly positively correlated with a higher share of RPOs with GEPs and with the share of women in R&I boards.
- Research shows that diverse teams perform better and make better decisions. Individuals from different genders, races, backgrounds and with different experience bring different perspectives that can lead to innovative solutions. Gender equality measures pay off.

The share of women in R&I is not the only or ideal indicator of gender equality

- The Gender Equality Index is negatively correlated with the share of women in research (both among researchers and among professors/Grade A). A possible explanation for this negative relationship could be that public research is not attractive enough for men, who can find alternative positions in the labour market.⁵ Also, countries with a higher share of women in R&I have total lower expenditures on R&I, and therefore fewer opportunities and lower salaries.⁶ The higher representation of women may indicate poverty of the sector and the fact that women work for lower pay.
- The share of women in Grade A positions is an indirect indicator of progress and will therefore only be effective in the long-term perspective. GEPs appear to be a more precise indicator of gender equality than female representation alone.

Differences between EU15⁷ and EU13 countries

- Compared to EU13 countries, EU15 countries have a higher Adjusted Research Excellence Indicator (52.7 vs 23.3), European Innovation Scoreboard Index (0.55 vs 0.32) and Gender Equality Index (68.2 vs 56.3). They also have a significantly higher share of RPOs that have adopted gender equality plans (67.1 % vs 15.5 %). In many countries, GEPs implementation and regular evaluation are required by law (France, Germany, Spain). **Gender equality policies** in these countries seem to **compensate for the lower representation of women** in Grade A positions.
- **The gap between EU15 and EU13 countries is not insurmountable**, as the examples set by Slovenia, Cyprus and Malta show. What matters are the preconditions and the types of support that aided the development of a comprehensive gender equality policy in R&I.

The European Research Area and Horizon Europe

- The ERA Roadmap defines six priorities for policies to build the ERA at national level: priority 4 is Gender equality and gender mainstreaming in research.
- To implement the ERA Roadmap at national level, countries have developed National Action Plans and Strategies which address gender imbalances particularly at senior levels as well as in decision making and which strengthen the gender dimension in research. Member States and Associated Countries should initiate gender equality policies in research performing organisations and research funding organisations. They should also regularly monitor the effectiveness of such policies and adjust measures as necessary.
- The recently adopted EU Gender Equality Strategy 2020-2025 demonstrates the European Commission's strong commitment to gender equality. In the

area of research and innovation, the Strategy mentions the possibility to require a gender equality plan from applicants, among other things.

- Support for gender equality measures can bring advantages to EU13 coun-

tries not only in terms of innovation, excellence and the general quality of life and the success of the economy, it will also equip the potential applicants to succeed in the new Framework Programme, Horizon Europe.

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- 1 | The European Innovation Scoreboard assesses relative strengths and weaknesses of national innovation systems and helps countries identify areas they need to address. For more see: <https://interactivetool.eu/EIS/index.html>.
 - 2 | <https://ec.europa.eu/jrc/en/publication/adjusted-research-excellence-index-2018-methodology-report>.
 - 3 | The Gender Equality Index is a tool to measure the progress of gender equality in the EU, developed by the European Institute of Gender Equality. It gives more visibility to areas that need improvement and ultimately supports policy makers in designing more effective gender equality measures. It reflects the situation in 6 core domains (work, money, knowledge, time, power and health) and in two additional domains (violence against women and intersecting inequalities) measured in total by 31 indicators. Hence, it provides a context indicator for gender equality in R&I. For more see: <https://eige.europa.eu/gender-equality-index/about>.
 - 4 | The correlation between the share of RPOs with GEPs and the European Innovation Scoreboard Index is 0.732 and the correlation with Adjusted Research Excellence Indicator is 0.751.
 - 5 | Ministry of Education and Science of Republic of Latvia (2016) *Latvian European Research Area Roadmap 2016-2020*.
 - 6 | European Commission (2003) *Waste of talents: turning private struggles into a public issue. Women and Science in the Enwise countries*.
 - 7 | The document works with terminology and number of states as of 31 January 2020, before the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union (EU13, EU15, EU28).

Information in this document is based on GENDERACTION Horizon 2020 Project 741466 (Wroblewski 2019) *Monitoring of ERA Priority 4 Implementation. Deliverable report 3.2*. Available at GENDERACTION website.

WHY WE NEED GENDER IN THE ERA

Gender equality, institutional changes and innovation performance go hand in hand

- There is a positive correlation between the European Innovation Scoreboard¹, Adjusted Research Excellence Indicator² and Gender Equality Index³. Support of gender equality pays off.
- A country's Gender Equality Index is strongly positively correlated with a higher share of research performing organisations (RPOs) with gender equality plans (GEPs) and with the share of women in R&I boards.⁴
- There is a positive correlation between the share of RPOs with GEPs and the innovation and excellence indicators.⁵ An increasing share of RPOs with GEPs is therefore positively correlated with a country's innovation potential.

What has been achieved in ERA Priority 4 so far

- To implement the ERA Roadmap at the national level, countries have developed National Action Plans and Strategies that address gender imbalances, particularly at senior levels as well as in decision-making and which strengthen the gender dimension in research. Member States and Associated Countries should initiate gender equality policies in research performing organisations (RPOs) and research funding organisations (RFOs) and should monitor the effectiveness of such policies and adjust measures as necessary.
- 26 of the 28⁶ EU Member States (MS) participated in the ERA process by submitting and implementing a National Action Plan (NAP).
- For several countries, the ERA Roadmap was the initial spark that triggered the development of their first-ever gender equality strategy for R&I.
- The NAP was the first policy document on gender equality in R&I for 57 % of newer MS but only for 25 % EU15 countries.
- In others, the NAP was used to consolidate and further develop existing policies which support gender equality in R&I.

Gender equality in the ERA: an unfinished work

- Apart from two countries that have not adopted NAPs (Slovakia, Hungary), two other countries saw no need for action because of the high share of women in Grade A positions (Bulgaria and Romania). However, this indicator does not prove gender equality has been achieved (see below).
- In terms of addressing gender equality in the NAPs:
 - Increasing female participation is mentioned in almost all NAPs containing gender equality policies.
 - 72 % of them refer to structural change (GEPs).
 - But only 40 % address the integration of the gender dimension in research content or teaching.
- NAPs show several inconsistencies in the ways priorities, gender equality objectives and actions to reach them are formulated.
- Gender is not mainstreamed across the other ERA priorities.
- There is a difference among EU15 and EU13 countries in implementing ERA Priority 4.

Consequently, it is necessary to strengthen the NAPs as a steering instrument for gender equality in R&I. A more detailed guidance for NAPs development, the involvement of relevant national stakeholders, the consideration of gender equality in other ERA priorities and a meaningful monitoring would further support the steering function of the NAPs.

Monitoring of the implementation of ERA Priority 4: More complex set of indicators needed

- The share of women (in grade A) is not a sufficient indicator for gender equality progress under the ERA: it represents only one of the three ERA gender equality objectives and is negatively correlated with the Gender Equality Index. Higher proportions of women that we see especially in EU13 countries may be actually a result of lower spending on the R&I sector, women working for lower pay and men not finding these positions attractive⁷.
- The share of women (in Grade A) will only be effective in a long-term perspective. Data shows that GEPs are a more precise indicator of gender equality.
- A combined approach to monitoring is strongly recommended using existing quantitative indicators (e.g. She Figures), qualitative indicators derived from NAP documents and additional information provided by MS (e.g. through a report on NAP implementation).

1 | The European Innovation Scoreboard assesses relative strengths and weaknesses of national innovation systems and helps countries identify areas they need to address. See more here: <https://interactivetool.eu/EIS/index.html>.

2 | <https://ec.europa.eu/jrc/en/publication/adjusted-research-excellence-index-2018-methodology-report>.

3 | The Gender Equality Index is a tool to measure the progress of gender equality in the EU, developed by the European Institute of Gender Equality. It gives more visibility to areas that need improvement and ultimately supports policy makers to design more effective gender equality measures. It reflects situation in 6 core domains such as work, money, knowledge, time, power and health and in two additional domains: violence against women and intersecting inequalities measured in total by 31 indicators. Hence, it provides a context indicator for gender equality in R&I.

4 | And on the contrary it is negatively correlated with the share of women in research (among professors, grade A) which means that in countries with higher proportion of women (in Grade A positions) men are not attracted to the R&I sector (e.g. because of the low pay and low spending).

5 | The correlation between the share of RPOs with GEPs and European Innovation Scoreboard Summary Innovation Index is 0.732 and the correlation with the Adjusted Research Excellence Indicator is 0.751.

6 | The document works with terminology and number of states as of 31 January 2020, before the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union (EU13, EU15, EU28).

7 | Ministry of Education and Science of Republic of Latvia (2016) *Latvian European Research Area Roadmap 2016-2020*.

Information in this document is based on GENDERACTION Horizon 2020 Project 741466 (Wroblewski 2019). *Monitoring of ERA Priority 4 Implementation. Deliverable report 3.2*. Available at GENDERACTION website.

CONQUERING CANCER: MISSION IMPOSSIBLE... UNLESS A GENDER DIMENSION IS TAKEN INTO ACCOUNT

What gender dimension means and why it is important for cancer R&I

A gender dimension in the context of Horizon Europe missions refers to the **integration of sex/gender analysis methods in the research content**. It aims to stimulate excellence in science and technology by “fixing the knowledge”. “Sex” and “gender” are two distinct terms that should not be used interchangeably.

“**Sex**” refers to the biological characteristics of beings, whether female, male, or intersex. This involves different levels of expression: genes, gametes, morphology (primary and secondary sex characteristics).

“**Gender**” refers to socio-cultural processes that shape behaviours, preferences, values, products, technologies, knowledges, and how individuals and groups interact with their environment. Importantly, the two terms

interact with and influence each other. A sex and gender perspective in health and cancer R&I is crucial as it focuses on people’s circumstances in relation to their economic, social, cultural and working environments. Analysing **factors intersecting with sex and gender** is key to avoid overlooking or overemphasising sex or gender differences (e.g. age, comorbidities, disabilities, environment, ethnicity, geography, religion, sexual orientation, socioeconomic status, etc.).

As Gendered Innovations¹ presents it: **“[s]ex and gender can influence all stages of research or development processes, from strategic considerations for establishing priorities and building theory to more routine tasks of formulating questions, designing methodologies, and interpreting data. Many pitfalls can be avoided—and new ideas or opportunities identified—by designing sex and gender analysis into re-**

1 | Gendered Innovations (a collaboration between Stanford University and the European Commission): <https://genderedinnovations.stanford.edu/methods-sex-and-gender-analysis.html>

This initiative provides with a wide range of terms explanation, methods, checklists and case studies in science, health & medicine, engineering and environment with regards to the integration of a gender dimension in research and innovation. We highly recommend consulting the Health & Medicine Checklist to incorporate sex and gender analyses: http://genderedinnovations.stanford.edu/methods/health_med_checklist.html

search from the start. *Sex and gender analysis work alongside other methodologies in a field to provide yet further “controls” (or filters for bias) providing critical rigor in science, medicine, and engineering research, policy, and practice”.*

An emphasis has been made on the significant inequities *“in access to and quality of cancer prevention, screening, early detection, treatment, care and survivorship support among Member States and among different social groups and demographic groups”* (p. 17, recommendation 9), mentioning age and **gender**. That is why **the integration of sex/gender analysis methods as a 14th cross-cutting recommendation** in all the Mission’s areas is necessary. Below we discuss differences in the incidence and mortality, development, diagnosis and responses to therapy as well as the quality of life and survivorship.

Examples of how sex and gender interact in relation to cancer

Incidence and mortality²: women and men not only differ in the fact that they have sex-specific cancers such as uterine cancers or prostate cancers but the incidence and mortality of various non-sex specific cancers are associated with these differences:

- Colorectal cancer: *“women developed right-sided malignancy while men manifested more on the left side (Kim et al., 2015). Right-sided colon cancer is associated with a higher severity compared with left-sided disease (Kim et al., 2015). The cause of disparity in location might*

be due to differences in estrogen level between men and women.”

- Breast cancer: 99% of breast cancers are found in females. This leaves 1% of males and transgender men and women whose research needs must be addressed too, as their incidence and characteristics may differ from cisgender people³.
- Melanoma mortality: *“Men had a 34% higher risk of death compared with women (Crocetti et al., 2015)”*.
- Genetic and molecular sex differences with the example of the bladder cancer: *“Men show a higher incidence of bladder cancer than women (Siegel et al., 2016)[...] It was reported that the His213 allele genotype SUL1A1 significantly decreased the risk of bladder cancer exclusively in women (Zheng et al., 2003)”*.
- Sex hormones: estrogen seems to have a protective role in cancers such as colon cancer or leukaemia. However, *“[e]strogen is linked closely to a higher rate of thyroid cancer development in women (Lee et al., 2005; Dorak and Karpuzoglu, 2012)”*.

Efficacy and toxicity of treatments⁴: 5-FU, Paclitaxel, Doxorubicin, Cisplatin, Bevacizumab, Rituximab anti-cancer agents all present sex differences in efficacy and toxicity. This is linked to the fact that research involving animal model and clinical trials has been almost only male-oriented.

Gendered lifestyles:

- Colorectal cancer⁵: diet, physical activity (PA) and obesity are three factors that

2 | Kim, H. I., Lim, H., & Moon, A. (2018) Sex Differences in Cancer: Epidemiology, Genetics and Therapy. *Biomolecules & Therapeutics*, 26(4), 335–342.

3 | de Blok, C.J.M. et al. (2019) Breast cancer risk in transgender people receiving hormone treatment: nationwide cohort study in the Netherlands. *BMJ*, 365: l1652.

4 | Kim, H. I., Lim, H., & Moon, A. (2018) *Ibid*.

5 | Conti, Lucia, Manuela Del Cornò, and Sandra Gessani (2020) Revisiting the Impact of Lifestyle on Colorectal Cancer Risk in a Gender Perspective. *Critical Reviews in Oncology/Hematology*, 145: 102834.

play a role in the incidence of colorectal cancer. There are gender-specific responses to these as women tend to have better diets, drink less alcohol and report less physical activity than men. Moreover, obesity, and especially weight gain in the waist and abdominal area has a stronger negative impact for men than for women.

- Smoking and lung cancer⁶: Cancer rates in women increased after they started smoking in larger numbers. Once smoking and cancer were linked, the overall smoking rate decreased, revealing that non-smoking women were more at risk at developing lung cancer than men (20% of death cases for women vs less than 15% for men).

Quality of life and gender: women and men can at times experience cancer and treatments in different ways, leading to a different quality of life (QOL).

- Cancer pain and QOL⁷: among women, QOL was significantly predicted by pain intensity and by depression, whereas among men, depression was the only symptom found to predict QOL.
- Colorectal patients' QOL⁸: gender differences were shown in illness symptoms and chemotherapy treatment effects where women reported body image, abdominal pain and dry mouth as the symptoms affecting their QOL while men

reported fecal incontinency, sexual impotency and sexual arousal.

Survivorship: gender norms and social expectations of masculinity and femininity shape how individuals experience illness and perform the roles of patient and survivor.

- Lymphoma survivors⁹: women tend to report greater personal posttraumatic growth and positive outcomes of cancer on their lives while men tend to deny growth and positive outcomes to maintain masculinity, preventing them from experiencing the benefits of growing from difficult experiences.
- Women continue to be primary caregivers and are affected by their relatives' cancer experience.

Recommendations on how to integrate a gender dimension in Framework conditions for Missions, Mission Work Programmes, project portfolios and evaluation

- Include sex and gender analysis in animal studies and clinical trials as a default requirement and if sex and gender are not relevant, an explanation must be provided why not. Sex and gender must be included in the entire research cycle from research design, methodology, to data interpretation and communication. It should be noted that populations under study can

5 | Conti, Lucia, Manuela Del Cornò, and Sandra Gessani (2020) Revisiting the Impact of Lifestyle on Colorectal Cancer Risk in a Gender Perspective. *Critical Reviews in Oncology/Hematology*, 145: 102834.

6 | Chloe Bird, video "Sex & Gender Influences on Health & Disease". Available at National Institutes of Health website.

7 | Pud, Dorit (2011) Gender Differences in Predicting Quality of Life in Cancer Patients with Pain. *European Journal of Oncology Nursing: The Official Journal of European Oncology Nursing Society*, 15(5): 486–91.

8 | Trinquinato, Isadora et al. (2017) Gender Differences in the Perception of Quality of Life of Patients with Colorectal Cancer. *Investigación y Educación en Enfermería*, 35(3): 320–29.

9 | Powroznik, Karen, Irena Stepanikova, and Karen Cook (2018) Growth from Trauma: Gender Differences in the Experience of Cancer and Long-Term Survivorship. *Gender, Women's Health Care Concerns and Other Social Factors in Health and Health Care (Research in the Sociology of Health Care)*, 36: 17–36.

- vary depending on the cancer researched whether it is sex-specific or mixed-sex.
- Include the integration of sex and gender in the research proposal as part of the evaluation process.
 - Include gender scholars in the relevant research domain in the research team.
 - Include gender experts among Mission project evaluators and ensure gender balance among evaluators.
 - Strive for gender balance in research teams.
 - Include in Work Programmes research projects that address knowledge gaps in cancer research (e.g. by focusing on only women or men, or trans women and men, or intersex individuals, etc.). Projects filling the data gaps should receive equal attention as studies that have a gender-balanced sample.
 - Include gender indicators in Mission monitoring and evaluation and among key performing indicators.
 - Using new technologies such as AI and machine learning to improve data gathering, interpretation, and medical protocol/treatment decisions was mentioned in several recommendations (e.g. 4, 6, 12). This will be beneficial to the whole society only if the dataset is free from gender bias¹⁰.
 - Fund research that focuses on a gender analysis of quality of life of cancer patients, survivors and their carers while recognising that women are primary carers worldwide.

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100 CLIMATE-NEUTRAL CITIES BY 2030 BY AND FOR... ALL CITIZENS

What gender dimension means and why is it important for the future of our cities?

A gender dimension in the context of Horizon Europe missions refers to the **integration of sex/gender analysis methods in the research content**. Its aim is to stimulate excellence in science and technology by “fixing the knowledge”. “Sex” and “gender” are two distinct terms that should not be used interchangeably.

“**Sex**” refers to the biological characteristics of beings, whether female, male, or intersex. This involves different levels of expression: genes, gametes, morphology (primary and secondary sex characteristics).

“**Gender**” refers to socio-cultural processes that shape behaviours, preferences, values, products, technologies, knowledges, and so on, and how individuals and groups interact with their environment. Here, with our cities. Importantly, those two terms interact and influence each other. There is no anteriority of one on the

other but rather a co-influence. Analysing **factors intersecting with sex and gender** is key to avoid overlooking or overemphasizing sex or gender differences (e.g. age, comorbidities, disabilities, environment, ethnicity, geography, religion, sexual orientation, socioeconomic status, etc.).

As Gendered Innovation¹ presents it: “[s]ex and gender can influence all **stages of research or development processes**, from strategic considerations for establishing priorities and building theory to more routine tasks of formulating questions, designing methodologies, and interpreting data. Many pitfalls can be avoided—and new ideas or opportunities identified—by designing sex and gender analysis into research from the start. Sex and gender analysis work alongside other methodologies in a field to provide yet further “controls” (or filters for bias) providing critical rigor in science, medicine, and engineering research, policy, and practice”.

Gender and/or equality issues have not been mentioned so far in the document

1 | Gendered Innovations (a collaboration between Stanford University and the European Commission): <https://genderedinnovations.stanford.edu/methods-sex-and-gender-analysis.html>.

This initiative provides with a wide range of terms explanation, methods, checklists and case studies in science, health & medicine, engineering and environment with regards to the integration of a gender dimension in R&I. We highly recommend consulting their Urban Planning & Design Checklist: http://genderedinnovations.stanford.edu/methods/urban_checklist.html.

produced by the Cities Mission Board. The report does stress the importance of “leaving no one behind”, of participatory approaches and contributing moderately to SDG 5 and 10. We argue that **gender should be mainstreamed as a cross-cutting issue in this Mission**. Below, we introduce examples of relevant inclusion of sex/gender perspectives in urban planning, sustainable Industries, digitalisation, and cities governance followed by recommendations.

Examples of how sex and gender interact in relation to Urban & Industry planning

Integrated and gender-sensitive Urban Planning

Sustainable and gender-sensitive transportation

- **Different uses**²: It has been shown that, on average, men and women do not use the same means of transport and use them differently. Only 30% of women have access to a car during daytime³. When it comes to public transportation, women spend 1/4 of their public transportation use for caring work. They also make more stops on their way to work compared to men. Men, on the other hand have simpler travel patterns from home to work and back.
- **Can snow-clearing be sexist?**⁴ Snow-clearing is part of the cities’ duties for safe commuting. In Karlskoga, Sweden, major traffic arteries were cleaned

before sidewalks. This impacts men and women differently as women tend to walk more than men worldwide. By exchanging the order in the schedule, the city saved expenses on health care as less pedestrians/cyclists were injured by falls on slippery sidewalks.

- **Gender-sensitivity and accessibility**: As women make up most public transports users, their needs should be considered. This includes accessible stations and step-free entrance to the transport (e.g. for baby carriage). It also involves redesigning ticket fares (e.g. charging an hour instead of a journey or at each connection, as women tend to make stops).

Housing and neighbourhood design and gender

- **Gender-sensitive neighbourhoods**⁵: In many countries, women are the primary caregivers for children and elderly and/or do most of the housework. This involves a lot of commuting (as seen above) which has bad consequences on the environment and on these populations. To support them (as well as working parents) and reduce pollution, neighbourhoods can be organised in a gender-sensitive way, i.e. by including on-site child and elderly care facilities, shops, and primary-care medical facilities.
- **Gender-sensitive housing**⁶: Vienna developed sustainable and gender-sensitive housing. One example is the FWS-I floorplan, where “kitchens

2 | <http://genderedinnovations.stanford.edu/case-studies/transportation.html#tabs-2>

3 | Roero, L. M., Scioneri V., and Abluton A. (2009) *UrbSpace, WP3 Joint Strategy, Activity 3.2 Criteria and Principles, Sub-activity 3.2.3 Gender Aspects*, p. 17.

4 | Criado Perez C. (2019) *Invisible Women. Data Bias in a World Designed for Men*. New York: Abrams Press.

5 | <http://genderedinnovations.stanford.edu/case-studies/urban.html#tabs-2>

6 | *Ibid.*

are cantilevered and extend beyond the footprint of the building to allow an unobstructed view of open spaces for caregivers to monitor children at play". They also included different types of apartments in the buildings for inter-generational living and giving the possibility for families to have their elderly, who are predominantly women, in the same building/neighbourhood.

Safety issues⁷: men and women face safety issues in public spaces and transports. It has been shown that men face more violence and robbery while women face more sexual harassment and gender-based violence. Women, especially women of colour and/or LGBTQI+ women, as well as disable people, children and the elderly are more vulnerable groups as they encounter more intersecting discrimination (racism, ableism, homophobia, etc.). It has an impact on their use of transports and their quality of life. Part of the solution is to have well-lit open spaces, removing bushes around public transports stops, Wi-Fi connectivity in public transports or campaigns⁸.

Industry, Economy & Energy

Gender gaps in energy education and labour markets⁹: Gender segregation continues in STEM studies, including green energy education. This is then reflected in the energy labour market (composed of 77.9% of men in Europe). Additionally, women are mostly found in lower-skilled jobs. Explanations for this include lack of interest, idea that it is a "male domain",

difficulty of work-life balance, stereotypes, insufficient promotion and lack of mentors and role models.

Gender and economy: Cities gather most of employment possibilities and this will force women to move from rural areas to urban areas. Access to cities must then take this into account by designing better public transportation (as they tend to use more public transports than cars).

Gender and energy¹⁰

- **Women and energy poverty:** Women are more at risk of energy poverty (especially single mothers and elderly women) due to their average lower incomes although they rely more than men on heating and indoor air quality since they spend more time, on average, in the home, taking care of the unpaid work at home.
- **Women as sustainable consumers:** Women tend to have more environmentally friendly consumption patterns in terms of nutrition and transportation and are more willing to change their behaviour due to environmental pressures than men.

Urban digitalisation and gender

- **Free to Be maps, a crowd-mapping tool that identifies safe and unsafe spaces¹¹:** This tool is an online crowd-mapping that identifies spaces in Sydney, Delhi, Kampala, Lima, and Madrid where young women felt happy and good or uneasy and scared.

7 | [https://eige.europa.eu/gender-mainstreaming/policy-areas/transport#\[1type\]](https://eige.europa.eu/gender-mainstreaming/policy-areas/transport#[1type])

8 | M. Nuala, S. Lazar, and S. Weber (2019) *Gender Equal Cities*. Paris: URBACT.

9 | <https://eige.europa.eu/gender-mainstreaming/policy-areas/energy>.

10 | European Institute for Gender Equality (2012) *Gender Equality and Climate Change. Review of the Implementation in the EU of Area K of the Beijing Platform for Action: Women and the Environment: Report*. Luxembourg: Publications Office of the European Union.

11 | PLAN International (2018) *Free to Be initiative*.

- **Smart Kiosks¹²:** Access to Wi-Fi and information are part of women's empowerment. This can be done through smart kiosks. An example from Baltimore which did a pre-assessment of the needs of the targeted population showed that women would not use it as the space is not well-lit and they do not feel safe staying outside for long time because of crime rates. As a result, the city decided to improve the infrastructures and lighting before implanting the kiosks.
- Require cities to assess through a gender lens the utilisation of sites, locations, means of transports, etc. before planning projects and that gendered impacts of the Contract initiatives are assessed.
- Ensure sex-disaggregated data for additional indicators (e.g. decrease of energy in buildings, final energy consumed per inhabitant) to inform future policies.
- For the evaluation process, include the integration of sex and gender in the research proposal, include gender experts among Mission project evaluators and ensure gender balance among evaluators.

Cities governance

- **Women in decision-making positions:** In the European Union, 28.6% of regional assembly members, 36% of municipal council members and only 15% of mayors, are women. Sustainable cities may be attained faster with a more diverse representation in power structures.
- **Gender-sensitive public consultations¹³:** Consultations are a great tool to hear more diverse voices and shapes policies. They need to be accessible for all in terms of location, culture, language, timetable, and inclusive design.
- Strive for gender balance among all stakeholders involved in the Climate City Contract drafting, implementation, monitoring and evaluation and in participatory approaches, including the involvement of gender scholars and women who are locally active in urban planning and energy fields or actions.
- To improve women's participation and representation in urban planning and energy science and workforce, we advise you to take a look at our policy papers on structural change, disruptive measures for gender equality in R&I and on the role of Research Funding Organisations for gender equality in R&I.

Recommendations

- Include sex and gender analysis where relevant and on topics affecting human populations as a default requirement. If sex and gender are not relevant, an explanation must be provided why not. Sex and gender must be included in the entire research/innovation cycle from research design, methodology, to data interpretation and communication.
- The gender commitments must be accompanied by gender budgeting (in all levels of procedure)¹⁴.
- Cultivate a zero-tolerance attitude towards sexual harassment and gender-based violence in urban public spaces. Safety measures in the city should be accompanied by educational campaigns, information stands and other tools¹⁵.

12 | The Global Centre for Technology, Innovation and Sustainable Development (2020) *How to ensure gender inclusion of Smart City services*. Webinar.

13 | URBACT (2019) *Ibid*. See the case study of the consultation to increase women's presence in public sports spaces in Ramicu Sarat, Romania, p. 15.

14 | URBACT (2019) *Ibid*. See the case study on gender-responsive budgeting in Ixelles, Brussels, p. 22.

15 | URBACT (2019) *Ibid*. See the case study on Madrid, Spain, p. 48.

- Digitalisation implies collecting and using multiple sets of data on transportation, energy consumption, use of services, etc. Privacy issues and ethics should be the main concerns before the cities' optimisation and efficiency.

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European Commission (2020) *100 Climate-Neutral Cities by 2030 – by and for the Citizens. Interim Report of the Mission Board for Climate-Neutral and Smart Cities*. Luxembourg: Publications Office of the European Union.

HEALTHY OCEANS, SEAS, COASTAL AND INLAND WATERS... AND THEIR GENDER IMPLICATIONS

What gender dimension means and why it is important for healthy waters R&I

A gender dimension in the context of Horizon Europe missions refers to the **integration of sex/gender analysis methods in the research content**. It aims to stimulate excellence in science and technology by “fixing the knowledge”. “Sex” and “gender” are two distinct terms that should not be used interchangeably.

“**Sex**” refers to the biological characteristics of beings, whether female, male, or intersex and for maritime populations, hermaphrodites. This involves different levels of expression: genes, gametes, morphology (primary and secondary sex characteristics).

“**Gender**” refers to socio-cultural processes that shape behaviours, preferenc-

es, values, products, technologies, knowledges, and so on, and how individuals and groups interact with their environment. Here, with ocean, seas, coastal and inland waters. Importantly, those two terms interact and influence each other. There is no anteriority of one on the other but rather a co-influence. Analysing **factors intersecting with sex and gender** is key to avoid overlooking or overemphasizing sex or gender differences (e.g. age, disabilities, environment, ethnicity, geography, religion, sexual orientation, socioeconomic status...).

As Gendered Innovations¹ presents it: **“[s]ex and gender can influence all stages of research or development processes, from strategic considerations for establishing priorities and building theory to more routine tasks of formulating questions, designing methodologies, and interpreting**

1 | Gendered Innovations (a collaboration between the Stanford University and the European Commission): <https://genderedinnovations.stanford.edu/methods-sex-and-gender-analysis.html>. This initiative provides with a wide range of terms explanation, methods, checklists and case studies in science, health & medicine, engineering and environment with regards to the integration of a gender dimension in research and innovation. We highly recommend to consult the case studies on Water Infrastructure: <http://genderedinnovations.stanford.edu/case-studies/water.html#tabs-2>

data. Many pitfalls can be avoided—and new ideas or opportunities identified—by designing sex and gender analysis into research from the start. Sex and gender analysis work alongside other methodologies in a field to provide yet further “controls” (or filters for bias) providing critical rigor in science, medicine, and engineering research, policy, and practice”.

An emphasis of this mission board has been put on the necessity to aim for “life-long gender-balanced learning opportunities for all ages to re- and up-skill a blue gender balanced workforce” (p. 20 of the Interim Report). This may not be sufficient.

Gender should be included in all streams of actions as a cross-cutting issue. Below, we discuss how sex or gender can be relevant regarding fishing, ocean acidification and pollution, women’s representation in ocean science and marine governance.

Examples of how sex and gender interact in relation to the Mission’s challenges

Unsustainable human footprint (incl. pollution, fisheries, tourism)

Blue economy and gender: the ocean, seas, coastal and inland waters are a life-support system for billions of people for food, jobs and resources, whether we talk about fisheries, maritime shipping, deep-sea mining, renewable energies or tourism. Gender needs to be taken into account.

- **Fisheries, climate change and gender:** In research, fishing has long been seen as a male activity but women have

always had an important role that has been overlooked². They can be found throughout the entire supply chain with pre-harvest activities (e.g preparing bait and nets), harvesting mainly in shallow waters (for family nutrition and supporting household income). They also dominate the processing and trade sectors (women compose 85% of the processing workforce)³. As climate change affects coastal biodiversity, it will affect women’s fishing practices and livelihoods.

- **Sustainable fishery and gender⁴:** Studies show that sustainability and gender are linked with, for example, women presenting more sustainable catches, better resources management and meeting high standards of sustainability.

Human Ocean pollution disasters and gender⁵: Fadigas (2017) shows through a case-study on the pre-2002 Prestige oil disaster that not only the entire coastal environment is at risk but that there are more vulnerable groups such as Galician shell-fisherwomen. They were vulnerable already before the spill because of different causes (e.g. strong gender roles, pollution, lack of disaster response training, lack of risk perception, etc.) that the disaster made worse, forcing them to relocate or lose their jobs.

Climate change and acidification

Natural marine sciences and sex analysis: There is a lack of sex-disaggregated data in marine sciences. Marine ecosystems consist

2 | Gissi, E., M. E. Portman, and A. K. Hornidge (2018) Un-Gendering the Ocean: Why Women Matter in Ocean Governance for Sustainability. *Marine Policy*, 94: 215–19.

3 | WWF (2019) *Policy Brief Empowering women in marine communities to mitigate the impacts of climate change*.

4 | Gissi, E., M. E. Portman, and A. K. Hornidge (2018) *Ibid*.

5 | Fadigas, Amanda B.M. (2017) Vulnerability Factors of Shellfisherwomen in the Face of Oil Spill Events: An Analysis of the Prestige Case. *International Journal of Disaster Risk Reduction*, 24: 560–67.

of organisms with different reproductive qualities (female, male or hermaphrodite). Sex-based differences are interesting to understand the species better but also to understand the impacts global warming and ocean acidification can have on them, and consequently on us.

- **Ocean acidification (OA) and sex analysis:** Ellis et al. (2017)⁶ showed that only 3.9% of the experimental OA studies assessed sex-based differences in OA responses. Plus, *“only 10.5% of studies account for possible sex effects by assessing males and/or females independently”*. Moreover, it has been shown that *“ocean acidification results in 16% more female oysters over a single generational cycle, and increased aquatic pH results in more female cichlids”*⁷ to give only two examples.
- **Global warming and sex analysis:** Some fish and turtles are known for relying on temperature for sex determination. *“Turtles originating from warmer northern Great Barrier Reef [...] exhibit a female sex ratio of 99%, whereas cooler southern sites maintain a 68% female juvenile ratio”*⁸.
- **Anthropogenic disturbances and sex analysis:** Anthropogenic disturbances include habitat destruction, pollution and overfishing. *“Primary sex differen-*

*tion has been shown to respond to a diverse range of these environmental factors in a growing number of species. Hypoxia, for example, has resulted in a higher ratio of males in zebrafish”*⁹.

All of these factors impact marine populations. It poses risks to sex ratios, demographic stability and viability of the species. This will impact the overall functioning of the oceans and waters and its capacity to absorb CO₂, and hence impact us. If we do not take into account sex analysis methods, we cannot fully understand how these factors influence waters.

Gendered vulnerabilities to impacts of climate change: Emerging research indicates that climate change impacts on women and men often differ and are more pronounced or severe in developing countries and for some local communities and indigenous peoples¹⁰. In most societies, women and children are among the poorest segments, the most ill-equipped to cope with and adapt to climate change, and thus the most impacted by its effects¹¹. In addition, they are less likely to be in positions of power to influence action to address climate change, even though they usually have distinctive knowledge due to their roles in coastal work and communities.

6 | Ellis, Robert P. et al. (2017) Does Sex Really Matter? Explaining Intraspecies Variation in Ocean Acidification Responses. *Biology Letters* 13(2).

7 | Tannenbaum, Cara et al. (2019) Sex and Gender Analysis Improves Science and Engineering. *Nature* 575(7781): 137–46.

8 | *Ibid.*

9 | *Ibid.*

10 | IPCC (2014) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge and New York: Cambridge University Press.

11 | Munoz Boudet, A. M., Buitrago, P., Leroy De La Briere, B., Newhouse, D. L., Rubiano Matulevich, E. C., Scott, K., Suarez Becerra, P (2018) *Gender differences in poverty and household composition through the life-cycle: a global perspective. Policy Research working paper; no. WPS 8360*. Washington, D.C.: World Bank Group.

Lack of understanding and connection

Recognising the impact of women in marine conservation: Although marine R&I and policymaking has historically been a male-dominated environment, women have been at the forefront of marine conservation. Using these examples as role models for girls and boys for ocean literacy could help achieve a gender-balanced Blue workforce:

- **Rachel Carson**, one of the pioneers who initiated the contemporary environmental movement with her three bestsellers (*Under the Sea-Wind*, *The Sea Around Us*, and *The Edge of the Sea*).
- **Sylvia Earle**, first woman to create an all-female team of aquanauts in the 1960s.
- **Elisabeth Mann Borgese**, internationally-recognised German expert on maritime law and policy and environment protection.

Inadequate Governance

Women's inadequate participation in decision-making: As the examples above attest, women have experiences, skills and knowledges about ocean and maritime sustainability that should not be ignored in decision-making at all levels. Moreover, because women tend to have higher environmental concern than men^{12, 13}, they may

promote more sustainable group outcomes if given the opportunity to participate in decision making¹⁴.

A gender dimension in maritime security strategies¹⁵: The current instruments are gender-blind. They should respond to a human security approach, including the principle of gender equality explicitly. This should address, *inter alia*, actions against the illicit acts against girls and women at sea in addition to gender-balanced law enforcement rescue teams that will be able to better protect them from gender-based violence.

Migration and human trafficking at sea and gender has not been mentioned in the Mission's Interim report. It has not yet fully caught the attention of law enforcement.

- **Illegal, unregulated and unreported fishing (IUUF) and human trafficking¹⁶:** The majority of forced labour in IUUF are male and children. But women are also reported to work on vessels or offshore in supply chains and are subject to sexual abuse, as the "fish-for-sex" phenomenon has shown (women engaging in sexual work with fishers in order to obtain fish to sell and support their families). There are many shortcomings in international maritime law described in this article.
- **Climate change induced migration¹⁷:** *"Some scholars argue that due to relatively higher levels of female poverty and broadly unequal power relations,*

12 | European Commission (2017) *Special Eurobarometer 459: Climate Change*. Brussels: European Union.

13 | European Commission (2017) *Special Eurobarometer 468: Attitudes of European Citizens towards the Environment*. Brussels: European Union.

14 | Volland, B., Henry, A.D. (2019) Diversity in decision-making. *Nat. Clim. Chang.* 9: 258–259.

15 | Lirola-Delgado, Isabel (2019) Maritime Security Strategies from a Gender Perspective: Implications for United Nations SDG 5 Implementation. *WMU Journal of Maritime Affairs* 18(4): 537–55.

16 | Becker-Weinberg, V. (2019) The protection of women in illegal, unregulated and unreported fishing. *WMU Journal of Maritime Affairs*, 18, 531–535.

17 | Hunter, Lori M, and Emmanuel David (2009) *Climate Change and Migration: Considering the Gender Dimensions*. Institute of behavioral science, University of Colorado. Boulder, CO, USA.

climate change will disproportionately impact women (Beuchler 2009)", pushing them to relocate. Girls and women's vulnerabilities in migration have to be recognised.

Recommendations

- Include sex and gender analysis in animal studies where relevant and on topics affecting human populations as a default requirement. If sex and gender are not relevant, an explanation must be provided why not. Sex and gender must be included in the entire research cycle from research design, methodology, to data interpretation and communication.
- Tool to integrate gender perspectives in marine research and innovation: GenderWave¹⁸.
- Include the integration of sex and gender in the research proposal as part of the evaluation process.
- Include gender scholars in the relevant research domain in the research team where relevant.
- Include gender experts among Mission project evaluators and ensure gender balance among evaluators.
- Strive for gender balance at all levels in research teams and in decision-making / governance.

- Include women who are locally active in marine or water-related fields or actions.
- Address sexual harassment and gender-based violence at sea, during expeditions, on vessels¹⁹.
- To improve women's participation and representation in ocean science and the blue workforce, we advise you to take a look at our policy papers on structural change, disruptive measures for gender equality in R&I and on the role of Research Funding Organisations in making gender equality happening.

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Special Thanks

We would like to thank our colleagues from Horizon 2020 project Baltic Gender for their precious contribution to this paper.

18 | This tool was developed by the Horizon 2020 funded project Baltic Gender.

19 | Find examples of good practice to involve more women in decision-making and on how to tackle sexual harassment and sexual violence at sea in Baltic Gender's brochure "Gender equality in marine sciences, Best practices on structural change". Available at: <http://oceanrep.geomar.de/44349/>. They also developed three tools on sexualised violence at sea to help institutes and vessels implementing their guidelines: <http://oceanrep.geomar.de/49888/>.

CARING FOR SOIL IS CARING FOR LIFE

Ensure 75% of soils are healthy by 2030 for healthy food, people, nature and climate

What gender dimension means and why it is important for our soils' health

A gender dimension in the context of Horizon Europe missions refers to the **integration of sex/gender analysis methods in the research content**. Its aim is to stimulate excellence in science and technology by “fixing the knowledge”. “Sex” and “gender” are two distinct terms that should not be used interchangeably.

“**Sex**” refers to the biological characteristics of beings, whether female, male, or intersex. This involves different levels of expression: genes, gametes, morphology (primary and secondary sex characteristics).

“**Gender**” refers to socio-cultural processes that shape behaviours, preferences, values, products, technologies, knowledges, and so on, and how individuals and groups interact with their environment. Here, with our soils and the food they

produce. Importantly, those two terms interact and influence each other. There is no anteriority of one on the other but rather a co-influence. Analysing **factors intersecting with sex and gender** is key to avoid overlooking or overemphasizing sex or gender differences (e.g. age, comorbidities, disabilities, environment, ethnicity, geography, religion, sexual orientation, socioeconomic status, etc.) and acknowledge heterogeneity within groups of the same sex and gender.

As Gendered Innovation¹ presents it: “[s]ex and gender can influence all stages of research or development processes, from strategic considerations for establishing priorities and building theory to more routine tasks of formulating questions, designing methodologies, and interpreting data. Many pitfalls can be avoided—and new ideas or opportunities identified—by designing sex and gender analysis into research from the start. Sex and gender analysis work

1 | Gendered Innovations (a collaboration between Stanford University and the European Commission): <https://genderedinnovations.stanford.edu/methods-sex-and-gender-analysis.html>.

This initiative provides with a wide range of terms explanation, methods, checklists and case studies in science, health & medicine, engineering and environment with regards to the integration of a gender dimension in R&I. There is an upcoming contribution on agriculture that will be added in Gendered Innovation publication, website and policy recommendations.

alongside other methodologies in a field to provide yet further “controls” (or filters for bias) providing critical rigor in science, medicine, and engineering research, policy, and practice”.

The Mission emphasises the importance of its **gender inclusive communication** (p.14). However, we argue that gender should be mainstreamed throughout the Mission and especially in its research and innovation content. Below, we present **examples of how gender and sex are relevant in agriculture, soil and health and international cooperation**.

Examples of how sex and gender interact in relation to agriculture and Soil health R&I

Gender equality in Agriculture

Agriculture has a key role in food production, environmental and landscape protection, Europe’s resilience, and in income generation and employment. Differences between men and women persist in this area in Europe.

- **Farm ownership²**: Women are under-represented in farm ownership. They own smaller farms than men and represent only 27% of EU farms holders specialising in livestock rearing or crop production, and 24% of EU organic farm holders. A growing literature on gender equality and agriculture shows that

equal access to resources and assets is correlated with economic growth.

- **Invisibilisation of women in agricultural and rural development³**: 3.3% of women are employed in agriculture compared to 5.2% of men. Women’s input is often under-reported since they are not asked to report by themselves, or farm work is narrowly defined as wage labour and therefore questions exclude activities predominantly performed by women without pay (e.g. processing, storage or caring services to farm workers and visitors). Women in rural areas also undertake most of house and care work which is often more intensive since facilities are often far, and children and the nearby living relatives (such as grandparents) rely on them for transport or errands. This invisibility and remoteness lead to the ignorance of women’s needs of access to resources, social security, land rights and other facilities.
- **Women as sustainable agents⁴**: In Europe, it appears that workshops on sustainable soil management attract more men than women. This is probably due to the higher visibility of men in agriculture. European projects (SoilCare and RECARE) showed that men were more willing to invest in new technologies, increase productivity and profit while women focused on the future health of soils. This is in line with a growing number of studies^{5,6,7} showing that women tend to

2 | European Institute for Gender Equality (2016) *Gender in Agriculture and Rural Development*. Luxembourg: Publications Office of the European Union.

3 | *Ibid.*

4 | Food and Agriculture Organizations of the United Nations (2019) *Mainstreaming gender for sustainable soil management*, n°161.

5 | European Institute for Gender Equality (2012) *Gender Equality and Climate Change: Review of the Implementation in the EU of Area K of the Beijing Platform for Action: Women and the Environment: Report*. Luxembourg: Publications Office of the European Union.

6 | European Commission (2017) *Special Eurobarometer 459: Climate Change*. Brussels: European Union.

7 | European Commission (2017) *Special Eurobarometer 468: Attitudes of European Citizens towards the Environment*. Brussels: European Union.

have more environmentally friendly consumption patterns in terms of nutrition and transportation, and are more willing to change their behaviour due to environmental pressures than men.

Gender, Soil and Health

- **Lack of data, health impact of chemicals and focus on women**⁸: Literature reviews demonstrate that women are understudied in chemicals and health-related studies. The male default prevails. Additionally, women's exposure to pesticides and poisoning are underestimated. For example:
 - FREIA project⁹ showed how endocrine disrupting chemicals (EDCs) worsen the risks for women to develop reproductive health issues such as early menopause, breast cancer, polycystic ovary syndrome, endometriosis, infertility, or irregular menstrual cycles.
 - The FP7 project Reproductive effects of environmental chemicals in females (REEF)¹⁰ found out that environmental chemicals had an impact on fertility and bone homeostasis which affected more males than females.
- **Poor health and agricultural productivity**¹¹: Poor health and nutrition (micronutrient deficiencies, undernutrition) affect work capacity but also resistance to diseases such as malaria and HIV but also new zoonic viruses such as Covid-19. Women are especially vulnerable

to those for different reasons such as changes in immunity during pregnancy, cultural norms reducing women's control over their sexuality thus increasing their risk to face STDs, work patterns increasing exposure to soil borne infectious diseases as they have a predominant role in acquiring and handling of water, wood, and food on all continents.

International cooperation in Soil R&I

The mission Interim report highlights the importance of European global footprint and thus international cooperation in R&I.

Agricultural innovations for sustainability

Technological interventions and innovation towards more sustainable agriculture in developing countries can have harmful consequences if gender and social perspectives are not considered. On the other hand, positive outcomes can emerge if they are taken into account:

- **Mechanical and technological innovations**¹²: Examples from developing countries show that the introduction of technology without considering the cultural settings (e.g. restrictions on leaving the house) may have negative consequences, such as replacing women's work or increasing their work-

8 | García, Ana M. (2003) Pesticide Exposure and Women's Health. *American Journal of Industrial Medicine*, 44(6): 584–94.

9 | FREIA and the Health and Environment Alliance (2020) *Endocrine disrupting chemicals (EDCs) and women's reproductive health*.

10 | <http://genderinnovations.stanford.edu/case-studies/environment.html#tabs-2>

11 | Harris, J. (2014) Gender Implications of Poor Nutrition and Health in Agricultural Households. *Gender in Agriculture*. Dordrecht: Springer Netherlands, pp. 267–283.

12 | Beuchelt T.D. (2016) Gender, Social Equity and Innovations in Smallholder Farming Systems: Pitfalls and Pathways. In: Gatzweiler F., von Braun J. (eds) *Technological and Institutional Innovations for Marginalized Smallholders in Agricultural Development*. Springer, Cham.

load (e.g. mechanical thresher, treadle pumping, seeder technologies). This negatively influences their economic status, health, and care work capacities. On the other hand, other innovations have been shown to have opposite outcome as it increased women's work opportunities.

- **Availability of more robust seed:** Innovations on seeds may help them become more resistant to drought and the lack of irrigation or to high temperatures; some unintended consequences of this were that the new seeds required longer cooking time, thus also more water and wood. This directly impacted women as they are usually in charge of acquiring and handling those items for the household.
- **Gender and "climate-smart" agricultural practices¹³:** Many of the 'climate-smart' agricultural practices and interventions, for example composting, vermiculture, and conservation agriculture may substantially increase women's workloads. This combined with the lack of access to resources is likely to hinder them to change their practices.

Recommendations

- Include sex and gender analysis where relevant and on topics affecting human populations as a default requirement. If sex and gender are not relevant, an explanation must be provided why not. Sex and gender must be included in the entire research/innovation cycle from research design, methodology, to data interpretation and communication.
- Produce and cross-analyse sex-disaggregated data on women's participation in

and contribution to agriculture (paid and unpaid work included), their access to key resources and assets, as well as on farm safety and health incidents, inclusion in sustainability efforts, differentiated by agro-ecological zones, types of farming, and conventional / organic agriculture.

- Make sure women and men are not addressed as homogeneous groups but systematically include their heterogeneity.
- Ensure gender balance in citizen engagement and co-creation, in Living Labs and the Lighthouse.
- Involve women who are locally active in agriculture, soil management and food security.
- For the evaluation process, include the integration of sex and gender in the research proposal, include gender experts among Mission project evaluators and ensure gender balance among evaluators.
- Include gender scholars in the relevant research domain in the research team and strive for gender balance in research teams.
- To improve women's participation and representation in agriculture and soil health studies and workforce, we advise you to take a look at our policy papers on structural change, disruptive measures for gender equality in R&I and on the role of Research Funding Organisations.
- Strategic Research options:
 - Alternative agriculture and gender: Reviewing what can be learned from alternative approaches to conventional agriculture in which women participate prominently (including organic or circular agriculture).

13 | Jost, C. et al. (2015) Understanding gender dimensions of agriculture and climate change in small-holder farming communities. *Climate and Development*. Dordrecht: Springer Netherlands, pp. 133-144.

- Modern agriculture, land uses and gender: Reviewing what can be learned about the relationship between ‘modern’ agriculture and land uses with degradation of soils, quality of produce as food, move away from soils in horticulture and urban farming warehouses, in combination with gendered impacts and inclusion.
- Developing a framework to include relationships of agricultural production alternatives (farming systems), soil and people’s health, (as differentiated by agro-ecological zones, types of farming, and conventional / organic agriculture) with gendered engagement, contributions, potential, needs, connections, decision-making, etc.

Special Thanks

We would like to thank Margreet van der Burg from Wageningen University and Gender-SMART team member (Gender in Science Management of Agriculture & life-sciences, including Research and Teaching) for her valuable inputs to this document.

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ACCELERATING THE TRANSITION TO A CLIMATE PREPARED AND RESILIENT EUROPE

What gender dimension means and why is it important in the field of climate studies?

A gender dimension in the context of Horizon Europe missions refers to the **integration of sex/gender analysis methods in the research content**. Its aim is to stimulate excellence in science and technology by “fixing the knowledge”. “Sex” and “gender” are two distinct terms that should not be used interchangeably.

“**Sex**” refers to the biological characteristics of beings, whether female, male, or intersex. This involves different levels of expression: genes, gametes, morphology (primary and secondary sex characteristics).

“**Gender**” refers to socio-cultural processes that shape behaviours, preferences, values, products, technologies, knowledges, and so on, and how individuals and groups interact with their environment. Importantly, those two terms interact and influence each other. There is no anteriority of one on the other but rather a co-influ-

ence. Analysing **factors intersecting with sex and gender** is key to avoid overlooking or overemphasizing sex or gender differences (e.g. age, comorbidities, disabilities, environment, ethnicity, geography, religion, sexual orientation, socioeconomic status, etc.).

As Gendered Innovation¹ presents it: “[s]ex and gender can influence all stages of research or development processes, from strategic considerations for establishing priorities and building theory to more routine tasks of formulating questions, designing methodologies, and interpreting data. Many pitfalls can be avoided—and new ideas or opportunities identified—by designing sex and gender analysis into research from the start. Sex and gender analysis work alongside other methodologies in a field to provide yet further “controls” (or filters for bias) providing critical rigor in science, medicine, and engineering research, policy, and practice”.

The report highlights the socio-economic consequences of climate change and the

1 | Gendered Innovations (a collaboration between Stanford University and the European Commission): <https://genderedinnovations.stanford.edu/methods-sex-and-gender-analysis.html>.

This initiative provides with a wide range of terms explanation, methods, checklists and case studies in science, health & medicine, engineering and environment with regards to the integration of a gender dimension in R&I.

principles of “the resilience of social and economic systems with a commitment to equity, social justice and to leave no one behind” (p. 9). **We argue that sex and gender should be mainstreamed throughout the Mission as a cross-cutting issue.** Climate change is also a cross-cutting issue, but as other EU Missions already focus on soils, waters, and cities, we will not focus on these aspects specifically here². Below, we will present examples of how gender and sex are relevant in climate change research and innovation, covering gendered impacts of climate disruptions, the role of women in risk management, building resilience, and mitigation.

Examples of how sex and gender interact in relation to climate change

Gendered impacts of climate disruptions

Gendered impacts of climate disruptions in developing countries³: Climate disruptions such as droughts, crops fail, extreme weather and natural disasters affect developing countries to a larger extent. There are different risks when facing these disruptions from a gender perspective. On the one hand, women may have to walk longer to get water because of droughts (as they

are the primary house workers). They also may have less possibilities to flee a disaster because of their care duties, cultural expectations that restrict their mobility or the fact that they were not taught how to behave in an extreme case. On the other hand, men face higher death rates as cultural pressures of masculinity imply that they take more risks.

Gendered impacts of climate disruptions in Europe: The heatwave in 2006 in France killed around “1% more elderly women than men due to cardiovascular disease, respiratory disease and directly heat-related deaths”⁴. In Italy, another study shows that more men than women die from landslides and floods due to “a different propensity towards the risk taking and a different degree of exposure between males and females”⁵. In Serbia, the 2014 floods impacted more women, elderly people and disabled people because of the lack of information on the state of emergency, the possibilities for evacuation and difficulties during the rehabilitation after the disaster⁶.

Increase of gender-based violence during/after climate change-induced disasters⁷: Extensive literature shows that gender-based violence and inequalities, especially towards women and girls, but also against LGBTIQ+ communities⁸, increase during and after a climate change-induced

2 | Make sure to consult our other 2-pagers on Horizon Europe Missions at GENDERACTION website.

3 | Allwood, Gill (2014) Gender mainstreaming and EU climate change policy. In Weiner, Elaine and Heather MacRae (eds) The persistent invisibility of gender in EU policy. European Integration online Papers (EIoP), Special issue 1, Vol. 18, Article 6, 1-26.

4 | European Gender Equality Institute (EIGE), *Environment and climate change*.

5 | Salvati, P., Petrucci, O., Rossi, M., Bianchi, C., Pasqua, A. A., & Guzzetti, F. (2018) Gender, age and circumstances analysis of flood and landslide fatalities in Italy. *Science of The Total Environment*, 610-611, 867–879.

6 | Organisation for Security and Co-operation in Europe (2015) *Gender analysis of the Impact of the 2014 Floods in Serbia*.

7 | UN Women (2014) *Climate Change, Disasters and Gender-Based Violence in the Pacific*.

8 | Gorman-Murray, A., McKinnon, S., & Dominey-Howes, D. (2014) *Queer Domicide*. *Home Cultures*. 11(2), 237–261.

disaster whether in the domestic sphere⁹, or during displacements and sheltering. This is due to marginalisation from social and political spaces and from economic resources that aggravate their vulnerabilities.

Accelerate transition to a resilient future

Women as agents of change: A growing number of studies^{10,11,12} show that women tend to have more environmentally friendly consumption patterns in terms of nutrition (they are more likely to buy eco-labelled products than men, they eat less meat) and transportation (they are more likely to use public transports, for economic reasons but also as a choice) and are more willing to change their behaviour due to environmental pressures than men.

Women and mitigation strategies¹³: EIGE showed that women, in Europe, were more at risk of energy poverty because of their average lower incomes. On the other hand, as they spend more time at home doing unpaid housework, they rely on energy for heating, air quality, and household devices. Mitigation measures to lower GHG emissions might put pressures on women because of the financial burden. Research still needs to be done on women's need for energy and its impact on climate change

and the possible counterbalance with women's willingness to change their behaviours toward more environmental friendliness.

Inclusion of women in climate innovations:

- **Women's Weather Watch¹⁴:** After the floods in 2004 in the northern part of Fiji, WWW developed a community radio, providing real-time information via SMS alerts, a Viber group and Facebook page. The radio is composed of women leaders and correspondents.
- **Gender and water infrastructure¹⁵:** In developing countries, as women and girls spend a lot of time fetching water, they develop knowledge of soils and water yields. Using their knowledge and skills has proven efficient as the three case-studies on water infrastructure, on girls' and boys' education on water and health and on assistive technology to fetch water from Gendered Innovations show.

The inclusion of women in risk management¹⁶: Two case studies show that women take an important part in the aftermath of a disaster. They are usually taking on typical caring work, emotional work and taking care of resources such as food and water. But they also take part in the reconstruction

9 | Nguyen, H. T., & Rydstrom, H. (2018) Climate disaster, gender, and violence: Men's infliction of harm upon women in the Philippines and Vietnam. *Women's Studies International Forum*, 71, 56–62.

10 | European Institute for Gender Equality (2012) *Gender Equality and Climate Change. Review of the Implementation in the EU of Area K of the Beijing Platform for Action: Women and the Environment: Report*. Luxembourg: Publications Office of the European Union.

11 | European Commission (2017) *Special Eurobarometer 459: Climate Change*. Brussels: European Union.

12 | European Commission (2017) *Special Eurobarometer 468: Attitudes of European Citizens towards the Environment*. Brussels: European Union.

13 | European Institute for Gender Equality (2012), *Ibid*.

14 | Innovation Station: Women's Weather Watch, Fiji.

15 | <http://genderedinnovations.stanford.edu/case-studies/water.html#tabs-2>

16 | Drolet, J. et al. (2015) Women rebuilding lives post-disaster: innovative community practices for building resilience and promoting sustainable development. *Gender & Development*, 23(3), pp.433-448.

and recovery processes through agriculture and rebuilding houses devastated by disasters. The issue is that they are rarely part of the decision-making thus, their needs and concerns are not considered, and their potential knowledge and skills lost.

Harmful consequences of gender-blind EU responses to climate¹⁷: EU measures to reduce its use of fossil fuels and emissions from transports led to an increased demand for biofuels. This has the consequence of importing them from developing countries and to *“land use changes, which are often gendered, since the land used for biofuels production is most likely to be marginal land farmed by women for household subsistence rather than the prime agricultural land farmed by men for export”*.

Women in energy and climate change¹⁸: In Europe, sectors such as energy, transports and technological sustainable development are dominated by men in the workforce. It is also true in decision-making positions in ministries (18.2%) and at managerial level (27%). This is despite the fact that women make up (in 2012) 53% of the tertiary graduates in natural sciences and technologies.

Recommendations

- Include sex and gender analysis where relevant and on topics affecting human populations as a default requirement. If sex and gender are not relevant, an explanation must be provided why not.

Sex and gender must be included in the entire research/innovation cycle from research design, methodology, to data interpretation and communication.

- Include gender experts and local women active in climate actions in all of the actions of the Mission (the creation of climate risk profiles and comprehensive climate risk management plans, community resilience contracts, adaptation pathways, actionable solutions and Deep Demonstrations).
- Ensure the mainstreaming of gender perspectives in all the actions of the Mission.
- Make sure that the community infrastructures are safe, including prevention of gender-based violence.
- Ensure the production and use of sex-disaggregated data on climate change.
- Strive for gender balance in governance.
- To improve women’s participation and representation in climate change studies and workforce, we advise you to take a look at our policy papers on structural change, disruptive measures for gender equality in R&I and on the role of Research Funding Organisations.

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¹⁷ | Allwood, Gill (2014): *Ibid*.

¹⁸ | EIGE Gender Statistics Database

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