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GENDER PAY EQUITY AND SOCIAL SUSTAINABILITY: PERSPECTIVES FROM UKRAINIAN ENERGY COMPANIES

Background. *The study's relevance lies in analyzing the gender wage gap in Ukraine's energy sector, using survey data from energy companies to identify its key drivers. The study aims to provide empirical insights into the causes of this gap. The object of the study is the processes of wage determination and pay inequality across professional groups within energy companies, while the subject is the approaches and tools for assessing gender-based differences in wages and career progression. Applying the factor-weighted gender pay gap method, the research estimates disparities between women and men with comparable education, tenure, and hierarchical positions. The findings show that unequal access to wage-enhancing qualifications and experience is the main driver of the gap, with evidence of informal institutional barriers limiting women's career progression. These results have practical implications for revising gender equality policies and strengthening women's roles in the energy industry.*

Methods. *The article applies the factor-weighted gender pay gap method, grouping employees by education, tenure, and position in the qualification hierarchy to estimate gender pay differences.*

Results. *The study showed that the gender wage gap in Ukraine's energy sector is mainly driven by unequal access of women to wage-enhancing qualifications and experience, with evidence of informal institutional barriers that hinder their career progression.*

Conclusions. *The study concludes that gender wage inequality in Ukraine's energy sector mirrors patterns seen in Europe, is most pronounced at lower qualification levels, and is reinforced by "men's clubs" practices, highlighting the urgent need to remove institutional barriers to women's career advancement, especially under wartime labor shortages.*

Keywords: *gender wage gap, energetics, professions groups, inequality, access to work, sustainability.*

Background

That paper, which grounds on data, obtained before the Russian invasion of Ukraine began, reflects the performance, reached by Ukrainian energetic and society as a whole in approximation to gender equity in labor remuneration before the war and expands the obtained results by taking into account the characteristics of the sustainability of energy enterprises of Ukraine in war conditions, which, as it turned out, positively depends on the efforts made to implement gender-sensitive management procedures (Analysis of gender..., 2023). It may serve as a starting point, a "base of comparison," for analyzing the dynamics of gender sensitivity in the Ukrainian energy sector and society as a whole during the war and in the process of post-war reconstruction. Thus, it contributes to a deeper understanding of gender equity's place in the system of factors, defining social resistance and the capacity to maintain social cohesion in the face of highly negative social upheavals. At the same time, it contributes to improving views on the challenges of gender equity, the energetic approach driven by war, and ways to overcome these challenges.

A large-scale reduction in the economically active population is a common problem across both the energy and

other sectors of the Ukrainian economy. Such a trend had a significant impact on business models already before the war and has strengthened with the mobilization of human resources (mostly male) for the army's needs. The severity of this problem for businesses in Ukraine has traditionally been mitigated by stagnation of national production scales and the possibility of labor replacement by capital. However, the development of the industry, the implementation of projects to expand production scale, and the qualitative improvement of organizational and technical levels are extremely difficult under such conditions. A significant proportion of the surveyed managers of energy enterprises points to the lack of staff with critical competencies for the energy sector as an important factor limiting the choice of business strategies for development and adaptation to new challenges (Gender aspects..., 2021; Dyachuk, Galustyan, & Blizniuk, 2019). At the same time, the presence of large-scale "traditionally male" employment segments within enterprises is perceived by most managers as a fact of life rather than an opportunity to improve the enterprise's provision of qualified personnel.

Gendered employment segments are evident even in societies that rank among the world's leaders in the

effectiveness of gender equality policies, as seen in Sweden's IT industry (Tokbaeva, & Achtenhagen, 2023) and its gaming segment (Szczepanska, 2023). The presence of "traditionally male" professions and industries under such conditions is considered a sign of the existence of complex, socially determined systems for fixing female and male roles in professional activity: this can partly be explained by the continued existence of a hidden gendered system. Such systems are characterized by distinguishing tasks, roles, and professions within a dichotomy of what is considered "typically male" and "typically female" (Tokbaeva, & Achtenhagen, 2023). It is important that the functioning of such systems requires the active involvement of women (Acker, 1990; Connell, 2002; Martin, 2003). After all, it is women's attitudes toward the behavior, stereotypes, procedures, and practices for solving business tasks that constitute mandatory attributes for certain activity areas and form an important component in distinguishing "women's and men's" employment segments.

In this study, we consider the premises of Ukrainian women's decision-making as "other things equal" and, at this stage, focus only on estimating the contribution of women's lower representation in relatively higher-paid workplaces to the existing gender wage gap in the Ukrainian energy sector. However, in further research, we will be able, based on the quantitative assessments, presented in this article, to determine the prospects for the expansion of both the sphere of women employment, thanks to the strengthening of the sustainability of their career growth (Tokbaeva, & Achtenhagen, 2023; Jogulu, & Esmé, 2023), as well as the accumulation of their economic potential and the improvement of incentives for mastering STEM-oriented professions.

The implementation of such opportunities requires careful "structuring" of the labor sphere in the energy sector, highlighting and evaluating certain aspects of gender inequality in the industry. In particular, understanding the scale and causes of gender-based salary inequality is important for assessing the expected impact of equalizing the ability of women and men to realize their work potential in the energy sector.

Accordingly, this article is devoted to improving analytical and methodological support for assessing the consequences of implementing programs and policies to equalize employment and career opportunities in the energy sector for women and men. We expect that its results will be useful to business representatives, enabling them to better understand the mechanism of influence of the gender approach in personnel management on the volume and structure of labor costs. Also, the results of the study will help developers of regulatory policies and sectoral development programs clarify the scale and distribution of the expected socio-economic effects of eliminating factors of labor discrimination against women in the energy sector.

The purpose of the research is to empirically investigate the drivers of the gender wage gap in Ukraine's energy sector, focusing on how education, tenure, and hierarchical position influence pay disparities, and to provide evidence-based recommendations to improve gender equality policies and strengthen women's career opportunities in the industry.

The object of the research is the processes of wage determination and pay inequality across professional groups within energy companies.

The subject of the research is the approaches and tools for assessing gender-based differences in wages and career progression.

Literature review. In the literature on gender issues, the pay gap between men and women is divided into two qualitatively different components. The first is the so-called "explained" component of the pay gap. This is the component of the gender gap caused by differences inherent in the "male" and "female" employee populations, based on qualifications or the work they perform. Empirical studies almost always show that the overall gender pay gap is not entirely driven by this component, although in most cases it makes the predominant contribution to it (Cortina, 2008; Cotter et al., 2001; Davidson, & Cooper; Dreher, 2003).

The second component is the "unexplained" gender gap, which reflects the disparity between women and men in the labor market. The allocation of the second component is based on the fact that the functional relationship between salary factors (characteristics of human capital and work performed) and remuneration is reflected in different coefficients for women and men. It is the second component that can be interpreted as a sign of discrimination against a certain socio-demographic group regarding the ability to realize their economic potential as employees. Its significant impact is the basis for further research and clarification of the institutional conditions and factors of occurrence of such a difference and justification of the expediency of using the term "discrimination" in relation to a certain set of specific cases of unequal returns on investments in human capital for women and men (Blau, & Kahn, 2017).

To a certain extent, the regularity of the existence of such a "discriminatory" component of the gender pay gap is justified by the concept of G. Becker, who assumes that maximizing employer satisfaction is achieved by making a suboptimal (from the point of view of production needs) choice of the performer in the process of external hiring or promotion (Becker, 1957).

Accordingly, the difference between the salaries of women and men due to such reasons should manifest itself even if their qualifications and experience are identical and if they perform identical work. In turn, the "explained" component of the gender pay gap cannot be interpreted as "free from inequality" between socio-demographic groups. It may also include components of inequality in access to certain educational resources or career opportunities for women and men, as well as a component of inequality in the preferences of women and men regarding the areas in which they seek to realize their economic potential. Such a component of the gender wage gap still remains practically unresearched in relation to the industries of the Ukrainian economy, where male employment prevails. This creates a significant gap between existing studies of the conditions for the formation of predominantly male employment in certain sectors of the economies of European countries (Linnenluecke, 2017; Bimrose, & Hearne, 2012; Frome et al., 2006) and a very small body of literature on the socio-psychological prerequisites of male dominance in Ukraine's energy sector (Tyshchenko et al., 2022). Therefore, having formed in this article only preliminary quantitative estimates of the general scale of inequality in women and men in the energy sector, we plan to investigate in further detail the reasons for the unequal distribution of women and men in different professional groups and at different levels of the management hierarchy of energy companies in further research.

Thus, the "bonding and selection" models (Lazear, 1981; Salop, & Salop, 1976), in the context of strategic decisions to invest in human capital, argue that employers will consider women of fertile age less inclined to permanent employment and prefer to hire men for jobs that require highly specialized training. The idea that women of fertile age are more prone to shifts in working life and, respectively,

prefer to invest in universal skills (which retain value in the event of a change of workplace), rather than in special ones (focused on a specific enterprise) can find empirical confirmation in different returns from tenure for women and men: lower returns to tenure for women could be due to employer discrimination based on rational expectations about women's attachment to jobs. For example, if employers engage in statistical discrimination, the perception of women as "fewer" stable workers could lead them to systematically avoid hiring women into jobs with opportunities for specific training or learning (Munasinghe, Reif, & Henriques, 2008).

In particular, even though back in the 80s of the XX century in developed countries, women minimized the gap in the educational level, and since the beginning of the XXI century, they mainly have an educational level higher than average (OECD, 2012), women are much less represented in technical and engineering professions than men (ILO, 2018). A similar situation is common in Ukraine, where women have higher educational levels than men, but engineering and technical professions traditionally remain "male" (State Statistics Service of Ukraine, 2019).

In turn, the tools for identifying and evaluating the components of the gender pay gap include a number of methods based on two main approaches. The first approach involves "equalizing" the values of salary factors for women and men, by selecting to compare populations those women and men who have identical traits important for determining the amount of wage: "in essence, we group women and men wage employees into more homogeneous subgroups, and then estimate the gender pay gap in each of the subgroups" (ILO, 2018).

This technique allows us to "eliminate" the impact of unequal salary factors for women and men within the studied groups and to highlight the gender gap arising from differences in returns to these factors. At the same time, both the characteristics of the employees themselves (their educational level, work experience, etc.) and the characteristics of the work performed can be unified for women and men. For example, using the Edward N. Hay method of assessing gender differences, comparing the earnings of men and women who are employed by the same company, in the same position within its structure, and performing the same functions allows us to evaluate the so-called "like-for-like" pay gap (Ferry, 2018).

The employee's characteristics, which can be interpreted as signs of their qualifications and, accordingly, productivity, and affect the level of payment, are even more diverse. Almost all research is based on the concept of human capital (Mincer, 1974), according to which the characteristics of educational level and experience are an important determinant of the amount of earnings: "it is widely accepted that education and labor market experience (age serving as an approximation of the later) are two important indicators of the job profile of wage employees" (ILO, 2018).

At the same time, both features can, depending on the research goals and subject, be evaluated using different quantitative indicators. So, the educational level may be evaluated according to the classification of educational levels, or the number of accumulated years of study (Blau, & Winkler, 2017), experience is evaluated according to work experience at a certain enterprise (when mainly special human capital is evaluated), total employment experience or stay in the status of an economically active person (if mainly the universal component of human capital is evaluated), or even general age: "age serving as an approximation of the labor market experience" (ILO, 2018).

Also, the traditional factors that are considered for grouping women and men with identical salary factors include the length of working hours (widespread result is that women are more likely to work part-time), belonging to a trade union protection (Goldin, 2015; Iversen, Rosenbluth, & Skorge, 2020), and the field of employment (Blau, & Kahn, 2017; Munasinghe, Reif, & Henriques, 2008). The latter can also be evaluated by industry affiliation, according to the scheme "private-sector versus public-sector employment", or by "occupation", which also allows for the allocation of different groups. For example, the selection of 10 groups based on occupation from "occupations unique to processing, manufacturing, and utilities" to "management occupations" (Cool, 2010; Koshulko, & Dluhopolskyi, 2022).

The second approach to identifying and evaluating the components of the gender pay gap involves modeling remuneration as a dependent variable, with human capital and other wage determinants as independent variables. In particular, the general form of the model is traditionally defined as: "regressions for individual *i*" (the *i* and *t* subscripts are suppressed to simplify the notation) (Blau, & Kahn, 2017):

$$Y_m = X_m B_m + u_m; Y_f = X_f B_f + u_f, \quad (1)$$

where *Y* is the log of wages, *X* is a vector of explanatory variables such as education and experience, *B* is a vector of coefficients, and *u* is an error term.

By determining its parameters from a common database for women and men, an estimate is obtained that quantifies the impact of the entire set of factors on the wage gap. By determining the model coefficients for a database in which women and men have identical characteristics (identical vectors of characteristics affecting wages, Blau, & Kahn, 2017, p. 812), estimates of the impact of special (gendered) factors (adjusted coefficients) can be obtained.

Then, the calculated coefficients allow us to identify the "unexplained component of the wage gap" substituting in the "male function" those values that are inherent in the population of women – the result shows the level of remuneration that would be achieved by women, according to the actual values of the main determinants of the wage size, if they had identical conditions for realizing their economic potential with men. Accordingly, the difference between this calculated value and the actual level of women's remuneration can be interpreted as the result of discrimination (worse conditions that women have compared to men to realize their economic potential in the labor market): "this residual corresponds to an experiment where we compare a woman's actual wage with her predicted wage from the male equation. One might think of the predicted wage as the outcome of a discrimination case in which a firm that previously was found to have discriminated against women is now required to treat women the same as it treats men" (Blau, & Kahn, 2017).

Methods

The choice of tools for our research was determined by two main factors. The first is the model's extremely low explanatory capacity, reflecting the dependence of salary size on educational level and tenure in Ukrainian Energy Enterprises (Gender aspects..., 2021; Dyachuk, Galustyan, & Blizniuk, 2019). The high level of standardization of wage conditions, inherent to the labor contracts of the vast majority of energy employees, powerful state regulation that limits the variability of wages at different energy enterprises, the extremely narrow scope of application of personal employment contracts (only for top managers) in the industry – all these factors significantly reduce the wage differentiation depending on the personal characteristics of employees. This made it inappropriate to use

the tools commonly used in the literature on modeling wage dependence on human capital characteristics. Accordingly, the construction of the "female" and "male" functions of wages (the differences between which serve as the basis for assessing the wage gap and defining its main factors) becomes unproductive, as workplace parameters contribute much more to wage size than a person's human capital characteristics. So, the personal characteristics of human capital take on a new meaning: they show how significant investment in human capital is to attain a position at a certain level of the managerial hierarchy. An analogous approach was used across a range of research devoted to women's career resilience in male-dominated industries (Tokbaeva, & Achtenhagen, 2023; Linnenluecke, 2017; Bimrose, & Hearne, 2012). And this creates a new dimension of gender inequality: if women must achieve better educational parameters to obtain a similar position to men, this can be interpreted as a sign of gender-based limitations. Similarly, if the research shows that, for men with certain levels of education and experience, the probability of reaching a given position in the management hierarchy is significantly higher than for a woman with similar experience and education, this is a sign of gender inequality in the workplace.

The second factor is the good suitability of the research information base for identifying both the traits of the employees (their experience, education, as the basis for assessing the reserves of their human capital) and their position in the qualification hierarchy of the enterprise (as the basis for assessing the complexity of the work performed). Accordingly, the existing database creates the necessary conditions for effective application of the "factor-weighted gender pay gap" method: "in essence, we group women and men wage employees into more homogeneous subgroups, and then estimate the gender pay gap in each of the subgroups. We then construct a weighted sum of all subgroups' specific gender pay gaps, with weights reflecting each subgroup's population size. Thus, we arrive at an alternative to the classic way of estimating the gender pay gap – an alternative we call the "factor-weighted gender pay gap" (ILO, 2018).

Actually, the sum of the factor-weighted gender pay gap shows the proportion of the actual pay gap between women and men observed under the same characteristics selected for classification by gender. Accordingly, the factor-weighted gender pay gap reflects the unequal return observed for women and men on the effort and costs required to acquire the characteristics selected for classification.

Thus, the excess of the actual pay gap between women and men over the factor-weighted gender pay gap reflects the part of the differences caused by the unequal distribution of women and men between the selected groups – differences in the specific weights of respondents belonging to the selected groups in the total number of women and men. For example, the component of factor-weighted gender pay gap in our study is the difference in wages observed between women and men who have the following characteristics: occupy positions, belong to the second qualification group (skilled workers with tools, operators of machines and mechanisms), have up to 5 years of tenure (work experience at the enterprise), and have special vocational education. This difference is weighed by the specific weight of respondents (women and men) with these characteristics relative to the total number of respondents surveyed.

Similarly, the contribution to the total factor-weighted gender pay gap of each selected group is determined. Therefore, the factor-weighted gender pay gap considers only the part of the pay differences observed between

women and men with the same "prerequisites" for receiving a given salary.

We took into account three leading factors of wage size: two reflect respondents' characteristics (education and work experience with a specific energy company), and one reflects the work they perform (position/role in the enterprise's qualification hierarchy). To distinguish groups based on the complexity of the work performed, the international standard for classification of professions, ISCO-08, was used, adapted to the specifics of domestic reference books of professional and qualification characteristics of professions. To distinguish groups by level of education, the National Classification of educational levels serves as the basis for labor statistical reporting of Ukrainian enterprises (Ukrstat, 2010).

Identification of groups by tenure (length of service at the enterprise) was based on the hypothesis that the payment's sensitivity to the five-year difference in tenure was confirmed by respondents' questionnaire responses.

According to the first characteristic (level of education), four groups are distinguished: 1) basic secondary education; 2) vocational and technical education; 3) basic (bachelor's level) higher education; 4) full (master's level) higher education.

According to the second characteristic (tenure – length of service in the company), five groups were distinguished: 1) length of service in the company (length of service) < 5 years; 2) $5 \leq \text{length of service} < 10$; 3) $10 \leq \text{length of service} < 15$; 4) $15 \leq \text{length of service} < 20$; 5) $20 \leq \text{length of service}$.

According to the third characteristic (the respondent's position/workplace in the company's qualification hierarchy), eight groups were identified: 1) simple jobs that do not require qualifications; 2) qualified workers with tools, machine and mechanism operators; 3) linear management of production processes; 4) technical employees; 5) specialists and professionals of initial qualification levels; 6) professionals of higher qualification levels; 7) managers and senior managers; 8) top management of the company (ISCO-08).

This division has a significant drawback: it is not sensitive to differentiation within the same qualification level (for example, an engineer of category I or II; a worker of categories II or VI falls into the same group). In the future, we plan to improve this classification to ensure sensitivity to changes in positions within a particular professional group. Groups that turned out to be "empty" or "empty" for women or men are not taken into account in determining the final value of the factor-weighted gender pay gap.

For groups that turned out to be "empty" for both women and men, the calculation procedure mechanically excludes their influence from the aggregated results. As for groups that turned out to be "empty" for only women or only men, their "gaps" were deliberately excluded from the calculations. After all, then the gap is not caused by differences in the salaries of women and men with identical values of wage factors, but by differences in the distribution of women and men between groups. And this is the influence of exactly the group of factors that is eliminated by the factor-weighted gender pay gap calculation method. In addition, groups that turned out to be "empty" only for men require a change in the procedure for determining the relative deviation of salary: since the size of the wage for men is used as the basis for calculation, it is incorrect to use the "zero value".

The final formula for calculating the factor-weighted gender pay gap for our study was as follows:

$$FWGPG = \sum_{i=1}^8 \sum_{j=1}^5 \sum_{k=1}^7 GG_{ijk} \times N_{ijk} / N_{total}, \quad (2)$$

where k – group number based on the first factor of salary amount (position/workplace in the company's qualification hierarchy); j – group number based on the second factor of salary (work experience in the company); i – group number based on the third factor of salary (educational level of the respondent); GG_{ijk} – gender gap for the group with " i, j, k " combination of the characteristics of salary factors; N_{ijk} – the number of respondents (women and men) in the group with " ijk " combination of the characteristics of salary factors; N_{total} – total number of respondents ($N = 158$).

The above formula was applied both to determine the absolute size of the factor-weighted gender pay gap and to determine the relative value. In the latter case, all terms represent the ratio of the absolute gap ("salary of women in the group" – "salary of men in the group") to the size of the salary of men in the group.

Results

The gender-disaggregated distribution of respondents by salary size ($N = 158$) for positions at different levels of the qualification hierarchy, along with the average wage for these levels, is shown in Table 1.

The actual average monthly salary of 158 respondents (employees of Ukrainian energy companies who indicated

their current salary in the questionnaires) is UAH 16214.2, including UAH 14434.8 for 73 female respondents and UAH 17742.4 for 85 male respondents. Accordingly, the average salary of women is 89.0% of the average salary for the sample and 81.4% of the salary of men. The gender gap is 18.6%.

The sample did not include representatives of the simplest professions (jobs that do not require qualifications). At the 2nd qualification level (positions of skilled workers with tools, operators of machines and mechanisms), there is a relatively high gender gap – 28.2%. At the third qualification level (positions of linear management of production processes), the gender gap is reduced to 5.2%, and at the fourth level (technical employees) it reaches its maximum value – 51.0%. However, this qualification level accounts for only 4.5% of respondents, so the overall impact of this large discrepancy on the aggregated gender gap is small. More significant in determining the overall gender gap are the 5th level (positions of specialists and professionals of lower skill levels) and the 6th (professionals of higher skill levels), which account for 33.5% and 27.2% of the total respondents, respectively. However, within these qualification levels, the gender gap is 5.4% at the fifth level and 1.3% at the sixth. Finally, at the seventh qualification level (respondents in management positions), which accounts for 13.3% of respondents, the gender gap is 3.6%.

Table 1

Gender pay gap: general and qualification levels

	Gender pay gap: general and qualification levels							Total
	Qualification level							
	2	3	4	5	6	7	8	
Women								
Number of employees	8	7	4	28	22	4	0	73
Average salary, UAH	8750	19285.71	10000	12700.75	16562.32	22187.5	-	14434.8
Men								
Number of employees	4	11	3	25	21	17	4	85
Average salary, UAH	12187.5	20340.9	20416.7	13424.5	16785.3	23014.7	23750	17742.4
"women/men" balance, %	71.8	94.8	49.0	94.6	98.7	96.4	-	81.4
All respondents								
Number of employees	12	18	7	53	43	21	4	158
Average salary, UAH	9895.8	19930.6	14464.3	13042.2	16671.2	22857.1	23750	16214.2
Gender gap, %	-28.2	-5.2	-51.0	-5.4	-1.3	-3.6	-	-18.6
Share of respondents of the relevant qualification group in the total number. %	7.6	11.4	4.4	33.5	27.2	13.3	2.5	100

Source: own calculations based on sample survey data.

The eighth qualification level (employees in positions of top management of energy companies) is represented only by men, whose number is 2.5% of the number of respondents, and the salary is UAH 23,750, which is 33.9% higher than the average salary for men and 46.5% higher than the average salary for all respondents.

The hypothesis that a significant gender gap in the remuneration of respondents at the 2nd qualification level (skilled workers) is due to the greater involvement of male respondents in work under difficult and hazardous conditions was considered. The high share of surcharges and allowances that compensate for extreme working conditions is a distinctive feature of the remuneration system in Ukraine, especially in the public sector, and, according to interviews with employees, is fully reflected in the surveyed energy enterprises.

However, in fact, according to the results of the survey, it was revealed that both in terms of the presence of factors of severity and harmfulness of work, and in terms of the share of the non-tariff part of wages (which includes compensation surcharges for severity and harmful working conditions), women have higher indicators than men.

We group all respondents into two main groups of gender gap factors. First, the differences observed between the "women's" and "men's" indicators are due to characteristics that affect wage size (education, experience, position in the company's qualification hierarchy). Second, differences in returns by a certain level of such characteristics observed for women and men (differences in wages between women and men with identical characteristics of tenure, educational level, and position in the qualification hierarchy).

To estimate the share of the gender gap attributable to the unequal returns to analogous workplace and employee-mix factors for women and men, we used the factor-weighted gender pay gap method.

The corresponding calculations are presented in Table 2. The rest (28 respondents) were found in groups having no one representative belonging to another gender group and were excluded from evaluating the factor weighted gender pay gap – differences between their salaries were accounted as a component of the gender wage gap, caused by unequal access of women and men to workplaces with relatively higher levels of wages.

Table 2

Calculation of the components of the gender gap for groups of respondents with identical characteristics of qualifications, experience, and complexity of the work performed (factor-weighted gender pay gap)

Indicators	Complete (master's) higher education, experience from 5 to 10 years, second qualification level	Complete (master's) higher education, experience from 10 to 15 years, third qualification level	Complete (master's) higher education, experience from 15 to 20 years, third qualification level	Complete (master's) higher education, more than 20 years of experience, third qualification level
Number of respondents in the group	3	4	2	10
Absolute gap ("women-men"), UAH	-4375.0	-2083.3	0.0	0.0
Relative wage gap ("women – men/men"), %	-33.3	-10.6	0.0	0.0
Weight of the group gap in the overall gender gap (group size / total number of respondents), %	0.0	0.0	0.0	0.1
Weighted absolute gap, UAH	-101.0	-64.1	0.0	0.0
Weighted relative gap, %	-0.8	-0.3	0.0	0.0
Number of respondents in the group	4	13	8	4
Absolute gap ("women-men"), UAH	-16666.7	2841.6	-957.5	-2704.3
Relative wage gap ("women – men/men"), %	-81.6	24.9	-6.9	-17.3
Weight of the group gap in the overall gender gap (group size / total number of respondents), %	0.0	0.1	0.1	0.0
Weighted absolute gap, UAH	-512.8	284.2	-58.9	-83.2
Weighted relative gap, %	-2.5	2.5	-0.4	-0.5
Number of respondents in the group	14	2	7	5
Absolute gap ("women-men"), UAH	444.4	-2500.0	-6873.7	2814.5
Relative wage gap ("women – men/men"), %	3.5	-18.2	-40.7	19.2
Weight of the group gap in the overall gender gap (group size / total number of respondents), %	0.1	0.0	0.1	0.0
Weighted absolute gap, UAH	47.9	-38.5	-370.1	108.3
Weighted relative gap, %	0.4	-0.3	-2.2	0.7
Number of respondents in the group	7	8	18	3
Absolute gap ("women-men"), UAH	-5874.2	-500.0	1510.1	-1875.0
Relative wage gap ("women – men/men"), %	-32.0	-2.8	9.8	-12.0
Weight of the group gap in the overall gender gap (group size / total number of respondents), %	0.1	0.1	0.1	0.0
Weighted absolute gap, UAH	-316.3	-30.8	209.1	-43.3
Weighted relative gap, %	-1.7	-0.2	1.4	-0.3
Number of respondents in the group	4	6	8	130*
Absolute gap ("women-men"), UAH	-4166.7	0.0	892.9	
Relative wage gap ("women – men/men"), %	-19.2	0.0	3.9	
Weight of the group gap in the overall gender gap (group size / total number of respondents), %	0.0	0.0	0.1	1
Weighted absolute gap, UAH	-128.2	0.0	54.9	-1042.8
Weighted relative gap, %	-0.6	0.0	0.2	-4.6 (-5.88)

Source: own calculations based on sample survey data.

According to calculations, the total gender pay gap attributable to differences in pay for workers with identical qualifications, experience, and job complexity is UAH 1042.8 per month, or 5.88 of the average salary of men in the sample (4.6% of the salary of men with qualifications, experience, and job complexity identical to those of women).

Accordingly, about one-third (31.5%) of the total gender pay gap is due to differences in the pay of women and men with similar qualifications, experience, and job complexity. This portion of the gap can be interpreted as evidence of discrimination against women in remuneration at the surveyed energy enterprises.

The predominant share of the gender pay gap (UAH 2264.8 of the absolute size of the gap, or 68.5% of the total gap) is not explained by differences in pay among with similar qualifications, experience and job complexity, but rather by differences in the distribution of women and men across jobs (positions) with different qualification levels and across groups with different levels of education and experience.

Thus, the contributions of the main factors to the gender pay gap in the surveyed enterprises can be summarized as follows (Table 3).

Discussion and conclusions

Of the 15 groups in which salaries of women and men with similar characteristics of qualifications, tenure, and position in organizational hierarchy were compared, in 5 the level of payment of women was higher than the level of payment of men, in two, the salaries were almost identical, and in 8 groups, the salaries of men were higher than the salaries of women. Groups where women receive higher salaries than men with similar characteristics account for 58 respondents, groups where similar characteristics are better paid to men – 54 respondents, and groups with almost identical salaries – 18 respondents.

At the same time, groups in which women's pay exceeds that of men are shifted closer to the upper qualification levels. Thus, the lowest level, where there is an advantage for women in terms of the size of payment on similar characteristics of education, tenure, and position in the

qualification hierarchy, is the fifth. So, we observe evidence that in accordance with the results of Germany's researcher C. Kräft: "However, the higher the executive hierarchy, the less pronounced is the wage differential between women and men" (Kräft, 2022). Such a similarity in results of researches, occurred in different countries, in different industries, where similarities were observed only in terms of gender characteristics (both studies were conducted in industries dominated by male employment) may testify in

favor of the thesis about the universality of factors that determine the "genderization" of certain types of activities and, accordingly, the growing importance of supranational regulation and international cooperation in the field of elimination gender discrimination in the field of work. It may also be evidence in favor of a processed approach, which emphasizes the importance of continuous efforts toward gender equality (Risberg, & Corvellec, 2022).

Table 3

Contribution of major groups of factors to the gender pay gap for the enterprises surveyed

Group of factors	Contribution to the absolute gap (UAH month)	Contribution to the relative gap (% of men's salaries)	Share of the absolute gap caused by the factors' impact, % of the absolute gap "women-men"
Differences in the distribution of the total number of women and men between jobs (positions) with different qualification levels and groups with different levels of education and tenure	2264.8	12.8	68.5
Differences in pay for men and women who have similar characteristics of factors, impacting the size of the wage gap	1042.8	5.9	31.5

Source: own calculations based on sample survey data.

Men have an advantage already at the second and third qualification levels. In the group with the highest characteristics of education, experience, and complexity of the work performed, where women are represented, their salary is higher than that of men (a group of employees of the seventh qualification level – managers and leaders, with full higher education and more than 20 years of experience).

In general, there is a tendency for "more experience – better remuneration for women, compared to men". So, of the 5 groups where similar characteristics of experience, qualifications and complexity of the work performed are paid for women better than for men, two are a group with more than 20 years of experience, one – from 15 to 20 years, and one – from 10 to 15, which results in almost one and a half times more experience in groups where women's work is paid better than men, compared with groups where men's work is paid better.

This trend is consistent with the thesis of the "leading" and "peripheral" segments of employment, which is widely accepted in the scientific literature (Lukiyanova, 2010; Libanova, 2015). At the same time, in Ukraine, the main factor in entering the "leading" segment of employment is length of service, which employers value more than investments in human capital at the early stages of a working career. A widespread explanation for this situation is the predominance of paternalistic principles of wage differentiation in Ukraine and other post-Soviet countries: loyalty to the employer, as reflected in length of service, affects wage size more than the scale of investment in human capital (Libanova, 2015). In addition, the employer's propensity to invest in human capital increases with increasing length of service (at least up to a certain limit), which is also characteristic of social and labor relations in developed countries (Fevre, 2003; Pereira, & Martins, 2004; Psacharopoulos, & Patrinos, 2004) and can be traced in the system of payment differentiation factors in post-Soviet countries (Lukiyanova, 2010) and in Ukraine (Libanova, 2015).

According to calculations, there are signs of inequality in the conditions for realizing the labor potential of women and men in employment segments characterized by lower qualifications and less work experience. At the same time, the growth of the qualification level and value of the corresponding group of employees for the employer is

accompanied by a noticeable equalization of attitudes towards women and men regarding remuneration.

So, the gender pay gap of UAH 3307.6, or 18.6% of men's wages, observed in the sample in the conditions of a fairly high standardization of wages in the Ukrainian energy sector, indicates the presence of a complex system of factors that limit the ability of women to realize their labor potential through high-paying work in the male-dominated area of employment of energy enterprises. For example, a paper on the British oil and gas industry in the early 2010s reported that the size of the gender wage gap "for the executive sphere ranges between 21.7% and 26.8%" (Kräft, 2022).

The leading factor in the gender pay gap is the unequal access of women and men to the characteristics that increase wages. In particular, the disparity in the distribution of the total number of female and male respondents between the qualification levels (the average qualification level of women is 4.8 vs. 5.5 for men), together with differences in education and experience, causes UAH 2265 of the absolute wage gap (12.8% of men's salaries and 68.5% of the total size of the actually recorded gender gap).

The unequal level of remuneration of women and men who have similar characteristics of the complexity of the work (they work at the same level in the qualification hierarchy of companies), experience, and education causes a UAH 1043 of absolute wage gap (5.9% of men's salaries and 31.5% of the total gender gap). Such results are very similar to results obtained in the paper (Kräft, 2022): "A substantial part of the pay differential, 6.0-9.5%, can be attributed to the fact that the same characteristics shared by women and men are evaluated differently".

Accordingly, the calculations suggest that the inequality in opportunities to realize the labor potential of women and men in the energy sector manifests primarily in restricting women's access to higher-paid positions rather than in underpaying women relative to men in similar positions.

We identified the limitations of women's career growth in two main dimensions. First, the absence of women in the sample at the higher (8th) qualification level. It is important that this sample was organized in such a way that men and women at each qualification level had approximately the same probability of getting into the sample, accordingly, the

gender structure of the sample is close to the gender structure of the general population and the backwardness of women in the sample at a certain qualification level indicates, at least, about the lower representation of women in the relevant positions of the surveyed enterprises. Second – if among men at the penultimate (7th) qualification level some do not have the desired formal education (higher in the relevant specialty), then this is not observed among women: all women who got to the penultimate (7th) qualification level have an absolutely appropriate position education. This testifies to the fact that there are stricter formal restrictions on career growth applied to women compared to men. To a certain extent, both identified features may be a sign of the existence of the phenomenon of "men's clubs" (Windsor, & Auyeung, 2006), the functioning of which contributes to unequal conditions for the promotion of women and men, in particular, due to the mentioned practice of more harshly applying formal requirements to the educational level concerning women.

Gender gap formation through unequal remuneration of women and men having similar characteristics of experience, education and qualification level of the work is localized in the lower qualification levels (from the 2nd to the 4th), and through inequality of access to high-paying work is manifested in the absence of women at the highest (8th) qualification level, a clear predominance of men at the 7th qualification level and a noticeable predominance at the third qualification level, which in terms of payment outcores both the 5th and 6th qualification levels. Accordingly, the leading factor in the gender pay gap is the predominance of men at the three highest-paid qualification levels.

At the same time, according to research conducted by the NGO Poruch (Analysis of gender..., 2023), after the war began, respondents employed in energy enterprises with lower gender pay gaps were less inclined to change their place of work or residence. Besides, such respondents, more often than employees of enterprises with a high gender pay gap, kept their jobs and maintained the level of their incomes.

Accordingly, we observe the example of establishing a connection between the additional costs that energy companies incurred in the pre-war period to ensure gender equity in access to labor (as a factor) and the saving of budget and donor resources, due to the reduction of the need for social and humanitarian help (as a dependent parameter). This form of connection (where the centers of cost formation and benefit extraction are separated, respectively, the motivation to spend resources on ensuring gender equality and social inclusion is weak, and the load on the relevant institutional capacity of organizations is increasing) is considered the most difficult to spread in society (Sabirianova, 2001; ILO, 2017; Vysochyna et al., 2023; Simakhova et al., 2022). Thus, the example of establishing such a connection is especially demonstrative.

The limitations of the article lie in the fact that the data analyzed were collected before the full-scale invasion of Russia into Ukraine. Therefore, our extrapolation of the situation to the conditions of the ongoing war involves certain assumptions regarding the current situation in the country. An additional limiting factor is the insensitivity to finer gradations within a single qualification level (for example, within the category of engineers), which masks part of the "explained" gap. The small number of respondents in certain qualification levels (for example, Level 4 accounting for only 4.5% of respondents) leads to extreme gap values (51%), which appear to be statistically random. Further research on the dynamics of changes is planned for the 2024-2026 period.

The results show that wage differences between women and men (both caused by unequal pay for the same characteristics of experience, education, and work performed, and associated with unequal access to high-paid work) in Ukraine are quite close to the patterns of inequality observed in several European countries. Such results may support the hypothesis that the industry-specificity (type of activity) affects wage gender differentiation more than national specificity.

Localization of differences in remuneration of similar characteristics of qualifications, experience, and complexity of work at lower levels of the qualification hierarchy, as well as the weakening of such inequality as the experience of employees increases, indicates that the problem of gender inequality is more inherent in the segment of "peripheral" employment. As the skills and experience grow (respectively, the value of employees to employers), the problem of gender pay inequality becomes less noticeable. However, the number of women who reach a career level at which gender pay inequality is almost absent is fewer than the number of men who do.

Such results indicate that the phenomenon described in the literature on "men's clubs" is observed in Ukrainian energetics and may significantly contribute to unequal conditions for the promotion of women and men, particularly through the practice of harsher application of formal educational requirements to women. In the context of the war and worsening labor shortages, eliminating artificial barriers to women's professional mobility in the energy sector is critical for Ukraine. Therefore, further research on selecting a set of measures to eliminate or compensate for the effects of "men's clubs" at the highest levels of energy companies' management will be a significant factor in improving the analytical support for gender equality policy in energy.

In a general sense, the positive connection between decreasing the gender wage gap and the sustainability of organizations in war conditions, observed in the Ukrainian energy sector, may be the prospective subject of further research in the context of embedding gender equality and social inclusion in the economic preconditions of the sustainability of the liberal-democratic order in post-Soviet countries.

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ГЕНДЕРНА РІВНІСТЬ ОПЛАТИ ПРАЦІ ТА СОЦІАЛЬНА СТІЙКІСТЬ: ПЕРСПЕКТИВИ УКРАЇНСЬКИХ ЕНЕРГЕТИЧНИХ КОМПАНІЙ

Вступ. Актуальність дослідження полягає в аналізі гендерного розриву в оплаті праці в енергетичному секторі України на основі даних опитування енергетичних компаній із метою виявлення його ключових чинників. Метою дослідження є отримання емпіричних висновків щодо причин цього розриву. Об'єктом дослідження є процеси визначення заробітної плати та нерівності в оплаті праці між професійними групами в енергетичних компаніях, а предметом – підходи й інструменти оцінювання гендерних відмінностей у заробіт-

ній платі та кар'єрному просуванні. Використовуючи метод факторно-зваженого гендерного розриву в оплаті праці, дослідження оцінює відмінності між жінками та чоловіками з порівнянням рівнем освіти, стажем і позиціями в ієрархії кваліфікацій. Результати показують, що основним чинником розриву є нерівний доступ жінок до кваліфікацій, які підвищують заробітну плату, а також наявність неформальних інституційних бар'єрів, що обмежують їхнє кар'єрне зростання. Ці висновки мають практичне значення для перегляду політики гендерної рівності та посилення ролі жінок в енергетичній галузі.

Методи. Застосовано метод факторно-зваженого гендерного розриву в оплаті праці, який групує працівників за рівнем освіти, стажем і позицією в кваліфікаційній ієрархії для оцінювання гендерних відмінностей у заробітній платі.

Результати. Дослідження показало, що гендерний розрив в оплаті праці в енергетичному секторі України зумовлений переважно нерівним доступом жінок до кваліфікацій, які підвищують заробітну плату, а також наявністю неформальних інституційних бар'єрів, що стримують їхнє кар'єрне просування.

Висновки. Дослідження засвідчує, що гендерна нерівність в оплаті праці в енергетичному секторі України відображає європейські тенденції, найбільш виражена на нижчих рівнях кваліфікації та посилюється практиками "чоловічих клубів", що підкреслює нагальну потребу усунення інституційних бар'єрів для кар'єрного зростання жінок, особливо в умовах воєнного дефіциту робочої сили.

Ключові слова: гендерний розрив в оплаті праці, енергетика, професійні групи, нерівність, доступ до роботи, стійкість.

Автори заявляють про відсутність конфлікту інтересів. Спонсори не брали участі в розробленні дослідження; у зборі, аналізі чи інтерпретації даних; у написанні рукопису; в рішенні про публікацію результатів.

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