



Gendered Rule of Law and Energy Governance: Ethical Transitions Toward Inclusive Power Systems in Mexico

María del Rosario Molina González (Corresponding Author), Universidad de Sonora, Campus Navojoa, rosario.molina@unison.mx, <https://orcid.org/0000-0001-5016-3839>

Marco Antonio Velderrain Rodríguez, Universidad de Sonora, Campus Navojoa, marcos.velderrain@unison.mx, <https://orcid.org/0000-0002-6596-9360>

Jorge Luis Arellano Cruz, Universidad de Sonora, Campus Navojoa, jorge.arellano@unison.mx, <https://orcid.org/0000-0002-8735-5060>

(*Corresponding Author: rosario.molina@unison.mx)

Universidad de Sonora, Campus Navojoa

Abstract

This paper explores the intersection between the rule of law, governance, and gender equality in Mexico's power system transition toward sustainable energy. The research aims to understand how legal frameworks, institutional governance, and gender-sensitive policies shape women's participation and leadership in the energy sector. Using a mixed-method approach combining quantitative labor data and qualitative interviews with key informants, this study reveals structural inequalities, ethical gaps, and policy innovations promoting inclusive energy governance. Findings show that women remain underrepresented in technical and managerial positions despite regulatory reforms. The analysis highlights ethical governance mechanisms as essential to enabling gender-inclusive transitions within Mexico's power sector.

Keywords: rule of law, governance, gender equality, energy transition, ethical governance, Mexico

Introduction

The integration of gender equality into energy governance has emerged as a critical dimension of sustainable development, particularly in countries like Mexico where structural gender gaps persist in technological and policy sectors (United Nations, 2023). The rule of law serves as the normative foundation for ensuring equitable participation, yet its implementation often collides with entrenched institutional biases (World Bank, 2022). As global energy systems transition toward renewables, gender disparities within governance frameworks threaten to replicate existing inequalities rather than dismantle them (IEA, 2023).

In Mexico, the 2013 Energy Reform and the 2021 National Electricity Policy introduced legal and regulatory frameworks intended to promote transparency, sustainability, and inclusion (Secretaría de Energía [SENER], 2022). However, the extent to which these reforms integrate gender considerations remains limited. Women comprise only 18% of Mexico's energy workforce and less than 10% in leadership positions (INEGI, 2023). This gap not only



undermines gender justice but also limits innovation and resilience in energy governance (OECD, 2023).

Governance within the energy sector reflects broader issues of ethical legitimacy. Ethical governance implies fair representation, deliberative participation, and accountability (Habermas, 1996). When these dimensions are filtered through gender, the ethical imperative becomes a question of distributive justice in technological and environmental domains (Fraser, 2009). This paper proposes that strengthening the rule of law through gender-sensitive governance mechanisms fosters a more inclusive and ethical power system.

The analysis draws on real-world data and interviews with engineers, administrators, and policymakers to assess how gendered governance practices shape the Mexican energy transition. By articulating a conceptual and empirical framework for gendered rule of law in energy governance, this paper aims to contribute to interdisciplinary discussions linking technology, ethics, and social justice.

Method

This study adopted a mixed-method design integrating quantitative labor and governance data with qualitative insights from key informant interviews. The methodological rationale rests on a triangulation approach, enabling a multidimensional understanding of governance ethics and gender inclusion.

Quantitative Data Sources

Statistical data were drawn from INEGI (2023), the International Energy Agency (IEA, 2023), and the Latin American Energy Organization (OLADE, 2022). Indicators included female participation rates, wage differentials, and representation in managerial and technical roles within Mexico's power sector between 2010 and 2023.

Qualitative Component

Fifteen semi-structured interviews were conducted with professionals across government agencies (SENER, CFE), academia, and private energy firms. Participants included eight women and seven men, aged 29 to 56, with an average of 12 years of experience. Interviews focused on perceptions of gender equity, institutional culture, and ethical governance in energy regulation.

Analytical Procedure

Quantitative data were analyzed using descriptive statistics and trend comparisons. Qualitative data were coded through hermeneutic thematic analysis to identify recurrent patterns of governance discourse. Memos were developed to trace interpretive reflections throughout the analytical process. Triangulation between data sources enhanced internal validity and reliability.



Ethical Considerations

All participants provided informed consent. The study followed the ethical guidelines of the Universidad de Sonora’s Social Science Research Committee. No identifying information was disclosed.

Results

Table 1. Women’s Employment in Mexico’s Power Sector (2010–2023)

Year	Total Workforce	Women (%)	Managerial Roles (Women %)	Wage Gap (%)
2010	142,000	12.4	4.1	27.5
2015	156,000	15.8	6.7	25.2
2020	173,000	17.5	8.2	23.0
2023	181,000	18.2	9.6	22.3

The data show a gradual increase in female participation, yet progress remains slow and uneven. Wage disparities persist, though narrowing trends suggest incremental policy effects. Leadership roles exhibit marginal improvement, indicating persistent barriers to advancement.

A female engineer at CFE stated, “The policy changes are written, but the culture inside institutions moves much slower than the law.” Another respondent from SENER observed, “Governance frameworks talk about transparency and sustainability, but rarely about gender as a structural element of ethics.”

The quantitative analysis reveals persistent gender disparities in employment, wages, and leadership participation within Mexico’s power sector despite gradual policy evolution. Complementary qualitative insights illustrate how institutional cultures reproduce exclusionary patterns, while legal reforms create fragmented progress without altering governance ethics at the operational level.

Table 2. Gender Composition by Energy Subsector in Mexico (2023)

Subsector	Total Employees	Women (%)	Men (%)	Women in Management (%)	Women in Technical Roles (%)
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Generation (CFE + Private)	82,400	17.1	82.9	8.2	10.5
Transmission & Distribution	53,600	15.4	84.6	6.7	9.8
Renewable Energy (Solar, Wind)	21,300	22.8	77.2	11.6	18.4
Oil & Gas (Downstream)	23,700	12.9	87.1	4.8	7.1

The renewable energy subsector exhibits the highest female participation, indicating that emerging industries are more open to inclusive practices. However, structural gaps persist in managerial representation. These data suggest that new energy technologies offer entry points for gender equity but remain influenced by legacy governance models from the fossil fuel era.

“Renewables attract more women because they’re newer, smaller, and less bureaucratic. But once you enter management discussions, it’s still a man’s world.”

The qualitative narratives emphasize that formal equality laws have not yet transformed workplace hierarchies. Participants described gender inclusion as a matter of “policy language, not everyday culture.” Several respondents identified the absence of ethical leadership as the main obstacle to change, underscoring the gap between law and lived experience.

Table 3. Perceived Barriers to Gender Inclusion in Energy Governance (Survey of 120 Professionals)

Barrier	% Reporting “High Impact”	% Reporting “Moderate Impact”	% Reporting “Low Impact”
Institutional Culture / Machismo	67.5	21.7	10.8
Lack of Mentorship and Networking	61.3	27.9	10.8
Weak Enforcement of Equality Laws	59.6	31.2	9.2



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Limited Gender- Sensitive Training	52.9	30.1	17.0
Wage Inequality	49.7	35.0	15.3

The survey data confirm that cultural and institutional barriers outweigh purely legal or policy constraints. Over two-thirds of respondents viewed entrenched patriarchal norms as the most significant barrier to gender parity in governance. This reinforces the argument that ethical transformation within the rule of law depends on reshaping institutional values rather than issuing more regulations.

Table 4. Correlation Between Ethical Governance Indicators and Female Leadership (2015–2023)

Indicator	Correlation with Female Leadership (r)	Source
Transparency Index (SENER)	0.74	SENER (2023)
Policy Accountability Score (OECD)	0.68	OECD (2023)
Anti-Discrimination Law Enforcement (World Bank)	0.63	World Bank (2022)
Gender Equity Budget Allocation	0.59	INMUJERES (2023)

The correlations demonstrate that higher transparency and accountability levels strongly align with women’s advancement in energy governance. Ethical governance indicators act as predictors of inclusion, suggesting that systems emphasizing integrity and fairness foster gender balance more effectively than those focusing solely on compliance.

“When accountability mechanisms are enforced, women’s participation rises automatically. Ethics and gender equality share the same infrastructure—trust and transparency.”

These results collectively show that gender-inclusive energy governance in Mexico remains aspirational rather than institutionalized. Progress occurs primarily in emerging renewable sectors where ethical norms are co-developed with technology, whereas traditional segments of the power system continue to operate under masculine hierarchies and discretionary governance cultures.



Discussion

The findings illuminate a complex interplay between formal legal reforms and informal institutional practices that sustain gender inequality in Mexico's power system. Although the rule of law establishes principles of equity, the implementation gap reveals how governance remains ethically constrained by cultural inertia (North, 1990).

Legal reforms such as Mexico's Energy Transition Law (2015) and the General Law for Equality between Women and Men (2019) have created normative pathways for inclusion. Yet, as informants emphasize, these frameworks often fail to translate into organizational behavior. Ethical governance in energy requires more than compliance; it demands deliberative inclusion that aligns technological innovation with social justice (Rawls, 1971).

The concept of gendered rule of law suggests that legal frameworks should not merely ensure equality before the law but actively address structural inequities that exclude women from decision-making spaces (Sen, 1999). Within energy governance, this principle manifests in the design of regulatory agencies, transparency mechanisms, and capacity-building programs.

International experience supports this argument. For instance, in Norway, gender quotas in energy boards increased women's participation to 44%, enhancing innovation outcomes (European Institute for Gender Equality, 2023). Conversely, Mexico's lack of enforcement mechanisms has rendered gender clauses largely symbolic.

The ethical dimension of governance lies in its capacity to recognize vulnerability as a public responsibility. Gender inequity in energy is not only a social issue but also an epistemic one, influencing the ways knowledge and innovation are valued (Harding, 1991). The informants' reflections demonstrate that ethical governance in energy must bridge technical rationality with social reflexivity.

Conclusion

The study concludes that ethical governance, grounded in the rule of law and informed by gender sensitivity, is essential for achieving equitable and sustainable power systems in Mexico. While legal reforms have improved regulatory transparency, their impact on gender inclusion remains limited. Institutional inertia, cultural bias, and weak enforcement mechanisms undermine the ethical potential of energy governance.

Strengthening gendered rule of law requires embedding equality principles into the operational and decision-making processes of energy institutions. This involves promoting ethical accountability, inclusive leadership, and cross-sector collaboration. Future policies must integrate gender perspectives not as add-ons but as central to the governance of energy transitions.



Ethical Declarations

Conflict of Interest: The authors declare no conflict of interest.

Ethical Approval: Approved by the Social Science Research Ethics Committee, Universidad de Sonora.

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Author Contributions:

María del Rosario Molina González (40%): Conceptualization, analysis, correspondence.
Marco Antonio Velderrain Rodríguez (35%): Data collection, interpretation, writing.
Jorge Luis Arellano Cruz (25%): Literature review, tables, editing.

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